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Terms and Conditions

ORDERING

Orders may be placed by contacting our factory directly. You may also contact our sales representative for your area. Please contact us for the name of your local representative.

TERMS

Open account terms are Net 30. To establish an open account, please provide credit references with your order. We also accept Visa and MasterCard, or will ship C.O.D. International orders may be made by electronic wire transfer, or company check prior to shipment.

PRICING

Due to continuing changes in technology and design, prices and specifications are subject to change without notice. We suggest that you confirm pricing at the time of order.

MINIMUM ORDER

Our minimum order amount is \$50.00.

WARRANTY

We warrant our products to be free from defects in materials and workmanship for a period of one year from the date of delivery. This warranty obligates us to perform repair or replacement after the product is returned, freight prepaid to our factory, and we determine the product to be defective. Contact the factory for a Return Material Authorization prior to returning products for warranty repair.

QUALITY ASSURANCE

MDI meets the quality assurance requirements of MIL-I-45208A.

NON-WARRANTY REPAIRS

Consult the factory before returning products for repair or service. We will provide estimates before repair service is started.

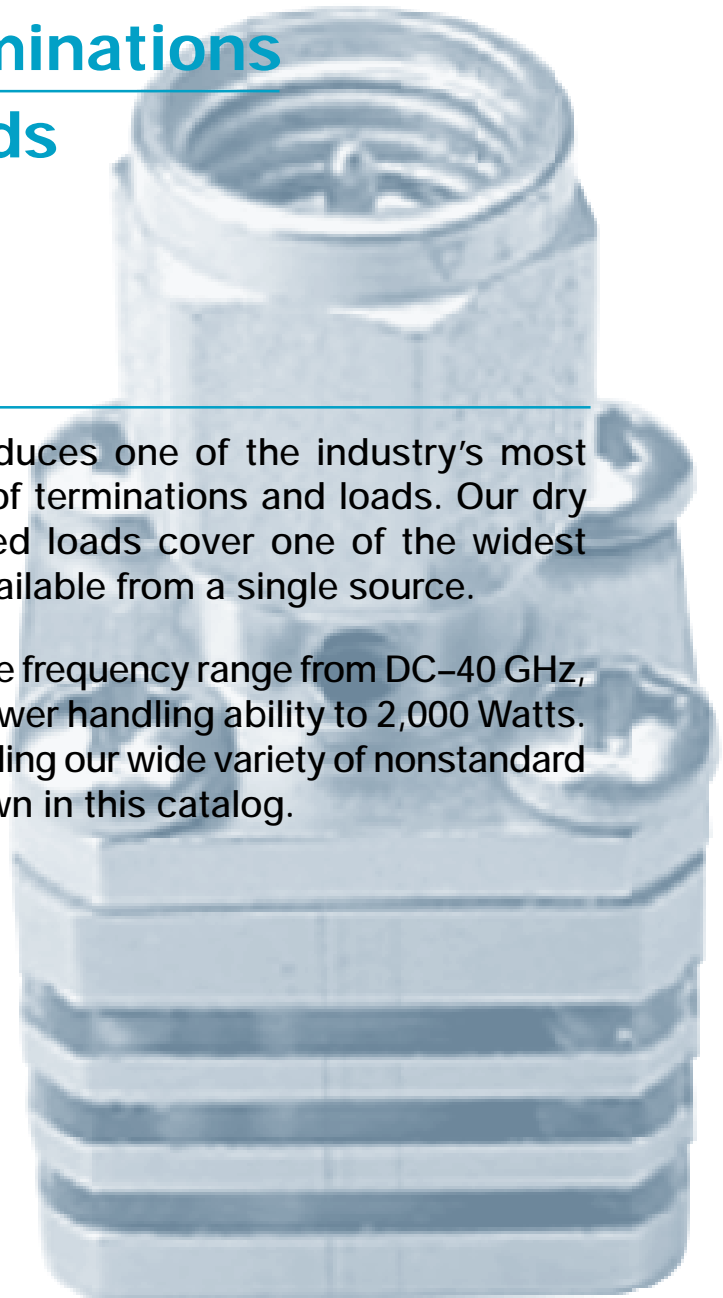
SHIPPING

Our normal method of shipping is UPS. In most cases we will "prepay and add." If you request a collect shipment, please provide your account number.

Terminations Loads

Microwave Devices produces one of the industry's most comprehensive lineups of terminations and loads. Our dry terminations and oil-filled loads cover one of the widest ranges of capabilities available from a single source.

Our terminations cover the frequency range from DC-40 GHz, and our loads provide power handling ability to 2,000 Watts. Consult the factory regarding our wide variety of nonstandard models that are not shown in this catalog.



High Frequency Terminations



Our high frequency terminations provide excellent electrical performance and are available with a variety of connectors and frequency ranges. Power ratings range from 1 to 20 Watts. Contact the factory regarding nonstandard requirements.

SPECIFICATIONS

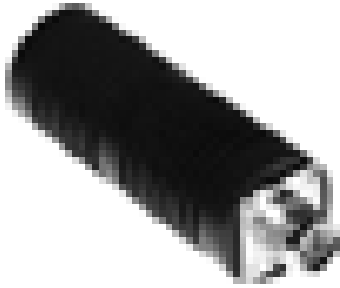
MODELS

	618	622	624	628	652	658	610	620-18
Frequency (GHz)	DC-18.0	DC-3.0	DC-4.0	DC-18.0	DC-12.4	DC-18.0	DC-18.0	DC-18.0
Impedance (Ohms)	50	50	50	50	50	50	50	50
Input power (Watts)	1	2	2	2	5	5	10	20
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Connectors	SMA	N	BNC	SMA, N	SMA, N	SMA, N	SMA, N*	N
Weight (ounces)	0.2	1	1	2	2	4	2	10
Length (inches)	1/3	1 3/8	1	1 1/3 - 1 1/3	7/8 - 1 3/8	7/8 - 1 3/8	1 2/3	2 1/2

**Also available with 2.92mm connector.*



Medium Power Dry Loads



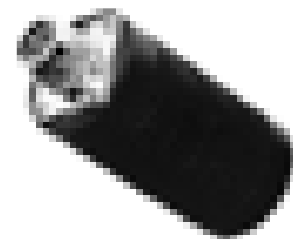
MDI's convection air-cooled medium power loads provide superior electrical performance and effective cooling capability over a broad power range. These models offer power handling capabilities from 20 through 60 Watts, and perform over an extended range of frequencies.

