PHILIPS INTERNATIONAL 56E D 7110826 0041614 39T PHIN

T-01-17

SILICON RECTIFIER DIODES

Silicon rectifier diodes in DO-4 metal envelopes, intended for use in power rectifier applications. The series consists of the following types:
Normal polarity (cathode to stud): BYX38-300 to 1200.
Reverse polarity (anode to stud): BYX38-300R to 1200R.

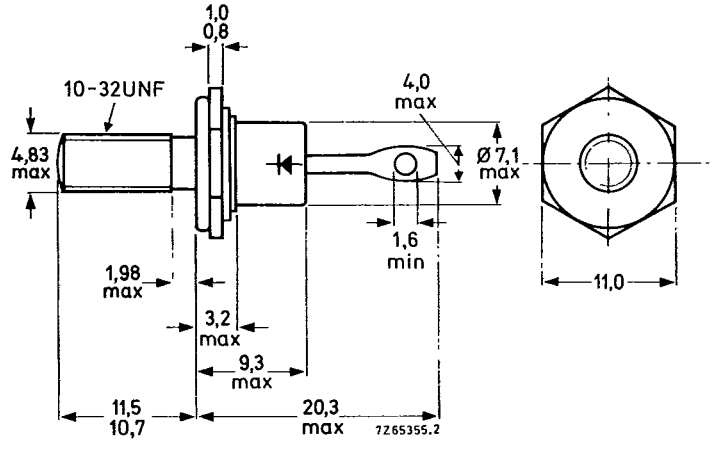
QUICK REFERENCE DATA

			BYX38-300(R)	600(R)	1200(R)	
Repetitive peak reverse voltage	V_{RRM}	max.	300	600	1200	V
Average forward current	$I_{F(AV)}$	max.		6		A
Non-repetitive peak forward current	I_{FSM}	max.		50		A

MECHANICAL DATA

Dimensions in mm

DO-4



Net mass: 6 g

Diameter of clearance hole: max. 5,2 mm

Accessories supplied on request:
see ACCESSORIES section

Torque on nut: min. 0,9 Nm
(9 kg cm)
max. 1,7 Nm
(17 kg cm)

Supplied with device: 1 nut, 1 lock washer
Nut dimensions across the flats: 9,5 mm

The mark shown applies to normal polarity types.

Products approved to CECC 50 009-019 available on request.

RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

Voltages			BYX38-300(R)	600(R)	1200(R)	
Non-repetitive peak reverse voltage ($t \leq 10$ ms)	V_{RSM}	max.	300	600	1200	V
Repetitive peak reverse voltage ($\delta \leq 0,01$)	V_{RRM}	max.	300	600	1200	V
Crest working reverse voltage	V_{RWM}	max.	200	400	800	V
Continuous reverse voltage	V_R	max.	200	400	800	V

Currents				
Average forward current (averaged over any 20 ms period) up to T_{mb} = 110 °C	$I_{F(AV)}$	max.	6	A
at T_{mb} = 125 °C	$I_{F(AV)}$	max.	4	A
R.M.S. forward current	$I_{F(RMS)}$	max.	10	A
Repetitive peak forward current	I_{FRM}	max.	50	A
Non-repetitive peak forward current (t = 10 ms; half sine-wave) T_j = 150 °C prior to surge; with reapplied V_{RWMmax}	I_{FSM}	max.	50	A
I^2t for fusing (t = 10 ms)	I^2t	max.	13	A^2s

Temperatures				
Storage temperature	T_{stg}	−55 to +150		°C
Junction temperature	T_j	max.	150	°C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	50	°C/W
From junction to mounting base	$R_{th\ j-mb}$	=	4	°C/W
From mounting base to heatsink with heatsink compound	$R_{th\ mb-h}$	=	0,5	°C/W
without heatsink compound	$R_{th\ mb-h}$	=	0,6	°C/W
Transient thermal impedance; t = 1 ms	$Z_{th\ j-mb}$	=	0,3	°C/W

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CHARACTERISTICS

Forward voltage

I_F = 20 A; T_j = 25 °C	V_F	<	1,7	V [1]

