fischer elektronik

to cool to protect to connect

f.cool.e 15/16

made in Germany

AEO

TÜV ISO 9001 ISO 14001 ISO 27001

Extruded heatsinks LED heatsinks Cooling aggregates

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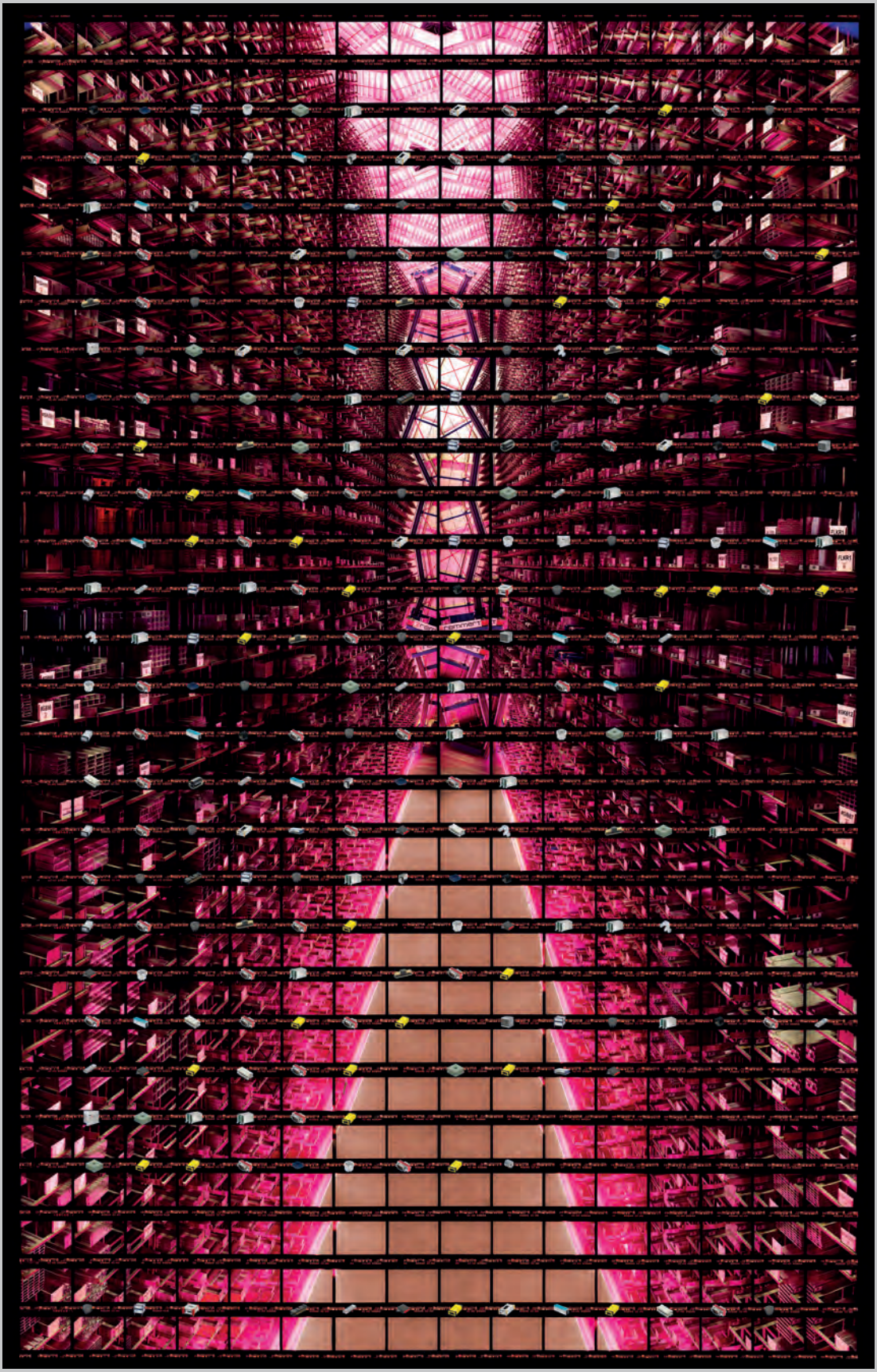

Quotations for Fischer Elektronik 3

C-print on Alu Dibond 65,5 x 98 cm

from:
Thomas Kellner
www.thomaskellner.com

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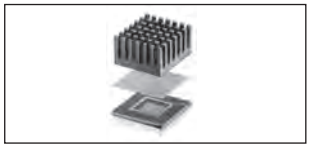
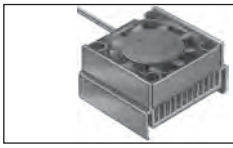
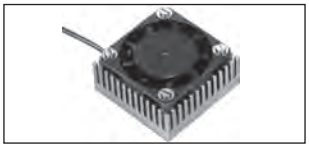
B	B 1 – B 62				
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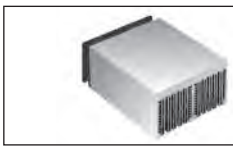
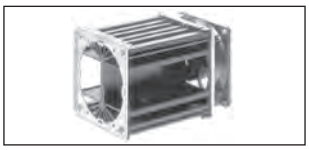
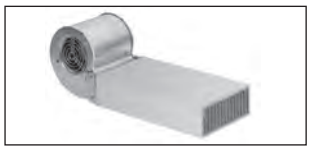
D	D 1 – D 36				
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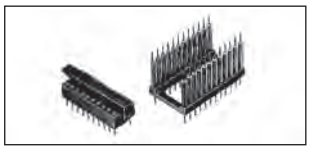
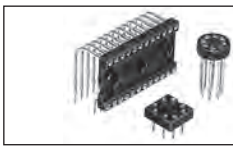
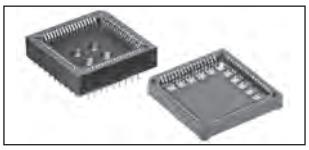
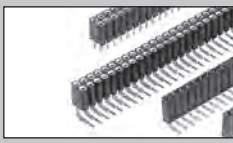
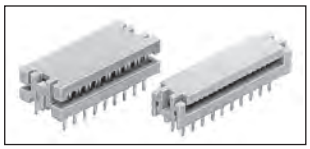
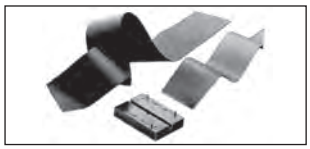
F	F 1 – F 28				
G	G 1 – G 84				
H	H 1 – H 12				
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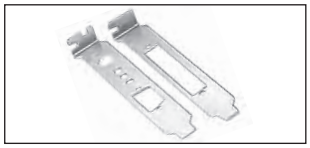
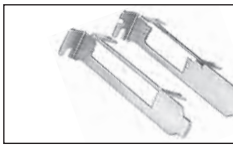
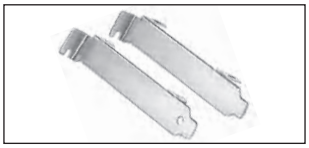
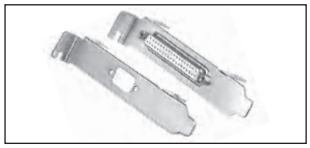
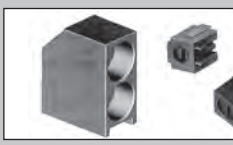
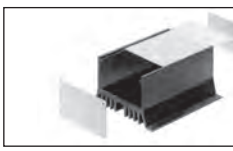
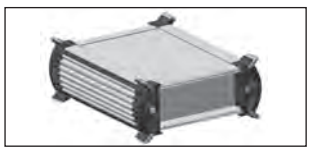
K	K 1 – K 28				
L	L 1 – L 10				
M	M 1 – M 56				
N	N 1 – N 80				

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Alphanumerical product list

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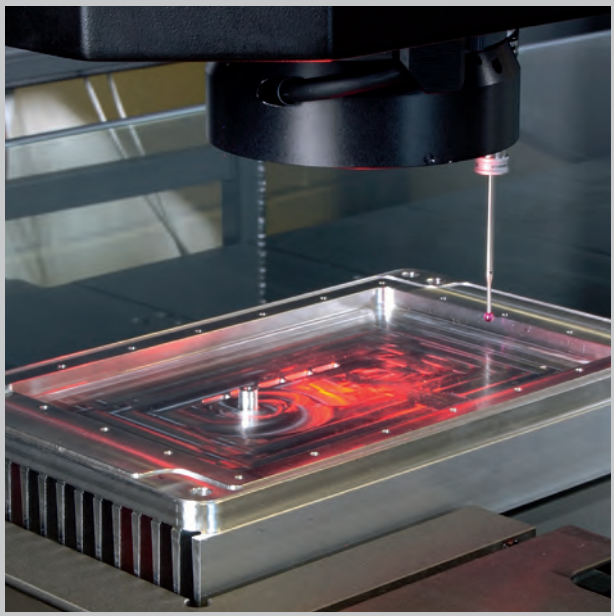
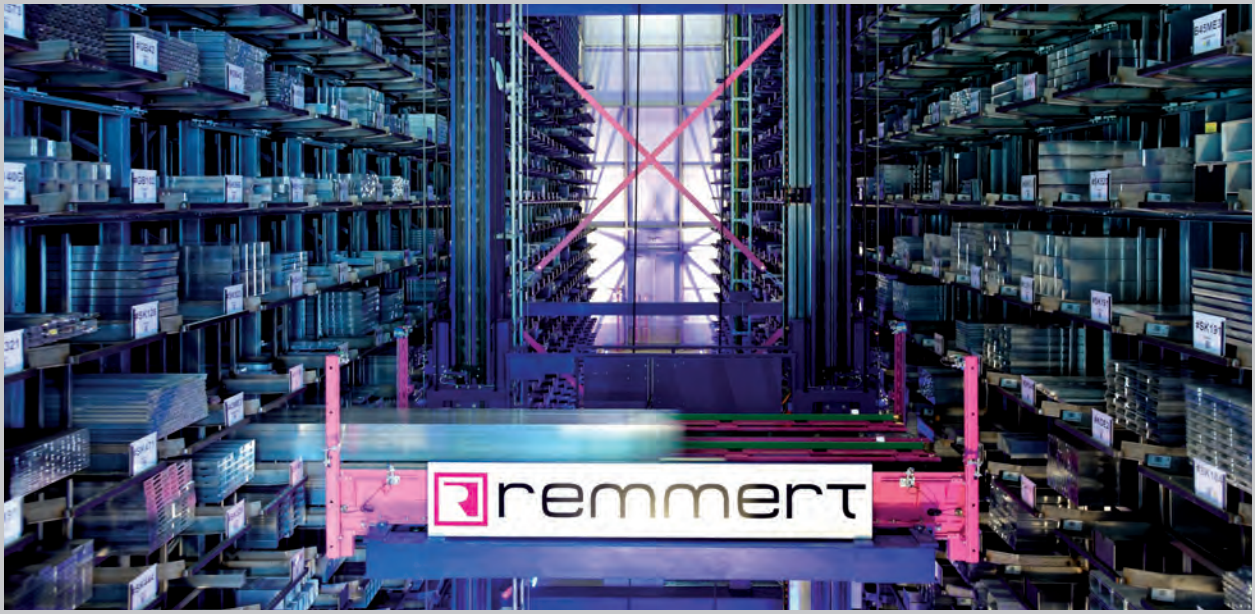


certified quality management

own tool-making department



foresighted storekeeping

efficient special machines

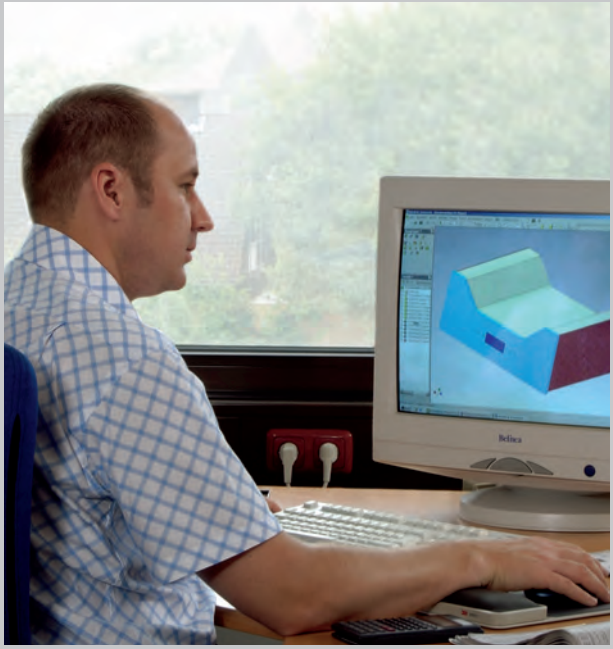
precise punching department

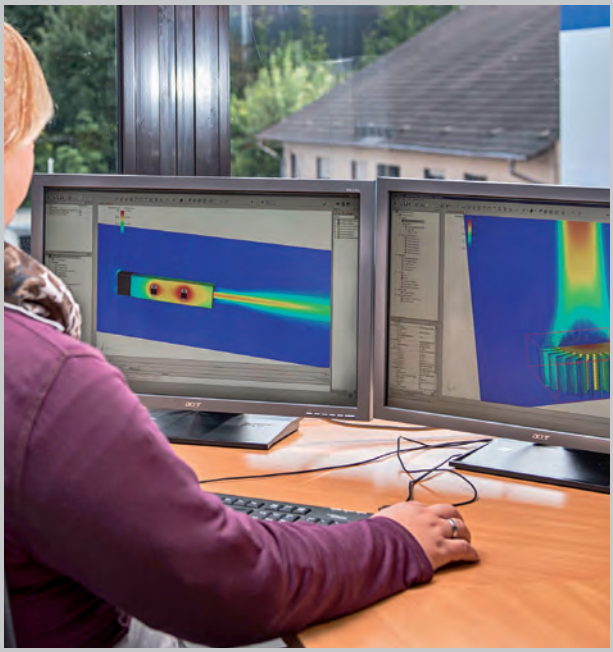
up-to-date milling technology

foyer of the company

motivated employees

committed field service





innovative product development

Quality-Management System DIN EN ISO 9001

We are certified to DIN EN ISO 9001.
This process-directed quality management system implies a constant focus on satisfying the demands of customers, and this is the major objective of our company.

The implementation and further development of our quality management system demonstrably ensures
- guaranteed customer satisfaction and thus the success of our company,
- compliance with customers' requirements at all times through defined processes,
- early detection and prevention of errors, and
- checking of both process effectiveness and efficiency on a regular basis together with steady improvement.

It is through constant vigilance and the provision of evidence that we deliver flawless products, which fully comply with quality requirements, that we maintain our quality certification.
In order to secure lasting company success and to meet our customers' expectations now and in the future, we define measurable objectives within the framework of our quality system, which are regularly checked and developed.
We are committed to constant measurement and improvement of our performance.

Our quality management system applies to all processes carried out by our company.

Certificate

Standard **ISO 9001:2008**

Certificate Registr. No. 09 100 4274

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Certificate Holder: fischer elektronik

Fischer Elektronik GmbH & Co. KG
Nottebohmstraße 28
D - 58511 Lüdenscheid

Scope: Design/construction, manufacture, assembly and technical advice for heatsinks, sockets, connectors, mounting parts, cases, 19" assembly systems, computer accessories

An audit was performed, Report No. 4274. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
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Validity: The certificate is valid from 2012-11-01 until 2015-10-31.
First certification 1994

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Environmental Management System DIN EN ISO 14001

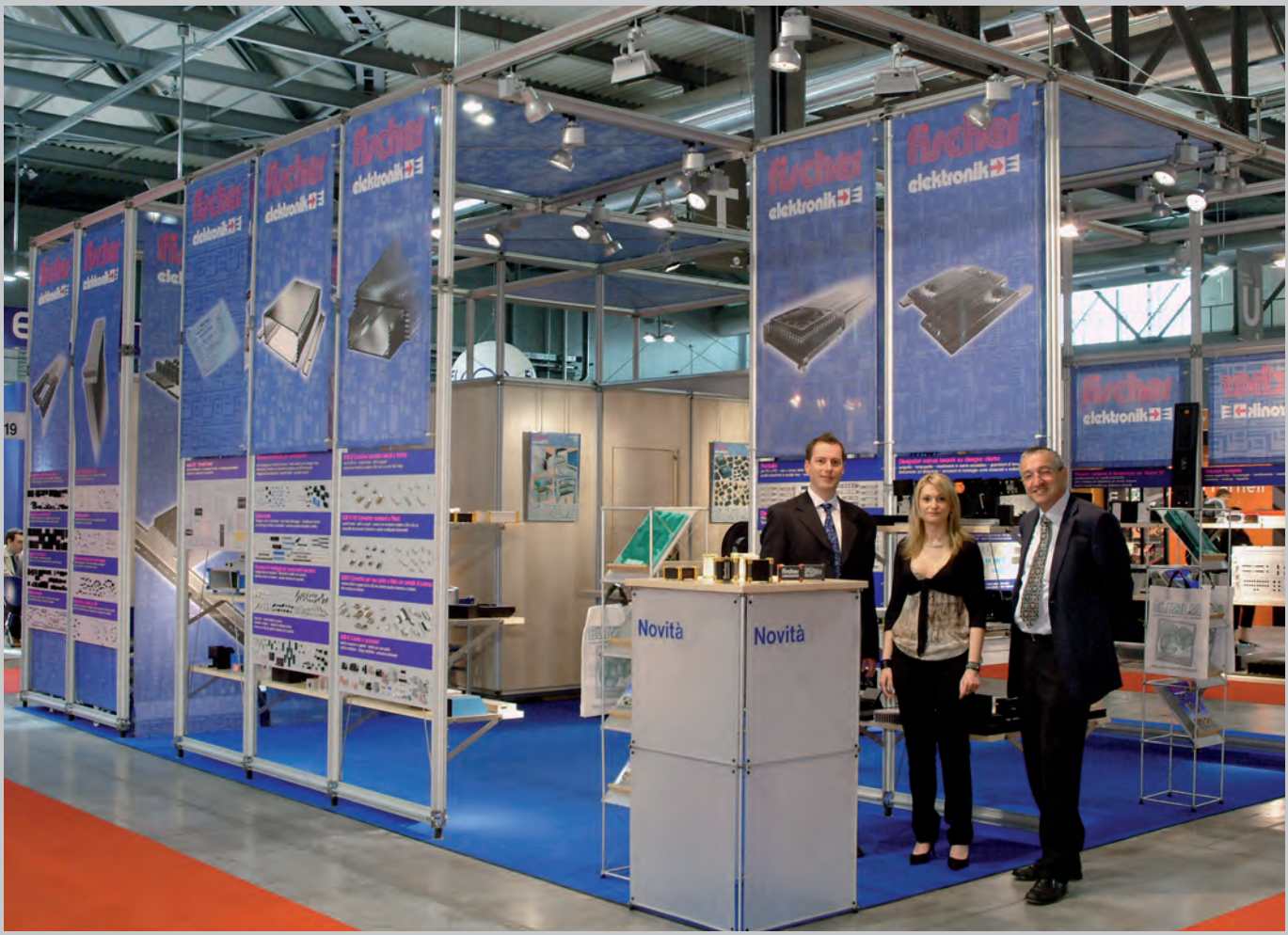
Fischer Elektronik considers protection of the environment and saving of natural resources entrepreneurial tasks of high priority.

Aware of this, Fischer Elektronik was the first German heatsink manufacturer to implement, in 1998, the environmental management system in accordance with DIN EN ISO 14001.

Our entrepreneurial responsibility comprises preventing accidents, safeguarding against occupational diseases, designing workplaces to suit human requirements, developing products which are safe to use, saving resources and avoiding environmental impact to the maximum extent possible.

We already consider environmental compatibility at the product and process development stage. The environmental impact of our activities is documented, assessed and in a continuous improvement process reduced to a minimum.

Implementation and consistent working on and with the environmental management system is a vital process and a constant challenge but finally it will always lead to better results.



BIAS, Milan I

Electronica, Tel Aviv IL

PCIM, Nuremberg D

Electro Salon, Budapest HU

Elkom, Helsinki FI

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We exhibit

Paris F
16. 9. - 18. 9. 2014
www.enova-event.com
hall 7.2

Hamburg D
23. 9. - 26. 9. 2014
www.windenergyhamburg.com
hall B 7, stand 537

Bregenz A
30. 9. - 2. 10. 2014
www.led-professional.com

Paris F
14. 10. - 15. 10. 2014
www.forumled.com
stand B 10

Munich D
11. 11. - 14. 11. 2014
www.electronica.de
hall B 1, stand 155

London GB
19. 11. - 20. 11. 2014
www.luxlive.co.uk
hall A 32

Nuremberg D
24. 2. - 26. 2. 2015
www.embedded-world.de
stand 4 A - 311

Nuremberg D
20. 5. - 22. 5. 2015
www.pcim.de

Stockholm S
19. 4. - 21. 4. 2016
www.see-event.se

Explanations – references – printings

A ... index area: shows topics/categories "current"

B ... index area: shows topics/categories "following"

D 15 ... page number

Standard aluminium profiles	→ A 135 - 136
Technical explanations	→ A 2 - 8
Extruded heatsinks	→ A 22 - 83
Assignment table	→ A 18 - 22

... footnotes, give references to pages with combinable or similar products

SA = black anodised
MI = solderable surface
ME = clear anodised
TP = chrom-free transparent passivated

... option for surface finishing

→ A 10 ... link to page

... length on stock in mm

... hole pattern

... symbol of heatsink geometry

R_{th} ... thermal resistance in K/W

... thickness of sheet/plate

v ... air/speed in m/s

Imprinting of cardholders - Your and our time is expensive

An order for imprinting must state the font, the font size and the exact position of the imprint with dimensions, taking due account of countersunk holes etc.. When placing the first order, the company logo must be supplied as a vector file. If these conditions are not complied with, the order for imprinting may have to be turned down, or additional costs will have to be charged.

Compliance with the following criteria ensures smooth handling:

Adobe Illustrator (.ai/.eps)	without half-tone images, fonts transformed into paths or supplied
CorelDraw (.cdr)	
Adobe Acrobat (.pdf)	
QuarkXPress (.qxd)	all fonts enclosed; half-tone images colour-separated (full-tone or scale colours) and
InDesign (.indd)	with correct resolution (300 dpi colour, black / white 600 dpi), no RGB

All this takes additional time and consequently incurs extra costs.
The usability must be checked by our printing shop:
screen formats (.jpg, .gif, .png) and paper copies, stickers and the like are not suitable for preparing printer's copies!

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Please always add dimensional drawings (.dxf) to the parts to be imprinted! Please note as a general rule:
Retouching work extending beyond the standard time will be invoiced additionally at cost price.

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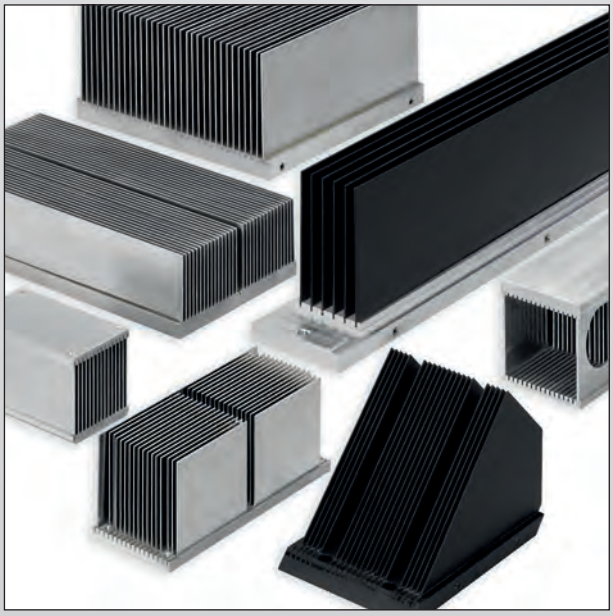
Machined heatsinks
Fluid heatsinks
Lamella heatsinks
Extruded heatsink with solder pins

Machined heatsinks
- several hundreds of extrusion profiles available
- future orientated stockkeeping of heatsink profiles in a fully automatic honeycomb warehouse
- precise milling treatments in highest quality
- effective heat spreading by means of heatsinks with grouted copper areas
- designs and modifications according to your demand

Fluid heatsinks
- fluid heatsinks for dissipation of big heat flow volumes
- compact design with internal lamella structure
- thick bottom plates for optimal heat dissipation
- I- and U streamed versions
- water connection or mounting flange for your special application
- customized treatments and solutions



Lamella heatsinks
- compact lamella heatsinks with a big surface
- special design for forced convection
- thermotechnical optimal fitted lamellas
- precise milled flat semiconductor mounting surface
- single and double sided bottom plate made of aluminium or copper
- production according to customer specified demands

Extruded heatsinks with solder pins
- solid pressed in soldering pins and threaded bolts for a direct pcb-mounting
- for horizontal and vertical mounting position
- standard drilling patterns and transistor retaining springs for various semi-conductive elements
- soldering pins with insulation for spacing help
- variations and modifications according to drawing

Technical introduction

1. General points

In order to provide optimum performance of semi-conducting devices it is essential not to exceed the maximum junction temperature indicated by the manufacturer.

Generally this maximum junction temperature can only be maintained without exceeding it by running the device concerned at lower power outputs.

At outputs approaching the maximum ratings semi-conductor devices have to be cooled by so called heatsinks, sometimes called dissipators.

The thermal performance of these heatsinks primarily depends on the thermal conductivity of the material from which they are made, size of surface area and mass.

In addition, surface colour, mounting position,temperature, ambient air velocity and mounting place all have varying influence on the final performance of the heatsink from one application to another..

However, a figure for thermal resistance can be experimentally determined in a reliable manner and used in the equations that follow in part 2.

There are no agreed international standard methods for testing electronic cooling systems or for the determination of the thermal resistance.

Therefore the diagrams and values given in our catalogue have been determined under practical operating conditions and therefore allow the most suitable heatsink from the range to be selected.

We expressly point out that all information and data is given to the best of our knowledge and belief. The user is solely responsible for the proper use of our products and he should check their suitability for the intended application.

Fischer Elektronik do not assume any warranty, whether expressed or implied, for the suitability, function or merchantibility of their products in specific or general applications, and they cannot be held liable for accidental or consequential damage due to non-observance of the above.

Furthermore Fischer Elektronik reserve the right to carry out technical modifications to their products at any time.
All orders are subject to the General Sales Conditions of Fischer Elektronik.

2. The determination of thermal resistance

The thermal resistance is the parameter that is the most important in cooler selection, apart from mechanical considerations.

For determination of the thermal resistance the following equation applies:

Equation 1:

$$R_{thK} = \frac{\vartheta i - \vartheta u}{P} - (R_{thG} + R_{thM}) = \frac{\Delta\vartheta}{P} - R_{thGM}$$

In case of an application where the maximum junction temperature is not exceeded the temperature has to be verified.
When the case temperature has been measured the use of the following equation will enable the maximum junction temperature to be calculated:

Equation 2:

$$\vartheta_i = \vartheta_G + P \times R_{thG}$$

The meaning of the determinants:

ϑ_i = maximum junction temperature in °C of the device as indicated by manufacturer.
As a »safety factor« this should be reduced by 20-30 °C.

ϑ_u = ambient temperature in °C.
The rise in temperature caused by radiant heat of the heatsink should be increased by a margin of 10-30 °C.

$\Delta\vartheta$ = difference between maximum junction temperature and ambient temperature.

ϑ_G = measured temperature of device case (equation 2).

P = maximum power rating of device in watts

R_{th} = thermal resistance in K/W

R_{thG} = internal thermal resistance of semiconductor device (as indicated by manufacturer)

Heatsinks profile-overview → **A 13 - 17**
Heatsink special design → **A 137 - 138**
Special profiles → **A 140**
Heatsink as visual & decor-parts → **A 10**
Heatsinks for SSR → **A 11 - 12**
Die-cast heatsinks → **A 125**
Assigment table → **A 18 - 20**
Order example → **A 21**

R_{thM} = thermal resistance of mounting surface. For TO 3 cases the following approximate values apply:

1. dry, without insulatar	0.05 - 0.20 K/W
2. with thermal compound/without insulator	0.005 - 0.10 K/W
3. Aluminium oxide wafer with thermal compound	0.20 - 0.60 K/W
4. Mica wafer (0.05 mm thick) with thermal compound	0.40 - 0.90 K/W

R_{thK} = thermal resistance of heatsink, which can be directly taken from the diagrams

R_{thGM} = sum of R_{thG} and R_{thM}. For parallel connections of several transistors the value R_{thGM} can be determined by the following equation:

Equation 3:
$$\frac{1}{R_{thGM\ ges.}} = \frac{1}{R_{thG1} + R_{thM1}} + \frac{1}{R_{thG2} + R_{thM2}} + \cdots + \frac{1}{R_{thGn} + R_{thMn}}$$

The result can be substituted into equation 1.

K = Kelvin, which is the standard measure of temperature differences, measured in °C, therefore 1°C = 1 K.

K/W = Kelvin per watt, the unit of thermal resistance.

Calculation examples:

1. A TO 3 power transistor with 60 watt rating has a maximum junction temperature of 180 °C and an internal resistance of 0.6 K/W at an ambient of 40 °C with aluminium oxide wafers.
What thermal resistance is required for the heatsink?

given:
P = 60 W
ϑ_i = 180 °C - 20 °C =160 °C (for safety margin)
ϑ_u = 40 °C
R_{thG} = 0.6 K/W
R_{thM} = 0.4 K/W (average value)

find: R_{thK} using equation 1
$$R_{thK} = \frac{\vartheta_i - \vartheta_u}{P} - (R_{thG} + R_{thM}) = \frac{160\ °C - 40\ °C}{60\ W} - (0.6\ K/W + 0.4\ K/W) = \underline{1{,}0\ K/W}$$

2. Same conditions as above but for three devices with equally distributed power ratings.

solution use equation 1 and equation 3
$$\frac{1}{R_{thGM\ ges.}} = \frac{1}{0.6 + 0.4\ K/W} + \frac{1}{0.6 + 0.4\ K/W} + \frac{1}{0.6 + 0.4\ K/W} = \frac{3}{1}\ W/K$$

$$R_{thGM\ ges.} = \frac{1}{3}\ K/W = \underline{0.33\ K/W}$$

substitute into Equation 1 gives:
$$R_{thK} = \frac{160\ °C - 40\ °C}{60\ W} - 0.33\ K/W = \underline{1.67\ K/W}$$

With these values determined, the tabulation on page A 13 - 17 can be used to give a choice of possible heatsink profiles. Then by examination of the drawings and curves the final choice can be made.

3. A transistor with power rating of 50 W and internal thermal resistance of 0.5 K/W has a case temperature of 40 °C.
What is the actual value of junction temperature?

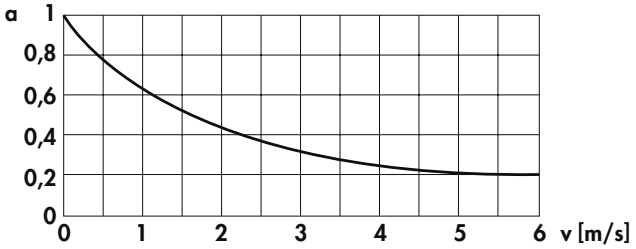
given:
P = 50 W R_{thG} = 0.5 K/W ϑ_G = 40 °C

find: ϑ_i using equation 2

$$\vartheta_i = \vartheta_G + (P \bullet R_{thG}) \qquad \vartheta_i = 40\ °C + (50\ W \bullet 0.5\ K/W) = \underline{65\ °C}$$

Thermal resistances of any profiles with forced convection

$R_{thKf} \approx a \bullet R_{thK}$
R_{thKf} = thermal resistance with forced convection
R_{thK} = thermal resistance with natural convection
a = factor of proportion

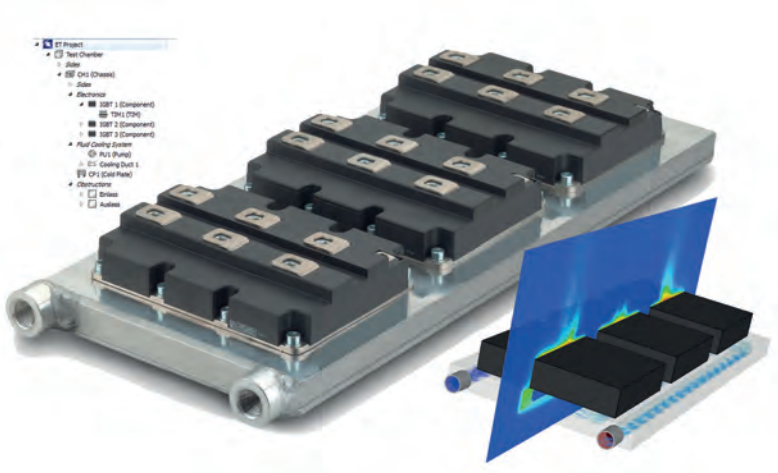


Standard aluminium profiles	**→ A 135 - 136**	**Thermal conductive material**	**→ E 2 - 24**
Extruded heatsinks	**→ A 22 - 83**	**Hole pattern**	**→ A 21**
Lamella heatsinks	**→ A 129 - 130**	**Drilling pattern for SSR**	**→ A 12**
Fluid coolers	**→ A 131 - 133**	**Technical introduction**	**→ A 2 - 8**

Computer based thermal simulation for optimal cooling concepts

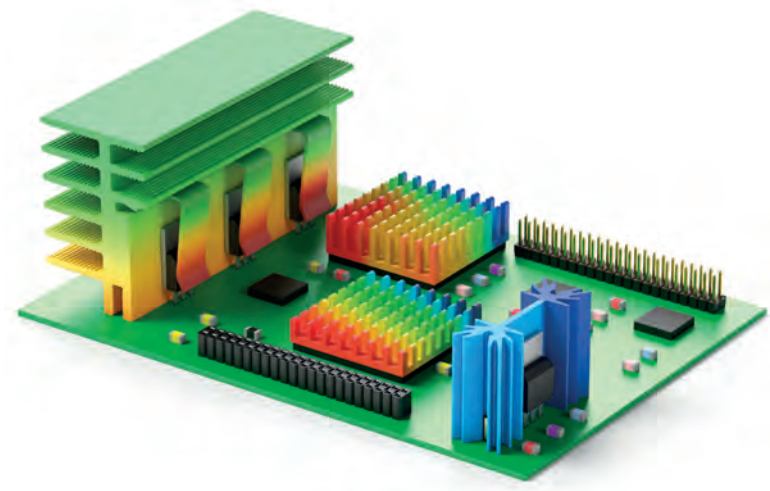
Performance, service life and reliability of electronic semiconductor devices are significantly determined by the thermal load to which the devices are exposed. An exceeding of the maximum operating temperature leads to malfunctions. An exceeding of the permissible junction temperature leads to a destruction of the semiconductor. To make it worse there is an advancing trend in the semiconductor industry for continuous increasing integration- and power densities of electronic devices. For the solution of thermal problems the first question is which kind of heat dissipation has to be considered. For this there are different processes available: by means of free convection (passive) with different heatsink solutions, by means of forced convection (active with help of fans, cooling aggregates) or by means of fluid media (fluid cooling).

However, electronic devices and systems have many different boundary and installation conditions. Therefore the choice of the optimum thermal management is often difficult. There are surely possibilities to find the right heat dissipation concept by using the thermal resistance for calculations or by testing and verifying prototypes directly in the application, but nowadays customer specified mechanical adjustments are requested and demanded more than ever. Small mechanical post-machinings, such as additional integrated threads or drilling can be considered in the calculation with safety reserves in the temperature of the thermal resistance, but extensive modifications demand a repeated inspection of the thermal circumstances.



To facilitate the determination of passive heat dissipation concepts Fischer Elektronik offers a computer based thermal simulation as a kind of service.

Considered factors in the thermal simulation



With help of the computer based thermal simulation the necessary characteristics of the cooling concept can be determined exactly. Based on physical concepts such as mass, energy and impulse the software especially considers the thermal requirements for free or forced convection. Simultaneously the system is aligned to thermal dissipation by means of fluid. Moreover the thermal simulation calculates physical effects such as thermal radiation and turbulences. The emission factor of the different surfaces also plays its role. As a result the simulation software delivers a precise cooling solution for the application and is a big help for the decision-making and interpretation of the electronic design.

Advantages of a computer based simulation

The computer based thermal simulation is already used for the prototype development. Herewith the development cycles of heat dissipation concepts is reduced considerably. Unsuitable concepts can be discarded quickly and without big costs of material. A lot of features and options of the simulation system also reduce the temporary and apparatuses efforts compared to a conventional simulation in the measurement chamber.

We will be happy to advise you in detail about the theme thermal simulation.

Heatsinks profile-overview → **A 13 - 17**
Heatsink special design → **A 137 - 138**
Special profiles → **A 140**
Heatsink as visual & decor-parts → **A 10**
Heatsinks for SSR → **A 11 - 12**
Die-cast heatsinks → **A 125**
Assigment table → **A 18 - 20**
Order example → **A 21**

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Technical introduction

Remarks:

1. The values indicated in the diagrams apply only for heatsinks with black anodised surface, mounted vertically and natural convection.

Correction factors: natural surface: +10 to 15 % for horizontal mounting: +15 to 20 %

2. Heatsink profiles are extruded to European standard DIN EN 12020 (former DIN 17615).
   For profiles exceeding a circumscribed circle of 350 mm, the tolerances to DIN EN 755 (former DIN 1748) apply.

Important note:
Manufacturers of certain electronic components, especially modules with a large surface area, IGBT etc., specify installation surfaces for heatsinks etc. with an flatness, which is beyond standard tolerances. Such perfect flatness can only be achieved by milling the installation surface. Furthermore, it should be noted that threaded wire inserts may be required in order to reach higher tightening torques in aluminium (e.g. Heli-Coil or similar.). Please observe the semiconductor manufacturers' information.

3. The mentioned heatsink profiles in our catalogue contain so called extrusion marks between the fins for a profile identification. To avoid misuse the operator has to check the size and position for the mechanical treatment or placement of the components.

4. Profile extruded threaded channels are no threads conforming to standards, as they have no thread pitch. The thread pitch is imitated by staggered webs (ribs). The customer is responsible for appropriate use.

5. Machining of our extruded and non extruded profiles conforms to requirements of DIN ISO 2768 m - unless otherwise stated. For all ICK S types DIN ISO 2768c is valid.

6. The lengths of extruded profiles [|↔|] and the pin layouts [⌖] indicate only the standard range. We offer every profile cut to customer's exact length and machining requirement made to drawing or sample. We bore, countersink, mill, saw, grind and cut threads into your heat sink to meet your specific requirements. With our modern machine tools including CNC machining centres, multispindled drills (up to 26 drillings/threads at the same time) and digital milling and stamping tools plus our own "in house" tool room we are able to manufacture competetively priced prototypes as well as batch and mass produced parts with short lead times.

7. The standard material of our heatsinks is warm age-hardened aluminium alloy according to EN AW 6060 – T66 (former AlMgSi05 – F22 acc. to DIN 1748). Our standard surface treatments are raw degreased aluminium (Al) and black anodised (SA). On request, we anodise clear natural (ME) or decorative in any colour that is technically possible.

8. If you cannot find a suitable profile within our range of approx. 400 profiles, 13 small heatsinks and 50 finger shaped heatsinks, we can design and produce to your requirements. Please contact us at the start of your next project so that we can work together, either directly or through our representatives. Remember that we have the ability to find the solution for "your" cooling problem.

9. Note on tolerances

All dimensions given in this cataloque for products, items and machined parts are acc. to DIN ISO 2768 m if not otherwise stated. Not included are items like extruded profiles, diecasts, handles, vibration dumpers etc. for which different standards apply.

Update - August 2014

The information given in this catalogue were established and examined carefully.
Nevertheless, mistakes or printing errors, and especially technical modifications and updating and improvement of our products, cannot be excluded. All trade marks are recognised even if they are not specifically identified or mentioned. No identification does not imply that a product or trademark is not registered. No part of this catalogue may be reproduced or distributed without prior written consent of Fischer Elektronik. All data contained in this catalogue, in texts, illustrations, documents and descriptions are subject to copyright and the provisions of DIN ISO 16016. All rights reserved.

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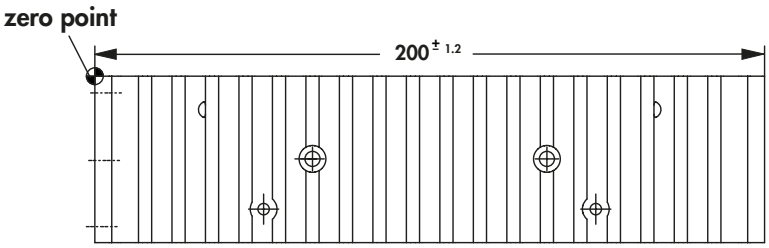
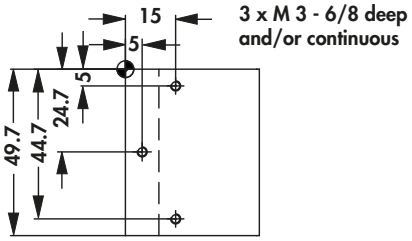
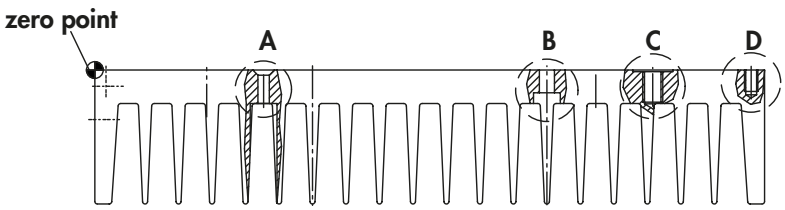
General information

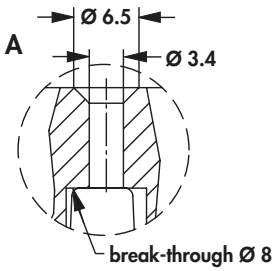
Blind holes are produced after anodising. Through holes are produced before anodising. With completely visual parts, additional painting is recommended. The sections are extruded according to DIN EN 12020. For sections that exceed a circumscribed circle of 300 mm, DIN EN 755 apply. The machining tolerances are specified according to DIN ISO 2768 m.

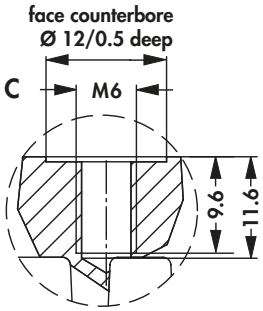
Visual parts: Please indicate at which place **clamp points** are allowed! We recommend e.g. supplementary laquering.

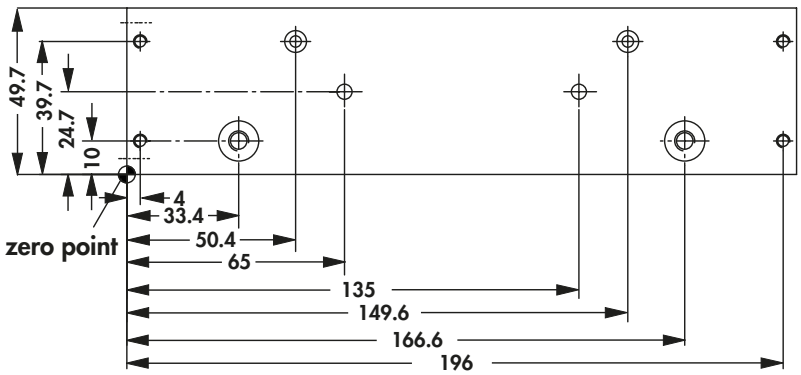


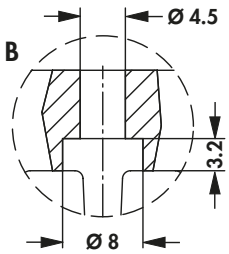


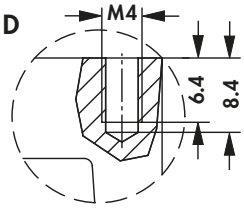












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Technical introduction

Information for dimensioning, shown on SK 47 general:

The deflection can be up to 0.8 mm concave, 0.2 mm convex. If a certain flatness of the bottom surface is required the bottom thickness can be decreased by a maximum of approx. 0.8 mm by means of face-milling. This situation must be taken into consideration with the bore hole depths for blind holes.
Counterbores and bore hole diameters are to be produced according to DIN 74, if not explicitly stated otherwise.
The depth of thread should be calculated as follows.

Example M 5:
thread: <M> 5 x 1.6 mm = 8 mm core bore: 8 mm + 2 mm = 10 mm

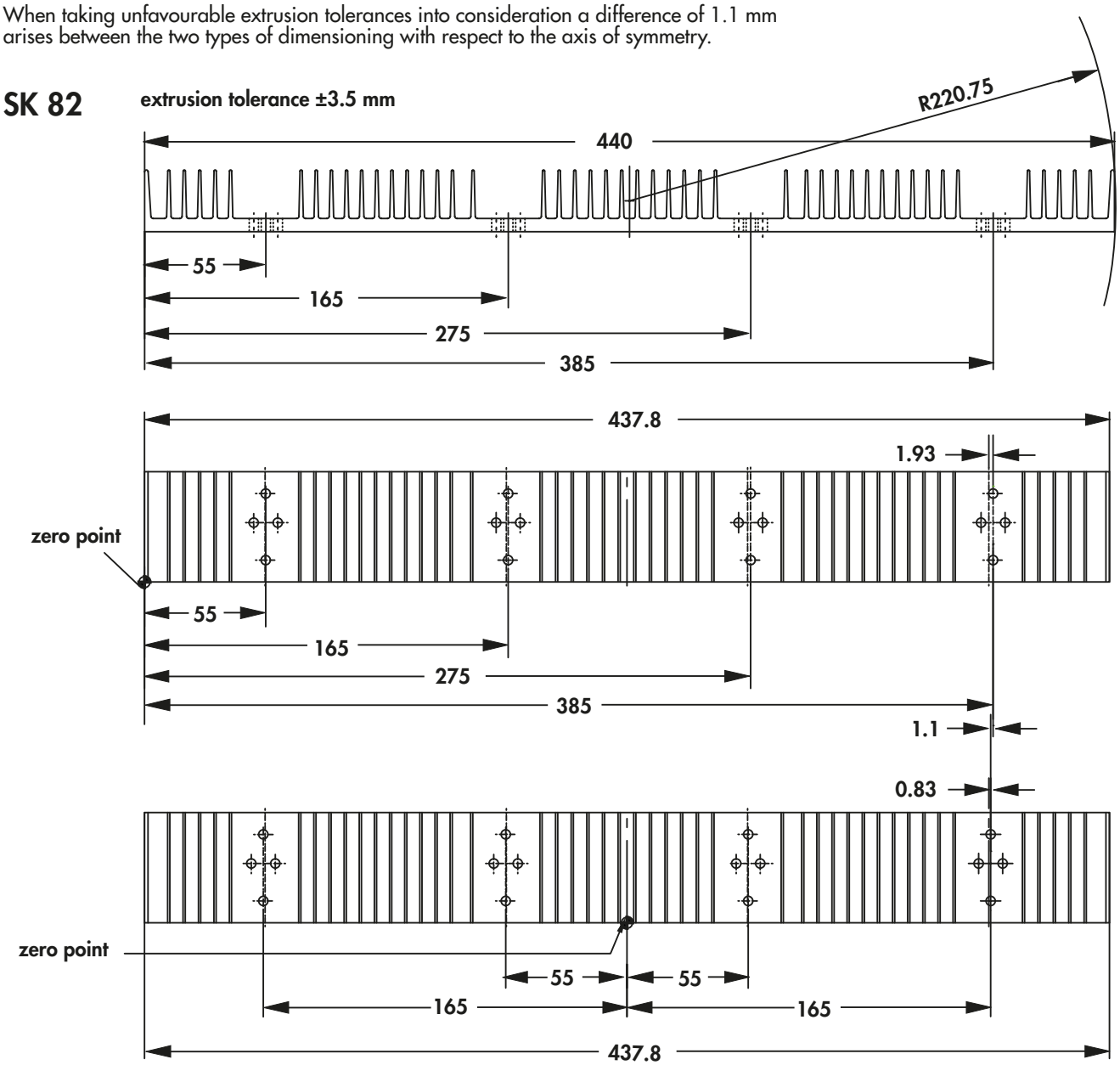
Examples:
cutout A: Through-hole according to DIN 74 A m 3, counterbore bottom side, undercut of the fins.
cutout B: Through hole with break-through of the fins according to DIN 74 H m 4, counterbore on fin side.
cutout C: Thread M 6. Depth of thread 1.6 x 6 mm = 9.6 mm, bore depth 9.6 mm + 2 mm = 11.6 mm. Bore hole on fin base is plunged through. Face counterbore dia. 12 x 0.5 on bottom side.
cutout D: Blind thread M 4. Depth of thread 1.6 x 4 mm = 6.4 mm, bore depth 6.4 mm + 2 mm = 8.4 mm.

Extrusion tolerances – production tolerances

There is often the problem, that the production tolerances cannot be adhered to, due to the extrusion tolerances. The two examples show how the production tolerances can be cut in half by means of suitable dimensioning (here: extension of the zero point from the outer edge to the center of the section).

When taking unfavourable extrusion tolerances into consideration a difference of 1.1 mm arises between the two types of dimensioning with respect to the axis of symmetry.

SK 82 **extrusion tolerance ±3.5 mm**



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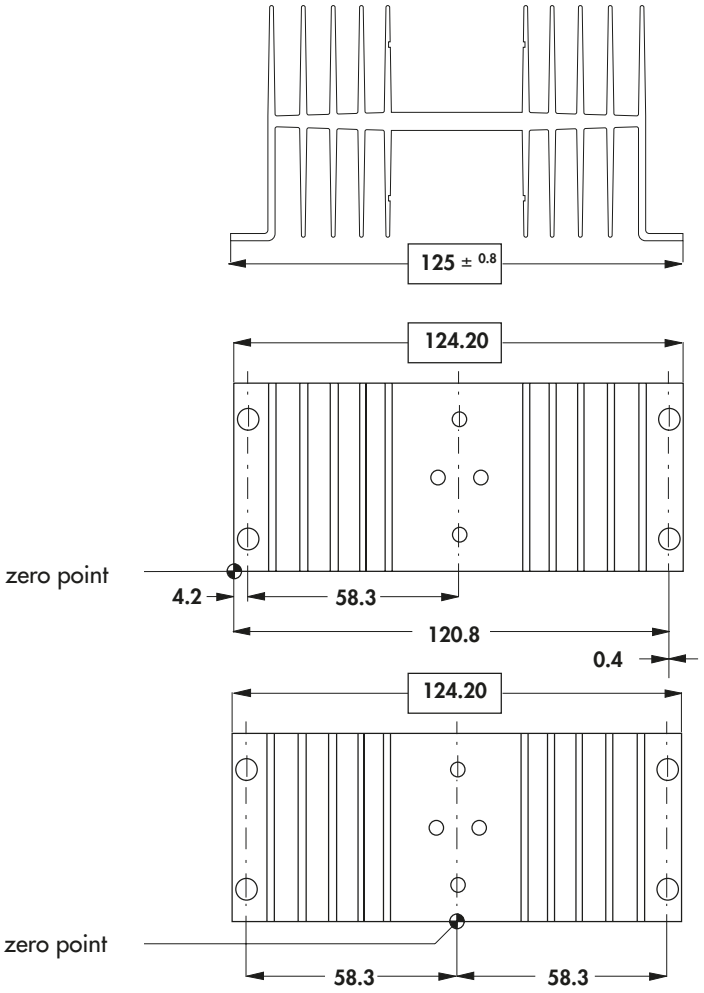
SK 34



extrusion tolerance ± 0.8 mm

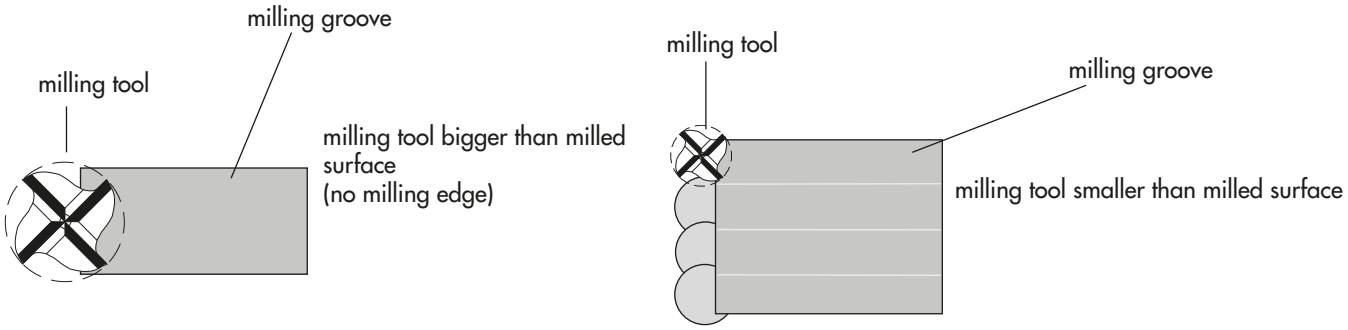
dimensioning set to the outer edges

dimensioning set to the center

When taking unfavourable extrusion tolerances into consideration, a difference of 0.4 mm arises between the two types of dimensioning with respect to the axis of symmetry.

Milling

If, when milling heatsinks, cooling aggregates, etc., the milling tool diameter is smaller than the area being milled for production reasons, so called „milling grooves" with steps or edges are produced (see sketch). Even if the roughness depth value for the surface is observed, it is a good idea to specify the area of the component in which no milling edges are allowed.



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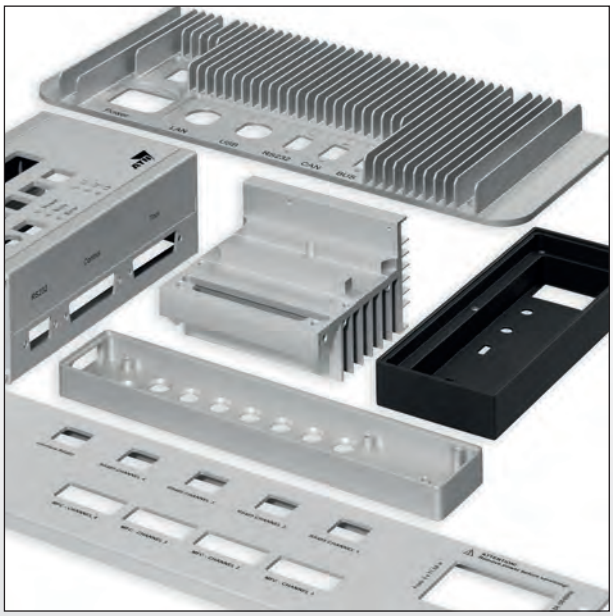
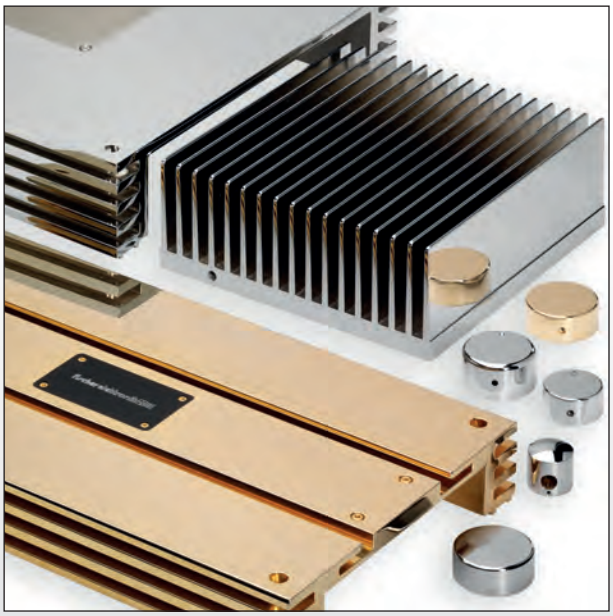
Precision machining and highly decorative surfaces



Decorative aluminium milled parts
- high quality, very precise milled, decorative aluminium parts
- exact radii and sharp-edged cutouts
- precision ground surfaces
- natural colour and black anodized

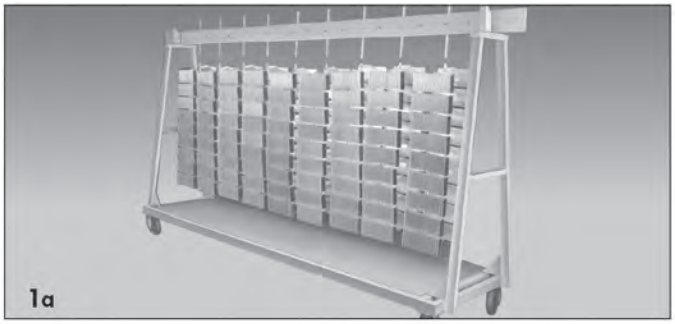


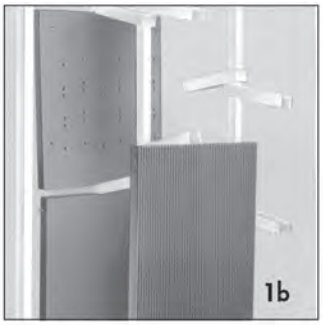
Chromium plating and gold plating
- chromium plating and gold plating of front panels, extruded profiles and construction parts
- qualitative constant and reproducible, high quality surfaces
- various gloss levels by means of different polishing processes
- processing of brass, aluminium and steel

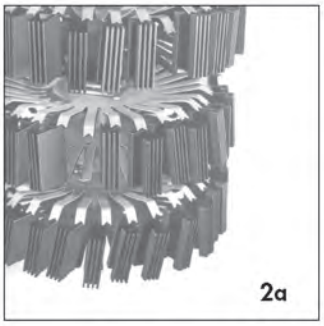
Surface refinements
- corrosion resistant and decorative anodize layers
- lacquerings and durable powder coatings in all current RAL colours
- anti-glare surfaces, Nextel®-Suide Coating
- electrically conductive surfaces, chromate VI free
- prevention of clamp marks by means of special contacting systems

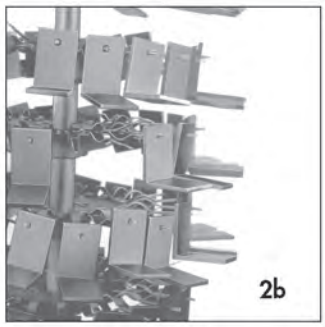
Development and construction
- compentent partner with experience of more than 40 year
- Innovative product development, product-specific support by means of application engineers
- design assistance, feasibility analyses and product optimizations
- construction support and preparation of drawings

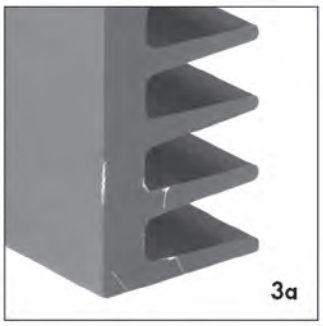
Heatsinks for decorative purposes and as visual parts

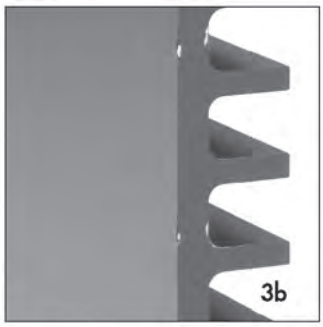


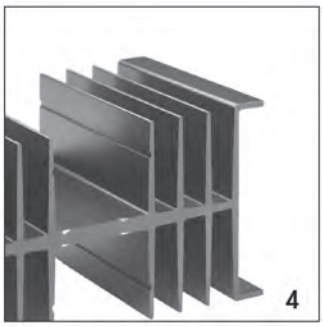


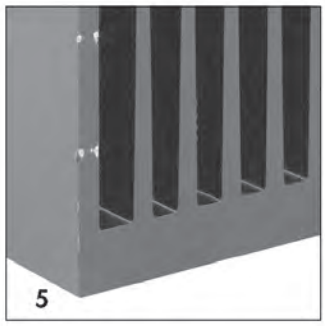


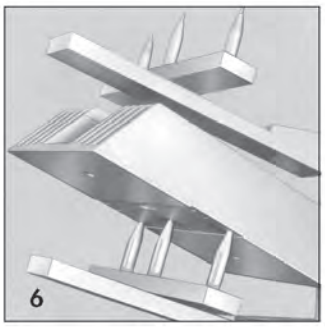












Anodising (also known as ELOXAL: **EL**ectrically **OX**idised **AL**uminium) is used in many cases for decorative surface protection of aluminium. In this process, the aluminium parts to be treated are connected to the positive pole of a direct-current source (anode) in a suitable electrolyte where aluminium, in so doing, forms the negative pole (cathode). The flowing direct current now causes a migration of oxygencontaining ions, with electrically negative charge, to the anode in order to deposit the oxygen. At this point, the aluminium reacts with this oxygen, forming aluminium oxide. A non-porous, electrically insulating, abrasion free, oxide barrier, or „eloxallayer", then develops. The development and therefore thickness of this layer can be controlled by the amount of current flow.

For process handling, secure transportation and electrical connection, the parts to be anodised must be placed on „racks" (figure 1). As excellent electrical contact is necessary and the parts being processed must be mounted on the carrying racks in a totally secure manner a high clamping force is required especially for those large and heavy heatsinks (figure 2). This will mean that „clamp marks" are visible. These are mere bare points in the case of small and light weight heatsinks with black anodising (figure 3) but for heavy parts the clamping pressures and current can cause deformation of the surface (figure 4). Any such deformations on large heatsinks is unavoidable and varies with each part (figure 5).

If heat sinks are used as visual parts, in other words parts whose surface must be blemish-free in appearance, it is suggested that the customer will define specific areas which should have no clamp marks. If, for technical production reasons, it is not possible to place clamps on the remaining points then consideration should be either given to the construction of separate specialpurpose frames which will allow processing (figure 6). Existing or additional threaded holes may possibly also be used for screwing on fixing angles, upon which the clamps may then be placed (figure 7). Furthermore, there is always the possibility to remove the clamp marks by hand finishing, although some slight indentation may still be visible. Alternatively, instead of using the anodising process there are various paint finishes available.

With visual parts and mouldings, both discussion of all technical details and determination of the desired design in cooperation with the manufacturer - even at the initial enquiry stage - are imperative for the smooth completion of orders to the satisfaction of the customer.

Our experts are at your disposal for all technical advice.

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Extruded heatsinks → **A 22 - 83**
Assigment table → **A 18 - 20**
Drilling pattern for SSR → **A 12**
Die-cast heatsinks → **A 125**
High capacity heatsinks → **D 30 - 32**
Heatsinks for PCB → **A 89 - 112**

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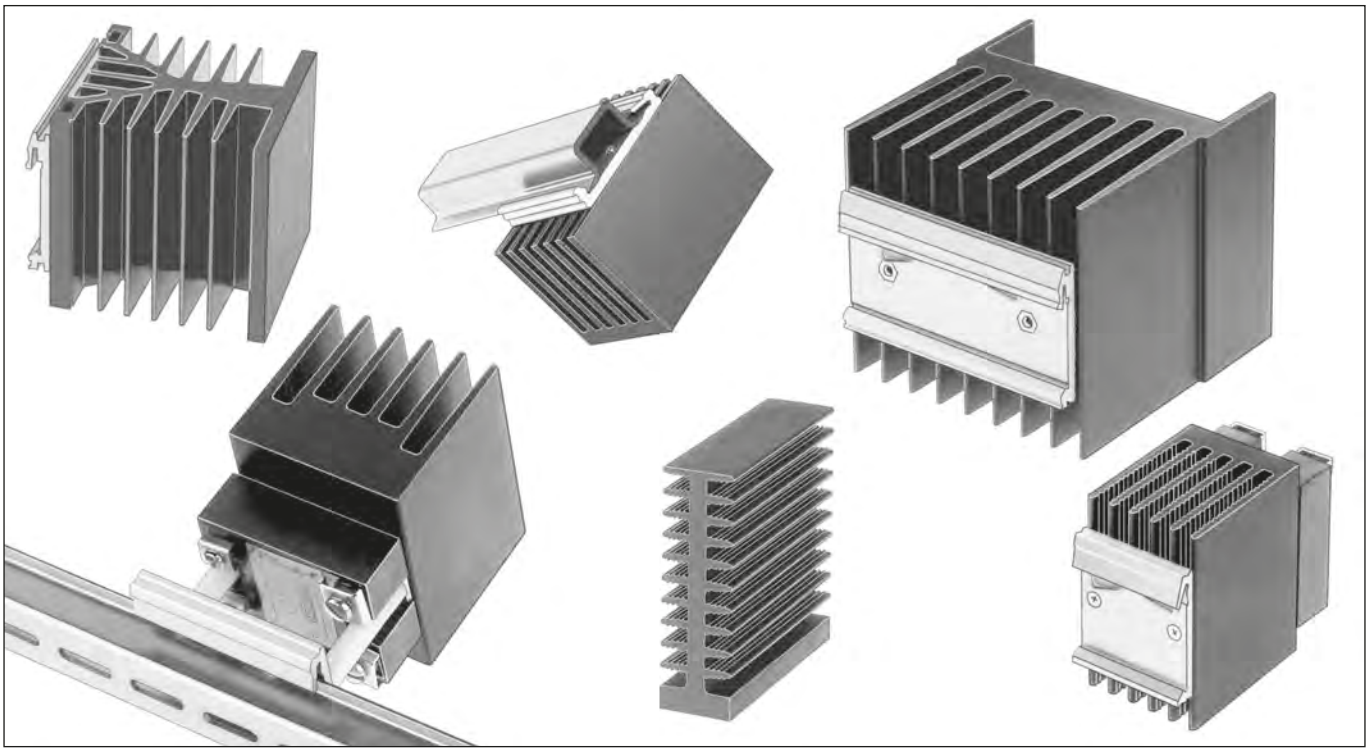
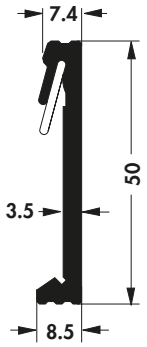
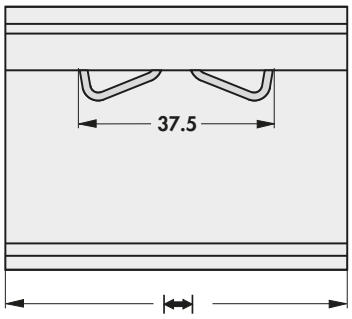
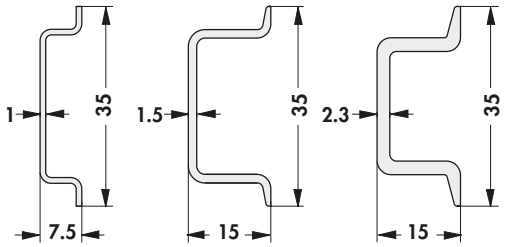
Heatsinks for solid state relays



- universal clip fastening, suitable for all 35 mm mounting rails according to DIN EN 50 022, rail thickness from 1 to 2.3 mm → **E 25**
- fast and simple asssembly of heatsinks by means of snapping them onto the mounting rail
- secure hold due to a stable extruded profile with integral stainless steel spring
- special lengths (≥40 mm) and drillings on request



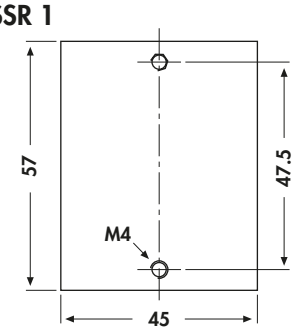
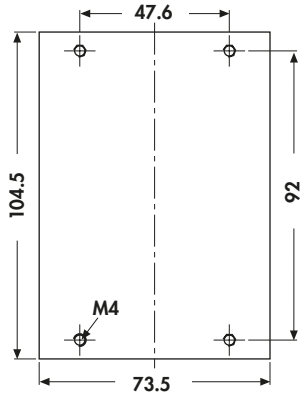
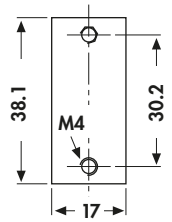
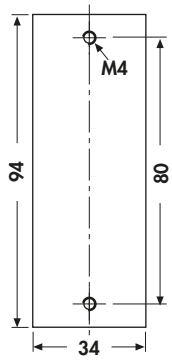




Examples of mounting rail versions suitable for KL 35

surface:	finish clear anodised

Heatsinks for solid state relays

perforations – drilling pattern rotated by 90° as well as further drilling patterns upon request	with KL 35 – fixing of the SSR by means of screws with the help of insert nuts in the heatsink	with KL 35 – fixing of the SSR by means of screws with the help of tapped holes in the heatsink	without KL 35 – fixing of the SSR by means of screws with the help of tapped holes in the heatsink
	art. no.	art. no.	art. no.
SSR 1 	SK 172 75 KL SSR 1	SK 89 75 KL SSR 1 SK 89 100 KL SSR 1 SK 111 75 KL SSR 1 SK 434 75 KL SRR 1 SK 453 75 KL SRR 1 SK 467 75 KL SRR 1 SK 507 75 KL SSR 1	SK 04 75 SSR 1 SK 33 75 SSR 1 SK 453 75 SSR 1 SK 455 75 SSR 1 SK 467 75 SRR 1 SK 507 75 SRR 1
SSR 2 		SK 89 100 KL SSR 2 SK 89 150 KL SSR 2 SK 176 100 KL SSR 2 SK 176 150 KL SSR 2 SK 194 75 KL SSR 2 SK 507 100 KL SSR 2	SK 04 150 SSR 2 SK 33 75 SSR 2 SK 507 100 SSR 2 SK 507 150 SSR 2
SSR 3 	SK 187 75 KL SSR 3	SK 111 75 KL SSR 3	SK 48 50 SSR 3
SSR 4 	SK 172 150 KL SSR 4	SK 455 100 KL SSR 4	SK 455 100 SSR 4 SK 467 100 SSR 4

Distance sleeves → E 32 - 39
Fastening for mounting rail → E 25
Guide rails for PCBs → E 26 - 30
Mounting material for semiconduct → E 44 - 48
Spacers → E 40
Mica wafers → E 19
Aluminium oxide wafers → E 17 - 18
Mounting parts for heatsinks → A 2 - 8

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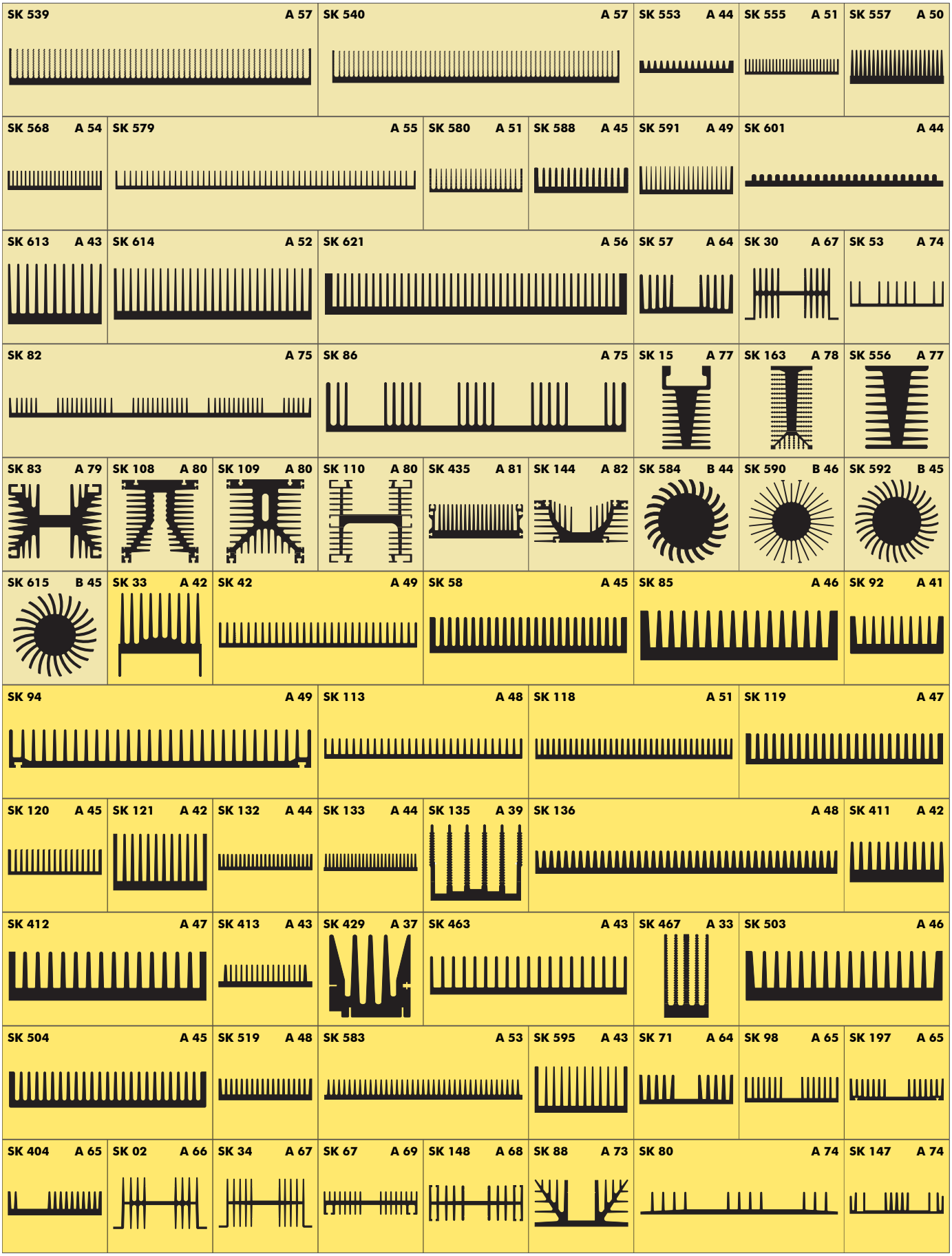
Heatsink-chart

SK 440 D 30	SK 441 D 30	SK 458 D 30	SK 461 D 30	SK 497 D 30	SK 498 D 30
SK 47 A 49	SK 49 A 51	SK 56 A 54	SK 66 A 55	SK 90 A 48	SK 91 A 52
SK 93 A 56	SK 101 A 54	SK 102 A 50	SK 130 A 56	SK 139 A 53	
SK 149 A 53	SK 154 A 46	SK 155 A 45	SK 157 A 54	SK 158 A 58	
SK 159 A 58	SK 160 A 58	SK 161 A 58	SK 162 A 58		
SK 168 A 50	SK 190 A 52	SK 191 A 56	SK 193 A 50		
SK 198 A 53	SK 199 A 51	SK 416 A 47	SK 418 A 58	SK 438 A 52	
SK 439 A 55	SK 446 A 53	SK 466 A 43	SK 479 A 55		
SK 501 A 54	SK 502 A 49	SK 507 A 40	SK 510 A 46	SK 520 A 50	SK 523 A 55
SK 524 A 52	SK 530 A 57	SK 531 A 57	SK 533 A 57		
SK 535 A 57	SK 536 A 57	SK 537 A 57	SK 538 A 57		

Heatsink-chart classified in categories of thermal resistance at 75 mm length

Heatsink-chart



< 1 K/W | 1-1,5 K/W | 1,5-2 K/W | 2-2,5 K/W

2,5-3 K/W | 3-4 K/W | 4-5 K/W | > 5 K/W

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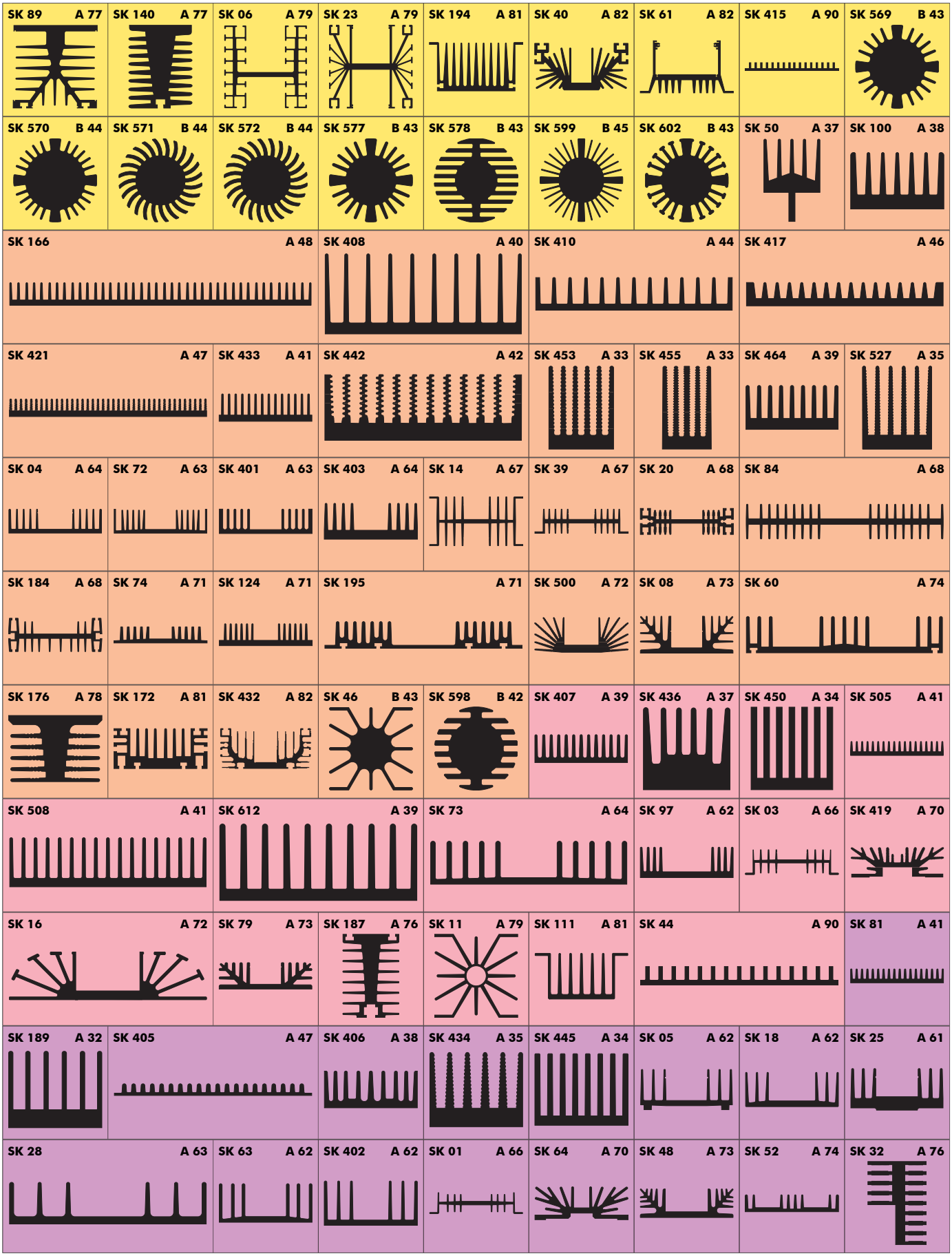
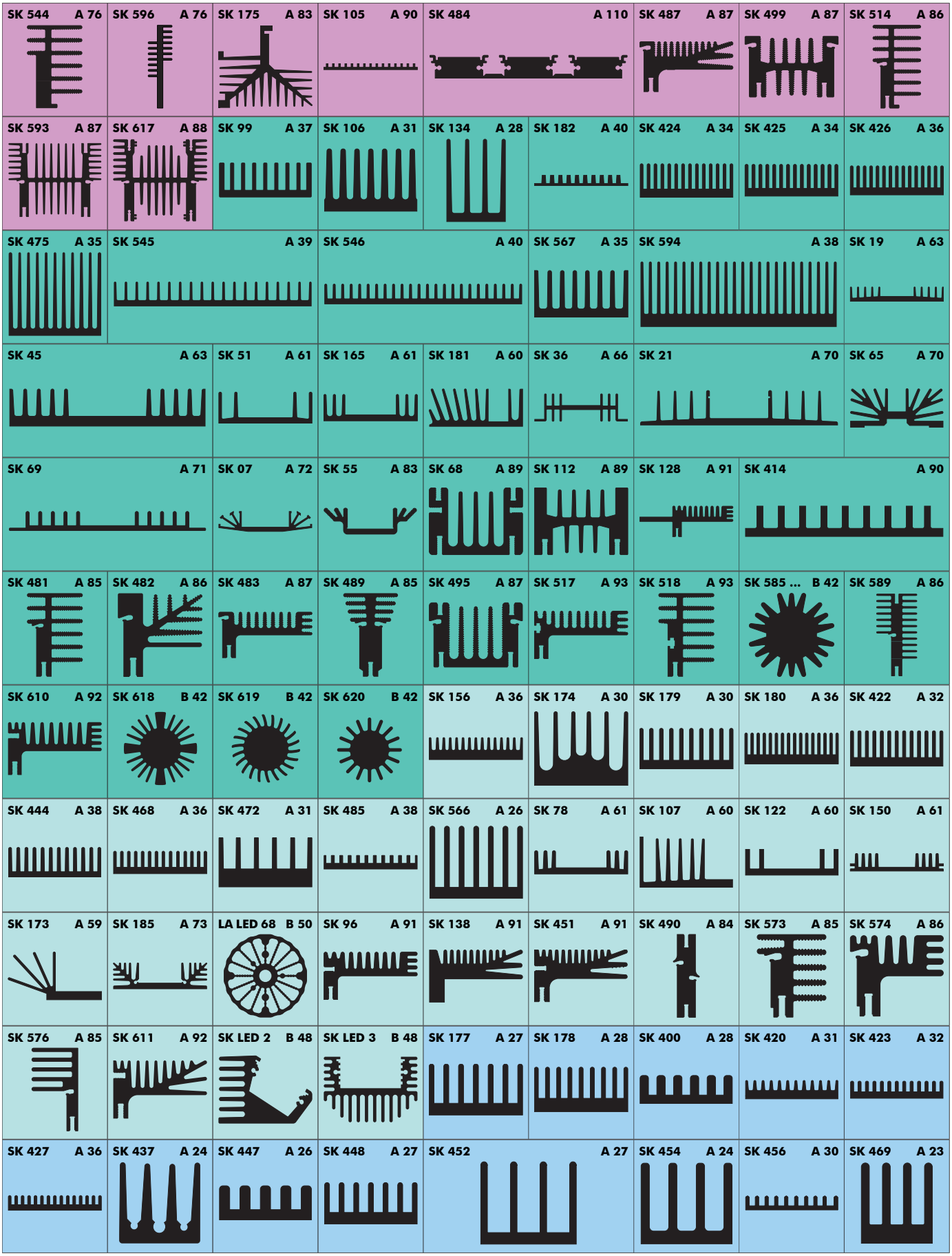
Heatsink-chart



Heatsink-chart classified in categories of thermal resistance at 75 mm length

Heatsink-chart



< 1 K/W | 1-1,5 K/W | 1,5-2 K/W | 2-2,5 K/W

2,5-3 K/W | 3-4 K/W | 4-5 K/W | > 5 K/W

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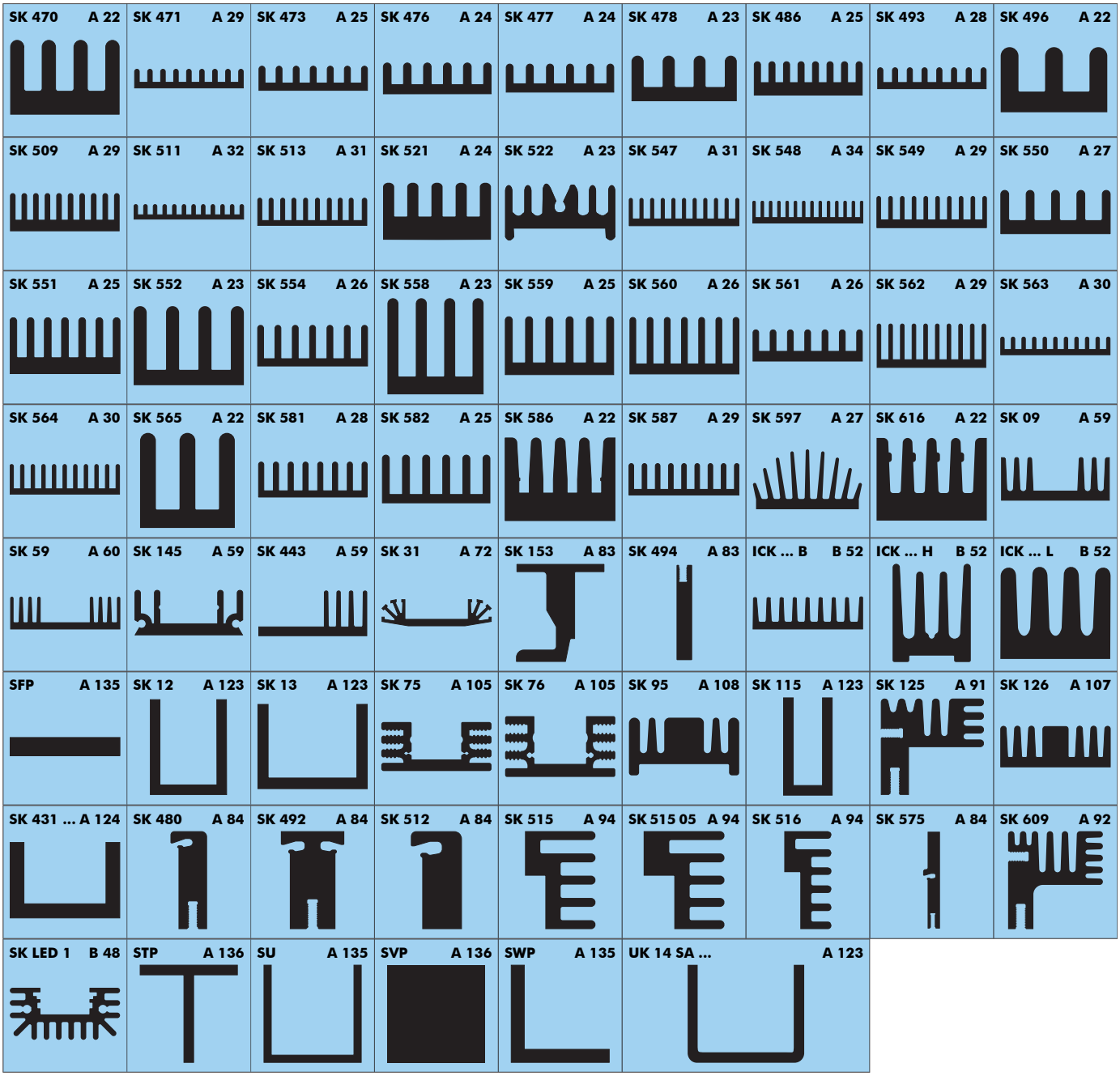
Heatsink-chart



Heatsink-chart classified in categories of thermal resistance at 75 mm length

Assignment table of transistor heatsinks

	TO 3	TO 66	SOT 9	TO 220	SOT 32
					
extruded profiles	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 67 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 84 SK 88 SK 97 SK 122 SK 124 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 122 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 122 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404	SK 09 SK 59 SK 145	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 122 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404

Extruded heatsinks → A 22 - 83
Heatsinks f. printed circuit boards → A 89 - 111
Thermal conductive material → E 2 - 24
Mount. material f. semiconductors → E 44 - 48

Die-cast heatsinks → A 125
Reating springs for transistors → A 115 - 117
Lock-in transistor fixing spring → A 84 - 88
Technical introduction → A 2 - 8

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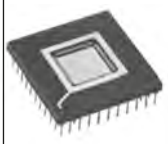
Assignment table of transistor heatsinks

	TO 3	TO 66	SOT 9	TO 5	TO 247	TO 3 P
						
extruded heatsink with solder pins					SK 126 SK 145 SK 437 SK 459 SK 484	SK 104 SK 129 SK 400 SK 409 SK 448 SK 456 SK 484
extruded heatsinks	WP 4030				SK 126 SK 452	SK 452
set-up/clip-on heatsinks	AKK 127 AKK 191				FK 243 FK 245	
finger-shaped heatsinks	FK 201 FK 202 FK 205 FK 206 FK 223 FK 236	FK 201 FK 202 FK 205 FK 206 FK 207 FK 208 FK 217 FK 225 FK 234 FK 236	FK 201 FK 202 FK 205 FK 206 FK 207 FK 208 FK 217 FK 234 FK 236			
small heatsinks				KF KK 562 SKK		

Extruded heatsinks → A 22 - 83
Heatsinks f. printed circuit boards → A 89 - 112
Thermal conductive material → E 2 - 24
Mount. material f. semiconductors → E 44 - 48
Die-cast heatsinks → A 125
Reating springs for transistors → A 115 - 117
Lock-in transistor fixing spring → A 84 - 88
Technical introduction → A 2 - 8

Assignment table transistor heatsinks

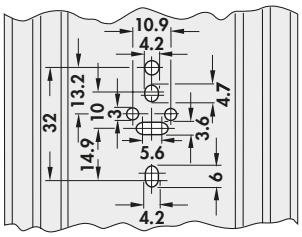
	TO 218	TO 220	SOT 32	DIL	PLCC	P-SIP	PGA/BGA
							
U-heatsinks		ICK 35 SK 13 SK 431 UK 14	SK 12				assignment table → B 2 - 10
extruded heatsink with solder pin	SK 145 SK 437 SK 459 SK 460	SK 75 SK 104 SK 129 SK 145 SK 185 SK 409 SK 459 SK 460	SK 104 SK 129 SK 409 SK 459 SK 469 SK 470			SK 459 SK 460	
extruded heatsinks	SK 126 SK 452	SK 95 SK 126 SK 452 SK 454 SK 517 SK 518	SK 95 SK 454	ICK...B ICK..H ICK...L	ICK PLCC ICK R		
set-up/clip-on heatsinks	FK 224 FK 241 SK 516	FK 220 FK 224 FK 237 SK 515				FK 224 FK 241	
finger-shaped heatsinks	FK 224 FK 243 FK 245	FK 205 FK 206 FK 207 FK 208 FK 210 FK 212 FK 214 FK 216 FK 217 FK 218 FK 219 FK 220 FK 222 FK 225 FK 227 FK 228 FK 229 FK 230 FK 231 FK 232 FK 233 FK 234 FK 235 FK 247	FK 201 FK 205 FK 206 FK 207 FK 208 FK 209 FK 210 FK 211 FK 212 FK 213 FK 214 FK 215 FK 216 FK 217 FK 218 FK 219 FK 223 FK 234 FK 235 FK 236 FK 239			FK 224	
small heatsinks			KK 32 KK 92				

Extruded heatsinks → A 22 - 83
Heatsinks f. printed circuit boards → A 89 - 112
Thermal conductive material → E 2 - 24
Mount. material f. semiconductors → E 44 - 48

Die-cast heatsinks → A 125
Reating springs for transistors → A 115 - 117
Lock-in transistor fixing spring → A 84 - 88
Technical introduction → A 2 - 8

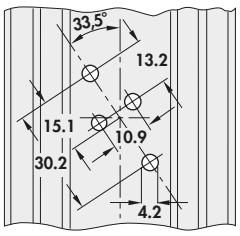
Hole pattern

CB



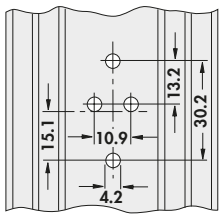
CB = TO 3 + SOT 9 + TO 66 + SOT 32
at |↔| 37.5 mm oblique drilling

TO 3 S



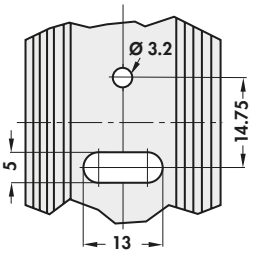
TO 3 oblique drilling for |↔| 37.5 mm

TO 3

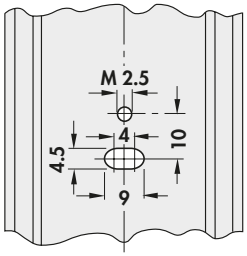


TO 3 exceeding |↔| 50 mm

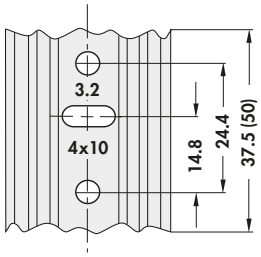
TO 220



SOT 32



K

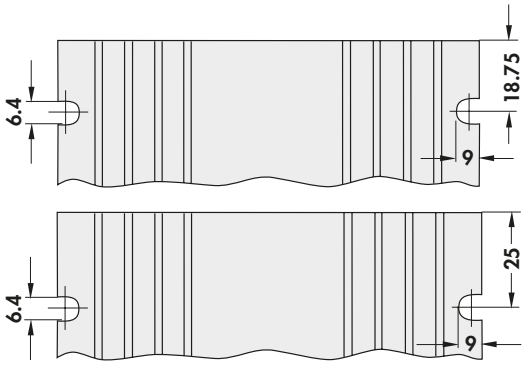


SOT 32 / TO 220 exceeding |↔| 37.5 mm

Standard hole pattern are processed as complete pin layouts, centered on the length of the heatsink.
Other positions of the pin layout on the heatsink, multiple drillings or changes of the drillings are processed according to customer's requirements.

For heatsinks exceeding |↔| 75 mm standard hole pattern can be supplied in multiple design.

Fixing slots



|↔| [mm]	number of fixing slots
37.5	2
75	4

|↔| [mm]	number of fixing slots
50	2
100	4

Heatsinks with the following shape ⊣⊢ and a standard hole pattern have these fixing slots as part of the serial production

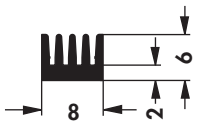
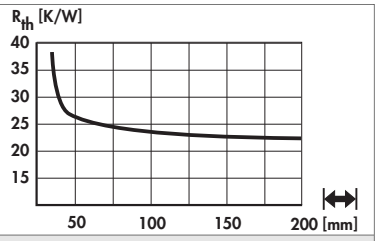
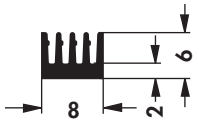
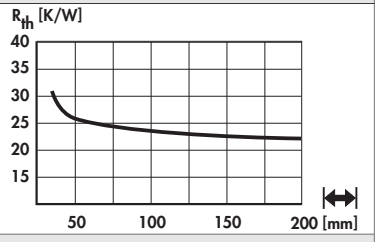
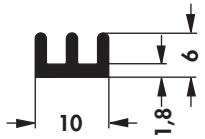
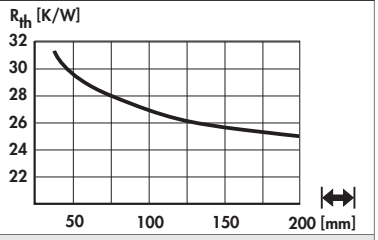
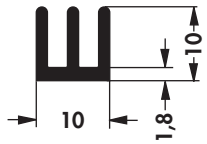
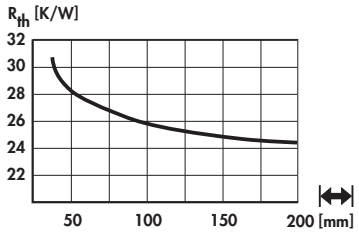
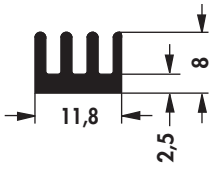
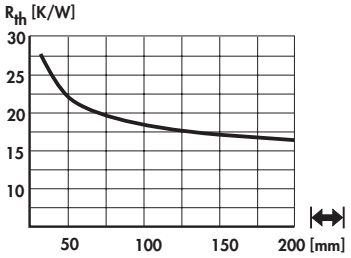
Order example

SK 01	50	SA	TO3
profile	length	surface	pin layout

Surface treatment for heatsinks with standard drilling: black anodised **(SA).**

Raw degreased aluminium **(AL)** and clear natural anodise **(ME)** on request.

Extruded heatsinks → **A 22 - 83**
Heatsinks for printed circuit boards → **A 89 - 112**
Thermal conductive material → **E 2 - 24**
Mount. material for semiconductors → **E 44 - 48**
Die-cast heatsinks → **A 125**
Reating springs for transistors → **A 115 - 117**
Lock-in transistor fixing spring → **A 84 - 88**
Technical introduction → **A 2 - 8**

art. no.		
SK 586 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 616 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 496 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 565 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 470 ...		
	extruded heatsinks for PCB mounting → A 110	
please indicate:	**... ↔ 25 37.5 50 75 100 1000 mm**	**... ⌖ (optional) SOT 32; TO 220**

High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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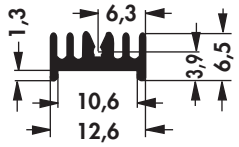
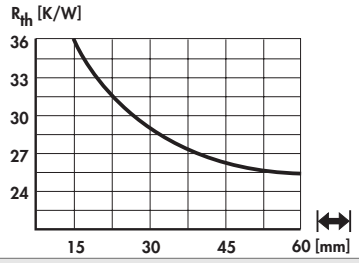
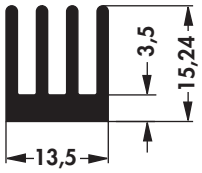
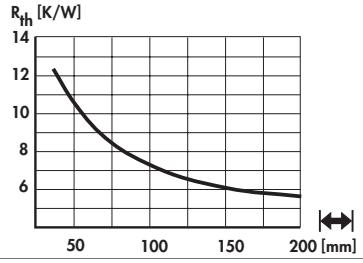
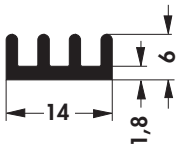
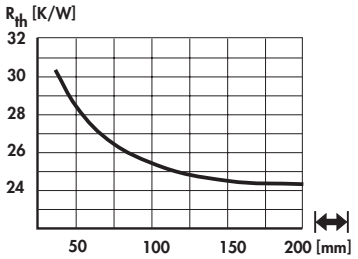
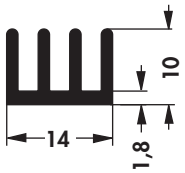
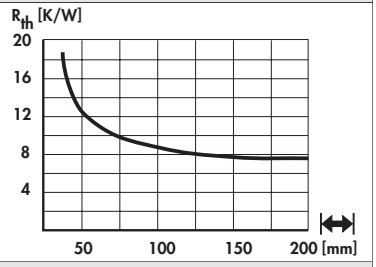
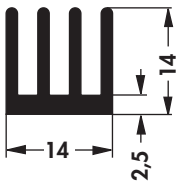
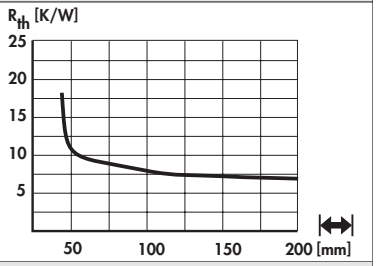
Standard extruded heatsinks

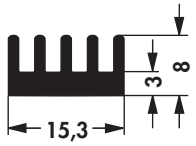
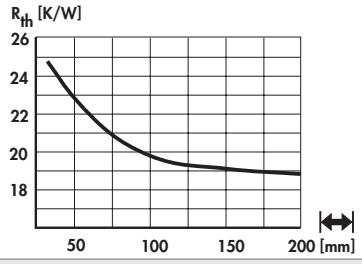
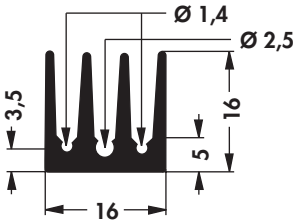
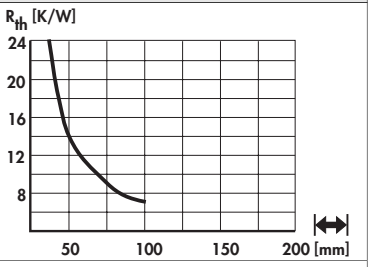
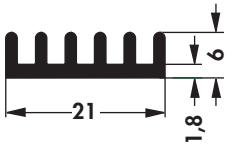
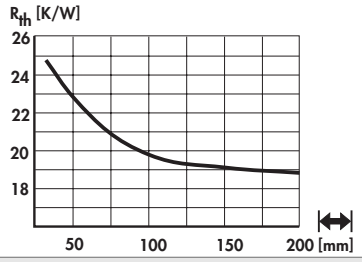
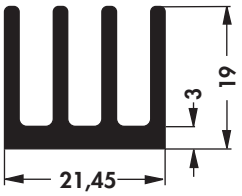
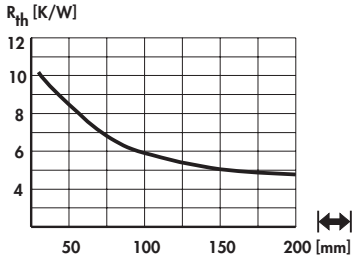
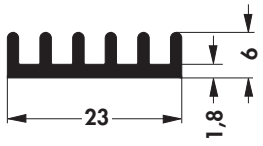
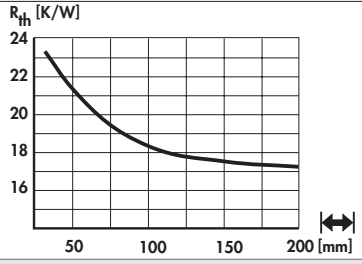
art. no.		
SK 522 ...		
please indicate:	**... ↔** **15 25 37.5 50 1000 mm**	

art. no.		
SK 469 ...		
	extruded heatsinks for PCB mounting → A 110	
please indicate:	**... ↔** **25 37.5 75 100 1000 mm**	**... ⌖ (optional)** **SOT 32; TO 220**

art. no.		
SK 478 ...		
please indicate:	**... ↔** **25 37.5 50 75 1000 mm**	

art. no.		
SK 552 ...		
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**	

art. no.		
SK 558 ...		
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**	

art. no.		
SK 521 ...		
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**	
art. no.		
SK 437 ...		
	extruded heatsinks for PCB mounting → A 109	
please indicate:	**... ↔** **100 1000 mm**	**... ⌖ (optional)** **TO 218; TO 220; TO 247; TO 248**
art. no.		
SK 476 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 454 ...		
	extruded heatsinks for PCB mounting → A 96	
please indicate:	**... ↔** **37.5 50 75 100 150 1000 mm**	**... ⌖ (optional)** **SOT 32; TO 220**
art. no.		
SK 477 ...		
please indicate:	**... ↔** **37.5 50 100 1000 mm**	

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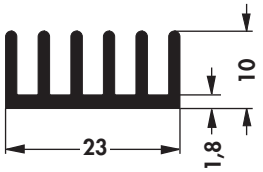
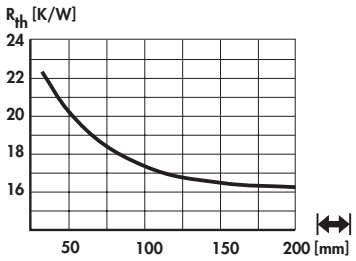
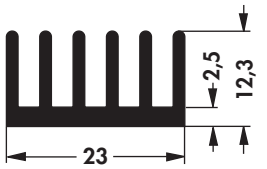
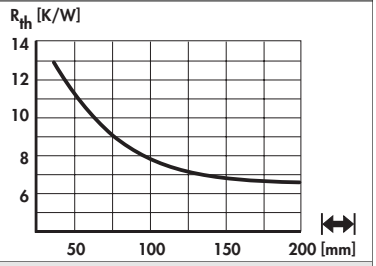
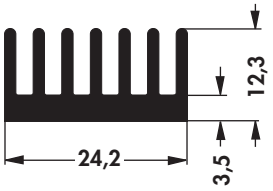
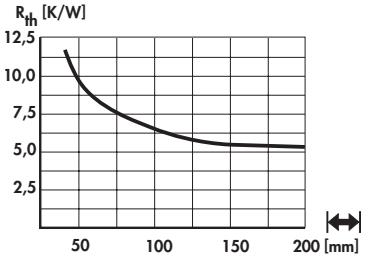
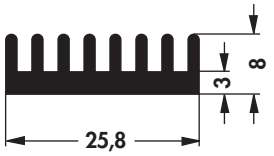
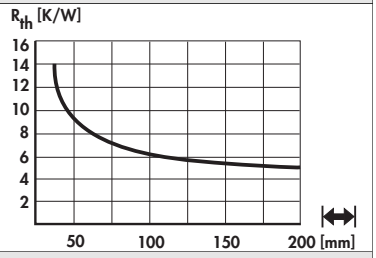
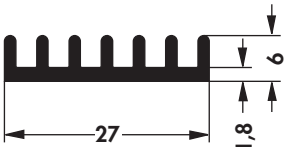
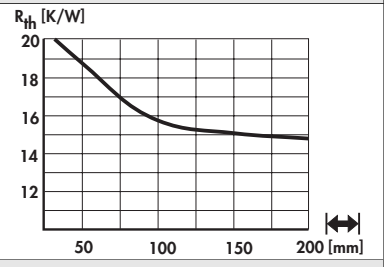
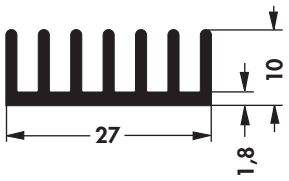
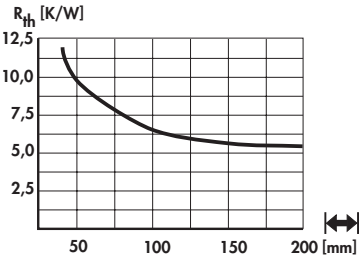
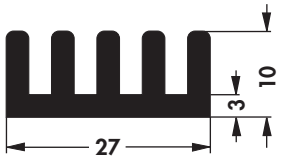
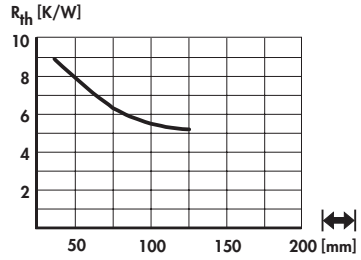
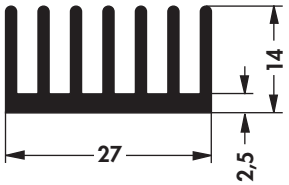
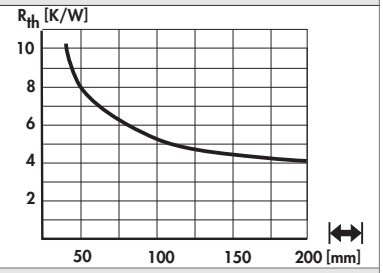
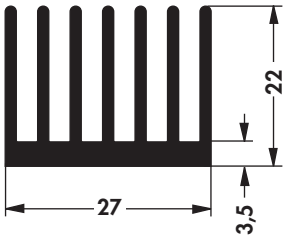
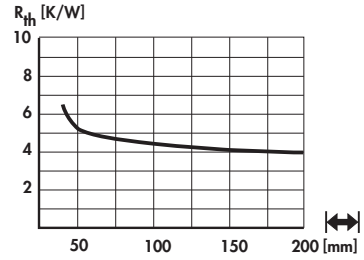
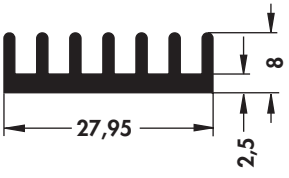
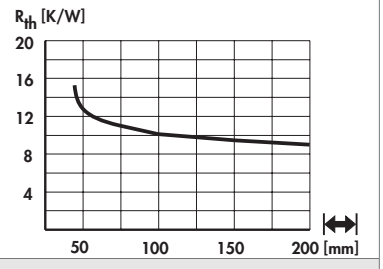
art. no.		
SK 582 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 559 ...		
please indicate:	**... ↔ 37.5 75 100 1000 mm**	
art. no.		
SK 551 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 486 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 473 ...		
please indicate:	**... ↔ 37.5 50 75 1000 mm**	

art. no.		
SK 554 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

art. no.		
SK 447 ...		
please indicate:	... ↔ 37.5 1000 mm	

art. no.		
SK 560 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

art. no.		
SK 566 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

art. no.		
SK 561 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

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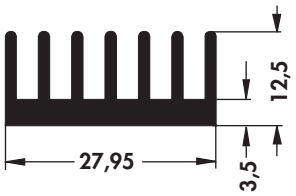
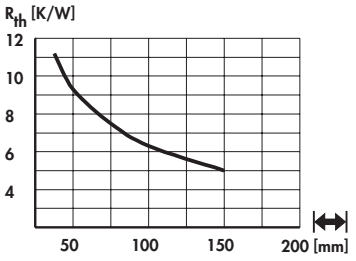
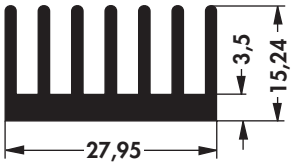
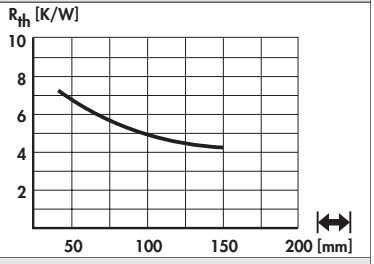
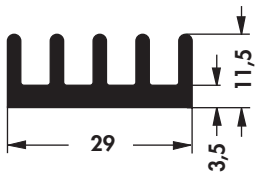
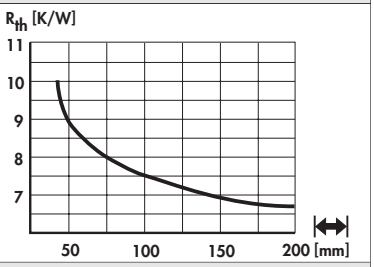
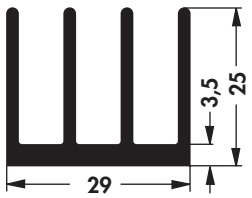
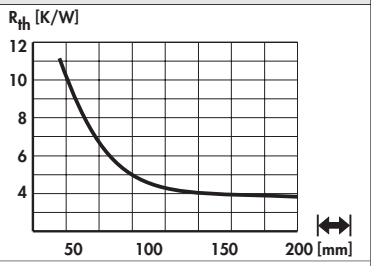
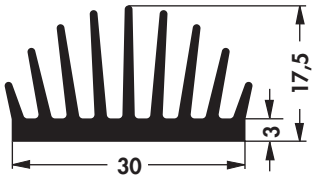
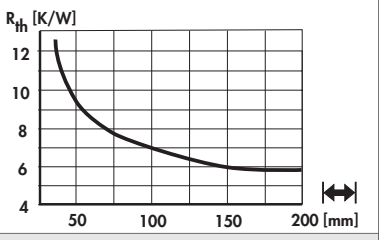
Standard extruded heatsinks

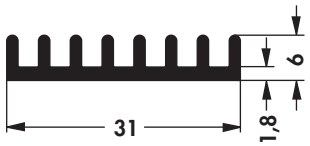
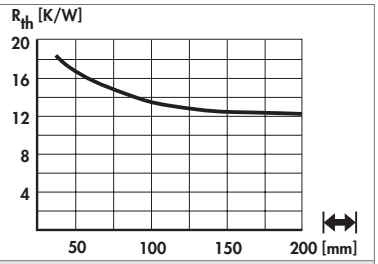
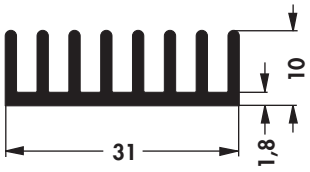
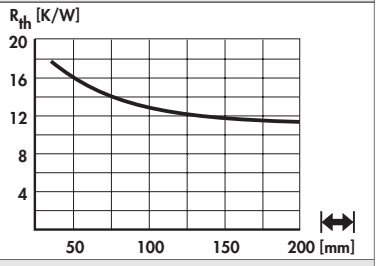
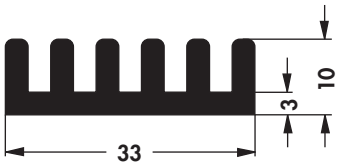
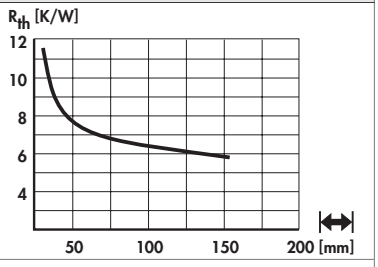
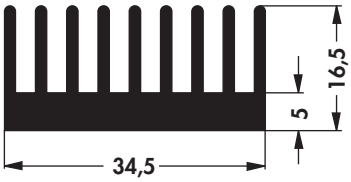
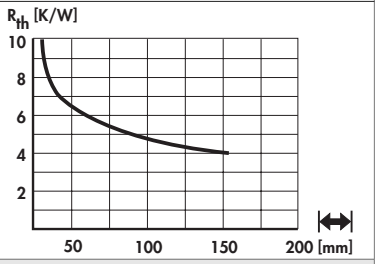
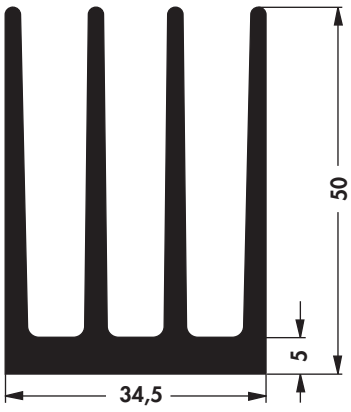
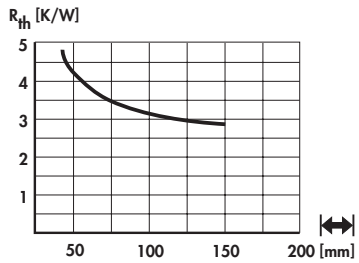
art. no.		
SK 448 ...		
	extruded heatsinks for PCB mounting → A 111	
please indicate:	**... ↔ 37.5 50 75 mm**	

art. no.		
SK 177 ...		
please indicate:	**... ↔ 50 75 100 1000 mm**	

art. no.		
SK 550 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	

art. no.		
SK 452 ...		
	extruded heatsinks for PCB mounting → A 96	
please indicate:	**... ↔ 37.5 100 1000 mm**	**... ⌖ (optional) TO 218; TO 220; TO 247; TO 248; TO 3 P**

art. no.		
SK 597 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	

art. no.		
SK 493 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 581 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 400 ...	 extruded heatsinks for PCB mounting → A 111	
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 178 ...		
please indicate:	**... ↔** **37.5 75 100 1000 mm**	
art. no.		
SK 134 ...		
please indicate:	**... ↔** **37.5 50 100 1000 mm**	

High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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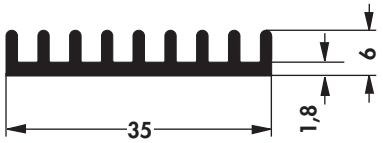
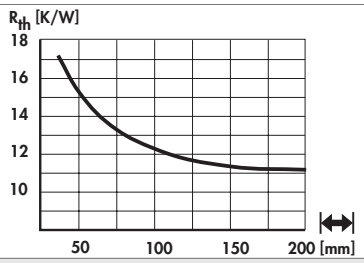
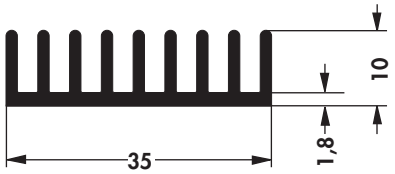
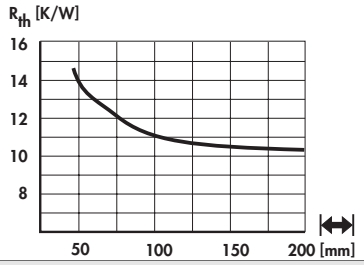
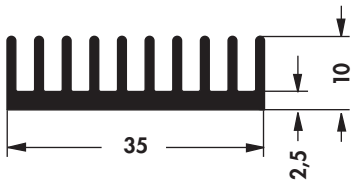
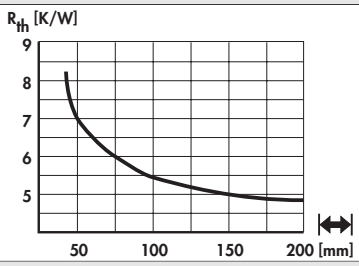
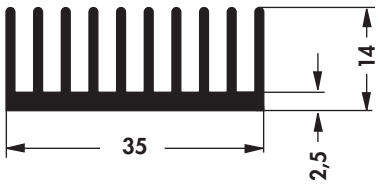
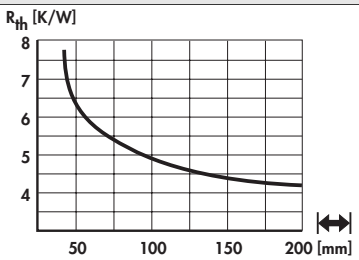
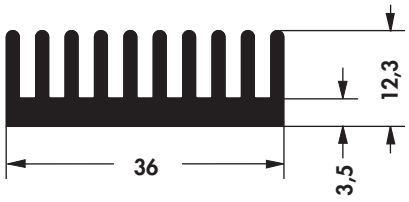
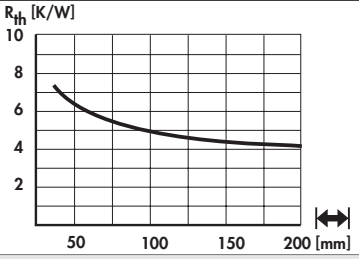
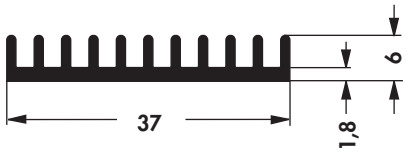
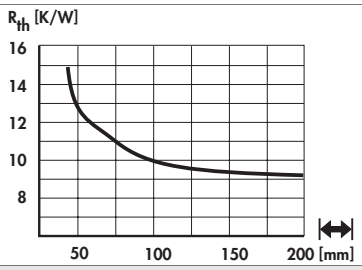
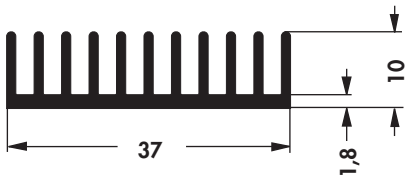
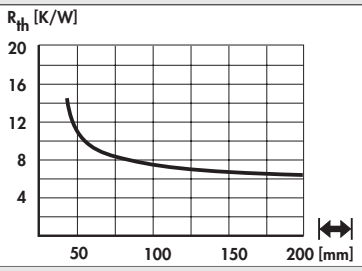
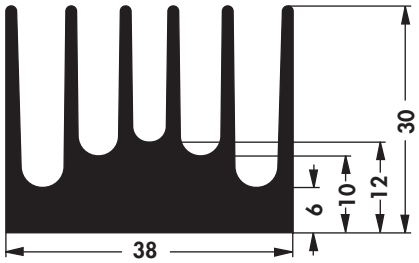
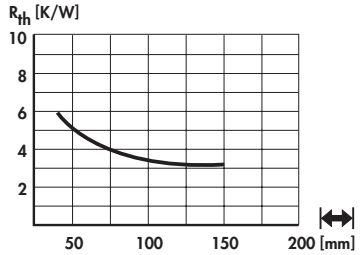
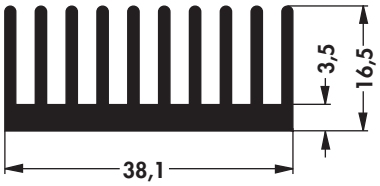
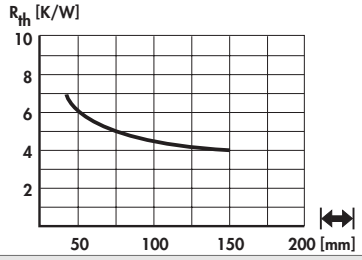
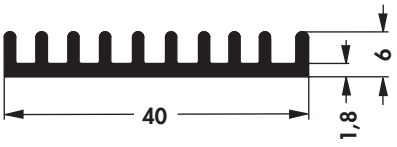
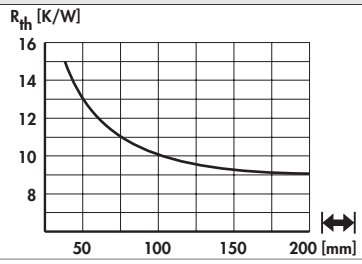
art. no.		
SK 471 ...		
please indicate:	... ↔ 37.5 50 75 1000 mm	

art. no.		
SK 587 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

art. no.		
SK 549 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

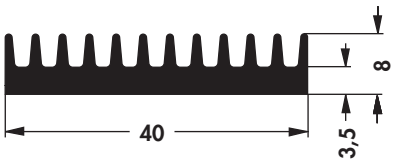
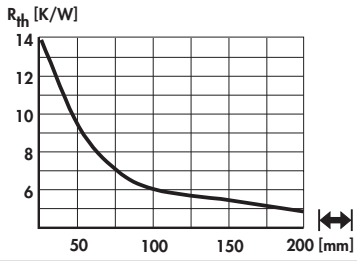
art. no.		
SK 562 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

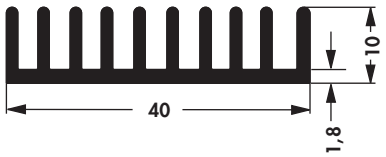
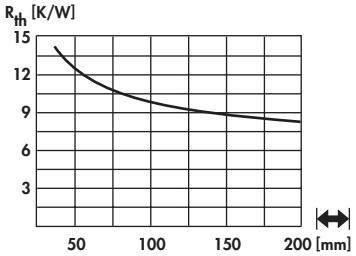
art. no.		
SK 509 ...		
please indicate:	... ↔ 37.5 50 100 1000 mm	

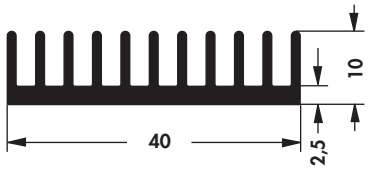
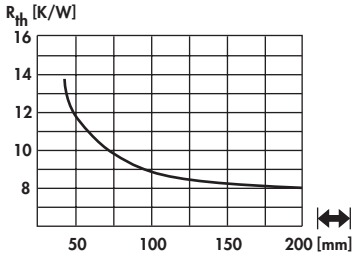
art. no.		
SK 563 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 564 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 174 ...		
please indicate:	**... ↔ 75 1000 mm**	
art. no.		
SK 179 ...		
please indicate:	**... ↔ 37.5 50 100 1000 mm**	
art. no.		
SK 456 ...		
	extruded heatsinks for PCB mounting → A 111	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	

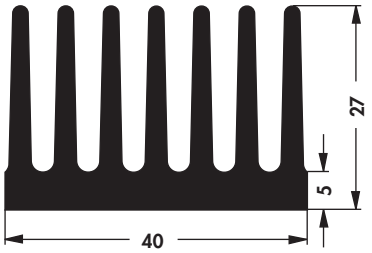
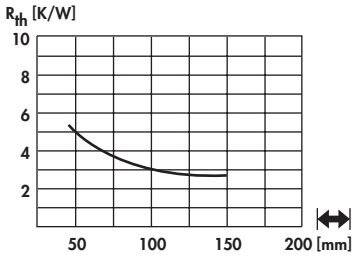
High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

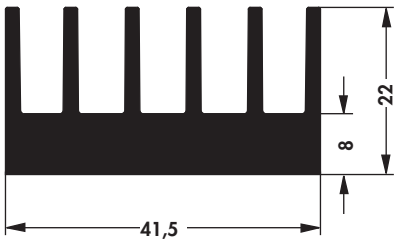
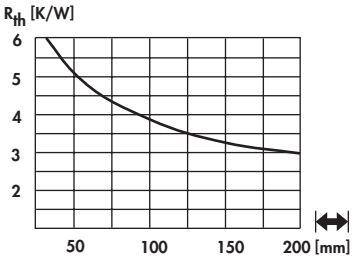
Standard extruded heatsinks

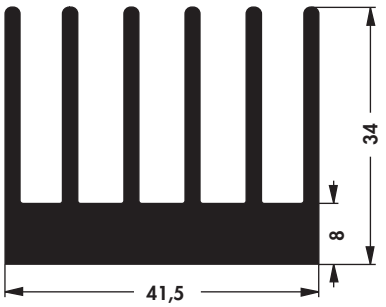
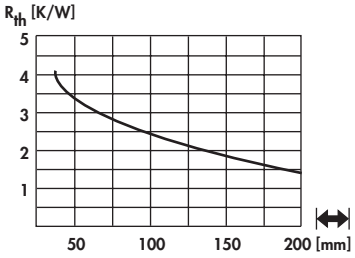
art. no.		
SK 420 ...		
please indicate:	... ↔ 37.5 75 1000 mm	

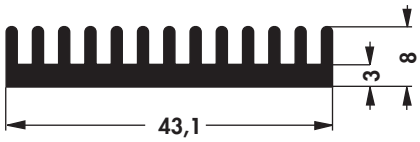
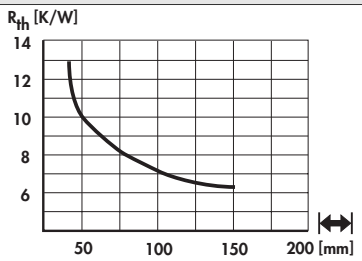
art. no.		
SK 513 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

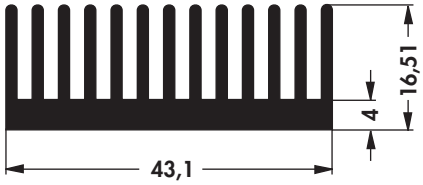
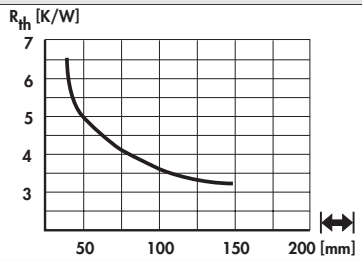
art. no.		
SK 547 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

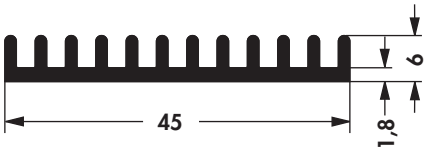
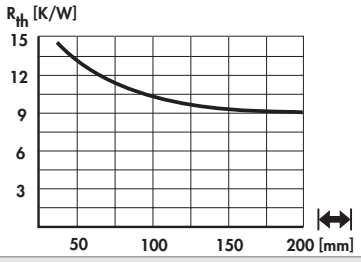
art. no.		
SK 106 ...		
please indicate:	... ↔ 50 75 1000 mm	

art. no.		
SK 472 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

art. no.		
SK 189 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	

art. no.		
SK 423 ...		
please indicate:	**... ↔** **100 1000 mm**	

art. no.		
SK 422 ...		
please indicate:	**... ↔** **50 1000 mm**	

art. no.		
SK 511 ...		
please indicate:	**... ↔** **50 75 100 1000 mm**	

High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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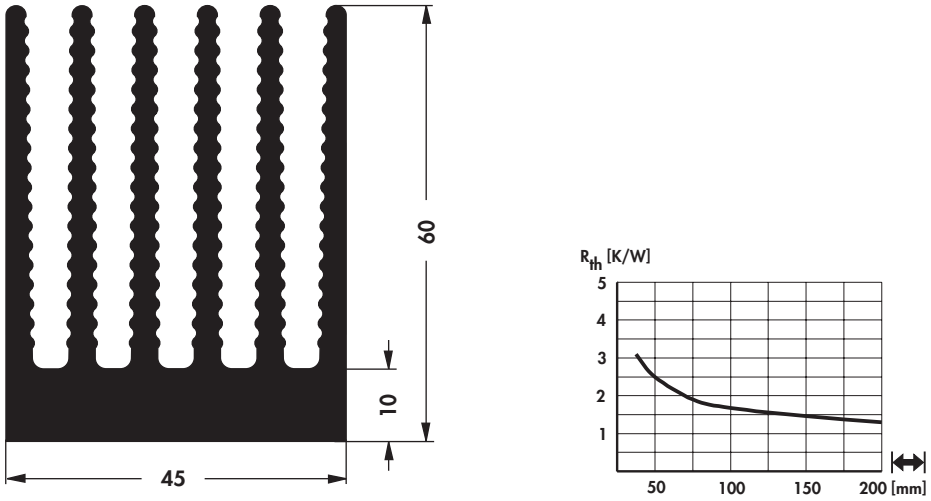
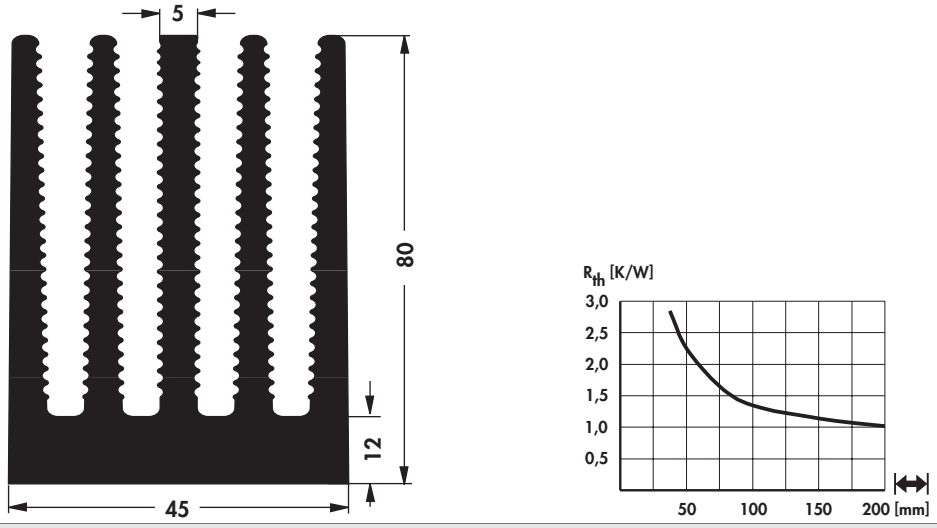
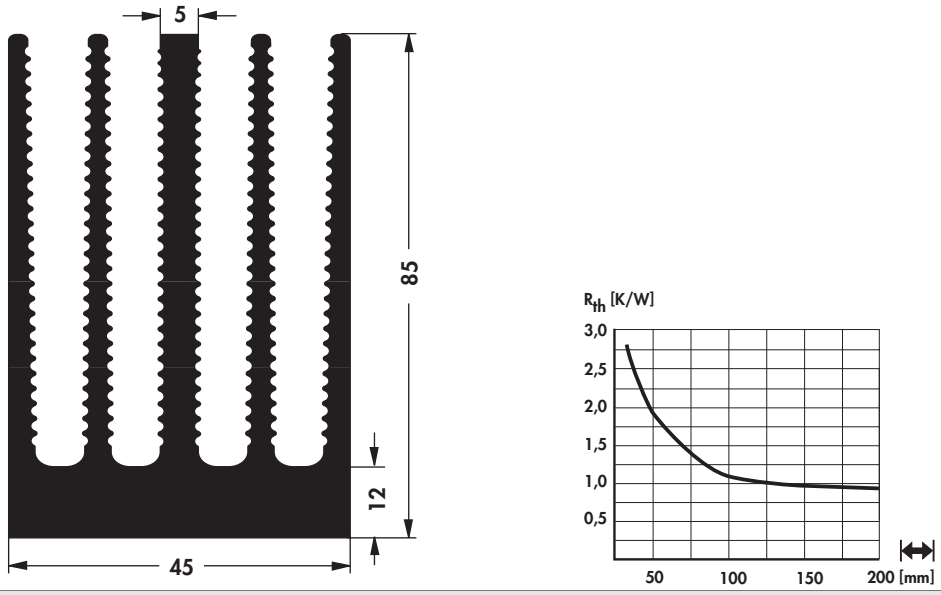
Standard extruded heatsinks

art. no.	
SK 453 ...	

please indicate: ... ↔ 37.5 75 mm ... ◈ (optional) SSR 1

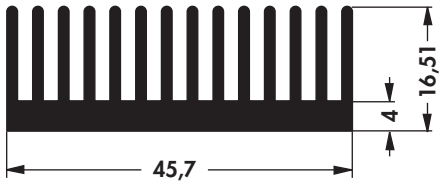
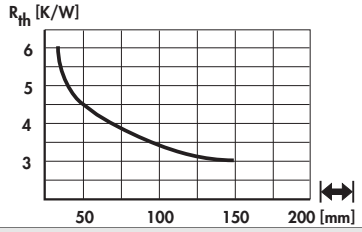
art. no.	
SK 455 ...	

