



MIDISCO

Adapters
Adapto-Pads
Attenuators
Bias Tees
Cable Assemblies
Couplers
DC Blocks
Delay Lines
Detectors
High Power Attenuators & Terminations
Hybrids
Isolators & Circulators
Lightning Protectors
Limiters
Mixers
Phase Adjusters
Phase Equal Adapters
Power Dividers
Switches
Terminations
Waveguide Products
and Much More!

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www.midisco.net

Midisco is now well into their fourth decade of providing a wide range of standard and custom RF and Microwave components to a varied range of customers. These customers run the gamut from large and small OEMs, Universities, Research Laboratories, and US Government facilities. Our products are used in virtually every type of application requiring reliable RF/Microwave components. Microwave Distributors Company, our distribution affiliate, is the largest Off-The-Shelf Stocking Distributor of RF/Microwave components – carrying the entire line of MIDISCO products as well as the products of other franchised quality suppliers.

MIDISCO is continually monitoring the market to ensure that what we offer is in tune with the constantly changing needs of the industry. We recognize the need for coaxial components operating at higher frequencies, the need for Wave Guide components, as well as the proliferation of requirements in Cellular, PCS, and LAN arenas. Increasing needs in 75 Ω CATV and related activities are addressed as well.

This new catalog edition features many new products which emphasize MIDISCO's commitment to staying in step with our customers' changing requirements. Page 3 summarizes the new products that are included.

Of particular interest are the Bias Tees and Mixers-available in connectorized and surface mount packages, 2.4 – 2.9 mm adapters, Delay Lines, LMR™ & VNA Cable Assemblies, and the F Series 75 Ω Cal Kit to name a few. We have also added many new components to the existing product line which are too numerous to mention here. For example, the Resistive Power Divider section has been greatly expanded with the addition of 3-W, 4-W and 5-W 50 Ω and 75 Ω units. These are in addition to the 18 GHz Type N and the 2.9 mm units featured in the New Product Section.

A major MIDISCO strength is the ability to cross-reference the products of other manufacturers. Many RF/Microwave component sources have discontinued product lines, are having delivery or quality problems, or have simply gone out of business. **Our vast database and reference library enables us to quickly provide exact or functionally equivalent replacements.**

Midisco and its dedicated Sales and Technical staff welcome your inquiries about our products and capabilities. We are looking forward to serving you for many more years.

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Standards: MIDISCO uses a calibration system traceable to the National Bureau of Standards. Our Quality Assurance and Inspection system is in accordance with MIL-I-45208 and follows the guidelines of ISO-9000.

Terms: Major Credit Cards, C.O.D., Advance pay, or Net 30 days upon approval (Past Due accounts are subject to interest at the rate of 10 percent per annum).

Exchanges and credits: All Sales are final and thus, once order has been processed, they may not be returned for credit except as covered by the Limited Warranty. Order Cancellations or request to return merchandise are subject to a 30% Cancellation charge. All cable assemblies are made for each specific order and are not returnable.

Repairs: When returning items for any reason, please contact MIDISCO for shipping instructions and RMA number which must be on the outside of the box to avoid the box being refused by our Receiving Department.

Limited Warranty: All products are covered by a Limited Warranty for a period of 120 days from the date of shipment. This warranty is limited to the original purchaser, for the repair, replacement or credit, at MIDISCO's option, for any times found to be defective after inspection by MIDISCO. The warranties here stated are exclusive.

FOB: Our facility

Prices: All prices are subject to change without notice. Formal price quotations remain open for 30 days unless otherwise noted.

Specifications: Pictures and art work shown are only representative and may vary from the actual products. MIDISCO reserves the right to make, without notice, modifications of the products described in this catalog without effecting the right to sell such products under orders based on the catalog description, if the modifications shall not materially effect performance. We also reserve the right to withdraw from sale, without notice, any items described in our catalogs.

Cage Code:
52335

Catalog Additions

- New N, 2.9 mm Resistive Dividers
- 2, 3, 4, 5-Way 50 Ω & 75 Ω Resistive Dividers
- Adapto-Pads
- Medium and High Power Fixed Attenuators
- High Frequency, Specialty Attenuators
- Waveguide Terminations, Attenuators
- Continuously Variable Attenuators
- Medium, High Power Coaxial Terminations
- 3.5 mm Phase Equal Adapter Kit
- F Series Calibration Kit
- 2.4-2.9 mm Inter-Series Adapters
- Broadband 2.9 mm DC Blocks
- Broadband Bias Tees
- Doubly, Triple Balanced Mixers
- 50, 75 Ω Transformers, Matching Pads
- Coaxial Delay Lines
- Pin Diode Switches
- LMR, VNA Cable Assemblies

This section contains MIDISCO products that do not appear in the main body of the catalog. They are either new products or expansions of an existing product line, or products that we have been supplying on an ongoing basis, but were never in the full line catalog. Understand that even with these updates, no catalog can come close to fully summarizing our capability or full breadth of products. In addition to the featured new products, we can provide many additional products as discussed below. If you don't see what you want, please call. There is a good likelihood we can supply it.

The table to the left summarizes the products that are in this section. In addition to those listed, MIDISCO can supply a much broader range of RF and Microwave products. In addition to the pin diode switches shown, we also supply electro-mechanical and transfer switches. Among other major MIDISCO products are programmable attenuators with either digital or analog control, and relay controlled units that are GPIB/RS232/Ethernet compatible.

Resistive Power Dividers

Broadband - DC to 18 GHz (Type N) DC-26.5 GHz (2.9 mm)

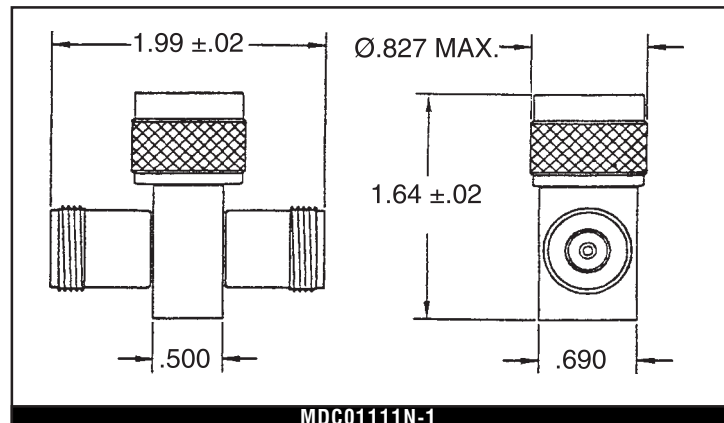
Features

- Broadband
- -55° C to +125° C
- 50 Ω Impedance
- 1-Watt CW, 1 kW Peak
- Connector Options
- Stainless Steel Connectors
- Small Size
- All Port Symmetry

MIDISCO Resistive Power Dividers utilize a mature design to provide excellent output power symmetry over frequency with minimum insertion loss above the theoretical 6-dB split. The MDC01111N- (*) shown below and the MDC01111- (*)-(**) on the next page complement the MDC1193F3, and the MDC1191 and MDC1192 series shown on page 35 of this catalog. Phase tracking between outputs is $\pm 2^\circ$ nominal on the MDC01111N- (*), and $\pm 3^\circ$ and $\pm 4^\circ$ on the MDC01111- (*)-(**) at 18 GHz and 26.5 GHz respectively.

DC to 18 GHz, Type N Connectors

Model Number	Connectors
MDC01111N-1 (Shown)	Type N (1 male 2 females)
MDC01111N-2 (Not Shown)	Type N (3 females)
<u>Max. VSWR</u> DC-10 GHz: 1.25:1 10-18 GHz: 1.35:1 <u>Maximum Insertion Loss (dB)</u> DC-10 GHz: 1.2* 10-18 GHz: 1.5* *Above theoretical 6-dB split	



Resistive Power Divider

DC to 26.5 GHz. 2.9 mm Connector Configuration Options

New Products

Model Number	Max. VSWR/Insertion Loss (dB)		
	DC-26.5 GHz	DC-18 GHz	DC-12.4 GHz
MDC01111-1-(**)	1.40/2.5*	1.30/1.5*	1.20/6 Nominal
MDC01111-2-(**)	NA	1.30/1.5*	1.20/6 Nominal
MDC01111-3-(**)	NA	NA	1.20/6 Nominal

*: Loss above theoretical 6-dB split

**: Insert Code for connector configuration required

F3: 3 female

F2: 2 female, 1 male (standard, shown)

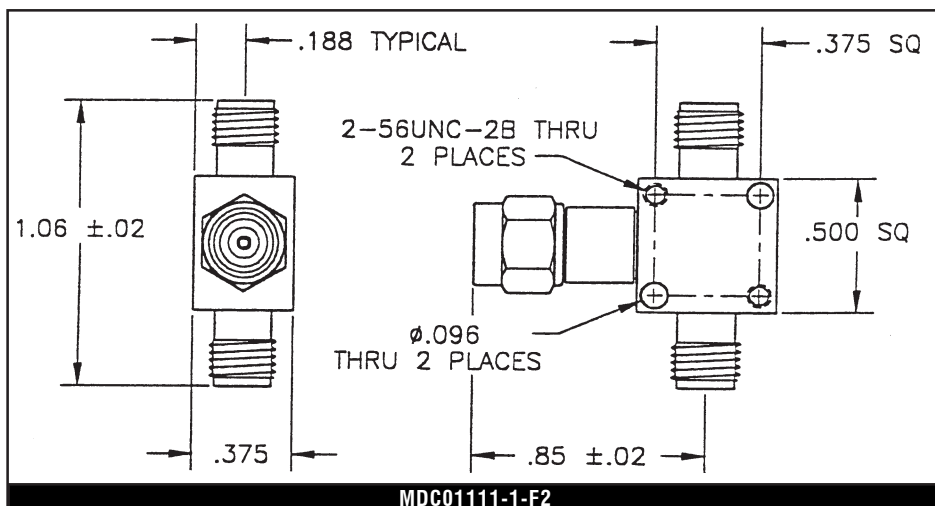
M3: 3 male

Note 1: 2.9 mm connectors mate with all SMA, KTM, and 3.5 mm connectors.

Note 2: For SMA connectors, add suffix "S" to basic model number. Standard frequencies for SMA models are 18, 12.4 and 6 GHz (-1, -2, -3 respectively).

For example, an SMA unit with 2 females and 1 male connector operating to 18 GHz is model MDC01111S-1-F2.

TM: The K connector is a trademark of Wiltron Corp.

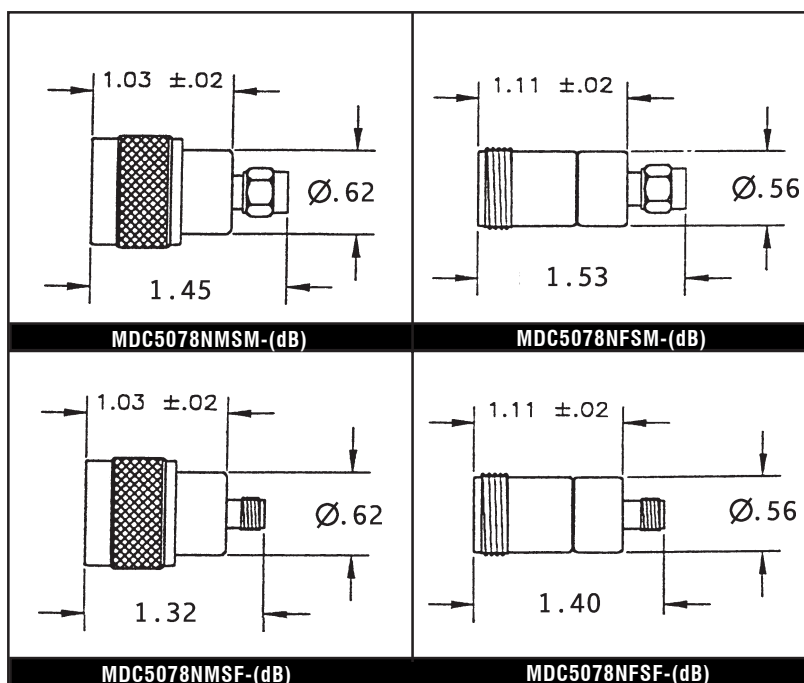


Adapto-Pads

Type N to SMA Inter-Series Attenuators - DC to 18 GHz

- DC to 18 GHz Operation
- 0-20 dB Available Values
- Accuracy +/-0.3 dB, 1 to 6 dB
+/-0.5 dB, 7 to 20 dB
- VSWR (Max): 1.10:1 to 4 GHz; 1.20:1 from 4 to 10 GHz; 1.30:1 from 10 to 18 GHz.
- Input Power: 2-Watts CW, 250-Watts Peak
- 50 Ω Impedance
- Stainless Steel Connectors
- Operating Temperature -65° C to +125° C

Model Number: (dB)
(dB): Insert dB value required



Medium & High Power Fixed Attenuators

5 to 300 Watts Available

Features

- 5 to 50 Watts offered to 18 GHz in Type N, TNC, and SMA
- 5 to 50 watt 7/16 DIN offered to 7.5 GHz. 100 and 200 watt units also shown. All components in the signal path are silver plated for low intermodulation distortion
- BNC up to 20 Watts available
- Other Options available

MIDISCO steps up with an expanded lineup of high power, high frequency attenuators that have widespread use in EW, Communication, and Cellular systems. Applications include new systems, upgrades to existing ones, and for use in Test Laboratories. 18 GHz Type N, SMA, TNC, and 7.5 GHz 7/16 DIN are available to 50 watts. Lower frequency 100 watt units are also available. Consult factory for 300 watt attenuators and for 100 and 200 watt dB values not listed.

Specifications: (All parts listed are Male to Female. Male to Male and Female to Female available.)

Model No.	Frequency (GHz)	VSWR Vs Frequency GHz (Max.)	Available Values (dB)	Power (Watts)	Size (in.) (L X W X H)
SMA					
MDC9040-(dB)	DC-4	1.15	0-10,12,15,20,30,40	5	0-30 dB: 1.2 X Ø 0.61 40 dB: 1.49 X Ø 0.61
MDC9030-(dB)	DC-6	1.20:1	0-10,12,15,20,30,40	5	
MDC9055-(dB)	DC-12.4	DC-4: 1.15:1; 4-8: 1.20:1; 8-12.4: 1.25:1	0-10,12,15,20,30,40	5	
MDC9065-(dB)	DC-18	Same as MDC9055-(dB), 12.4-18 is 1.35:1	0-10,12,15,20,30,40	5	
MDC9131B-(dB)	DC-6	1.20:1	0-10,12,15,20,30,40	10	1.7 X Ø 1.00
MDC8155-(dB)	DC-12.4	1.30:1	0-10,12,15,20,30,40	10	1.7 X Ø 1.00
MDC8165-(dB)	DC-18	1.40:1	0-10,12,15,20,30,40	10	1.7 X Ø 1.00
MDC8255-(dB)	DC-18	DC-6:1.20:1; 6-12.4:1.30:1; 12.4-18: 1.40:1	3-40	20	2.3 X Ø 1.50
MDC9231-(dB)	DC-6	1.20:1	3-40	25	3.79 X 2.65 X 2.65
MDC9255-(dB)	DC-12.4	1.30:1	3-40	25	3.79 X 2.65 X 2.65
MDC9265-(dB)	DC-18	1.40:1	3-40	25	3.79 X 2.65 X 2.65
MDC9331-(dB)	DC-6	1.25:1	3-40	50*	3.79 X 3.50 X 2.65
MDC9355-(dB)	DC-12.4	1.35:1	3-40	50*	3.79 X 3.50 X 2.65
MDC9365-(dB)	DC-18	1.45:1	3-40	50*	3.79 X 3.50 X 2.65
MDC9785-(dB)	DC-3	1.15:1	10,20,30	100*	5.66 X 3.46 X 3.46
MDC9885-(dB)	DC-6	1.35:1	20,30	100*	5.66 X 3.46 X 3.46
TYPE N					
MDC1102X-(dB)	DC-18	DC-6: 1.20:1; DC-12.4: 1.30:1; DC-18: 1.40:1	3,6,10,20,30,40	20	3.04 X Ø 1.49
MDC9231N-(dB)	DC-6	1.20:1	3,6,10,20,30,40	25	4.49 X 2.65 X 2.65
MDC9255N-(dB)	DC-12.4	1.30:1	3,6,10,20,30,40	25	4.49 X 2.65 X 2.65
MDC9265N-(dB)	DC-18	1.40:1	3,6,10,20,30,40	25	4.49 X 2.65 X 2.65
MDC9331N-(dB)	DC-6	1.25	3,6,10,20,30,40	50*	4.49 X 3.50 X 2.65
MDC9355N-(dB)	DC-12.4	1.35	3,6,10,20,30,40	50*	4.49 X 3.50 X 2.65
MDC9365N-(dB)	DC-18	1.45	3,6,10,20,30,40	50*	4.49 X 3.50 X 2.65
MDC9785N-(dB)	DC-1.5	1.15	3,6,10,20,30,40	100*	6.36 X 3.46 X 3.46
MDC9795-(dB)	DC-6	1.35:1	20,30	100*	6.36 X 3.46 X 3.46
MDC9885N-(dB)	DC-3	1.25:1	10,20,30	100*	6.36 X 3.46 X 3.46
MDC9886N-(dB)	DC-1.5	1.35:1	10,20,30,40	200*	8.4 X 6.25 X 6.25
MDC9886AN-(dB)	DC-2.5	1.25:1	30,40	200*	8.4 X 6.25 X 6.25
BNC					
MDC9110B-(dB)	DC-4	1.25:1	1-40	5	1-30 dB: 2.10 X Ø 0.61 40 dB: 2.39 X Ø 0.61
MDC9040B-(dB)	DC-4	DC-2: 1.20:1; 2-4: 1.40:1	1-60	5	2.63 X Ø 0.63
MDC9040BA-(dB)	DC-4	DC-1: 1.30:1; 1-4: 1.60:1	0-40	10	2.60 X Ø 1.00
MDC9040BB-(dB)	DC-4	1.40:1	1-60	10	2.58 X Ø 1.25
MDC9040BC-(dB)	DC-4	1.20:1	3,6,10,20,30,40	20	3.23 X Ø 1.49

New Products

Model No.	Frequency (GHz)	VSWR Vs Frequency GHz (Max.)	Available Values (dB)	Power (Watts)	Size (in.) (L X W X H)
TNC					
MDC9110T-(dB)	DC-6	1.20:1	0-10, 12, 15, 20, 30, 40	5	0-30dB: 2.06 X Ø 0.61
MDC9088-(dB)	DC-12.4	1.25:1	0-10, 12, 15, 20, 30, 40	5	31-60 dB: 2.25 X Ø 0.61
MDC9088X-(dB)	DC-18	1.35:1	0-10, 12, 15, 20, 30, 40	5	0-40 dB: 2.58 X Ø 1.00
MDC9111T-(dB)	DC-6	1.20:1	0-10, 12, 15, 20, 30, 40	10	40 dB: 2.82 X Ø 1.24
MDC9188-(dB)	DC-12.4	1.30:1	0-10, 12, 15, 20, 30, 40	10	
MDC9188X-(dB)	DC-18	1.40:1	0-10, 12, 15, 20, 30, 40	10	4.66 X 2.65 X 2.65
MDC9112T-(dB)	DC-6	1.20:1	3, 6, 10, 20, 30, 40	25	4.66 X 2.65 X 2.65
MDC9288-(dB)	DC-12.4	1.30:1	3, 6, 10, 20, 30, 40	25	4.66 X 2.65 X 2.65
MDC9288X-(dB)	DC-18	1.40:1	3, 6, 10, 20, 30, 40	25	4.66 X 2.65 X 2.65
MDC9113T-(dB)	DC-6	1.25:1	3, 6, 10, 20, 30, 40	50*	4.66 X 3.50 X 2.65
MDC9388-(dB)	DC-12.4	1.35:1	3, 6, 10, 20, 30, 40	50*	4.66 X 3.50 X 2.65
MDC9388X-(dB)	DC-18	1.45:1	3, 6, 10, 20, 30, 40	50*	4.66 X 3.50 X 2.65
MDC9785T-(dB)	DC-1.5	1.15:1	3, 6, 10, 20, 30, 40	100*	6.53 X 3.46 X 3.46
MDC9785AT-(dB)	DC-2	1.15:1	3, 6, 10, 20, 30, 40	100*	6.53 X 3.46 X 3.46
MDC9885T-(dB)	DC-2.5	1.35:1	30, 40	200*	8.52 X 6.25 X 6.25
7/16 DIN					
MDC9716-(dB)	DC-7.5	1.20:1	1-12, 20, 30, 40	5	2.33 X Ø 1.49
MDC9726-(dB)	DC-7.5	1.30:1	1-10, 20, 30, 40	10	4.49 X 2.65 X 2.65
MDC9736-(dB)	DC-7.5	1.30:1	3, 6, 10, 20, 30, 40	20	4.49 X 2.65 X 2.65
MDC9746-(dB)	DC-7.5	1.30:1	3, 6, 10, 20, 30, 40	25	4.49 X 2.65 X 2.65
MDC9756-(dB)	DC-7.5	1.35:1	3, 6, 10, 20, 30, 40	50*	4.49 X 3.50 X 2.65
MDC9785-(dB)	DC-3	1.35:1	10, 20, 30	100*	4.49 X 3.50 X 2.65
MDC9766-(dB)	DC-2.5	1.35:1	30, 40	200*	4.49 X 3.50 X 2.65

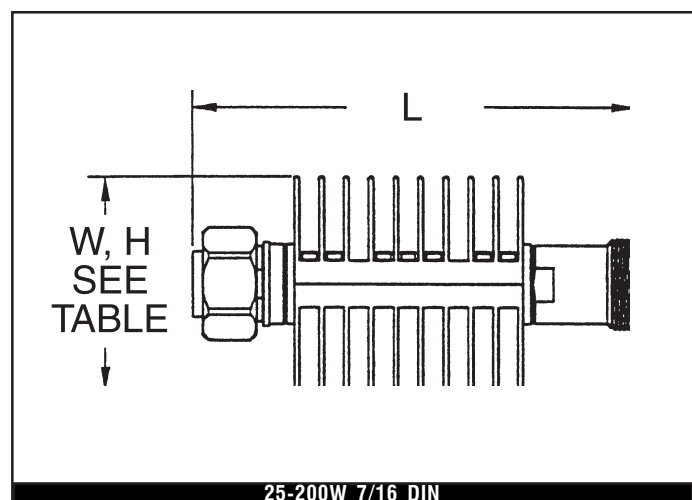
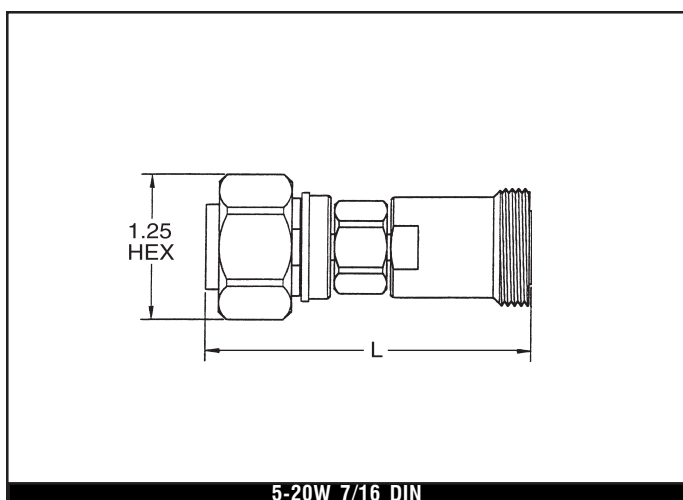
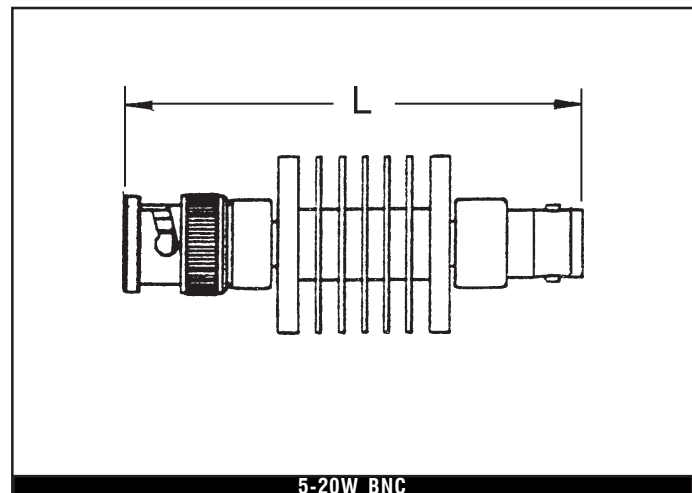
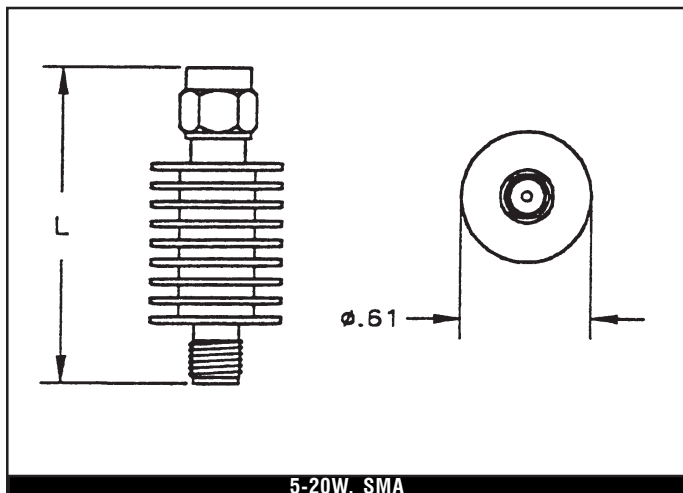
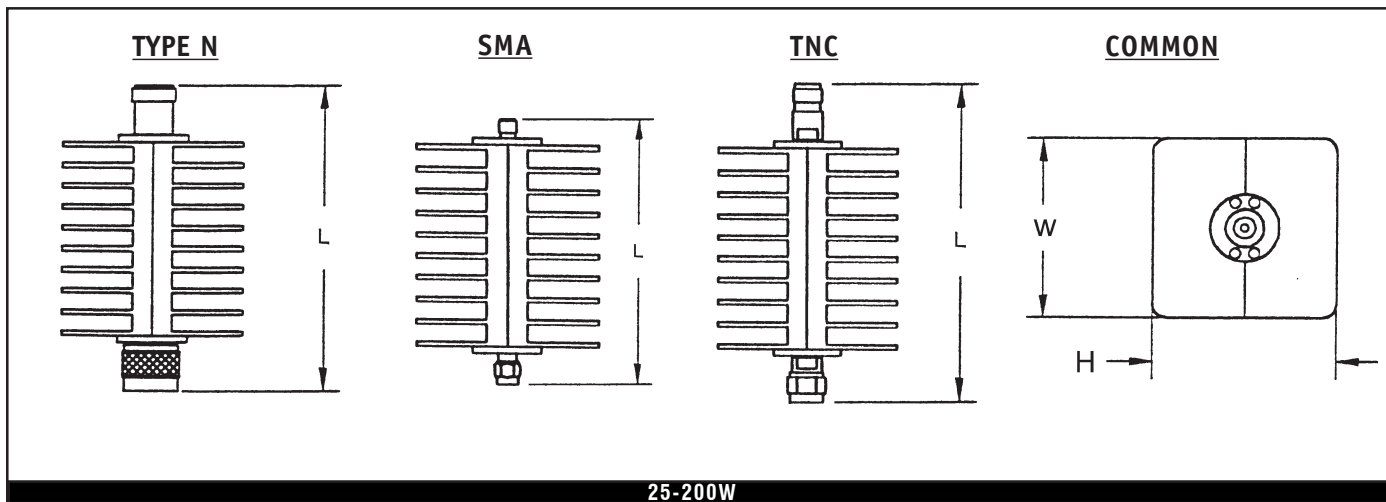
*: Units are uni-directional. The male connector is the input unless otherwise specified at the time of order.

Attenuator Accuracy (+/- dB):

SMA	
5 watts	DC-18 GHz: 0-6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB; 31-40 dB: 1.5 dB
10 watts	0-6 dB: 0.3 dB to 12.4 GHz, 0.5 dB to 18 GHz; 7-20 dB: 0.5 dB to 12.4 GHz, 0.7 dB to 18 GHz; 21-40 dB: 0.7 dB to 12.4 GHz, 1.0 dB to 18 GHz
20, 25 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 10,20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz, 1.0 dB to 18 GHz; 30,40 dB: 0.75 dB to 6 GHz, 1.0 dB to 12.4 GHz, 1.5 dB to 18 GHz
50 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 7-20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz, 1.0 dB to 18 GHz; 21-30 dB: 0.75 dB to 6 GHz; 1.0 dB to 12.4 GHz, 1.25 dB to 18 GHz; 31-40 dB: 1.0 dB to 6 GHz, 1.25 dB to 12.4 GHz, 1.5 dB to 18 GHz
100 watts	1-10 dB: 0.5 dB; 20-40 dB: 0.75 dB
TYPE N	
5 watts	DC-18 GHz: 0-6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB; 31-40 dB: 1.5 dB
10 watts	0-6 dB: 0.3 dB to 12.4 GHz, 0.5 dB to 18 GHz; 7-20 dB: 0.5 dB to 12.4 GHz, 0.7 dB to 18 GHz; 21-40 dB: 0.7 dB to 12.4 GHz, 1.0 dB to 18 GHz
20 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 10,20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz; 1.0 dB to 18 GHz; 30,40 dB: 0.75 dB to 6 GHz; 1.0 dB to 12.4 GHz; 1.5 dB to 18 GHz
25 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 7-20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz, 1.0 dB to 18 GHz; 21-30 dB: 0.75 dB to 6 GHz; 1.0 dB to 12.4 GHz, 1.25 dB to 18 GHz; 31-40 dB: 1.0 dB to 6 GHz, 1.25 dB to 12.4 GHz, 1.5 dB to 18 GHz
50 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 7-20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz, 1.0 dB to 18 GHz; 21-30 dB: 0.75 dB to 6 GHz; 1.0 dB to 12.4 GHz, 1.25 dB to 18 GHz; 31-40 dB: 1.0 dB to 6 GHz, 1.25 dB to 12.4 GHz, 1.5 dB to 18 GHz
100 watts	1-10 dB: 0.5 dB; 20-40 dB: 0.75 dB
250 watts	3-6 dB: 0.5 dB to 2.5 GHz, 0.75 dB to 4 GHz; 10-40 dB: 0.75 to 1.5 GHz; 1.5 dB to 4 GHz
TNC	
5 watts	DC-18 GHz: 0-6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB; 31-40 dB: 1.5 dB
10 watts	0-6 dB: 0.3 dB to 12.4 GHz, 0.5 dB to 18 GHz; 7-20 dB: 0.5 dB to 12.4 GHz, 0.7 dB to 18 GHz; 21-40 dB: 0.7 dB to 12.4 GHz, 1.0 dB to 18 GHz
20, 25 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 10,20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz, 1.0 dB to 18 GHz; 30,40 dB: 0.75 dB to 6 GHz, 1.0 dB to 12.4 GHz, 1.5 dB to 18 GHz
50 watts	3-6 dB: 0.3 dB to 6 GHz, 0.5 dB to 12.4 GHz, 0.75 dB to 18 GHz; 7-20 dB: 0.5 dB to 6 GHz, 0.75 dB to 12.4 GHz, 1.0 dB to 18 GHz; 21-30 dB: 0.75 dB to 6 GHz; 1.0 dB to 12.4 GHz, 1.25 dB to 18 GHz; 31-40 dB: 1.0 dB to 6 GHz, 1.25 dB to 12.4 GHz, 1.5 dB to 18 GHz
100 watts	1-10 dB: 0.5 dB; 20-40 dB: 0.75 dB
250 watts	3-6 dB: 0.5 dB to 1.5 GHz, 0.75 dB to 2.5 GHz; 10-40 dB: .75 dB to 1.5 GHz, 1.5 dB to 2.5 GHz
BNC	
5 watts	1-6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB; 31-40 dB: 1.5 dB; 41-60 dB: DC-1 GHz: 3%; 1-4 GHz: 4%
10 watts	DC- 1 GHz: 0.6 dB; 1-4 GHz: 1.0 dB; 41-60 dB: DC-1 GHz: 3%; 1-4 GHz: 4%
20 watts	3-6 dB: 0.3 dB; 10,20 dB: 0.5 dB; 30,40 dB: 0.75 dB
7/16 DIN	
5, 10 watts	0-6 dB: 0.3 dB: 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB
20 watts	3,6 dB: 0.3 dB; 10 dB: 0.5 dB; 20 dB: 0.75 dB; 30 dB: 1.0 dB
25, 50 watts	3-6 dB: 0.3 dB; 7-20 dB: 0.75 dB; 21-30 dB: 1.0 dB; 31-40 dB: 1.25 dB
100 watts	3-10 dB: 0.5 dB; 20-40 dB: 0.75 dB
250 watts	3-6 dB: 0.5 dB to 2.5 GHz, 0.75 dB to 4 GHz; 10-40 dB: 0.75 dB to 1.5 GHz; 1.0 dB to 2.5 GHz; 1.5 dB to 4 GHz

Medium & High Power Attenuator Outlines

New Products



High Frequency and Specialty Fixed Attenuators

DC to 50 GHz Coverage

Features

- Frequency Range Options
- 2.4 mm to 50 GHz
- 2.9 mm to 40 GHz
- 75 Ω F Series to 3 GHz
- Low and High Frequency SMP
- 75 Ω Type N to 4 GHz

MIDISCO

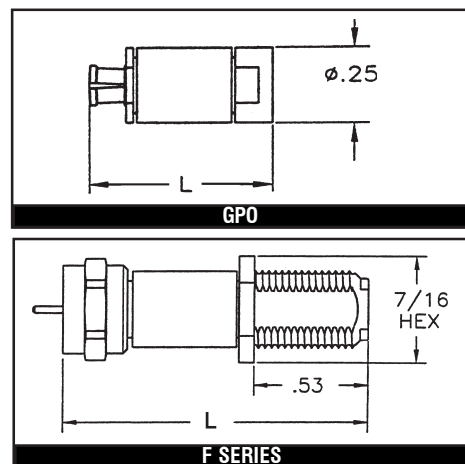
tracks the market to assess customers' needs on an ongoing basis. The attenuators offered here are a result of this. We recognize increases in coaxial component operating frequencies, as well as the activity in the 75 Ω wireless and cellular arena. The SMP's listed are all the full detent type. Limited detent is also available. The SMP series attenuators are electrically and mechanically compatible with the GPO series (GPO is a registered trademark of Corning Gilbert Corporation).

Specifications (All parts listed are Male to Female, Double Male or Female Available, add suffix "M" or "F" to Model No.)

Model No.	Frequency (GHz)	VSWR Vs Frequency GHz (Max.)	Available Values (dB)	Power (Watts)	Length (in.)
2.4 mm					
MDC9096-dB	DC-50	DC-26.5: 1.35:1; 26.5-40: 1.60:1; 40-50: 1.75:1	0, 3, 6, 10, 20, 30	1	1.12
MDC9095-dB	DC-40	DC-26.5: 1.35:1; 26.5-40: 1.60:1	0, 3, 6, 10, 20, 30	1	1.12
2.92 mm					
MDC8095X-dB	DC-40	1.40:1	0, 3, 6, 10, 20, 30	2	0.86 (>20 dB: 0.99)
MDC8095-dB	DC-26.5	DC-18: 1.30:1; 18-26.5: 1.40:1	0, 3, 6, 10, 20, 30	2	0.86 (0-20 dB); 0.99 (30 dB)
SMP (Compatible with GPO)					
MDC9991-dB	DC-26.5	DC-8: 1.25:1; 8-18: 1.35:1; 18-26.5: 1.40:1	1, 2, 3, 6, 10, 20, 30	1	0.62 (>12 dB: 0.75)
MDC9992-dB	DC-18	DC-8: 1.25:1; 8-18: 1.35:1	1-12, 20, 30	1	0.62 (>12 dB: 0.75)
MDC9993-dB	DC-12	1.35:1	1-12, 20, 30	1	0.62 (>12 dB: 0.75)
MDC9994-dB	DC-6	1.25:1	1-12, 20, 30	1	0.62 (>12 dB: 0.75)
F Series					
MDC8009-dB	DC-3	1.15:1	3, 6, 10, 15, 20, 30	2	1.48
MDC8010-dB	DC-2	DC-1: 1.30:1; 1-2: 1.40:1	1-20	1	2.38
MDC8011-dB	DC-1.45	DC-0.5: 1.20:1; 0.5-1: 1.30:1; 1-1.45: 1.40:1	3, 6, 10, 15, 20, 30	1	2.19
MDC8008-dB	DC-3	DC-1.3: 1.12:1; 1.3-3: 1.30:1	3-10	0.5	2.53
N, 75 Ω					
MDC1110NX75-dB	DC-4	1.30:1	1, 2, 3, 6, 10, 20, 30	2	1.80
MDC1110N75-dB	DC-2	DC-0.5: 1.20:1; 0.5-1: 1.30:1	1-20	1	2.50
200 Volt DC Blocking Attenuators (Unidirectional, Input is marked)					
MDC1110NDC-dB	.01-2 (Type N)	1.15:1	0-10, 12, 15, 20	2	2.04 MAX.
MDC1110TDC-dB	.01-2 (TNC)	1.15:1	0-10, 12, 15, 20	2	2.38
MDC1012DC-dB	.01-2 (SMA)	1.15:1	0-10, 12, 15, 20	2	1.20 MAX.
MDC8010DC-dB	.01-2 (Type F)	1.15:1	0-10, 12, 15, 20	2	1.50

Attenuator Accuracy ($\pm$ dB):

2.4 mm Series	≤ 10 dB: 0.5 dB to 26.5 GHz; 1.0 dB to 40 GHz; 1.5 dB to 50 GHz 10-30 dB: 0.75 dB to 26.5 GHz; 1.25 dB to 40 GHz; 2.0 dB to 50 GHz
2.92 mm Series	MDC8095: 0, 3, 6 dB: 0.5 dB; 10-20 dB: 0.6 dB; 30 dB: 1.0 dB. MDC8095X: DC-26.5 GHz: Same as MDC8095 above; 26.5-40 GHz: 0, 3, 6 dB: 0.8 dB; 10, 20, 30 dB: 1.0 dB
SMP Series	≤ 6 dB: 0.4 to 26.5 GHz; ≈ 12 dB: 0.6 dB to 26.5 GHz; 10, 20, 30 dB: 0.8 dB to 26.5 GHz;
F Series (MDC8011 = 5%)	≤ 6 dB: 0.3 dB to 1 GHz; 0.5 dB to 3 GHz 10, 15 dB: 0.5 dB to 1 GHz; 0.75 dB to 3 GHz 20, 30 dB: 0.5 dB to 1 GHz; 1 dB to 3 GHz
Type N, 75 Ω	DC-4 GHz: ≤ 6 dB: 0.4 dB; 10, 20 dB: 0.6 dB; 30 dB: 0.8 dB DC-0.5 GHz: 0.3 dB; 0.5-1 GHz: 0.5 dB



Continuously Variable Attenuators

Broadband, Octave Bandwidths to 18 GHz

Features

- Frequency Range Options to 18 GHz
- 50 Ohm impedance
- 5W Average, 3KW Peak Power
- -65° to +125°C Operation
- Screwdriver or Counting Dial Adjustment

MIDISCO's Series of Continuously Variable Attenuators (CVA's) allow the user to quickly and accurately adjust the system signal level as required. Both the Screwdriver Adjust and the Turns Counting Dial feature a locking device to hold settings for long periods of time. Either type can be panel or surface mounted at the next higher assembly level.

New Products

Model	Frequency	Min. Atten.	Max. Loss	Max. VSWR
MDC2013-10-*	1-2 GHz **	7 dB	0.50 dB	2.0:1
MDC2014-10-*	2-4 GHz	10 dB	0.50 dB	1.8:1
MDC2014-20-*	2-4 GHz **	20 dB	0.50 dB	1.5:1
MDC2015-10-*	4-8 GHz	10 dB	0.75 dB	1.5:1
MDC2015-20-*	4-8 GHz	20 dB	0.75 dB	1.5:1
MDC2015-30-*	4-8 GHz **	30 dB	0.75 dB	1.5:1
MDC2016-10-*	8-12.4 GHz	10 dB	0.75 dB	1.7:1
MDC2016-20-*	8-12.4 GHz	20 dB	0.75 dB	1.7:1
MDC2016-30-*	8-12.4 GHz	30 dB	0.75 dB	1.7:1
MDC2016-40-*	8-12.4 GHz	40 dB	0.75 dB	1.7:1
MDC2019-10-*	12.4-18 GHz	10 dB	0.75 dB	1.8:1
MDC2019-20-*	12.4-18 GHz	20 dB	0.75 dB	1.8:1
MDC2019-30-*	12.4-18 GHz	30 dB	0.75 dB	1.8:1
MDC2019-40-*	12.4-18 GHz	40 dB	0.75 dB	1.8:1

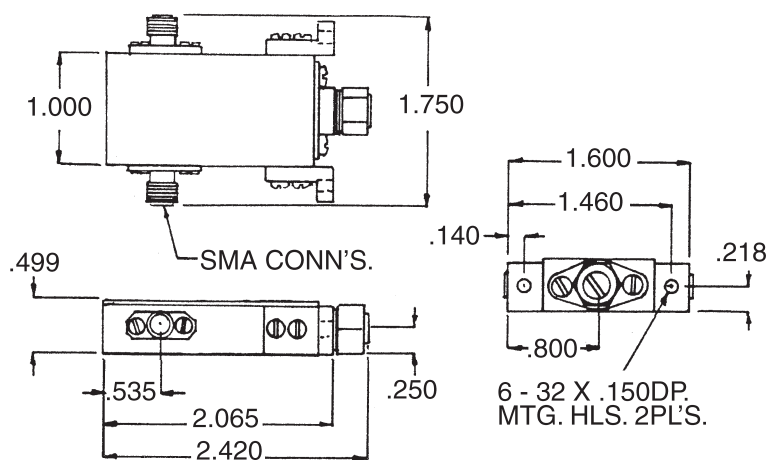
*: Add suffix below to part number for configuration required.

-1: Surface Mount -2: Panel Mount -3: Surface Mount & Counting Dial -4: Panel Mount & Counting Dial

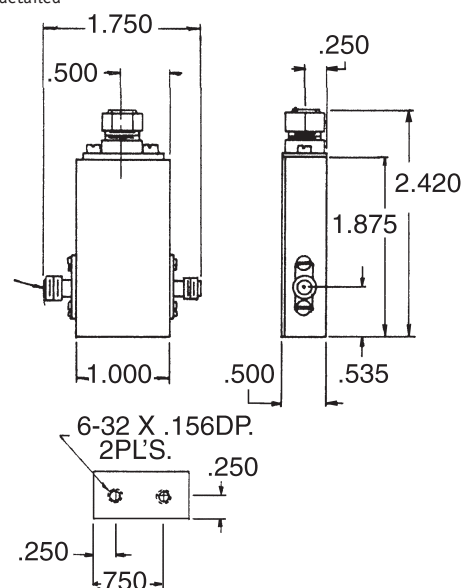
** : These units are larger by 0.350 width, and 0.240 length than shown in drawings.

Note: The performance of the CVA's with the Counting Dials is identical to what is shown. For more detailed information on mounting, consult factory.

Panel Mount



Surface Mount



Coaxial Attenuators

Unusual BNC , SMA, F, N Series Attenuators

New Products

Features

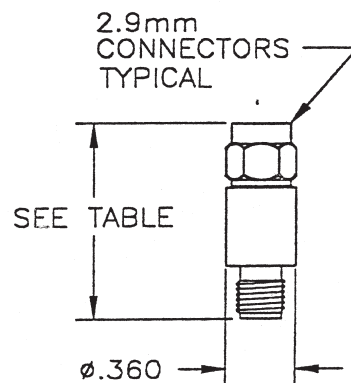
- 4 GHz, 12.4 GHz BNC's
- 18 GHz SMA flange mounted jacks
- 12.4 GHz SMA stripline jacks (MDC8055P)
- "DC Pass" F, N attenuators
- Attenuator Kits

This page groups some unusual MIDISCO coaxial attenuator types that are primarily a result of market tracking to assess customers' needs. We recognize increases in coaxial component operating frequencies, increased activity in the 75 Ω wireless and cellular arena, and other unique user needs.

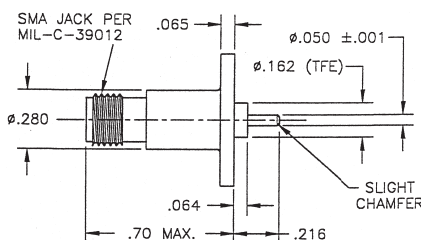
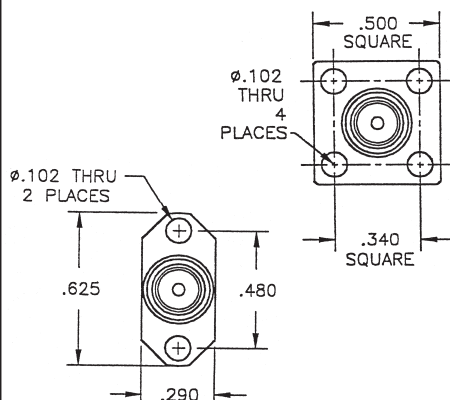
Model No.	Freq. (GHz)	VSWR Vs Frequency GHz (Max)	Available Values (dB)	Power (Watts)	Length (in.)
SMA					
MDC8065P-dB	DC-18	DC-8: 1.15; 8-12.4: 1.25; 12.4-18: 1.35	0-30 in 1 dB steps	2	1.12, 4-H Flange
MDC8065PM-dB	DC-18	DC-8: 1.15; 8-12.4: 1.25; 12.4-18: 1.35	0-30 in 1 dB steps	2	1.24, 4-H Flange
MDC8065PF-dB	DC-18	DC-8: 1.15; 8-12.4: 1.25; 12.4-18: 1.35	0-30 in 1 dB steps	2	0.990, 4-H Flange
MDC8055P/2-dB	DC-12.4	DC-4: 1.15; 4-12.4: 1.25	0-20 in 1 dB steps	1	0.70, 2-hole Flange
MDC8055P/4-dB	DC-12.4	DC-4: 1.15; 4-12.4: 1.25	0-20 in 1 dB steps	1	0.70, 4-hole Flange
50 OHM BNC					
MDC1110BX-dB	DC-4	1.25:1 max.	0-30 in 1 dB steps	2	1.36
MDC1110BHF-dB	DC-12.4	DC-4: 1.25; 4-8: 1.30; 8-12.4: 1.35	1-30 in 1 dB steps	2	1.65
75 OHM BNC					
MDC1110BX75-dB	DC-2.2	DC-0.5: 1.2; 0.5-1: 1.3; 1-2.2: 1.4	1-20 in 1 dB steps	1	1.93
MDC1110BHF75-dB	DC-4	DC-1: 1.10; 1-2: 1.20; 2-4: 1.35	0-30 in 1 dB steps	2	1.36
N SERIES (DC Pass, RF is AC Coupled)					
MDC1110NDC-dB	0.6-1.9	1.3:1 MAX.	3-20 in 1 dB steps	+21dBm RF, 4 amp. DC, 150 VDC	2.8
TYPE N ATTENUATOR KIT (WITH MOLDED STORAGE CASE)					
MDC5078S-KIT (See Note 1)	DC-18	DC-4: 1.15; 4-8: 1.20:1; 8-12.4: 1.25; 12.4-18: 1.35	1-20 in 1 dB steps, 30,40,50,and 60 dB	5	L=2.04, DIA. = 0.62
F SERIES (DC Pass, RF is AC Coupled)					
MDC8011DC-dB	0.45-2	1.4:1 MAX.	3-20 in 1 dB steps	1 Watt RF, 50 VDC	2.53
ATTENUATOR ACCURACY (dB)					
SMA SERIES	=/ $\leq$ 6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB				
50 OHM BNC	DC-4GHz: MDC1110BX-dB: =/ $\leq$ 6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB DC-12.4 GHz: MDC1110BHF-dB: =/ $\leq$ 6 dB: 0.4 dB; 7-30 dB: 0.8 dB				
75 OHM BNC	DC-2 GHz: MDC1110BX75-dB: 0.3 dB to 1 GHz; 0.5 dB or 5% (whichever is greater) from 1-2 GHz DC-4 GHz: MDC1110BHF75-dB: =/ $\leq$ 6 dB: 0.3 dB; 7-20 dB: 0.5 dB; 21-30 dB: 0.75 dB				
TYPE N, DC PASS	+/- 0.25 dB, all values, full band.				
TYPE F, DC PASS	+/- 0.5 dB , all values, full band.				
TYPE N KIT	1, 2 dB: 0.4 dB; 3-9 dB: 0.3 dB; 10-20 dB: 0.5 dB; 30,40 dB: 1.0 dB; 50 dB: 1.25 dB; 60 dB: 1.5 dB.				