SPECIFICATIONS

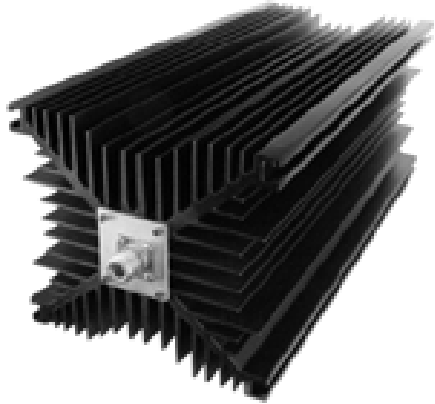
MODELS

	620	625	630	640	650	660
Frequency (GHz)	DC-2.5*	DC-3.0*	DC-3.0*	DC-3.0*	DC-3.0*	DC-3.0
Impedance (Ohms)	50	50	50	50	50	50
Input power (Watts)	20	25	30	40	50	60
VSWR (maximum)	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Connectors	N, SMA, 7/16,TNC	N, SMA, 7/16,TNC	N, SMA, 7/16,TNC	N, SMA, 7/16,TNC	N, SMA, 7/16,TNC	N, SMA, 7/16,TNC
Weight (ounces)	8	8	12	16	16	28
Length (inches)	4 ³ / ₄	2 ¹ / ₃	4	5 ¹ / ₂	5 ¹ / ₂	2 ³ / ₄
Diameter/width [§] (inches)	1 ³ / ₄	1 ¹ / ₄	1 ³ / ₄	1 ³ / ₄	1 ³ / ₄	3 ¹ / ₂ [§]

*Frequency range up to 18 GHz available on these models.



High Power Dry Loads



Our convection air-cooled high power loads offer efficient power handling ability and excellent electrical performance. Standard models handle RF power levels from 100 to 2,000 Watts.

SPECIFICATIONS

MODELS

	6100	6150	6250	6500	61000	62000
Frequency (GHz)	DC-2.4	DC-2.4	DC-2.4	DC-2.4	DC-2.4	DC-0.5
Impedance (Ohms)	50	50	50	50	50	50
Input power (Watts)	100	150	250	500	1,000	2,000
VSWR (DC-0.5 GHz)	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.25:1
(0.5-1 GHz)	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	—
(1-2.4 GHz)	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	—
Connectors	N, 7/16	N, 7/16	N, 7/16	N, 7/16	N, 7/16	N, 7/16
Weight (pounds)	4	6.5	6.5	15	17	25

High Power Oil-Filled Loads



We manufacture a complete line of high power, oil-filled loads that provide superior cooling performance at a reasonable cost. These loads can be operated in any position, and are available in standard RF power ratings of 150 to 1,200 Watts. Call us regarding connector options or nonstandard wattage applications.

SPECIFICATIONS

MODELS

	634	635	674	636	6312
Frequency (GHz)	DC-3.0	DC-3.0	DC-3.0	DC-3.0	DC-3.0
Impedance (Ohms)	50	50	50	50	50
Input power (Watts)	150	200	400	600	1,200
VSWR (DC-1 GHz)	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1
(1-2 GHz)	1.25:1	1.25:1	1.30:1	1.30:1	1.30:1
(2-3 GHz)	1.30:1	1.30:1	1.35:1	1.35:1	1.35:1
Weight (pounds)	8	8	16	18	25
Dimensions (inches) (L, W, H)	12 ¹ / ₂ x 7 ¹ / ₈ x 6			18 x 7 ¹ / ₈ x 6	



Fixed Attenuators

Microwave Devices' fixed attenuators cover a wide range of attenuation values, frequencies, and connector types. These products also feature an unusually broad selection of power capabilities. Most MDI attenuators are offered in several frequency ranges for each power rating listed.

Models are available in frequency ranges to 40 GHz, and other models provide power handling ability to 2,000 Watts. Call us regarding nonstandard requirements.

Now available with 7/16 DIN and GPO™ connectors.

Fixed Attenuators

DC–2 GHz / 50 and 75 Ohm



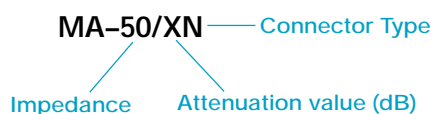
Our fixed attenuator models are available in a wide range of attenuation values. MA-50 series attenuators are rated to 2 GHz, and MA-75 series attenuators are rated to 1 GHz. Both series are designed to provide accurate attenuation at a low cost.

SPECIFICATIONS

MODELS

	MA-50	MA-75	MA-75A
Frequency (GHz)	DC–2.0	DC–1.0	DC–1.4
Impedance (Ohms)	50	75	75
Attenuation value	1–30 dB in 1 dB steps	1–20 dB in 1 dB steps	1–20 dB in 1 dB steps
Accuracy (1 GHz) (2 GHz)	±0.5 dB ±0.8 dB	±0.5 dB	±0.3 dB, DC-500 MHz ±0.5 dB, 500-1000 MHz ±0.5 or 5% 500-1450 MHz
VSWR (1 GHz) (2 GHz)	1.2:1 1.3:1	1.2:1 —	1.2:1@ 500MHz 1.3:1@ 1000MHz 1.4:1@ 1450MHz
Input power (Watts) (Peak)	1 1,000	1 1,000	1 1,000
Operating temperature	-55 to 125°C	-55 to 125°C	-55 to 125°C
Connectors	BNC, SMA TNC, N	BNC, F	BNC, F, N, TNC

Ordering information



Fixed Attenuators Medium Power

Our MA-505 through 560 series of fixed attenuators offer various frequency ranges at power levels of 5 to 60 watts. These units are constructed to provide light weight along with excellent cooling capabilities.

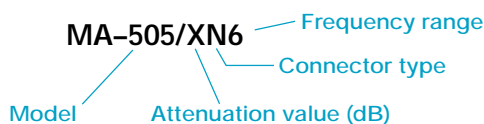


SPECIFICATIONS

MODELS

	MA-505	MA-510	MA-520	MA-530	MA-560
Frequency (GHz) <i>*Also available from: DC-4, 6, 12 or 18 GHz</i>	DC-2.0*	DC-2.0*	DC-2.0*	DC-2.4*	DC-2.4*
Impedance (Ohms)	50	50	50	50	50
Attenuation value	1-60 dB in 1 dB steps	1-60 dB in 1 dB steps	1-60 dB in 1 dB steps	1-60 dB in 1 dB steps	1-60 dB in 1 dB steps
Accuracy (1-6 dB) (7-20 dB) (21-30 dB)	±0.3 dB ±0.5 dB ±0.75 dB	±0.3 dB ±0.5 dB ±0.75 dB	±0.3 dB ±0.5 dB ±0.75 dB	±0.5 dB or 3% (greater of)	±0.5 dB or 3% (greater of)
VSWR (DC-1 GHz) (1-2.4 GHz) (2.4-6 GHz)	1.15:1 1.15:1 1.2:1	1.15:1 1.15:1 1.2:1	1.15:1 1.15:1 1.2:1	1.2:1 1.2:1 1.25:1	1.2:1 1.2:1 1.25:1
Input power (Watts) (peak)	5 1,000	10 1,000	20 1,000	30 2,000	60 2,000
Connectors	N, SMA, TNC, 7/16	N, SMA, 7/16, TNC	TNC, SMA, N, 7/16	TNC, BNC, SMA, N, 7/16	SMA, BNC, N, 7/16, TNC
Length (inches)	1 ⁷ / ₈	2 ³ / ₈	3	2 ³ / ₄	2 ³ / ₄
Diameter/width [§] (inches)	³ / ₈	1	1 ¹ / ₂	2 ³ / ₄ [§]	2 ³ / ₄ [§]

Ordering information



Fixed Attenuators High Power



MDI's high power attenuators combine maximum cooling efficiency along with excellent frequency and accuracy characteristics. Various attenuation values are offered at all power levels. Consult us for power levels and attenuation values that are not listed.