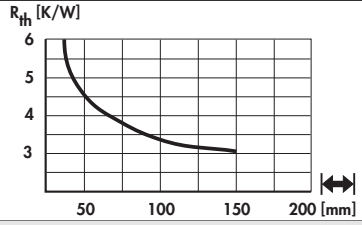
please indicate: ... ↔ 75 mm ... ◈ (optional) SSR 4

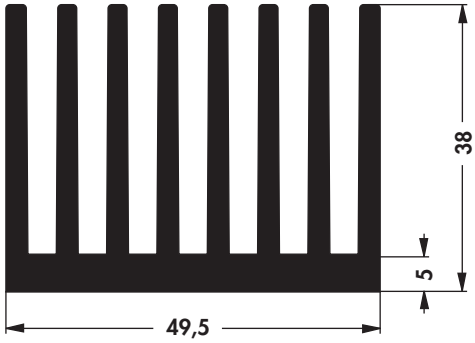
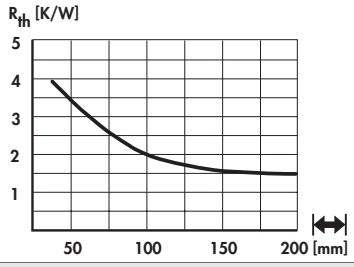
art. no.	
SK 467 ...	

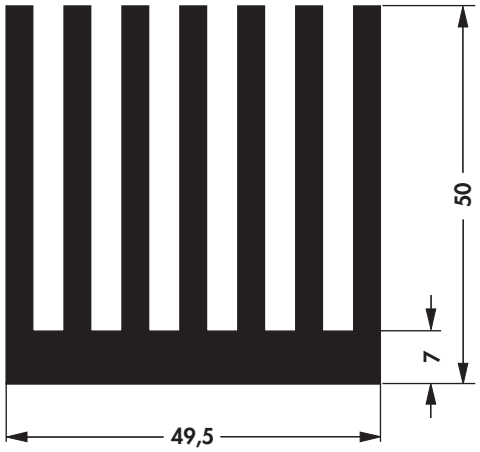
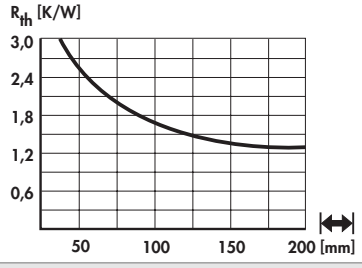
please indicate: ... ↔ 37.5 50 75 100 1000 mm ... ◈ (optional) SSR 1; SSR 4

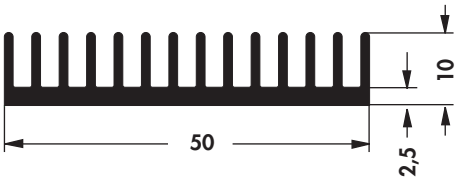
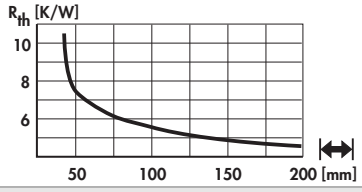
High decorative surfaces	→ A 9	Heatsinks for Solid State Relay	→ A 11 – 12
Order example	→ A 21	Special heatsink design	→ A 137 – 138
Heatsink as visual & decor-parts	→ A 10	Special profiles	→ A 140
Drilling pattern for Solid State Relais	→ A 12	Technical introduction	→ A 2 – 8

art. no.		
SK 424 ...		
please indicate:	... ↔ 75 1000 mm	

art. no.		
SK 425 ...		
please indicate:	... ↔ 75 mm	

art. no.		
SK 445 ...		
please indicate:	... ↔ 100 1000 mm	

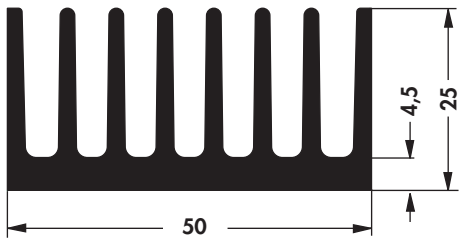
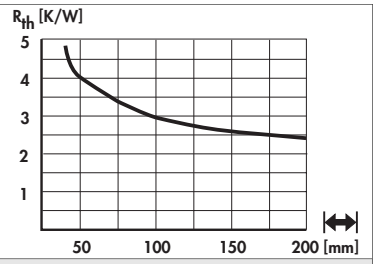
art. no.		
SK 450 ...		
please indicate:	... ↔ 75 1000 mm	

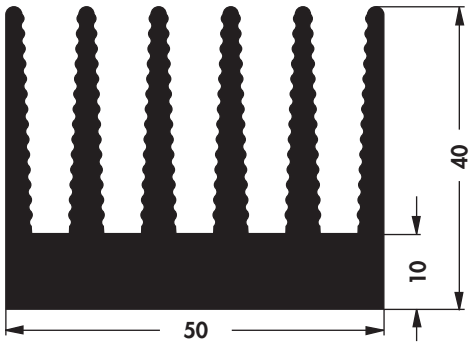
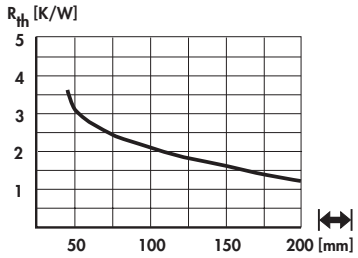
art. no.		
SK 548 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

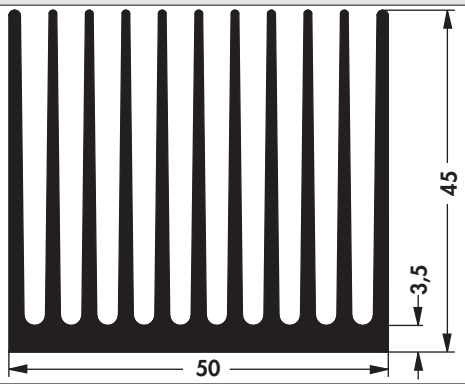
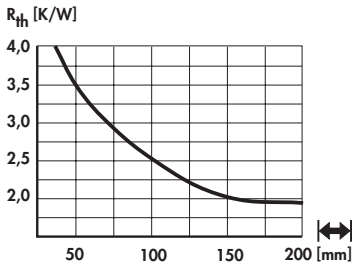
High decorative surfaces → A 9
Order example → A 21
Heatsink as visual & decor-parts → A 10
Drilling pattern for Solid State Relais → A 12
Heatsinks for Solid State Relay → A 11 – 12
Special heatsink design → A 137 – 138
Special profiles → A 140
Technical introduction → A 2 – 8

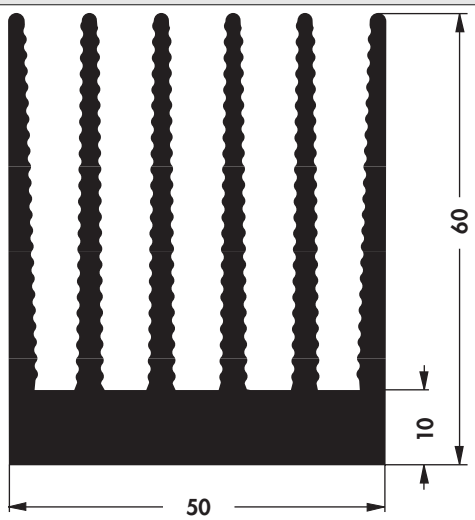
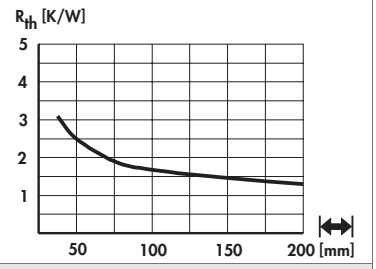
fischer elektronik

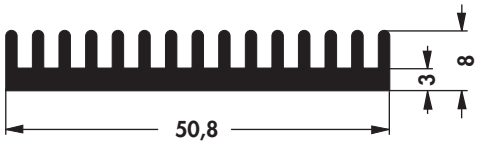
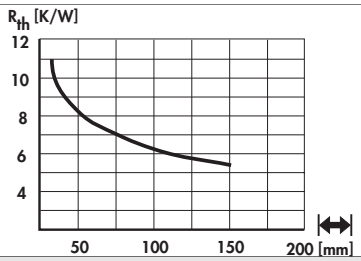
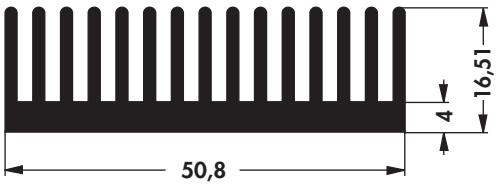
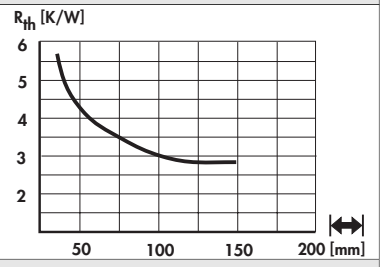
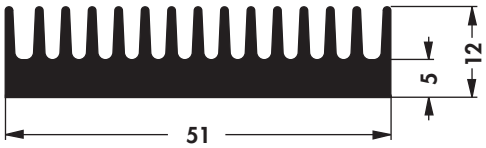
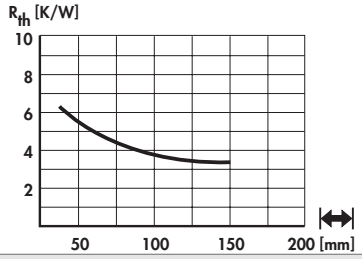
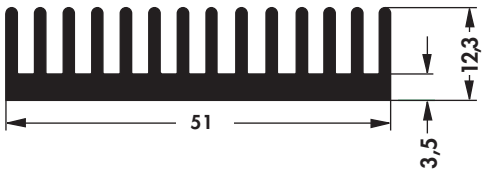
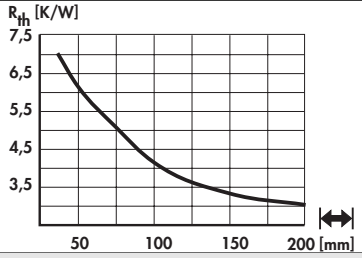
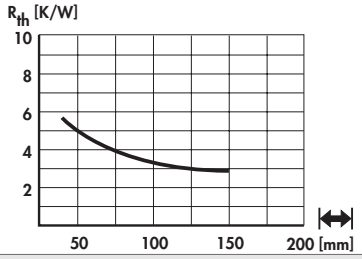
Standard extruded heatsinks

art. no.		
SK 567 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	

art. no.		
SK 434 ...		
please indicate:	... ↔ 50 75 100 1000 mm	... ◈ (optional) SSR 1

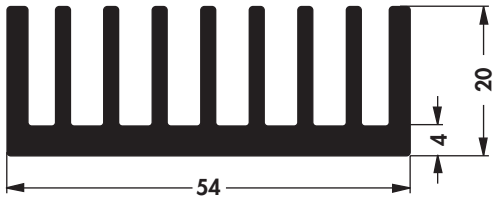
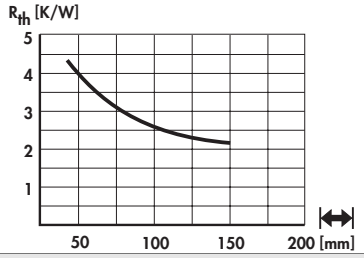
art. no.		
SK 475 ...		
please indicate:	... ↔ 37.5 50 100 1000 mm	

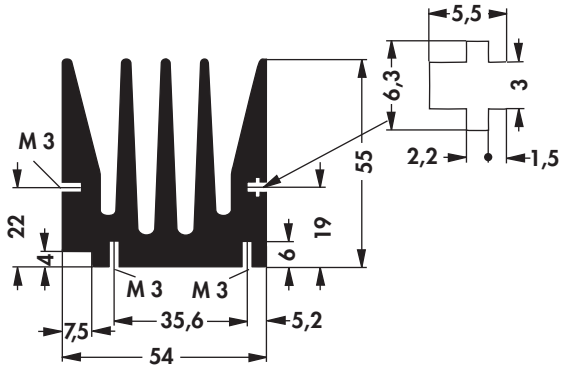
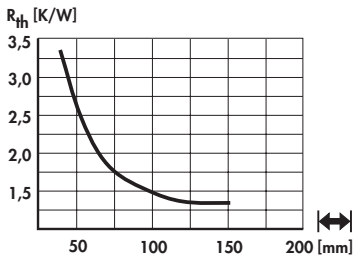
art. no.		
SK 527 ...		
please indicate:	... ↔ 50 75 100 1000 mm	

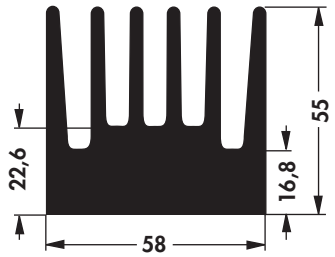
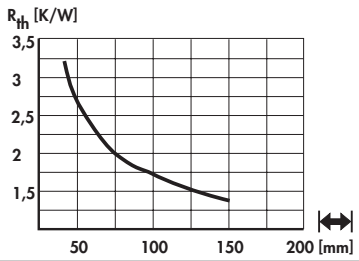
art. no.		
SK 427 ...		
please indicate:	**... ↔** **50 75 1000 mm**	
art. no.		
SK 426 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 156 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 468 ...		
please indicate:	**... ↔** **37.5 75 1000 mm**	
art. no.		
SK 180 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	

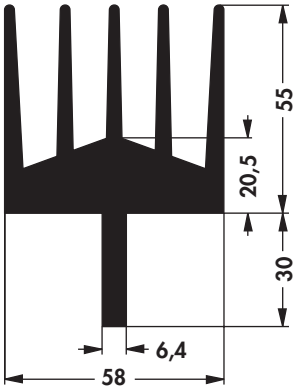
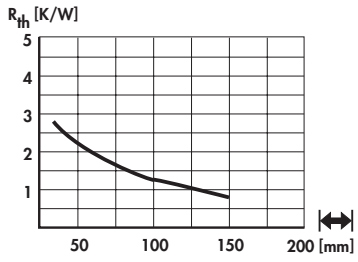
High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

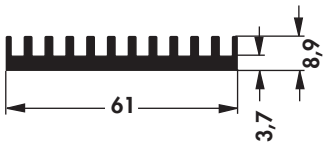
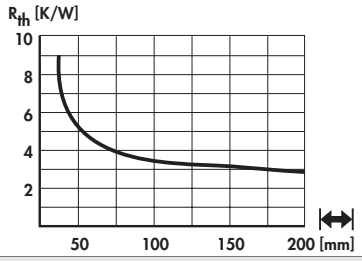
Standard extruded heatsinks

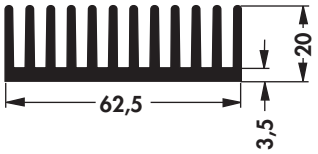
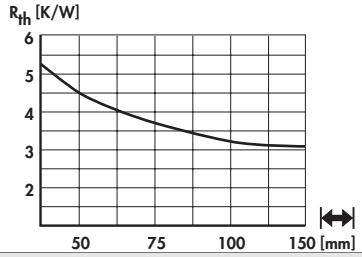
art. no.	
SK 99 ...	 
please indicate:	... ↔ 37.5 50 75 100 150 1000 mm

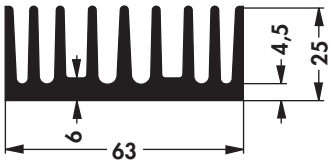
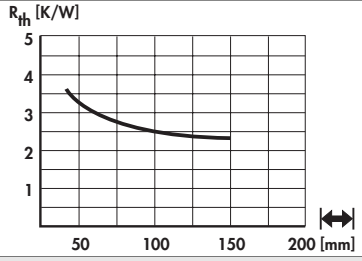
art. no.	
SK 429 ...	 
please indicate:	... ↔ 37.5 50 75 100 1000 mm

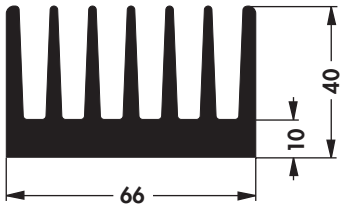
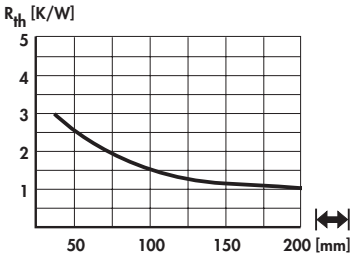
art. no.	
SK 436 ...	 
please indicate:	... ↔ 75 1000 mm

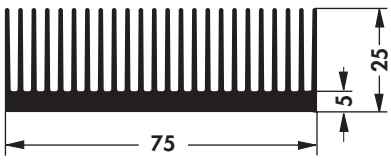
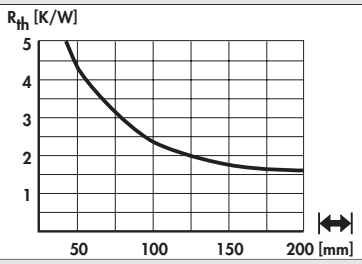
art. no.	
SK 50 ...	 
please indicate:	... ↔ 75 1000 mm

art. no.		
SK 485 ...		
please indicate:	... ↔ **50 75 100 1000 mm**	

art. no.		
SK 444 ...		
please indicate:	... ↔ **37.5 50 75 1000 mm**	

art. no.		
SK 406 ...		
please indicate:	... ↔ **37.5 50 75 100 1000 mm**	

art. no.		
SK 100 ...		
please indicate:	... ↔ **37.5 50 75 100 150 1000 mm**	

art. no.		
SK 594 ...		
please indicate:	... ↔ **37.5 50 75 100 1000 mm**	

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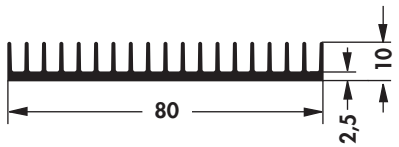
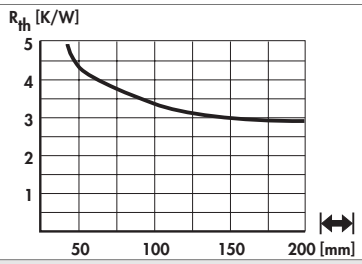
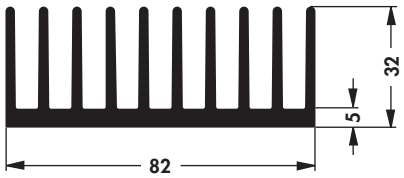
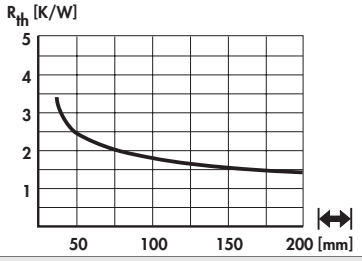
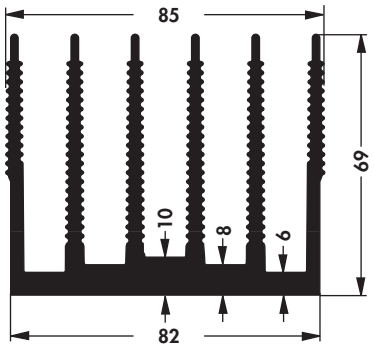
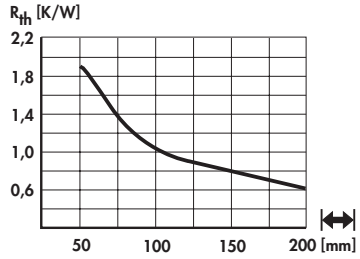
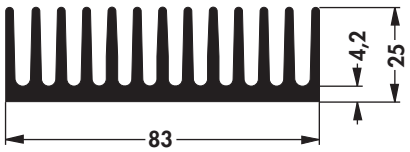
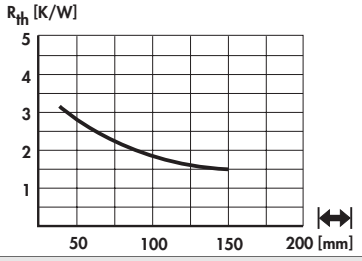
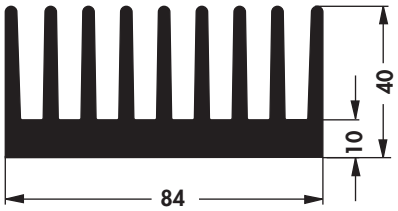
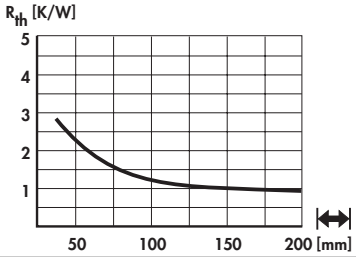
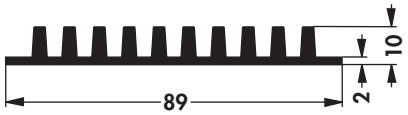
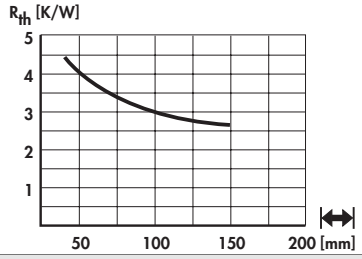
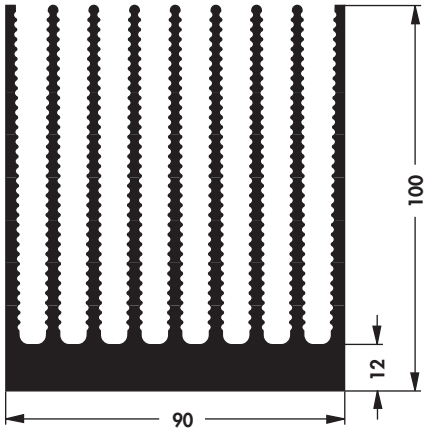
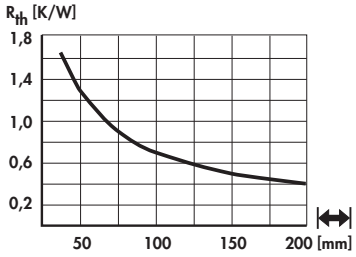
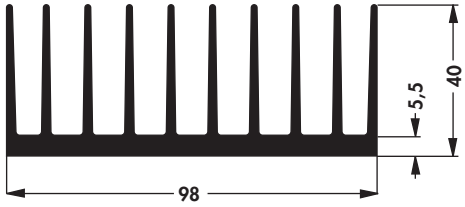
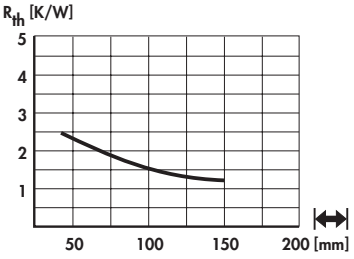
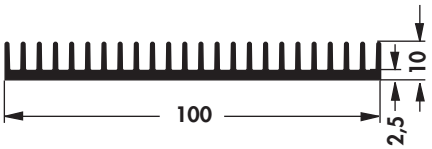
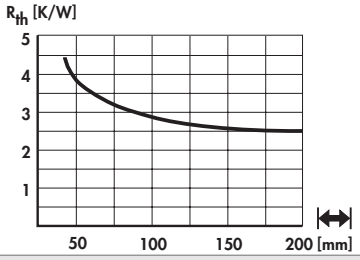
Standard extruded heatsinks

art. no.		
SK 545 ...		
please indicate:	**... ↔ 50 75 100 150 1000 mm**	
art. no.		
SK 612 ...		
please indicate:	**... ↔ 37.5 50 75 100 150 1000 mm**	
art. no.		
SK 135 ...		
please indicate:	**... ↔ 50 100 1000 mm**	
art. no.		
SK 407 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	
art. no.		
SK 464 ...		
please indicate:	**... ↔ 50 75 100 150 1000 mm**	

art. no.	
SK 182 ...	 
please indicate:	**... ↔** **37.5 50 75 100 150 200 1000 mm**

art. no.	
SK 507 ...	 
please indicate:	**... ↔** **37.5 75 100 1000 mm** **... ⌖ (optional)** **SSR 1; SSR 2**

art. no.	
SK 408 ...	 
please indicate:	**... ↔** **50 75 100 150 1000 mm**

art. no.	
SK 546 ...	 
please indicate:	**... ↔** **37.5 50 75 100 150 1000 mm**

High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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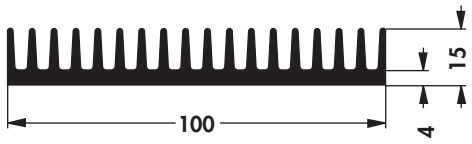
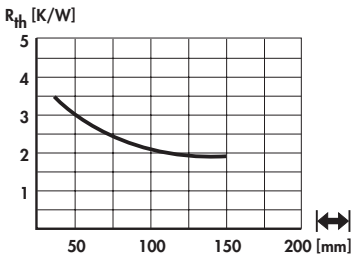
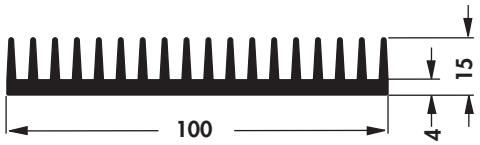
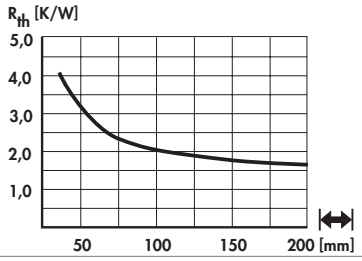
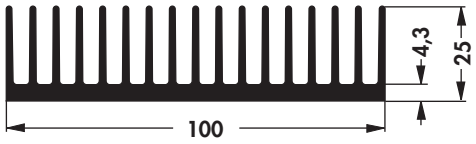
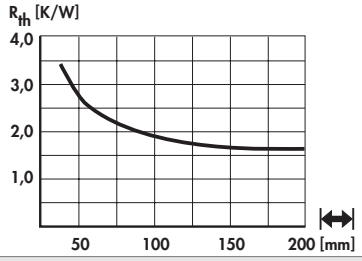
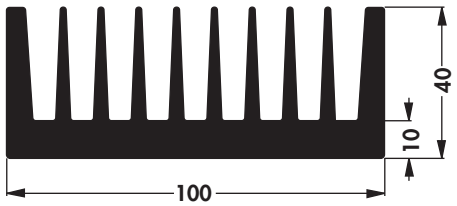
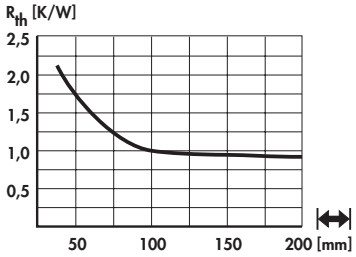
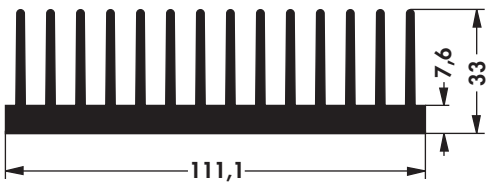
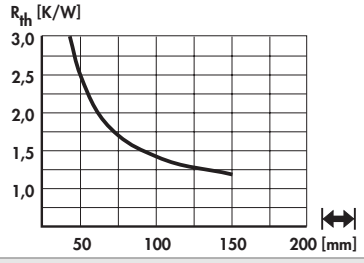
Standard extruded heatsinks

art. no.		
SK 81 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	

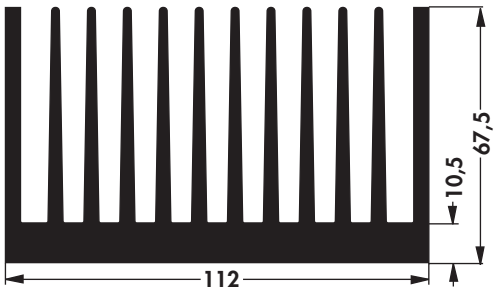
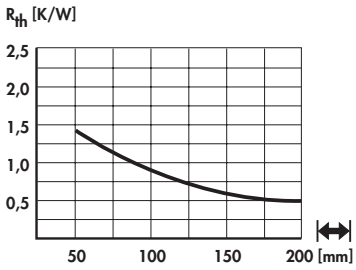
art. no.		
SK 505 ...		
	weight reduced like SK 81	
please indicate:	**... ↔** **37.5 50 75 100 150 1000 mm**	

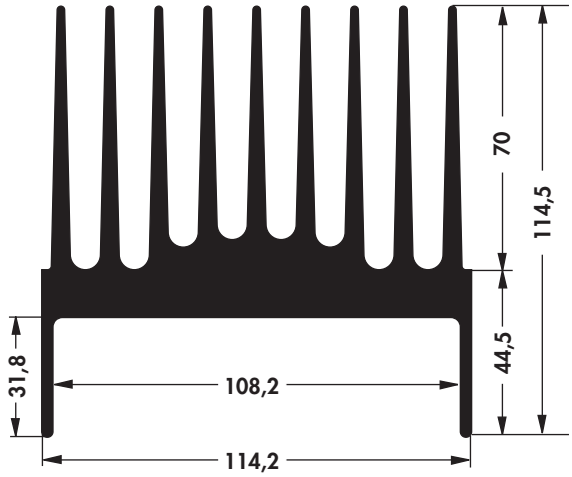
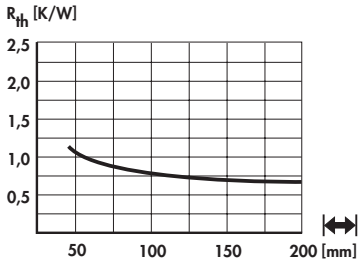
art. no.		
SK 508 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	

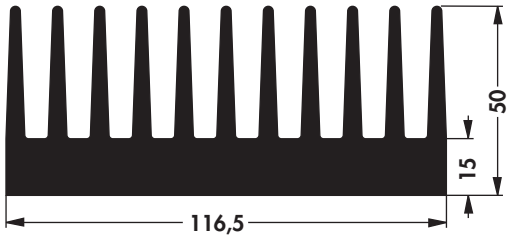
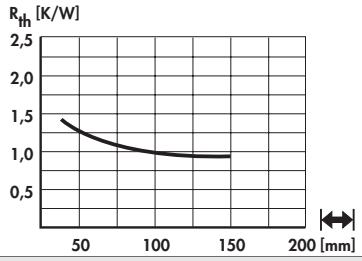
art. no.		
SK 92 ...		
please indicate:	**... ↔** **50 75 100 150 1000 mm**	

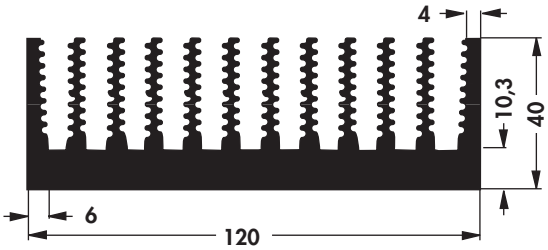
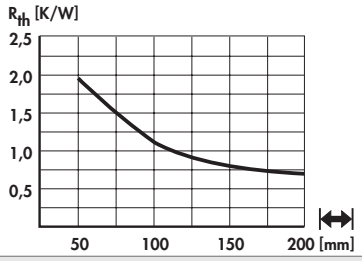
art. no.		
SK 433 ...		
please indicate:	**... ↔** **37.5 50 75 1000 mm**	

High decorative surfaces	→ A 9	Heatsinks for Solid State Relay	→ A 11 – 12
Order example	→ A 21	Special heatsink design	→ A 137 – 138
Heatsink as visual & decor-parts	→ A 10	Special profiles	→ A 140
Drilling pattern for Solid State Relais	→ A 12	Technical introduction	→ A 2 – 8

art. no.	
SK 121 ...	 
please indicate:	**... ↔** **75 100 150 1000 mm**

art. no.	
SK 33 ...	 
please indicate:	**... ↔** **50 75 100 1000 mm** **... ⌖ (optional)** **SSR 1**

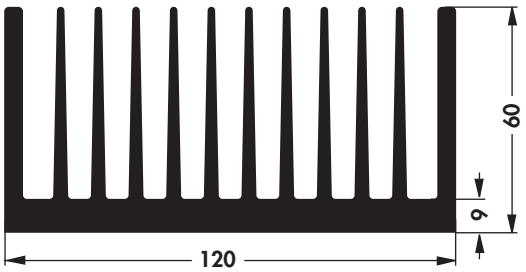
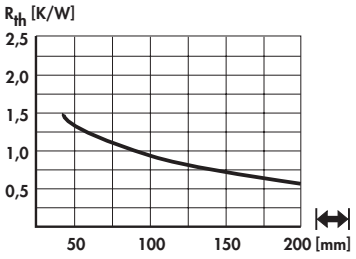
art. no.	
SK 411 ...	 
please indicate:	**... ↔** **50 75 100 150 1000 mm**

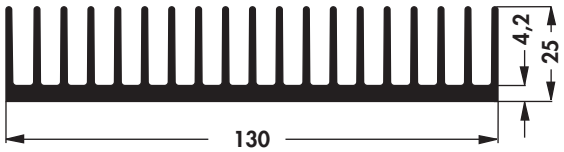
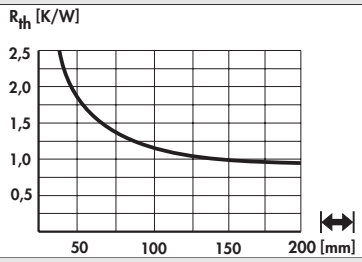
art. no.	
SK 442 ...	 
please indicate:	**... ↔** **50 75 100 150 1000 mm**

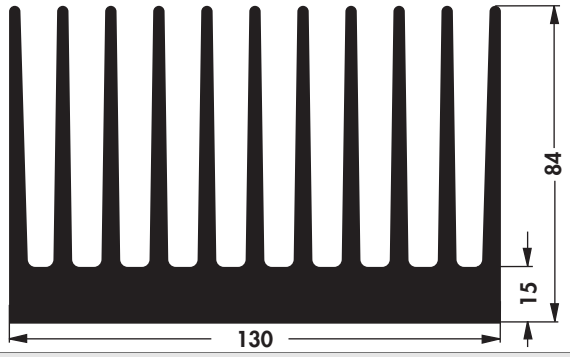
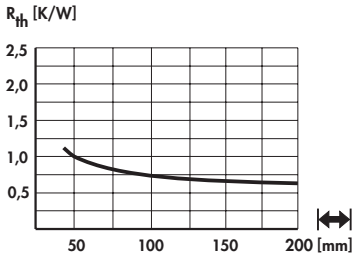
High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

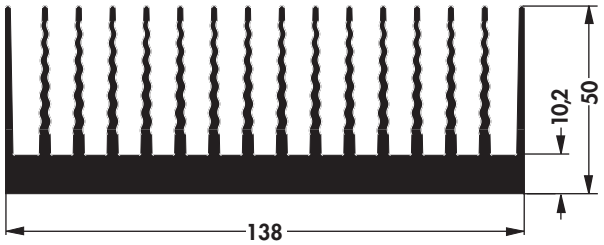
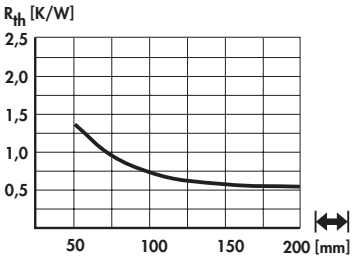
fischer elektronik

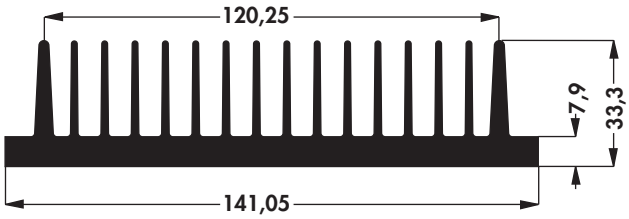
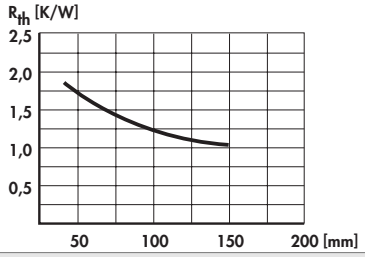
Standard extruded heatsinks

art. no.		
SK 595 ...		
please indicate:	**... ↔** **50 75 100 150 1000 mm**	

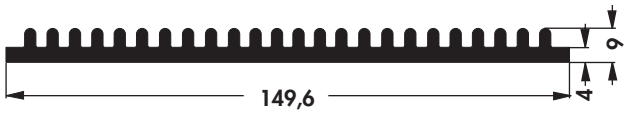
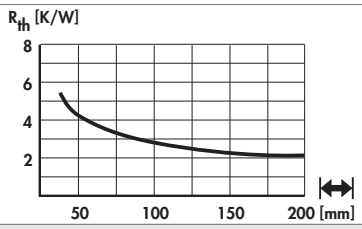
art. no.		
SK 463 ...		
please indicate:	**... ↔** **50 75 100 150 1000 mm**	

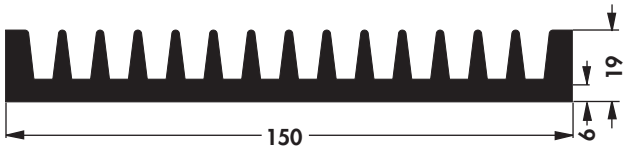
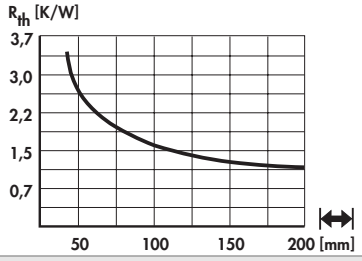
art. no.		
SK 613 ...		
please indicate:	**... ↔** **37.5 50 75 100 150 1000 mm**	

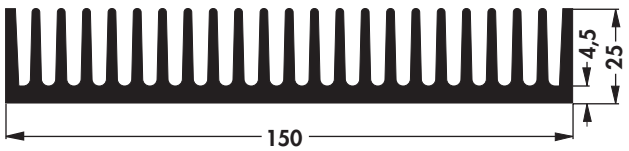
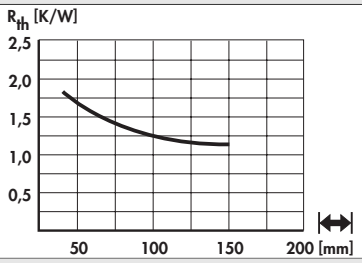
art. no.		
SK 466 ...		
please indicate:	**... ↔** **50 75 100 150 1000 mm**	

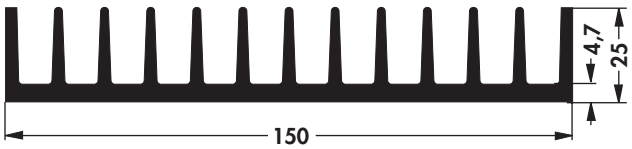
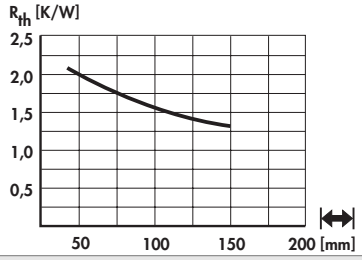
art. no.		
SK 413 ...		
please indicate:	**... ↔** **100 1000 mm**	

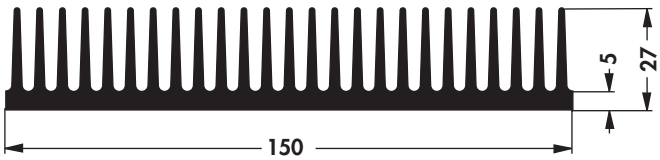
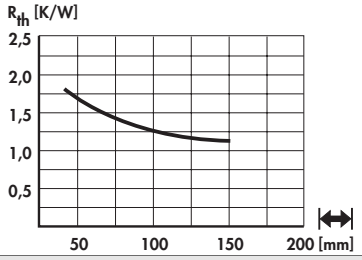
High decorative surfaces → A 9
Order example → A 21
Heatsink as visual & decor-parts → A 10
Drilling pattern for Solid State Relais → A 12
Heatsinks for Solid State Relay → A 11 – 12
Special heatsink design → A 137 – 138
Special profiles → A 140
Technical introduction → A 2 – 8

art. no.		
SK 601 ...		
please indicate:	... ↔ 50 75 100 150 1000 mm	

art. no.		
SK 553 ...		
please indicate:	... ↔ 37.5 50 75 100 150 1000 mm	

art. no.		
SK 132 ...		
please indicate:	... ↔ 37.5 50 75 100 150 1000 mm	

art. no.		
SK 410 ...		
please indicate:	... ↔ 37.5 50 75 100 150 1000 mm	

art. no.		
SK 133 ...		
please indicate:	... ↔ 50 75 100 1000 mm	

High decorative surfaces → A 9
Order example → A 21
Heatsink as visual & decor-parts → A 10
Drilling pattern for Solid State Relais → A 12
Heatsinks for Solid State Relay → A 11 – 12
Special heatsink design → A 137 – 138
Special profiles → A 140
Technical introduction → A 2 – 8

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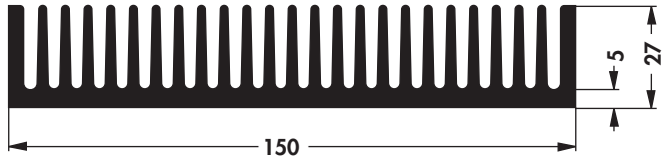
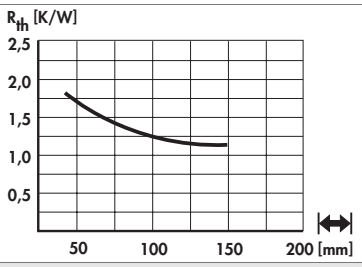
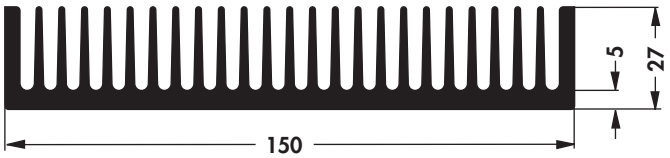
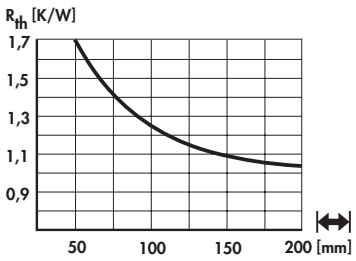
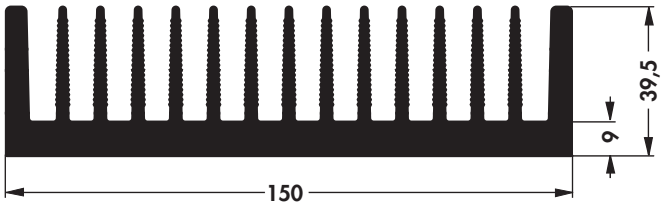
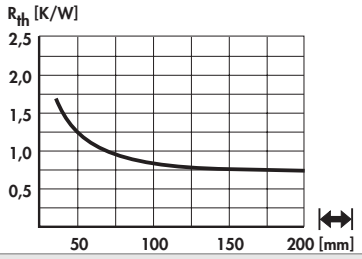
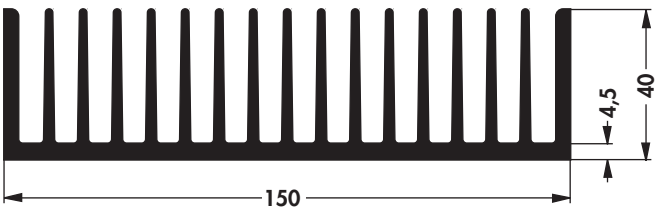
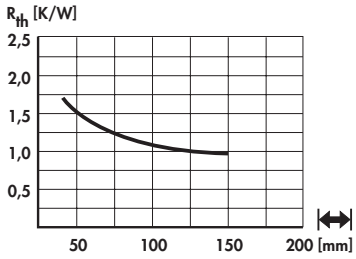
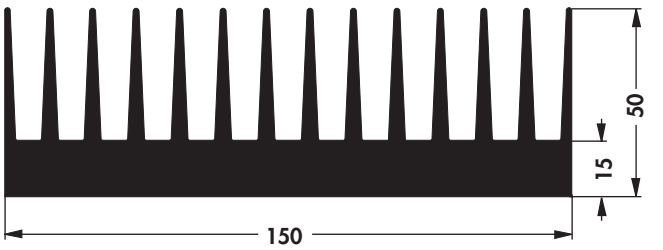
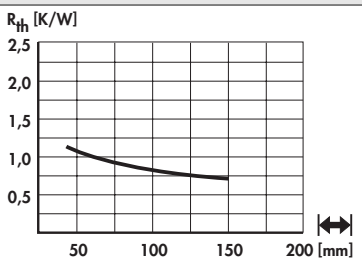
Standard extruded heatsinks

art. no.	
SK 58 ...	 
please indicate:	**... ↔ 50 75 100 150 1000 mm**

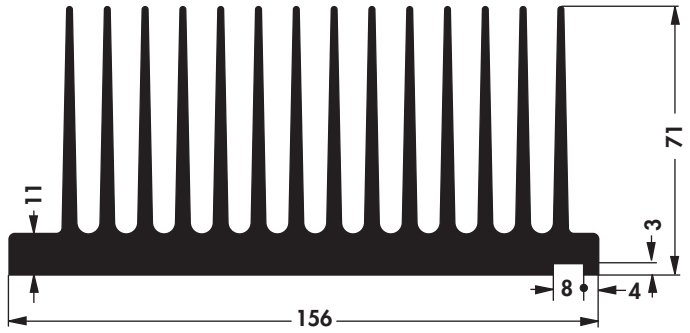
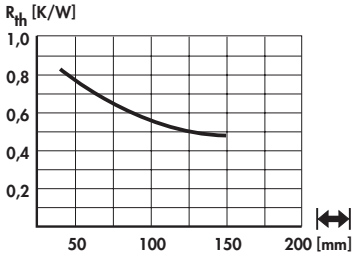
art. no.	
SK 504 ...	  weight reduced like SK 58
please indicate:	**... ↔ 37.5 50 75 100 150 1000 mm**

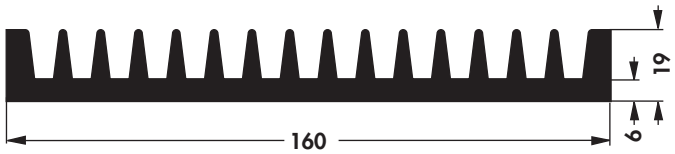
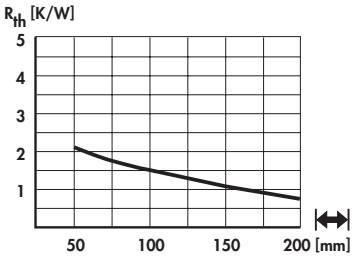
art. no.	
SK 588 ...	 
please indicate:	**... ↔ 50 75 100 150 1000 mm**

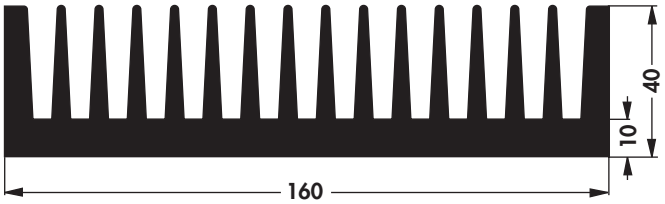
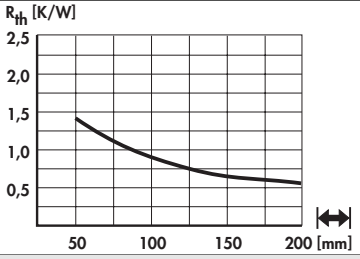
art. no.	
SK 120 ...	 
please indicate:	**... ↔ 50 75 100 150 1000 mm**

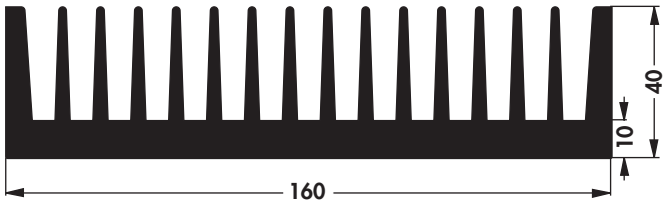
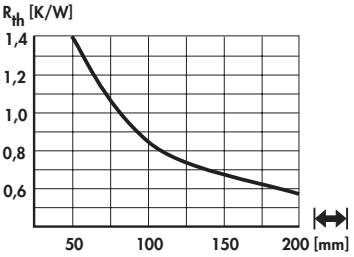
art. no.	
SK 155 ...	 
please indicate:	**... ↔ 75 100 150 1000 mm**

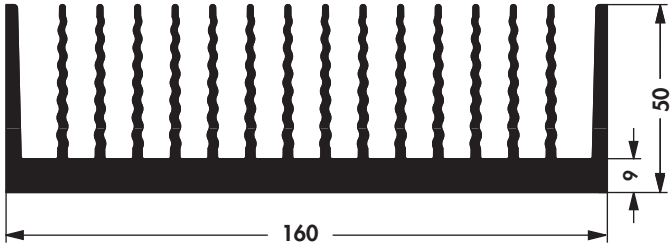
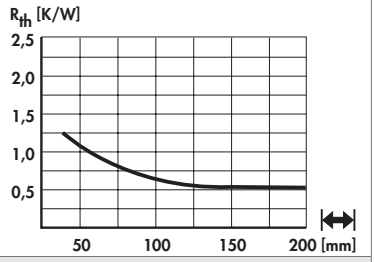
High decorative surfaces	→ A 9	Heatsinks for Solid State Relay	→ A 11 – 12
Order example	→ A 21	Special heatsink design	→ A 137 – 138
Heatsink as visual & decor-parts	→ A 10	Special profiles	→ A 140
Drilling pattern for Solid State Relais	→ A 12	Technical introduction	→ A 2 – 8

art. no.	
SK 154 ...	 
please indicate:	... ↔ **50 75 100 150 mm**

art. no.	
SK 417 ...	 
please indicate:	... ↔ **75 100 150 1000 mm**

art. no.	
SK 85 ...	 
please indicate:	... ↔ **37.5 50 75 100 150 1000 mm**

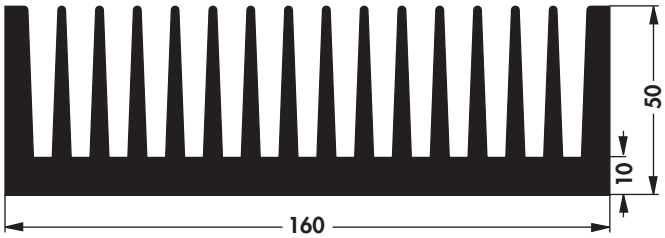
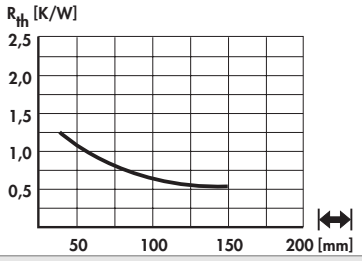
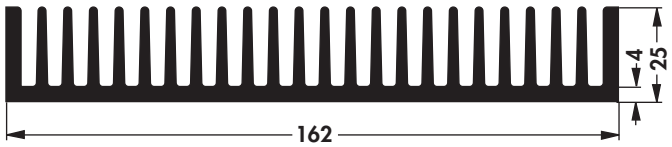
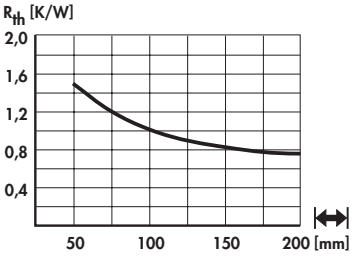
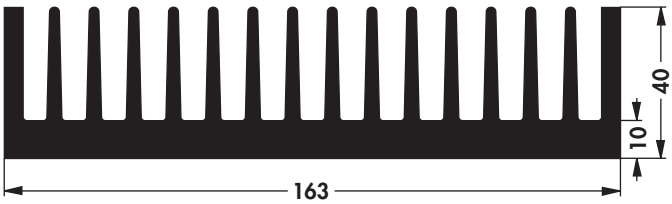
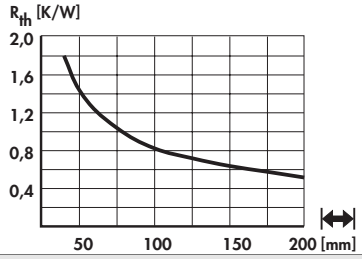
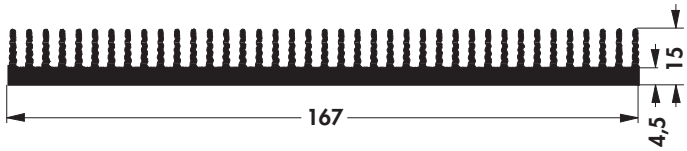
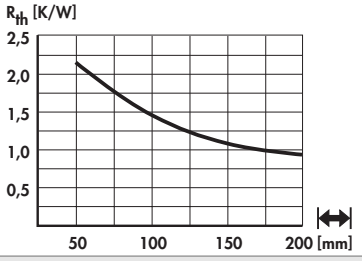
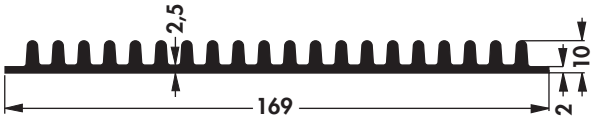
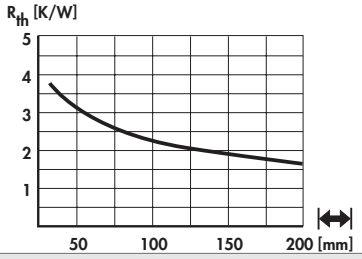
art. no.	
SK 503 ...	  weight reduced like SK 85
please indicate:	... ↔ **75 100 1000 mm**

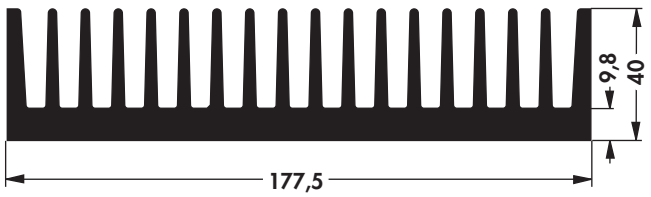
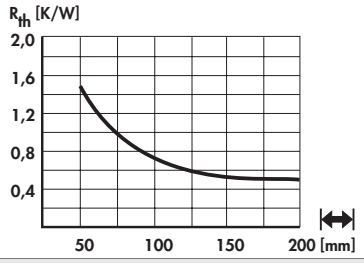
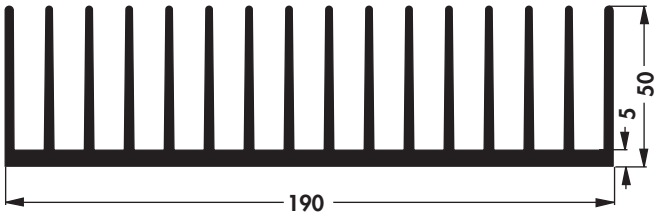
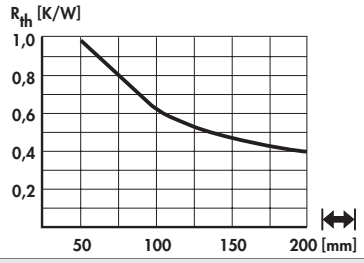
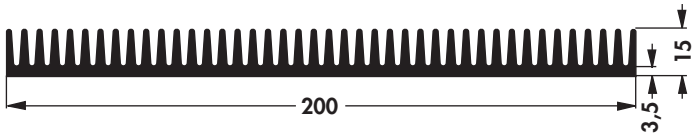
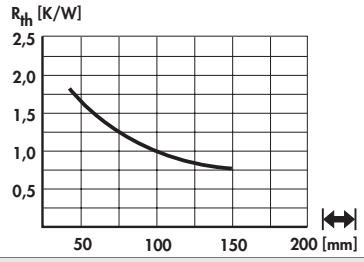
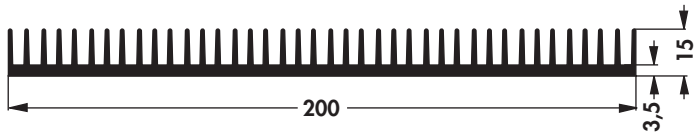
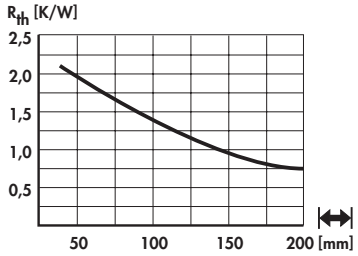
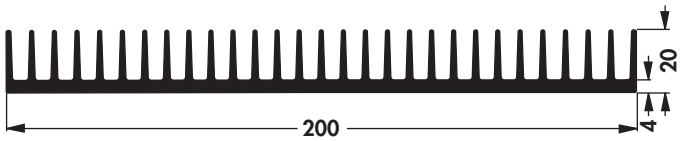
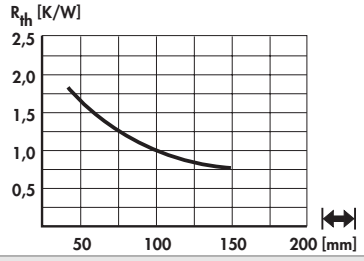
art. no.	
SK 510 ...	 
please indicate:	... ↔ **50 75 100 150 1000 mm**

High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

fischer elektronik

Standard extruded heatsinks

art. no.		
SK 416 ...		
please indicate:	... ↔ 50 75 100 150 1000 mm	
art. no.		
SK 119 ...		
please indicate:	... ↔ 50 75 100 150 1000 mm	
art. no.		
SK 412 ...		
please indicate:	... ↔ 50 75 100 150 1000 mm	
art. no.		
SK 421 ...		
please indicate:	... ↔ 50 75 100 150 200 1000 mm	
art. no.		
SK 405 ...		
please indicate:	... ↔ 100 1000 mm	

art. no.		
SK 519 ...		
please indicate:	... ↔ 50 100 1000 mm	
art. no.		
SK 90 ...		
please indicate:	... ↔ 50 75 100 1000 mm	
art. no.		
SK 136 ...		
please indicate:	... ↔ 75 100 150 1000 mm	
art. no.		
SK 166 ...		
please indicate:	... ↔ 1000 mm	
art. no.		
SK 113 ...		
please indicate:	... ↔ 50 75 100 150 1000 mm	

High decorative surfaces → A 9
Order example → A 21
Heatsink as visual & decor-parts → A 10
Drilling pattern for Solid State Relais → A 12
Heatsinks for Solid State Relay → A 11 – 12
Special heatsink design → A 137 – 138
Special profiles → A 140
Technical introduction → A 2 – 8

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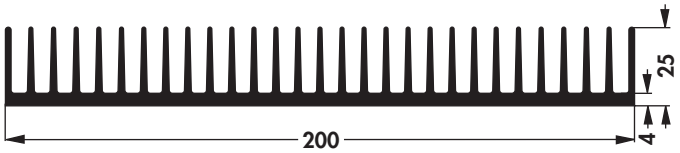
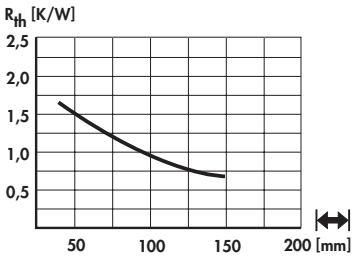
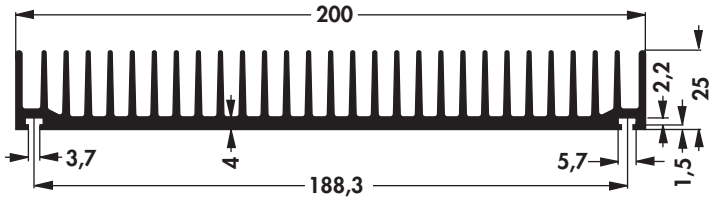
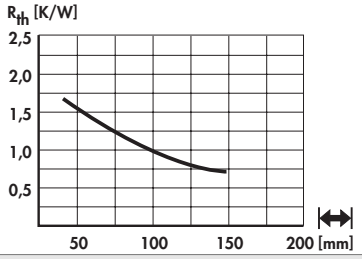
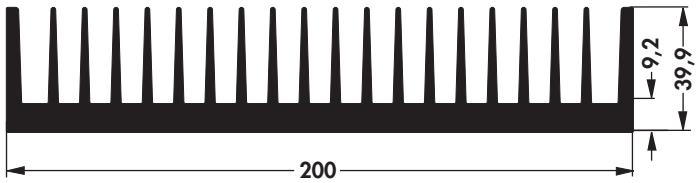
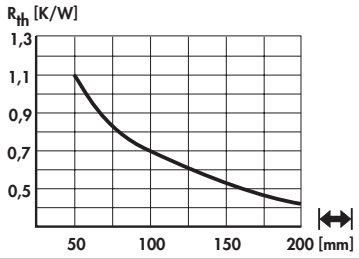
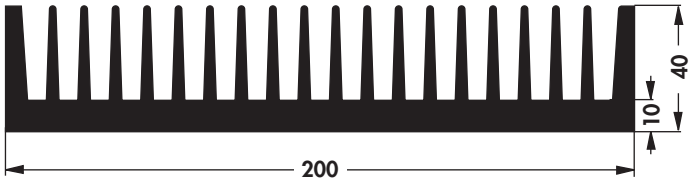
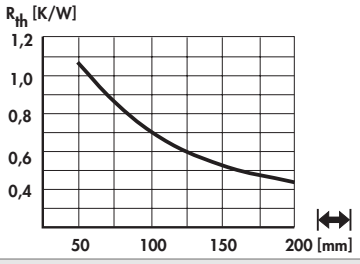
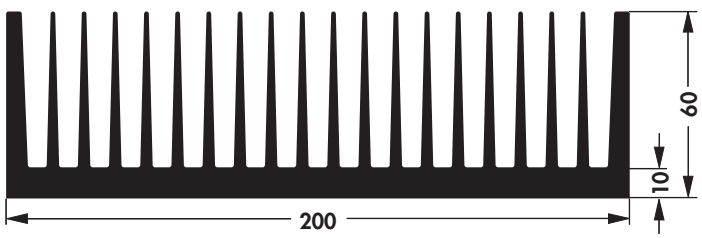
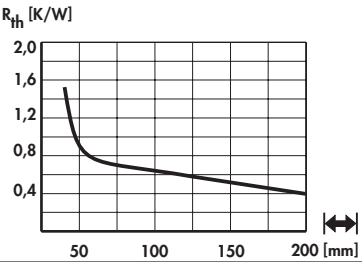
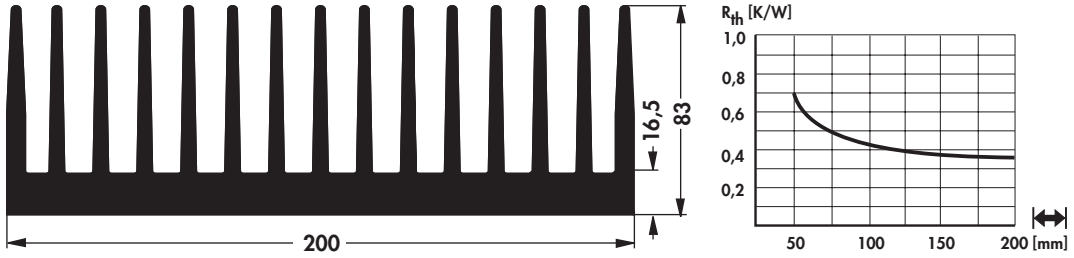
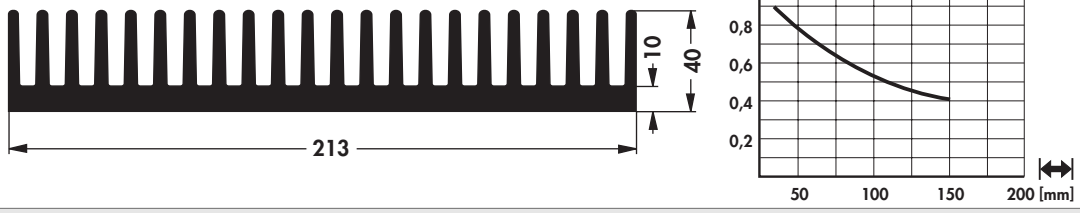
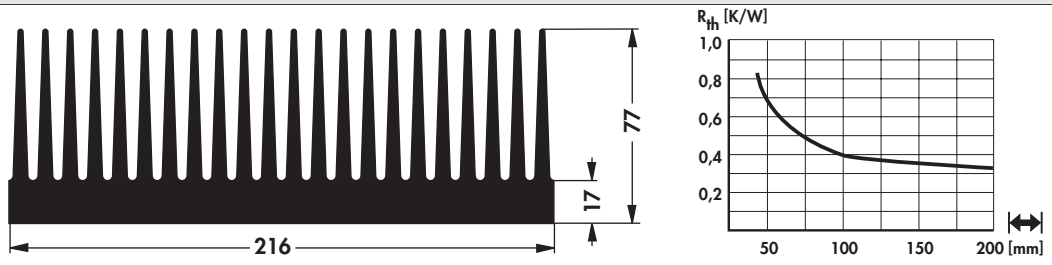
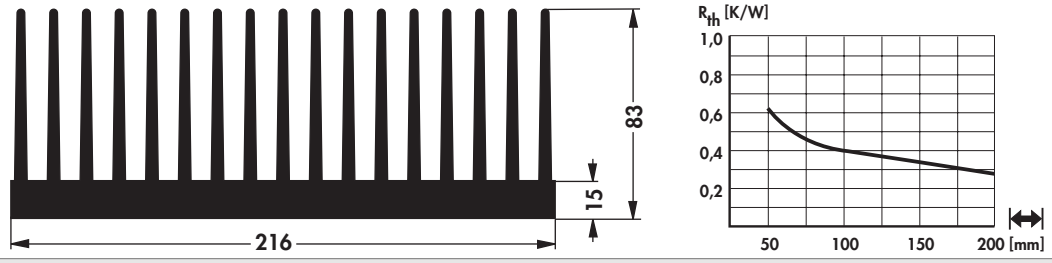
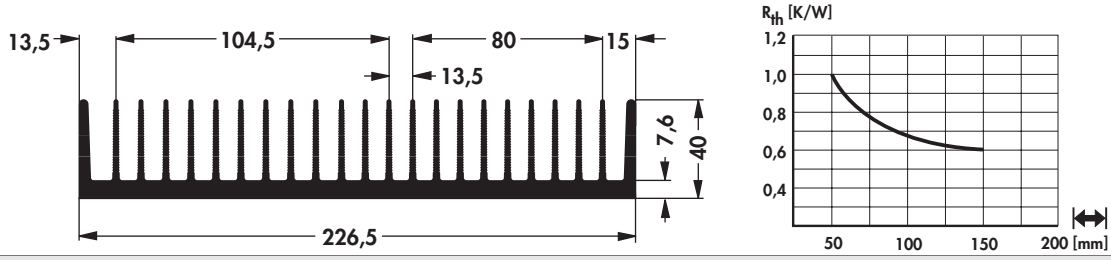
Standard extruded heatsinks

art. no.	
SK 42 ...	 
please indicate:	**... ↔ 50 75 100 150 200 1000 mm**
art. no.	
SK 94 ...	 
please indicate:	**... ↔ 1000 mm**
art. no.	
SK 502 ...	  weight reduced like SK 47
please indicate:	**... ↔ 37.5 50 75 100 150 1000 mm**
art. no.	
SK 47 ...	 
please indicate:	**... ↔ 75 100 150 1000 mm**
art. no.	
SK 591 ...	 
please indicate:	**... ↔ 75 100 150 1000 mm**

High decorative surfaces	→ A 9	Heatsinks for Solid State Relay	→ A 11 – 12
Order example	→ A 21	Special heatsink design	→ A 137 – 138
Heatsink as visual & decor-parts	→ A 10	Special profiles	→ A 140
Drilling pattern for Solid State Relais	→ A 12	Technical introduction	→ A 2 – 8

Standard extruded heatsinks

art. no.	
SK 520 ...	
please indicate:	... ↔ **75 100 150 1000 mm**
art. no.	
SK 193 ...	
please indicate:	... ↔ **100 150 1000 mm**
art. no.	
SK 557 ...	
please indicate:	... ↔ **75 100 150 1000 mm**
art. no.	
SK 102 ...	
please indicate:	... ↔ **75 100 150 1000 mm**
art. no.	
SK 168 ...	
please indicate:	... ↔ **1000 mm**

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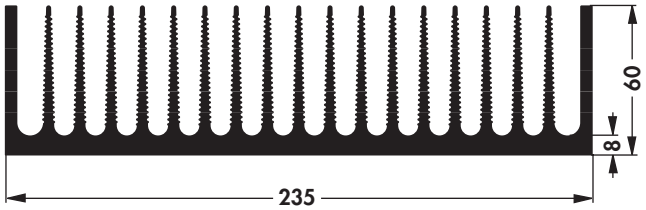
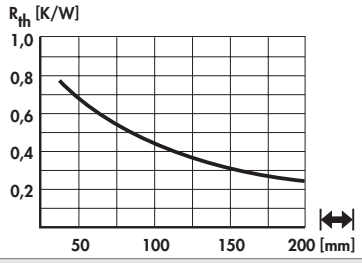
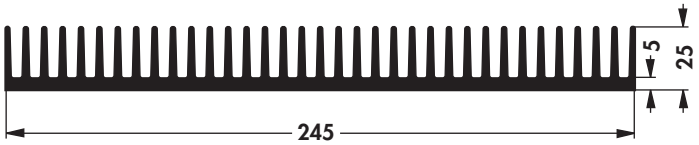
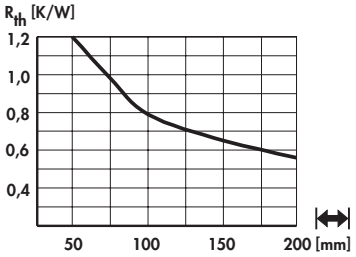
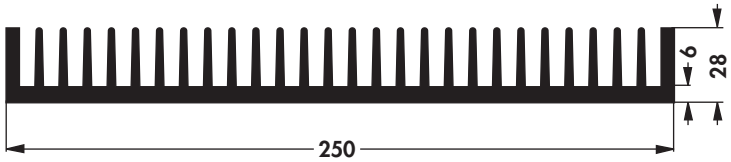
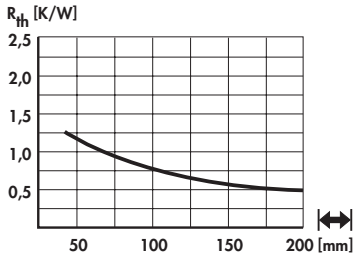
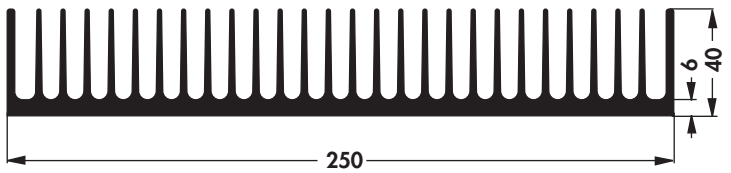
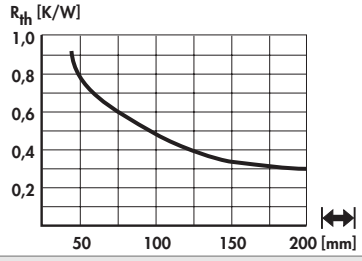
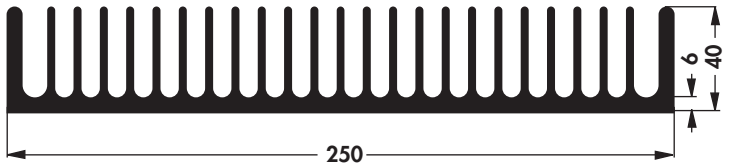
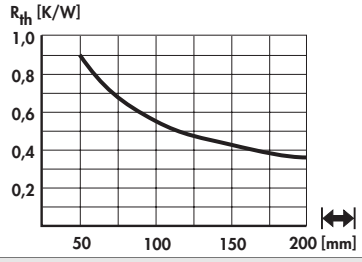
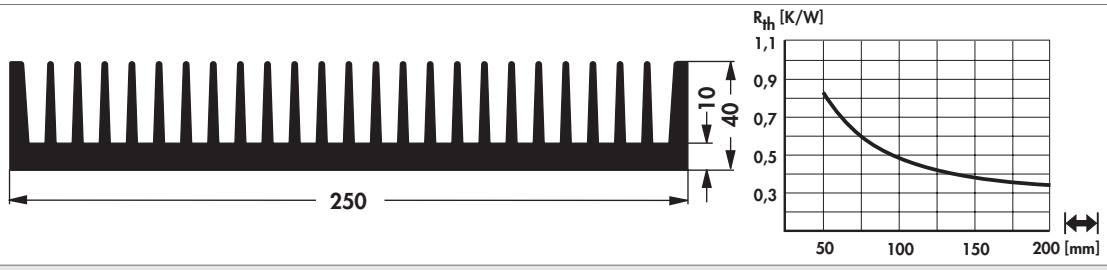
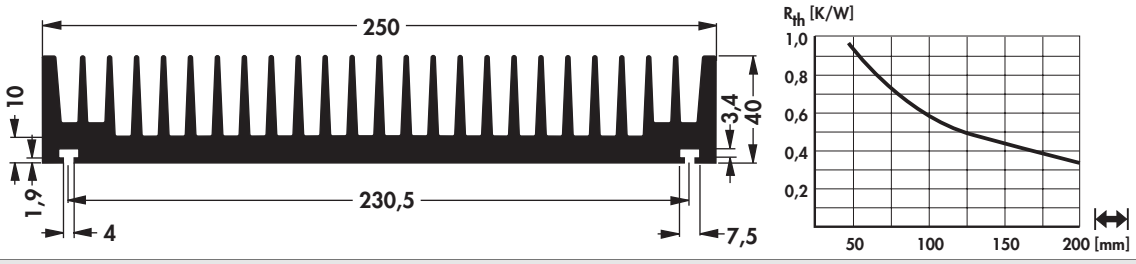
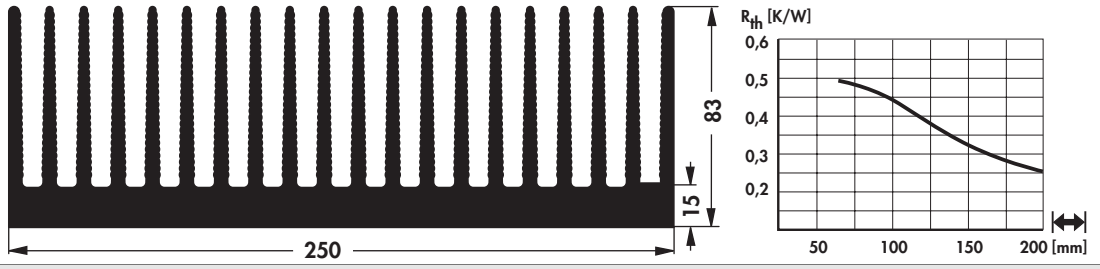
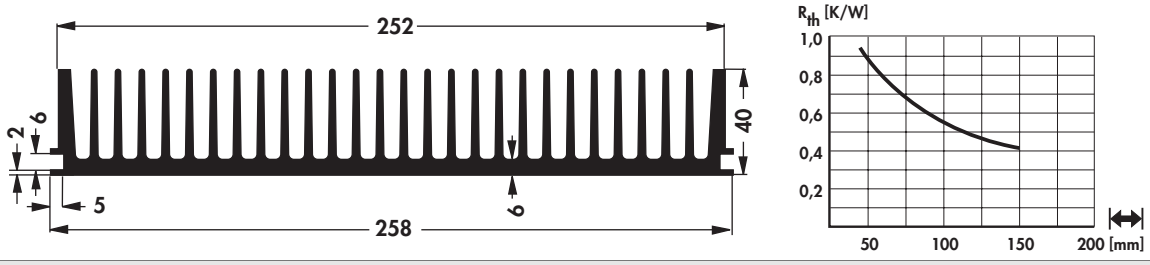
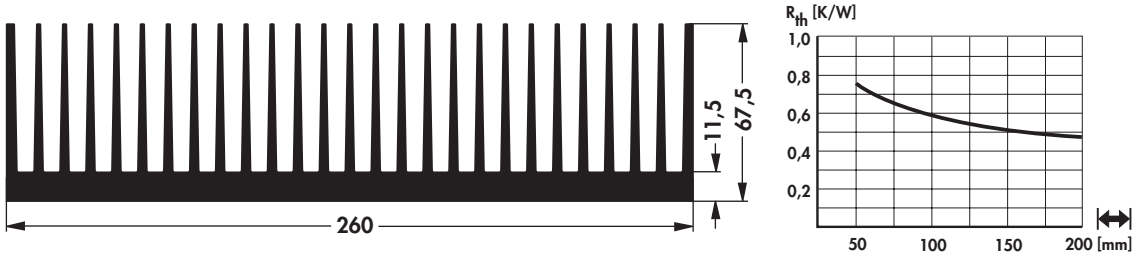
Standard extruded heatsinks

art. no.		
SK 580 ...		
please indicate:	... ↔ 75 100 150 200 1000 mm	
art. no.		
SK 118 ...		
please indicate:	... ↔ 75 100 150 1000 mm	
art. no.		
SK 49 ...		
please indicate:	... ↔ 50 75 150 200 1000 mm	
art. no.		
SK 555 ...		
please indicate:	... ↔ 75 100 150 1000 mm	
art. no.		
SK 199 ...		
please indicate:	... ↔ 75 100 1000 mm	

High decorative surfaces	→ A 9	Heatsinks for Solid State Relay	→ A 11 – 12
Order example	→ A 21	Special heatsink design	→ A 137 – 138
Heatsink as visual & decor-parts	→ A 10	Special profiles	→ A 140
Drilling pattern for Solid State Relais	→ A 12	Technical introduction	→ A 2 – 8

art. no.	
SK 524 ...	
please indicate:	... ↔ 75 100 150 1000 mm
art. no.	
SK 91 ...	
please indicate:	... ↔ 75 100 150 1000 mm
art. no.	
SK 438 ...	
please indicate:	... ↔ 75 100 150 1000 mm
art. no.	
SK 190 ...	
please indicate:	... ↔ 150 1000 mm
art. no.	
SK 614 ...	
please indicate:	... ↔ 75 100 150 200 1000 mm

High decorative surfaces → A 9
Order example → A 21
Heatsink as visual & decor-parts → A 10
Drilling pattern for Solid State Relais → A 12
Heatsinks for Solid State Relay → A 11 – 12
Special heatsink design → A 137 – 138
Special profiles → A 140
Technical introduction → A 2 – 8

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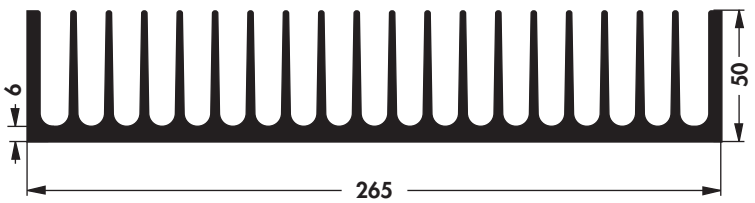
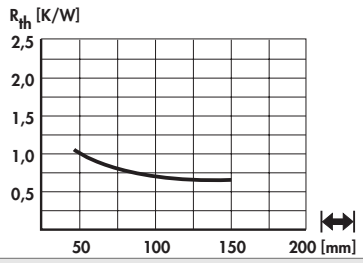
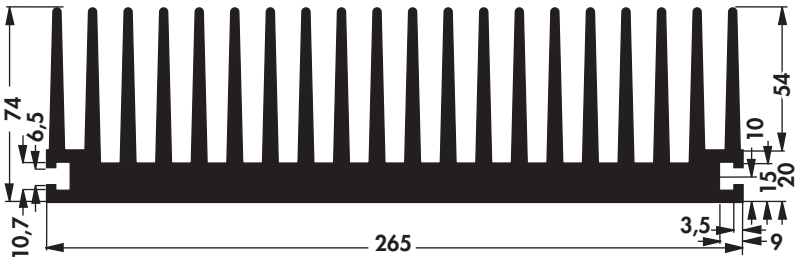
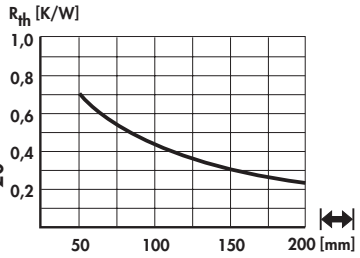
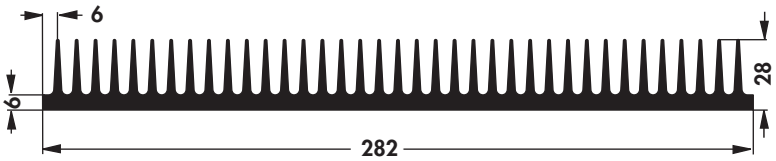
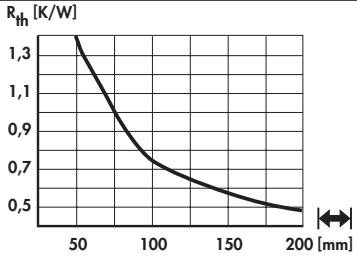
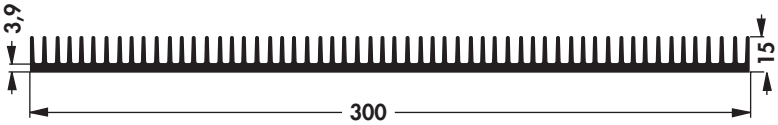
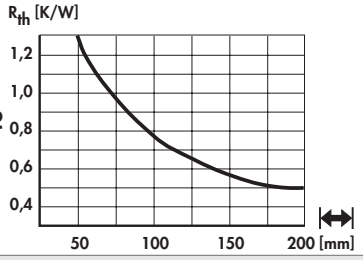
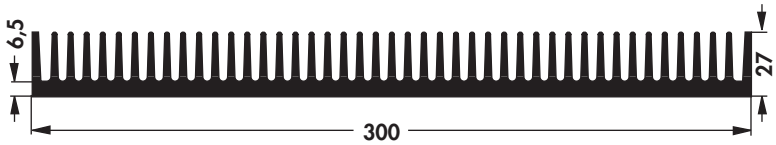
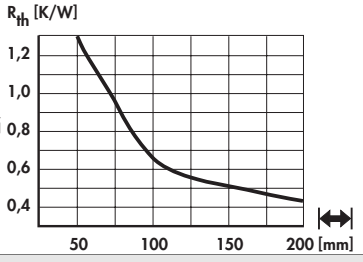
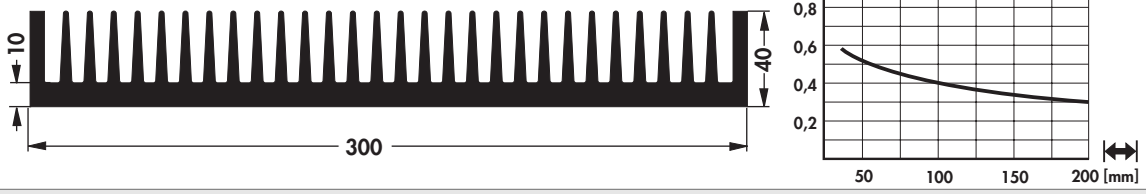
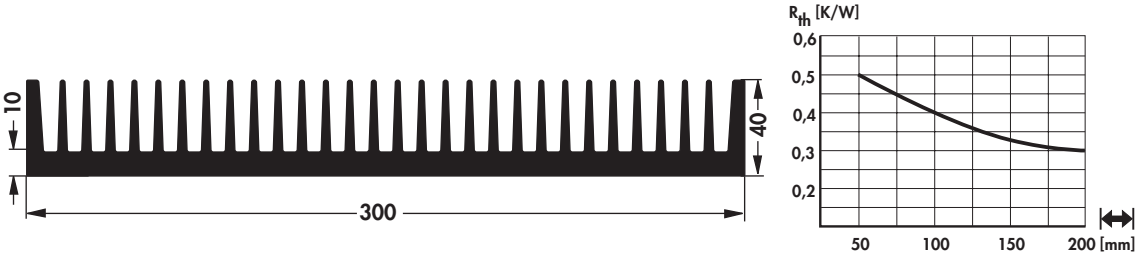
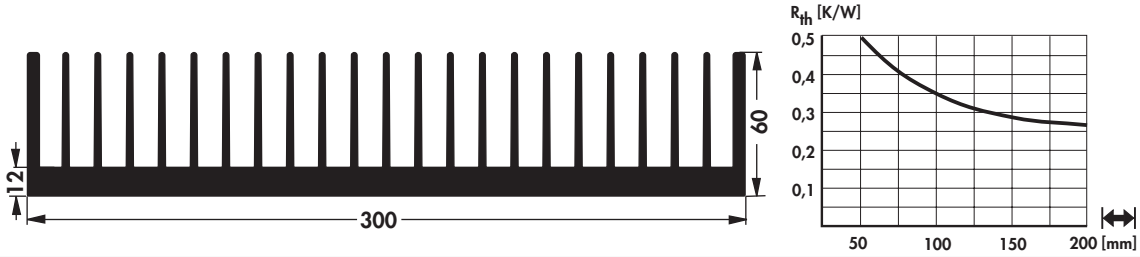
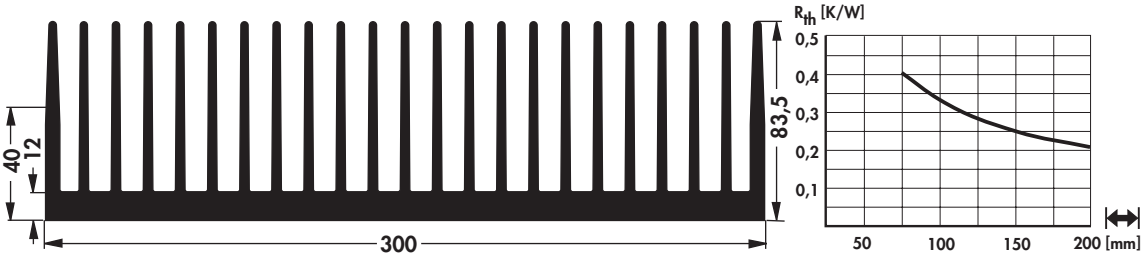
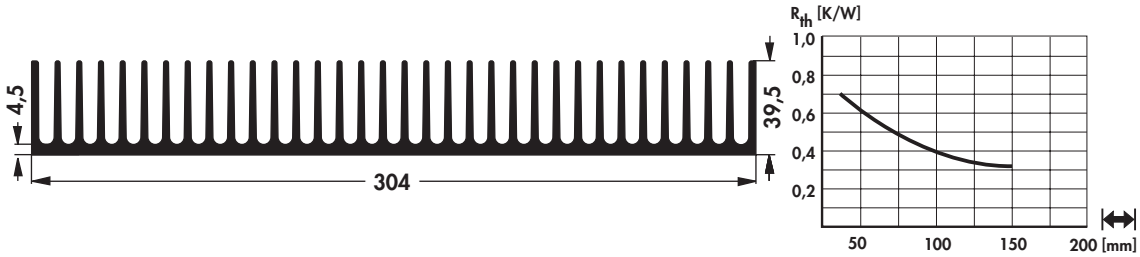
Standard extruded heatsinks

art. no.		
SK 149 ...		
please indicate:	... ↔ 200 1000 mm	
art. no.		
SK 139 ...		
please indicate:	... ↔ 100 150 200 1000 mm	
art. no.		
SK 583 ...		
please indicate:	... ↔ 100 150 200 1000 mm	
art. no.		
SK 198 ...		
please indicate:	... ↔ 100 150 1000 mm	
art. no.		
SK 446 ...		
please indicate:	... ↔ 75 100 150 1000 mm	

art. no.	
SK 56 ...	
please indicate:	**... ↔ 75 100 150 200 1000 mm**
art. no.	
SK 501 ...	 weight reduced like SK 56
please indicate:	**... ↔ 37.5 50 75 100 150 200 1000 mm**
art. no.	
SK 568 ...	
please indicate:	**... ↔ 75 100 150 200 1000 mm**
art. no.	
SK 157 ...	
please indicate:	**... ↔ 100 150 200 1000 mm**
art. no.	
SK 101 ...	
please indicate:	**... ↔ 75 100 1000 mm**

High decorative surfaces → **A 9**
Order example → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relay → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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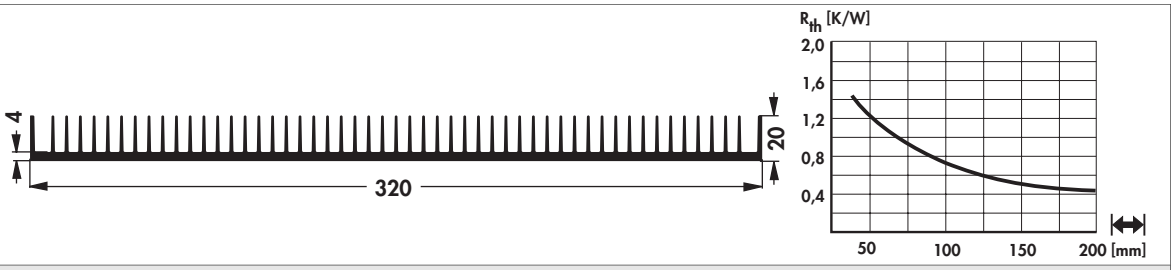
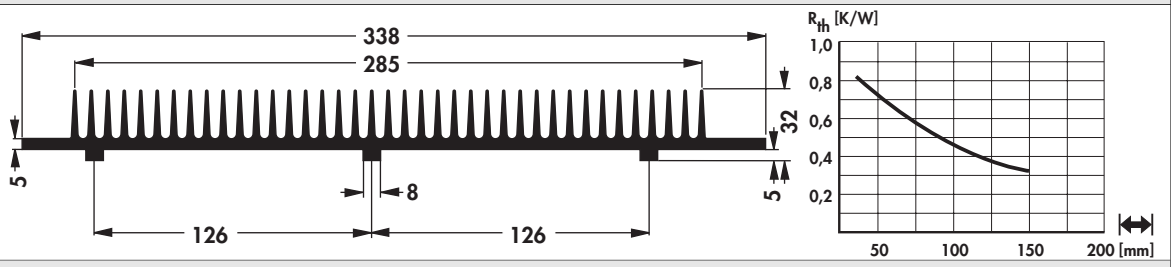
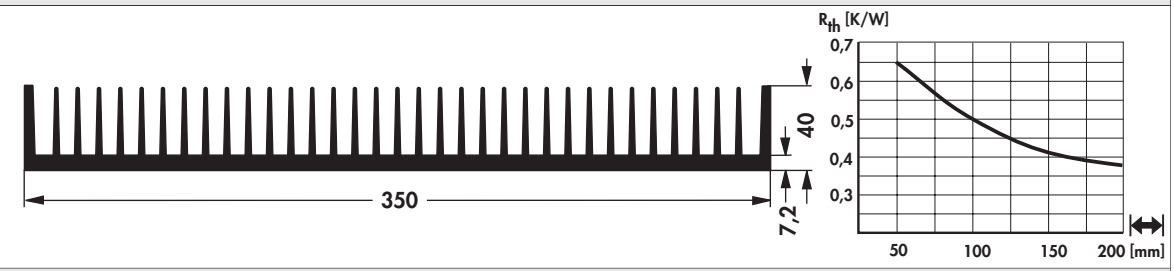
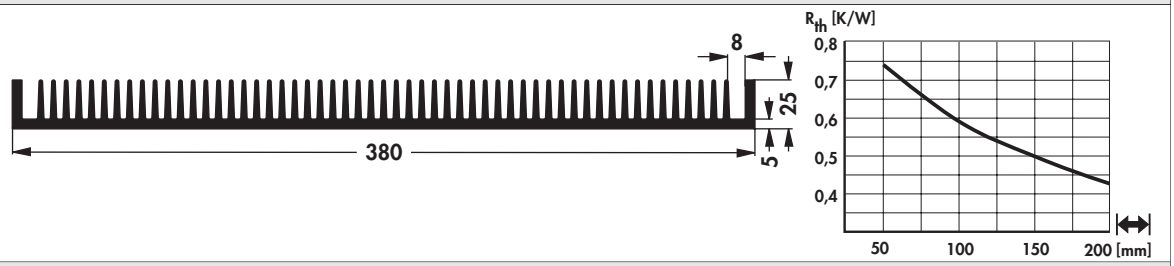
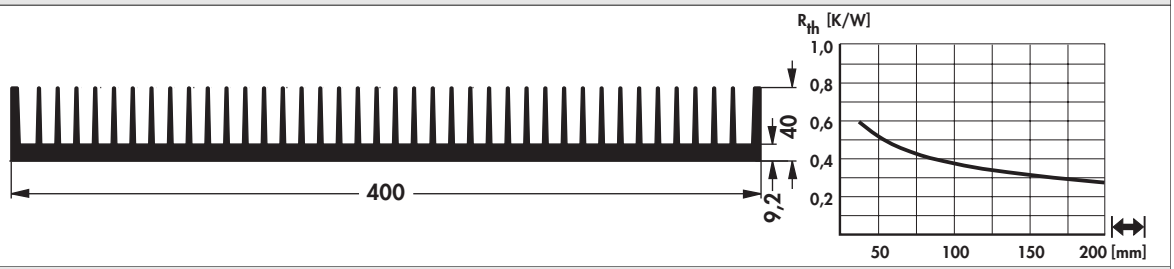
Standard extruded heatsinks

art. no.	
SK 579 ...	
please indicate:	**... ↔ 75 100 150 200 1000 mm**

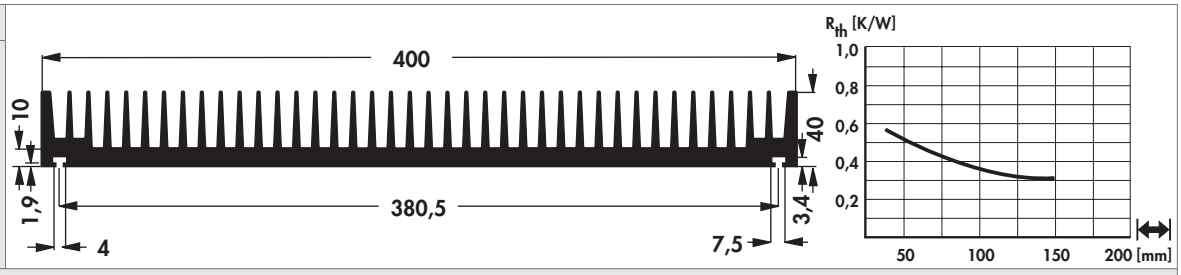
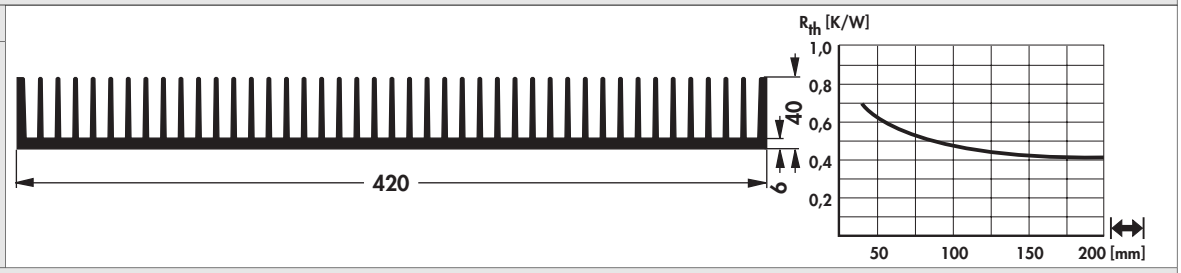
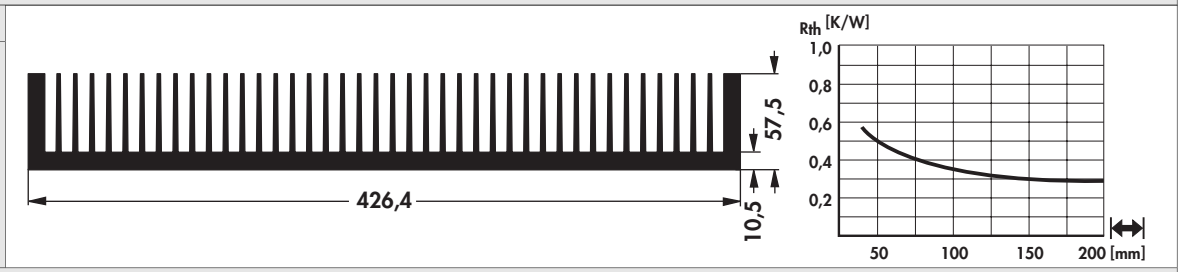
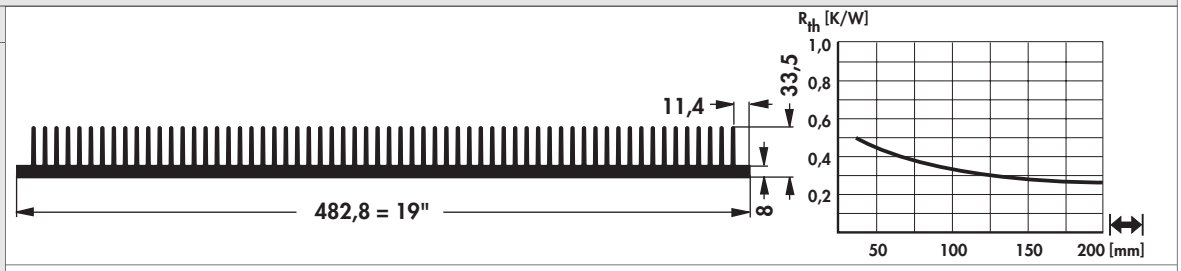
art. no.	
SK 66 ...	
please indicate:	**... ↔ 75 100 1000 mm**

art. no.	
SK 523 ...	
please indicate:	**... ↔ 100 150 200 1000 mm**

art. no.	
SK 439 ...	
please indicate:	**... ↔ 100 150 1000 mm**

art. no.	
SK 479 ...	
please indicate:	**... ↔ 75 100 150 1000 mm**

High decorative surfaces	→ A 9	Heatsinks for Solid State Relay	→ A 11 – 12
Order example	→ A 21	Special heatsink design	→ A 137 – 138
Heatsink as visual & decor-parts	→ A 10	Special profiles	→ A 140
Drilling pattern for Solid State Relais	→ A 12	Technical introduction	→ A 2 – 8

art. no.	
SK 93 ...	
please indicate:	... ↔ 75 100 150 1000 mm
art. no.	
SK 130 ...	
please indicate:	... ↔ 200 1000 mm
art. no.	
SK 621 ...	
please indicate:	... ↔ 75 100 150 200 1000 mm
art. no.	
SK 191 ...	 suitable heatsink for rear panal in 19" cases
please indicate:	... ↔ 75 100 150 200 1000 mm

High decorative surfaces → A 9
Order example → A 21
Heatsink as visual & decor-parts → A 10
Drilling pattern for Solid State Relais → A 12
Heatsinks for Solid State Relay → A 11 – 12
Special heatsink design → A 137 – 138
Special profiles → A 140
Technical introduction → A 2 – 8

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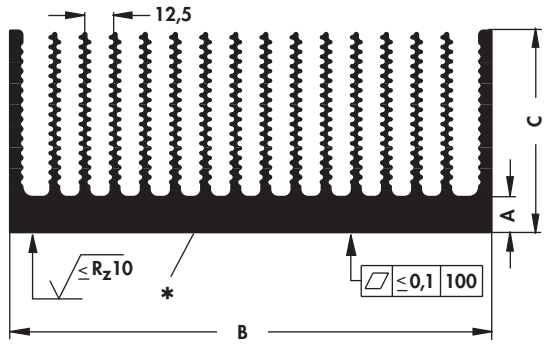
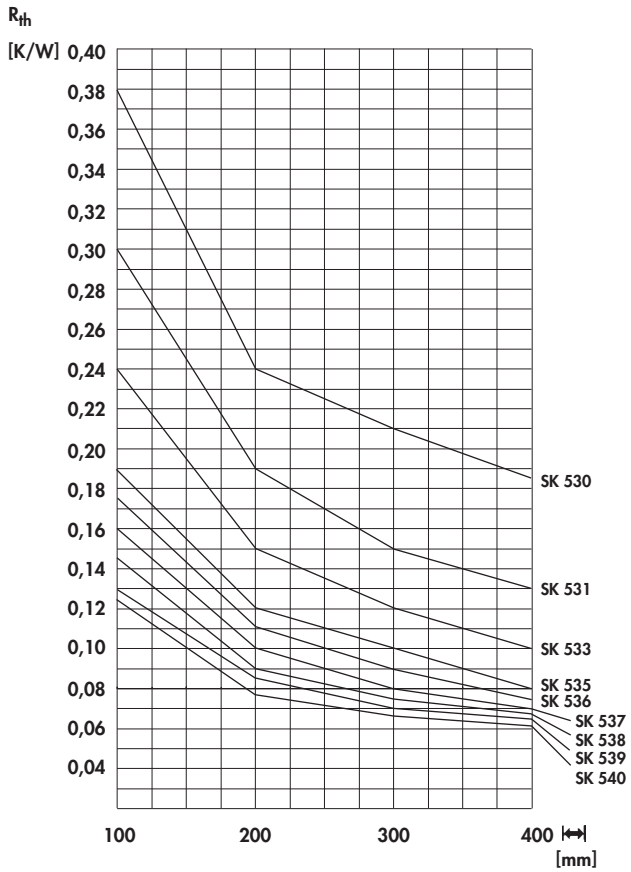
Welded high perfomance heatsinks

– optimum fin geometry and fin quantity for free convection
– well suited for forced convection
– flat milled base (not SK 530, SK 531)
– * = welded joint (not SK 530, SK 531)
– length according customer´s details
– customer specific versions and machining on request





art. no.	number of fins	dim. [mm] A	B	C
SK 530 ...	14	15 ±0.7	200 ±0.7	84 ±0.7
SK 531 ...	22	15 ±0.7	300 ±1	84 ±0.7
SK 533 ...	30	16 +0/ -1.5	400 +0.6/ -1.6	84 +0/ -1.5
SK 535 ...	38	16 +0/ -1.5	500 +0.6/ -1.6	84 +0/ -1.5
SK 536 ...	42	16 +0/ -1.5	550 +0.6/ -1.6	84 +0/ -1.5
SK 537 ...	46	16 +0/ -1.5	600 +0.6/ -1.6	84 +0/ -1.5
SK 538 ...	50	16 +0/ -1.5	650 +0.6/ -1.6	84 +0/ -1.5
SK 539 ...	54	16 +0/ -1.5	700 +0.6/ -1.6	84 +0/ -1.5
SK 540 ...	58	16 +0/ -1.5	750 +0.6/ -1.6	84 +0/ -1.5

please indicate: **... ↔**
200 300 400 500 600 mm

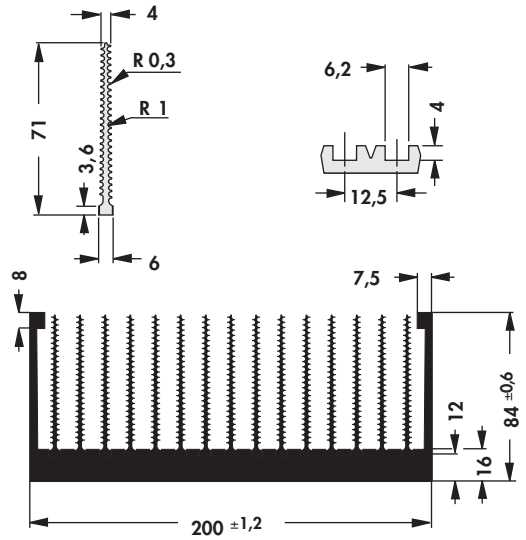
High decorative surfaces → **A 9**
Heatsink profile-overview → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
heatsinks for Solid State Relais → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

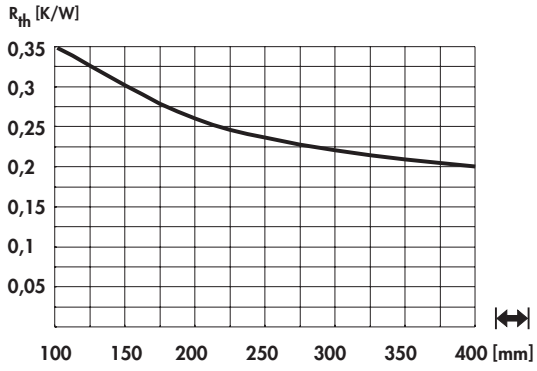
High performance heatsinks with press-in fins

– other length according to customer´s details
– customer specific versions and machining upon request

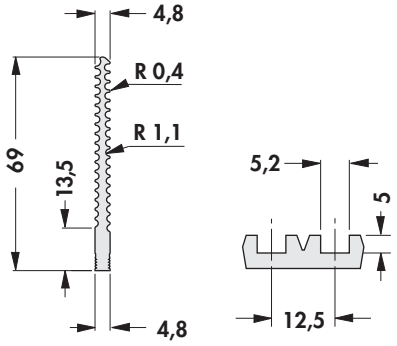
art. no.

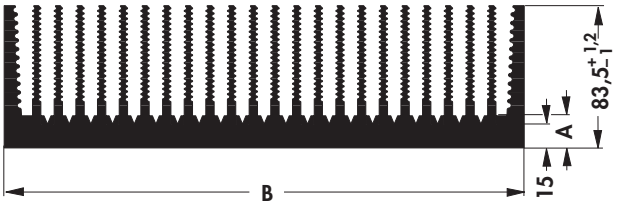
SK 418 ...

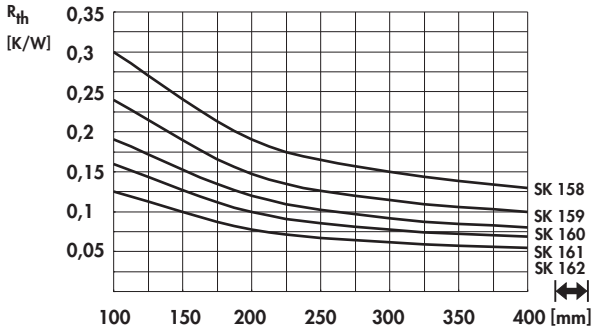


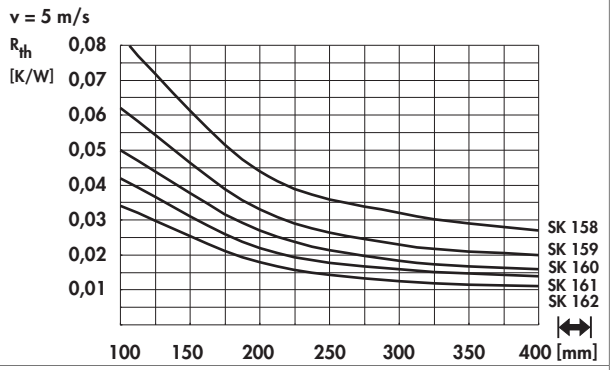


please indicate: **... ↔**
100 150 200 1000 mm









art. no.	number of fins	dim. [mm]	
		A	B
SK 158 ...	22	20	300 ±2
SK 159 ...	30	20	400 ±2
SK 160 ...	38	20	500 ±2.5
SK 161 ...	46	20	600 ±3
SK 162 ...	58	20	750 ±4

please indicate: **... ↔**
200 300 400 500 600 mm

High decorative surfaces → **A 9**
Heatsink profile-overview → **A 21**
Heatsink as visual & decor-parts → **A 10**
Drilling pattern for Solid State Relais → **A 12**
heatsinks for Solid State Relais → **A 11 – 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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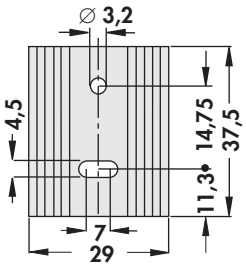
Standard extruded heatsinks

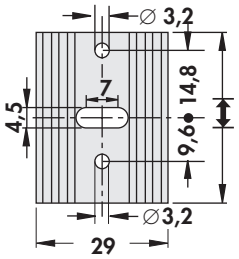
art. no.

SK 09 ...

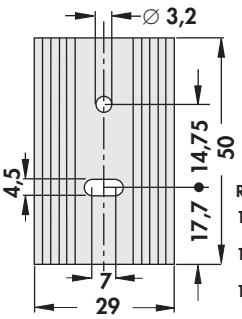
SK 09 37,5 TO 220



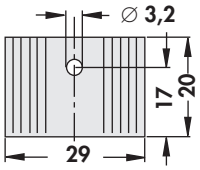
SK 09 37,5 TO 220 1
SK 09 50,0 TO 220 1

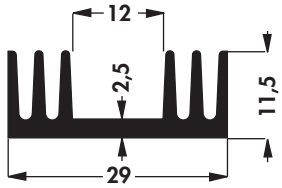


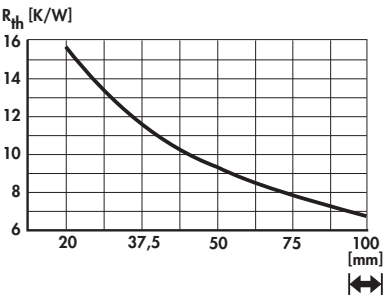
SK 09 50 TO 220



SK 09 20 TO 220







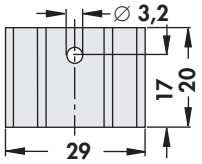
please indicate: ... ↔
20 37.5 50 1000 mm

... ◈ **(optional)**
K; TO 220

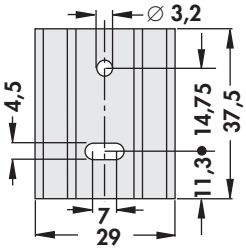
art. no.

SK 145 ...

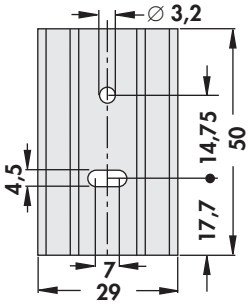
SK 145 20 TO 220



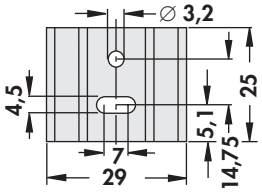
SK 145 37,5 TO 220

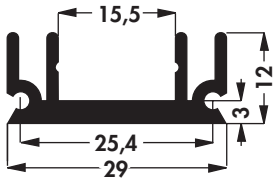


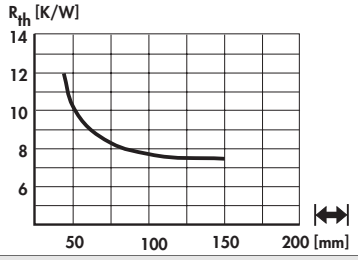
SK 145 50 TO 220



SK 145 25 TO 220





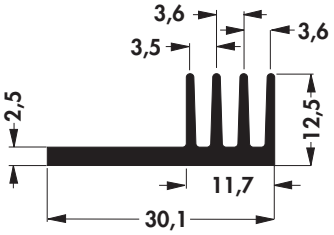


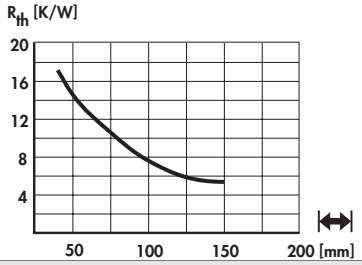
please indicate: ... ↔
20 25 37.5 50 1000 mm

... ◈ **(optional)**
TO 220

art. no.

SK 443 ...

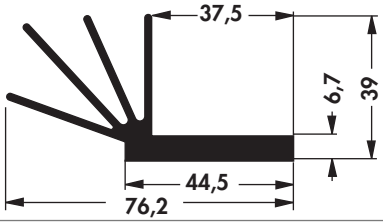


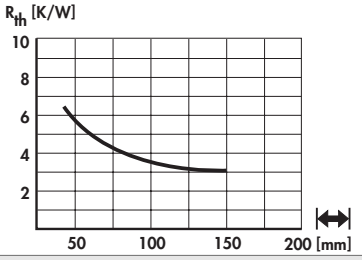


please indicate: ... ↔
37.5 75 100 1000 mm

art. no.

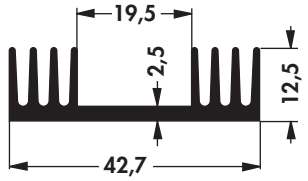
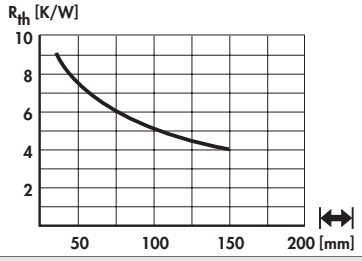
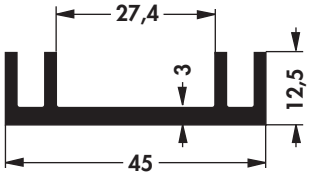
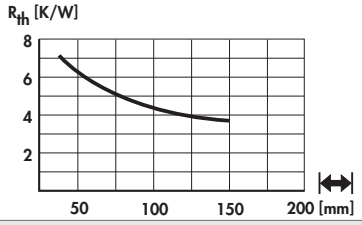
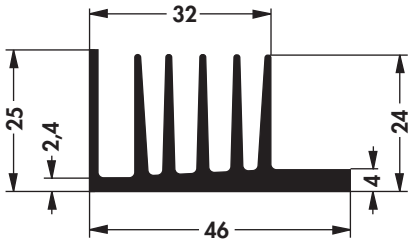
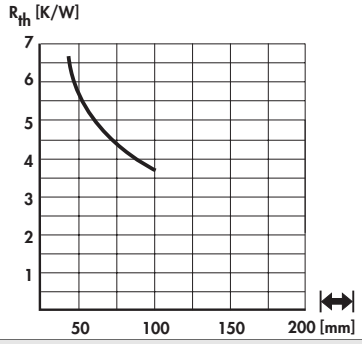
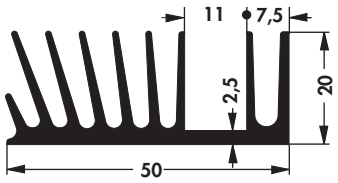
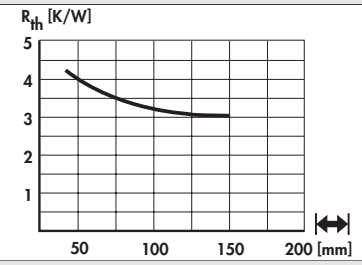
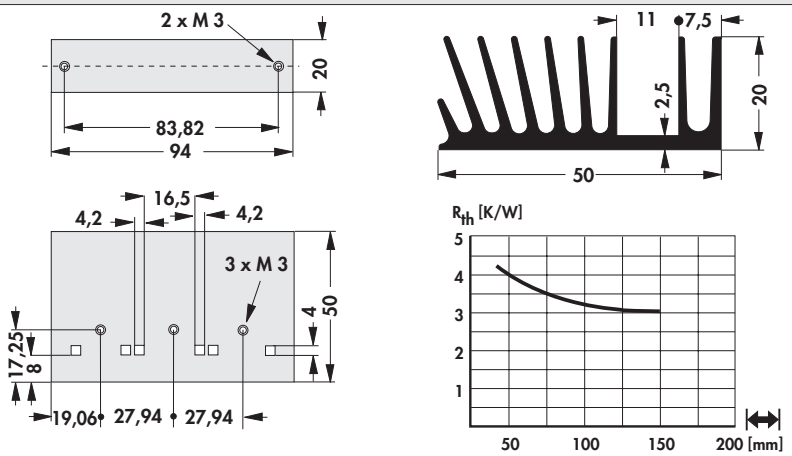
SK 173 ...