Notes:

1. The Basic Kit contains 10 attenuators: 1 each of 1, 2, 3, and 6-dB values; and 2 each of 10, 15, and 30-dB values. User may specify any combination of values or frequency in any quantity to personalize a kit. Contact factory about mixing connector series as well. Case size varies with contents. Basic case size is 8.5" x 6.0" x 2.5" for up to 12 type N attenuators.
2. The figures on the next page summarize the outline drawings for the parts described above.
3. Attenuators without an M or F suffix on model number are male to female. Models with an M or F suffix are double male or double female, respectively. The MDC8055P series are stripline jacks.

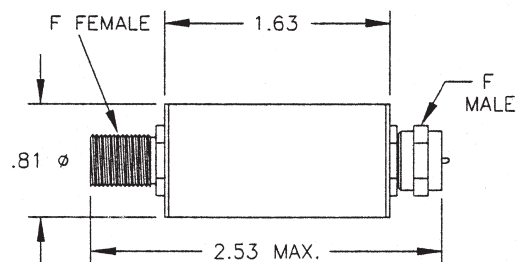
**MDC9096-dB and MDC9096X-dB**

ALL 2.9 mm ATTENUATORS

**MDC8065P-dB**

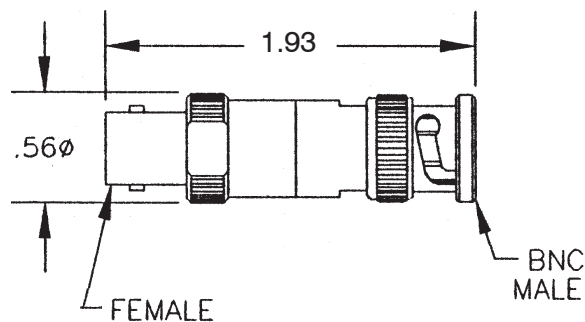
4-HOLE FLANGE AND 2-HOLE FLANGE

MDC8055P/2-dB and MDC8055P/4-dB



MDC110NDC-dB

MDC8011DC-dB



MDC1110BX-dB, MDC1110BHF-dB, MDC1110BHF75-dB

MDC1110BX75-dB

New Products

Medium & High Power Terminations

5 to 300 Watts Available

Features

- Low VSWR Designs
- -65° C to +125° C Operation
- Conservative Derating
- SMA, N, and TNC to 18 GHz @ 50 watts.
- 7/16 DIN to 150 watts
- 300 watt units (not shown) are available in most series.

MIDISCO

has greatly expanded its standard line of medium and high power coaxial terminations to service new designs and upgrades to existing ones. MIDISCO terminations have applications in EW, Communication, PCS and Cellular systems, and find widespread use in test laboratories. All the standard connector series are available, including 7/16 DIN, Type N, SMA, TNC, and 2.9 mm. SMA, type N and TNC terminations are readily available to 50 watts @ 18 GHz. Consult factory for additional options and 300 watt termination information.

New Products

Model No.	Frequency (GHz)	VSWR Note 1	Power (Watts)	Figure	Length
SMA					
MDC1171SM	18	1.25:1	10	1	1.395
MDC1171SF	18	1.25:1	10	1	1.265
MDC1195SM	12.4	1.20:1	10	1	1.395
MDC1195SF	12.4	1.20:1	10	1	1.265
MDC1161SM	6	1.15:1	10	1	1.395
MDC1161SF	6	1.15:1	10	1	1.265
MDC1164SM	18	1.25:1	25	2	3.485
MDC1164SF	18	1.25:1	25	2	3.355
MDC1163SM	12.4	1.20:1	25	2	3.485
MDC1163SF	12.4	1.20:1	25	2	3.355
MDC1162SM	6	1.15:1	25	2	3.485
MDC1162SF	6	1.15:1	25	2	3.355
MDC1176SM	18	1.25:1	50	3	3.485
MDC1176SF	18	1.25:1	50	3	3.335
MDC1173SM	12.4	1.20:1	50	3	3.485
MDC1173SF	12.4	1.20:1	50	3	3.335
MDC1172SM	6	1.15:1	50	3	3.485
MDC1172SF	6	1.15:1	50	3	3.335
MDC1168SM	18	1.25:1	50	8	Note 2
MDC1168SF	18	1.25:1	50	8	Note 2
MDC1165SM	1.5	1.15:1	100	4	5.375
MDC1165SF	1.5	1.15:1	100	4	5.245
MDC1166SM	6	1.35:1	100	4	5.375
MDC1166SF	6	1.35:1	100	4	5.245
TYPE N					
MDC1171NM	18	1.35:1	10	1	1.64
MDC1171NF	18	1.35:1	10	1	1.72
MDC1195NM	12.4	1.20:1	10	1	1.64
MDC1195NF	12.4	1.20:1	10	1	1.72
MDC1161NM	6	1.15:1	10	1	1.64
MDC1161NF	6	1.15:1	10	1	1.72
MDC1164NM	18	1.25:1	25	2	3.735
MDC1164NF	18	1.25:1	25	2	3.81
MDC1163NM	12.4	1.20:1	25	2	3.735
MDC1163NF	12.4	1.20:1	25	2	3.81
MDC1162NM	6	1.15:1	25	2	3.735
MDC1162NF	6	1.15:1	25	2	3.81
MDC1176NM	18	1.25:1	50	3	3.735
MDC1176NF	18	1.25:1	50	3	3.81
MDC1173NM	12.4	1.20:1	50	3	3.735
MDC1173NF	12.4	1.20:1	50	3	3.81
MDC1172NM	6	1.15:1	50	3	3.735
MDC1172NF	6	1.15:1	50	3	3.81
MDC1165NM	1.5	1.15:1	100	4	5.62

Chart and figures continue on next two pages

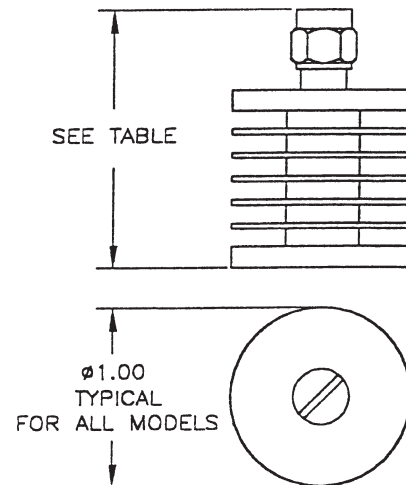


FIGURE 1
MDC1171SM - 10 WATT SHOWN

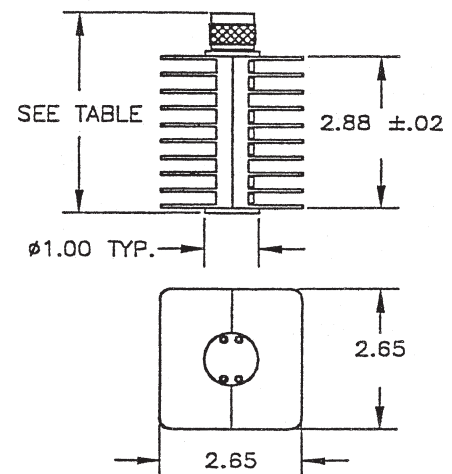


FIGURE 2
MDC1164SM - 25 WATT SHOWN

Medium & High Power Terminations (cont.)

Model No.	Frequency (GHz)	VSWR Note 1	Power (Watts)	Figure	Length
TYPE N (cont.)					
MDC1165NF	1.5	1.15:1	100	4	5.70
MDC1166NM	6	1.35:1	100	4	5.62
MDC1166NF	6	1.35:1	100	4	5.70
MDC1167NM	3	1.30:1	300	5	7.63
MDC1167NF	3	1.30:1	300	5	7.71
TNC					
MDC1171TM	18	1.25:1	10	1	1.72
MDC1171TF	18	1.25:1	10	1	1.81
MDC1195TM	12.4	1.20:1	10	1	1.72
MDC1195TF	12.4	1.20:1	10	1	1.81
MDC1161TM	6	1.15:1	10	1	1.72
MDC1161TF	6	1.15:1	10	1	1.81
MDC1164TM	18	1.25:1	25	2	3.81
MDC1164TF	18	1.25:1	25	2	3.905
MDC1163TM	12.4	1.20:1	25	2	3.81
MDC1163TF	12.4	1.20:1	25	2	3.905
MDC1162TM	6	1.15:1	25	2	3.81
MDC1162TF	6	1.15:1	25	2	3.905
MDC1176TM	18	1.25:1	50	3	3.81
MDC1176TF	18	1.25:1	50	3	3.905
MDC1173TM	12.4	1.20:1	50	3	3.81
MDC1173TF	12.4	1.20:1	50	3	3.905
MDC1174TM	6	1.15:1	50	3	3.81
MDC1174TF	6	1.15:1	50	3	3.905
MDC1165TM	6	1.35:1	100	4	5.70
MDC1165TF	6	1.35:1	100	4	5.79
MDC1166TM	4	1.35:1	100	4	5.70
MDC1166TF	4	1.35:1	100	4	5.79
2.9 mm					
MDC1129M-5	26.5	1.45:1	5	6	0.81
MDC1129F-5	26.5	1.45:1	5	6	0.765
BNC					
MDC1166BM	1.2	1.20:1	30	Note 3	2.87
MDC1166BF	1.2	1.20:1	30	Note 3	2.95
MDC1165BM	1.5	1.15:1	100	7	5.81
MDC1165BF	1.5	1.15:1	100	7	5.70
MDC1165ABM	2.5	1.20:1	100	7	5.81
MDC1165ABF	2.5	1.20:1	100	7	5.70
MDC1165BBM	3	1.30:1	100	7	5.81
MDC1165BBF	3	1.20:1	100	7	5.70
7/16 DIN					
MDCDIN7M-10	7.5	1.25:1	10	9	2.14
MDCDIN7F-10	7.5	1.25:1	10	9	2.28
MDCDIN7M-20	7.5	1.25:1	20	10	2.78
MDCDIN7F-20	7.5	1.25:1	20	10	2.92
MDCDIN7M-25	7.5	1.25:1	25	11	4.25
MDCDIN7F-25	7.5	1.25:1	25	11	4.39
MDCDIN7M-50	7.5	1.25:1	50	11	4.25
MDCDIN7F-50	7.5	1.25:1	50	11	4.39
MDCDIN7M-100	2.5	1.25:1	100	12	4.25
MDCDIN7F-100	2.5	1.25:1	100	12	4.39
MDCDIN7MX-100	6	1.35:1	100	12	4.25
MDCDIN7FX-100	6	1.35:1	100	12	4.39

Figures continue on next page

Notes:

1. Entry is maximum VSWR @ maximum frequency.
2. Conduction Cooled: Case temperature must be $\leq 85^{\circ}\text{C}$
3. Similar to figure 1, except diameter = $\varnothing 1.50$ "
4. 300 watt units are available in SMA, type N, TNC, BNC, and 7/16.
5. 100 Watt terminations are also available in cost-effective, application-specific upper frequency limits of 2, 3, and 4 GHz.

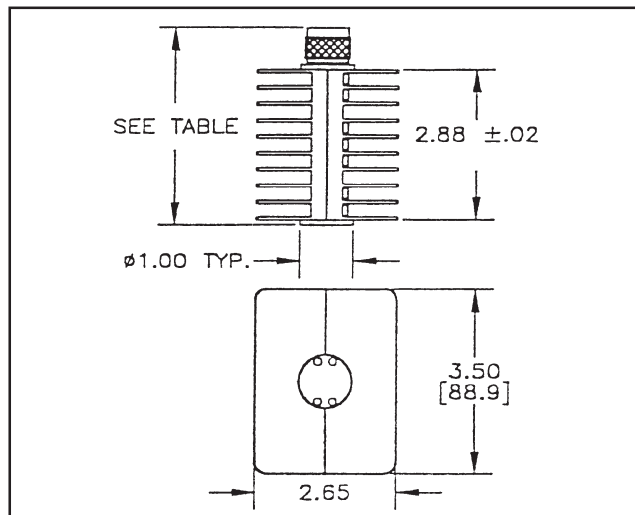
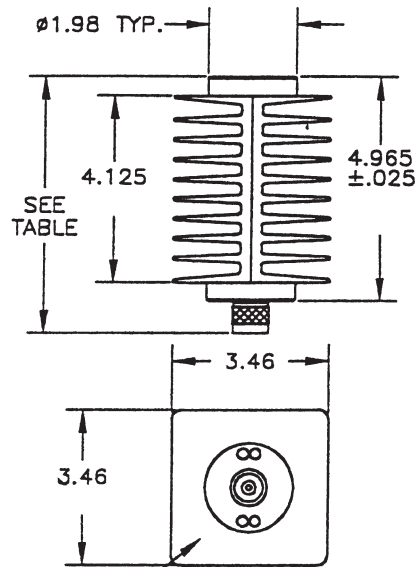


FIGURE 3 - MDC1176SM SHOWN



CUSTOM MOUNTING HOLE CONFIGURATIONS MAY BE ADDED TO THIS SURFACE TO YOUR REQUIREMENTS.

FIGURE 4 - MDC1165SM SHOWN

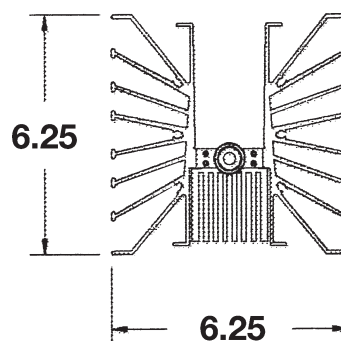


FIGURE 5A - MDC1167NM

New Products

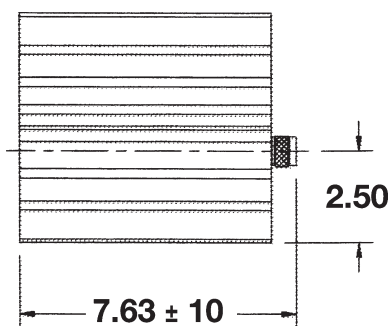


FIGURE 5B - MDC11167NM

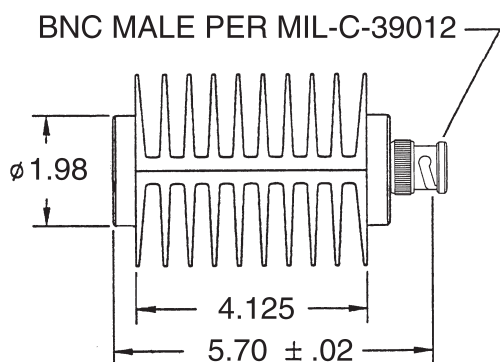


FIGURE 7 - MDC1165BM SHOWN

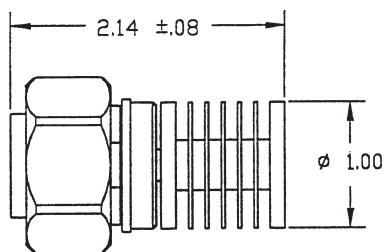


FIGURE 9 - MDCDIN7M-10 SHOWN

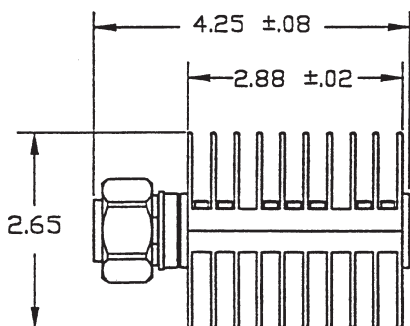


FIGURE 11 - MDCDIN7M-50 SHOWN

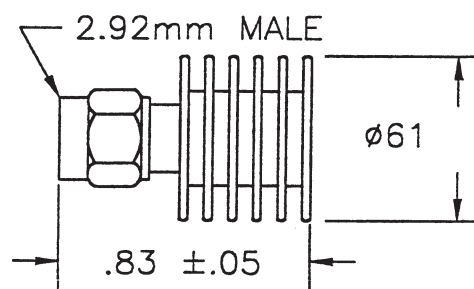


FIGURE 6 - MDC1091MX/2.9 SHOWN

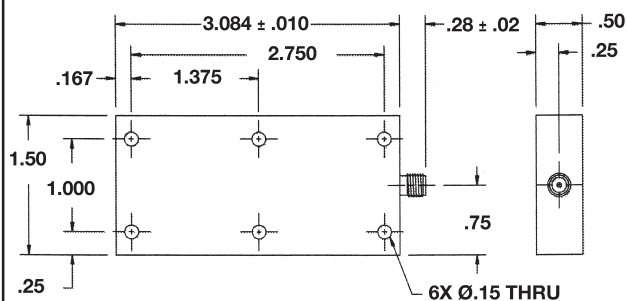


FIGURE 8 - MDC1168SM SHOWN

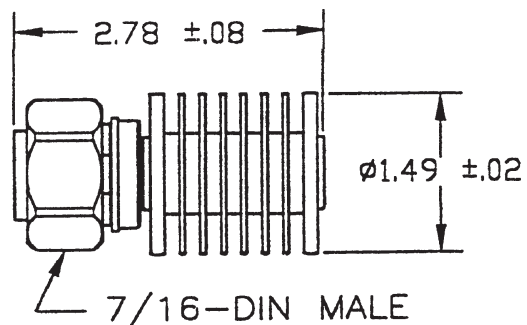


FIGURE 10 - MDCDIN7M-20 SHOWN

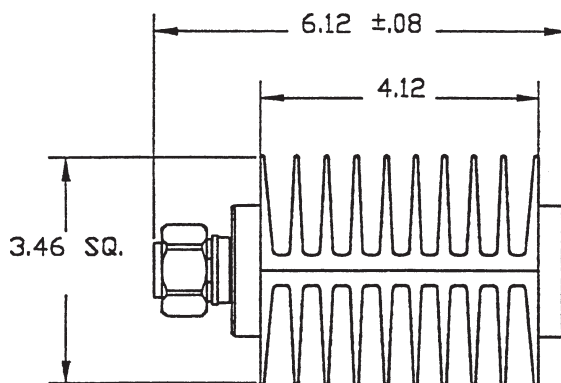


FIGURE 12 - MDCDIN7M-100 SHOWN

TTL-Compatible PIN Diode Switches

0.01 - 18 GHz Frequency Range

Features

- .01 to 18 GHz Frequency Range
- TTL-Compatible
- 100 to 250 nsec. Switching Speed
- Hi-Rel Screening Available
- SMA Female Connectors Standard (Drop-ins Available)
- Reflective and Absorptive Units
- SPST to SP5T Available

MIDISCO TTL compatible switches have widespread applications in EW and Communications Systems as well as in Automated Test Equipment. The SPDT switches shown here is only a partial listing of our cost-effective narrow-band and high-performance broadband designs. Other frequency ranges to 26 GHz and reversed logic available. TTL Drivers operate from +5V, and -15 +/- 3V power supplies. All switches are DC blocked on the RF ports. Epoxy-sealed and hermetically sealed options screened to MIL-STD-883 are available.

New Products

Frequency (GHz)	ABSORPTIVE SWITCHES				REFLECTIVE SWITCHES			COMMON SPECIFICATIONS	
	Model Number	Loss (dB) max.	VSWR (max.)	Isolation (min.)	Loss (dB) max.	VSWR (max.)	Isolation (min.)	Switching Speed (nsec.)	Max. RF (Watts CW)
0.01-0.5	MDC3037-1	1.0	1.5	80	0.9	1.5	75	250	2.0
0.01-2.0	MDC3037-2	1.9	1.6	80	1.8	1.6	75	250	2.0
0.01-4.0	MDC3037-3	2.7	1.8	80	2.6	1.8	75	250	2.0
0.1-1.0	MDC3037-4	1.3	1.5	80	1.2	1.5	80	250	2.0
0.1-4.0	MDC3037-5	2.7	1.8	80	2.6	1.8	75	250	2.0
0.5-2.0	MDC3037-6	1.5	1.6	80	1.4	1.6	80	100	2.0
0.5-4.0	MDC3037-7	2.1	1.8	80	2.0	1.8	75	100	2.0
1.0-4.0	MDC3037-8	1.3	1.6	85	1.2	1.6	80	100	2.0
1.0-8.0	MDC3037-9	2.0	1.8	80	1.9	1.8	75	100	2.0
1.0-18.0	MDC3037-10	3.1	2.0	65	2.9	2.0	60	100	0.5
2.0-4.0	MDC3037-11	1.2	1.6	75	1.1	1.6	70	100	2.0
2.0-8.0	MDC3037-12	1.9	1.8	75	1.8	1.8	70	100	1.0
2.0-12.0	MDC3037-13	2.2	1.9	70	2.1	1.8	65	100	1.0
2.0-18.0	MDC3037-14	3.1	2.0	65	2.9	2.0	60	100	0.5
4.0-8.0	MDC3037-15	1.9	1.6	75	1.7	1.6	70	100	1.0
4.0-12.0	MDC3037-16	2.2	1.8	70	2.0	1.8	65	100	1.0
4.0-18.0	MDC3037-17	3.0	2.0	65	2.8	2.0	60	100	0.5
6.0-12.0	MDC3037-18	2.2	1.8	70	2.0	1.8	65	100	1.0
6.0-18.0	MDC3037-19	3.0	2.0	65	2.8	2.0	60	100	0.5
8.0-18.0	MDC3037-20	3.0	2.0	65	2.8	2.0	60	100	0.5

Common Specifications: +5V @ 80 ma. max., -15 +/- 3V @ 50 ma. max. TTL logic "0" = Low loss. TTL logic "1" = Isolation.

Model Number Construction

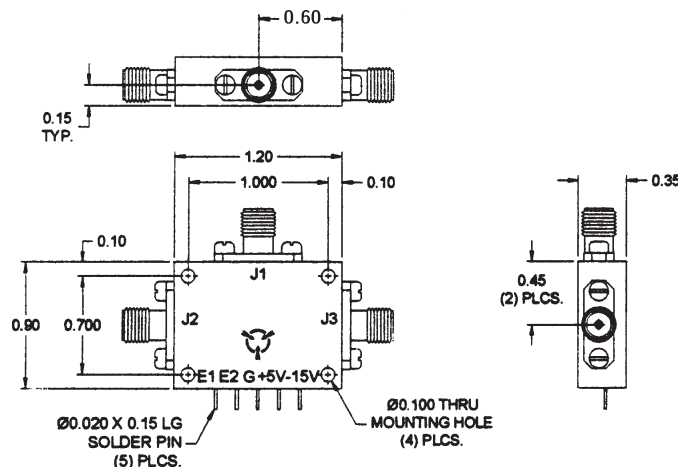
MDC3037X-(*)-(**)

(*): Insert -1 through -20 as shown in table above for frequency required.

X: Substitute R for X for reflective switch. Leave blank for absorptive switch.

(**): Add suffix -1, -3, -4, or -5 for SPST, SP3T, SP4T, or SP5T respectively. No suffix is required for SPDT.

ie: A SP3T reflective switch for 2-8 GHz is a MDC3037R-12-3.
A SP2T absorptive switch operating over the same frequency range is an MDC3037-12.



Coaxial Cable Delay Lines

Fabricated Using stable Copper or Aluminum Semi-rigid Cable

Features

- +/-0.5 nanoseconds standard tolerance
- +/-20 picoseconds tolerance on special order
- Copper or aluminum jackets (aluminum 40% lighter)
- Cable size based on customer insertion loss and power handling requirements
- Specialists in customizing units to user requirements

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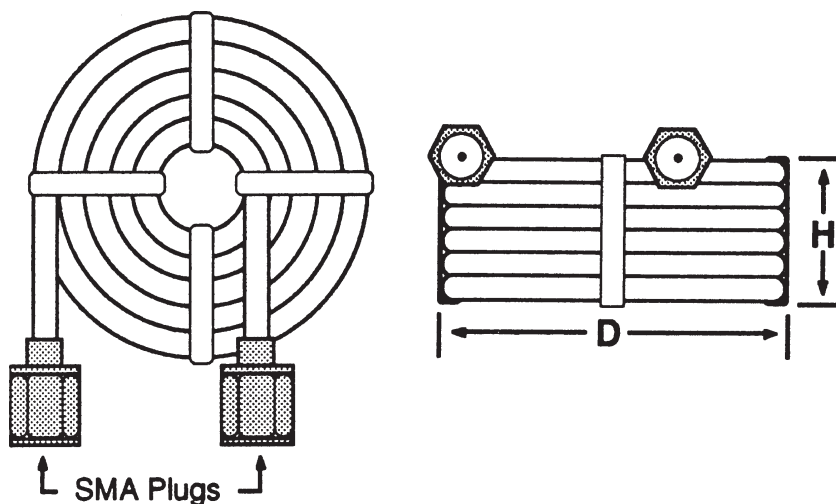
has a line of standard Delay Lines with a short delivery time that can service many customer applications. They include delays of 5, 10, 25, 50 and 100 nanoseconds, using 0.086, 0.141 or 0.250 semi-rigid cable. Larger cable diameters decrease insertion loss, and increase average power handling capability. We also produce Delay Lines to exacting customer requirements.

New Products

Model Number*	Cable Size	Delay (+/- 0.5 ns)	Max. Dimensions (HXD)	Max. Weight (oz)
MDC086DL5	0.086	5	0.19 X 2.57	3.5
MDC086DL10	0.086	10	0.38 X 2.57	4.5
MDC086DL25	0.086	25	1.42 X 2.38	7.2
MDC086DL50	0.086	50	1.32 X 2.76	11.7
MDC086DL100	0.086	100	1.70 X 3.14	19.5
MDC141DL5	0.141	5	0.45 X 2.60	4.8
MDC141DL10	0.141	10	0.90 X 2.60	6.7
MDC141DL25	0.141	25	1.35 X 2.90	12.8
MDC141DL50	0.141	50	1.95 X 3.20	23.0
MDC141DL100	0.141	100	3.00 X 3.50	44.0
MDC250DL5	0.250	5	1.65 X 2.55	8.8
MDC250DL10	0.250	10	1.65 X 3.10	14.4
MDC250DL25	0.250	25	2.20 X 3.65	32.0
MDC250DL50	0.250	50	3.03 X 4.20	61.6
MDC250DL100	0.250	100	3.58 X 5.30	120.0

*:Standard cable jacket is copper. Add "AL" to part number for aluminum.

Standard Delay Configuration



Double, Triple Balanced Mixers

Narrow Band Broadband to 18 GHz

Features

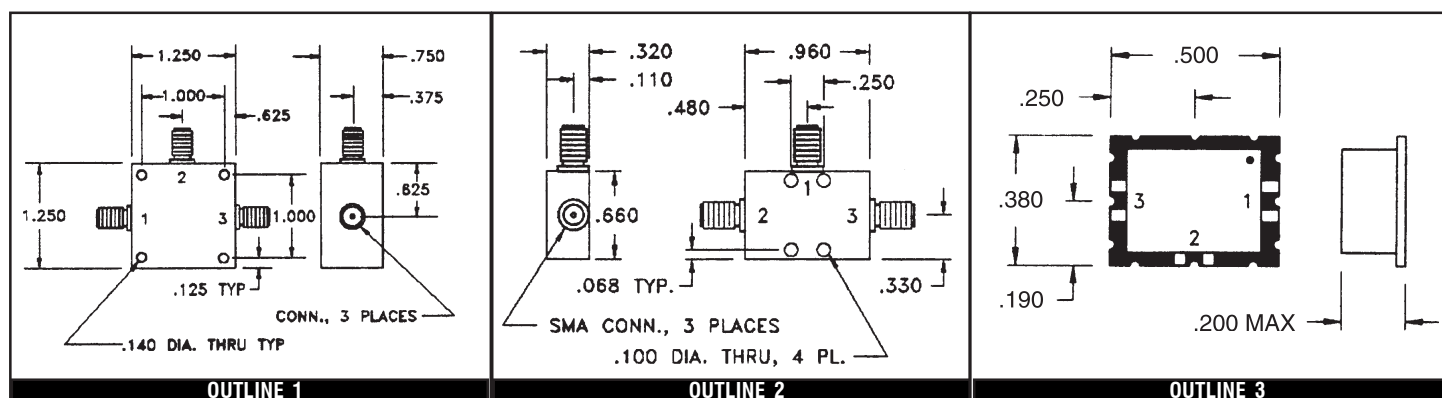
- 2-18 GHz in a Single Model
- AC, DC coupled IF's
- Double, Triple Balanced Designs
- Image Reject Mixers Available
- High Intercept Point Mixers
- Field Replaceable Connectors
- Optimized, Application Specific Units
- SMA connectors are standard
- Phase Detector, Attenuator Applications

MIDISCO High Performance Mixers feature double balanced mixers for cost-effective performance and triple balanced units to provide superior third order (IP³) intercept performance. Double balanced mixers are available to cover RF and LO frequencies from 0.01 MHz to 18 GHz, in various bandwidths. Some have DC coupled output ports to support phase detector and attenuator applications. Many of MIDISCO's triple balanced devices are optimized to cover specific bands (Cellular, PCS, LAN), or to user specified requirements. Image Rejection mixers are also available. The MDC02274 series is also available with removable connectors. Shown below is only a sampling of our capability. Please consult the factory with your specific requirements.

New Products

Frequency GHz		LO Drive (dBm)	Conversion Loss (dB)	P (1 dB) (dBm)	L/R Isolation (dB)	L/I Isolation (dB)	Outline	Model Number
LO/RF	IF							
0.0005-3	.0005-2	+10	8.5 max	+5	25 min	25 min	1	MDC02301-1
0.0005-4.2	.0005-2	+13	10 max	+7	20 min	25 min	1	MDC02301-2
RF :0.87-0.97 LO: 0.80-0.90	70 +/- 2 MHz	+23	7 max	IP ³ : +33	30 min	26 min	3	MDC02300-1 (Cellular)
0.8 - 4	DC - 0.7	+7	9 max	+1	25 min	20 min	1	MDC00299
RF: 1.85-1.91 LO: 1.78-1.84	240 +/- 5 MHz	+17	8.5 max	IP ³ : +27	26 min	25 min	3	MDC02300-2 (PCS)
RF: 1.85-1.91 LO: 1.78-1.84	70 +/- 2 MHz	+23	8.3 max	IP ³ : +33	30 min	30 min	3	MDC02300-3 (PCS)
2 - 8	DC - 1 DC - 2	+17	6 typ/7.5 max 6.5 typ/8 max	+10	30 typ/25 min 30 typ/25 min	25 typ/20 min 25 typ/20 min	2	MDC02274-1
2 - 18	.005 - 1 .005 - 2 .005 - 4	+13	6.5 typ/8 max 7.5 typ/9 max 8 typ/9.5 max	+7	30 typ/20 min 30 typ/20 min 30 typ/20 min	30 typ/20 min 30 typ/20 min 30 typ/20 min	2	MDC02274-3
6-18	DC - 1 DC - 2	+13	6 typ/7.5 max. 6.5 typ/8 max	+7	25 typ/20 min 20 typ/20 min	20 min 20 min	2	MDC02274-2

Note: On units with DC coupled IF ports, the polarity is negative.



3.5 mm Phase Equal Adapter Kit

DC to 34 GHz Application

Features

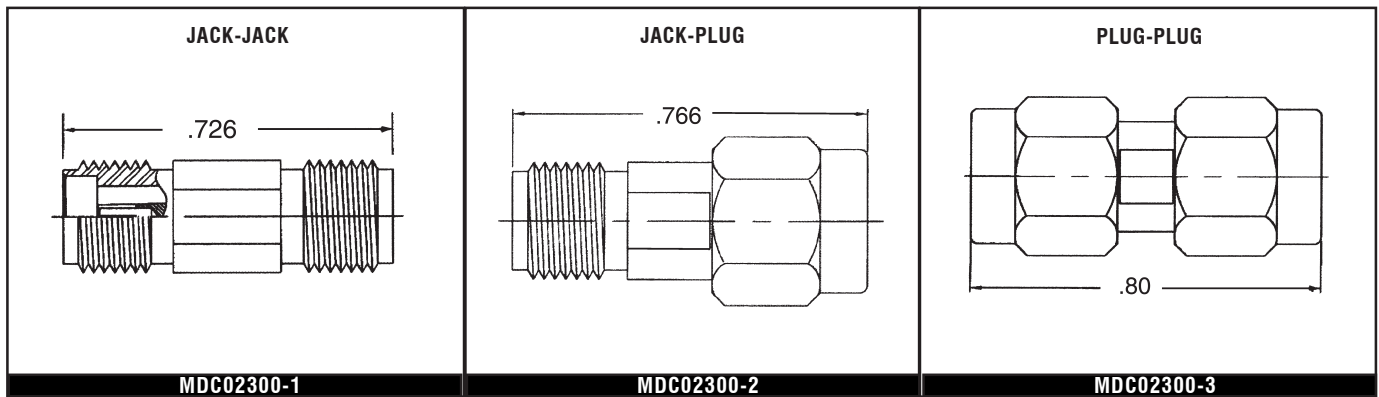
- 34 GHz Operation
- Low VSWR and Insertion Loss
- -55° C to +105° C Operation
- Replacement Adapters will not compromise kit integrity
- Kit supplied in foam-lined, zippered storage case
- 0.218" Wrench Flats

MIDISCO's 3.5 mm Phase Equal Adapter Kit consists of three 3.5 mm in-series adapters that have the same electrical insertion lengths. This allows them to be readily interchanged in test and measurement setups without significantly degrading system calibration. The adapters feature stainless steel bodies, and gold plated beryllium copper conductors. The female contacts use a 4-slot configuration to preclude misalignment when mating. Each kit is supplied in a foam lined, zippered storage case.

VSWR: 1.15 TO 18 GHz. 1.25 TO 34 GHz
INSERTION LOSS: <0.3 dB TO 34 GHz

KIT MODEL NUMBER

MDC02300



F Series Calibration Kit

DC to 3 GHz, Case Included

Features

- DC to 3 GHz Operation
- Kits can be user customized
- Replacement parts available separately
- Optional Carrying Case

The MIDISCO Calibration Kit is available in 3 basic options. The -1 kit contains a male open, short, and termination, while the -2 kit contains a female open, short, and termination. The -3 kit contains the contents of both the -1 and -2 kit. Kits can be user customized for quantities of existing components, or to add additional components such as 75Ω to 50Ω matching pads or transformers, and inter and intra series adapters.

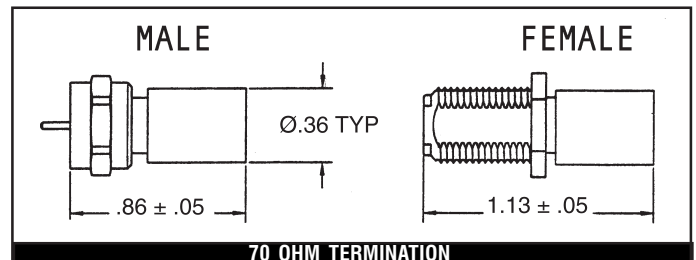
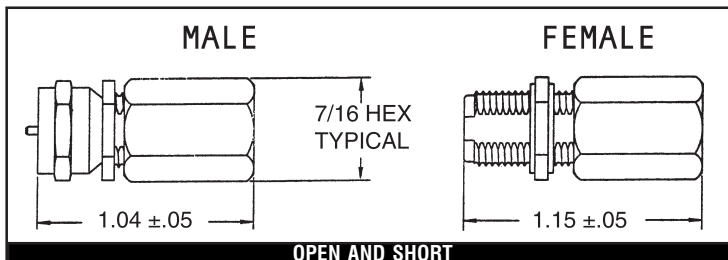
Nominal Impedance: 75 Ω
 VSWR: 1.10:1 TO 2 GHz, 1.20:1 TO 3 GHz.
 Average Power: 2 watts @ 25° C,
 derates linearly to 1 watt @ 125° C.

KIT MODELNUMBER

MDC99293-*

* Insert Dash No. for kit required.

MDC1045M Type F male Termination
MDC1045F Type F female Termination
MDC1125M-F Type F male Open Circuit
MDC1125F-F Type F female Open Circuit
MDC1025M-F Type F male Short
MDC1025F-F Type F female Short



Waveguide Terminations, Fixed Attenuators

DC to 40 GHz Applications

Termination Features

- WR650 to WR28 available
- Pressurized to 30 PSI
- Low VSWR (Suitable for test standard)
- Dummy Loads to 5000 W (WR430) and 4000 W (WR284, WR229)
- Stub Terminations for tight locations

MIDISCO

provides a wide assortment of Waveguide (W/G) components in addition to the adapters shown elsewhere. They are too numerous to include all data here, and include terminations, dummy loads, straight sections, transitions, mitered and swept 90° bends, directional couplers, pressure inlets, as well as fixed attenuators, and flexible W/G sections. Medium power terminations and dummy loads are shown. Both are available in low and high power as well. For information on components not shown, contact factory.

New Products

Medium Power Terminations, Dummy Loads (Frequency in GHz per EIA Designations)

Model No.	Frequency	W/G	Max. VSWR	CW Pwr	A Dim.	B Dim.	C Dim.	D Dim.
T-X-650-M (1)	1.12-1.17	WR650	1.05	50 W	15	NA	NA	NA
T-X-430-M (1)	1.7-2.6	WR430	1.07	30 W	12	NA	NA	NA
T-X-284-M	2.6-3.95	WR284	1.07	30 W	11	NA	NA	NA
T-X-229-M	3.3-4.9	WR229	1.07	30 W	8	NA	NA	NA
T-X-187-M	3.95-5.85	WR187	1.07	30 W	7	NA	NA	NA
T-X-159-M	4.9-7.05	WR159	1.07	30 W	6	NA	NA	NA
T-X-137-M	5.85-8.2	WR137	1.07	30 W	6	NA	NA	NA
T-X-112-M	7.05-10.0	WR112	1.07	30 W	6	NA	NA	NA
T-X-90-M	8.2-12.4	WR90	1.07	40 W	5	NA	NA	NA
T-X-75-M	10.0-15.0	WR75	1.07	50 W	4	NA	NA	NA
T-X-62-M	12.4-18.0	WR62	1.07	30 W	4	NA	NA	NA
T-X-42-M	18.0-26.5	WR42	1.07	15 W	3	NA	NA	NA
T-X-28-M	26.5-40.0	WR28	1.07	15 W	2	NA	NA	NA
ST-X-229-M	3.7-4.2	WR229	1.20	60 W	3	NA	NA	NA
ST-X-187-M	5.0-6.0	WR187	1.20	50 W	3	NA	NA	NA
ST-X-159-M	5.9-6.5	WR159	1.10	50 W	2	NA	NA	NA
ST-X-137-M	5.9-6.5	WR137	1.10	50 W	1.5	NA	NA	NA
ST-X-112-M	7.25-8.4	WR112	1.15	35 W	1.5	NA	NA	NA
ST-X-90-M	11.7-12.2	WR90	1.10	35 W	1.5	NA	NA	NA
ST-X-75-M	11.7-12.2	WR75	1.10	30 W	1.25	NA	NA	NA
ST-X-75-M	14.0-14.5	WR75	1.10	30 W	1.25	NA	NA	NA
ST-X-62-M	14.0-14.5	WR62	1.10	25 W	1	NA	NA	NA
DL-X-650-M (1)	1.12-1.17	WR650	1.10	3000 W	35	10	9	.265
DL-X-430-M (1)	1.7-2.6	WR430	1.10	2000 W	25	7.5	6.5	.265
DL-X-284-M	2.6-3.95	WR284	1.10	2000 W	15	6	5	.265
DL-X-229-M	3.3-4.9	WR229	1.10	1500 W	21	6	5	.265
DL-X-187-M	3.95-5.85	WR187	1.10	1500 W	14	5	4	.265
DL-X-159-M	4.9-7.05	WR159	1.10	1500 W	18	5	4	.265
DL-X-137-M	5.85-8.20	WR137	1.10	1500 W	9.5	5	4	.265
DL-X-112-M	7.05-10.0	WR112	1.10	1000 W	11	5	4	.265
DL-X-90-M	8.2-12.4	WR90	1.10	1000 W	11	5	4	.203
DL-X-75-M	10.0-15.0	WR75	1.10	1000 W	11	5	4	.265
DL-X-62-M	12.4-18.0	WR62	1.10	1000 W	11	5	4	.265
DL-X-42-M	18.0-26.5	WR42	1.10	500 W	7.5	3.5	3	.203
DL-X-28-M	26.5-40.0	WR28	1.10	250 W	5.5	2	2.5	.203

(1): Available in aluminum only

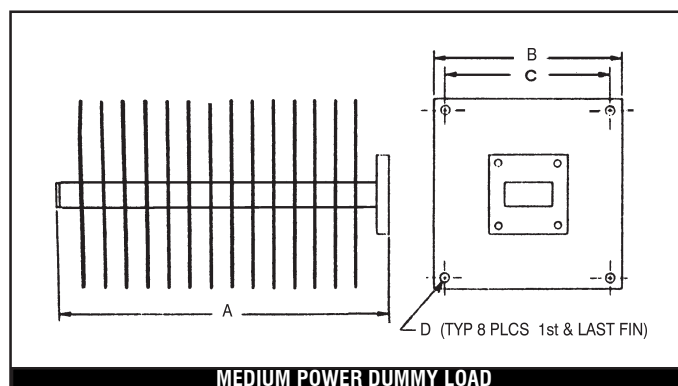
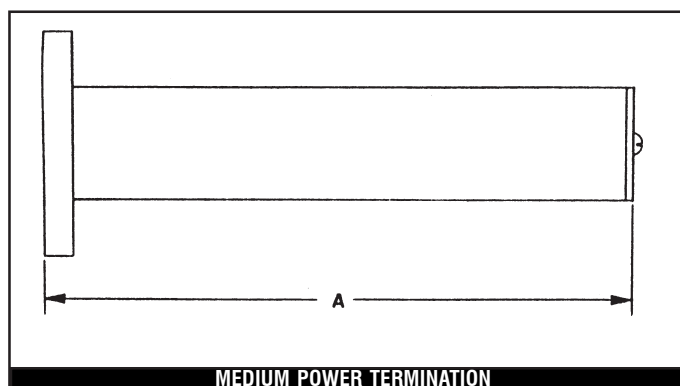
Part Number Construction **X**: Insert 1, 2, 3, 4, 5, or 6 in place of X for flange type. **M**: Insert A, B, C or S for material required.

Material: A = Aluminum, B = Brass, C = Copper, S = Special **Flange**: 1 = Cover, 2 = Choke, 3 = CPRF, 4 = CPRG, 5 = Special, 6 = CMR

Example: A WR90, 50 watt termination with a brass choke flange is part number T-2-90-B

Notes: Standard Finish is black polyurethane enamel. All dimensions are in inches. See next page for outline drawings.

Medium Power Waveguide Termination and Dummy Load Outline Drawings

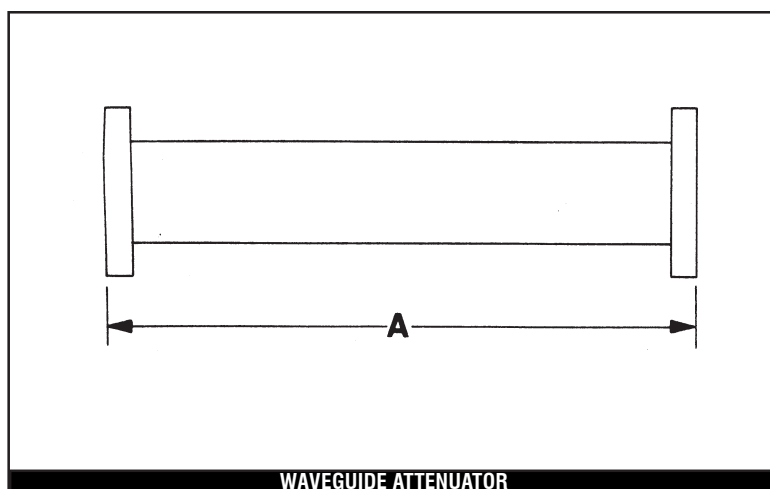


Attenuator Features

- 3, 6, 10, 20 dB Standard Values
- Full Waveguide Bandwidth
- Calibrated @ Center Frequency (+/- 0.2 dB Accuracy)
- 2.6 – 40 GHz Coverage
- VSWR: 1.15 max., all cases

MIDISCO's W/G attenuator repertoire includes fixed units operating to 40 GHz. Standard values are 3, 6, 10, and 20 dB. Other values are available. Standard exterior finish is flat black polyurethane paint.