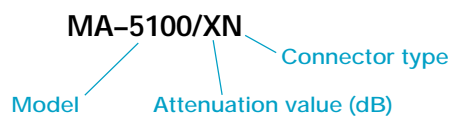
SPECIFICATIONS

MODELS

	MA-5100	MA-5250	MA-5500	MA-51000	MA-51500	MA-52000
Frequency (GHz)	DC-2.4	DC-2.4	DC-2.4	DC-2.4	DC-0.5	DC-0.5
Impedance (Ohms)	50	50	50	50	50	50
Attenuation value	3-40 dB in 1 dB steps	3-40 dB in 1 dB steps	3-40 dB in 1 dB steps	3-40 dB in 1 dB steps	3-40 dB in 1 dB steps	3-30 dB in 1 dB steps
Accuracy (greater of)	±0.5 dB or 3%	±0.5 dB or 3%	±0.5 dB or 3%	±0.5 dB or 3%	±0.5 dB or 3%	±0.5 dB or 3%
VSWR (DC-0.5 GHz)	1.2:1	1.2:1	1.2:1	1.2:1	1.25:1	1.25:1
(0.5-1 GHz)	1.2:1	1.2:1	1.2:1	1.25:1	—	—
(1-2.4 GHz)	1.25:1	1.25:1	1.25:1	1.35:1	—	—
Input power (Watts)	100	250	500	1,000	1,500	2,000
Connectors	N, 7/16	N, 7/16	N, 7/16	N, 7/16	N, 7/16	N, 7/16
Weight (pounds)	4	6.5	15	17	26	25
Dimensions (inches) (L, W, H)	6 ³ / ₄ x 4 ¹ / ₄ x 4 ¹ / ₄	10 ¹ / ₂ x 4 ¹ / ₄ x 4 ¹ / ₄	16 x 6 ¹ / ₂ x 6	16 x 6 ¹ / ₂ x 6	21 ³ / ₄ x 6 ¹ / ₂ x 6 ¹ / ₂	17 x 13 x 6 ¹ / ₂

Note: Consult factory for custom power levels between standard levels shown above.

Ordering information



Fixed Attenuators High Frequency



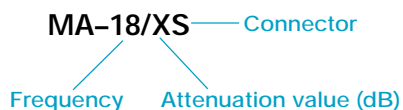
Microwave Devices' MA-18 series attenuators feature rugged stainless steel construction and high performance at a reasonable price. Models are available in values up to 40 dB and are offered with SMA or N connectors. MA-26 and MA-40 attenuators are equipped with 2.92 mm or GPO connectors.

SPECIFICATIONS

MODELS

	MA-18S	MA-18N	MA-26.5S	MA-40G
Frequency (GHz)	DC-18.0	DC-18.0	DC-26.5	DC-40.0
Impedance (Ohms)	50	50	50	50
Attenuation value	1-40 dB in 1 dB steps	1-40 dB in 1 dB steps	1-40 dB in 1 dB steps	3,6,10,20,30 dB
Accuracy (1-6 dB) (7-20 dB) (21-30 dB)	±0.3 dB ±0.5 dB ±0.75 dB	±0.3 dB ±0.5 dB ±0.75 dB	±0.5 dB ±0.75 dB ±1.0 dB	±0.5 dB ±0.75 dB ±1.0 dB
VSWR	1.20:1 DC-18.0 GHz	1.20:1 DC-18 GHz	1.25:1 DC-26.5 GHz	1.5:1 DC-40.0 GHz
Input power (Watts) (Peak)	2 250	2 250	2 250	2 250
Connectors	SMA	N	2.92mm	GPO™, 2.92mm

Ordering information



Fixed Attenuator Sets

MDI fixed attenuator sets contain standard values of attenuation and are available in various frequency ranges and connector types. Our standard kits are available in two different combinations of attenuation values, however, you may specify custom values to meet your needs.

MODEL	SPECIFICATIONS		
	Connector	Attenuation (dB)	Frequency Range (GHz)
A4400	N	3, 6, 10, 20	DC - 18.0 GHz
A4401	N	3, 6, 10, 20	DC - 12.4 GHz
A4402	N	3, 6, 10, 20	DC - 6.0 GHz
A4403	SMA	3, 6, 10, 20	DC - 18.0 GHz
A4404	SMA	3, 6, 10, 20	DC - 12.4 GHz
A4405	SMA	3, 6, 10, 20	DC - 6.0 GHz
A4406	N	1, 3, 6, 10, 20, 30	DC - 18.0 GHz
A4407	N	1, 3, 6, 10, 20, 30	DC - 12.4 GHz
A4408	N	1, 3, 6, 10, 20, 30	DC - 6.0 GHz
A4409	SMA	1, 3, 6, 10, 20, 30	DC - 18.0 GHz
A4410	SMA	1, 3, 6, 10, 20, 30	DC - 12.4 GHz
A4411	SMA	1, 3, 6, 10, 20, 30	DC - 6.0 GHz
A4412	7mm	3, 6, 10, 20, 30	DC - 18.0 GHz
A4413	7mm	1, 3, 6, 10, 20, 30	DC - 18.0 GHz
A4414	2.92mm	3, 6, 10, 20, 30	DC - 26.5 GHz
A4415	2.92mm	1, 3, 6, 10, 20, 30	DC - 26.5 GHz

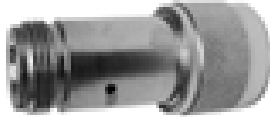
DC Blocks

MDI's DCB series of DC blocks were designed to accommodate all configurations of blocking DC current, while passing RF frequencies with minimal effect. Our models are available in three configurations: inner block only, outer block only, or both inner and outer block. The series covers a very broad range of frequencies, 10 MHz to 40 GHz, and are available in assorted connector types.