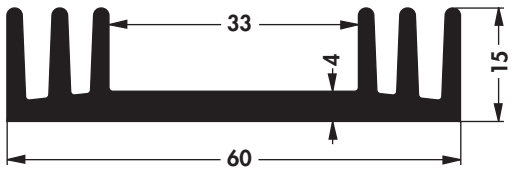
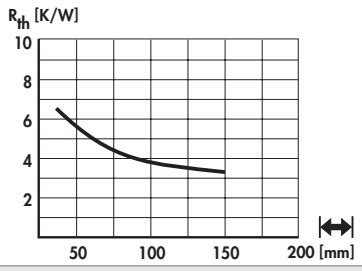
please indicate: ... ↔
1000 mm

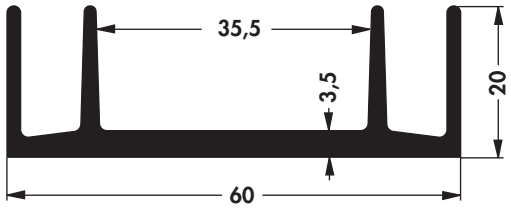
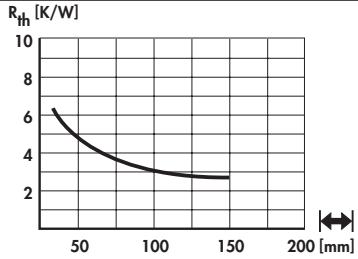
Hole pattern	→ A 21	Screw mounted guide rails	→ E 26 – 27
Profiles for PCB components	→ A 91	Thermal conductive material	→ E 2 – 24
Heatsinks for PCB	→ A 89	Heatsink-cooling aggregates	→ D 14
Profiles for PCB mounting	→ A 89 – 112	Technical introduction	→ A 2 – 8

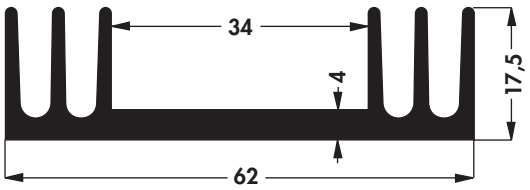
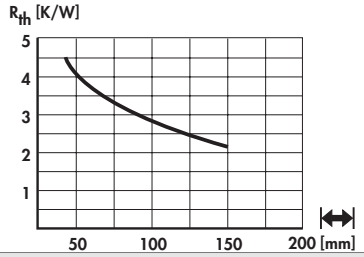
art. no.		
SK 59 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	... ⌖ (optional) TO 220
art. no.		
SK 122 ...		
please indicate:	... ↔ 37.5 50 mm	... ⌖ (optional) TO 3; CB
art. no.		
SK 107 ...		
please indicate:	... ↔ 50 75 100 1000 mm	
art. no.		
SK 181 ...		
please indicate:	... ↔ 50 75 100 1000 mm	
art. no.		
SK 181 94 C 3 x TO 220	 SK 181 94 C 3 x TO 220	
SK 181 94 C 3 x TO 220	retaining spring for transistor THF 409 TO 220 → A 115	

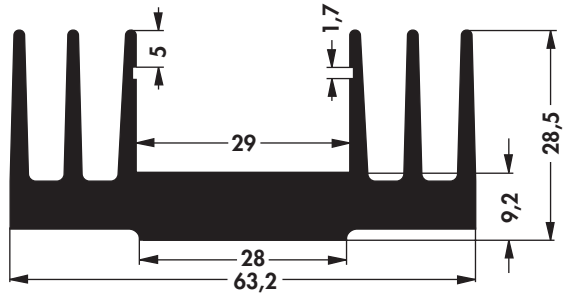
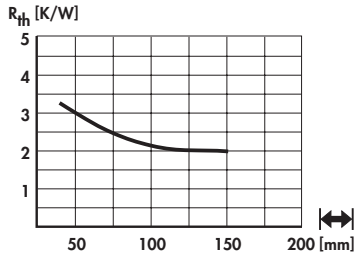
Hole pattern → A 21
Profiles for PCB components → A 91
Heatsinks for PCB → A 89
Profiles for PCB mounting → A 89 – 112
Screw mounted guide rails → E 26 – 27
Thermal conductive material → E 2 – 24
Heatsink-cooling aggregates → D 14
Technical introduction → A 2 – 8

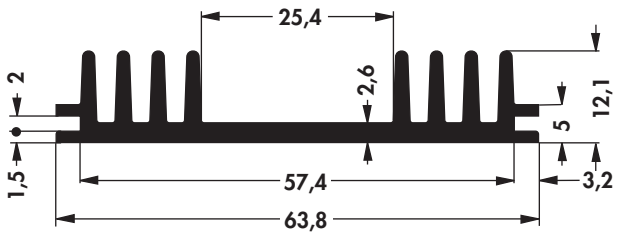
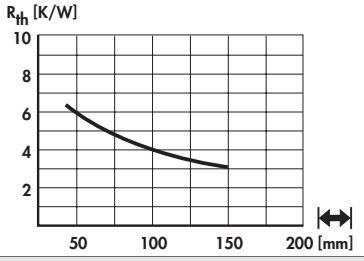
Standard extruded heatsinks

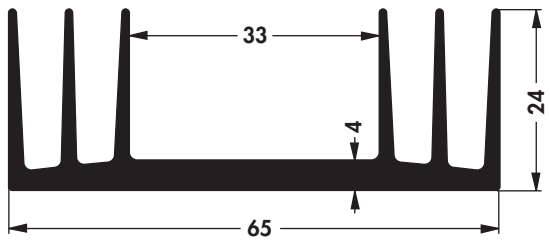
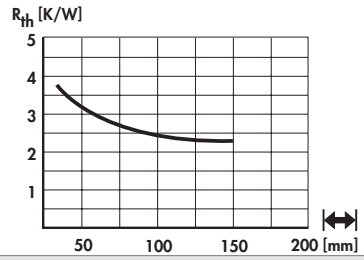
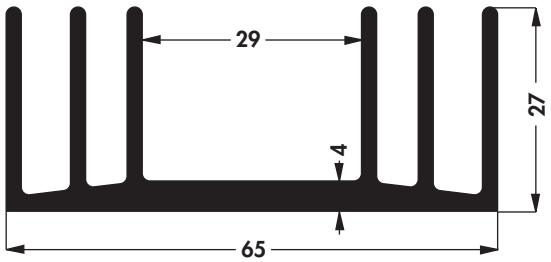
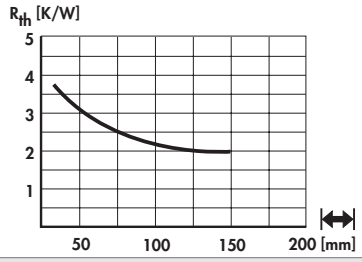
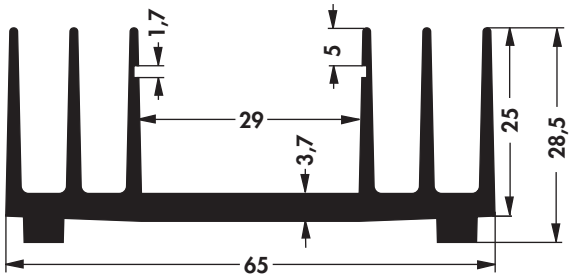
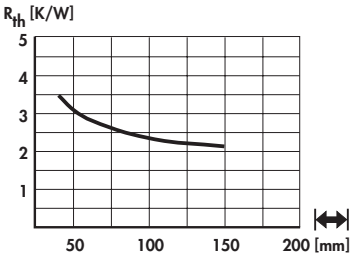
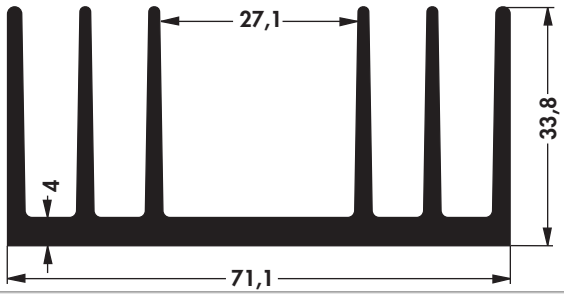
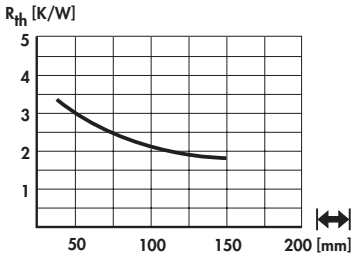
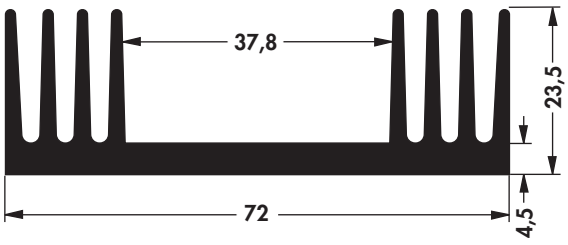
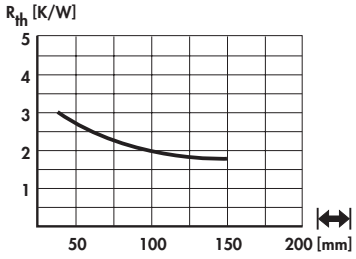
art. no.		
SK 78 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**

art. no.		
SK 51 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**

art. no.		
SK 165 ...		
please indicate:	**... ↔ 37.5 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**

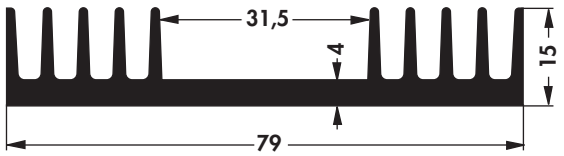
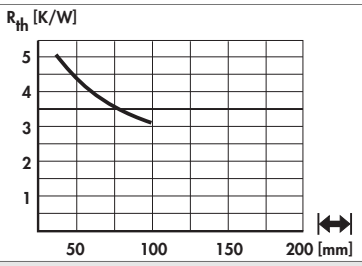
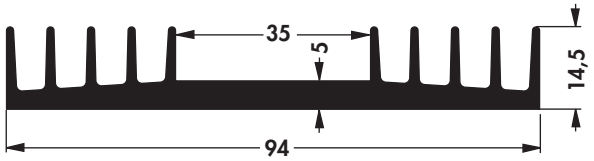
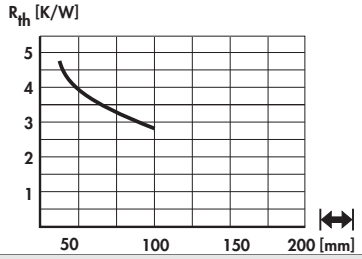
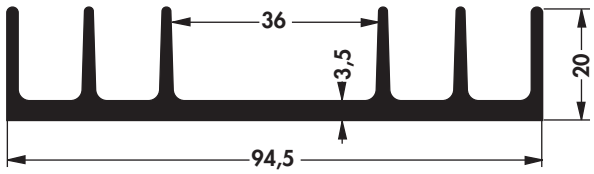
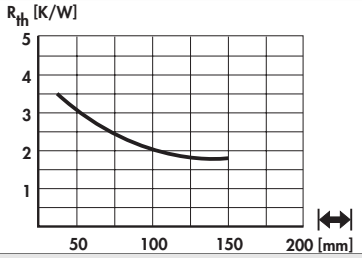
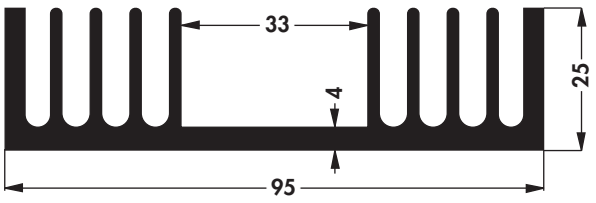
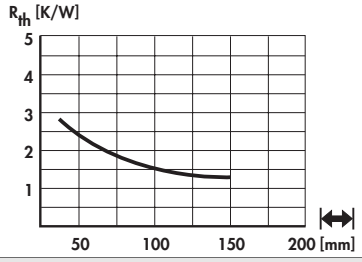
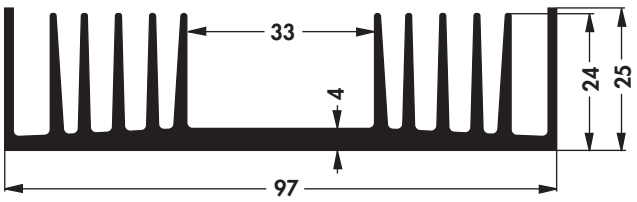
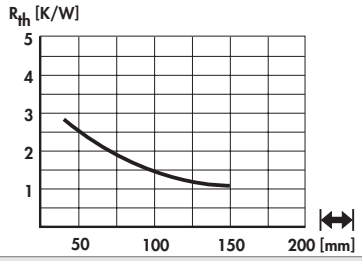
art. no.		
SK 25 ...		
with slots for cover plates or PCBs		
please indicate:	**... ↔ 37.5 50 1000 mm**	

art. no.		
SK 150 ...		
please indicate:	**... ↔ 1000 mm**	

art. no.		
SK 18 ...		
please indicate:	**... ↔ 37.5 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 63 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 05 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 402 ...		
please indicate:	**... ↔ 100 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 97 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3**

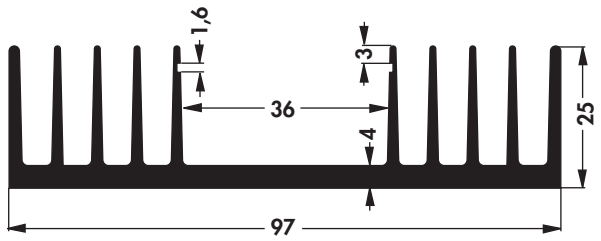
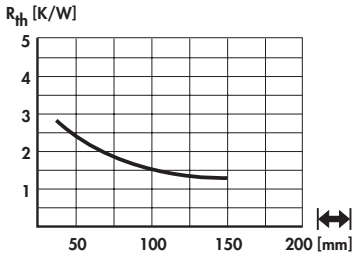
Hole pattern → A 21
Profiles for PCB components → A 91
Heatsinks for PCB → A 89
Profiles for PCB mounting → A 89 – 112
Screw mounted guide rails → E 26 – 27
Thermal conductive material → E 2 – 24
Heatsink-cooling aggregates → D 14
Technical introduction → A 2 – 8

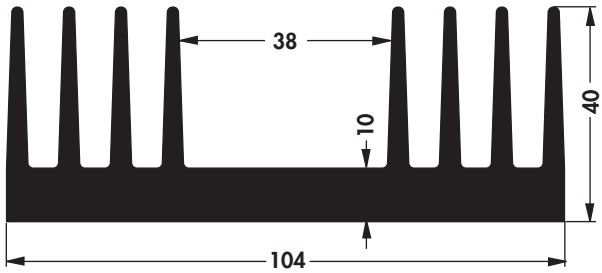
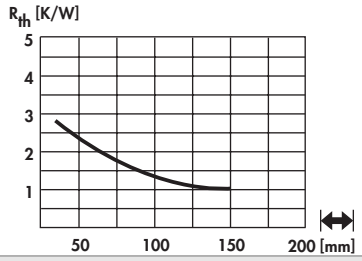
Standard extruded heatsinks

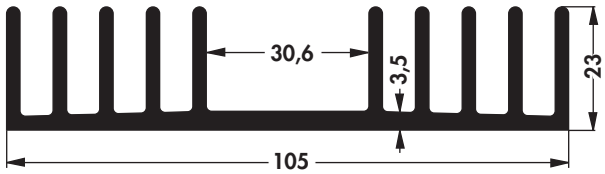
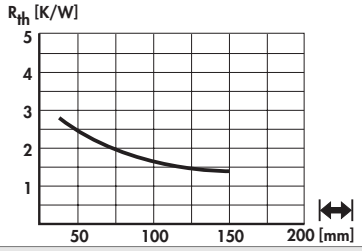
art. no.		
SK 45 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	... ◈ (optional) TO 3; CB
art. no.		
SK 19 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	... ◈ (optional) TO 3; CB
art. no.		
SK 28 ...		
please indicate:	... ↔ 37.5 50 75 1000 mm	... ◈ (optional) TO 3; CB
art. no.		
SK 401 ...		
please indicate:	... ↔ 100 1000 mm	... ◈ (optional) TO 3; CB
art. no.		
SK 72 ...		
please indicate:	... ↔ 37.5 50 75 100 1000 mm	... ◈ (optional) TO 3; CB

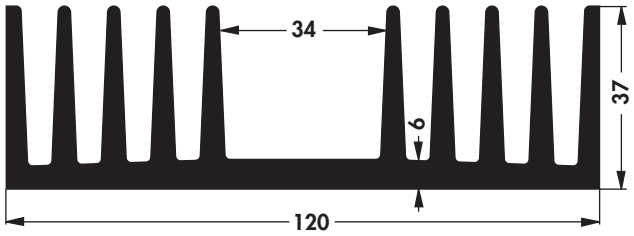
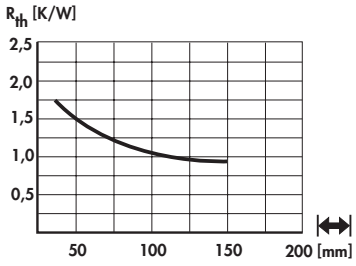
Hole pattern	→ A 21	Screw mounted guide rails	→ E 26 – 27
Profiles for PCB components	→ A 91	Thermal conductive material	→ E 2 – 24
Heatsinks for PCB	→ A 89	Heatsink-cooling aggregates	→ D 14
Profiles for PCB mounting	→ A 89 – 112	Technical introduction	→ A 2 – 8

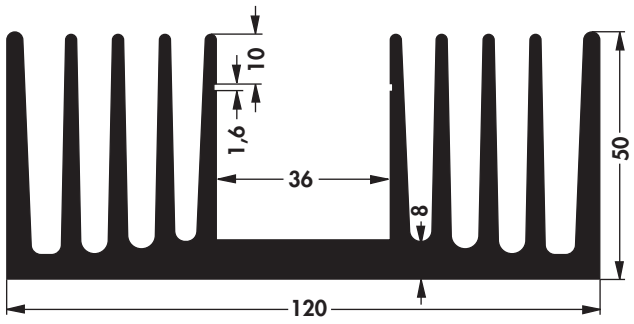
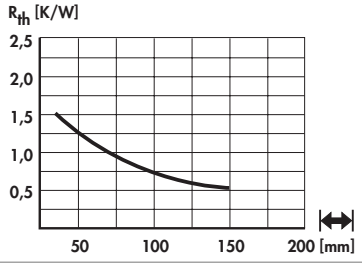
Standard extruded heatsinks

art. no.		
SK 04 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) SSR 1; SSR 2; TO 3; CB**

art. no.		
SK 403 ...		
please indicate:	**... ↔ 1000 mm**	

art. no.		
SK 73 ...		
please indicate:	**... ↔ 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**

art. no.		
SK 71 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3**

art. no.		
SK 57 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 37.5 75 100 1000 mm**	

Hole pattern → **A 21**
Profiles for PCB components → **A 91**
Heatsinks for PCB → **A 89**
Profiles for PCB mounting → **A 89 – 112**
Screw mounted guide rails → **E 26 – 27**
Thermal conductive material → **E 2 – 24**
Heatsink-cooling aggregates → **D 14**
Technical introduction → **A 2 – 8**

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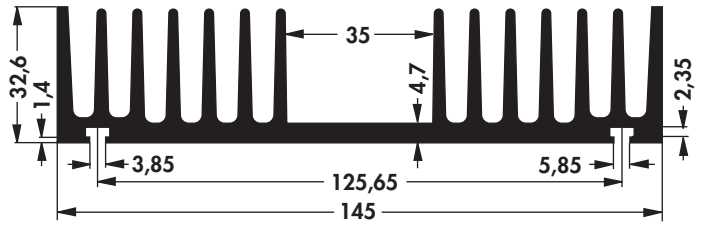
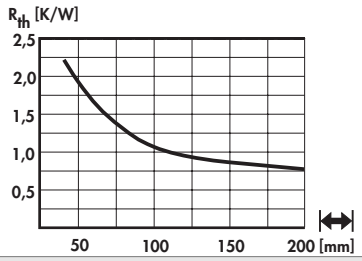
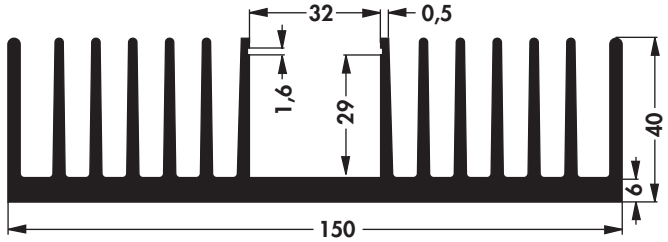
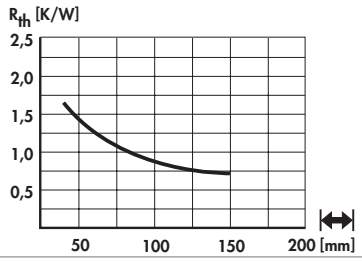
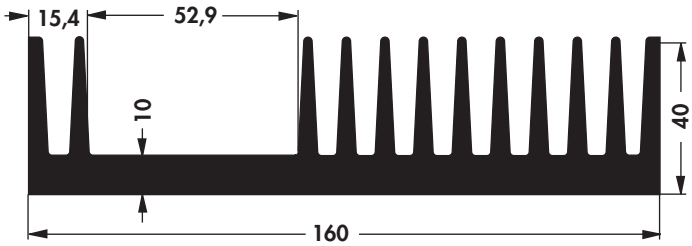
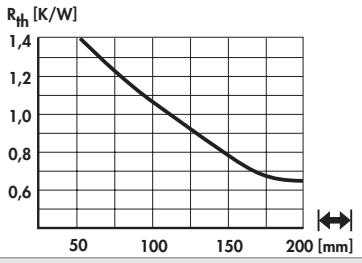
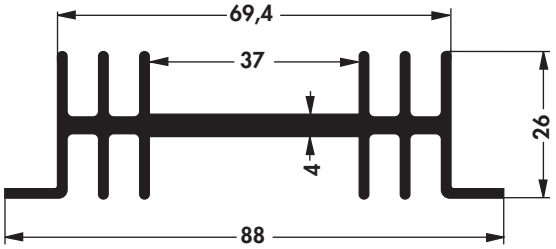
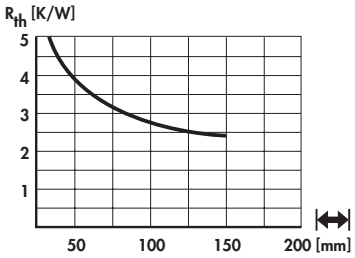
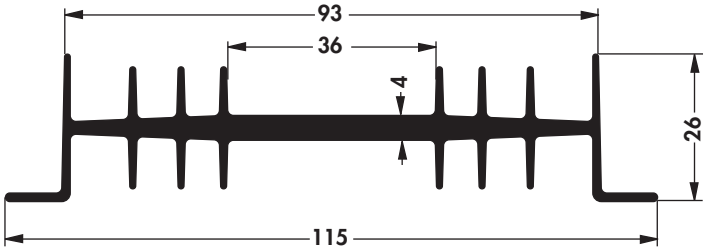
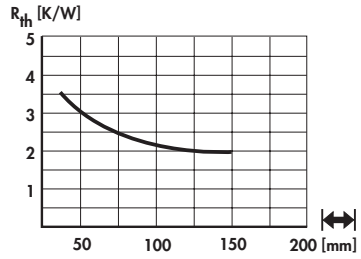
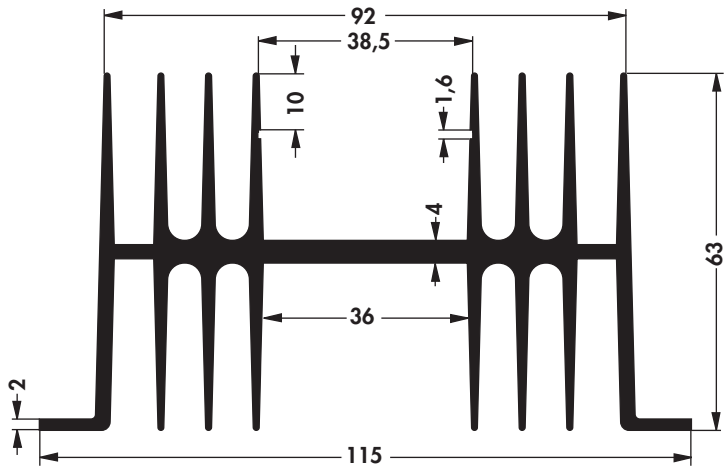
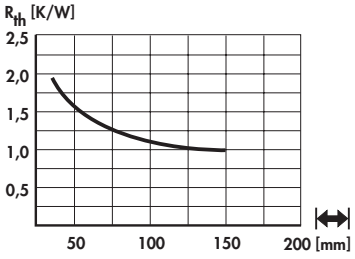
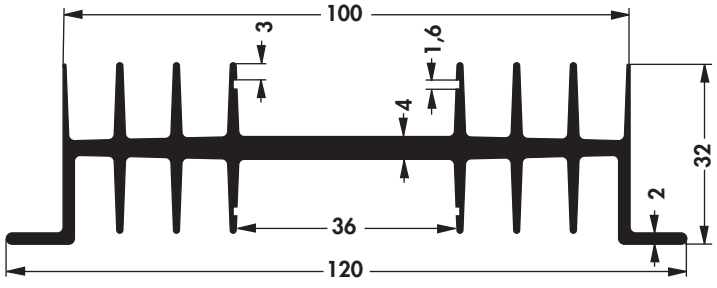
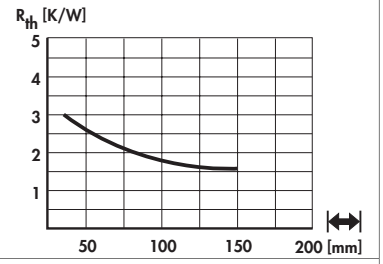
Standard extruded heatsinks

art. no.		
SK 197 ...		
please indicate:	**... ↔ 37.5 1000 mm**	**... ◈ (optional) TO 3; CB**

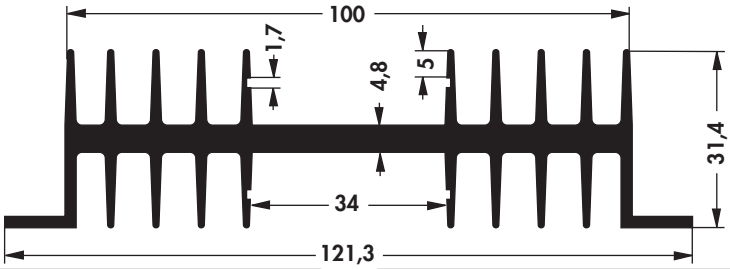
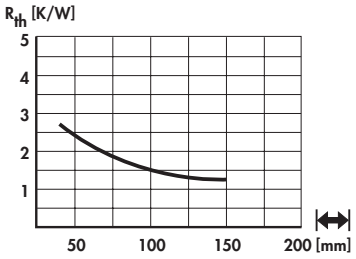
art. no.		
SK 98 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 100 150 mm**	

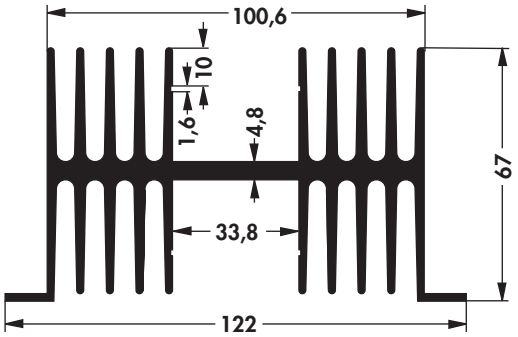
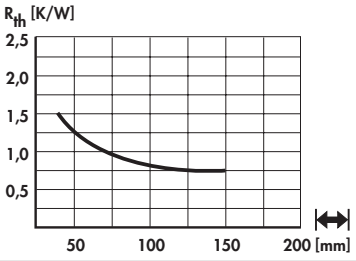
art. no.		
SK 404 ...		
please indicate:	**... ↔ 50 75 1000 mm**	**... ◈ (optional) TO 3; CB**

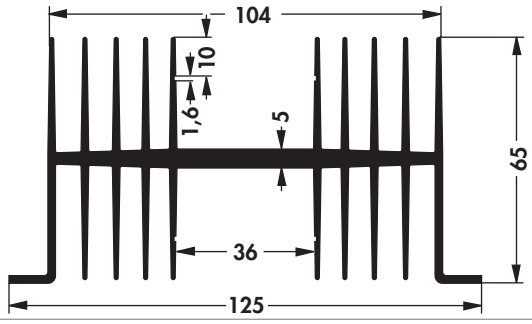
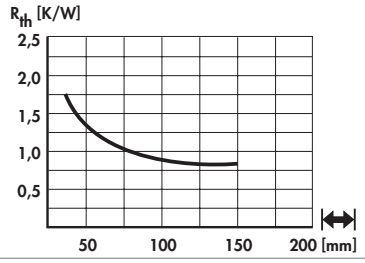
art. no.		
SK 36 ...		
	mounting parts IS 1, IS 2, IS 3 → E 49	
please indicate:	**... ↔ 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 01 ...		
	mounting parts IS 1, IS 2, IS 3 → E 49	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 02 ...		
	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 03 ...		
	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49	
please indicate:	**... ↔ 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**

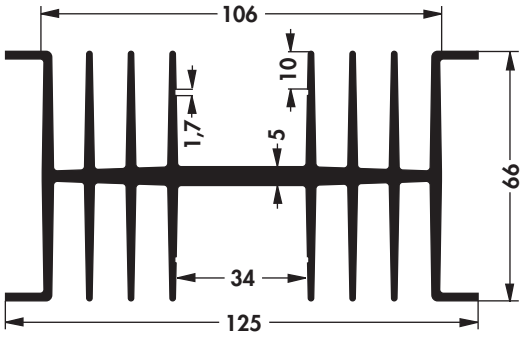
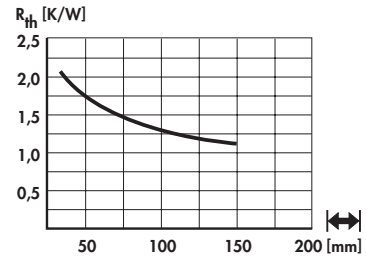
Thermal conductive material → E 2 – 5
Mounting material for semiconduct. → E 44 – 48
Mounting parts for heatsinks → E 49 – 50
Distance sleeves for PCB´s in HP grid → E 39
Order example → A 21
Guide rails for PCBs → E 26 – 27
Heatsink-cooling aggregates → D 14
Technical introduction → A 2 – 8

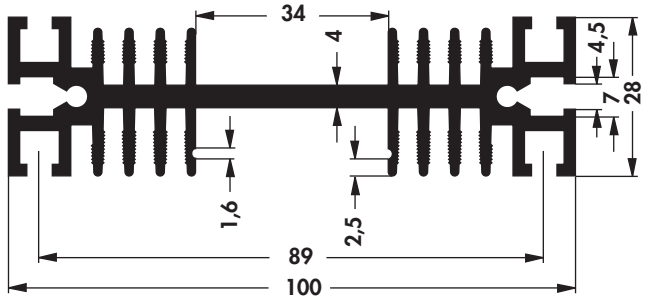
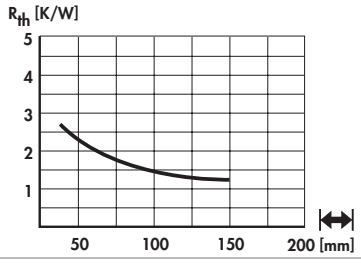
Standard extruded heatsinks

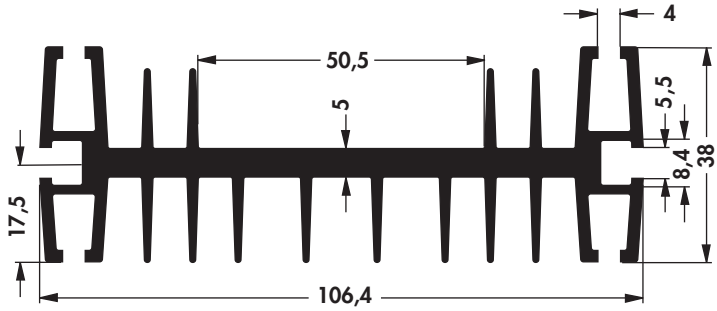
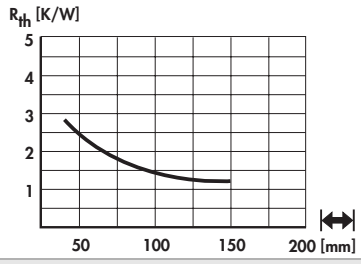
art. no.		
SK 39 ...	 	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49
please indicate:	**... ↔ 75 100 1000 mm**	**... ◈ (optional) TO 3; CB**

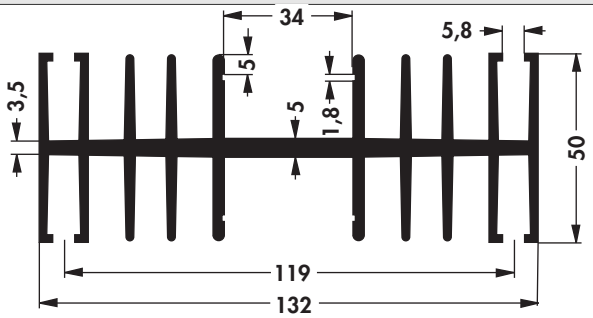
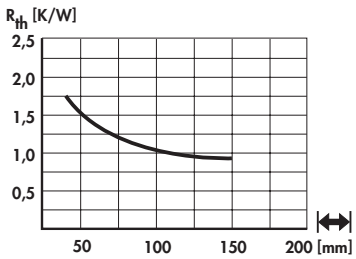
art. no.		
SK 30 ...	 	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49
please indicate:	**... ↔ 75 100 1000 mm**	**... ◈ (optional) TO 3; CB**

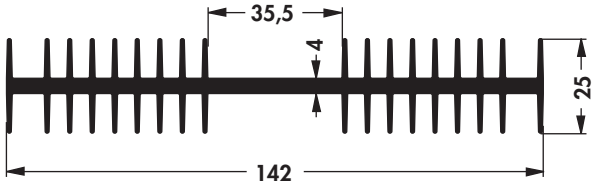
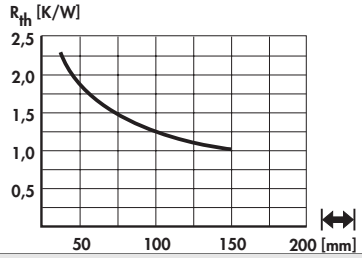
art. no.		
SK 34 ...	 	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49
please indicate:	**... ↔ 50 75 100 1000 mm**	**... ◈ (optional) TO 3; CB**

art. no.		
SK 14 ...	 	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49
please indicate:	**... ↔ 50 75 100 mm**	**... ◈ (optional) TO 3; CB**

art. no.	
SK 20 ...	  with slots for cover plates or PCBs; mounting parts IS 5, IS 8 → E 49
please indicate:	**... ↔** **37.5 75 100 1000 mm** **... ◈ (optional)** **TO 3; CB**

art. no.	
SK 184 ...	 
please indicate:	**... ↔** **100 1000 mm**

art. no.	
SK 148 ...	  with slots for cover plates or PCBs
please indicate:	**... ↔** **37.5 100 1000 mm** **... ◈ (optional)** **TO 3; CB**

art. no.	
SK 84 ...	 
please indicate:	**... ↔** **50 150 1000 mm** **... ◈ (optional)** **TO 3**

Guide rails for PCBs → **E 26 – 30**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Heatsink-cooling aggregates → **D 14**
Order example → **A 21**
Assignment table → **A 18 – 20**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

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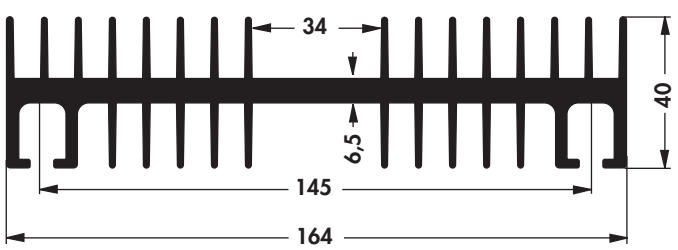
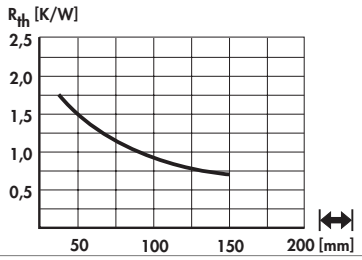
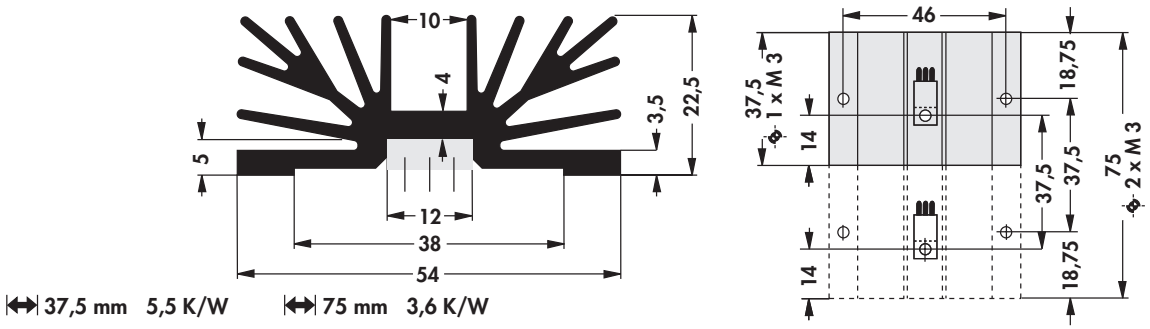
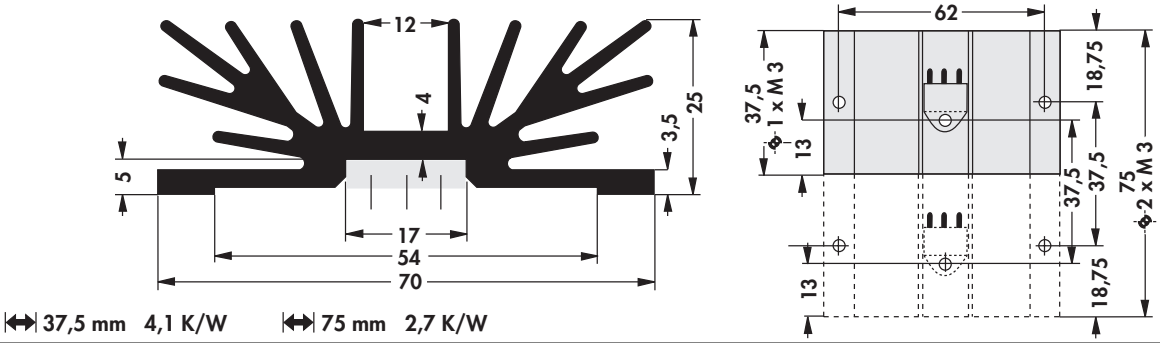
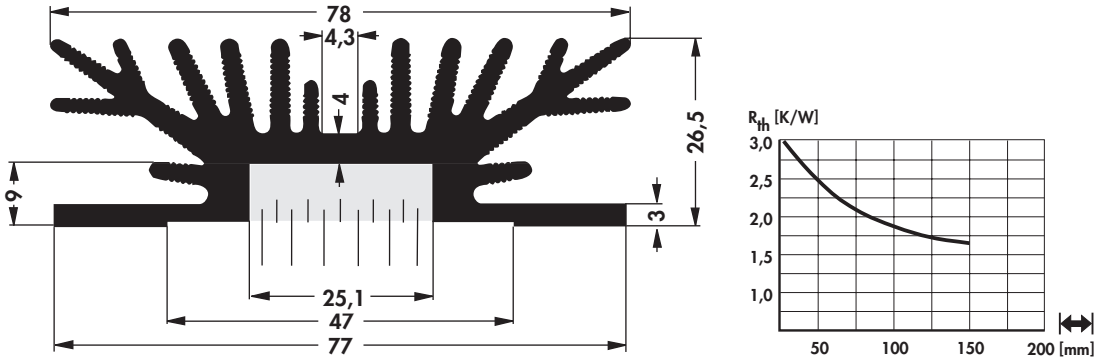
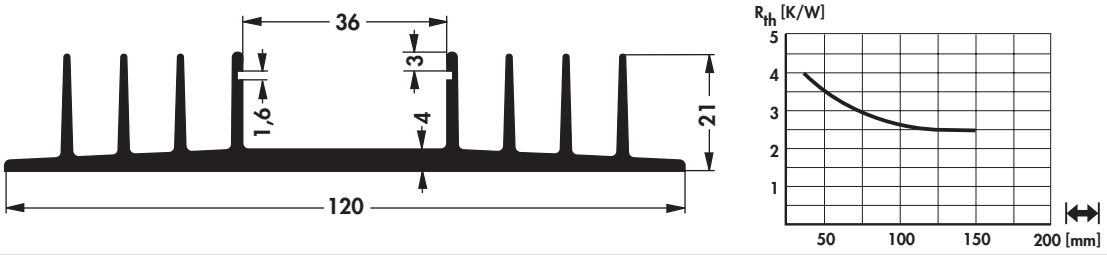
Standard extruded heatsinks

art. no.	
SK 67 ...	  mounting part IS 6 → E 49

please indicate: **... ↔ 37.5 50 100 1000 mm** **... ⌖ (optional) TO 3**

Guide rails for PCBs	→	E 26 – 30	Order example	→	A 21
Mounting material for semiconduct.	→	E 44 – 48	Assignment table	→	A 18 – 20
Mounting parts for heatsinks	→	E 49 – 50	Hole pattern	→	A 21
Heatsink-cooling aggregates	→	D 14	Technical introduction	→	A 2 – 8

art. no.	
SK 65 ...	 ↔ 37,5 mm 5,5 K/W ↔ 75 mm 3,6 K/W for cases SOT 32
please indicate:	... ↔ 37.5 75 mm ... ⌖ (optional) 1xM3; 2xM3
art. no.	
SK 64 ...	 ↔ 37,5 mm 4,1 K/W ↔ 75 mm 2,7 K/W for cases TO 220, TOP 3
please indicate:	... ↔ 37.5 75 mm ... ⌖ (optional) 1xM3; 2xM3
art. no.	
SK 419 ...	
please indicate:	... ↔ 1000 mm
art. no.	
SK 21 ...	 with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 49
please indicate:	... ↔ 37.5 1000 mm ... ⌖ (optional) TO 3; CB

Mounting for TO 3 angle → A 125
Order example → A 21
Special heatsink design → A 137 – 138
Heatsinks for DC/DC converter → A 113 – 114
Insulting clamping parts → E 45
Mica wafers → E 19
Insulator sleeves → E 52
Technical introduction → A 2 – 8

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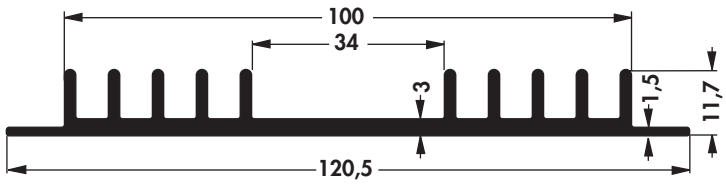
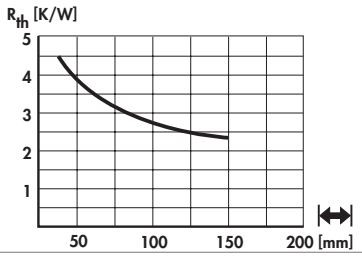
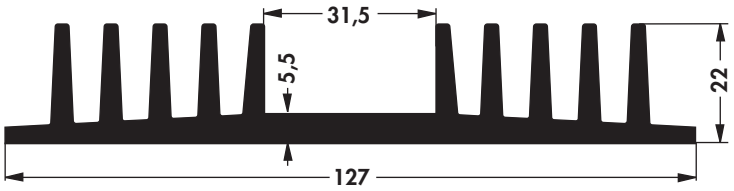
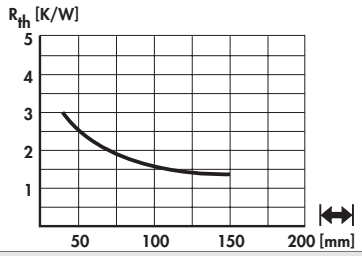
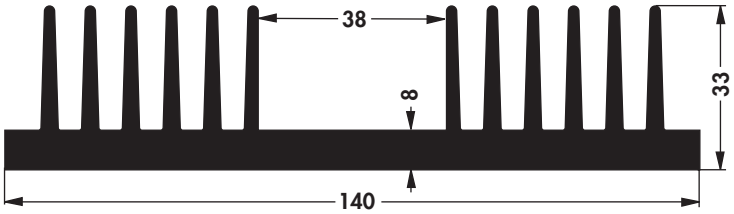
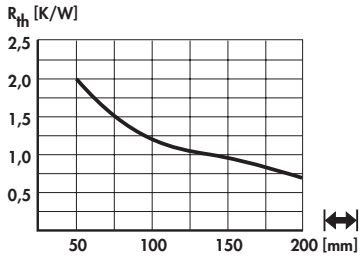
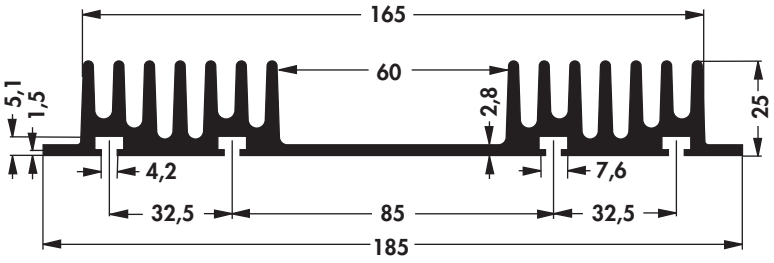
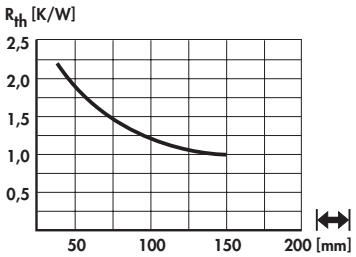
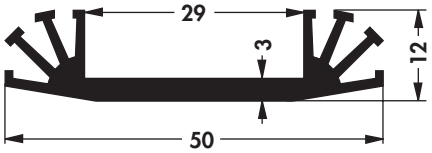
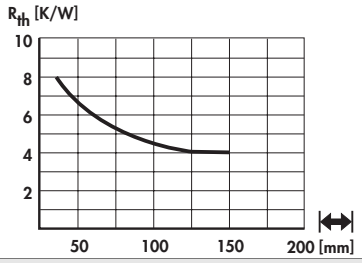
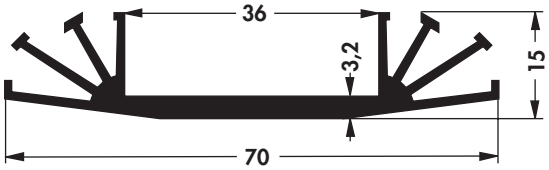
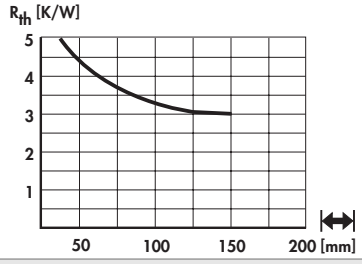
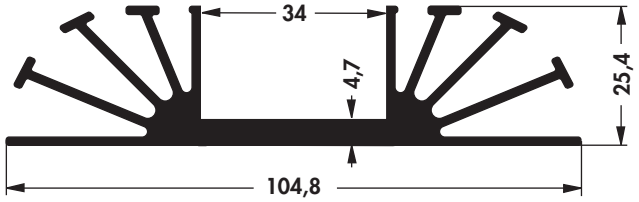
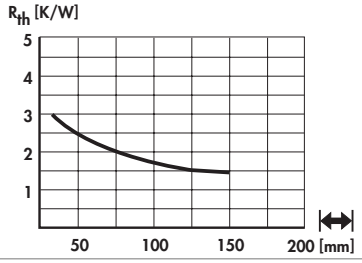
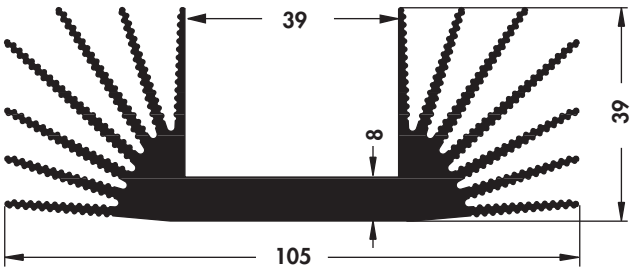
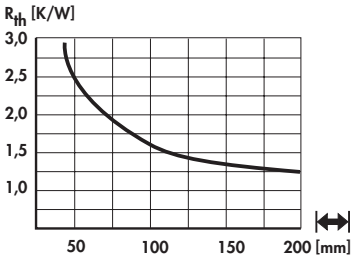
art. no.		
SK 69 ...		
	mounting parts IS 1, IS 2, IS 3 → E 49	
please indicate:	**... ↔ 50 75 100 1000 mm**	**... ⌖ (optional) TO 3; CB**

art. no.		
SK 74 ...		
please indicate:	**... ↔ 37.5 100 1000 mm**	**... ⌖ (optional) TO 3; CB**

art. no.		
SK 124 ...		
please indicate:	**... ↔ 50 100 150 1000 mm**	**... ⌖ (optional) TO 3**

art. no.		
SK 195 ...		
please indicate:	**... ↔ 75 100 mm**	**... ⌖ (optional) TO 3; CB**

art. no.		
SK 31 ...		
please indicate:	**... ↔ 37.5 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 07 ...		
please indicate:	**... ↔ 37.5 50 75 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 16 ...	 mountingpart IS 3 → E 49	
please indicate:	**... ↔ 75 1000 mm**	**... ⌖ (optional) TO 3; CB**
art. no.		
SK 500 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	

Special heatsink design → A 137 – 138
Mounting for TO 3 angle → A 125
Special profiles → A 140
Fin coolers → A 129
Hole pattern → A 21
Profiles for lock-in fixing spring → A 84 – 88
Extruded heatsinks → A 22 – 83
Technical introduction → A 2 – 8

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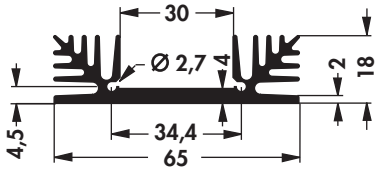
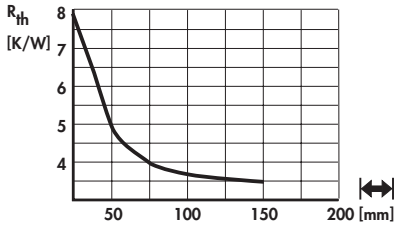
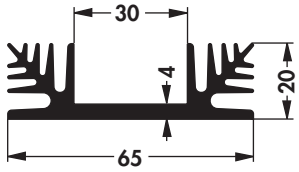
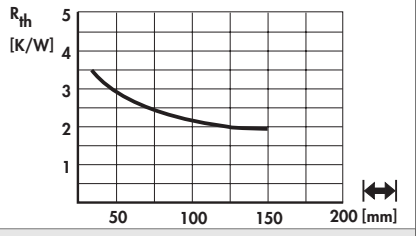
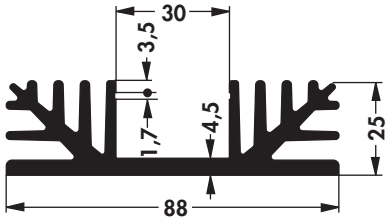
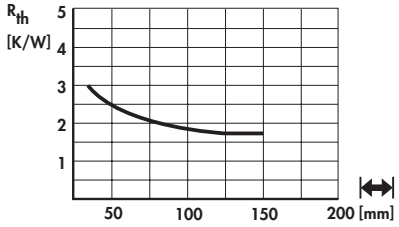
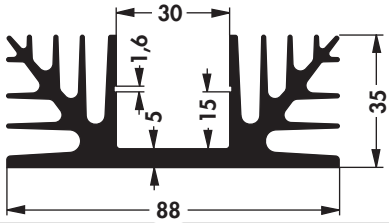
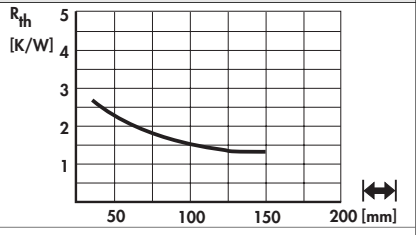
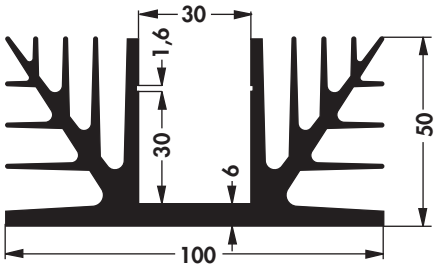
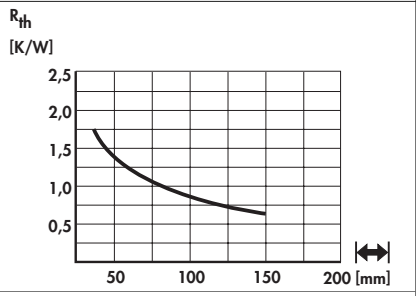
Standard extruded heatsinks

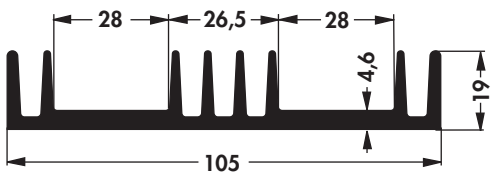
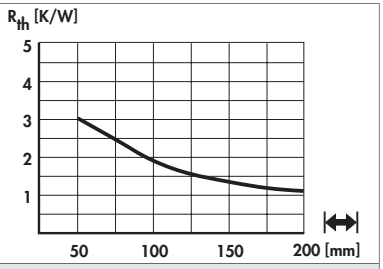
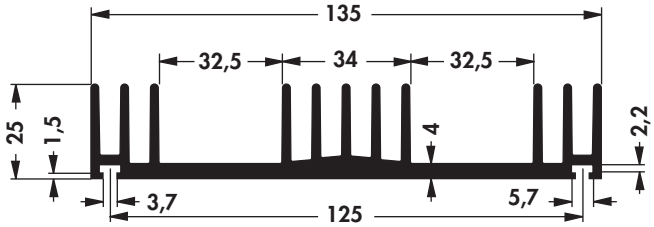
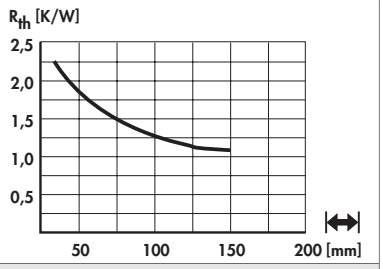
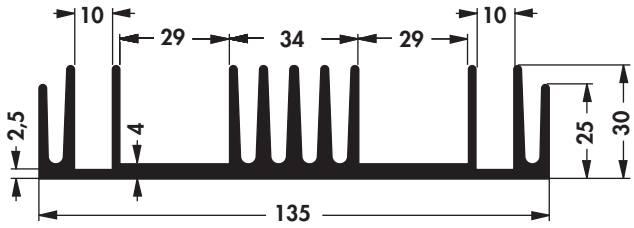
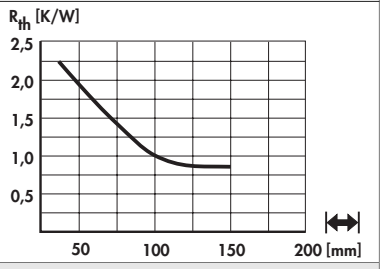
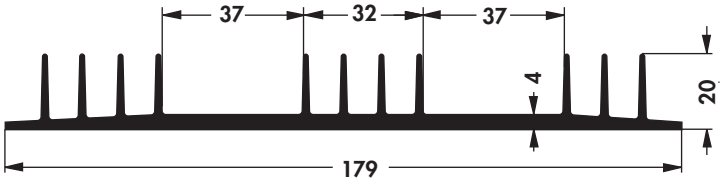
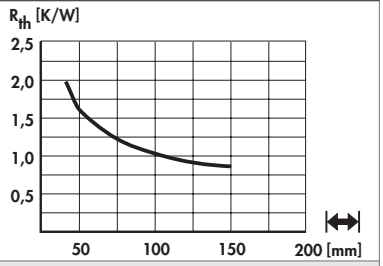
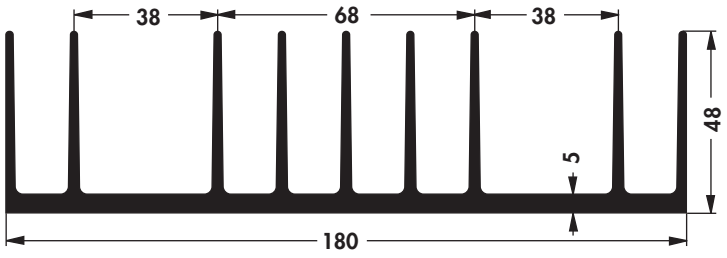
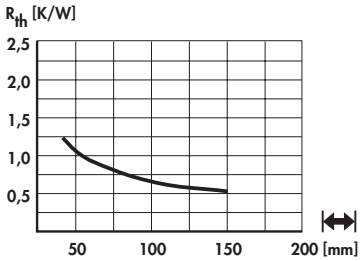
art. no.		
SK 185 ...		
	extruded heatsink for PCB mounting → A 104	
please indicate:	**... ↔ 37.5 50 1000 mm**	**... ◈ (optional) TO 3; CB**

art. no.		
SK 48 ...		
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ◈ (optional) SSR 3; TO 3; CB**

art. no.		
SK 79 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ◈ (optional) TO 3; CB**

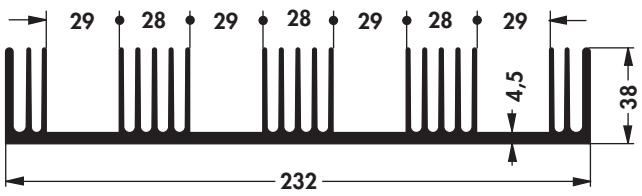
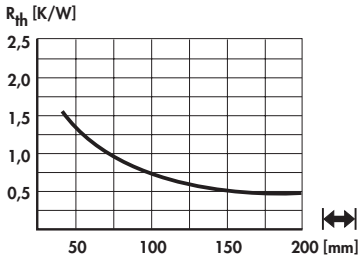
art. no.		
SK 08 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ◈ (optional) TO 3; CB**

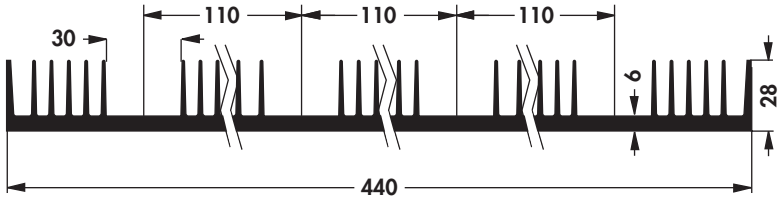
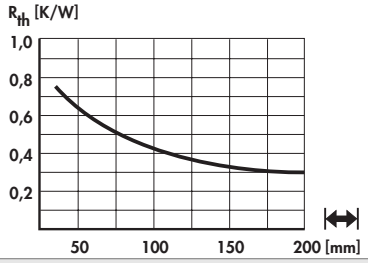
art. no.		
SK 88 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔ 37.5 50 75 100 1000 mm**	**... ◈ (optional) TO 3**

art. no.			
SK 52 ...			
please indicate:	... ↔ 37.5 50 75 100 1000 mm		... ⌖ (optional) 2xTO 3; 2xCB
art. no.			
SK 60 ...			
please indicate:	... ↔ 50 75 100 1000 mm		... ⌖ (optional) 2xTO 3; 2xCB
art. no.			
SK 147 ...			
please indicate:	... ↔ 50 150 1000 mm		... ⌖ (optional) 2xTO 3; 2xCB
art. no.			
SK 80 ...			
please indicate:	... ↔ 75 100 1000 mm		... ⌖ (optional) 2xTO 3; 2xCB
art. no.			
SK 53 ...			
please indicate:	... ↔ 50 75 100 150 1000 mm		... ⌖ (optional) 2xTO 3; 2xCB

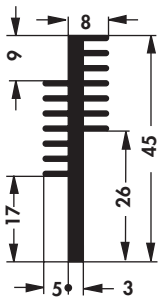
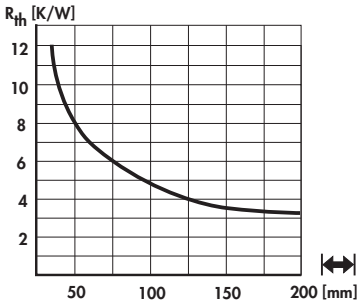
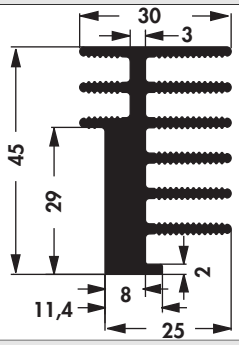
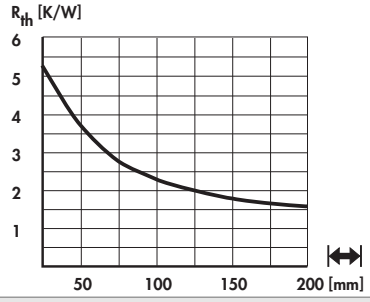
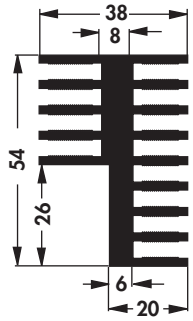
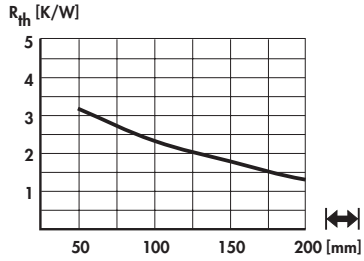
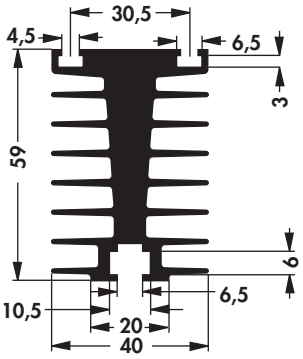
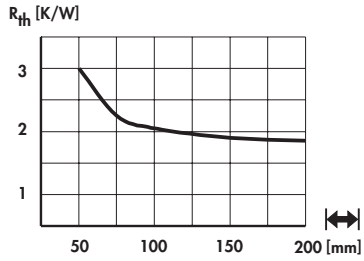
Hole pattern → A 21
Standard aluminium profiles → A 135 – 136
Extruded heatsinks → A 22 – 83
Thermal conductive material → E 2 – 5
Heatsink as visual & decor-parts → A 10
Assignment table → A 18 – 20
Kapton insulator washers → E 16
Technical introduction → A 2 – 8

Standard extruded heatsinks

art. no.	
SK 86 ...	 
please indicate:	**... ↔ 100 150 1000 mm**

art. no.	
SK 82 ...	 
please indicate:	**... ↔ 100 1000 mm**

Hole pattern	→ A 21	Heatsink as visual & decor-parts	→ A 10
Standard aluminium profiles	→ A 135 – 136	Assignment table	→ A 18 – 20
Extruded heatsinks	→ A 22 – 83	Kapton insulator washers	→ E 16
Thermal conductive material	→ E 2 – 5	Technical introduction	→ A 2 – 8

art. no.		
SK 596 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 544 ...		
please indicate:	**... ↔** **50 75 100 1000 mm**	
art. no.		
SK 32 ...		
please indicate:	**... ↔** **37.5 50 75 100 1000 mm**	
art. no.		
SK 187 ...		
please indicate:	**... ↔** **75 1000 mm**	**... ⌖ (optional)** **SSR 3**

Hole pattern	**→ A 21**	**heatsinks for Solid State Relais**	**→ A 11 – 12**
Standard aluminium profiles	**→ A 135 – 136**	**Assignment table**	**→ A 18 – 20**
Extruded heatsinks	**→ A 22 – 83**	**Kapton insulator washers**	**→ E 16**
Thermal conductive material	**→ E 2 – 5**	**Technical introduction**	**→ A 2 – 8**

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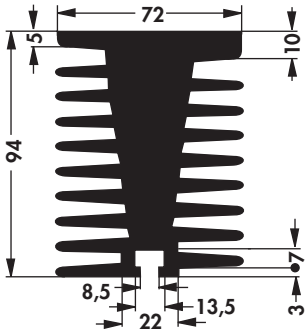
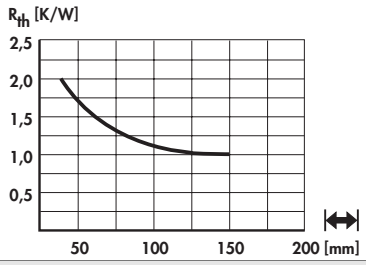
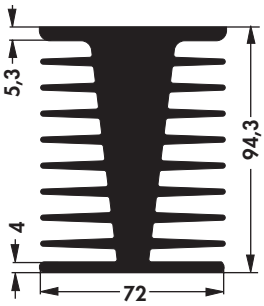
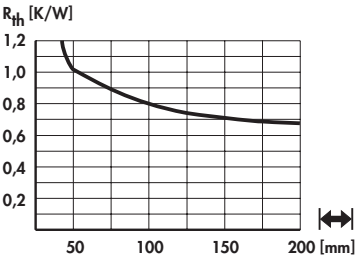
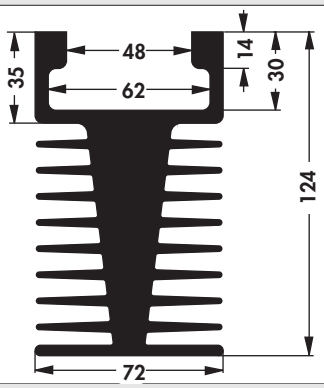
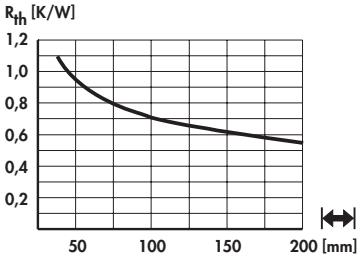
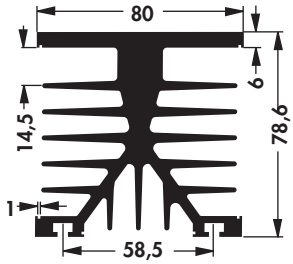
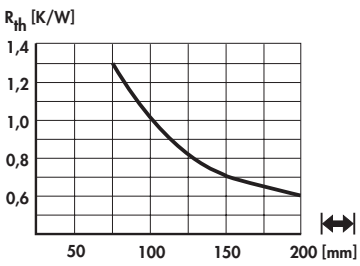
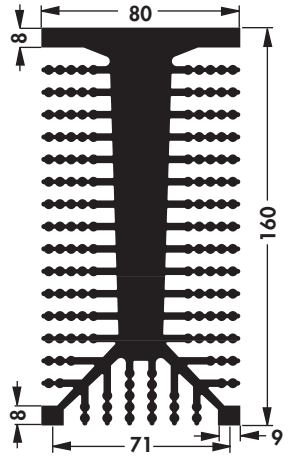
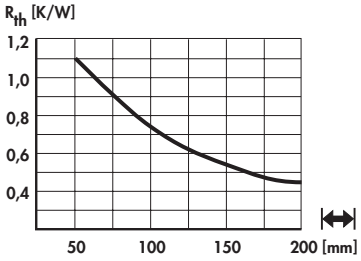
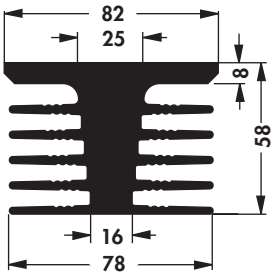
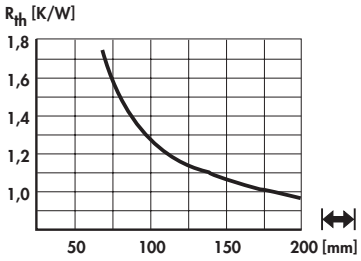
Standard extruded heatsinks

art. no.		
SK 140 ...		
please indicate:	**... ↔** **1000 mm**	
art. no.		
SK 556 ...		
please indicate:	**... ↔** **75 100 150 1000 mm**	
art. no.		
SK 15 ...		
please indicate:	**... ↔** **75 1000 mm**	
art. no.		
SK 89 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔** **100 150 1000 mm**	**... ◈ (optional)** **SSR 1; SSR 2**

Standard extruded heatsinks

art. no.	
SK 163 ...	 
please indicate:	**... ↔** **100 150 1000 mm**

art. no.	
SK 176 ...	 
please indicate:	**... ↔** **75 100 150 1000 mm** **... ⌖ (optional)** **SSR 2**

Hole pattern → **A 21**
Standard aluminium profiles → **A 135 – 136**
Extruded heatsinks → **A 22 – 83**
Thermal conductive material → **E 2 – 5**
heatsinks for Solid State Relais → **A 11 – 12**
Assignment table → **A 18 – 20**
Kapton insulator washers → **E 16**
Technical introduction → **A 2 – 8**

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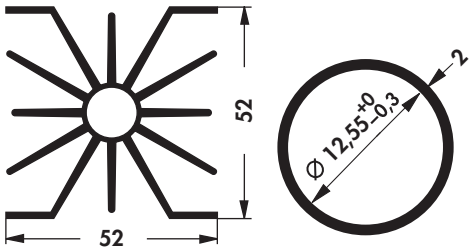
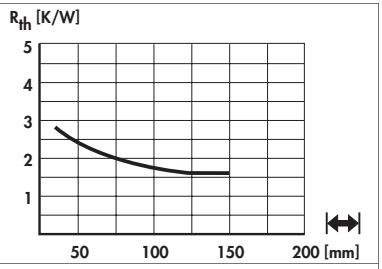
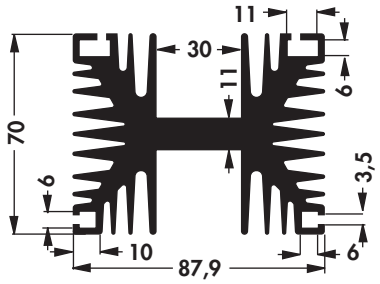
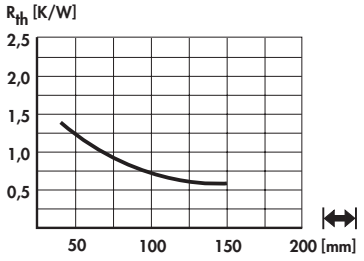
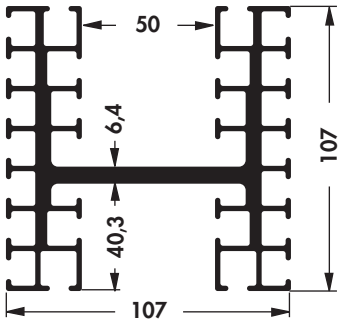
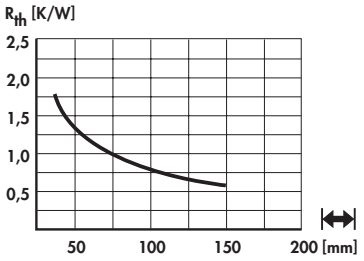
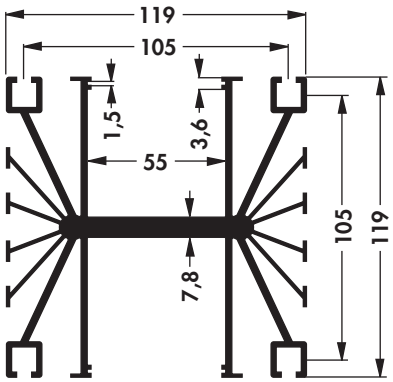
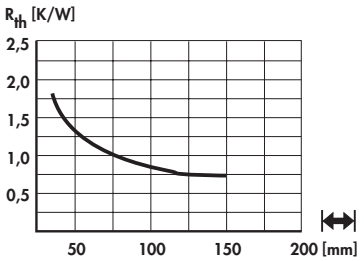
Standard extruded heatsinks

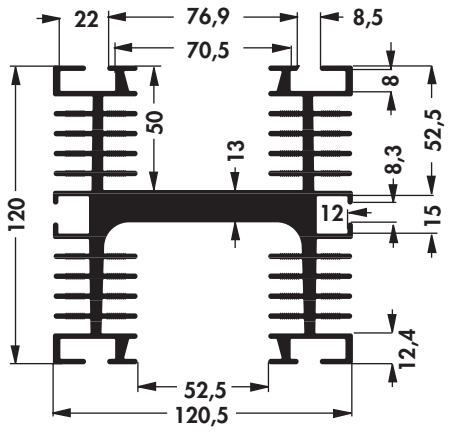
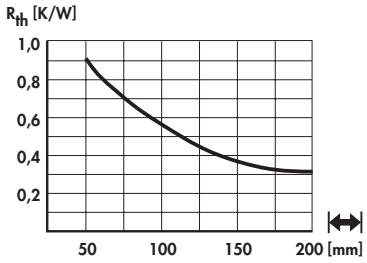
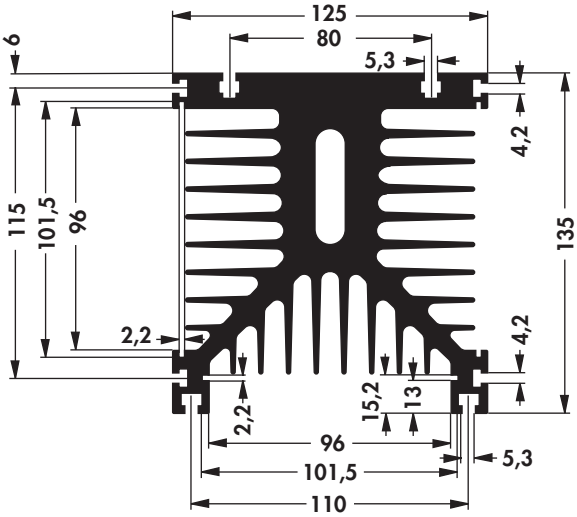
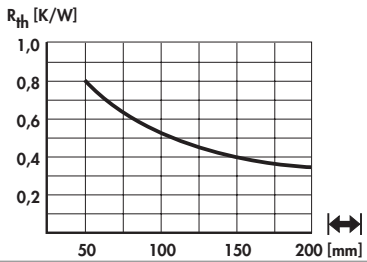
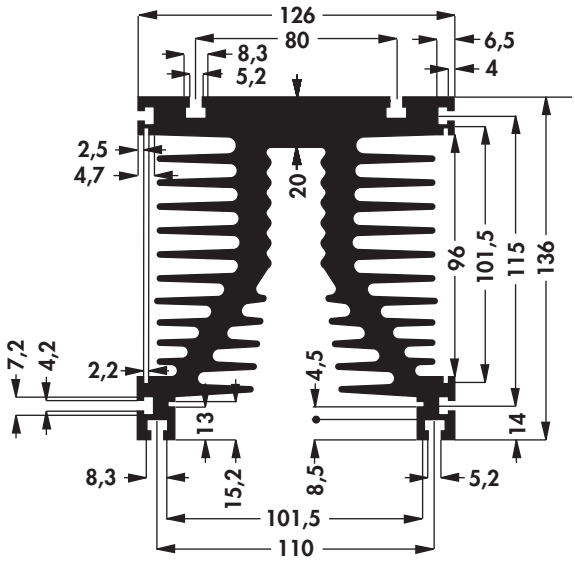
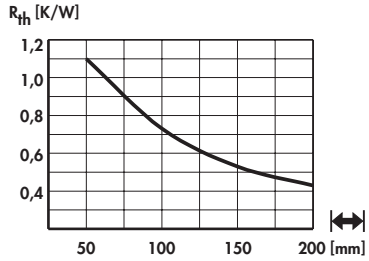
art. no.	
SK 11 ...	 
	threads, through holes and fixing according to your demand; mounting parts IS 1, IS 2, IS 3 → E 49
please indicate:	**... ↔ 1000 mm**

art. no.	
SK 83 ...	 
please indicate:	**... ↔ 100 1000 mm**

art. no.	
SK 06 ...	 
	mounting part IS 4 → E 49
please indicate:	**... ↔ 75 1000 mm**

art. no.	
SK 23 ...	 
	with slots for cover plates or PCBs; equipped with fan and endplates = **LA 4** → D 14
please indicate:	**... ↔ 75 mm**

Standard extruded heatsinks

art. no.	
SK 110 ...	 
please indicate:	**... ↔** **150 200 1000 mm**
art. no.	
SK 109 ...	  with slots for cover plates or PCBs
please indicate:	**... ↔** **100 150 200 1000 mm**
art. no.	
SK 108 ...	  with slots for cover plates or PCBs
please indicate:	**... ↔** **100 1000 mm**

Profiles for PCB components → **A 91**
High capacity heatsinks → **A 57 – 58**
Mounting for TO 3 angle → **A 125**
Heatsinks for PCB → **A 89 – 112**
heatsinks for lock-in retaining spring → **A 85 – 88**
Heatsink-cooling aggregates → **D 14**
Special heatsink design → **A 137 – 138**
Technical introduction → **A 2 – 8**

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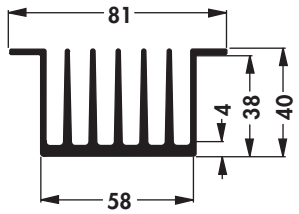
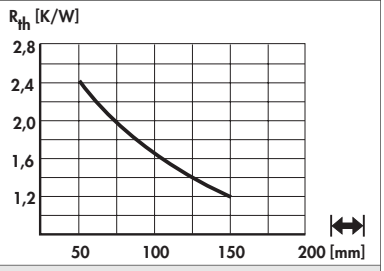
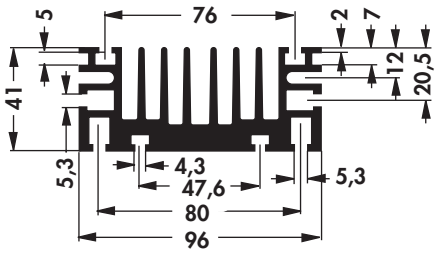
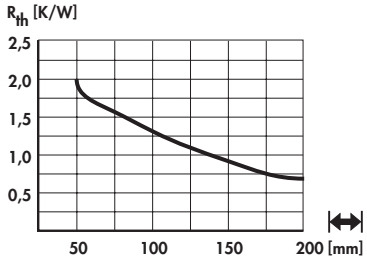
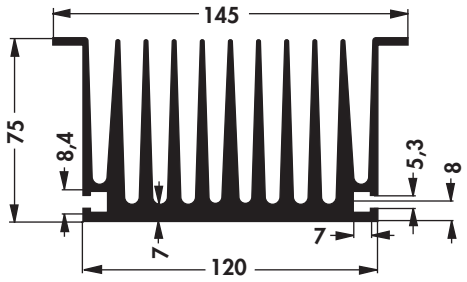
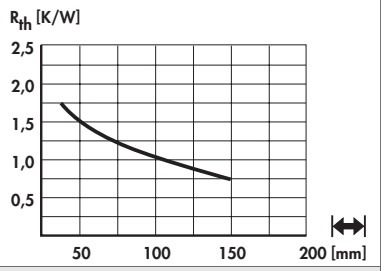
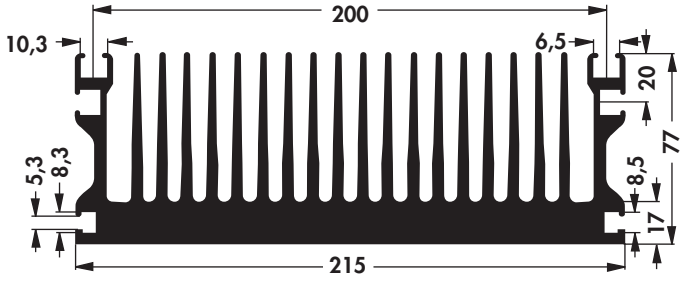
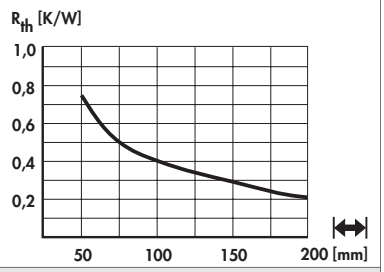
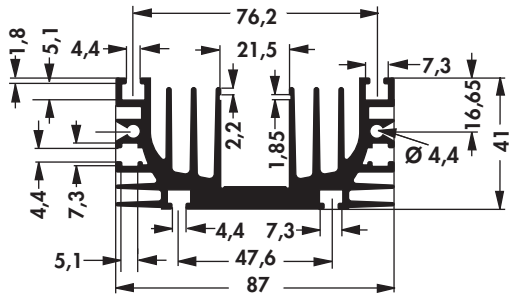
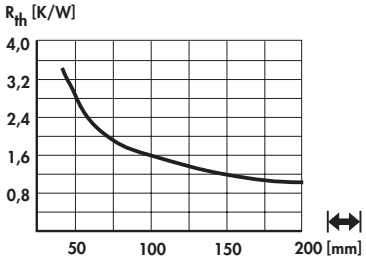
Standard extruded heatsinks

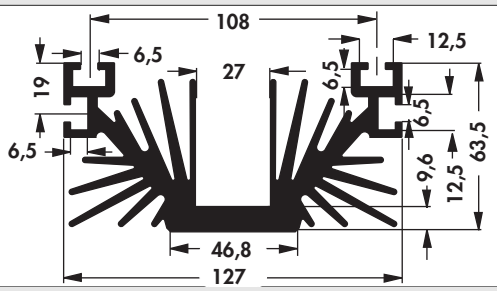
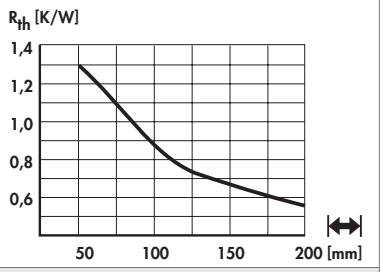
art. no.		
SK 111 ...		
please indicate:	... ↔ 75 100 1000 mm	... ◈ (optional) SSR 1; SSR 3

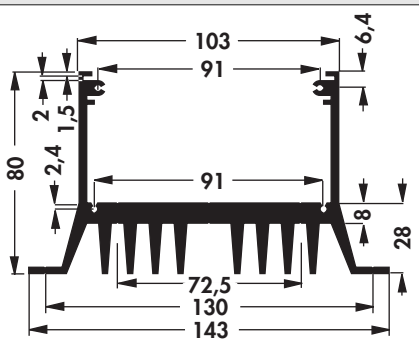
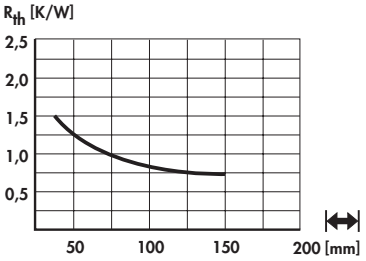
art. no.		
SK 172 ...		
please indicate:	... ↔ 50 75 100 150 1000 mm	... ◈ (optional) SSR 1; SSR 4

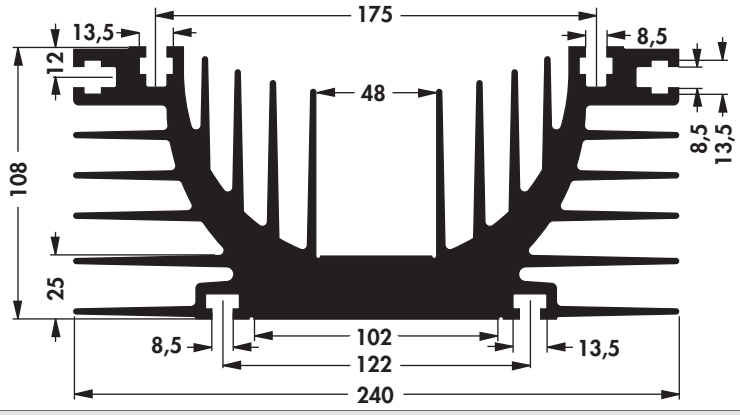
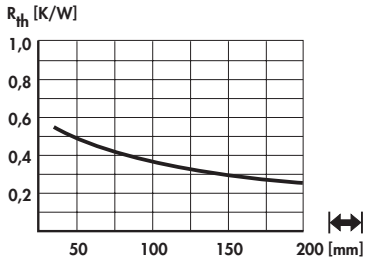
art. no.		
SK 194 ...		
please indicate:	... ↔ 75 1000 mm	... ◈ (optional) SSR 2

art. no.		
SK 435 ...		
please indicate:	... ↔ 150 200 1000 mm	

art. no.		
SK 432 ...		
	with slots for cover plates or PCBs	
please indicate:	**... ↔** **100 1000 mm**	

art. no.		
SK 40 ...		
please indicate:	**... ↔** **100 1000 mm**	

art. no.		
SK 61 ...		
	with slots for cover plates or PCBs; cooling case → M 29	
please indicate:	**... ↔** **75 100 150 1000 mm**	

art. no.		
SK 144 ...		
please indicate:	**... ↔** **1000 mm**	

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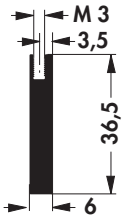
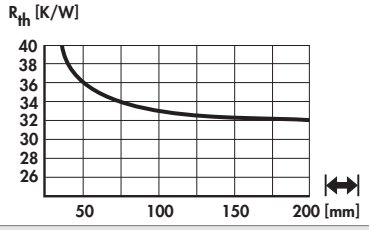
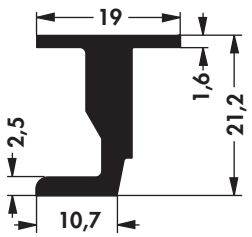
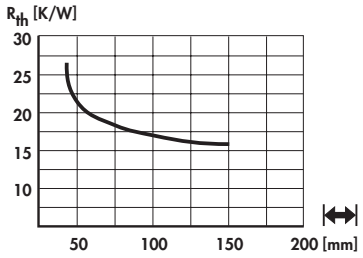
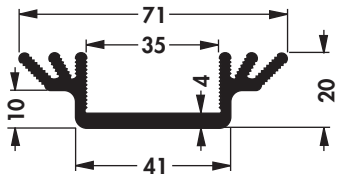
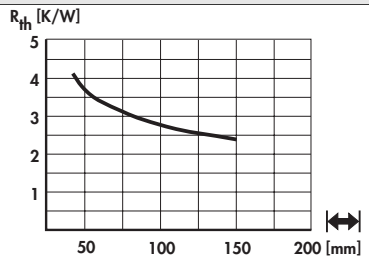
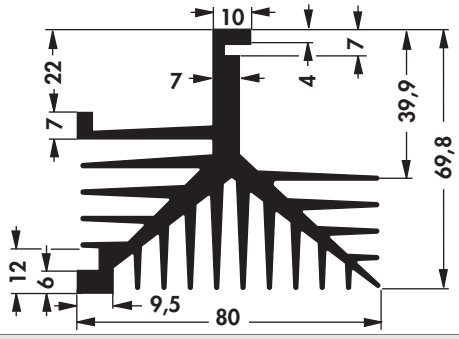
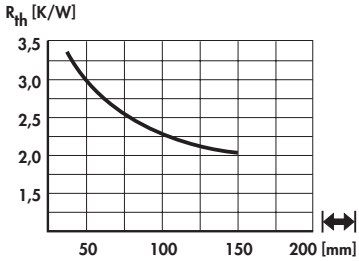
Standard extruded heatsinks

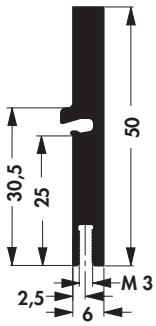
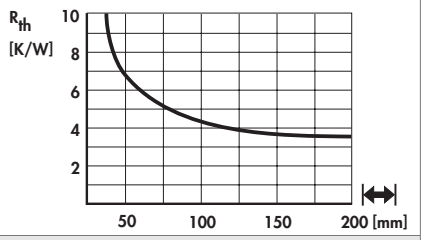
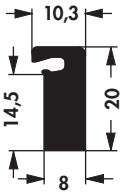
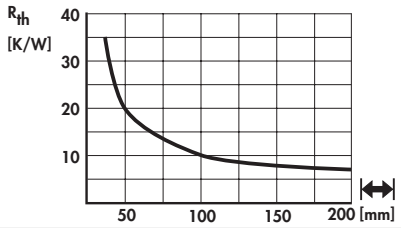
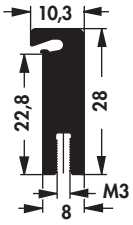
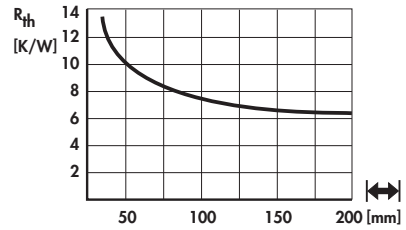
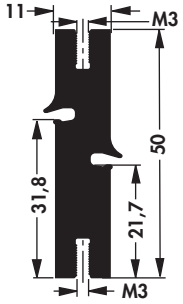
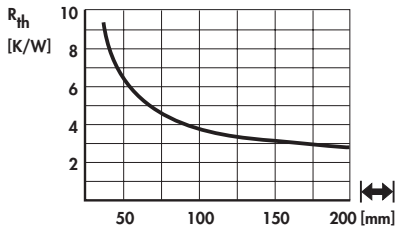
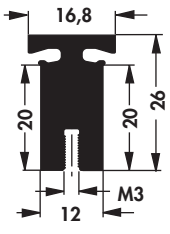
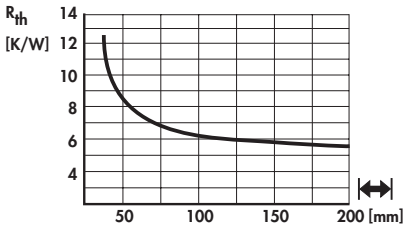
art. no.		
SK 494 ...		
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**	

art. no.		
SK 153 ...	 	
please indicate:	**... ↔** **50 mm**	

art. no.		
SK 55 ...		
please indicate:	**... ↔** **37.5 1000 mm**	**... ◈ (optional)** **TO 3; CB**

art. no.		
SK 175 ...		
please indicate:	**... ↔** **50 1000 mm**	

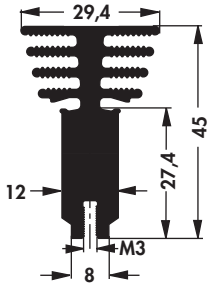
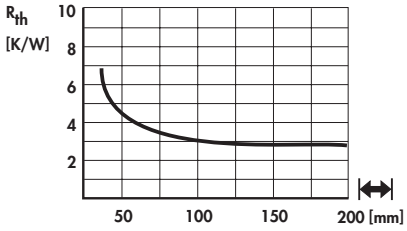
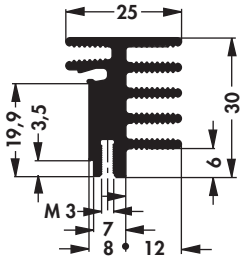
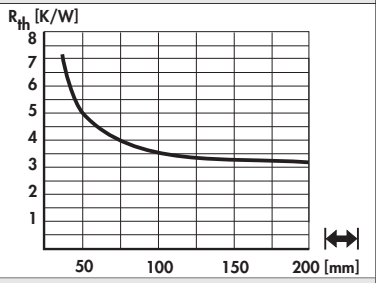
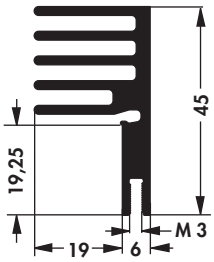
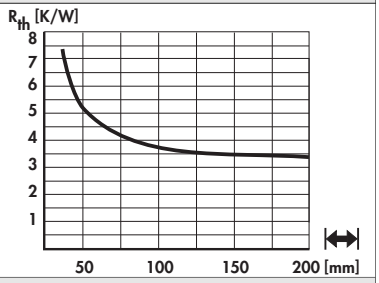
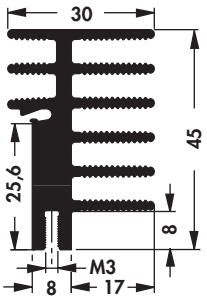
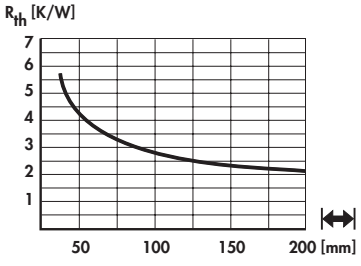
Extruded heatsinks for lock-in retaining spring

art. no.			
SK 575 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 512 ...			
please indicate:	**... ↔** **25 50 100 1000 mm**		
art. no.			
SK 480 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 490 ...			
please indicate:	**... ↔** **37.5 50 75 84 100 1000 mm**		
art. no.			
SK 492 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		

please note: profile threads → A 5

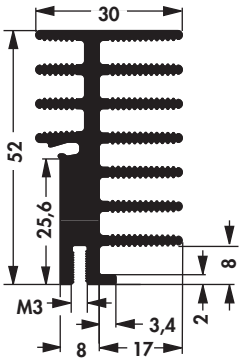
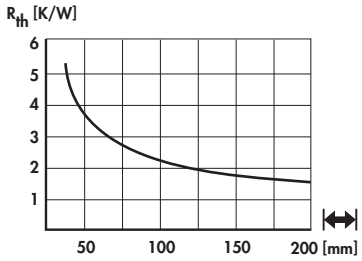
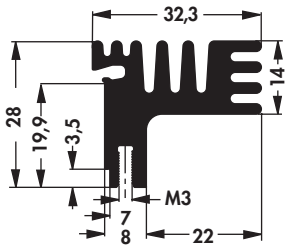
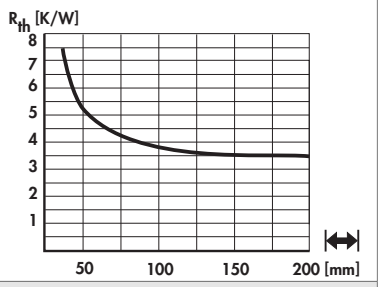
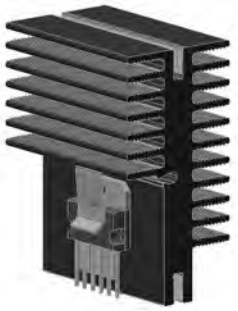
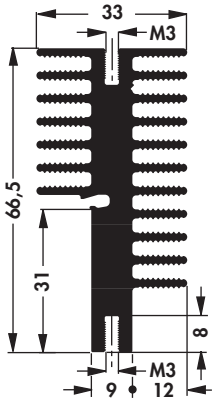
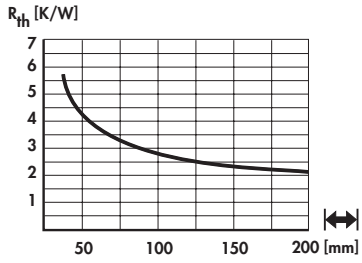
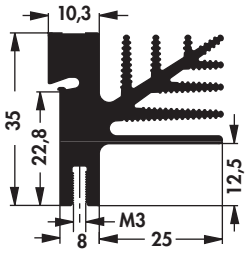
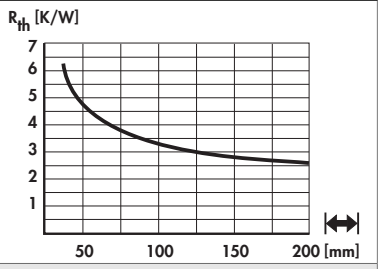
Mounting parts for heatsinks → **E 49 – 50**
Insulating caps → **E 51**
Mounting pads → **E 46**
Lock-in retaining spring for transistors → **A 119 – 121**
Heatsinks for PCB → **A 89**
Profiles for PCB components → **A 91**
Heatsinks with threaded rail → **A 93**
Technical introduction → **A 2 – 8**

Extruded heatsinks for lock-in retaining spring

art. no.			
SK 489 ...			
please indicate:	**... ↔ 25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 573 ...			
please indicate:	**... ↔ 25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 576 ...			
please indicate:	**... ↔ 25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 481 ...			
please indicate:	**... ↔ 25 37.5 50 75 84 100 1000 mm**		

please note: profile threads → A 5

Extruded heatsinks for lock-in retaining spring

art. no.			
SK 514 ...			
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**		
art. no.			
SK 574 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 589 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 482 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		

please note: profile threads → A 5

Mounting parts for heatsinks	**→ E 49 – 50**	**Heatsinks for PCB**	**→ A 89**
Insulating caps	**→ E 51**	**Profiles for PCB components**	**→ A 91**
Mounting pads	**→ E 46**	**Heatsinks with threaded rail**	**→ A 93**
Lock-in retaining spring for transistors	**→ A 119 – 121**	**Technical introduction**	**→ A 2 – 8**

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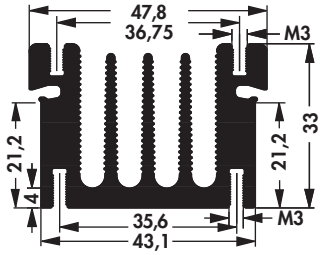
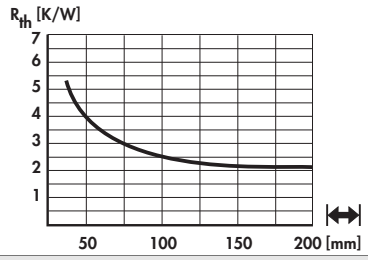
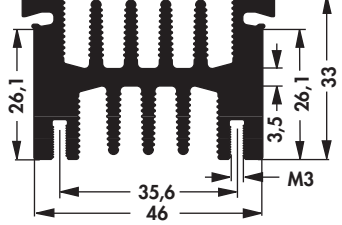
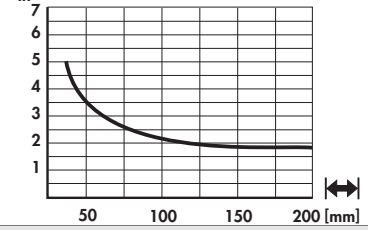
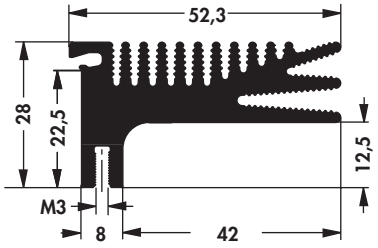
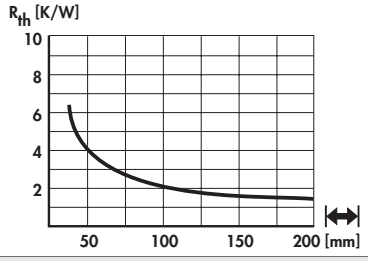
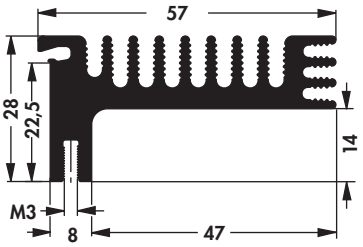
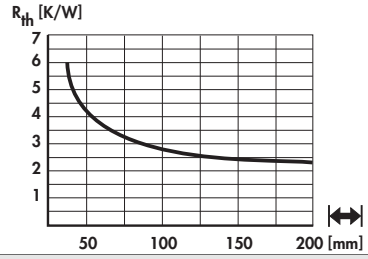
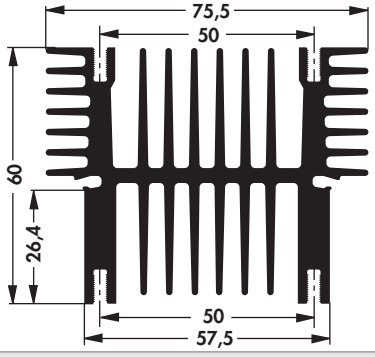
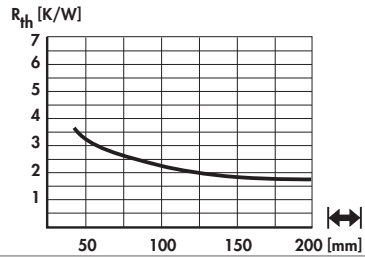
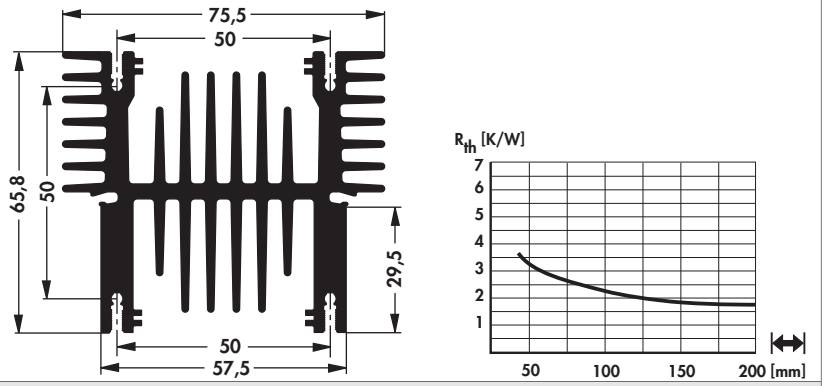
Extruded heatsinks for lock-in retaining spring

art. no.			
SK 495 ...			
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**		
art. no.			
SK 499 ...			
please indicate:	**... ↔** **25 37.5 50 75 100 1000 mm**		
art. no.			
SK 487 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 483 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		
art. no.			
SK 593 ...			
please indicate:	**... ↔** **25 37.5 50 75 84 100 1000 mm**		

please note: profile threads → A 5

Mounting parts for heatsinks	→ E 49 – 50	Heatsinks for PCB	→ A 89
Insulating caps	→ E 51	Profiles for PCB components	→ A 91
Mounting pads	→ E 46	Heatsinks with threaded rail	→ A 93
Lock-in retaining spring for transistors	→ A 119 – 121	Technical introduction	→ A 2 – 8

Extruded heatsinks for lock-in retaining spring

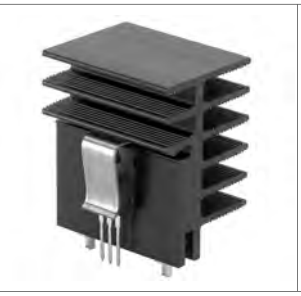
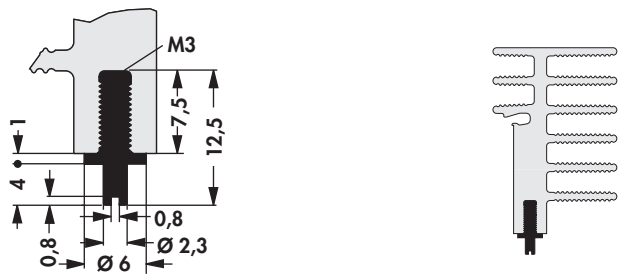
art. no.		
SK 617 ...		

please indicate: **... ↔**
25 37.5 50 75 84 94 100 1000 mm

please note: profile threads → A 5

Screw-in solder pin ELS 3

– screw in solder pin made of brass
– easy mounting
– secure hold
– surface coating suitable for soldering
– suitable for all heatsinks with M3 profile thread
– position in the threaded channel as required
– specific designs upon customer´s request

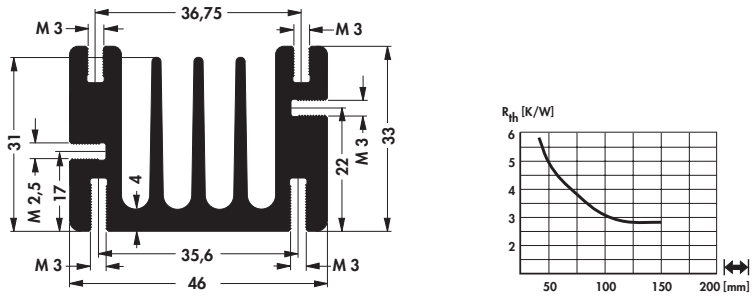
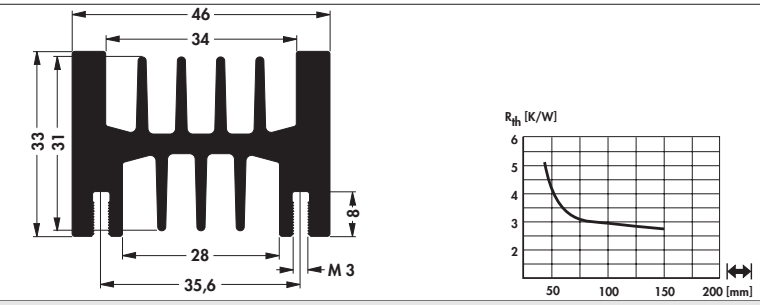
art. no.		
ELS 3		

Mounting parts for heatsinks → **E 49 – 50**
Insulating caps → **E 51**
Mounting pads → **E 46**
Lock-in retaining spring for transistors → **A 119 – 121**
Heatsinks for PCB → **A 89**
Profiles for PCB components → **A 91**
Heatsinks with threaded rail → **A 93**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

Heatsinks for printed circuit boards

– matching cylindrial screws according to DIN 84 with zinc coated surface
– M 3 thread diameter: 2.90 ... 2.94 mm **(art. no.: SZ M 3 x 8)**
– screw-in solder pin M 3 **(art. no.: ELS 3)**

art. no.		
SK 68 ...		
art. no.		
SK 112 ...		

please indicate: **... ↔**
37.5 50 75 94 100 1000 mm

please note: profile threads → A 5

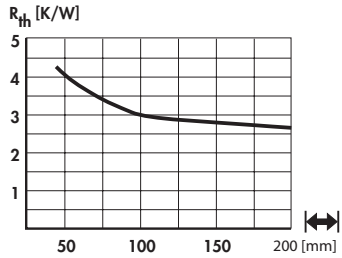
Lock-in retaining spring for transistors	**→ A 119 – 121**	**Miniature distance sleeves**	**→ E 34**
Profiles for PCB components	**→ A 91**	**Thermal conductive glue**	**→ E 23 – 24**
Vibration dampers	**→ E 41**	**Thermal conductive paste**	**→ E 21 – 22**
Heatsinks with threaded rail	**→ A 93**	**Technical introduction**	**→ A 2 – 8**

Extruded heatsinks for PCB mounting

Heatsinks for printed circuit boards

– the heatsinks SK 414, SK 105, SK 44 and SK 415 are especially suitable for printed circuit board heatsinks for 19" plug in units

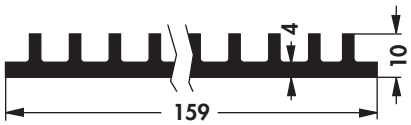
art. no.

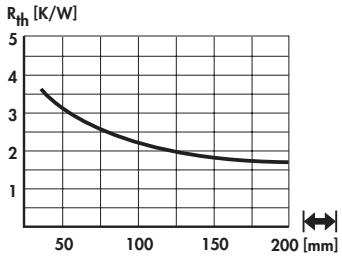


SK 414 ...

please indicate: **... ↔**
100 233.4 1000 mm

art. no.

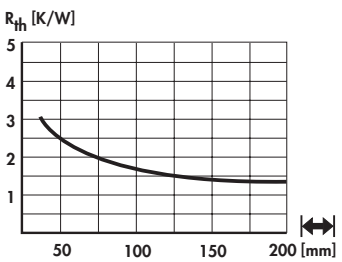




SK 105 ...

please indicate: **... ↔**
37.5 50 75 100 150 200 233.4 1000 mm

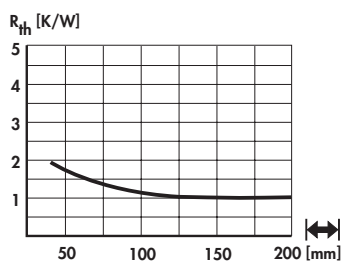
art. no.



SK 44 ...

please indicate: **... ↔**
50 75 100 150 200 233.4 1000 mm

art. no.



SK 415 ...

please indicate: **... ↔**
37.5 100 150 1000 mm

Lock-in retaining spring for transistors → **A 119 – 121**
Heatsink profile overview → **A 13 – 17**
Heatsinks for PCB → **A 89**
Heatsinks with threaded rail → **A 93**
Thermal conductive material → **E 2 – 23**
Profiles for lock-in fixing spring → **A 84 – 88**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

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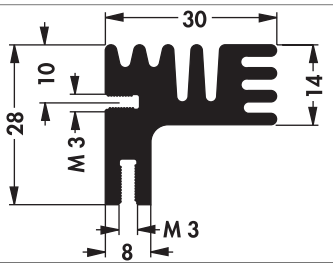
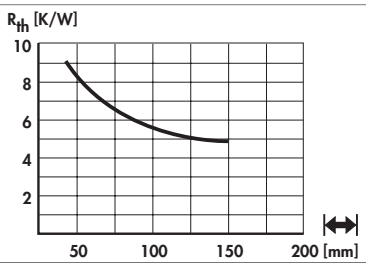
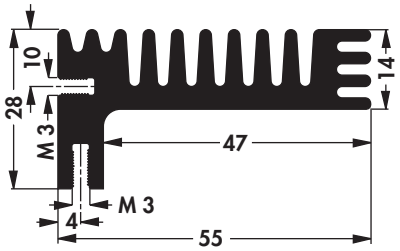
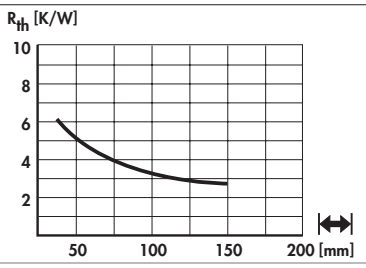
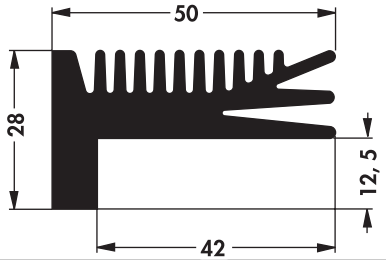
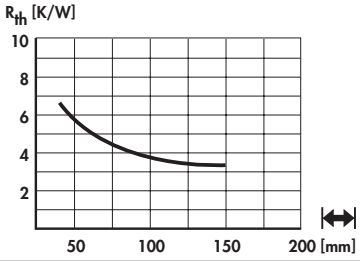
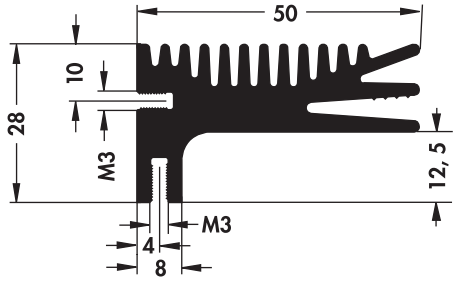
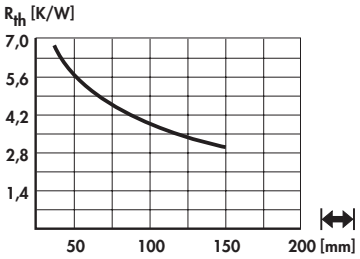
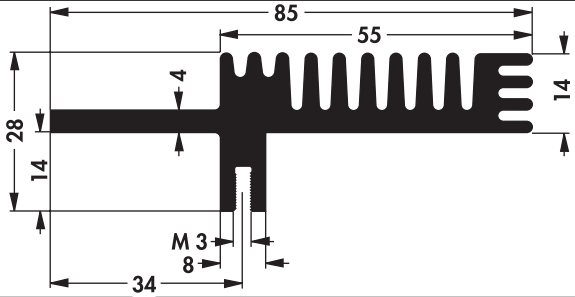
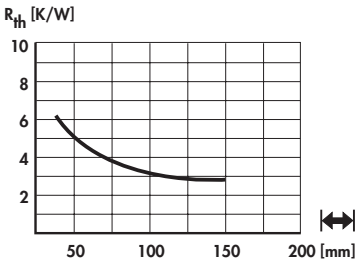
Extruded heatsinks for PCB mounting

Heatsinks for printed circuit boards

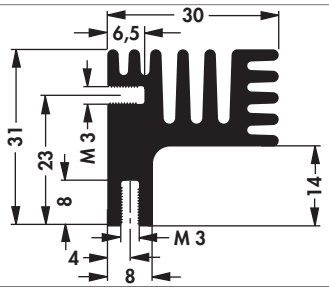
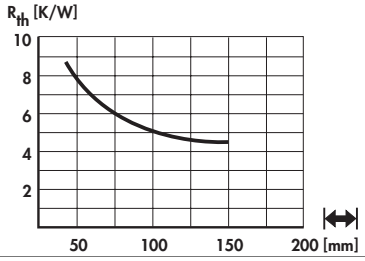
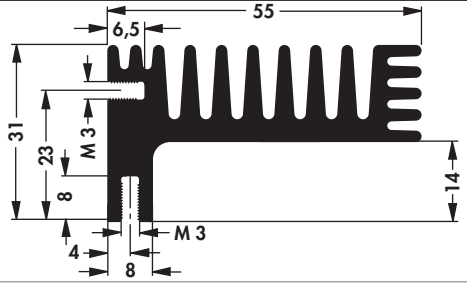
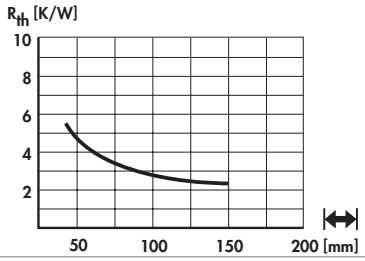
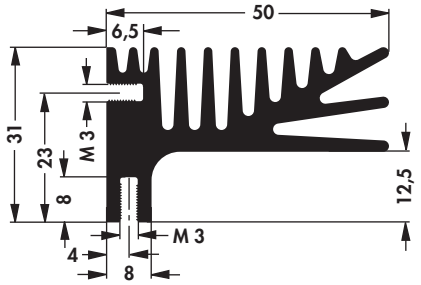
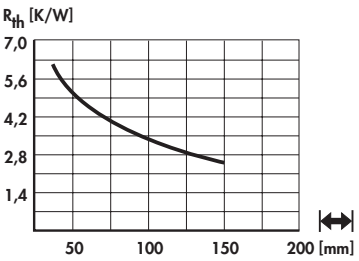
– for use on eurocards

art. no.		
SK 125 ...		
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**	
art. no.		
SK 96 ...	 	
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**	
please indicate:	**... ↔** **50 84 94 1000 mm**	
art. no.		
SK 138 ...		
art. no.		
SK 451 ...		
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**	
art. no.		
SK 128 ...		
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**	
please indicate:	**... ↔** **50 84 94 1000 mm**	

please note: profile pressed threads → A 5

Lock-in retaining spring for transistors	→ A 119 – 121	Thermal conductive material	→ E 2 – 23
Heatsink profile overview	→ A 13 – 17	Profiles for lock-in fixing spring	→ A 84 – 88
Heatsinks for PCB	→ A 89	Retaining springs for transistors	→ A 115 – 117
Heatsinks with threaded rail	→ A 93	Technical introduction	→ A 2 – 8

Extruded heatsinks for PCB mounting

art. no.	
SK 609 ...	 
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**
art. no.	
SK 610 ...	 
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**
art. no.	
SK 611 ...	 
	screws M 3: **art. no.: SZ M 3 x 8**; screw-in solder pin: **art. no.: ELS 3**
please indicate:	**... ↔** **50 84 94 1000 mm**

please note: profile pressed threads → A 5

Lock-in retaining spring for transistors → **A 119 – 121**
Heatsink profile overview → **A 13 – 17**
Heatsinks for PCB → **A 89**
Heatsinks with threaded rail → **A 93**
Thermal conductive material → **E 2 – 23**
Profiles for lock-in fixing spring → **A 84 – 88**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

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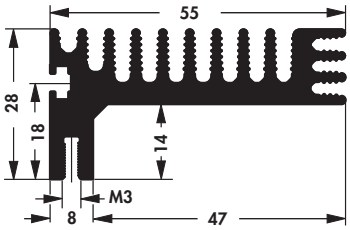
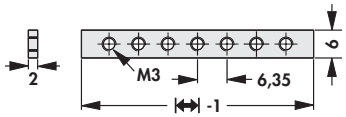
Extruded heatsinks for PCB mounting

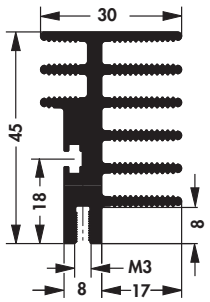
Heatsink for PCB with threaded rail

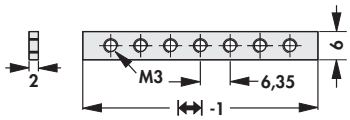
– transistor mounting onto the heatsink using a slide-in rail with M 3 thread
– easy positioning using a grid 6.35mm
– other rail grids upon request
– suitable for TO 220, TO 218, TO 247 and similar
– suitable screws M 3 **(art. no.: SZ M 3 x 8)**
– screw-in solder pin M 3 **(art. no.: ELS 3)**
– specific versions upon customer´s request





art. no.	↔ [mm]	R_{th} [K/W]	◈	version
SK 517 50 GS	50	5.0	TO 220	with threaded rail
SK 517 75 GS	75	3.9	TO 220	with threaded rail
SK 517 84 GS	84	3.6	TO 220	with threaded rail
SK 517 50	50	5.0	—	without threaded rail
SK 517 75	75	3.9	—	without threaded rail
SK 517 84	84	3.6	—	without threaded rail





art. no.	↔ [mm]	R_{th} [K/W]	◈	version
SK 518 50 GS	50	4.3	TO 220	with threaded rail
SK 518 75 GS	75	3.3	TO 220	with threaded rail
SK 518 84 GS	84	3.0	TO 220	with threaded rail
SK 518 50	50	4.3	—	without threaded rail
SK 518 75	75	3.3	—	without threaded rail
SK 518 84	84	3.0	—	without threaded rail

please note: profile threads ➔ A 5

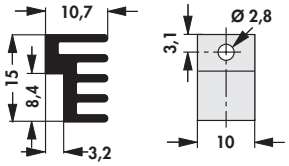
surface:	black anodised

Extruded heatsinks for PCB mounting

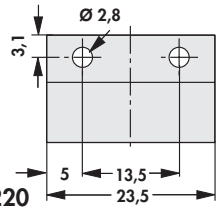
Attachable heatsinks for transistors

– compact heatsink in transistor dimensions
– for horizontal and vertical transistors
– can be screwed or glued
– specific versions upon customer´s request

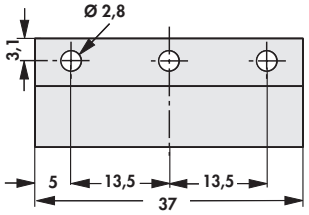
SK 515 10 S TO 220



SK 515 23,5 S 2 x TO 220

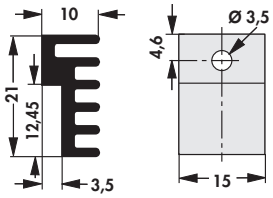


SK 515 37 S 3 x TO 220

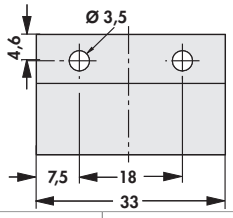


art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 515 10 S TO 220	10.0	30.0	TO 220	for screw fastening M2.5
SK 515 23,5 S 2 x TO 220	23.5	27.5	2xTO 220	for screw fastening M2.5
SK 515 37 S 3 x TO 220	37.0	26.1	3xTO 220	for screw fastening M2.5
SK 515 10 TO 220	10.0	30.0	—	without screw fastening
SK 515 23,5 TO 220	23.5	27.5	—	without screw fastening
SK 515 37 TO 220	37.0	26.1	—	without screw fastening

SK 516 15 S TO 218



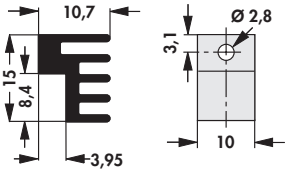
SK 516 33 S 2 x TO 218



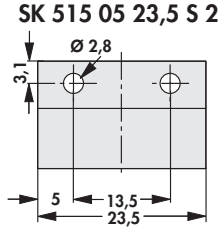
art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 516 15 S TO 218	15	28.4	TO 218	for screw fastening M3
SK 516 33 S 2 x TO 218	33	26.9	2xTO 218	for screw fastening M3
SK 516 15 TO 218	15	28.4	—	without screw fastening
surface:		black anodised		

Attachable extruded heatsinks for transistors with thin bottom plate (0.5 mm)

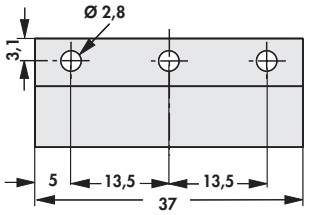
SK 515 05 10 S



SK 515 05 23,5 S 2



SK 515 05 37 S 3



art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 515 05 10 S	10.0	30.0	TO 220	for screw fastening M2.5
SK 515 05 23,5 S 2	23.5	27.5	2xTO 220	for screw fastening M2.5
SK 515 05 37 S 3	37.0	26.1	3xTO 220	for screw fastening M2.5
SK 515 05 10	10.0	30.0	—	without screw fastening
SK 515 05 23,5	23.5	27.5	—	without screw fastening
SK 515 05 37	37.0	26.1	—	without screw fastening
surface:		black anodised		

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Lock-in retaining spring for transistors → **A 119 – 121**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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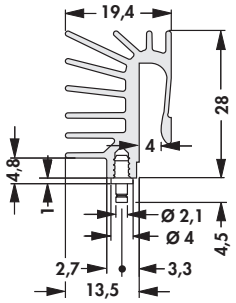
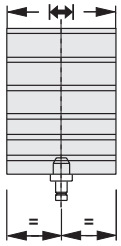
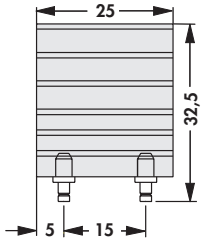
Extruded heatsinks for PCB mounting

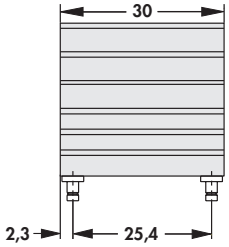
Attachable heatsinks for transistors

– extruded heatsink with intergrated spring locking function
– simple assembly by pushing the heatsink onto the transistor
– optimum heat transfer between component and heatsink
– solderable pin for PCB mounting
– specific versions upon customer´s request

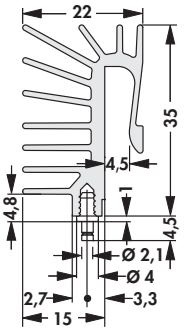


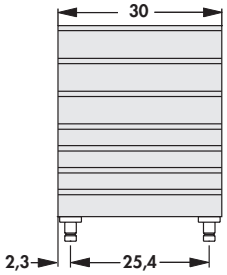






art. no.	for transistor	⟷ [mm]	R_{th} [K/W]	spring force [N]	version
SK 525 15	TO 220	15	13.3	54	without solder pins
SK 525 30	TO 220	30	7.8	100	without solder pins
SK 525 15 ST	TO 220	15	13.3	54	with 1 solder pin
SK 525 20 ST	TO 220	20	10.7	70	with 1 solder pin
SK 525 25 ST	TO 220	25	9.0	85	with 2 solder pins
SK 525 30 ST	TO 220	30	7.8	100	with 2 solder pins



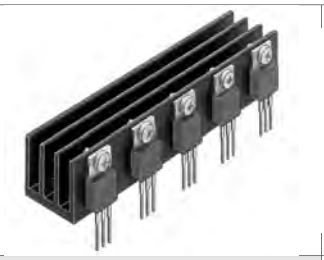


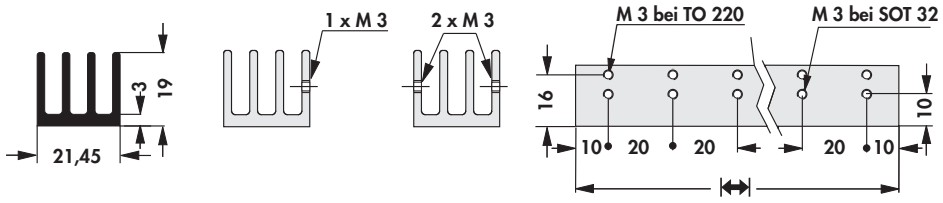
art. no.	for transistor	⟷ [mm]	R_{th} [K/W]	spring force [N]	version
SK 526 30 ST	TO 247	30	6.3	100	with 2 solder pins
surface:	black anodised				

Extruded heatsinks for PCB mounting

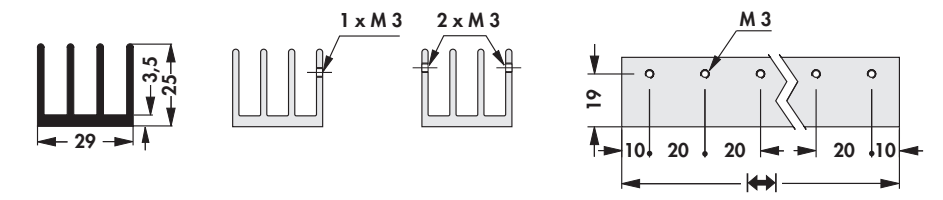
Extruded heatsinks for transistors

– compact PCB heatsink
– effective heat dissipation for single and double row transistor mounting
– profile **SK 454** → A 24
– profile **SK 452** → A 27
– specific versions upon customer´s request





art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 454 20 1 x M3 ...	20	10.8	SOT 32/ TO 220
SK 454 60 3 x M3 ...	60	7.7	SOT 32/ TO 220
SK 454 20 2 x M3 ...	20	10.8	SOT 32/ TO 220
SK 454 40 4 x M3 ...	40	9.4	SOT 32/ TO 220
SK 454 60 6 x M3 ...	60	7.7	SOT 32/ TO 220
SK 454 40 2 x M3 TO 220	40	9.4	TO 220
SK 454 80 4 x M3 TO 220	80	6.5	TO 220
SK 454 100 5 x M3 TO220	100	5.9	TO 220
SK 454 80 8 x M3 TO 220	80	6.5	TO 220
SK 454 100 10xM3 TO220	100	5.9	TO 220
please indicate:	**... ⌖ SOT 32; TO 220**		



art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 452 20 1 x M3	20	11.1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 40 2 x M3	40	7.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 60 3 x M3	60	5.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 80 4 x M3	80	4.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 100 5 x M3	100	4.3	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 20 2 x M3	20	11.1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 40 4 x M3	40	7.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 60 6 x M3	60	5.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 80 8 x M3	80	4.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 100 10 x M3	100	4.3	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
surface:		black anodised	

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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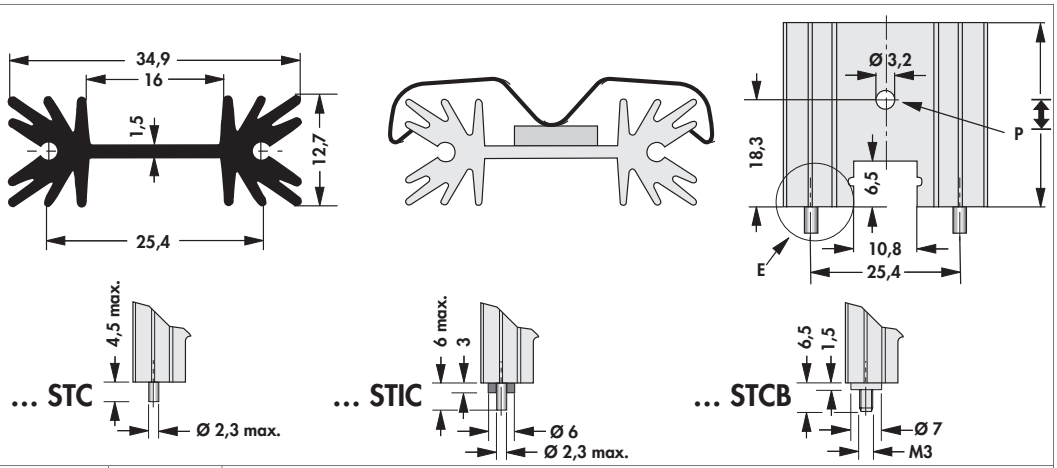
Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– special lengths and transistor drillings upon request
– **P** = raised retaining stud, **E** = mounting method

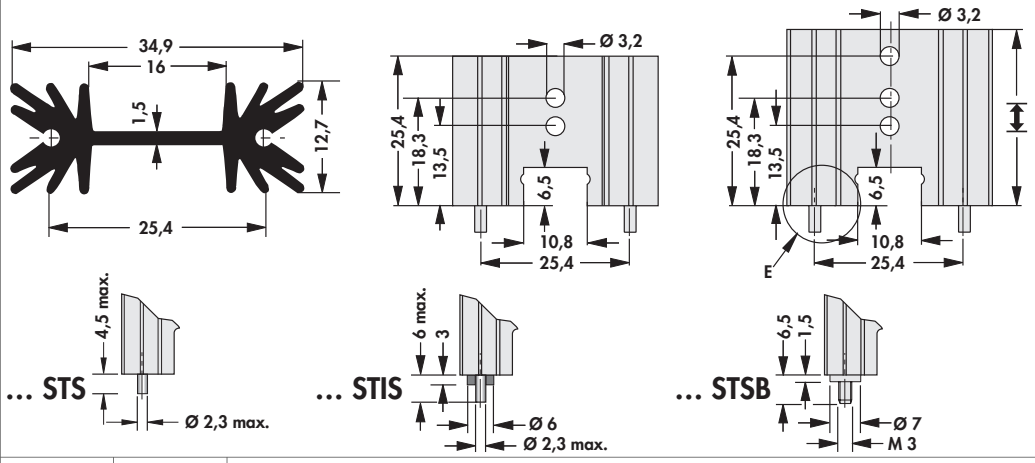


art. no.	[mm]	R_{th} [K/W]	
SK 104 25,4 ...	25.4	14	TO 220
SK 104 38,1 ...	38.1	11	TO 220
SK 104 50,8 ...	50.8	9	TO 220
SK 104 63,5 ...	63.5	8	TO 220

please indicate: **... mounting method**
STC = **with solder pin**
STIC = **with solder pin and insulating washer**
STCB = **with threaded bolt M 3, brass**

surface: black anodised

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method



art. no.	[mm]	R_{th} [K/W]	
SK 104 25,4 ...	25.4	14	SOT 32/ TO 220/ TO 3 P
SK 104 38,1 ...	38.1	11	SOT 32/ TO 220/ TO 3 P
SK 104 50,8 ...	50.8	9	SOT 32/ TO 220/ TO 3 P
SK 104 63,5 ...	63.5	8	SOT 32/ TO 220/ TO 3 P

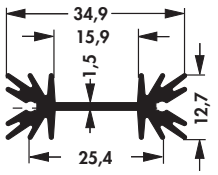
please indicate: **... mounting method**
STS = **with solder pin**
STIS = **with solder pins and insulating washer**
STSB = **with threaded bolt M 3, brass**

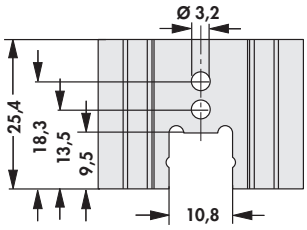
surface: black anodised

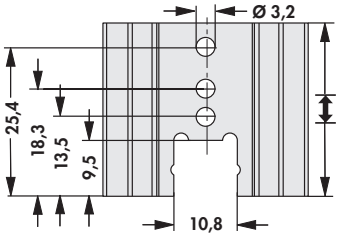
Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– horizontal for semiconductor screw-mounting
– special lengths and transistor drillings on request





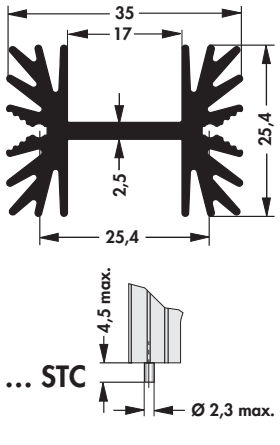


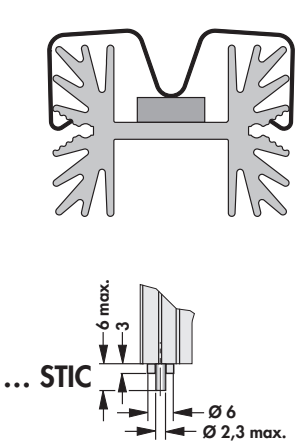
art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 104 25,4 LS	25.4	14	SOT 32/ TO 220/ TO 3 P
SK 104 38,1 LS	38.1	11	SOT 32/ TO 220/ TO 3 P
SK 104 50,8 LS	50.8	9	SOT 32/ TO 220/ TO 3 P
surface:			black anodised

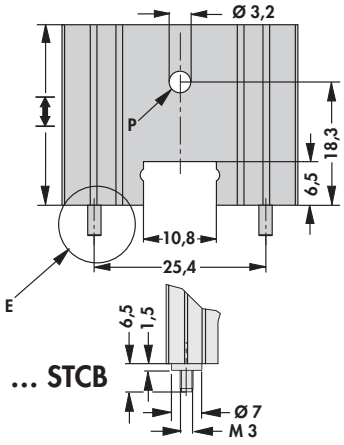
Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– special lengths and transistor drillings on request
– **P** = raised retaining stud, **E** = mounting method





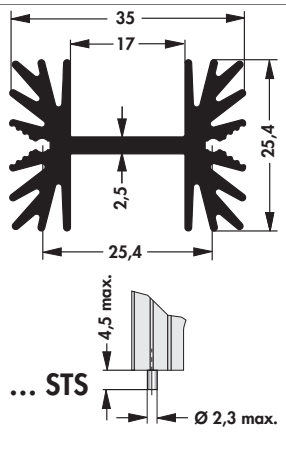


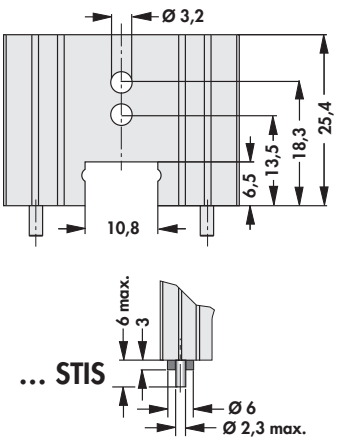
art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 600 25,4 ...	25.4	11.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 38,1 ...	38.1	9.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 50,8 ...	50.8	7.3	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 63,5 ...	63.5	6.5	TO 218/ TO 220/ TO 247/ TO 3 P

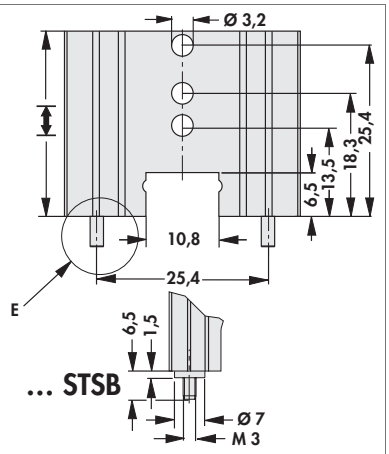
please indicate: **... mounting method**
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M 3, brass

surface: black anodised

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method







art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 600 25,4 ...	25.4	11.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 38,1 ...	38.1	9.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 50,8 ...	50.8	7.3	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 63,5 ...	63.5	6.5	TO 218/ TO 220/ TO 247/ TO 3 P

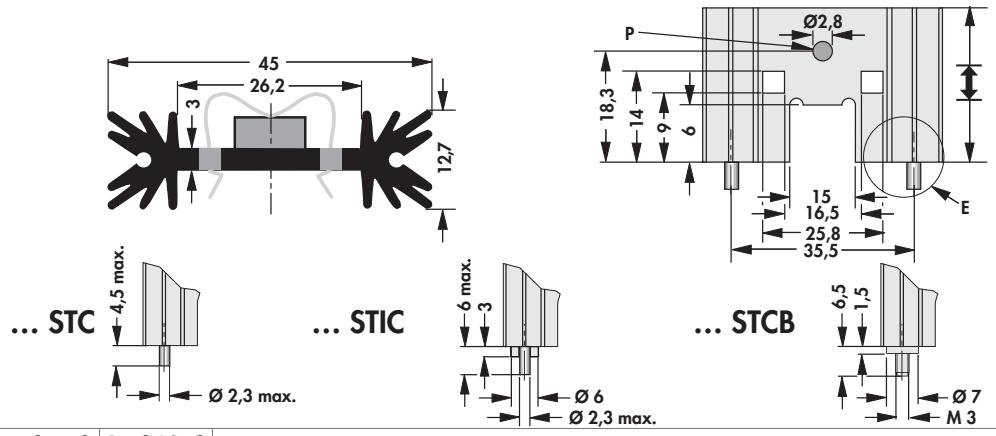
please indicate: **... mounting method**
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M 3, brass

surface: black anodised

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– special lengths and transistor drillings on request
– **P** = raised retaining stud, **E** = mounting method

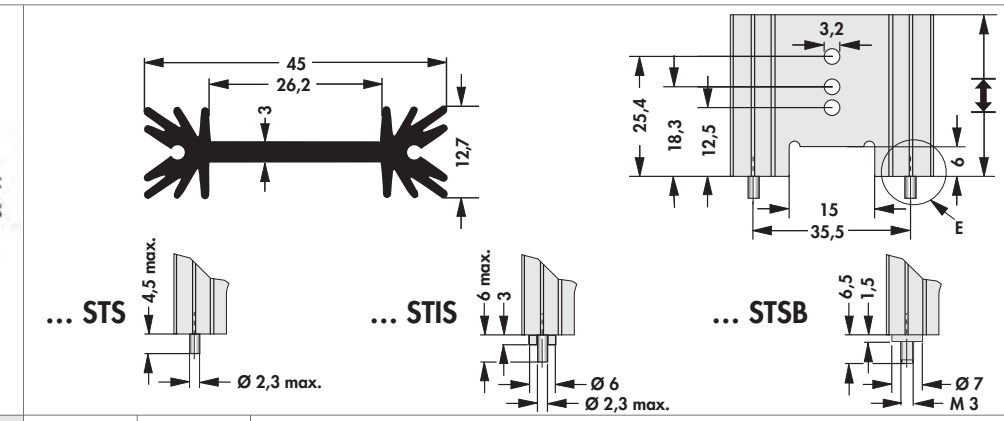


art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 409 25,4 ...	25.4	8.2	TO 220/ TO 3 P
SK 409 38,1 ...	38.1	7.0	TO 220/ TO 3 P
SK 409 50,8 ...	50.8	6.2	TO 220/ TO 3 P
SK 409 63,5 ...	63.5	5.6	TO 220/ TO 3 P

please indicate: **... mounting method**
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M 3, brass

surface: black anodised

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method



art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 409 25,4 ...	25.4	8.2	TO 220/ TO 3 P
SK 409 38,1 ...	38.1	7.0	TO 220/ TO 3 P
SK 409 50,8 ...	50.8	6.2	TO 220/ TO 3 P
SK 409 63,5 ...	63.5	5.6	TO 220/ TO 3 P

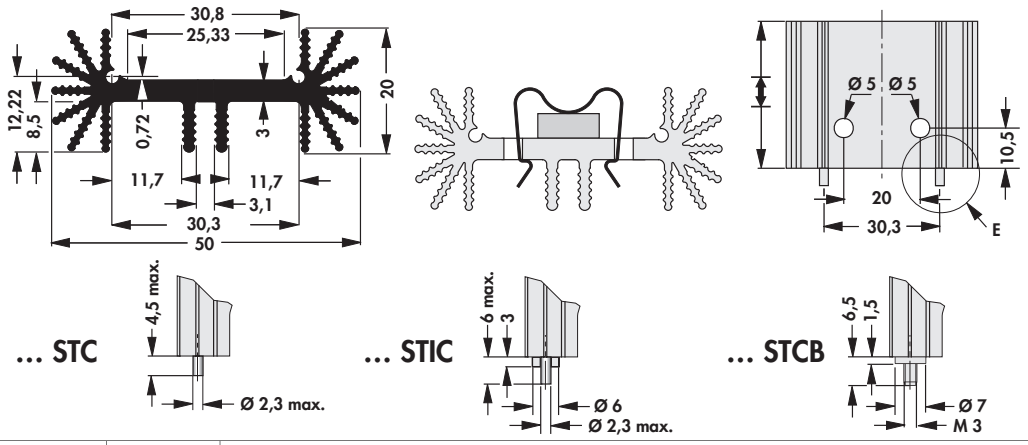
please indicate: **... mounting method**
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M 3, brass

surface: black anodised

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– special lengths and transistor drillings on request
– **E** = mounting method