Model No.	Frequency	W/G	Pwr	A
A-XY-284-M-DB	2.6-3.95	WR284	10 W	10
A-XY-229-M-DB	3.3-4.9	WR229	8 W	9
A-XY-187-M-DB	3.95-5.85	WR187	5 W	8.5
A-XY-159-M-DB	4.9-7.05	WR159	5 W	8
A-XY-137-M-DB	5.85-8.2	WR137	4 W	8
A-XY-112-M-DB	7.05-10.0	WR112	1 W	4.5
A-XY-102-M-DB	7.0-11.0	WR102	1 W	4
A-XY-90-M-DB	8.2-12.4	WR90	1 W	3.5
A-XY-75-M-DB	10.0-15.0	WR75	1 W	3.5
A-XY-62-M-DB	12.4-18.0	WR62	1 W	3
A-XY-51-M-DB	15.0-22.0	WR51	1 W	2.5
A-XY-42-M-DB	18.0-26.5	WR42	1 W	2.5
A-XY-34-M-DB	22.0-33.0	WR34	1 W	2
A-XY-28-M-DB	26.5-40.0	WR28	1 W	2



Part Number Construction: Part numbers for attenuators are constructed by inserting the codes for flange type and material as shown on the previous page for terminations (with the addition of "Y" for the second flange), and an added suffix for the dB value desired. For example, a WR90 brass 10 dB attenuator with one cover flange and one choke flange is part number **A-12-90-B-10**.

Other Midisco Waveguide Products

Please contact **MIDISCO** for all of your waveguide component requirements. In addition to the terminations and attenuators summarized here - and the products mentioned in the introduction to this section – we can supply many other rectangular and double ridge waveguide components. These include but are not limited to flanges, gaskets for pressure and EMI sealing, twists with flanges, end launch W/G to coaxial adapters, pressure windows, hybrid tees, and more.

50 to 75 Ohm Transformers, Minimum Loss Matching Pads

Connector Frequency Range Options

Features

- Transformers and Matching Pads available.
- 1-watt average power, all units
- 75 Ohm F series available
- -20° C to +85° C Operation
- Call factory for configurations not shown.

MIDISCO

addresses the need to provide controlled 50 to 75 Ohm impedance transformations in fielded systems and laboratory test environments. We provide off-the-shelf minimum-loss matching pads, as well as matching transformers. Transformers have a lower insertion loss than minimum-loss pads, but have a finite bandwidth. The most common connector series that are available in 50 and 75 Ohm impedances are type N, TNC, and BNC. These are the thrust of MIDISCO's product line. Shown below is a sampling of our standard product line. Many designs are custom. Please call the factory with your requirements.

New Products

MDC1529-# (Minimum Loss Matching Pads):

Insertion Loss: 5.7 +/-0.5 dB (+/-0.3 dB for -11, -12 @ Frequencies =/ < 1.5 GHz)

*: VSWR is worst case @ max. frequency. In all cases, it is 1.20 max. to 1 GHz, 1.30:1 max. to 2 GHz.

MDC1530-# Matching Transformers:

Frequency: 0.5 to 600 MHz

0.5-300 MHz: Loss = 0.75 max. VSWR = 1.2:1 max.

300-600 MHz: Loss = 1.0 dB max. VSWR = 1.3:1 max.

Model	50 Ohm Conn	75 Ohm Conn	Frequency	VSWR*	Fig
MDC1529-1	BNC-M	BNC-F	DC-1 GHz	1.20	1
MDC1529-2	BNC-F	BNC-M	DC-1 GHz	1.20	1
MDC1529-3	BNC-M	BNC-F	DC-2 GHz	1.30	2
MDC1529-4	BNC-F	BNC-M	DC-2 GHz	1.30	2
MDC1529-5	BNC-M	TNC-F	DC-2 GHz	1.30	2
MDC1529-6	BNC-F	TNC-M	DC-2 GHz	1.30	2
MDC1529-7	BNC-M	F-F	DC-2 GHz	1.30	2
MDC1529-8	BNC-F	F-M	DC-2 GHz	1.30	2
MDC1529-9	TNC-M	F-F	DC-2 GHz	1.30	2
MDC1529-10	TNC-F	F-M	DC-2 GHz	1.30	2
MDC1529-11	N-M	N-F	DC-3 GHz	1.35	3
MDC1529-12	N-F	N-M	DC-3 GHz	1.35	3
MDC1529-13	SMA-M	BNC-F	DC-2 GHz	1.30	2
MDC1529-14	SMA-M	SMA-M*	DC-3 GHz	1.35	2
MDC1529-15	TNC-M	TNC-F	DC-3 GHz	1.30	3
MDC1529-15A	TNC-M	TNC-F	DC-4 GHz	1.35	3
MDC1529-16	N-M	BNC-F	DC-2 GHz	1.30	3
MDC1529-17	SMA-F	F-M	DC-2 GHz	1.30	3

Model	50 Ohm Conn	75 Ohm Conn	Fig
MDC1530-1	BNC-M	BNC-F	2
MDC1530-2	BNC-F	BNC-M	2
MDC1530-3	BNC-M	TNC-F	2
MDC1530-4	BNC-F	TNC-M	2
MDC1530-5	N-M	N-F	3
MDC1530-6	N-F	N-M	3

*50 Ohm Connector

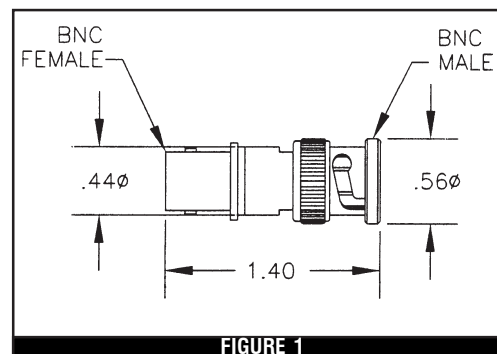


FIGURE 1

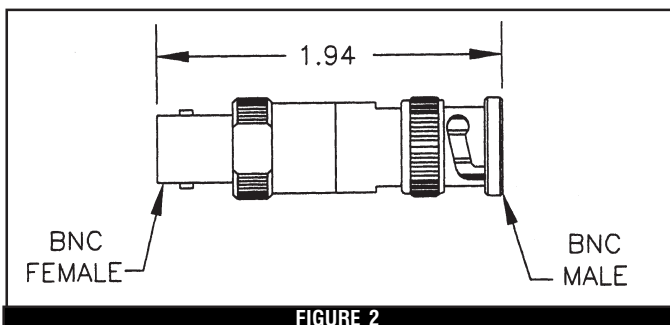


FIGURE 2

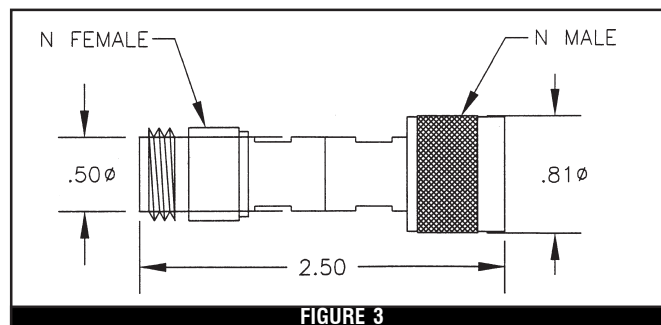


FIGURE 3

Broadband Bias Tees

0.300 to 18 GHz in Single Unit

Features

- Up to 18 GHz Operation
- Power and current options
- Connectorized and Surface Mount packages available
- Higher Frequency ranges available

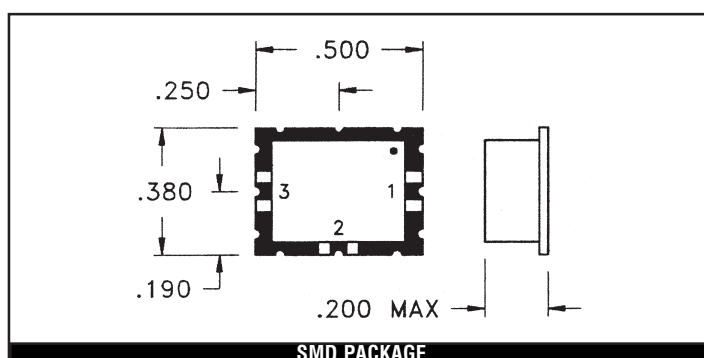
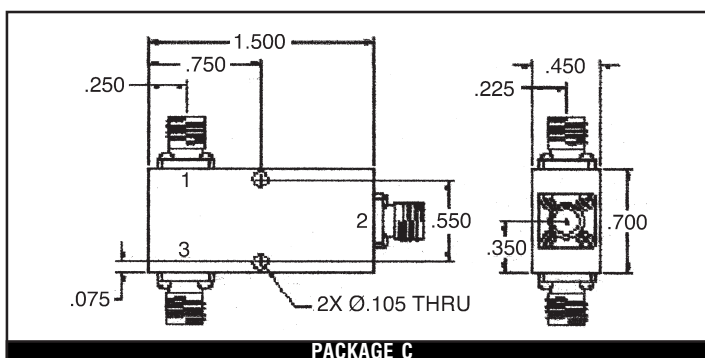
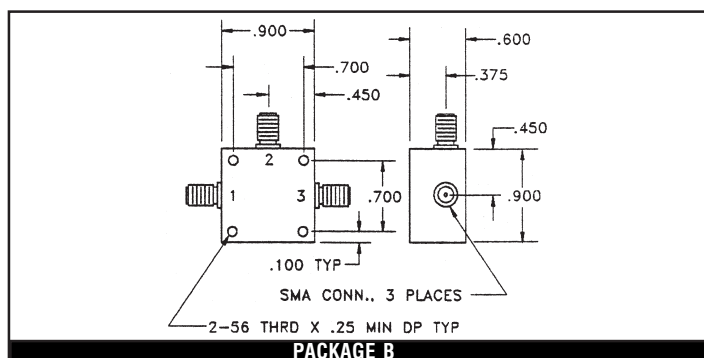
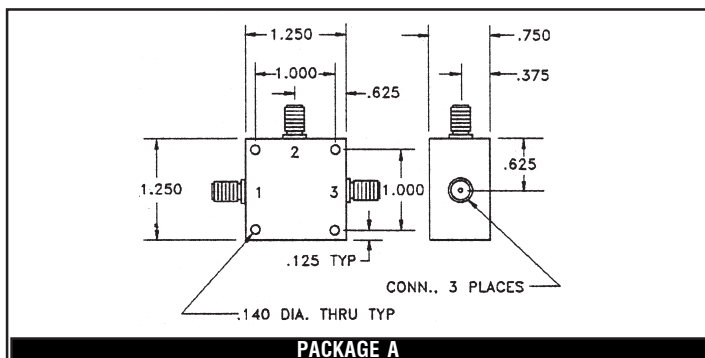
MIDISCO's catalog broadband Bias Tees are available for operation up to 18 GHz. The MDC9045-15 covers the frequency range of 0.3 to 18 GHz in a single unit. Current handling is as high as 8 amperes in standard units. Many units are also available in a 0.500 x 0.380 x 0.200 Surface Mount package. Consult factory for additional details.

Bias Tee Performance Summary

MODEL*	FREQ (GHZ)	VSWR (MAX)	MAX. LOSS (dB)	RF POWER	CURRENT AMPERES MAX	ISOLATION (dB MIN.)	PACKAGE AVAILABILITY
MDC9045-1	0.01-1.0	1.20:1	1.0	2 WATTS	0.200 @ 50 VDC	25 (SMD: 20)	A, B, SMD
MDC9045-2	0.5-2.5	1.20:1	0.8	2 WATTS	0.200 @ 50 VDC	25 (SMD: 20)	A, B, SMD
MDC9045-3	0.01-4.2	1.20:1	1.6	2 WATTS	0.200 @ 50 VDC	25 (SMD: 20)	A, B, SMD
MDC9045-4	1.0-5.0	1.50:1	1.0	2 WATTS	1.0 @ 50 VDC	25	A, B
MDC9045-5	0.01-3.0	1.50:1	1.8	2 WATTS	3.0 @ 50 VDC	25	A
MDC9045-6	0.10-6.0	1.50:1	1.5	2 WATTS	0.500 @ 50 VDC	25	A, B
MDC9045-7	0.425-0.80	1.50:1	0.6	2 WATTS	8.0 @ 50 VDC	25	A
MDC9045-8	0.10-1.0	1.20:1	0.5	2 WATTS	0.200 @ 50 VDC	25	A, B
MDC9045-9	0.80-1.0	1.50:1	0.5	2 WATTS	5.0 (1.0 FOR SMD) @ 50 VDC	30 (SMD: 20)	A, B, SMD
MDC9045-10	1.7-2.0	1.50:1	0.5	2 WATTS	5.0 (1.0 FOR SMD) @ 50 VDC	30 (SMD: 20)	A, B, SMD
MDC9045-11	0.5-3.0	1.50:1	1.8	2 WATTS	2.0 (0.5 FOR SMD) @ 50VDC	25 (SMD: 20)	A, B, SMD
MDC9045-12	0.5-10.0	1.50:1	1.8	2 WATTS	0.200 @ 50 VDC	25	C
MDC9045-13	10.0-12.0	1.50:1	1.0	2 WATTS	0.200 @ 50 VDC	25	B
MDC9045-14	0.8-15.0	1.50:1	1.0	2 WATTS	0.200 @ 50 VDC	25	C
MDC9045-15	0.3-18.0	1.60:1	1.5	2 WATTS	0.500 @ 50 VDC	25	C

*: When a model is available in more than one package style, a suffix (A, B, or SMD) is added to the model number following the dash number. For a feed-through bias terminal in place of the SMA connector, an additional suffix "T" is used. For example, the complete model number for the MDC9045-9 in package B with a feed-through terminal becomes MDC9045-9BT.

Pin	Function
1	RF In
2	DC In
3	RF/DC Out

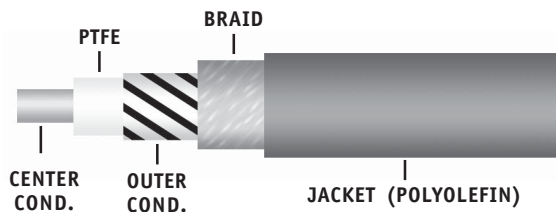


VNA Cable Assemblies

up to 40 GHz

FREQUENCY	LOSS DB/FT	VSWR
10 GHz	0.46	1.25
18 GHz	0.65	1.30
26.5 GHz	0.83	1.35
40 GHz	1.2	1.40

MIDISCO 8285 SERIES CUTAWAY VIEW



MIDISCO's 8285 series cable assemblies provide a cost-effective solution to the growing need for phase and amplitude stable test cables for production test environments up to 40 GHz. One end is fitted with a ruggedized 2.4 mm, 2.9 mm, or 3.5 mm female test port connector to interface directly with HP/Agilent and Aritsu/Wiltron VNA's (Vector Network Analyzers). Available connectors for the 2nd end include 2.4 mm, 2.9 mm, 3.5 mm, 7 mm, 26.5 GHz SMA, TNC, and type N. The outer conductor is a thin wall copper tube helix that provides performance stability, and crush resistance of 150 lbs. of plane compressive force per inch. The outer jacket is polyolefin.

Key Parameters

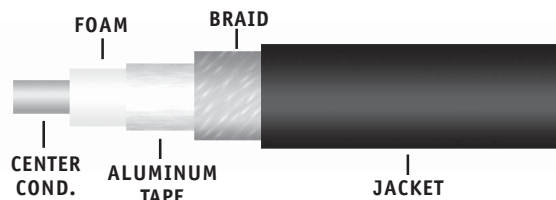
Bend Radius: 0.5"

Phase and Amplitude Stable

LMR™ Cable Assemblies

Low Loss, Flexible

LMR SERIES CUTAWAY VIEW



MIDISCO now supplies cable assemblies using the popular LMR series cable. LMR cables have insertion losses compatible with corrugated copper cables, but are more flexible. Until recently, users had few options for LMR assemblies because of limited connector availability. MIDISCO has connectors readily available to fabricate cable assemblies using LMR100, 100A, 195, 200, 240, 400, 500 and 600. Consult the factory for LMR cables not listed including those suitable for direct burial and more flexible versions of LMR240, 400, and 600. Performance data on all LMR series cables is available.

TYP. INSERTION LOSS DB/100 FEET

CABLE	DIA.	1 GHZ.	2 GHZ.	2.5 GHZ.	PWR*
LMR100	.110	22.48	31.79	35.54	20 W
LMR195	.195	11.75	16.9	19.02	100 W
LMR200	.195	10.47	15.01	16.87	120 W
LMR240	.240	7.98	11.49	12.93	170 W
LMR400	.405	4.13	5.99	6.76	370 W
LMR600	.590	2.65	3.90	4.43	590 W

* 2 GHz CW @ 40° C, SL. (See derating chart inside back cover)

TM: LMR is a trademark of Times Microwave.

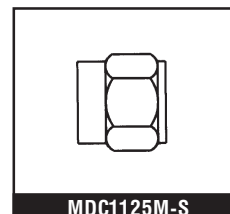
LMR cables have copper center conductors, foam dielectric, aluminum laminated tape bonded to the dielectric, a tinned copper braid, and then a black polyethylene jacket.

Open Circuits

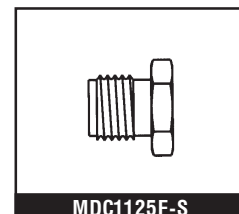
up to 40 GHz

Model Number	Connector Type	Frequency Range
MDC1125M-N*	N-M	18GHz
MDC1125F-N*	N-F	18GHz
MDC1125M-S*	SMA-M	18GHz
MDC1125F-S*	SMA-F	18GHz
MDC1125F-7/16	7/16-F	7.5GHz
MDC1125M-7/16	7/16-M	7.5GHz
MDC1125M-F	F-M	3.0GHz
MDC1125F-F	F-F	3.0GHz
MDC1125F-2.9	2.9-F	40GHz
MDC1125M-2.9	2.9-M	40GHz

*: Add -C to Model Number for Chain.



MDC1125M-S



MDC1125F-S

2.4 to 2.9 mm Adapters

DC to 40 GHz Application

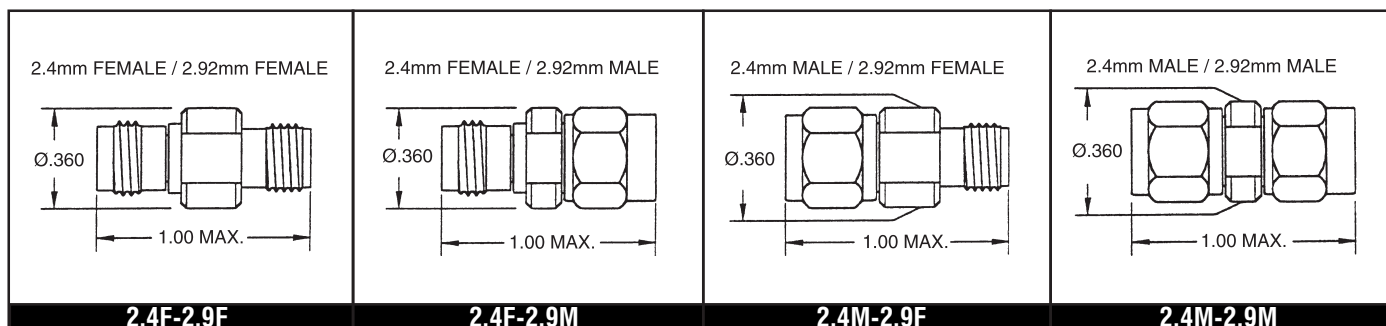
Features

- 40 GHz Operation
- Low VSWR
- -65° C to +125° C Operation
- 5/16" Wrench Flats on housings for precise, reliable torquing
- Selected units with very low VSWR are also available

These MIDISCO Adapters

address the growing need to inter-connect units having 2.4 and 2.9 mm interfaces respectively. They are especially useful in the laboratory when test equipment fitted with 2.4 mm connectors need to be used with components that feature 2.9 mm, 3.5 mm, or SMA connectors. The adapters provide a low VSWR interface, and utilize a wrench flat on the housing for precise torquing, which is a must for accuracy and repeatability. The connectors and housings are passivated stainless steel, while conductors are gold plated beryllium copper IAW MIL-G-45204. Most combinations of 2.4 mm, 2.9 mm and 3.5 mm are available. Contact factory.

MAXIMUM VSWR: DC-18 GHz: 1.10:1; 18-26.5 GHz: 1.20:1; 26.5-40 GHz: 1.30:1



DC Blocking Devices

High Voltage, 75 Ω , and Inter-Series

10 MHz to 26.5 GHz

Features

- 10 MHz to 26.5 GHz Operation
- Low Insertion Loss
- Up to 950 V Blocking (HV Series)
- All DC Blocks shown are Inner Blocks. Outer, Outer-Inner available
- Other Connector Options Offered (In Series and Between Series)

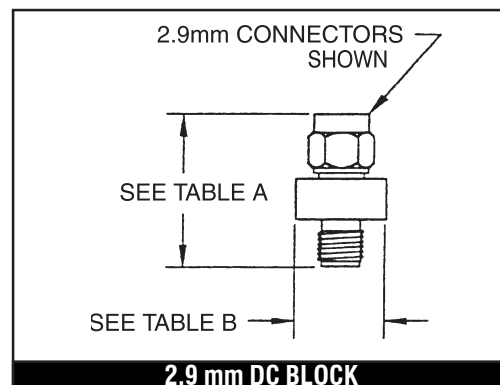
The MIDISCO DC Blocking Devices

Product Line continues to grow, consistent with Industry needs for more versatile components. All are capacitive coupled and essentially transparent to RF signals up to 26.5 GHz, while providing rejection to DC and audio frequencies. Most provide a minimum of 55 dB of rejection at 65 KHz. Applications include ground loop elimination, test setup isolation, and wherever undesired DC or audio signals are present.

Additional DC Blocking Devices including attenuators, terminations and connectors are available. Consult factory.

Model No.	Device Type	Freq. (GHz)	VSWR	Conn. Conf.	A	B
MDC1181-26	DC Block	.01-26.5	1.35:1	2.9 MM-M/F	.855	Ø .28
MDC1181HS4	HV DC Block	0.1-4	1.25:1	SMA-M/F	.860	Ø .28
MDC1181HS	HV DC Block	0.1-18	1.35:1	SMA-M/F	1.08	Ø .36
MDC1181HN	HV DC Block	0.1-18	1.35:1	N-M/F	1.78	Ø .56
MDC1181F2	75 Ω DC Block	.01-2	1.35:1	F-M/F	1.51	Ø .33
MDC1181N4	75 Ω DC Block	0.1-4	1.35:1	N-M/F	1.90	Ø .56
MDC1181B4	75 Ω DC Block	0.1-4	1.35:1	BNC-M/F	1.60	Ø .50
MDC1181BMSF	DC Block*	0.01-4	1.35:1	BNC-M/SMA-F	1.39	Ø .50
MDC1181NMSM	DC Block	0.01-18	1.25:1	N-M/SMA-M	1.58	Ø .56
MDC1181NMSF	DC Block	0.01-18	1.25:1	N-M/SMA-F	1.43	Ø .56
MDC1181NFSM	DC Block	0.01-18	1.25:1	N-F/SMA-M	1.66	Ø .56
MDC1181NFSF	DC Block	0.01-18	1.25:1	N-F/SMA-F	1.53	Ø .56

*: 100V Rating, all others except HV Series are 200 V.



Phase Adjustable SMA Adapters & Connectors

Up to 18 GHz

Features

- Phase Adjustment = $10^\circ \times F$ (GHz)
- Available for .141 Dia. and .085 Dia. Semi Rigid Cable
- Available as Male/Female Adapter
- DC to 18 GHz with low VSWR
- DC to 4GHz adapter model available
- Meets Stringent Environmental Specifications
- Impedance: 50 Ohms
- Delivery from stock

Electrical (typical characteristics)

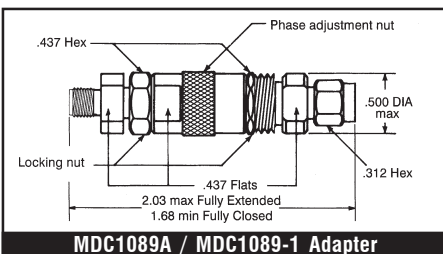
Impedance	50 ohms
Frequency Range	DC-18GHz
Insertion Loss	$\text{dB} = 0.1 \times \sqrt{f}$ (adapter) $\text{dB} = .08 \times \sqrt{f}$ (connector) f is frequency in GHz
Phase Adjustment (degrees)	$10^\circ \times f$
Phase Change per revolution of adjustment nut	$0.636^\circ \times f$
Voltage Rating	500 Vrms

Mechanical

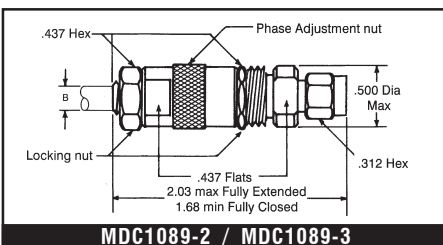
Mating	Interface dimensions are IAW MIL-STD-348/SMA.
Connector Durability	500 cycles

Material

Center Conductor	Beryllium Copper, Gold Plated
Connector Body	Brass or Beryllium Copper, Gold Plated
Adjusting Nut and Locking Nut	Brass with bright nickel plate
Connector Coupling Insulation	Stainless Steel Passivated TFE



MDC1089A / MDC1089-1 Adapter



MDC1089-2 / MDC1089-3

Simple Mechanical Phase Adjustment

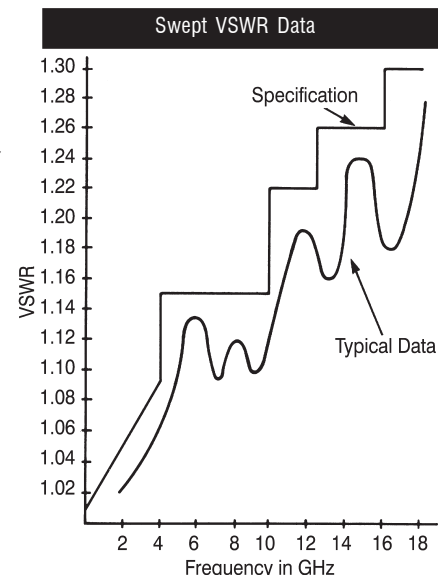
These SMA connectors for semi-rigid coaxial cables offer a precise yet extraordinarily simple means of phase adjustment for microwave instrumentation. MIDISCO phase adjustable connectors incorporate a threaded interconnection of variable length. Turning a phase adjustment nut creates small-increment changes in cable length and hence phase, up to a maximum of 180° , at 18 GHz.

MIDISCO phase adjustable connectors are available in two standard sizes, number MDC1089-2 for .141" dia. cable and number MDC1089-3 for .085" dia. cable. Adapter versions, numbers MDC1089-1 (DC-18GHz) and MDC1089A (DC-4GHz), are also available for in-line applications.

For phased array radar, test equipment, ILS & other instrumentation using phase matching techniques, the new connectors substitute the ease of mechanical screw adjustments for laborious cable-trimming. Phase matching may be performed at final production stages, allowing less stringent specifications for equipment components. Once established, the proper phase setting for each cable is maintained by a connector locking nut. To compensate for system aging, the locking nut may be released and new phase adjustments made at any time.

Electrical Performance

Unlike other phase-matching techniques with limited frequency ranges which may hamper performance or require use of more than one model, each broadband MIDISCO phase adjustable connector covers the entire range from DC to 18 GHz. (MDC1089A: DC to 4GHz). Low VSWR is typical (see chart above).



Phase adjustment range in degrees is ten times the frequency in GHz (e.g. 100° , at 10 GHz, 180° at 18 GHz).

Environmental Performance

MIDISCO phase adjustable SMA connectors are operational at temperatures from -65°C to $+125^\circ\text{C}$. They also meet the following sections of MIL-Std-202 for environmental conditions. Vibration: Method 204 - Test Condition D

Mechanical Shock: Method 213 - Test Condition I

Model	Frequency Range	Max Length (inches)	Description
MDC1089A	DC-4GHz	$2 \frac{1}{2}$	In-line Adapter
MDC1089-1	DC-18GHz	$2 \frac{1}{2}$	In-line Adapter
MDC1089-2	DC-18GHz	$2 \frac{1}{32}$	0.141" Cable Connector
MDC1089-3	DC-18GHz	$2 \frac{1}{32}$	0.085" Cable Connector

These connectors are available for other semi-rigid cables. Please consult the factory.

Coaxial Detectors

100 kHz to 26.5 GHz - Zero Bias Schottky

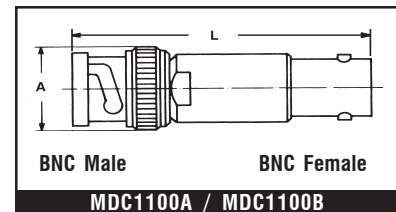
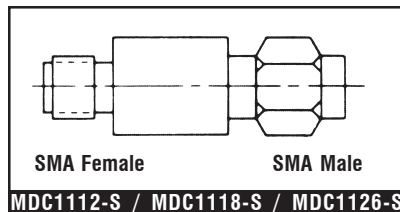
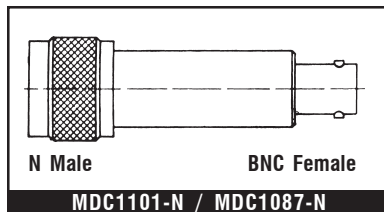
Features

- Broadband (0.01 to 26.5 GHz)
- Excellent flatness (± 0.5 dB to 26.5 GHz)
- Low VSWR due to matched input
- Very high sensitivity
- No bias required
- Metallurgically bonded diodes
- High burnout protection
- Choice of 3.5mm, 7mm (APC-7), N, K, BNC, or SMA input connectors
- Positive or Negative polarity available
- Matched pairs available
- Delivery from stock

The **MIDISCO** Zero Bias Schottky broadband coaxial detectors, with their superior broadband flatness, low VSWR, ruggedness and burnout protection, relative to point-contact models, are excellent for use in broadband EW system applications and microwave instrumentation. Since they do not require DC bias and can be used with common oscilloscopes, their ease of use and broadband performance make them very useful in laboratory measurements.

The various series include choices of 3.5mm, 7 mm (APC-7), N, K, SMA, or BNC input connectors and BNC, SMA, or SMC output connectors. Matched pairs are available (suffix -M to part number) with a frequency response less than ± 0.3 dB to 18.5 GHz and ± 0.5 dB from 18.5 to 26.5 GHz.

Biased detectors are also available. Consult factory.



SPECIFICATIONS †

Frequency Range	Model Number	Connectors		Mech. Dimensions		VSWR	Frequency Response		Low Level Sensitivity	Input Power
		Input	Output	Length	Diameter		Octave	Broadband		
100kHz to 2 GHz	MDC1100A	BNC Male	BNC Female	2.50 in. (64 mm)	0.51 in. (13mm)	1.3:1 max.	±0.1dB (per 100kHz)	±0.3 dB	0.50mV/μW	Maximum operating 200mW; Short duration (less than 1 minute) 1 watt (typical)
100kHz to 4 GHz	MDC1100B									
0.01 to 12.4 GHz	MDC1101-N	Type N Male	BNC Female	2.46 in. (62.5 mm)	0.75 in. (19 mm)	1.20:1 max. (to 4.5 GHz) 1.30:1 max. (to 7 GHz) 1.40:1 max. (to 12.4 GHz)	±0.2 dB	±0.5 dB (to 12.4 GHz)	0.40mV/μW	
	MDC1101-S	SMA Male	BNC Female	2.50 in. (64 mm)	0.56 in. (14 mm)	1.25:1 max.			0.50mV/μW	
	MDC1112-S	SMA Male	SMA Female	1.15 in. (29 mm)	0.34 in. (8.6 mm)					
	MDC1112-C	SMA Male	SMC Male	1.50 in. (38 mm)	0.34 in. (8.6 mm)					
0.01 to 18 GHz	MDC1087-7	APC-7	BNC Female	2.59 in. (65.8 mm)	0.75 in. (19 mm)	1.2:1 max. (to 4GHz) 1.4:1 max. (to 18GHz)	±0.2dB (to 8GHz)	±0.3dB (to 8 GHz) ±0.5dB (to 18 GHz)	>0.42mV/μW	
	MDC1087-N	Type N Male	BNC Female	2.46 in. (62.5 mm)	0.75 in. (19 mm)	1.2:1 max. (to 4GHz) 1.5:1 max. (to 18GHz)				
	MDC1087-S	SMA Male	BNC Female	2.50 in. (64 mm)	0.56 in. (14 mm)					
0.01 to 18 GHz	MDC1118-S	SMA Male	SMA Female	1.15in. (29 mm)	0.34 in. (8.6 mm)	1.25:1 max.	±0.2 dB	±0.3 dB (to 8 GHz) ±0.5 dB (to 18 GHz)	0.50 mV/μW	
	MDC1118-C	SMA Male	SMC Male	1.50 in. (38 mm)	0.34 in. (8.6 mm)					
0.01 to 26.5 GHz	MDC1126-S	SMA Male	SMA Female	1.15 in. (29 mm)	0.34 in. (8.6 mm)	1.3:1 max. (to 18.5 GHz) 2:1 max. (to 26.5 GHz)	±0.5 dB (to 18GHz) ±1.0 dB (to 26.5GHz)		0.50 mV/μW	
	MDC1126-C	SMA Male	SMC Male	1.50 in. (38 mm)	0.34 in. (8.6 mm)					
0.01 to 40 GHz	MDC1140-S	K † Male (2.9mm)	SMA Female	1.30 in. (33 mm)	0.32 in. (8.2 mm)	1.3:1 max. (to 18 GHz) 1.6:1 max. (to 26 GHz) 1.8:1 max. (to 40 GHz)	±0.3 dB (to 18 GHz) ±0.6 dB (to 26 GHz) ±1.0 dB (to 40 GHz)		0.40 mV/μW	
	MDC1140-B	K † Male (2.9mm)	BNC Female	1.89 in. (48 mm)	0.39 in. (9.9 mm)					
	MDC1140-C	K † Male (2.9mm)	SMC Male	1.35 in. (34 mm)	0.32 in. (8.2 mm)					
0.01 to 26.5 GHz	MDC1087A-3.5	3.5mm Male	BNC Female	1.85 in. (50 mm)	.40 in. (10.2 mm)	1.3:1 max. (to 20 GHz) 1.4:1 max. (to 26.5 GHz)	±0.3 dB (to 20 GHz)	±0.6 dB (to 26.5 GHz)	0.40 mV/μW	

† Specifications given for $T_A = +25^\circ\text{C}$

‡ K Connector trademark of Wiltron Co.

Matched pairs are available for frequency response within ± 0.3 dB to 18.5 GHz and ± 0.5 dB to 26.5 GHz - add suffix M.

Output Polarity: Negative polarity standard.

For positive polarity models, add "R" suffix to part number.

Example: MDC1087-SR

Dimensions are for reference only and are subject to change

Pin Diode Limiters

0.5 to 18 GHz

Features

P SERIES

- Low insertion loss
- 1 watt CW and 100 Watt peak (1 μ sec) power handling capability
- Fast response and short recovery time (10 to 20 nsec typical)
- Built-in DC return
- Hermetically sealed module
- Moderate cost

Y SERIES

- Low limiting threshold (+6 dBm typ.)
- Low leakage level (+13 dBm typ.)
- 1 Watt CW and 200 Watts peak (1 μ sec) power handling capability
- Built-in DC block both ends
- Hermetically sealed module
- Typical recovery time is less than 10 μ sec

Specifications

Operating temperature -55°C to +125°C
Storage temperature -55°C to +150°C
Shock 50G, 11msec
Vibration 20G, 100 to 2000Hz

Insertion Loss and VSWR tested @ -10dBm

Minimum power handling capability: 1watt CW or 100 watts peak (1 μ sec, 0.1% duty) derated to 20% @+125°C.

Standard outline in "1F" style. Add Suffix "D" or "2F" to the model number for optional outlines.

Package style: (inches)

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limiters are passive (series P) or detector activated (series Y), broadband integrated module devices that are designed for power leveling and receiver protection. In ECM, radar and communications systems, these limiters can protect transistor, tunnel diode or FET amplifiers, detectors and mixers. The limiting threshold is the incident power at which the low level insertion loss increases by one dB and the limiter begins its protective role. In series Y the detector provides a bias to the PIN diode which allows the diode to attenuate at a lower level providing harder limiting than it could achieve on its own.

The 50 ohm hermetically sealed modules provide high reliability in severe environments. Both types are available in module form (Pkg D) or in SMA connector packages (1F or 2F).



Passive Pin Diode, Type P series @25°C				
Model	Frequency Range (GHz)	Maximum Insertion Loss (dB)	VSWR (max)	Max Leak. @1W CW Input (dBm)
MDC1527P-1	0.5-1	0.5	1.4:1	+20
MDC1527P-2	0.5-2	0.7	1.4:1	+20
MDC1527P-3	1-2	0.5	1.4:1	+19
MDC1527P-4	2-4	0.8	1.4:1	+19
MDC1527P-5	2-8	1.5	1.5:1	+19
MDC1527P-6	2-18	2.2	2.2:1	+20
MDC1527P-7	4-8	1.4	1.5:1	+19
MDC1527P-8	7-12	1.8	1.7:1	+19
MDC1527P-9	8-16	2.0	1.8:1	+19
MDC1527P-10	11-18	2.2	2.0:1	+19

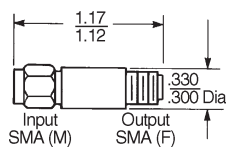
Limiting threshold +9dBm (typ.)



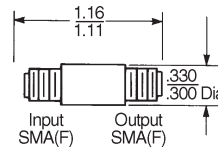
Detector Activated Type, Y series @25°C				
Model	Frequency Range (GHz)	Maximum Insertion Loss (dB)	VSWR (max)	Max Leak. @1W CW Input (dBm)
MDC1527Y-1	0.5-1	0.7	1.4:1	+14
MDC1527Y-2	0.5-2	0.7	1.4:1	+14
MDC1527Y-3	1-2	0.7	1.4:1	+14
MDC1527Y-4	2-4	0.8	1.4:1	+14
MDC1527Y-5	2-8	1.4	1.6:1	+14
MDC1527Y-6	2-18	2.5	2.5:1	+14
MDC1527Y-7	4-8	1.4	1.5:1	+13
MDC1527Y-8	7-12	1.8	1.6:1	+13
MDC1527Y-9	8-16	2.2	2.0:1	+13
MDC1527Y-10	11-18	2.5	2.2:1	+13

Limiting threshold +6dBm (typ.)

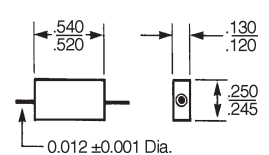
Package Style 1F



Package Style 2F



Package Style D



Tunnel (Back) Diode Detectors

For Stripline/Microstrip Assemblies — 0.01 to 18 GHz

Features

- Drop-in miniature construction
- Very low output resistance
- Broadband, flat frequency response
- Excellent temperature stability
- Very low 1/f noise

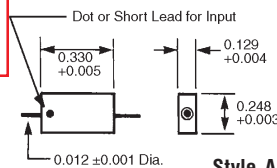
Maximum Ratings

Input power + 17 dBm
Operating temp -65°C to +115°C
Storage temp -65°C to +125°C
Soldering temp 230°C, 5 secs

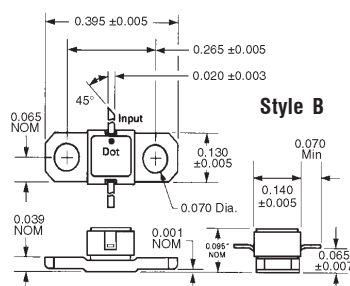
Negative output polarity standard. Add R to end of model number for positive output polarity. TSS based on 2 MHz video band width and 2 dB amplifier NF. Add "A" or "B" to the end of the model number for package style desired. Also available with SMA connectors. Consult factory.

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drop-in tunnel diode detectors are narrow or broadband matched without resistive loading. They provide excellent sensitivity and flat response with optimum input VSWR and tangential sensitivity. The performance of these modules, in wideband video systems requiring fast pulse rise times, is impressive and the square law performance is essentially unaffected by changes in microwave power levels at small signals of less than -23dBm. Application notes are available.



Style A



Style B

Specifications (@ +25°C, up to -20dBm power input)

Model	Freq. Range (GHz)	Min. Sensitivity K(mV/mW)	Typical TSS (dBm)	Max. Flatness (±dB)	Typical VSWR	Nominal Output Cap (pF)	Nominal Output Res (ohm)
MDC1528-1	0.1-2	1000	-51	±0.3	1.5:1	150	250
MDC1528-2	0.1-4	900	-50	±0.5	2:1	150	250
MDC1528-3	0.1-0.5	1000	-51	±0.75	2:1	150	150
MDC1528-4	0.1-1	800	-50	±0.75	2:1	150	130
MDC1528-5	0.5-2	800	-50	±0.7	3:1	50	130
MDC1528-6	2-6	800	-50	±0.7	4:1	10	130
MDC1528-7	2-8	750	-50	±1.0	4:1	10	130
MDC1528-8	2-12	700	-50	±1.2	4:1	10	130
MDC1528-9	6-18	600	-49	±1.0	3:1	10	130
MDC1528-10	2-18	600	-49	±1.5	4:1	10	130

INTRODUCTION - Inter and intra series coaxial adapters and waveguide-to-coaxial adapters are some of the more common components used in RF, microwave and wireless applications. OEM's and manufacturing and engineering test facilities are continually required to provide temporary or permanent connections between the many coaxial and waveguide series in use. This is particularly true today where long established connector series (N, TNC, BNC, 874, 900, SMA, etc.) must be mated with interfaces introduced later (3.5 mm, 2.9 mm, 2.4 mm, 7/16 DIN, SSMB, SSMC, MCX, MMCX, 7mm, etc.).

Recognizing this need, MIDISCO maintains a large inventory of the most common (and some not so common) inter and intra series coaxial and coaxial-to-waveguide adapters. We can also supply waveguide transitions in standard and double ridge configurations. If you have a requirement not shown in the catalog, contact the factory for a prompt response.

The user should bear in mind that for best performance, the usable frequency for a given adapter is established by the operating range of the lower frequency interface on the adapter. As a guideline, a table is provided below to summarize the recommended frequency range of the more common coaxial interfaces. These guidelines represent the range for optimum performance. Most adapters are usable at higher frequencies with limitations.

SERIES	FREQUENCY (GHZ)	COMMENTS
N	DC-11	STANDARD TYPE N
XN	DC-18	PRECISION N
7 mm	DC-18	SEXLESS MATING
TNC	DC-11	STANDARD TNC
XTNC	DC-15	PRECISION TNC (18 GHZ ALSO AVAILABLE)
1.85 mm	DC-65	MATES WITH 2.4 mm
2.4 mm	DC-50	MATES WITH 1.85 mm
2.9 mm	DC-40	MATES WITH SMA, 3.5 mm
3.5 mm	DC-33	MATES WITH SMA 2.9 mm
SMA	DC-18	MATES WITH SMA 3.5 mm, 2.9 mm
XSMA	DC-26.5	EXTENDED RANGE SMA
F	DC-2	75 OHM CONNECTOR
BNC	DC-4	PRECISION VERSION USABLE TO 8 GHZ
SMC	DC-10	
SMB	DC-4	
MINI SMB	DC-4	75 OHM CONN. MATES WITH 50 OHM SMB
SSMB	DC-12.4	
SSMC	DC-12.4	
SC	DC-11	
900	DC-8.5	
874	DC-7.5	
MCX	DC-6	
MMCX	DC-6	MINIATURE MCX
7/16 DIN	DC-7.5	
UHF	DC-300	USABLE TO 500 MHZ
MINI-UHF	DC-2.5	
C	DC-11	
SSMA	DC-38	
HN	DC-4	
CMS	DC-4	SLIDE ON SMB
SCMS	DC-12.4	SLIDE ON SSMB
75 Ω	DC-2	SNAP ON/SCREW ON TYPE SIMILAR TO SMB/SMC
75 Ω N	DC-1	DOESN'T MATE WITH 50 OHM N
OSSP™	DC-28	MATES WITH DYNAMITES™
SMP	DC-40	MATES WITH GPO™, OSMPTM
BMA	DC-22	MATES WITH OSP™, DYNAMATES™

MIDISCO manufactures standard and precision adapters. Standard adapters are usable to frequencies less than 12 GHz for N and TNC, or up to the recommended frequency range for the other series. Precision adapters use an "X" prefix for the part number and feature stainless steel construction for a more precise interface, and an extended frequency range for the N and TNC series. In the case of precision N, TNC or SMA's interfaced with lower frequency series (ie: XBM-SM, XNF-BM etc.), the precise construction and stepped internal transition yields improved performance beyond the normal operating range of the lower frequency series.

NOTES

1. 75 Ω SMB AND SMC "TYPE" DO NOT MATE WITH 50 OHM SERIES.
2. 50 Ω AND 75 Ω TYPE N DO NOT MATE WITH EACH OTHER.
3. 50 AND 75 Ω BNC MATE WITH EACH OTHER WITHOUT RESTRICTION.
4. 50 AND 75 Ω TNC MATE WITH EACH OTHER WITHOUT RESTRICTION.

TM: OSSP, OSMPTM, OSP are trademarks of Tyco Ma/Com; GPO is trademark of Gilbert; Dynamite, Dynapac and Dynamate are trademarks of Dynawave Inc.

Coaxial Adapters

Adapter Tables

A convenient Adapter Part Number Table, Adapter Code Table, and Adapter Construction Table can help you find a part number. They can also help you understand our part numbering system. Since there are many combinations possible, only some of the most common are shown here. **Please call if you don't see exactly what you need.**

	SSMA		SMA		SMB		SMC		BNC		Type N		TNC	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
SMA	Male	MDC3314 MDC3100	SM-SM	SM-SF	MDC3037	MDC3038	MDC3039	MDC3040	BM-SM	BF-SM	NM-SM	NF-SM	TM-SM	TF-SM
	Female	MDC3312 MDC3313	SM-SF	SF-SF	MDC3033	MDC3034	MDC3035	MDC3036	BM-SF	BF-SF	NM-SF	NF-SF	TM-SF	TF-SF
SMB	Male	MDC7916-3 MDC7915-3	MDC3037	MDC3033	MDC6234	MDC6004	MDC3041	MDC3042	MDC4021-3	MDC4030-3	MDC4024-3	MDC4032-3	MDC4027-3	MDC4031-3
	Female	MDC7916-4 MDC7915-4	MDC3038	MDC3034	MDC6004	MDC6237	MDC3045	MDC3044	MDC4021-4	MDC4030-4	MDC4024-4	MDC4032-4	MDC4027-4	MDC4031-4
SMC	Male	MDC7916-1 MDC7915-1	MDC3039	MDC3035	MDC3041	MDC3045	MDC8134	MDC8001	MDC4021-1	MDC4030-1	MDC4024-1	MDC4032-1	MDC4027-1	MDC4031-1
	Female	MDC7916-2 MDC7915-2	MDC3040	MDC3036	MDC3042	MDC3044	MDC8001	MDC8137	MDC4021-2	MDC4030-2	MDC4024-2	MDC4032-2	MDC4027-2	MDC4031-2
BNC	Male	MDC7909 MDC7903	BM-SM	BM-SF	MDC4021-3	MDC4021-4	MDC4021-1	MDC4021-2	BM-BM	BM-BF	NM-BM	NF-BM	BM-TM	BM-TF
	Female	MDC7910 MDC7904	BF-SM	BF-SF	MDC4030-3	MDC4030-4	MDC4030-1	MDC4030-2	BM-BF	BF-BF	NM-BF	NF-BF	BF-TM	BF-TF
N	Male	MDC7911 MDC7905	NM-SM	NM-SF	MDC4024-3	MDC4024-4	MDC4024-1	MDC4024-2	NM-BM	NM-BF	NM-NM	NM-NF	NM-TM	NM-TF
	Female	MDC7912 MDC7906	NF-SM	NF-SF	MDC4032-3	MDC4032-4	MDC4032-1	MDC4032-2	NF-BM	NF-BF	NM-NF	NF-NF	NF-TM	NF-TF
TNC	Male	MDC7913 MDC7907	TM-SM	TMSF	MDC4027-3	MDC4027-4	MDC4027-1	MDC4027-2	BM-TM	BF-TM	NM-TM	NF-TM	TM-TM	TM-TF
	Female	MDC7914 MDC7908	TF-SM	TF-SF	MDC4031-3	MDC4031-4	MDC4031-1	MDC4031-2	BM-TF	BF-TF	NM-TF	NF-TF	TM-TF	TF-TF
SSMA	Male	MDC1143 MDC1144	MDC3314	MDC3312	MDC7916-3	MDC7916-4	MDC7916-1	MDC7916-2	MDC7909	MDC7910	MDC7911	MDC7912	MDC7913	MDC7914
	Female	MDC1144 MDC1142	MDC3100	MDC3313	MDC7915-3	MDC7915-4	MDC7915-1	MDC7915-2	MDC7903	MDC7904	MDC7905	MDC7906	MDC7907	MDC7908

Most standard adapters are nickel plated brass except SMA and SSMA which are usually gold plated stainless steel. When available, particular adapters in the MDC3XXX series can be ordered with a passivated finish by adding "S" to the part number. In the MDC4XXX series, add "G" to part number for gold plating.