DC Blocks

SMA - N



SMA Models

MODEL	Type	Connector	Frequency Range (GHz)
DCB1S	Inner	SMA M/F	0.01 - 18.0
DCB2S	Outer	SMA M/F	0.01 - 18.0
DCB3S	Inner/Outer	SMA M/F	0.01 - 18.0
DCB1SF	Inner	SMA F/F	0.01 - 18.0
DCB2SF	Outer	SMA F/F	0.01 - 18.0
DCB3SF	Inner/Outer	SMA F/F	0.01 - 18.0
DCB1SM	Inner	SMA M/M	0.01 - 18.0
DCB2SM	Outer	SMA M/M	0.01 - 18.0
DCB3SM	Inner/Outer	SMA M/M	0.01 - 18.0

Type N Models

MODEL	Type	Connector	Frequency Range (GHz)
DCB1N	Inner	N M/F	0.01 - 18.0
DCB2N	Outer	N M/F	0.01 - 18.0
DCB3N	Inner/Outer	N M/F	0.01 - 18.0
DCB1NF	Inner	N F/F	0.01 - 18.0
DCB2NF	Outer	N F/F	0.01 - 18.0
DCB3NF	Inner/Outer	N F/F	0.01 - 18.0
DCB1NM	Inner	N M/M	0.01 - 18.0
DCB2NM	Outer	N M/M	0.01 - 18.0
DCB3NM	Inner/Outer	N M/M	0.01 - 18.0

DC Blocks

BNC - TNC

BNC Models

MODEL	SPECIFICATIONS		
	Type	Connector	Frequency Range (GHz)
DCB1B	Inner	BNC M/F	0.01 - 4.0
DCB2B	Outer	BNC M/F	0.01 - 4.0
DCB3B	Inner/Outer	BNC M/F	0.01 - 4.0
DCB1BF	Inner	BNC F/F	0.01 - 4.0
DCB2BF	Outer	BNC F/F	0.01 - 4.0
DCB3BF	Inner/Outer	BNC F/F	0.01 - 4.0
DCB1BM	Inner	BNC M/M	0.01 - 4.0
DCB2BM	Outer	BNC M/M	0.01 - 4.0
DCB3BM	Inner/Outer	BNC M/M	0.01 - 4.0

TNC Models

MODEL	SPECIFICATIONS		
	Type	Connector	Frequency Range (GHz)
DCB1T	Inner	TNC M/F	0.01 - 18.0
DCB2T	Outer	TNC M/F	0.01 - 18.0
DCB3T	Inner/Outer	TNC M/F	0.01 - 18.0
DCB1TF	Inner	TNC F/F	0.01 - 18.0
DCB2TF	Outer	TNC F/F	0.01 - 18.0
DCB3TF	Inner/Outer	TNC F/F	0.01 - 18.0
DCB1TM	Inner	TNC M/M	0.01 - 18.0
DCB2TM	Outer	TNC M/M	0.01 - 18.0
DCB3TM	Inner/Outer	TNC M/M	0.01 - 18.0

DC Blocks

2.92mm



2.92mm Models (26.5 GHz)

MODEL	SPECIFICATIONS		
	Type	Connector	Frequency Range (GHz)
DCB12	Inner	2.92mm M/F	0.01 - 26.5
DCB22	Outer	2.92mm M/F	0.01 - 26.5
DCB32	Inner/Outer	2.92mm M/F	0.01 - 26.5
DCB12F	Inner	2.92mm F/F	0.01 - 26.5
DCB22F	Outer	2.92mm F/F	0.01 - 26.5
DCB32F	Inner/Outer	2.92mm F/F	0.01 - 26.5
DCB12M	Inner	2.92mm M/M	0.01 - 26.5
DCB22M	Outer	2.92mm M/M	0.01 - 26.5
DCB32M	Inner/Outer	2.92mm M/M	0.01 - 26.5

DC Blocks

2.92mm - 7mm

2.92mm Models (40 GHz)

MODEL	SPECIFICATIONS		
	Type	Connector	Frequency Range (GHz)
DCB124	Inner	2.92mm M/F	0.01 - 40.0
DCB224	Outer	2.92mm M/F	0.01 - 40.0
DCB324	Inner/Outer	2.92mm M/F	0.01 - 40.0
DCB124F	Inner	2.92mm F/F	0.01 - 40.0
DCB224F	Outer	2.92mm F/F	0.01 - 40.0
DCB324F	Inner/Outer	2.92mm F/F	0.01 - 40.0
DCB124M	Inner	2.92mm M/M	0.01 - 40.0
DCB224M	Outer	2.92mm M/M	0.01 - 40.0
DCB324M	Inner/Outer	2.92mm M/M	0.01 - 40.0

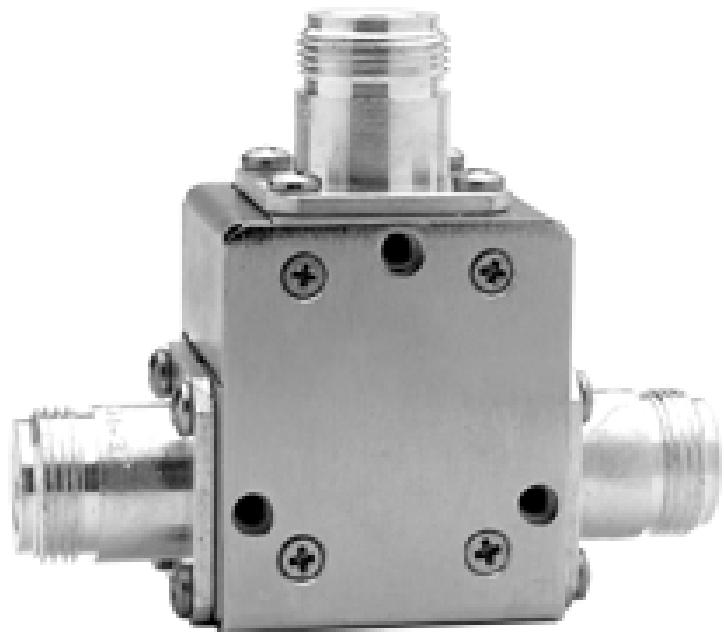
7mm Models

MODEL	SPECIFICATIONS		
	Type	Connector	Frequency Range (GHz)
DCB17	Inner	7mm	0.01 - 18.0
DCB27	Outer	7mm	0.01 - 18.0
DCB37	Inner/Outer	7mm	0.01 - 18.0



Ferrite Devices

The MDI product line of ferrite isolators and circulators cover the frequency range from 30 MHz to 50 GHz in coaxial type, and up to 60 GHz in waveguide type. Models are available in narrow-band, standard, or octave bandwidths with input power ratings up to several kilowatts. We also produce high isolation dual junctions, Stripline, Microstrip and Drop-in isolators and circulators.





Isolators and Circulators

MDI's ferrite circulators and isolators are widely used in communications, navigation, and radar systems, and are available in connectorized or stripline configurations. See our waveguide products section for waveguide isolators and circulators. Please contact us with any applications requiring nonstandard specifications.