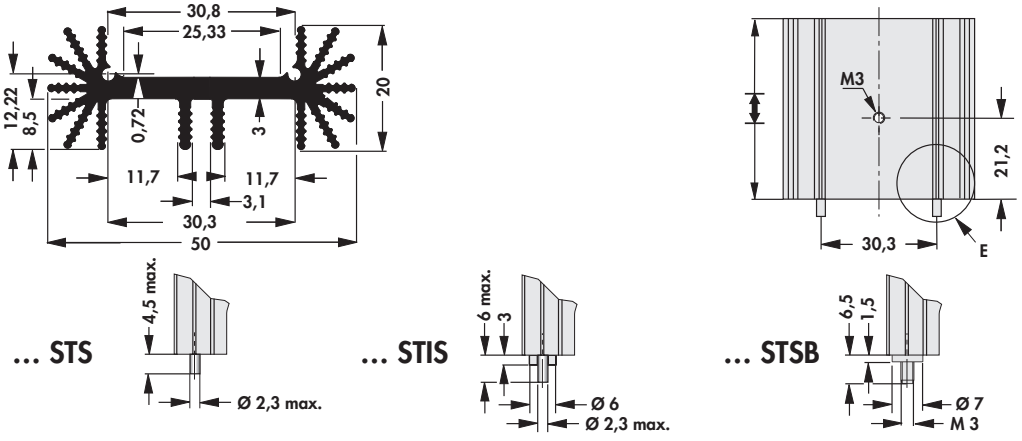


art. no.	[mm]	R_{th} [K/W]	
SK 459 25 ...	25.0	7.9	TO 218/ TO 220/ TO 247/ TO 248
SK 459 37,5 ...	37.5	6.3	TO 218/ TO 220/ TO 247/ TO 248
SK 459 50 ...	50.0	5.6	TO 218/ TO 220/ TO 247/ TO 248

please indicate: **... mounting method**
STC = **with solder pin**
STIC = **with solder pin and insulating washer**
STCB = **with threaded bolt M 3, brass**

surface: black anodised

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method



art. no.	[mm]	R_{th} [K/W]	
SK 459 25 ...	25.0	7.9	TO 218/ TO 220/ TO 247/ TO 248
SK 459 37,5 ...	37.5	6.3	TO 218/ TO 220/ TO 247/ TO 248
SK 459 50 ...	50.0	5.6	TO 218/ TO 220/ TO 247/ TO 248

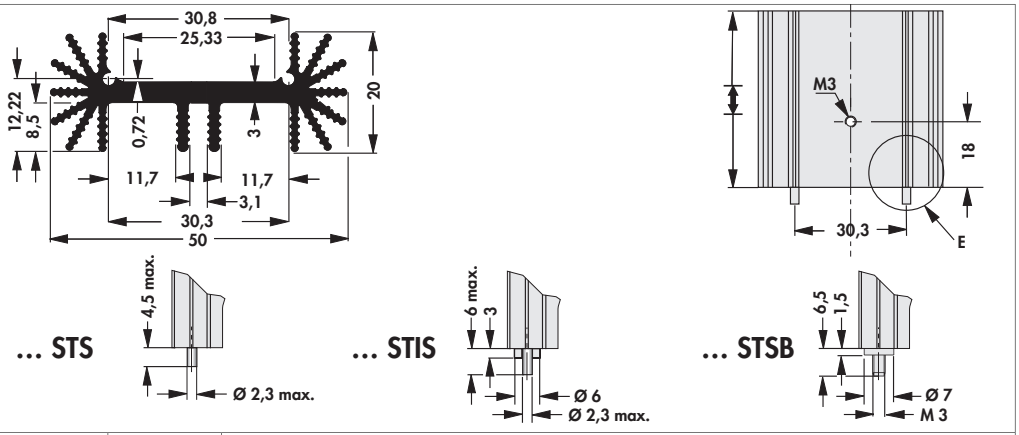
please indicate: **... mounting method**
STS = **with solder pin**
STIS = **with solder pins and insulating washer**
STSB = **with threaded bolt M 3, brass**

surface: black anodised

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method

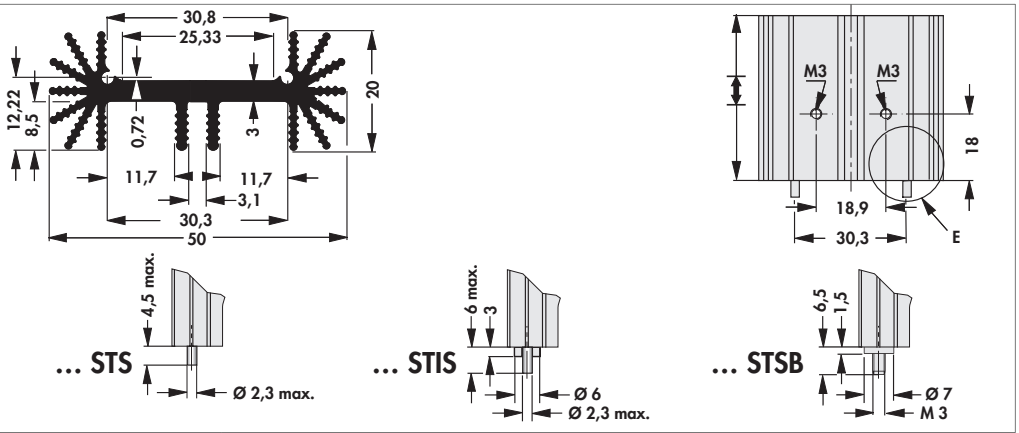


art. no.	[mm]	R_{th} [K/W]	
SK 459 25 M ...	25.0	7.9	SIP-Multiwatt
SK 459 37,5 M ...	37.5	6.3	SIP-Multiwatt
SK 459 50 M ...	50.0	5.6	SIP-Multiwatt

please indicate: **... mounting method**
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M 3, brass

surface:	black anodised

– for semiconductor screw-mounting
– with **combination-hole pattern** for mounting of 2 x TO 220 or 2 x SOT 32
– special lengths and transistor drillings on request
– **E** = mounting method



art. no.	[mm]	R_{th} [K/W]	
SK 459 25 2 x TO 220 ...	25.0	7.9	2xSOT 32/ 2xTO 220
SK 459 37,5 2 x TO 220...	37.5	6.3	2xSOT 32/ 2xTO 220
SK 459 50 2 x TO 220 ...	50.0	5.6	2xSOT 32/ 2xTO 220

please indicate: **... mounting method**
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M 3, brass

surface:	black anodised

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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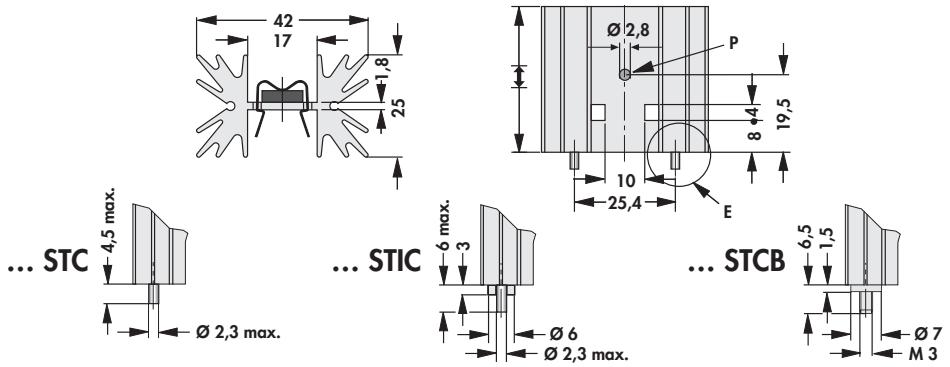
Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– special lengths and transistor drillings on request
– **P** = raised retaining stud, **E** = mounting method

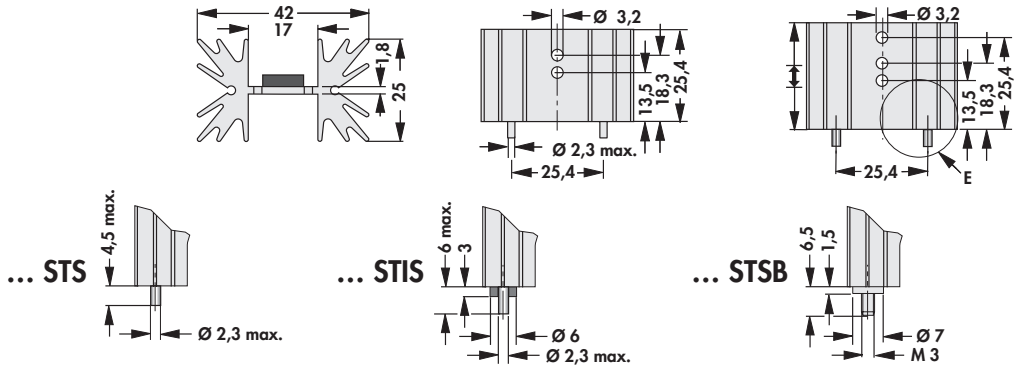


art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 129 25,4 ...	25.4	7.8	TO 220
SK 129 38,1 ...	38.1	6.5	TO 220
SK 129 50,8 ...	50.8	5.3	TO 220
SK 129 63,5 ...	63.5	4.5	TO 220

please indicate: **... mounting method**
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M 3, brass

surface:	black anodised

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method



art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 129 25,4 ...	25.4	7.8	SOT 32/ TO 220/ TO 3 P
SK 129 38,1 ...	38.1	6.5	SOT 32/ TO 220/ TO 3 P
SK 129 50,8 ...	50.8	5.3	SOT 32/ TO 220/ TO 3 P
SK 129 63,5 ...	63.5	4.5	SOT 32/ TO 220/ TO 3 P

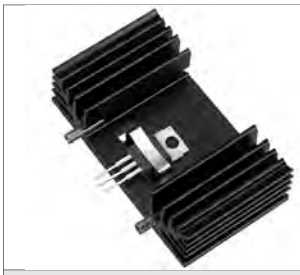
please indicate: **... mounting method**
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M 3, brass

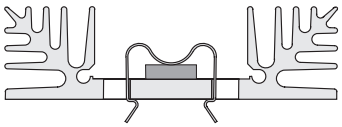
surface:	black anodised

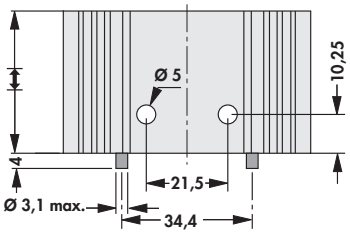
Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– profile **SK 185** → A 73
– special lengths and drillings on request
– **L** = solderable pins

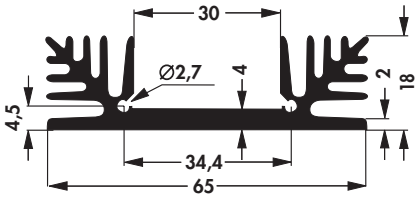


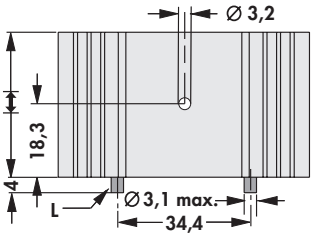




art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 185 25 STC TO 220	25.0	7.9	TO 220	with solder pins
SK 185 37,5 STC TO 220	37.5	6.4	TO 220	with solder pins
SK 185 50 STC TO 220	50.0	4.9	TO 220	with solder pins
SK 185 50 C TO 220	50.0	4.9	TO 220	without solder pins
surface:		black anodised		

– for semiconductor screw-mounting
– profile **SK 185** → A 73
– special lengths and drillings on request
– **L** = solderable pins





art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 185 25 STS TO 220	25.0	7.9	TO 220	with solder pins
SK 185 37,5 STS TO 220	37.5	6.4	TO 220	with solder pins
SK 185 50 STS TO 220	50.0	4.9	TO 220	with solder pins
SK 185 25 TO 220	25.0	7.9	TO 220	without solder pins
SK 185 37,5 TO 220	37.5	6.4	TO 220	without solder pins
SK 185 50 TO 220	50.0	4.9	TO 220	without solder pins
surface:		black anodised		

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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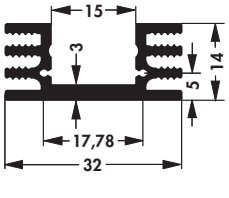
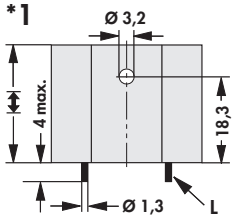
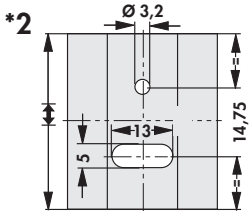
Extruded heatsinks for PCB mounting

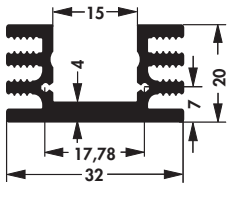
– for semiconductor screw-mounting
– hole pattern is centered to the total length of the heatsink
– special lengths and drillings on request
– ***1** = versions with solder pins; ***2** = versions without solder pins
– **L** = solderable pins

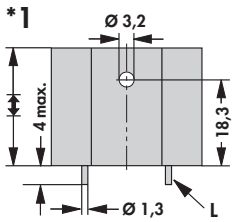


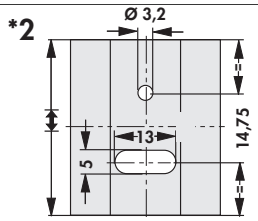




art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 75 25 STS TO 220	25.0	12.5	TO 220/*1	with solder pins
SK 75 37,5 STS TO 220	37.5	10.0	TO 220/*1	with solder pins
SK 75 50 STS TO 220	50.0	8.5	TO 220/*1	with solder pins
SK 75 25	25.0	12.5	—	without solder pins
SK 75 25 TO 220	25.0	12.5	TO 220/*2	without solder pins
SK 75 37,5	37.5	10.0	—	without solder pins
SK 75 37,5 TO 220	37.5	10.0	TO 220/*2	without solder pins
SK 75 50	50.0	8.5	—	without solder pins
SK 75 50 TO 220	50.0	8.5	TO 220/*2	without solder pins
SK 75 75	75.0	7.0	—	without solder pins
SK 75 1000	1000.0	—	—	without solder pins





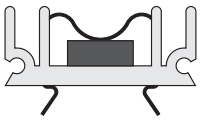


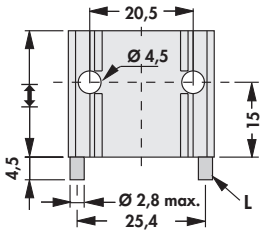
art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 76 25 STS TO 220	25.0	10.0	TO 220/*1	with solder pins
SK 76 37,5 STS TO 220	37.5	8.0	TO 220/*1	with solder pins
SK 76 50 STS TO 220	50.0	7.0	TO 220/*1	with solder pins
SK 76 25	25.0	10.0	—	without solder pins
SK 76 25 TO 220	25.0	10.0	TO 220/*2	without solder pins
SK 76 37,5	37.5	8.0	—	without solder pins
SK 76 37,5 TO 220	37.5	8.0	TO 220/*2	without solder pins
SK 76 50	50.0	7.0	—	without solder pins
SK 76 50 TO 220	50.0	7.0	TO 220/*2	without solder pins
SK 76 75	75.0	5.9	—	without solder pins
SK 76 1000	1000.0	—	—	without solder pins
surface:		black anodised		

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

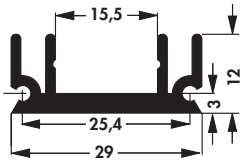
– for semiconductor clip-mounting
– profile **SK 145** → A 73
– special lengths and drillings on request
– **L** = solderable pins

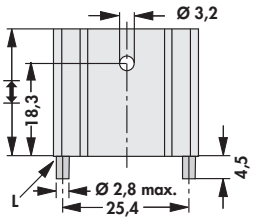




art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 145 25 STC	25	13.5	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 30 STC	30	12.4	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 50 STC	50	10.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
surface:		black anodised		

– for semiconductor screw-mounting
– profile **SK 145** → A 73
– special lengths and drillings on request
– **L** = solderable pins





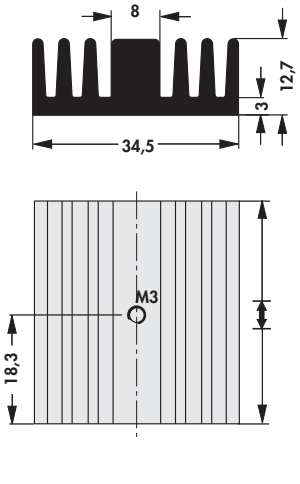
art. no.	↔ [mm]	R_{th} [K/W]	⌖	version
SK 145 25 STS TO 220	25.0	13.5	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 37,5 STS TO 220	37.5	12.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 50 STS TO 220	50.0	10.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
surface:		black anodised		

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

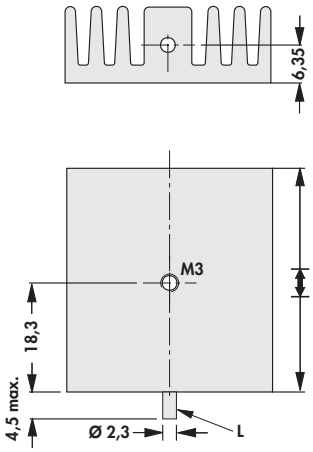
Extruded heatsinks for PCB mounting

– special lengths and drillings on request
– **L** = solderable pins

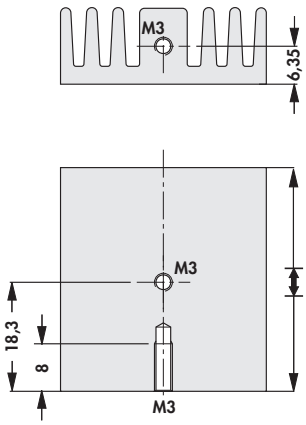
SK 126 25 TO 220
SK 126 37,5 TO 220



SK 126 25 STS TO 220
SK 126 37,5 STS TO 220



SK 126 25 2 x M 3
SK 126 37,5 2 x M 3

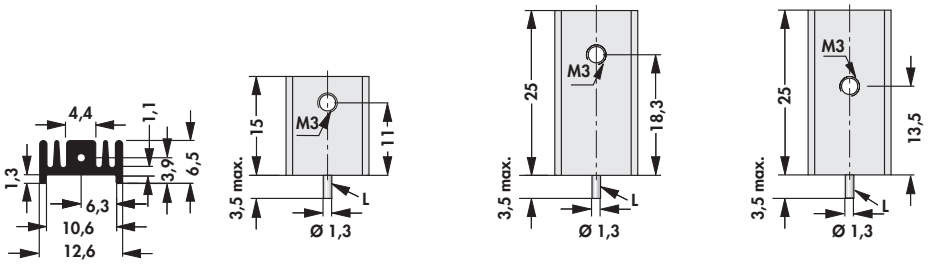


art. no.	⟷ [mm]	R_{th} [K/W]	⌖	version
SK 126 25 STS TO 220	25.0	8.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pin and thread M3
SK 126 37,5 STS TO 220	37.5	6.5	TO 218/ TO 220/ TO 247/ TO 248	with solder pin and thread M3
SK 126 25 TO 220	25.0	8.0	TO 218/ TO 220/ TO 247/ TO 248	ohne Lötstift, mit M3-Gewinde
SK 126 25 2 x M3	25.0	8.0	TO 218/ TO 220/ TO 247/ TO 248	ohne Lötstift, mit M3-Gewinde
SK 126 37,5 TO 220	37.5	6.5	TO 218/ TO 220/ TO 247/ TO 248	ohne Lötstift, mit M3-Gewinde
SK 126 37,5 2 x M3	37.5	6.5	TO 218/ TO 220/ TO 247/ TO 248	ohne Lötstift, mit M3-Gewinde
SK 126 25	25.0	8.0	—	—
SK 126 37,5	37.5	6.5	—	—
SK 126 1000	1000.0	—	—	—
surface:		black anodised		

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

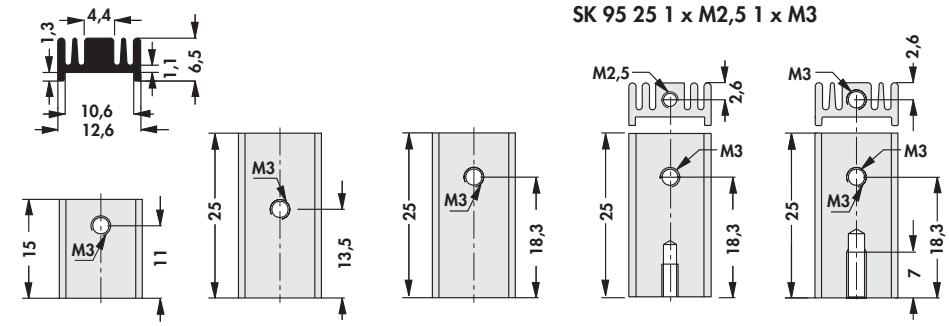
Extruded heatsinks for PCB mounting

– special lengths and drillings on request
– **L** = solderable pins



SK 95 15 STS SOT 32 S | SK 95 25 STS TO 220 | SK 95 25 STS SOT 32

art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 95 15 STS SOT 32 S	15	38.5	SOT 32
SK 95 25 STS SOT 32	25	36.0	SOT 32
SK 95 25 STS TO 220	25	36.0	TO 220



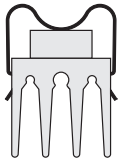
SK 95 15 SOT 32 S | SK 95 25 SOT 32 | SK 95 25 TO 220 | SK 95 25 2 x M3

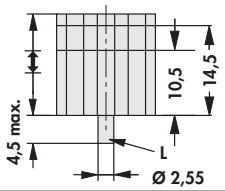
art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 95 15 SOT 32 S	15	38.5	SOT 32
SK 95 25 SOT 32	25	36.0	SOT 32
SK 95 25 TO 220	25	36.0	TO 220
SK 95 25 1x M2,5 1x M3	25	36.0	1xM2.5/ 1xM3 (TO 220)
SK 95 25 2 x M3	25	36.0	2xM3 (TO 220)
SK 95 15	15	38.5	—
SK 95 25	25	36.0	—
SK 95 1000	1000	—	—
surface:		black anodised	
type of thread:		not anodised	

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

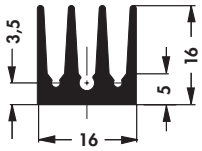
Extruded heatsinks for PCB mounting

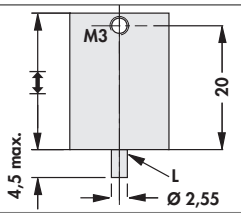
– single solder pin
– profile **SK 437** → A 24
– special lengths and drillings on request
– **L** = solderable pin





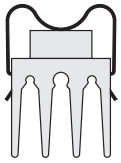
art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 437 25 STC	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STC	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STC	35	18	TO 218/ TO 220/ TO 247/ TO 248
SK 437 50 STC	50	14	TO 218/ TO 220/ TO 247/ TO 248

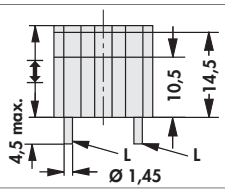




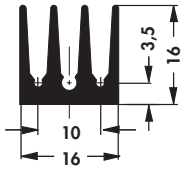
art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 437 25 STS	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STS	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STS	35	18	TO 218/ TO 220/ TO 247/ TO 248
SK 437 50 STS	50	14	TO 218/ TO 220/ TO 247/ TO 248
surface:	black anodised		

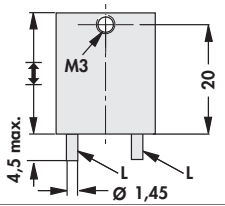
– double solder pin
– profile **SK 437** → A 24
– special lengths and drillings on request
– **L** = solderable pin





art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 437 25 STC 2	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STC 2	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STC 2	35	18	TO 218/ TO 220/ TO 247/ TO 248



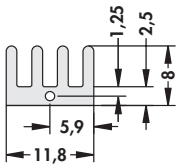


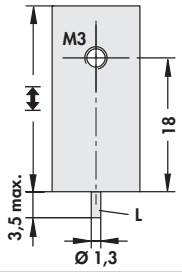
art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 437 25 STS 2	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STS 2	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STS 2	35	18	TO 218/ TO 220/ TO 247/ TO 248
surface:	black anodised		

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

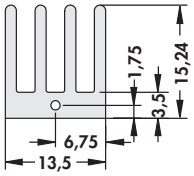
Extruded heatsinks for PCB mounting

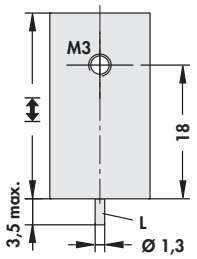
– special versions on customer´s request
– **L** = solderable pin





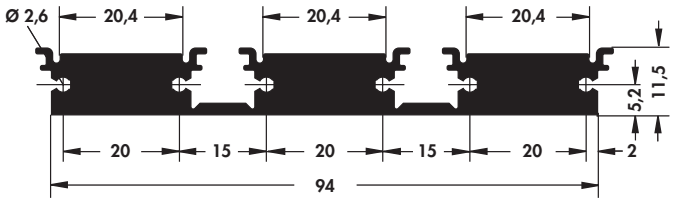
art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 470 25 STS	25	29.0	SOT 32/ TO 220
SK 470 30 STS	30	27.2	SOT 32/ TO 220
SK 470 35 STS	35	25.6	SOT 32/ TO 220
SK 470 50 STS	50	23.2	SOT 32/ TO 220





art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 469 25 STS	25	15.3	SOT 32/ TO 220
SK 469 30 STS	30	14.3	SOT 32/ TO 220
SK 469 35 STS	35	13.0	SOT 32/ TO 220
SK 469 50 STS	50	10.6	SOT 32/ TO 220
surface:	black anodised		

– as mounting- and connecting piece
– for clamp mounting of the transistors
– triple unit can be seperated
– solder pin mounting possible
– special versions on customer´s request



art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 484 25	25.0	6.0	TO 218/ TO 220/ TO 247/ TO 264/ TO 3 P
SK 484 37,5	37.5	4.5	TO 218/ TO 220/ TO 247/ TO 264/ TO 3 P
SK 484 50	50.0	3.7	TO 218/ TO 220/ TO 247/ TO 264/ TO 3 P
SK 484 75	75.0	2.8	TO 218/ TO 220/ TO 247/ TO 264/ TO 3 P

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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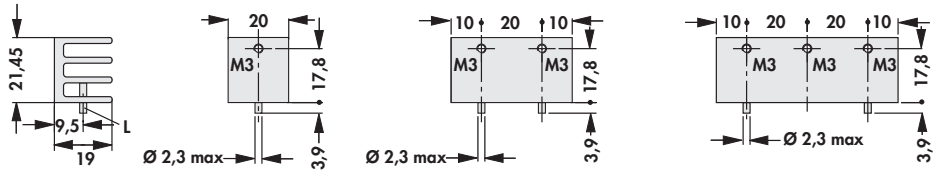
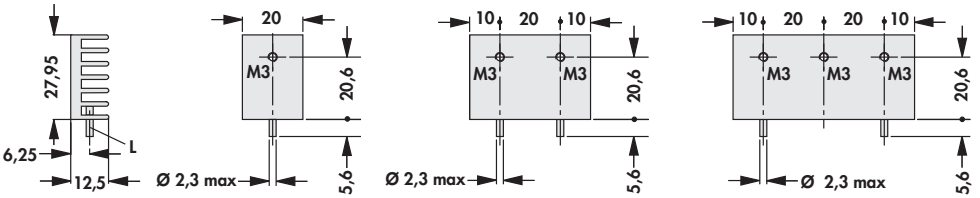
Extruded heatsinks for PCB mounting

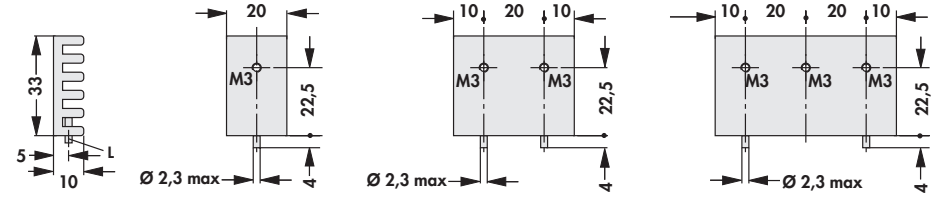
– compact PCB heatsinks
– especially suitable for vertical PCB mounting in housings, racks etc.
– easy solder fixing
– special versions on customer´s request
– **L** = solderable pin



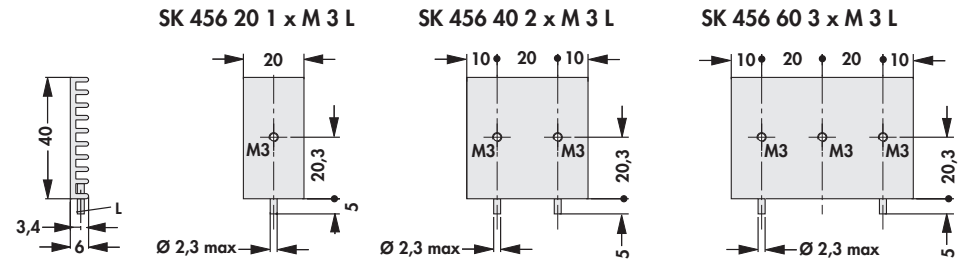
art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 454 20 1 x M3 L	20	10.1	SOT 32/ TO 220
SK 454 40 2 x M3 L	40	8.8	SOT 32/ TO 220
SK 454 60 3 x M3 L	60	7.5	SOT 32/ TO 220



art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 448 20 1 x M3 L	20	11.8	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 448 40 2 x M3 L	40	9.8	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 448 60 3 x M3 L	60	7.1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P



art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 400 20 1 x M3 L	20	11.6	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 400 40 2 x M3 L	40	8.2	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 400 60 3 x M3 L	60	7.2	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P

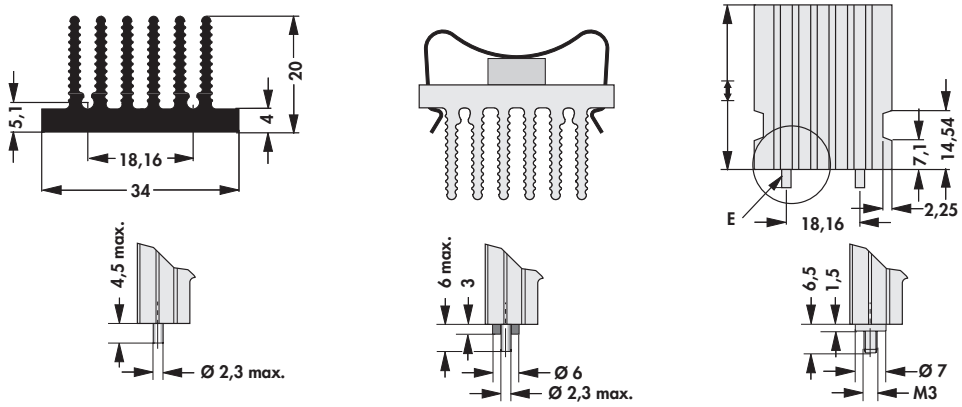


art. no.	↔ [mm]	R_{th} [K/W]	⌖
SK 456 20 1 x M3 L	20	13.0	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 456 40 2 x M3 L	40	10.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 456 60 3 x M3 L	60	8.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Extruded heatsinks for PCB mounting

– for semiconductor clip-mounting
– special lengths and transistor drillings on request
– **E** = mounting method



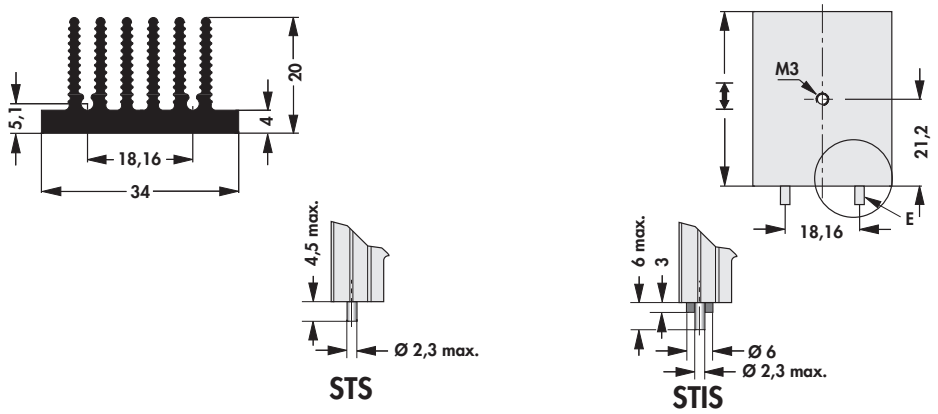
… STC … STIC … STCB

art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 460 25 …	25.0	9.0	SIP-Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248
SK 460 37,5 …	37.5	7.9	SIP-Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248
SK 460 50 …	50.0	7.0	SIP-Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248

please indicate: **… mounting method**
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M 3, brass

surface:	black anodised

– for semiconductor screw-mounting
– special lengths and transistor drillings on request
– **E** = mounting method



STS STIS

art. no.	⟷ [mm]	R_{th} [K/W]	⌖
SK 460 25 STS	25.0	9.0	SIP-Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248
SK 460 37,5 STS	37.5	7.9	SIP-Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248
SK 460 50 STIS	50.0	7.0	SIP-Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248

surface:	black anodised

Profiles for lock-in fixing spring → **A 84 – 88**
Assignment table → **A 18 – 20**
Thermal conductive material → **E 2 – 5**
Attachable heatsinks → **C 10 – 16**
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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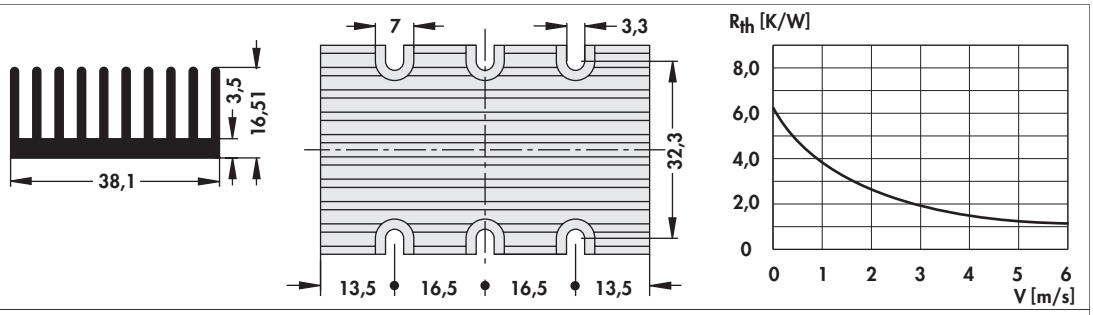
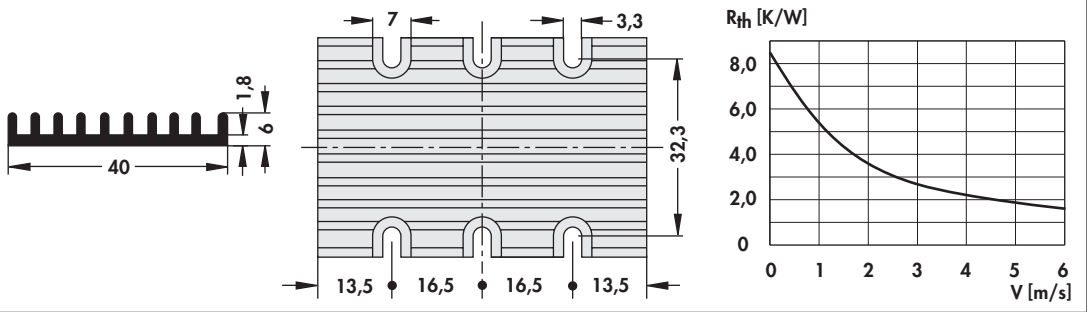
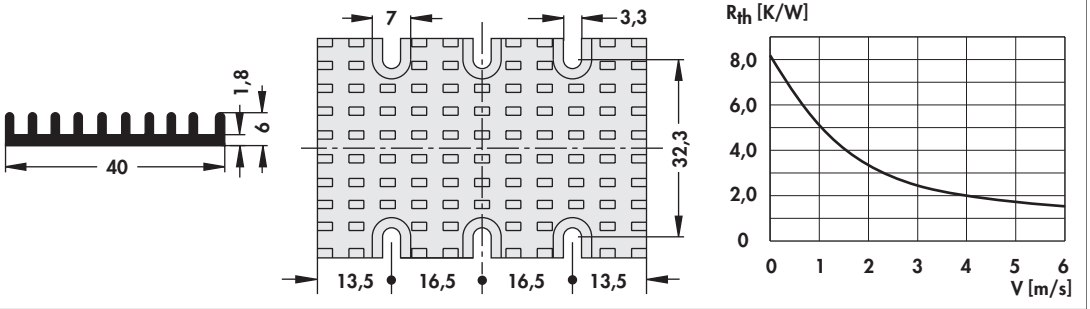
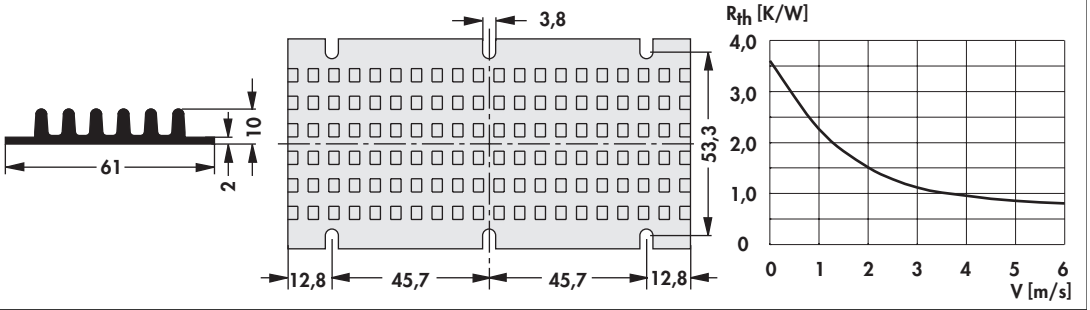
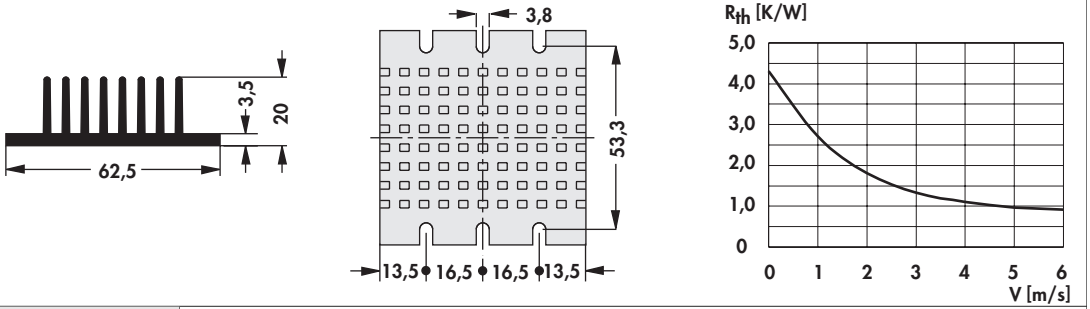
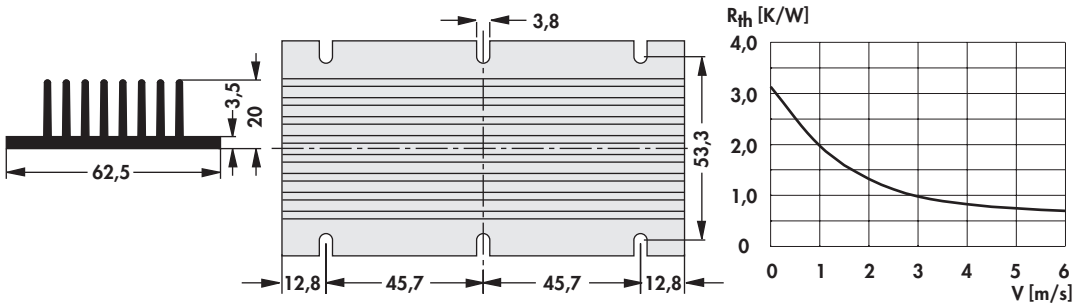
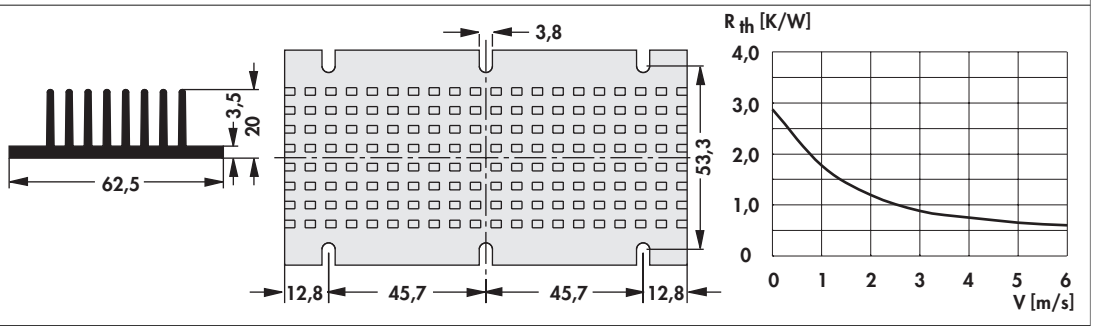
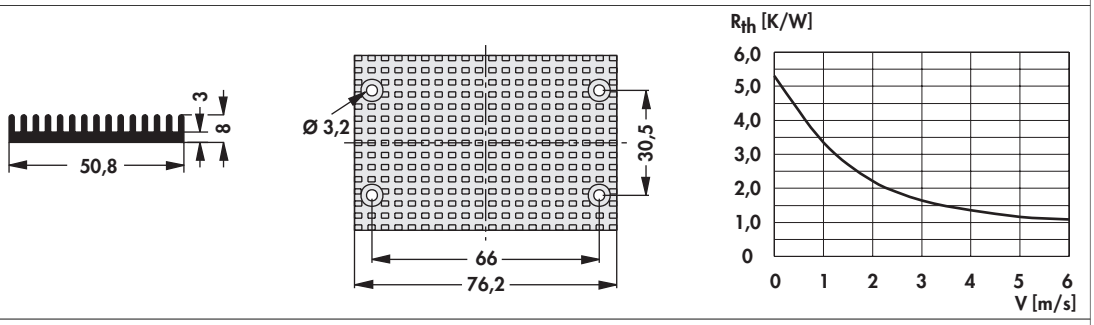
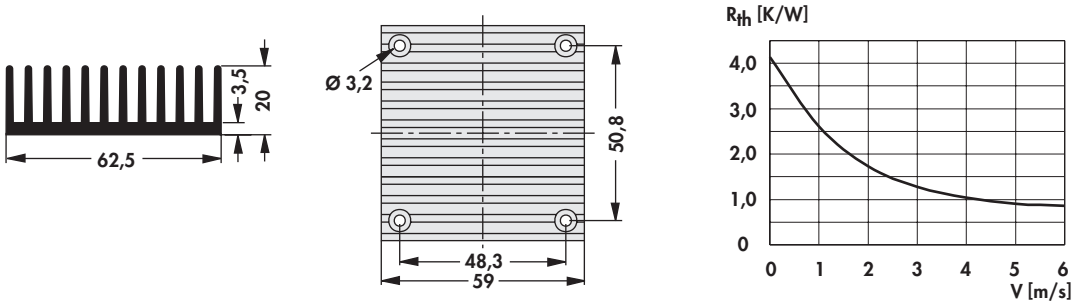
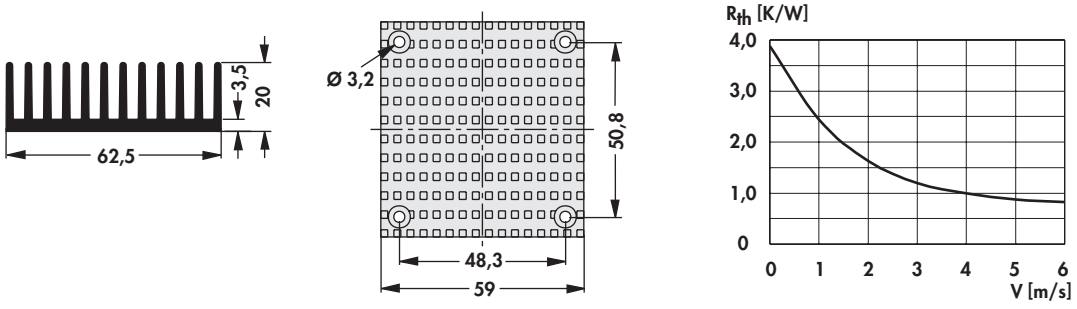
Extruded heatsinks for DC/DC converter

– special versions on customer´s request

art. no.	
SK DC 10 60 SA	
art. no.	
SK DC 8 60 SA	
art. no.	
SK DC 8 1 60 SA	
art. no.	
SK DC 4 1 117 SA	
art. no.	
SK DC 6 1 60 SA	
surface:	black anodised

Extruded heatsinks for DC/DC converter

– special versions on customer´s request

art. no.	
SK DC 7 117 SA	
art. no.	
SK DC 7 1 117 SA	
art. no.	
SK DC 2 1 76 SA	
art. no.	
SK DC 5 59 SA	
art. no.	
SK DC 5 1 59 SA	
surface:	black anodised

Heatsink profile-overview → **A 13 – 17**
Drilling pattern for Solid State Relais → **A 12**
Heatsinks for Solid State Relais → **A 11 – 12**
Special profiles → **A 140**
Standard aluminium profiles → **A 135 – 136**
Extruded heatsinks → **A 22 – 83**
Profiles for PCB mounting → **A 89 – 112**
Technical introduction → **A 2 – 8**

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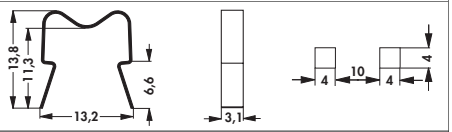
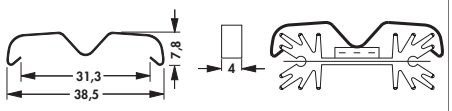
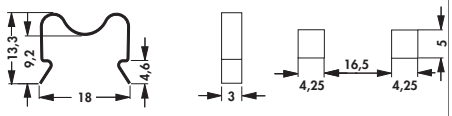
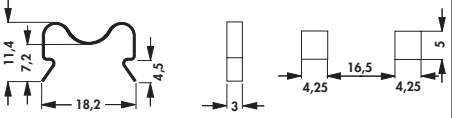
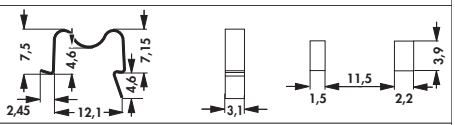
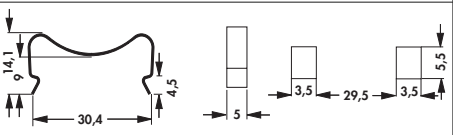
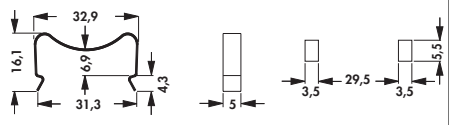
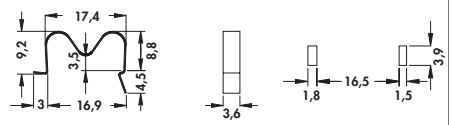
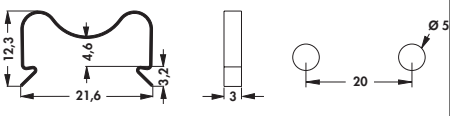
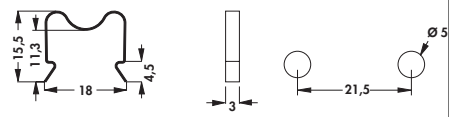
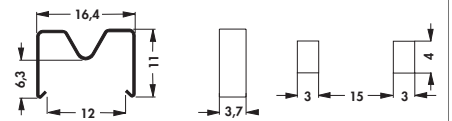
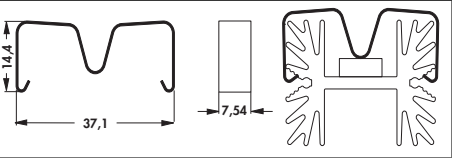
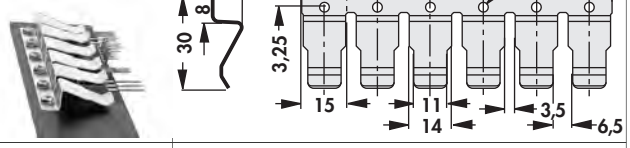
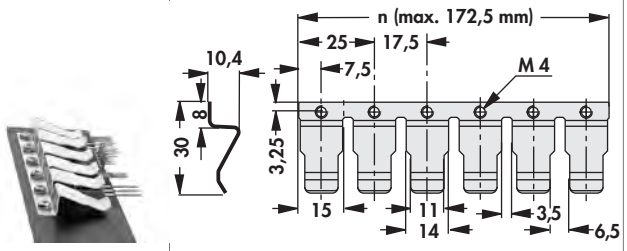
Retaining springs for transistors

art. no.	for transistor-housing	suitable for heatsinks	plate thick-ness [mm]	material	
THF 129 TO 220	TO 220	FK 219/ FK 222/ SK 129	1-2	spring steel, corrosion protec-ted	
THF 104	TO 220/ TO 247/ TO 248/ TO 3 P	SK 104	1-2	stainless steel	
THF 409 TO 220	TO 220/ TO 247/ TO 248/ TO 3 P	SK 409	1.5-3.0	stainless steel	
THF 409 SOT 32	TO 126/ SOT 32/ SOT 82	SK 409	2-3	stainless steel	
THF 220	TO 220	FK 219/ FK 222	1-2	spring steel, corrosion protec-ted	
THF 247	TO 220/ TO 247/ TO 248/ TO 3 P	SK 484	2	stainless steel	
THF 247 4	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	SK 460	4	stainless steel	
THF 220 17	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	UK 35	1.0-1.5	stainless steel	
THF 409 220 1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	SK 409/ SK 459	2-3	stainless steel	
THF 409 220 2	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	SK 145/ SK 185/ SK 437	4	stainless steel	
THF 249	TO 220	FK 249	1.0-1.5	spring steel, corrosion protec-ted	
THF 600	TO 218/ TO 220/ TO 247/ TO 3 P	SK 600	2.5	spring steel, corrosion protec-ted	

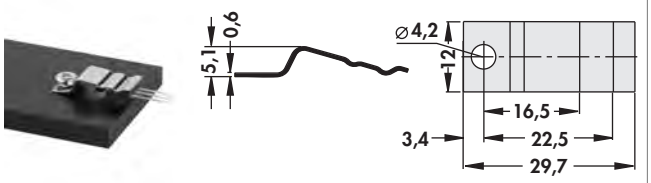
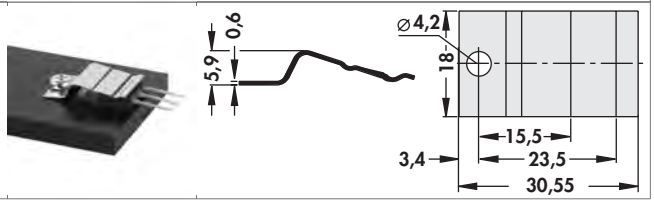
Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Heatsinks for PCB → **A 89 – 112**
Profiles for lock-in fixing spring → **A 84 – 88**
Thermal conductive material → **E 2 – 5**
Insulating caps → **E 51**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

Retaining springs for transistors

– universal **retaining spring** for transistor housings types TO 218, TO 220, TO 247, TO 264, SOT 32 and various SIP Multiwatt etc.
– utility patent 200 14 739.0
– fast and easy mounting of the transistors
– number of retaining spring elements can be chosen **(n = max. 10)**
– **THFMG** with thread M 4
– specific versions and modifications on customer´s request

art. no.	for transistor-housing	spring force [N]	material	
THFM ...	TO 218/ TO 220/ TO 247/ TO 264/ SOT 32/ SIP Multiwatt	60 ±5	stainless steel	
THFMG ...	TO 218/ TO 220/ TO 247/ TO 264/ SOT 32/ SIP Multiwatt	60 ±5	stainless steel	

please indicate: **... number of retaining-spring elements 1 - 10**

art. no.	for transistor-housing	spring force [N]	material	
THFK 220	TO 220	79	stainless steel	
THFK 247	TO 218/ TO 247	119	stainless steel	

Mica wafers → **E 19**
Kapton insulator washers → **E 16**
Heatsinks for PCB → **A 89 – 112**
Profiles for lock-in fixing spring → **A 84 – 88**
Thermal conductive material → **E 2 – 5**
Insulating caps → **E 51**
Thermal conductive paste → **E 21**
Technical introduction → **A 2 – 8**

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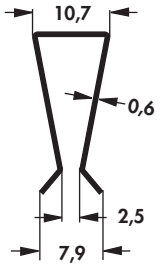
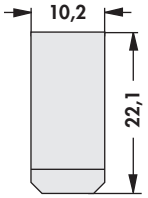
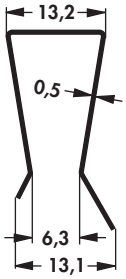
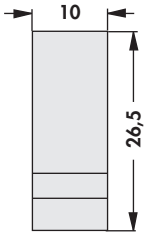
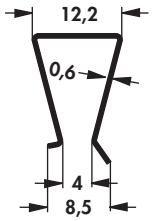
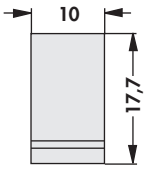
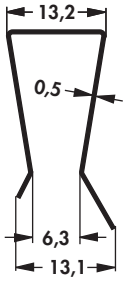
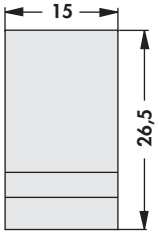
Retaining springs for transistors

– able to slide on the transistor and mounting plate
– easy mounting
– high pressure force and firm grip
– specific versions upon customer´s request

art. no.	for transistor-housing	plate thick-ness [mm]	hold-ing force [N]	material		
THFA 1	TO 220	2	20	stainless steel		 
THFA 2	TO 220	6.5	20	spring steel, corrosion protected		 
THFA 3	TO 220	5.5	33	spring steel, corrosion protected		 
THFA 4	TO 218/ TO 247	6.5	59	spring steel, corrosion protected		 

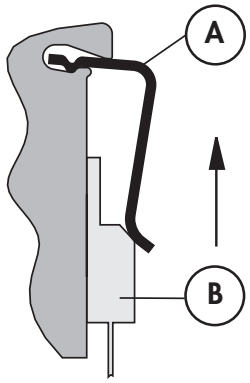
Mica wafers → **E 19**
Lock-in retaining spring for transistors → **A 119 – 121**
Heatsinks for PCB → **A 89 – 91**
Mounting material for semiconduct. → **E 44 – 48**
Thermal conductive material → **E 2 – 5**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive paste → **E 21 – 22**
Technical introduction → **A 2 – 8**

Retaining springs for transistors

– universal lock-in retaining spring for types TO 218, TO 220, TO 247, TO 264 and various SIP-Multiwatt etc. transistor housings
– clip fastening also for power transistors without holes, MAX types etc.
– easy assembly and secure hold when using a special groove geometry in heatsinks, housing parts etc.
– optimal heat transfer between component and cooling element
– various spring clip shapes available for fastening the components (see sketch)
– the range of suitable heat sinks is continuously extended
– versions specifically designed to meet customers requirements on request

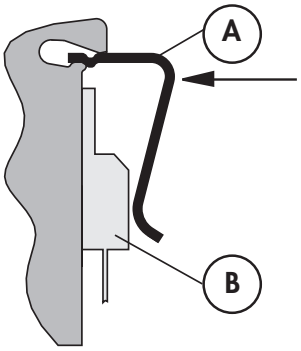
Installation

THFU 1

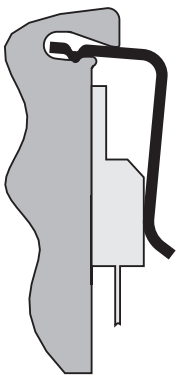


– **insert** the lock-in retaining spring for transistors THFU 1 (A) into the groove of the profile
– **push** transistor (B) below the springinu

THFU 2, THFU 3, THFU 4, THFU 5, THFU 6, THFU 7



– **place** transistor (B) onto the mounting area
– **press** the lock-in retaining spring for transistors THFU 2 - 7 (A) into the groove of the profile (a suitable installation aid will facilitate pressing in)



– Once in place, the spring will keep its position and fix the transistor with a high contact pressure on the installation surface (the spring remains in its position and it can neither be moved in a lengthwise direction nor fall it can out of the groove in a cross direction).

material:	stainless steel
material thickness:	0.8 mm

Mica wafers → **E 19**
Lock-in retaining spring for transistors → **A 119 – 121**
Heatsinks for PCB → **A 89 – 91**
Mounting material for semiconduct. → **E 44 – 48**
Thermal conductive material → **E 2 – 5**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive paste → **E 21 – 22**
Technical introduction → **A 2 – 8**

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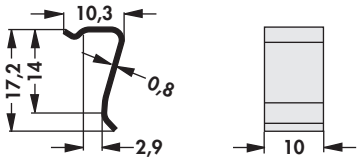
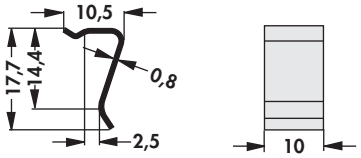
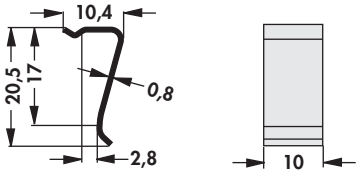
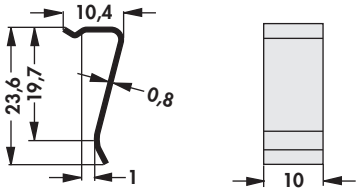
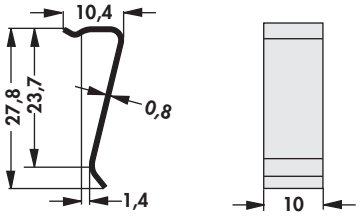
Lock-in retaining spring for transistors

art. no.	for transistor-housing	suitable for heatsinks	spring force [N]	material	
THFU 1	TO 218/ TO 220/ TO 247/ TO 262/ TO 3 P/ SOT 199/ SOT 429	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 512/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ SK 617/ LAM 3 K/ LAM 4 K/ LAM 5 K/ LA 27 K	60 ±5	stain-less steel	 
THFU 2	TO 218/ TO 220/ TO 247/ TO 262/ TO 3 P/ SOT 199/ SOT 429	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 512/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ SK 617/ LAM 3 K/ LAM 4 K/ LAM 5 K/ LA 27 K	60 ±5	stain-less steel	 

Lock-in retaining spring for transistors

art. no.	for transistor-housing	suitable for heatsinks	spring force [N]	material	
THFU 3	TO 218/ TO 220/ TO 247/ TO 262/ TO 3 P/ SOT 199/ SOT 429	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ SK 617/ LAM 3 K/ LAM 4 K/ LAM 5 K/ LA 27 K	50 ±5	stain-less steel	 
THFU 4	TO 218/ TO 202/ TO 220/ TO 248/ TO 262/ TO 264/ TO 3 P/ SOT 199	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 495/ SK 499/ SK 514/ SK 575/ SK 589/ SK 593/ SK 617/ LAM 5 K/ LA 27 K	32 ±5	stain-less steel	 
THFU 5	TO 218/ TO 202/ TO 220/ TO 247/ TO 248/ TO 262/ TO 264/ TO 3 P/ SOT 199/ SOT 429	SK 490/ SK 589/ SK 617/ LAM 5 K/ LA 27 K	25 ±5	stain-less steel	 

Heatsinks for PCB → **A 89 – 93**
Heatsink profile-overview → **A 13 – 17**
Assignment table → **A 18 – 20**
Profiles for lock-in fixing spring → **A 84 – 88**
Mounting parts for heatsinks → **E 49 – 50**
Profiles for PCB mounting → **A 89 – 112**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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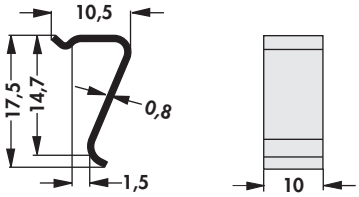
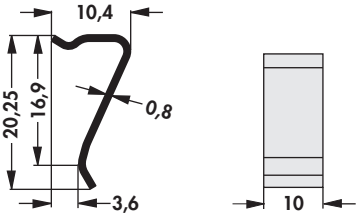
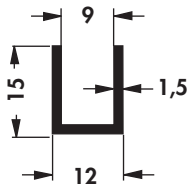
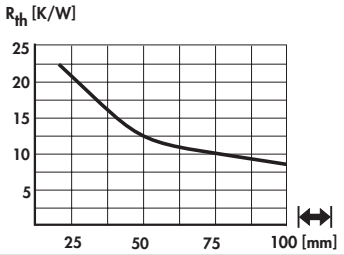
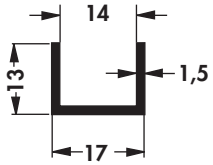
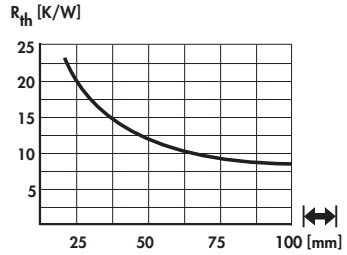
Lock-in retaining spring for transistors

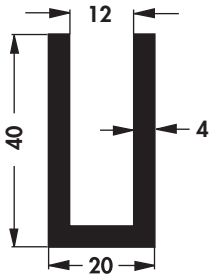
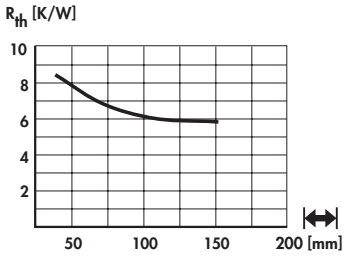
– THFU for transistors with low component height

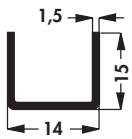
art. no.	for transistor-housing	suitable for heatsinks	spring force [N]	material		
THFU 6	TO 126/ TO 218/ TO 220/ TO 225/ TO 247/ TO 248/ TO 251/ TO 3 P/ SOT 32	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 512/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ SK 617/ LAM 3 K/ LAM 4 K/ LAM 5 K/ LA 27 K	65 ±5	stain-less steel		
THFU 7	eSIP	SK 480/ SK 482/ SK 483/ SK 487/ SK 490/ SK 492/ SK 495/ SK 573/ SK 574/ SK 576/ LAM 3 K	46 ±5	stain-less steel		

U-Extruded heatsinks

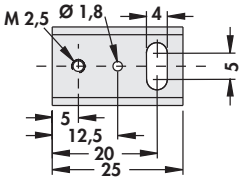
art. no.	
SK 12 ...	 
please indicate:	**... ↔ 1000 mm**

art. no.	
SK 13 ...	 
please indicate:	**... ↔ 25 35 mm**

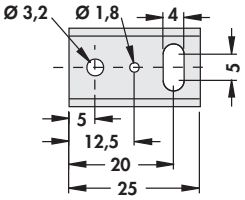
art. no.	
SK 115 ...	 
please indicate:	**... ↔ 37.5 50 1000 mm**



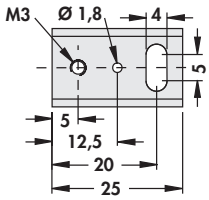
UK 14 SA 220



UK 14 SA 220 3,2

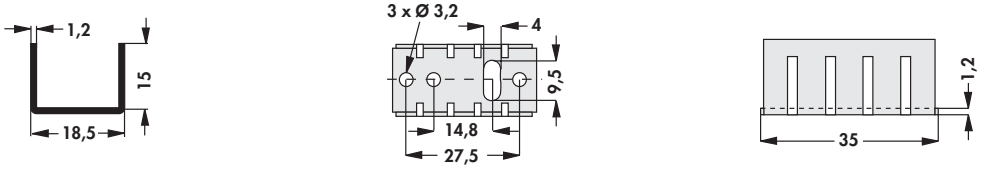


UK 14 SA M3

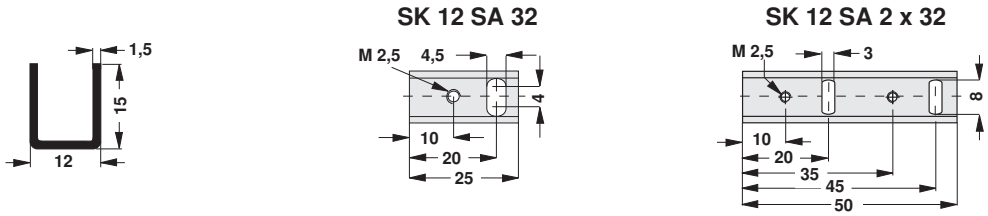


art. no.	R_{th} [K/W]	⌖
UK 14 SA 220	20	TO 220
UK 14 SA 220 3,2	20	TO 220
UK 14 SA M3	20	TO 220
surface:	black anodised	

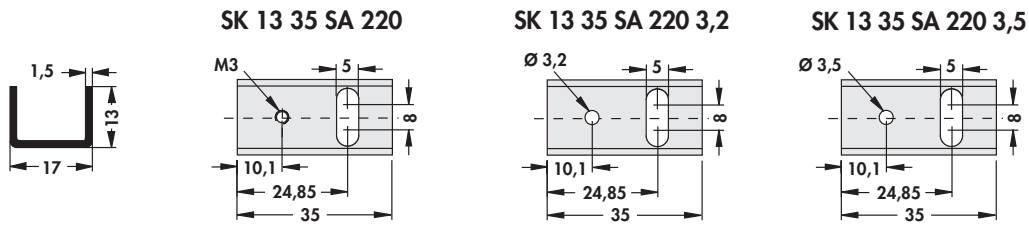
U-Extruded heatsinks



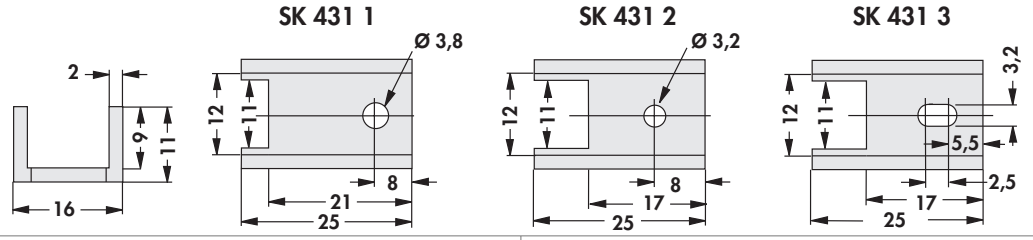
art. no.	R_{th} [K/W]	⌖
ICK 35 SA	15	TO 220



art. no.	R_{th} [K/W]	⌖
SK 12 SA 32	30	1xSOT 32
SK 12 SA 2 x 32	15	2xSOT 32



art. no.	R_{th} [K/W]	⌖
SK 13 35 SA 220	17	TO 220
SK 13 35 SA 220 3,2	17	TO 220
SK 13 35 SA 220 3,5	17	TO 220



art. no.	R_{th} [K/W]	⌖
SK 431 1	18	TO 220
SK 431 2	18	TO 220
SK 431 3	18	TO 220

surface:	black anodised

Profiles for PCB components → **A 91**
Heatsink profile-overview → **A 13 – 17**
Heatsinks for PCB → **A 89 – 91**
Hole pattern → **A 21**
Profiles for PCB mounting → **A 89 – 112**
Extruded heatsinks → **A 22 – 83**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

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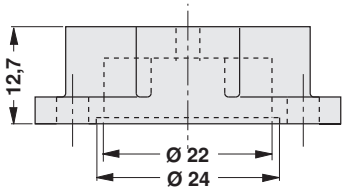
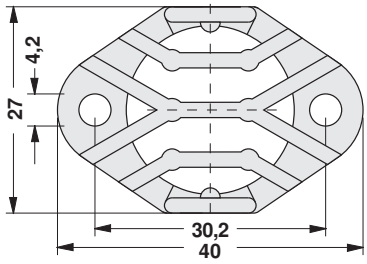
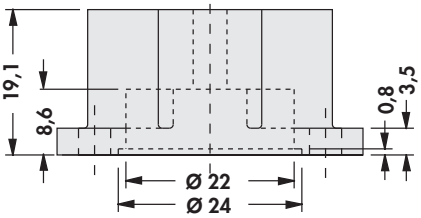
Die-cast heatsinks

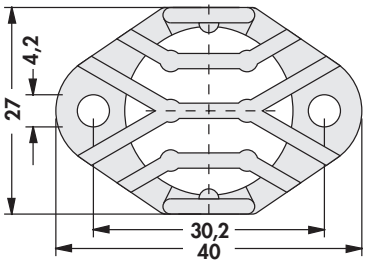
Setup heatsinks and angle for TO 3





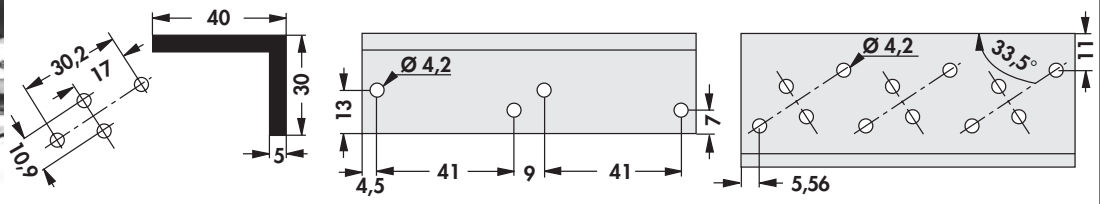
art. no.	↔ [mm]	R_{th} [K/W]
AKK 127	27	14





art. no.	↔ [mm]	R_{th} [K/W]
AKK 191	27	12

surface:	black lacquered
material:	die-casting aluminium



art. no.	↔ [mm]	R_{th} [K/W]	⌖
WP 4030 100 ...	100	3.7	—
WP 4030 100 3 ...	100	3.7	TO 3

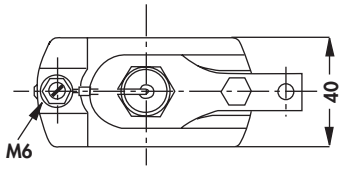
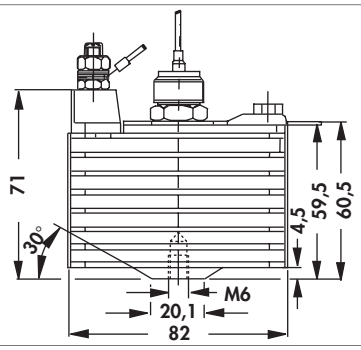
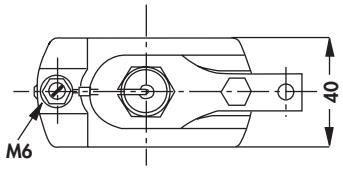
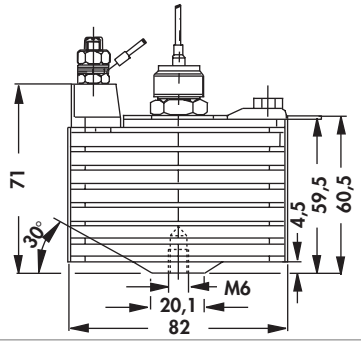
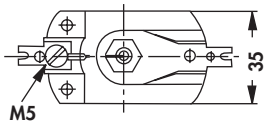
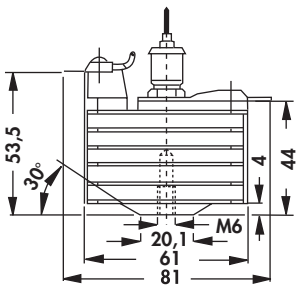
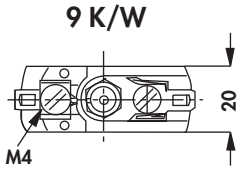
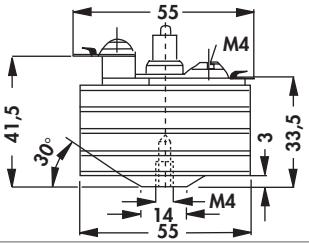
please indicate: **... surface**
SA = black anodised
AL = raw degreased aluminium

socket: TF 3 2 → E 50

Die-cast heatsinks

Die-cast acc. to german standard DIN 41882

– other lengths and drillings on request

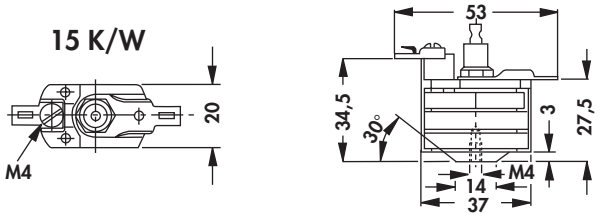
art. no.		
K 3 ...		2,8 K/W  
	for mounting use insulator: **art. no.: IS 53**	
please indicate:	**... semiconductor retaining thread M 6, M 8, M 10, M 12, 1/4"-28 UNF**	
art. no.		
K 3 T ...		2,8 K/W  
	Cathode lug insulator with an additional insulated connection (M 3). for mounting use insulator: **art. no.: IS 53**	
please indicate:	**... semiconductor retaining thread M 6, M 8**	
art. no.		
K 5 ...		5 K/W  
	for mounting use insulator: **art. no.: IS 53**	
please indicate:	**... semiconductor retaining thread M 5, M 6, M 8, 1/4"-28 UNF**	
art. no.		
K 9 ...		9 K/W  
please indicate:	**... semiconductor retaining thread M 4, M 5**	
surface:	black lacquered	

Mounting for TO 3 angle → **A 125**
Special profiles → **A 21**
Standard aluminium profiles → **A 135 – 136**
Heatsinks for PCB → **A 89 – 112**
Heatsinks for DC/DC converter → **A 113 – 114**
Profiles for lock-in fixing spring → **A 84 – 88**
Heatsink profile-overview → **A 13 – 17**
Technical introduction → **A 2 – 8**

Die-cast heatsinks

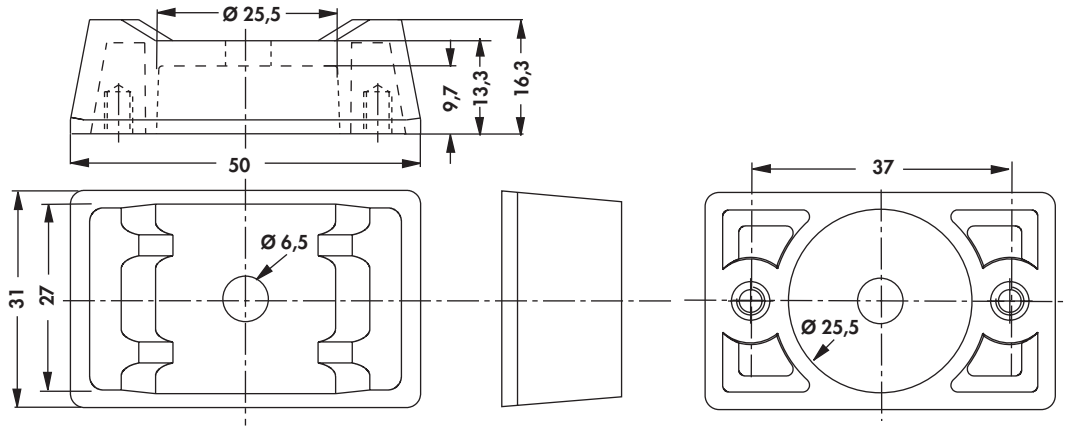
Die-cast acc. to german standard DIN 41882

– other lengths and drillings on request

art. no.		
K 15 ...		

please indicate:	**... semiconductor retaining thread M 4, M 5**
surface:	black lacquered

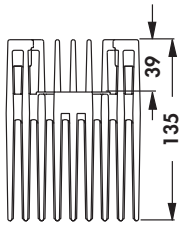
Mounting parts for heatsinks

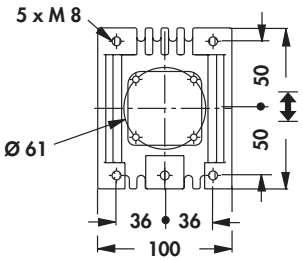
art. no.	
IS 53	

Die-cast heatsinks

– completely milled mounting surface for semiconductors with square bottom plates
– the mounting surface can be equipped with threads for fastening semiconductors with screwed glands (semiconductor thread tapping)
– threads from M 4 to M 32 x 1.5 or 4 x threads for semiconductors with clamping plate mounting are available
– strap fastening thread M 8
– delivery without anode strap
– other lengths and drillings on request

0,55 K/W

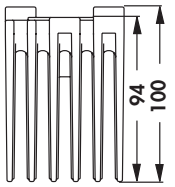


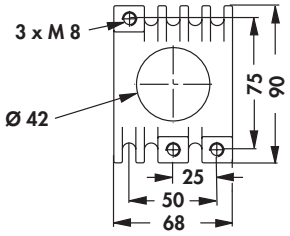


art. no.	⟷ [mm]	R_{th} [K/W]
K 0,55 ...	120	0.55

please indicate: **... semiconductor retaining thread M 12, M 24 x 1,5**

1,1 K/W





art. no.	⟷ [mm]	R_{th} [K/W]
K 1,1 ...	90	1.1

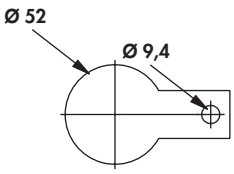
please indicate: **... semiconductor retaining thread M 8, M 12, M 16 x 1,5**

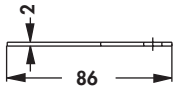
surface:	black lacquered

Accessories

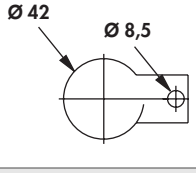
– anode end strap made of tin-plated cathode copper

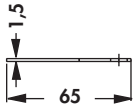
FL 0,55





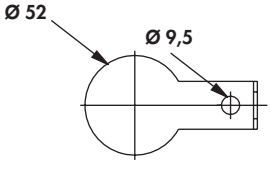
FL 1,1

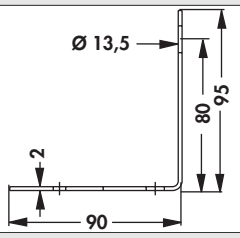




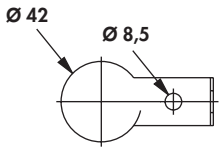
art. no.	art. no.
FL 0,55	**FL 1,1**

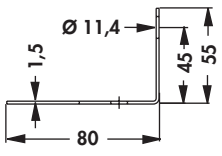
WL 0,55





WL 1,1



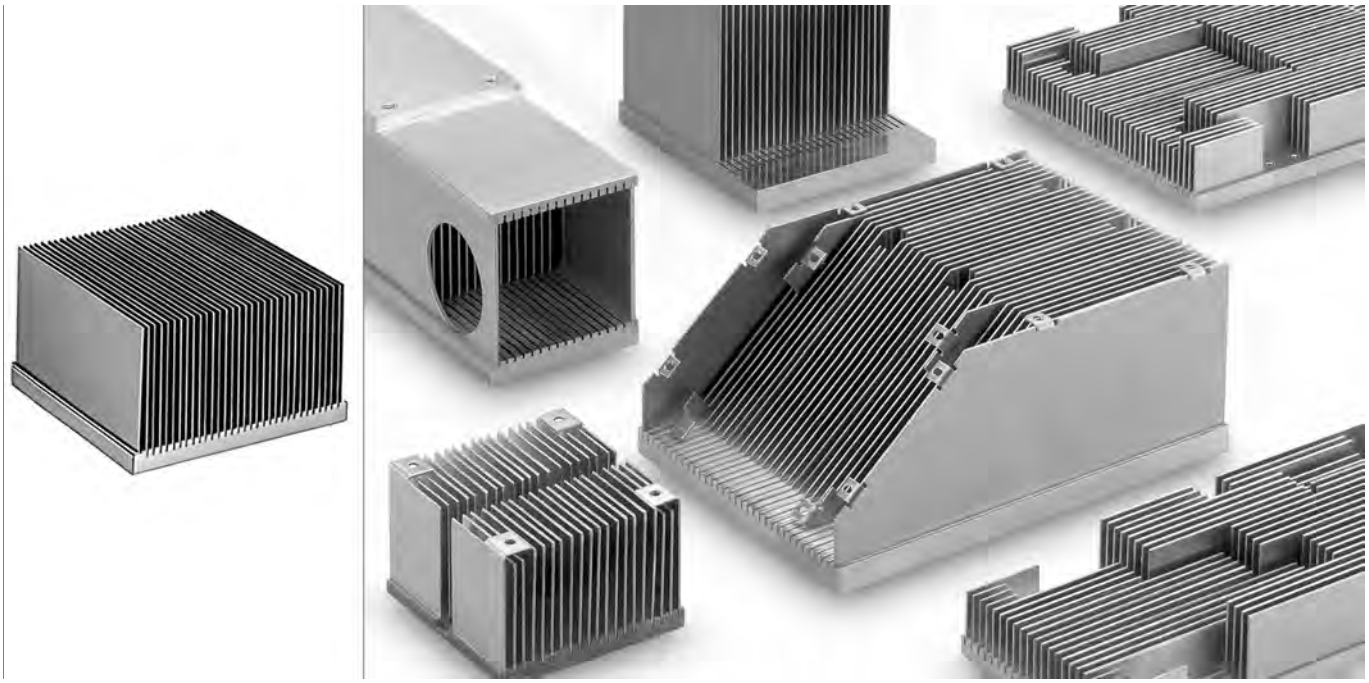


art. no.	art. no.
WL 0,55	**WL 1,1**

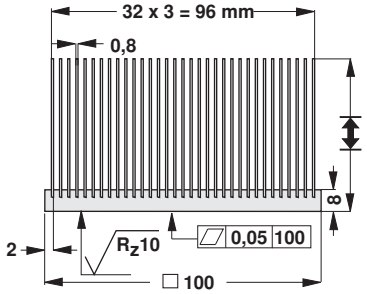
Mounting for TO 3 angle → **A 125**
Special profiles → **A 21**
Standard aluminium profiles → **A 135 – 136**
Heatsinks for PCB → **A 89 – 112**
Heatsinks for DC/DC converter → **A 113 – 114**
Profiles for lock-in fixing spring → **A 84 – 88**
Heatsink profile-overview → **A 13 – 17**
Technical introduction → **A 2 – 8**

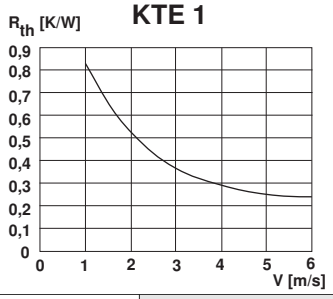
fischer elektronik

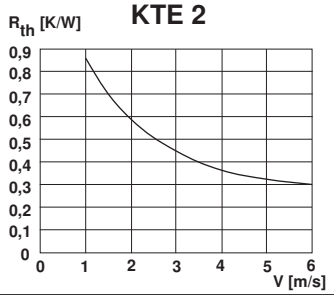
Standard fin coolers for thermoelectrical elements



- fin coolers in special design
- especially suitable for thermoelectric elements (Peltier-elements) and similar power modules
- compact design with reduced volume
- large surface, therefore more efficient than extruded profiles
- particularly low heat resistance with forced air cooling
- ideally fitted fins from a heat engineer´s point of view
- accurately flat milled surfaces
- very low roughness
- machining for module mounting according to drawing
- heat bridges (spacing bridges) on request
- lapped surface on request
- customer specific special design



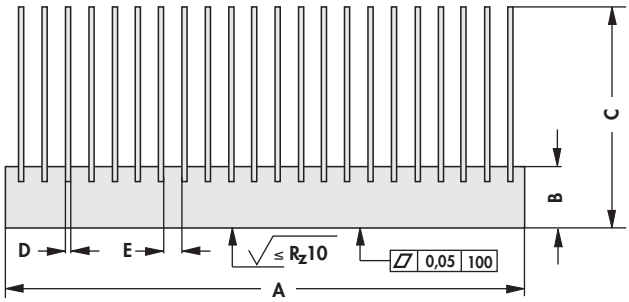


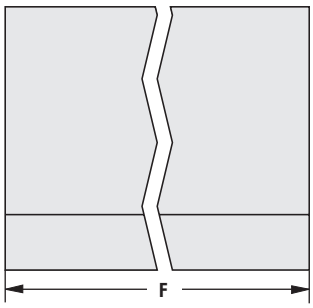


art. no.	↕ [mm]	art. no.	↕ [mm]
KTE 1	58	**KTE 2**	46
material:	aluminium, construction with copper on request		

Fin coolers KTE/KTED custom design

KTE



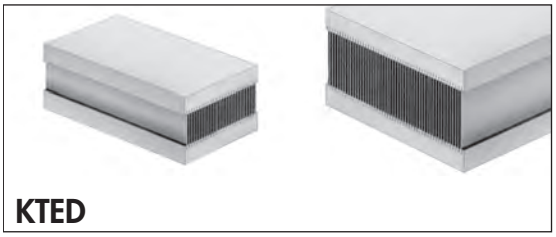


possible dimensions:

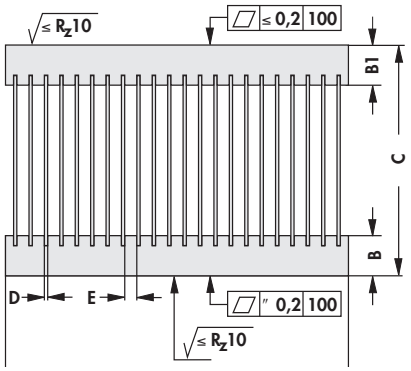
dimensions [mm]					
A	B	C	D	E	F
max. 400	max. 30	max. 150	0.8 / 1 / 1.5 / 2	min. 2	max. 400

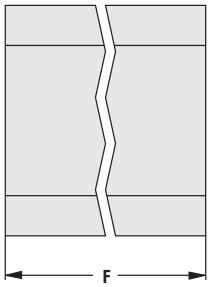
please indicate with your order:

dimensions [mm]					
A	B	C	D	E	F
material:	aluminium, construction with copper upon request				



KTED





- fin coolers in special design
- for forced convection, thus particularly low thermal resistance
- two opposite bottom plates as mounting surfaces for power modules and similar
- mounting surfaces precisely flat milled
- compact design with reduced volume
- ideally fitted fins from a heat engineering point of view
- lapped finish on request
- additional machining according to customer's requirements
- fan versions on request
- special constructions to customer's indications

possible dimensions:

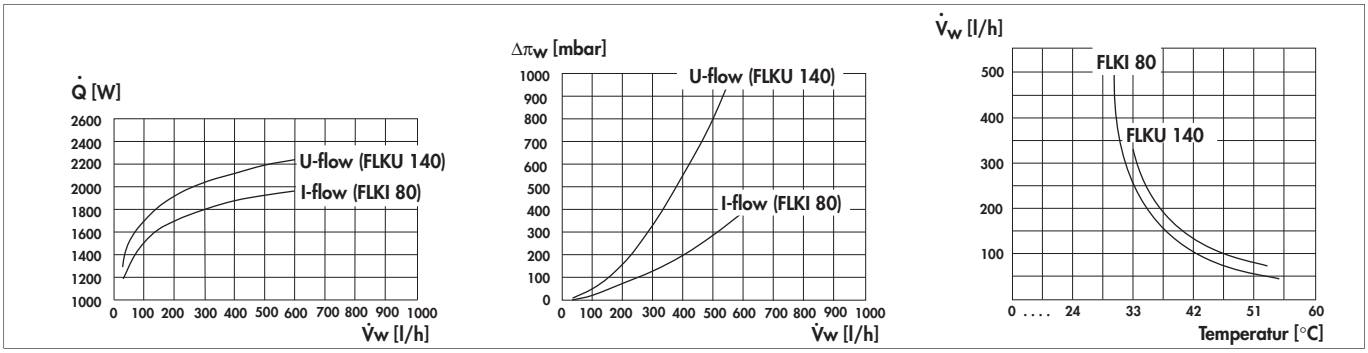
dimensions [mm						
A	B	B 1	C	D	E	F
max. 400	max. 30	max. 30	max. 150	0.8 / 1 / 1.5 / 2	min. 2	max. 400

please indicate with your order:

dimensions [mm]						
A	B	B 1	C	D	E	F
max. 400	max. 30	max. 30	max. 150	0.8 / 1 / 1.5 / 2	min. 2	max. 400
material:	aluminium, construction with copper upon request					

Fluid coolers → **A 131 – 133**
Standard aluminium profiles → **A 135 – 136**
High capacity cooling aggregat. → **D 26 – 29**
Heatsink profile-overview → **A 13 – 17**
Drilling pattern for Solid State → **A 12**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

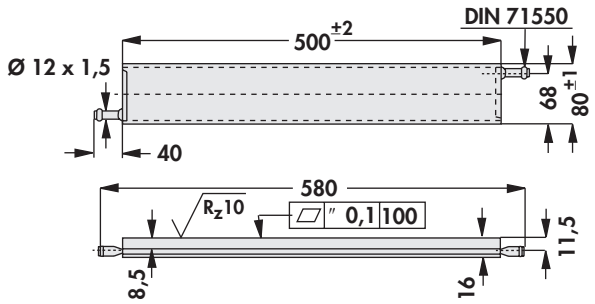
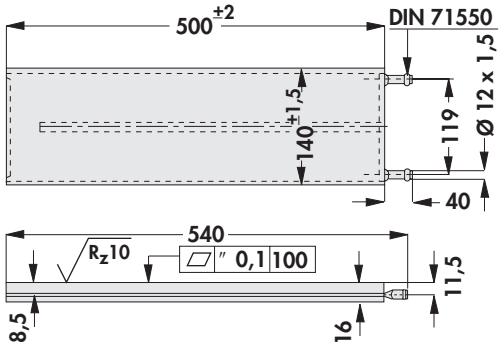
Fluid coolers for power modules



– water-gycol mixture (60/40); inlet temperature approx. 26 °C

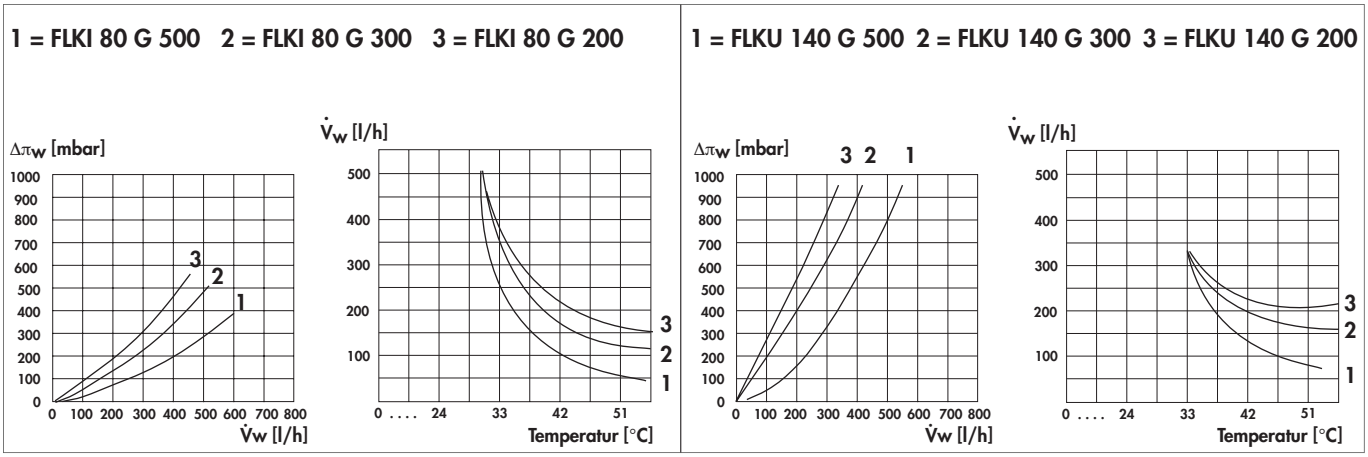
Fluid cooler for dissipating large quantities of heat with low space requirement; **effective system to cool power modules**; suitable for water pH 6.5-8.5 with anticorrosives, as well as other fluids (eg. oil, alcohols, etc.); **compact design with internal fin structure for particularly good heat transfer to the fluid**; minimised flow pressure losses (see diagram); **operating pressure up to 2 bar possible**; thick base plate for optimum heat distribution and to secure the heat-emmiting elements; **mounting flange for the cooler according to customer's instructions**; precisely face milled surface of component mounting area with very good flatness and low roughness depth; **dimensionally accurate adjustment to given mounting conditions**; connections using hole ports 12 mm in diameter with reinforcing seam to DIN 71550 or installation flange to customers instuctions; **I- or U-throughflow or multiple throughflow versions**; max. drilling depth in the base plate: 7 mm
To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60% (preferred is 50%) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

– dimensions and designs using customer's instructions

art. no.		
FLKI 80		
art. no.		
FLKU 140		
material:	EN AW 6060 (AlMgSi 0.5)	

Fin coolers	→ A 129	Special heatsink design	→ A 137 – 138
Cooling aggregates with axial fan	→ D 13 – 25	Special profiles	→ A 140
High capacity cooling aggregat.	→ D 26 – 29	Hole pattern	→ A 21
Heatsink profile-overview	→ A 13 – 17	Technical introduction	→ A 2 – 8

Fluid coolers for power modules

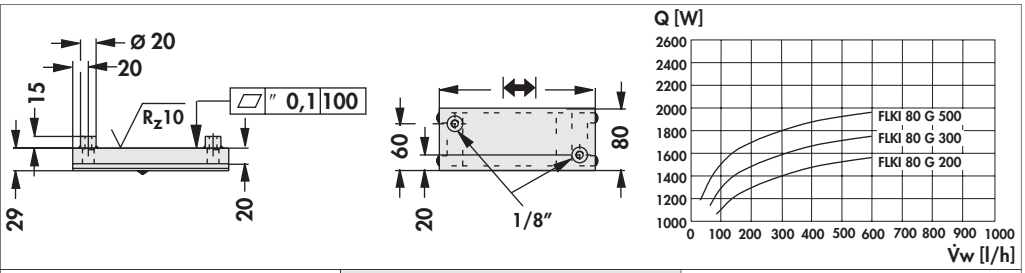


– water-gycol mixture (60/40); inlet temperature approx. 26 °C

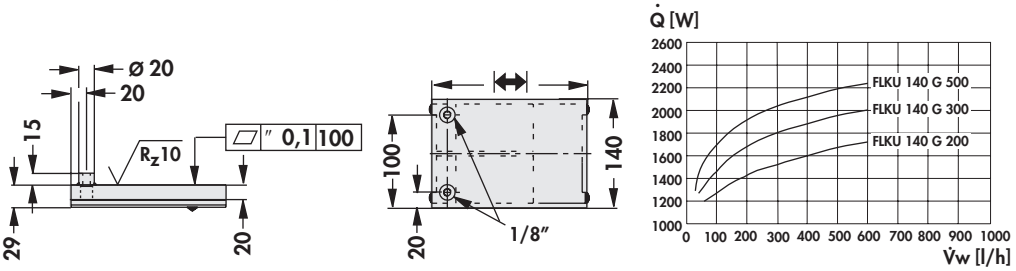
Fluid cooler for dissipating large quantities of heat with low space requirement; **effective system to cool power modules;** suitable for water pH 6.5-8.5 with anticorrosive, as well as other fluids (eg. oil, alcohols, etc.); **compact design with internal fin structure for particularly good heat transfer to the fluid;** minimised flow pressure losses; **operating pressure up to 2 bar possible;** thick base plate for optimum heat distribution and to secure the heat-emitting elements; **mounting flange for the cooler according to customer's instructions;** precisely face milled surface of component mounting area with very good eveness and low roughness depth; **for power modules like IGBT-module, Thyristor-module, SCR diode module, bridge amplifiers and others;** dimensionally accurate adjustment to given mounting conditions; **conncetions with thread muffle 1/8" or mounting flange according to customer's instructions;** I- or U-throughflow or multiple throughflow versions; **max. drilling depth in the base plate: 17 mm**

To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60% (preferred is 50%) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

– dimensions and designs using customer's instructions



art. no.	↔ [mm]	art. no.	↔ [mm]
FLKI 80 G 200	200	**FLKI 80 G 500**	500
FLKI 80 G 300	300		



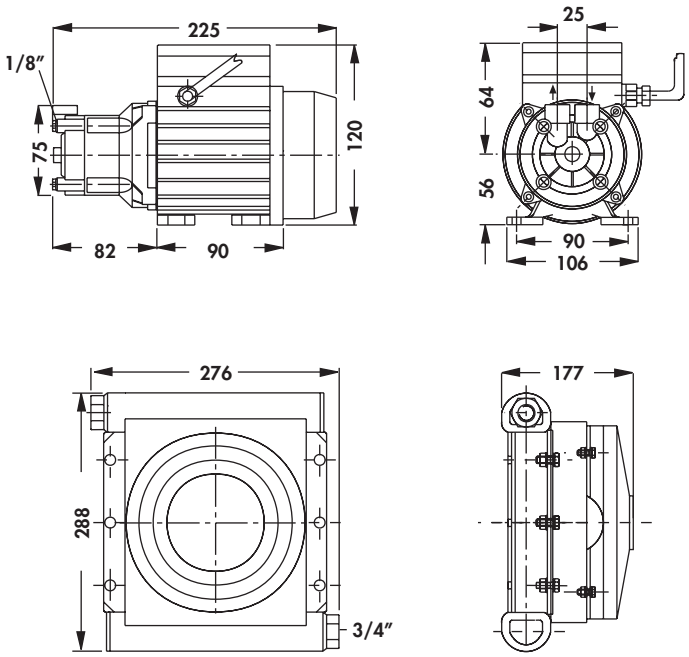
art. no.	↔ [mm]	art. no.	↔ [mm]
FLKU 140 G 200	200	**FLKU 140 G 500**	500
FLKU 140 G 300	300		
material:	EN AW 6060 (AlMgSi 0.5)		

Fin coolers → **A 129**
Cooling aggregates with axial fan → **D 13 – 25**
High capacity cooling aggregat. → **D 26 – 29**
Heatsink profile-overview → **A 13 – 17**
Special heatsink design → **A 137 – 138**
Special profiles → **A 140**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

Recooling systems for liquid coolers

– recooling system for all types of liquid coolers
– cools up to 2,600 watts thermal power loss
– consists of pump and recooler
– pump as normally aspirating, single-stage centrifugal pump with spiral housing in block construction
– recooler with liquid-conducting tube system with air lamella and electrically driven fan motor
– further information free of charge under: **FLK R1-Info**
– notes: anticorrosive agents are required when water is used as coolant (eg. water/glykol - 60/40)
– the hose systems used (NOT in scope of delivery) must be resistant to anticorrosive agents (eg. material EPDM according to DIN 73411, ISO 4081)

To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60% (preferred is 50%) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

art. no.		
FLKR 1		

thermal cooling capacity:	max. 2.600 W
pump:	single-phase 230 V AC, 120 W
recooler:	single-phase 230 V AC, 120 W/ three-phase 400 V AC, 90 W
type of delivery:	pump and recooler

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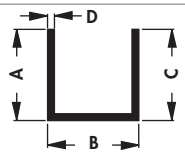
Standard aluminium profiles

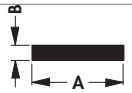
– length, drilling and surface finishes to customer's instructions
– other standard profiles on request

U-profiles



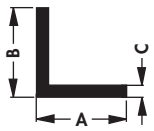
art. no.	A [mm]	B [mm]	C [mm]	D [mm]	art. no.	A [mm]	B [mm]	C [mm]	D [mm]
SU 02	20	40	20	2.5	**SU 16**	30	30	30	2.0
SU 03	20	40	20	2.0	**SU 27**	40	40	40	2.5
SU 05	30	20	30	2.0	**SU 29**	40	40	40	4.0
SU 09	20	20	20	1.5	**SU 32**	30	30	30	3.0
tolerances:	EN 755								
material:	EN AW 6060 (AlMgSi 0.5)								

flat profiles



art. no.	A [mm]	B [mm]	art. no.	A [mm]	B [mm]
SFP 005	40	15	**SFP 058**	40	8
SFP 006	30	8	**SFP 060**	80	8
SFP 007	40	5	**SFP 067**	30	15
SFP 016	70	15	**SFP 074**	70	10
SFP 028	40	10	**SFP 076**	60	30
SFP 029	30	10	**SFP 079**	90	100
SFP 037	55	10	**SFP 090**	120	15
SFP 046	25	5	**SFP 100**	100	15
SFP 054	50	10	**SFP 106**	40	20
SFP 057	115	100	**SFP 112**	100	25
tolerances:	EN 755				
material:	EN AW 6060 (AlMgSi 0.5)				

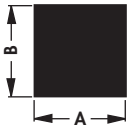
angled profile



art. no.	A [mm]	B [mm]	C [mm]	art. no.	A [mm]	B [mm]	C [mm]
SWP 02	80	80	8	**SWP 29**	15	10	2
SWP 06	80	40	6	**SWP 36**	75	50	5
SWP 10	30	20	2	**SWP 40**	40	30	5
SWP 15	40	20	4	**SWP 55**	40	40	5
SWP 23	20	15	2	**SWP 57**	60	30	5
SWP 25	50	30	5				
tolerances:	EN 755						
material:	EN AW 6060 (AlMgSi 0.5)						

Standard aluminium profiles

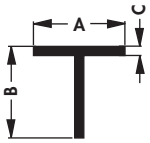
quadrangular profile



art. no.	A [mm]	B [mm]	art. no.	A [mm]	B [mm]
SVP 01	8	8	**SVP 12**	50	50
SVP 04	25	25	**SVP 13**	55	55
SVP 10	10	10			

tolerances:	EN 755
material:	EN AW 6060 (AlMgSi 0.5)

T-profile



art. no.	A [mm]	B [mm]	C [mm]	art. no.	A [mm]	B [mm]	C [mm]
STP 4	60	60	6	**STP 5**	20	20	2

tolerances:	EN 755
material:	EN AW 6060 (AlMgSi 0.5)

Hole pattern → **A 21**
Extruded heatsinks → **A 22 – 83**
Mounting for TO 3 angle → **A 125 – 126**
High capacity heatsinks → **A 57 – 58**
Construction parts made of aluminium → **A 139**
Heatsink as visual & decor-parts → **A 10**
Special profiles → **A 140**
Technical introduction → **A 2 – 8**

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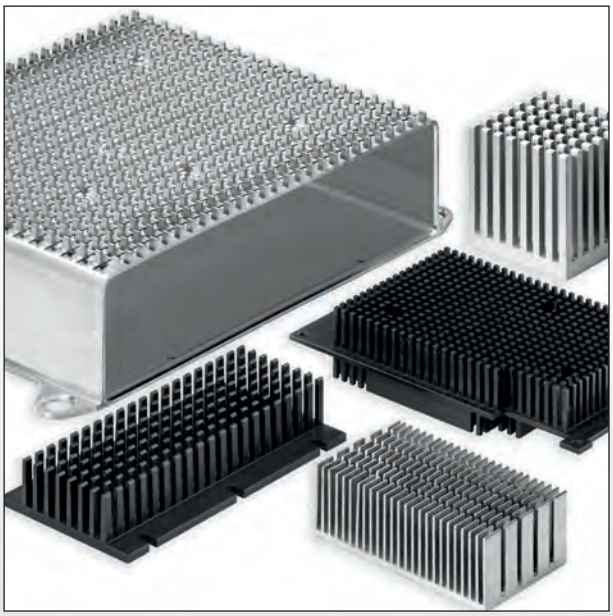
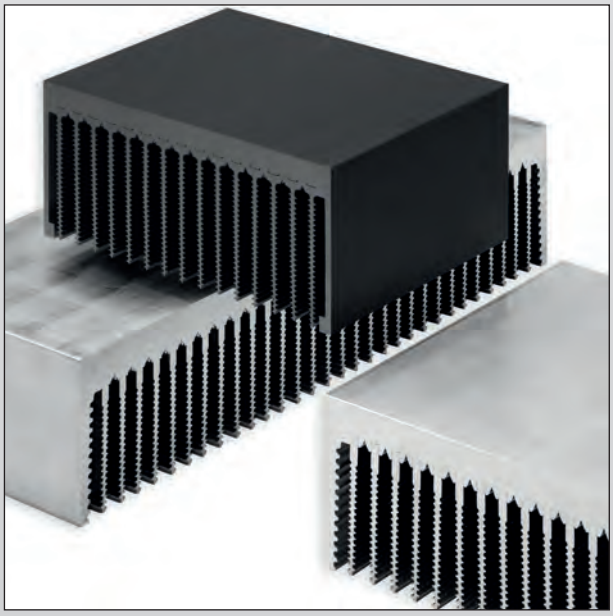
CNC treatments of cooling profiles
Streamlined omnidirectional fin geometrie
Heatsinks with pressed-in fins
Precise milled flat surfaces

Customer specified CNC treatments of cooling profiles
- latest CNC machining centres for highest quality demands
- profile treatments for seizes up to 1600 mm
- future orientated stockkeeping of the aluminium profiles in fully automated honeycomb warehouses
- batch size optimized production flow
- special profiles, modifications and surfaces according to your special demand



Streamlined omnidirectional fin geometrie
- free-standing cooling fingers for forced cooling
- incident flow of the heatsinks by means of fans from all sides (omnidirectional)
- no direction-oriented installation position
- fin spacings according to your demand
- special designs, treatments and versions according to customer's request



Extruded heatsinks with pressed-in fins
- for highest thermal dissipation losses
- channelled fin geometrie for increasing the surface
- thermotechnical optimized connection between fin and bottom plate
- deliverable in widths of 200 up to 750 mm
- customer specific versions and treatments

Precise milled flat surfaces
- very small depth of roughness and unevenness
- individually milled flat semi-conductor mounting surfaces for minimizing the heat-transmission resistances
- millings on the already anodized heatsinks
- protective foil avoid scratching of the high-quality mounting surface
- special designs according to customer's drawing

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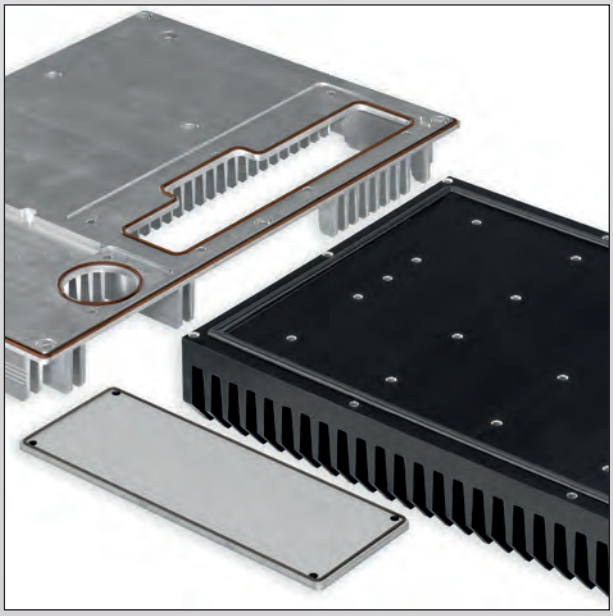
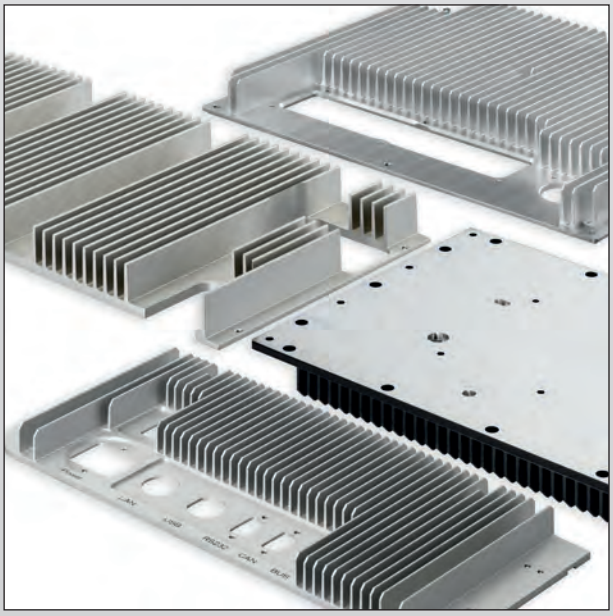
Surface labelling
Additional equipments
Heatsinks with integrated sealing
19" compliant CNC-treatment

Surface labelling
- durable and high quality labeling by means of YAG-laser, silk screen-, pad- and digital printing
- print layout preparation by means of in-house repro department
- precise in contrast, precise engraved fonts and contours by means of CNC-controlled treatment systems
- labeling of aluminium, Plexiglas and plastics

Additional equipments
- fractional semi-conductor mounting surfaces made of copper for heat dissipation
- pressed-in or screwed distance sleeves made of metal and plastics
- threaded bolts with internal and external thread
- support rail mountings made of metal or plastics according to DIN EN 50022



Heatsinks with integrated sealing
- foamed sealing applied on the profile as a permanent element of the heatsink
- also usable for front plates or milled parts
- groove filled or stacked
- permanently elastic and CFC-free
- adaption of the sealing properties to the specific application



19" compliant CNC-treatment
- milled heatsink side or back panels for 19" cases, 19" plug in boxes, subracks and insert modules
- pressing in or welding of threaded bolts
- customer specified modifications, designs
- surfaces and printing upon request

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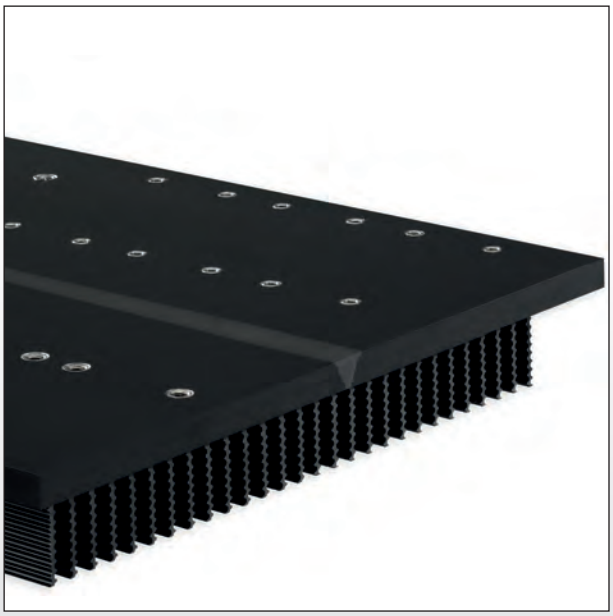
Welded high perfomance heatsinks
Welded heatsinks
Construction- and milled parts
Cases and contour milled parts

Welded high performance heatsinks
- optimal fin geometry with channelled structure for free convection
- production of heatsink widths outside of the press-technical production possibilities
- removing of the welding line by means of precise milled flat surfaces
- individual surface design



Welded heatsinks
- homogeneous connection of the materials by means of special welding methods
- welding on additional mounting levels which are situated diagonally to the pressing direction of the profiles
- production of prototypes
- application-based special designs and treatments according to your demand

Construction- and milled parts made of aluminium according to customer specifications
- precise milled contours and surfaces
- inserting of holes and cut-outs, cutting or milling of threads
- turning in of wire thread inserts for high- and wear-resistant threads
- simple data exchange by means of up to date CAD- / CAM-systems

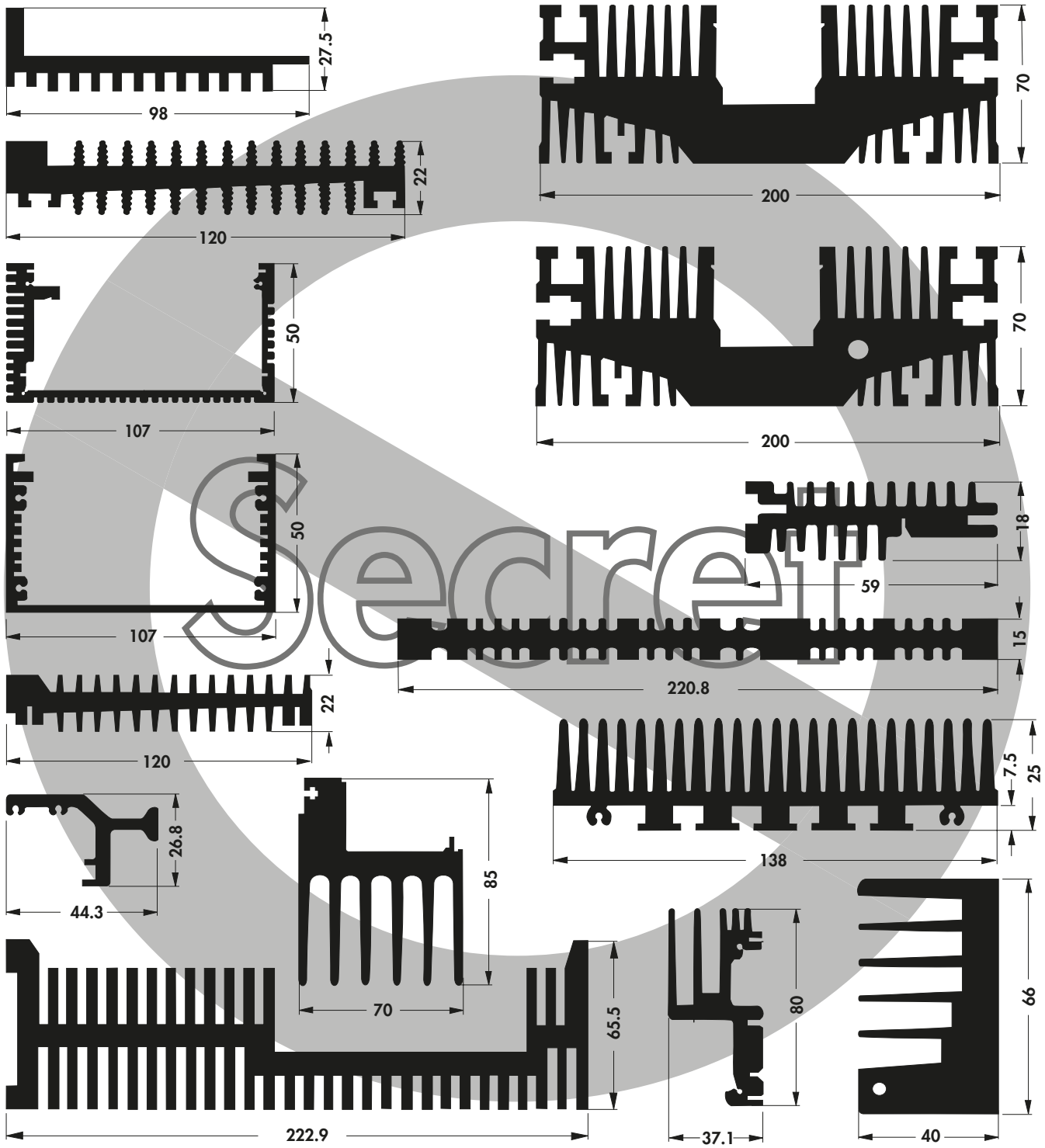
Cases and contour milled parts made of aluminium
- customer specific cases and construction parts
- precise mechanical treatments for highest quality demands
- all requested surface designs
- modifications and versions, special requirements, treatments and designs according to your drawing specification

Special profiles

Whenever you cannot find the ideal solution for your problem from the wide range of standard extrusions on offer or a solution constitutes a compromise between the use of the space available and the weight, as long as the quantity is correct a special section is the answer.

Released from the dimensional restrictions of the standard profiles, special extrusions are tailored to your design requirements, and offer considerable benefits in terms of machining time and use of space.

Furthermore your calculation will be influenced positively by the optimised material use and shorter machining times.
You can determine the combination of the desired thermal properties and the design element yourself, by the use of a special profile.
We are not allowed to publish many of our customer-specific Profiles, because they are subject to „non disclosure agreements".
Therefore we only show some examples for customer profiles in the industry.
All figures are illustrations. Changes reserved.



If required please send your request.