Adapter Code Table

BNC	B
C	C
874	874
HN	H
N	N
SC	SC
SMA	S
TNC	T
UHF	U
Male	M
Female	F
Bulkhead	Prefix with B
Right Angle	Prefix with R
Radius (swept)	RR
Panel (flange)	Prefix with P
usage through 18 GHz: Precision	Prefix with X
Examples	Part No.
N (male) to SMA (female)	NM-SF
TNC (female) to SMA (male)	TF-SM
BNC (male) to BNC (female)	BM-BF
Precision panel mount	
N (female) to SMA (female)	XPNF-SF
Bulkhead N (male) to SMA (female)	BNM-SF

General Adapter Information (Consult factory for additional information)

Many MIDISCO adapters are available with one or both interfaces reverse polarized (RP), indicated by adding the suffix RP after the series designator. For example, a standard Type N Plug to SMA jack adapter is a NM-SF. If the type N side is reverse polarized, the part number is NMRP-SF, while reverse polarizing on both sides is indicated as a NMRP-SFRP. Although not heavily stressed in this catalog, MIDISCO also has a wide variety of MCX and MMCX inter and intra series adapters.

Many BNC, TYPE N, TNC, and MCX (jack-to-jack adapters only) are also available in 75 Ω configurations. A -75 suffix is added to part number. With the exception of the type N series, all 75 Ω adapters will interface mechanically and electrically with their 50 Ω counterparts.

The Adapter Part Number Table shown above will aid the user in finding a part number. Page 33 contains an Adapter Suffix Table. It shows how the part numbers for the 4XXX series shown on this page are derived, and provides the user a tool to create part numbers for specific adapters not shown in catalog.

Coaxial Adapters

Standard Adapters

Features

- RF leakage: 90 dB (min.)
- Dielectric withstanding voltage: 1000Vrms, 60Hz (sea level)
- Temperature range: -65°C to +165°C
- Impedance: 50 ohms (some 75 ohm models available)
- Delivery from stock

Standard adapters are an inexpensive alternative to the MIDISCO Precision series, when operating at frequencies less than 12 GHz in TNC and type N. Construction is rugged and, wherever applicable, is in accordance with MIL-PRF-39012 and MIL-A-55339. Construction is stainless steel, beryllium copper or brass as the connector series dictates with corresponding plating of gold or nickel as the specification applies.

Additional types, including bulkhead, panel (flange), right angle and other series combinations are also available, usually from stock.

SMA Male to Type N Female NF-SM	SMA Female to Type N Female NF-SF	SMA Female to Type N Male NM-SF	SMA Male to Type N Male NM-SM
SMA Male to BNC Male BM-SM	SMA Male to BNC Female BF-SM	SMA Female to BNC Female BF-SF	SMA Female to BNC Male BM-SF
SMA Female to TNC Female TF-SF	SMA Female to TNC Male TM-SF	SMA Male to TNC Male TM-SM	SMA Male to TNC Female TF-SM
Type N Female to BNC Male NF-BM	BNC Female to TNC Male BF-TM	BNC Female to Type N Male NM-BF	TNC Female to BNC Male BM-TF
BNC Female to UHF Male UM-BF	BNC Female to Type C Male CM-BF	UHF Female to BNC Male UF-BM	TNC Female to Female Adapter TF-TF

For precision stainless steel construction where applicable — Prefix "X" (See precision adapters section). All dimensions shown in inches (mm).
 Note: Dimensions are for reference only and are subject to change.

Coaxial Adapters

Standard Adapters

TNC Male to Type N Male NM-TM	TNC Female to Type N Male NM-TF	TNC Male to TNC Male TM-TM	TNC Male to Type N Female NF-TM
BNC Female to Female BF-BF	BNC Male to Male BM-BM	BNC Tee - 3 Female BF-BF-BF	BNC Female, Male, Female BF-BM-BF
BNC T - Female, Female, Male BM-BF-BF	Right Angle BNC Female to BNC Male RBF-BM	BNC Female to Female Flange Mount PBF-BF	Type N Female to Female Flange Mount PNF-NF
Type N Female to Female NF-NF	Type N Male to Male NM-NM	Type N Tee - 3 Females NF-NF-NF	Type N Male to Right Angle Type N Female RNF-NM
Type N Tee Female, Male, Female NF-NM-NF	Type N Tee - 3 Males NM-NM-NM	Right Angle Type N Male to Type N Male RNM-NM	Type N Tee Female, Female, Male NF-NF-NM

Standard Material & Finish: Non-Tarnish (Nickel) Plated Brass
 For Precision Stainless Steel Construction where applicable— Prefix "X"
 (See Precision Adapter Section)

All dimensions shown in inches (millimeters)
 Note: Dimensions are for reference and are subject to change.

Coaxial Adapters

Standard Adapters

SC Adapters			900 Adapters
SC Male to SC Male .78 Dia. Ref. 1.39 Ref.	SC Female to SC Female 1.59 Ref. .75 Dia.	Right Angle SC Male to SC Female 1.03 Ref. .94 Ref. .78 Dia.	 see adapter code table x: Connector Series y: M=Male F=Female 900-xy
SCM-SCM	SCF-SCF	RSCM-SCF	
MCX Adapters			SSMB Adapter
MCX Male to MCX Male 	MCX Female to MCX Female 	MCX Male to MCX Female 	SSMB Male to SSMB Male Bulkhead Mount 620 Ref. 360 200 "D" FLAT #6-40 UNF 3/16 HEX 5/32 HEX
MCXM-MCXM	MCXF-MCXF	MCXM-MCXF	MDC6M243
SMB Adapters			
SMB Male Jack to SMB Male Jack .687 REF .295 (TYP) 1/4 HEX	SMB Female Plug to SMB Female Plug .687 REF 1/4 HEX	SMB Tee — 3 Male Jacks .75 Ref. 25 SQ 225 (TYP) 375 (TYP) 50 Ref. 375	SMB Tee — 3 Female Plugs .78 Ref. 39 (TYP) 25 SQ 52 Ref. 39
MDC6234	MDC6237	MDC6328	MDC6329
SMC Adapters			
SMC Male Jack to SMC Male Jack .687 REF .285 (TYP) 1/4 HEX	SMC Female Plug to SMC Female Plug .735 1/4 HEX 7/32 HEX (2 PLACES)	SMC Tee — 3 Male Jacks .84 REF 265 (TYP) 420 (TYP) 42 55 REF	SMC Tee — 3 Female Plugs 1.00 REF 50 (TYP) 7/32 HEX (3 PLACES) 63 REF 50
MDC8134	MDC8137	MDC8128	MDC8129
SMB to SMC Adapters			
SMC Male Jack to SMB Male Jack .285 0.690 REF. .295 1/4 HEX	SMC Female Plug to SMB Male Jack 0.660 REF. 7/32 HEX 1/4 HEX	SMC Female Plug to SMB Female Plug 0.625 REF. 7/32 HEX 1/4 HEX	SMC Male Jack to SMB Female Plug 0.705 REF. 1/4 HEX
MDC 3041	MDC 3042	MDC3044	MDC3045

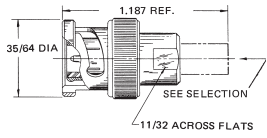
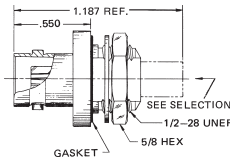
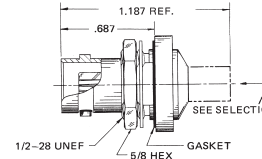
All units are 50 ohms unless specified otherwise.

Note: SMB, SMC, SSMB plugs have female contact.
Dimensions are for reference and subject to change.

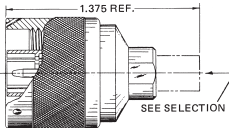
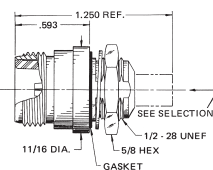
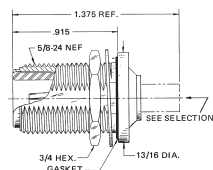
Coaxial Adapters

Standard Adapters

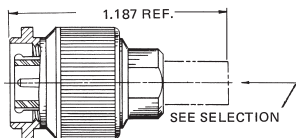
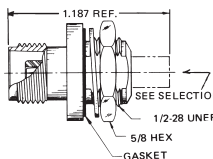
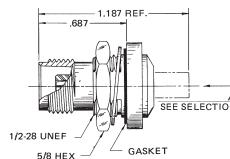
BNC to Subminiature (SMB, SMC, CMS, SSMB, SSMC, SCMS, 50 & 75 ohm)

BNC Plug  MDC4021- ()	BNC Bulkhead Jack Front Mount  MDC4022- ()	BNC Bulkhead Jack Rear Mount  MDC4023- ()
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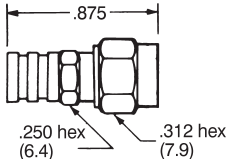
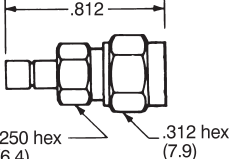
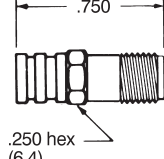
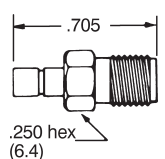
N to Subminiature (SMB, SMC, CMS, SSMB, SSMC, SCMS, 50 & 75 ohm)

N Plug  MDC4024- ()	N Bulkhead Jack Front Mount  MDC4025- ()	N Bulkhead Jack Rear Mount  MDC4026- ()
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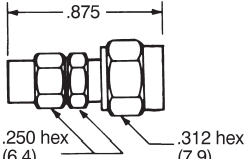
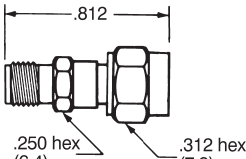
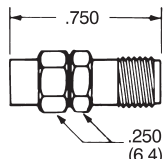
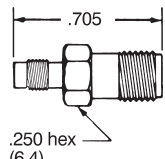
TNC to Subminiature (SMB, SMC, CMS, SSMB, SSMC, SCMS, 50 & 75 ohm)

TNC Plug  MDC4027- ()	TNC Bulkhead Jack Front Mount  MDC4028- ()	TNC Bulkhead Jack Rear Mount  MDC4029- ()
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SMA to SMB Adapters

SMB Female to SMA Male  MDC3038S	SMB Male to SMA Male  MDC3037S	SMB Female to SMA Female  MDC3034S	SMB Male to SMA Female  MDC3033S
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SMA to SMC Adapters / Frequency: DC-10GHz / VSWR: 1.15 max / Material is Passivated Stainless Steel

SMC Female to SMA Male  MDC3040S	SMC Male to SMA Male  MDC3039S	SMC Female to SMA Female  MDC3036S	SMC Male SMA Female  MDC3035S
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All units are 50 ohms unless specified otherwise.

Material & Finish: Nickel Plated Brass.

SMA: Stainless Steel Passivated or Gold Plated per applicable MIL specs.

Example: MDC4022-3 is a front mount BNC bulkhead jack to SMB male jack.

Note: SMB, SSMB, SMC, SSMC, CMS, SCMS plugs have female contact.

SMA plugs have male contact.

For Gold Plated Finish: For MDC4000 Series, add "G" to basic part number.

For MDC3000 Series, drop the "S" suffix.

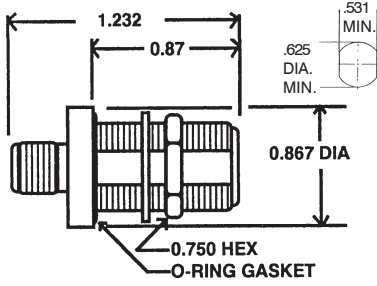
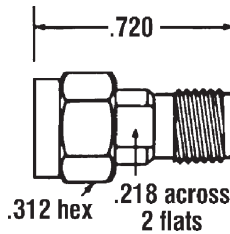
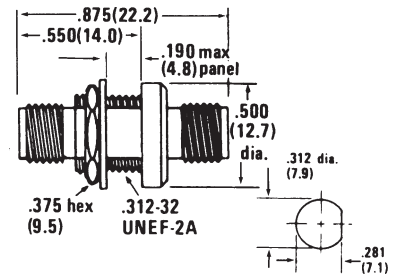
† Suffix "7" and "8" adapters are available as true 75 ohm connectors (both sides) by adding /75 to basic part number. The Snap-On side can also be specified as a 75 ohm mini-SMB by adding an "M" after the "7" or "8" suffix.

Adapter Suffix Table

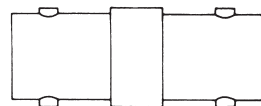
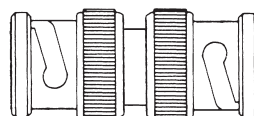
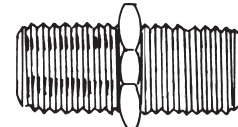
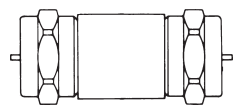
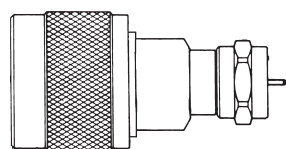
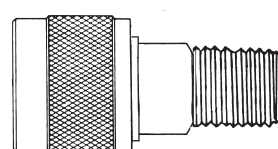
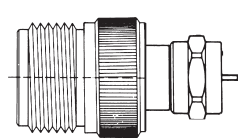
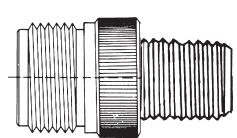
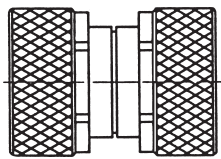
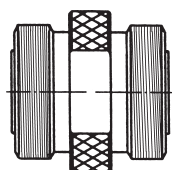
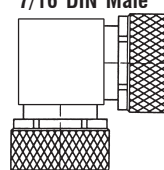
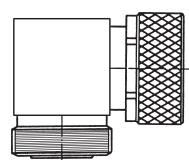
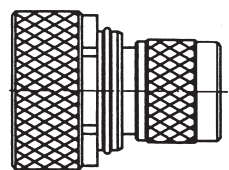
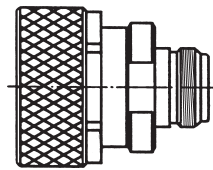
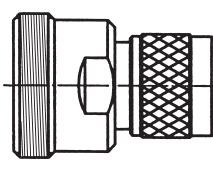
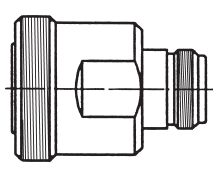
To	Suffix
SMC Male Jack	-1
SMC Female Plug	-2
SMB Male Jack	-3
SMB Female Plug	-4
75 ohm screw-on Male Jack	-5
75 ohm screw-on Female Plug	-6
75 ohm snap-on Male Jack	-7 †
75 ohm snap-on Female Plug	-8 †
CMS Male Jack	-9
CMS Female Plug	-10
SSMC Male Jack	-11
SSMC Female Plug	-12
SSMB Male Jack	-13
SSMB Female Plug	-14
SCMS Male Jack	-15
SCMS Female Plug	-16

Coaxial Adapters

Unique and Popular Adapters

Popular Precision Bulkhead Adapter		Quick Connect or Connector Saver	Hermetically Sealed Bulkhead SMA Fem to SMA Fem
Precision Bulkhead N Fem to SMA Fem 		Quick Connect SMA Male to SMA Fem Also available in Type N, TNC, Type F and others. 	
XBNF-SF-S		QSM-SF-S	HBSF-SF-S

Standard Adapters

BNC 75 ohm Adapters		Type F Adapters	
BNC Female to BNC Female 	BNC Male to BNC Male 	Type F Female to Type F Female 	Type F Male to Type F Male 
BF-BF-75	BM-BM-75	FF-FF	FM-FM
Type N to Type F Adapters			
Type N Male to Type F Male 	Type N Male to Type F Female 	Type N Female to Type F Male 	Type N Female to Type F Female 
NM-FM	NM-FF	NF-FM	NF-FF
7/16 DIN Adapters			
7/16 DIN Male to 7/16 DIN Male 	7/16 DIN Female to 7/16 DIN Female 	Right Angle 7/16 DIN Male to 7/16 DIN Male 	Right Angle 7/16 DIN Male to 7/16 DIN Female 
716M-716M	716F-716F	R716M-716M	R716M-716F
7/16 DIN to Type N Adapters			
7/16 DIN Male to Type N Male 	7/16 DIN Male to Type N Female 	7/16 DIN Female to Type N Male 	7/16 DIN Female to Type N Female 
716M-NM	716M-NF	716F-NM	716F-NF

7/16 connectors & cable assemblies are also available.

Coaxial Adapters

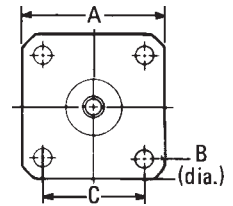
Precision Adapters

Features

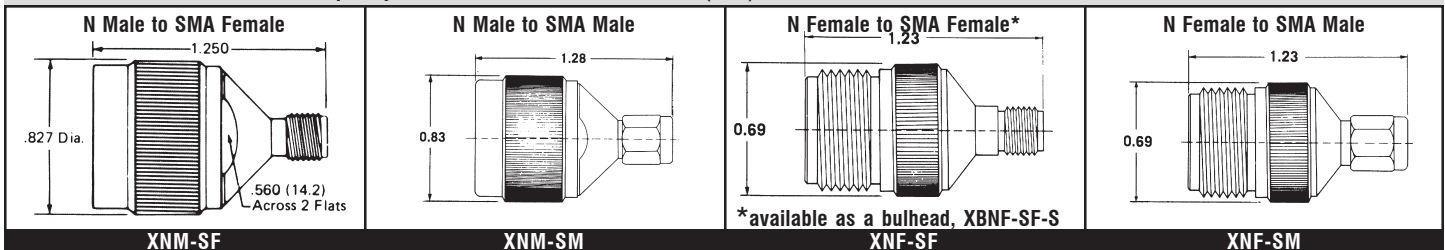
- Low VSWR
- Broadband coverage
- Simplified numbering
- Precision construction
- Smallest size for best performance
- Bulkhead and panel types
- Straight or right angle types
- Radius (bent) configurations
- Performance to 26 GHz and up
- Delivery from stock

Precision inter and intra series adapters, with performance to 26 GHz and beyond, appear on the following pages. Construction is in accordance with MIL-PRF-39012 and MIL-A-55339, where applicable. In most cases, material is stainless steel passivated or gold plated, remaining consistent with that normally specified in that connector series.

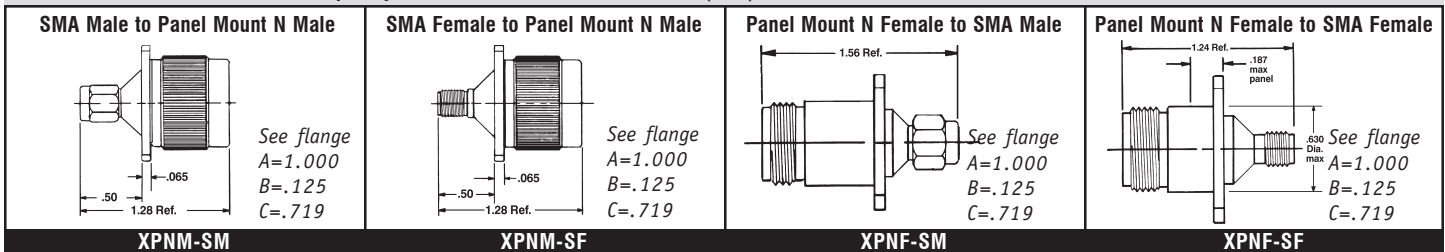
For lower frequency applications, see the MIDISCO standard series adapters in another section of this catalog. Additional adapters, not shown here, are usually from stock. Custom adapters are also available.



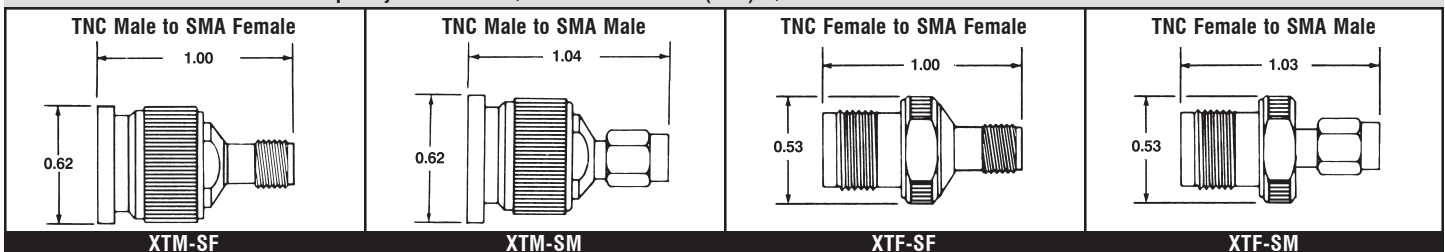
Frequency: DC-18GHz / VSWR: 1.25 GHz (max) / Material is Passivated Stainless Steel



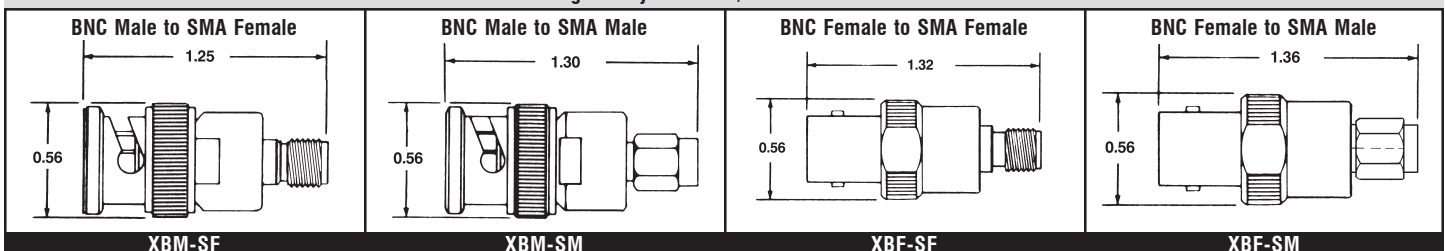
Frequency: DC-18GHz / VSWR: 1.25 GHz (max) / Material is Passivated Stainless Steel



Frequency: DC-15GHz / VSWR: 1.15 GHz (max) / Material is Passivated Stainless Steel



BNC is Brass with Bright Alloy Finish / SMA is Passivated Stainless Steel

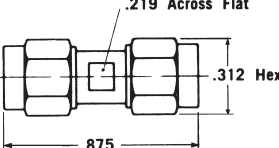
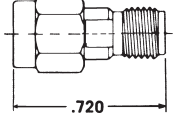
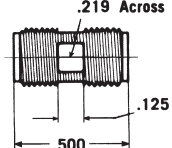
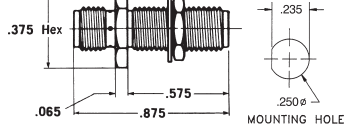


Note: Dimensions are for reference and are subject to change.

Coaxial Adapters

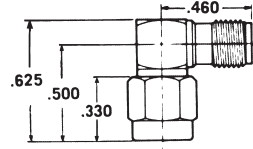
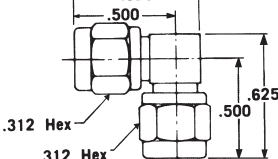
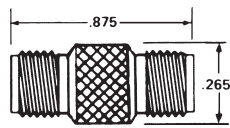
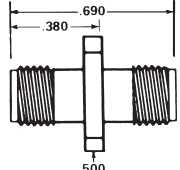
Precision Adapters

Frequency: DC-18GHz / VSWR: 1.15 GHz (max) / Material is Passivated Stainless Steel

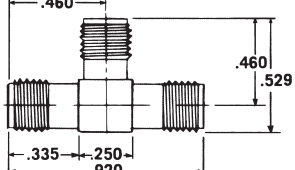
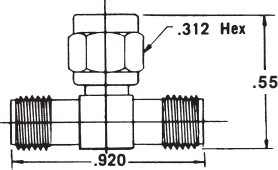
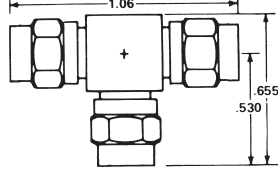
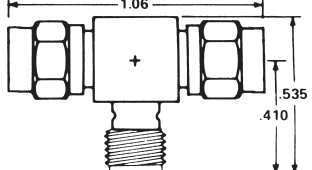
SMA Male to SMA Male  .219 Across Flat .312 Hex .875	SMA Male to SMA Female*  .720 *Quick connect available QSM-SF-S	SMA Female to SMA Female  .219 Across Flat .125 .500	Bulkhead SMA Female to SMA Female*  .375 Hex .065 .575 .875 .235 .250 Ø MOUNTING HOLE *Hermetically sealed HBSF-SF-S
SM-SM-S	SM-SF-S	SF-SF-S	BSF-SF-S

Frequency: DC-18GHz / VSWR: 1.20 GHz (max)
Material is Passivated Stainless Steel

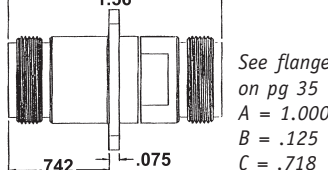
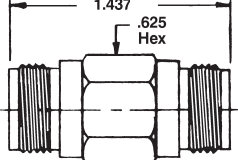
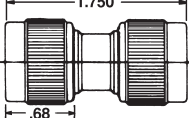
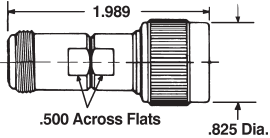
Frequency: DC-18GHz / VSWR: 1.15 GHz (max)
Material is Passivated Stainless Steel

Right Angle SMA Male to SMA Female  .625 .500 .330 .460	Right Angle SMA Male to SMA Male  .625 .500 .312 Hex .312 Hex .500 .625	SMA Female to SMA Female with Knurl  .875 .265	SMA Female Panel Adapter  See flange on pg 35 A = .500 B = .102 C = .340 .690 .380 .500
RSM-SF-S	RSM-SM-S	MDC3125S	MDC3145S / MDC3145S-2 (2 Hole)

Unmatched Power Dividers / Material is Passivated Stainless Steel

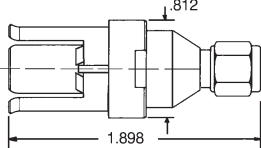
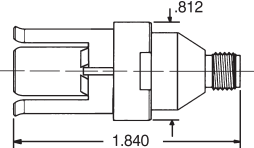
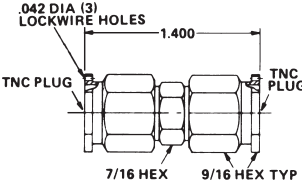
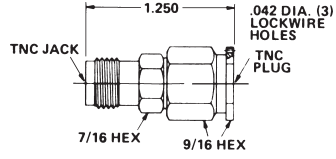
SMA Tee — Female-Female-Female  .460 .460 .529 .335 .250 .920	SMA Tee — Female-Male-Female  .312 Hex .55 .920	SMA Tee — Male-Male-Male  1.06 .655 .530	SMA Tee — Male-Female-Male  1.06 .535 .410
SF-SF-SF-S	SF-SM-SF-S	SM-SM-SM-S	SM-SF-SM-S

Frequency: DC-18GHz / VSWR: 1.25 max / Material is Passivated Stainless Steel

Panel Mount N Female to N Female  1.56 See flange on pg 35 A = 1.000 B = .125 C = .718 .742 .075	N Female to N Female  1.437 .625 Hex	N Male to N Male  1.750 .68	N Female to N Male  1.989 .500 Across Flats .825 Dia.
XPNF-NF	XNF-NF	XNM-NM	XNM-NF

SMA Material is Passivated Stainless Steel

Frequency: DC-18 GHz / VSWR: 1.25 max / Material is Passivated Stainless Steel

874 to SMA Male †  .812 1.898	874-SMA Female †  .812 1.840	TNC Male to TNC Male  .042 DIA (3) LOCKWIRE HOLES 1.400 TNC PLUG 7/16 HEX 9/16 HEX TYP	TNC Female to TNC Male  1.250 .042 DIA. (3) LOCKWIRE HOLES TNC JACK 7/16 HEX 9/16 HEX TNC PLUG
874-SM	874-SF	XTM-TM	XTM-TF-S

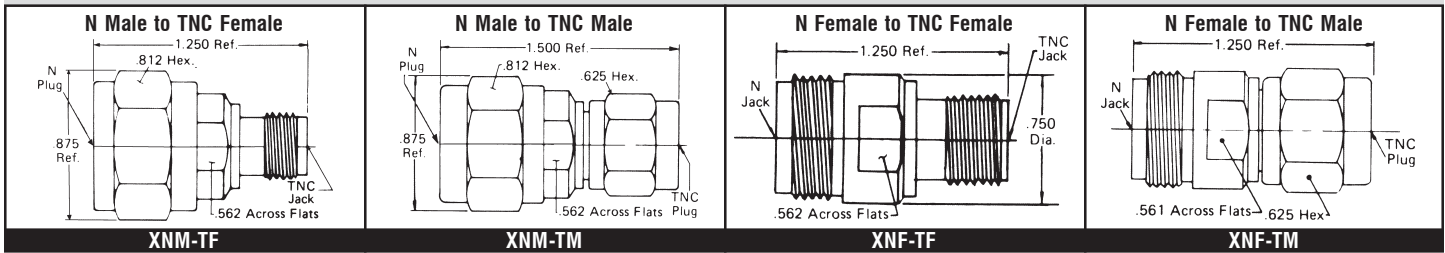
† 874 Adapters are available to BNC, C, HN, N, TNC, UHF, and other series.
All dimensions are reference and are subject to slight changes.

Drop the last "S" in part number for gold-plated body where applicable.

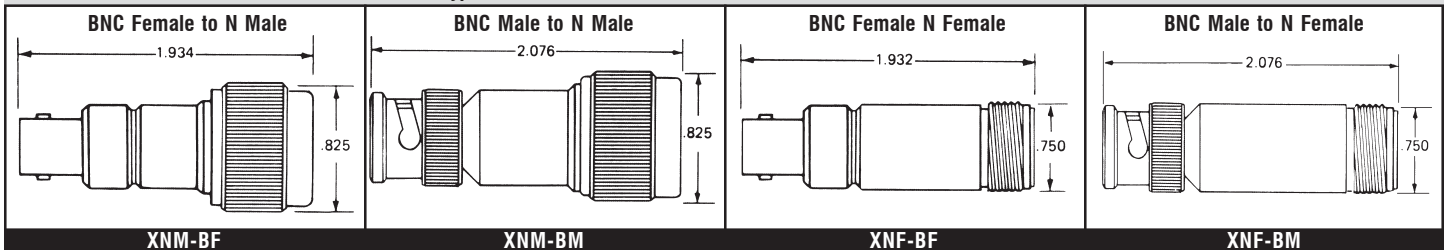
Coaxial Adapters

Precision Adapters

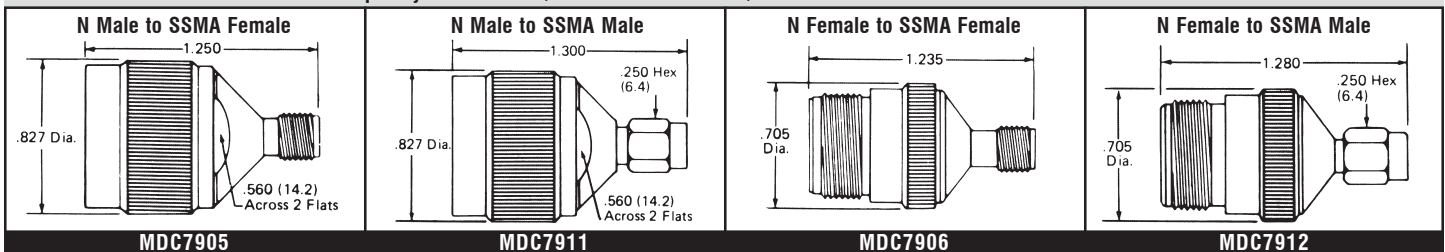
Material is Passivated Stainless Steel



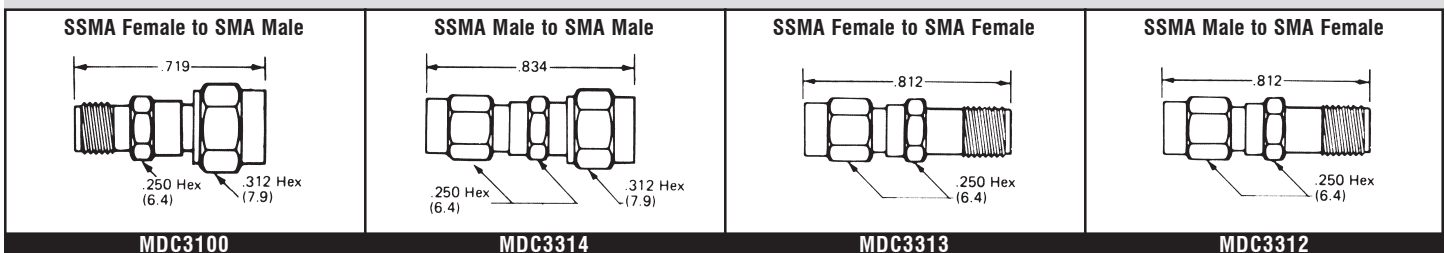
Type N: Passivated Stainless Steel / BNC: Nickel Plated Brass



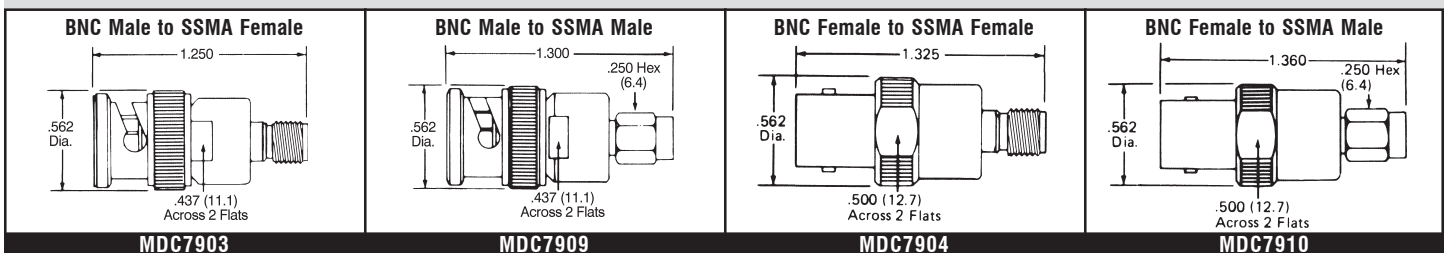
Frequency: DC-18GHz / VSWR: 1.30 max / Material is Passivated Stainless Steel



Material is Passivated or Gold Plated Stainless Steel



BNC: Nickel Plated Brass / SSMA: Passivated Stainless Steel



Dimensions are for reference and subject to change.

Radius Swept 90° Adapters & Connectors

N, TNC, SMA

Features

- One piece center conductor
- Low VSWR to 18 GHz
- BeCu or Stainless construction
- SMA, N, or TNC
- Specials available
- Low susceptibility to vibration and shock
- Delivery from stock

MIDISCO swept adapters and connectors consist of a bent section that houses a one-piece center conductor. This design eliminates the vibration and shock failures that could occur if there were a solder joint. Superior VSWR to 18 GHz is inherent in the design.

Model	Adapter Ends		A	B	Figure
RRNM-NM	N Plug	N Plug	1.094	1.084	4
RRNM-NF	N Plug	N Jack	1.109	1.000	4
RRSM-SM-S	SMA Plug	SMA Plug	0.550	0.550	4
RRSM-SF-S	SMA Plug	SMA Jack	0.550	0.460	4
RRSF-SF-S	SMA Jack	SMA Jack	0.460	0.460	4
RRSM-SF-S/45	SMA Plug	SMA Jack	N/A	N/A	5
RRTM-TM	TNC Plug	TNC Plug	1.060	1.060	4
RRTM-TF	TNC Plug	TNC Jack	0.953	1.060	4

Model	Description	A	B	Figure
MDC0451S	Extended contact, .590 insulator	1.017	0.590	1
MDC0452S	SMA jack, solder pot per figure 2	0.488	0.090	1
MDC0453S	Extended contact and insulator	0.612	0.100	1
MDC0456S	Flush insulator, extended contact	0.747	0.000	1
MDC0458S	Plug with solder pot	0.488	0.090	2
MDC0460S	Plug for RG55, 142, 223 cable	0.960	0.780	3
MDC0462S	Plug for 0.085 (RG405) cable	0.712	0.525	3
MDC0464S	Flush insulator, extended contact	0.622	0.000	1
MDC0465S	Flush insulator, extended contact	0.386	0.000	1
MDC0466S	Flush insulator, extended contact	0.412	0.000	1
MDC0467S	Flush insulator, extended contact	0.362	0.000	1
MDC0468S	Flush insulator, extended contact	0.562	0.000	1
MDC0469S	Flush insulator, extended contact	0.712	0.000	1
MDC0470S	Flush insulator, extended contact	0.772	0.000	1
MDC0471S	Extended contact and insulator	0.612	0.100	1
MDC0472S	Extended contact and insulator	1.017	0.590	1
MDC0473S	Extended contact and insulator	0.412	0.050	2

Note: The default finish is passivated. For gold plating drop the S suffix from part number.

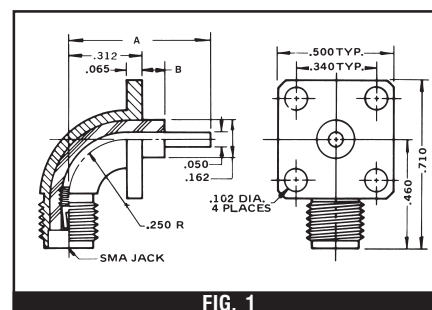


FIG. 1

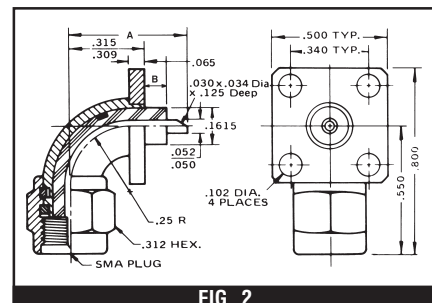


FIG. 2

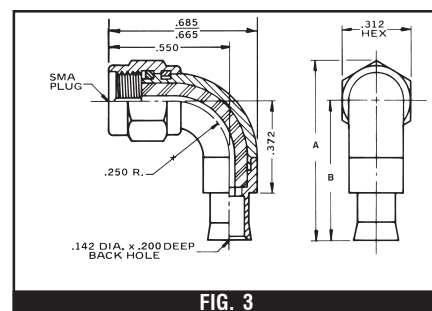


FIG. 3

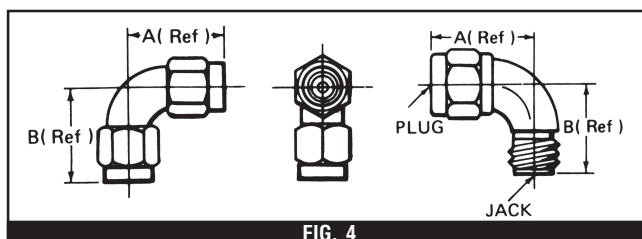
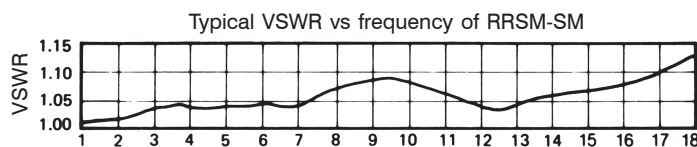


FIG. 4

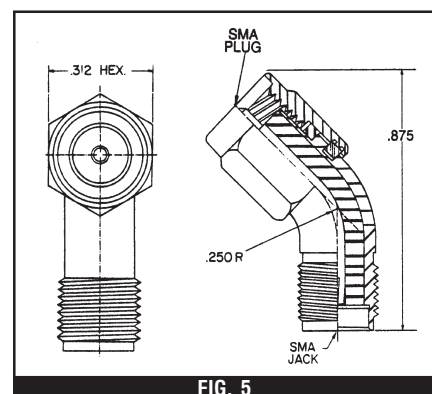


FIG. 5

Swept Right Angle Adapter Assembly

N, TNC, SMA, SMB, SMC

Features

- Economical and dependable
- Low VSWR to 18 GHz as applicable
- Available with MIDISCO Snake or Ultra Flex Cable
- SMA, SMB, SMC, N & TNC
- Specials & mixed series available
- Delivery from stock

MIDISCO Swept Right Angle Adapters Assemblies offer an economical and dependable alternative to the Radius Swept Adapters shown on the previous page. They provide better electrical performance than standard mitered or cubed right angle adapters. They consist of either MIDISCO Snake 0.141 diameter semi-rigid cable, or MIDISCO Ultra-Flex 0.141 diameter coaxial cable, combined with low profile connectors. The use of the Snake semi-rigid or Ultra-Flex cable eliminates the solder joint found in standard adapters. The elimination of this internal transition improves electrical performance while at the same time enhancing reliability.

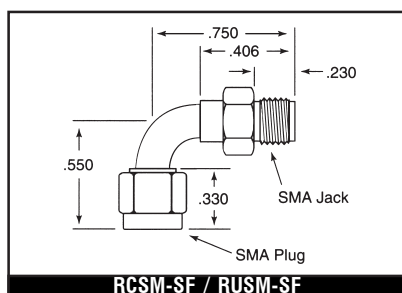
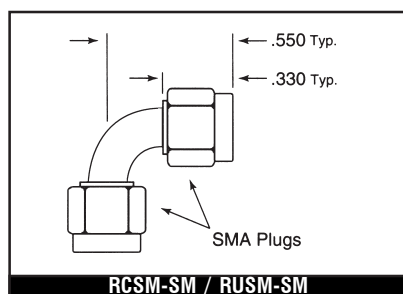
The table shown below summarizes the more common connector configurations available with the MIDISCO Swept Right Angle Adapters. Additional types including bulkhead, panel (flange), and other series connectors are also available.

Model	Adapter Ends		Coaxial Cable Type
RCSM-SM	SMA Plug	SMA Plug	MIDISCO Snake 0.141 dia. Reformable Semi-Rigid Cable
RCSF-SF	SMA Jack	SMA Jack	
RCSM-SF	SMA Plug	SMA Jack	
RCNM-NM	N Plug	N Plug	
RCNF-NF	N Jack	N Jack	
RCNM-NF	N Plug	N Jack	
RCTM-TM	TNC Plug	TNC Plug	MIDISCO Ultra-Flex 0.141 dia. Hand Formable Coaxial Cable
RCTF-TF	TNC Jack	TNC Jack	
RCTM-TF	TNC Plug	TNC Jack	
RUSM-SM	SMA Plug	SMA Plug	
RUSF-SF	SMA Jack	SMA Jack	
RUSM-SF	SMA Plug	SMA Jack	
RUNM-NM	N Plug	N Plug	
RUNF-NF	N Jack	N Jack	
RUNM-NF	N Plug	N Jack	
RUTM-TM	TNC Plug	TNC Plug	
RUTF-TF	TNC Jack	TNC Jack	
RUTM-TF	TNC Plug	TNC Jack	

For Bulkhead types, add "B" to basic part number.
Example: RCBSM-SF

For Panel Mount types, add "P" to basic part number.
Example: RCPSM-SF

Also available using 0.085 & 0.250 diameter cable, consistent with connector size & power handling requirements. Consult factory.



Features

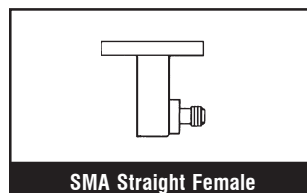
- VSWR typ. 1.3:1
- Insertion Loss typ. <0.15 dB
- SMA, N, 7 mm connectors standard
- Connectors per MIL-PRF-39012
- Aluminum, brass, copper material
- Standard Finish: gold chromate with black paint

MIDISCO Rectangular Coaxial to Waveguide Adapters are available as standard items in fourteen common waveguide sizes as shown in the accompanying table. Five connector styles are offered, including an SMA swept radius right angle which can be specified in one of three orientations. TNC and other connectors also available. Units to 40 GHz also available as well as units with lower VSWR.

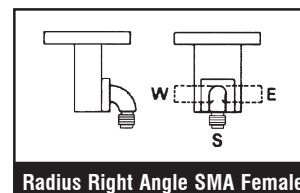
Freq (GHz)	Waveguide Size	Model Number†	VSWR (typ.)	Insertion Loss (dB typ.)
1.12-1.70	WR650	x-650-m-f	1.3	.15
1.70-2.60	WR430	x-430-m-f	1.3	.15
2.20-3.25	WR340	x-340-m-f	1.3	.15
2.60-3.95	WR284	x-284-m-f	1.3	.15
3.30-4.90	WR229	x-229-m-f	1.3	.15
3.95-5.85	WR187	x-187-m-f	1.3	.15
4.90-7.05	WR159	x-159-m-f	1.3	.15
5.85-8.20	WR137	x-137-m-f	1.3	.15
7.00-11.00	WR102	x-102-m-f	1.3	.15
7.05-10.00	WR112	x-112-m-f	1.3	.15
8.20-12.40	WR90	x-900-m-f	1.3	.15
10.00-15.00	WR75	x-750-m-f	1.4	.20
12.40-18.00	WR62	x-620-m-f	1.4	.20
18.00-26.50	WR42	x-420-m-f	1.5	.25
26.50-40	WR28	x-280-m-f	1.5	.20

†: x (Connector Type), m (Material), & f (Flange) to be selected by customer.