Coaxial Isolators and Circulators

Narrow Bandwidth - High Isolation Models



SPECIFICATIONS

MODELS

	I-1.485/.1	I-1.70/.1	I-2.25/.1	I-2.3/.2	I-2.6/.2	I-2.8/.2	I-3.3/.4	I-3.95/.5
Frequency (GHz)	1.435 - 1.535	1.65 - 1.75	2.2 - 2.3	2.2 - 2.4	2.5 - 2.7	2.7 - 2.9	3.1 - 3.5	3.7 - 4.2
Impedance (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	23	25	26	25	25	25	23	23
VSWR	1.15:1	1.15:1	1.12:1	1.12:1	1.15:1	1.15:1	1.15:1	1.15:1
Insertion loss (dB)	0.20	0.20	0.12	0.20	0.15	0.15	0.15	0.15

*Note: Substitute the prefix "C" on any model to change from an isolator to a circulator.
Standard connectors are SMA. Type N, 7/16, 3.5mm and 2.92mm are also available.*

Coaxial Isolators and Circulators

Narrow Bandwidth - High Isolation Models



SPECIFICATIONS

MODELS

	I-4.77/6	I-5.15/5	I-5.65/5	I-6.18/5	I-7.5/5	I-8.15/5	I-9.6/8	I-11.15/5
Frequency (GHz)	4.4 - 5.0	4.9 - 5.4	5.4 - 5.9	5.93 - 6.43	7.25 - 7.75	7.90 - 8.4	9.20 - 10.0	10.9 - 11.4
Impedance (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	25	25	25	25	25	25	25	25
VSWR	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1
Insertion loss (dB)	0.15	0.15	0.15	0.15	0.15	.15	0.15	0.15

SPECIFICATIONS

MODELS

	I-11.95/5	I-12.45/5	I-14.25/5	I-15.5/1.0	I-16.5/1.0	I-17.5/1.0	I-19/2.0	I-21/2.0	I-31.5/2.0
Frequency (GHz)	11.7 - 12.2	12.2 - 12.7	14.0 - 14.5	15.0 - 16.0	16.0 - 17.0	17.0 - 18.0	18.0 - 20.0	20.0 - 22.0	29.0 - 31.0
Impedance (Ohms)	50	50	50	50	50	50	50	50	50
Isolation (dB)	25	25	22	22	23	23	20	20	20
VSWR	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.25:1	1.25:1	1.25:1
Insertion loss (dB)	0.20	0.20	0.25	0.30	0.30	0.30	0.45	0.45	0.50

Note: Substitute the prefix "C" on any model to change from an isolator to a circulator.

Standard connectors are SMA. Type N, 7/16, 3.5mm and 2.92mm are also available.

Standard Bandwidth Models



SPECIFICATIONS

MODEL

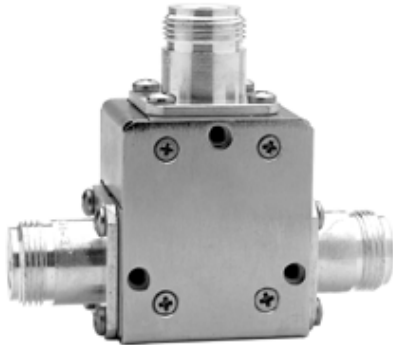
	I-332.5/85	I-437.5/125	I-575/150	I-750/200	I-975/250	I-1090/260	I-1425/350	I-2050/700
Frequency (MHz)	290-375	375-500	500-650	650-850	850-1100	960-1220	1250-1600	1700-2400
Impedance: (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	19	19	20	20	20	20	20	20
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Insertion Loss: (dB)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4

*Standard connectors are SMA. Type N, 7/16, 3.5mm, and 2.92mm are also available.

To specify a circulator, replace the prefix I with the letter C in the model number.



Standard Bandwidth Models



SPECIFICATIONS

MODELS

	I-2.2/1.6	I-3.0/1.0	I-4.0/1.0	I-5.35/1.3	I-6.0/1.6	I-9.0/4.0	I-10.0/4.0	I-15.0/6.0
Frequency (GHz)	1.9-2.5	2.5-3.5	3.5-4.5	4.7-6.0	5.2-6.8	7.0-11.0	8.0-12.0	12.0-18.0
Impedance: (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	20	20	20	20	20	20	20	20
VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	1.35:1
Insertion Loss: (dB)	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.6

SPECIFICATIONS

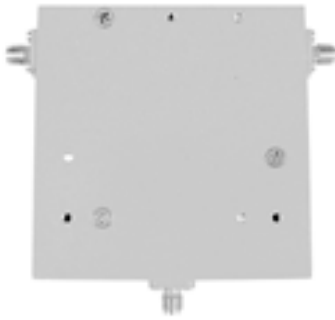
MODELS

	I-22.25/8.5	I-20.5/3.0	I-22.4/2.4	I-24/1.0	I-24.25/4.5	I-28/4.0	I-28.75/1.5	I-29/4.0
Frequency (GHz)	18.0-26.5	19.0-22.0	21.2-23.6	23.5-24.5	22.0-26.5	26.0-30.0	28.0-29.5	27.0-31.0
Impedance: (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	20	20	20	20	20	20	20	20
VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	1.35:1	1.30:1	1.30:1
Insertion Loss: (dB)	0.3	0.3	0.3	0.3	0.3	1.0	0.6	0.8

*Standard connectors are SMA. Type N, 7/16, 3.5mm and 2.92mm are also available.

*Frequencies up to 40GHz, and higher isolation units are also offered.

Octave Bandwidth Models



SPECIFICATIONS

MODELS

	I-.750/.5	I-.825/.550	I-1.05/.7	I-1.2/.8	I-1.5/1.0	I-2.25/1.5	I-3.0/2.0	I-3.9/2.6
Frequency (GHz)	.500-1.0	.550-1.10	.700-1.4	.800-1.6	1.0-2.0	1.5-3.00	2.0-4.0	2.6-5.2
Impedance (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	17	17	17	18	18	18	20	20
VSWR	1.40:1	1.35:1	1.35:1	1.28:1	1.30:1	1.30:1	1.25:1	1.25:1
Insertion loss (dB)	1.0	0.7	0.7	0.6	0.5	0.5	0.4	0.4

SPECIFICATIONS

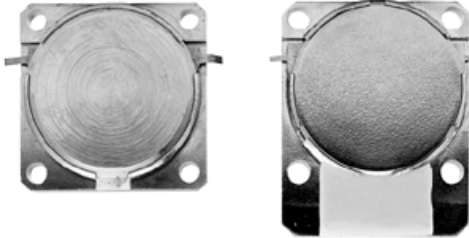
MODELS

	I-4.5/3.0	I-5.25/3.5	I-6.0/4.0	I-7.5/5.0	I-10.5/7.0	I-12.0/8.0	I-13.0/10.0
Frequency (GHz)	3.0 - 6.0	3.5 - 7.0	4.0 - 8.0	5.0 - 10.0	7.00 - 14.0	8.0 - 16.0	8.0 - 18.0
Impedance (Ohms)	50	50	50	50	50	50	50
Isolation (dB)	20	20	20	20	18	17	16
VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.28:1	1.35:1	1.45:1
Insertion loss (dB)	0.4	0.4	0.4	0.4	0.5	0.7	0.8

Note: Substitute the prefix "C" on any model to change from an isolator to a circulator. Standard connectors are SMA. Type N, 7/16, 3.5mm and 2.92mm are also available.