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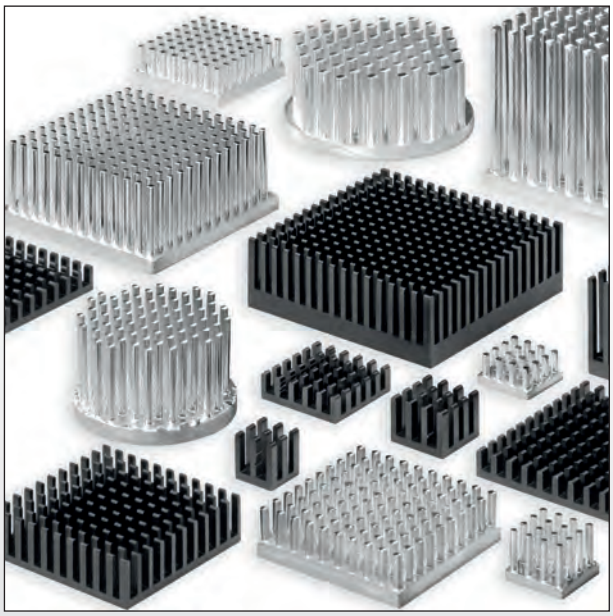
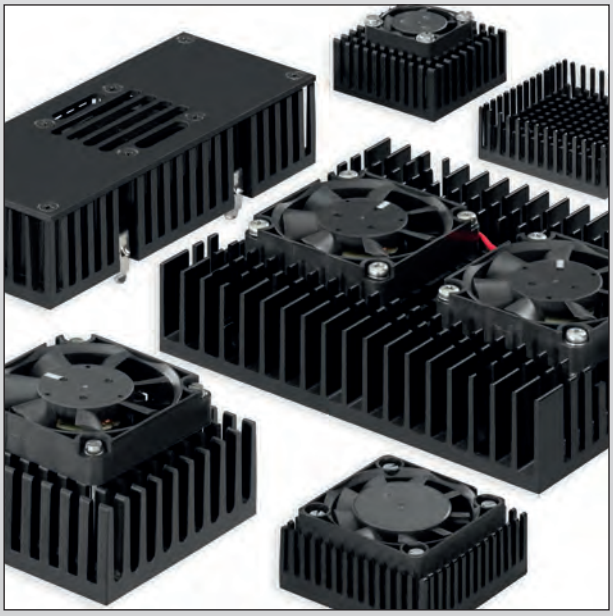
Round and pin heatsinks
Heatsinks for LEDs
Heatsinks for all transistor types
Heatsinks and coolers for processors



Round and pin heatsinks
- streamlined omnidirectional fin geometrie
- excellent thermal conductivity due to special aluminium alloys
- suitable for free and forced convection
- no direction bounded installation position
- flat semiconductor mounting surfaces
- contour also as milled parts according to your demands

Heatsinks for LEDs
- various heatsink geometries adjusted to all current LED-types and light-engines
- star shaped heatsinks for the use as a LED-lamp housing
- LED mounting by means of screws, thermal conductive adhesive foil or thermal conductive glue
- customer specified versions with application based „thermal management"

Heatsinks for all current PL CC, DIL-IC and SMD transistor types
- effective heat dissipation at a low profile and low weight
- direct mounting of the component by means of a double-sided adhesive thermal foil or glue
- solderable versions of the surface
- special packaging such as tape & reel, magazine or tray upon request



Heatsinks and coolers for processors
- passive and active product solutions
- effective heat dissipation due to optimal conception of fan and heatsink
- long lifetime and high operating safety due to high quality fans
- versions for screw, glue and clip mounting
- customer specific solutions and fans

Heatsinks for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK PGA 6 x 6 x 14	B 11	20	6.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 8 x 8 x 12	B 11	14.8	8.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 9 x 9	B 11	14	3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 11 x 11 x 8	B 11	16	7.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 11 x 11	B 11	10.9	4.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 11 x 11 x 12	B 12	12.3	3.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14	B 12	10	4.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14 x 10	B 12	10.5	11.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14 x 14	B 12	9.6	12.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14 x 12	B 12	9.8	5.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 15 x 15	B 12	9.4	5.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 16 x 16 x 8	B 13	14	4.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 16 x 16 x 10	B 13	10.5	12.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 16 x 16 x 12	B 13	9.3	6.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 17 x 17	B 13	8.6	6.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 17 x 17 x 8	B 13	13.2	5.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 17 x 17 x 12	B 13	9	6.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 18 x 18	B 14	8.4	7.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 19 x 19	B 14	8.6	7.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 19 x 19 x 12	B 14	9	6.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20 x 10	B 14	8.5	15.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20	B 14	7.6	8.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20 K	B 15	7.6	8.3	fixing clamp	socket 7/ socket 370	IDT W2A/ AMD® K6-III/ AMD® K6-2/ MMX/ IDT C6/ Intel® Pentium®
ICK PGA 20 x 20 x 8	B 15	12	6.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20 x 12	B 15	8	8.1	therm. conductive foil/ therm. cond. adhesive	universal	universal

– very good thermal efficiency
– aerodynamic imnidirectional fin geometry
– simple mounting by means fo fixing clamp, thermal conductive adhesive film or thermal conductive glue
– customer specified designs, surfaces and modifications upon request

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Heatsinks for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK PGA 21 x 21	B 15	7	8.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 22 x 22	B 15	6.2	8.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 25 x 25	B 16	5	11.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 10 x 10	B 17	30	1.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 10 x 10 x 10	B 17	28.5	1.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 14 x 14	B 17	30	2.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 14 x 14 x 10	B 17	27.4	2.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 21 x 21	B 18	24.3	2.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 23 x 23	B 18	22.5	2.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 23 x 23 x 10	B 18	21.5	2.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27	B 18	20	3.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27 x 10	B 18	18.5	3.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27 x 14	B 18	13.5	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27 x 22	B 19	10.5	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 31 x 31	B 19	18.6	3.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 31 x 31 x 10	B 19	17	3.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 35 x 35	B 19	16.5	3.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 35 x 35 x 10	B 19	15.7	3.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 37 x 37 x 6	B 19	15.7	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 37 x 37 x 10	B 20	14	10.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 40 x 40	B 20	14.6	4.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 40 x 40 x 10	B 20	13.8	4.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 42,5 x 45	B 20	13.6	4.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 10 x 10 x 6,5	B 21	25	2.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 10 x 10 x 10	B 21	23.75	2.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 10 x 10 x 12,5	B 21	22.5	2.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 10 x 10 x 18,5	B 22	21.75	3	therm. conductive foil/ therm. cond. adhesive	universal	universal

- **very good thermal efficiency**
- **aerodynamic imnidirectional fin geometry**
- **simple mounting by means fo fixing clamp, thermal conductive adhesive film or thermal conductive glue**
- **customer specified designs, surfaces and modifications upon request**

Heatsinks for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK S 14 x 14 x 6,5	B 22	9	5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 14 x 14 x 10	B 22	8.8	5.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 14 x 14 x 12,5	B 22	8.1	5.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 14 x 14 x 18,5	B 22	7.9	5.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 17 x 17 x 15	B 22	8.36	5.95	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 17 x 17 x 20	B 23	7.89	6.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 18 x 18 x 6,5	B 23	7	7.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 18 x 18 x 10	B 23	6.8	8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 22 x 22 x 10	B 23	5.9	8.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 22 x 22 x 18,5	B 23	5	10	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 25 x 25 x 6,5	B 23	5.8	12.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 25 x 25 x 12,5	B 24	5.3	14.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 25 x 25 x 18,5	B 24	5.2	14.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 29 x 29 x 10	B 24	5.7	13.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 29 x 29 x 20	B 24	3.7	20.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 29 x 29 x 30	B 24	2.9	21	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 32 x 32 x 10	B 24	5.4	13.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 32 x 32 x 20	B 25	3.7	20.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 10	B 25	4.7	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 15	B 25	3.9	19.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 20	B 25	3.2	22	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 30	B 25	2.5	23.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 40 x 40 x 10	B 25	4.6	16.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 40 x 40 x 20	B 26	3.5	21.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 40 x 40 x 25	B 26	3.1	23.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 45 x 45 x 10	B 26	4.7	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 45 x 45 x 20	B 26	4.4	17	therm. conductive foil/ therm. cond. adhesive	universal	universal

– very good thermal efficiency
– aerodynamic imnidirectional fin geometry
– simple mounting by means fo fixing clamp, thermal conductive adhesive film or thermal conductive glue
– customer specified designs, surfaces and modifications upon request

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Heatsinks for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK S 50 x 50 x 20	B 26	2.7	27.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 25	B 26	2.4	31.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 40	B 27	6.05	13.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 50	B 27	4.05	14.32	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 98 x 98 x 30	B 27	2.4	35	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 98 x 98 x 45	B 27	3.5	42	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 12 x 12 x 7,5	B 28	10.85	4.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 18 x 12 x 7,5	B 28	9	5.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 24 x 18 x 7,5	B 28	8.5	5.85	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 98 x 98 x 10	B 28	4.88	10.25	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 6,5	B 29	5.82	15.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 10	B 29	5.65	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 12,5	B 29	5.53	16.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 18,5	B 29	4.25	20.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 10	B 29	5.54	9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 20	B 29	5.6	8.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 30	B 30	4.2	11	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 40	B 30	3.2	15	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 50	B 30	2.7	18	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 36,5 x 20	B 30	6.41	18	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 10	B 30	11.04	8.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 20	B 30	10.32	8.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R A 40 x 20	B 31	11.62	8.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 30	B 31	9.77	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 50	B 31	2	25	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 45 x 30	B 31	8	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 45 x 45	B 31	6	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal

- **very good thermal efficiency**
- **aerodynamic imnidirectional fin geometry**
- **simple mounting by means fo fixing clamp, thermal conductive adhesive film or thermal conductive glue**
- **customer specified designs, surfaces and modifications upon request**

Heatsinks for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK S R 50 x 10	B 31	5.28	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 20	B 32	8.55	9.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 30	B 32	8.26	10	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 45	B 32	6.32	12.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 54 x 20	B 32	8.11	10.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 54 x 30	B 32	6.95	11.57	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 54 x 45	B 33	5.37	15.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 70 x 30	B 33	1.8	27	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 70 x 50	B 33	1.5	33	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 85 x 30	B 33	2	25	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 85 x 45	B 33	1.8	27	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 98 x 30	B 34	1.65	30	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 98 x 50	B 34	1.4	35	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 23,5 x 14	B 35	18.58	6.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 23,5 x 14 G	B 35	19.16	6.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 27 x 10	B 35	17.69	6.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 27 x 10 G	B 35	18.24	6.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 28 x 15	B 35	15.24	7.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 28 x 15 G	B 36	15.72	7.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 29 x 11,5	B 36	17.26	8.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 29 x 11,5 G	B 36	17.8	8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 32 x 14	B 36	15.23	7.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 32 x 14 G	B 36	15.23	7.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 10	B 36	17.6	6.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 10 G	B 36	18.15	6.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 16,5	B 37	13.87	8.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 16,5 G	B 37	14.3	8.3	therm. conductive foil/ therm. cond. adhesive	universal	universal

– very good thermal efficiency
– aerodynamic imnidirectional fin geometry
– simple mounting by means fo fixing clamp, thermal conductive adhesive film or thermal conductive glue
– customer specified designs, surfaces and modifications upon request

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Heatsinks for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK LED R 35 x 10	B 37	16.9	9.35	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 35 x 10 G	B 37	17.5	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 36 x 12	B 37	12.88	10	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 36 x 12 G	B 37	13.28	8.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 10	B 37	12.28	9.45	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 10 G	B 38	12.66	9.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 27	B 38	9.41	12.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 27 G	B 38	9.71	11.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 45,7 x 16,5	B 38	10.46	11.05	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 45,7 x 16,5 G	B 38	10.49	10.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50 x 10	B 38	10.57	10.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50 x 10 G	B 39	10.9	10.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50,8 x 16,5	B 39	10.17	11.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50,8 x 16,5 G	B 39	10.49	10.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 54 x 20	B 39	9.48	12.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 54 x 20 G	B 39	9.78	11.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 66 x 40	B 39	3.2	21	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 75 x 10	B 40	5.2	12.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 84 x 40	B 40	2.5	14.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 100 x 40	B 40	2	27	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 160 x 40	B 40	1.4	42	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 200 x 40	B 41	1	51	therm. conductive foil/ therm. cond. adhesive	universal	universal

- **very good thermal efficiency**
- **aerodynamic imnidirectional fin geometry**
- **simple mounting by means fo fixing clamp, thermal conductive adhesive film or thermal conductive glue**
- **customer specified designs, surfaces and modifications upon request**

Fan coolers for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
LA LED 40 x 30	B 49	1.4	35	therm. conductive foil/ therm. cond. adhesive	universal	universal
LA LED 50 x 20	B 49	1.25	40	therm. conductive foil/ therm. cond. adhesive	universal	universal
LA LED 50 x 45	B 49	0.9	50	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PPC 51	B 56	8.1	14	screw fastening		Power PC
ICK PEN 3 XE	B 56	2	31.3	screw fastening	Slot 2	Intel® Pentium® III-Xeon™ Slot II Format
ICK PEN 3 XE 1	B 56	1.8	33.6	screw fastening	Slot 2	Intel® Pentium® III-Xeon™ Slot II Format
ICK EM 25	B 56	3.9	20.4	screw fastening		Q7 Board
ICK PEN 38 F	B 57	4	15.1	therm. conductive foil	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
ICK PEN 38 W	B 57	4	15.1	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
ICK PEN 45 W	B 57	3.5	21	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
ICK PRO 40 W	B 57	2.7	22	therm. cond. adhesive	socket 8	Intel® Pentium® PRO
ICK PEN 3 FC	B 57	3.5	22	fixing clamp	socket 7/ socket 370	Intel® Pentium® III FC PGA (Mendocino, Coppermine)
LA ICK 15 x 15 F 05	B 58	2.3	22.2	therm. conductive foil	universal	universal
LA ICK 15 x 15 F 12	B 58	2.3	22.2	therm. conductive foil	universal	universal
LA ICK 17 x 17 F 12	B 58	1.6	35.8	therm. conductive foil	universal	universal
LA ICK 17 x 17 F 12 A	B 58	1.6	35.8	therm. conductive foil	universal	universal
LA ICK 17 x 17 W 05	B 58	1.6	35.8	therm. cond. adhesive	universal	universal
LA ICK 17 x 17 W 12	B 58	1.6	35.8	therm. cond. adhesive	universal	universal
LA ICK 18 x 18 F 12	B 58	1.5	41.7	therm. conductive foil	universal	universal
LA ICK 18 x 18 W 12	B 58	1.5	41.7	therm. cond. adhesive	universal	universal
LA ICK 21 x 21 F 05	B 58	1.4	46.3	therm. conductive foil	universal	universal
LA ICK 21 x 21 F 12	B 58	1.4	46.3	therm. conductive foil	universal	universal
LA ICK 21 x 21 W 05	B 58	1.4	46.3	therm. cond. adhesive	universal	universal
LA ICK 21 x 21 W 12	B 58	1.4	46.3	therm. cond. adhesive	universal	universal

- **high-quality industrial design**
- **compact design with high mechanical stability**
- **fan with doubled ball bearing axis**
- **optimal thermotechnical design of fan and heatsink**

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Fan coolers for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
LA ICK PEN 8 F 05	B 59	2.5	23.4	therm. conductive foil	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 8 F 12	B 59	2.5	23.4	therm. conductive foil	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 8 W 05	B 59	2.5	23.4	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 8 W 12	B 59	2.5	23.4	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 16 K 12	B 59	1.2	51.1	fixing clamp	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 16 W 12	B 59	1.2	51.1	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 16 W 12 A	B 59	1.2	51.1	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2

- **high-quality industrial design**
- **compact design with high mechanical stability**
- **fan with doubled ball bearing axis**
- **optimal thermotechnical design of fan and heatsink**

Fan coolers for IC processor

art. no.	page	R_{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
LA ICK PEN 18 W 12	B 59	1.6	38.6	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 38 W 12	B 59	1.1	53.6	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PRO 25 F 12	B 59	0.97	60	therm. conductive foil	socket 8	Intel® Pentium® PRO
LA ICK PEN 2 K 12	B 60	1.2	58		Slot A/ Slot 1	Intel® Pentium® II/ AMD® Athlon®
LA ICK PEN 3 XE	B 60	0.8	61.8	screw fastening	Slot 2	Intel® Pentium® III-Xeon™
LA ICK PEN 4 1 K	B 60	0.6	85	fixing clamp	socket 463/ socket 423	Intel® Pentium® IV

– high-quality industrial design
– compact design with high mechanical stability
– fan with doubled ball bearing axis
– optimal thermotechnical design of fan and heatsink

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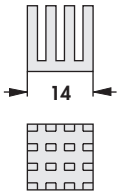
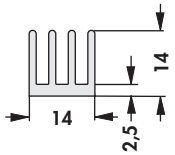
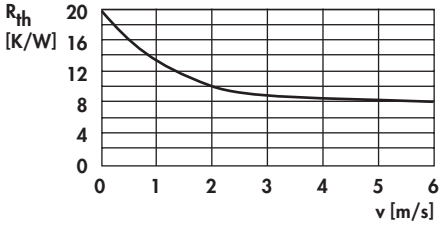
Heatsinks for PGA

– double-sided adhesive thermal conductive foil **WLF ...** → E 7
– **surface:** black anodised

art. no.			
ICK PGA 6 x 6 x 14 WLF ... 14 x 14			
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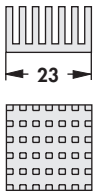
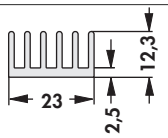
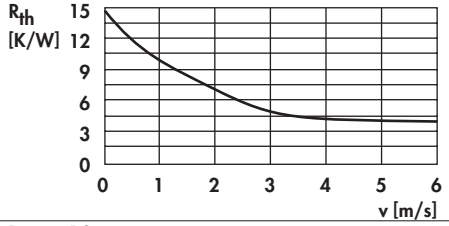
ICK PGA 8 x 8 x 12 WLF ... 23 x 23			
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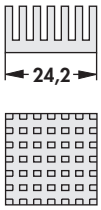
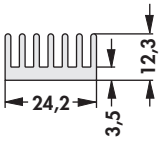
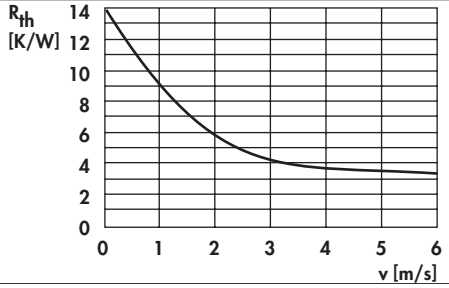
ICK PGA 9 x 9 WLF ... 24 x 24			
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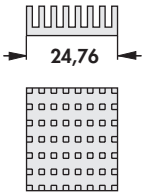
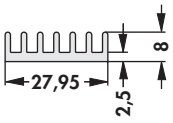
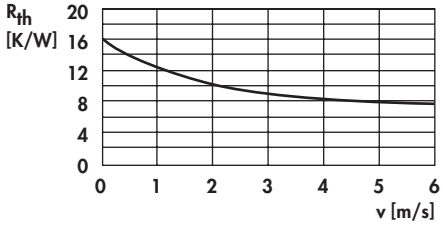
ICK PGA 11 x 11 x 8 WLF ... 24 x 27			
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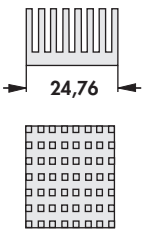
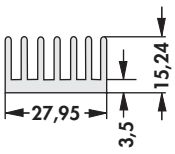
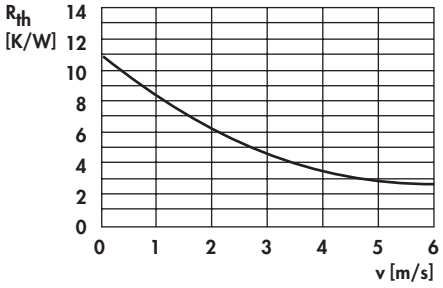
ICK PGA 11 x 11 WLF ... 24 x 27			

Heatsinks for PGA

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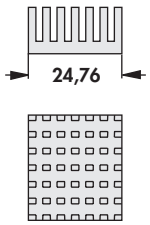
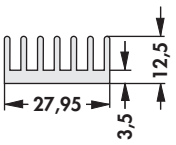
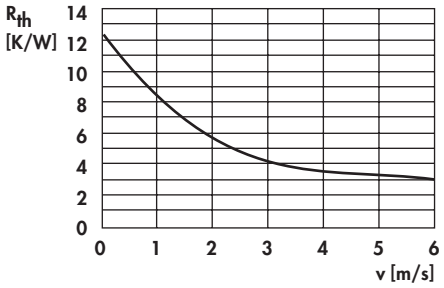
ICK PGA 11 x 11 x 12 WLF ... 24 x 27			
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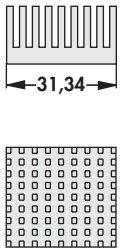
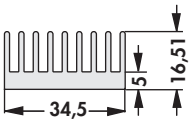
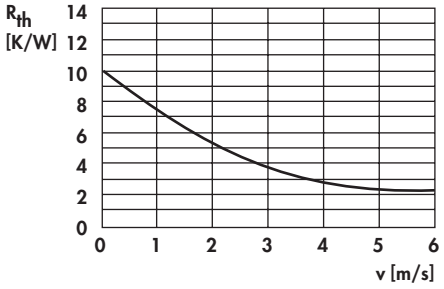
ICK PGA 14 x 14 WLF ... 31 x 34			
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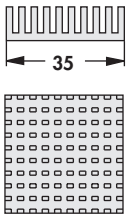
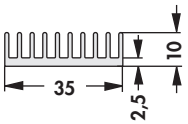
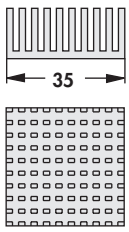
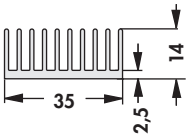
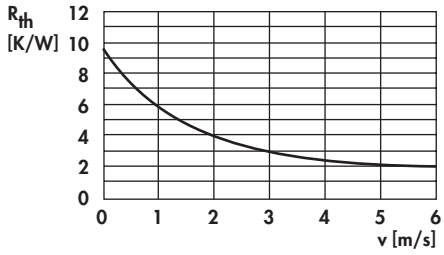
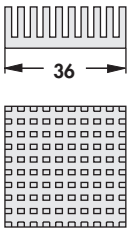
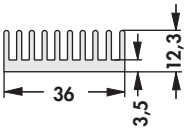
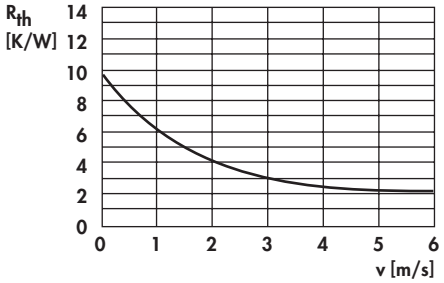
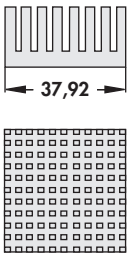
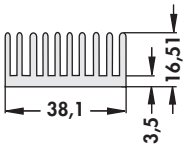
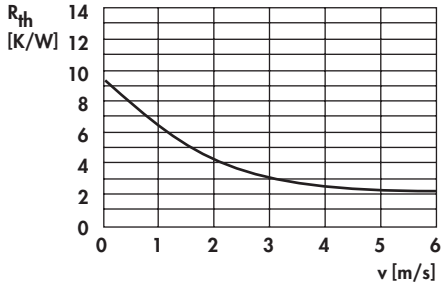
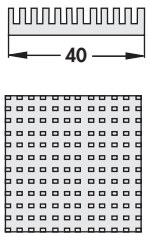
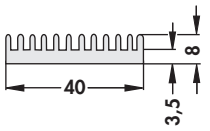
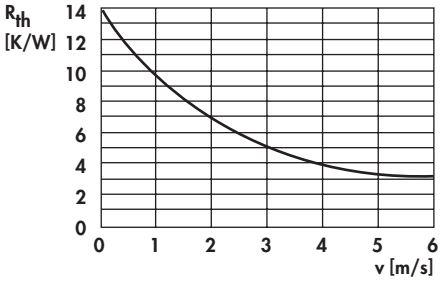
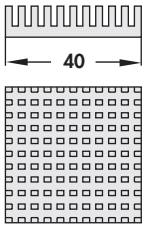
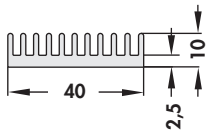
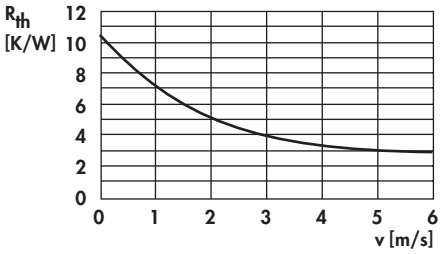
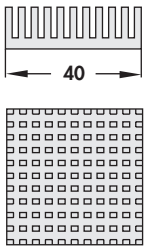
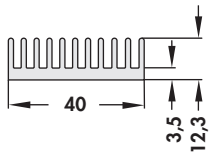
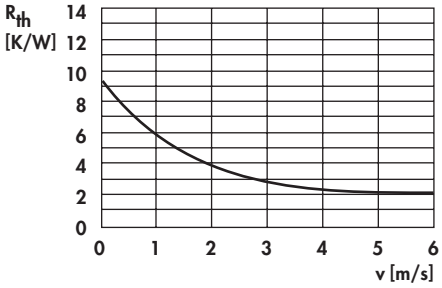
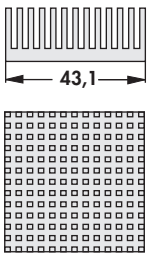
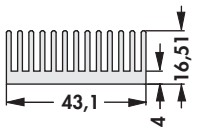
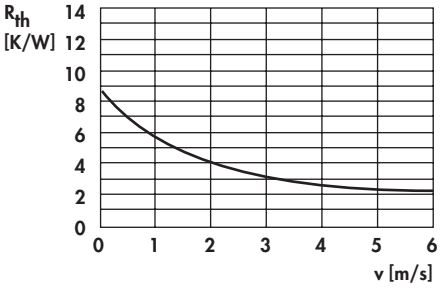
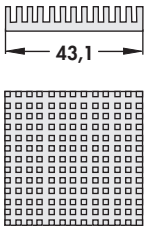
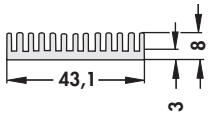
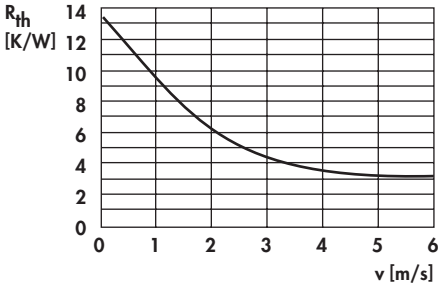
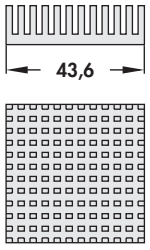
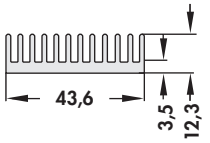
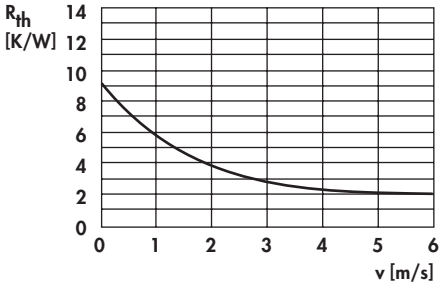
ICK PGA 14 x 14 x 10 WLF ... 35 x 35			
art. no.			
ICK PGA 14 x 14 x 14 WLF ... 35 x 35			
art. no.			
ICK PGA 14 x 14 x 12 WLF ... 36 x 36			
art. no.			
ICK PGA 15 x 15 WLF ... 37 x 37			

Mounts → E 44 – 48
Heatsinks for PLCC → B 52
Thermal conductive paste → E 21 – 24
Thermal conductive glue → E 23 – 24
Pin heatsinks for IC → B 21 – 27
SMD-heatsinks → B 53 – 54
Heatsinks for PGA → B 11 – 16
Technical introduction → A 2 – 8

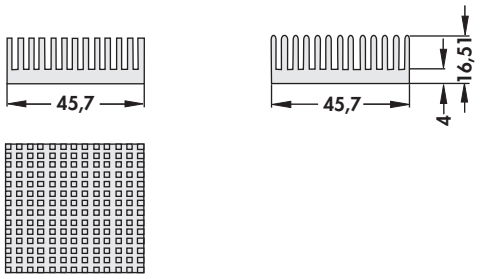
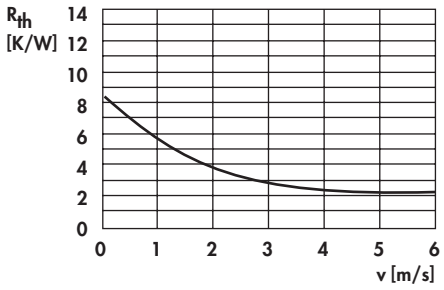
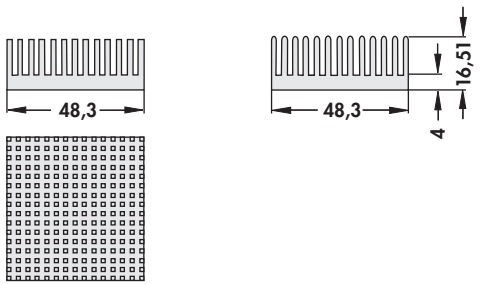
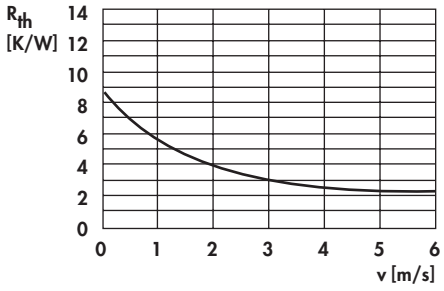
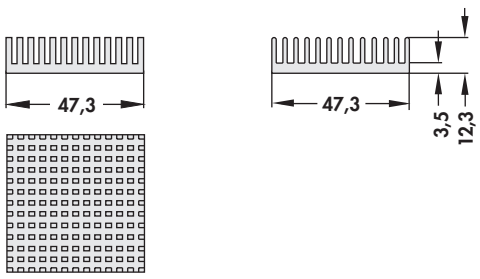
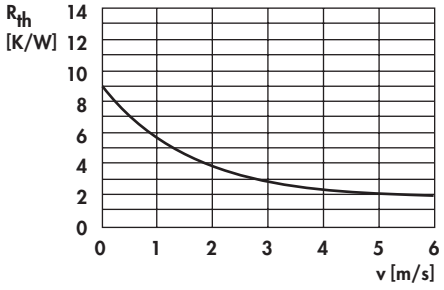
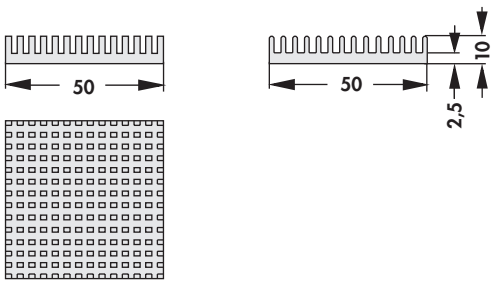
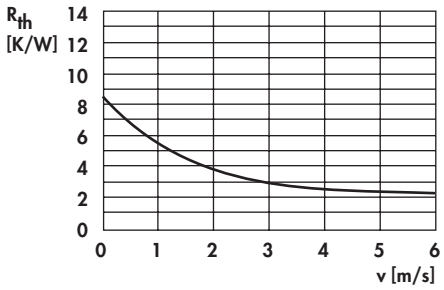
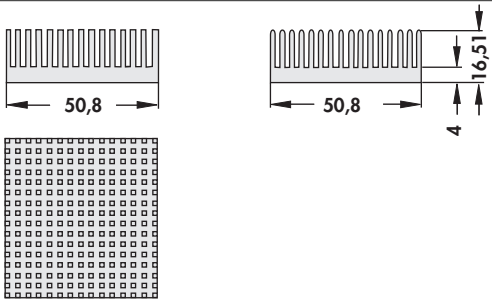
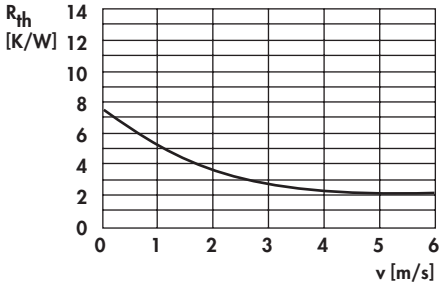
fischer elektronik

Heatsinks for PGA

art. no.			
ICK PGA 16 x 16 x 8 WLF ... 40 x 40			
art. no.			
ICK PGA 16 x 16 x 10 WLF ... 40 x 40			
art. no.			
ICK PGA 16 x 16 x 12 WLF ... 40 x 40			
art. no.			
ICK PGA 17 x 17 WLF ... 43 x 43			
art. no.			
ICK PGA 17 x 17 x 8 WLF ... 43 x 43			
art. no.			
ICK PGA 17 x 17 x 12 WLF ... 43 x 43			

Mounts → E 44 – 48
Heatsinks for PLCC → B 52
Thermal conductive paste → E 21 – 24
Thermal conductive glue → E 23 – 24
Pin heatsinks for IC → B 21 – 27
SMD-heatsinks → B 53 – 54
Heatsinks for PGA → B 11 – 16
Technical introduction → A 2 – 8

Heatsinks for PGA

art. no.		
ICK PGA 18 x 18 WLF ... 45 x 45		
art. no.		
ICK PGA 19 x 19 WLF ... 48 x 48		
art. no.		
ICK PGA 19 x 19 x 12 WLF ... 47 x 47		
art. no.		
ICK PGA 20 x 20 x 10 WLF ... 48 x 48		
art. no.		
ICK PGA 20 x 20 WLF ... 50 x 50		

Mounts → **E 44 – 48**
Heatsinks for PLCC → **B 52**
Thermal conductive paste → **E 21 – 24**
Thermal conductive glue → **E 23 – 24**
Pin heatsinks for IC → **B 21 – 27**
SMD-heatsinks → **B 53 – 54**
Heatsinks for PGA → **B 11 – 16**
Technical introduction → **A 2 – 8**

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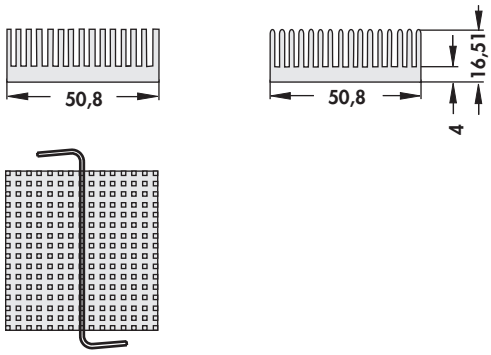
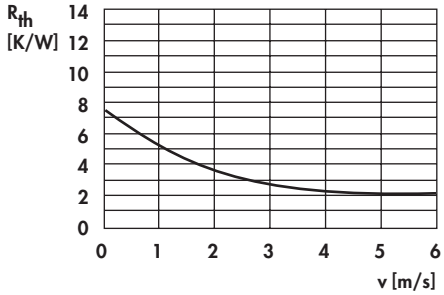
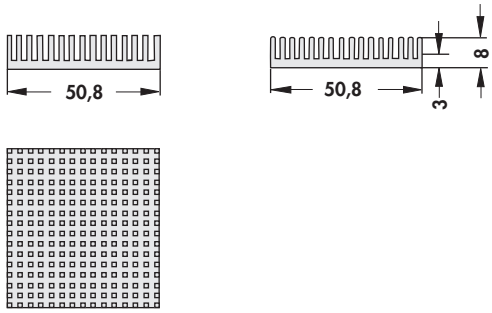
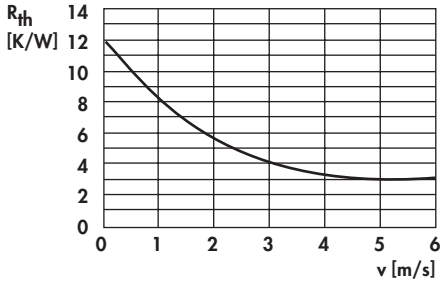
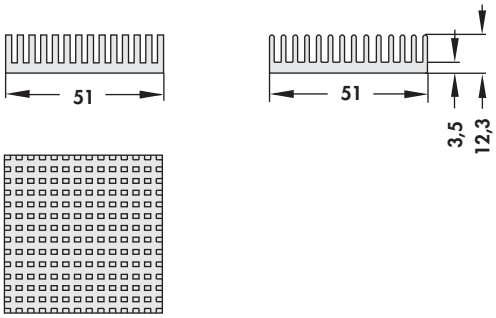
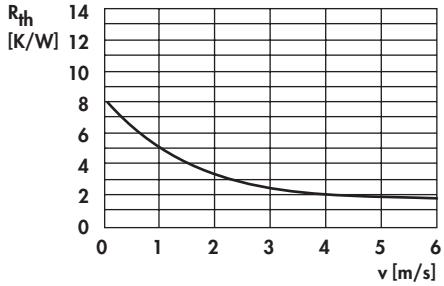
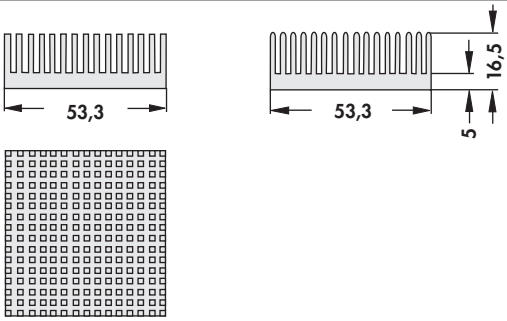
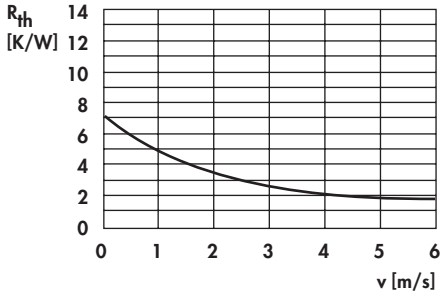
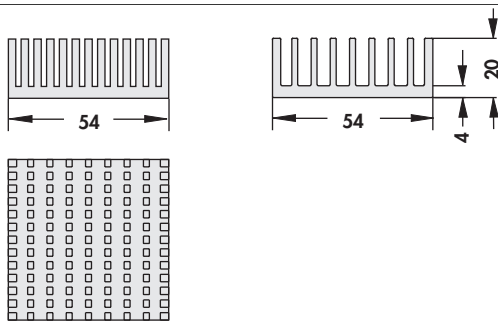
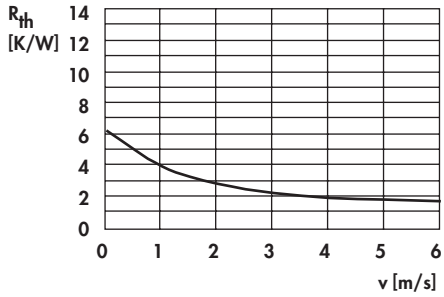
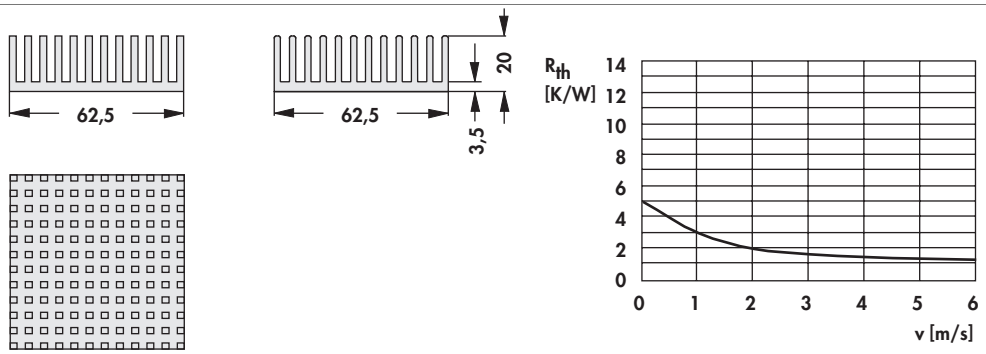
Heatsinks for PGA

art. no.		
ICK PGA 20 x 20 K WLF ... 50 x 50		
with fixing clamp for socket 7 and socket 370		
art. no.		
ICK PGA 20 x 20 x 8 WLF ... 50 x 50		
art. no.		
ICK PGA 20 x 20 x 12 WLF ... 50 x 50		
art. no.		
ICK PGA 21 x 21 WLF ... 53 x 53		
art. no.		
ICK PGA 22 x 22 WLF ... 54 x 54		

Mounts → E 44 – 48
Heatsinks for PLCC → B 52
Thermal conductive paste → E 21 – 24
Thermal conductive glue → E 23 – 24
Pin heatsinks for IC → B 21 – 27
SMD-heatsinks → B 53 – 54
Heatsinks for PGA → B 11 – 16
Technical introduction → A 2 – 8

Heatsinks for PGA

art. no.	
ICK PGA 25 x 25 WLF ... 62 x 62	

Mounts	→ **E 44 – 48**	**Pin heatsinks for IC**	→ **B 21 – 27**
Heatsinks for PLCC	→ **B 52**	**SMD-heatsinks**	→ **B 53 – 54**
Thermal conductive paste	→ **E 21 – 24**	**Heatsinks for PGA**	→ **B 11 – 16**
Thermal conductive glue	→ **E 23 – 24**	**Technical introduction**	→ **A 2 – 8**

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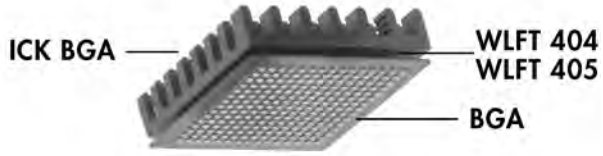
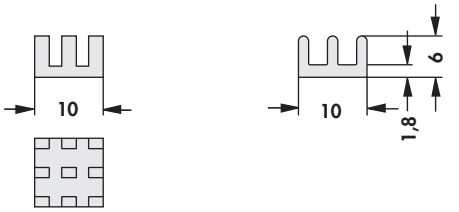
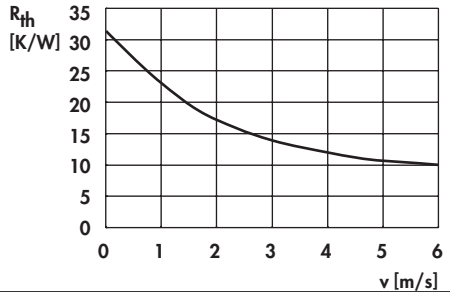
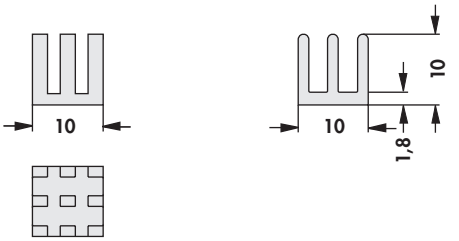
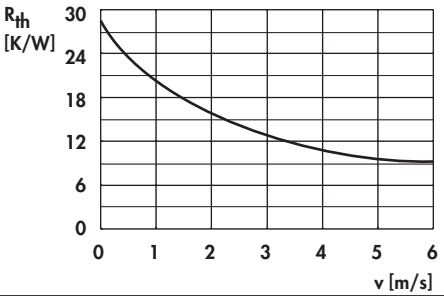
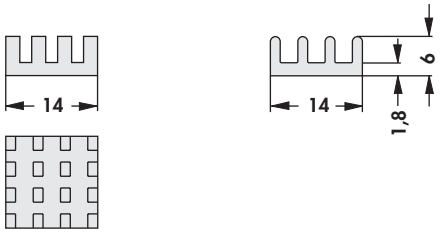
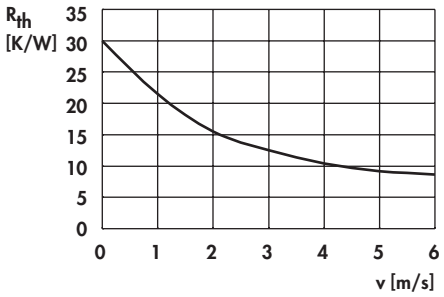
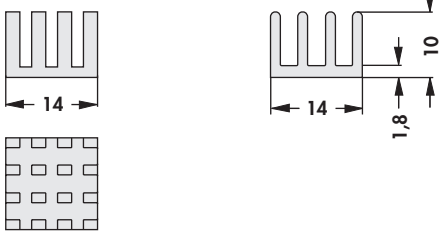
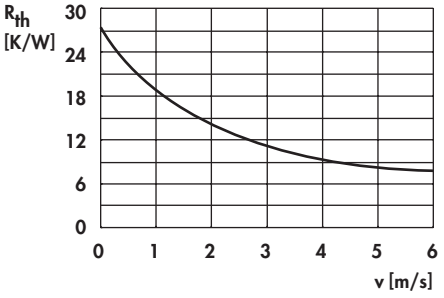
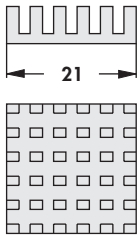
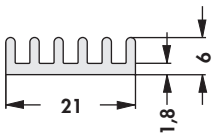
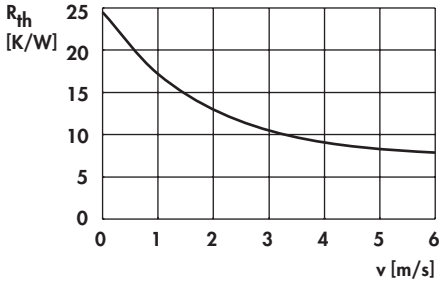
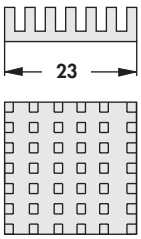
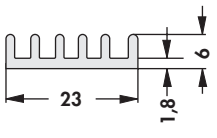
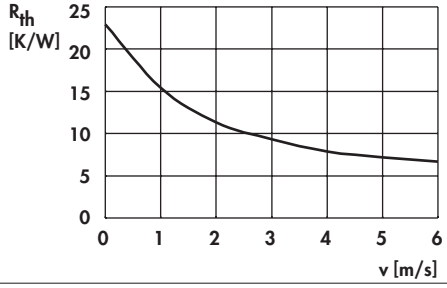
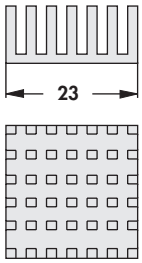
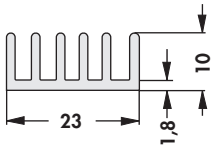
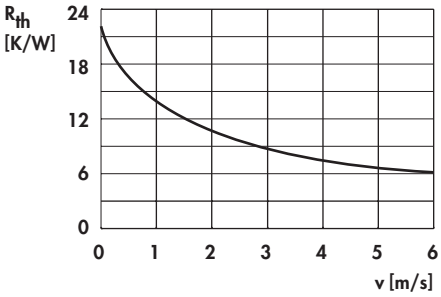
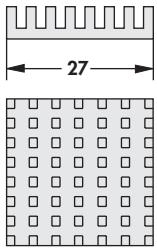
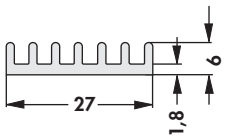
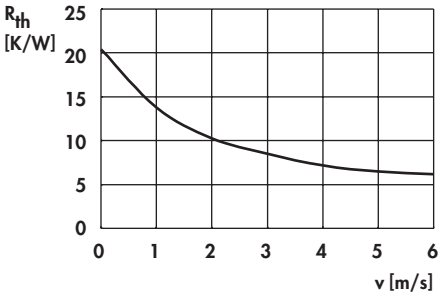
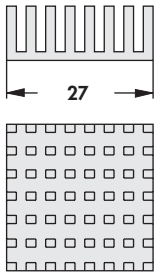
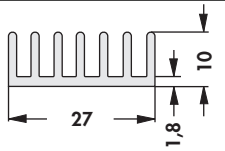
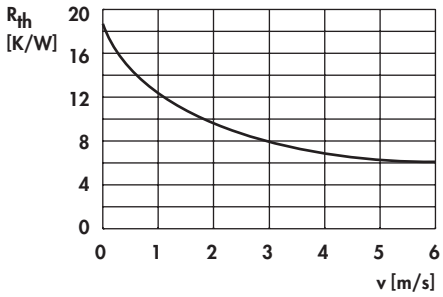
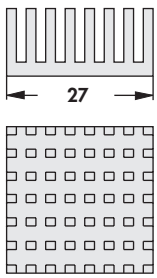
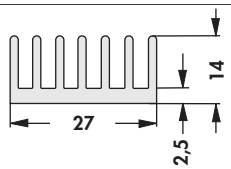
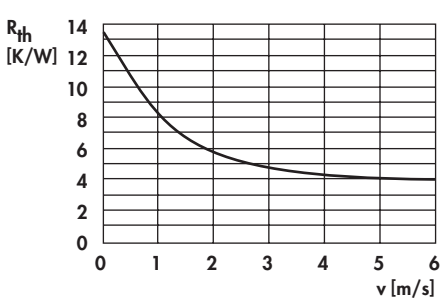
Heatsinks for BGAs



– particularly suited for **B**all **G**rid **A**rrays
– heatsink dimensions match the respective BGA-type
– can be glued directly on the BGA component
– double-sided adhesive thermal conductive foil **WLF ...** → E 7
– **surface:** black anodised

art. no.		
ICK BGA 10 x 10 WLF ... 10 x 10		
art. no.		
ICK BGA 10 x 10 x 10 WLF ... 10 x 10		
art. no.		
ICK BGA 14 x 14 WLF ... 14 x 14		
art. no.		
ICK BGA 14 x 14 x 10 WLF ... 14 x 14		

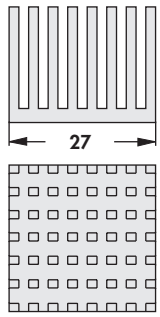
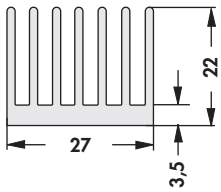
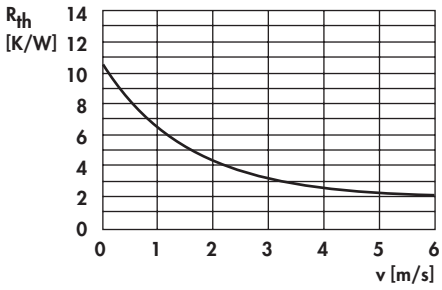
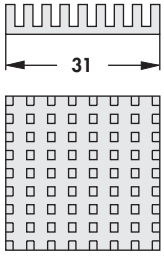
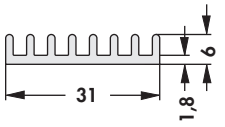
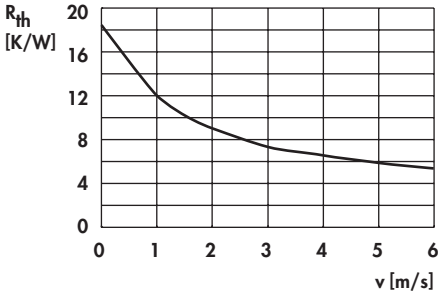
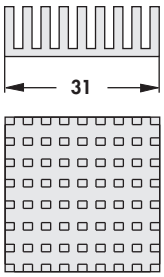
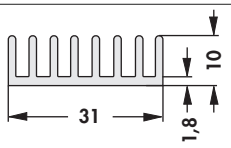
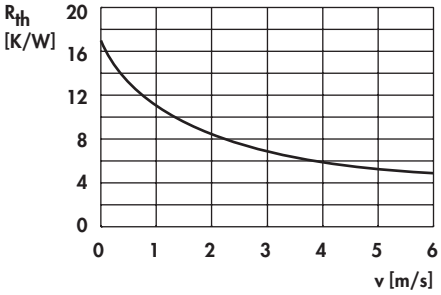
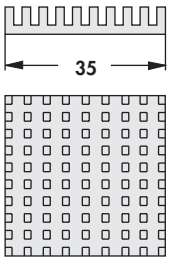
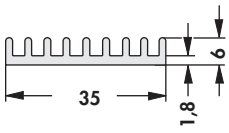
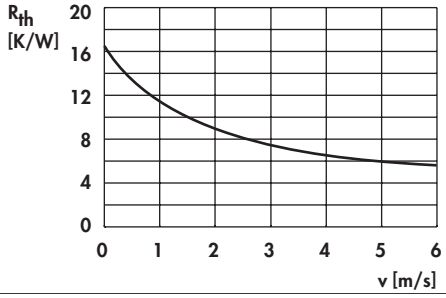
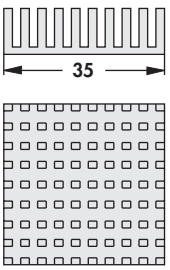
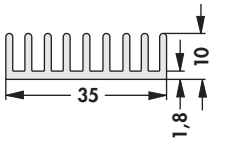
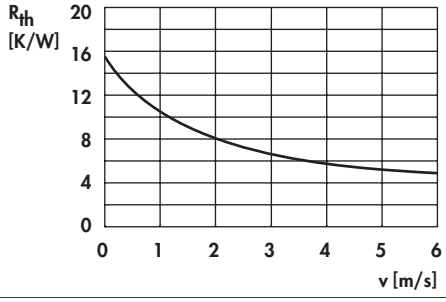
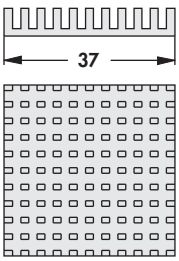
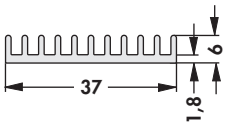
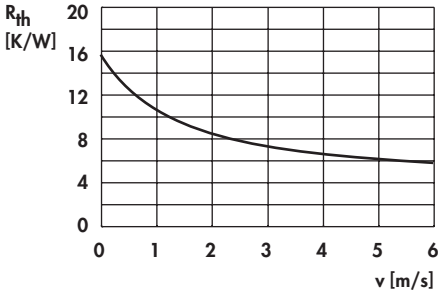
Mounts	→ **E 44 – 48**	**Thermal conductive glue**	→ **E 23 – 24**
SMD-heatsinks	→ **B 53 – 55**	**Hole pattern**	→ **A 21**
Thermally conductive foil	→ **E 5 – 15**	**Processor overview**	→ **B 2 – 10**
Thermal conductive paste	→ **E 21 – 22**	**Technical introduction**	→ **A 2 – 8**

art. no.			
ICK BGA 21 x 21 WLF ... 21 x 21			
art. no.			
ICK BGA 23 x 23 WLF ... 23 x 23			
art. no.			
ICK BGA 23 x 23 x 10 WLF ... 23 x 23			
art. no.			
ICK BGA 27 x 27 WLF ... 27 x 27			
art. no.			
ICK BGA 27 x 27 x 10 WLF ... 27 x 27			
art. no.			
ICK BGA 27 x 27 x 14 WLF ... 27 x 27			

Mounts → E 44 – 48
SMD-heatsinks → B 53 – 55
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Hole pattern → A 21
Processor overview → B 2 – 10
Technical introduction → A 2 – 8

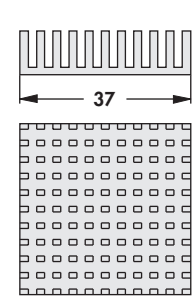
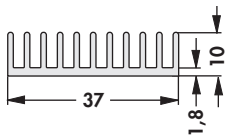
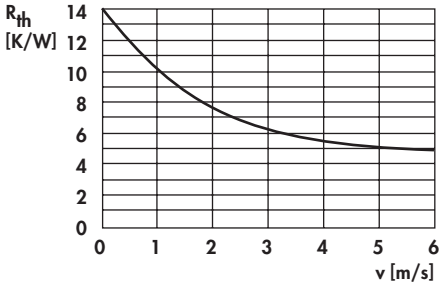
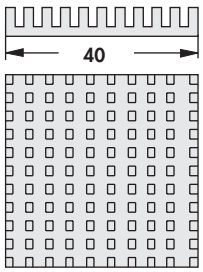
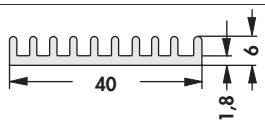
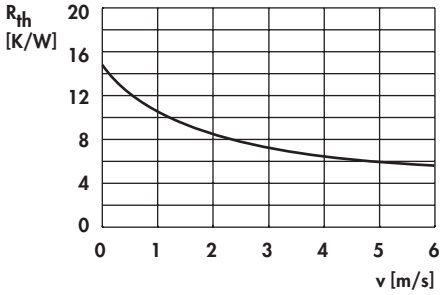
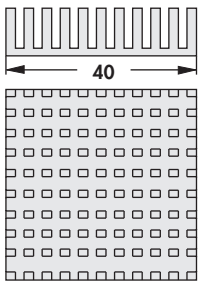
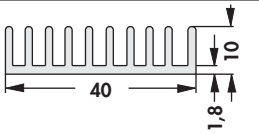
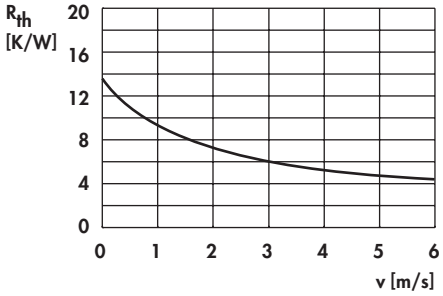
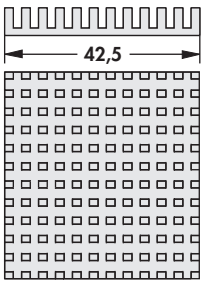
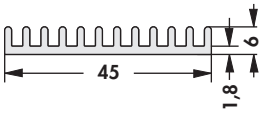
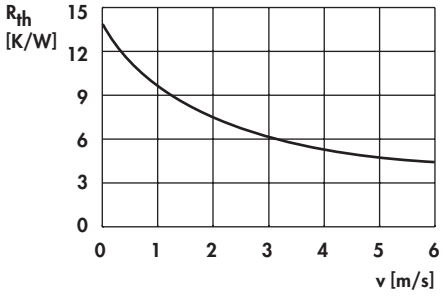
fischer elektronik

Heatsinks for BGAs

art. no.			
ICK BGA 27 x 27 x 22 WLF ... 27 x 27			
art. no.			
ICK BGA 31 x 31 WLF ... 31 x 31			
art. no.			
ICK BGA 31 x 31 x 10 WLF ... 31 x 31			
art. no.			
ICK BGA 35 x 35 WLF ... 35 x 35			
art. no.			
ICK BGA 35 x 35 x 10 WLF ... 35 x 35			
art. no.			
ICK BGA 37 x 37 x 6 WLF ... 37 x 37			

Mounts → E 44 – 48
SMD-heatsinks → B 53 – 55
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Hole pattern → A 21
Processor overview → B 2 – 10
Technical introduction → A 2 – 8

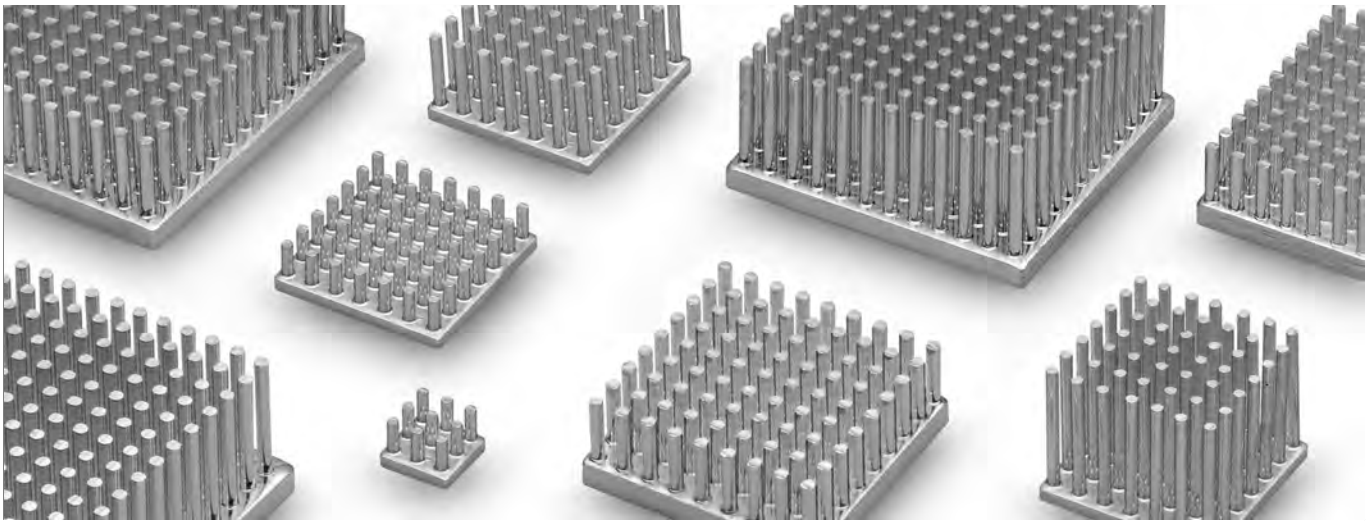
Heatsinks for BGAs

art. no.			
ICK BGA 37 x 37 x 10 WLF ... 37 x 37			
art. no.			
ICK BGA 40 x 40 WLF ... 40 x 40			
art. no.			
ICK BGA 40 x 40 x 10 WLF ... 40 x 40			
art. no.			
ICK BGA 42,5 x 45 WLF ... 42,5 x 45			

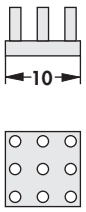
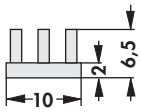
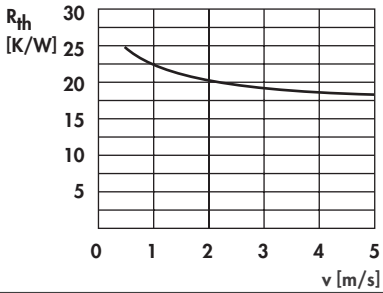
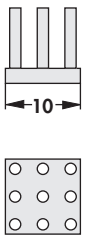
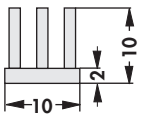
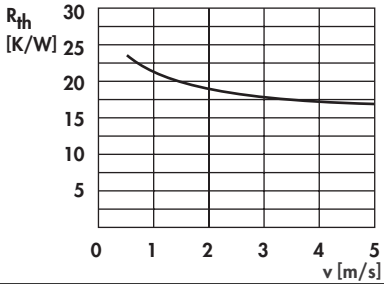
Mounts → E 44 – 48
SMD-heatsinks → B 53 – 55
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Hole pattern → A 21
Processor overview → B 2 – 10
Technical introduction → A 2 – 8

fischer elektronik

Pin heatsinks



- arrangement and number of pins for optimum air flow
- suitable for forced and free convection
- excellent thermal conductivity by the alloy material (Al99,5; 220 W/mK) and homogeneous arrangement of materials
- constant heat dissipation in the base and the pins in the direction of heat flow
- low weight achieved by optimised geometry
- components fastened using glue, adhesive foil or clamps
- customer-specific modifications and special designs
- other pin-lengths and surfaces on request
- **surface:** Al-natural

art. no.			
ICK S 10 x 10 x 6,5 WLF ... 10 x 10 weight: 1g			
art. no.			
ICK S 10 x 10 x 10 WLF ... 10 x 10 weight: 1g			
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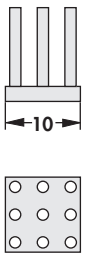
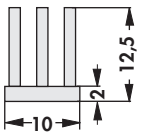
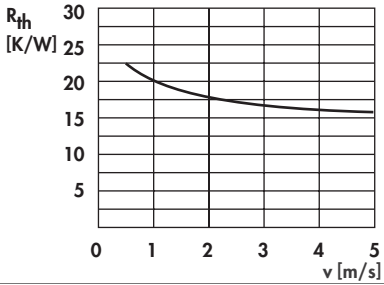
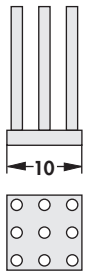
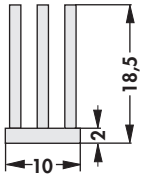
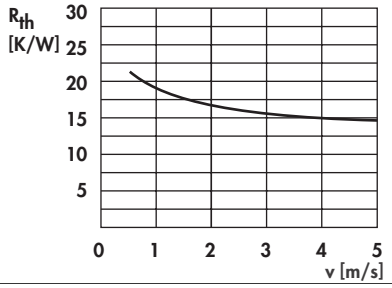
ICK S 10 x 10 x 12,5 WLF ... 10 x 10 weight: 1.3g			

Processor overview	→ **B 2 – 10**	**Thermal conductive paste**	→ **E 21 – 22**
Mounts	→ **E 44 – 48**	**Thermal conductive glue**	→ **E 23 – 24**
SMD-heatsinks	→ **B 53 – 55**	**Heatsinks for LEDs**	→ **B 35 – 48**
Thermally conductive foil	→ **E 5 – 15**	**Technical introduction**	→ **A 2 – 8**

Pin heatsinks

art. no.			
ICK S 10 x 10 x 18,5 WLF ... 10 x 10 weight: 1.3g			
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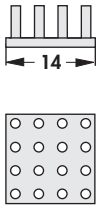
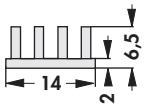
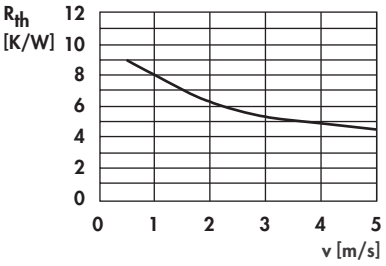
ICK S 14 x 14 x 6,5 WLF ... 14 x 14 weight: 1.5g			
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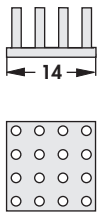
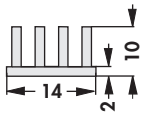
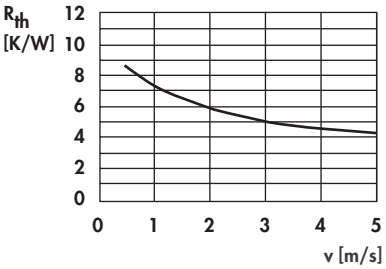
ICK S 14 x 14 x 10 WLF ... 14 x 14 weight: 1.9g			
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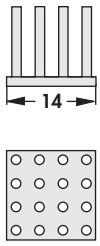
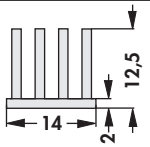
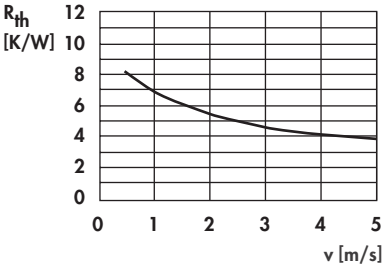
ICK S 14 x 14 x 12,5 WLF ... 14 x 14 weight: 2g			
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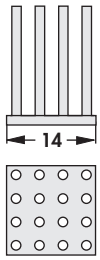
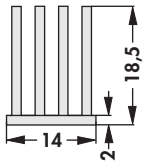
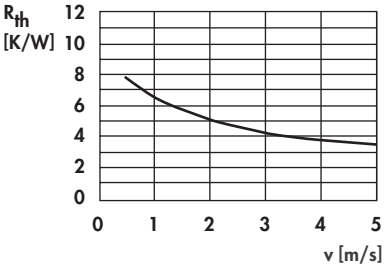
ICK S 14 x 14 x 18,5 WLF ... 14 x 14 weight: 2.4g			
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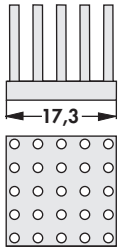
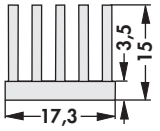
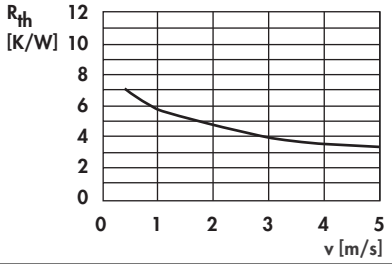
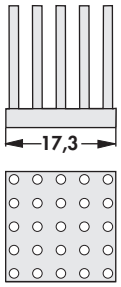
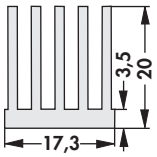
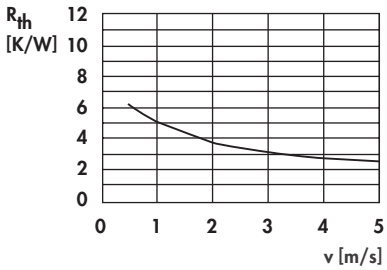
ICK S 17 x 17 x 15 WLF ... 17 x 17 weight: 4.7g			

Processor overview → **B 2 – 10**
Mounts → **E 44 – 48**
SMD-heatsinks → **B 53 – 55**
Thermally conductive foil → **E 5 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Heatsinks for LEDs → **B 35 – 48**
Technical introduction → **A 2 – 8**

fischer elektronik

Pin heatsinks

art. no.			
ICK S 17 x 17 x 20 WLF ... 17 x 17 weight: 5.6g			
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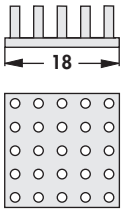
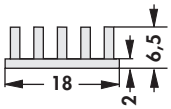
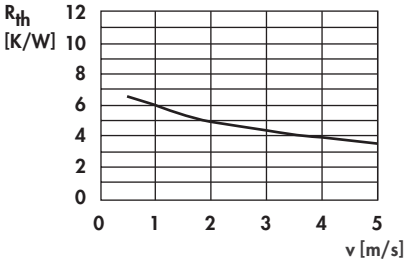
ICK S 18 x 18 x 6,5 WLF ... 18 x 18 weight: 2.5g			
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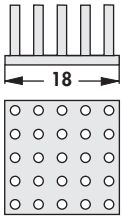
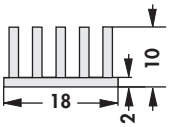
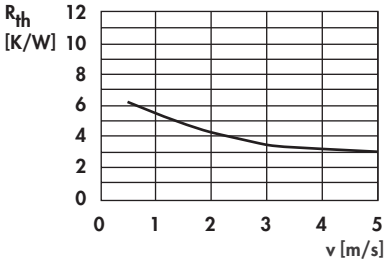
ICK S 18 x 18 x 10 WLF ... 18 x 18 weight: 3.1g			
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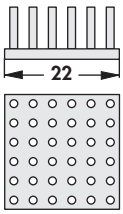
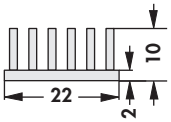
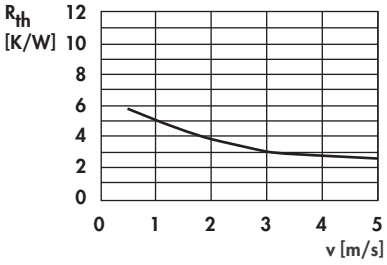
ICK S 22 x 22 x 10 WLF ... 22 x 22 weight: 4g			
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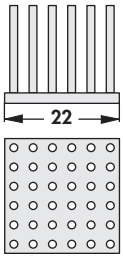
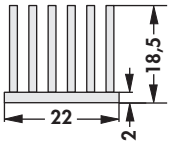
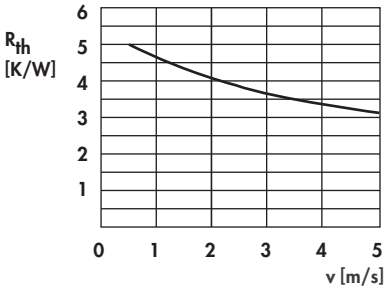
ICK S 22 x 22 x 18,5 WLF ... 22 x 22 weight: 5.4g			
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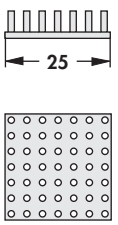
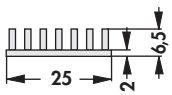
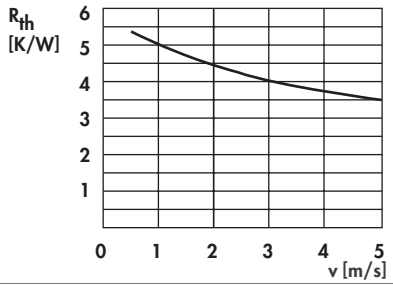
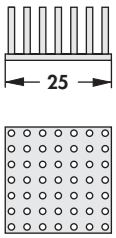
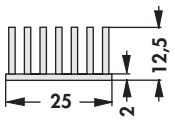
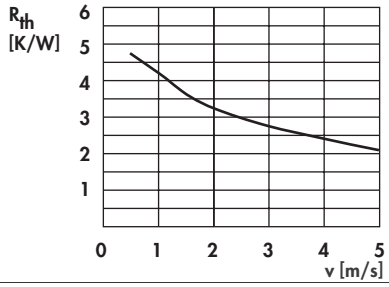
ICK S 25 x 25 x 6,5 WLF ... 25 x 25 weight: 4g			

Processor overview	→ **B 2 – 10**	**Thermal conductive paste**	→ **E 21 – 22**
Mounts	→ **E 44 – 48**	**Thermal conductive glue**	→ **E 23 – 24**
SMD-heatsinks	→ **B 53 – 55**	**Heatsinks for LEDs**	→ **B 35 – 48**
Thermally conductive foil	→ **E 5 – 15**	**Technical introduction**	→ **A 2 – 8**

Pin heatsinks

art. no.			
ICK S 25 x 25 x 12,5 WLF ... 25 x 25 weight: 6g			
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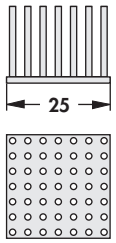
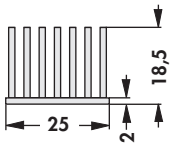
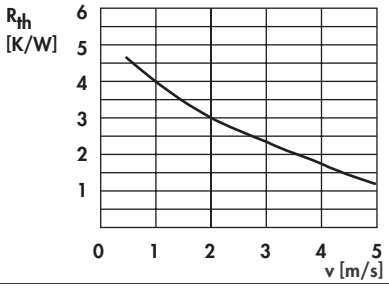
ICK S 25 x 25 x 18,5 WLF ... 25 x 25 weight: 7g			
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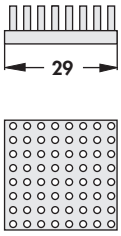
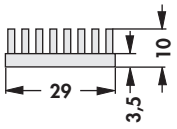
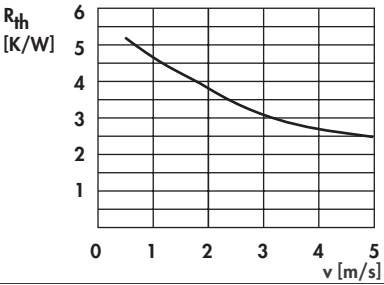
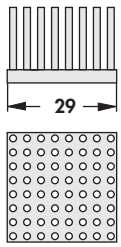
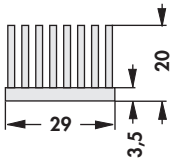
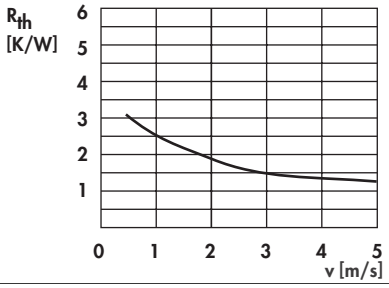
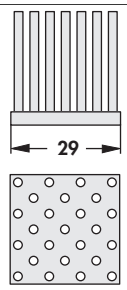
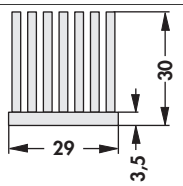
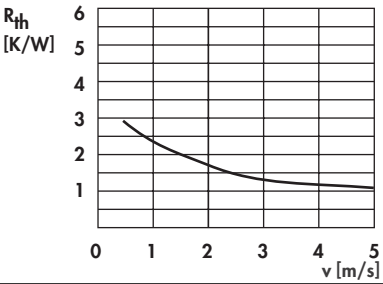
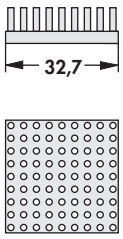
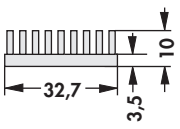
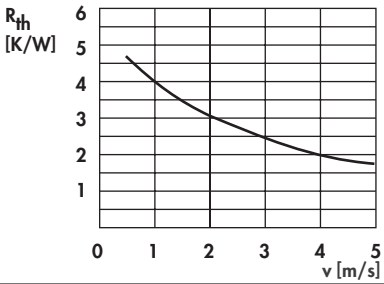
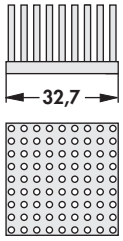
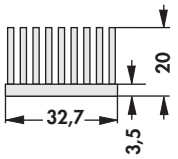
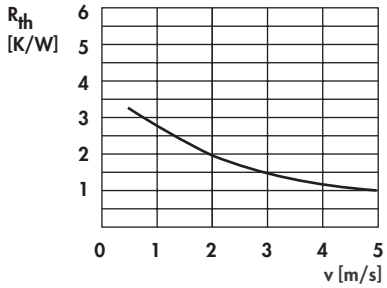
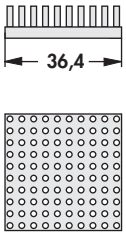
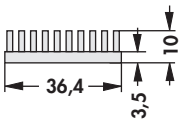
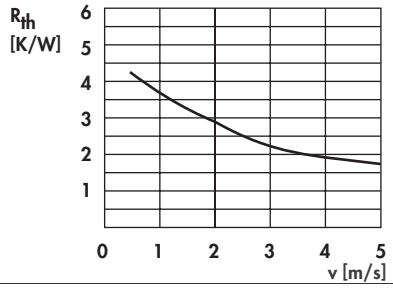
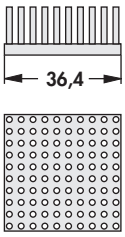
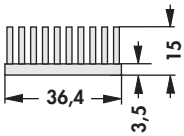
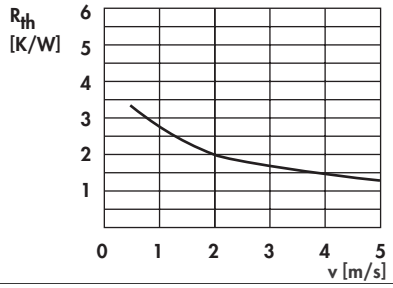
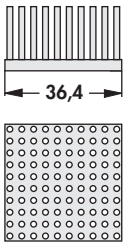
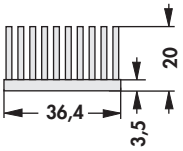
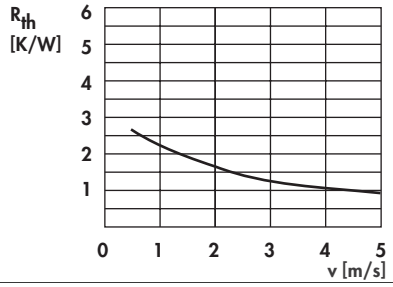
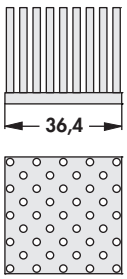
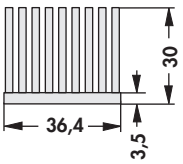
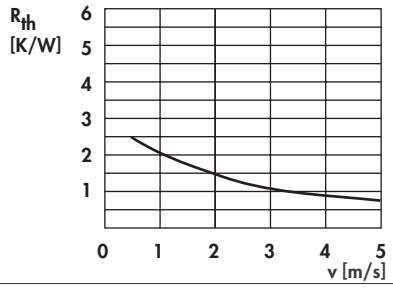
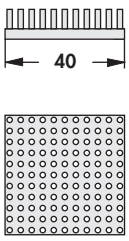
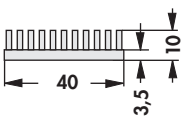
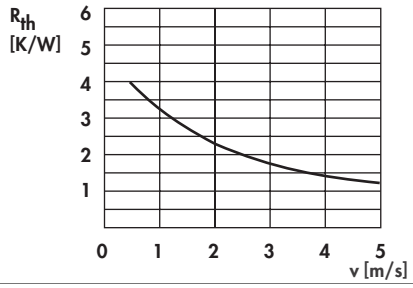
ICK S 29 x 29 x 10 WLF ... 29 x 29 weight: 11g			
art. no.			
ICK S 29 x 29 x 20 WLF ... 29 x 29 weight: 15g			
art. no.			
ICK S 29 x 29 x 30 WLF ... 29 x 29 weight: 15.4g			
art. no.			
ICK S 32 x 32 x 10 WLF ... 32 x 32 weight: 14g			

Processor overview → **B 2 – 10**
Mounts → **E 44 – 48**
SMD-heatsinks → **B 53 – 55**
Thermally conductive foil → **E 5 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Heatsinks for LEDs → **B 35 – 48**
Technical introduction → **A 2 – 8**

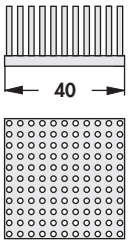
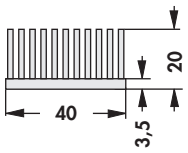
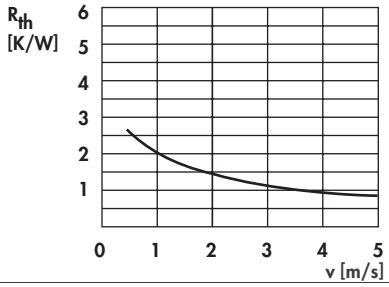
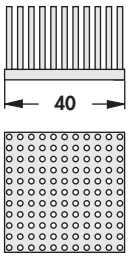
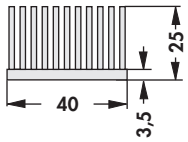
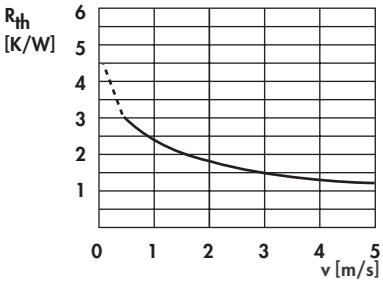
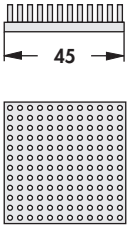
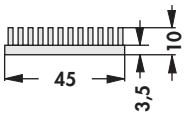
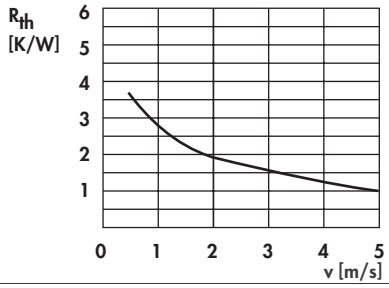
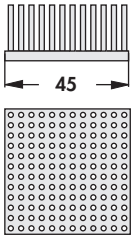
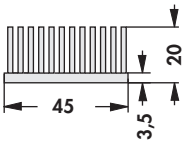
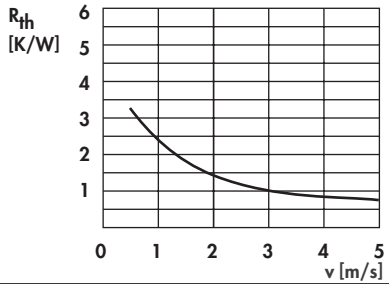
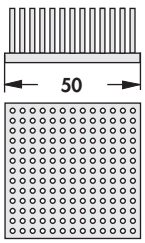
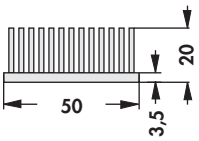
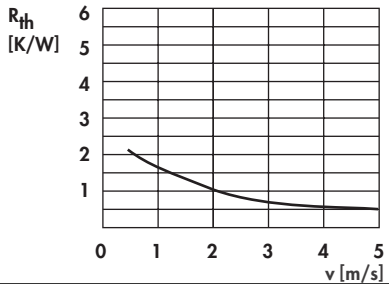
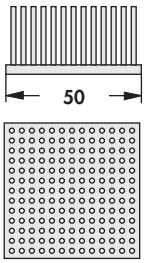
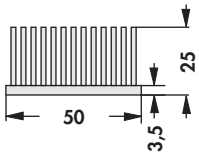
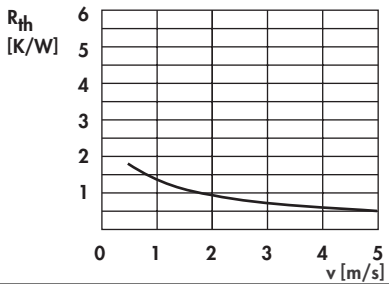
fischer elektronik

Pin heatsinks

art. no.			
ICK S 32 x 32 x 20 WLF ... 32 x 32 weight: 19g			
art. no.			
ICK S 36 x 36 x 10 WLF ... 36 x 36 weight: 17g			
art. no.			
ICK S 36 x 36 x 15 WLF ... 36 x 36 weight: 20g			
art. no.			
ICK S 36 x 36 x 20 WLF ... 36 x 36 weight: 24g			
art. no.			
ICK S 36 x 36 x 30 WLF ... 36 x 36 weight: 24.4g			
art. no.			
ICK S 40 x 40 x 10 WLF ... 40 x 40 weight: 21g			

Processor overview	→ B 2 – 10	Thermal conductive paste	→ E 21 – 22
Mounts	→ E 44 – 48	Thermal conductive glue	→ E 23 – 24
SMD-heatsinks	→ B 53 – 55	Heatsinks for LEDs	→ B 35 – 48
Thermally conductive foil	→ E 5 – 15	Technical introduction	→ A 2 – 8

Pin heatsinks

art. no.			
ICK S 40 x 40 x 20 WLF ... 40 x 40 weight: 29g			
art. no.			
ICK S 40 x 40 x 25 WLF ... 40 x 40 weight: 37g			
art. no.			
ICK S 45 x 45 x 10 WLF ... 45 x 45 weight: 26g			
art. no.			
ICK S 45 x 45 x 20 WLF ... 45 x 45 weight: 36g			
art. no.			
ICK S 50 x 50 x 20 WLF ... 50 x 50 weight: 43g			
art. no.			
ICK S 50 x 50 x 25 WLF ... 50 x 50 weight: 49g			

Processor overview → B 2 – 10
Mounts → E 44 – 48
SMD-heatsinks → B 53 – 55
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Heatsinks for LEDs → B 35 – 48
Technical introduction → A 2 – 8

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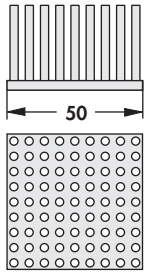
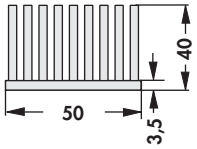
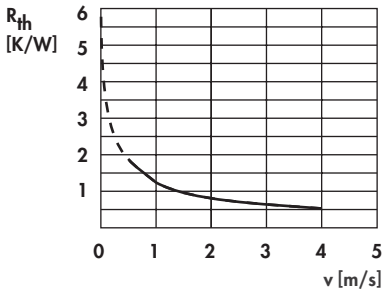
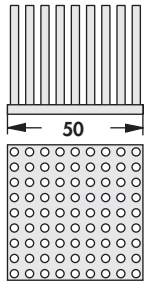
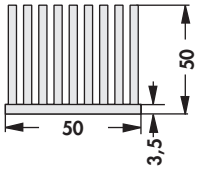
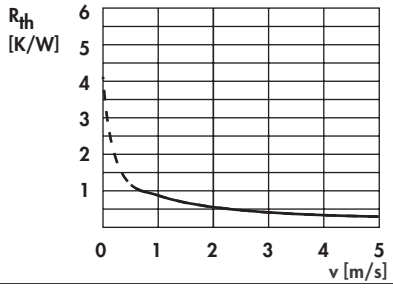
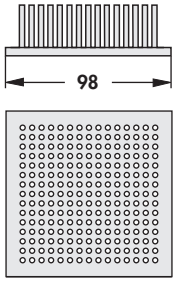
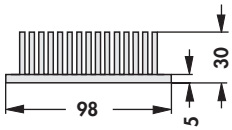
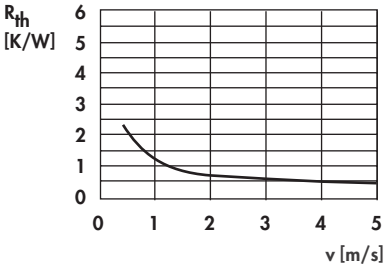
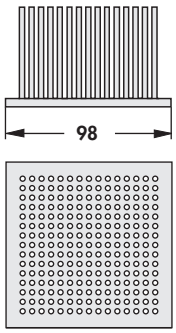
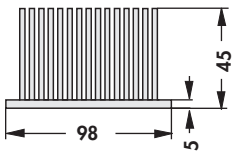
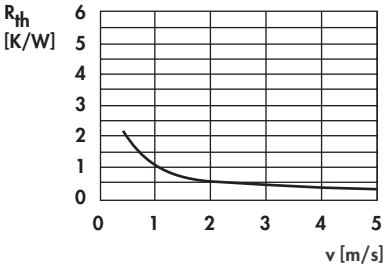
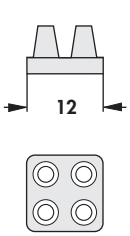
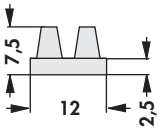
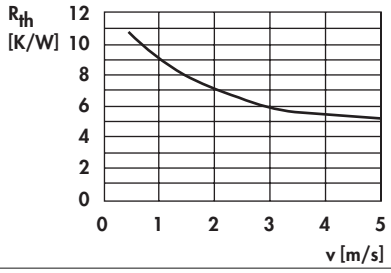
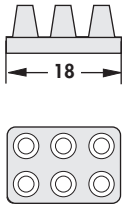
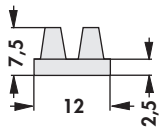
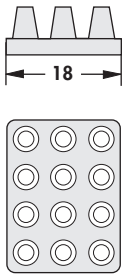
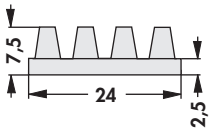
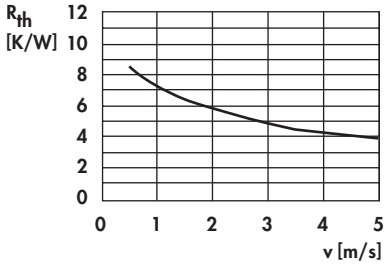
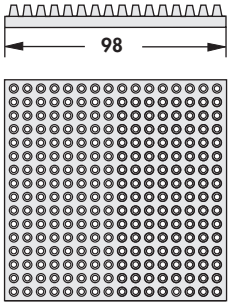
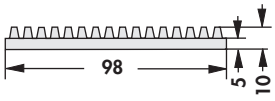
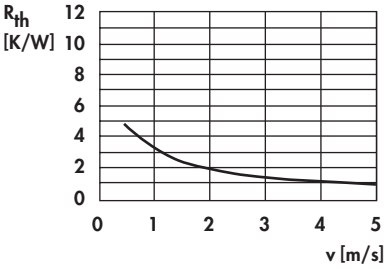
Pin heatsinks

art. no.			
ICK S 50 x 50 x 40 WLF ... 50 x 50 weight: 80.05g			
art. no.			
ICK S 50 x 50 x 50 WLF ... 50 x 50 weight: 95.51g			
art. no.			
ICK S 98 x 98 x 30 WLF ... 98 x 98 weight: nullg			
art. no.			
ICK S 98 x 98 x 45 WLF ... 98 x 98 weight: 301.3g			

Processor overview	→ B 2 – 10	Thermal conductive paste	→ E 21 – 22
Mounts	→ E 44 – 48	Thermal conductive glue	→ E 23 – 24
SMD-heatsinks	→ B 53 – 55	Heatsinks for LEDs	→ B 35 – 48
Thermally conductive foil	→ E 5 – 15	Technical introduction	→ A 2 – 8

Dome

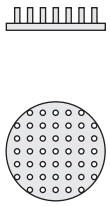
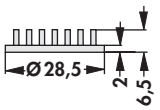
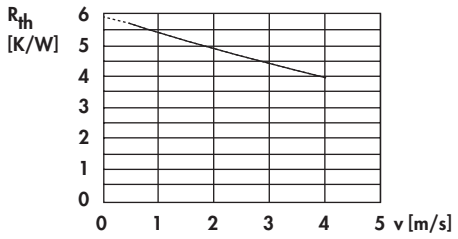
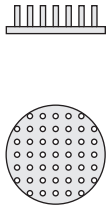
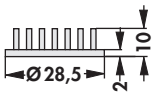
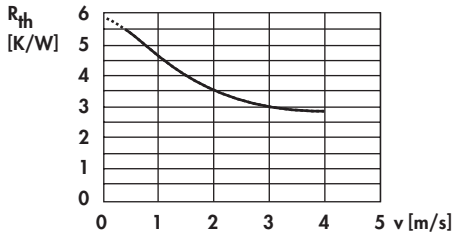
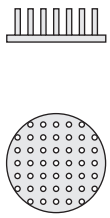
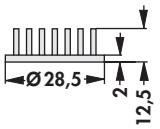
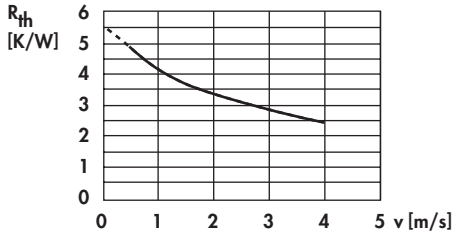
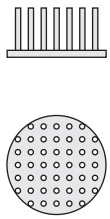
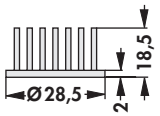
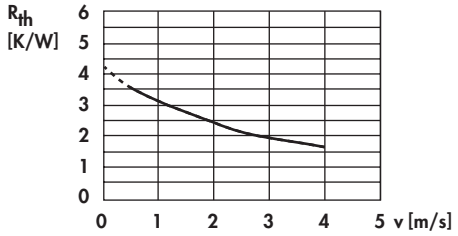
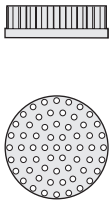
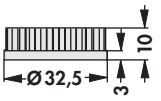
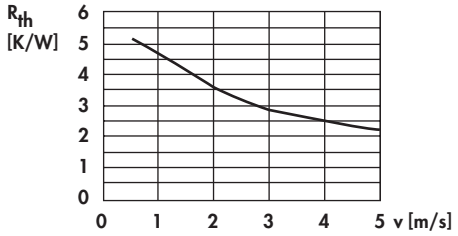
art. no.			
ICK S D 12 x 12 x 7,5 WLF ... 12 x 12 weight: 1.8g			
art. no.			
ICK S D 18 x 12 x 7,5 WLF ... 12 x 18 weight: 2.7g			
art. no.			
ICK S D 24 x 18 x 7,5 WLF ... 18 x 24 weight: 4.4g			
art. no.			
ICK S D 98 x 98 x 10 WLF ... 98 x 98 weight: 154g			

Processor overview → B 2 – 10
Mounts → E 44 – 48
SMD-heatsinks → B 53 – 55
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Heatsinks for LEDs → B 35 – 48
Technical introduction → A 2 – 8

fischer elektronik

Pin heatsinks

Round

art. no.			
ICK S R 28,5 x 6,5 WLF ... D 28,5 weight: 4.41g			
art. no.			
ICK S R 28,5 x 10 WLF ... D 28,5 weight: 5.16g			
art. no.			
ICK S R 28,5 x 12,5 WLF ... D 28,5 weight: 5.7g			
art. no.			
ICK S R 28,5 x 18,5 WLF ... D 28,5 weight: 6.98g			
art. no.			
ICK S R 32,5 x 10 WLF ... D 32 weight: 9.7g			
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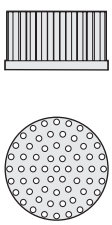
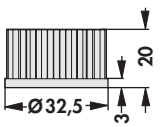
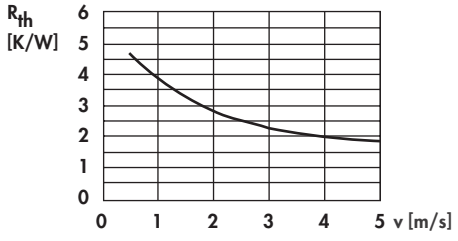
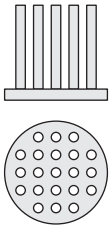
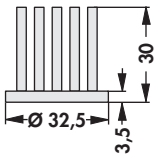
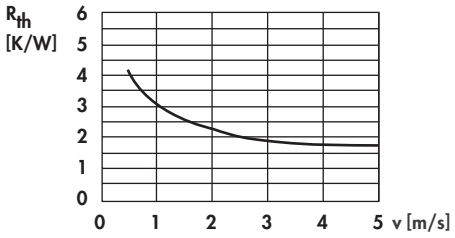
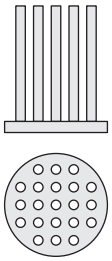
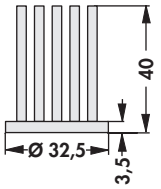
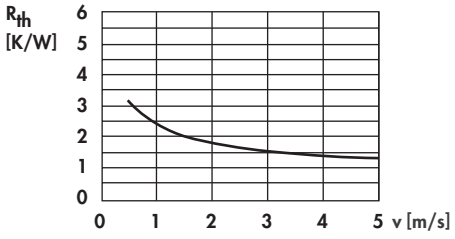
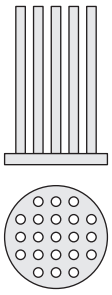
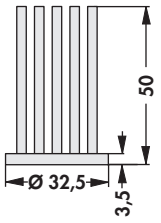
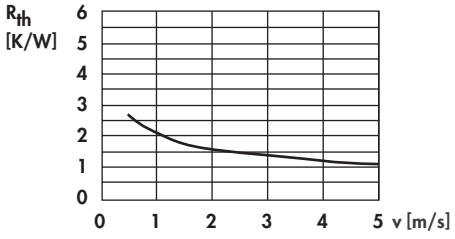
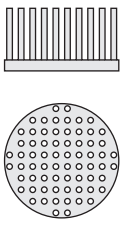
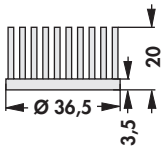
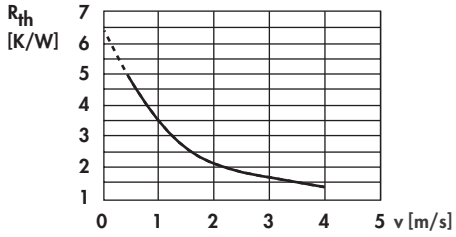
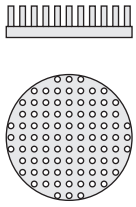
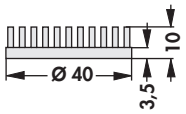
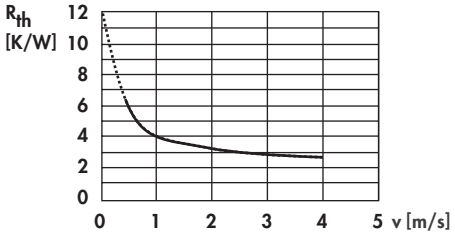
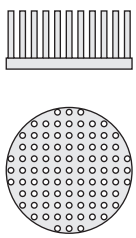
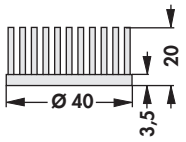
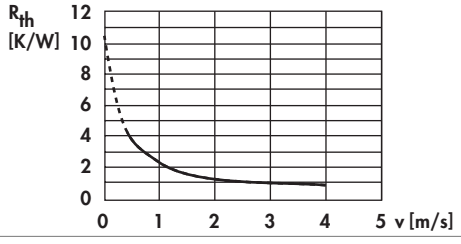
ICK S R 32,5 x 20 WLF ... D 32 weight: 13.8g			

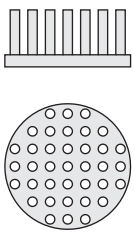
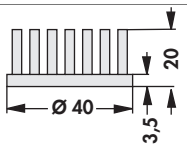
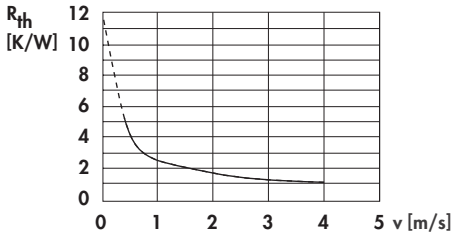
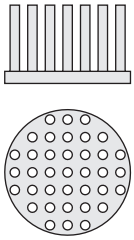
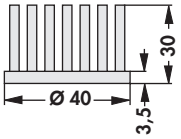
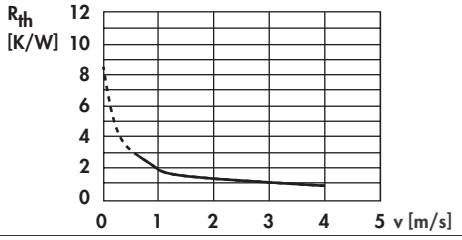
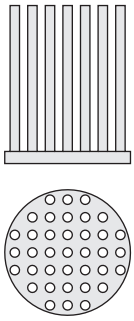
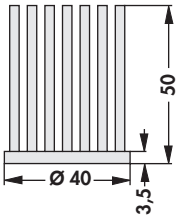
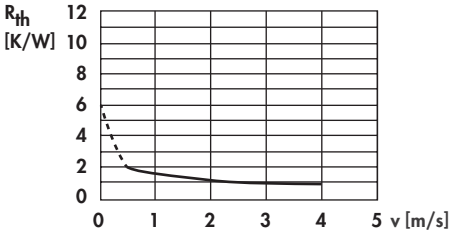
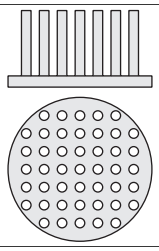
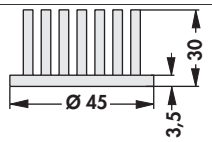
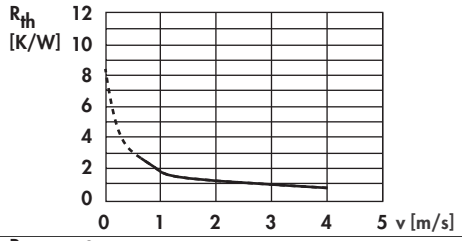
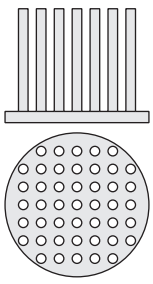
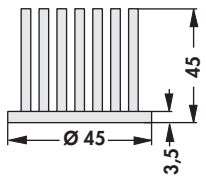
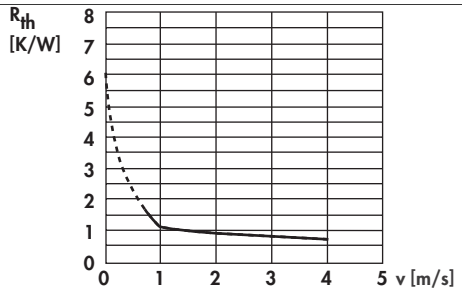
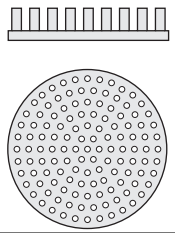
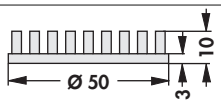
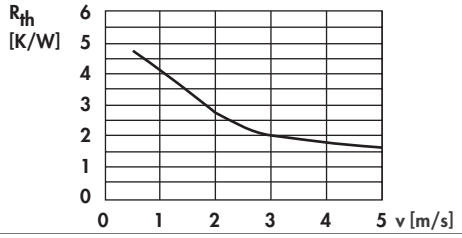
Thermal conductive glue → E 23 – 24
Thermal conductive paste → E 21 – 22
SMD-heatsinks → B 53 – 55
Processor overview → B 2 – 8
Mounting material for semiconduct. → E 44 – 48
Thermally conductive foil → E 5 – 15
Heatsinks for LEDs → B 35 – 51
Technical introduction → A 2 – 8

art. no.			
ICK S R 32,5 x 30 WLF ... D 32 weight: 20.6g			
art. no.			
ICK S R 32,5 x 40 WLF ... D 32 weight: 24.61g			
art. no.			
ICK S R 32,5 x 50 WLF ... D 32 weight: 28.62g			
art. no.			
ICK S R 36,5 x 20 WLF ... D 36,5 weight: 17.59g			
art. no.			
ICK S R 40 x 10 WLF ... D 40 weight: 15.85g			
art. no.			
ICK S R 40 x 20 WLF ... D 40 weight: 21.96g			

Thermal conductive glue → **E 23 – 24**
Thermal conductive paste → **E 21 – 22**
SMD-heatsinks → **B 53 – 55**
Processor overview → **B 2 – 8**
Mounting material for semiconduct. → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Heatsinks for LEDs → **B 35 – 51**
Technical introduction → **A 2 – 8**

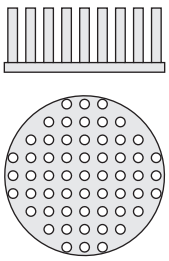
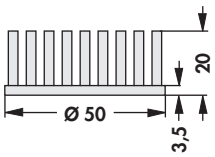
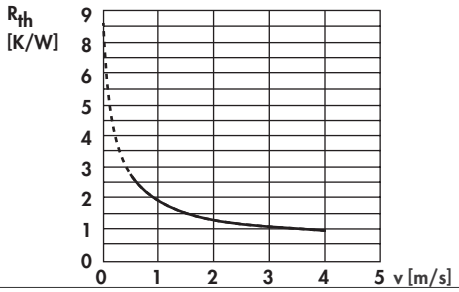
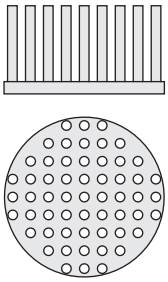
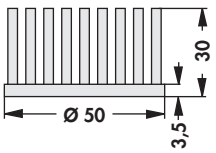
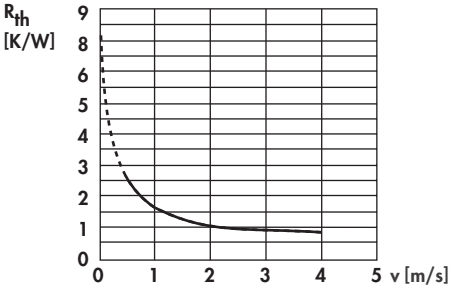
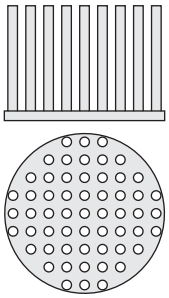
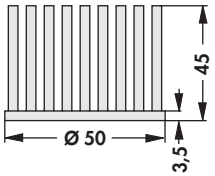
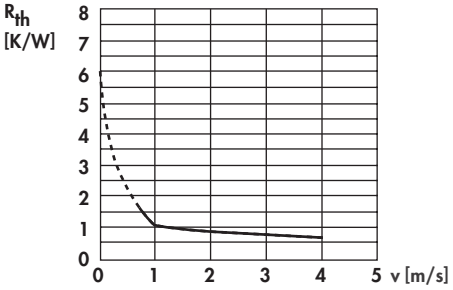
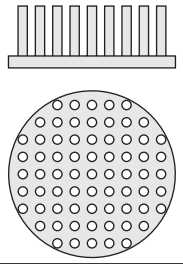
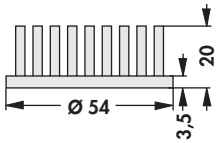
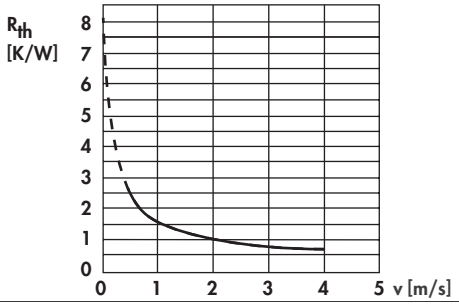
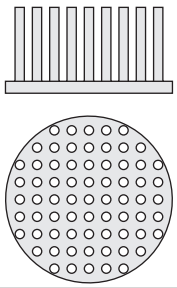
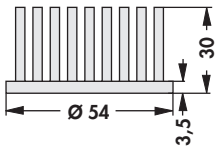
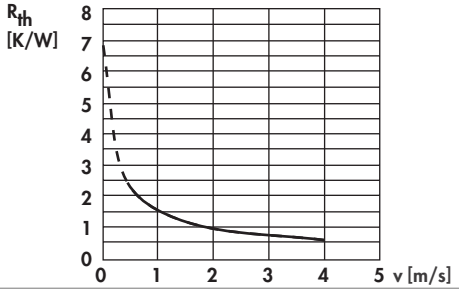
fischer elektronik

Pin heatsinks

art. no.			
ICK S R A 40 x 20 WLF ... D 40 weight: 22.18g			
art. no.			
ICK S R 40 x 30 WLF ... D 40 weight: 29.24g			
art. no.			
ICK S R 40 x 50 WLF ... D 40 weight: 47.96g			
art. no.			
ICK S R 45 x 30 WLF ... D 45 weight: 37.78g			
art. no.			
ICK S R 45 x 45 WLF ... D 45 weight: 50.67g			
art. no.			
ICK S R 50 x 10 WLF ... D 50 weight: 22g			

Thermal conductive glue → E 23 – 24
Thermal conductive paste → E 21 – 22
SMD-heatsinks → B 53 – 55
Processor overview → B 2 – 8
Mounting material for semiconduct. → E 44 – 48
Thermally conductive foil → E 5 – 15
Heatsinks for LEDs → B 35 – 51
Technical introduction → A 2 – 8

Pin heatsinks

art. no.			
ICK S R 50 x 20 WLF ... D 50 weight: 34.39g			
ICK S R 50 x 30 WLF ... D 50 weight: 45.28g			
ICK S R 50 x 45 WLF ... D 50 weight: 61.59g			
ICK S R 54 x 20 WLF ... D 54 weight: 40.94g			
ICK S R 54 x 30 WLF ... D 54 weight: 54.11g			

Thermal conductive glue → **E 23 – 24**
Thermal conductive paste → **E 21 – 22**
SMD-heatsinks → **B 53 – 55**
Processor overview → **B 2 – 8**
Mounting material for semiconduct. → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Heatsinks for LEDs → **B 35 – 51**
Technical introduction → **A 2 – 8**

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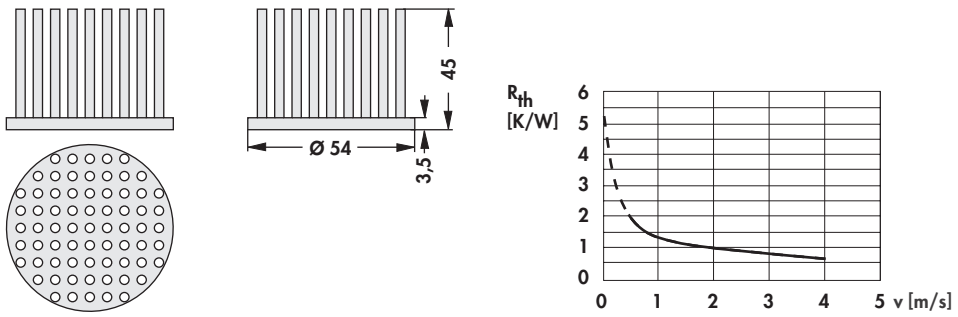
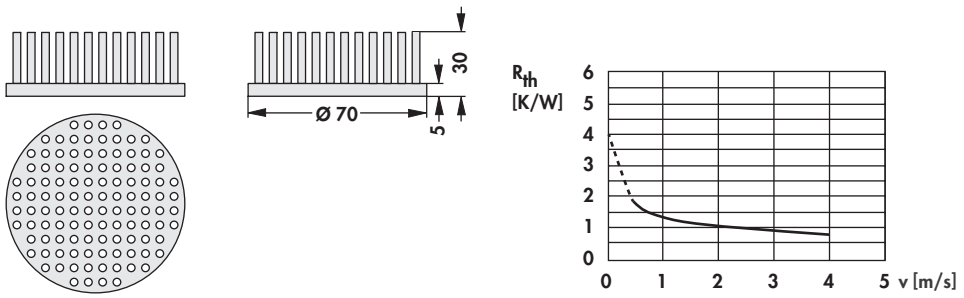
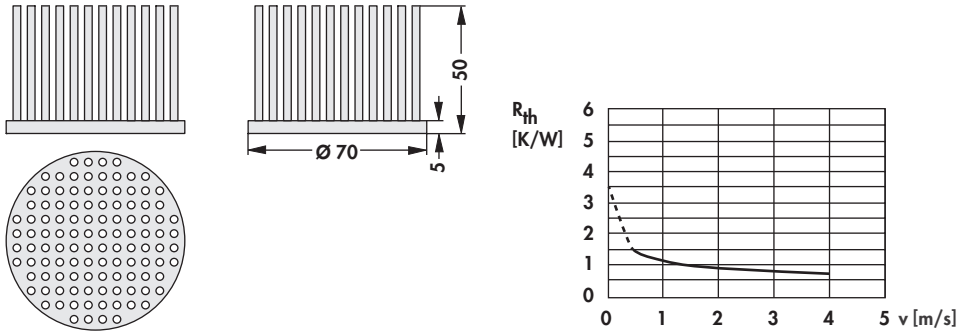
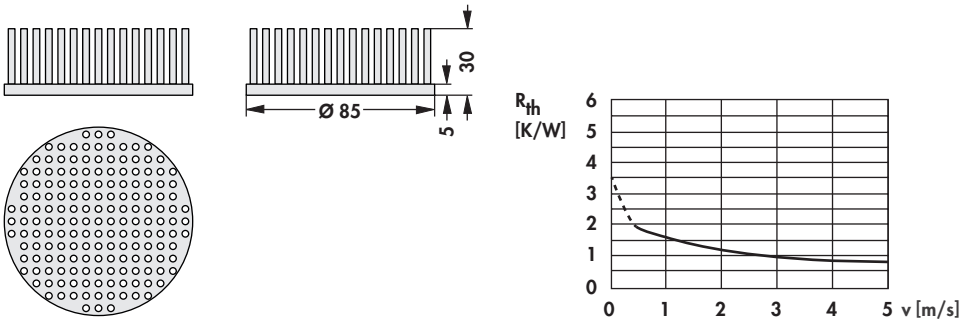
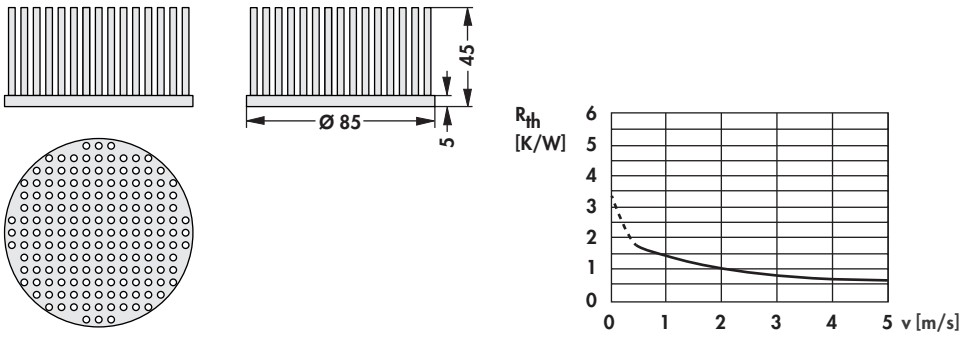
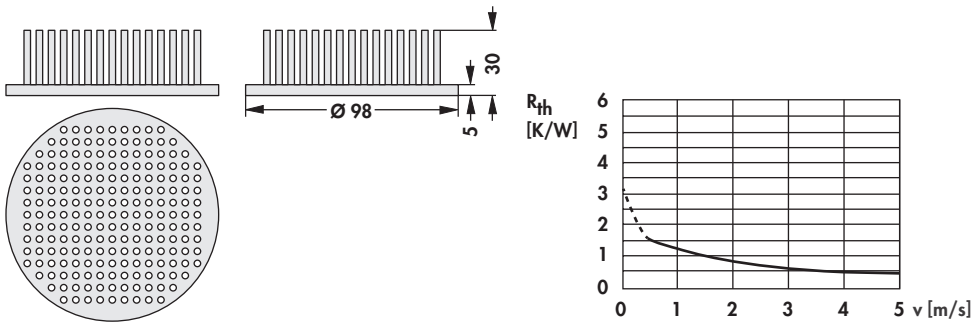
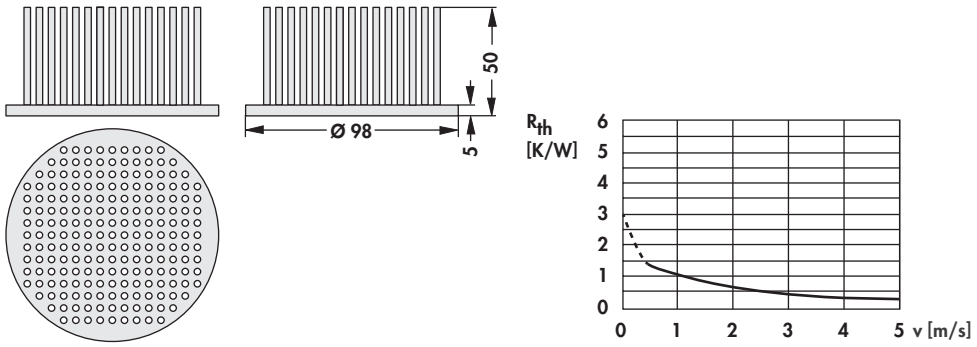
Pin heatsinks

art. no.	
ICK S R 54 x 45 WLF ... D 54 weight: 73.86g	
art. no.	
ICK S R 70 x 30 WLF ... D 70 weight: 92.8g	
art. no.	
ICK S R 70 x 50 WLF ... D 70 weight: 135.56g	
art. no.	
ICK S R 85 x 30 WLF ... D 85 weight: nullg	
art. no.	
ICK S R 85 x 45 WLF ... D 85 weight: nullg	

Thermal conductive glue	→ E 23 – 24	Mounting material for semiconduct.	→ E 44 – 48
Thermal conductive paste	→ E 21 – 22	Thermally conductive foil	→ E 5 – 15
SMD-heatsinks	→ B 53 – 55	Heatsinks for LEDs	→ B 35 – 51
Processor overview	→ B 2 – 8	Technical introduction	→ A 2 – 8

Pin heatsinks

art. no.	
ICK S R 98 x 30 WLF ... D 98 weight: nullg	
art. no.	
ICK S R 98 x 50 WLF ... D 98 weight: 194.23g	

Thermal conductive glue → **E 23 – 24**
Thermal conductive paste → **E 21 – 22**
SMD-heatsinks → **B 53 – 55**
Processor overview → **B 2 – 8**
Mounting material for semiconduct. → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Heatsinks for LEDs → **B 35 – 51**
Technical introduction → **A 2 – 8**

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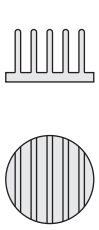
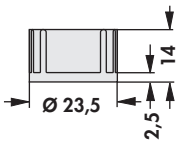
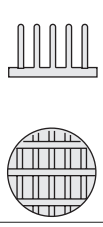
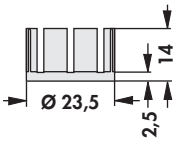
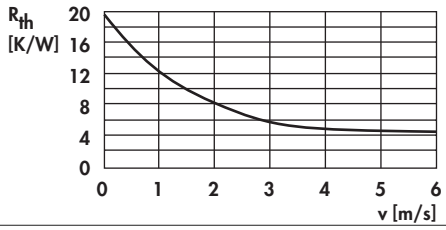
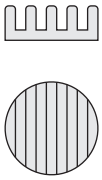
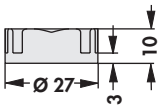
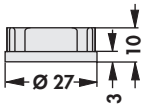
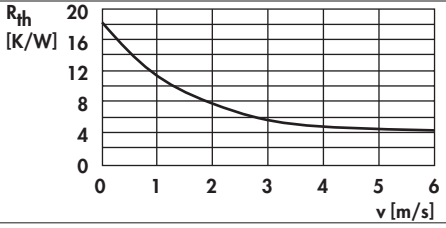
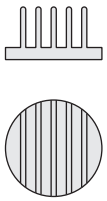
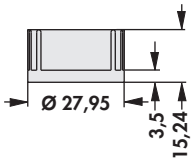
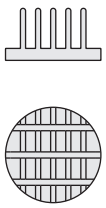
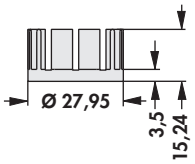
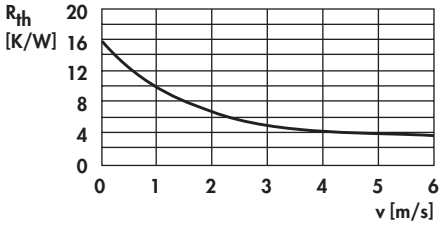
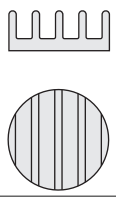
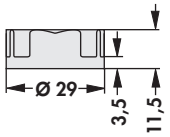
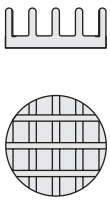
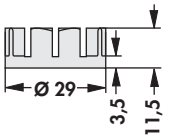
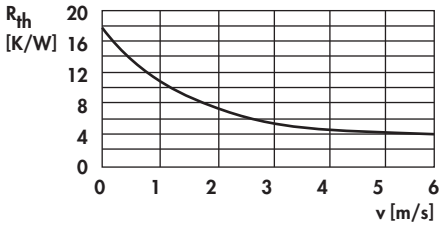
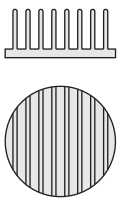
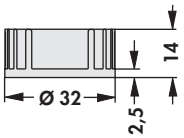
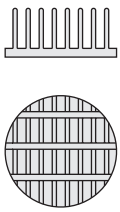
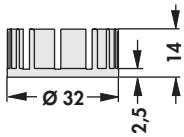
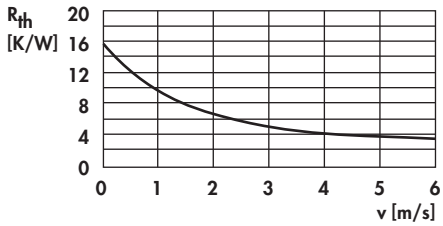
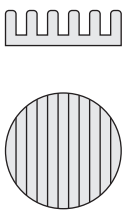
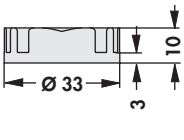
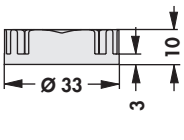
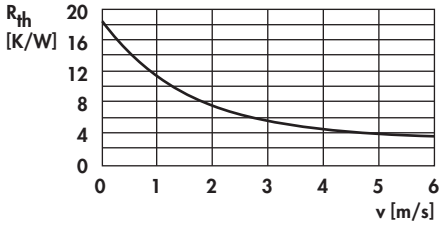
Heatsinks for LEDs

– suitable for free or forced convection
– heat sink dimensions are fitted to the respective LED typ
– simple mounting by using thermally conductive adhesive foil, glue or screw mounting
– specific versions on customer´s request
– double-sided adhesive thermal conductive foil **WLF ...** → E 7
– special design, surfaces and modification to customer specification on request
– **surface:** black anodised

art. no.			
ICK LED R 23,5 x 14 WLF ... D 23			R_{th} = 18,58 K/W
art. no.			
ICK LED R 23,5 x 14 G WLF ... D 23			
art. no.			
ICK LED R 27 x 10 WLF ... D 27			R_{th} = 17,69 K/W
art. no.			
ICK LED R 27 x 10 G WLF ... D 27			
art. no.			
ICK LED R 28 x 15 WLF ... D 28			R_{th} = 15,24 K/W

Pin heatsinks Ø	→ **B 29 – 33**	**Thermal conductive glue**	→ **E 23 – 24**
Mounts	→ **E 44 – 48**	**Hole pattern**	→ **A 21**
Thermally conductive foil	→ **E 5 – 15**	**Heatsink profile-overview**	→ **A 13 – 17**
Thermal conductive paste	→ **E 21 – 22**	**Technical introduction**	→ **A 2 – 8**

art. no.			
ICK LED R 28 x 15 G WLF ... D 28			
art. no.			
ICK LED R 29 x 11,5 WLF ... D 29			R_{th} = 17,26 K/W
art. no.			
ICK LED R 29 x 11,5 G WLF ... D 29			
art. no.			
ICK LED R 32 x 14 WLF ... D 32			R_{th} = 15,23 K/W
art. no.			
ICK LED R 32 x 14 G WLF ... D 32			
art. no.			
ICK LED R 33 x 10 WLF ... D 33			R_{th} = 17,6 K/W
art. no.			
ICK LED R 33 x 10 G WLF ... D 33			

Pin heatsinks Ø → B 29 – 33
Mounts → E 44 – 48
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Hole pattern → A 21
Heatsink profile-overview → A 13 – 17
Technical introduction → A 2 – 8

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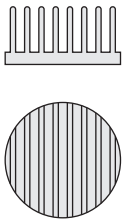
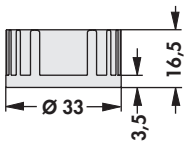
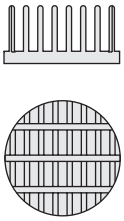
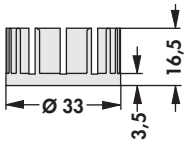
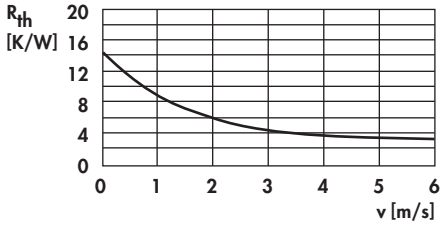
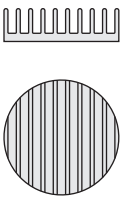
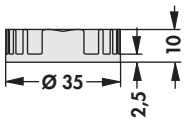
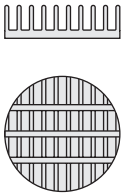
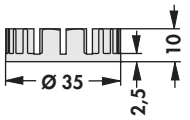
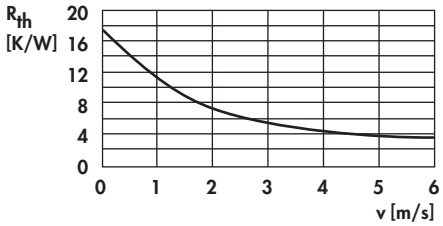
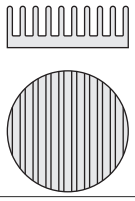
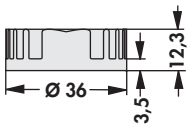
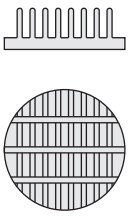
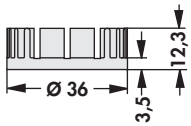
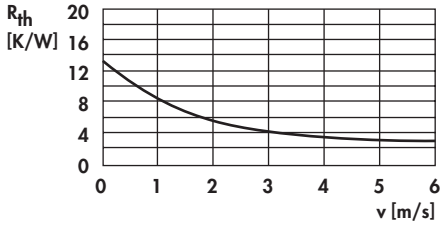
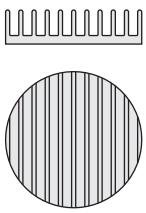
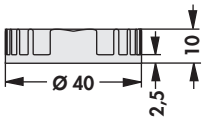
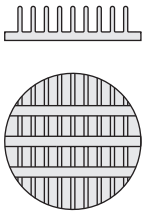
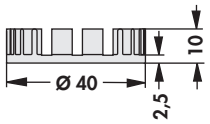
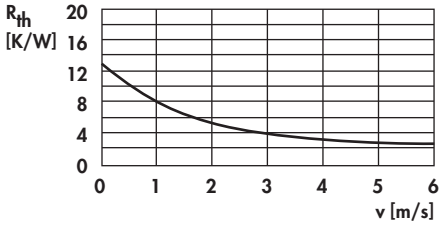
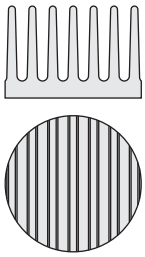
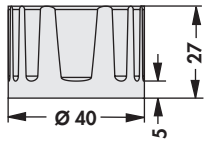
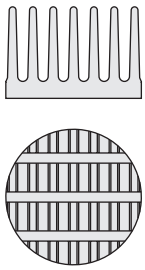
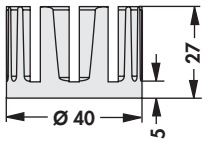
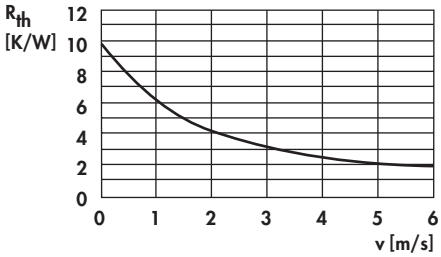
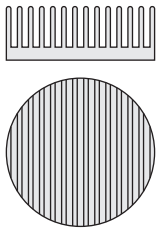
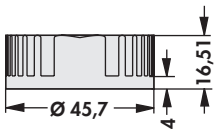
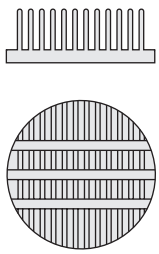
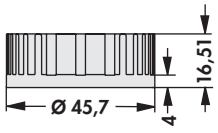
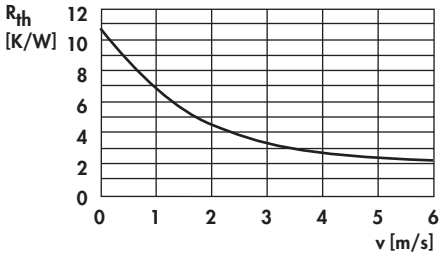
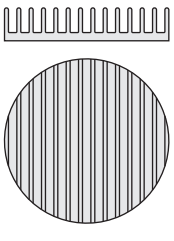
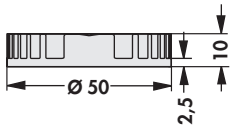
Heatsinks for LEDs

art. no.			
ICK LED R 33 x 16,5 WLF ... D 33			R_{th} = 13,87 K/W
ICK LED R 33 x 16,5 G WLF ... D 33			
ICK LED R 35 x 10 WLF ... D 35			R_{th} = 16,9 K/W
ICK LED R 35 x 10 G WLF ... D 35			
ICK LED R 36 x 12 WLF ... D 36			R_{th} = 12,88 K/W
ICK LED R 36 x 12 G WLF ... D 36			
ICK LED R 40 x 10 WLF ... D 40			R_{th} = 12,28 K/W

Pin heatsinks Ø	→ B 29 – 33	Thermal conductive glue	→ E 23 – 24
Mounts	→ E 44 – 48	Hole pattern	→ A 21
Thermally conductive foil	→ E 5 – 15	Heatsink profile-overview	→ A 13 – 17
Thermal conductive paste	→ E 21 – 22	Technical introduction	→ A 2 – 8

art. no.			
ICK LED R 40 x 10 G WLF ... D 40			
art. no.			
ICK LED R 40 x 27 WLF ... D 40			R_{th} = 9,41 K/W
art. no.			
ICK LED R 40 x 27 G WLF ... D 40			
art. no.			
ICK LED R 45,7 x 16,5 WLF ... D 45			R_{th} = 10,46 K/W
art. no.			
ICK LED R 45,7 x 16,5 G WLF ... D 45			
art. no.			
ICK LED R 50 x 10 WLF ... D 50			R_{th} = 10,57 K/W

Pin heatsinks Ø → B 29 – 33
Mounts → E 44 – 48
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Hole pattern → A 21
Heatsink profile-overview → A 13 – 17
Technical introduction → A 2 – 8

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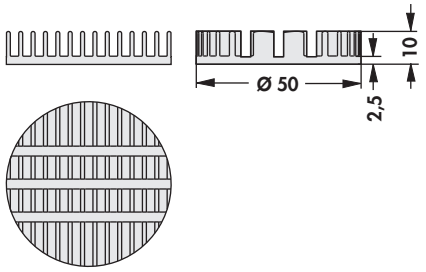
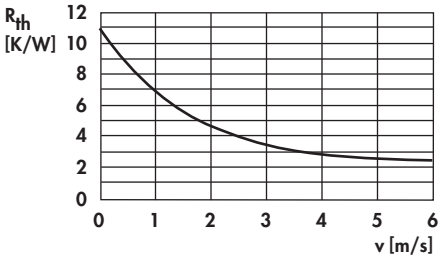
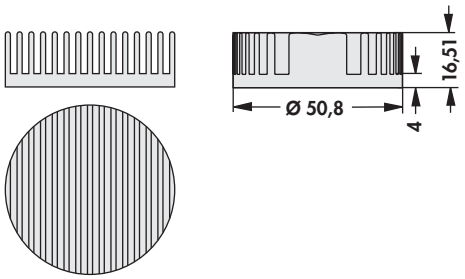
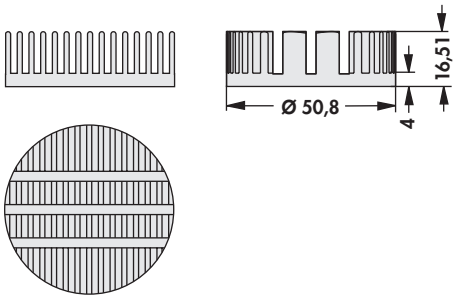
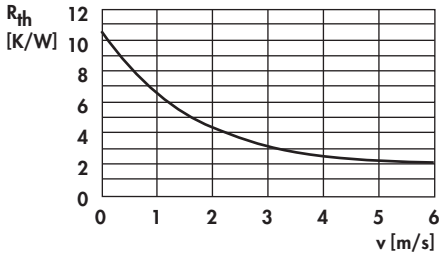
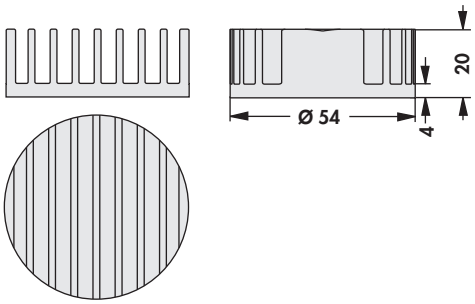
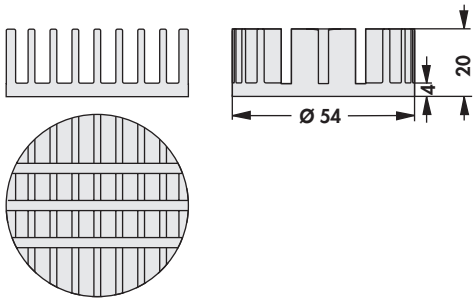
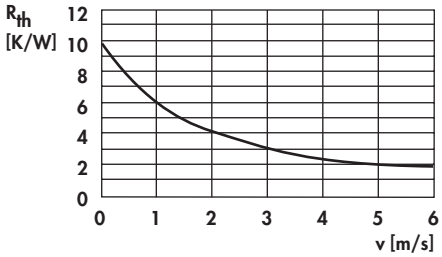
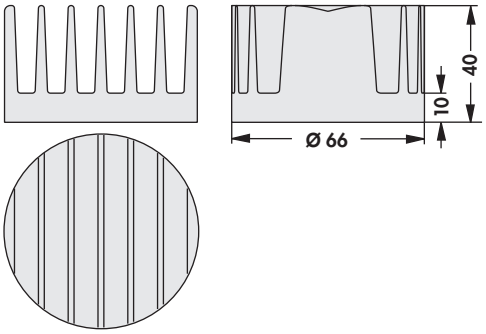
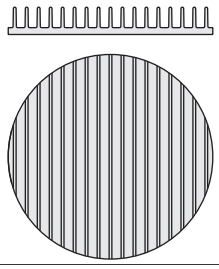
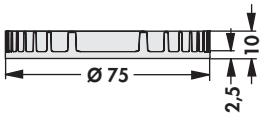
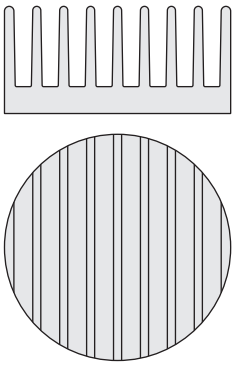
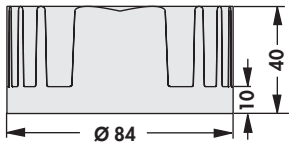
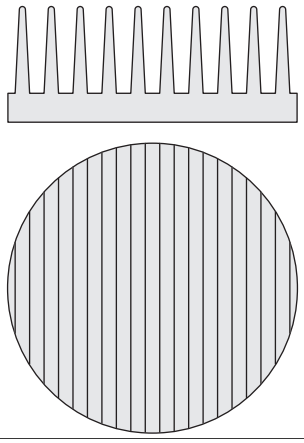
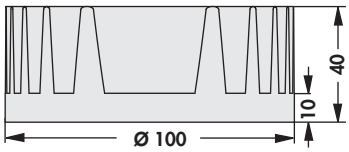
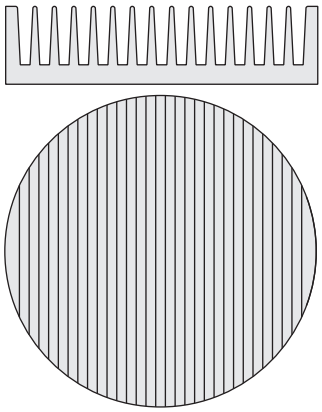
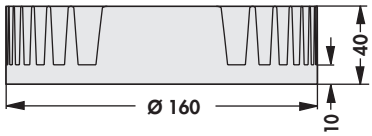
Heatsinks for LEDs

art. no.		
ICK LED R 50 x 10 G WLF ... D 50		
art. no.		
ICK LED R 50,8 x 16,5 WLF ... D 50		R_{th} = 10,17 K/W
art. no.		
ICK LED R 50,8 x 16,5 G WLF ... D 50		
art. no.		
ICK LED R 54 x 20 WLF ... D 54		R_{th} = 9,48 K/W
art. no.		
ICK LED R 54 x 20 G WLF ... D 54		
art. no.		
ICK LED R 66 x 40 WLF ... D 66		R_{th} = 3,2 K/W

Pin heatsinks Ø	→ B 29 – 33	Thermal conductive glue	→ E 23 – 24
Mounts	→ E 44 – 48	Hole pattern	→ A 21
Thermally conductive foil	→ E 5 – 15	Heatsink profile-overview	→ A 13 – 17
Thermal conductive paste	→ E 21 – 22	Technical introduction	→ A 2 – 8

art. no.	
ICK LED R 75 x 10 WLF ... D 75	  R_{th} = 5,2 K/W
art. no.	
ICK LED R 84 x 40 WLF ... D 84	  R_{th} = 2,5 K/W
art. no.	
ICK LED R 100 x 40 WLF ... D 100	  R_{th} = 2 K/W
art. no.	
ICK LED R 160 x 40 WLF ... D 160	  R_{th} = 1,4 K/W

Pin heatsinks Ø → B 29 – 33
Mounts → E 44 – 48
Thermally conductive foil → E 5 – 15
Thermal conductive paste → E 21 – 22
Thermal conductive glue → E 23 – 24
Hole pattern → A 21
Heatsink profile-overview → A 13 – 17
Technical introduction → A 2 – 8

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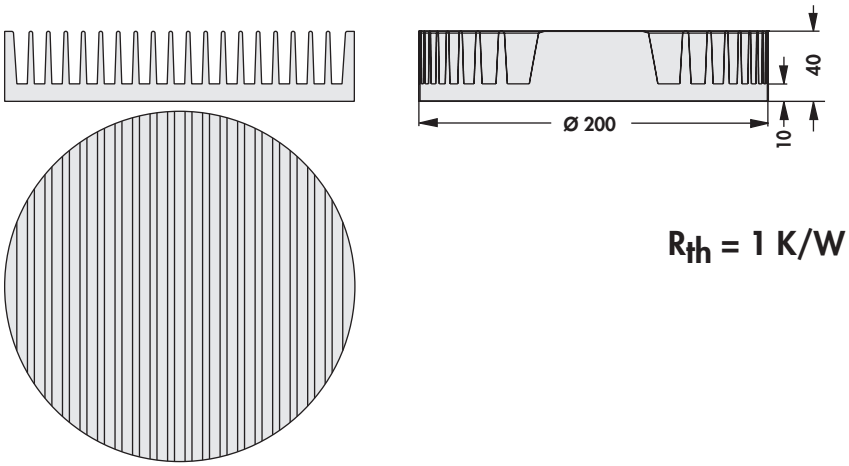
Heatsinks for LEDs

art. no.	
ICK LED R 200 x 40 WLF ... D 200	 R_{th} = 1 K/W

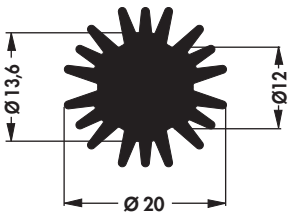
Pin heatsinks Ø	→ B 29 – 33	Thermal conductive glue	→ E 23 – 24
Mounts	→ E 44 – 48	Hole pattern	→ A 21
Thermally conductive foil	→ E 5 – 15	Heatsink profile-overview	→ A 13 – 17
Thermal conductive paste	→ E 21 – 22	Technical introduction	→ A 2 – 8

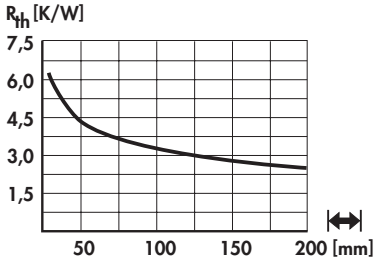
Heatsinks for LEDs

– special design, surfaces and modification to customer specification on request
– up from a profile length of 25 mm: optional adapter plate **LA LED 68 ...** → B 50 suitable for LED modules:
Bridgelux Vero, Citizen CitiLED, Cree XLamp, Edison Edilex, GE Infusion, Luga Shop und Industrial, Lustrous Lustron, Megaman Teco, Osram PrevaLED und Soleriq, Philips Fortimo und Luxeon, Prolight Opto, Sharp Mega Zenigata, Toshiba E-Core, Tridonic Stark, Vexica Lumaera, Vossloh Schwabe

art. no.

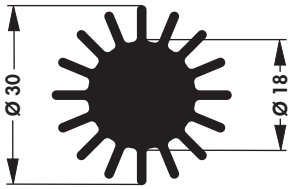
SK 585 ...

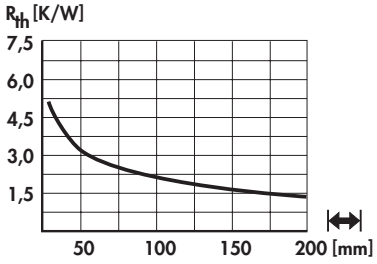




art. no.

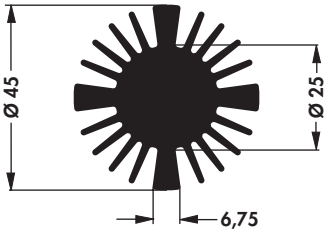
SK 620 ...

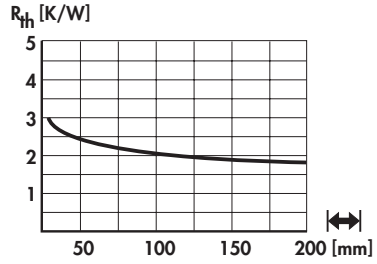




art. no.

SK 618 ...