For example, an SM-900-A-1 is a WR90 (8.20 to 12.4 GHz) aluminum adapter with a cover flange and an SMA female coaxial connector.



SMA Straight Female



Radius Right Angle SMA Female

Notes:

Right angle connector will be supplied in position "S" unless orientation is specified. When inquiring, specify restricted frequency ranges whenever possible for better performance or lower cost.

Connector Type

N	Type N female
SM	SMA female
RRSM	Radius right angle SMA female
7	7mm
SMM	SMA male

Material

A	Aluminum
B	Brass
C	Copper
S	Special

Flange

1	Cover
2	Choke
3	CPRF
4	CPRG
5	Special
6	CMR

MIDISCO can also supply coaxial to waveguide adapters including additional sizes, reduced height, extended range and custom configurations. Please call the factory.

Ordering Information

Using the accompanying tables for waveguide size, connector type, material and flange type, the user can construct the part number for the desired coaxial to waveguide adapter.

MIDISCO Waveguide Components

MIDISCO also has a broad assortment of other waveguide components as summarized below. For additional information, please consult the factory Technical Sales Department.

- High power Coaxial to Waveguide Adapters
- High power end launch Coaxial to Waveguide Adapters
- Double Ridge Precision Coaxial to Waveguide Adapters
- Straight, flanged waveguide sections
- Rigid, flanged twists
- Flexible, and twistable-flexible flanged waveguide sections
- Low and high power fixed waveguide loads and terminations
- Directional Couplers
- Waveguide transitions (VSWR 1.10:1 max in the overlap frequency bands)

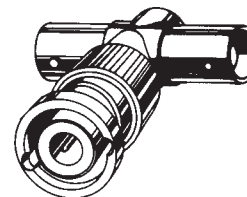
BNC Pre-terminated Adapter

Hassle Free

Features

- Available in 50 & 75 ohm versions
- 5% 1/4W ceramic resistor
- Bulkhead version
- T version
- No external termination necessary.

MIDISCO Pre-terminated bulkhead and T adapters have a built in ceramic resistor that eliminates the cost and inconvenience of separate terminations. The internal termination is automatically disabled when an external connection is made. The bulkhead version is designed for 0.5" diameter panel mounting.



BF-BM-BF-50T (shown) T connector with 50 ohm termination

BF-BM-BF-75T T connector with 75 ohm termination

BBF-BF-50T Bulkhead connector with 50 ohm termination

BBF-BF-75T Bulkhead connector with 75 ohm termination

BF-BM-BF-50T

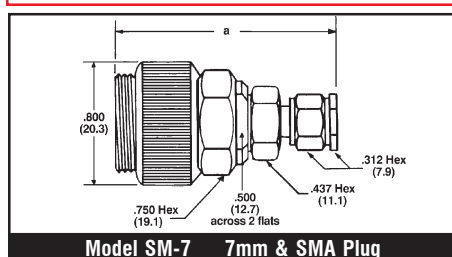
7mm Coaxial Adapters

Features

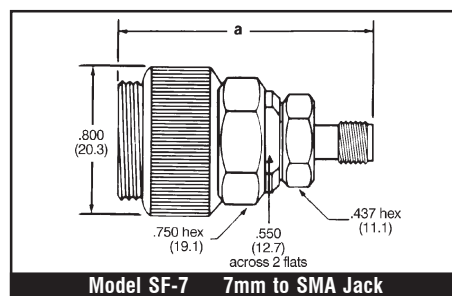
- VSWR is $1.003 + 0.02f$ (GHz)
- Impedance is 50 Ohms
- Voltage Rating: 1000 Vrms
- Dielectric Withstanding Voltage (max) 2500 Vrms
- Body: Gold Plated Beryllium Copper
- Frequency Range: 0-18 GHz (Except for BNC)

MIDISCO 7mm precision adapters have low VSWR over wide frequencies. Adapters are available from 7mm to N, TNC, BNC, SMA, SSMA, 3.5mm and 2.4mm. Specifications are shown for the adapter and for a mated pair of 7mm connectors alone. The connectors as well as the adapters are available from stock.

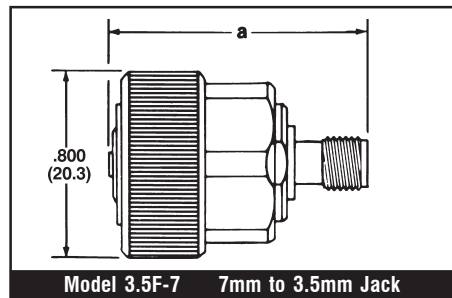
High Performance



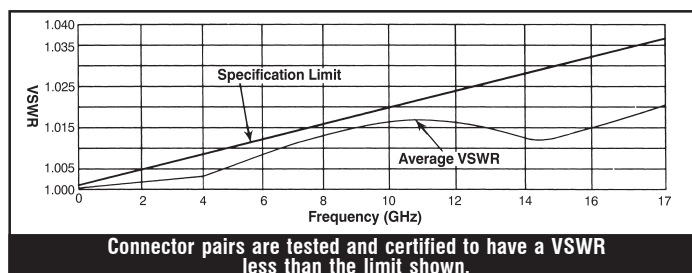
Model SM-7 7mm & SMA Plug



Model SF-7 7mm to SMA Jack



Model 3.5F-7 7mm to 3.5mm Jack



Adapter Ends	Dimensions, in. (mm) A	Maximum VSWR to 18 GHz	MIDISCO Number
7mm - 2.4mm Plug	1.420 (36.1)	1.01 + 0.004f (GHz)	2.4M-7
7mm - 2.4mm Jack	1.420 (36.1)	1.01 + 0.004f (GHz)	2.4F-7
7mm - SSMA Plug	1.300 (33.0)	1.01 + 0.005f (GHz)	SSM-7
7mm - SSMA Jack	1.380 (35.0)	1.01 + 0.005f (GHz)	SSF-7
7mm - N Jack	1.672 (42.5)	1.01 + 0.002f (GHz)	NF-7
7mm - N Plug	1.813 (46.0)	1.01 + 0.002f (GHz)	NM-7
7mm - TNC Jack	1.609 (40.9)	1.01 + 0.006f (GHz)	TF-7
7mm - TNC Plug	1.750 (44.5)	1.01 + 0.006f (GHz)	TM-7
7mm - BNC Jack	1.609 (40.9)	1.035 @4GHz	BF-7
7mm - BNC Plug	1.719 (43.7)	1.035 @4GHz	BM-7
7mm - 3.5mm Plug	1.567 (39.8)	1.02 + 0.0025f (GHz)	3.5M-7
7mm - 3.5mm Jack	1.483 (37.7)	1.02 + 0.0025f (GHz)	3.5F-7
7mm - SMA Jack	1.31 (33.3)	1.02 + 0.0025f (GHz)	SF-7
7mm - SMA Plug	1.39 (35.3)	1.02 + 0.0025f (GHz)	SM-7

Adapter Kits

For series adaptation: SMA, SMB, SMC, N, TNC, BNC

Any Adapto-Kit consists of one (1) of each of the following:

Kit No. AK-SMB

From	To	Adapter P/N
SMB Male	SMB Male	MDC6234
SMB Female	SMB Female	MDC6237
SMB Male	SMC Female	MDC3042
SMB Male	N Male	MDC4024-3
SMB Male	TNC Male	MDC4027-3
SMB Male	BNC Male	MDC4021-3
SMB Male	SMA Male	MDC3037
SMB Male	SMC Male	MDC3041
SMB Male	SMA Female	MDC3033
SMB Female	SMC Male	MDC3045
SMB Female	N Male	MDC4024-4
SMB Female	TNC Male	MDC4027-4
SMB Female	BNC Male	MDC4021-4
SMB Female	SMA Male	MDC3038
SMB Female	SMC Female	MDC3044

Kit No. AK-SMC

From	To	Adapter P/N
SMC Male	SMC Male	MDC8134
SMC Female	SMC Female	MDC8137
SMC Male	SMB Female	MDC3045
SMC Male	N Male	MDC4024-1
SMC Male	TNC Male	MDC4027-1
SMC Male	BNC Male	MDC4021-1
SMC Male	SMB Male	MDC3039
SMC Male	SMB Male	MDC3041
SMC Male	SMB Female	MDC3035
SMC Female	SMB Male	MDC3042
SMC Female	N Male	MDC4024-2
SMC Female	TNC Male	MDC4027-2
SMC Female	BNC Male	MDC4021-2
SMC Female	SMA Male	MDC3040
SMC Female	SMB Female	MDC3044

Kit No. AK-TNC

From	To	Adapter P/N
TNC Male	TNC Male	TM-TM
TNC Female	TNC Female	TF-TF
TNC Male	TNC Female	TM-TF
TNC Male	SMA Male	TM-SM
TNC Male	SMA Female	TM-SF
TNC Male	N Male	NM-TM
TNC Male	N Female	NF-TM
TNC Male	BNC Male	BM-TM
TNC Male	BNC Female	BF-TM
TNC Female	SMA Male	TF-SM
TNC Female	SMA Female	TF-SF
TNC Female	N Male	NM-TF
TNC Female	N Female	NF-TF
TNC Female	BNC Male	BM-TF
TNC Female	BNC Female	BF-TF

Kit No. AK-SMA

From	To	Adapter P/N
SMA Male	SMA Male	SM-SM
SMA Female	SMA Female	SF-SF
SMA Male	SMA Female	SM-SF
SMA Male	N Male	NM-SM
SMA Male	N Female	NF-SM
SMA Male	TNC Male	TM-SM
SMA Male	TNC Female	TF-SM
SMA Male	BNC Male	BM-SM
SMA Male	BNC Female	BF-SM
SMA Female	N Male	NM-SF
SMA Female	N Female	NF-SF
SMA Female	TNC Male	TM-SF
SMA Female	TNC Female	TF-SF
SMA Female	BNC Male	BM-SF
SMA Female	BNC Female	BF-SF

Kit No. AK-N

From	To	Adapter P/N
N Male	N Male	NM-NM
N Female	N Female	NF-NF
N Male	N Female	NM-NF
N Male	SMA Male	NM-SM
N Male	SMA Female	NM-SF
N Male	TNC Male	NM-TM
N Male	TNC Female	NM-TF
N Male	BNC Male	NM-BM
N Male	BNC Female	NM-BF
N Female	SMA Male	NF-SM
N Female	SMA Female	NF-SF
N Female	TNC Male	NF-TM
N Female	TNC Female	NF-TF
N Female	BNC Male	NF-BM
N Female	BNC Female	NF-BF

Kit No. AK-BNC

From	To	Adapter P/N
BNC Male	BNC Male	BM-BM
BNC Female	BNC Female	BF-BF
BNC Male	BNC Female	BM-BF
BNC Male	SMA Male	BM-SM
BNC Male	SMA Female	BM-SF
BNC Male	N Male	NM-BM
BNC Male	N Female	NF-BM
BNC Male	TNC Male	BM-TM
BNC Male	TNC Female	BM-TF
BNC Female	SMA Male	BF-SM
BNC Female	SMA Female	BF-SF
BNC Female	N Male	NM-BF
BNC Female	N Female	NF-BF
BNC Female	TNC Male	BF-TM
BNC Female	TNC Female	BF-TF

The MIDISCO Adapto-Kit

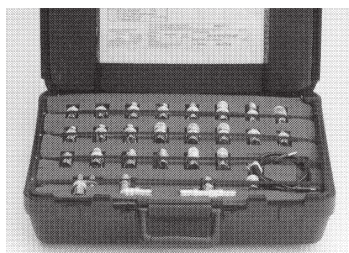
consists of a hanging display board with spring clips which holds a total of 15 inter- and intra-series adapters. Kits are available in N, TNC, BNC, SMA, SMB, and SMC. This enables the technician to adapt from one series to all of the other series. Replacement adapters are available.

Delivery from stock.
Also available in carrying case.

874 Adapters

Features

- 50 ohms impedance
- hermaphrodite, can connect with other 874
- Available in many different configurations
- Locking and non-locking versions
- Delivery from stock



Kit number AK-874

MIDISCO 874 connectors have excellent electrical performance, and any two can be mated. This connector is available in both the non locking and the high performance locking versions. The 874 connectors offer SWR performance superior to any cable with which they can be used and therefore add no significant reflections when used in cabled measurement set-ups.

High Performance

Qty	Desc.	Part #	Qty	Desc.	Part #
2	874 to BNC Female Jack Adapter	874-BF	1	874 to SMA Male Plug Adapter	874-SM
2	874 to BNC Male Plug Adapter	874-BM	1	874 to TNC Female Jack Adapter	874-TF
1	874 to C Female Plug Adapter	874-CF	1	874 to TNC Male Plug Adapter	874-TM
1	874 to C Male Adapter	874-CM	2	874 to UHF Female Jack Adapter	874-UF
1	874 to HN Female Jack Adapter	874-HNF	2	874 to UHF Male Plug Adapter	874-UM
1	874 to HN Male Plug Adapter	874-HNM	1	874 to Banana Female Jacks	874-2BPJ
3	874 to N Female Jack Adapter	874-NF	1	874 Tee Adapter	874-T
3	874 to N Male Plug Adapter	874-NM	1	874 Right Angle Adapter	R874
1	874 to SMA Female Jack Adapter	874-SF	1	874 3 ft patch cord to Ban. Plugs	874-72-BP-36

*A selection of 874 products are packaged in a rugged travel case. The 874 connectors are non-locking type.

Adapto-Cable Kits

SMA, SMB, SMC, N, TNC, BNC

Features

- Permits connections without adapters
- Available in various cable types
- Kits may be ordered with different lengths
- Re-bendable semi rigid types
- Less expensive than if purchased individually
- High quality connectors per MIL-PRF-39012
- Cable per MIL-C-17 as applicable
- Quality assembly techniques
- Bulkhead or Panel (flange) connectors available
- Right angle connectors when required
- Special Kits or individual assemblies obtainable
- FAST delivery—usually one week

MIDISCO Adapto-Cable Kits are similar in nature to the Adapto-Kits which provide the user with coaxial adapters for complete series adaptation at a more reasonable cost than ordering separately. The Adapto-Cable Kits consist of an assortment of eight cable assemblies with various popular combinations of connectors that are commonly found in the field or laboratory. Each Kit may be purchased in one of several coaxial cable types and cable lengths as shown. When specifying, add the cable series and the length desired to the part number for each kit type you are ordering.

Bulkhead (hex-nut) or panel (flange) mount connectors are available. If the semi-rigid types are to be formed for system applications or used in a laboratory environment, MDC5141 (0.141 dia) or MDC5085 (0.085 dia) rebendable semi-rigid cable, shown in this catalog, or the new Ultra-Flex types should be specified instead of RG402 or RG405 respectively. Standard Kit lengths are shown, however, other lengths and cable types can be obtained as a kit or as individual cable assemblies. Delivery is normally one week.

CKA - (Cable Series) - L

BNC Male	BNC Male
BNC Male	BNC Female
BNC Male	N Male
BNC Male	TNC Male
BNC Male	SMA Male
BNC Male	SMB Male
BNC Male	SMC Male
BNC Female	BNC Female

CKD - (Cable Series) - L

SMA Male	SMA Male
SMA Male	SMA Female
SMA Male	N Male
SMA Male	BNC Male
SMA Male	TNC Male
SMA Male	SMB Male
SMA Male	SMC Male
SMA Female	SMA Female

CKG - (Cable Series) - L

SMA Male	SMA Male
SMA Male	SMA Female
SMA Male	SMB Male
SMA Male	SMB Female
SMB Male	SMB Female
SMB Male	SMB Male
SMB Female	SMB Female
SMB Female	SMA Female

CKB - (Cable Series) - L

N Male	N Male
N Male	N Female
N Male	BNC Male
N Male	TNC Male
N Male	SMA Male
N Male	SMB Male
N Male	SMC Male
N Female	N Female



CKC - (Cable Series) - L

TNC Male	TNC Male
TNC Male	TNC Female
TNC Male	N Male
TNC Male	BNC Male
TNC Male	SMA Male
TNC Male	SMB Male
TNC Male	SMC Male
TNC Female	TNC Female

CKF - (Cable Series) - L

N Male	BNC Male
N Male	BNC Female
N Male	BNC Male
N Male	BNC Female
BNC Male	BNC Male
BNC Male	BNC Female
BNC Male	TMC Male
TNC Female	TNC Male

CKE - (Cable Series) - L

SMB Male	SMB Male
SMB Male	SMB Female
SMC Male	SMC Male
SMC Male	SMC Female
SMB Male	SMC Female
SMC Male	SMB Female
SMC Female	SMC Female
SMB Female	SMB Female

CKH - (Cable Series) - L

SMA Male	SMA Male
SMA Male	SMA Female
SMA Male	SMC Male
SMA Male	SMC Female
SMC Male	SMC Female
SMC Male	SMC Male
SMC Female	SMC Female
SMA Female	SMA Female

Note: Please insert the desired cable series for each ADAPTO-CABLE KIT ordered into the Kit Model Number. Also select the length you wish each cable to be and substitute that length for "L" in the Kit Model Number. EXAMPLE: CKC-58-48 is Kit Model CKC; all cables use RG58 cable and each one is 48 inches overall length.

Cable Series: RG55, 58, 59, 62, 141, 142, 174, 178, 180, 188, 195, 196, 214, 223, 316, 400, 402, 405, MDC5085, MDC5141, and Ultra-Flex series MDC8084, MDC8085 and MDC8141. Please note that not every cable series is available in every kit model due to connector restrictions and MIDISCO may request to substitute a similar cable type where necessary for that connector only.

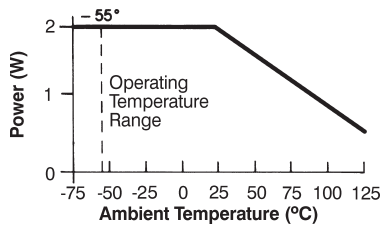
Coaxial Attenuators

SMA

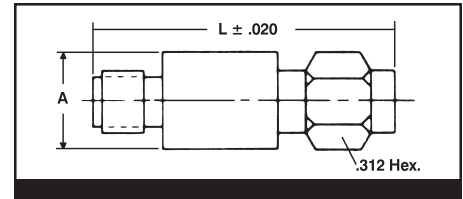
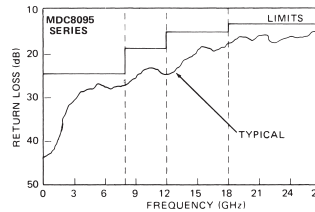
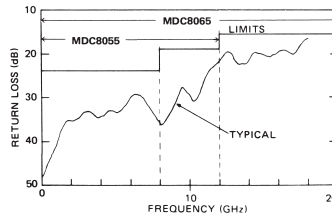
Features

- Meets or exceeds all applicable MIL Specs
- 50 Ohms impedance
- Rugged -55° to +125° operating temperature
- All attenuation values available
- Calibration chart at nominal cost
- Phase track $\pm 5^\circ$ typical between units
- Smallest models made
- Low VSWR
- Extremely flat over frequency
- Delivery from stock

Typical Temperature vs. Power Derating Chart



MIDISCO SMA attenuators are ruggedly constructed to all military specifications where applicable; including MIL-A-3933 and MIL-C-39012. A sufficient selection is included here for various frequency applications. Each performs well within the specified limit from -65°C to +125°C. The MDC7065 series will handle higher input power for some attenuation values. All models will handle 2 watts at +25°C derated to 0.5 watts at +125°C. Higher power models and other attenuation values are available. Upper frequency models use a thin-film laser trimmed attenuation element on a ceramic substrate. MDC1012, 1055 and 1065 have square bodies that technicians desire for the laboratory; all others are round. Calibration data is available at extra cost. Double male or female specified by the suffix "M" or "F". All models shown below are in stock. Additional frequency ranges are available. Type F attenuators available as model number MDC8011-(dB).



Freq Range (GHz)	DC-2.5	DC-4.0	DC-8.0	DC-12.4		DC-18.0			DC-23	
Model	*MDC1012-dB	MDC8040-dB	MDC8030-dB	*MDC1055-dB	MDC8055-dB	*MDC1065-dB	MDC8065-dB	MDC7065-dB	MDC7065X-dB**	
ATTENUATION AND MAXIMUM DEVIATION OVER THE ENTIRE FREQUENCY RANGE IN dB (Deviation is much tighter over narrower frequency segments - contact MIDISCO for data)	0-0.30	0-0.30	0-0.30	0-0.30	0-0.30	0-0.40	0-0.30	0-0.40	0-0.30	
	1±0.30	1±0.30	1±0.30	1±0.30	1±0.30	1±0.30	1±0.30	1±0.65	1±0.30	
	2±0.30	2±0.30	2±0.30	2±0.30	2±0.30	2±0.30	2±0.30	2±0.65	2±0.30	
	3±0.30	3±0.30	3±0.30	3±0.30	3±0.30	3±0.30	3±0.30	3±0.70	3±0.30	
	4±0.30	4±0.30	4±0.30	4±0.30	4±0.30	4±0.30	4±0.30	4±0.70	4±0.30	
	5±0.30	5±0.30	5±0.30	5±0.30	5±0.30	5±0.30	5±0.30	5±0.80	5±0.30	
	6±0.35	6±0.30	6±0.30	6±0.30	6±0.30	6±0.35	6±0.30	6±0.80	6±0.30	
	7±0.35	7±0.30	7±0.30	7±0.35	7±0.30	7±0.35	7±0.40	7±0.80	7±0.50	
	8±0.40	8±0.30	8±0.30	8±0.40	8±0.30	8±0.40	8±0.40	8±0.80	8±0.50	
	9±0.45	9±0.30	9±0.30	9±0.45	9±0.30	9±0.45	9±0.40	9±0.90	9±0.50	
	10±0.50	10±0.40	10±0.40	10±0.50	10±0.40	10±0.50	10±0.40	10±0.90	10±0.50	
	11±0.50	11±0.50	11±0.50	11±0.50	11±0.50	11±0.50	11±0.50	11±0.90	11±0.50	
	12±0.60	12±0.50	12±0.50	12±0.50	12±0.50	12±0.60	12±0.50	12±0.90	12±0.50	
	13±0.60	13±0.50	13±0.50	13±0.50	13±0.50	13±0.60	13±0.50	13±1.00	13±0.50	
	14±0.70	14±0.50	14±0.50	14±0.50	14±0.50	14±0.70	14±0.50	14±1.00	14±0.50	
	15±0.70	15±0.50	15±0.50	15±0.50	15±0.50	15±0.70	15±0.50	15±1.00	15±0.50	
	16±0.80	16±0.50	16±0.50	16±0.75	16±0.50	16±0.80	16±0.50	16±1.00	16±0.50	
	17±0.80	17±0.50	17±0.50	17±0.75	17±0.50	17±0.80	17±0.50	17±1.00	17±0.50	
	18±0.90	18±0.50	18±0.50	18±0.75	18±0.50	18±0.90	18±0.50	18±1.00	18±0.50	
	19±0.90	19±0.50	19±0.50	19±0.75	19±0.50	19±0.90	19±0.50	19±1.00	19±0.50	
	20±1.00	20±0.50	20±0.50	20±0.75	20±0.50	20±1.00	20±0.50	20±1.00	20±0.50	
	30±1.50	30±0.60	30±0.60	30±0.60	30±1.25	30±0.60	30±1.25	30±0.60	30±1.20	30±1.00
	40±1.75	40±0.75	40±0.75	40±0.75	40±1.50	40±1.00	40±1.50	40±1.00	40±1.75	40±1.50
Length "L" (in.)	1.45 max (0-20dB) 2.15 max (30-40dB)	(0-12dB) 0.86 (13-40dB) 1.02	(0-12dB) 0.86 (13-40dB) 1.02	1.25 max all models	(0-12dB) 0.86 (13-40dB) 1.02	1.25 max all models	(0-12dB) 0.86 (13-40dB) 1.02	(10-12dB) 0.755 (13-30dB) 0.885 (31-40dB) 1.02	(0-20dB) 0.700 (21-40dB) 0.830	
"A"(nom.)	*0.375 sq.	0.30 dia.	0.30 dia.	*0.375 sq.	0.30 dia.	*0.375 sq.	0.30 dia.	0.35 dia. max	0.312 hex	
Weight (oz.)	0.25	0.15	0.15	0.25	0.15	0.25	0.15	0.18	0.15	
VSWR (max.) @f (GHz)	DC-1.0 (1.20) 1.0-2.5 (1.30)	DC-4.0 (1.15)	DC-4.0 (1.15) 4.0-8.0 (1.25)	DC-4.0 (1.15) 4.0-10.0 (1.30) 10.0-12.4 (1.35)	DC-8.0 (1.15) 8.0-12.4 (1.25)	DC-4.0 (1.15) 4.0-8.0 (1.30) 8.0-12.4 (1.35) 12.4-18.0 (1.40)	DC-8.0 (1.20) 8.0-12.4 (1.25) 12.4-18.0 (1.35)	DC-8.0 (1.20) 8.0-12.4 (1.25) 12.4-18.0 (1.35)	DC-4.0 (1.10) 4.0-8.0 (1.15) 8.0-12.4 (1.20) 12.4-23 (1.25)	
Power	2 Watts average and 500 watts peak - maximum rated average power at 25°C ambient temperature that derates linearly to 1.25 watts at +75 and 0.5 watt at +125°.							2w Avg.(min) 200w peak	2w Avg.(min) 250w peak	

* MDC1012R, MDC1055R and MDC1065R are available with 0.36 diameter round body indicated by suffix "R".

** MDC7065X-dB has 5/16 hex on body for torquing in tight spaces.

NOTE: All SMA attenuators are Stainless Steel.

Coaxial Attenuators

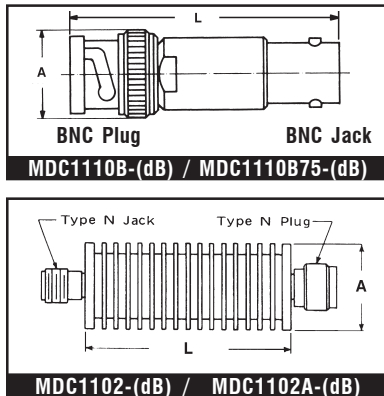
Type BNC, N, TNC, 7 mm

Features

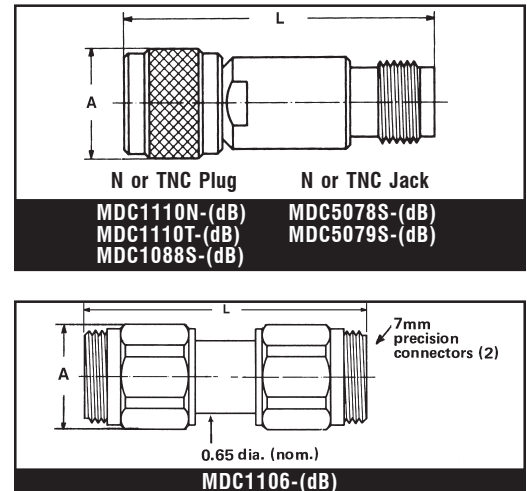
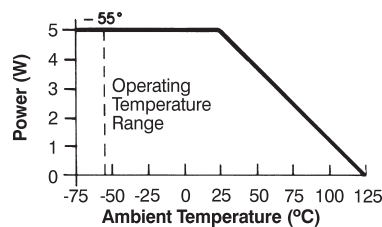
- 50 or 75 Ohm Impedance
- Up to 20W average power (higher available)
- Rugged brass or stainless construction
- All attenuation values available
- Calibration chart at nominal cost
- Low VSWR and attenuation variation
- Good phase tracking
- Meets or exceeds all applicable MIL Specs
- Delivery from stock

MIDISCO

attenuators are designed to exceed MIL-A-3933 and MIL-C-39012 where applicable. The high quality models shown here provide the user with a sufficient selection of attenuation values and frequency coverage to properly select for the application. Other attenuation values, different connector types such as SMS, SMC, SSMA and higher power models are available. Calibration charts may be purchased at nominal cost. Double male or female connector combinations are specified by the suffix "M" or "F". All models shown below are in stock. Additional frequency ranges are available.



Typical Temperature vs. Power Derating Chart for MDC5078S and MDC5079S Series



Freq Range (GHz)	DC-500 MHz		DC-2.0		DC-4.0		DC-12.4		DC-18.0	
Connector Type	BNC	BNC	N	TNC	N	¹ TNC***	N	N	N	7 mm**
Model	MDC1110B75-(dB)	MDC1110B-(dB)	MDC1110N-(dB)	MDC1110T-(dB)	MDC1102A-(dB)	MDC1088S-(dB)	MDC5079S-(dB)	MDC1102-(dB)	MDC5078S-(dB)	MDC1106-(dB)
ATTENUATION AND MAXIMUM DEVIATION OVER THE ENTIRE FREQUENCY RANGE IN dB (Deviation is much tighter over narrower frequency segments - contact MIDISCO for data)	1±0.4	1±0.5	1±0.3	1±0.3		1±0.3	1±0.3		1±0.4	1±0.3
	2±0.4	2±0.5	2±0.3	2±0.3		2±0.3	2±0.3		2±0.4	2±0.3
	3±0.4	3±0.5	3±0.3	3±0.3	3±0.75	3±0.3	3±70.3	3±0.75	3±0.3	3±0.3
	4±0.4	4±0.5	4±0.4	4±0.4		4±0.3	4±0.3		4±0.3	4±0.3
	5±0.4	5±0.5	5±0.4	5±0.4		5±0.3	5±0.3		5±0.3	5±0.3
	6±0.4	6±0.5	6±0.4	6±0.4	6±0.75	6±0.3	6±0.3	6±0.75	6±0.3	6±0.3
	7±0.4	7±0.5	7±0.4	7±0.4		7±0.3	7±0.3		7±0.3	7±0.5
	8±0.4	8±0.5	8±0.4	8±0.4		8±0.4	8±0.3		8±0.3	8±0.5
	9±0.4	9±0.5	9±0.4	9±0.4		9±0.4	9±0.3		9±0.3	9±0.5
	10±0.4	10±0.5	10±0.4	10±0.4	10±0.75	10±0.5	10±0.5	10±0.75	10±0.5	10±0.5
	11±0.4	11±0.5	11±0.5	11±0.5		11±0.5	11±0.5		11±0.5	11±0.5
	12±0.4	12±0.5	12±0.5	12±0.5		12±0.6	12±0.5		12±0.5	12±0.5
	13±0.4	13±0.5	13±0.5	13±0.5		13±0.6	13±0.5		13±0.5	13±0.5
	14±0.4	14±0.5	14±0.5	14±0.5		14±0.6	14±0.5		14±0.5	14±0.5
	15±0.4	15±0.5	15±1.0	15±1.0		15±0.6	15±0.75		15±0.5	15±0.5
	16±0.4	16±0.5	16±1.0	16±1.0		16±0.7	16±0.75		16±0.5	16±0.5
	17±0.4	17±0.5	17±1.0	17±1.0		17±0.7	17±0.75		17±0.5	17±0.5
	18±0.4	18±0.5	18±1.0	18±1.0		18±0.8	18±0.75		18±0.5	18±0.5
	19±0.4	19±0.5	19±1.0	19±1.0		19±0.9	19±0.75		19±0.5	19±0.5
	20±0.4	20±0.5	20±1.0	20±1.0	20±0.75	20±1.0	20±0.75	20±0.75	20±0.5	20±0.5
	30±0.4	30±0.75	30±1.5	30±1.5	30±1.00	30±1.5	30±0.75	30±1.00	30±1.00	30±.75
	40±0.4	40±0.75	40±1.5	40±1.5		40±2.0	40±0.75		40±1.00	40±1.5
		50±2.0	50±2.0	50±2.0		50±2.0	50±0.75		50±1.25	50±1.5
		60±2.5	60±2.5	60±2.5		60±2.5	60±1.20		60±1.50	60±1.5
Length "L" (in.)*	1.43	1.90	2.50	2.30	2.75	1.80	2.04	3.20	2.04	2.12 (thru 30 dB)
"A"(nom.)	0.58 dia.	0.58 dia.	0.82 dia.	0.63 dia.	1.50 dia.	0.63 dia.	0.83 dia.	1.50 dia.	0.83 dia.	0.87 dia.
Material & Finish	Brass - Nickel or Silver plated				Stainless Steel & Black Anodize	Brass - Nickel plated	Stainless Steel	Stainless Steel & Black Anodize	Stainless Steel	
Weight (oz.)	1.40	1.40	2.8	1.40	6.0	1.8	2.6	6.0	2.6	5.0
Impedance (ohms)	75	50	50	50	50	50	50	50	50	50
VSWR (max.) @f (GHz)	DC-0.5 (1.30)		DC-2.0 (1.25)		DC-4.0 (1.20)	DC-4.0 (1.15) 4.0-8.0 (1.25) 8.0-12.4 (1.28)	DC-4.0 (1.15) 4.0-8.0 (1.20) 8.0-12.4 (1.25)	DC-4.0 (1.20) 4.0-8.0 (1.25) 8.0-12.4 (1.35)	DC-4.0 (1.15) 4.0-8.0 (1.20) 8.0-12.4 (1.25) 12.4-18.0 (1.40)	DC-4.0 (1.10) 4.0-12.4 (1.15) 12.4-18.0 (1.20)
Power	1 Watt Average 1 kW Peak	1 Watt Average 500 W Peak	2 Watts Average; 200 W Peak		20 watts Avg. 1 kW peak @ +25°C	2 watts Avg. 500 W peak @ +25°C	5 watts Avg. 500 W peak @ +25°C	20 watts Avg. 1 kW peak @ +25°C	5 watts Avg. 500 W peak @ +25°C	2 watts Avg. 250 W peak @ +25°C
Oper. Temp. Range	-55° to +125°C	-55° to +100°C	-55° to +125°C							

* Higher values may be slightly longer.

Note: BNC attenuators - DC-4.0 GHz also available; Model MDC1051-(dB)

** 7 mm attenuators are also available in 1 dB increments from 21 to 29 dB with a +/-0.75 dB accuracy, and from 31-60 dB with a +/-1.5 dB accuracy.

*** Available in Stainless Steel version up to 18 GHz (MDC1088SX, etc.) consult MIDISCO.

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Rotary Attenuators

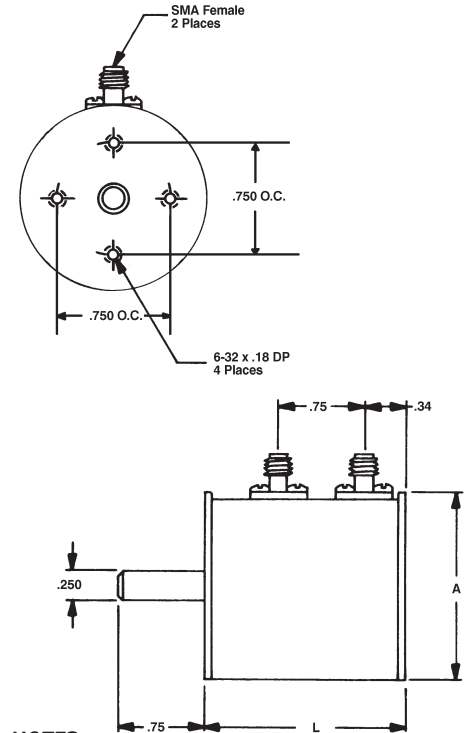
50 & 75 Ohm

Features

- Rugged Construction
- SMA, BNC, N, or F connectors
- Excellent electrical performance
- Dual Concentric Types Available
- Low Cost

MIDISCO Rotary Step Attenuators are available in sufficient variety to satisfy most requirements. Rugged construction (MDC2017S-117 has a life design of 100,000 cycles minimum) is apparent in all models. Other connector types may be ordered as well as dual concentric types in 50 and 75 ohms. Delivery is from stock.

Model	Atten. Range	Nom. Imped.	VSWR/Insertion Loss (dB) max.	Attenuation Accuracy (dB)	L (inches)	A (inches)
MDC2017S-49¹ DC-1000 MHz	0 to 1 dB ⁴ 0.1 dB steps	50 Ω	DC-1000: 1.2/0.7	DC-30: 0.01 30 -500: 0.03 500-1000: 0.05	2.00	1.50
MDC2017S-270¹ DC-2500 MHz	0 to 1 dB ⁴ 0.1 dB steps	50 Ω	DC-1100: 1.2/1.0 1100-2500: 1.4/1.0	0.05	2.00	1.50
MDC2017S-40¹ DC-2200 MHz	0 to 10 dB ⁴ 1 dB steps	50 Ω	DC-1000: 1.2/0.2 1000-2200: 1.4/0.4	DC-1000: 0.2 1000-2200: 0.4	2.00	1.50
MDC2017S-50^{1,7} DC-2200 MHz	0 to 70 dB ⁴ 10 dB steps	50 Ω	DC-1000: 1.2/0.3 1000-2000: 1.4/0.5	DC-500: 0.5 or 1% ³ 500-1000: 0.5 or 2% ³ 1000-2200: 0.5 or 3% ³	2.70	1.50
MDC2017S-64¹ DC-1000 MHz	0 to 100 dB ⁴ 10 dB steps	50 Ω	DC-1000: 1.2/0.3	DC-500: 0.5 or 1% ³ 500-1000: 0.5 or 2% ³	2.70	1.50
MDC2017S-104⁸ DC-2000 MHz	0 to 10 dB ⁴ 1 dB steps	50 Ω	DC-1000: 1.2/0.2 1000-2000: 1.4/0.4	DC-1000: 0.2 1000-2000: 0.4	1.83	1.28
MDC2017S-105⁸ DC-2200 MHz	0 to 60 dB ⁴ 10 dB steps	50 Ω	DC-1000: 1.2/0.3 1000-2200: 1.4/0.5	DC-500: 0.5 or 1% ³ 500-1000: 0.5 or 2% ³ 1000-2200: 0.5 or 3% ³	2.40	1.28
MDC2017S-117^{8,9} DC-1200 MHz	0 to 100 dB ⁴ 10 dB steps	50 Ω	DC-1200: 1.3/0.2	1.5%	2.30	1.28
MDC2017S-184⁸ DC-4000 MHz	0 to 10 dB ⁴ 1 dB steps	50 Ω	DC-2000: 1.3/0.25 2000-4000: 1.5/0.4	DC-1000: 0.2 1000-2000: 0.3 2000-4000: 0.4	1.75	1.63
MDC2017B-27² DC-500 MHz	0 to 1 dB ⁴ 0.1 dB steps	75 Ω	DC-500: 1.3/0.7	DC-30: 0.01 30 -300: 0.02 300-500: 0.03	2.40	1.87
MDC2017B-23² DC-500 MHz	0 to 10 dB ⁴ 1 dB steps	75 Ω	DC-500: 1.3/0.4	DC-300: 0.2 300-500: 0.3	2.40	1.87
MDC2017B-22² DC-500 MHz	0 to 70 dB ⁴ 1 dB steps	75 Ω	DC-500: 1.3/0.4	DC-30: 0.2 30 -300: 0.5 300-500: 1.0	3.00	1.87



NOTES:

- 1) SMA Female connectors are standard. Change S to B for BNC.
- 2) BNC Female connectors are standard. Change B to F for Type F.
- 3) Whichever is greater of the two is applicable.
- 4) The attenuation increases with clockwise rotation.
- 5) The attenuation increases with counterclockwise rotation.
- 6) MDC2017S-104 available with same specifications; L = 1.83"; 0.77" between centerline of connectors; SMA only.
- 7) MDC2017S-105 available (0-60dB only) with same specifications; L = 2.40"; 1.36" between centerline of connectors; SMA only.
- 8) Available in SMA only; 0.75" between centerline of connectors.
- 9) Shaft length of MDC2017S-117 is 0.62".

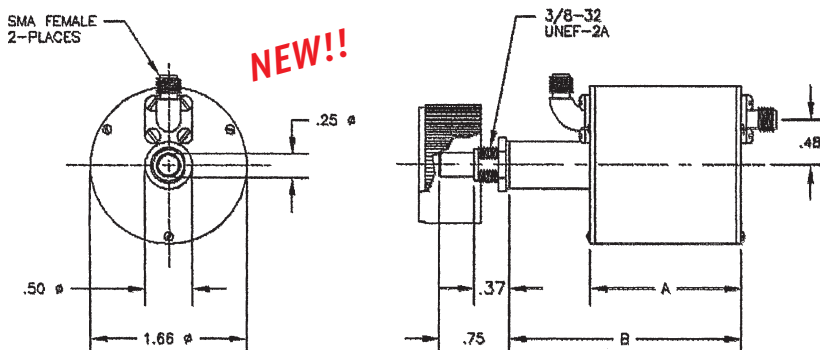
All Models have a 2 W average and a Peak Power Rating of 1 KW, except MDC2017S-184 which is 800 W.

Indexing is 30 degrees, stopping at maximum & minimum.

Operating Temperature Range is -20°C to +85°C. (0°C to +55°C for 12.4 GHz units).

Midisco introduces its new line of 12.4 GHz SMA Rotary Attenuators as shown below

Model	Frequency (GHz)	Impedance Nom (ohms)	Range, Step Size	VSWR / Insertion Loss (max)	Accuracy $\pm$ dB	Avg/Pk Pwr	A	B
MDC2017S-288	DC-12.4	50	0-9 0.1 dB steps	1.50:1/1 dB	+/- 0.35 dB	2/200	1.18	2.05
MDC2017S-291	DC-12.4	50	0-60 10 dB steps	1.50:1/1 dB	+/-0.5 dB or 5% ³	2/200	1.62	2.49



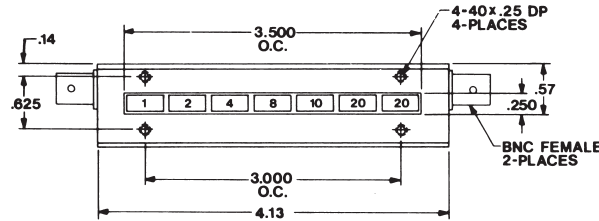
Pushbutton Attenuators

50 & 75 Ohm

Features

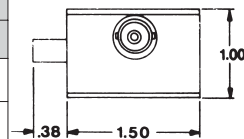
- Wide Attenuation Range
- Close Attenuation Accuracy
- 75 or 50 Ohm
- Rugged Construction
- -20°C to + 85°C Operating Temperature
- Delivery from stock
- 1 Watt Average, 1000 Watts Peak

MIDISCO Pushbutton Attenuators are available in eight models; six 50 ohm units, and two that are 75 ohms. Step sizes available depending on model selected are 0.5 dB, 1 dB, 2 dB, 4 dB, 10 dB and 20 dB. Attenuation ranges provided



are 45.5 dB, 65 dB, 82.5 dB, 85 dB and 102 dB. Units with ranges greater than 65 dB are slightly larger than shown in accompanying figure. Consult factory for details.

Model	Freq. Range (MHz)	Range, Step Size	Attenuation Steps (dB)	VSWR (max.) vs Frequency			Loss dB (max.)	Attenuation Accuracy (+/- dB) vs Frequency			
				DC-100	100-500	500-750		DC-100	100-300	300-500	500-750
MDC2018B-22 ¹ (50 Ω)	DC-750	0-65 dB 1dB steps	1, 2, 4, 8, 10, 20, 20	1.1	1.3	1.4	1.0 @ 500 MHz	0.3	0.5	0.8	1.3
MDC2018B-23 ¹ (50 Ω)	DC-750	0-45.5 dB 0.5dB steps	0.5, 1, 2, 4, 8, 10, 20	1.1	1.3	1.4	1.0 @ 500 MHz	0.2	0.3	0.5	0.75
MDC2018B-64 ² (50 Ω)	DC-750	0-102 dB 1dB steps	1, 2, 3, 6, 10, 20, 20, 20, 20	1.4	1.4	1.4	1.5	0.3, or 1%	0.3, or 1%	0.3, or 1%	0.3, or 1%
MDC2018B-65 ² (50 Ω)	DC-750	0-82.5 dB 0.5dB steps	0.5, 1, 2, 3, 6, 10, 20, 20, 20	1.4	1.4	1.4	1.5	0.3, or 1%	0.3, or 1%	0.3, or 1%	0.3, or 1%
MDC2018B-71 ² (50 Ω)	DC-1300	0-102 dB 1dB steps	1, 2, 3, 6, 10, 20, 20	1.5	1.5	1.5	750 MHz: 2, 1300 MHz: 4	0.5, or 2%	0.5, or 2%	0.5, or 2%	0.5, or 2% ³
MDC2018B-56 ² (50 Ω)	DC-750	0-85 dB 1dB steps	1, 2, 4, 8, 10, 20, 20	1.3	1.3	1.4	500 MHz: 1, 750 MHz: 1.5	0.5, or 1%	0.5, or 1%	0.5, or 2%	0.5, or 2%
MDC2718B-22 ¹ (75 Ω)	DC-500	0-65 dB 1dB steps	1, 2, 4, 8, 10, 20, 20	1.1	1.2	1.3	1.0 @ 500 MHz	0.3	0.5	0.8	N/A
MDC2718B-23 ¹ (75 Ω)	DC-500	0-45.5 dB 0.5dB steps	0.5, 1, 2, 4, 8, 10, 20	1.1	1.2	1.3	1.0 @ 500 MHz	0.2	0.3	0.5	N/A



Notes:

- 1 BNC connectors are standard. Change "B" to "F" for F female connectors (75 Ω units only)
2. BNC connectors are standard. Change B to N, S, or T for type N, SMA, or TNC female respectively.
3. +/-0.5 dB or 3% of programmed attenuation from 750 to 1300 MHz.

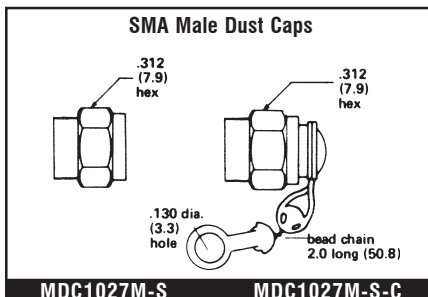
Coaxial Accessories

Resistive Terminations & Dust Caps

Features

- Sturdy Construction
- All Applicable MIL-Specs
- Special Impedances Available
- Other Connector Types Available
- With or Without Bead Chains
- Tarnish Resistant
- Delivery from stock

The accessories shown below are typical of the most popular types of Terminations and Dust Caps. In addition, MIDISCO has similar items with UHF, HN, C, SMB, SMC, and many other types of connector configurations. By adding the suffix "-C" a bead chain may be specified. The user should also be aware of the precision types of Coaxial Terminations and Shorts which may be found in other sections of this catalog.