Drop In Isolators and Circulators

Drop-In Flange Models



SPECIFICATIONS

STANDARD MODELS

	ID-850/100	ID-880/40	ID-881.5/25	ID-1080/240	ID-1300/200	ID-1485/110	ID-1750/100	ID-1850/100
Frequency (GHz)	800-900	860-900	869-894	960-1200	1200-1400	1430-1540	1700-1800	1800-1900
Impedance (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	20	20	20	20	20	20	20	20
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Insertion loss (dB)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4

*Note: Substitute the prefix "C" on any model to change from an isolator to a circulator.
Higher power rating is available on all models with average power ratings of up to 350 watts.

SPECIFICATIONS

MODELS

	ID-2.3/.2	ID-2.45/.1	ID-2.75/.3	ID-3.0/.2	ID-3.3/.4	ID-3.7/.4	ID-3.95/.5	ID-4.3/.2
Frequency (GHz)	2.2 - 2.4	2.4 - 2.5	2.6 - 2.9	2.9 - 3.1	3.1 - 3.5	3.5 - 3.9	3.7 - 4.2	4.2 - 4.4
Impedance (Ohms)	50	50	50	50	50	50	50	50
Isolation (dB)	20	20	20	20	20	20	20	20
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Insertion loss (dB)	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.6

Drop In Isolators and Circulators

Drop-In Flange Models



SPECIFICATIONS

MODELS

	ID-4.65/5	ID-6.15/5	ID-7.4/2.0	ID-10/1.0	ID-12.5/2.0	ID-14.25/5	ID-14.95/1.1	ID-16.2/1.6	ID-17.5/1.0
Frequency (GHz)	4.4 - 4.9	5.9 - 6.4	6.4 - 8.4	9.5 - 10.5	11.5 - 13.5	14.0 - 14.5	14.4 - 15.5	15.4 - 17.0	17.0 - 18.0
Impedance (Ohms)	50	50	50	50	50	50	50	50	50
Isolation (dB)	20	20	20	20	20	20	18	17	17
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.3:1	1.35:1	1.35:1
Insertion loss (dB)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Note: Please consult factory for frequencies from 18.0 to 40 GHz.



Power Dividers/Combiners

Microwave Devices offers a very comprehensive selection of power dividers and combiners. Frequency ranges between 3 kHz and 40.0 GHz are covered with exceptional performance and power handling. In addition to our standard models, you may specify custom requirements with enhanced specifications including isolation and power handling. 2 way to 32 way designs are available and are offered with most standard connector types.

2 Way Power Dividers/Combiners



1 to 2500 MHz

SPECIFICATIONS

MODELS	Frequency (MHz)	Insertion Loss (dB)	Isolation (dB)	VSWR
2PD30X	0.3 - 60	0.5	35	1.30:1
2PD50X	0.5 - 100	0.5	28	1.30:1
2PD250X	5 - 500	0.7	28	1.30:1
2PD300X	100 - 500	0.5	35	1.20:1
2PD495X	10 - 1000	0.8	28	1.30:1
2PD750X	20 - 1500	1.3	25	1.50:1
2PD900X	200 - 2000	2.0	20	1.65:1
2PD990X	20 - 2000	2.7	25	2.00:1
2PD1248X	5-2500	1.8	20	1.50:1
2PD1150X	200 - 2500	1.6	22	1.50:1

Standard Connectors are SMA. Type N, BNC and TNC also available.

Higher isolation available. Consult factory.

Custom frequency ranges and higher power levels to 1500 watts are available. Some high power units may require to be attached to a heat sink.

2 Way Power Dividers/Combiners



0.5 - 40.0 GHz

SPECIFICATIONS

MODELS	Frequency (GHz)	Insertion Loss (dB)	Isolation (dB)	VSWR
2PD1.25S	0.5 - 2.0	0.5	22	1.25:1
2PD1.9S	0.8 - 3.0	0.3	28	1.20:1
2PD1.5S	1.0 - 2.0	0.3	28	1.20:1
2PD2.0S	1.0 - 3.0	0.3	28	1.20:1
2PD2.25S	1.5 - 3.0	0.3	28	1.20:1
2PD3.0S	2.0 - 4.0	0.4	20	1.20:1
2PD6.0S	2.0 - 8.0	0.3	20	1.30:1
2PD10.0S	8.0 - 12.0	0.3	20	1.30:1
2PD22.25S	18.0 - 26.5	1.4	18	1.60:1
2PD29.0X2	18.0 - 40.0	1.6	13	1.80:1

Standard Connectors are SMA. Type N and 2.92mm also available.

Input Power Rating is 30 Watts average min. Power rating may be increased considerably on some models.

Higher isolation available. Consult factory.

Custom frequency ranges and higher power levels to 1500 watts are available. Some high power units may require to be attached to a heat sink.

4 Way Power Dividers/Combiners

SPECIFICATIONS

MODELS	Frequency (GHz)	Insertion Loss (dB)	Isolation (dB)	VSWR
4PD1.25S	0.5 - 2.0	0.9	20	1.40:1
4PD1.65S	0.8 - 2.5	0.7	20	1.40:1
4PD1.5S	1.0 - 2.0	0.6	20	1.40:1
4PD3.0S	2.0 - 4.0	0.6	20	1.35:1
4PD6.0S	4.0 - 8.0	0.5	20	1.40:1
4PD10.0S	8.0 - 12.0	0.8	18	1.40:1
4PD15.0S	12.0 - 18.0	1.5	20	1.50:1
4PD22.25S	18.0 - 26.5	2.5	15	1.60:1

Standard Connectors are SMA. Type N also available.

Input Power Rating is 30 Watts average min. Power rating may be increased considerably on some models.

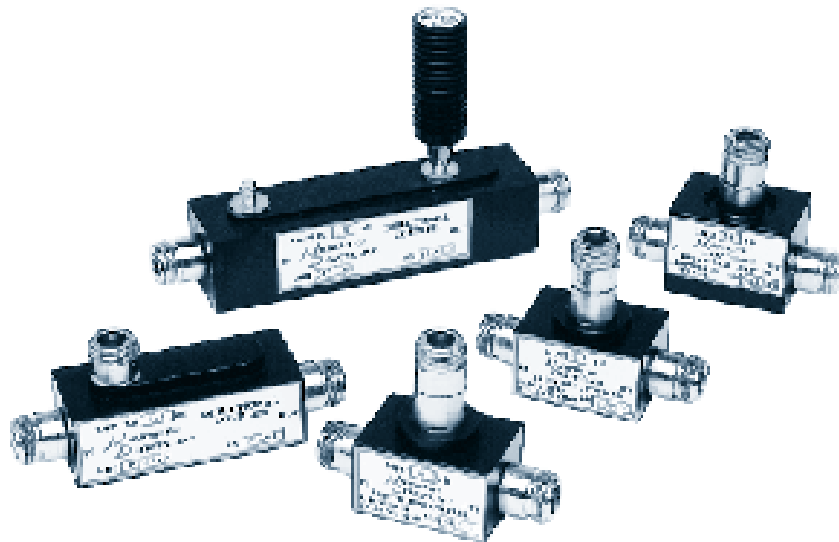
Custom frequency ranges and higher power levels to 1500 watts are available. Some high power units may require to be attached to a heat sink.