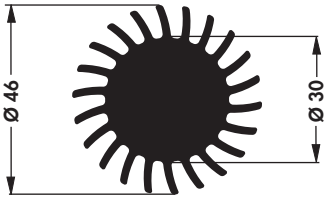


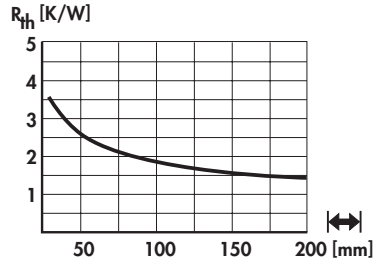
please indicate: **... ↔**
10 15 20 25 37.5 50 1000 mm

surface: black anodised

art. no.

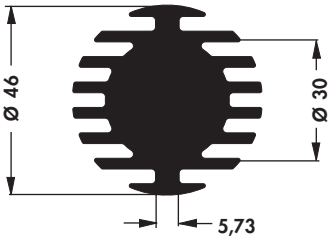
SK 619 ...

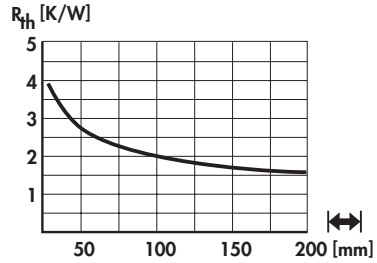




art. no.

SK 598 ...





please indicate: **... ↔**
10 15 20 25 37.5 50 1000 mm

... adapter (optional)
AD = adapter plate

surface: black anodised

Pin heatsinks Ø → **B 29 – 33**
Hole pattern → **A 21**
Special heatsink design → **A 137 – 138**
Thermal conductive paste → **E 21 – 22**
Mounts → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Thermal conductive glue → **E 23 – 24**
Technical introduction → **A 2 – 8**

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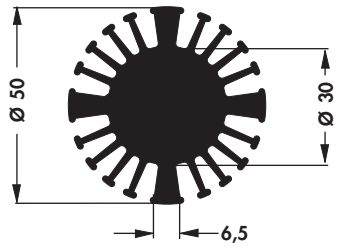
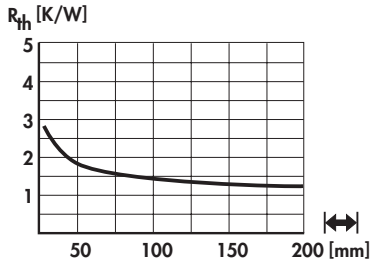
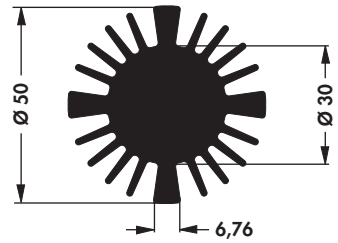
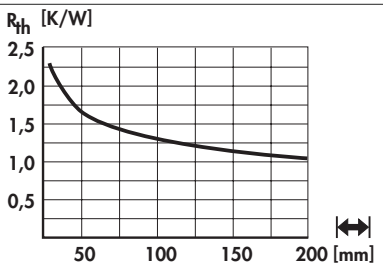
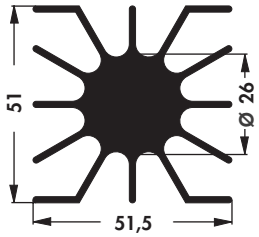
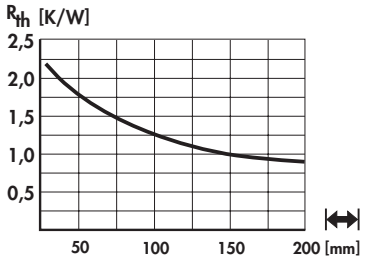
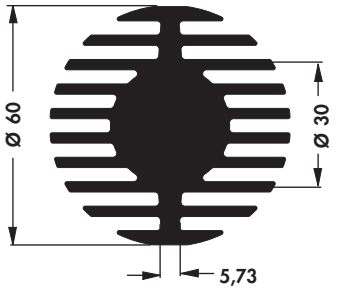
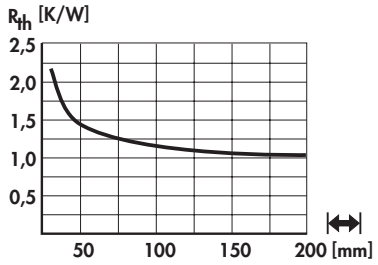
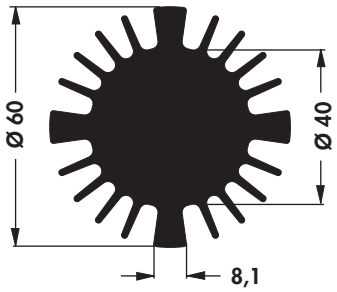
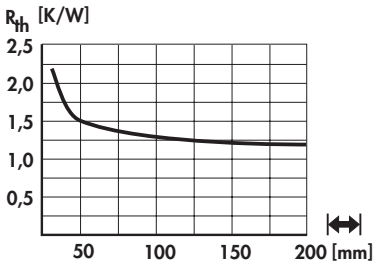
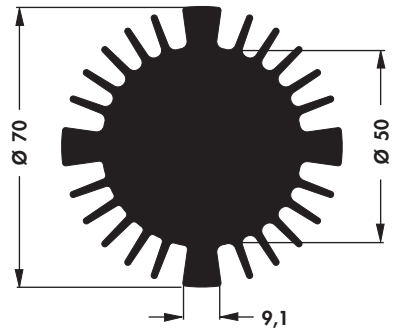
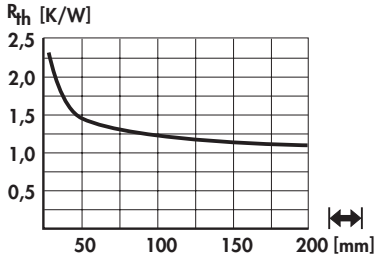
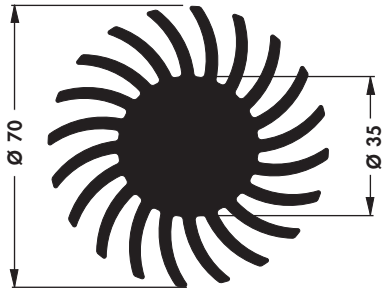
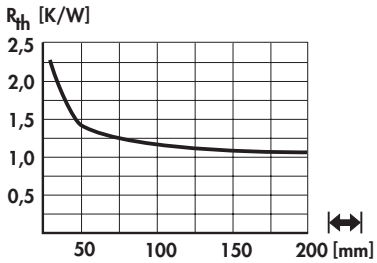
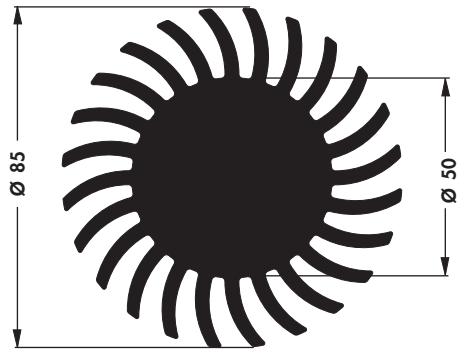
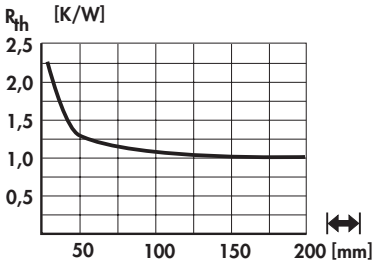
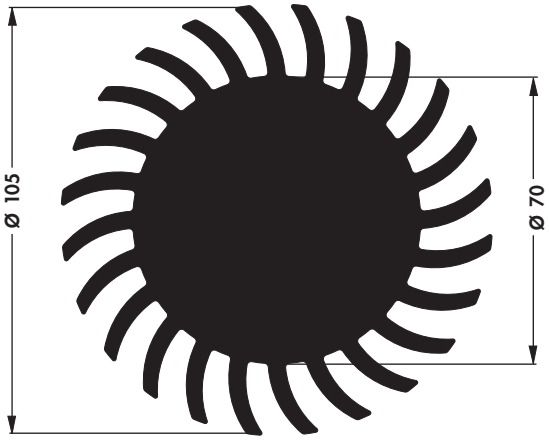
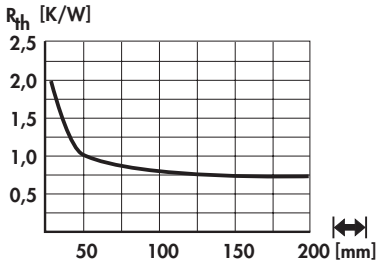
Heatsinks for LEDs

art. no.		
SK 602 ...		
art. no.		
SK 577 ...		
art. no.		
SK 46 ...		
art. no.		
SK 578 ...		
art. no.		
SK 569 ...		

please indicate:	**... ↔** **10 15 20 25 37.5 50 1000 mm**	**... adapter (optional)** **AD = adapter plate**
surface:	black anodised	

art. no.		
SK 570 ...		
art. no.		
SK 571 ...		
art. no.		
SK 572 ...		
please indicate:	**... 10 15 20 25 37.5 50 1000 mm**	**... adapter (optional) AD = adapter plate**
surface:	black anodised	

art. no.		
SK 584 ...		
please indicate:	**... 10 15 20 25 37.5 50 1000 mm**	
surface:	black anodised	

Pin heatsinks Ø → **B 29 – 33**
Hole pattern → **A 21**
Special heatsink design → **A 137 – 138**
Thermal conductive paste → **E 21 – 22**
Mounts → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Thermal conductive glue → **E 23 – 24**
Technical introduction → **A 2 – 8**

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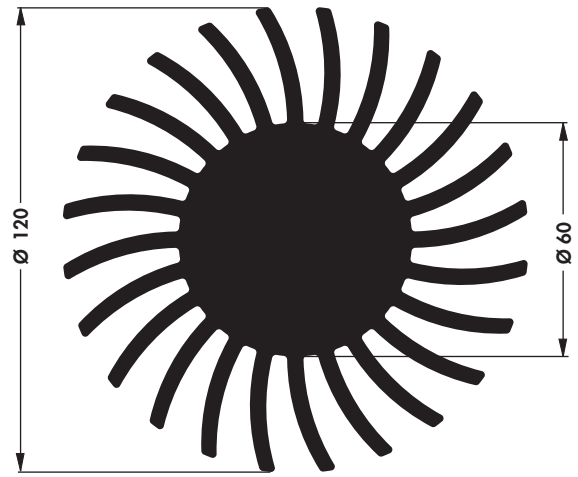
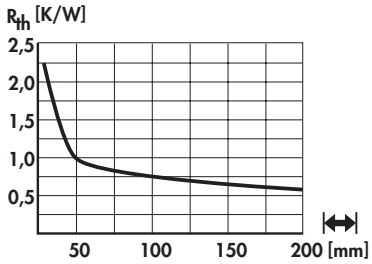
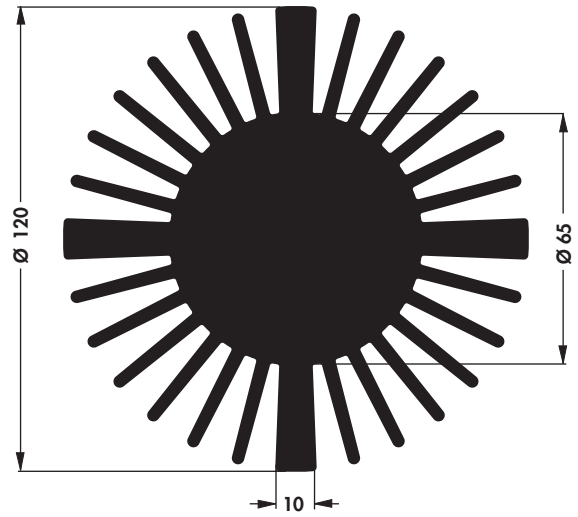
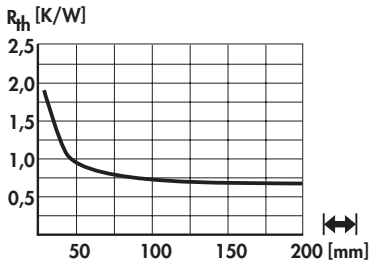
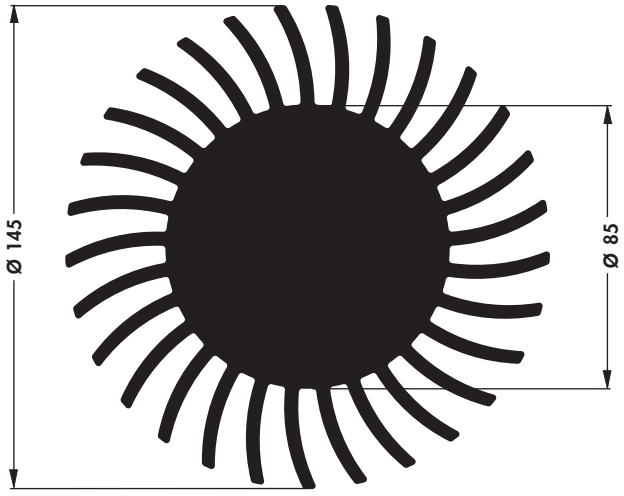
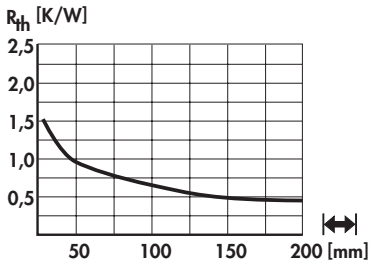
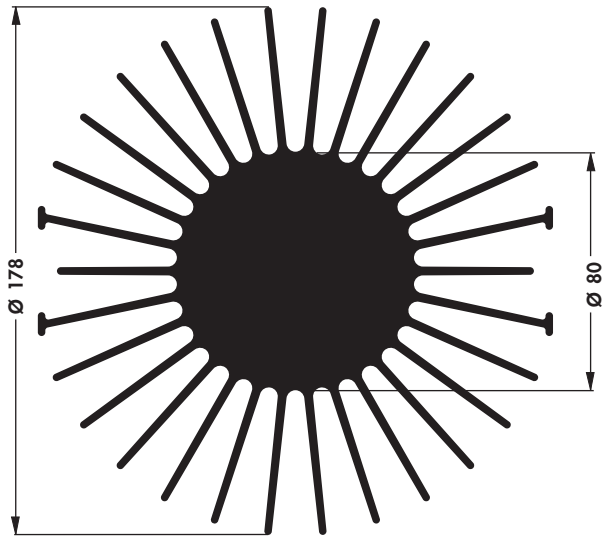
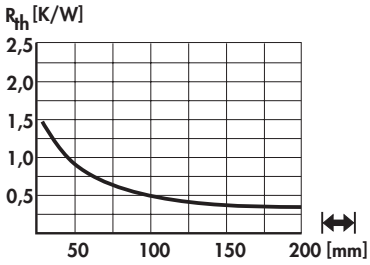
Heatsinks for LEDs

art. no.	
SK 615 ...	 
art. no.	
SK 599 ...	 
art. no.	
SK 592 ...	 
please indicate:	**... ↔ 10 15 20 25 37.5 50 75 100 150 1000 mm**
surface:	black anodised

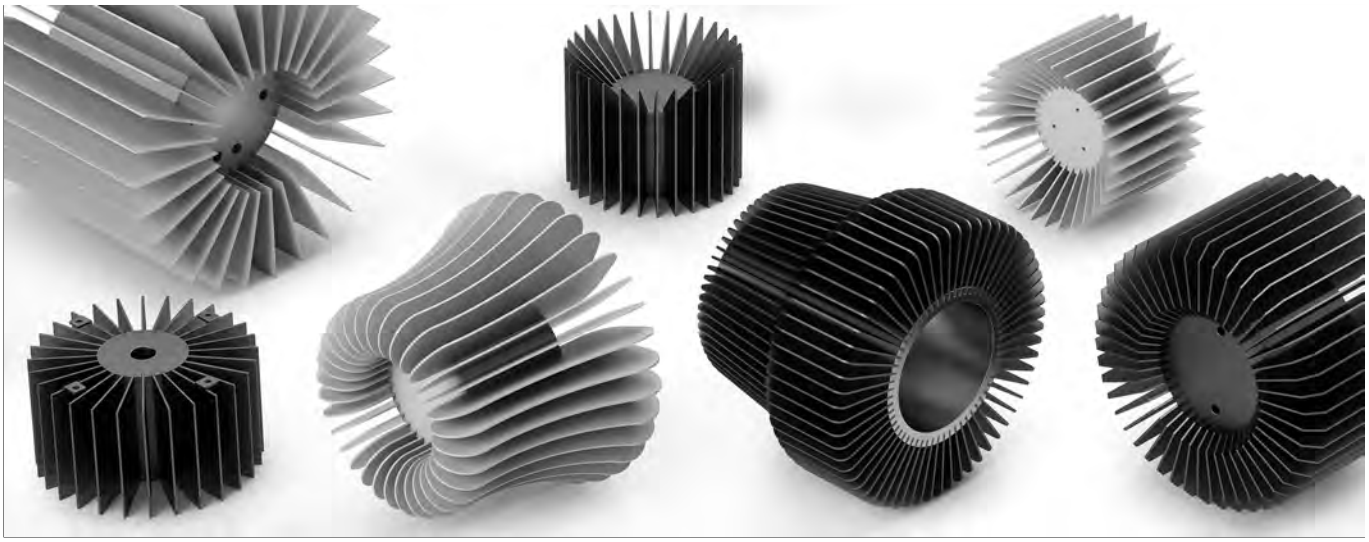
Pin heatsinks Ø	**→ B 29 – 33**	**Mounts**	**→ E 44 – 48**
Hole pattern	**→ A 21**	**Thermally conductive foil**	**→ E 5 – 15**
Special heatsink design	**→ A 137 – 138**	**Thermal conductive glue**	**→ E 23 – 24**
Thermal conductive paste	**→ E 21 – 22**	**Technical introduction**	**→ A 2 – 8**

Heatsinks for LEDs

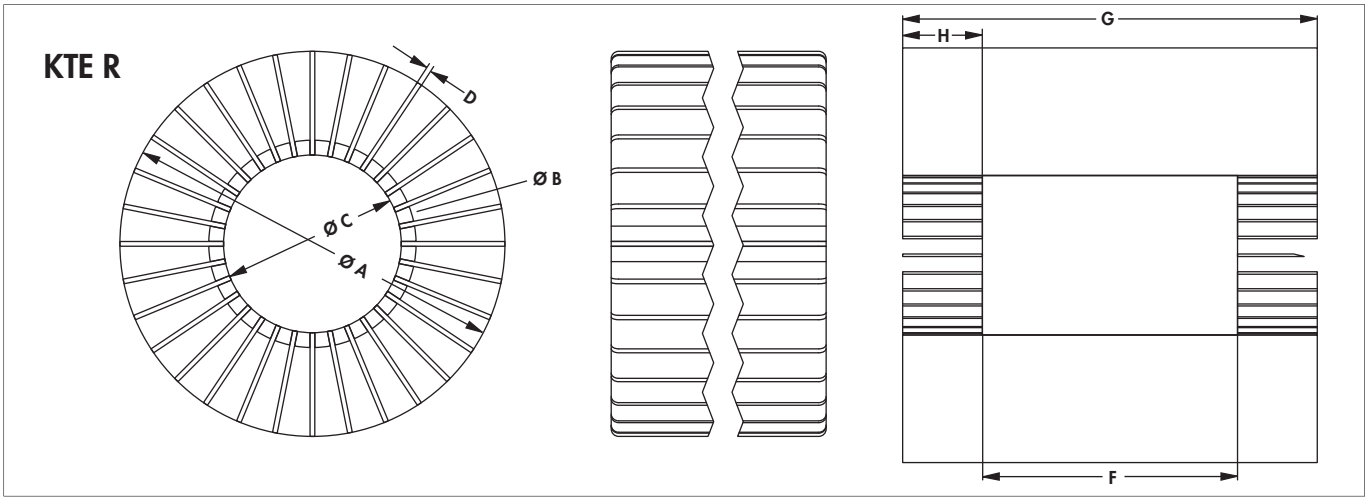
art. no.	
SK 590 ...	 
please indicate:	**... ↔ 10 15 20 25 37.5 50 75 100 150 1000 mm**
surface:	black anodised

Pin heatsinks Ø	**→ B 29 – 33**	**Mounts**	**→ E 44 – 48**
Hole pattern	**→ A 21**	**Thermally conductive foil**	**→ E 5 – 15**
Special heatsink design	**→ A 137 – 138**	**Thermal conductive glue**	**→ E 23 – 24**
Thermal conductive paste	**→ E 21 – 22**	**Technical introduction**	**→ A 2 – 8**

LED fin cooler KTE R customised



– individual LED heatsinks acc. to customer's requests
– adaptable to all common LED modules and sizes
– integration possibility of reflectors or fans by using special sheet metal design
– entry core for heat dissipation made of copper upon request
– other dimensions, sheet metal geometries, surfaces and mechanical machinings upon request



possible dimensions:

dim. [mm]							
A	B	C	D	E	F	G	H
B + 20 to 200	35	30	0.8	32	max. 400	max. 800	max. 200
	40	35	1	36			
	55	50	1.5	50			
	80	75	2	72			
	90	85		84			
	100	95		92			
E max. number of grooves at D = 0.8 mm							

please indicate with your order:

dim. [mm]							
A	B	C	D	E	F	G	H

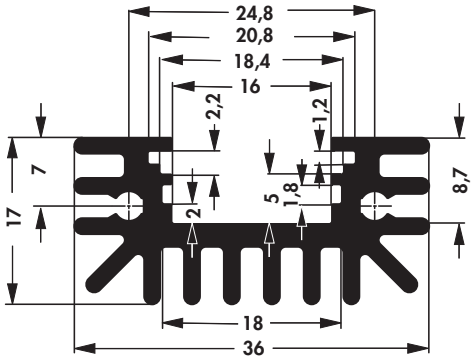
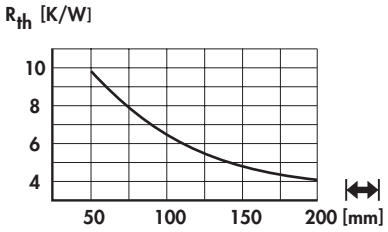
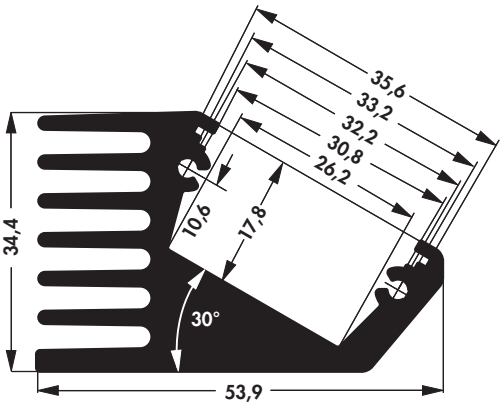
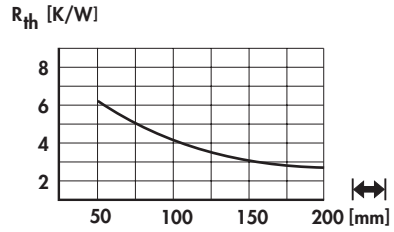
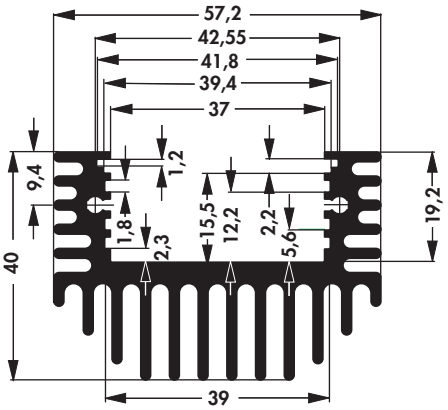
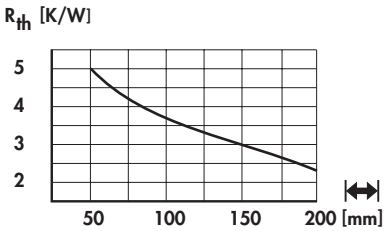
please indicate: ... surface
SA = black anodised
ME = clear anodised

material:	aluminium

Pin heatsinks Ø → **B 29 – 33**
Hole pattern → **A 21**
Special heatsink design → **A 137 – 138**
Thermal conductive paste → **E 21 – 22**
Mounts → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Processor overview → **B 2 – 10**
Technical introduction → **A 2 – 8**

Heatsinks for LEDs

– heatsink specially made for flexible and fixed LED Line Modules
– insertion possibility of metal sheets and sheets of Plexiglas
– customer specified designs, lengths and treatments upon request

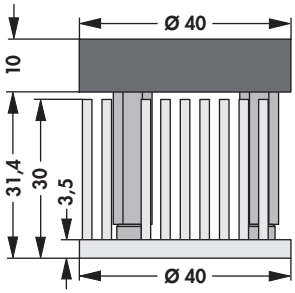
art. no.		
SK LED 1		
art. no.		
SK LED 2		
art. no.		
SK LED 3		

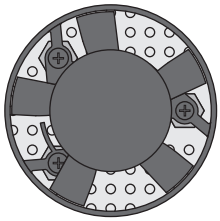
please indicate: **... ↔**
50 75 100 150 1000 mm

... surface
SA = black anodised
ME = clear anodised

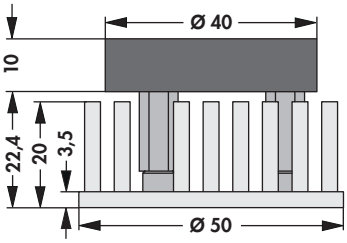
Pin heatsinks Ø	**→ B 29 – 33**	**Mounts**	**→ E 44 – 48**
Hole pattern	**→ A 21**	**Thermally conductive foil**	**→ E 5 – 15**
Special heatsink design	**→ A 137 – 138**	**Processor overview**	**→ B 2 – 10**
Thermal conductive paste	**→ E 21 – 22**	**Technical introduction**	**→ A 2 – 8**

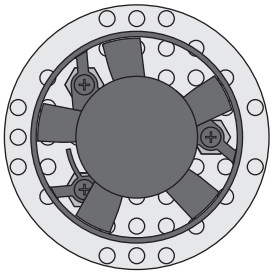
Active heat dissipation of LEDs



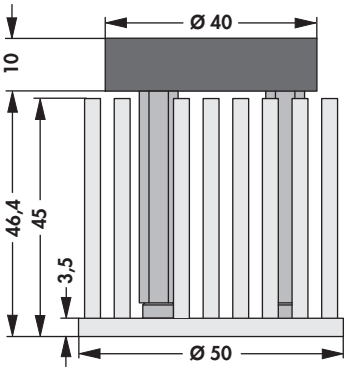


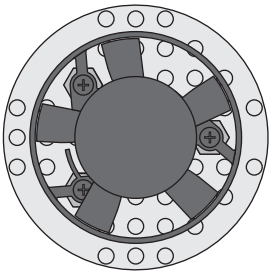
art. no.	R_{th} [K/W]
LA LED 40 x 30	1.4





art. no.	R_{th} [K/W]
LA LED 50 x 20	1.25





art. no.	R_{th} [K/W]
LA LED 50 x 45	0.9

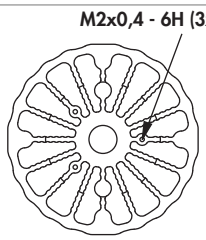
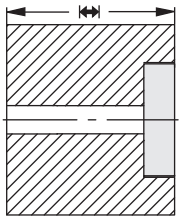
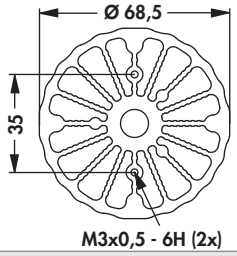
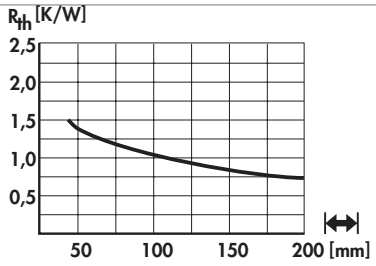
Technical data of the fans

	LF 40B12
circuit voltage	12 V
bearing type	two-way plain bearing
cur. consumpt.	50 mA
max. iuitial current	160 mA
max. volume flow	157 l/min - 9.4 m^3/h
max. static pressure	3.4 mmH_2O - 33 Pa
noise level	26 dB(A), 1 m lateral
temperature range	-20°C... +60°C
failure rate (L_{10})	60,000 h
MTBF	1,900,000 h (20°C)
Type rotor speed	6,600 min^{-1}
weight	10 g

Pin heatsinks Ø → **B 29 – 33**
Hole pattern → **A 21**
Special heatsink design → **A 137 – 138**
Thermal conductive paste → **E 21 – 22**
Mounts → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Processor overview → **B 2 – 10**
Technical introduction → **A 2 – 8**

Active heat dissipation of LEDs

– active heat dissipation of LED modules
– Zhaga compliant mounting possibility
– integrated low noise fan
– optional adapter plate suitable for LED modules:
Bridgelux Vero, Citizen CitiLED, Cree XLamp, Edison Edilex, GE Infusion, Luga Shop und Industrial, Lustrous Lustron, Megaman Teco, Osram PrevaLED und Soleriq, Philips Fortimo und Luxeon, Prolight Opto, Sharp Mega Zenigata, Toshiba E-Core, Tridonic Stark, Vexica Lumaera, Vossloh Schwabe

art. no.				
LA LED 68 ...				

please indicate: **... ↔** **50 75 100 mm** | **... surface** **SA = black anodised** **ME = clear anodised** | **... adapter (optional)** **AD = adapter plate**

Technical data of the fans

	LF 40B12
circuit voltage	12 V
bearing type	two-way plain bearing
cur. consumpt.	50 mA
max. iuitial current	160 mA
max. volume flow	157 l/min - 9.4 m^3/h
max. static pressure	3.4 mmH_2O - 33 Pa
noise level	26 dB(A), 1 m lateral
temperature range	-20°C... +60°C
failure rate (L_{10})	60,000 h
MTBF	1,900,000 h (20°C)
Type rotor speed	6,600 min^{-1}
weight	10 g

Pin heatsinks Ø → **B 29 – 33**
Hole pattern → **A 21**
Special heatsink design → **A 137 – 138**
Thermal conductive paste → **E 21 – 22**
Mounts → **E 44 – 48**
Thermally conductive foil → **E 5 – 15**
Processor overview → **B 2 – 10**
Technical introduction → **A 2 – 8**

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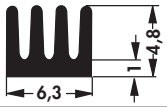
Sample box LED Heatsinks

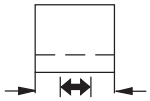
– Sample box for verification of the thermal management for LEDs
– Contains a choice of different extruded heatsinks, LED extruded heatsinks in round design, LED pin heatsinks and extruded profiles for LED-Line modules
– for thermal contacting or mounting of LED a high-performance thermal conductive graphite foil is also enclosed (**WLFG**, sample strips 25x150mm), a high-performance thermal conductive (silicone-free) ceramic-filled thermal conductive paste (**WLPK**, syringe), a double-sided sticky thermal conductive foil (**WLFT 404**, sample strips 25x150mm) and a thermal conductive epoxy based two-component adhesive (**WLK DK**, syringe)

art. no.
SK LED BOX 1

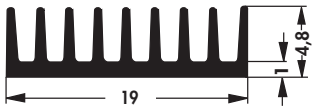
Heatsinks for DIL-IC

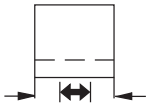
– other length on request





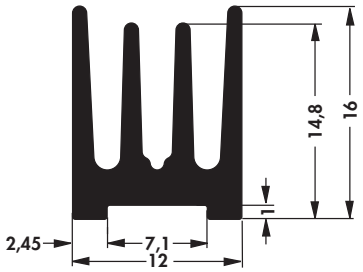
art. no.	for cases	↔ [mm]	R_{th} [K/W]	art. no.	for cases	↔ [mm]	R_{th} [K/W]
ICK 6 8 L	6/8 contacts	8.5	83	**ICK 20 L**	20 contacts	25.0	34
ICK 14 16 L	14/16 contacts	19.0	46				

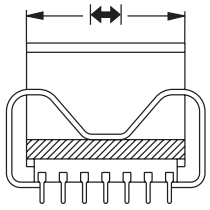




art. no.	for cases	↔ [mm]	R_{th} [K/W]	art. no.	for cases	↔ [mm]	R_{th} [K/W]
ICK 14 16 B	14/16 contacts	6.3	54.0	**ICK 36 B**	36 contacts	47.0	16.5
ICK 24 B	24 contacts	33.0	19.4	**ICK 40 B**	40 contacts	51.0	15.8
ICK 28 B	28 contacts	37.0	18.5	**ICK 1000 B**	—	1000.0	—
surface:		black anodised					

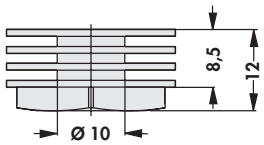
– with clip
– other length on request

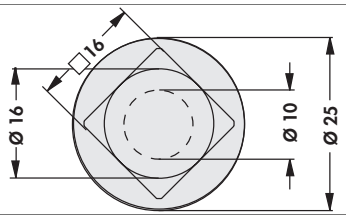




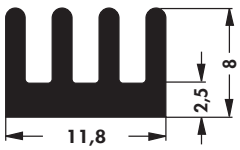
art. no.	for cases	↔ [mm]	R_{th} [K/W]	art. no.	for cases	↔ [mm]	R_{th} [K/W]
ICK 14 H	14 contacts	18.0	20	**ICK 18 H**	18 contacts	23.0	16
ICK 16 H	16 contacts	20.5	18	**ICK 1000 H**	—	1000.0	—
surface:		black anodised					

Heatsinks for PLCC





art. no.	R_{th} [K/W]
ICK R	19



art. no.	↔ [mm]	R_{th} [K/W]
ICK PLCC 28	11.8	25
surface:	black anodised	

Extruded heatsinks → **A 22 – 83**
Pin heatsinks for IC → **B 21 – 28**
Insulting clamping parts → **E 45**
Thermal conductive glue → **E 23 – 24**
Thermally conductive foil → **E 5 – 15**
Thermal conductive paste → **E 21 – 22**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

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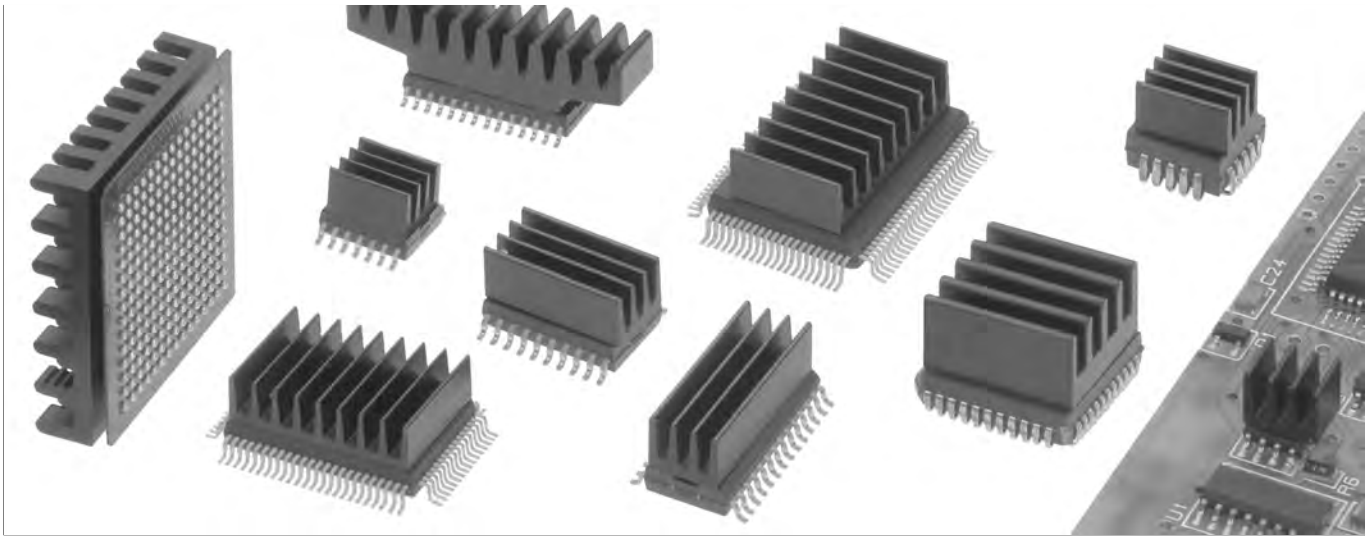
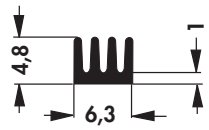
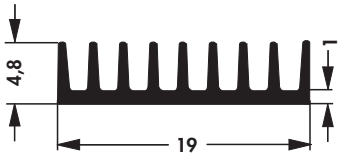
Heatsinks for SMD



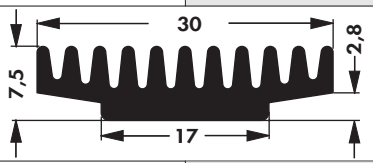
- particularly suitable for SMD components
- low profile
- reduced weight
- effective heat dissipation
- can be glued directly onto the component
- solderable versions
- customer specific versions on request
- special packaging like tape and real, bar magazin, tray etc. on request



art. no.	⟷ [mm]	R_{th} [K/W]	art. no.	⟷ [mm]	R_{th} [K/W]
ICK SMD A 5 ...	5	123	**ICK SMD A 13 ...**	13	63
ICK SMD A 8 ...	8	87	**ICK SMD A 17 ...**	17	51
ICK SMD A 10 ...	10	75	**ICK SMD A 22 ...**	22	34



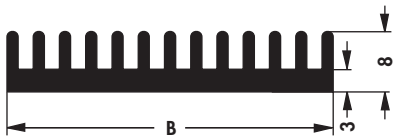
art. no.	⟷ [mm]	R_{th} [K/W]	art. no.	⟷ [mm]	R_{th} [K/W]
ICK SMD B 5 ...	5	56	**ICK SMD B 13 SA**	13	29
ICK SMD B 7 SA	7	47	**ICK SMD B 19 ...**	19	22
ICK SMD B 10 SA	10	35			



art. no.	⟷ [mm]	R_{th} [K/W]	art. no.	⟷ [mm]	R_{th} [K/W]
ICK SMD C 7 SA	7	33	**ICK SMD C 17 ...**	17	17
ICK SMD C 10 SA	10	26			

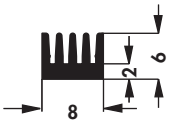
please indicate: **... surface**
SA = black anodised
MI = solderable surface

Extruded heatsinks → **A 22 – 83**
ICK S 10 x 10 x 6,5 → **B 21 – 28**
Insulting clamping parts → **E 45**
Thermal conductive glue → **E 23 – 24**
Thermally conductive foil → **E 5 – 15**
Thermal conductive paste → **E 21 – 22**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

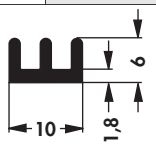


B ≙ ↔

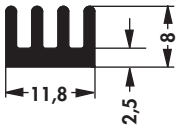
art. no.	↔ [mm]	R_{th} [K/W]	art. no.	↔ [mm]	R_{th} [K/W]
ICK SMD E 15 SA	15.3	27	**ICK SMD E 29 SA**	29.0	18
ICK SMD E 22 SA	22.3	21			



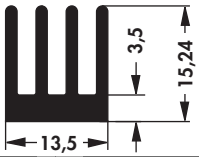
art. no.	↔ [mm]	R_{th} [K/W]	art. no.	↔ [mm]	R_{th} [K/W]
ICK SMD F 8 ...	8	74	**ICK SMD F 19 ...**	19	37
ICK SMD F 10 ...	10	71	**ICK SMD F 21 ...**	21	33
ICK SMD F 17 SA	17	42	**ICK SMD F 26 ...**	26	26



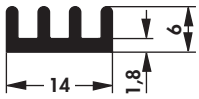
art. no.	↔ [mm]	R_{th} [K/W]	art. no.	↔ [mm]	R_{th} [K/W]
ICK SMD G 8 MI	8	73	**ICK SMD G 17 SA**	17	41
ICK SMD G 10 ...	10	70	**ICK SMD G 19 SA**	19	36
ICK SMD G 13 SA	13	61	**ICK SMD G 21 ...**	21	32



art. no.	↔ [mm]	R_{th} [K/W]	art. no.	↔ [mm]	R_{th} [K/W]
ICK SMD H 8 ...	8	33.0	**ICK SMD H 19 SA**	19	23.0
ICK SMD H 10 ...	10	29.0	**ICK SMD H 25 ...**	25	20.0
ICK SMD H 17 ...	17	24.5			



art. no.	↔ [mm]	R_{th} [K/W]	art. no.	↔ [mm]	R_{th} [K/W]
ICK SMD K 8 ...	8	25.6	**ICK SMD K 17 ...**	17	19.4
ICK SMD K 10 SA	10	23.4	**ICK SMD K 19 ...**	19	18.0
ICK SMD K 13 ...	13	21.5	**ICK SMD K 21 ...**	21	16.5



art. no.	↔ [mm]	R_{th} [K/W]	art. no.	↔ [mm]	R_{th} [K/W]
ICK SMD M 8 SA	8	72	**ICK SMD M 19 SA**	19	35
ICK SMD M 10 SA	10	66	**ICK SMD M 21 SA**	21	31
ICK SMD M 17 MI	17	40			

please indicate: **... surface**
SA = black anodised
MI = solderable surface

Extruded heatsinks → **A 22 – 83**
ICK S 10 x 10 x 6,5 → **B 21 – 28**
Insulting clamping parts → **E 45**
Thermal conductive glue → **E 23 – 24**
Thermally conductive foil → **E 5 – 15**
Thermal conductive paste → **E 21 – 22**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

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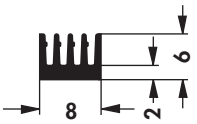
heatsink for SMD



art. no.	⟷ [mm]	R_{th} [K/W]	art. no.	⟷ [mm]	R_{th} [K/W]
ICK SMD N 8 ...	8	74	**ICK SMD N 19 ...**	19	37
ICK SMD N 10 ...	10	71	**ICK SMD N 21 ...**	21	33
ICK SMD N 17 ...	17	42	**ICK SMD N 26 ...**	26	26

please indicate: **... surface**
SA = black anodised
MI = solderable surface

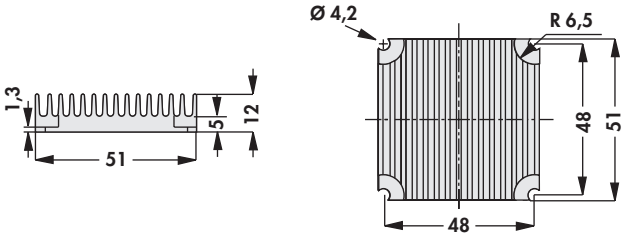
Sample box SMD heatsinks

– contains an assortment of SMD heatsinks with anodised and solderable surface as well as thermally conductive glue (**WLK**) and double-sided adhesive thermal foil (**WLF**)

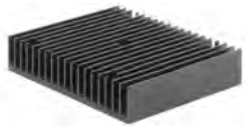
art. no.
ICK SMD BOX 1

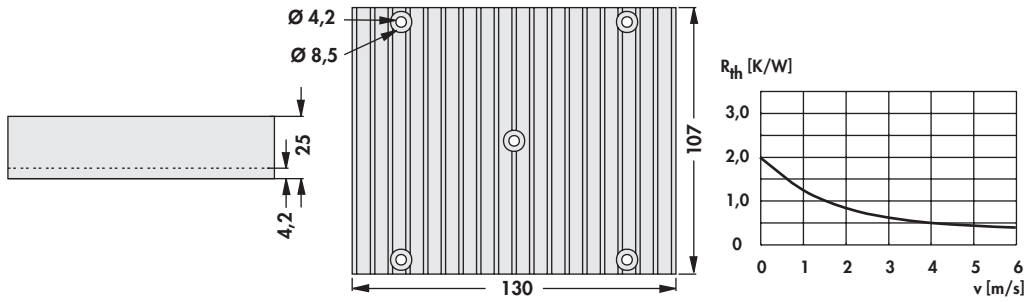
Extruded heatsinks → **A 22 – 83**
ICK S 10 x 10 x 6,5 → **B 21 – 28**
Insulting clamping parts → **E 45**
Thermal conductive glue → **E 23 – 24**
Thermally conductive foil → **E 5 – 15**
Thermal conductive paste → **E 21 – 22**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

Passive heatsinks for processors

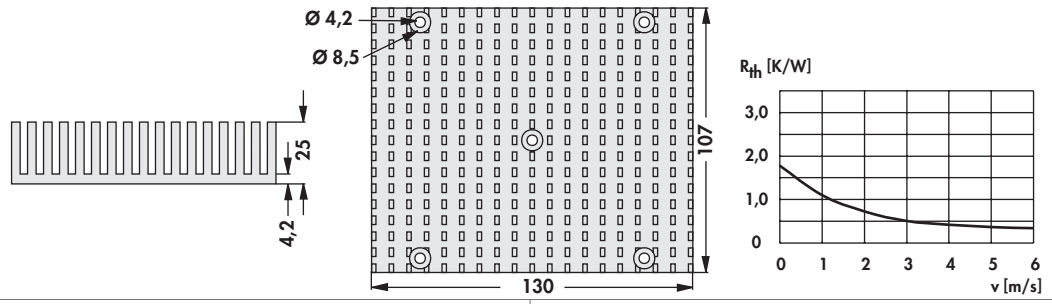


art. no.	R_{th} [K/W]	suitable for processor type
ICK PPC 51	8.1	Power PC



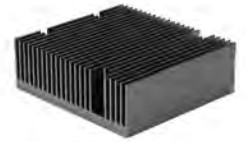


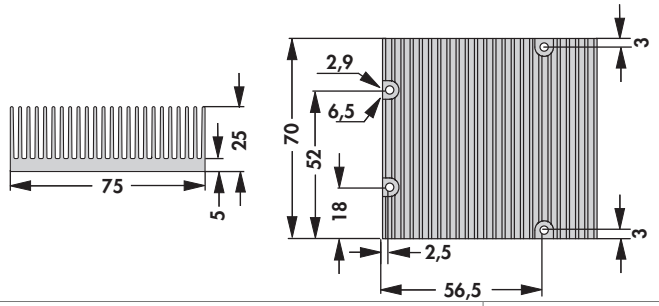
art. no.	R_{th} [K/W]	suitable for processor type
ICK PEN 3 XE	2	Intel® Pentium® III-Xeon™ Slot II Format



art. no.	R_{th} [K/W]	suitable for processor type
ICK PEN 3 XE 1	1.8	Intel® Pentium® III-Xeon™ Slot II Format

Heatsink specially for Q7 "Embedded-Boards"





art. no.	R_{th} [K/W]	suitable for processor type
ICK EM 25	3.9	Q7 Board

Fan cooler for Intel PentiumIIIXeon → **B 60**
Fan cooler, universal → **B 58**
Attachable heatsinks → **C 10 – 16**
Thermal conductive material → **E 2 – 24**
Heatsinks for Q7 "Embedded-Boards" → **B 56**
Heatsinks for BGA → **B 17 – 20**
Heatsinks for PGA → **B 11 – 16**
Technical introduction → **A 2 – 8**

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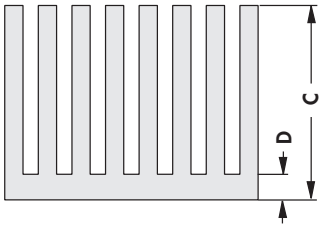
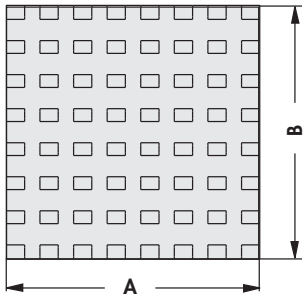
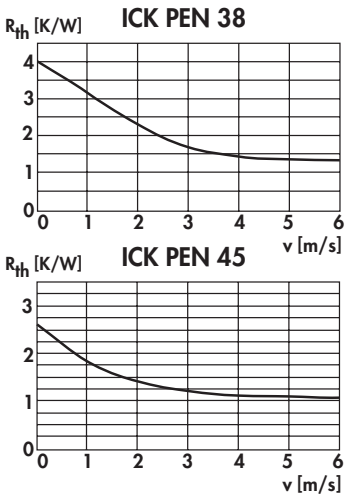
Passive heatsinks for processors

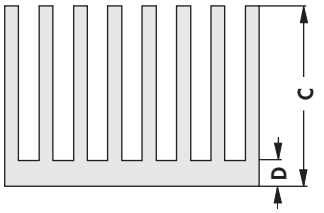
– customer specific versions and modifications on request

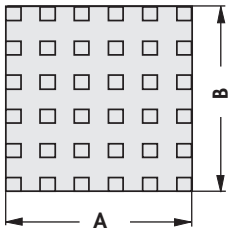


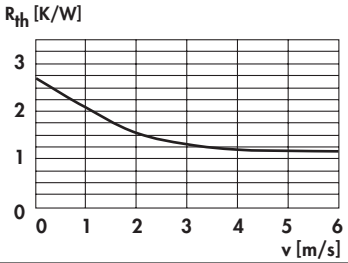




art. no.	R_{th} [K/W]	suitable for processor type	dim. [mm]			
			A	B	C	D
ICK PEN 38 F	4.0	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	49.5	49.5	38	5.0
ICK PEN 38 W	4.0	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	49.5	49.5	38	5.0
ICK PEN 45 W	3.5	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.0	50.0	45	3.5

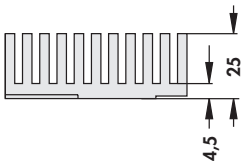


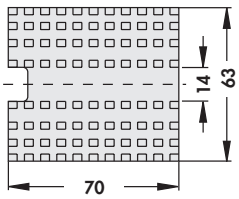


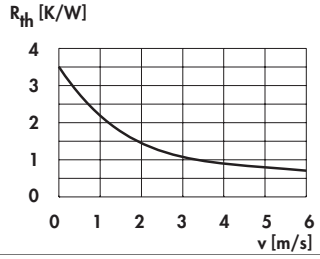


art. no.	R_{th} [K/W]	suitable for processor type	dim. [mm]			
			A	B	C	D
ICK PRO 40 W	2.7	Intel® Pentium® PRO	65	67.5	40	4.5

F = with double-sided thermally conductive adhesive foil
W = for thermally conductive adhesive (please order separately)
WLK ... → E 23



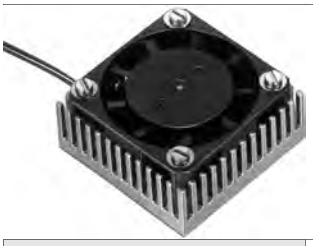


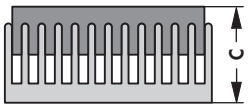


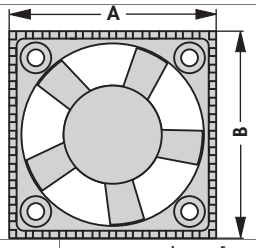
art. no.	R_{th} [K/W]	suitable for processor type
ICK PEN 3 FC	3.5	Intel® Pentium® III FC PGA (Mendocino, Coppermine)

fixing method: K = with fixing clamp (incl. one-sided adherent thermal foil)

Active heatsinks for processors







art. no.	R_{th} [K/W]	suitable for processor type	dim. [mm]		
			A	B	C
LA ICK 15 x 15 F 05	2.3	universal	37.92	38.10	20
LA ICK 15 x 15 F 12	2.3	universal	37.92	38.10	20
LA ICK 17 x 17 F 12	1.6	universal	43.10	43.10	20
LA ICK 17 x 17 F 12 A	1.6	universal	43.10	43.10	20
LA ICK 17 x 17 W 05	1.6	universal	43.10	43.10	20
LA ICK 17 x 17 W 12	1.6	universal	43.10	43.10	20
LA ICK 18 x 18 F 12	1.5	universal	45.70	45.70	20
LA ICK 18 x 18 W 12	1.5	universal	45.70	45.70	20
LA ICK 21 x 21 F 05	1.4	universal	53.34	53.34	20
LA ICK 21 x 21 F 12	1.4	universal	53.34	53.34	20
LA ICK 21 x 21 W 05	1.4	universal	53.34	53.34	20
LA ICK 21 x 21 W 12	1.4	universal	53.34	53.34	20

used fans:
5 Volt = **Sepa MFB 25 F 05 L / MFB 40 H 05 / MFB 40 H 05 A**;
12 Volt = **Sepa MFB 25 F 12 / MFB 40 H 12 / MFB 40 H 12 A**

F = with double-sided thermally conductive adhesive foil
W = for thermally conductive adhesive (please order separately) **WLK ...** → E 23

A = alarm exit

Heatsinks for BGA → **B 17 – 20**
Heatsinks for Q7 "Embedded-Boards" → **B 56**
Fan cooler, universal → **B 58**
Heatsinks for Pentium PRO → **B 57**
Heatsinks for P II-Mobile Module → **B 56**
Fan cooler for Pentium IV → **B 60**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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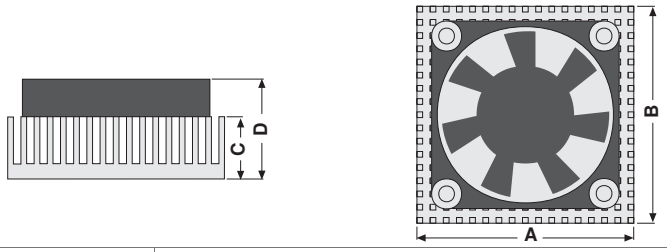
Active heatsinks for processors

– easy assembly on ZIF socket by fixing clamp



art. no.	R_{th} [K/W]	suitable for processor type	dim. [mm]			
			A	B	C	D
LA ICK PEN 8 F 05	2.50	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 8 F 12	2.50	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 8 W 05	2.50	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 8 W 12	2.50	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 16 K 12	1.20	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	16.51	26.51
LA ICK PEN 16 W 12	1.20	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	16.51	26.51
LA ICK PEN 16 W 12 A	1.20	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	16.51	26.51
LA ICK PEN 18 W 12	1.60	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	18.00
LA ICK PEN 38 W 12	1.10	AMD® K6-III/ IDT W2A/ Cyrix MII and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	49.5	49.5	38.00	48.00
LA ICK PRO 25 F 12	0.97	Intel® Pentium® PRO	63.5	67.5	25.00	35.00

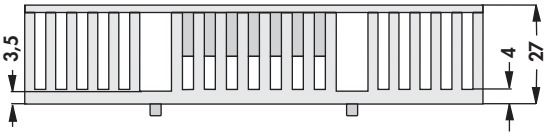
used fans: 5 Volt = **Sepa MFB 50 E 05**; 12 Volt = **Sepa MFB 50 E 12/ Sepa MFB 50 E 12 A**;
LA ICK PEN 8: 5 Volt = **Sepa HFB 44 X 05 A**; 12 Volt = **Sepa HFB 44 B 12 A**
K = with fixing clamp (incl. one-sided adherent conductive foil)
F = with double-sided thermally conductive adhesive foil
W = for thermally conductive adhesive (please order separately) **WLK ...** → E 23

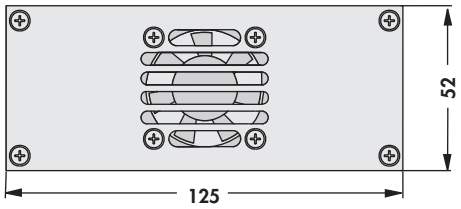
A = alarm exit

Heatsinks for BGA → **B 17 – 20**
Heatsinks for Q7 "Embedded-Boards" → **B 56**
Fan cooler, universal → **B 58**
Heatsinks for Pentium PRO → **B 57**
Heatsinks for P II-Mobile Module → **B 56**
Fan cooler for Pentium IV → **B 60**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Active heatsinks for processors

– incl. one-sided adherent thermal foil

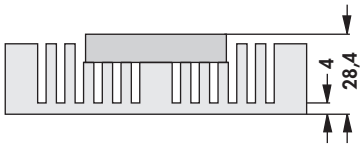


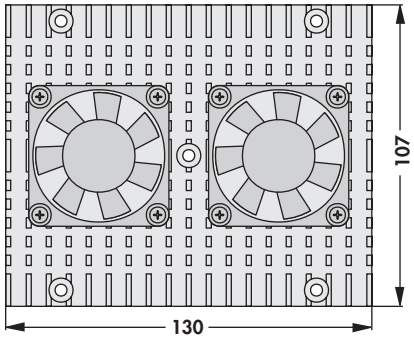


art. no.	R_{th} [K/W]	suitable for processor type
LA ICK PEN 2 K 12 ...	1.2	Intel® Pentium® II/ AMD® Athlon®

please indicate: **... accessory (optional)**
SM = molex connection plug

utilized fans: 12 Volt = **Sepa MFB 40 H 12**



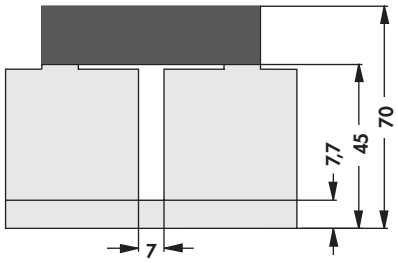


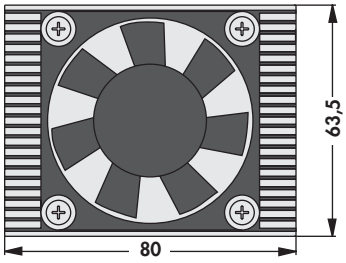
art. no.	R_{th} [K/W]	suitable for processor type
LA ICK PEN 3 XE	0.8	Intel® Pentium® III-Xeon™

please indicate: **... accessory (optional)**
A = alarm exit
SM = molex connection plug

fixing method: SB= screw fixing
utilized fans: 12 Volt = **Sepa MFB 50 E 12**

– with copper base plate
– customer specific designs and modifications on request





art. no.	R_{th} [K/W]	suitable for processor type
LA ICK PEN 4 1 K	0.6	Intel® Pentium® IV

please indicate: **... accessory (optional)**
SM = molex connection plug

fixing method: K = with fixing clamp
operating voltage of the fan motor: 12 Volt (Papst 612 NHH)

Heatsinks for BGA → **B 17 – 20**
Heatsinks for Q7 "Embedded-Boards" → **B 56**
Fan cooler, universal → **B 58**
Heatsinks for Pentium PRO → **B 57**
Heatsinks for P II-Mobile Module → **B 56**
Fan cooler for Pentium IV → **B 60**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Technical data of the fans

molex crimp case series: 6471; molex crimp terminals: 2759

– Sepa-fan 24 h BURN-IN tested

5 volt fan

	Sepa MFB 25 F 05 L	**Sepa MFB 40 H 05**	**Sepa MFB 40 H 05 A**	**Sepa MFB 50 E 05**	**Sepa HFB 44 X 05 A**	**ebmpapst 405 F**
circuit voltage	4.5...5.5 V DC	4.5...5.5 V DC	4.5...5.5 V DC	4.5...5.5 V DC	4.5...5.5 V DC	4.5...5.5 V DC
bearing type	double ball bearing	double ball bearing	double ball bearing	double ball bearing	ball bearing	double slide bearing
fan dimensions	25x25x10 mm	40x40x10 mm	40x40x10 mm	50x50x10 mm	44x44x6.2 mm	40x40x10 mm
cur. consumpt.	90 mA	90 mA	90 mA	50 mA	90 mA	140 mA
max. iuitial current	170 mA	250 mA	250 mA	120 mA	160 mA	
max. volume flow	46 l/min 2.8 m^3/h	184 l/min 11 m^3/h	184 l/min 11 m^3/h	169 l/min 10.1 m^3/h	50 l/min 3 m^3/h	132 l/min 8 m^3/h
max. static pressure	2.2 mmH_2O 22 Pa	3.1mm H_2O 30.5 Pa	3.1mm H_2O 30.5 Pa	1.6mm H_2O 15.6 Pa	2.6mm H_2O 25.5 Pa	3.06mm H_2O 30 Pa
noise level	18 dB(A), 1 m lateral	24 dB(A), 1 m lateral	24 dB(A), 1 m lateral	17 dB(A), 1 m lateral	28 dB(A), 1 m lateral	22.1 dB(A), 1 m lateral
temperature range	-10°C ... +85°C	-40°C... +80°C	-40°C... +80°C	-10°C... +70°C	-40°C... +80°C	-20°C... +70°C
failure rate (L_{10})	95,000 h	95,000 h	95,000 h	95,000 h	95,000 h	45,000 h (20°C)
MTBF	280,000 h (20°C)	280,000 h (20°C)	280,000 h (20°C)	280,000 h (20°C)	280,000 h (20°C)	
weight	8 g	13 g	13 g	19 g	7 g	17 g
cases	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E38324)

12 volt fan

	Sepa MFB 25 F 12	**Sepa MFB 40 H 12**	**Sepa MFB 40 H 12 A**	**Sepa MFB 50 E 12**	**Sepa HFB 44 B 12 A**	**ebmpapst 412 F**
circuit voltage	10.2...13.8 V DC	10.2...13.8 V DC	10.2...13.8 V DC	10.2...13.8 V DC	10.2...13.8 V DC	10-14 V DC
bearing type	double ball bearing	double ball bearing	double ball bearing	ball bearing	ball bearing	double slide bearing
fan dimensions	25x25x10 mm	40x40x10 mm	40x40x10 mm	50x50x10 mm	44x44x6.2 mm	40x40x10 mm
cur. consumpt.	70 mA	50 mA	50 mA	60 mA	40 mA	60 mA
max. iuitial current	150 mA	130 mA	130 mA	140 mA	70 mA	
max. volume flow	70 l/min 4.1 m^3/h	173 l/min 10.3 m^3/h	173 l/min 10.3 m^3/h	238 l/min 14.3 m^3/h	50 l/min 3 m^3/h	132 l/min 8 m^3/h
max. static pressure	2.24mm H_2O 41.5 Pa	2.9 mmH_2O 28.5 Pa	2.9 mmH_2O 28.5 Pa	2.7mm H_2O 26.9 Pa	2.6mm H_2O 25.5 Pa	3.06mm H_2O 30 Pa
noise level	23 dB(A), 1 m lateral	24 dB(A), 1 m lateral	21 dB(A), 1 m lateral	22 dB(A), 1 m lateral	28 dB(A), 1 m lateral	22.1 dB(A), 1 m lateral
temperature range	-40°C... +80°C	-40°C... +80°C	-40°C... +80°C	-10°C... +70°C	-40°C... +80°C	-20°C... +70°C
failure rate (L_{10})	95,000 h	95,000 h	95,000 h	95,000 h	95,000 h	45,000 h (20°C)
MTBF	280,000 h (20°C)	280,000 h (20°C)	280,000 h (20°C)	280,000 h (20°C)	280,000 h (20°C)	
weight	8 g	13 g	13 g	19 g	20 g	17 g
cases	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	steel/aluminium (UL E54695)	plastic PBT (UL E38324)

Fans with pulse output - Technical data of fans with pulse output:

– pulse output for activation of the alarm control
– pulse similar to a square pulse with three times the frequency of the rotor speed
– when the rotor is blocked, the output signal may be L (≤0.8 V) or H (Vcc-1 V)
– the pulse output must not be connected to GND or Vcc withoutb protective resistor (>10 K)
– in order to avoid short circuits, the pulse output not being used must be insulated

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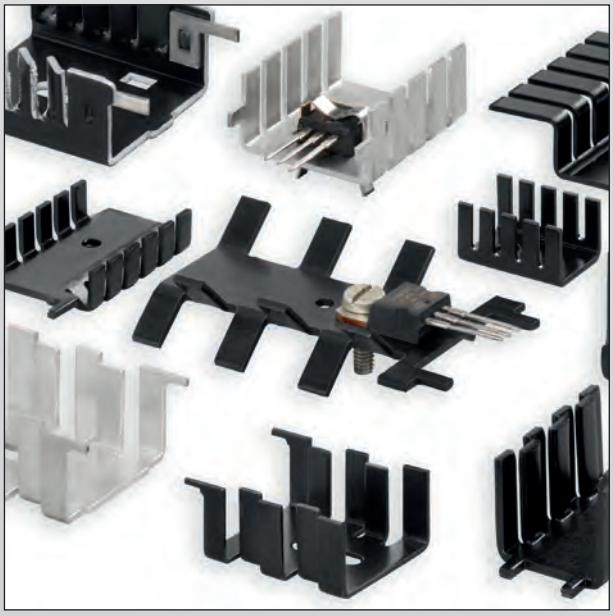
Finger shaped heatsinks for power semiconductors
Attachable heatsinks
Finger shaped heatsinks for transistors
Miniature heatsinks

Finger shaped heatsinks for power semiconductors
- specially compatible for power semiconductors in a TO-case
- made as a bent sheet metal part or die cast heatsink made of aluminium
- aligned heatsink contours for the best heat dissipation
- direct screwing of the component to the heatsink on the PCB

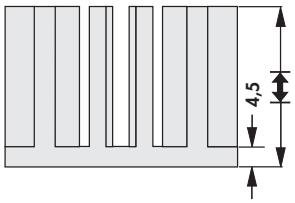
Attachable heatsinks
- made of aluminium or copper material
- solderable surface coating
- integrated spring clip for easy and fast mounting of the transistor
- secure hold of the component due to optimized spring force and geometry
- customer specific version upon request

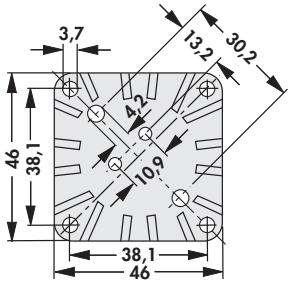


Finger shaped heatsinks for transistors
- effective heat dissipation of transistors
- efficient radiation of heat at a horizontal or vertical mounting position
- component fastening by means of screws or special transistor retaining springs
- solder mounting by means of integrated solder pins and solderable surfaces

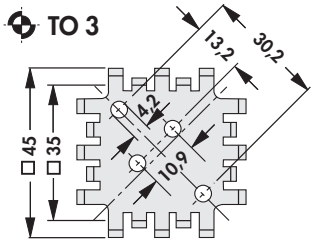
Miniature heatsinks
- for TO 5, SOT 82, D PAK and similar semiconductors
- made of aluminium, phosphorus bronze or copper
- simple mounting by direct plugging or soldering of the heatsink
- special types of packaging such as tape & reel, magazine or tray upon request
- versions and designs for your application

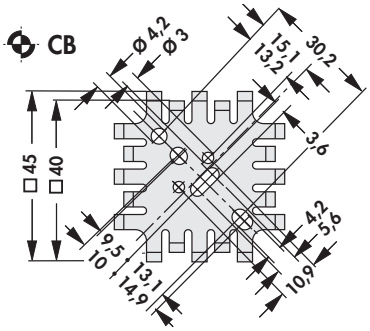
Finger shaped heatsinks for power semiconductors



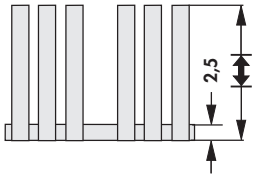


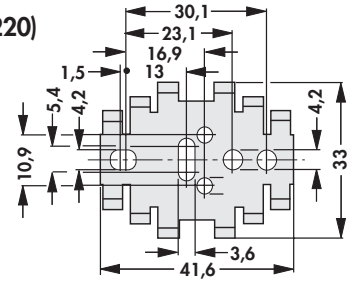
art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 254 SA 3	25.4	5.8	TO 3
FK 318 SA	31.8	4.8	without
FK 318 SA 3	31.8	4.8	TO 3
material:	die-casting aluminium		
surface:	black lacquered		





art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 201 SA	25.4	6	without
FK 201 SA 3	25.4	6	TO 3
FK 201 SA CB	25.4	6	CB
FK 202 SA	12.7	8	without
FK 202 SA 3	12.7	8	TO 3
FK 202 SA CB	12.7	8	CB

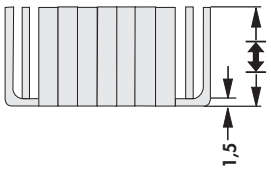




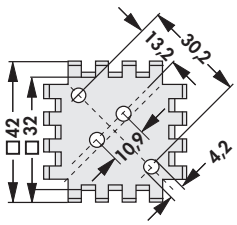
art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 205 SA L	31.8	9.0	L
FK 206 SA L	25.4	10.5	L
FK 207 SA L	19.1	12.0	L
FK 208 SA L	12.7	14.0	L
material:	aluminium		
surface:	black anodised		

Attachable heatsinks → **C 10 – 14**
Heatsinks for TO 5 and TO 18 → **C 17 – 19**
Heatsinks for D PAK → **C 21 – 117**
Aluminium oxide wafers → **E 17 – 18**
Mounts → **E 44 – 48**
Insulating caps → **E 51**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

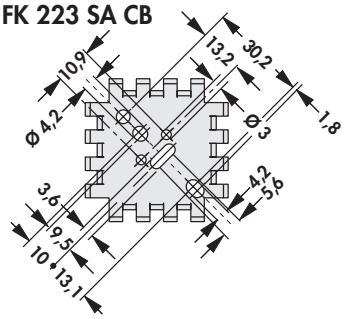
Finger shaped heatsinks for power semiconductors



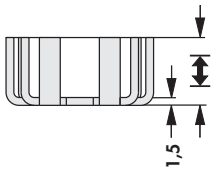
FK 223 SA 3

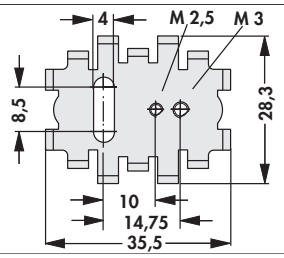


FK 223 SA CB



art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 223 SA	17	6.8	without
FK 223 SA 3	17	6.8	TO 3
FK 223 SA CB	17	6.8	CB



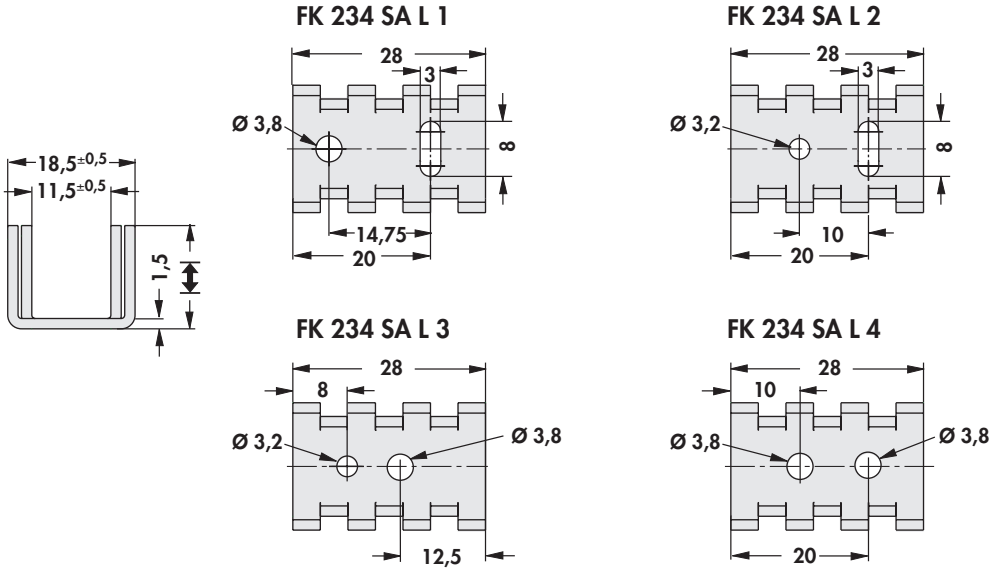


art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 217 SA CB 2	13	16	CB 2 (SOT 32; TO 220)

material:	aluminium
surface:	black anodised

Heatsinks for transistors in plastic case

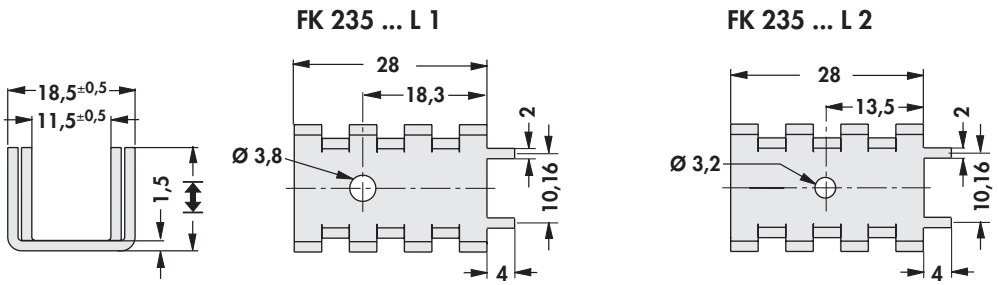
– for semiconductor screw-assembly, horizontal



art. no.	↕ [mm]	R_{th} [K/W]	◈
FK 234 SA L 1	15	17	TO 220
FK 234 SA L 2	15	17	SOT 32
FK 234 SA L 3	15	17	CB
FK 234 SA L 4	15	17	CB

material:	aluminium
surface:	black anodised

– for semiconductor screw-assembly, vertical



art. no.	↕ [mm]	R_{th} [K/W]	◈
FK 235 MI L 1	15	16	TO 220
FK 235 MI L 2	15	16	SOT 32
FK 235 SA L 1	15	16	TO 220
FK 235 SA L 2	15	16	SOT 32

material:	aluminium
surface:	solderable surface/ black anodised

Attachable heatsinks → **C 10 – 14**
Heatsinks for TO 5 and TO 18 → **C 17 – 19**
Heatsinks for D PAK → **C 21**
Aluminium oxide wafers → **E 17 – 18**
Mounts → **E 44**
Insulating caps → **E 51**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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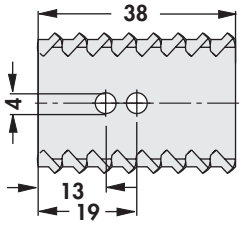
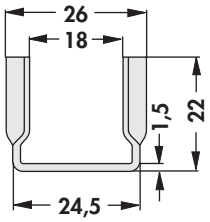
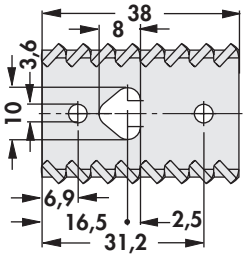
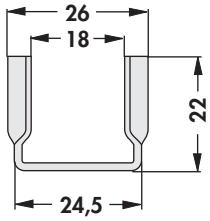
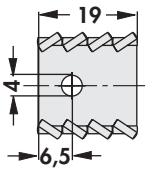
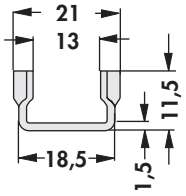
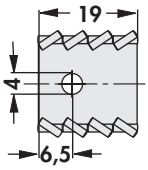
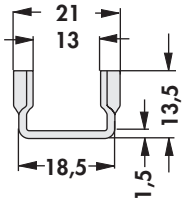
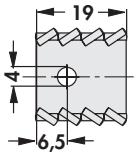
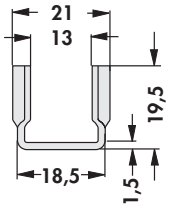
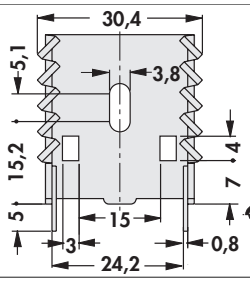
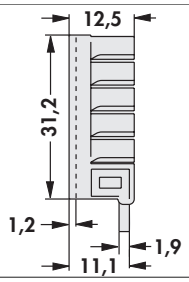
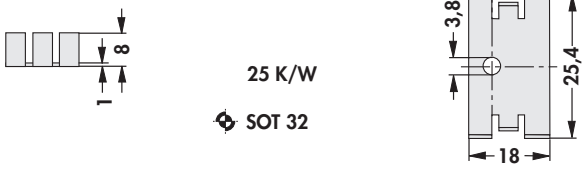
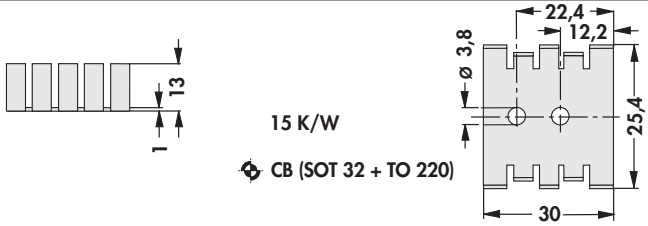
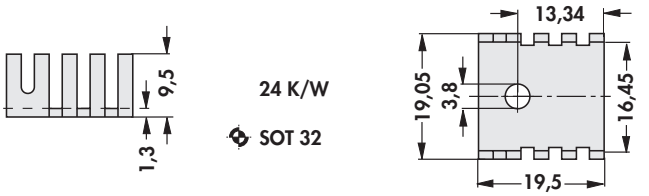
Heatsinks for transistors in plastic case

art. no.				
FK 225 SA L 1			9,9 K/W TO 220	
art. no.				
FK 225 SA L 2			9,9 K/W TO 220	
art. no.				
FK 228 SA L 1			30 K/W TO 220	
art. no.				
FK 229 SA L 1			27 K/W TO 220	
art. no.				
FK 230 SA L 1			21 K/W TO 220	
material:	aluminium			
surface:	black anodised			

art. no.				
FK 249 SA 220			17 K/W TO 220	
material:	aluminium			
surface:	black passivated, solder pins tin plated			

Attachable heatsinks → C 10 – 14
Heatsinks for TO 5 and TO 18 → C 17 – 19
Heatsinks for D PAK → C 21
Aluminium oxide wafers → E 17 – 18
Mounts → E 44 – 48
Insulating caps → E 51
Thermal conductive material → E 2 – 24
Technical introduction → A 2 – 8

Heatsinks for transistors in plastic case

art. no.		
FK 209 SA 32		 25 K/W SOT 32
	available without hole pattern as well	
art. no.		
FK 210 SA CB		 18 K/W CB (SOT 32 + TO 220)
	available without hole pattern as well	
art. no.		
FK 213 SA 32		 21 K/W SOT 32
	available without hole pattern as well	
art. no.		
FK 214 SA CB		 15 K/W CB (SOT 32 + TO 220)
	available without hole pattern as well	
art. no.		
FK 231 SA 220		 24 K/W TO 220
art. no.		
FK 239 SA 32		 24 K/W SOT 32
material:	aluminium	
surface:	black anodised	

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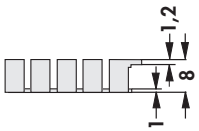
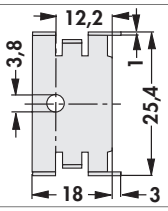
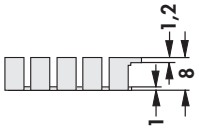
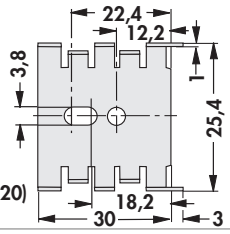
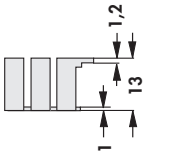
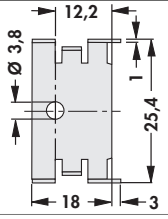
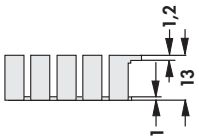
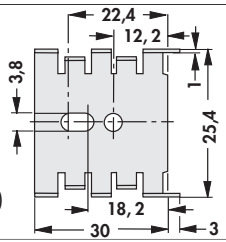
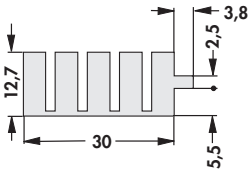
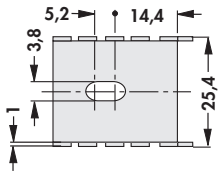
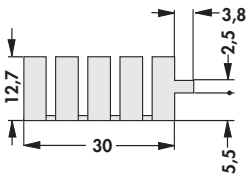
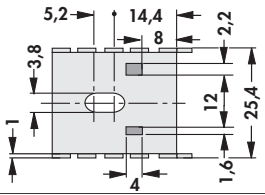
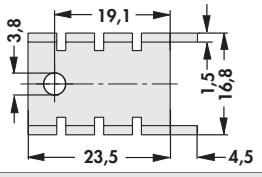
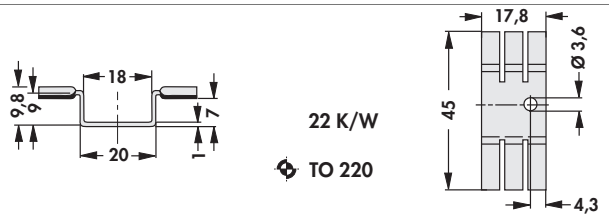
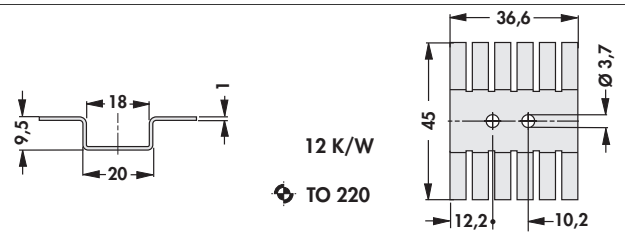
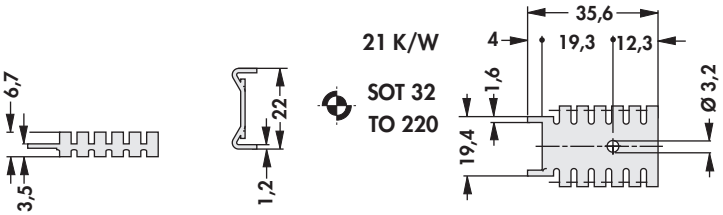
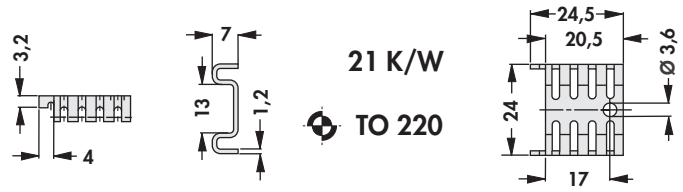
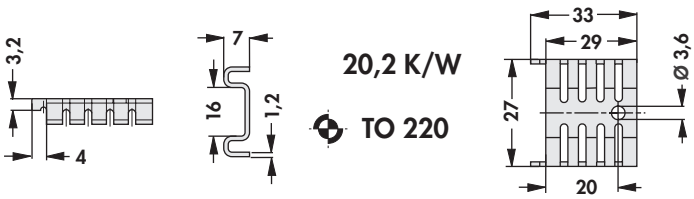
Heatsinks for transistors in plastic case

art. no.			
FK 211 32 ...		 25 K/W SOT 32	
	available without hole pattern as well		
art. no.			
FK 212 CB ...		 18 K/W CB (SOT 32 + TO 220)	
	available without hole pattern as well		
art. no.			
FK 215 32 ...		 21 K/W SOT 32	
	available without hole pattern as well		
art. no.			
FK 216 CB		 15 K/W CB (SOT 32 + TO 220)	
	available without hole pattern as well		
art. no.			
FK 222 ...		 20 K/W TO 220	
	available without hole pattern as well		
art. no.			
FK 222 THF ...		 20 K/W TO 220	
art. no.			
FK 247 220 ...		 22 K/W TO 220	
please indicate:	**... surface** **SA = black anodised** **MI = solderable surface**		
material:	aluminium		

Heatsinks for transistors in plastic case

art. no.		
FK 227 SA L 1		
art. no.		
FK 238 SA L 1		
material:	aluminium	
surface:	black anodised	

art. no.		
FK 218 32 ...		
art. no.		
FK 232 220 ...		
art. no.		
FK 233 220 ...		
please indicate:	... surface SA = black anodised MI = solderable surface	
material:	aluminium	

Attachable heatsinks	→ C 10 – 14	Mounts	→ E 44
Heatsinks for TO 5 and TO 18	→ C 17 – 19	Insulating caps	→ E 51
Heatsinks for D PAK	→ C 21	Thermal conductive material	→ E 2 – 24
Aluminium oxide wafers	→ E 17 – 18	Technical introduction	→ A 2 – 8

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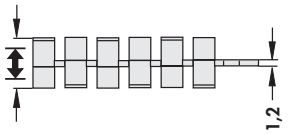
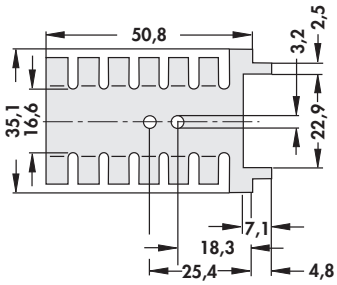
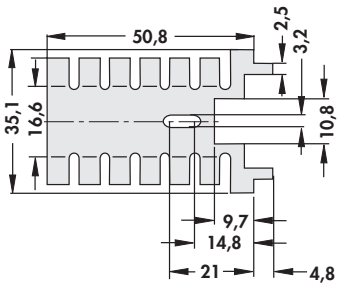
Heatsinks for transistors in plastic case



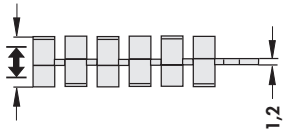
FK 219 CB 1 ...

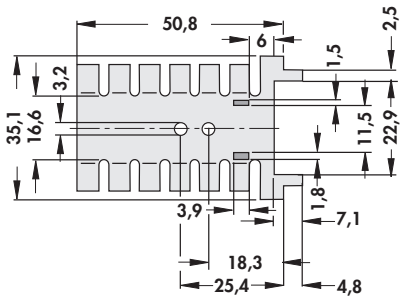


FK 219 CB 2 ...

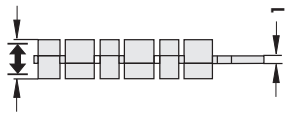


art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 219 CB 1 ...	12.6	14	CB 1 (TO 220)
FK 219 CB 2 ...	12.6	14	CB 2 (TO 220)

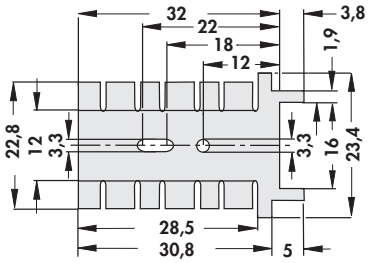




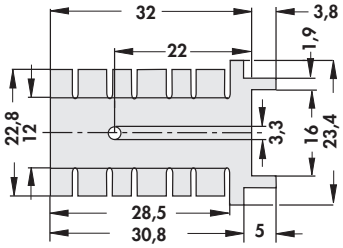
art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 219 CB 3 ...	12.6	14	CB 3 (TO 220)



FK 236 CB ...



FK 236 220 ...

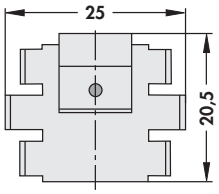


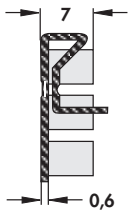
art. no.	↕ [mm]	R_{th} [K/W]	⌖
FK 236 220 ...	5	18	TO 220
FK 236 CB ...	5	18	CB

please indicate: **... surface**
SA = black anodised
MI = solderable surface

material: aluminium

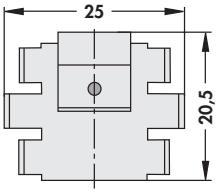
Retaining springs for transistors → **A 115 – 117**
Lock-in retaining spring for transistors → **A 119**
Profiles for lock-in fixing spring → **A 84**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for TO 5 and TO 18 → **C 17 – 19**
Attachable heatsinks → **C 10 – 14**
Mounting material for semiconductors → **E 46**
Technical introduction → **A 2 – 8**

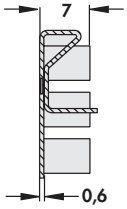




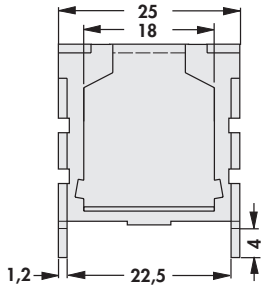
art. no.	R_{th} [K/W]	⌖
FK 220 SA 220	25	TO 220
material:	aluminium	
surface:	black anodised	

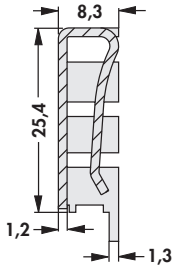
– for transistiors with thin bottom thickness (0.5 mm)





art. no.	R_{th} [K/W]	⌖
FK 258 SA 220	25	TO 220
material:	aluminium	
surface:	black anodised	



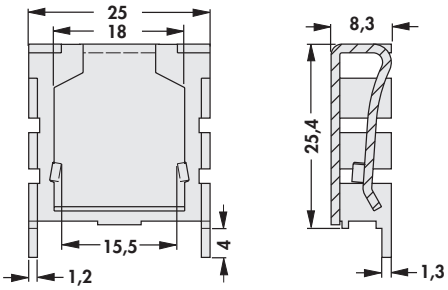


art. no.	R_{th} [K/W]	⌖
FK 224 ... P SIP	18	P SIP
please indicate:	**... surface** **SA = black anodised** **MI = solderable surface**	
material:	aluminium	

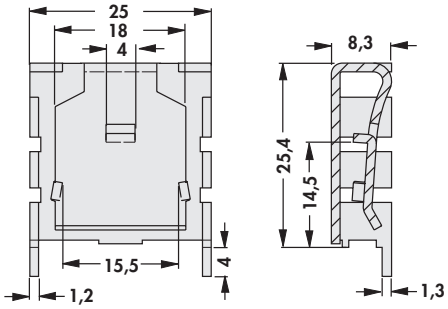
Heatsinks for D PAK → **C 21**
Heatsinks for transistors → **C 4 – 9**
Kapton insulator washers → **E 16**
Vibration dampers → **E 41**
Vibration dampers → **E 41**
U-shaped heatsink → **A 123 – 124**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Attachable heatsinks

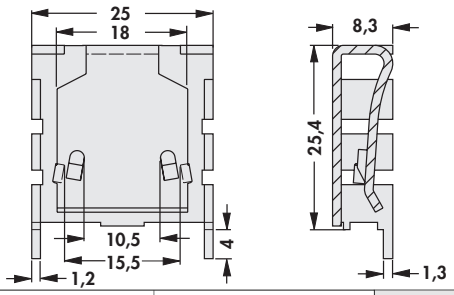
FK 224 ... 218 1



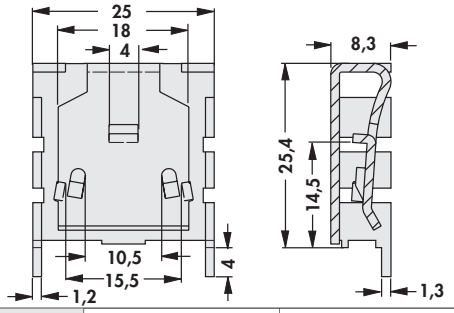
FK 224 ... 218 2



FK 224 ... 220 1



FK 224 ... 220 2

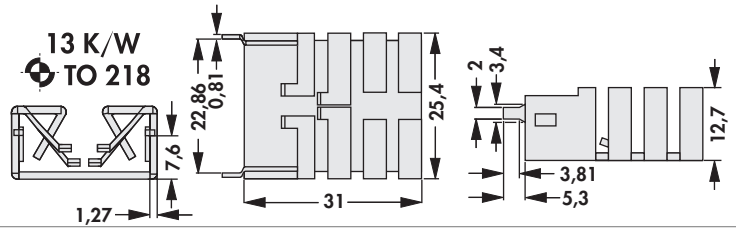


art. no.	R_{th} [K/W]	⌖	art. no.	R_{th} [K/W]	⌖
FK 224 ... 218 1	18	TO 218	**FK 224 ... 220 1**	18	TO 220
FK 224 ... 218 2	18	TO 218	**FK 224 ... 220 2**	18	TO 220

please indicate: **... surface**
SA = black anodised
MI = solderable surface

material:	aluminium

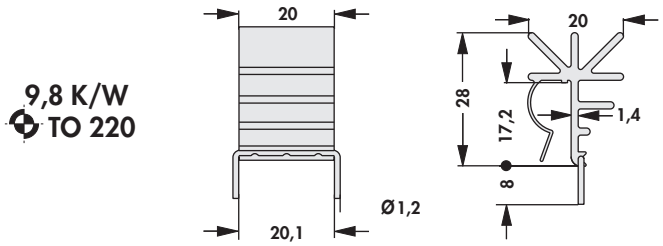
art. no.



FK 241 SA 218 V

with tin-plated soldering lug for direct soldering onto circuit board, for vertical installation

art. no.



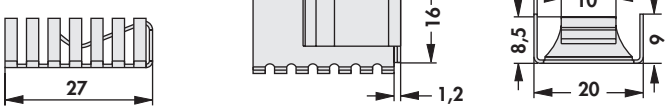
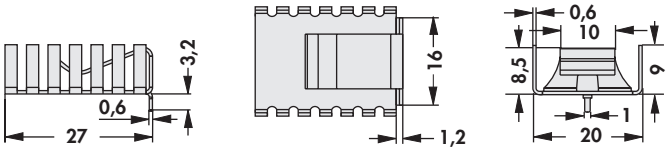
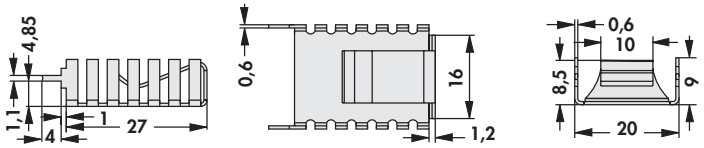
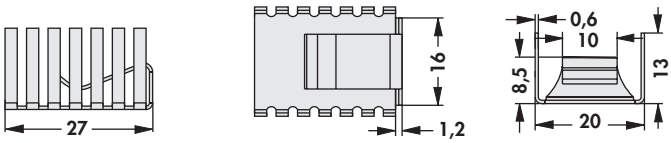
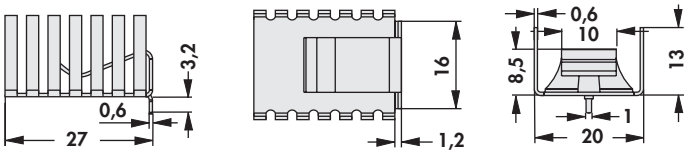
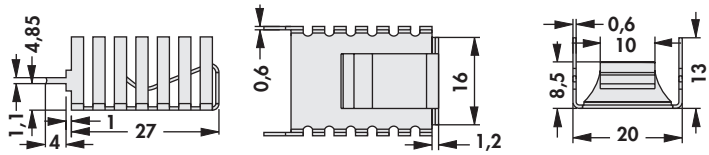
FK 248 SA 220

material:	aluminium
surface:	black anodised, solder pins tin plated

Heatsinks for D PAK → **C 21**
Heatsinks for transistors → **C 4 – 9**
Kapton insulator washers → **E 16**
Vibration dampers → **E 41**
Vibration dampers → **E 41**
U-shaped heatsink → **A 123 – 124**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Attachable heatsinks

– universal clip on heatsinks for type TO 218, TO 229, TO 247, TO 248, SIP-Muliwatt and similar
– easy assembly by pushing the heatsink onto the component
– for vertical and horizontal fastening by soldering
– fin height variations on request
– special design accord. to customized specification

art. no.		
FK 245 MI 247 O		20,2 K/W  without soldering lug
art. no.		
FK 245 MI 247 H		20,5 K/W  with soldering lug for horizontal mounting
art. no.		
FK 245 MI 247 V		19,7 K/W  with soldering lug for vertical mounting
art. no.		
FK 243 MI 247 O		18,4 K/W  without soldering lug
art. no.		
FK 243 MI 247 H		19 K/W  with soldering lug for horizontal mounting
art. no.		
FK 243 MI 247 V		18,4 K/W  with soldering lug for vertical mounting

material:	copper (Cu)
surface:	solderable surface
material thickness:	0.6 mm

Heatsinks for D PAK → **C 21**
Heatsinks for transistors → **C 4 – 9**
Kapton insulator washers → **E 16**
Vibration dampers → **E 41**
Vibration dampers → **E 41**
U-shaped heatsink → **A 123 – 124**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

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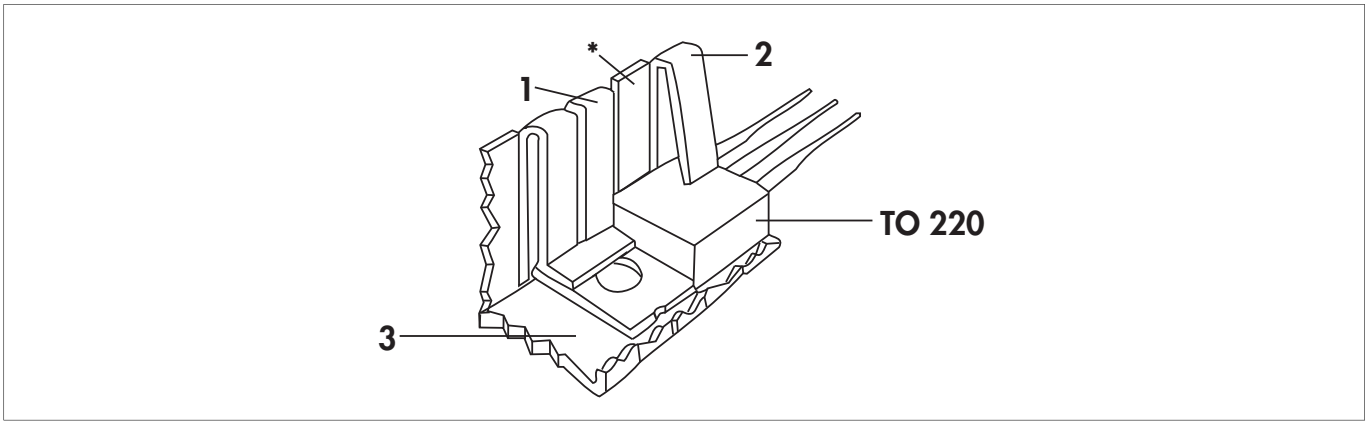
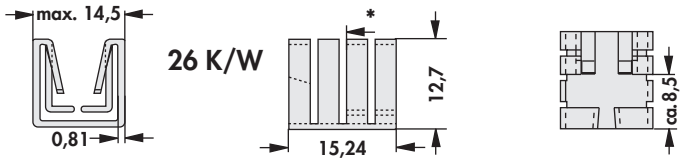
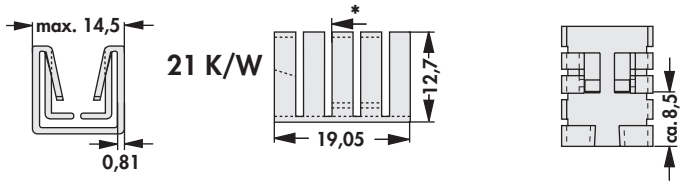
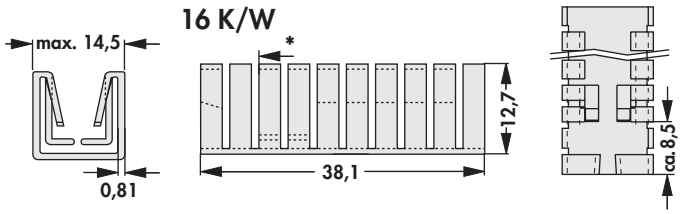
Attachable heatsinks

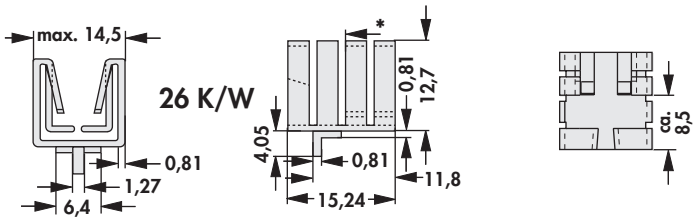
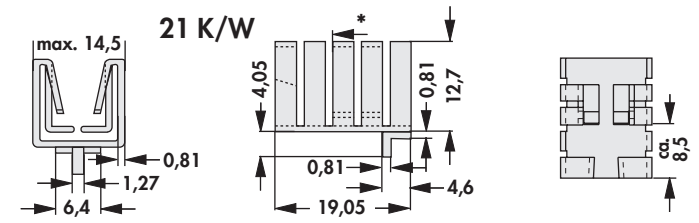
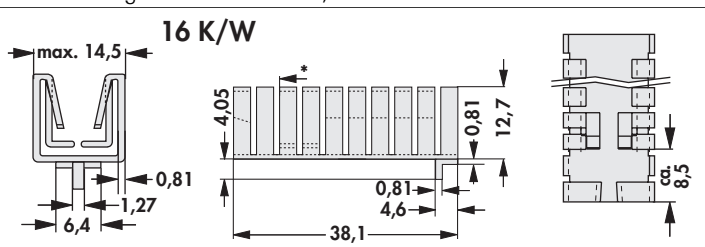


– narrow version with better thermal resistance
– max. 14.5 mm wide
– 3 different lengths for varied dissipation power
– takes less space than any other attachable heatsink
– simple assembly by pushing the heatsink onto the TO 220 housing
– the cooling fingers form spring clamps **(1+2)**, which pushes the TO 220 and it's mounting flange onto the heatsink **(3)**
– optimum heat transfer due the constant pressure on the entire contact surface of the TO 220 cases
– effective heat emmision with horizontal and vertical mounting
– ***** = touch in edge of transistor

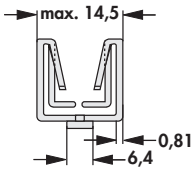
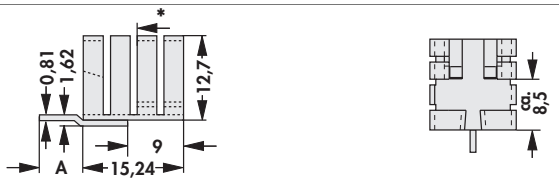
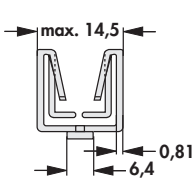
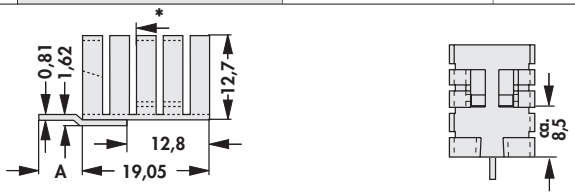
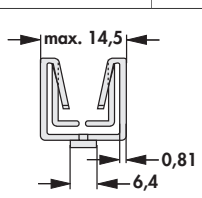
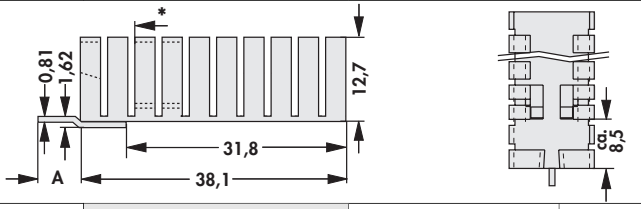
art. no.		
FK 242 SA 220 O		
	without soldering lug	
art. no.		
FK 237 SA 220 O		
	without soldering lug	
art. no.		
FK 240 SA 220 O		
	without soldering lug	
material:	aluminium	
surface:	black anodised, solder pins tin plated	

Heatsinks for D PAK → **C 21**
Heatsinks for transistors → **C 4 – 9**
Kapton insulator washers → **E 16**
Vibration dampers → **E 41**
Vibration dampers → **E 41**
U-shaped heatsink → **A 123 – 124**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Attachable heatsinks

art. no.		
		
FK 242 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation	
art. no.		
		
FK 237 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation	
art. no.		
		
FK 240 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation	
material:	aluminium	
surface:	black anodised, solder pins tin plated	

– with tinned soldering lug for direct soldering onto circuit board, for vertical installation

					
art. no.	A [mm]	R_{th} [K/W]	**art. no.**	A [mm]	R_{th} [K/W]
FK 242 SA 220 V	6.35	26	**FK 242 SA 220 VL**	9.53	26
					
art. no.	A [mm]	R_{th} [K/W]	**art. no.**	A [mm]	R_{th} [K/W]
FK 237 SA 220 V	6.35	21	**FK 237 SA 220 VL**	9.53	21
					
art. no.	A [mm]	R_{th} [K/W]	**art. no.**	A [mm]	R_{th} [K/W]
FK 240 SA 220 V	6.35	16	**FK 240 SA 220 VL**	9.53	16
material:	aluminium				
surface:	black anodised, solder pins tin plated				

Heatsinks for D PAK → **C 21**
Heatsinks for transistors → **C 4 – 9**
Kapton insulator washers → **E 16**
Vibration dampers → **E 41**
Vibration dampers → **E 41**
U-shaped heatsink → **A 123 – 124**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

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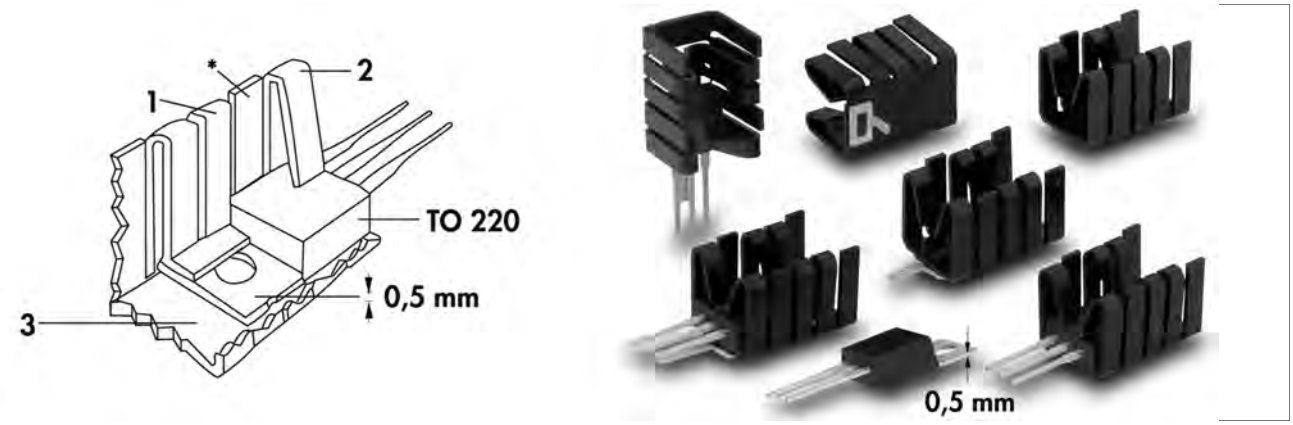
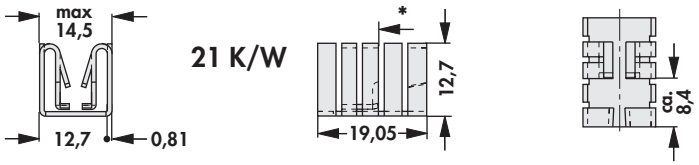
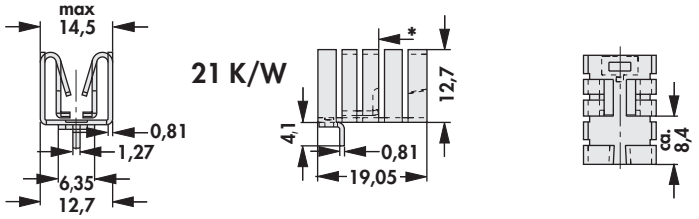
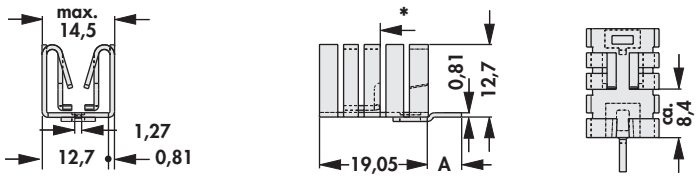
Attachable heatsinks for TO 220 with a bottom plate thickness of 0.5 mm



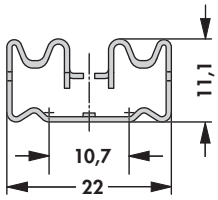
– narrow version with better thermal resistance
– max. 14.5 mm wide
– takes less space than any other attachable heatsink
– simple assembly by pushing the heatsink onto the TO 220 housing
– the cooling fingers form spring clamps **(1+2)**, which pushes the TO 220 and it's mounting flange onto the heatsink **(3)**
– optimum heat transfer due the constant pressure on the entire contact surface of the TO 220 cases
– effective heat emmision with horizontal and vertical mounting
– * = touch in edge of transistor

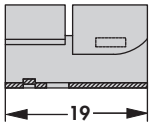
art. no.		
		
FK 252 SA 220 O	without soldering lug	
art. no.		
		
FK 252 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation	
material:	aluminium	
surface:	black anodised	

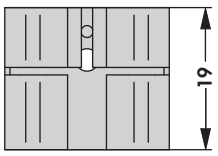
– with tinned soldering lug for direct soldering onto circuit board, for vertical installation

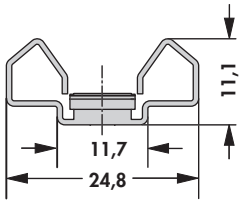
art. no.	A [mm]	R_{th} [K/W]	art. no.	A [mm]	R_{th} [K/W]
FK 252 SA 220 V	6.35	21	**FK 252 SA 220 VL**	9.53	21
material:	aluminium				
surface:	black anodised				

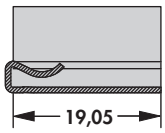


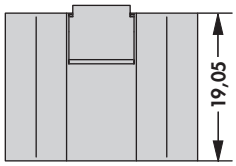




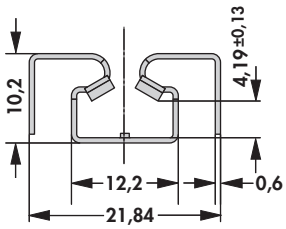
art. no.	R_{th} [K/W]	⌖
FK 253	23.7	TO 220

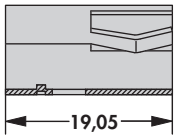


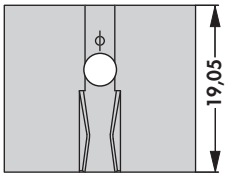




art. no.	R_{th} [K/W]	⌖
FK 255	16.8	TO 220







art. no.	R_{th} [K/W]	⌖
FK 257	21.2	TO 220

material:	aluminium
surface:	black anodised

Heatsinks for D PAK → **C 21**
Heatsinks for transistors → **C 4 – 9**
Kapton insulator washers → **E 16**
Vibration dampers → **E 41**
Vibration dampers → **E 41**
U-shaped heatsink → **A 123 – 124**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

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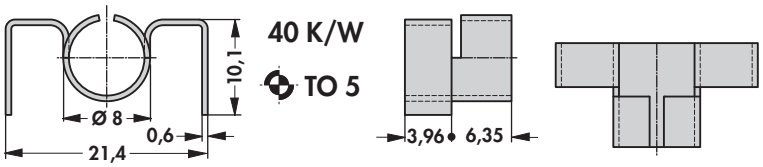
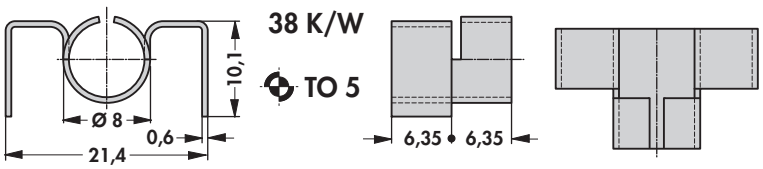
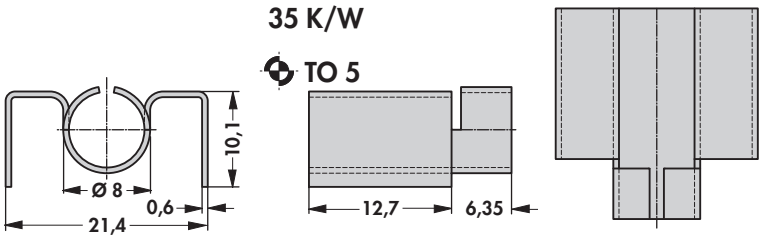
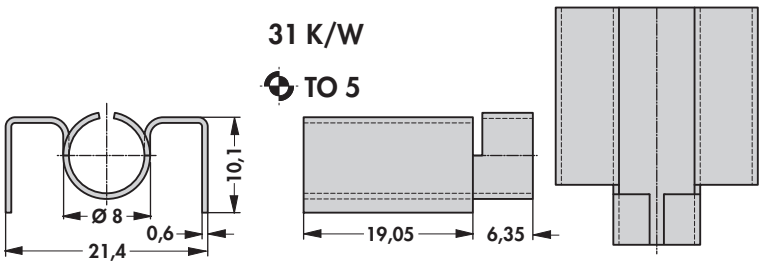
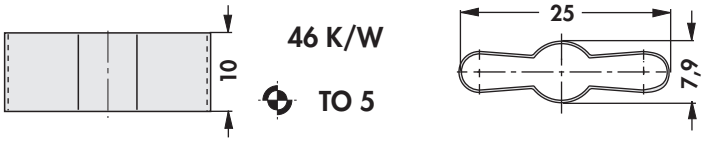
Small heatsinks

art. no.		
KK 1 3,96		
art. no.		
KK 1 6,35		
art. no.		
KK 1 12,7		
art. no.		
KK 1 19,05		

material:	aluminium
surface:	black anodised

art. no.		
KF 5/5		
art. no.		
KF 5/10		
art. no.		
KF 5/15		
material:	brass	
surface:	blackened	

art. no.		
KK 562 GS		
	T = gap; **F** = spring loaded	
material:	special bronze CuZn 15	
material thickness:	0.3 mm	
surface:	blackened	

Finger-shaped heatsinks → **C 2 – 3**
Heatsinks for transistors → **C 4 – 9**
Attachable heatsinks → **C 10 – 16**
Heatsinks for D PAK → **C 21 – 22**
Thermal conductive material → **E 2 – 24**
Mounting material for semiconductors → **E 46 – 48**
Extruded heatsinks → **A 22 – 83**
Technical introduction → **A 2 – 8**

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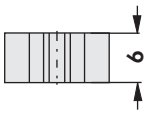
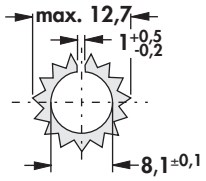
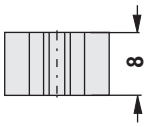
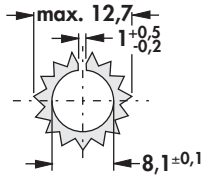
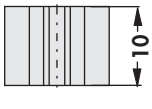
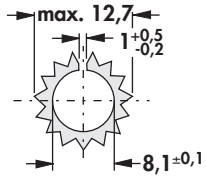
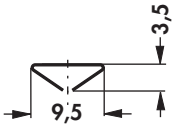
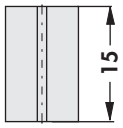
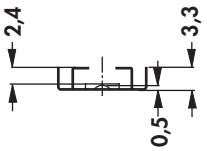
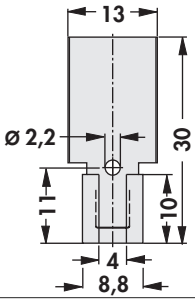
Small heatsinks

art. no.			
SKK 56		 63 K/W TO 5	
art. no.			
SKK 58		 55 K/W TO 5	
art. no.			
SKK 510		 44 K/W TO 5	
material:	aluminium		
surface:	etched (other surfaces on request)		

art. no.			
KK 92		 80 K/W TO 126 SOT 32 SOT 82	
art. no.			
KK 32		 60 K/W TO 126 SOT 32 SOT 82	
material:	special bronze CuZn 6		
surface:	blackened		

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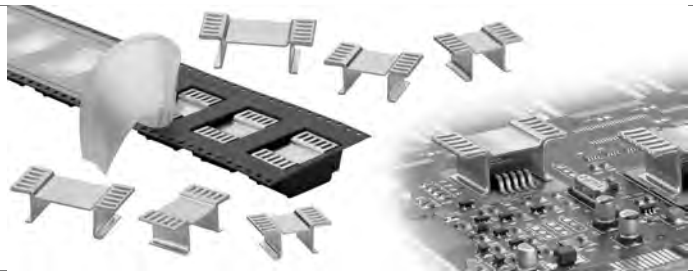
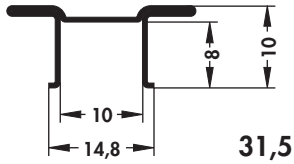
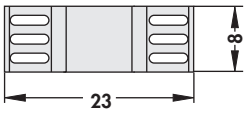
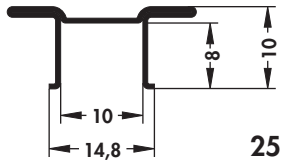
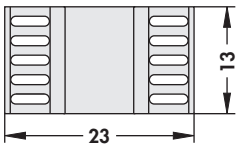
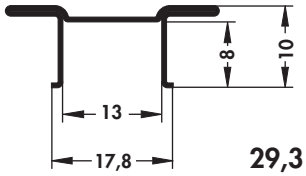
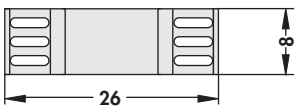
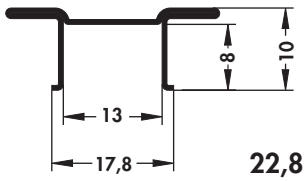
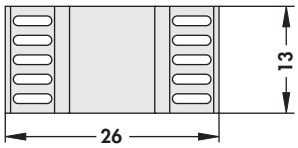
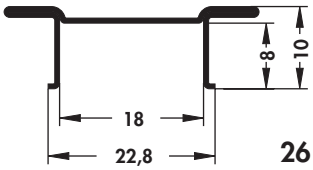
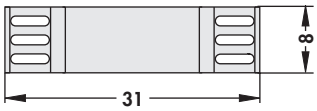
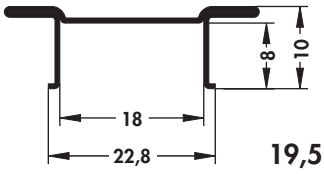
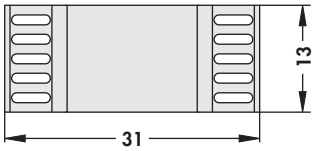
Heatsinks for D PAK and others



– copper heatsinks with excellent heat conductivity
– direct mounting on printed circuit through solderable surface
– especially suitable for SMD components of type D PAK (TO 252), D^2 PAK (TO 263), D^3 PAK (TO 268), SOT 669 LF PAK, SO IC-8 FL MP, Power SO-8, Power SO-10, Power SO-20, Power SO-36, SO-14, SO-16, SOT 223 etc
– available standard packing: bulk parts or reel
– special packing like magazine, tray etc. on request; - special versions according to customers specifications
– **tape width**: 44 mm, **reel diameter**: 330 mm, **quantity**: FK 244 08 = 450, FK 244 13 = 200

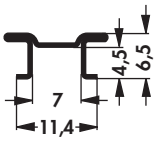
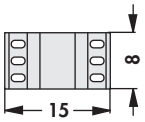
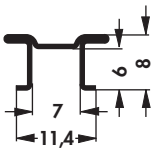
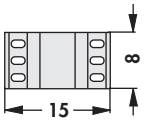
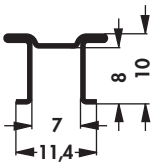
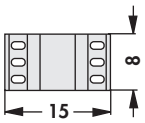
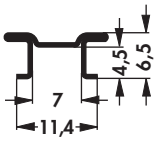
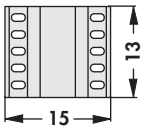
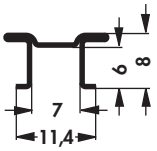
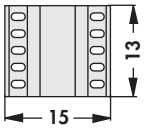
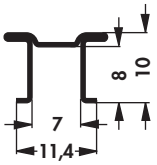
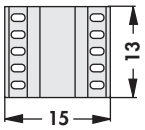
art. no.			
FK 244 08 D PAK ... weight: 2g		 **31,5 K/W**	
art. no.			
FK 244 13 D PAK ... weight: 3.3g		 **25 K/W**	
art. no.			
FK 244 08 D2 PAK ... weight: 2.2g		 **29,3 K/W**	
art. no.			
FK 244 13 D2 PAK ... weight: 3.6g		 **22,8 K/W**	
art. no.			
FK 244 08 D3 PAK ... weight: 2.5g		 **26 K/W**	
art. no.			
FK 244 13 D3 PAK ... weight: 3.9g		 **19,5 K/W**	

please indicate: **... packing (optional)**
TR = tape and reel

surface:	solderable surface
material:	copper (Cu)
material thickness:	0.6 mm

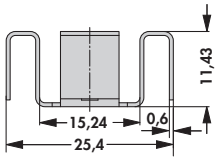
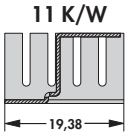
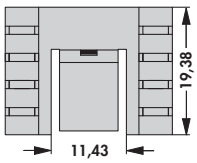
Heatsinks for D PAK and others

– **tape width**: 24 mm, **reel diameter**: 330 mm, **quantity**: FK 250 06 = 450, FK 250 08 = 450, FK 250 10 = 350
– **tape width**: 24 mm, **reel diameter**: 330 mm, **quantity**: FK 251 06 = 450, FK 251 08 = 350, FK 251 10 = 250

art. no.				
FK 250 06 LF PAK ... weight: 1g			**37 K/W**	
art. no.				
FK 250 08 LF PAK ... weight: 1.1g			**34,8 K/W**	
art. no.				
FK 250 10 LF PAK ... weight: 1.2g			**28,8 K/W**	
art. no.				
FK 251 06 LF PAK ... weight: 1.3g			**32 K/W**	
art. no.				
FK 251 08 LF PAK ... weight: 1.4g			**29,8 K/W**	
art. no.				
FK 251 10 LF PAK ... weight: 1.5g			**24 K/W**	

please indicate: **... packing (optional)**
TR = tape and reel

surface:	solderable surface
material:	copper (Cu)
material thickness:	0.6 mm

art. no.				
FK 256			**11 K/W** 	

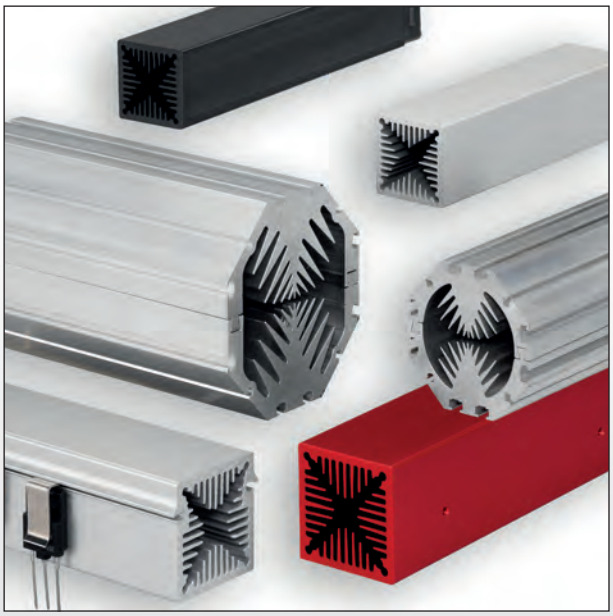
surface:	solderable surface
material:	aluminium
material thickness:	0.6 mm

Heatsink profile-overview → **A 13 – 17**
Assignment table → **A 18 – 20**
Finger-shaped heatsinks → **C 2 – 3**
Heatsinks for transistors → **C 4 – 9**
Attachable heatsinks → **C 10 – 16**
Heatsinks for TO 5 and TO 18 → **C 17 – 19**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

fischer elektronik

Segment cooling aggregates
Miniature cooling aggregates
Hollow fin cooling aggregates
High performance heatsinks

Segment cooling aggregates
- modular assembly consisting of different circle- and length segments
- electrical and thermal insulation of the single cooling segment sections
- standard drilling patterns TO 3 and pressfit
- segment profile also sold by the meter
- other fan types and fan voltages upon request

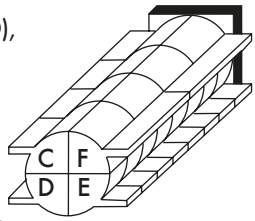


Miniature cooling aggregates
- compact construction for dissipating high power losses on smallest installation space
- heatsink geometries and fixed length optimal adjusted to the fan being used
- homogeneous heat dissipation
- mounting of the semi-conductor by means of sliding nut chanels or specific snap-to-retaining springs for transistors

Hollow fin cooling aggregates
- flow-optimized hollow fin geometry
- precise milled flat semiconductor mounting surface, single- and double-sided
- laminar airflow and noise reduction by means of harmonized chamber systems
- additional treatments, modifications and designs according to customers specifications

High performance heatsinks
- exclusive for forced convection
- for radial- and tangential fans
- flow-optimized design, best heat dissipation by means of especially thick bottom plates
- precise milled flat semiconductor mounting surfaces
- mechanical treatments, special designs and surface coating for your application

Order example (see drawing on the right)

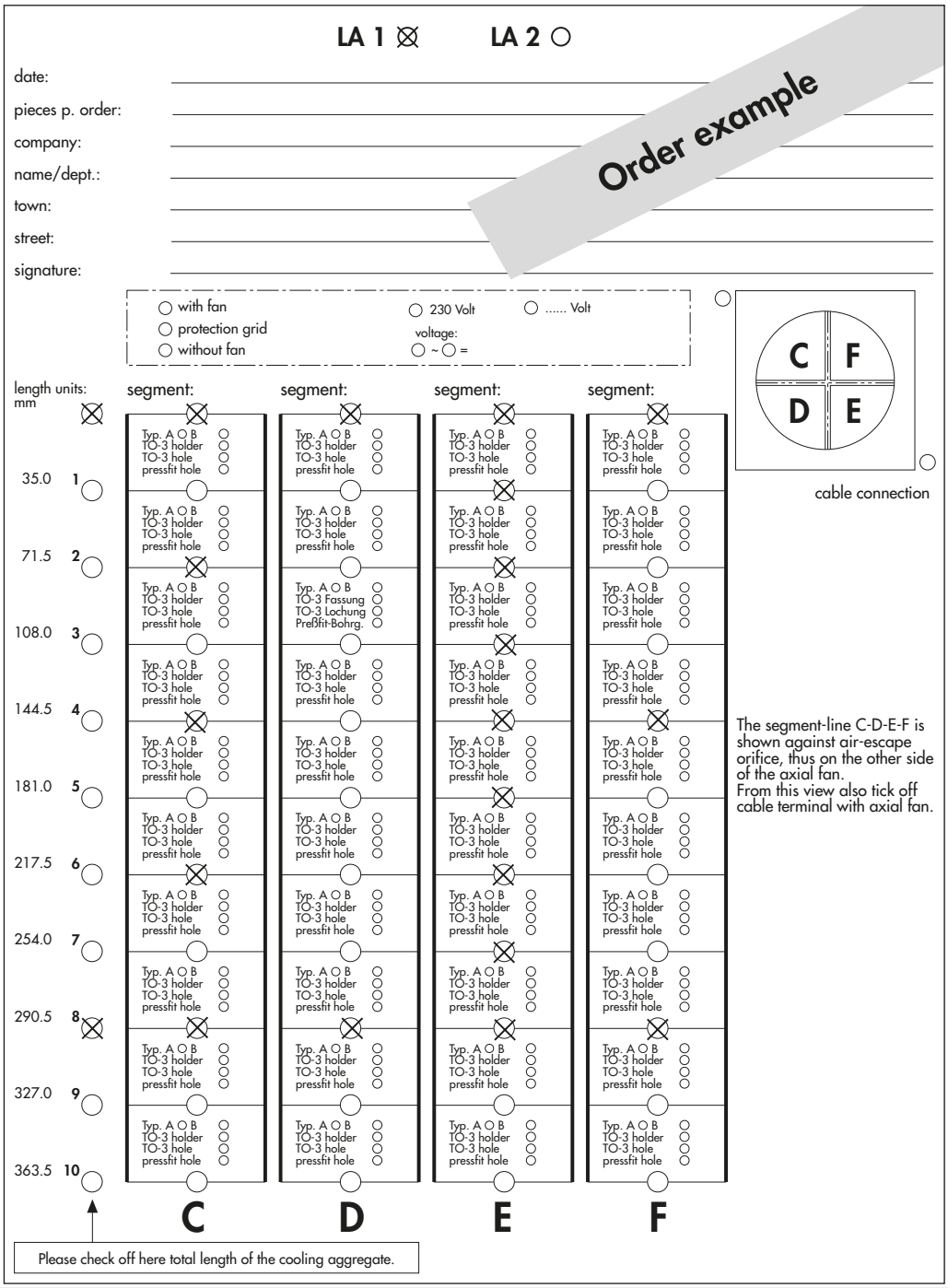


Semiconductor cooling package, consisting of 4 heatsinks LA 1 -2 A (segment C), 1 heatsink LA 1 - 8 A (segment D), 8 heatsinks LA 1 - 1 A (segment E) and 2 heatsinks LA 1- 4 A (segment F).
Total dissipation 1280 W.

How to tick off?

1. Tick on the left hand side the circles corresponding to an eight element long package, and also at the end of each row of the segments C, D, E and F to define the length.
2. For segment C: 4 marks for four double length elements, insulated from each other. This indicates 4 units LA 1 - 2.
3. For segment D: 1 mark for one single length of heatsink, 290.5 mm long. This indicates 1 unit LA 1 - 8.
4. For segment E: 8 marks for 8 elements of the standard length (35 mm) each insulated from the other. This indicates 8 units LA 1 - 1.
5. For segment F: 2 marks for each two heatsinks of 144.5 mm length, each insulated from the other. This indicates 2 units LA 1 - 4.
6. For each segment the profile types, either A or B, must be indicated for aggregate LA 1.
7. In the rectangle corresponding to the heatsink elements, the pin layouts for the transistor should also be indicated.
8. In the order form please indicate whether the cooling-aggregate is to be supplied with a fan and whether this is equipped with a protection-grid, or if it is to be supplied without a fan.