Notes:

Suffix "-C" for a Bead Chain.
SMA Accessories are Passivated Stainless Steel;
all others are Brass with Bright Alloy finish

Model	Connector	Description
MDC1026M-B-(ohms)	BNC Male	25, 50, 75, 93, 100, 150 or 600 ohm Resistive Termination 1%, 1/2 watt
MDC1027M-B	BNC Male	Male Dust Cap-Non Shorting for protection of BNC Females
MDC1027F-B	BNC Female	Female Dust Cap-Non Shorting for protection of BNC Males
MDC1026M-T-(ohms)	TNC Male	25, 50, 75, 93, 100, 150 or 600 ohm Resistive Termination 1%, 1/2 watt
MDC1027M-T	TNC Male	Male Dust Cap-Non Shorting for protection of TNC Females
MDC1027F-T	TNC Female	Female Dust Cap-Non Shorting for protection of TNC Males
MDC1026M-N-(ohms)	N Male	25, 50, 75, 93, 100, 150 or 600 ohm Resistive Termination 1%, 1/2 watt
MDC1027M-N	N Male	Male Dust Cap-Non Shorting for protection of N Females
MDC1027F-N	N Female	Female Dust Cap-Non Shorting for protection of N Males
MDC1026M-S	SMA Male	25, 50, 75, 93, 100, 150 or 600 ohm Resistive Termination 1%, 1/2 watt
MDC1027M-S	SMA Male	Male Dust Cap-Non Shorting for protection of SMA Females
MDC1027F-S	SMA Female	Female Dust Cap, Non Shorting for protection of SMA Males
MDC1027M-SS	SSMA Male	Male Dust Cap, Non-Shorting for protection of SSMA Females
MDC1027M-H	HN Male	Male Dust Cap, Non-Shorting for protection of HN Females
MDC1027F-H	HN Female	Female Dust Cap, Non-Shorting for protection of HN Males
MDC1027M-7/16	7/16 Male	Male Dust Cap, Non-Shorting for protection of 7/16 Females

Coaxial Terminations

Type SMA, SSMA, 2.4 mm, 7 mm, MCX, MMCX

Features

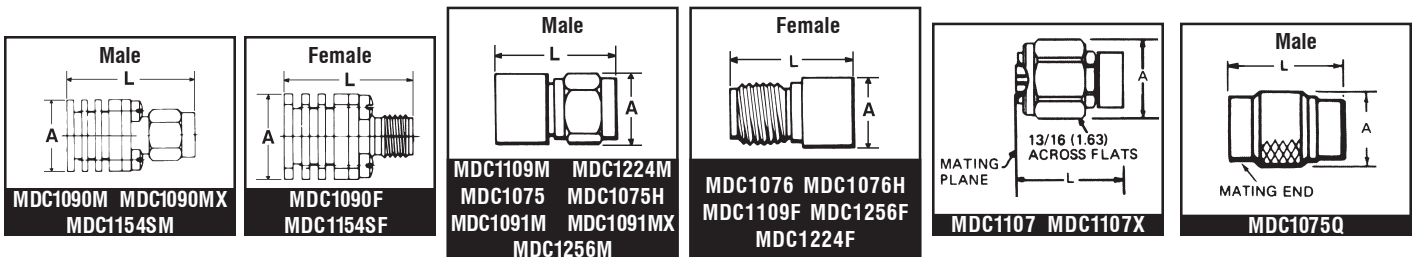
- Connectors per MIL-PRF-39012
- Constructed per all applicable MIL-Specs
- Low VSWR
- DC up to 50 GHz
- Small size
- Lightweight
- Operating temperature -55°C to +125°C
- 50 ohms impedance
- RF leakage 90 dB min
- Snap on/off SMA type available - MDC1075Q
- 500 cycle durability
- Most available with bead chain - (Suffix "-C")
- Delivery from stock

MIDISCO high precision coaxial terminations were designed for broad frequency coverage at reasonable cost. Each model meets the applicable interface parameters of MIL-PRF-39012. A sufficient selection is offered to permit the user to choose the correct model for the application considering VSWR, power and size versus cost.

The "Q" model is actually a snap-on SMA type termination for laboratory or system use, that will snap on to any SMA female connector with excellent detent characteristics. The MDC1075Q-C (with bead chain) is very useful on front panels where it must be removed repeatedly. The quick-disconnect SMA termination finds great use in laboratory testing including phase matching.

2.9 mm, SMP*, F Series, and 75 Ω Type N terminations are also available. Higher power terminations are available. The models shown here are in stock.

*SMP connectors mate with the GPO series (Trademark of Corning Gilbert Corporation)



Model Number	Connector Type (Note 1)	Power @ 25°C		VSWR (max) @ Frequency (GHz)						L (in) (max)	A (in) (max)	Material & Finish	Weight (oz)
		Avg. (W)	Peak (kW)	DC-4	4-8	8-12	12-18	18-26	26 - Above				
MDC1075	SMA Male	1	1.0	1.05	1.10	1.15	1.20	1.35		0.55	0.31 dia.	Stainless Steel Passivated	0.12
MDC1075H		2	1.5				1.25			0.65			0.15
MDC1091MX		1	1.0	1.03	1.04	1.08	1.25			0.33			0.08
MDC1091M				1.05	1.06	1.09				0.35			0.09
MDC1090M		5	2.0	1.20	1.30	1.40	1.25	1.25	0.90	0.50 sq.	Stainless Steel Passivated Coupling Nut Black Anodized Aluminum Body	0.90	
MDC1090MX			4.0	1.15	1.15				1.35	0.75 dia.		1.10	
MDC1256M			2.0	1.10		1.20			1.35	1.50		0.75 dia.	0.43
MDC1154SM			15									2.00	1.25 dia.
MDC1075Q	SMA Male Snap-On	1		1.08	1.13	1.17	1.23			0.55	0.38 dia.	Beryllium Copper Gold Plated	0.13
MDC1076	SMA Female	1	1.0	1.05	1.10	1.15	1.20	1.35		0.52	0.31 dia.	Stainless Steel Passivated, For Gold, Drop S from Model No.	0.08
MDC1076H		2		1.08	1.12	1.20	1.30	1.40		0.44	0.28 hex		0.06
MDC1090F		5	2.0	1.20	1.30	1.40	1.35	0.76		0.50 sq.	Stainless Steel Passivated Coupling Nut Black Anodized Aluminum Body	0.89	
MDC1090FX			4.0	1.15	1.15	1.25		1.25		0.90		0.75 dia.	1.09
MDC1256F		15	2.0	1.10	1.15	1.20		1.35		1.30		0.50 dia.	0.43
MDC1154SF										1.90		1.25 dia.	0.90
MDC1109M	SSMA Male	0.5	1.0	1.05	1.10	1.12	1.15	1.35	1.45 to 30 GHz	0.45	0.25 hex	Stainless Steel Passivated	0.07
MDC1109F	SSMA Female								0.43	0.31 dia.	0.06		
MDC1224M	2.4 mm Male	0.5	1.0	1.05	1.10	1.12	1.15	1.35	1.60 to 50 GHz	0.75	0.31 hex	Stainless Steel Coupling Nut Tellurium Copper Nickel Plated Body	0.09
MDC1224F	2.4 mm Female									0.75	0.31 dia.		0.08
MDC1107	7 mm (Note 2)	2	1.0	1.05	1.10	1.10	1.15			1.40	0.82 dia.	Stainless Steel Passivated	1.50
MDC1107X				1.04	1.05	1.07	1.08						

Note 1: MCX & MMCX terminations available. MCX male, female = MDC1001MM, MDC1001MF. MMCX male, female = MDC1001MMM, MDC1001MMF

Note 2: VSWR for MDC1107X is based on the following: $VSWR = 1.03 + 0.0003 \times F$ (GHz).

Other finishes are available, please consult MIDISCO.

Engagement force for MDC1075Q or MDC1075Q-C is 10lbs. axial.

Coaxial Terminations

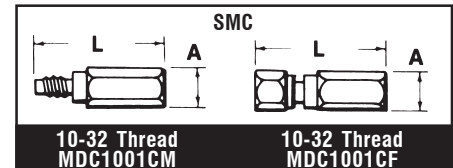
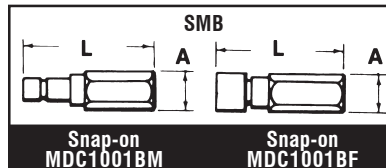
Type N, TNC, BNC, SMB, SMC

Features

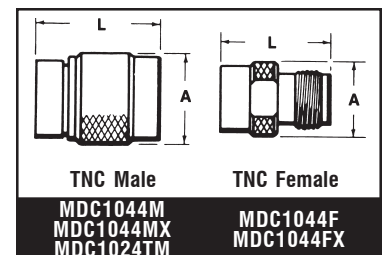
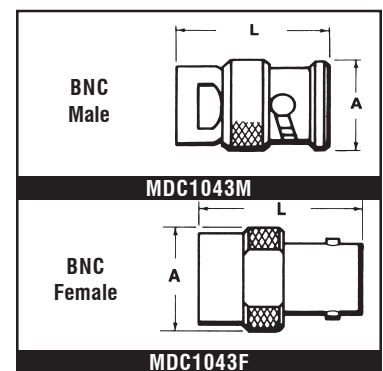
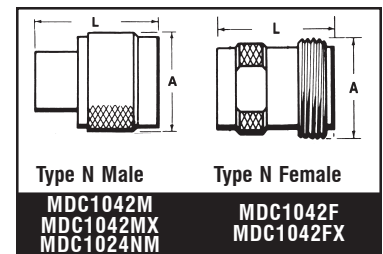
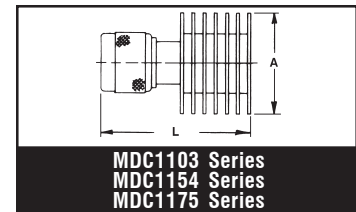
- Construction per all applicable MIL-Specs
- Interface per MIL-PRF-39012
- Low VSWR
- Small size
- DC to 18 GHz
- Lightweight
- 50 ohms (other impedance available)
- Operating temperature -55°C to +125°C
- RF leakage 90 dB minimum
- Some precision models in brass or stainless
- Higher power models available
- Most available with bead chain (Suffix "-C")
- SMB (snap on) and SMC terminations shown
- Delivery from stock

MIDISCO

coaxial terminations in the series shown were designed for optimum performance in the smallest package possible. Parameters for cost consideration when making a selection include connector type, frequency range, power handling and reflection coefficient (VSWR). The range of models shown is sufficient for laboratory & systems applications. Construction is in accordance with all applicable military specifications and connector interface is per MIL-PRF-39012. Some stainless steel "X" models shown are available in brass, indicated by dropping the "X". Most models shown can be obtained with a bead chain (add suffix "-C"). Higher power and models selected for narrow frequency applications may be ordered; models shown are in stock.



Model Number	Connector Type	Power @ 25°C		VSWR (max) @ Frequency (GHz)				L (in) (max)	A (in) (dia.)	Material & Finish	Weight (oz)
		Avg. (W)	Peak (kW)	DC-4*	4-8	8-12	12-18				
MDC1042M	N Male	2	1.0	1.10	1.10	1.15		0.98	0.80	Brass with Bright Alloy	1.43
MDC1042MX						1.25		Stainless Steel Passivated		1.57	
MDC1024NM		1.20	1.50								
MDC1103NX		5	2.0	1.15	1.20	1.30	1.85	1.02	Stainless Steel Connector with Black Anodized Aluminum Body	1.79	
MDC1154NM		15	2.0	1.15	1.20		1.25	1.93	1.25		3.37
MDC1175NM		40	7.5	1.20	1.30	1.41		5.06	1.66		10.00
MDC1175NF	N Female	40	7.5	1.20	1.30	1.41		4.91	1.66	Stainless Steel Connector with Black Anodized Aluminum Body	10.00
MDC1154NF		15	2.0	1.15	1.20	1.25	1.30	1.93	1.25		3.30
MDC1103NFX		5	2.0	1.10	1.15	1.20	1.30	1.80	0.75		1.72
MDC1042F		2	1.0	1.10	1.10	1.15		0.98	0.65	Brass with Bright Alloy	1.30
MDC1042FX							1.40				
MDC1044M	TNC Male	2	1.0	1.10	1.10	1.15		0.87	0.60	Brass with Bright Alloy	1.03
MDC1044MX							1.40			Stainless Steel Passivated	1.40
MDC1024TM		1.20	1.50								
MDC1103TX			1.80	1.02	Stainless Steel Connector with Black Anodized Aluminum Body	1.51					
MDC1154TM		15	2.0	1.15	1.20	1.25	1.30	2.30	1.38		2.82
MDC1154TF	TNC Female	15	2.0	1.15	1.20	1.25	1.30	2.30	1.38	Stainless Steel Connector with Black Anodized Aluminum Body	2.74
MDC1103TFX		5	2.0	1.10	1.15	1.20	1.30	1.90	0.75		1.44
MDC1044F		2	1.0	1.10	1.10	1.15		0.88	0.56	Brass with Bright Alloy	0.96
MDC1044FX	1.40										
MDC1043M	BNC Male	2	1.0	1.10	1.15			0.83	0.56	Brass with Bright Alloy	1.02
MDC1103BX		5	2.0	1.15	1.25	-	-	1.65	1.02	Stainless Steel Connector with Black Anodized Aluminum Body	1.93
MDC1154BM		15						2.10	1.25		2.30
MDC1154BF	BNC Female	15	2.0	1.15	1.25	-	-	2.15	1.25	Same as Above	2.15
MDC1043F		2	1.0	1.10	1.15			0.88	0.57	Brass with Bright Alloy	0.90
MDC1001BM	SMB Male	0.5	0.2	1.20	-	-	-	0.85 (1)	0.23	Brass with Bright Alloy	0.08
MDC1001BF	SMB Female										
MDC1001CM	SMC Male	0.5	0.2	1.20	1.30	-	-	0.85 (1)	0.23	Brass with Bright Alloy	0.08
MDC1001CF	SMC Female										



*: DC-1 GHz for SMB, SMC

1: Smaller models are available

MDC1103BX, 1103NX, and 1103TX available with nickel plated brass connectors; drop "X" from part number.

For a bead chain, add suffix "-C" to Model Number.

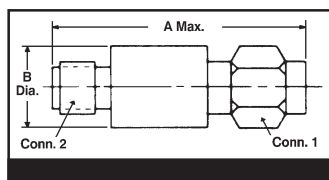
Example" MDC1042M-C. The power chain ratings shown are at +25°C, although some will provide the same performance up to 75°C.

D.C. Blocks

0.1 to 18 GHz – Type N, SMA, TNC, BNC, 7 mm, F, 2.9 mm

Features

- 0.1 to 18 GHz
- Stainless steel or brass construction
- Maximum loss @ 18 GHz: 0.5 dB
- Impedance: 50 Ohms
- Temperature (operating): -55°C to +125°C (except F series = +80°C max.)
- Most models in stock
- Voltage (main line): 200 volts
- See p. 24 for 26.5 GHz and other models



MIDISCO MDC1181 inside blocks are capacitively coupled through the center conductor to prevent DC current flow. The MDC1182 In/Out adds series capacitance to the outer conductor as well to suppress the flow of ground and audio interference signals. RF power flows uninterrupted.

Model Number	Type	VSWR @ F (GHz)			Connectors		Dim.(Ref.)	
		0.1-8	8-12.4	12.4-18	1	2	A	B
MDC1181S	Inside	1.2	1.25	1.35	SMA (M)	SMA (F)	0.86	0.28
MDC1182A-S12	In/Out	1.2	1.25	N/A	SMA (M)	SMA (F)	1.07	0.50
MDC1182A-S18	In/Out	1.2	1.25	1.35	SMA (M)	SMA (F)	1.10	0.50
MDC1181N	Inside	1.2	1.25	1.35	N (M)	N (F)	1.77	0.63
MDC1182A-N12	In/Out	1.2	1.25	N/A	N (M)	N (F)	1.91	0.50
MDC1182A-N18	In/Out	1.2	1.25	1.35	N (M)	N (F)	1.91	0.50
MDC1181T	Inside	1.2	1.25	1.35	TNC (M)	TNC (F)	2.07	0.56
MDC1182-T18	In/Out	1.2	1.25	1.35	TNC (M)	TNC (F)	2.07	0.50
MDC1181B	Inside	1.35*	N/A	N/A	BNC (M)	BNC (F)	1.60	0.50
MDC1182B	In/Out	1.35*	N/A	N/A	BNC (M)	BNC (F)	1.60	0.50
MDC1181F	Inside	1.35**	N/A	N/A	F (M)	F (F)	1.51	0.44
MDC1182F	In/Out	1.35**	N/A	N/A	F (M)	F (F)	1.51	0.44

*: to 4 GHz **: to 2 GHz

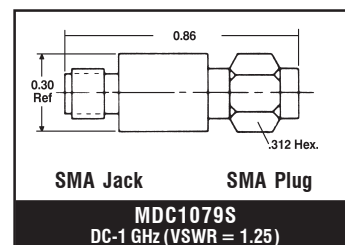
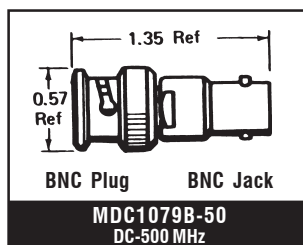
Note: Most DC blocks are also available with double-male or double-female connectors. MIDISCO also supplies 2.9 mm 26.5 GHz models, as well as 75 Ω BNC and Type N, and Type N to SMA interseries models. See page 24 or consult factory for more information.

Feed-Thru Terminations

Features

- Impedance 50 ohms $\pm 1\%$
- MDC1079B available in 75, 93, 150, 600 ohms and other impedances.
- Average power 2 watts.
- Connectors: BNC male/female
Finish: Bright alloy
Material: Brass
- Connectors: SMA male/female
Finish: Passivated
Material: Stainless steel
- Other connector types available
- Frequency DC-1 GHz (SMA)
- VSWR 1.1 (DC-250MHz) 1.2 (250-500MHz)
- Delivery from stock

MIDISCO Coaxial Feed-Thru Termination Model MDC1079 is ideal for terminating pulse microwave or UHF instruments in their own characteristic impedance. Each unit can be supplied with either a BNC male and female connector on a brass body (MDC1079B) or SMA male and female on a stainless steel body (MDC1079S). To maintain a good laboratory appearance, each SMA unit is passivated and each BNC unit has a bright alloy finish.

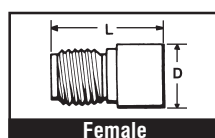
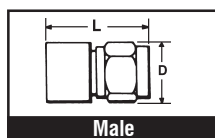


Coaxial Shorts

Features

- Stainless steel passivated or Brass with Bright alloy finish
- Short lengths
- Available with bead chains (suffix "-C")
- Connectors per MIL-PRF-39012
- SMA-N-TNC-BNC-SMB
- Plugs or Jacks
- Delivery from stock

MIDISCO coaxial fixed shorts are used as phase references when calibrating equipment. At exactly one-half wavelength from the connection point the maximum amplitude appears. Each model is designed to produce a reflection coefficient that is approximately equal to one. They are also available with bead chains. Delivery is from stock.



Type SMA, N, TNC, BNC

Model Number	Type	D (Ref.)	L (Ref.)	Material
MDC1025M-S	SMA Male	0.31	0.33	Stainless Steel
MDC1025F-S	SMA Female	0.31	0.48	
MDC1025MX-N	N Male	0.78	0.69	
MDC1025MX-T	TNC Male	0.59	0.70	
MDC1025M-T	TNC Male	0.59	0.70	Brass with Bright Alloy Finish
MDC1025F-T	TNC Female	0.50	0.58	
MDC1025M-N	N Male	0.78	0.69	
MDC1025F-N	N Female	0.78	0.75	
MDC1025M-B	BNC Male	0.59	0.70	
MDC1025F-B	BNC Female	0.50	0.58	
MDC1025M-SMB	SMB Male	0.22	0.84	
MDC1025F-SMB	SMB Female	0.22	0.84	

Note: For Bead Chain add suffix "-C"

Features

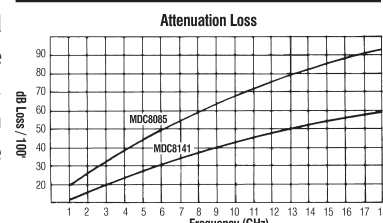
- No bending tools required
- Ultra-flexibility
- 100% shielded
- Many connector possibilities
- Low insertion loss
- Cable spools & cable assemblies available to 100 feet
- Perfect for prototypes
- Excellent for laboratory
- May be purchased without connectors
- Dielectric material: Teflon (TFE)
- Outer jacket: Silver coated copper covered steel
- Shield: Tin filled copper braid, 100% coverage
- Velocity of propagation: 70% nominal

MIDISCO Ultra-Flex

coaxial cable and assemblies eliminate the need for tooling normally required to form semi-rigid assemblies. This cable series is extremely flexible, can be shaped and reshaped by hand, and supplied with most of the standard connector types. The 100% shielded cable has a copper-tin composition outer jacket, teflon insulator and a silver coated copper over steel center conductor. Both 50 ohm versions, the 0.085 diameter (MDC8085) and 0.141 diameter (MDC8141) types have excellent electrical performance to 20 GHz and above at temperatures to 200°C. A 75 ohm version (MDC8084) is also available.

These assemblies are perfect for prototype and production applications, especially when there are close quarters that don't permit pre-bending. The low loss, good VSWR ultra- flexibility and wide connector selection make them useful in the test laboratory. Connectors are also available separately. Delivery is one week.

Performance



Cable Type*	Impedance ohms (nom)	Cable O.D.	Dielectric O.D.	Shield ohms/K'	Conductor O.D.	Capacitance pF/ft (nom)	Attenuation (loss) @ Freq. (MHz) dB/100ft.										Bend Radius	
							50	100	200	400	700	1000	4000	7000	10000	18000	min.	suggstd.
MDC8141	50	0.141	0.118	4.5	0.0365	29.3	2.4	3.5	5.0	7.6	10.0	13.0	30.0	41.0	50.0	73.0	.500	.750
MDC8085	50	0.083	0.064	10.2	0.0201	29.3	4.5	6.5	9.2	13.0	17.0	22.0	44.0	58.0	70.0	105.0	.125	.250
MDC8084	75	0.084	0.065	10.2	0.0113	19.3	4.5	6.6	10.0	15.0	21.0	26.0	60.0	82.0	110.0	—	.125	.250

* Also see MDC8402 & MDC8405 in High Performance Cable Assemblies section of catalog.

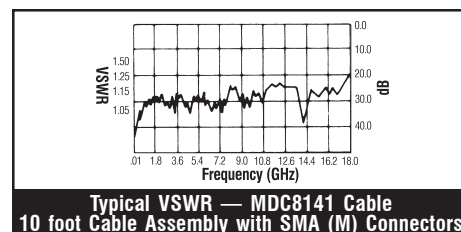
Cable Assembly Ordering Information

Insert Cable Type chosen into part number formula: ConnectorA—Cable—ConnectorB—Length(inches)
Example: SM-8085-BF-27 is a 27 inch assembly with an SMA male and BNC female connectors using

MDC8085 cable. For further information, please contact MIDISCO.

See the Coaxial Cable Assemblies section for cable assemblies available from stock.

Connectors (Precision)



Semi-Rigid, Ultra-Flex, & Snake — Type N & SMA

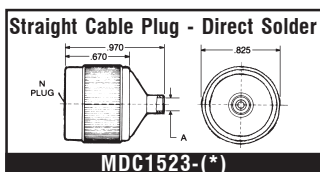
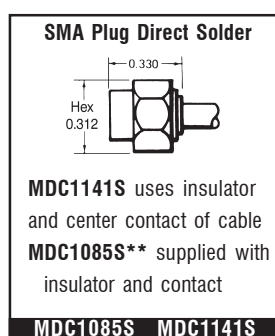
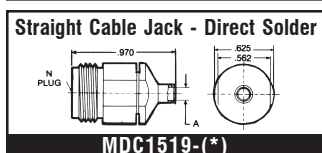
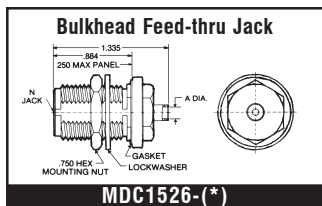
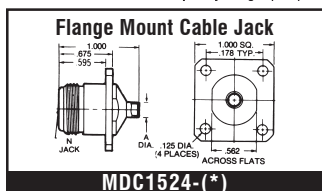
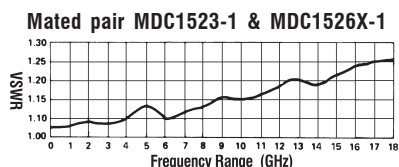
MIDISCO'S cable assembly department

designed two versatile, very small SMA plugs, model MDC1141S for 0.141 dia. (RG402) and MDC1085S for 0.085 dia. (RG405) semi-rigid cable. Each is small enough to allow tight bends, has retractable coupling nuts (snap

off "C" rings), that eliminate blind mating, are self facing, and assemble easily and quickly. MDC1141S is also designed to be used with rebendable SNAKE MDC5141 and Ultra-Flex MDC8141. MDC1085S, in addition to standard semi-rigid cable, is for use with SNAKE MDC5085 and Ultra-Flex MDC8085. Both types are assembled to the cable with a single soldering operation. Standard versions have a gold plated body and stainless finish (passivated) coupling nut. For gold plating all over, drop the "S" suffix (example MDC1141).

MIDISCO's MDC1523-* precision type N plugs for semi-rigid, and similar type cables use mode-free design techniques to provide excellent VSWR to 18 GHz. The MDC1519-(*), MDC1524-(*), and the MDC1526-(*) jacks all provide good performance to 12.4 GHz. The MDC1526-(*) Bulkhead Feed-thru Jack is also available for 18 GHz applications as the MDC1526X-(*). All type N connectors shown accommodate 0.085, 0.141, and 0.250 diameter semi-rigid cables and the complimentary SNAKE, Ultra-Flex, and the MDC8401, MDC8402 and MDC8405 coaxial cables, which are flexible, teflon-jacketed equivalents to 0.085, 0.141 and 0.250 semi-rigid. All are easy-to-assemble direct solder types.

Suffixes: "-1" for 0.141 (RG402) Semi-Rigid Cable; "-2" for 0.085 (RG405) Semi-Rigid Cable; "-3" for 0.250 (RG401) Semi-Rigid Cable; "-4" for RG174, 188, 316 flexible cable (slightly different dimensions and assembly)



** For connector with pre-assembled contact, specify MDC1085PS or MDC1085P.

Custom Cable Assemblies

Flexible, Semi-Rigid, Ultra-Flex, LMR

Features

- Broad range of connector series, styles, and cable choices
- Flexible, Semi-Rigid, Ultra-Flex, LMR, standard RG/U types
- Kits may be ordered with different lengths

MIDISCO's easy to use cable and connector numbering system allows the user to quickly and confidently determine the part number for cable assemblies of virtually any length, cable type, connector series and configuration.

THE table below summarizes the connector and cable nomenclature used to construct the complete part number for a MIDISCO custom cable assembly. The finished part number is created by "filling in the blanks" as shown. This allows the convenient "mixing and matching" of connector series and styles on a given cable. **Please call the factory if the connector series or cable you require is not listed. Also, see pages 55-57 for high performance cable assemblies to 40 GHz.**

Part Number Format: MAB-XXXX-MAB-L. A and B define the connector series and sex respectively, and M is a modifier used for right angle, bulkhead, and panel mounted connectors. XXXX is the code to define the cable required. Fill in 2, 3, or 4 digits as dictated by the Cable Code shown below. L is the cable length in inches.

M: Insert R for right angle, B for bulkhead, or P for panel mount, otherwise leave blank.
A: Insert code from table below.

B: Insert M for Male and F for female. The sex refers to that of the contact pin. In most series the plug has the male contact pin. However, in the SMB, SMC, CMS, SSMB, SSMC, SCMS and 75 Ω snap-on and screw-on series, the female contact is in the plug.

Connector and Cable Code Table

Connector Codes				Representative Cable Codes			
Series	"A"	Series	"A"	Cable	"XXXX"	Cable	"XXXX"
BNC	B	SSMC	SSMC	RG6	6	RG400	400
Type N	N	SCMS	SCMS	RG11	11	LMR400	L400
TNC	T	MCX	MCX	RG55A	55	MDC5047	5047
SMA	S	MMCX	MMCX	RG58/U	58	MDC5085	5085
SSMA	SS	UHF	U	RG59	59	MDC5141	5141
SMB	SMB	Mini-UHF	uU	RG62	62	MDC5250	5250
SMC	SMC	75 Ω Snap	75SN	RG142B	142	MDC8034	8034
CMS	CMS	75 Ω Screw	75SC	RG174	174	MDC8047	8047
SSMB	SSMB	F Series	F	RG180	180	MDC8084	8084
7/16 DIN	7/16	3.5 mm	3.5	RG223	223	MDC8085	8085
2.4 mm	2.4	2.9 mm	2.9	RG316	316	MDC8141	8141
FME	FME	BNC TWIN	BTW	RG316DS	316D	MDC8250	8250

Cable Length Definition

The most common method of specifying cable assembly lengths with straight connectors is the end-to-end distance. With modifications for assemblies with right angle, bulkhead, and flange connectors, this method works fine for most applications. For high frequencies and critical lengths, the assemblies shown on the next page illustrate an industry-wide method of defining cable lengths, where the reference plane internal to a straight connector is one of the datum points. Figure 1 shows a flexible cable with a male SMA plug at each end, and the cable length is defined as the distance between the reference planes of the connectors. In Figure 2, one of the straight SMA plugs has been replaced with a right angle plug, which makes the center line of the right angle connector the second datum line. Shown in Figure 3 is a flexible cable using a straight female SMC plug on one end, and a bulkhead jack on the other. Here, the new datum is the flat surface of the connector bulkhead that is installed against the rear of the mounting panel. Figure 4 shows a MDC8141 Snake semi-rigid cable using 2-hole panel jacks on each end. The length is defined as the distance between the two back surfaces of the panel. **Unless otherwise specified, MIDISCO will assume end-to-end lengths with the appropriate adjustments for right angle, bulkhead or flange mount connectors.**

Custom Cable Assemblies (cont.)

Cable Length Measurement Guidelines

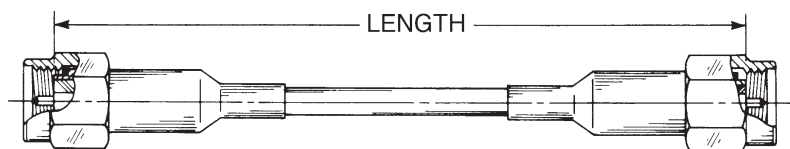


FIGURE 1

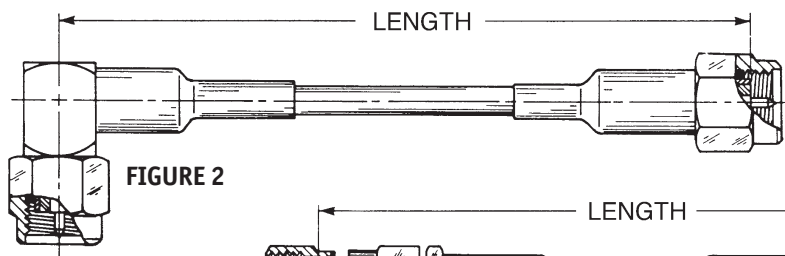


FIGURE 2

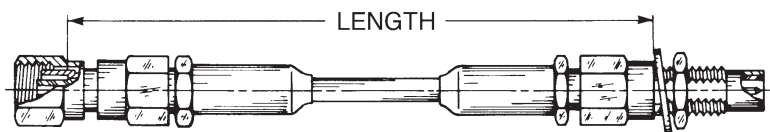


FIGURE 3

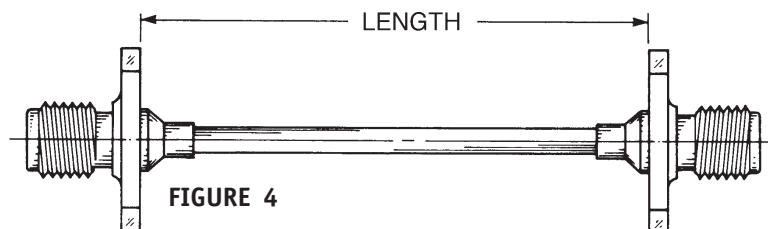


FIGURE 4

Custom Semi-Rigid Assemblies

Capabilities and Guidelines

Features

- Construction from print, sketch, black box or bent wire for fast prototype
- Precision bending
- Quality tooling, assembly and bending techniques
- Fast delivery from stocked cable and connectors
- Phase Adjustable Connectors available (see MIDISCO models MDC1089-2, 3)
- Testing to 26.5 GHz
- Prototype or production quantities

The MIDISCO web site contains an Engineering Note with a detailed set of guidelines and recommendations for the design of cost-effective semi-rigid cable assemblies. The entire Engineering Note should be read before designing complex semi-rigid cable assemblies. However, a few of the guidelines are given here for introduction:

1. Make drawings full scale.
2. Use tight dimensioning, loose tolerance.
3. Avoid right angle connectors whenever possible. They are more expensive than straight connectors and perform poorly at high frequencies. MIDISCO can bend cables tightly enough so that a straight plug will have the same profile as a right angle connector (see page 54).

The MIDISCO custom cable assembly department will manufacture custom coaxial cable configurations to your exact specifications. Semi-rigid and rebendable semi-rigid types are available from 0.047 diameter to 0.325 diameter.



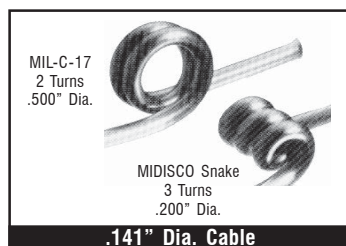
Prototypes are available within three days, working from a sketch, outfitting a black box or from a bent wire coat hanger. Each assembly can be tested on our network analyzer to 26.5 GHz if required. Phase adjustable connectors are maintained in inventory to satisfy quick reaction phase match requirements.

Reformable Semi-Rigid Cable

MIDISCO Snake — Copper and Aluminum

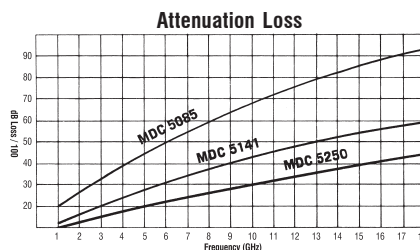
Features

- Tighter bend radii than conventional cable
- Easier alignment of connector interface
- Better phase stability with temperature and flexing
- Coils to 100 feet or straight 5 foot lengths
- Fine performance with solder or crimp connectors
- Meets all MIL-C-17 requirements
- Delivery from stock



When semi-rigid cables need to be formed and re-formed before or after the connectors have been attached, the MIDISCO-Snake will provide the flexibility without a significant effect on insertion loss, VSWR, or impedance.

Performance



Part Number	Impedance	Cable O.D.	Dielectric O.D.	Conductor O.D.	Min. Bend Radius	Corona Extnc. Voltage	Weight / 100ft.
MDC5034	50±1ohm	0.034 max	0.026 nom	0.0080 nom	0.050"	0.75kV 60Hz RMS	0.26
MDC5047	50±1ohm	0.047 max	0.037 nom	0.0113 nom	0.095"	1.00kV 60Hz RMS	0.45
MDC5085	50±1ohm	0.086 max	0.066 nom	0.0201 nom	0.137"	1.50kV 60Hz RMS	1.5
MDC5141	50±1ohm	0.141 max	0.117 nom	0.0362 nom	0.237"	1.90kV 60Hz RMS	3.5
MDC5250	50±1ohm	0.250 max	0.209 nom	0.0641 nom	0.312"	3.00kV 60Hz RMS	10.5

For aluminum jacketed semi-rigid cable, add suffix "A". Example: MDC5141SA

Ordering Information

When ordering, complete the part numbers above by adding the following suffix:
Suffix "C" for a silver plated copper center conductor. Suffix "S" for a silver plated copper clad steel center conductor.

The further addition of "TP" or "SP" will signify whether the outer conductor (jacket) is to be either tin plated or silver plated. Standard put-ups are 5' straight length & 25' coils.
50' & 100' coils also available.

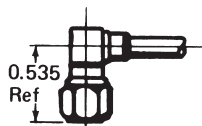
SMA Right Angle Bent Assembly

Features

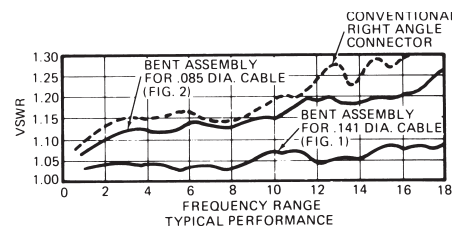
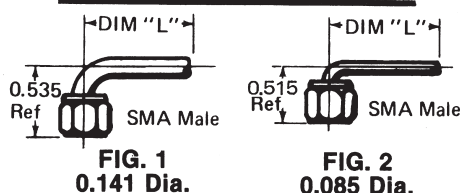
- Lower VSWR than with mitred connectors
- Standard with 0.085 and 0.141 semi-rigid cable
- Saves assembly time
- Available with MIDISCO Snake Cable (Reformable)
- Same or lower profile than right angle connectors
- Other connector types available
- Delivery from stock

MIDISCO bending techniques, combined with the ultra short SMA Plugs MDC 1141S for RG 402 (0.141) and MDC 1085S for RG 405 (0.085), eliminate the need for conventional mitred right angle semi-rigid cable connectors. The user specifies the cable type and length up to 60" and receives the connector already attached with a tight 90° bend at one end. Any lengths are available from stock.

Conventional Method



BENT CABLE METHOD



Ordering Information:

MDC1052-"L" — part number for 0.141 cable
MDC1053-"L" — part number for 0.085 cable

High Performance Cable Assemblies

Low Insertion Loss

"MORE POWER TO YOU"

Whether you are "coming" (receiving) or "going" (transmitting) MIDISCO's high performance cable assemblies will help you preserve your precious dBs. The low insertion loss makes these cable assemblies ideal for receiving systems where noise figure is a major consideration, while the power handling capabilities of the 8290 and 8305 series combined with their low loss make them extremely suitable for transmission applications. The entire line of MIDISCO high performance cable assemblies are rugged enough for the demanding repetitive use of engineering and production laboratories, as well as for permanent indoor and outdoor installations - anyplace where reliability, durability and performance are paramount. Most assemblies are available in lengths up to 100 feet or longer.

Summarized in table 1 are key parameters of some of MIDISCO's more popular types. Table 2 tabulates the insertion loss and VSWR of some standard lengths of MDC 8301 cable assemblies, including connector contributions. Figure 1 shows typical VSWR and insertion loss data for the MDC 8190 cable, while figure 2 shows the same data for the MDC 8165 cable.

Part numbers for high performance cables are constructed the same as for standard cables. The 18 GHz cable assemblies are available with SMA, type N, TNC and 7 mm connectors. 26.5 GHz assemblies are available with extended range SMA or 3.5 mm connectors. On the MDC 8165, the cable is an integral part of the connector resulting in better VSWR to 26.5 GHz (35 GHz when mated with a type "K" connector). Standard length tolerances for high performance cable assemblies are summarized below. Lengths are measured to the reference plane of straight connectors and the center line of right angle connectors.

<u>Length</u>	<u>Tolerance</u>
up to 1 foot	-0.25, + 0.50 inches
1 to 3 feet	-0.25, + 0.75 inches
3 to 6 feet	-0.50, + 1.0 inches
6 to 20 feet	-1.0, + 2.0 inches
greater than 20 feet	please call

USER CONSIDERATIONS: In estimating the total loss of an assembly, the user must consider the loss of the connectors, and the mismatch associated with both the VSWR of the cable assembly and the interfacing components at the next higher assembly. Connector losses are difficult to estimate. MIDISCO minimizes the loss by utilizing solder in addition to compression and clamping to fasten the outer conductor. Typical losses for straight connectors range from less than 0.05 dB per connector @ 2 GHz to about 0.20 dB @ 26.5 GHz. Angle connectors typically run about 20-25% higher in insertion loss. Radius angle connectors however, have virtually the same VSWR and loss as straight connectors.

In critical RF and microwave applications, a cable assembly must be treated like any other component, and its' effect on end-to-end performance considered.. These features are particularly important in applications operating over a wide instantaneous bandwidth where the frequency dependent VSWR of the cable assembly and its' interacting components can cause unacceptable variations in composite P-P insertion loss (ie: gain flatness). To illustrate this, consider the examples below.

<u>COMPONENT 1 VSWR</u>	<u>CABLE VSWR</u>	<u>COMPONENT 2 VSWR</u>	<u>WORST CASE GAIN/LOSS</u>
1.5:1	N/A	1.5:1	+0.34/-0.35 dB
1.5:1	1.15:1	1.5:1	+0.45/-0.48 dB
1.5:1	1.5:1	1.5:1	+0.63/-0.71 dB

As can be seen, interconnecting cable performance can yield unexpected results to the unsuspecting user if their contributions are not considered during initial analysis. MIDISCO's high performance cable assemblies have inherently low VSWR and small fine grain variations, making them ideal for critical applications at initial design or retrofitting.

High Performance Cable Assemblies

TABLE I HIGH PERFORMANCE CABLE SUMMARY

PARAMETER	8402*	8301	8165	8190/8190A**	8916***	8305	8305P	8305S	8305SP
Cable Code	DC-20	DC-18	DC-26.5	DC-26.5	DC-40	DC-18	DC-18	DC-18	DC-18
FREQ (GHz)									
LOSS DB/100'									
@2GHz	16.8	11.7	SEE CURVE	SEE CURVE	56.0 (18 GHz)	8.2	8.2	7.5	7.5
@10GHz	42.2	27.2	SEE CURVE	SEE CURVE	69.0 (26.5 GHz)	20.4	20.4	18.7	18.7
@18 GHz	60.9	37.6	SEE CURVE	SEE CURVE	89.0 (40 GHz)	29	29	26.8	26.8
SHIELDING	>90 DB	>100 DB	>90 DB	>90 DB	>90 DB	>90 DB	>90 DB	>90 DB	>90 DB
OD (IN)	0.163"	0.200"	0.165"	0.190"	0.160"	0.305"	0.305"	0.305"	0.305"
DIELECTRIC	PTFE	AIR/PTFE	PTFE	AIR/PTFE	AIR/PTFE	AIR/PTFE	AIR/PTFE	AIR/PTFE	AIR/PTFE
JACKET	FEP TEFLON	FEP TEFLON	FEP TEFLON	FEP TEFLON	FEP TEFLON	FEP TEFLON	POLYURETHANE	FEP TEFLON	POLYURETHANE
CONDUCTOR	SOLID	SOLID	SOLID	SOLID	SOLID	STRANDED	STRANDED	SOLID	SOLID
BEND RADIUS	0.200	1.0"	1.0"	1.0"	0.9"	1.7"	1.7"	1.8"	1.8"
WEIGHT	.48 OZ.	.4 OZ/FT	0.6 OZ/FT	0.6 OZ/FT	.64 OZ/FT	1.44 OZ/FT	1.44 OZ/FT	1.44 OZ/FT	1.44 OZ/FT
TEMPERATURE	-65/200 C	-55/105C	-48/200C	-48/200C	-65/200C	-65/200C	-65/85C	-65/200C	-65/85C
CW POWER (WATTS)									
@.5 GHz	600	1050	650	3000	-	6000	6000	6000	6000
@1 GHz	450	700	450	2000	400	4100	4100	4100	4100
@2 GHz	--	500	310	1550	-	2700	2700	2700	2700
@4 GHz	--	350	215	1000	-	2000	2000	2000	2000
@6 GHz	--	290	170	800	-	1700	1700	1700	1700
@10 GHz	120	215	150	600	120	1200	1200	1200	1200
@12 GHz	--	180	98	550	-	960	960	960	960
@18 GHz	75	140	80	420	70 (20 GHz)	830	830	830	830

* Also available in 0.100" outer jacket as cable code MDC8405, & 0.265" outer jacket as cable code MDC8401. Performance is similar to MDC8085 & MDC8250 respectively.

** For 26.5 GHz operation, specify 8190A.

*** 50 GHz cable assemblies also available.

To order a High Performance cable assembly, construct the part number as follows:

First Connector- Cable Code- Second Connector-Length in inches The Connector codes are on page 53.