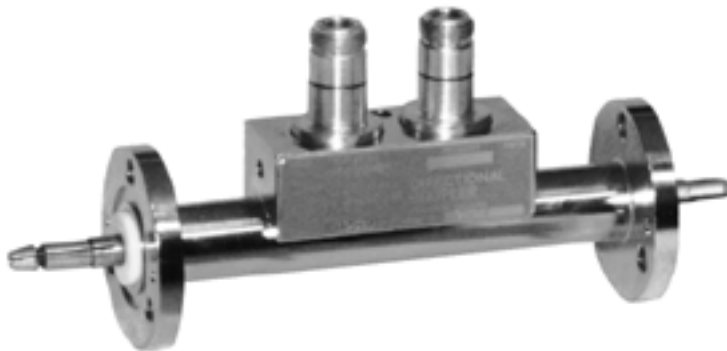
Higher isolation available. Consult factory.

Directional Couplers

Coaxial

MDI's family of directional couplers provides uncommon performance and versatility. Coaxial designs include unidirectional or bidirectional, RF or DC output, high power, cellular band, PCS and dual band models. Waveguide designs are also available.

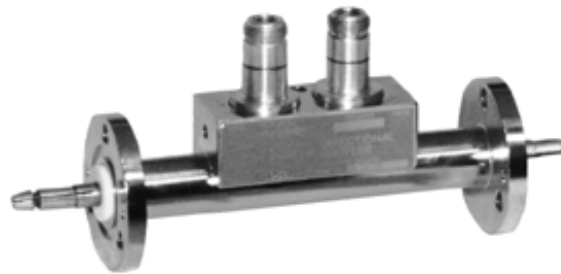




Directional Couplers DC Output



MDI offers DC output, short-loop directional couplers in a wide selection of models. All feature superior coupling adjustability along with excellent power handling. Designs are available in unidirectional or bidirectional configurations, with positive or negative output, and cover a broad range of frequencies and bandwidths. Contact the factory with any nonstandard requirements.



SPECIFICATIONS

SERIES

	517	518	557	558	567	568	577	578
Frequency* (GHz)	0.1–3.0	0.1–3.0	0.1–6.0	0.1–6.0	0.1–6.0	0.1–6.0	0.1–6.0	0.1–6.0
Type	unidirectional	bidirectional	unidirectional	bidirectional	unidirectional	bidirectional	unidirectional	bidirectional
Impedance (Ohms)	50	50	50	50	50	50	50	50
Input power (Watts)	1,000	1,000	4,000	4,000	12,000	12,000	40,000	40,000
VSWR (mainline)	1.20:1	1.20:1	1.20:1	1.20:1	1.20:1	1.20:1	1.20:1	1.20:1
Directivity (dB–typ.)	20–25	20–25	20–25	20–25	20–25	20–25	20–25	20–25
Line type	RG-214	RG-214	7/8" EIA	7/8" EIA	1 5/8" EIA	1 5/8" EIA	3 1/8" EIA	3 1/8" EIA
Connectors	N, LC, SC	LC, N, SC	Flange	Flange	Flange	Flange	Flange	Flange

**Frequency listed is of the series. Actual bandwidths are frequency limited.*



High Power Directional Couplers RF Output



Our line of short-loop and airline RF output directional couplers are available in a variety of unidirectional and bidirectional models that provide superior coupling adjustability and power handling. *Virtually any coupling value is available*, with an assortment of connectorized or flanged airline packages. Bandwidths are frequency dependent on all models. Contact us for higher directivity models.

Series 317, 357, 318 and 358 couplers are available with a variety of connector options. Consult us regarding specific applications requiring nonstandard specifications or for information concerning power handling capability or package dimensions. Multiple coupling ports on a single unit are available, in any configuration of coupling values, in forward or reverse power coupling modes.

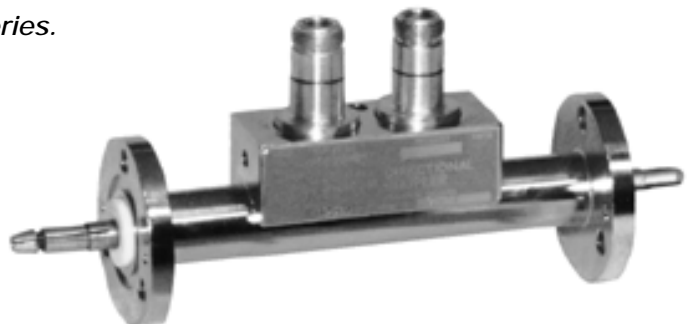
SPECIFICATIONS

SERIES

	317**	318**
Frequency (GHz)*	0.15–8.0	0.15–8.0
Type	unidirectional	bidirectional
Impedance (Ohms)	50	50
Coupling (dB)	6-60	6-60
Flatness (typical)	±1.0 dB	±1.0 dB
Input power (Watts)	1 to 80,000	1 to 80,000
VSWR (mainline)	1.20:1	1.20:1
Directivity (dB–typ.)	20–25	20–25
Line type	RG-214	RG-214
Connectors / Flange	N, SMA, L, LC, 7/16 DIN 7/8", 1 5/8", 3 1/8" EIA	N, SMA, L, LC, 7/16 DIN 7/8", 1 5/8", 3 1/8" EIA

*This is the operating frequency range of the series. Models are bandwidth limited by frequency.

**For airline couplers replace the "1" in the series number to "5" Ex....357 or 358.



Directional Couplers Cellular Band



MDI's MDC series directional couplers are designed specifically to provide both low cost and high performance for cellular applications. These models offer a versatile range of coupling values and power capabilities. Standard connectors are N, SMA or 7/16.

Standard models are also available with coupling values up to 70 dB. Contact the factory for applications requiring nonstandard directivity or power handling capability. All models are available in either internally or externally terminated configurations.

SPECIFICATIONS

MODELS

	MDC-6	MDC-7.5	MDC-10	MDC-20	MDC-30	MDC-40	MDC-50
Frequency (MHz)**	860-904	860-904	860-904	860-904	860-904	860-904	860-904
Impedance (Ohms)	50	50	50	50	50	50	50
Coupling (dB)***	6.0	7.5	10.0	20.0	30.0	40.0	50.0
Accuracy (dB)	±0.2	±0.2	±0.3	±0.5	±0.6	±1.0	±1.0
Flatness (dB)	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
Input power (Watts)	500*	500*	500	1,000	1,000	1,000	1,000
VSWR (mainline)	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Directivity (dB-typical)	20-25	20-25	20-25	20-25	20-25	20-25	20-25

*Input power may be increased to 1000 watts with external termination.