Upon request, it is possible to supply fans for special voltages and higher temperatures.



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Order / inquiry

LA 1 ○ LA 2 ○

date: _____

pieces p. order: _____

company: _____

name/dept.: _____

town: _____

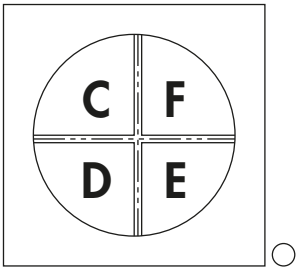
street: _____

signature: _____

○ with fan
○ protection grid
○ without fan

○ 230 Volt ○ ..... Volt

voltage:
○ ~ ○ =



cable connection

length units: mm

	segment: C	segment: D	segment: E	segment: F
35.0 1	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
71.5 2	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 Fassung ○ TO-3 Lochung ○ Preßfit-Bohrg. ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
108.0 3	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
144.5 4	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
181.0 5	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
217.5 6	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
254.0 7	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
290.5 8	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
327.0 9	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○
363.5 10	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○	Typ. A ○ B TO-3 holder ○ TO-3 hole ○ pressfit hole ○

The segment-line C-D-E-F is shown against air-escape orifice, thus on the other side of the axial fan.
From this view also tick off cable terminal with axial fan.

Please check off here total length of the cooling aggregate.

D 3

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Order / inquiry

LA 1 ○ LA 2 ○

date: _____

pieces p. order: _____

company: _____

name/dept.: _____

town: _____

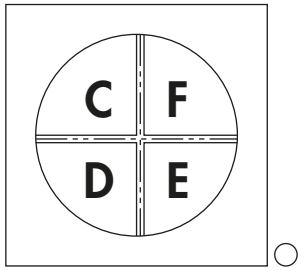
street: _____

signature: _____

○ with fan
○ protection grid
○ without fan

○ 230 Volt ○ ..... Volt

voltage:
○ ~ ○ =



cable connection

length units: mm

segment: segment: segment: segment:

		C	D	E	F
35.0	1	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
71.5	2	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
108.0	3	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 Fassung TO-3 Lochung Preßfit-Bohrg.	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
144.5	4	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
181.0	5	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
217.5	6	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
254.0	7	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
290.5	8	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
327.0	9	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole
363.5	10	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole	Typ. A ○ B TO-3 holder TO-3 hole pressfit hole

The segment-line C-D-E-F is shown against air-escape orifice, thus on the other side of the axial fan.
From this view also tick off cable terminal with axial fan.

Please check off here total length of the cooling aggregate.

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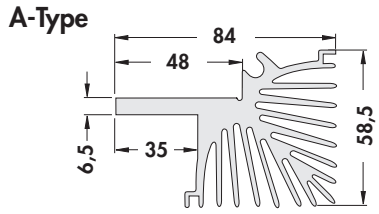
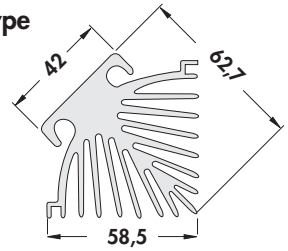
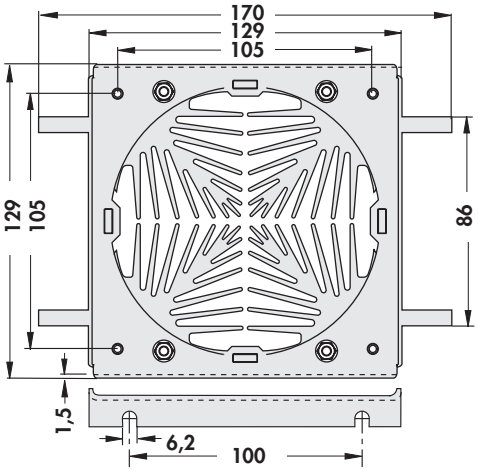
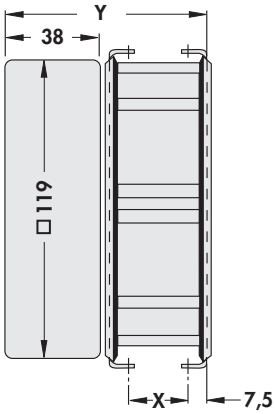
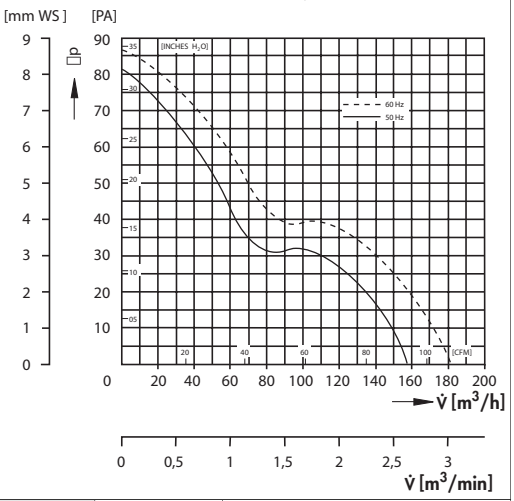
Segment cooling aggregates











art. no.	L [mm]	dim. [mm] X	dim. [mm] Y	art. no.	L [mm]	dim. [mm] X	dim. [mm] Y
LA 1 01 ...	35.0	26.0	88.6	**LA 1 06 ...**	217.5	208.5	271.1
LA 1 02 ...	71.5	62.5	125.1	**LA 1 07 ...**	254.0	245.0	307.6
LA 1 03 ...	108.0	99.0	161.6	**LA 1 08 ...**	290.5	281.5	344.1
LA 1 04 ...	144.5	135.5	198.1	**LA 1 09 ...**	327.0	318.0	380.6
LA 1 05 ...	181.0	172.0	234.6	**LA 1 10 ...**	363.5	354.5	417.1

... for A-types: please add an "A", for B-types: please add a "B".
L: unit lengths of the segments incl. insulation; **X**: mounting distance; **Y**: length of the cooling aggregate incl. fan

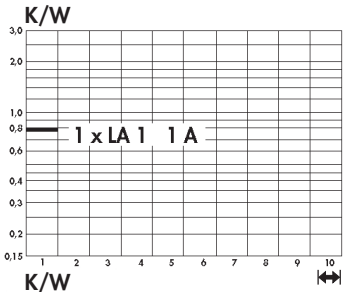
24 V DC fan on request
In case of order please use order form.
segments also available in meter length:
art. no. for A-type: LA 1 1000 A; art. no. for B-type: LA 1 1000 B
Other fan types and fan voltages on request.

Technical data of the fans

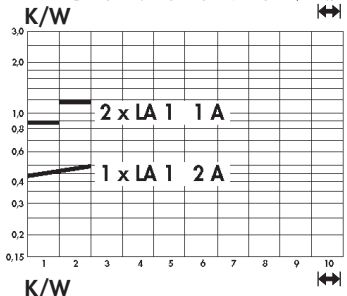
	... 230
type	ebmpapst, ball bearing
dimensions	119x119x38 mm
tension	230 V AC
power inout	19 W
max. air volume	160 m^3/h
temperature range	-40°C... +85°C
noise level	47 dB(A)
speed	2,650 min^{-1}
weight	550 g
failure rate (L_{10})	L_{10} < 37,500 h (40°C)

Thermal resistance LA 1

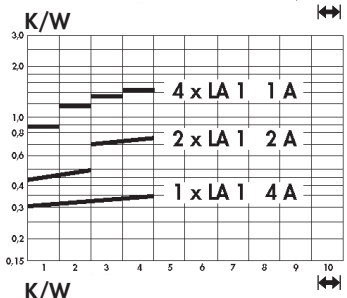
The thermal resistance in the following diagrams is given on the base of a total dissipation of 40 Watt per heatsink of the „A"-type. When using „B"-types this value increases by 3 %.



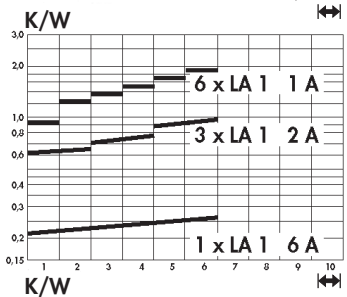
1. Cooling aggregate consisting of 4 heatsinks LA 1 - 1 A.
   Total dissipation 160 W.



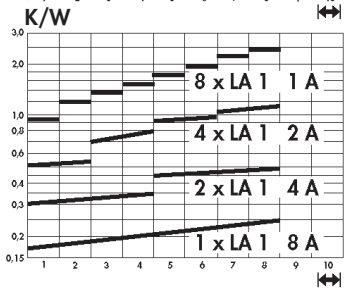
2. Cooling aggregate consisting of 4 heatsinks LA 1 - 1 A and 2 x 1 heatsink LA 1 - 2 A.
   Total dissipation 320 W.



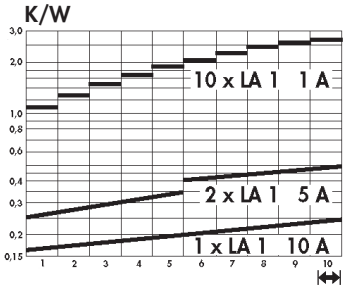
3. Cooling aggregate consisting of 4 heatsinks LA 1 - 1 A, 2 heatsinks
   LA 1 - 2 A and 2 x 1 heatsink LA 1 - 4 A. Total dissipation 640 W.



4. Cooling aggregate consisting of 6 heatsinks LA 1 - 1 A, 3 heatsinks
   LA 1 - 2 A and 2 x 1 heatsink LA 1 - 6 A. Total dissipation 960 W.



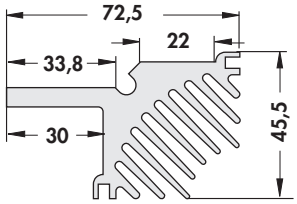
5. Cooling aggregate consisting of 8 heatsinks LA 1 - 1 A, 4 heatsinks LA 1 - 2 A,
   2 heatsinks LA 1 - 4 A and 1 heatsink LA 1 - 8 A. Total dissipation 1280 W.

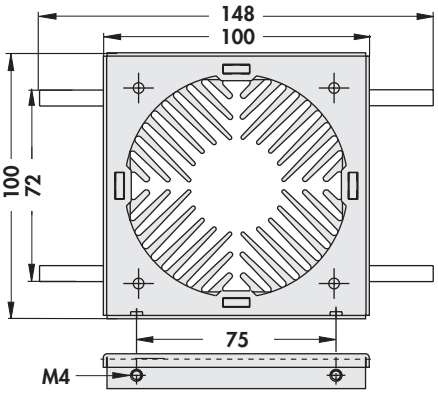


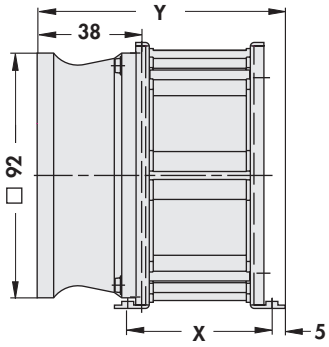
6. Cooling aggregate consisting of 10 heatsinks LA 1 – 1 A, 2 heatsinks LA 1 – 5 A,
   and 2 x 1 heatsink LA 1 – 10 A. Total dissipation 1600 W.

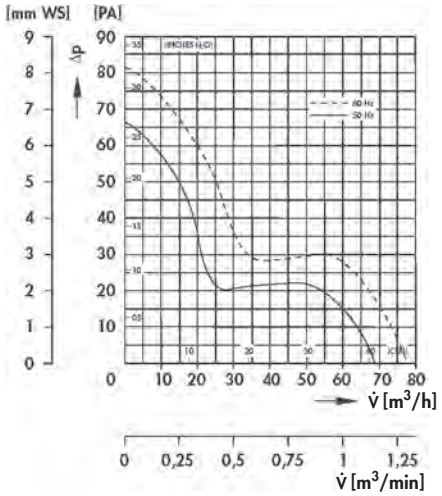
Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Thermal conductive material → **E 2 – 29**
Heatsinks with hollow fin profile → **D 30**
Order example → **D 2**
Order form → **D 3 – 4**
Mounting parts for heatsinks → **E 49 – 50**
Technical introduction → **A 2 – 8**

Segment cooling aggregates









art. no.	L [mm]	dim. [mm] X	dim. [mm] Y	art. no.	L [mm]	dim. [mm] X	dim. [mm] Y
LA 2 01 ...	35.0	54.2	92.0	**LA 2 06 ...**	217.5	236.7	274.5
LA 2 02 ...	71.5	90.7	128.5	**LA 2 07 ...**	254.0	273.2	311.0
LA 2 03 ...	108.0	127.2	165.0	**LA 2 08 ...**	290.5	309.7	347.5
LA 2 04 ...	144.5	163.7	201.5	**LA 2 09 ...**	327.0	346.2	384.0
LA 2 05 ...	181.0	200.2	238.0	**LA 2 10 ...**	363.5	382.7	420.5

L: unit lengths of the segments incl. insulation; **X**: mounting distance; **Y**: length of the cooling aggregate incl. fan

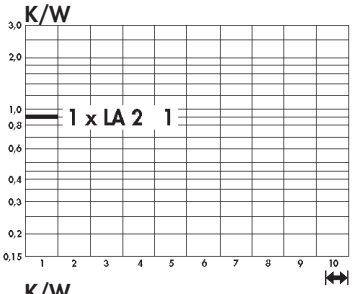
24 V DC fan on request
In case of order please use order form.
segments also available in meter length: **art. no. for A-type: LA 1 1000 A; art. no. for B-type: LA 2 1000 B**
Other fan types and fan voltages on request.

Technical data of the fans

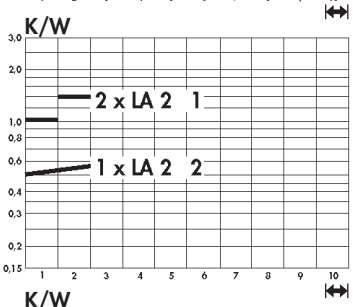
	... 230
type	ebmpapst, ball bearing
dimensions	92x92x38 mm
tension	230 V AC
power inout	12 W
max. air volume	75 m³/h
temperature range	-40°C... +75°C
noise level	37 dB(A)
speed	2,700 min^{-1}
weight	420 g
failure rate (L_{10})	L_{10} < 52,500 h (40°C)

Thermal resistance LA 2

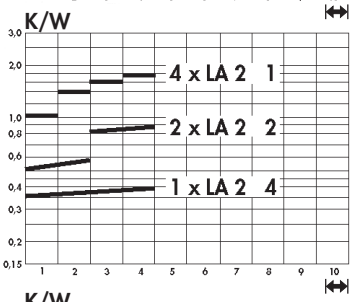
The thermal resistance in the following diagrams is given on the base of a total dissipation of 40 Watt per heatsink of the „A"-type.



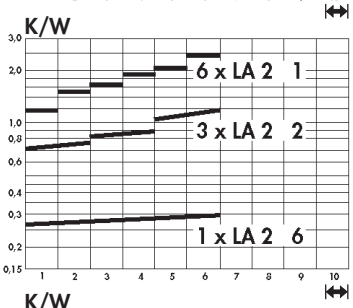
1. Cooling aggregate consisting of 4 heatsinks LA 2 - 1. Total dissipation 160 W maximal.



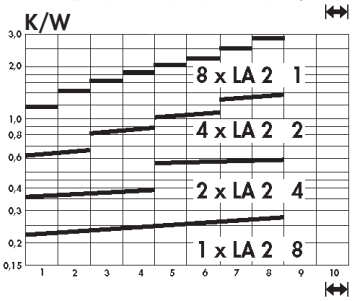
2. Cooling aggregate consisting of 4 heatsinks LA 2 - 1 and 2 x 1 heatsink LA 2 - 2. Total dissipation 320 W.



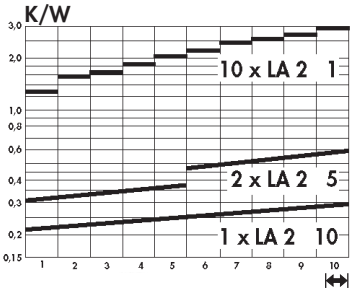
3. Cooling aggregate consisting of 4 heatsinks LA 2 - 1, 2 heatsinks LA 2 - 2 and 2 x 1 heatsink LA 2 - 4. Total dissipation 640 W.



4. Cooling aggregate consisting of 6 heatsinks LA 2 - 1, 3 heatsinks LA 2 - 2 and 2 x 1 heatsink LA 2 - 6. Total dissipation 960 W.



5. Cooling aggregate consisting of 8 heatsinks LA 2 - 1, 4 heatsinks LA 2 - 2, 2 heatsinks LA 2 - 4 and 1 heatsink LA 2 - 8. Total dissipation 1280 W.



6. Cooling aggregate consisting of 10 heatsinks LA 2 - 1, 2 heatsinks LA 2 - 5, and 2 x 1 heatsink LA 2 - 10. Total dissipation 1600 W.

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Thermal conductive material → **E 2 – 29**
Heatsinks with hollow fin profile → **D 30**
Order example → **D 2**
Order form → **D 3 – 4**
Mounting parts for heatsinks → **E 49 – 50**
Technical introduction → **A 2 – 8**

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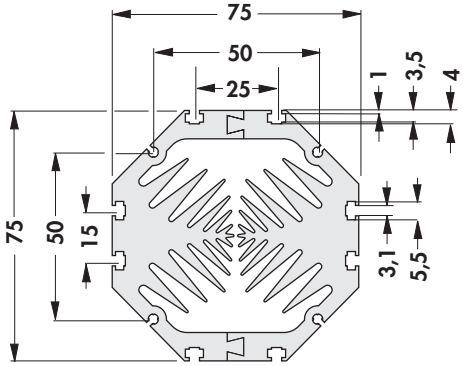
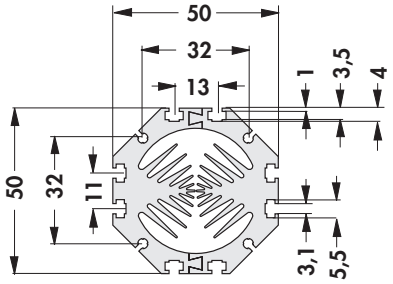
Miniature cooling aggregates

– made for dissipation of high power within a very small space
– approximate length is optimised to the fan motor
– slide-nut channels for M3 nuts for mounting the transistors and circuit boards
– other fan types and fan voltages on request

art. no.		
LAM 1		↔ 140 mm 0,3 K/W 
art. no.		
LAM 2		↔ 100 mm 0,73 K/W 
surface:	natural colour anodised	

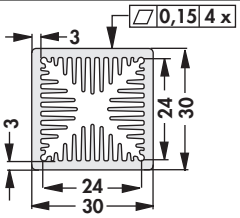
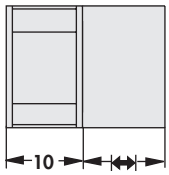
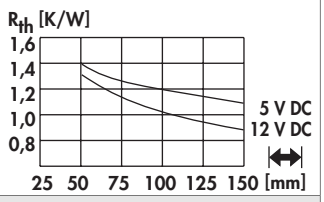
Technical data of the fans

	LAM 1	LAM 2
type	ebmpapst 612 NHH-118	ebmpapst 412 F
dimensions	60x60x25 mm	40x40x10 mm
tension	12 V DC	12 V DC
power inout	2.9 W	0.7 W
max. air volume	56 m^3/h	8 m^3/h
temperature range	-20°C... +70°C	-20°C... +70°C
noise level	41 dB(A)	22.1 dB(A)
speed	6,800 min^{-1}	5,400 min^{-1}
weight	66 g	17 g
failure rate (L_{10})	L_{10} < 60,000 h (40°C)	L_{10} < 45,000 h (20°C)

Retaining springs for transistors → **A 115 – 117**
Special heatsink design → **A 137 – 138**
Hollow-fin cooling aggregates → **D 15 – 25**
High capacity cooling aggregat. → **D 26 – 35**
Fluid coolers → **A 131 – 133**
Protection grid for axial fans → **D 36**
Thermally conductive foil → **E 5 – 15**
Technical introduction → **A 2 – 8**

Miniature cooling aggregates

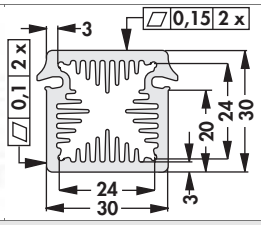
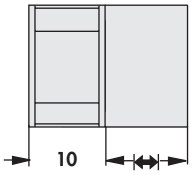
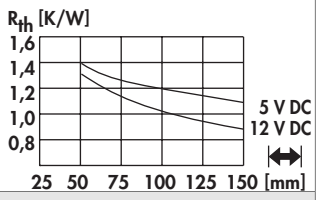
– compact design
– homogeneous heat dissipation
– mounting possible on any side
– powerful axial-fan motor
– other lengths, special designs and processing according to customer´s requirements
– other surfaces treatment, fan types and fan voltages on request

art. no.				
LAM 3 ...				

please indicate: **... ↔ 50 75 100 125 150 mm** **... fan type 5 = 5 V DC 12 = 12 V DC**

surface:	natural colour anodised

– with grooves for lock-in retaining spring for transistors THFU → A 119
– compact design
– homogeneous heat dissipation
– mounting possible on any side
– powerful axial-fan motor
– other lengths, special designs and processing according to customers requirements
– other surfaces treatment, fan types and fan voltages on request

art. no.				
LAM 3 K ...				

please indicate: **... ↔ 50 75 100 125 150 mm** **... fan type 5 = 5 V DC 12 = 12 V DC**

surface:	natural colour anodised

Technical data of the fans

	... 5	... 12
type	Sepa, ball bearing	Sepa, ball bearing
dimensions	30x30x10 mm	30x30x10 mm
tension	5 V DC	12 V DC
max. air volume	6.8 m^3/h	7.7 m^3/h
cur. consumpt.	130 mA	70 mA
temperature range	-10°C... +70°C	-10°C... +70°C
noise level	21 dB(A)	23 dB(A)
speed	8,500 min^{-1}	9,100 min^{-1}
weight	8 g	8 g
failure rate (L_{10})	L_{10} < 95,000 h (20°C) MTBF < 280,000 h (20°C)	L_{10} < 95,000 h (20°C) MTBF < 280,000 h (20°C)

Retaining springs for transistors → **A 115 – 117**
Special heatsink design → **A 137 – 138**
Hollow-fin cooling aggregates → **D 15 – 25**
High capacity cooling aggregat. → **D 26 – 35**
Fluid coolers → **A 131 – 133**
Protection grid for axial fans → **D 36**
Thermally conductive foil → **E 5 – 15**
Technical introduction → **A 2 – 8**

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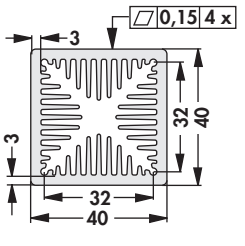
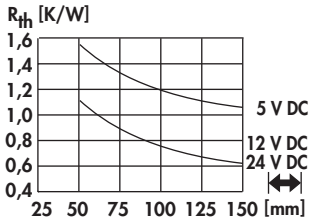
Miniature cooling aggregates

– compact design
– homogeneous heat dissipation
– mounting possible on any side
– powerful axial-fan motor
– other lengths, special designs and processing according to customer´s requirements
– other surfaces treatment, fan types and fan voltages on request

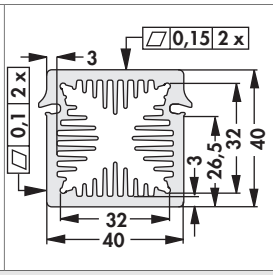
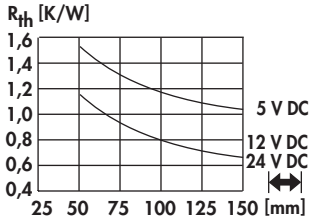
art. no.			
LAM 4 ...			

please indicate: **... ↔ 50 75 100 125 150 mm**

... fan type
5 = 5 V DC
12 = 12 V DC
24 = 24 V DC

surface:	natural colour anodised

– with grooves for lock-in retaining spring for transistors THFU → A 119
– compact design
– homogeneous heat dissipation
– mounting possible on any side
– powerful axial-fan motor
– other lengths, special designs and processing according to customer's requirements
– other surfaces treatment, fan types and fan voltages on request

art. no.			
LAM 4 K ...			

please indicate: **... ↔ 50 75 100 125 150 mm**

... fan type
5 = 5 V DC
12 = 12 V DC
24 = 24 V DC

surface:	natural colour anodised

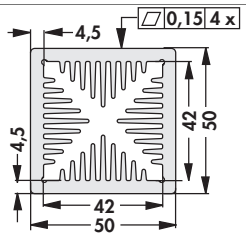
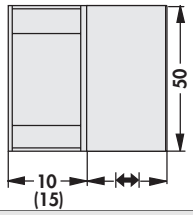
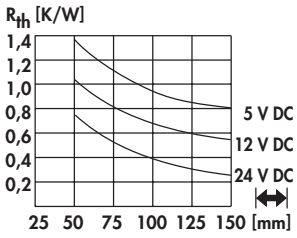
Technical data of the fans

	... 5	... 12	... 24
type	ebmpapst 405	ebmpapst 412 JHH	ebmpapst 414 JHH
dimensions	40x40x20 mm	40x40x25 mm	40x40x25 mm
tension	5 V DC	12 V DC	24 V DC
power inout	0.9 W	3.3 W	3.6 W
max. air volume	10 m^3/h	24 m^3/h	24 m^3/h
temperature range	-20°C... +70°C	-20°C... +60°C	-20°C... +60°C
noise level	18 dB(A)	46 dB(A)	46 dB(A)
speed	6,000 min^{-1}	13,000 min^{-1}	13,000 min^{-1}
weight	27 g	50 g	50 g
failure rate (L_{10})	L_{10} < 50,000 h (40°C) L_{10} < 20,000 h (tmax)	L_{10} < 57,500 h (40°C) L_{10} < 35,000 h (tmax)	L_{10} < 57,500 h (40°C) L_{10} < 35,000 h (tmax)

Retaining springs for transistors → **A 115 – 117**
Special heatsink design → **A 137 – 138**
Hollow-fin cooling aggregates → **D 15 – 25**
High capacity cooling aggregat. → **D 26 – 35**
Fluid coolers → **A 131 – 133**
Protection grid for axial fans → **D 36**
Thermally conductive foil → **E 5 – 15**
Technical introduction → **A 2 – 8**

Miniature cooling aggregates

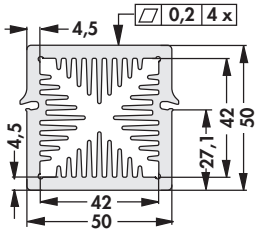
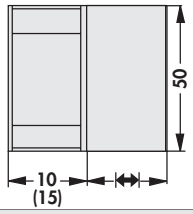
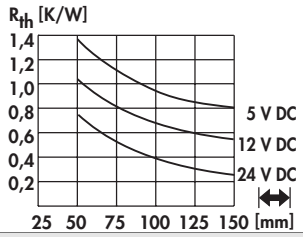
– compact design
– homogeneous heat dissipation
– mounting possible on any side
– powerful axial-fan motor
– other lengths, special designs and processing according to customer´s requirements
– other surfaces treatment, fan types and fan voltages on request

art. no.				
LAM 5 ...				

please indicate: **... ⟷** **50 75 100 125 150 mm** **... fan type** **5 = 5 V DC** **12 = 12 V DC** **24 = 24 V DC**

surface:	natural colour anodised

– with grooves for lock-in retaining spring for transistors THFU → A 119
– compact design
– homogeneous heat dissipation
– mounting possible on any side
– powerful axial-fan motor
– other lengths, special designs and processing according to customer´s requirements
– other surfaces treatment, fan types and fan voltages on request

art. no.				
LAM 5 K ...				

please indicate: **... ⟷** **50 75 100 125 150 mm** **... fan type** **5 = 5 V DC** **12 = 12 V DC** **24 = 24 V DC**

surface:	natural colour anodised

Technical data of the fans

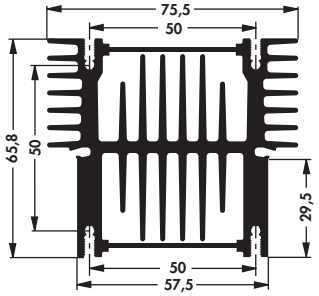
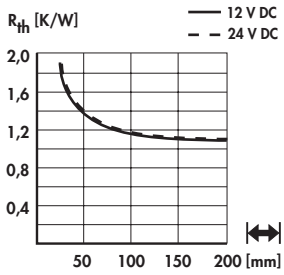
	... 5	... 12	... 24
type	Sepa, ball bearing	Sepa, ball bearing	ebmpapst
dimensions	50x50x10 mm	50x50x10 mm	50x50x15 mm
tension	5 V DC	12 V DC	24 V DC
max. air volume	10 m^3/h	14.3 m^3/h	20 m^3/h
temperature range	-10°C... +70°C	-10°C... +70°C	-20°C... +70°C
speed	3,400 min^{-1}	4,800 min^{-1}	5,000 min^{-1}
noise level	17 dB(A)	22 dB(A)	30 dB(A)
weight	19 g	19 g	27 g
failure rate (L_{10})	L_{10} < 95,000 h (20°C) MTBF < 280,000 h (20°C)	L_{10} < 95,000 h (20°C) MTBF < 280,000 h (20°C)	L_{10} 50,000 h (20°C)
alarm output	with	with	

Retaining springs for transistors → **A 115 – 117**
Special heatsink design → **A 137 – 138**
Hollow-fin cooling aggregates → **D 15 – 25**
High capacity cooling aggregat. → **D 26 – 35**
Fluid coolers → **A 131 – 133**
Protection grid for axial fans → **D 36**
Thermally conductive foil → **E 5 – 15**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

Heatsink-cooling aggregates

– with grooves for lock-in retaining springs THFU → A 119
– screw-in solder pin M 3 **(art. no.: ELS 3)**
– different lengths, special designs and machinings according to customer specifications
– different surfaces, fan types and fan voltages upon request

art. no.		
LA 27 K ...		 

please indicate: **... ↔**
50 75 84 94 100 125 150 mm

... fan type
12 = 12 V DC
24 = 24 V DC

Technical data of the fans

	... 12	**... 24**
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60x60x25 mm	60x60x25 mm
tension	12 V DC	24 V DC
power inout	2.9 W	2.9 W
max. air volume	56 m^3/h	56 m^3/h
temperature range	-20°C... +70°C	-20°C... +70°C
noise level	41 dB(A)	41 dB(A)
speed	6,800 min^{-1}	6,850 min^{-1}
weight	66 g	66 g
failure rate (L_{10})	L_{10} < 60,000 h (40°C)	L_{10} < 60,000 h (40°C)

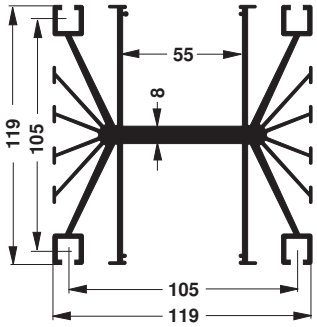
Cooling aggreg. in segment mount. → **D 5 – 7**
Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Thermal conductive material → **E 2 – 29**
Extruded heatsinks → **A 22 – 83**
Cooling aggregates with radial fan → **D 33 – 35**
Heatsinks with hollow fin profile → **D 30**
Technical introduction → **A 2 – 8**

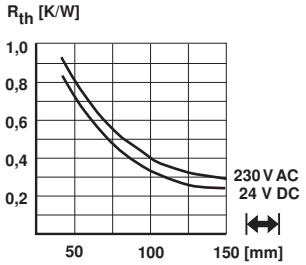
Cooling aggregates with axial fan

Heatsink-cooling aggregates

– especially suitable for IGBT, SSR, semiconductor modules, high performance transistors etc.
– effective construction with axial fans
– good thermal performance
– additional machining according to customer's instructions
– cooling aggregates also available without fans
– other fan types and fan voltages on request

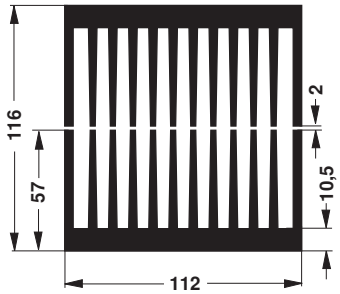
art. no.

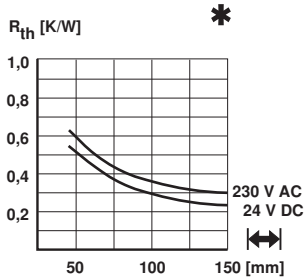




LA 4 ...

art. no.





LA 5 ...

* for one segment

please indicate: **... ⟷ 75 100 150 mm** **... fan type 24 = 24 V DC 230 = 230 V AC**

Technical data of the fans

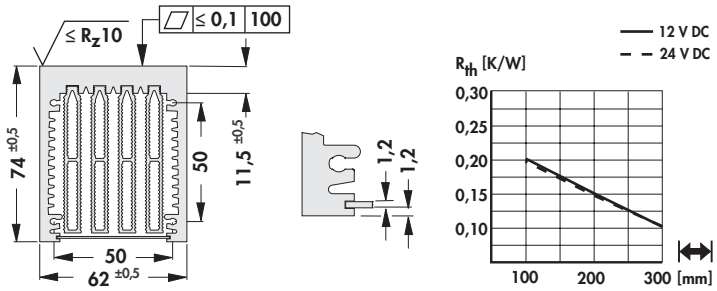
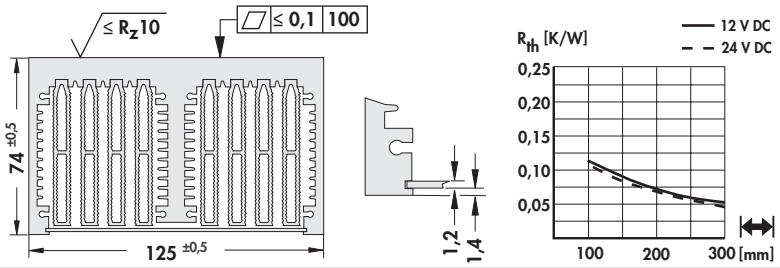
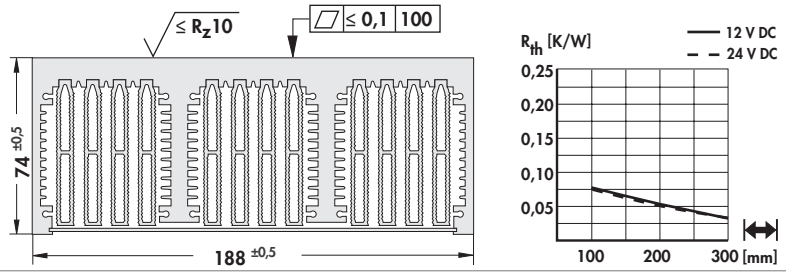
	... 24	**... 230**
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119x119x38 mm	119x119x38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m^3/h	160 m^3/h
temperature range	-30°C ... +70°C	-40°C... +85°C
noise level	57 dB(A)	47 dB(A)
speed	4,400 min^{-1}	2,650 min^{-1}
weight	390 g	550 g
failure rate (L_{10})	L_{10} < 70,000 h (40°C)	L_{10} < 37,500 h (40°C)

Cooling aggreg. in segment mount. → **D 5 – 7**
Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Thermal conductive material → **E 2 – 29**
Extruded heatsinks → **A 22 – 83**
Cooling aggregates with radial fan → **D 33 – 35**
Heatsinks with hollow fin profile → **D 30**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin opimising the air flow
- particularly effective heat dissipation
- compact construction
- milled flat semiconductor mounting surface
- other fan types and fan voltages on request

art. no.		
LA 6 ...		
	without air flow chamber	
art. no.		
LA 7 ...		
	without air flow chamber	
art. no.		
LA 8 ...		
	without air flow chamber	

please indicate: **... ↔ 100 150 200 250 300 mm** **... fan type 12 = 12 V DC 24 = 24 V DC**

Technical data of the fans

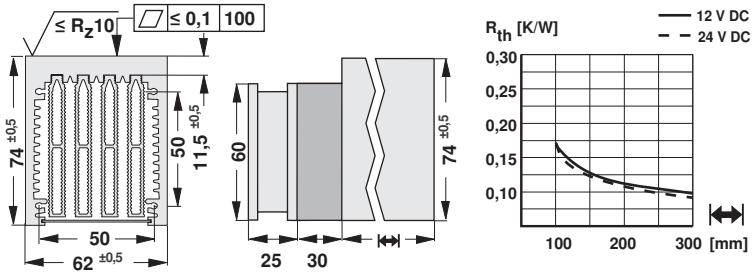
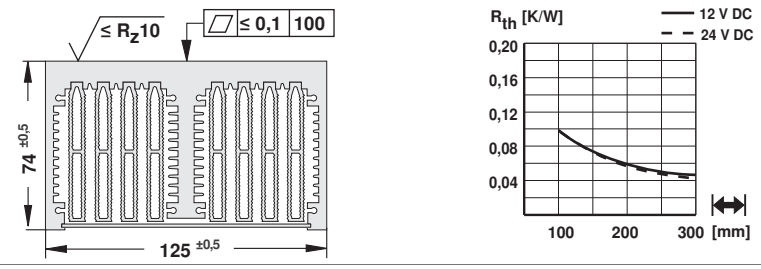
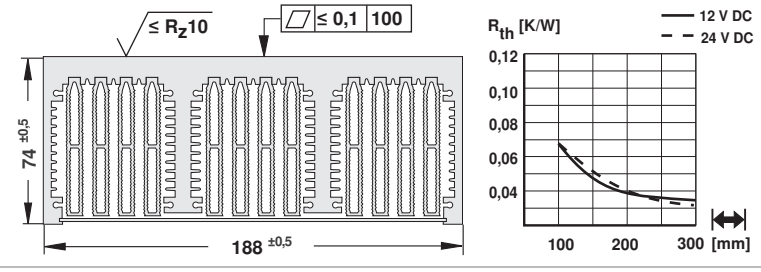
	... 12	... 24
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60x60x25 mm	60x60x25 mm
tension	12 V DC	24 V DC
power inout	2.9 W	2.9 W
max. air volume	56 m^3/h	56 m^3/h
temperature range	-20°C... +70°C	-20°C... +70°C
noise level	41 dB(A)	41 dB(A)
speed	6,800 min^{-1}	6,850 min^{-1}
weight	66 g	66 g
failure rate (L_{10})	L_{10} < 60,000 h (40°C)	L_{10} < 60,000 h (40°C)

Miniature cooling aggregates → D 9 – 11
Protection grid for axial fans → D 36
Drilling pattern for Solid State Relais → A 12
High capacity heatsinks → A 57 – 58
Special heatsink design → A 137 – 138
Heatsinks with hollow fin profile → D 30
Thermal conductive material → E 2 – 24
Technical introduction → A 2 – 8

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

– geometry of hollow fin optimising the air flow
– particularly effective heat dissipation
– compact construction
– milled flat semiconductor mounting surface
– other fan types and fan voltages on request

art. no.		
LA V 6 ...		
	with air flow chamber	
art. no.		
LA V 7 ...		
	with air flow chamber	
art. no.		
LA V 8 ...		
	with air flow chamber	

please indicate: **... ↔ 100 150 200 250 300 mm** **... fan type 12 = 12 V DC 24 = 24 V DC**

Technical data of the fans

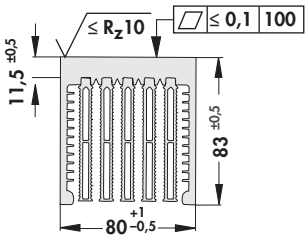
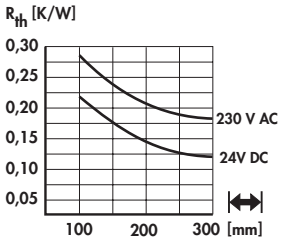
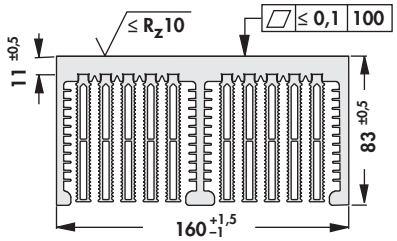
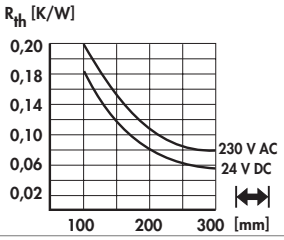
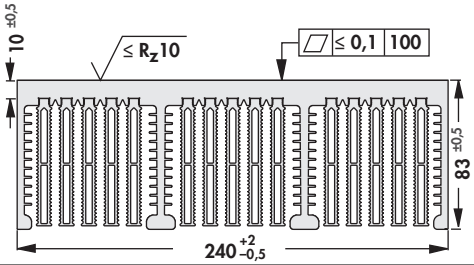
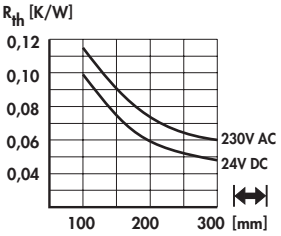
	... 12	... 24
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60x60x25 mm	60x60x25 mm
tension	12 V DC	24 V DC
power inout	2.9 W	2.9 W
max. air volume	56 m^3/h	56 m^3/h
temperature range	-20°C... +70°C	-20°C... +70°C
noise level	41 dB(A)	41 dB(A)
speed	6,800 min^{-1}	6,850 min^{-1}
weight	66 g	66 g
failure rate (L_{10})	L_{10} < 60,000 h (40°C)	L_{10} < 60,000 h (40°C)

Miniature cooling aggregates → D 9 – 11
Protection grid for axial fans → D 36
Drilling pattern for Solid State Relais → A 12
High capacity heatsinks → A 57 – 58
Special heatsink design → A 137 – 138
Heatsinks with hollow fin profile → D 30
Thermal conductive material → E 2 – 24
Technical introduction → A 2 – 8

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin opimising the air flow
- particularly effective heat dissipation
- compact construction
- milled flat semiconductor mounting surface
- other fan types and fan voltages on request

art. no.		
LA 9 ...		 
	without air flow chamber	
art. no.		
LA 10 ...		 
	without air flow chamber	
art. no.		
LA 11 ...		 
	without air flow chamber	

please indicate: **... ↔ 100 150 200 250 300 mm**

... fan type
24 = 24 V DC
230 = 230 V AC

Technical data of the fans

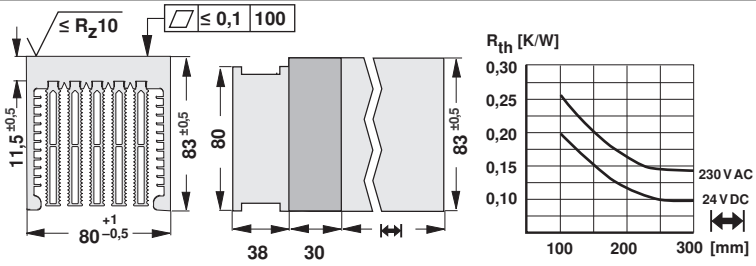
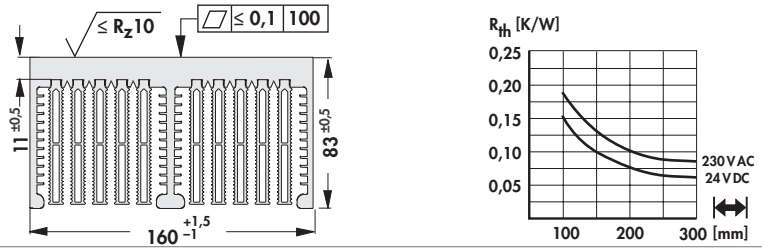
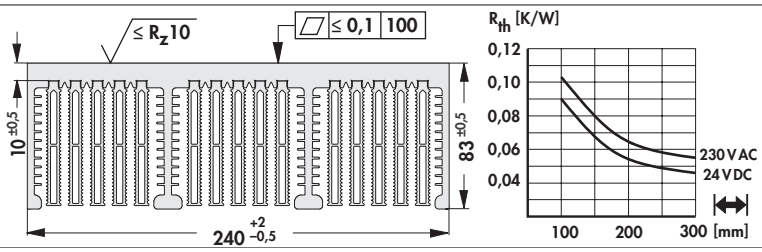
	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	80x80x32 mm	80x80x38 mm
tension	24 V DC	230 V AC
power inout	6 W	12 W
max. air volume	80 m^3/h	50 m^3/h
temperature range	-20°C... 75°C	-40°C... +90°C
noise level	48 dB(A)	31 dB(A)
speed	5,000 min^{-1}	2,800 min^{-1}
weight	170 g	490 g
failure rate (L_{10})	L_{10} < 55,000 h (40°C)	L_{10} < 52,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

– geometry of hollow fin optimising the air flow
– particularly effective heat dissipation
– compact construction
– milled flat semiconductor mounting surface
– other fan types and fan voltages on request

art. no.		
LA V 9 ...		
	with air flow chamber	
art. no.		
LA V 10 ...		
	with air flow chamber	
art. no.		
LA V 11 ...		
	with air flow chamber	

please indicate: **... ⟷**
100 150 200 250 300 mm

... fan type
24 = 24 V DC
230 = 230 V AC

Technical data of the fans

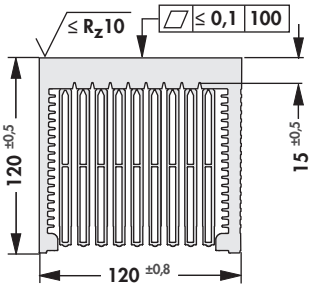
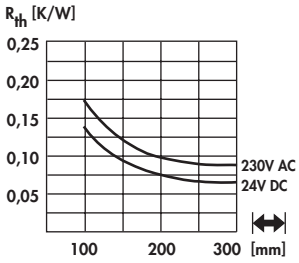
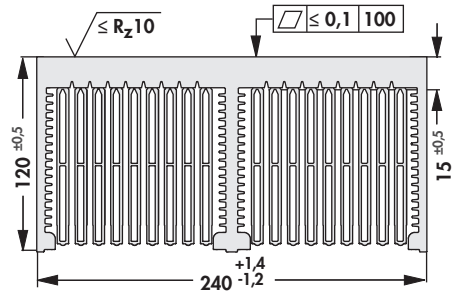
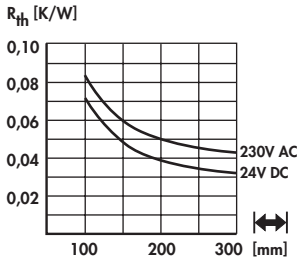
	... 24	**... 230**
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	80x80x32 mm	80x80x38 mm
tension	24 V DC	230 V AC
power inout	6 W	12 W
max. air volume	80 m^3/h	50 m^3/h
temperature range	-20°C... 75°C	-40°C... +90°C
noise level	48 dB(A)	31 dB(A)
speed	5,000 min^{-1}	2,800 min^{-1}
weight	170 g	490 g
failure rate (L_{10})	L_{10} < 55,000 h (40°C)	L_{10} < 52,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremly low losses due to optimised hollow fin geometry
- particularly effective heat dissipation
- compact design with axial fan
- milled flat semiconductor mounting surface
- addtional design to customer's intructions
- other fan types and fan voltages on request

art. no.			
LA 14 ...			
	without air flow chamber		
art. no.			
LA 15 ...			
	without air flow chamber		

please indicate: **... ↔**
100 150 200 250 300 400 mm

... fan type
24 = 24 V DC
230 = 230 V AC

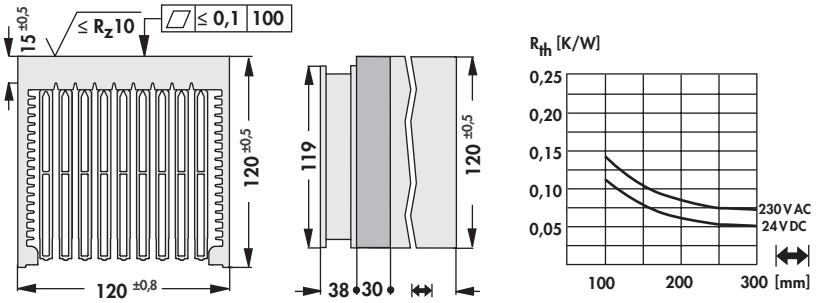
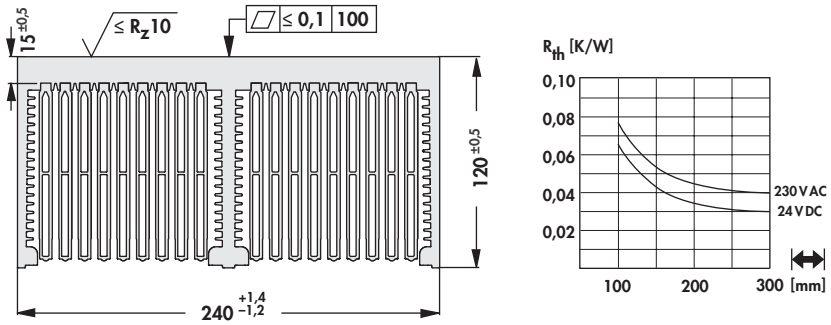
Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119x119x38 mm	119x119x38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m^3/h	160 m^3/h
temperature range	-30°C ... +70°C	-40°C... +85°C
noise level	57 dB(A)	47 dB(A)
speed	4,400 min^{-1}	2,650 min^{-1}
weight	390 g	550 g
failure rate (L_{10})	L_{10} < 70,000 h (40°C)	L_{10} < 37,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Hollow-fin cooling aggregates

– extremly low losses due to optimised hollow fin geometry
– particularly effective heat dissipation
– compact design with axial fan
– milled flat semiconductor mounting surface
– addtional design to customer's intructions on request
– other fan types and fan voltages on request

art. no.		
LA V 14 ...		
	with air flow chamber	
art. no.		
LA V 15 ...		
	with air flow chamber	

please indicate: **... ↔**
100 150 200 250 300 400 mm

... fan type
24 = 24 V DC
230 = 230 V AC

Technical data of the fans

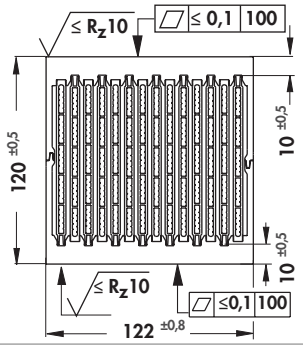
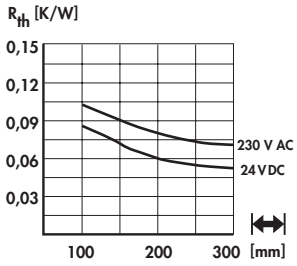
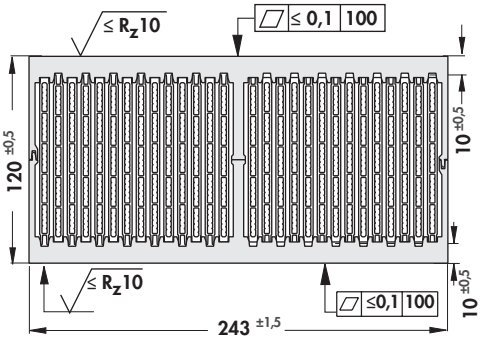
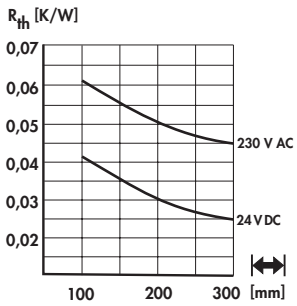
	... 24	**... 230**
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119x119x38 mm	119x119x38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m^3/h	160 m^3/h
temperature range	-30°C ... +70°C	-40°C... +85°C
noise level	57 dB(A)	47 dB(A)
speed	4,400 min^{-1}	2,650 min^{-1}
weight	390 g	550 g
failure rate (L_{10})	L_{10} < 70,000 h (40°C)	L_{10} < 37,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremly low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two oposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.			
LA 17 ...			
	without air flow chamber		
art. no.			
LA 18 ...	without air flow chamber		

please indicate: **... ↔**
100 150 200 250 300 400 mm

... fan type
24 = 24 V DC
230 = 230 V AC

Technical data of the fans

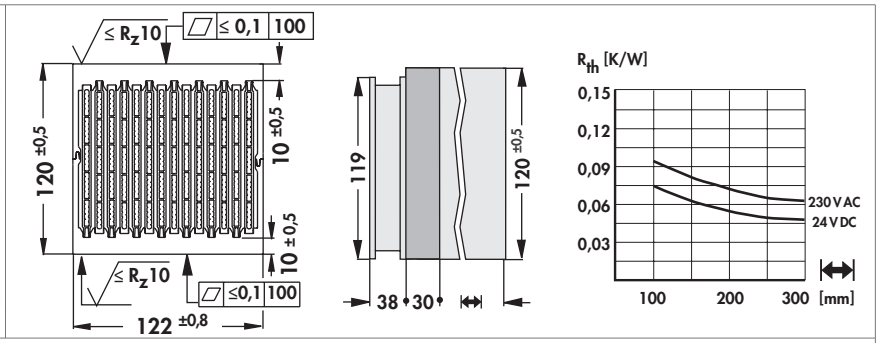
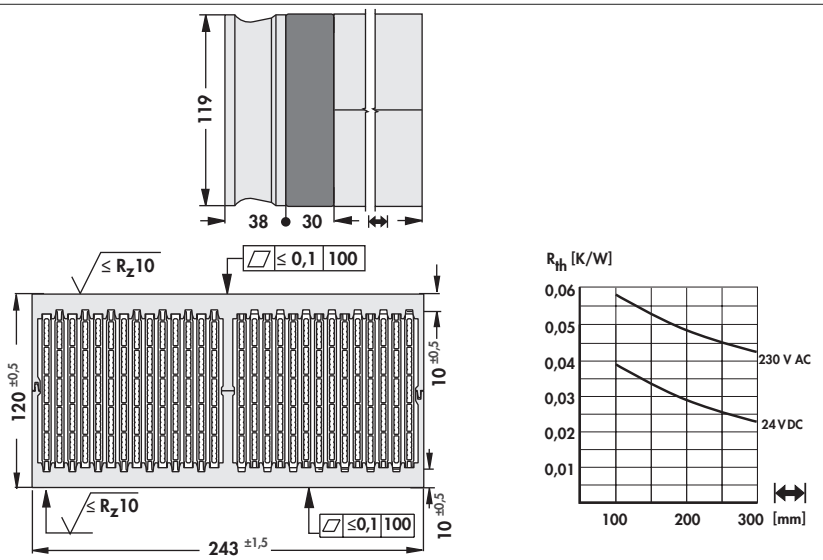
	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119x119x38 mm	119x119x38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m^3/h	160 m^3/h
temperature range	-30°C ... +70°C	-40°C... +85°C
noise level	57 dB(A)	47 dB(A)
speed	4,400 min^{-1}	2,650 min^{-1}
weight	390 g	550 g
failure rate (L_{10})	L_{10} < 70,000 h (40°C)	L_{10} < 37,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

– extremly low losses due to optimised hollow fin geometry
– effective heat dissipation
– compact construction with axial fans
– two oposite mounting surfaces are milled flat
– additional treatment upon customer's request
– other fan types and fan voltages on request

art. no.		
LA V 17 ...		
	with air flow chamber	
art. no.		
LA V 18 ...		
	with air flow chamber	

please indicate: **... ↔**
100 150 200 250 300 400 mm

... fan type
24 = 24 V DC
230 = 230 V AC

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119x119x38 mm	119x119x38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m^3/h	160 m^3/h
temperature range	-30°C ... +70°C	-40°C... +85°C
noise level	57 dB(A)	47 dB(A)
speed	4,400 min^{-1}	2,650 min^{-1}
weight	390 g	550 g
failure rate (L_{10})	L_{10} < 70,000 h (40°C)	L_{10} < 37,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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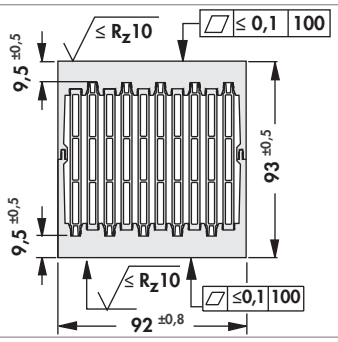
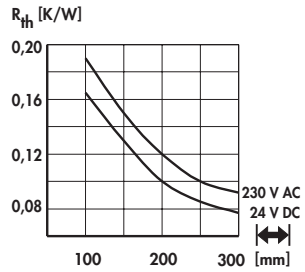
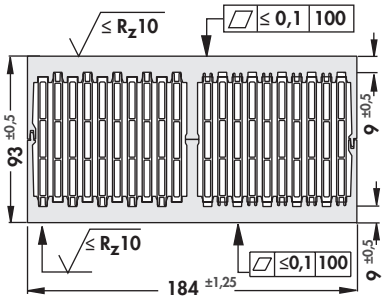
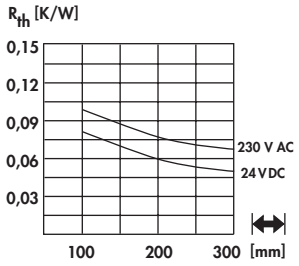
Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremly low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two oposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.			
LA 21 ...			
	without air flow chamber		
art. no.			
LA 22 ...			
	without air flow chamber		

please indicate: **... ↔**
100 150 200 250 300 400 mm

... fan type
24 = 24 V DC
230 = 230 V AC

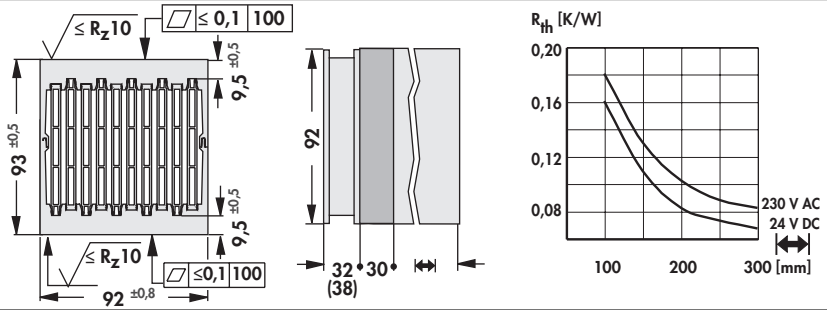
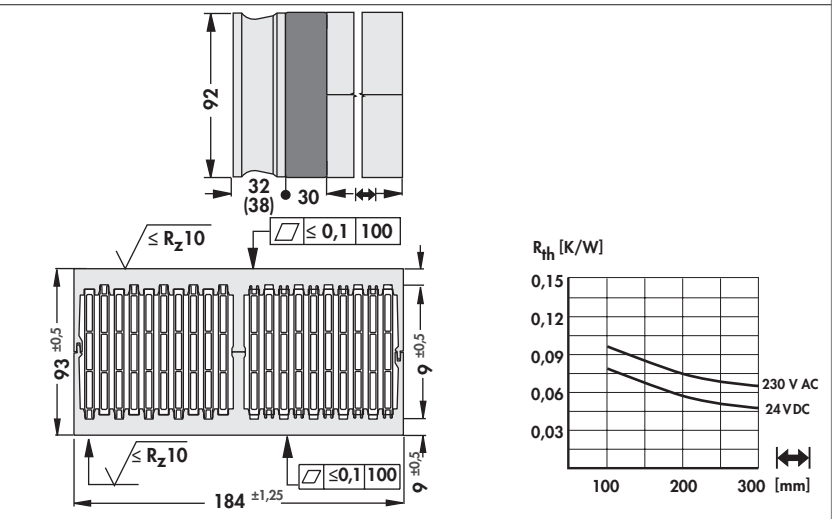
Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	92x92x32 mm	92x92x38 mm
tension	24 V DC	230 V AC
power inout	5 W	12 W
max. air volume	107 m^3/h	75 m^3/h
temperature range	-20°C... 75°C	-40°C... +75°C
noise level	47 dB(A)	37 dB(A)
speed	4,000 min^{-1}	2,700 min^{-1}
weight	190 g	420 g
failure rate (L_{10})	L_{10} < 57,500 h (40°C)	L_{10} < 52,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Hollow-fin cooling aggregates

- extremly low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two oposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.		
LA V 21 ...		
	with air flow chamber	
art. no.		
LA V 22 ...		
	with air flow chamber	

please indicate: **... ↔** **100 150 200 250 300 400 mm** **... fan type** **24 = 24 V DC** **230 = 230 V AC**

Technical data of the fans

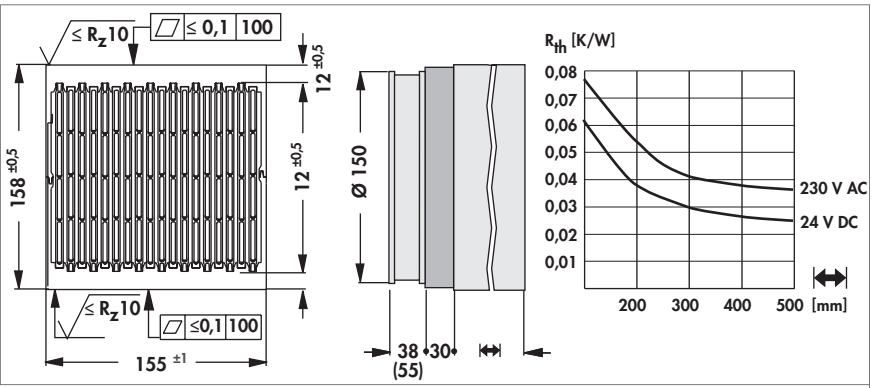
	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	92x92x32 mm	92x92x38 mm
tension	24 V DC	230 V AC
power inout	5 W	12 W
max. air volume	107 m^3/h	75 m^3/h
temperature range	-20°C... 75°C	-40°C... +75°C
noise level	47 dB(A)	37 dB(A)
speed	4,000 min^{-1}	2,700 min^{-1}
weight	190 g	420 g
failure rate (L_{10})	L_{10} < 57,500 h (40°C)	L_{10} < 52,500 h (40°C)

Miniature cooling aggregates → D 9 – 11
Protection grid for axial fans → D 36
Drilling pattern for Solid State Relais → A 12
High capacity heatsinks → A 57 – 58
Special heatsink design → A 137 – 138
Heatsinks with hollow fin profile → D 30
Thermal conductive material → E 2 – 24
Technical introduction → A 2 – 8

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremly low losses due optimised hollow fin geometry
- especially effective heat dissipation
- compact construction with axial fans
- two oposite mounting surfaces are miled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.		
LA V 24 ...		
	with air flow chamber	

please indicate: **... ↔**
200 300 400 mm

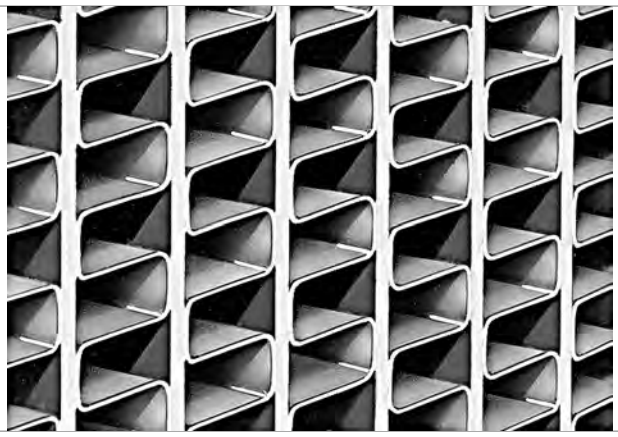
... fan type
24 = 24 V DC
230 = 230 V AC

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing, with grid	ebmpapst, ball bearing, with grid
dimensions	Ø150x38 mm	Ø150x55 mm
tension	24 V DC	230 V AC
power inout	19 W	47 W
max. air volume	420 m^3/h	380 m^3/h
temperature range	-25°C... +72°C	-30°C... +60°C
noise level	59 dB(A)	60 dB(A)
speed	3,350 min^{-1}	2,700 min^{-1}
weight	620 g	1,100 g
failure rate (L_{10})	L_{10} < 75,000 h (40°C)	L_{10} < 40,000 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

High performance cooling aggregate



extremely low losses of air flow as compared to cooling aggregates with extruded aluminium
– compact dimensions, that means high performance density due to large heat-conducting surfaces
– maximum heat flow due to brazing or thermal adhesion
– high performance cooling aggregates are only effective with forced ventilation by means of the fan, but not with free convection
– other fan types and fan voltages on request

material: solder-plated aluminium sheet, thus minimal weight due to the thickness of the material

An optimised unit for any application can be produced from the wide range of existing components upon request.
The specific capacity will be determined by a test run upon customer´s request.

Technical data of the fans

	... 230
type	ebmpapst, ball bearing
dimensions	119x119x38 mm
tension	230 V AC
power inout	19 W
max. air volume	160 m^3/h
temperature range	-40°C... +85°C
noise level	47 dB(A)
speed	2,650 min^{-1}
weight	550 g
failure rate (L_{10})	L_{10} < 37,500 h (40°C)

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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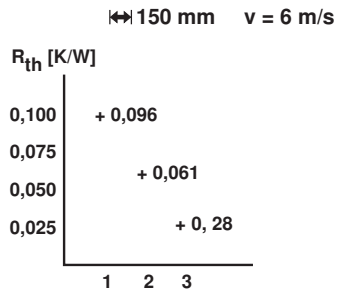
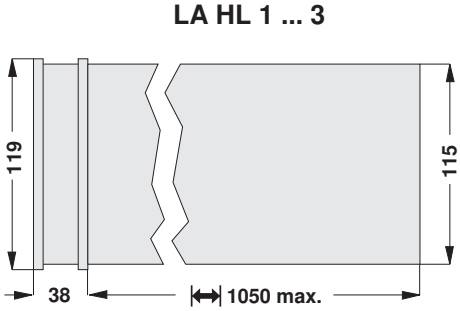
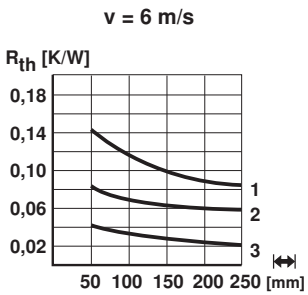
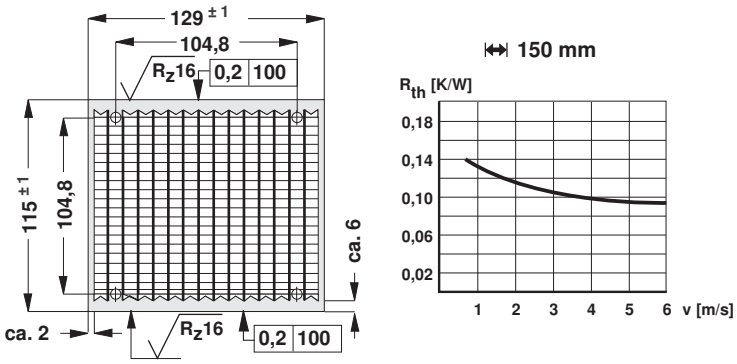
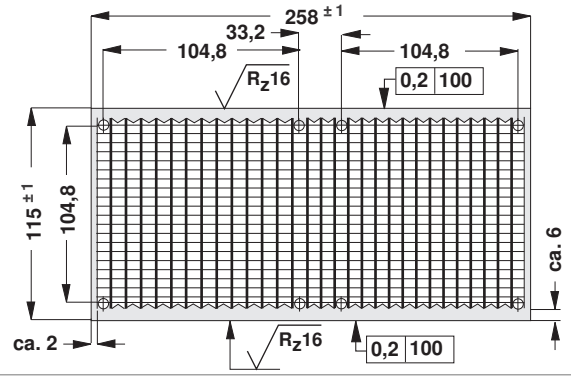
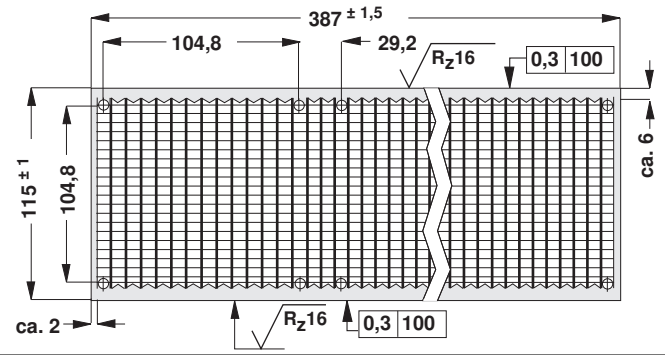
Cooling aggregates with axial fan

High performance cooling aggregate







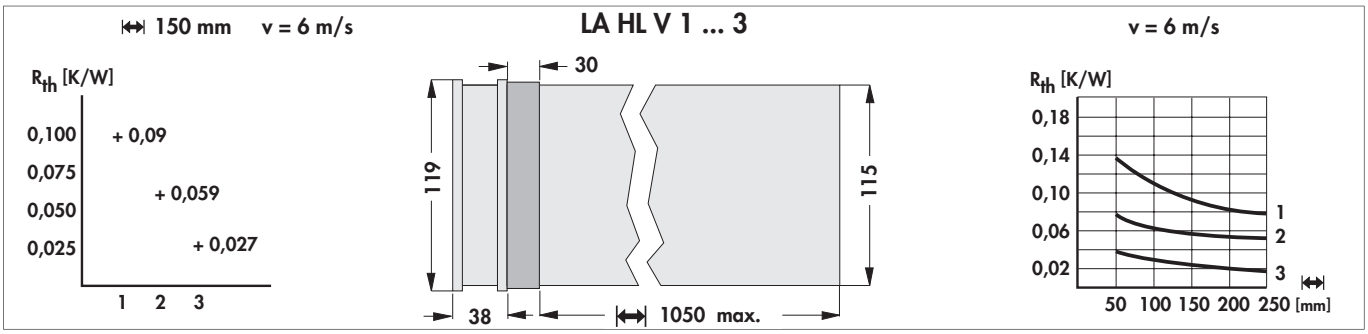
art. no.		
LA HL 1 ...		
	without air flow chamber	
art. no.		
LA HL 2 ...		
	without air flow chamber	
art. no.		
LA HL 3 ...		
	without air flow chamber	

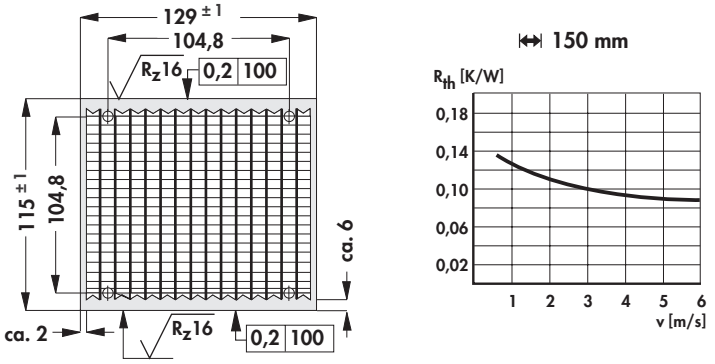
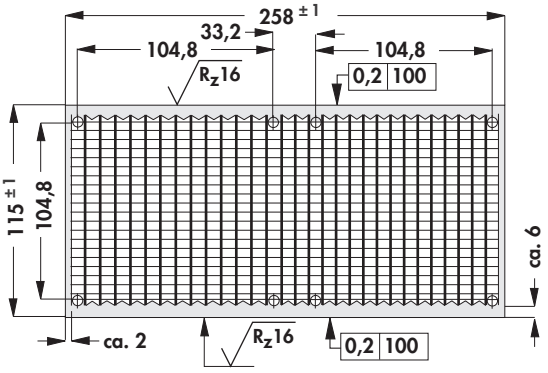
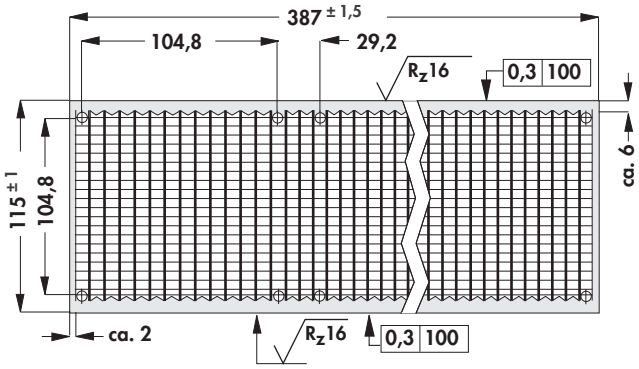
please indicate: ... ↔
100 150 200 250 300 400 mm

Miniature cooling aggregates → D 9 – 11
Protection grid for axial fans → D 36
Drilling pattern for Solid State Relais → A 12
High capacity heatsinks → A 57 – 58
Special heatsink design → A 137 – 138
Heatsinks with hollow fin profile → D 30
Thermal conductive material → E 2 – 24
Technical introduction → A 2 – 8

Cooling aggregates with axial fan

High performance cooling aggregate



art. no.		
LA HLV 1 ...		
	with air flow chamber	
art. no.		
LA HLV 2 ...		
	with air flow chamber	
art. no.		
LA HLV 3 ...		
	with air flow chamber	

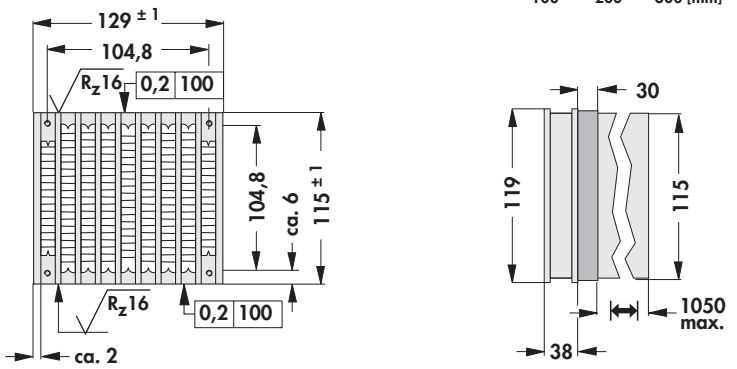
please indicate: ... ↔
100 150 200 250 300 400 mm

Miniature cooling aggregates → **D 9 – 11**
Protection grid for axial fans → **D 36**
Drilling pattern for Solid State Relais → **A 12**
High capacity heatsinks → **A 57 – 58**
Special heatsink design → **A 137 – 138**
Heatsinks with hollow fin profile → **D 30**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Cooling aggregates with axial fan

High performance cooling aggregate

– innovative, efficient heatsink design
– thick multiwall sheets for maximum heat dissipation
– specially formed laminated structures ensure optimum heat exchange with the air flow
– powerful mixed axial fan for highly effcient heat dissipation
– reduced noise output achieved by an optimised adaption of fan and heatsink
– additional treatment and modifications upon customer's request
– double and triple versions upon request

art. no.		
LAHL D 1 ...		

please indicate: **... ↔** **100 150 200 250 300 400 mm** **... fan type** **12 = 12 V DC** **24 = 24 V DC**

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing, with grid	ebmpapst, ball bearing, with grid
dimensions	119x119x38 mm	119x119x38 mm
tension	12 V DC	24 V DC
power inout	21 W	19.5 W
max. air volume	310 m^3/h	310 m^3/h
temperature range	-20°C... +65°C	-20°C... +65°C
noise level	65 dB(A)	65 dB(A)
speed	6,000 min^{-1}	6,000 min^{-1}
weight	390 g	390 g
failure rate (L_{10})	L_{10} > 60,000 h (40°C) L_{10} > 37,500 h (tmax)	L_{10} > 65,000 h (40°C) L_{10} > 37,500 h (tmax)

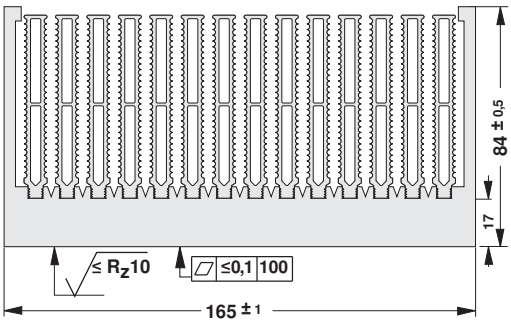
Miniature cooling aggregates → D 9 – 11
Protection grid for axial fans → D 36
Drilling pattern for Solid State Relais → A 12
High capacity heatsinks → A 57 – 58
Special heatsink design → A 137 – 138
Heatsinks with hollow fin profile → D 30
Thermal conductive material → E 2 – 24
Technical introduction → A 2 – 8

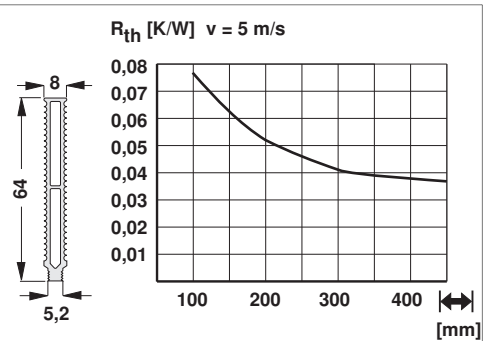
High performance heatsinks with hollow-fin profile

– high performance heatsinks for fan operation
– exclusively for forced convection
– preferably for radial or tangential fans
– hollow fin geometry optimises the air flow
– particularly effective heat dissipation
– milled flat base (except length 1000 mm)

art. no.

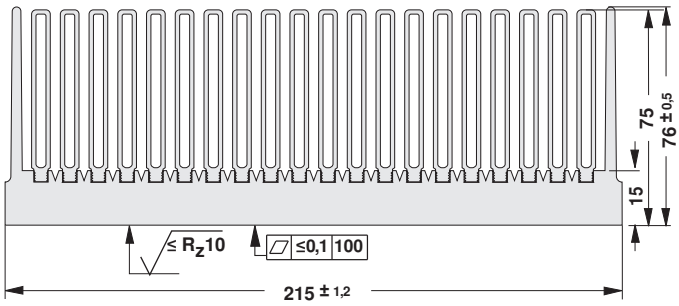
SK 497 ...

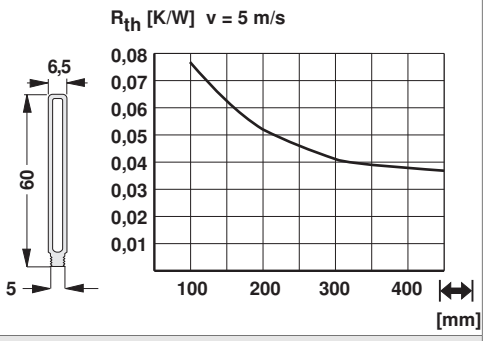




art. no.

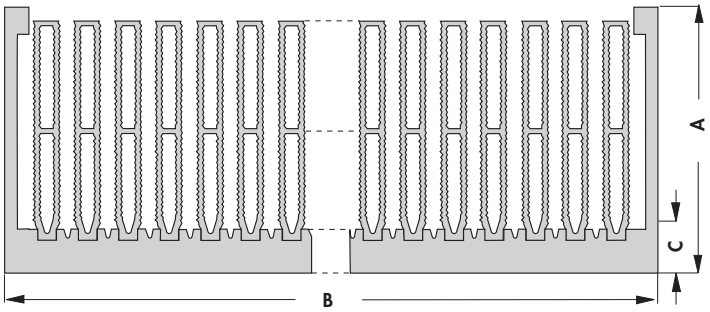
SK 498 ...

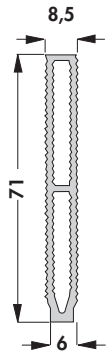


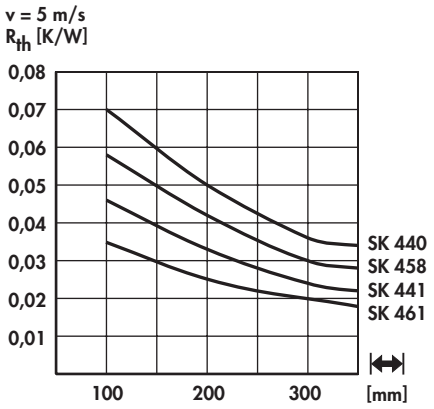


please indicate: **... ↔**
150 200 250 300 1000 mm

... surface
SA = black anodised
AL = raw degreased aluminium







art. no.	number of fins	dim. [mm] A	B	C
SK 440 ...	15	84 ±1	200 ±1.2	16
SK 458 ...	19	84 ±1	250 ±1.4	16
SK 441 ...	23	84 ±1	300 ±1.6	16
SK 461 ...	31	88 ±1	400 ±2	20

please indicate: **... ↔**
150 200 300 1000 mm

... surface
SA = black anodised
AL = raw degreased aluminium

High capacity cooling aggregat. → **D 26 – 29**
Cooling aggregates with radial fan → **D 33 – 35**
Heatsinks with hollow fin profile → **D 30 – 31**
Hollow-fin cooling aggregates → **D 15 – 25**
Heatsink-cooling aggregates → **D 14**
Cooling aggreg. in segment mount. → **D 5**
Miniature cooling aggregates → **D 9 – 11**
Technical introduction → **A 2 – 8**

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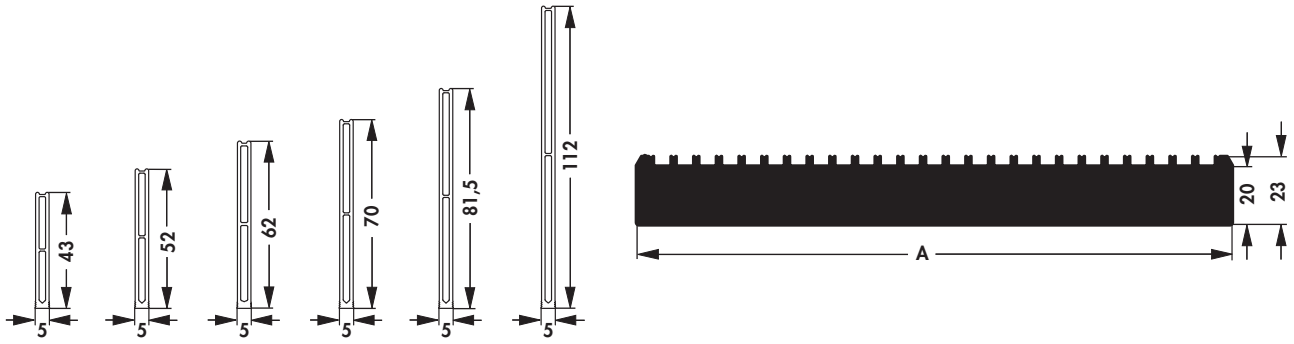
High performance heatsinks with hollow-fin profile

– high capacity heatsinks for fan operation preferably for radial- or tangential fan motors
– universal modular design
– exclusively for forced convection
– flow-optimized hollow fin geometry
– minimum order quantity: 1000 kg, samples on request



art. no.	number of fins	dim. [mm] A
SK 603 ...	25	200
SK 604 ...	32	250
SK 605 ...	39	300
SK 606 ...	45	350
SK 607 ...	52	400
SK 608 ...	65	500

please indicate:

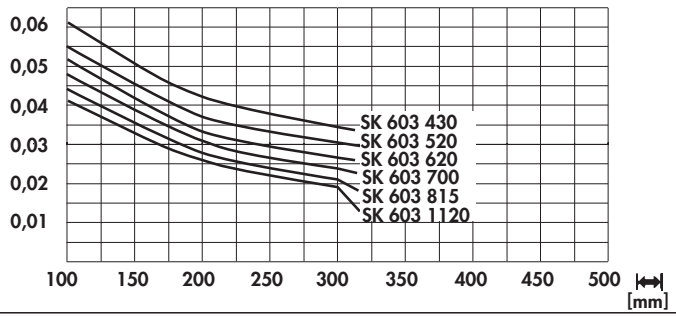
... fin height
430 = 43 mm
520 = 52 mm
620 = 62 mm
700 = 70 mm
815 = 81.5 mm
1120 = 112 mm

... ↔
200 300 400 500 mm

... surface
SA = black anodised
ME = clear anodised

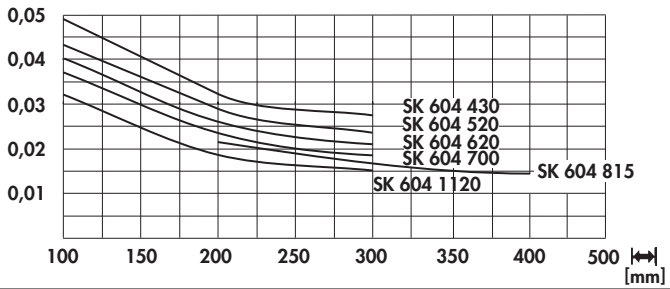
SK 603

R_{th} [K/W] v = 11 m/s



SK 604

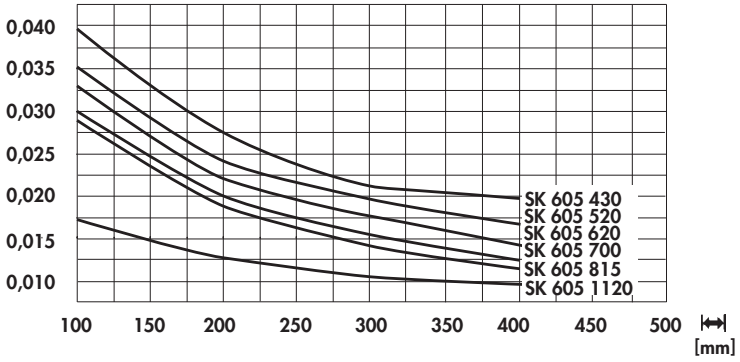
R_{th} [K/W] v = 11 m/s



High capacity cooling aggregat. → D 26 – 29
Cooling aggregates with radial fan → D 33 – 35
Heatsinks with hollow fin profile → D 30 – 31
Hollow-fin cooling aggregates → D 15 – 25
Heatsink-cooling aggregates → D 14
Cooling aggreg. in segment mount. → D 5
Miniature cooling aggregates → D 9 – 11
Technical introduction → A 2 – 8

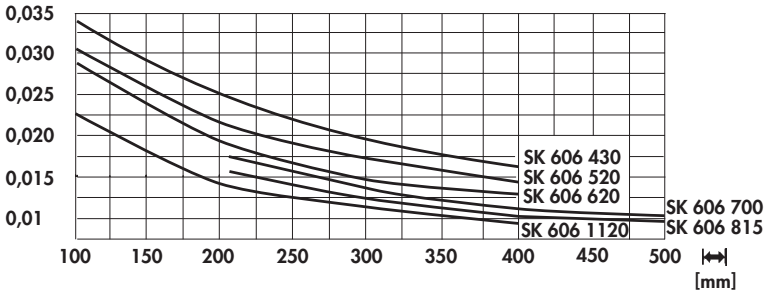
SK 605

R_{th} [K/W] v = 11 m/s



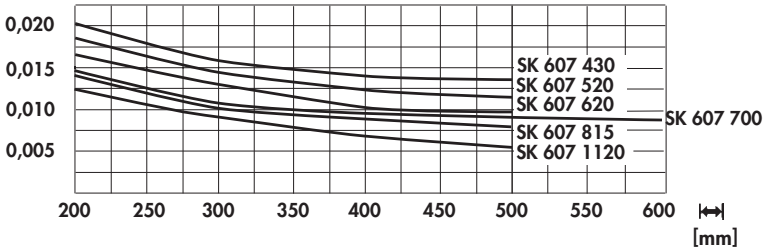
SK 606

R_{th} [K/W] v = 11 m/s



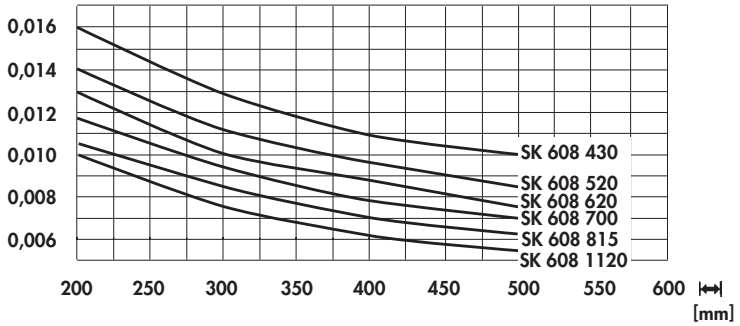
SK 607

R_{th} [K/W] v = 11 m/s



SK 608

R_{th} [K/W] v = 11 m/s



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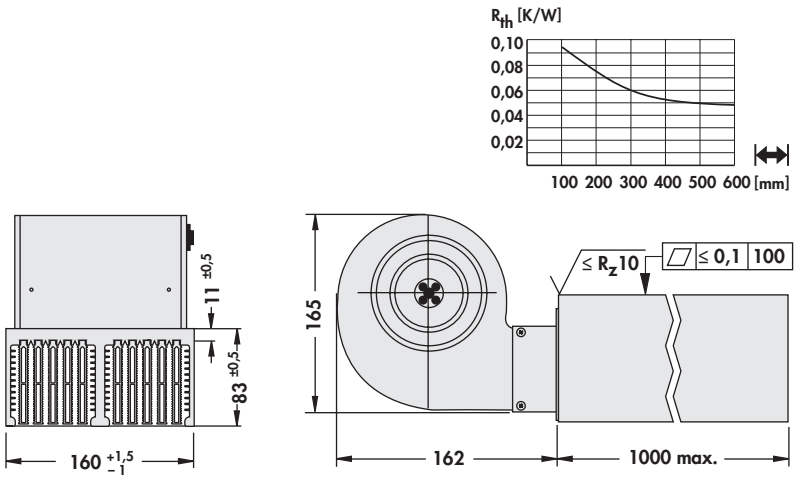
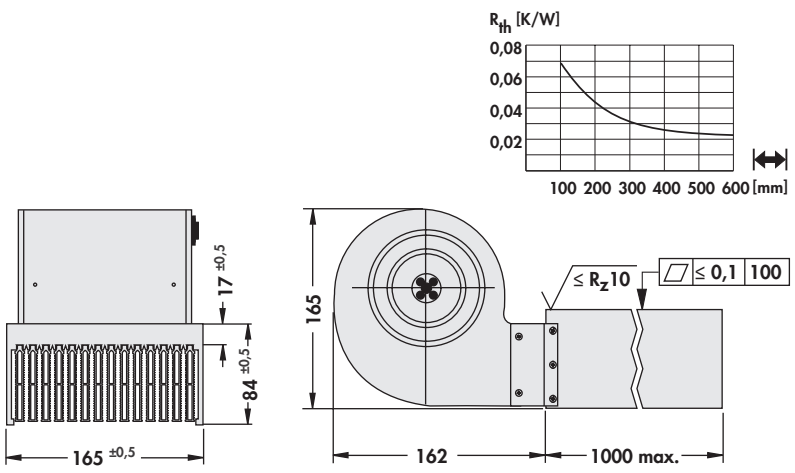
Cooling aggregates with radial fan

High performance cooling aggregate

- optimised air flow due to hollow fin geometrie
- very good thermal performance
- optimized high performance construction with radial fan
- milled flat mounting surface for semiconductor
- cover plate for fin side upon request
- additional customized treatment upon request
- fan condenser: **art. no. LAHLR K 2**

art. no.		
LA 25 ...		
art. no.		
LA 26 ...		
please indicate:	**... ↔** **200 300 400 500 600 mm**	

Technical data of the fans

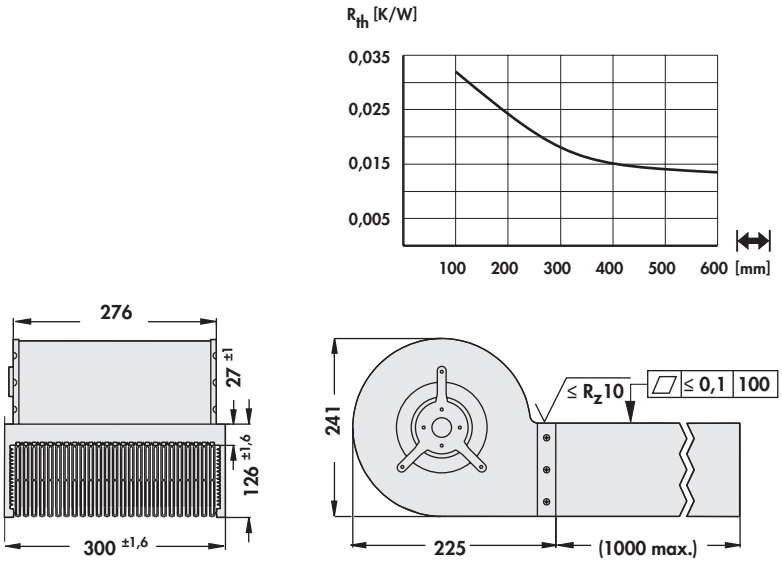
	... 230
type	ebmpapst, radial blower with grid, double sided absorbtion
bearing type	ball bearing
discharge air flow	435 m^3/h
rotation speed	1,950 min^{-1}
power inout	87 W
current consumption	0.39 A
temperature range	-25°C... +40°C
circuit voltage	230 V AC
motor condenser	2 µF/400 V
noise level	58 dB(A)
weight	1,500 g

Drilling pattern for Solid State Relais	**→ A 12**	**Miniature cooling aggregates**	**→ D 9 – 12**
Mounting for TO 3 angle	**→ A 125 – 128**	**heatsinks for Solid State Relais**	**→ 135 – 136**
High capacity heatsinks	**→ A 57 – 58**	**Hole pattern**	**→ A 21**
Cooling aggreg. in segment mount.	**→ D 5 – 7**	**Technical introduction**	**→ A 2 – 8**

Cooling aggregates with radial fan

High performance cooling aggregate

– optimised air flow due to hollow fin geometrie
– very good thermal performance
– optimized high performance construction with radial fan
– milled flat mounting surface for semiconductor
– cover plate for fin side upon request
– additional customized treatment upon request
– fan condenser: **art. no. LA 20 K 6**

art. no.		
LA 20 ...		

please indicate: **... ↔**
200 300 400 500 600 mm

Technical data of the fans

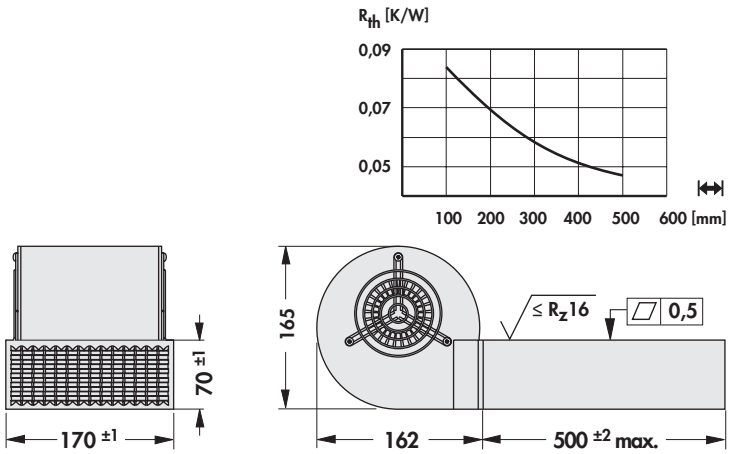
	... 230
bearing type	ball bearing
type	ebmpapst, radial blower with grid, double sided absorbtion
discharge air flow	1,310 m^3/h
rotation speed	1,350 min^{-1}
power inout	185 W
current consumption	0.81 A
circuit voltage	230 V AC
temperature range	-25°C... +70°C
motor condenser	6 µF
noise level	64 dB(A)
weight	5,900 g

Drilling pattern for Solid State Relais → **A 12**
Mounting for TO 3 angle → **A 125 – 128**
High capacity heatsinks → **A 57 – 58**
Cooling aggreg. in segment mount. → **D 5 – 7**
Miniature cooling aggregates → **D 9 – 12**
heatsinks for Solid State Relais → **135 – 136**
Hole pattern → **A 21**
Technical introduction → **A 2 – 8**

Cooling aggregates with radial fan

High performance cooling aggregate

– other lengths upon request
– fan condenser: **art. no. LAHLR K 2**

art. no.		
LAHLR 1 500		

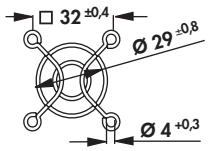
construction:	solid frame construction with inner animation and carrier plates, thermally connected by soldering
weight:	6,300 g
material:	aluminium alloy
surface:	blanc, milled flat

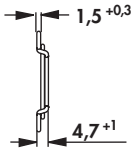
Technical data of the fans

	... 230
type	ebmpapst, radial blower with grid, double sided absorbtion
bearing type	ball bearing
discharge air flow	435 m^3/h
rotation speed	1,950 min^{-1}
power inout	87 W
current consumption	0.39 A
temperature range	-25°C... +40°C
circuit voltage	230 V AC
motor condenser	2 µF/400 V
noise level	58 dB(A)
weight	1,500 g

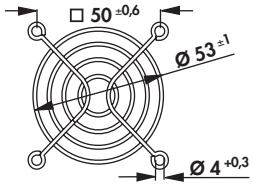
Protection grid for fans

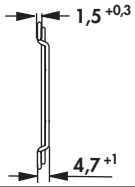
– protection against contact as per EN 294
– aerodynamic contruction
– minimized noise modification
– only low modification of the air flow



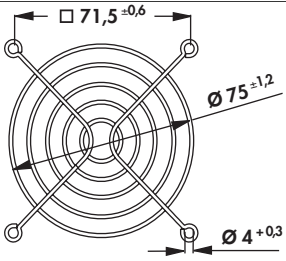


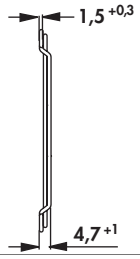
art. no.	suitable for cooling aggregate
LAGI 40	LAM 2/ LAM 4/ LAM 4 K



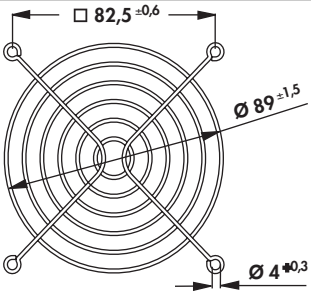


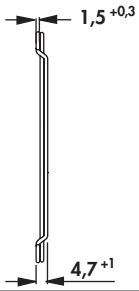
art. no.	suitable for cooling aggregate
LAGI 60	LAM 1/ LA (V) 6/ LA (V) 7/ LA (V) 8/ LA 27 K



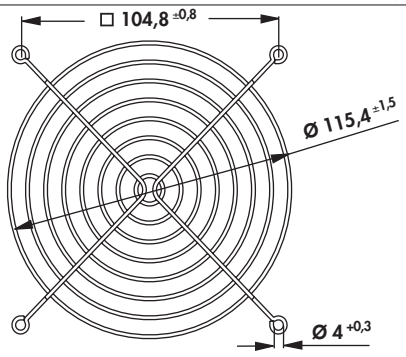


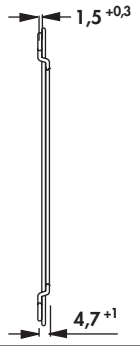
art. no.	suitable for cooling aggregate
LAGI 80	LA (V) 9/ LA (V) 10/ LA (V) 11





art. no.	suitable for cooling aggregate
LAGI 92	LA 2/ LA (V) 21/ LA (V) 22





art. no.	suitable for cooling aggregate
LAGI 119	LA 1/ LA 4/ LA 5/ LA (V) 14/ LA (V) 15/ LA (V) 17/ LA (V) 18/ LA HL (V) 1/ LA HL (V) 2/ LA HL (V) 3 / LA HL D1
material:	steel wire, nickel-plated

High capacity cooling aggregat. → **D 26 – 29**
Cooling aggregates with radial fan → **D 33 – 35**
Heatsinks with hollow fin profile → **D 30**
Hollow-fin cooling aggregates → **D 15 – 25**
Heatsink-cooling aggregates → **D 14**
Cooling aggreg. in segment mount. → **D 5**
Miniature cooling aggregates → **D 9 – 11**
Technical introduction → **A 2 – 8**

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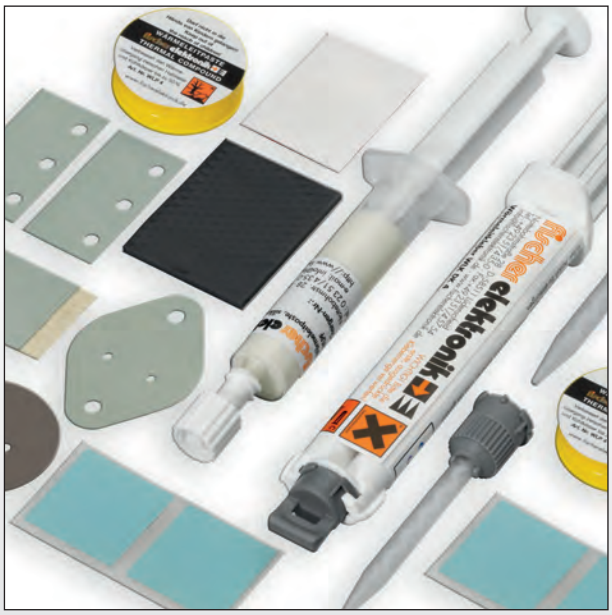
Thermal conductive material
Guide rails for PCBs
Mounting material for semiconductors-
Mounting material for mechanical components



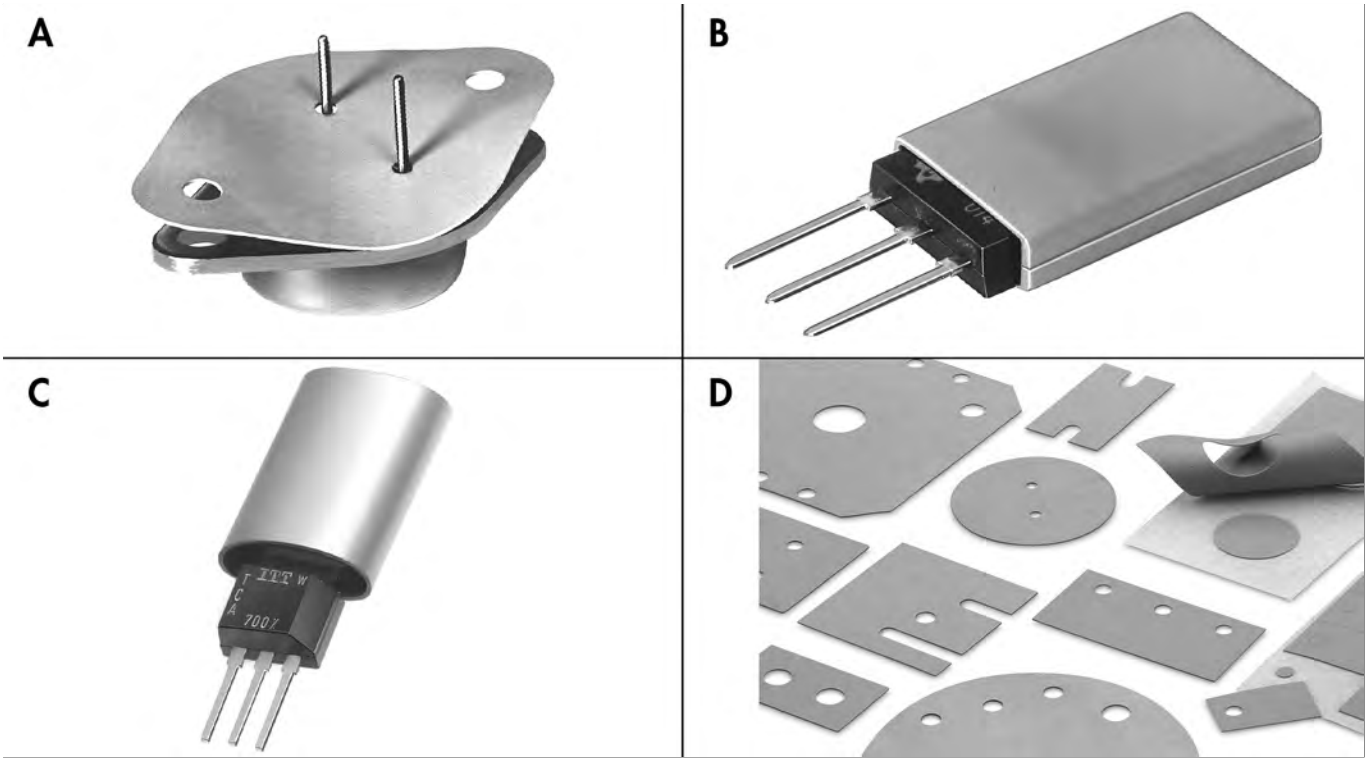
Thermal conductive material
- large standard programme for thermal conductive pastes and glues, silicone-, GEL-, and foam foils (Gap Filler), cuts, tapes, tubes and caps
- thermal conductive electrically insulating foils
- customer specific productions made in our in-house punching shop

Guide rails for PCBs
- for horizontal and vertical assembly
- suitable for sheet thicknesses of 0.5 - 1.85 mm
- with and without lock mechanism
- slim an wide designs
- screwable and snapable versions, extractors with locking pin fixing
- special designs upon request

Mounting material for semiconductors
- mounting disc for discrete devices such as transistors, capacitors and LEDs
- electrically insulating mounting of the transistors
- simple and fast assembly
- insulating clamping pins for various semiconductors for increasing the dielectric strength
- cover and insulating cap for transistors

Mounting material for mechanical components
- distance bolts made of metal and plastics with inner or outer thread
- clamp mounting made of aluminium and plastics for mounting the heatsinks and cases on the mounting rail acc. to DIN EN 50022
- anti-vibration device for minimizing the noise and resonance

Silicon-rubber insulating material for semiconductors



A: washer
B: insulating cap
C: insulating tube
D: cuts

Our thermal conduction wafers effect following advantages:
– good surface contact as material is flexible
– reduced production costs as a matter of mounting without thermal conducting paste (clean and fast)
– spring-back of the elastic material protects the transistor against damage
– free of any toxic substances

Customer specific versions:
– punching and cuts of our thermal conductive foil according to drawing
– sold per sheet or by the meter
– other foils, plastics, papers, etc. upon request

The thermal details refer to an area of 1 inch^2 (6.45 cm^2).

Thermal conductive foil	**→ E 7 – 10**	**Heatsinks for PCB**	**→ A 89 – 112**
GEL thermal conductive foils	**→ E 12 – 15**	**Heatsinks for BGA**	**→ B 17 – 20**
Thermal conductive paste	**→ E 21 – 22**	**Extruded heatsinks**	**→ A 22 – 83**
Thermal conductive glue	**→ E 23 – 24**	**Technical introduction**	**→ A 2 – 8**

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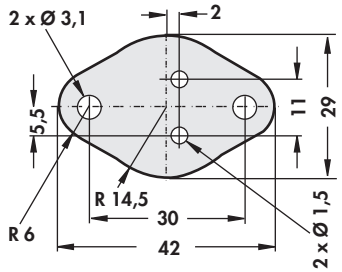
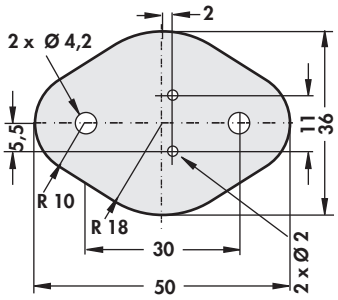
Silicone rubber insulating material for semiconductors

– other cuttings on request

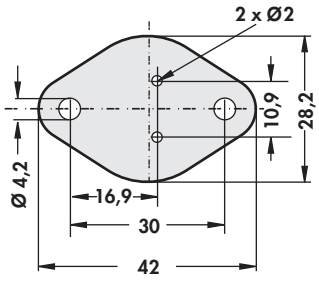
TO 3



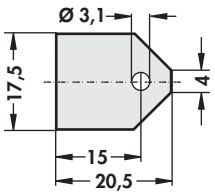
TO 3 M



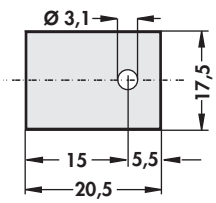
TO 3/4



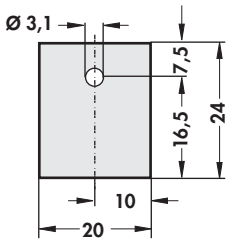
TOP 3



TOP 3/1

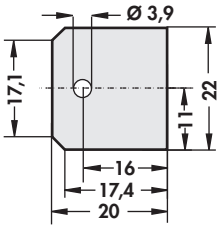


TOP 3 PF

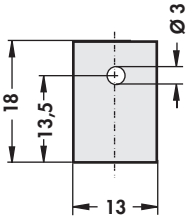


TO 218

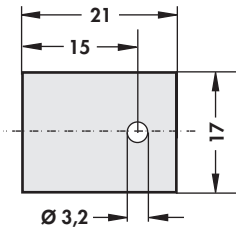
Multiwatt



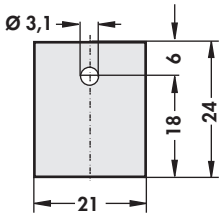
TO 220



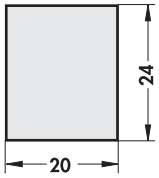
TO 247



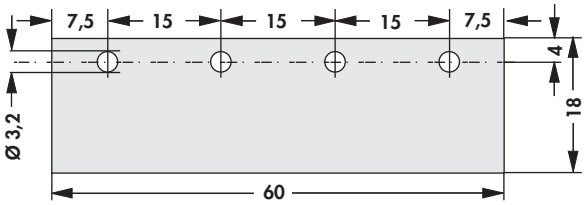
TO 247/1



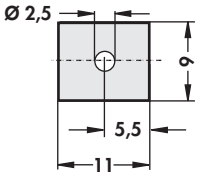
TO 3158



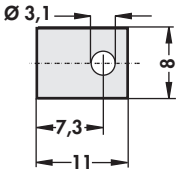
4 x TO220



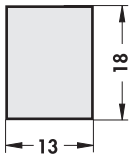
TO 126



SOT 32



TO 3159



Thermally conductive foil made of siliconelastomer

foil type	foil WS	foil WG	foil WK	foil WB
material	silicone foil, standard	silicone foil, GF reinforced	silicone foil, GF reinforced, one-sided self-adhesive	silicone foil, GF reinforced
Washer				
TO-3	**WS 3**	**WG 3**	**WK 3**	**WB 3**
TO-3 M	**WS 3 M**			
TO-3/4	**WS 3/4**		**WK 3/4**	
TO-3 PF	**WS 3 P**	**WG 3 P**	**WK 3 P**	**WB 3 P**
3158	**WS 3158**		**WK 3158**	**WB 3158**
TOP 3	**WS TOP 3**			
TOP 3/1	**WS TOP 3/1**		**WK TOP 3/1**	
TO 218 (Multiwatt)		**WG 218**		
TO 247	**WS 247**		**WK 247**	
TO 220	**WS 220**	**WG 220**	**WK 220**	**WB 220**
4 X TO 220	**WS 4 220**			
3159	**WS 3159**		**WK 3159**	**WB 3159**
TO 126			**WK 126**	
SOT 32			**WK 32**	
TO 247/1	**WS 247/1**			
Insulating tube				
TO-220 Ø 11 mm, length 25 mm	**WSC-220**			
TO-3 PF Ø 13.5 mm, length 25 mm	**WSC-3 P**			
TO-247 Ø 14.5 mm, length 30 mm	**WSC-247**			
Insulating tube as meterpiece				
TO-220 Ø 11 mm	**WSM-220**			
TO-3 PF Ø 13.5 mm	**WSM-3 P**			
Tape material (width)				
24 mm			**WKT 24**	
30 mm	**WST 30**			**WBT 30**
36 mm	**WST 36**			
85 mm	**WST 85**			
300 mm		**WGT 300**	**WKT 300**	**WBT 300**

	Foil WS	Foil WG	Foil WK	Foil WB
material thickness	0.3 mm	0.2 mm		0.15 mm
material hardness	75 Shore A	87 Shore A		90 Shore A
dielectric strength	10 kV	6.5 kV		3 kV
thermal resistance	0.4 K/W	0.42 K/W	0.45 K/W	0.34 K/W
thermal conductivity	1.22 W/m·K	1.13 W/m·K	0.92 W/m·K	1.43 W/m·K
insulation resistance	$2.9 \cdot 10^{15}$ Ω·cm	$5.7 \cdot 10^{15}$ Ω·cm		$1.6 \cdot 10^{15}$ Ω·cm
extensibility	100 %	2 %		4 %
temperature range	-60°C... +180°C			
class of flammibility	UL 94 V-0			

Thermal conductive foil → **E 7 – 10**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Heatsinks for PCB → **A 89 – 112**
Heatsinks for BGA → **B 17 – 20**
Extruded heatsinks → **A 22 – 83**
Technical introduction → **A 2 – 8**

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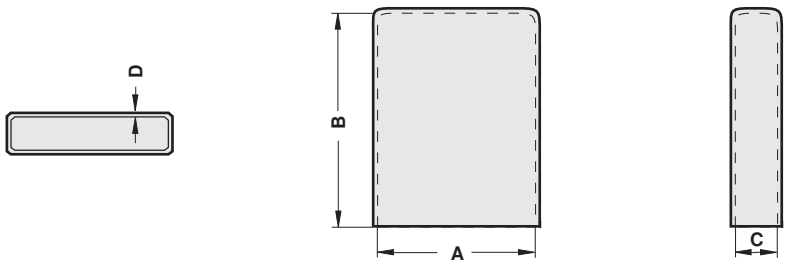
Insulating cap

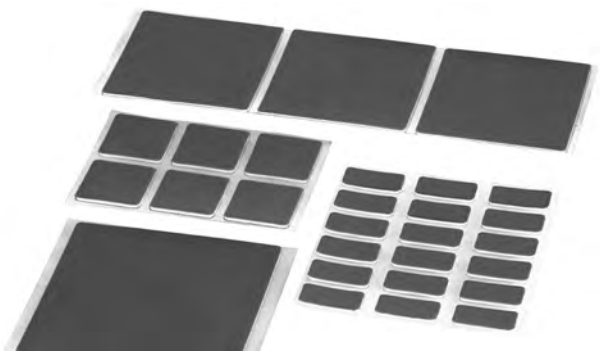


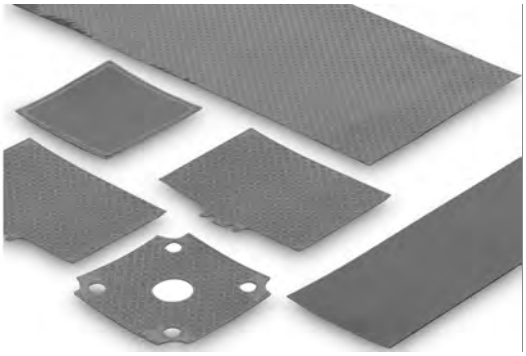
art. no.	type	dim. [mm]			
		A	B	C	D
WSI 220 210	TO 220	11	21.0	5.0	0.9
WSI 220 225	TO 220	11	22.5	5.0	0.3
WSI TOP 3 235	TOP 3	18	23.5	5.0	0.9
WSI TOP 3 280	TO 3 PL/TO 247	16	28.0	5.0	0.3
WSI TO 3 PL	TO 3 PL/TO 247	22	34.0	5.5	0.9

	Foil WSI	**Foil WSI**
material thickness	0.9 mm	0.3 mm
material hardness	75 Shore A	
dielectric strength	15 kV	10 kV
thermal resistance	0.96 K/W	0.4 K/W
thermal conductivity	1.22 W/m·K	
insulation resistance	$2.9 \cdot 10^{15}$ Ω·cm	
extensibility	100 %	
temperature range	-60°C... +180°C	
class of flammibility	UL 94 V-0	

Thermal conductive foil → **E 7 – 10**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Heatsinks for PCB → **A 89 – 112**
Heatsinks for BGA → **B 17 – 20**
Extruded heatsinks → **A 22 – 83**
Technical introduction → **A 2 – 8**

Thermal conductive foil one-sided adhesive





– one-sided acrylate adhesive coating, silicone-free carrier material
– good thermal characteristics with high operating temperature
– thin material thickness for optimal thermal resistance
– high dielectric strength, electrically insulating
– cuttings and customised cut-outs acc. to customer specific requirements

art. no.	type of delivery
WLFT 8943	plates, usable area 300x200mm

	WLFT 8943
description	one-sided adhesive, filled Copolymer
overall thickness	0.17 mm
filling material	ceramic
specific thermal resistance	4.7°C cm^2/W
thermal conductivity	0.4 W/m·K
temperature range	-40°C... +150°C
volume resistance	$2.5 \cdot 10^{13}$ Ω/cm
dielectric strength	62,7 kV/mm
peel strength at ambient temperature and 24 h	6 N/cm
class of flammibility	UL 94 V-0

Thermal conductive material → **E 2 – 5**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for transistors → **C 4 – 9**
GEL thermal conductive foils → **E 12 – 15**
Spacers → **E 40**
Insulating distance sleeves → **E 32 – 33**
Technical introduction → **A 2 – 8**

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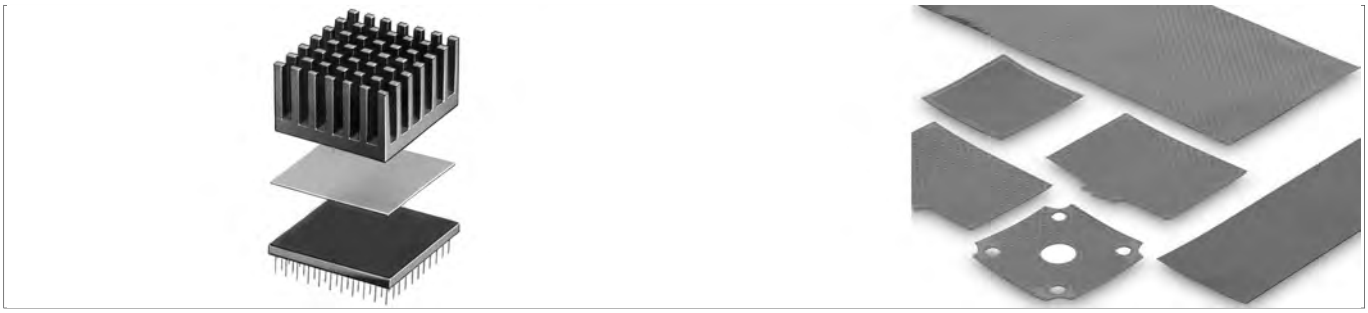
Thermally conductive foil both sides adhesive



– good thermal charactaristics
– double-sided adhesive layers
– replaces mechanical fastenings
– cuttings and cut-outs upon request

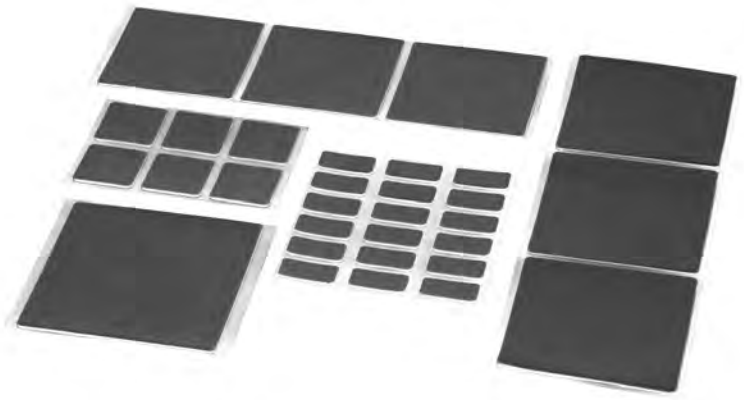
art. no.	width [mm]	type of delivery	art. no.	width [mm]	type of delivery
WLFT 404 R25	25	sold by the meter	**WLFT 414 R100**	100	sold by the meter
WLFT 404 R50	50	sold by the meter	**WLFT 414 R200**	200	sold by the meter
WLFT 404 R100	100	sold by the meter	**WLFT 405 R25**	25	sold by the meter
WLFT 404 R200	200	sold by the meter	**WLFT 405 R50**	50	sold by the meter
WLFT 414 R25	25	sold by the meter	**WLFT 405 R100**	100	sold by the meter
WLFT 414 R50	50	sold by the meter	**WLFT 405 R200**	200	sold by the meter

art. no.	dimensions [mm]	type of delivery	art. no.	dimensions [mm]	type of delivery
WLFT 404 100x100	100x100	plate	**WLFT 414 200x200**	200x200	plate
WLFT 404 100x200	100x200	plate	**WLFT 405 100x100**	100x100	plate
WLFT 404 200x200	200x200	plate	**WLFT 405 100x200**	100x200	plate
WLFT 414 100x100	100x100	plate	**WLFT 405 200x200**	200x200	plate
WLFT 414 100x200	100x200	plate			

	WLFT 404	WLFT 414	WLFT 405
description	insulating, double sided adhesive		non insulating, double-sided adhesive
overall thickness	0.127 mm ±0.03		0.15 mm ±0.03
truss material	polyimide (Kapton MT) 0.025mm		aluminium foil 0.05mm
glue layer	acrylate (pressure sensitive) double-sided		
thermal conductivity	0.4 W/m·K		0.5 W/m·K
specific thermal resistance	3.7°C cm²/W		3.4°C cm²/W
temperature range	-30°C... +125°C		
holding force (overlapping)	0.86 MPa		0.93 MPa
holding force (shear rate)	**Al** 25°C 0.897 [MPa]/ **Al** 150°C 0.345 [MPa]/ **Cu** 25°C 0.828 [MPa]/ **Cu** 150°C 0.31 [MPa]/ **Al**$_2$O$_3$ 25°C 1.17 [MPa]/ **Al**$_2$O$_3$ 150°C 0.34 [MPa]	**Al** 25°C 0.897 [MPa]/ **Al** 150°C 0.345 [MPa]	**Al** 25°C 0.86 [MPa]/ **Al** 150°C 0.38 [MPa]/ **Cu** 25°C 1.1 [MPa]/ **Cu** 150°C 0.48 [MPa]/ **Al**$_2$O$_3$ 25°C 1.0 [MPa]/ **Al**$_2$O$_3$ 150°C 0.41 [MPa]
dielectric strength	5 kV (AC)		
class of flammibility	UL 94 V-0		

Thermal conductive material → **E 2 – 5**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for transistors → **C 4 – 9**
GEL thermal conductive foils → **E 12 – 15**
Spacers → **E 40**
Insulating distance sleeves → **E 32 – 33**
Technical introduction → **A 2 – 8**

Thermally conductive foil both sides adhesive



– double sided adhesive layer
– optimal adhesion of different substrates
– very good thermal conductivity, electrical insulating
– easy handling due to double sided protection foil
– optimized surface moistening and excellent impact strength
– cutouts and different punchings according to customer drawing

art. no.	type of delivery
WLFT 8805	plates, usable area 300x200mm
WLFT 8810	plates, usable area 300x200mm
WLFT 8815	plates, usable area 300x200mm
WLFT 8820	plates, usable area 300x200mm
WLFT 8940	plates, usable area 300x200mm

	WLFT 8805	WLFT 8810	WLFT 8815	WLFT 8820	WLFT 8940
description	double sided adhesive, filled acrylic polymer				
overall thickness	0.13 mm	0.25 mm	0.38 mm	0.5 mm	0.19 mm
filling material	ceramic				
protection cover	silicone treated polyester, 37.5 - 50 µm				
thermal conductivity	0.6 W/m·K				0.9 W/m·K
specific thermal resistance	3.1°C cm²/W	5.7°C cm²/W	7.6°C cm²/W	9.7°C cm²/W	
temperature range	permanent up to 100°C				permanent up to 150°C
volume resistance	$5.2 \cdot 10^{11}$ Ω/cm	$3.9 \cdot 10^{11}$ Ω/cm	$3.8 \cdot 10^{11}$ Ω/cm		$2.5 \cdot 10^{13}$ Ω/cm
dielectric strength	37 kV/mm				55 kV/mm
peel strength at ambient temperature and 72 h	5.8 N/cm	8.3 N/cm	9.8 N/cm	11.9 N/cm	6 N/cm
class of flammibility	UL 746 C				UL 94 V-0

Thermal conductive material → **E 2 – 5**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for transistors → **C 4 – 9**
GEL thermal conductive foils → **E 12 – 15**
Spacers → **E 40**
Insulating distance sleeves → **E 32 – 33**
Technical introduction → **A 2 – 8**

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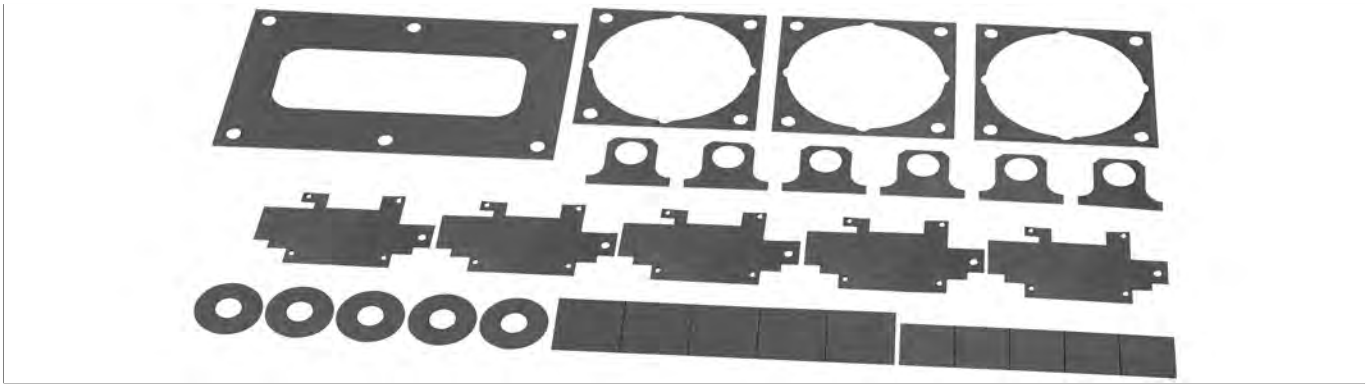
High thermoconducting graphite foils



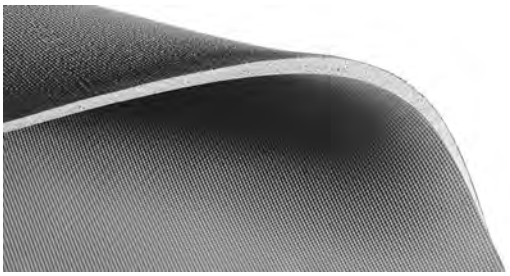
- high-compressed anisotropic natural graphite
- very good thermal characteristics
- optimal for heat spreading
- high operating temperature range
- different material thicknesses and coatings upon request
- customer specified cuttings and stampings acc. to drawing

art. no.	width [mm]	type of delivery	art. no.	width [mm]	type of delivery
WLFG 9010 R 25	25	sold by the meter	**WLFG 9020 R 25**	25	sold by the meter
WLFG 9010 R 50	50	sold by the meter	**WLFG 9020 R 50**	50	sold by the meter
WLFG 9010 R 100	100	sold by the meter	**WLFG 9020 R 100**	100	sold by the meter
WLFG 9015 R 25	25	sold by the meter	**WLFG S 900 K R 25**	25	sold by the meter
WLFG 9015 R 50	50	sold by the meter	**WLFG S 900 K R 50**	50	sold by the meter
WLFG 9015 R 100	100	sold by the meter	**WLFG S 900 K R 100**	100	sold by the meter

	WLFG 9010	**WLFG 9015**	**WLFG 9020**	**WLFG S 900 K**
description	base film made of graphite, electrically conductive	graphite foil, electrically conductive		
version		adherent layer on one side		
overall thickness	0.15 mm	0.2 mm	0.25 mm	0.175 mm
thermal resistance	0,09 K/W	0,07 K/W	0,23 K/W	0,08 K/W
thermal conductivity z (x/y)	5.5 (55) W/m·K	6 (55) W/m·K	4 (55) W/m·K	7.5 (<450) W/m·K
specific thermal resistance	36°C mm²/W	28.8°C mm²/W	72°C mm²/W	34°C mm²/W
temperature range	-40°C... +500°C			
hardness range	30 Shore D			
tensile strength	5.5 N/mm²	6 N/mm²	5.5 N/mm²	10 N/mm²
elongation at break	10 %			5 %
tightness	1 g/cm³			<1.6 g/cm³
class of flammibility	UL 94 V-0			

Thermal conductive material → **E 2 – 5**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for transistors → **C 4 – 9**
GEL thermal conductive foils → **E 12 – 15**
Spacers → **E 40**
Insulating distance sleeves → **E 32 – 33**
Technical introduction → **A 2 – 8**

Heat conductive silicon foam foil



– elastomer foam with closed cell structure
– good heat conductor e.g. between components, heatsinks and casing parts
– electrical insulating
– can be compressed even with a low contact pressure
– absorbs shocks and vibrations

art. no.	material thickness [mm]
WSF 16	1.60 ±0.4
WSF 32	3.20 ±0.8
WSF 635	6.35 ±1.2
WSFS 635	6.35 ±1.2

Thermal resistance at 3.2 mm material thickness:

compression %	contact	10	25	50
contact pressure PSI	>1	5	12	34
R_{th} K/W (1 in² x 3.2 mm)	6	4.5	2.5	1
heat conductivity W/mK	0.3	0.4	0.45	0.65

– **WSFS 635** double sided adhesive and **WSF** adhesive upon request
– according to NASA gas emission requirements

	WSF	**WSFS 635**
version	no adhesive	one-sided self-adhesive
thermal conductivity	0.108 W/m·K (substrate)	
hardness range	13 Shore D	
compression, 25%	18 PSI	
temperature range	-62°C... +205°C	
extensibility	150 %	
tensile strength	120 PSI	
dielectric strength	4 kV/mm	
tightness	1.118 g/cm³	
class of flammibility	UL 94 V-1 (at thickness ≥3.2mm)	
type of delivery	plates 914x914mm/ cuttings on customer's requirements	