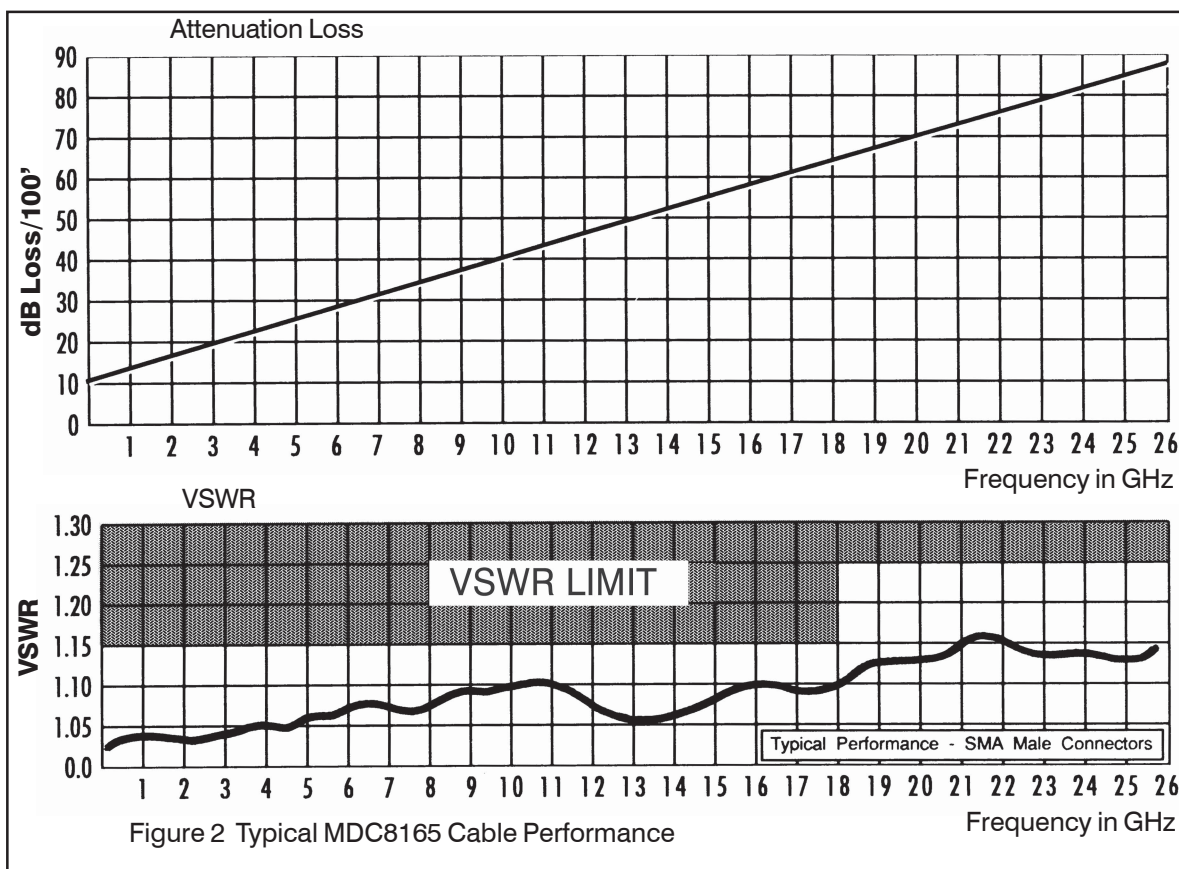
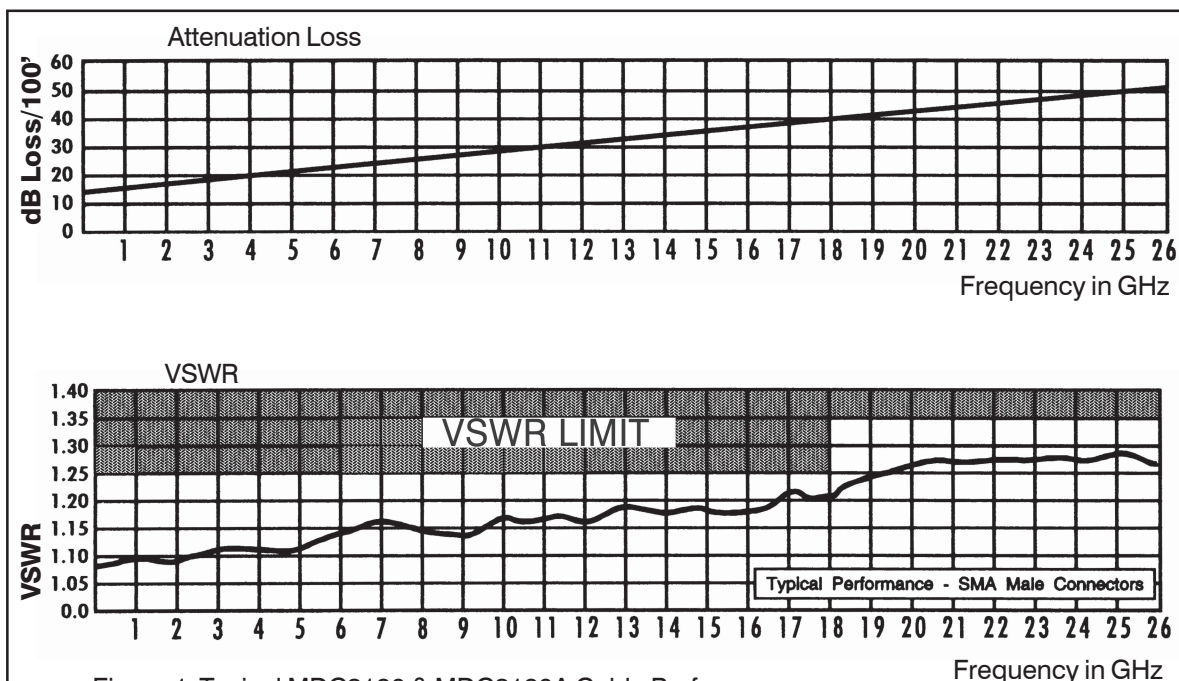
TABLE II

MAXIMUM LOSS (DB) AND VSWR OF SELECTED MDC8301 CABLE ASSEMBLIES

FREQ	N MALE			TNC MALE			SMA MALE		
	12"	24"	36"	12"	24"	36"	12"	24"	36"
DC-1	0.16	0.24	0.33	0.12	0.26	0.35	0.14	0.22	0.31
1-2	0.22	0.35	0.47	0.16	0.36	0.49	0.19	0.32	0.44
2-4	0.32	0.49	0.67	0.23	0.51	0.69	0.26	0.45	0.63
4-6	0.38	0.6	0.82	0.28	0.62	0.85	0.34	0.55	0.78
6-12	0.54	0.85	1.17	0.39	0.88	1.22	0.49	0.8	1.12
12-18	0.65	1.04	1.43	0.5	1.12	1.53	0.6	1.38	1.36:1

High Performance Cable Assemblies

Typical Cable Performance



Phase Adjustable Semi-Rigid Cable Assemblies

Mechanically Adjustable

Features

- Available as .141 dia. and .085 dia. semi-rigid assemblies
- Phase range = $10^\circ \times F(\text{GHz})$
- DC to 18 GHz, low VSWR
- Meets applicable paragraphs of MIL-STD-202

Specifications: Phase Adjustable SMA Connector

Electrical

Phase Change	$0.636^\circ \times F(\text{GHz})$ per rev. of adjustment nut
Frequency	DC-18 GHz
VSWR	See Adapter section
Insertion Loss	$0.08 \times F^{1/2} (\text{GHz})$
Impedance	50 ohms

Material

Conductor	Gold plated BeCu
Body	Gold plated brass or BeCu
Adjusting nut	Nickel plated brass
Coupling nut	Passivated Steel
Insulator	TFE

Mechanical

Mating	MIL-C-39012/55
Durability	500 cycles

Cable Compatibility

Because of its stability, .141" and 0.086" semi-rigid cable is most often used with the Midisco Phase Adjustable SMA Male Plug. However, in certain applications, Ultra-Flex, and the flexible MDC8402 MDC 8405 will be suitable, and can use the same connectors.

Phase Adjustable Cable Assembly Part Number Construction

Part Numbers for the phase adjustable cable assemblies are constructed in a manner similar to what is used on standard cables throughout this catalog. ØSM is a unique code for the Phase Adjustable SMA Male Plug.

Example: ØSM-5141-NM-6 is a 6-inch long .141 Snake semi-rigid with the phase adjustable SMA Male plug on one end, and a type N Male Plug on the other. See page 53 of this catalog for connector codes, and consult the factory for those not shown.

MIDISCO'S mechanically adjustable semi-rigid

cable assemblies provide the user a convenient, stable method of adjusting the phase (electrical length) of interconnecting cables at the end level. They offer a precise, yet simple means of phase adjustment for phased arrays, test equipment, instrument landing systems, and any application using phase matching techniques. They also find use in applications where a precise in-line electrical length is required.

A phase adjustable cable assembly replaces the labor intensive operation of cable trimming with the ease of mechanical screw adjustment. Once established, the phase setting for each cable is maintained by a connector locking nut. To compensate for system aging, the locking nut may be released, with a new adjustment made at any time.

Midisco phase adjustable cable assemblies are available with the phase adjustable SMA connector on one end, and a wide choice of connectors on the other end. These choices include type N, SMA, TNC, and 7 mm to name a few. Configurations available include right angle SMAs, and bulkheads in SMA, TNC, and N.

Electrical Performance

Midisco's phase adjustable cable assemblies, unlike other phase matching techniques, are broadband. They cover the frequency range to 18 GHz in a single assembly. Other phase matching methods with limited frequency range may require more than one unit, and hinder performance.

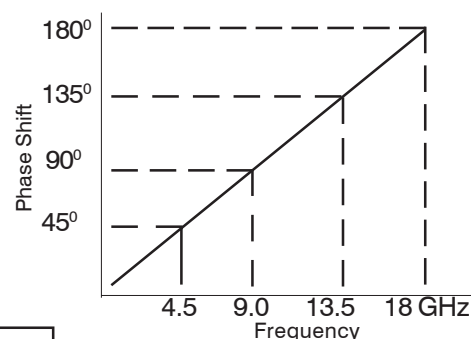
Phase Adjustable Cable Assembly Part Number Construction

Part numbers for Midisco's phase adjustable cable assemblies are constructed in a manner similar to that used on standard cables assemblies throughout this catalog.

Cable Codes

- 5141 (Snake .141 semi-rigid)
- 8141 (Ultra-Flex .141)
- 8402 (Flexible .141 equivalent)
- 5085 (Snake .086 semi-rigid)
- 8085 (Ultra-Flex .086)
- 8405 (Flexible .086 equivalent)

Phase Range vs. Frequency



Coaxial Lightning & EMP Protectors

DC to 2.5 GHz

Features

- Lightning or EMP protection
- Low VSWR
- Bidirectional protection
- 5kA through 20kA Devices
- Compact size
- Competitive Price and Fast Delivery
- Gas Tube & Quarter Wave Stub Technology
- Weatherproof

The MIDISCO

series of gas discharge and 1/4 wave coaxial protectors provide superior RF performance, small packages and competitive prices. The gas discharge units operate from DC to 2.5 GHz and are bi-directional. Unlike the gas discharge tube protectors which have a low-pass filter characteristic, the 1/4 wave design features a 1/4 wave stub between the center conductor and the shield, and has a band-pass response of typically 10% or 20% of nominal frequency (0.5 to 10 GHz). Most 1/4 wave units are application-specific and are not shown here. MIDISCO does have standard units for cellular (MQ7801-S, 805-915 MHz), satellite (MQ7802-S, 3.6-4.2 GHz), and PCS (MQ7803-S, 1.8-2.0 GHz) applications. **All data on this page is for the gas-discharge type units.** Consult factory for more information on both types of protectors, including additional connector options.

Transient Response			
Nominal Protector Voltage	V dynamic (@5kV/ μ sec)	Max Current (8 $\times$ 20 μ s) 10 pulses	Let through energy 50 ohm system ¹
Lightning Application ²			
90	800	20 kA	0.70 (mJ)
145	600	20 kA	0.30
230	650	20 kA	0.25
350	800	20 kA	0.70
470	1200	20 kA	2.20
600	1500	20 kA	4.40
800	1900	10 kA	9.00
1000	2200	10 kA	14.00
EMP Application ³			
200	800	5 kA	5.1 (μ J)
250	800	5 kA	5.1

- 1) Data given for 50 ohm systems. For 75 ohm systems, multiply by 0.66. For 90 ohm systems, multiply by 0.55.
- 2) Lightning let through is based on the 6kV/3kA Bi-waveform per ANSI C62.41
- 3) Let through energy based on the MIL-STD 461 6kV 5 $\times$ 200ns waveform.
- 4) RF power is also limited by the connector capability.

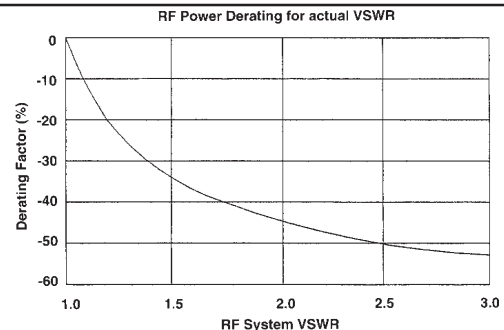
Pulse Lifetime

Pulse lifetime @ 500 amps peak 10 $\times$ 1000 μ s pulse.

Discharge Pulses

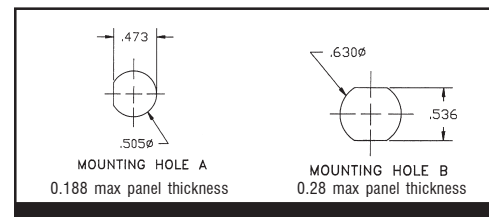
Lightning application: >500 times
EMP application: >200 times

Nominal Protector Voltage	Max RF Power (watts) 50 ohm system ^{1,4}
90	37
145	96
200	182
230	241
250	285
350	558
470	1006
600	1640
800	2915
1000	4555



Electrical Performance (Typ.)

Frequency (MHz)	Insertion Loss (dB)	VSWR (50 ohm)
100	0.02	1.02
200	0.03	1.05
1000	0.08	1.10
1200	0.10	1.15
2000	0.17	1.20
2500	0.20	1.25



Ordering Information:

Protector Voltage (XX): Divide required protection voltage by 10 (use 09 for 90V, 15 for 145V, and 99 for 1000V)
Example: Model MDC7803-60 is an N male to N female protector with a protector voltage of 600 Volts.

BNC Male to BNC Female M7801-XX	N Male to N Female M7803-XX	SMA Male to SMA Female M7810-XX	TNC Male to TNC Female M7806-XX	UHF Male to UHF Female M7808-XX
BNC Fem Bulkhead to BNC Fem Mounting Hole A M7802-XX	N Bulkhead Female to N Female Mounting Hole B M7804-XX	N Bulkhead Female to SMA Female Mounting Hole B M7805-XX	TNC Bulkhead Female to TNC Female Mounting Hole A M7807-XX	UHF Bulkhead Female to UHF Female Mounting Hole B M7809-XX

[†] UHF connectors: frequency range DC-500 MHz

Coaxial Hybrids (90°)

0.5 to 18 GHz (Standard & Multi-Octave)

Features

- Miniature Size
- High isolation
- Low VSWR
- 0.5-18GHz
- Octave and Multi-Octave Bandwidth
- Operating temp. 105°C (125°C storage)
- Qualified to MIL environments
- RF shielded
- Stripline construction
- Delivery from stock

Terminology

Coupling Loss - True loss measured from input port to 0° relative phase output port
(Note: DC open circuit between input port and coupled output port).

Thru Loss - True loss measured from input port to -90° relative phase output port
(Note: DC short circuit between input port and thru output port).

Isolation - Attenuation measured between two output ports when remaining ports are terminated in 50 ohms.

MIDISCO Series MDC 7200 coaxial hybrids are used for non reflective PIN attenuators, switching networks, digital phase shifters, bi-phase modulators, antenna feed networks, double port reflective gain amplifiers, mixers, paralleled amplifiers, power dividers, as well as combiners. When you apply a signal to one of the ports of a 90° hybrid, that signal is equally divided at the two opposite ports with a relative phase shift of 90°. Upon terminating the opposite ports, high isolation is obtained between the two adjacent ports. These characteristics display the versatility of the 90° Hybrid. Note the various applications shown in the diagrams below. All units have high isolation, low VSWR and meet MIL environments. Delivery is from stock.

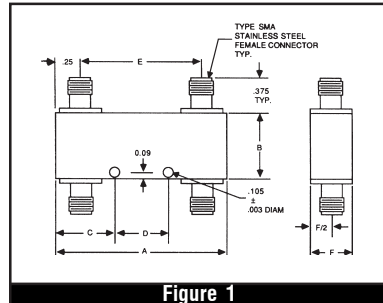


Figure 1

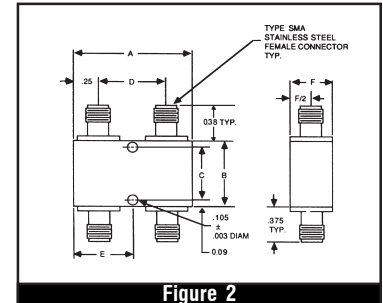
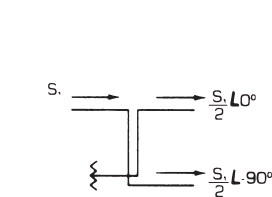
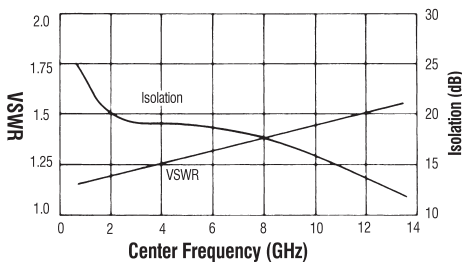
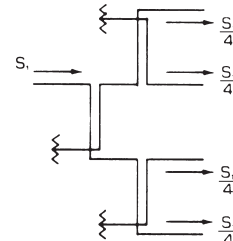


Figure 2

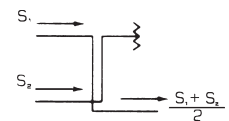
Octave band VSWR and isolation specifications as a function of center frequency



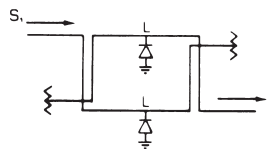
2 Way Power Divider



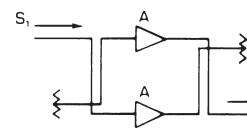
4 Way Power Divider



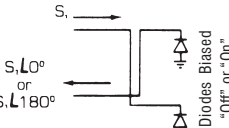
Signal Combiner
(3dB Loss)



Non Reflective Pin Attenuator



Paralleled Amplifiers



Bi-Phase Modulator

Model Number	Freq. Range (GHz)	Coupling † or Thru Loss (dB)	Frequency Sensitivity (dB)	VSWR (max.)	Isolation (dB) min	Input Power		Fig.	A	B	C	D	E	F
						Average (W)	Peak (kW)							
Octave Models														
MDC7223	0.5-1	3.1 ±0.6	±0.5	1.10	28	50	3	1	3.060	0.500	0.840	1.370	2.560	0.380
MDC7224	1-2	3.1 ±0.6	±0.5	1.10	28	50	3	1	1.780	0.500	0.640	0.500	1.280	0.380
MDC7225	2-4	3.1 ±0.6	±0.5	1.20	22	50	3	2	1.150	0.500	0.314	0.580	0.660	0.380
MDC7266	2.6-5.2	3.1 ±0.6	±0.5	1.25	20	50	3	2	1.000	0.500	0.314	0.500	0.500	0.380
MDC7226	4-8	3.2 ±0.7	±0.5	1.30	18	50	3	2	1.000	0.500	0.314	0.500	0.500	0.380
MDC7227	6-12.4	3.2 ±0.7	±0.5	1.35	18	50	3	2	1.000	0.500	0.314	0.500	0.500	0.380
MDC7288	7.5-16	3.4 ±0.9	±0.6	1.45	15	40	2	2	1.000	0.580	0.392	0.500	0.500	0.380
MDC7228	12-18	3.4 ±1.0	±0.7	1.50	15	40	1	2	1.000	0.580	0.392	0.500	0.500	0.380
Multi-Octave Models														
MDC7267	2-8	3.3 ±0.80	±0.40	1.30	17	30	3	1	2.600	0.750	0.670	1.260	2.030	0.440
MDC7277	4-12.4	3.3 ±0.80	±0.40	1.40	15	20	2	1	1.720	0.600	0.610	0.500	1.220	0.500
MDC7278	7-18	3.5 ±1.25	±0.75	1.50	13	20	1	2	1.000	0.580	0.392	0.500	0.500	0.380

† Includes frequency sensitivity.

Dimensions are in inches

Directional Couplers

0.5 to 18 GHz (Standard Bandwidths)

Features

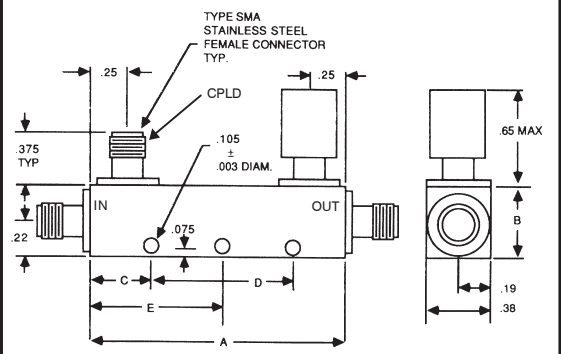
- Ultra-miniature
- Stripline construction
- Full frequency bandwidth
- High directivity
- Low VSWR
- RF Shielded
- 105°C operating temperature
- Meets MIL environments
- Type N connector models available
- Available from stock

NOTE: The coupler port designations shown on this page are typical of all SMA catalog couplers, where the coupled port is adjacent to the input. On the Dual High Power Couplers shown on page 63, the SMA connectors are the coupled ports for the adjacent Type N primary line connectors.

MIDISCO directional couplers of the MDC 6200 Series either meet or exceed the performance shown over the full frequency bandwidth. Each ultra-miniature unit is high quality stripline construction and has an operating temperature range of -55°C to +105°C. For broader bandwidths and multi-octave couplers, see MIDISCO Series 2000 and 4200. Type N connector models are available. All units are available from stock.

Outline	A	B	C	D	E
1	3.10	.50	.80	1.50	-
2	3.10	.55	.80	1.50	-
3	1.78	.50	.42	.94	-
4	1.78	.55	.42	.94	-
5	1.16	.50	.41	.34	-
6	1.16	.55	.41	.34	-
7	1.00	.50	-	-	.50
8	1.00	.55	-	-	.50
9	1.00	.60	-	-	.50

Dimensions in inches



Model No.	Frequency Range (Ghz)	Coupling † (dB)	Freq. Sens. (dB)	Insertion Loss (dB)		Directivity (dB min.)	VSWR max.		Power			Outline Dwg. No.
				Excl. Cpld Pwr	True		Primary Line	Secondary Line	Avg. Incident (W)	Avg. Refld. (W)	Peak (kW)	
MDC6223-6	0.5-1.0	6 ±1.00	±0.60	0.20	1.80	25	1.15	1.15	50	2	3	1
MDC6223-10	0.5-1.0	10 ±1.25	±0.75	0.20	0.80	25	1.10	1.10	50	5	3	1
MDC6223-20	0.5-1.0	20 ±1.25	±0.75	0.15	0.20	25	1.10	1.10	50	50	3	1
MDC6223-30	0.5-1.0	30 ±1.25	±0.75	0.15	0.20	25	1.10	1.10	50	50	3	2
MDC6224-6	1.0-2.0	6 ±1.00	±0.60	0.20	1.80	25	1.15	1.15	50	2	3	3
MDC6224-10	1.0-2.0	10 ±1.25	±0.75	0.20	0.80	25	1.10	1.10	50	5	3	3
MDC6224-20	1.0-2.0	20 ±1.25	±0.75	0.15	0.20	25	1.10	1.10	50	50	3	3
MDC6224-30	1.0-2.0	30 ±1.25	±0.75	0.15	0.20	25	1.10	1.10	50	50	3	4
MDC6225-6	2.0-4.0	6 ±1.00	±0.60	0.20	1.80	22	1.15	1.15	50	2	3	5
MDC6225-10	2.0-4.0	10 ±1.25	±0.75	0.20	0.80	22	1.15	1.15	50	5	3	5
MDC6225-20	2.0-4.0	20 ±1.25	±0.75	0.15	0.20	22	1.15	1.15	50	50	3	5
MDC6225-30	2.0-4.0	30 ±1.25	±0.75	0.15	0.20	22	1.15	1.15	50	50	3	6
MDC6266-6	2.6-5.2	6 ±1.00	±0.60	0.20	1.80	20	1.25	1.25	50	2	3	7
MDC6266-10	2.6-5.2	10 ±1.25	±0.75	0.20	0.80	20	1.25	1.25	50	5	3	7
MDC6266-20	2.6-5.2	20 ±1.25	±0.75	0.20	0.25	20	1.25	1.25	50	50	3	7
MDC6266-30	2.6-5.2	30 ±1.25	±0.75	0.20	0.20	20	1.25	1.25	50	50	3	8
MDC6226-6	4.0-8.0	6 ±1.00	±0.60	0.25	1.90	20	1.25	1.25	50	2	3	7
MDC6226-10	4.0-8.0	10 ±1.25	±0.75	0.25	0.90	20	1.25	1.25	50	5	3	7
MDC6226-20	4.0-8.0	20 ±1.25	±0.75	0.25	0.30	20	1.25	1.25	50	50	3	7
MDC6226-30	4.0-8.0	30 ±1.25	±0.75	0.25	0.25	20	1.25	1.25	50	50	3	8
MDC6227-6	7.0-12.4	6 ±1.00	±0.50	0.30	2.00	17	1.30	1.30	50	2	3	7
MDC6227-10	7.0-12.4	10 ±1.00	±0.50	0.30	1.00	17	1.30	1.30	50	5	3	7
MDC6227-20	7.0-12.4	20 ±1.00	±0.50	0.30	0.35	17	1.30	1.30	50	50	3	7
MDC6227-30	7.0-12.4	30 ±1.00	±0.50	0.30	0.30	17	1.30	1.30	50	50	3	8
MDC6288-6	7.5-16.0	6 ±1.10	±0.60	0.60	2.00	12	1.35	1.40	50	2	2	7
MDC6288-10	7.5-16.0	10 ±1.25	±0.75	0.60	1.00	12	1.35	1.40	50	5	2	7
MDC6288-20	7.5-16.0	20 ±1.25	±0.75	0.50	0.50	15	1.35	1.40	50	50	2	9
MDC6288-30	7.5-16.0	30 ±1.25	±0.75	0.50	0.50	15	1.35	1.40	50	50	2	9
MDC6228-6	12.4-18.0	6 ±1.00	±0.50	0.60	2.20	15	1.30	1.40	50	2	1	7
MDC6228-10	12.4-18.0	10 ±1.00	±0.50	0.60	1.20	15	1.30	1.40	50	5	1	7
MDC6228-20	12.4-18.0	20 ±1.00	±0.50	0.50	0.55	15	1.30	1.40	50	50	1	9
MDC6228-30	12.4-18.0	30 ±1.00	±0.50	0.50	0.50	15	1.30	1.40	50	50	1	9

† Includes Frequency Sensitivity

Dimensions are in inches

Directional Couplers

Broadband & Multi-Octave

Features

- Ultra-miniature
- Broadband
- SMA connectors
- High directivity
- Low VSWR
- Meets MIL environments
- 105°C operating temperature
- RF Shielded
- Stripline construction
- Type N connector models available
- Available from stock

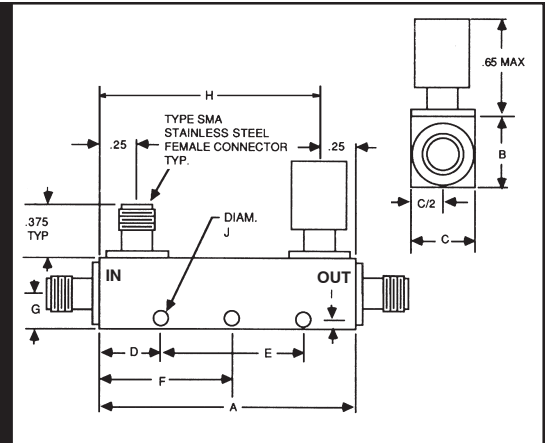
See Note on Page 61 referring to coupler port designations.

MIDISCO Series MDC 2000 and MDC 4200 broadband and multi-octave directional couplers are designed for test and ECM equipment where more than standard frequency bandwidths are required. Each model is miniature, lightweight, and able to meet stringent environmental requirements. Construction is stripline and designed to meet MIL-E-5400 & MIL-E-16400 environments. Type N connector models available. All units are available from stock.

Outline	A	B	C	D	E	F	G	H	I	J
1	3.60	.53	.38	.5	2.60	-	.22	3.35	.075	.105
2	3.60	.60	.38	.5	2.60	-	.22	3.35	.075	.105
3	2.90	.68	.38	.45	2.00	-	.34	2.65	.15	.148
4	2.90	.60	.38	.45	2.00	-	.22	2.65	.075	.105
5	1.78	.68	.38	.45	.875	-	.34	1.53	.15	.148
6	1.78	.60	.38	.45	.875	-	.22	1.53	.075	.148
7	1.22	.54	.38	.42	.375	-	.22	.97	.075	.105
8	1.22	.60	.38	.42	.375	-	.22	.97	.075	.105
9	1.00	.50	.38	-	-	.50	.22	.75	.075	.105
10	4.40	.60	.38	.50	3.40	-	.24	4.15	.075	.105
11	3.47	.70	.38	.74	2.00	-	.26	3.22	.10	.105
12	1.36	.60	.38	.43	.50	-	.26	1.11	.09	.105
13	3.47	.70	.50	.74	2.00	-	.26	3.22	.34	(1)
14	2.10	.70	.38	.55	1.00	-	.26	1.85	.10	.105
15	2.09	.70	.50	.55	1.00	-	.26	1.84	.34	(1)
16	1.36	.66	.38	.43	.50	-	.26	1.11	.09	.105

(1) 2-56 NC-28 x .12

Dimensions in inches



Model No.	Frequency Range (GHz)	Coupling† (dB)	Freq. Sens. (dB)	Insertion Loss (dB)		Directivity (dB) min	VSWR max		Power			Outline Dwg. No.	
				Excl. Cpld. Pwr.	True		Primary Line	Secondary Line	Avg. Incident (W)	Avg. Reflected (W)	Peak (kW)		
MDC2044-6	0.5-2	6±1.0	±0.75	0.35	2.00	23	1.20	1.20	50	2	3	1	
MDC2044-10		10±1.0	±0.75	0.35	0.90	23	1.20	1.20	50	5	3	1	
MDC2044-20		20±1.0	±0.75	0.35	0.40	23	1.20	1.20	50	50	3	2	
MDC2055-6	1-4.0	6±1.0	±0.5	0.35	2.00	23	1.20	1.20	50	2	3	3	
MDC2055-10		10±1.0	±0.5	0.35	0.90	23	1.20	1.20	50	5	3	3	
MDC2055-20		20±1.0	±0.5	0.40	0.45	23	1.20	1.20	50	50	3	4	
MDC2066-6	2-8	6±1.0	±0.3	0.50	2.20	20	1.25	1.25	50	2	3	5	
MDC2066-10		10±1.0	±0.3	0.35	1.00	20	1.25	1.25	50	5	3	5	
MDC2066-20		20±1.0	±0.4	0.40	0.45	20	1.25	1.25	50	50	3	6	
MDC2077-6	4-12.4	6±1.0	±0.3	0.50	2.20	17	1.30	1.30	50	2	2	7	
MDC2077-10		10±1.0	±0.3	0.50	1.20	17	1.30	1.30	50	5	2	7	
MDC2077-20		20±1.0	±0.4	0.50	0.55	17	1.30	1.30	50	50	2	8	
MDC2089-10	7-18	10±1.25	±0.75	0.60	1.10	15	1.35	1.40	50	5	1	9	
MDC4245-10	0.6-4	10±1.0	±0.75	0.40	0.90	18	1.25	1.30	50	5	3	10	
1-12.4 12.4-18													
MDC4259-10	1-18 †	10±1.0	±0.5	0.90	1.50	15	12	1.40	1.50	25	5	1	11
MDC4259-16		16±1.0	±0.5	0.80	0.90	15	12	1.40	1.50	25	20	1	13
MDC4259-20		20±1.0	±0.5	0.85	0.90	15	12	1.40	1.50	25	25	1	13
2-12.4 12.4-18													
MDC4269-6	2-18 †	6±1.0	±0.5	0.90	2.00	15	12	1.35	1.50	25	2	1	14
MDC4269-10		10±1.0	±0.5	0.60	1.00	15	12	1.35	1.50	25	5	1	14
MDC4269-16		16±1.0	±0.5	0.80	0.90	15	12	1.35	1.40	25	20	1	15
MDC4269-20		20±1.0	±0.5	0.80	0.90	15	12	1.35	1.40	25	25	1	15
4-12.4 12.4-18													
MDC4279-6	4-18	6±1.0	±0.5	0.90	2.00	15	12	1.35	1.40	25	2	1	12
MDC4279-10		10±1.0	±0.5	0.80	1.00	15	12	1.35	1.40	25	5	1	12
MDC4279-20		20±1.0	±0.5	0.60	0.70	15	12	1.40	1.40	25	25	1	16

† Indicates frequency sensitivity

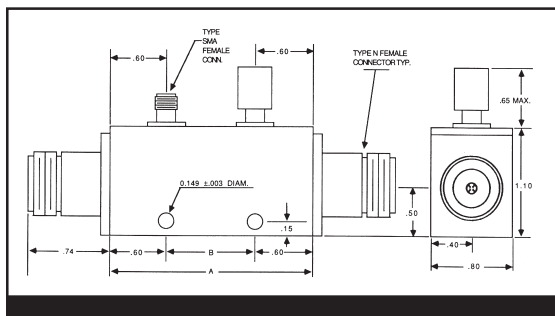
‡ Coupling relative to output power

High Power/600 Watts CW 10kW pk

Features

- 600 watts CW, 10 kW peak
- Wide bandwidths
- Small size
- Flat with frequency
- RF shielded
- Custom coupling values (30-50dB)
- Fast delivery

MIDISCO high power directional couplers, series MDC2300 and MDC3300 are available in any coupling value between 30dB and 50dB (substitute for "X" in part number). The frequency sensitivity is included in the coupling value. High power couplers find use in leveling circuits, VSWR protection, and transmitter carrier power monitors. Primary line connectors are normally Type N female, with SMA Female on the coupled port. Other connector types are available on special order. The couplers are flat with frequency and have good directivity.



† X to be selected by customer. Frequency sensitivity included in coupling. Primary line connectors Type N Female. Special order connectors available. Coupled port SMA Female. Dimensions are in inches.

Model Number	Freq. Range (GHz)	Coupling (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB) max	Directivity (dB) min	VSWR max Primary Line	A	B
MDC2344-X	0.5-2	X±1.0	±0.75	0.2	18	1.15	6.00	4.80
MDC2324-X	1-2	X±1.0	±0.75	0.2	18	1.15	3.50	2.30
MDC2325-X	2-4	X±1.0	±0.75	0.2	18	1.15	2.50	1.30
MDC3354-X	1-4	X±1.0	±0.70	0.2	15	1.15	3.85	2.65
MDC2366-X	2.6-5.2	X±1.0	±0.75	0.2	18	1.20	2.50	1.30
MDC2326-X	4-8	X±1.0	±0.75	0.2	18	1.30	2.00	0.80
MDC3355-X	1.5-4.5	X±1.0	±0.60	0.2	18	1.20	3.50	2.30
MDC3366-X	2-8	X±1.0	±0.60	0.2	16	1.30	3.00	1.80
MDC2327-X	7-11	X±1.0	±0.50	0.2	16	1.30	2.00	0.80
MDC2377-X	5-11	X±1.0	±0.50	0.2	15	1.30	2.00	0.80
MDC3377A-X	4-12	X±1.0	±0.60	0.2	15	1.30	2.50	1.30
MDC2357-35	1-11	35±1.5	±1.50	0.2	15	1.30	3.85	2.65

Directional Couplers

Dual High Power

Features

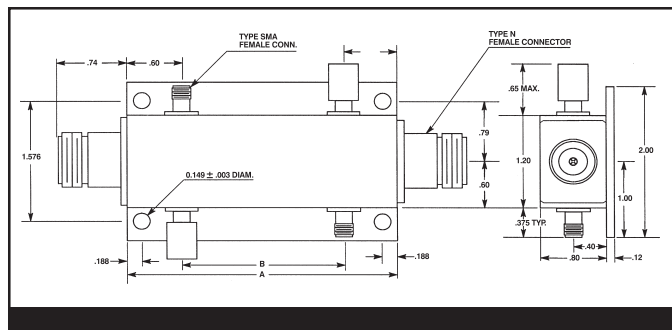
- 600 watts CW, 10 kW peak
- Wide bandwidths
- Small size
- Flat with frequency
- RF shielded
- Custom coupling values (30dB to 50dB)
- Fast delivery

MIDISCO dual directional couplers, series MDC2100 are available in any coupling value between 30dB and 50dB (substitute for "X" in part number). The frequency sensitivity is included in the coupling value. Dual high power directional couplers are built to give forward and reverse power monitoring capabilities in a package matching our MDC2300-MDC3300 series couplers. Forward and reverse coupling values can be independently selected. Primary line connectors are normally Type N female, with SMA female on the coupled port. Other connector types are available on special order. The couplers are flat with frequency and have good directivity. If both coupled ports are intended for monitoring forward power, change the suffix "B" to "C" when ordering. (i.e. MDC2125C-30)

Custom versions of this series are available with 3 or more coupled ports. Custom frequency requirements are easily met.

Model Number	Frequency Range (GHz)	Coupling (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB)	Directivity (dB)	VSWR max Pri. Line	Outline Dimensions	
							A	B
MDC2144B-X	0.5-2	X±1.0	±0.75	0.4	18	1.20	6.00	4.80
MDC2124B-X	1.2	X±1.0	±0.75	0.4	18	1.20	3.50	2.30
MDC2125B-X	2-4	X±1.0	±0.75	0.4	18	1.20	2.50	1.30
MDC2154B-X	1-4	X±1.0	±0.60	0.4	15	1.20	3.85	2.65
MDC2163B-X	2.6-5.2	X±1.0	±0.75	0.4	18	1.25	2.50	1.30
MDC2126B-X	4-8	X±1.0	±0.75	0.4	18	1.35	2.00	0.80
MDC2155B-X	1.5-4.5	X±1.0	±0.60	0.4	18	1.25	3.50	2.30
MDC2166B-X	2-8	X±1.0	±0.60	0.4	16	1.35	3.00	1.80
MDC2127B-X	7-11	X±1.0	±0.50	0.5	16	1.35	2.00	0.80
MDC2177B-X	5-11	X±1.0	±0.50	0.5	15	1.35	2.00	0.80
MDC2178B-X	4-12	X±1.0	±0.60	0.5	15	1.35	2.50	1.30
MDC2157B-35	1-11	35±1.5	±1.50	0.5	15	1.35	3.85	2.65

† X to be selected by customer (30dB to 50 dB). Frequency sensitivity to be included in coupling.



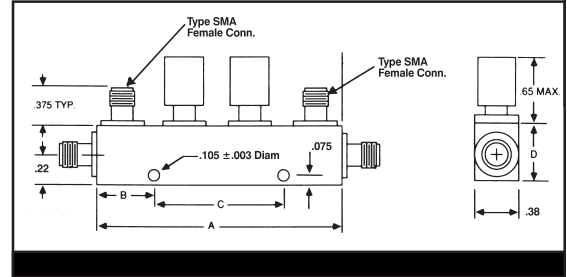
Directional Couplers

Dual Miniature

Features

- Etched teflon fiberglass stripline
- Miniature size
- High directivity
- MIL-SPEC construction
- Low VSWR
- RF shielded
- Resistance soldered SMA connectors
- Connectors per MIL-PRF-39012
- Delivery from Stock

MIDISCO Series MDC 3200 are stripline constructed dual directional couplers that have a variety of applications. These miniature devices, available in 10, 20, and 30 dB, have good directivity, tight coupling, and frequency sensitivity. When used in a reflectometer application, the reflected and incident power can be simultaneously monitored. When either incident or reflected power is monitored from two isolated ports, it is used as a dual in-line coupler. Special coupling values may be ordered. All standard values are available from stock.



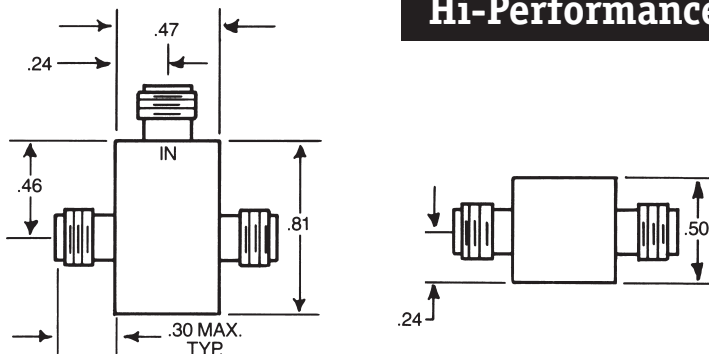
Model Number	Freq. Range (GHz)	Coupling† (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB) max - True	Directivity (dB) min	VSWR (max)		A	B	C	D
						Pri. Line	Sec. Line				
MDC3223-21	0.5-1	10±1.25	±0.80	1.50	22	1.15	1.10	6.30	0.80	4.70	0.50
MDC3223-22		20±1.25		0.50				6.30	0.80	4.70	0.50
MDC3223-23		30±1.25		0.40				6.30	0.80	4.70	0.55
MDC3224-21	1-2	10±1.25	±0.80	1.50	22	1.15	1.10	3.66	0.42	2.82	0.50
MDC3224-22		20±1.25		0.50				3.66	0.42	2.82	0.50
MDC3224-23		30±1.25		0.40				3.66	0.42	2.82	0.55
MDC3225-21	2-4	10±1.25	±0.80	1.50	20	1.20	1.15	2.42	0.41	1.60	0.50
MDC3225-22		20±1.25		0.50				2.42	0.41	1.60	0.50
MDC3225-23		30±1.25		0.40				2.42	0.41	1.60	0.55
MDC3266-21	2.6-5.2	10±1.25	±0.80	1.50	18	1.30	1.25	2.10	0.50	1.10	0.50
MDC3266-22		20±1.25		0.50				2.10	0.50	1.10	0.50
MDC3266-23		30±1.25		0.40				2.10	0.50	1.10	0.55
MDC3226-21	4-8	10±1.25	±0.80	1.70	18	1.35	1.25	2.10	0.50	1.10	0.50
MDC3226-22		20±1.25		0.50				2.10	0.50	1.10	0.50
MDC3226-23		30±1.25		0.40				2.10	0.50	1.10	0.55
MDC3227-21	7-12.4	10±1.25	±0.60	1.90	16	1.35	1.30	2.10	0.50	1.10	0.50
MDC3227-22		20±1.25		0.70				2.10	0.50	1.10	0.50
MDC3227-23		30±1.25		0.60				2.10	0.50	1.10	0.55
MDC3228-21	8-16	10±1.25	±0.80	2.20	15	1.40	1.40	2.10	0.50	1.10	0.50
MDC3228-22		20±1.25		1.00				2.10	0.50	1.10	0.60
MDC3228-23		30±1.25		1.00				2.10	0.50	1.10	0.60
MDC3288-21	12.4-18	10±1.25	±0.60	2.20	15	1.40	1.40	2.10	0.50	1.10	0.50
MDC3288-22		20±1.25		1.00				2.10	0.50	1.10	0.60
MDC3288-23		30±1.25		1.00				2.10	0.50	1.10	0.60

† Includes Frequency Sensitivity

Dimension are in inches.

Power Dividers-Resistive

Hi-Performance — "T" Configuration (DC-18GHz)



Model Number	Connectors	VSWR (max)		Insertion Loss (dB)		Amplitude Balance			Input Power
		DC-10	10-18	DC-10GHz	DC-18GHz	DC-4	4-10	10-18	
MDC2R06	SMA Female (3)	1.25	1.35	6 +1.20 / -0.20	6 +1.50 / -0	0.20	0.40	0.50	1 watt max

Features

- 2-Way through 5-Way available
- All port symmetry
- Miniature, lightweight
- DC-26.5 GHz in a single unit (see page 4)
- Most meet MIL-E-5400/MIL-STD-202
- 2 watt CW, 100 watt peak power
- -55° C to +125° C

MIDISCO Broadband resistive power dividers include 2-Way through 5-Way devices. 50 Ω and 75 Ω units are available. All feature excellent stability over temperature, with good amplitude and phase matching between ports. The internal resistive configuration provides symmetry to allow port interchangeability. Dividers with BNC, SMA, type N and 2.9 mm (see page 4) connectors are available. Unless otherwise indicated, all connectors are female.

Model No.	Connectors	Frequency	Insertion Loss (dB)	VSWR (max.)	Figure
2-WAY					
MDC1195F3	SMA	DC-4	DC-2 GHz: 6 +/-0.3; 2-4 GHz: 6 +/-0.5	DC-2 GHz: 1.2:1; 2-4 GHz: 1.3:1	1
MDC1194F3B	BNC	DC-2	6 +/- 0.3	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1193F3A	N	DC-4	6 +/- 0.6	1.35:1	2
MDC1193F3A-6	N	DC-6	DC-4 GHz: 6 +/-0.4; 4-6 GHz: 6 +/- 0.7	1.4:1	2
MDC1194F3N/75	75 Ω N	DC-2	6 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1194F3B/75	75 Ω BNC	DC-2	6 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
3-WAY					
MDC1197F4	SMA	DC-4	9.5 +/- 0.5	1.5:1	1
MDC1197F4B	BNC	DC-2	9.5 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1197F4N	N	DC-2	9.5 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1197F4B/75	75 Ω BNC	DC-2	9.5 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1197F4N/75	75 Ω N	DC-2	9.5 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
4-WAY					
MDC1196F5	SMA	DC-2	DC-1 GHz: 12 +/-0.3; 1-2 GHz: 12 +/- 0.5	1.5:1	1
MDC1196AF5	SMA	DC-4	12 +/- 0.75	1.5:1	1
MDC1196F5B	BNC	DC-2	12 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1196F5N	N	DC-2	12 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1196F5B/75	75 Ω BNC	DC-2	12 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1196F5N/75	75 Ω N	DC-2	12 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
5-WAY					
MDC1198F6	SMA	DC-1.5	DC-1 GHz: 14 +/- 0.3; 1-2 GHz: 14 +/- 0.5	1.2:1	1
MDC1198F6B	BNC	DC-2	14 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1198F6N	N	DC-2	14 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1198F6B/75	75 Ω BNC	DC-2	14 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2
MDC1198F6N/75	75 Ω N	DC-2	14 +/- 0.5	DC-1 GHz: 1.3:1; 1-2 GHz: 1.4:1	2

Note: See New Products Section for 18 GHz Type N and 26.5 GHz 2.9 mm dividers, and next page for additional 2-Way choices, including 75 Ω TNC.

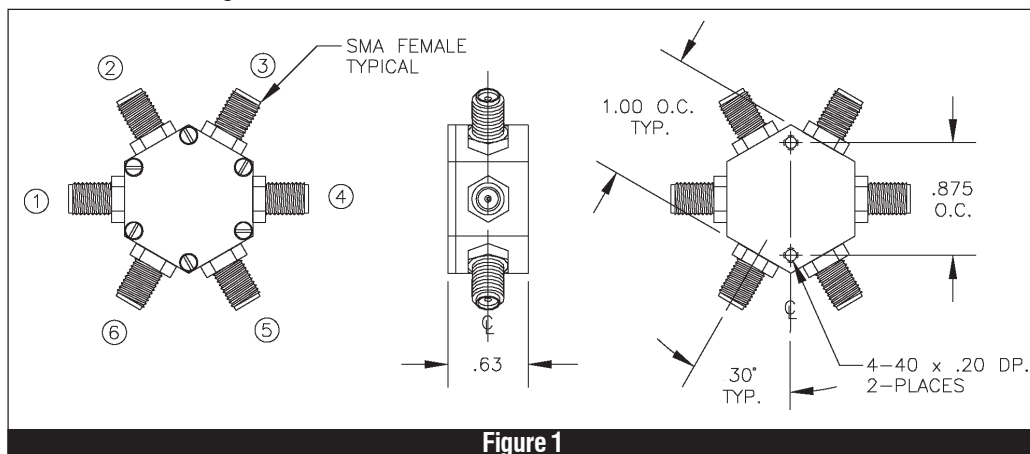


Figure 1

Connectors Used:

- 2-way: 1, 3, 5
- 3-Way: 1, 3, 4, 5
- 4-Way: 1, 2, 3, 5, 6
- 5-Way: 1, 2, 3, 4, 5, 6

Power Dividers

Resistive, Additional 2-Way Units

Model Number	Connectors	Frequency	Insertion Loss (dB)	VSWR (Max.)	Figure
2-WAY					
MDC1193AF3-1	N	DC-1	6 +/- 0.3	DC-2 GHz: 1.2:1; 2-4 GHz: 1.3:1	Note 1
MDC1193AF3-2	N	DC-2.55	DC-1 GHz: 6 +/- 0.3; 1-2.55 GHz: 6 +/- 0.5	DC-0.5 GHz: 1.1:1; 0.5-2.55 GHz: 1.3:1	Note 1
MDC1194AF3/75	75Ω BNC	DC-1	DC-0.5 GHz: 6 +/- 0.2; 0.5-1 GHz: 6 +/- 0.4	DC-0.5 GHz: 1.2:1; 0.5-1 GHz: 1.3:1	Note 1
MDC1194AF3T/75	75Ω TNC	DC-1	DC-0.5 GHz: 6 +/- 0.2; 0.5-1 GHz: 6 +/- 0.4	DC-0.5 GHz: 1.2:1; 0.5-1 GHz: 1.3:1	Note 1

Note 1: Not Shown. Consult factory for outline drawing. These units are 1 Watt average, 1 KW peak (-40 C° to +85° C).