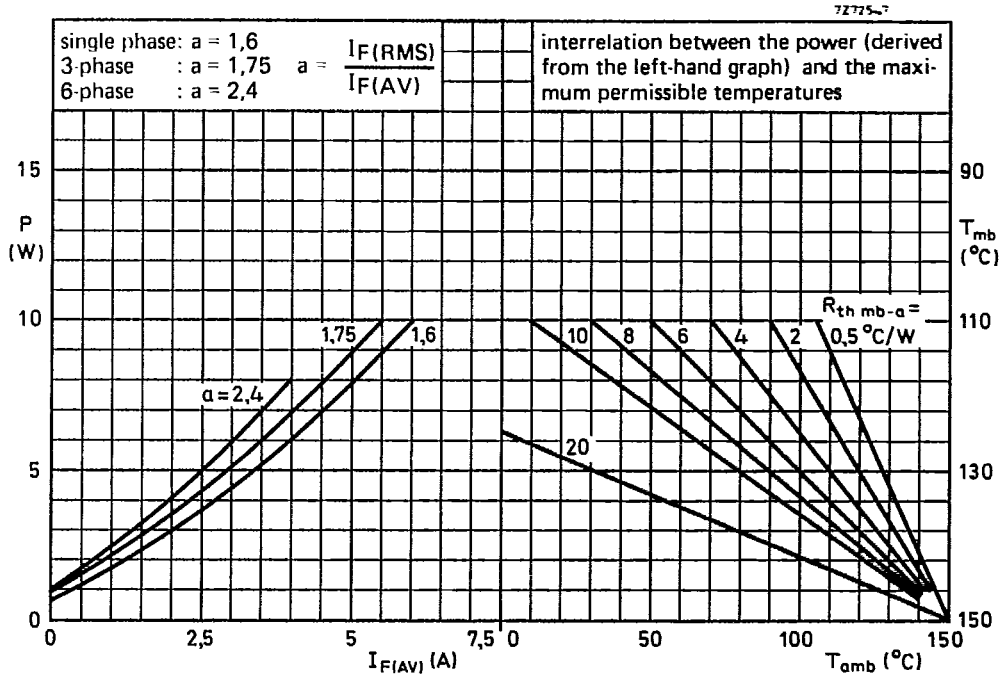
Reverse current

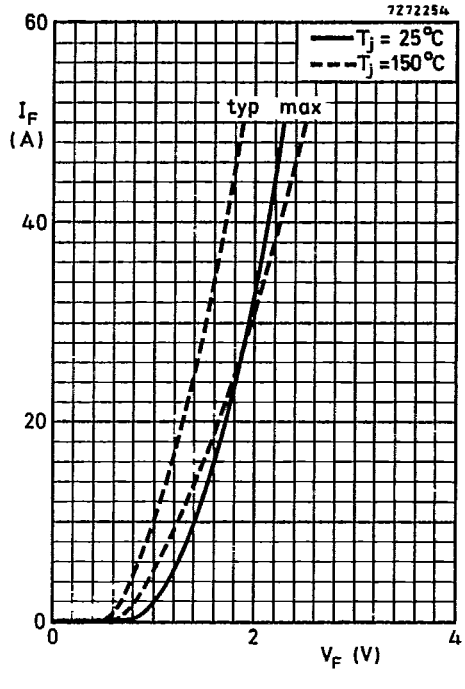
$V_R = V_{RWMmax}$; T_j = 125 °C	I_R	<	200	μA