Thermal conductive material → **E 2 – 5**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Kapton insulator washers → **E 16**
Heatsinks for PGA → **B 11 – 16**
Heatsinks for BGA → **B 17 – 20**
Technical introduction → **A 2 – 8**

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Silicone free thermal adhesive foils

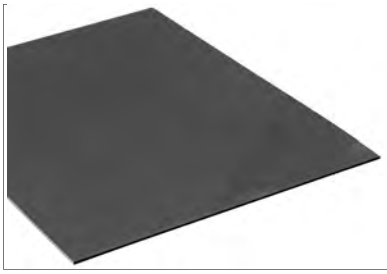
– silicone free gap-filler with good thermal characteristics
– smooth, compressible and elastic
– cut outs, punchings and modifications according to customer specification
– other material thicknesses upon request

art. no.	material thick-ness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]	art. no.	material thick-ness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]
GEL F 15 10	1.0 ±0.2	1.06	6.56	**GEL F 15 G 10**	1.0 ±0.2	1.16	7.55
GEL F 15 15	1.5 ±0.2	1.44	8.01	**GEL F 15 G 15**	1.5 ±0.2	1.52	9.22
GEL F 15 20	2.0 ±0.3	1.83	11.26	**GEL F 15 G 20**	2.0 ±0.3	1.93	10.89

	GEL F 15	GEL F 15 G
version	standard	polyamide film mash reinforced
thermal conductivity	1.5 W/m·K	
volume resistance	2 ·10³ MΩ/m	
hardness range	53 Shore 00	
temperature range	-40°C... +105°C	
extensibility	150 %	
dielectric constant	9,12 [50 Hz] / 8,55 [1 kHz] / 5,83 [1 MHz]	
dielectric loss factor	0,152 [50 Hz] / 0,135 [1 kHz] / 0,034 [1 MHz]	
dielectric strength	11 kV/mm	
tightness	2.1 g/cm³	
class of flammibility	UL 94 V-0	
type of delivery	on both sides covered with protective foil/ plates, usable area 300x200mm/ cuttings on customer's requirements	

Thermal conductive material → **E 2 – 5**
Thermal conductive foil → **E 7 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Extruded heatsinks → **A 22 – 83**
Heatsinks for LEDs → **B 35 – 48**
Heatsink profile-overview → **A 13 – 17**
Technical introduction → **A 2 – 8**

Gel thermal conducting foils



– highly heat-conductive silocon foil
– smooth, elastic and compressible
– equals uneven surfaces very well (Gap-Filler)

art. no.	material thick-ness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]	art. no.	material thick-ness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]
GEL 05	0.5 ±0.1	0.69	4.45	**GEL G 05**	0.5 ±0.1	0.63	4.04
GEL 10	1.0 ±0.2	1.03	6.64	**GEL G 1**	1.0 ±0.2	1.17	7.56
GEL 15	1.5 ±0.2	1.39	8.96	**GEL G 15**	1.5 ±0.2	1.59	10.27
GEL 20	2.0 ±0.3	1.52	9.78	**GEL G 2**	2.0 ±0.3	2.07	13.33
GEL 25	2.5 ±0.3	2.10	13.58	**GEL G 25**	2.5 ±0.3	2.61	16.81
GEL 30	3.0 ±0.3	2.35	15.15	**GEL G 3**	3.0 ±0.3	2.89	18.66
GEL 35	3.5 ±0.3	2.56	16.51	**GEL G 35**	3.5 ±0.3	3.35	21.63
GEL 40	4.0 ±0.4	3.25	20.95	**GEL G 4**	4.0 ±0.4	3.56	22.96
GEL 45	4.5 ±0.4	3.38	21.82	**GEL G 45**	4.5 ±0.4	3.89	25.10
GEL 50	5.0 ±0.5	3.52	22.70	**GEL G 5**	5.0 ±0.5	4.22	27.23

	GEL	**GEL G 05 - 25**	**GEL G 3 - 5**
version	standard	polyamide film mash reinforced, adherent layer on one side	
thermal conductivity	1.5 W/m·K		
volume resistance	$1 \cdot 10^6$ MΩ/m		
hardness range	49 Shore 00		
temperature range	-60°C ... +200°C		
extensibility	100 %	60 %	
dielectric constant	5.8 [50 Hz]/ 5.6 [1 KHz]/ 5.5 [1 MHz]		
dielectric loss factor	0.048 [50 Hz]/ 0.015 [1 KHz]/ 0.003 [1 MHz]		
dielectric strength	14 kV/mm (AC)	8 kV/mm (AC)	
tightness	2.6 g/cm³		
class of flammibility	UL 94 V-0	UL 94 V-1	UL 94 V-0
type of delivery	on both sides covered with protective foil/ plates, usable area 300x200mm/ cuttings on customer's requirements		

Thermal conductive material → **E 2 – 5**
Thermal conductive foil → **E 7 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Extruded heatsinks → **A 22 – 83**
Heatsinks for LEDs → **B 35 – 48**
Heatsink profile-overview → **A 13 – 17**
Technical introduction → **A 2 – 8**

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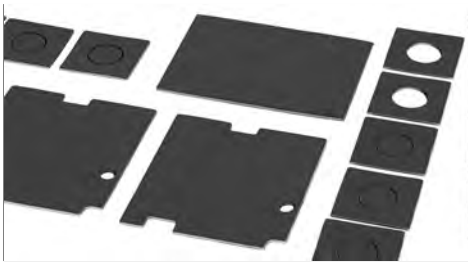
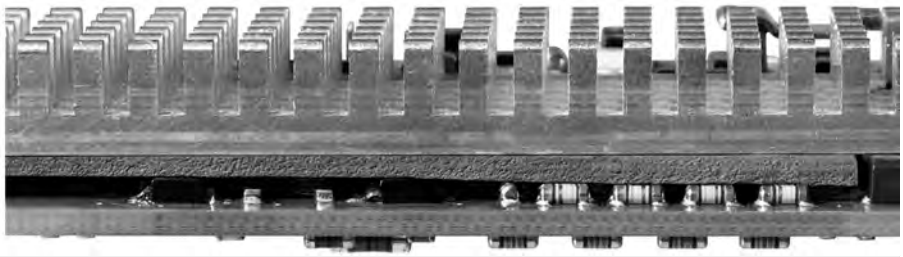
Gel thermal conducting foils





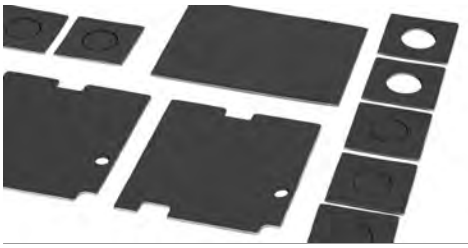
– GEL thermal conductive foils with very good thermical characteristics
– for balancing non-planarities and differences in components (Gap Filler)
– soft, elastic and compressible
– customer specific cuts and punchings according to drawing

art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]	art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]
GEL 28 05	0.5 ±0.15	0.23	1.48	**GEL 28 G 05**	0.5 ±0.15	0.29	1.85
GEL 28 10	1.0 ±0.2	0.44	2.76	**GEL 28 G 10**	1.0 ±0.2	0.47	2.99
GEL 28 15	1.5 ±0.2	0.61	3.82	**GEL 28 G 15**	1.5 ±0.2	0.72	4.53
GEL 28 20	2.0 ±0.3	0.80	5.00	**GEL 28 G 20**	2.0 ±0.3	0.97	6.07
GEL 28 25	2.5 ±0.3	0.90	5.65	**GEL 28 G 25**	2.5 ±0.3	1.15	7.23
GEL 28 30	3.0 ±0.3	1.10	6.90	**GEL 28 G 30**	3.0 ±0.3	1.23	7.69
GEL 28 35	3.5 ±0.3	1.27	7.97	**GEL 28 G 35**	3.5 ±0.3	1.35	8.46
GEL 28 40	4.0 ±0.3	1.39	8.69	**GEL 28 G 40**	4.0 ±0.3	1.67	10.47
GEL 28 50	5.0 ±0.3	1.67	10.47	**GEL 28 G 50**	5.0 ±0.3	1.92	12.02

	GEL 28	GEL 28 G
version	standard	polyamide film mash reinforced
thermal conductivity	2.5 W/m·K	
volume resistance	$3.6 \cdot 10^4$ MΩ/m	
hardness range	50 Shore 00	55 Shore 00
temperature range	-60°C ... +200°C	
extensibility	64 %	32 %
dielectric constant	8,98 [50 Hz] / 8,63 [1 kHz] / 8,05 [1 MHz]	
dielectric loss factor	0.0826 [50 Hz]/0.0300 [1 kHz]/0.0052 [1 MHz]	
dielectric strength	15 kV/mm	
tightness	2.7 g/cm³	
class of flammibility	UL 94 V-0	
type of delivery	on both sides covered with protective foil/ plates, usable area 300x200mm/ other dimensions upon request	

Thermal conductive material → **E 2 – 5**
Thermal conductive foil → **E 7 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Extruded heatsinks → **A 22 – 83**
Heatsinks for LEDs → **B 35 – 48**
Heatsink profile-overview → **A 13 – 17**
Technical introduction → **A 2 – 8**

Thermal adhesive foils



– gap filler with exceptionally good thermal conductivity and low outgassing
– especially smooth, compressible and elastic
– cut outs, punchings and modifications according to customer specification
– other material thicknesses upon request

art. no.	material thick-ness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]	art. no.	material thick-ness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]
GEL 45 05	0.5 ±0.15	0.61	3.94	**GEL 45 G 05**	0.5 ±0.15	0.64	4.17
GEL 45 10	1.0 ±0.2	0.96	6.27	**GEL 45 G 10**	1.0 ±0.2	0.97	6.28
GEL 45 15	1.5 ±0.2	1.30	8.42	**GEL 45 G 15**	1.5 ±0.2	1.71	11.06
GEL 45 20	2.0 ±0.3	1.52	9.85	**GEL 45 G 20**	2.0 ±0.3	1.71	11.06
GEL 45 25	2.5 ±0.3	1.71	11.08	**GEL 45 G 25**	2.5 ±0.3	2.03	13.11
GEL 45 30	3.0 ±0.3	1.94	12.52	**GEL 45 G 30**	3.0 ±0.3	2.28	14.76
GEL 45 35	3.5 ±0.35	2.20	14.20	**GEL 45 G 35**	3.5 ±0.35	2.54	16.40
GEL 45 40	4.0 ±0.4	2.46	15.88	**GEL 45 G 40**	4.0 ±0.4	2.80	18.12
GEL 45 45	4.5 ±0.45	2.68	17.34	**GEL 45 G 45**	4.5 ±0.45	3.03	19.56
GEL 45 50	5.0 ±0.5	2.84	17.34	**GEL 45 G 50**	5.0 ±0.5	3.22	20.82

	GEL 45	**GEL 45 G**
version	standard	polyamide film mash reinforced
thermal conductivity	4.5 W/m·K	
volume resistance	$1.4 \cdot 10^5$ Ω/cm	
hardness range	45 Shore 00	
temperature range	-60°C ... +200°C	
extensibility	50 %	
dielectric constant	8,98 [50 Hz] / 8,63 [1 kHz] / 8,05 [1 MHz]	
dielectric loss factor	0,0249 [50 Hz] / 0,0219 [1 kHz] / 0,00675 [1 MHz]	
dielectric strength	11 kV/mm	
tightness	3.2 g/cm³	
class of flammibility	UL 94 V-0	
type of delivery	on both sides covered with protective foil/ plates, usable area 300x200mm/ cuttings on customer's requirements	

Thermal conductive material → **E 2 – 5**
Thermal conductive foil → **E 7 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Extruded heatsinks → **A 22 – 83**
Heatsinks for LEDs → **B 35 – 48**
Heatsink profile-overview → **A 13 – 17**
Technical introduction → **A 2 – 8**

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Gel thermal conducting foils

– GEL silicone foils with especially high thermal conductivity
– balances non-planarities and differences in components (Gap Filler)
– soft, elastic and compressible
– cuts, punchings and special designs according to customer specifications

art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]	art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]
GEL 60 05	0.5 ±0.1	0.20	1.30	**GEL 60 G 05**	0.5 ±0.1	0.21	1.37
GEL 60 10	1.0 ±0.2	0.33	2.11	**GEL 60 G 10**	1.0 ±0.2	0.31	1.99
GEL 60 15	1.5 ±0.2	0.53	3.45	**GEL 60 G 15**	1.5 ±0.2	0.48	3.08
GEL 60 20	2.0 ±0.3	0.61	3.91	**GEL 60 G 20**	2.0 ±0.3	0.62	4.00
GEL 60 25	2.5 ±0.3	0.72	4.67	**GEL 60 G 25**	2.5 ±0.3	0.77	4.96

	GEL 60	GEL 60 G
version	standard	polyamide film mash reinforced
thermal conductivity	6 W/m·K	
volume resistance	$1 \cdot 10^6$ MΩ/m	
hardness range	52 Shore 00	
temperature range	-60°C ... +200°C	
extensibility	80 %	
dielectric constant	6.4 [50 Hz]/6.4 [1 kHz]/6.4 [1 MHz]	
dielectric loss factor	0.035 [50 Hz]/0.005 [1 kHz]/0.001 [1 MHz]	
dielectric strength	13 kV/mm	
tightness	3.2 g/cm³	
class of flammibility	UL 94 V-0	
type of delivery	on both sides covered with protective foil/ plates, usable area 300x200mm/ other dimensions upon request	

– especially soft design
– levels smallest air gaps and unevennesses
– cuts and contours with cutouts according to customer specifaction

art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]	art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in²/W]	R_{th} (100 kPa) [°C cm²/W]
GEL 27 S 25	2.5	0.94	6.05	**GEL 27 S 50**	5.0	1.69	10.91

version:	standard
thermal conductivity:	2.7 W/m·K
volume resistance:	$2 \cdot 10^7$ MΩ/m
hardness range:	53 Shore 00
temperature range:	-60°C ... +200°C
extensibility:	45 %
dielectric strength:	15 kV/mm
tightness:	3 g/cm³
class of flammibility:	UL 94 V-0
type of delivery:	on both sides covered with protective foil/ plates, usable area 300x200mm/ other dimensions upon request

Kapton insulator washers

- very low thermal resistance
- optimised heat conductivity
- best mechanical charactaristics
- polyimide-carrier foil with silicone-free phase changing thermal conductive layer completely coated on both sides
- clean processing, no abrasion of the coating
- stacked foils do not stick together
- good resistance against cleening agents
- no cold flow
- low pressure force necessary, thus particularly applicable for spring-fixing of semiconductors
- cuttings and special versions according to customer's requirements
- the thermal details refer to an area of 1 inch² (6.45 cm²)

art. no.	art. no.	art. no.	art. no.	art. no.
KAP 1 P suitable for pre-cut parts (plate)	**KAP 247 O** TO 248/ TO 218/ TO 247	**KAP 218 O** TO 218	**KAP 220 O** TO 220	**KAP 218** TO 248/ TO 218/ TO 247
art. no.	art. no.	art. no.	art. no.	
KAP 220 G TO 220	**KAP 220 K** TO 220	**KAP 3 G** TO 3	**KAP 3 K** TO 3	

	KAP
material	polyimide-carrier foil with silicone-free phase changing thermal conductive layer completely coated on both sides
material thickness	0.077mm (substrate 0.05mm)
thermal conductivity	0.45 W/m·K (substrate)
insulation resistance	10^{14} Ω
thermal resistance	0.15 K/W [at 1 inch²; = 6.45 cm²; = TO 3 (KAP 3)]
temperature range	-40°C... +150°C
phase change temperature	52 °C
extensibility	30 %
dielectric strength	7.8 kV
class of flammibility	UL 94 V-0

Profiles for PCB components → **A 91**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for transistors → **C 4 – 9**
Finger-shaped heatsinks → **C 2 – 3**
Distance sleeves for PCB´s in HP grid → **E 39**
Spacers → **E 40**
Technical introduction → **A 2 – 8**

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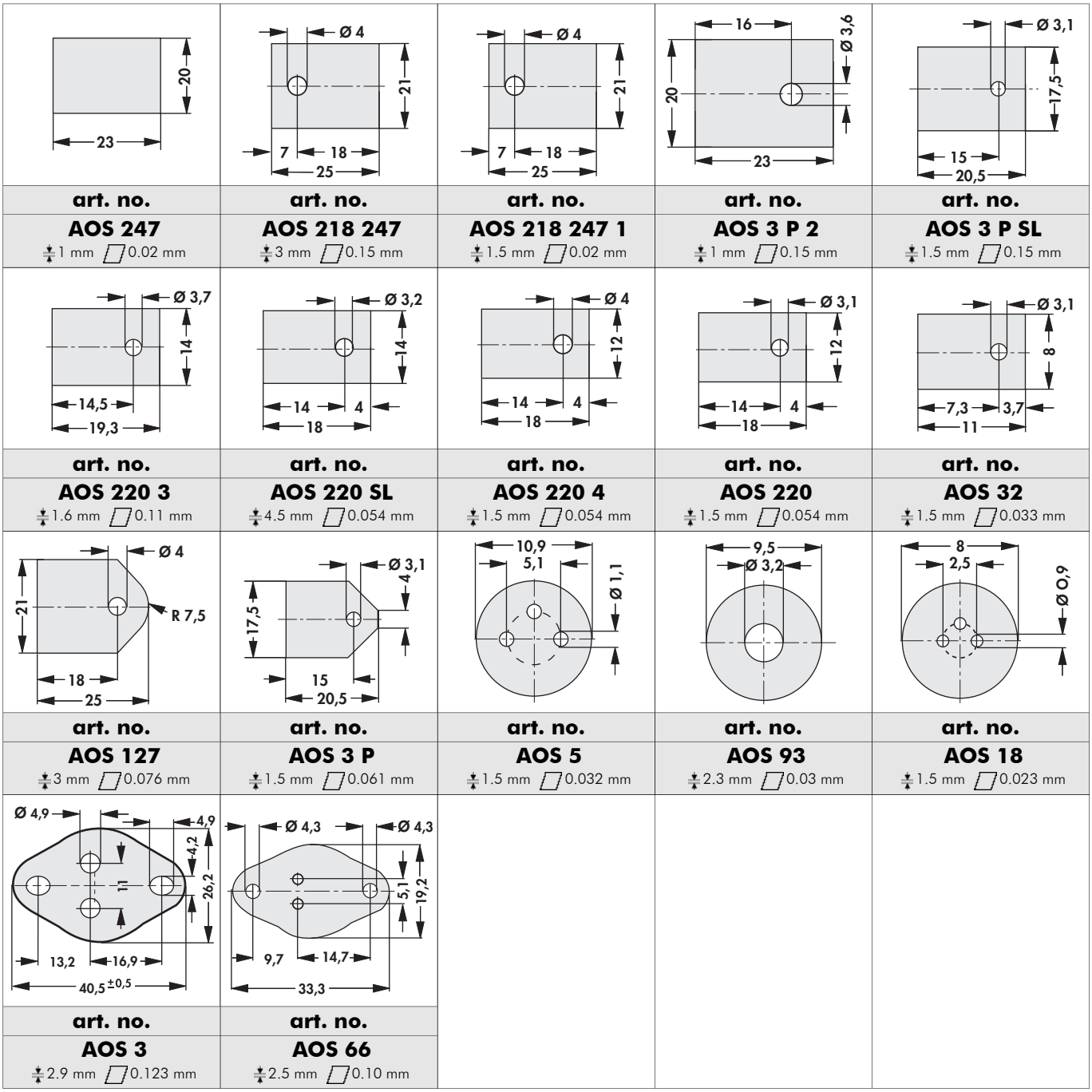
Aluminium oxide wafers

– other thicknesses and versions on request
⏚ = thickness; ▱ = flatness



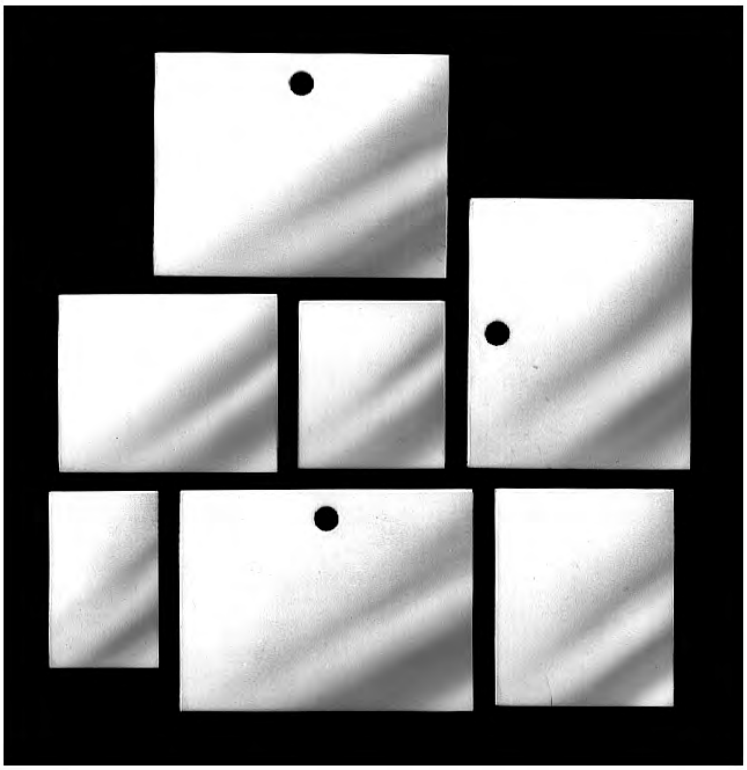
art. no.	art. no.	art. no.	art. no.	art. no.
AOS 247 ⏚1 mm ▱0.02 mm	**AOS 218 247** ⏚3 mm ▱0.15 mm	**AOS 218 247 1** ⏚1.5 mm ▱0.02 mm	**AOS 3 P 2** ⏚1 mm ▱0.15 mm	**AOS 3 P SL** ⏚1.5 mm ▱0.15 mm
art. no.	**art. no.**	**art. no.**	**art. no.**	**art. no.**
AOS 220 3 ⏚1.6 mm ▱0.11 mm	**AOS 220 SL** ⏚4.5 mm ▱0.054 mm	**AOS 220 4** ⏚1.5 mm ▱0.054 mm	**AOS 220** ⏚1.5 mm ▱0.054 mm	**AOS 32** ⏚1.5 mm ▱0.033 mm
art. no.	**art. no.**	**art. no.**	**art. no.**	**art. no.**
AOS 127 ⏚3 mm ▱0.076 mm	**AOS 3 P** ⏚1.5 mm ▱0.061 mm	**AOS 5** ⏚1.5 mm ▱0.032 mm	**AOS 93** ⏚2.3 mm ▱0.03 mm	**AOS 18** ⏚1.5 mm ▱0.023 mm
art. no.	**art. no.**			
AOS 3 ⏚2.9 mm ▱0.123 mm	**AOS 66** ⏚2.5 mm ▱0.10 mm			

	AOS
material	AL_2O_3 - ceramics
thermal resistance	0.3 K/W [at 1 inch²; = 6.45 cm²; = TO 3 (AOS 3 G)]
specific electrical resistance	$>10^{14}$ Ω/cm
thermal conductivity	25 W/m·K
dielectric constant	9
linear expansion coefficient	$\sim 8 \cdot 10^{-6}$/K
snap through stability	10 kV/mm

Thermal conductive material → **E 2 – 5**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Thermal conductive foil → **E 7 – 10**
Kapton insulator washers → **E 16**
Mica wafers → **E 19**
Technical introduction → **A 2 – 8**

Aluminium oxide wafers according to customer's instructions

– laser-cut versions with outer dimensions and cutouts according to customer's requirements
– other plate dimensions upon request
– max. plate dimension 180 x 180 mm



material thickness [mm]	outer dimensions [mm]
2.000	114x114
2.540	114x114
1.500	114x114
1.270	114x114
1.000	114x114/ 165x115/ 160x113
0.800	114x114/ 165x115/ 160x113
0.635	106.5x106.5/ 114x114/ 165x115/ 160x113
0.500	106.5x106.5/ 114x114
0.400	106.5x106.5/ 114x114
0.300	106.5x106.5/ 114x114
0.250	106.5x106.5/ 114x114

Thermal conductive material → **E 2 – 5**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Thermal conductive foil → **E 7 – 10**
Kapton insulator washers → **E 16**
Mica wafers → **E 19**
Technical introduction → **A 2 – 8**

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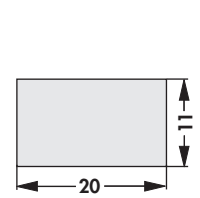
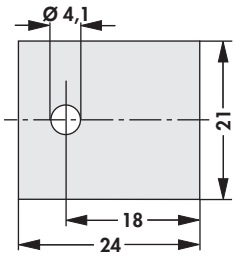
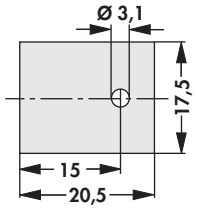
Mica wafers



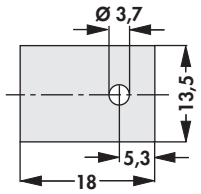
art. no.
GS 220 C TO 220



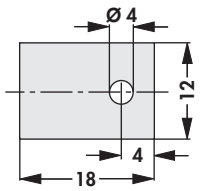
art. no.
GS 218 TO 218



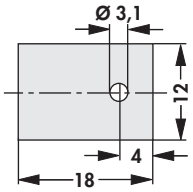
art. no.
GS 3 P SL TOP 3



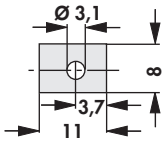
art. no.
GS 66 P TO 66



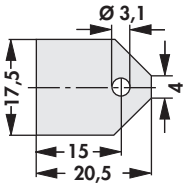
art. no.
GS 220 4 TO 220



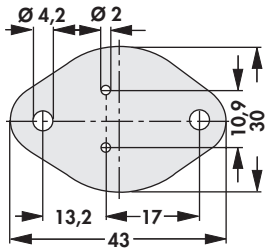
art. no.
GS 220 P TO 220



art. no.
GS 32 P SOT 32



art. no.
GS 3 P TOP 3

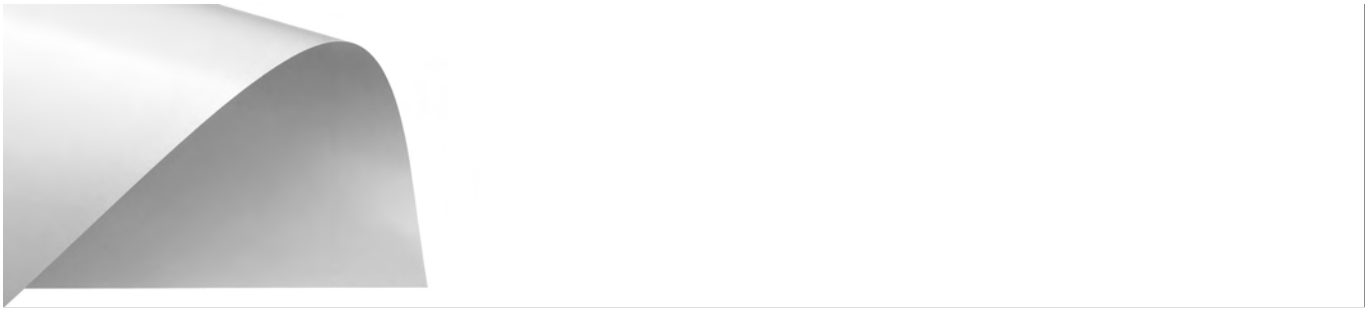


art. no.
GS 3 TO 3

	GS
material	muskovit
material thickness	0.05 mm
thermal resistance (GS 3)	0.4 K/W
insulation resistance	$3 \cdot 10^{17}$ Ω·cm
snap through stability	5 kV

Thermal conductive material → **E 2 – 5**
Thermal conductive foil → **E 7 – 10**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Kapton insulator washers → **E 16**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Free standing film



– self-supporting differential phase changing thermal interface material, contains no substrate (Free Standing Film)
– materials with phase change temperature at 52 °C;
– best thermal conductivity, exceeding phase change temperature point, material flows into all gaps between components and heatsink
– thixotropic, does not migrate from the interface area
– no lowering of thermal conductivity though thermal cycling
– application with very low contact pressure, due to non elastomeric material, particularly suitable for clamp mounting of components
– electrically non-conductive, but not an insulator
– self adhering characteristics, also suitable for large areas
– no toxic ingredients
– custom required shapes on request
– all with protection foil on both sides

art. no.	basin	dimensions [mm]
FSF 52 P	plate, protection foil on both sides	330x343x0.127 ± 0.025

	FSF 52 P
phase change temperature	52 °C
colour	white
tightness	2 g/cm³
thermal conductivity	0.9 W/m·K
thermal resistance (1 in², TO 3) at contact pressure of	0.03 K/W 0.031 N/mm²
temperature range	≤ +200°C
adhesive holding force	0.35 N/mm²
class of flammibility	UL 94 V-0
dielectric constant	3.8 [1 kHz] 3.4 [1 MHz]

Mica wafers → **E 19**
Thermal conductive foil → **E 7 – 10**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Thermal conductive material → **E 2 – 5**
Insulating caps → **E 51**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Thermal transfer compounds

Silicon thermal transfer compound

– thermal transfer compound used to reduce the thermal transmission resistance between semiconductor and heatsink

art. no.	basin	delivery quantity [g]
WLP 004	box	4
WLP 035	box	35
WLP 500	box	500
WLP 300 S	cartridge (310 ml)	300
WLP 500 S	cartridge (310 ml)	500

Silicone-free thermal transfer compound

– thermal transfer compound used to reduce the thermal transmission resistance between semiconductor and heatsink

art. no.	basin	delivery quantity [ml]	delivery quantity [g]
WLPF 05	syringe	2	—
WLPF 10	syringe	5	—
WLPF 20	syringe	10	—
WLPF 50	syringe	20	—
WLPF 300 S	cartridge (310 ml)	—	300

	WLP	**WLPF**
composition	silicone oil, inorganic filling material	silicone free synthetic liquid. Metal oxide filling.
consistance	pastey	
colour	white	white-grey
tightness	1.1 g/cm^3	approx. 2 g/cm^3
thermal conductivity	0.61 W/m·K	>0.7 W/m·K
specific electrical resistance	>10^{12} Ω/cm	
flashpoint	none (DIN 53213)	of the basic oil >280°C (ISO 2592)
drop point	>260°C	
thermal resistance	no bleeding at (4 h/200°C)	<1% (96 h/200°C)
temperature range	-40°C ... +250°C	-40°C... +150°C
acid number	< 0.01 mg KOH/g	
solubility in water	insoluble	

Mica wafers → **E 19**
Thermal conductive foil → **E 7 – 10**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Thermal conductive material → **E 2 – 5**
Insulating caps → **E 51**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Thermal transfer compounds

Ceramic filled, silicone-free thermal conductive paste with high thermal conductivity

– suitable especially for silicone-sensitive applications
– no drying out, hardening or melting of the thermal conductive paste
– high long-term stability
– further package sizes, container types such as cans, cartridge, etc. upon request

art. no.	basin	delivery quantity [ml]
WLPK 3	syringe	3
WLPK 5	syringe	5
WLPK 10	syringe	10

	WLPK
composition	silicone-free, synthetic fluid ceramic filled
consistance	pastey
colour	silver
tightness	1.4 g/cm^3
thermal conductivity	10 W/m·K
dielectric strength	not applicable, because conducting
temperature range	-60°C ... +150°C
solubility in water	insoluble

Mica wafers → **E 19**
Thermal conductive foil → **E 7 – 10**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Thermal conductive material → **E 2 – 5**
Insulating caps → **E 51**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

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Thermally conductive adhesive

– thermally conductive, electrically non-conductive adhesive
– two part epoxy resin adhesive, metaloxide filled
– fully replaces mechanical fastenings
– excellent function and application characteristics
– **to be stored at a cool and dark place**

WLK 5

art. no.	composition
WLK 5	5 g resin/0.5 g hardener

WLK 10

art. no.	composition
WLK 10	10 g resin/1 g hardener

WLK 30

art. no.	composition
WLK 30	30 g resin/3 g hardener

WLK 120

art. no.	composition
WLK 120	120 g resin/12 g hardener

	WLK
thermal conductivity	0.836 W/m·K
specific thermal resistance	1.2 m·K/W
volume resistance	10^{16} Ω/cm
temperature range	-56°C... +149°C
hardening time	20°C approx. 16-24h / 25°C approx. 8 h / 120°C approx. 20 min
glue layer	Epoxid
mixture proportion	10:1

Thermally conductive adhesive

– solvent-free and thermal conductive two part adhesive
– epoxy based filled with aluminium oxide
– composition of hardener and resin (1:1) with statical mixing tube
– lockability of the container via Luer-Lock System
– good usage and working properties

WLK DK 4

WLK DK 10

WLK DK 50

art. no.	basin	contents of delivery
WLK DK 4	syringe	1x 4 ml syringe / 3x mixer WLK M4
WLK DK 10	syringe	1x 10 ml syringe / 3x mixer WLK M4
WLK DK 50	cartridge	1x 50 ml cartridge / 3x mixer WLK M50

	WLK DK
thermal conductivity	1 W/m·K
specific thermal resistance	118°C cm/W
volume resistance	$8 \cdot 10^{11}$ Ω/cm
temperature range	-50°C... +145°C
working life at room temperature	approx. 30 min
hardening time	25°C approx. 4 h/50°C approx. 1 h/85°C approx. 10 min/125°C approx. 2 min
glue layer	Epoxid
mixture proportion	1:1

Accessories

– more package sizes and container types upon request
– store cool and dry

art. no.	contents of delivery
WLK M 4	10x mixer für 4 & 10 ml syringe (packing unit 10 pieces)
WLK M 50	10x mixer für 50 ml cartridge (packing unit 10 pieces)
WLK P	1x applicator gun for 50 ml cartridge

Thermal conductive material → **E 2 – 5**
Thermal conductive foil → **E 7 – 10**
GEL thermal conductive foils → **E 12 – 15**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
fan cooler for Pentium and MMX → **B 59**
heatsinks for Pentium III FC PGA → **B 57**
Technical introduction → **A 2 – 8**

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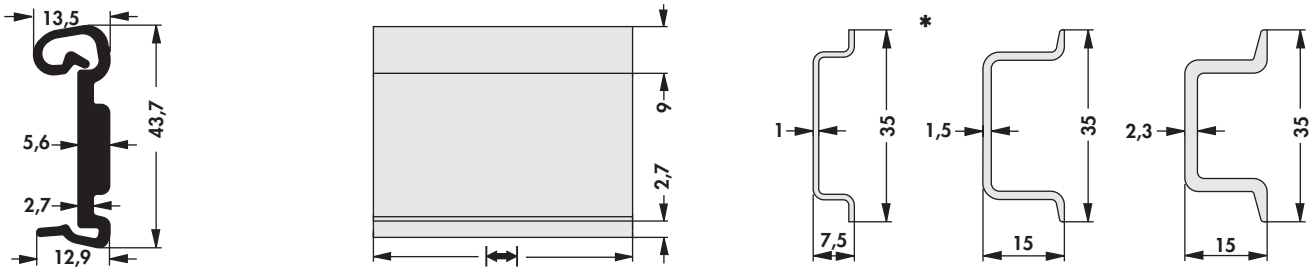
Fastening for mounting rail

KL 35 K ...

KL 35 ...

– universal, solid plastic clip fastening for all 35 mm mounting rails
– suitable for rail material thicknesses from 1 to 2.3 mm according to DIN EN 60 715 (formerly DIN EN 50 022)
– registrated design DE 200 07 435.0
– fast and easy mounting of heatsinks, casings etc. due to direct snap up on the mounting rail

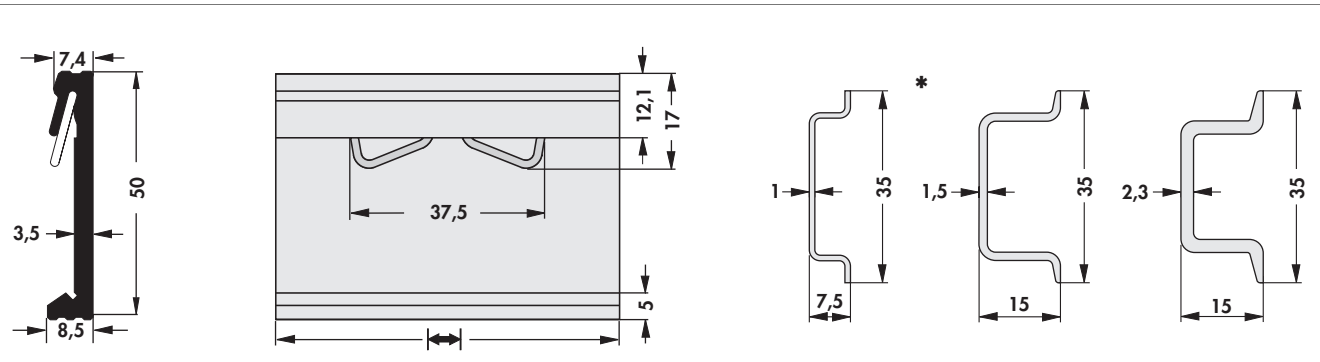
– safe hold due to a stable extruded plastic profile with integrated spring back
– electroconductive material or surface on request
– special lengths and treatments on customer's request
– * = examples of mounting rail versions suitable for **KL 35 K**



art. no.	dim. [mm] ↔	art. no.	dim. [mm] ↔
KL 35 K 40	40	**KL 35 K 75**	75
KL 35 K 50	50	**KL 35 K 100**	100

material:	rigid PVC
heat distortion:	-30°C ... +80°C
colour:	anthracite grey
class of flammibility:	UL 94 V-0

– safe hold due to a stable extuded profile with integrated stainless steel spring
– special lengths (≥40mm), treatments and surfaces on request
– * = examples of mounting rail versions suitable for KL 35



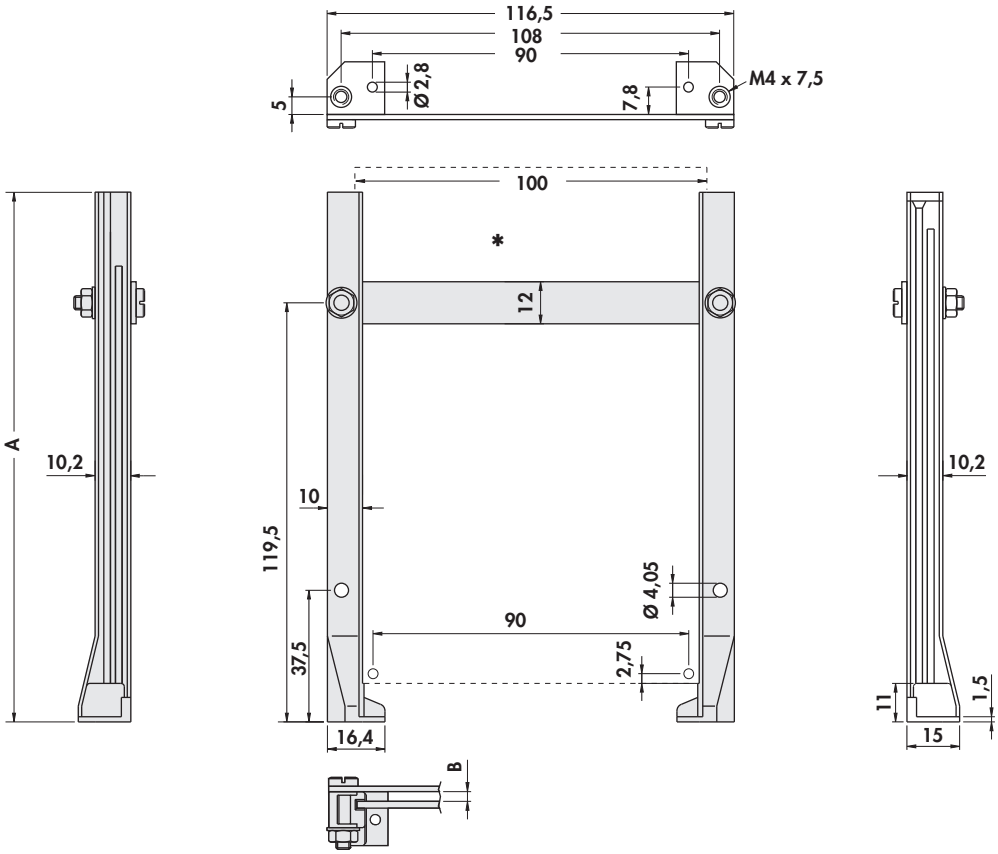
art. no.	dim. [mm] ↔	art. no.	dim. [mm] ↔	art. no.	dim. [mm] ↔
KL 35 50	50	**KL 35 75**	75	**KL 35 100**	100

material:	aluminium
surface:	clear anodised

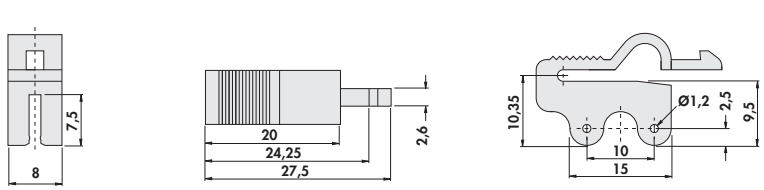
Distance sleeves for PCB´s in HP grid → **E 39**
Extractors for guide rails → **E 30**
Insulting clamping parts → **E 45**
Vibration dampers → **E 41**
Mounting pads for transistors → **E 47**
Mounting parts for heatsinks → **E 49**
Vibration dampers → **E 41**
Technical introduction → **A 2 – 8**

Screw-on type

– for eurocards
– connectors according to DIN 41612 or VG 95324 mountable
– high stability through inner reinforcements
– stable foot mounting trough inserted brass- thread inserts
– groove depth: 2.2 mm, groove width 1.9 mm
– suitable for PCB thicknesses from 0.5 to 1.85 mm
– * = printed circuit board



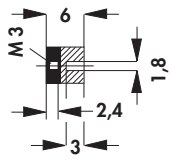
art. no.	dim. [mm]	
	A	B
FS 151 P	151	2.5

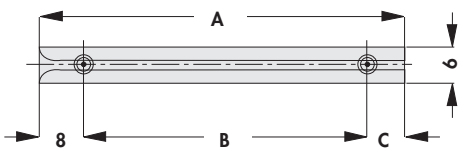
art. no.		
CLIP 151		
	only for **FS 151 P**	
material:	polycarbonate, GF reinforced	
temperature range:	-40°C... +125°C	
class of flammibility:	UL 94 V-0	

Solder pins → **E 43**
Snap-in guide rails → **E 29 – 30**
Extractors for guide rails → **E 30**
Insulting clamping parts → **E 45**
Distance sleeves for PCB´s in HP grid → **E 39**
Mounting pads for transistors → **E 47**
Vibration dampers → **E 41**
Technical introduction → **A 2 – 8**

Guide rails

Screw-on type

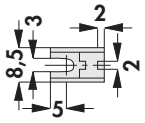


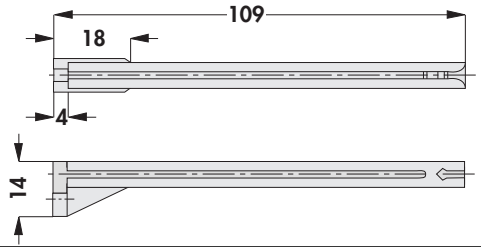


art. no.	dim. [mm] A	B	C
FS 6 065	65	50	7
FS 6 070	70	50	12
FS 6 080	80	67	5
FS 6 090	90	67	15
FS 6 100	100	84	8
FS 6 110	110	84	18
FS 6 120	120	84	28
FS 6 130	130	84	38

material:	polycarbonate, GF reinforced
temperature range:	-20°C... +130°C
thread nut:	brass nickel-plated
class of flammibility:	UL 94 V-0

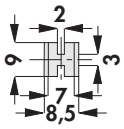
art. no.

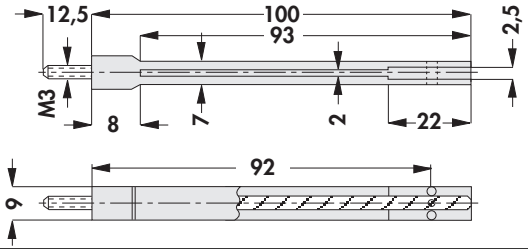




FS 109

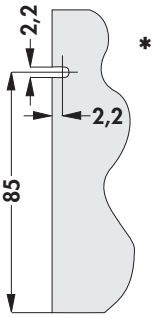
art. no.

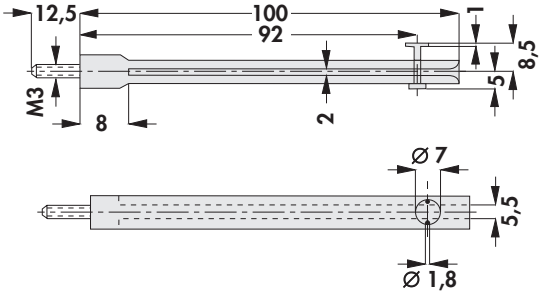




FS 100

art. no.





MSVL 100

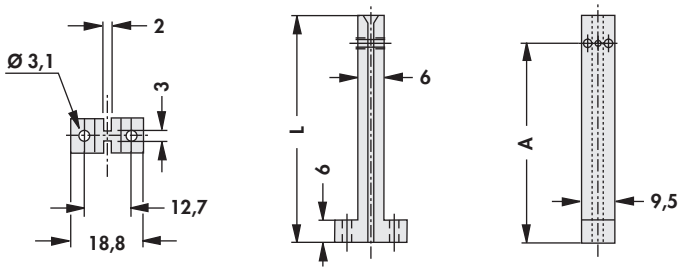
* = position of snap-in slot

material:	polyamide, GF reinforced
temperature range:	-40°C... +205°C
class of flammibility:	UL 94 V-0

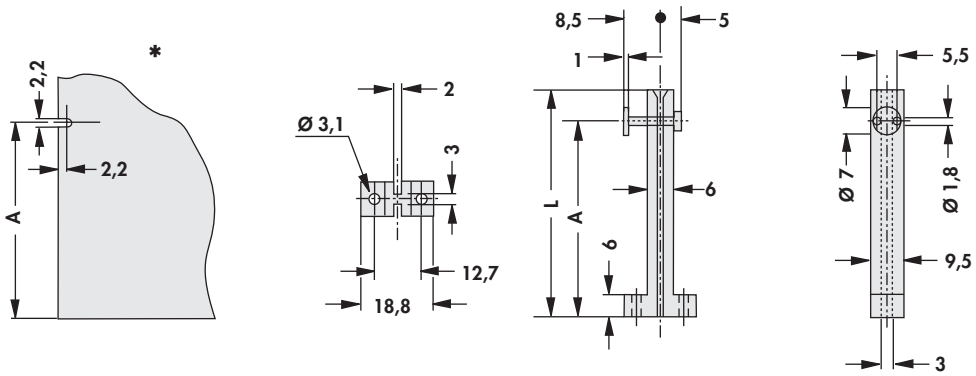
Solder pins → **E 43**
Snap-in guide rails → **E 29 – 30**
Extractors for guide rails → **E 30**
Insulting clamping parts → **E 45**
Distance sleeves for PCB´s in HP grid → **E 39**
Mounting pads for transistors → **E 47**
Vibration dampers → **E 41**
Technical introduction → **A 2 – 8**

Lockable mounting rails

– lockable by pushing the plastic pin or the metal button
– no conductive connection to the PCB
– the PCB requires a snap-in slot in accordance to the drawing
– other position with locking device on request
– * = position of snap-in slot



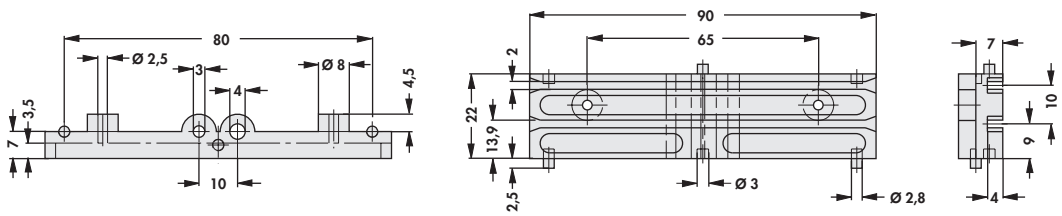
art. no.	version	dim. [mm] L	dim. [mm] A	art. no.	version	dim. [mm] L	dim. [mm] A
FS 85 50	without bolting device	50	42	**FS 85 70**	without bolting device	70	62
FS 85 60	without bolting device	60	52	**FS 85**	without bolting device	85	76



art. no.	version	dim. [mm] L	dim. [mm] A	art. no.	version	dim. [mm] L	dim. [mm] A
MSVL 50	with bolting device	50	42	**MSVL 70**	with bolting device	70	62
MSVL 60	with bolting device	60	52	**MSVL 85**	with bolting device	85	76

material:	polyamide, GF reinforced
temperature range:	-40°C... +205°C
class of flammibility:	UL 94 V-0

– the guide bars have got mounting holes for vertical and horizontal assembly of printed circuits
– they can also be stacked together horizontally or vertically using pins and treatments



art. no.
MSHV 90

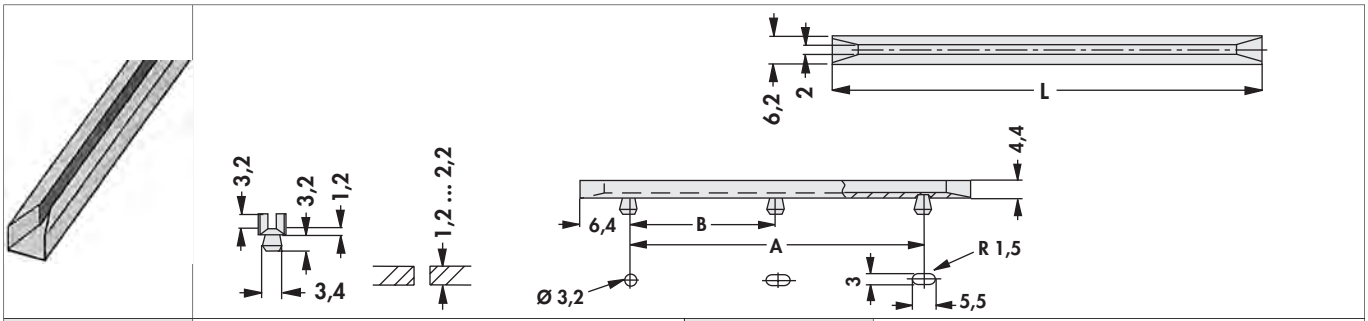
material:	polyamide, GF reinforced
class of flammibility:	UL 94 V-0

Solder pins → **E 43**
Snap-in guide rails → **E 29 – 30**
Extractors for guide rails → **E 30**
Insulting clamping parts → **E 45**
Distance sleeves for PCB´s in HP grid → **E 39**
Mounting pads for transistors → **E 47**
Vibration dampers → **E 41**
Technical introduction → **A 2 – 8**

Guide rails

Snap-in

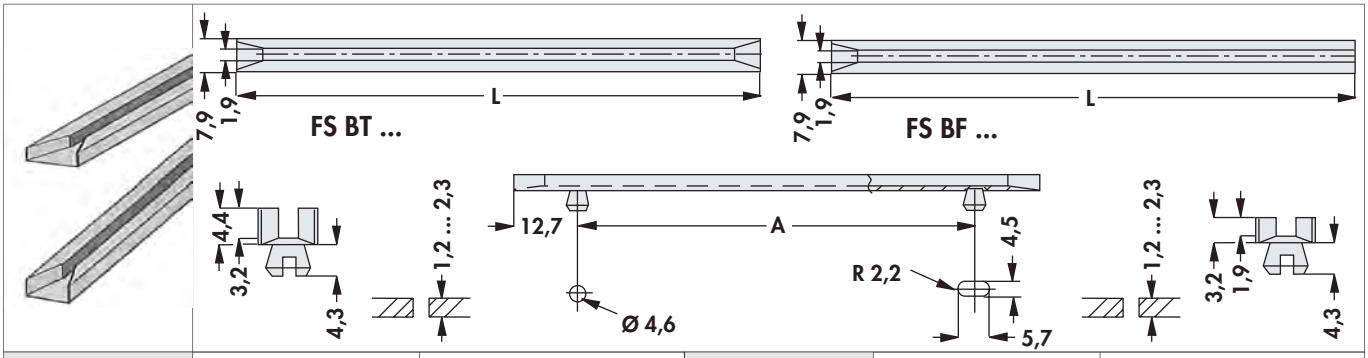
– narrow version



art. no.	dim. [mm] L	dim. [mm] A	art. no.	dim. [mm] L	dim. [mm] A	dim. [mm] B
FS S 06 2	63.5	50.8	**FS S 15 2**	152.4	139.7	—
FS S 07 2	76.2	63.5	**FS S 16 2**	165.1	152.4	—
FS S 08 2	88.9	76.2	**FS S 19 3**	190.5	177.8	88.9
FS S 10 2	101.6	88.9	**FS S 20 3**	203.2	190.5	95.2
FS S 11 2	114.3	101.6	**FS S 21 2**	215.9	203.2	—
FS S 12 2	127.0	114.3	**FS S 21 3**	215.9	203.2	101.6
FS S 13 2	139.7	127.0				

material:	nylon, natural coloured
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-2

– wide version



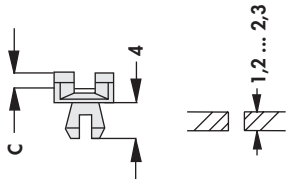
art. no.	version	dim. [mm] L	dim. [mm] A	art. no.	version	dim. [mm] L	dim. [mm] A
FS BT 06	deep groove	63.5	38.1	**FS BF 06**	shallow groove	63.5	38.1
FS BT 08	deep groove	88.9	63.5	**FS BF 07**	shallow groove	76.2	50.8
FS BT 10	deep groove	101.6	76.2	**FS BF 10**	shallow groove	101.6	76.2
FS BT 11	deep groove	114.3	88.9	**FS BF 11**	shallow groove	114.3	88.9
FS BT 13	deep groove	139.7	114.3	**FS BF 13**	shallow groove	139.7	114.3
FS BT 15	deep groove	152.4	127.0	**FS BF 15**	shallow groove	152.4	127.0
FS BT 16	deep groove	165.1	139.7	**FS BF 19**	shallow groove	190.5	165.1
FS BT 19	deep groove	190.5	165.1	**FS BF 20**	shallow groove	203.2	177.8
FS BT 20	deep groove	203.2	177.8				

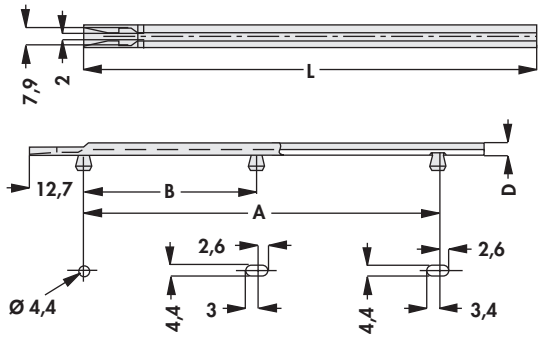
material:	nylon, natural coloured
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-2

Guide rails

Ejectors

– low profile
– suitable for ejectors **art. no. AHG V 14** und **AHG V 17**

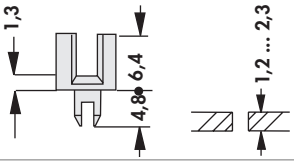


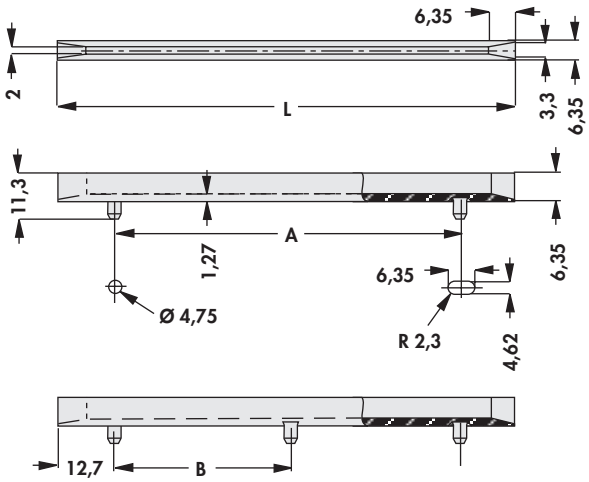


art. no.	dim. [mm]				art. no.	dim. [mm]				
	L	A	C	D		L	A	B	C	D
FS LP 05	50.8	25.8	2.0	3.2	**FS LP 15**	152.4	127.4	—	2.0	3.2
FS LP 07	76.2	38.5	2.0	3.2	**FS LP 16**	165.1	127.4	—	2.0	3.2
FS LP 08	88.9	38.5	2.0	3.2	**FS LP 17**	177.8	153.2	—	2.0	3.2
FS LP 10	101.6	76.6	2.0	3.2	**FS LP 22**	228.6	191.3	95.7	2.0	3.6
FS LP 11	114.3	76.6	2.0	3.2	**FS LP 30**	304.8	267.9	134.0	2.4	4.0
FS LP 13	139.7	76.6	2.0	3.2						

material:	polyamide, GF reinforced
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-0

– deep guideway
– bevelled entrance zone



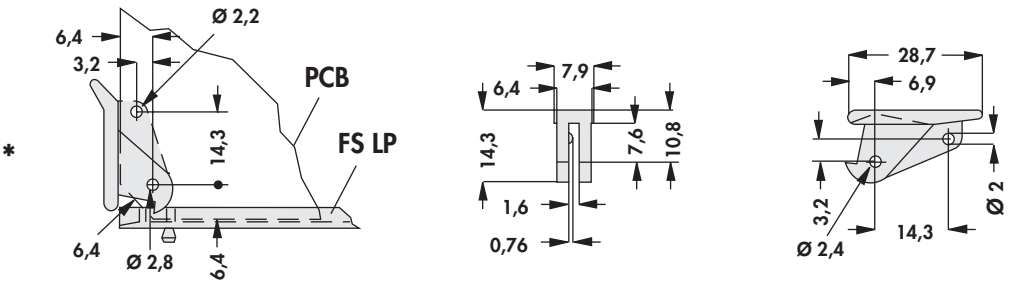
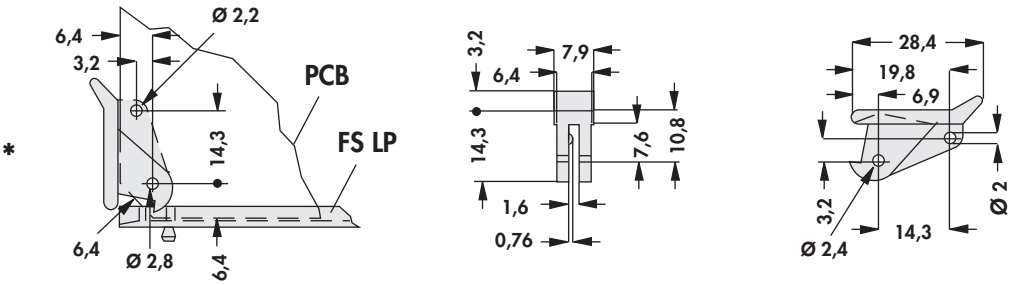
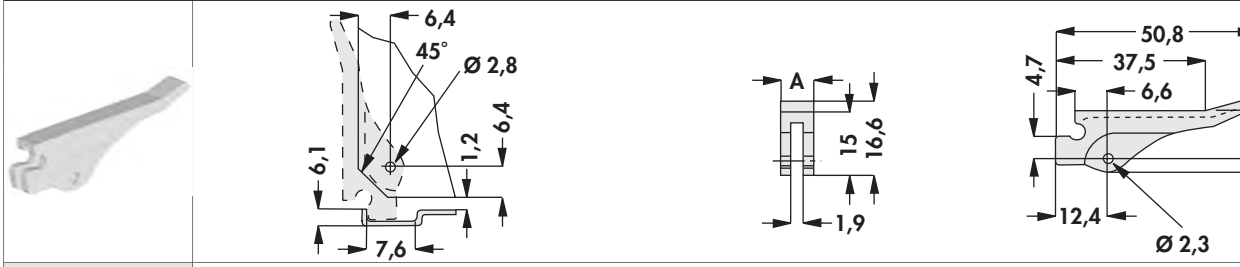


art. no.	dim. [mm]		
	L	A	B
FS U 06	63.5	38.1	—
FS U 11	114.3	88.9	—
FS U 20	203.2	177.8	88.9

material:	polyamide, GF reinforced
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-0

Solder pins → **E 43**
Snap-in guide rails → **E 29 – 30**
Extractors for guide rails → **E 30**
Insulting clamping parts → **E 45**
Distance sleeves for PCB´s in HP grid → **E 39**
Mounting pads for transistors → **E 47**
Vibration dampers → **E 41**
Technical introduction → **A 2 – 8**

Ejectors

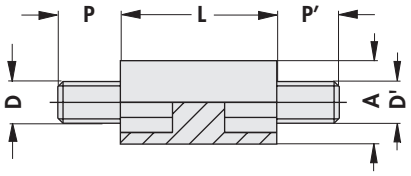
art. no.	
AHG V 14	
	* = mounting dimensions; locking in **FS LP**
art. no.	
AHG V 17	
	* = mounting dimensions; locking in **FS LP**
art. no.	
AHG K 27	
art. no.	
AHG K 28	
	
art. no.	dim. [mm] A
AHG L 7	7.4

material:	nylon
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-2
type of delivery:	all ejectors with matching spring pin

Solder pins → **E 43**
Snap-in guide rails → **E 29 – 30**
Extractors for guide rails → **E 30**
Insulting clamping parts → **E 45**
Distance sleeves for PCB´s in HP grid → **E 39**
Mounting pads for transistors → **E 47**
Vibration dampers → **E 41**
Technical introduction → **A 2 – 8**

Insulating spacers with internal and external thread

field of applications:
- insulated assembly of stacked PCB
- insulated assembly of stacked heatsinks with varying capacities
- insulated assembly of chassis plates in cases
- insulated supports in the wiring
- mechanicaly very stable as threads are made of brass
- other lengths on request
- dimensions = nominal size: deviation ±0.5 mm
- **... please indicate length "L"**

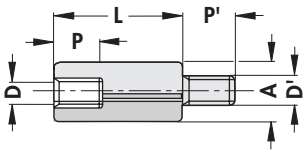


art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAB 25 A ...	8.0	M2.5/M2.5	10/ 15/ 20/ 25	6.0
ISAB 3 A ...	8.0	M3/M3	10/ 20	6.0
ISAB 4 A ...	8.0	M4/M4	15/ 20	6.0
ISAB 6 A ...	12.7	M6/M6	25	12.7

dielectric strength:	27 kV/mm
creeping current resistance:	CTI 600
thread inserts:	brass
temperature range:	-30°C... +85°C (short term +200°C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

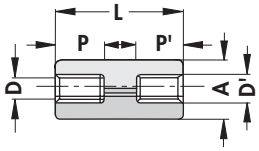
Spacers → **E 40**
Screw mounted guide rails → **E 26 – 30**
Ejectors → **E 31**
Vibration dampers → **E 41**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

Insulating spacers with internal and external thread



art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAB 25 B ...	8.0	M2.5/M2.5	10/ 13/ 15/ 18/ 20/ 25/ 30	6.0
ISAB 3 B ...	8.0	M3/M3	10/ 13/ 15/ 18/ 20/ 25/ 30/ 35/ 40	6.0
ISAB 4 B ...	8.0	M4/M4	15/ 20/ 25/ 30/ 40	6.0
ISAB 5 B ...	9.5	M5/M5	20/ 30/ 40	10.0
ISAB 6 B ...	12.7	M6/M6	25/ 30/ 35/ 40/ 50	12.7

– dimensions = nominal size: deviation ±0.5 mm; at **ISAB 3 C ...** L=10 => P/P'=3.5

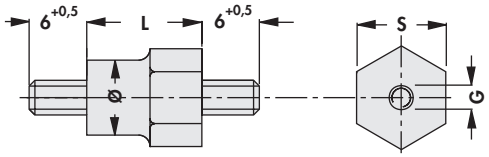


art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAB 25 C ...	8.0	M2.5/M2.5	10/ 13/ 15/ 18/ 20/ 25/ 30	6.0
ISAB 3 C ...	8.0	M3/M3	10/ 13/ 15/ 18/ 20	6.0
ISAB 4 C ...	8.0	M4/M4	15/ 35	6.0
ISAB 5 C ...	9.5	M5/M5	20	10.0
ISAB 6 C ...	12.7	M6/M6	25	12.0
ISAB 6 C ...	12.7	M6/M6	30	12.7

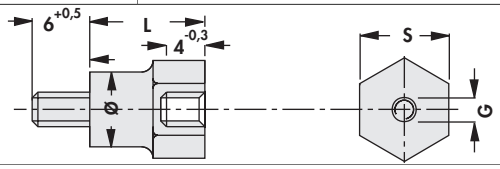
dielectric strength:	27 kV/mm
creeping current resistance:	CTI 600
thread inserts:	brass
temperature range:	-30°C... +85°C (short term +200°C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

Miniature spacers with threads

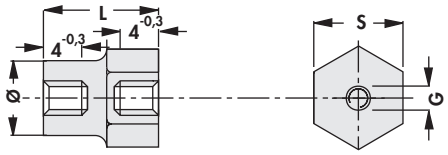
- allows compact, insulated constructions
- reduced volume in case of stack assembly
- insulated mounting of heatsinks, PCB, housingparts etc.
- very good mechanical stability due to brass inserts
- dimensions = nominal size: deviation ±0.5 mm
- **... please indicate length "L"**



art. no.	dim. [mm] S	type of thread	L	max. diameter of the bushing
ISAM 2 A ...	6	M2.5	4/ 5/ 7/ 9/ 11/ 12	6
ISAM 3 A ...	7	M3	4/ 5/ 7/ 8/ 9/ 10	7



art. no.	dim. [mm] S	type of thread	L	max. diameter of the bushing
ISAM 2 B ...	6	M2.5	8/ 9/ 10/ 11	6
ISAM 3 B ...	7	M3	7/ 8/ 9/ 10/ 11/ 12	7



art. no.	dim. [mm] S	type of thread	L	max. diameter of the bushing
ISAM 2 C ...	6	M2.5	9	6
ISAM 3 C ...	7	M3	9/ 10/ 12	7

dielectric strength:	28 kV/mm
creeping current resistance:	CTI 600
thread inserts:	brass
temperature range:	-30°C... +85°C (short term +200°C)
surface:	raw
plastic body:	polyamide 6
colour:	natural (opaque)

Spacers → **E 40**
Screw mounted guide rails → **E 26 – 30**
Ejectors → **E 31**
Vibration dampers → **E 41**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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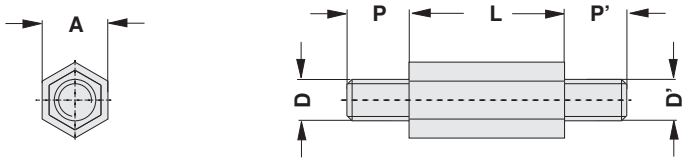
Distance hexagonal bolts insulating

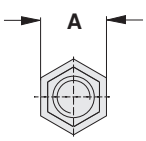
field of applications:
- insulated assembly of stacked PCBs
- insulated assembly of stacked heatsinks with varying capacities
- insulated assembly of chassis plates in cases
- insulated supports in the wiring
- mechanicaly very stable, as threads are made of brass
- other lengths on request
- dimensions = nominal size: deviation ±0.5 mm
- **... please indicate length "L"**

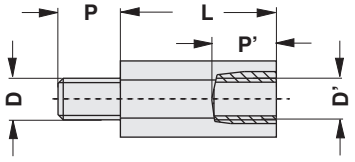


art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAS 25 A ...	6.35	M2.5/M2.5	15/ 20/ 25/ 30/ 35/ 40	6.0
ISAS 30 A ...	6.35	M3/M3	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 40 A ...	8.00	M4/M4	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 50 A ...	9.50	M5/M5	20/ 25/ 30/ 35/ 40/ 45/ 50	10.0
ISAS 60 A ...	12.70	M6/M6	25/ 30/ 35/ 40/ 45/ 50/ 60	12.7

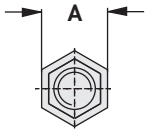
dielectric strength:	27 kV/mm
creeping current resistance:	CTI 600
thread inserts:	brass
temperature range:	-30°C... +85°C (short term +200°C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

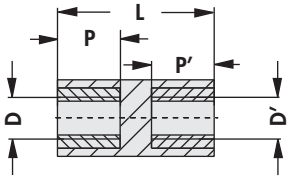
Distance hexagonal bolts insulating





art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAS 25 B ...	6.35	M2.5/M2.5	15/ 20/ 25/ 30/ 35/ 40	6.0
ISAS 30 B ...	6.35	M3/M3	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 40 B ...	8.00	M4/M4	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 50 B ...	9.50	M5/M5	20/ 25/ 30/ 35/ 40/ 45/ 50	10.0
ISAS 60 B ...	12.70	M6/M6	25/ 30/ 35/ 40/ 45/ 50/ 60	12.7





art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAS 25 C ...	6.35	M2.5/M2.5	15/ 20/ 25/ 30/ 35/ 40	6.0
ISAS 30 C ...	6.35	M3/M3	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 40 C ...	8.00	M4/M4	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 50 C ...	9.50	M5/M5	20/ 25/ 30/ 35/ 40/ 45/ 50	10.0
ISAS 60 C ...	12.70	M6/M6	25/ 30/ 35/ 40/ 45/ 50/ 60	12.7

dielectric strength:	27 kV/mm
creeping current resistance:	CTI 600
thread inserts:	brass
temperature range:	-30°C... +85°C (short term +200°C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

Spacers → **E 40**
Screw mounted guide rails → **E 26 – 30**
Ejectors → **E 31**
Vibration dampers → **E 41**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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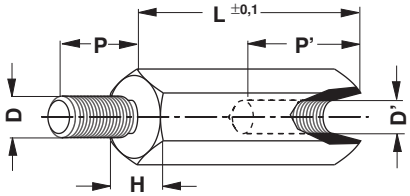
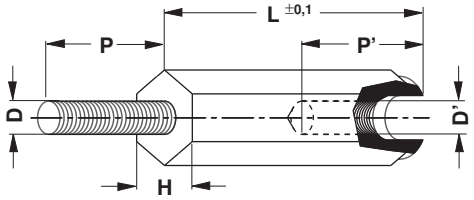
Spacers with internal and external thread

– other lengths and threads on request
– **... please indicate length "L"**



art. no.	dim. [mm]				
	H	D/D'	L	P	P'
GBM 2550 ...	5	M2.5	5	6	2.5
GBM 2550 ...	5	M2.5	10	6	5.0
GBM 2550 ...	5	M2.5	15/ 20	6	8.0
GBM 2550 ...	5	M2.5	25/ 30/ 35	8	10.0
GBM 3050 ...	5	M3	5	8	2.5
GBM 3050 ...	5	M3	10/ 12/ 14	8	5.0
GBM 3050 ...	5	M3	15/ 18/ 20	8	10.0
GBM 3050 ...	5	M3	25/ 30/ 35/ 40/ 45/ 50	10	10.0
GBM 4070 ...	7	M4	5	8	2.5
GBM 4070 ...	7	M4	10	8	5.0
GBM 4070 ...	7	M4	15	8	8.0
GBM 4070 ...	7	M4	20	8	10.0
GBM 4070 ...	7	M4	25/ 30/ 35/ 40/ 45/ 50	10	10.0
GBM 5080 ...	8	M5	10	8	5.0
GBM 5080 ...	8	M5	15/ 20	8	6.0
GBM 5080 ...	8	M5	25/ 30/ 35/ 40/ 45/ 50	10	10.0
material:	brass				
surface:	6 µm nickel-plated, solderable				

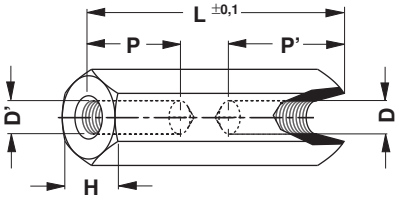
– other lengths and threads on request
– **... please indicate length "L"**



art. no.	dim. [mm]				
	H	D/D'	L	P	P'
GBP 3060 ...	6	M3	10	8	7
GBP 3060 ...	6	M3	12	8	8
GBP 3060 ...	6	M3	15/ 18/ 20/ 25/ 30	8	10
GBP 4080 ...	8	M4	10	8	7
GBP 4080 ...	8	M4	12	8	9
GBP 4080 ...	8	M4	15/ 18/ 20/ 25/ 30/ 35/ 40/ 45	8	10
material:	polyamide, GF reinforced				
temperature range:	-30°C... +110°C				
colour:	black				

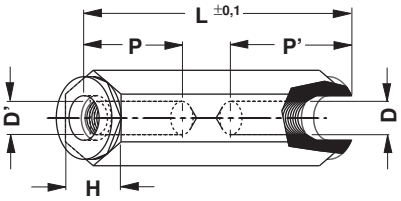
Distance sleeves with internal thread

– other lengths and threads on request
– **... please indicate length "L"**



art. no.	dim. [mm]				
	H	D/D'	L	P	P'
ABM 2550 ...	5	M2.5	5/ 8/ 10/ 12/ 15	=L	—
ABM 2550 ...	5	M2.5	18	8	8
ABM 2550 ...	5	M2.5	20/ 25/ 30/ 35/ 40/ 45/ 50	10	10
ABM 3050 ...	5	M3	5/ 8/ 9/ 10/ 12/ 13/ 15	=L	—
ABM 3050 ...	5	M3	16/ 18/ 19	8	8
ABM 3050 ...	5	M3	20/ 25/ 29/ 30/ 35/ 40/ 45/ 50	10	10
ABM 4070 ...	7	M4	5/ 8/ 10/ 12/ 15	=L	—
ABM 4070 ...	7	M4	18	9	9
ABM 4070 ...	7	M4	20/ 25/ 30/ 35/ 40/ 45/ 50	10	10
ABM 5080 ...	8	M5	5/ 12/ 15	=L	—
ABM 5080 ...	8	M5	20/ 30/ 40/ 50	10	10
material:	brass				
surface:	6 µm nickel-plated, solderable				

– other lengths and threads on request
– **... please indicate length "L"**



art. no.	dim. [mm]				
	H	D/D'	L	P	P'
ABP 2550 ...	5	M2.5	10	=L	—
ABP 2550 ...	5	M2.5	15/ 20/ 25/ 30	6	6
ABP 3060 ...	6	M3	10/ 12/ 15	=L	—
ABP 3060 ...	6	M3	20	8	8
ABP 3060 ...	6	M3	25/ 30	10	10
ABP 4080 ...	8	M4	10/ 15/ 20	=L	—
ABP 4080 ...	8	M4	30/ 40	10	10
material:	polyamide, GF reinforced				
temperature range:	-30°C... +110°C				
colour:	black				

Spacers → **E 40**
Screw mounted guide rails → **E 26 – 30**
Ejectors → **E 31**
Vibration dampers → **E 41**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

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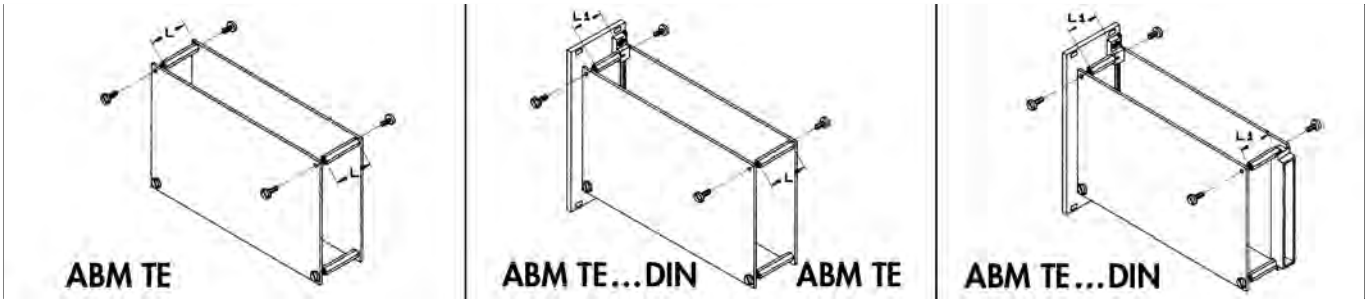
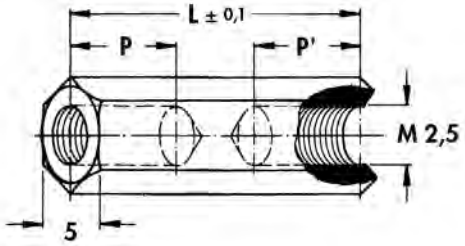
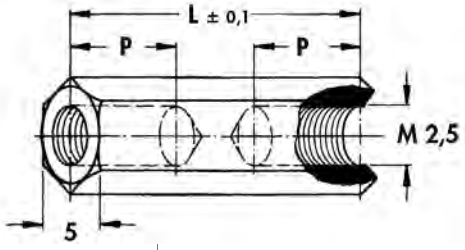
Distance sleeves for PCB in HP grid



– these internally threaded distance sleeves mount PCBs to the correct pitch for insertion into subracks
– **ABM TE**: spacer between two PC boards
– **ABM TE ... DIN**:spacer between two PC boards, one of them equipped with DIN-connector resp. A front panal/PCB Interconnection deviece VS 1
– spacers with internal and external thread to HP grid on request



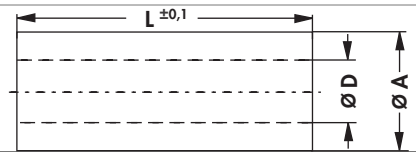
art. no.	suitable for TE	dim. [mm]	
		L	P/P'
ABM TE 04	4	18.72	8
ABM TE 06	6	28.88	8
ABM TE 08	8	39.04	8



art. no.	suitable for TE	dim. [mm]	
		L	P
ABM TE 04 DIN	4	12.72	=L
ABM TE 06 DIN	6	22.88	8
ABM TE 08 DIN	8	33.04	8

material:	brass
surface:	8 µm nickel-plated, solderable

– **... please indicate length "L"**

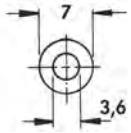


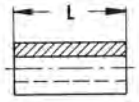
art. no.	dim. [mm]		
	A	D	L
AHM 3260...	6	3.2	1/ 2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 12/ 15/ 18/ 25/ 30
AHM 4380...	8	4.3	2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 12/ 15/ 18/ 20

material:	brass
surface:	8 µm nickel-plated, solderable

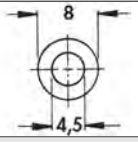
Distance spacers

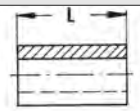
– special lengths on request



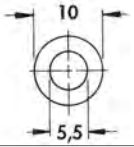


art. no.	C [mm]	art. no.	C [mm]	art. no.	C [mm]
DR 071 V0	1	**DR 079 V0**	9	**DR 725 V0**	25
DR 072 V0	2	**DR 710 V0**	10	**DR 730 V0**	30
DR 073 V0	3	**DR 711 V0**	11	**DR 735 V0**	35
DR 074 V0	4	**DR 712 V0**	12	**DR 740 V0**	40
DR 075 V0	5	**DR 713 V0**	13	**DR 745 V0**	45
DR 076 V0	6	**DR 714 V0**	14	**DR 750 V0**	50
DR 077 V0	7	**DR 715 V0**	15	**DR 760 V0**	60
DR 078 V0	8	**DR 720 V0**	20		





art. no.	C [mm]	art. no.	C [mm]	art. no.	C [mm]
DR 081 V0	1	**DR 089 V0**	9	**DR 825 V0**	25
DR 082 V0	2	**DR 810 V0**	10	**DR 830 V0**	30
DR 083 V0	3	**DR 811 V0**	11	**DR 835 V0**	35
DR 084 V0	4	**DR 812 V0**	12	**DR 840 V0**	40
DR 085 V0	5	**DR 813 V0**	13	**DR 845 V0**	45
DR 086 V0	6	**DR 814 V0**	14	**DR 850 V0**	50
DR 087 V0	7	**DR 815 V0**	15	**DR 860 V0**	60
DR 088 V0	8	**DR 820 V0**	20		



art. no.	C [mm]	art. no.	C [mm]	art. no.	C [mm]
DR 105 V0	5	**DR 125 V0**	25	**DR 140 V0**	40
DR 110 V0	10	**DR 130 V0**	30	**DR 145 V0**	45
DR 115 V0	15	**DR 135 V0**	35	**DR 150 V0**	50
DR 120 V0	20				

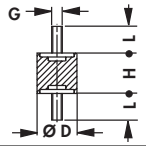
material:	polyamide
heat distortion:	180°C
temperature range:	+180°C
colour:	black
class of flammibility:	UL 94 V-0

Spacers → **E 40**
Screw mounted guide rails → **E 26 – 30**
Ejectors → **E 31**
Vibration dampers → **E 41**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Thermal conductive material → **E 2 – 24**
Technical introduction → **A 2 – 8**

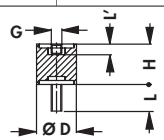
Contructional elements to vibration damping and insulation

– universal applicable round metal, antivibration buffers for solving vibration problems
– other lengths and hardness range on request
– **... please indicate height "H"**

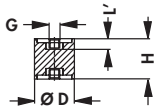
Field of applications:
– reduction of dynamic component stress
– vibration insulation for disc drives and motors
– impact reducing on sensitive instruments
– reduction of the noise level
– prevention of vibration resonance phenomena (amplified effect)
– compensation of mechanical inbalances



art. no.	dim. [mm]			
	H	type of thread	Ø D	L
SMP 410 A ...	10	M4	10	10
SMP 415 A ...	15	M4	15	10
SMP 515 A ...	15	M5	15	12



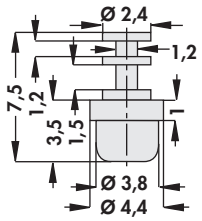
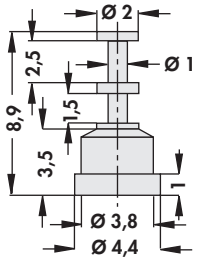
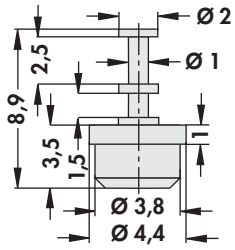
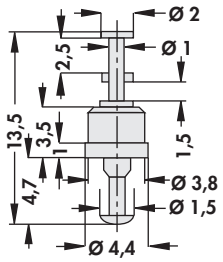
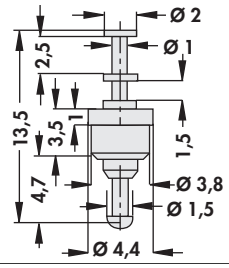
art. no.	dim. [mm]				
	H	type of thread	Ø D	L'	L
SMP 410 B ...	10	M4	10	4	10
SMP 415 B ...	15	M4	15	4	10
SMP 515 B ...	15	M5	15	5	12



art. no.	dim. [mm]			
	H	type of thread	Ø D	L'
SMP 410 C ...	15/ 20	M4	10	4
SMP 415 C ...	15/ 20	M4	15	4
SMP 515 C ...	20	M5	15	5

material:	rubber-metal connection
rubber:	natural rubber (NR according to ISO)
hardness range:	~ 50 Shore A
extensibility and tebsile strength:	very good
colour:	black
metall parts:	steel tin-plated
temperature range:	-40°C... +80°C (short term +90°C)

Solder terminals

art. no.		
LSD 07520		
art. no.		
LSD 08910		
art. no.		
LSD 08920		
art. no.		
LSD 13510		
art. no.		
LSD 13520		

material:	insulating body: PTFE (teflon)
contact pin:	brass, 2 µm Ni, 4 µm Ag
temperature range:	-200°C ... +260°C

Screw mounted guide rails → **E 26 – 28**
Ejectors → **E 31**
Insulating distance sleeves → **E 32 – 39**
Spacers → **E 40**
Insulting clamping parts → **E 45**
Mounting parts for heatsinks → **E 49 – 50**
Mounting material for semiconduct. → **E 44**
Technical introduction → **A 2 – 8**

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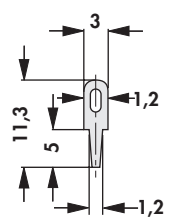
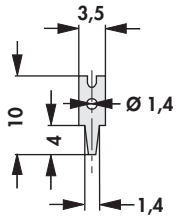
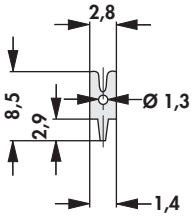
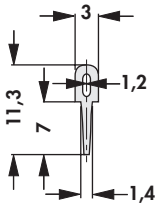
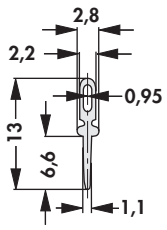
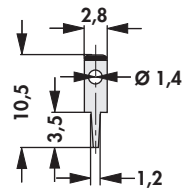
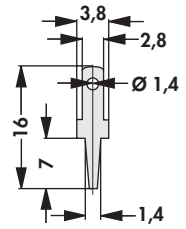
Solder pins

				
art. no.	**art. no.**	**art. no.**	**art. no.**	**art. no.**
LS 101 0.6 mm	**LS 102** 0.6 mm	**LS 103** 0.6 mm	**LS 104** 0.6 mm	**LS 105** 0.5 mm
				
art. no.	**art. no.**			
LS 106 0.8 mm	**LS 107** 0.5 mm			

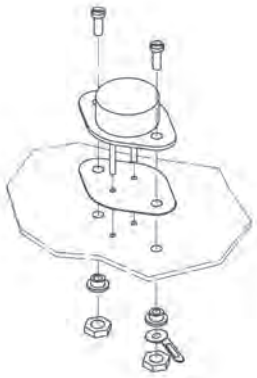
= thickness

	LS
material	brass, 6 µm Sn

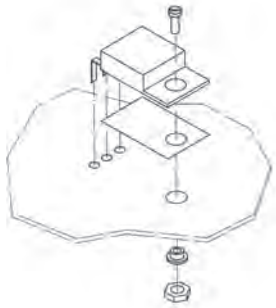
Solder terminals → **E 42**
Distance sleeves for PCB´s in HP grid → **E 39**
Spacers → **E 39 – 40**
Insulting clamping parts → **E 45**
Miniature distance sleeves → **E 34**
Mounting material for semiconduct. → **E 44 – 48**
Mounting parts for heatsinks → **E 49 – 50**
Technical introduction → **A 2 – 8**

Mounting kits for insulation of power transistors

MST 3
MSTS 3



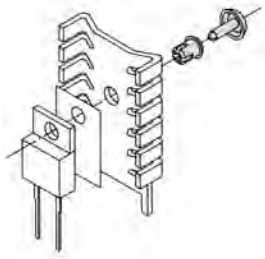
MST 220
MSTS 220

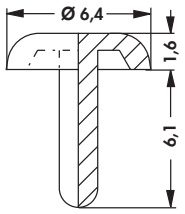


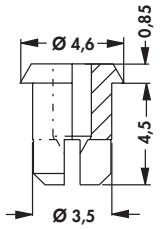
art. no.	for transistor	version	contents of delivery
MST 3	TO 3	with mica wafer GS 3	1 mica wafer, 2 insulator sleeves, 1 tin-plated solder lug, 2 cheese head screws, nickel-plated, 2 screw nuts M3 nickel-plated
MSTS 3	TO 3	with silicone wafer WS 3	1 silicone wafer, 2 insulator sleeves, 1 tin-plated solder lug, 2 cheese head screws, nickel-plated, 2 screw nuts M3 nickel-plated
MST 220	TO 220	with mica wafer GS 220	1 mica wafer, 1 tin-plated solder lug, 1 cheese head screw, nickel-plated, 1 screw nut M3 nickel-plated
MSTS 220	TO 220	with silicone wafer WS 220	1 silicone wafer, 1 insulator sleeve, 1 tin-plated solder lug, 1 cheese head screw, nickel-plated, 1 screw nut M3 nickel-plated

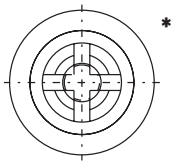
Snap rivet for quick fastening of TO 220

- detachable plastic snap rivet for quick fastening of transistors onto heatsinks and cooling plates (e.g. FK 212-CB, FK 216-CB, FK 222-220. FK 232. FK 233. FK 235-L 1)
- suitable for material thickness: 1 – 1.5 mm
- suitable for hole diameter: 3.5 – 4 mm
- * = bottom view, pin not inserted









art. no.	for transistor
EPN 1	TO 220

material:	polysulphone, GF reinforced
temperature range:	-70°C... +180°C (5s+260°C)
class of flammibility:	UL 94 V-0

Mounting parts for heatsinks → **E 49 – 50**
Spacers → **E 40**
Guide rails for PCBs → **E 26 – 30**
Finger-shaped heatsinks → **C 2 – 3**
Vibration dampers → **E 41**
Thermal conductive material → **E 2 – 24**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

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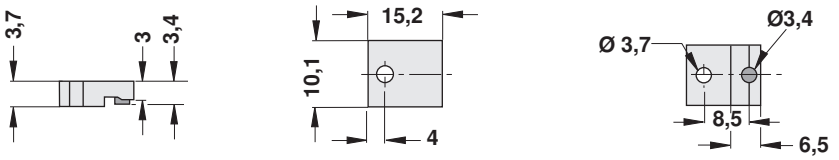
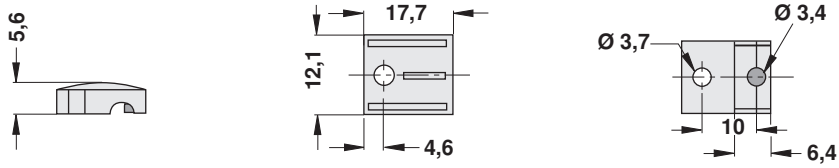
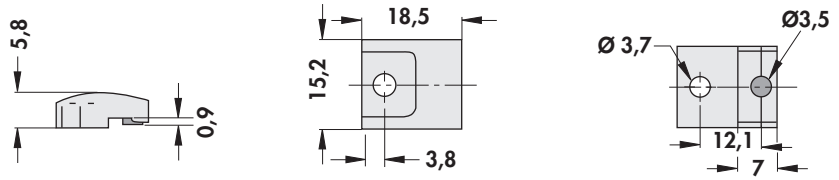
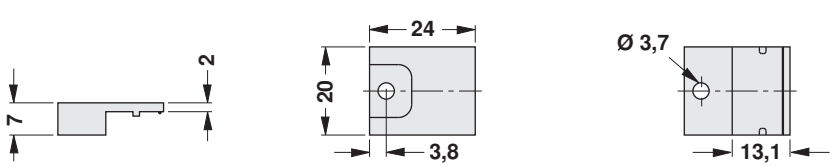
Insulating clamping parts for power transistors

Plastic insulating clamping parts for mounting transistors in cases TO 220, TO 218 and TO 247 for enhanced dielectric stengths

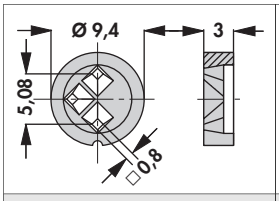
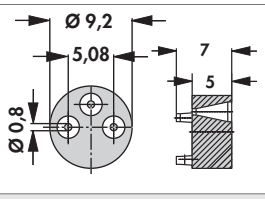
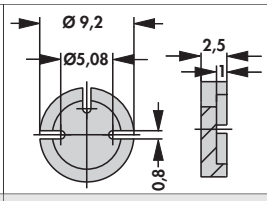
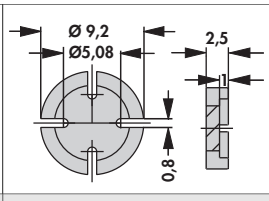
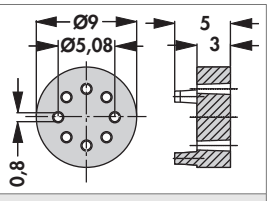
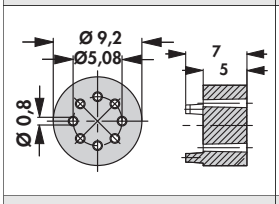
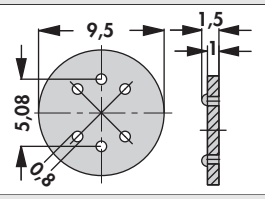
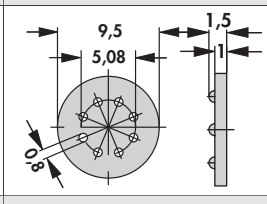
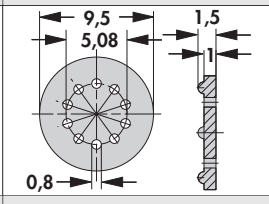
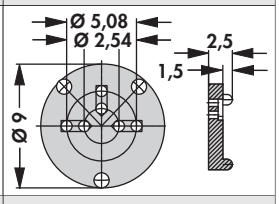
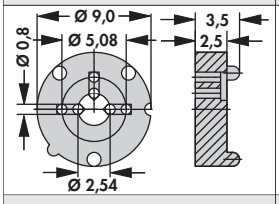
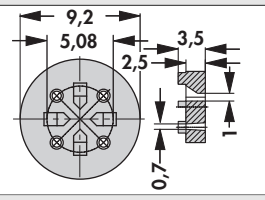
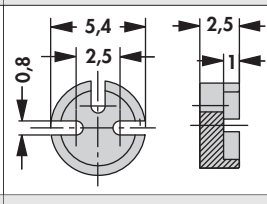
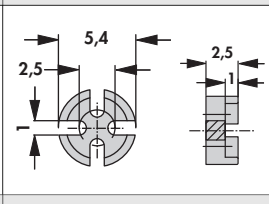
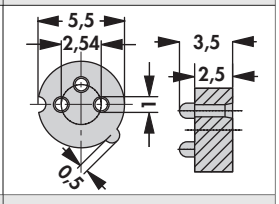
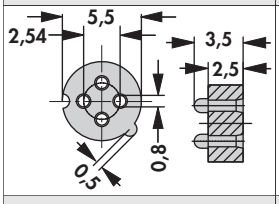
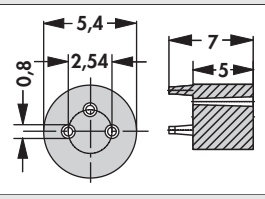
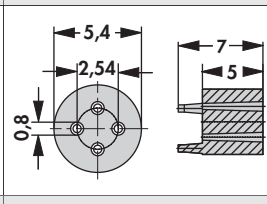
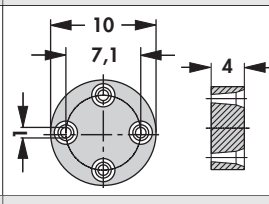
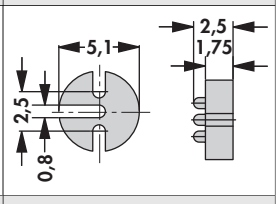
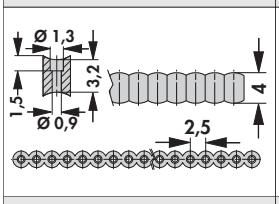
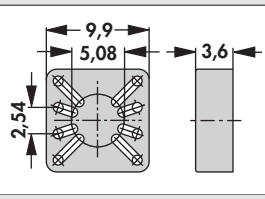
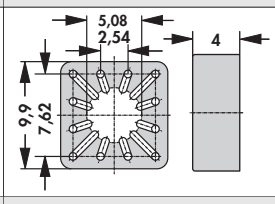
– electrically insulating assembly of the transistor by means of a plastic clamping part
– pin reaching into the hole of the transistor plate
– fastening of clamping part onto the mounting plate by screws, no electroinsulating connection to the transistor
– dielectric strength only determined by the insulating washer between transistor and mounting surface
– no insulating bush necessary, thus no dielectric breakdown

art. no.		
ISP 220		
art. no.		
ISP 220 V		
art. no.		
ISP 218		
art. no.		
ISP 247		

material:	polyamide 6, GF reinforced
dielectric strength:	<27 kV/mm
heat distortion:	205°C (1.8 MPa); 135°C (8 MPa)
dielectric constant:	8 [100 Hz]/4.5 [1 MHz]
dielectric loss factor:	1300 [100 Hz] 450 [1 MHz]
specific volume resistance:	$>10^{13}$ Ω·cm
colour:	black
class of flammibility:	UL 94 V-0

Profiles for PCB components → **A 91**
Heatsinks for PCB → **A 89**
Profiles for PCB mounting → **A 89 – 112**
Thermal conductive material → **E 2 – 23**
Insulating distance sleeves → **E 32 – 34**
Vibration dampers → **E 41**
Aluminium oxide wafers → **E 17 – 18**
Technical introduction → **A 2 – 8**

Mounts

				
art. no.	art. no.	art. no.	art. no.	art. no.
MS 53 3 TO 5	**MS 53 7** TO 5	**MS 53 25** TO 5	**MS 54 25** TO 5	**MS 58 5** TO 5-8 p.
				
art. no.	art. no.	art. no.	art. no.	art. no.
MS 58 7 TO 5-8 p.	**MS 56 15** TO 5-6 p.	**MS 58 15** TO 5-8 p.	**MS 510 15** TO 5-10 p.	**MS 3518 25** TO 5/ TO 18
				
art. no.	art. no.	art. no.	art. no.	art. no.
MS 3518 35 TO 5/ TO 18	**MS 34 518** TO 5/TO 18	**MS 183 25** TO 18	**MS 184 25** TO 18	**MS 183 35** TO 18
				
art. no.	art. no.	art. no.	art. no.	art. no.
MS 184 35 TO 18	**MS 183 7** TO 18	**MS 184 7** TO 18	**MS 84 4** TO 8	**MS 923 25** TO 92
				
art. no.	art. no.	art. no.		
MS 4016 max. 16 contacts	**US 58 4** TO 5	**US 512 4** TO 5		

***** = **transfer washer**: the US-pads convent the TO 5 pin circle to a pitch of 2.54 mm

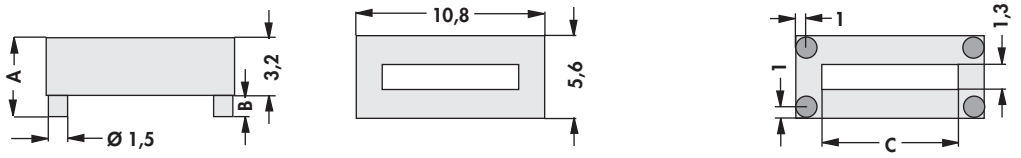
material:	polyamide 6, GF reinforced
temperature range:	-40°C... +205°C
class of flammibility:	UL 94 V-0 (at thickness ≥3mm), UL 94 V-1

Mounting parts for heatsinks → **E 49 – 50**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Thermal conductive material → **E 2 – 24**
Insulating distance sleeves → **E 32 – 34**
Finger-shaped heatsinks → **C 2 – 3**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

Mounts

Mounts for power transistors

– for TO 220, TO 219, TO 202 and similar
– for vertical and horizontal mounting
– also suitable as mounting bracket for angled connections

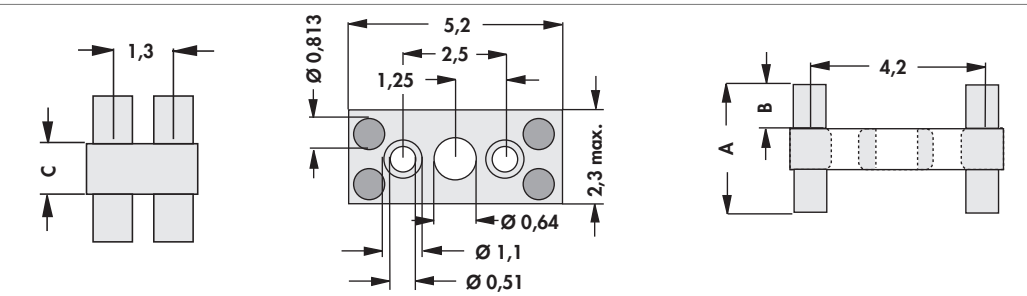


art. no.	colour	dim. [mm] A	B	C
MLW 32	white	3.2	—	7.1
MLW 44	white	4.4	1.3	7.1
MLW 51	white	5.1	1.9	7.1

material:	polyamide 6 (nylon)
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-2

Mounts for rectangular LEDs

– for LED 2x4 mm oder 2x5 mm
– symmetric version for easy assembly
– self-adhesive



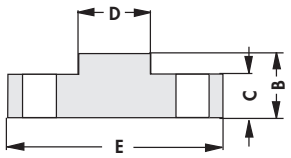
art. no.	colour	dim. [mm] A	B	C
MRL 20	white	2	0.5	1

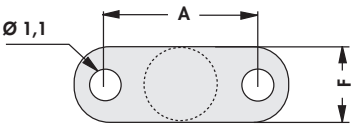
material:	polyamide 6 (nylon)
temperature range:	-40°C... +120°C
class of flammibility:	UL 94 V-2

Mounting parts for heatsinks → **E 49 – 50**
Heatsinks for PCB → **A 89 – 93**
Profiles for PCB mounting → **A 89 – 112**
Thermal conductive material → **E 2 – 24**
Insulating distance sleeves → **E 32 – 34**
Finger-shaped heatsinks → **C 2 – 3**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

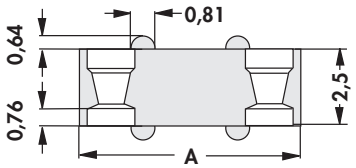
Mounts for discrete components

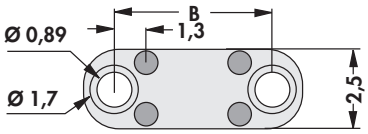
– suitable for various components e.g. resistors, capacitors etc.



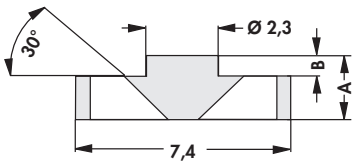


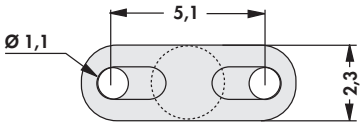
art. no.	dim. [mm]						art. no.	dim. [mm]					
	A	B	C	D	E	F		A	B	C	D	E	F
MD A 04	2.5	1.1	0.55	1.3	4.6	2.3	**MD A 09**	7.6	1.1	0.66	3.6	9.9	2.3
MD A 06	3.8	1.1	0.55	2.3	6.9	3.2	**MD A 12**	10.2	1.1	0.76	4.8	12.4	2.3
MD A 07	5.1	1.1	0.55	2.3	7.4	2.3							





art. no.	dim. [mm]		art. no.	dim. [mm]	
	A	B		A	B
MD B 07	7.6	5.1	**MD B 12**	12.7	10.2
MD B 10	10.2	7.6	**MD B 15**	15.2	12.7
MD B 11	11.4	8.9			





art. no.	dim. [mm]	art. no.	dim. [mm]	
	A		A	B
MD C 13	1.3	**MD C 22**	2.2	0.89

material:	polyamide 6 (nylon)
temperature range:	-30°C... +110°C
class of flammibility:	UL 94 V-2

Profiles for PCB components → **A 91**
Heatsinks for PCB → **A 89**
Profiles for PCB mounting → **A 89 – 112**
Thermal conductive material → **E 2 – 23**
Insulating distance sleeves → **E 32 – 34**
Finger-shaped heatsinks → **C 2 – 3**
Retaining springs for transistors → **A 115 – 117**
Technical introduction → **A 2 – 8**

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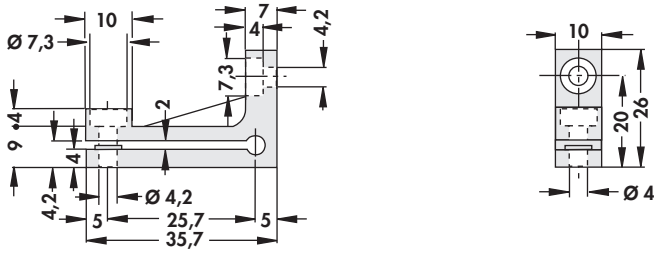
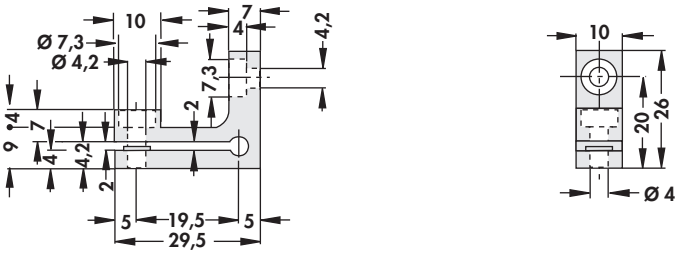
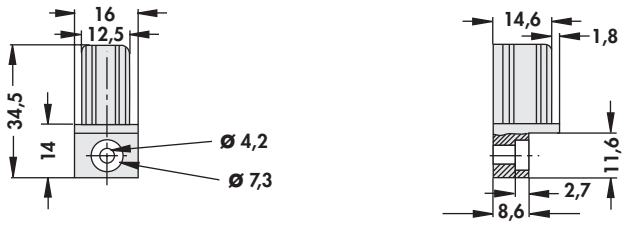
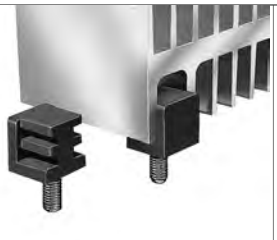
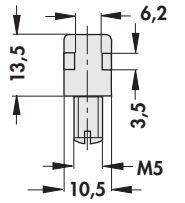
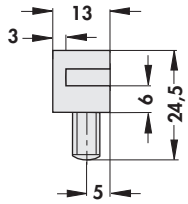
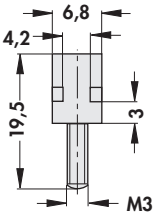
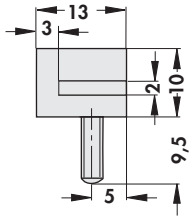
Mounting parts for heatsinks

art. no.		
IS 1		
for SK 01, 02, 03, 11, 14, 21, 30, 34, 36, 39, 46, 69; heatsink length: 50 mm		
art. no.		
IS 2		
for SK 01, 02, 03, 11, 14, 21, 30, 34, 36, 39, 46, 69; heatsink length: 37.5 75 100 mm		
art. no.		
IS 3		
for SK 01, 02, 03, 11, 14, 21, 30, 34, 36, 39, 46, 69		
art. no.		
IS 4		
for SK 06		
art. no.		
IS 5		
for SK 20		
art. no.		
IS 6		
for SK 67		

material:	polyamide 6, GF reinforced
class of flammibility:	UL 94 V-0

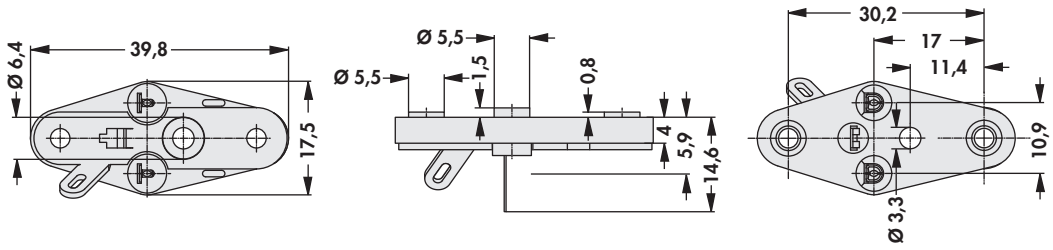
Heatsink profile-overview → **A 13 – 17**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for PCB → **A 89 – 93**
Insulating distance sleeves → **E 32 – 34**
Insulting clamping parts → **E 45**
Mounting pads for transistors → **E 47**
Mounting pads for single components → **E 48**
Technical introduction → **A 2 – 8**

Mounting parts for heatsinks

art. no.		
IS 7		 
art. no.		
IS 8	 for SK 20	 

material:	polyamide 6, GF reinforced
class of flammibility:	UL 94 V-0

Sockets for power transistors TO 3



art. no.	no. of contacts
TF 3 2	3

insulating body material:	stanyl PA 4.6
contact:	CuSn-alloy, CuSn 6; Ni 1-2µm, Au 0.2µm
current rating:	15 A max.
contact resistance:	<10 mΩ
temperature range:	-65°C ... +290°C
capacity:	1 pF
test voltage:	1650 V
class of flammibility:	UL 94 V-0

Heatsink profile-overview → **A 13 – 17**
Profiles for PCB mounting → **A 89 – 112**
Heatsinks for PCB → **A 89 – 93**
Insulating distance sleeves → **E 32 – 34**
Insulting clamping parts → **E 45**
Mounting pads for transistors → **E 47**
Mounting pads for single components → **E 48**
Technical introduction → **A 2 – 8**

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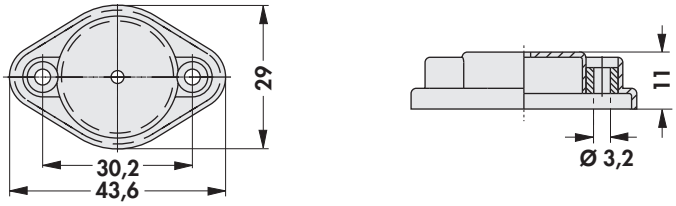
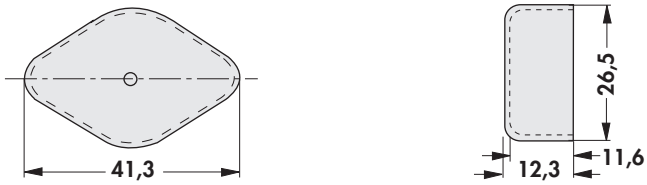
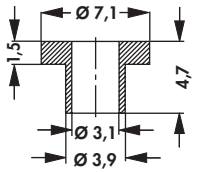
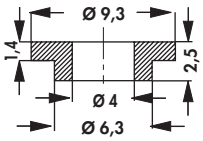
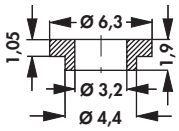
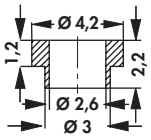
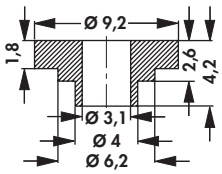
Insulating caps

– different transistor flange levels will be by the sleeves

art. no.		
IK 341 3		
art. no.		
IK 3		

material:	polyamide, GF reinforced
pressed-in sleeves:	brass, nickel-plated
class of flammibility:	UL 94 V-0

Insulating bush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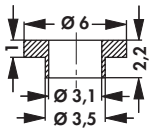
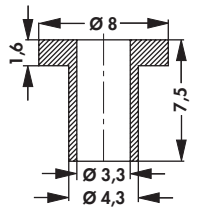
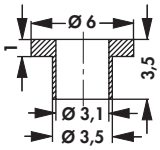
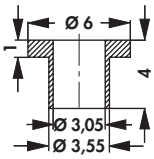
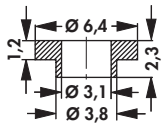
IB 1 / IBT 1	**IB 2 / IBT 2**	**IB 3 / IBT 3**	**IB 4 / IBT 4**	**IB 5**
				
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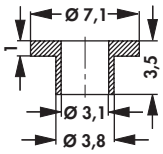
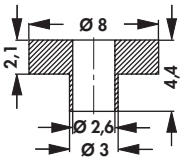
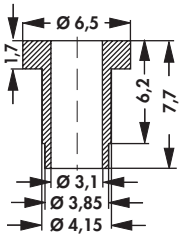
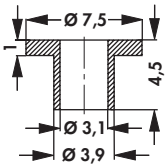
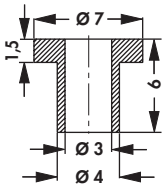
IB 6 / IBT 6	**IB 7 / IBT 7**	**IB 8 / IBT 8**	**IB 9 / IBT 9**	**IB 10 / IBT 10**
				
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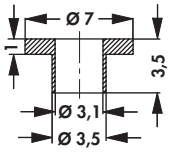
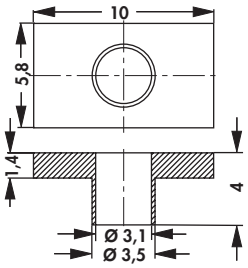
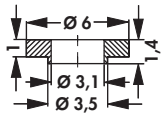
IB 11 / IBT 11	**IB 12 / IBT 12**	**IB 13**	**IB 14 / IBT 14**	**IB 15 / IBT 15**
				
art. no.	**art. no.**	**art. no.**		
IB 16	**IB 17**	**IB 18 / IBT 18**		

	IB 1 - IB 7 / 18	IBT 1 - IBT 15 / 18	IB 8 - IB 17
material	polyamide 4.6, GF reinforced	PTFE (teflon)	thermoplastic resin
form stability	-40°C ... +250°C (1.8 MPa)	-260°C ... +250°C	-40°C ... +200°C
dielectric strength	30 kV/mm	40 kV/mm	38 kV/mm
class of flammibility	UL 94 V-0		

Mica wafers → **E 19**
Thermal conductive material → **E 2 – 5**
Mounting for TO 3 angle → **A 125**
Insulating distance sleeves → **E 32 – 128**
Aluminium oxide wafers → **E 17 – 18**
Thermal conductive paste → **E 21 – 22**
Thermal conductive glue → **E 23 – 24**
Technical introduction → **A 2 – 8**

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OBERFLÄCHEN-VEREDELUNG GMBH

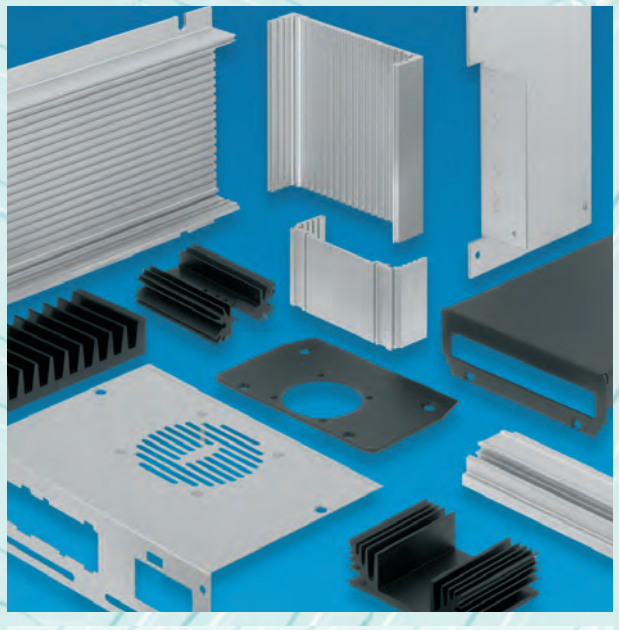
High quality surface treatment
for electronic components

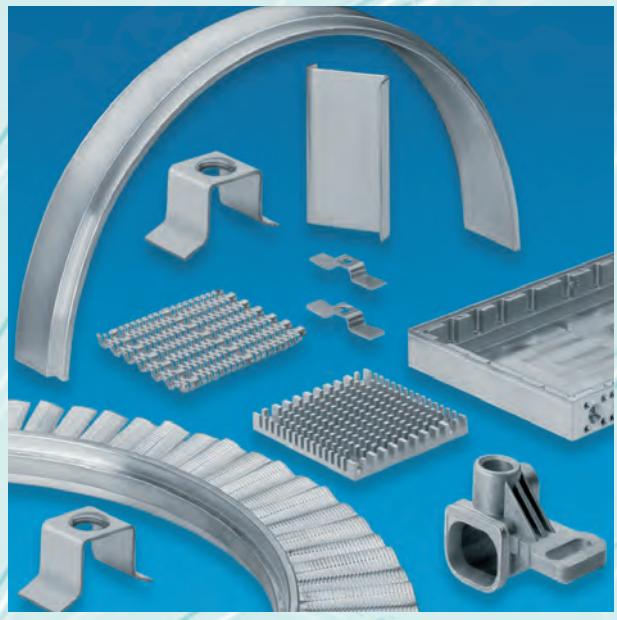
Gold-plating

properties:	high resistance to wear, good corrosion resistance, temperature stability and solderability
process:	drum technology
materials:	non-ferrous metals
coating system:	copper/nickel/gold

Tin-plating

properties:	solderable layers with improved tarnishing and corrosion resistance
process:	drum technology
materials:	non-ferrous metals
coating system:	copper/nickel/tin





Anodising

performance:	fabrication of corrosion resistant, decorative oxide films
process:	anodic oxidation in fully automated equipment
materials:	aluminium and aluminium alloys
max. component size:	1500 x 2000 x 450 mm
colour:	natural aluminium or black

Degreasing

performance:	degreasing of oily or greasy metallic surfaces
process:	steam degreasing using chlorinated hydro-carbons in hermetically sealed equipment
material:	aluminium and aluminium alloys
min. component size:	30 x 30 x 30 mm
max. component size:	600 x 400 x 380 mm
max. component weight:	80 kg

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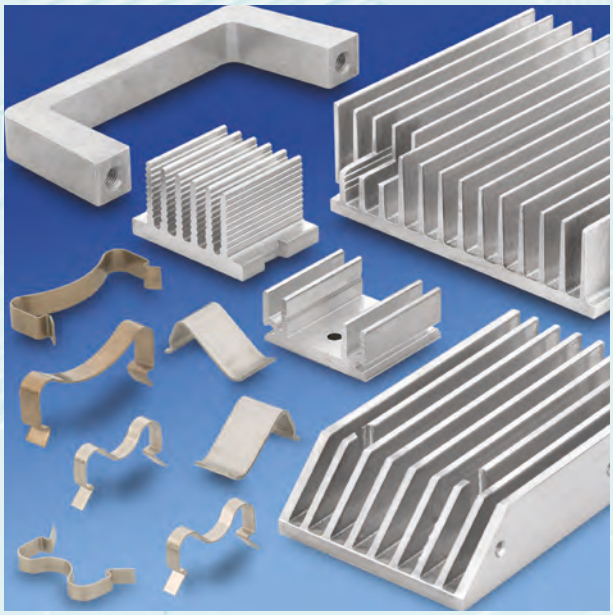
High quality surface treatment
for electronic components



Transparent passivating (surface free from chromium VI)

characteristics: environmental compatibility due to chrome free passivation of the aluminium surfaces
process: fabrication of conversion coatings by immersion process
materials: aluminium und aluminium alloys
max. component size: 1500 x 2000 x 450 mm
colour: natural aluminium or black

Vibratory grinding

characteristics: deburring, removing of sharp edges, rough and fine grinding
process: treatment using vibration technique and grinding tools (trowalization)
materials: metallic, aluminium favourized
max. component size: 230 x 200 mm

Anodisation facility

- economization of water by using spray-rinsing, automized ion exchange installation, cascade water guided system and recirculation of splash water
- reduction of electrical energy by means of current density regulation
- reduction of chemicals by recirculation of the dragged-off chemicals using a compensation of the evaporation losses
- recycling of the sulphuric acid out of the anodizing bathes

Certificate

Standard ISO 9001:2008

Certificate Registr. No. 01 100 052055

TÜV Rheinland Cert GmbH certifies:

Certificate Holder:

fischer OBERFLÄCHEN-VEREDELUNG GMBH

Fischer Oberflächenveredelung GmbH
Nottebohmstraße 26
D - 58511 Lüdenscheid

Scope: surfaces for electronics: goldplating, tinplating, nickelplating, anodizing, passivating, deburring.

An audit was performed, Report No. 052055. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 06-12 (dd.mm).

Validity: The certificate is valid from 2014-12-15 until 2017-12-14.
First certification 2005

2014-11-11

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

IAF
DGA-ZM-58-95-00

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General Business conditions

1. General provisions

Our deliveries are exclusively subject to the conditions set forth herein which shall be deemed to be explicitly accepted by the purchaser. No conditions which may appear on the purchaser's order shall be binding on us, even without our express contradiction.

2. Quotations and orders

Our quotations are not binding on us. This applies also to information contained in price lists, leaflets etc.. Delivery dates stated in our quotations or given to the purchaser by any other means are approximate, and we endeavour to keep to them. Delays in delivery shall give no right to claims, unless we have explicitly confirmed such delivery dates and an adequate period of grace granted to us has expired. Orders shall only be binding on us when they are explicitly confirmed in writing, regardless of the form in which they have been placed with us. Furthermore the characteristics of our samples cannot be regarded as guaranteed characteristics.

3. Prices

Prices shall be valid only when confirmed by us in writing. They are exclusive of VAT at the current rate and incidentals such as postage and packing, freight, insurance etc.. If delivery is made more than 4 months after the date of order, we shall be entitled to invoice the price valid at the date of despatch, even though different prices were initially confirmed. The price valid at the date of despatch shall also apply if the order was confirmed without prices. When an order on call is placed, partial deliveries shall be invoiced at the price valid at the date of despatch. Any request by the purchaser for subsequent modifications shall give us the right to amend prices.

4. Conditions of payment

Payment of the invoice amount shall become due following receipt of the invoice. Payments made within 14 days of the date of invoice give the right to a 2% cash discount. Payments 30 days after the date of invoice shall be made without any deduction. If the purchaser is in default with any payment, we are entitled to claim interest for such default at the normal rate for current accounts. If greater damage can be demonstrated to have been caused by the delay, we are entitled to request compensation for such damage.

5. Set-off, right to retention

Only uncontested or legally binding counterclaims may be offset against our invoices. Any right to a retention to be exercised by the purchaser in connection with our claims is explicitly excluded.

6. Delivery

Delivery of our goods is explicitly made on behalf of and at the risk of the purchaser. The risk shall pass on to the purchaser when the ordered goods leave our premises. The same applies if goods are collected in our premises after notification of their readi-ness. We decide at our discretion on the most economical delivery method without assuming any liability for the chosen means of delivery.

7. Specially manufactured goods

Components made according to a sample or a drawing or by special request must be taken over and paid for, unless they have a defect we are answerable for and which makes the components completely unfit for the purchaser's purposes. If their fitness for the purchaser's purposes is only reduced, the purchaser may request a reduction of payment but the contract shall not be cancelled.

8. Quantities

We are entitled to supply quantities which are above or below the ordered quantities by up to 10%. Such deviations are usual in this trade and the deliveries are deemed as being in compliance with the contract. If delivery quantities fall below the ordered quantities there shall be no right to subsequent delivery of the missing quantity.

9. Reservation of proprietary rights

9.1. All goods supplied shall remain our property until all of our claims resulting from the contract have been paid in full. The purchaser is entitled to dispose of the purchased goods in the ordinary course of business transactions. Reservation of proprietary rights also applies to products resulting from processing, mixing up or combining our goods with goods of third parties, in which case we are considered as manufacturers. In the case where our goods are processed, mixed up or combined with goods of third parties, and the proprietary rights of such third parties remain in force, we are entitled to co-ownership according to the proportion of the amount invoiced for such processed goods. Such right to coownership shall be safeguarded by the purchaser.

9.2. The purchaser shall transfer to us, as a security, his claims against third parties resulting from the re-sale of our goods in full or in the proportion of our co-ownership (see subparagraph 9.1). He is entitled to collect the amount of such claims on our behalf until revoked or until cessation of his payments made to us. The purchaser is not entitled to assign these claims to third parties.

9.3. The purchaser is not entitled to mortgage or transfer the goods which are subject to reservation by way of security.

9.4. The purchaser shall advise us immediately at any seizure of our goods or of any infringement of our rights by third parties.

9.5. In case of a default in payment or a deterioration in the financial situation, we are entitled to request immediate handing over of the goods which are subject to reservation. Any time limited claims shall immediately become due.

9.6. If the value of the securities exceeds our claims by more than 20%, securities to a corresponding amount will be released by us on request at our discretion.

10. Warranty

10.1. We expressly point out that all information and data is given to the best of our knowledge and belief. The user is solely responsible for the proper use of our products and he should check their suitability for the intended application.
Fischer Elektronik do not assume any warranty, whether expressed or implied, for the suitability, function or merchantibility of their products in specific or general applications, and they cannot be held liable for accidental or consequential damage due to non-observance of the above.

10.2. Claims for defects can only be considered if the purchaser has complied with his obligation to check and put forward a complaint as per § 377 HGB.

10.3. If goods have a defect attributable to us, we are obliged to provide subsequent fulfilment, excluding the purchaser's right to withdraw from the contract or to reduce the purchase price (abatement), unless we are entitled to refuse subsequent fulfilment by virtue of legal provisions. The purchaser shall grant us an adequate period of grace for subsequent fulfilment. Subsequent fulfilment may at our discretion be an elimination of the defect (rectification) or the supply of new products.

10.4. If rectification of the defect has failed, the purchaser shall be entitled to request a reduction in the purchase price (abatement) or to withdraw from the contract. Rectification shall be deemed to have failed after the second vain attempt, unless further attempts are reasonable in view of the object of the contract and can be reasonably imposed on the purchaser.

10.5. The purchaser's right to put forward further claims for damages shall remain unaffected by this.

10.6. The purchaser's warranty claims shall come under the limitation of time which is 12 months from the delivery of the goods to the purchaser, unless we have fraudulently concealed the defect. In this case, the legal provisions shall apply.

10.7 The purchaser's claims for damages shall come under the limitation of time which is 12 months from the delivery of the goods. This does not apply if the threat to life, bodily injury or injury to health is imputable to us, our legal representatives or other vicarious agents, or if we or our legal representatives have been grossly negligent, or if our vicarious agents have acted deliberately.

11. Withdrawal

When delivery in accordance with the contract is not possible for reasons beyond our control, we are entitled to withdraw from the contract. Such withdrawal shall not entitle the purchaser to assert any right against us.

12. Place of performance, place of venue, applicable law

12.1. The place of performance and the place of venue for deliveries and payments and for any litigation arising between us and the purchaser shall be the headquarters of our company.

12.2. The relations between the parties to the contract shall be exclusively governed by the law of the Federal Republic of Germany. The application of the UN Conventions on contracts for the international sale of goods is excluded.

If any provision herein is or will become invalid, such provision shall not affect the validity of the remaining provisions. The invalid provision shall be replaced by a valid provision which shall meet as closely as possible the legal and commercial purpose of the original one.

As at: 1. 1. 2014

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to cool to protect to connect

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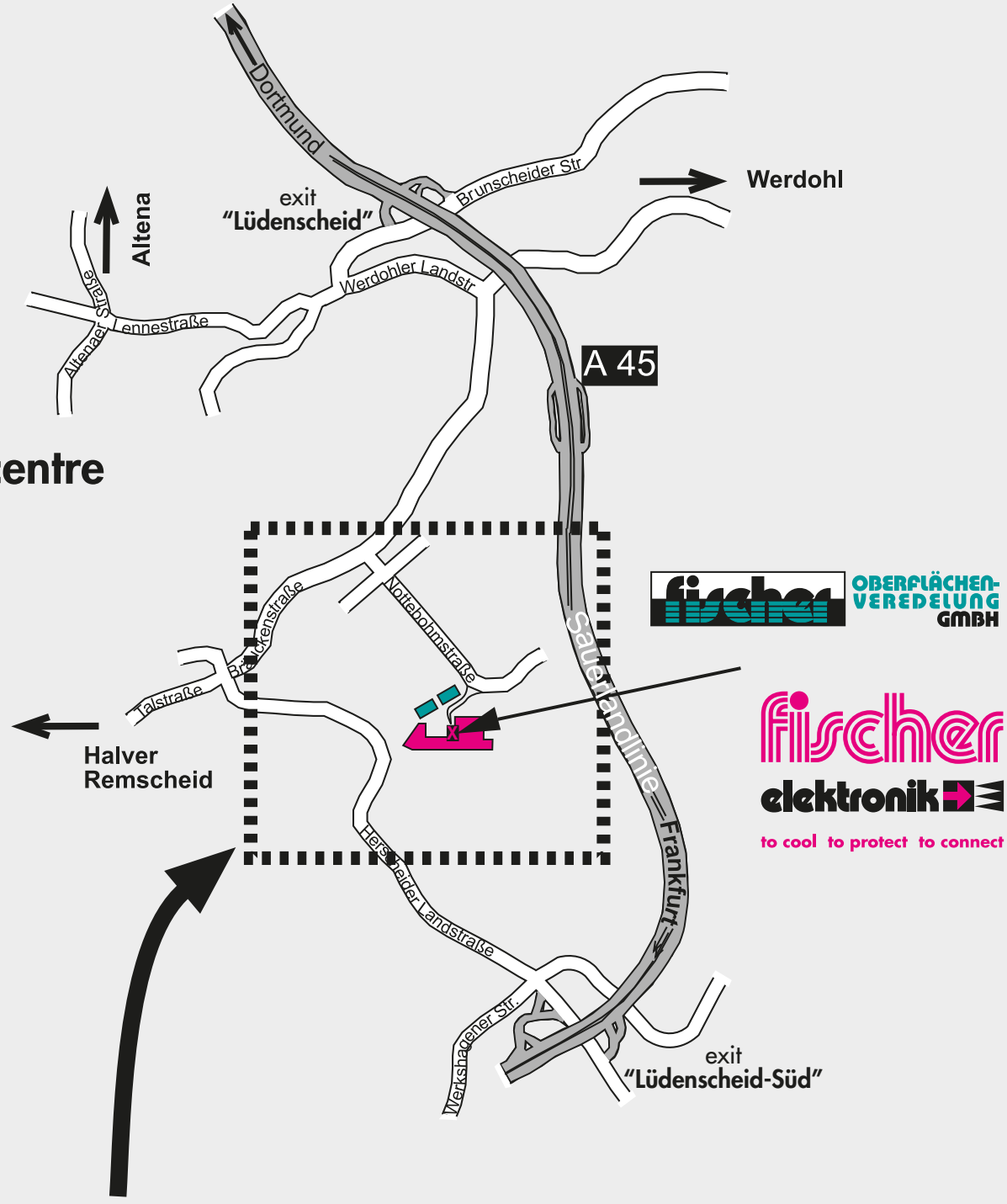

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