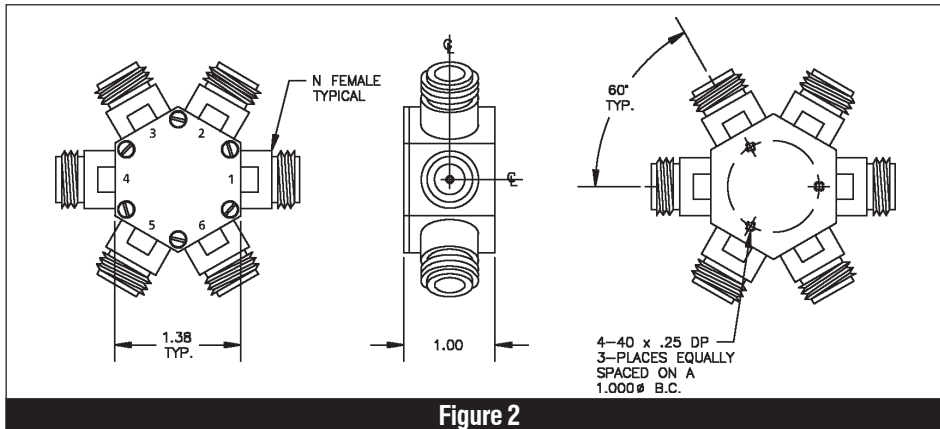


Figure 2

Connectors Used:

2-way: 1, 3, 5
3-Way: 1, 3, 4, 5
4-Way: 1, 2, 3, 5, 6
5-Way: 1, 2, 3, 4, 5, 6

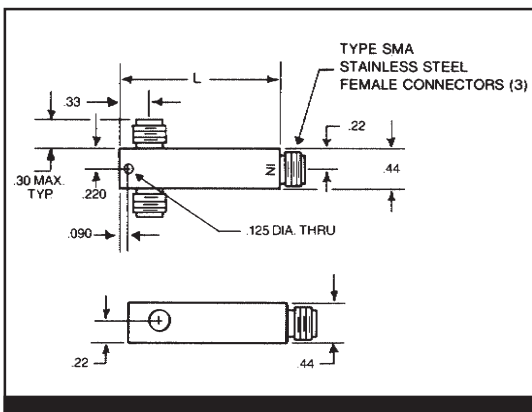
Power Dividers

Isolated In-Phase 2 Way — Ultra Broadband “T” Configuration

Features

- Very broadband in a single package
- Excellent phase balance
- Low cost
- Small size & weight
- High Isolation
- Delivery from stock

MIDISCO Ultra-Broadband power dividers offer either 1-20GHz or 2-26.5 GHz in a single package. Featuring high isolation and low insertion loss, both models are very small but ruggedly constructed. Both may also be used as combiners and have SMA female connectors.



Model Number	Freq. Range (GHz)	Insertion Loss (dB) max	Amplitude Balance (dB) max	Phase Balance (deg) max	VSWR		Isolation (dB) min	Input Power (W) max	Length (L) (inches)
					Input	Output			
MDC2P06	1-1.5	0.50	0.20	1	1.70:1	1.50:1	10	10	1.75
	1.5-2	0.50	0.20	1	1.60:1	1.40:1	15	10	1.75
	2-4	0.40	0.20	1	1.50:1	1.30:1	20	10	1.75
	4-8	0.50	0.20	1.5	1.50:1	1.40:1	17	10	1.75
	8-15	0.80	0.30	2	1.70:1	1.50:1	15	10	1.75
	15-16	0.80	0.30	3	1.70:1	1.60:1	15	10	1.75
	16-18	0.90	0.40	4	1.80:1	1.90:1	14	10	1.75
	18-20	1.10	0.40	4	2.00:1	2.00:1	7	10	1.75
MDC2P86	2-2.5	0.30	0.30	2	1.50:1	1.20:1	15	10	1.50
	2.5-20	1.00	0.40	4	1.30:1	1.30:1	20	10	1.50
	20-26.5	1.50	0.40	6	1.50:1	1.50:1	15	10	1.50

Power Dividers

Isolated In-Phase 2 Way — 0.5-26.5 GHz

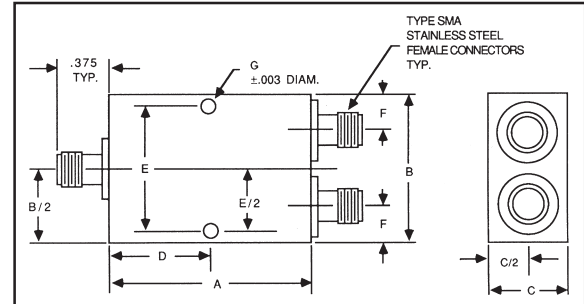
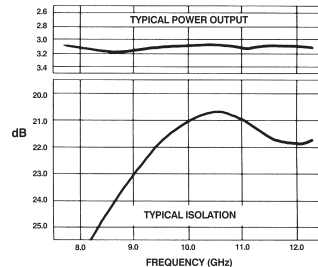
Features

- Use as divider or combiner
- Low insertion loss & VSWR
- Flat frequency response
- Excellent phase and amplitude tracking
- High isolation
- RF shielded
- Constructed to exceed MIL-E-5400 & MIL-E-16400
- Type N connector models available
- Delivery from stock

MIDISCO

miniature stripline power dividers provide high isolation in-phase division of input power between output ports. These low VSWR units are contained within precision machined housings that are designed to provide high RF shielding and eliminate unwanted RF modes.

Standard models have three SMA female connectors. Other frequency ranges, 4, 8 or 16 way configurations, and different connector types are available. Consult factory for 26.5 GHz units.



Outline	A	B	C	D	E	F	G
1	1.00	1.00	0.50	0.50	0.64	0.25	.104
2	1.50	1.50	0.50	0.75	1.31	0.25	.104
3	2.00	1.50	0.50	1.00	1.31	0.25	.104
4	1.50	2.50	0.50	0.53	2.31	0.75	.104
5	1.62	1.00	0.38	0.75	0.85	0.25	.104
6	3.00	1.50	0.50	1.50	0.66	0.25	.125

Power Dividers

Isolated In-Phase 4 Way — 0.5-26.5 GHz

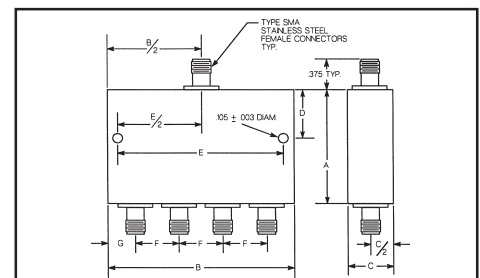
Features

- Low VSWR, insertion loss
- Flat frequency response
- Excellent phase and amplitude tracking
- Wide bandwidth
- Useable as combiner
- RF shielded
- Constructed to exceed MIL-E-5400 & MIL-E-16400
- Type N connector models available

MIDISCO

miniature stripline power dividers provide high isolation in-phase division of input power between output ports. These low VSWR units are contained within precision machined housings that are designed to provide high RF shielding and eliminate unwanted RF modes.

Standard models have five SMA Female connectors. Other frequency ranges, configurations, and connector types are available. Consult factory for 26.5 GHz units.



Outline	A	B	C	D	E	F	G
1	1.28	2.75	0.50	0.64	2.06	0.69	0.34
2	1.78	2.75	0.50	0.89	2.06	0.69	0.34
3	2.00	2.00	0.38	1.00	1.70	0.50	0.25
4	2.20	2.65	0.50	1.10	2.45	0.65	0.35
5	2.50	2.75	0.38	1.25	2.50	0.69	0.34
6	2.85	2.00	0.38	.95/1.9	1.70	0.50	0.25
7	3.40	3.60	0.50	1.70	3.40	1.00	0.30
8	3.70	4.00	0.50	1.85	3.70	1.10	0.35

Model Number	Freq. Range (GHz)	Insertion Loss (dB) max	Amplitude Balance (dB) max	Phase Balance (deg) max	VSWR max		Isolation (dB) min	Input Power (W) Load VSWR			Outline Dwg. #
					Input	Output		1.2	2.0	∞	
MDC2423	0.5-1	0.40	0.4	4.0	1.30	1.20	20	30	20	3	7
MDC2424	1-2	0.60	0.3	5.0	1.60	1.35	20	30	20	3	5
MDC2425	2-4	0.60	0.6	6.0	1.50	1.50	18	30	10	1	4
MDC2463	3-5	0.50	0.3	4.0	1.35	1.30	20	30	10	1	2
MDC2426	4-8	0.40	0.3	4.0	1.40	1.25	20	30	10	1	3
MDC2466	2-8	0.80	0.4	7.0	1.50	1.40	16	30	10	1	8
MDC2427	7-12.4	0.80	0.6	6.0	1.50	1.50	16	30	10	1	1
MDC2488	12-18	1.50	0.6	6.0	1.50	1.50	18	30	10	1	3
MDC2489	8-18	1.50	0.6	6.0	1.50	1.50	18	30	10	1	3
MDC2469	2-18	2.00	0.6	6.0	1.60	1.50	14	30	10	1	6

Power Dividers

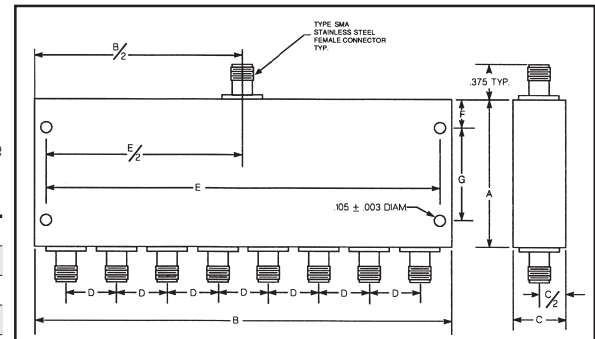
Isolated In-Phase 8 Way — 0.74-18GHz

Features

- Low VSWR, insertion loss
- Flat frequency response
- Excellent phase and amplitude tracking
- Wide bandwidth
- Useable as combiner
- RF shielded
- High isolation
- Constructed to exceed MIL-E-5400 & MIL-E-16400
- Delivery from stock

MIDISCO miniature stripline power dividers provide high isolation in-phase division of input power between output ports. These low VSWR units are contained within precision machined housings that are designed to provide high RF shielding and eliminate unwanted RF modes.

Standard models have nine SMA Female connectors. Other frequency ranges, 2, 4, or 16 way configurations, and different connector types are available.



Outline	A	B	C	D	E	F	G
1	2.40	4.00	0.38	0.50	3.80	0.30	1.80
2	2.45	5.20	0.38	0.60	4.95	0.48	1.50
3	3.50	5.20	0.38	0.60	5.00	1.80	—
4	3.80	5.50	0.50	0.69	5.10	0.50	2.60

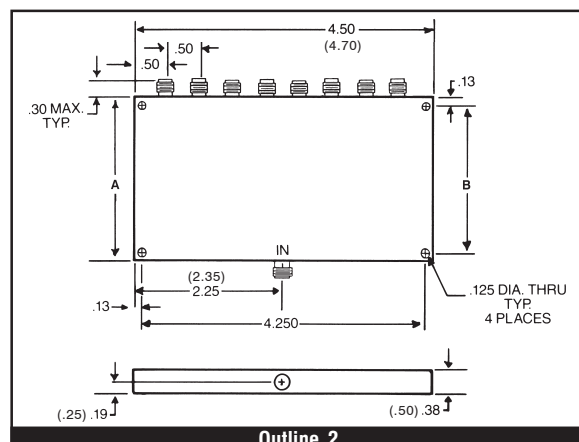
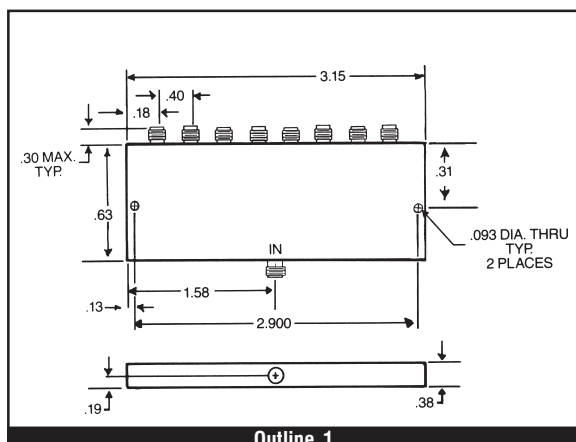
Model Number*	Freq. Range (GHz)	Insertion Loss (dB) max	Amplitude Balance (dB) max	Phase Balance (deg) max	VSWR max		Isolation (dB) min	Input Power (W) Load VSWR			Outline Dwg. No.
					Input	Output		1.2	2.0	∞	
MDC2823A	.74-.96	0.5	0.2	3.0	1.40	1.20	20	30	10	1	4
MDC2824A	1.3-1.76	0.4	0.2	4.0	1.35	1.20	19	30	10	1	2
MDC2825	2-4	1.0	0.4	5.0	1.60	1.30	18	30	10	1	2
MDC2863A	3.6-4.3	0.8	0.4	5.0	1.35	1.35	20	30	10	1	3
MDC2826	4-8	0.8	0.8	6.0	1.30	1.35	20	30	10	1	2
MDC2826A	5.5-8	0.7	0.3	6.0	1.75	1.25	20	30	10	1	1
MDC2827	7-12.4	0.8	0.6	6.0	1.55	1.45	16	30	10	1	1
MDC2888	12-18	1.5	0.6	6.0	1.60	1.50	15	30	10	1	1
MDC2889	8-18	2.0	0.6	6.0	1.60	1.50	15	30	10	1	1

* For type N connectors, add suffix "N" to part number.

Power Dividers

Broadband & Multi-Octave — 0.2 MHz - 18 GHz

Model Number	Freq. Range (MHz)	Insertion Loss (dB) max	Amplitude Balance (dB) max	Phase Balance (deg) max	VSWR max		Isolation (dB) min	Input Power (W) max	Outline Dwg. #	A	B
					Input	Output					
M8P65	.2-200	1.30	0.20	6.0	1.30	1.30	23	1.5	1	-	-
M8P66	5-500	1.50	0.20	6.0	1.30	1.30	23	1.5	1	-	-
M8P43	500-2000	1.50	0.30	6.0	1.40	1.25	20	30	2	4.50	4.25
M8P46	500-4000	1.80	0.50	2.0	1.50	1.50	20	30	2	4.50	4.25
M8P44	2000-8000	1.25	0.30	6.0	1.40	1.30	20	30	2	4.50	4.25
M8P32	6000-18000	1.50	0.50	5.0	1.70	1.70	15	30	2	2.00	1.75



(XX): Dimensions in brackets apply to M8P32 only.

Isolators / Circulators

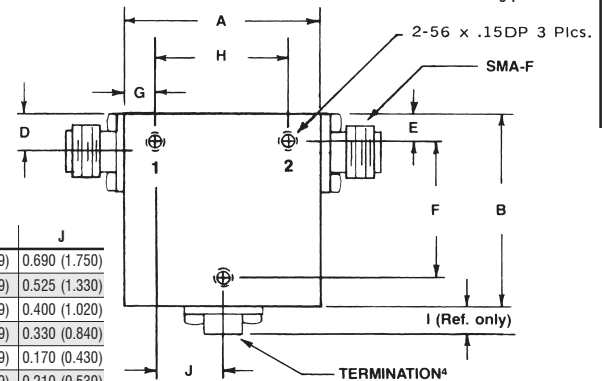
Single Junction - Octave/Broadband - High Performance Narrow Band

Features

- Small size
- SMA female connectors standard
- Optional removable connectors for assembly integration
- Nickel plated
- SMA male connectors & other types available⁵
- Dual Junction devices available
- Delivery from stock

MIDISCO

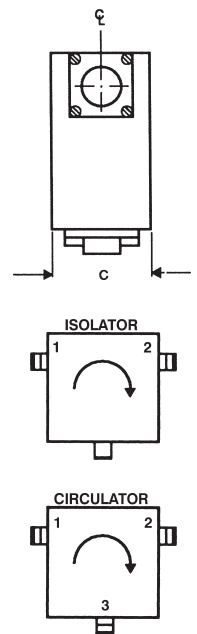
standard isolators and circulators are available in selected frequency ranges from 0.50-40.0 GHz. Standard are SMA female connectors but other types are available. Each model is nickel plate finish with chem film per MIL-C-5541B class 3. Test data may be ordered. Dual Junction devices are available. Standard units are in stock.



Note: Mtg holes for Outline 9 are 0-80 x .080 DP 2 Pl.

Outline No.	A	B	C	D	E	F	G	H	I	J
1	1.58 (4.01)	1.62 (4.11)	0.70 (1.78)	0.25 (0.63)	0.25 (0.63)	1.265 (3.213)	0.10 (0.25)	1.380 (3.505)	0.15 (0.29)	0.690 (1.750)
2	1.25 (3.17)	1.25 (3.17)	0.70 (1.78)	0.25 (0.63)	0.25 (0.63)	0.900 (2.286)	0.10 (0.25)	1.050 (2.667)	0.15 (0.29)	0.525 (1.330)
3	1.00 (2.54)	1.00 (2.54)	0.50 (1.27)	0.26 (0.66)	0.25 (0.63)	0.675 (1.715)	0.10 (0.25)	0.800 (2.032)	0.15 (0.29)	0.400 (1.020)
4	0.86 (2.18)	0.98 (2.49)	0.50 (1.27)	0.25 (0.63)	0.25 (0.63)	0.625 (1.587)	0.10 (0.25)	0.660 (1.676)	0.15 (0.29)	0.330 (0.840)
5	0.50 (1.27)	0.70 (1.78)	0.50 (1.27)	0.25 (0.63)	0.18 (0.46)	0.455 (1.156)	0.08 (0.20)	0.340 (0.864)	0.15 (0.29)	0.170 (0.430)
6	0.62 (1.57)	0.78 (1.98)	0.50 (1.27)	0.25 (0.63)	0.25 (0.63)	0.425 (1.079)	0.10 (0.25)	0.420 (1.067)	0.15 (0.29)	0.210 (0.530)
7	1.58 (4.01)	1.62 (4.11)	0.72 (1.90)	0.26 (0.66)	0.26 (0.66)	1.265 (3.213)	0.10 (0.25)	1.380 (3.505)	0.15 (0.29)	0.690 (0.530)
8	1.25 (3.17)	1.25 (3.17)	0.72 (1.90)	0.26 (0.66)	0.26 (0.66)	0.900 (2.286)	0.10 (0.25)	1.050 (2.667)	0.15 (0.29)	0.525 (1.330)
9	0.50 (1.27)	0.58 (1.47)	0.38 (0.97)	0.19 (0.48)	0.19 (0.48)	—	0.10 (0.25)	0.300 (0.762)	0.15 (0.29)	—

Frequency ¹ GHz	Model No. Isolator	Model No. Circulator	Isolation dB		Insertion Loss dB		VSWR		Size In. (cm) Outline No.	Approx. Weight oz. (gm.)	Isolator Power (Watts) ²		Operating Temperature ³ Range °C
			Typ.	Min	Typ.	Max.	Typ.	Max.			Avg.	Peak	
2.0-4.0	M3I2040	M3C2040	20	18	0.40	0.50	1.25	1.30	1	3.50 (100)	2	20	0 to +50
2.0-6.0	M3I2060	M3C2060	15	14	0.70	0.80	1.45	1.50	1	3.50 (100)	2	20	0 to +50
2.0-8.0	M3I2080	M3C2080	—	11	—	1.40	—	1.85	1	6.90 (195)	2	20	0 to +50
2.6-5.2	M3I2652	M3C2652	20	18	0.40	0.50	1.25	1.30	1	3.50 (100)	2	20	0 to +50
3.0-6.0	M3I3060	M3C3060	21	19	0.35	0.40	1.25	1.30	2	2.00 (60)	2	20	0 to +50
3.5-7.0	M3I3570	M3C3570	20	18	0.35	0.40	1.25	1.30	3	1.20 (35)	2	20	0 to +50
3.7-8.3	M3I3783	M3C3783	18	17	0.50	0.60	1.30	1.35	3	1.20 (35)	2	20	0 to +50
4.0-8.0	M3I4080	M3C4080	22	20	0.35	0.40	1.18	1.25	3	1.20 (35)	2	20	-10 to +60
6.0-12.4	M3I6012	M3C6012	19	17	0.50	0.60	1.30	1.35	6	1.00 (30)	2	20	-10 to +60
6.0-18.0	M3I6018	M3C6018	15	14	0.90	1.00	1.45	1.50	9	0.40 (11)	2	20	0 to +85
7.0-11.0	M3I7011	M3C7011	22	20	0.35	0.40	1.18	1.25	4	1.00 (30)	2	500	-30 to +85
7.0-12.4	M3I7012	M3C7012	21	20	0.35	0.40	1.22	1.25	5	1.00 (30)	5	500	-30 to +85
7.0-18.0	M3I7018	M3C7018	16	15	0.90	1.00	1.45	1.50	5	0.90 (25)	2	30	-10 to +85
8.0-12.4	M3I8012	M3C8012	22	20	0.35	0.40	1.18	1.25	4	1.00 (30)	2	500	-30 to +85
8.0-16.0	M3I8016	M3C8016	19	17	0.50	0.60	1.30	1.35	5	0.90 (25)	2	30	-20 to +65
8.0-18.0	M3I8018	M3C8018	17	16	0.70	0.80	1.40	1.45	5	0.90 (25)	2	30	-10 to +85
8.0-20.0	M3I8020	M3C8020	—	15	0.70	1.00	—	1.45	5	0.90 (25)	2	30	-10 to +85
10.0-20.0	M3I1020	M3C1020	17	16	0.60	0.70	1.35	1.40	5	0.90 (25)	2	30	-20 to +65
12.0-18.0	M3I1118	M3C1118	22	20	0.45	0.50	1.18	1.25	5	0.90 (25)	2	30	-20 to +65
18.0-26.5	M3I1826	M3C1826	20	18	0.70	0.80	1.35	1.40	5	0.90 (25)	2	30	-20 to +65
26.5-40.0*	M3I2640	M3C2640	15	14	0.80	1.00	1.45	1.50	5	0.90 (25)	2	30	-20 to +65
0.5-0.55	M3I0555	M3C0555	23	20	0.30	0.40	1.15	1.25	7	4.80 (135)	2	750	-20 to +65
0.525-0.6	M3I0560	M3C0560	23	20	0.30	0.40	1.15	1.25	7	4.80 (135)	2	750	-20 to +65
0.6-0.7	M3I0670	M3C0670	23	20	0.30	0.40	1.15	1.25	7	4.50 (129)	2	750	-20 to +65
0.7-0.8	M3I0780	M3C0780	23	20	0.30	0.40	1.15	1.25	7	4.50 (129)	2	750	-20 to +65
0.8-0.9	M3I0890	M3C0890	23	20	0.30	0.40	1.15	1.25	8	2.80 (80)	2	750	-20 to +65
0.95-1.225	M3I9525	M3C9525	22	20	0.35	0.40	1.18	1.25	8	2.80 (80)	2	500	-20 to +65
1.2-1.4	M3I0112	M3C0112	23	20	0.30	0.40	1.15	1.25	8	2.70 (76)	2	500	-20 to +65
1.4-1.6	M3I0116	M3C0116	23	20	0.30	0.40	1.15	1.25	8	2.00 (56)	2	500	-20 to +65
1.6-1.8	M3I0118	M3C0118	23	20	0.30	0.40	1.15	1.25	3	2.00 (56)	2	350	-20 to +65
1.7-2.0	M3I0120	M3C0120	23	20	0.30	0.40	1.15	1.25	3	2.00 (56)	2	350	-20 to +65
2.0-2.3	M3I0223	M3C0223	23	20	0.30	0.40	1.15	1.25	3	2.00 (56)	2	350	-20 to +65
3.7-4.2	M3I3742	M3C3742	26	23	0.10	0.15	1.10	1.15	3	1.40 (39)	2	20	-30 to +65
4.4-5.0	M3I4450	M3C4450	26	23	0.10	0.15	1.10	1.15	3	1.40 (39)	2	20	-30 to +65
5.4-5.9	M3I5459	M3C5459	26	23	0.10	0.15	1.10	1.15	6	1.00 (29)	2	20	-30 to +65
5.9-6.4	M3I5964	M3C5964	26	23	0.10	0.15	1.10	1.15	6	1.00 (29)	2	20	-30 to +65
7.5-10.0	M3I7510	M3C7510	23	20	0.30	0.50	1.15	1.25	5	0.74 (21)	2	50	-30 to +65
7.7-8.4	M3I7784	M3C7784	26	23	0.15	0.20	1.10	1.20	5	0.74 (21)	2	50	-30 to +65
8.5-9.6	M3I8596	M3C8596	26	23	0.15	0.20	1.10	1.20	5	0.74 (21)	2	50	-30 to +65
9.2-10.5	M3I9211	M3C9211	26	23	0.15	0.20	1.10	1.20	5	0.74 (21)	2	50	-30 to +65
10.7-11.7	M3I1112	M3C1112	26	23	0.15	0.20	1.10	1.20	5	0.74 (21)	2	50	-30 to +65
11.7-12.7	M3I1213	M3C1213	26	23	0.15	0.20	1.10	1.20	5	0.74 (21)	2	50	-30 to +65
17.0-20.0	M3I1720	M3C1720	24	22	0.30	0.40	1.15	1.20	5	0.74 (21)	2	50	0 to +50
19.0-22.0	M3I1922	M3C1922	24	22	0.30	0.40	1.15	1.20	5	0.74 (21)	2	50	0 to +50
20.0-21.5	M3I2021	M3C2021	24	22	0.30	0.40	1.15	1.20	5	0.74 (21)	2	50	0 to +50
20.0-23.0	M3I2023	M3C2023	24	22	0.30	0.40	1.15	1.20	5	0.74 (21)	2	50	0 to +50



1. Other frequencies available on request
2. Consult factory for power handling capability of circulator.
3. Storage temperature range is -55°C to 100°C.
4. Connector and termination locations are interchangeable.
5. SMA Male connectors are available by adding suffix "M1", "M2", or "M3" for corresponding port number(s). Example: M3I8018M1

* Supplied with "K" female connectors. K connector trademark of Wiltron Co.

See Note 6, Isolator Power footnote on page 70.

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MIDISCO

Isolators / Circulators

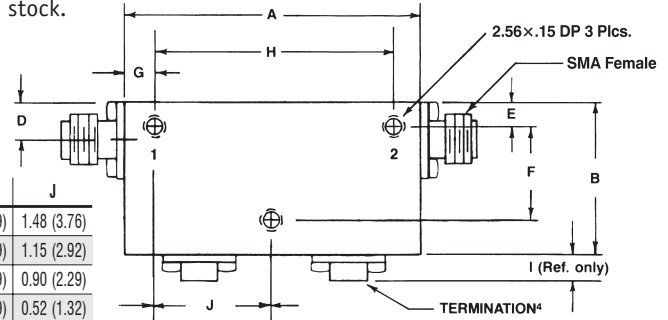
Dual Junction - Octave/Broadband - High Performance Narrow Band

Features

- Small size
- SMA female connectors standard
- Optional removable connectors for assembly integration
- Nickel plated
- SMA male connectors and other types available
- Single Junction devices available
- Delivery from stock

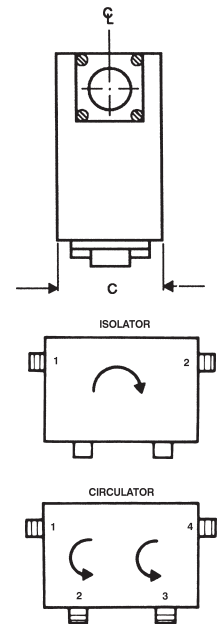
MIDISCO

dual junction isolators and circulators are available in selected frequency ranges from 0.50 to 40.0 GHz. Standard are SMA female connectors but other types are available. Each model is nickel plate finish with chem film per MIL-C-5541B class 3. Test data may be ordered. Single junction devices are available. Standard units are in stock.



Outline No.	A	B	C	D	E	F	G	H	I	J
1	3.16 (8.03)	1.62 (4.11)	0.72 (1.90)	0.26 (0.66)	0.26 (0.66)	1.265 (3.213)	0.10 (0.25)	2.960 (7.518)	0.15 (0.29)	1.48 (3.76)
2	2.50 (6.35)	1.25 (3.17)	0.72 (1.90)	0.26 (0.66)	0.26 (0.66)	0.900 (2.286)	0.10 (0.25)	2.300 (5.842)	0.15 (0.29)	1.15 (2.92)
3	2.00 (5.08)	1.00 (2.54)	0.50 (1.27)	0.25 (0.63)	0.25 (0.63)	0.675 (1.715)	0.10 (0.25)	1.800 (4.572)	0.15 (0.29)	0.90 (2.29)
4	1.24 (3.15)	0.78 (1.98)	0.50 (1.27)	0.25 (0.63)	0.25 (0.63)	0.425 (1.079)	0.10 (0.25)	1.040 (2.642)	0.15 (0.29)	0.52 (1.32)
5	1.00 (2.54)	0.70 (1.78)	0.50 (1.27)	0.25 (0.63)	0.18 (0.46)	0.455 (1.156)	0.08 (0.20)	0.840 (2.134)	0.15 (0.29)	0.42 (1.07)
6	3.16 (8.03)	1.62 (4.11)	0.70 (1.78)	0.25 (0.63)	0.25 (0.63)	1.265 (3.213)	0.10 (0.25)	2.960 (7.518)	0.15 (0.29)	1.48 (3.76)
7	2.50 (6.35)	1.25 (3.17)	0.70 (1.78)	0.25 (0.63)	0.25 (0.63)	0.900 (2.286)	0.10 (0.25)	2.300 (5.842)	0.15 (0.29)	1.15 (2.92)
8	1.72 (4.37)	0.98 (2.49)	0.50 (1.27)	0.25 (0.63)	0.25 (0.63)	0.625 (1.587)	0.10 (0.25)	1.520 (3.861)	0.15 (0.29)	0.76 (1.93)

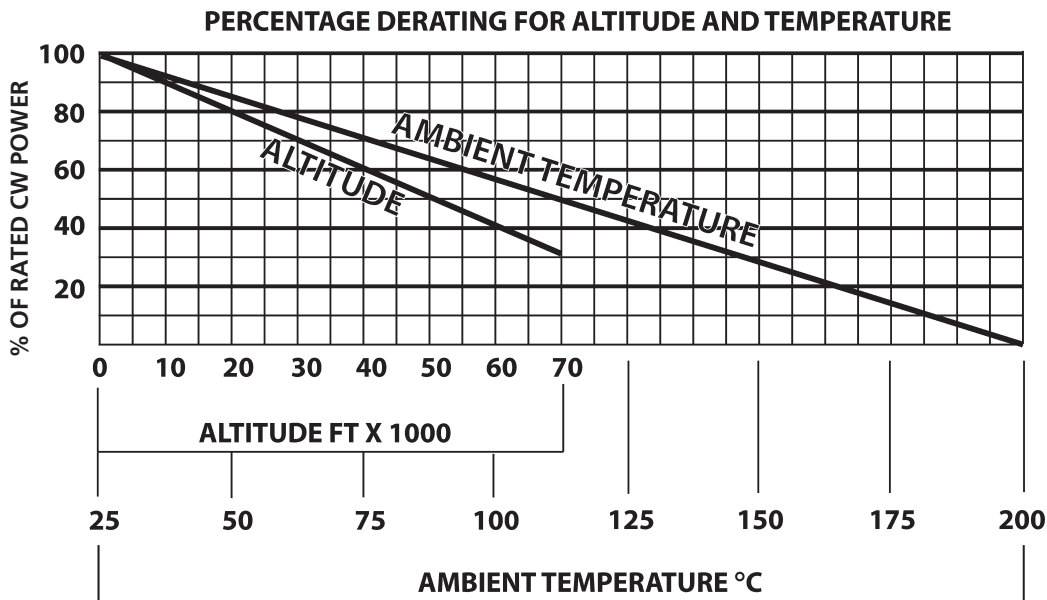
Frequency ¹ GHz	Model No. Isolator	Model No. Circulator	Isolation dB Min Per Jct.	Insertion Loss dB Max. Per Jct.	VSWR Max.	Size In. (cm) Outline No.	Approx. Weight oz. (gm.)	Isolator Power (Watts) ^{2, 6}		Operating Temperature Range °C ³
								Avg.	Peak	
2.0-4.0	M4I2040	M4C2040	18	0.50	1.30	6	6.9 (195)	2	20	0 to +50
2.0-6.0	M4I2060	M4C2060	14	0.80	1.50	6	6.9 (195)	2	20	0 to +50
2.0-8.0	M4I2080	M4C2080	11	1.40	1.85	6	6.9 (195)	2	20	-10 to +65
2.6-5.2	M4I2652	M4C2652	18	0.50	1.30	6	6.9 (195)	2	20	0 to +50
3.0-6.0	M4I3060	M4C3060	19	0.40	1.30	7	4.0 (115)	2	20	0 to +50
3.5-7.0	M4I3570	M4C3570	18	0.40	1.30	3	2.3 (65)	2	20	0 to +50
3.7-8.3	M4I3783	M4C3783	17	0.60	1.35	3	2.3 (65)	2	20	0 to +50
4.0-8.0	M4I4080	M4C4080	20	0.40	1.25	3	2.3 (65)	2	20	-10 to +60
6.0-12.4	M4I6012	M4C6012	17	0.60	1.35	4	1.9 (55)	2	20	-10 to +60
7.0-11.0	M4I7011	M4C7011	20	0.40	1.25	8	1.9 (55)	2	200	-30 to +85
7.0-12.4	M4I7012	M4C7012	20	0.40	1.25	8	1.9 (55)	5	500	-30 to +85
7.0-18.0	M4I7018	M4C7018	17	1.00	1.50	5	1.6 (45)	2	30	-10 to +85
8.0-12.4	M4I8012	M4C8012	20	0.40	1.25	8	1.9 (55)	2	200	-30 to +85
8.0-16.0	M4I8016	M4C8016	17	0.60	1.35	5	1.6 (45)	2	30	-20 to +65
8.0-18.0	M4I8018	M4C8018	16	0.80	1.45	5	1.6 (45)	2	30	-10 to +85
8.0-20.0	M4I8020	M4C8020	15	1.00	1.45	5	1.6 (45)	2	30	-20 to +65
10.0-20.0	M4I1020	M4C1020	16	0.70	1.40	5	1.6 (45)	2	30	-20 to +65
12.0-18.0	M4I1118	M4C1118	20	0.50	1.25	5	1.6 (45)	2	30	-20 to +65
18.0-26.5	M4I1826	M4C1826	18	0.80	1.40	5	1.6 (45)	2	30	-20 to +65
20.0-30.0*	M4I2030	M4C2030	18	0.70	1.40	5	1.6 (45)	2	30	-20 to +65
20.0-40.0*	M4I2004	M4C2004	13	1.20	1.60	5	1.6 (45)	2	30	-20 to +65
26.5-40.0*	M4I2640	M4C2640	14	1.00	1.50	5	1.6 (45)	2	30	-20 to +65
0.5-0.55	M4I0555	M4C0555	20	0.40	1.25	1	9.3 (265)	2	750	-20 to +65
0.525-0.6	M4I0560	M4C0560	20	0.40	1.25	1	9.3 (265)	2	750	-20 to +65
0.6-0.7	M4I0670	M4C0670	20	0.40	1.25	1	8.9 (253)	2	750	-20 to +65
0.7-0.8	M4I0780	M4C0780	20	0.40	1.25	1	8.9 (253)	2	750	-20 to +65
0.8-0.9	M4I0890	M4C0890	20	0.40	1.25	2	5.5 (155)	2	750	-20 to +65
0.95-1.225	M4I9525	M4C9525	20	0.40	1.25	2	5.5 (155)	2	500	-20 to +65
1.2-1.4	M4I0112	M4C0112	20	0.40	1.25	2	5.2 (147)	2	500	-20 to +65
1.4-1.6	M4I0116	M4C0116	20	0.40	1.25	2	3.8 (101)	2	500	-20 to +65
1.6-1.8	M4I0118	M4C0118	20	0.40	1.25	3	3.8 (107)	2	350	-20 to +65
1.7-2.0	M4I0120	M4C0120	20	0.40	1.25	3	3.8 (107)	2	350	-20 to +65
2.0-2.3	M4I0223	M4C0223	20	0.40	1.25	3	3.8 (107)	2	350	-20 to +65
3.7-4.2	M4I3742	M4C3742	23	0.15	1.15	3	2.6 (73)	2	20	-30 to +65
4.4-5.0	M4I4450	M4C4450	23	0.15	1.15	3	2.6 (73)	2	20	-30 to +65
5.4-5.9	M4I5459	M4C5459	23	0.15	1.15	4	1.9 (53)	2	20	-30 to +65
5.9-6.4	M4I5964	M4C5964	23	0.15	1.15	4	1.9 (53)	2	20	-30 to +65
7.5-10.0	M4I7510	M4C7510	20	0.50	1.25	5	1.3 (37)	2	50	-30 to +65
7.7-8.4	M4I7784	M4C7784	23	0.20	1.20	5	1.3 (37)	2	50	-30 to +65
8.5-9.6	M4I8596	M4C8596	23	0.20	1.20	5	1.3 (37)	2	50	-30 to +65
9.2-10.5	M4I9211	M4C9211	23	0.20	1.20	5	1.3 (37)	2	50	-30 to +65
10.7-11.7	M4I1112	M4C1112	23	0.20	1.20	5	1.3 (37)	2	50	-30 to +65
11.7-12.7	M4I1213	M4C1213	23	0.20	1.20	5	1.3 (37)	2	50	-30 to +65



1. Other frequencies available on request
2. Consult factory for power handling capability of circulator.
3. Storage temperature range is -55°C to 100°C.
4. Connector and termination locations are interchangeable.
5. SMA Male connectors are available by adding suffix "M1", "M2", "M3", or "M4" for corresponding port number(s). Example: M4I8018M1
6. Isolator powers shown are reflected powers. Average forward power for <2 GHz units is typically 150 watts. For units >2 GHz, it is usually in the range of 20-30 watts. Consult factory for specific models.

* Supplied with "K" female connectors. K connector trademark of Wiltron Co.

Coaxial Cable Derating for Altitude & Temperature



CABLE POWER CAPABILITY =
(RATED POWER) X (AMBIENT DERATING) X (ALTITUDE DERATING)

Example:

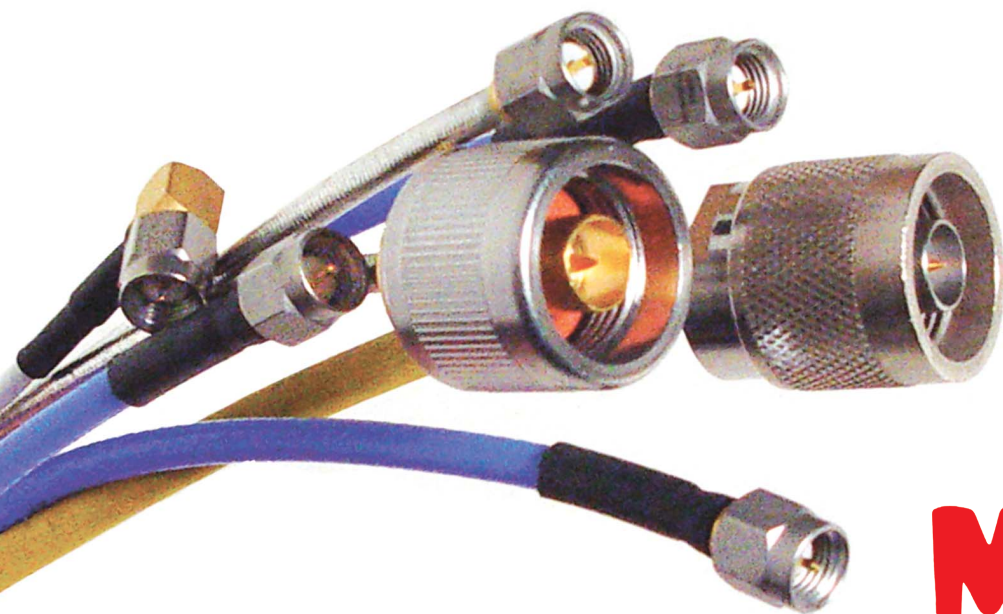
If cable in question is rated for **200 watts @ 25° C** at a given frequency, the capability at 40,000 feet altitude and 50° C is found as follows:

From charts, the derating for 40,000 feet altitude is 60% or 0.60, and for 50° C temperature is ≈ 87% or 0.87. Using the formula shown, the power handling capability is:

$$\text{Power Capability} = (200) \times (0.87) \times (0.60) = 105 \text{ Watts}$$

The Effect of VSWR on Transmitted Power

VSWR	Return Loss (dB)	Trans. Loss (dB)	Volt. Refl. Coeff.	Power Trans. (%)	Power Refl. (%)	VSWR	Return Loss (dB)	Trans. Loss (dB)	Volt. Refl. Coeff.	Power Trans. (%)	Power Refl. (%)	VSWR	Return Loss (dB)	Trans. Loss (dB)	Volt. Refl. Coeff.	Power Trans. (%)	Power Refl. (%)
1.00	∞	.000	.00	100.00	.0	1.34	16.8	.093	.15	97.9	2.1	1.98	9.7	.497	.33	89.2	10.8
1.01	46.1	.000	.00	100.00	.0	1.36	16.3	.102	.15	97.7	2.3	2.00	9.5	.512	.33	88.9	11.1
1.02	40.1	.000	.01	100.00	.0	1.38	15.9	.112	.16	97.5	2.5	2.50	7.4	.881	.43	81.6	18.4
1.03	36.6	.001	.01	100.00	.0	1.40	15.6	.122	.17	97.2	2.8	3.00	6.0	1.249	.50	75.0	25.0
1.04	34.2	.002	.02	100.00	.0	1.42	15.2	.133	.17	97.0	3.0	3.50	5.1	1.603	.56	69.1	30.9
1.05	32.3	.003	.02	99.9	.1	1.44	14.9	.144	.18	96.7	3.3	4.00	4.4	1.938	.60	64.0	36.0
1.06	30.4	.004	.03	99.9	.1	1.46	14.6	.155	.19	96.5	3.5	4.50	3.9	2.255	.64	59.5	40.5
1.07	29.4	.005	.03	99.9	.1	1.48	14.3	.166	.19	96.3	3.7	5.00	3.5	2.553	.67	55.6	44.4
1.08	28.3	.006	.04	99.9	.1	1.50	14.0	.177	.20	96.0	4.0	5.50	3.2	2.834	.69	52.1	47.9
1.09	27.3	.008	.04	99.8	.2	1.52	13.7	.189	.21	95.7	4.3	6.00	2.9	3.100	.71	49.0	51.0
1.10	26.4	.010	.05	99.8	.2	1.54	13.4	.201	.21	95.5	4.5	6.50	2.7	3.351	.73	46.2	53.8
1.11	25.7	.012	.05	99.7	.3	1.56	13.2	.213	.22	95.2	4.8	7.00	2.5	3.590	.75	43.7	56.2
1.12	24.9	.014	.06	99.7	.3	1.58	13.0	.225	.22	94.9	5.1	7.50	2.3	3.817	.76	41.5	58.5
1.13	24.3	.016	.06	99.6	.4	1.60	12.7	.238	.23	94.7	5.3	8.00	2.2	4.033	.78	39.5	60.5
1.14	23.7	.019	.07	99.6	.4	1.62	12.5	.250	.24	94.4	5.6	8.50	2.1	4.240	.79	37.7	62.3
1.15	23.1	.021	.07	99.5	.5	1.64	12.3	.263	.24	94.1	5.9	9.00	1.9	4.437	.80	36.0	64.0
1.16	22.6	.024	.07	99.5	.5	1.66	12.1	.276	.25	93.8	6.2	9.50	1.8	4.626	.81	34.5	65.5
1.17	22.1	.027	.08	99.4	.6	1.68	11.9	.289	.25	93.6	6.4	10.00	1.7	4.807	.82	33.1	66.9
1.18	21.7	.030	.08	99.3	.7	1.70	11.7	.302	.26	93.3	6.7	11.00	1.6	5.149	.83	30.6	69.4
1.19	21.2	.033	.09	99.2	.8	1.72	11.5	.315	.26	93.0	7.0	12.00	1.5	5.466	.85	28.4	71.6
1.20	20.8	.036	.09	99.2	.8	1.74	11.4	.329	.27	92.7	7.3	13.00	1.3	5.762	.86	26.5	73.5
1.21	20.4	.039	.10	99.1	.9	1.76	11.2	.342	.28	92.4	7.6	14.00	1.2	6.042	.87	24.9	75.1
1.22	20.1	.043	.10	99.0	1.0	1.78	11.0	.356	.28	92.1	7.9	15.00	1.2	6.301	.88	23.4	76.6
1.23	19.7	.046	.10	98.9	1.1	1.80	10.9	.370	.29	91.8	8.2	16.00	1.1	6.547	.88	22.1	77.9
1.24	19.4	.050	.11	98.9	1.1	1.82	10.7	.384	.29	91.5	8.5	17.00	1.0	6.780	.89	21.0	79.0
1.25	19.1	.054	.11	98.8	1.2	1.84	10.6	.398	.30	91.3	8.7	18.00	1.0	7.002	.89	19.9	80.1
1.26	18.8	.058	.12	98.7	1.3	1.86	10.4	.412	.30	91.0	9.0	19.00	.9	7.212	.90	19.0	81.0
1.27	18.5	.062	.12	98.6	1.4	1.88	10.3	.426	.31	90.7	9.3	20.00	.9	7.413	.90	18.1	81.9
1.28	18.2	.066	.12	98.5	1.5	1.90	10.2	.440	.31	90.4	9.6	25.00	.7	8.299	.92	14.8	85.2
1.29	17.9	.070	.13	98.4	1.6	1.92	10.0	.454	.32	90.1	9.9	30.00	.6	9.035	.94	12.5	87.5
1.30	17.7	.075	.13	98.3	1.7	1.94	9.9	.468	.32	89.8	10.2						
1.32	17.2	.083	.14	98.1	1.9	1.96	9.8	.483	.32	89.5	10.5						



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