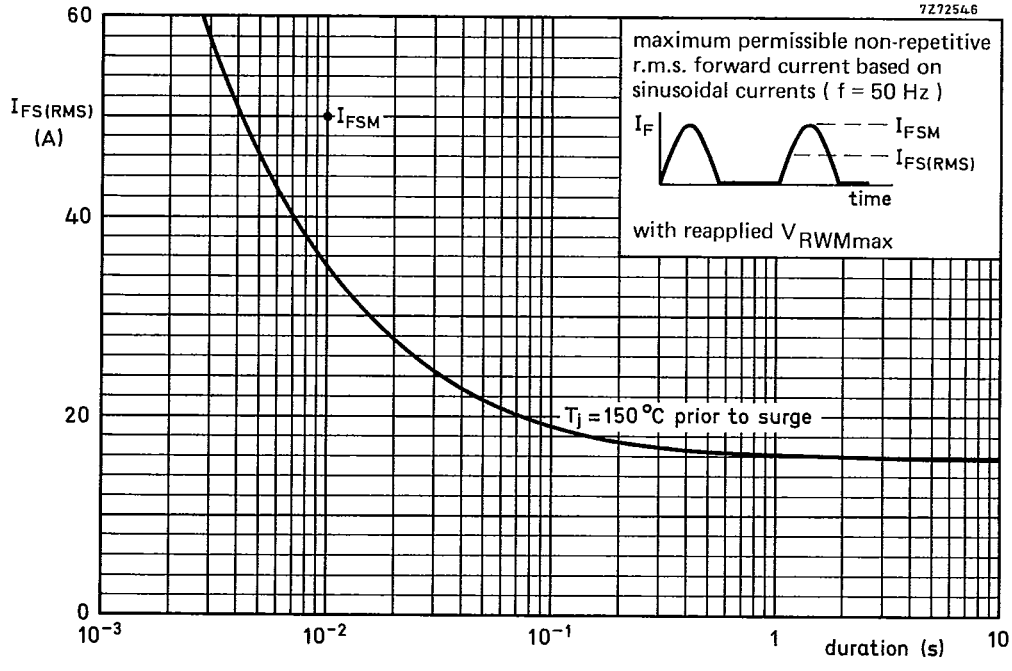
OPERATING NOTES

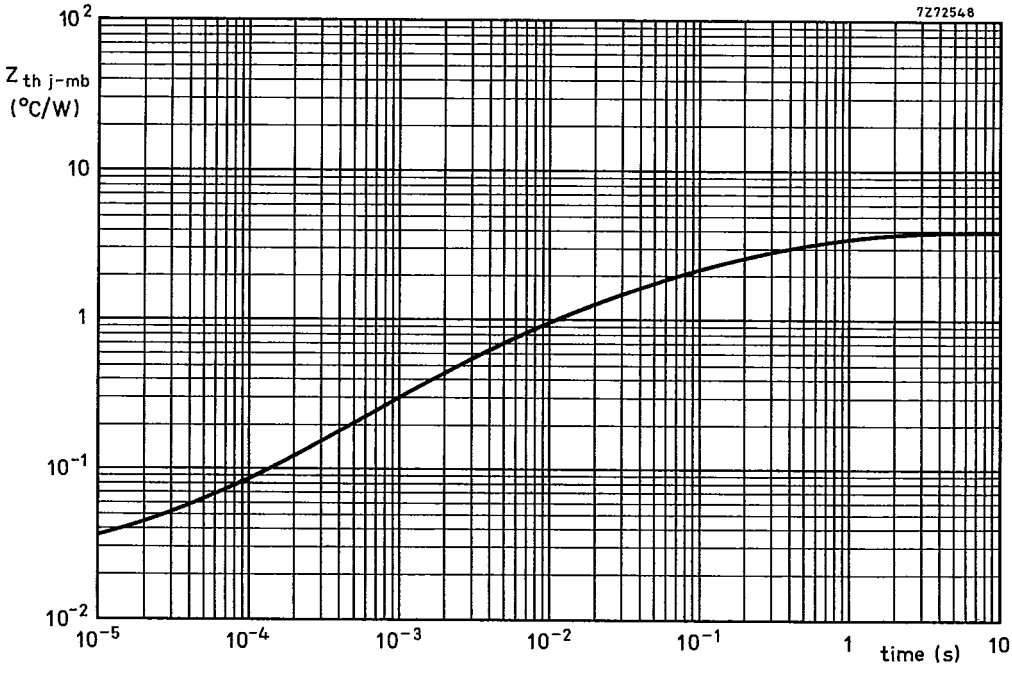
1. The top connector should neither be bent nor twisted; it should be soldered into the circuit so that there is no strain on it.
   During soldering the heat conduction to the junction should be kept to a minimum.
2. Where there is a possibility that transients, due to the energy stored in the transformer, will exceed the maximum permissible non-repetitive peak reverse voltage, see General Section for information on damping circuits.

[1]) Measured under pulse conductions to avoid excessive dissipation.


7Z725..7
single phase: a = 1,6
3-phase : a = 1,75
6-phase : a = 2,4
a = IF(RMS) / IF(AV)
interrelation between the power (derived from the left-hand graph) and the maximum permissible temperatures
P (W)
15
10
5
0
0
2,5
5
7,5
IF(AV) (A)
a=2,4
1,75
1,6
Tmb (°C)
90
110
130
150
0
50
100
150
Tamb (°C)
Rth mb-a =
0,5 °C/W
10
8
6
4
2
20


7Z72254
Tj = 25°C
Tj = 150°C
typ
max
IF (A)
60
40
20
0
0
2
4
VF (V)


7Z72546
maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50 Hz)
I_F
I_{FSM}
$I_{FS(RMS)}$
time
with reapplied V_{RWMmax}
$I_{FS(RMS)}$ (A)
I_{FSM}
T_j = 150 °C prior to surge
60
40
20
0
10^{-3}
10^{-2}
10^{-1}
1
10
duration (s)


7Z72548
$Z_{th\ j-mb}$ (°C/W)
10^2
10
1
10^{-1}
10^{-2}
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
time (s)