**Canadian cellular bands of 800-900 MHz also available.

***Coupling values are available in any value from 6 through 60dB.



Directional Couplers PCS Band



Our *MDP* directional couplers series provides exceptional performance for PCS applications. This line offers the ultimate in coupling versatility along with superior power handling capability. Standard connectors are N or SMA.

Standard models offer coupling values up to 70 dB. Call the factory regarding applications that require nonstandard directivity or power handling.

SPECIFICATIONS

MODELS

	MDP-6	MDP-7.5	MDP-10	MDP-20	MDP-30	MDP-40	MDP-50
Frequency (GHz)*	1.8-2.0	1.8-2.0	1.8-2.0	1.8-2.0	1.8-2.0	1.8-2.0	1.8-2.0
Impedance (Ohms)	50	50	50	50	50	50	50
Coupling (dB)	6.0	7.5	10.0	20.0	30.0	40.0	50.0
Accuracy (dB)	±0.5	±0.5	±1.0	±1.0	±1.0	±1.0	±1.0
Flatness (dB) typical	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5
Input power (Watts)	500**	500**	500	1,000	1,000	1,000	1,000
VSWR (mainline)	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Directivity (dB-typical)	20-25	20-25	20-25	20-25	20-25	20-25	20-25

*Frequency ranges of 2.2 GHz also available.

**1000 watts input power available with external termination.



Directional Couplers Dual Band & Dual Band +

Our MPC series dualband directional couplers were designed specifically to cover both the cellular and PCS bands simultaneously, without sacrificing performance. These models cover not only the cellular and PCS bands, but all frequencies in between.

These couplers are offered with standard coupling values of 3 through 40 dB, and are available in any custom value up to 60 dB. Standard connectors are N, SMA, and 7/16 DIN.

SPECIFICATIONS

MODELS	Frequency (GHz)	Impedance (Ohms)	Coupling (dB)	Accuracy (dB)	Flatness (dB)	Input Power (Watts)	VSWR (mainline)	Directivity (dB typical)
MPC3	0.8 - 2.0	50	3.0	±0.5	±1.0	200	1.2:1	20
MPC6	0.8 - 2.0	50	6.0	±0.5	±1.0	500	1.2:1	20
MPC7.5	0.8 - 2.0	50	7.5	±0.5	±1.0	500	1.2:1	20
MPC10	0.8 - 2.0	50	10.0	±0.5	±1.0	500	1.2:1	20
MPC20	0.8 - 2.0	50	20.0	±0.5	±1.0	1000	1.2:1	20
MPC30	0.8 - 2.0	50	30.0	±0.6	±1.0	1000	1.2:1	20
MPC40	0.8 - 2.0	50	40.0	±1.0	±1.0	1000	1.2:1	20

SPECIFICATIONS

MODELS	Frequency (GHz)	Impedance (Ohms)	Coupling (dB)	Accuracy (dB)	Flatness (dB)	Input Power (Watts)	VSWR (mainline)	Directivity (dB typical)
2MPC3	0.8 - 2.4	50	3.0	±0.5	±1.0	200	1.2:1	20
2MPC6	0.8 - 2.4	50	6.0	±0.5	±1.0	200	1.2:1	20
2MPC7.5	0.8 - 2.4	50	7.5	±0.5	±1.0	200	1.2:1	20
2MPC10	0.8 - 2.4	50	10.0	±0.5	±1.0	200	1.2:1	20
2MPC20	0.8 - 2.4	50	20.0	±0.5	±1.0	200	1.2:1	20
2MPC30	0.8 - 2.4	50	30.0	±0.6	±1.0	200	1.2:1	20
2MPC40	0.8 - 2.4	50	40.0	±1.0	±1.0	200	1.2:1	20



Directional Couplers Dual Band +

SPECIFICATIONS

MODELS	Frequency (GHz)	Impedance (Ohms)	Coupling (dB)	Accuracy (dB)	Flatness (dB)	Input Power (Watts)	VSWR (mainline)	Directivity (dB typical)
3MPC3	0.8 - 3.0	50	3.0	±0.5	±1.0	200	1.2:1	20
3MPC6	0.8 - 3.0	50	6.0	±0.5	±1.0	200	1.2:1	20
3MPC7.5	0.8 - 3.0	50	7.5	±0.5	±1.0	200	1.2:1	20
3MPC10	0.8 - 3.0	50	10.0	±0.5	±1.0	200	1.2:1	20
3MPC20	0.8 - 3.0	50	20.0	±0.5	±1.0	200	1.2:1	20
3MPC30	0.8 - 3.0	50	30.0	±0.6	±1.0	200	1.2:1	20
3MPC40	0.8 - 3.0	50	40.0	±1.0	±1.0	200	1.2:1	20

Directional Couplers High Power - Wide Band

Type N Connectors -30 to -50 dB

SPECIFICATIONS

MODELS	Frequency Range (GHz)	*Coupling (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB Max)	**Directivity (dB Min.)	VSWR Primary Line	Power Capability (Watts)
317.2200-X	0.01-0.20	X ± 1.2	± 0.50	0.25	20	1.25:1	400
317.2201-X	0.5-2.0	X ± 1.0	± 0.75	0.2	18	1.15:1	600
317.2202-X	1.0-2.0	X ± 1.0	± 0.75	0.2	18	1.15:1	600
317.2203-X	1.0-4.0	X ± 1.0	± 0.60	0.2	15	1.15:1	600
317.2204-X	1.0-8.0	X ± 1.2	± 0.90	0.25	20	1.25:1	300
317.2205-X	1.0-11.0	X ± 1.0	± 1.90	0.2	15	1.30:1	250
317.2206-X	1.5-4.5	X ± 1.0	± 0.60	0.2	18	1.20:1	600
317.2207-X	2.0-4.0	X ± 1.0	± 0.75	0.2	18	1.15:1	600
317.2208-X	2.0-8.0	X ± 1.0	± 0.60	0.2	16	1.30:1	400
317.2209-X	2.6-5.2	X ± 1.0	± 0.75	0.2	18	1.20:1	600
317.2210-X	4.0-6.0	X ± 1.0	± 0.50	0.25	18	1.25:1	400
317.2211-X	4.0-8.0	X ± 1.0	± 0.75	0.2	18	1.30:1	600
317.2212-X	4.0-12.0	X ± 1.0	± 0.60	0.2	15	1.30:1	250
317.2213-X	5.0-11.0	X ± 1.0	± 0.75	0.2	15	1.30:1	250
317.2214-X	6.0-12.0	X ± 1.7	± 1.50	1.0	12	1.80:1	100
317.2215-X	7.0-11.0	X ± 1.0	± 0.50	0.2	16	1.30:1	300
317.2216-X	8.0-12.4	X ± 1.2	± 0.75	0.4	14	1.40:1	250
317.2217-X	12.0-14.0	X ± 1.5	± 1.00	0.6	12	1.70:1	100

*Replace X with coupling value from -30 to -50 dB.

**Higher directivity designs available. Consult factory with requirements.

Dual Directional Couplers High Power - Wide Band

SPECIFICATIONS

MODELS*	Frequency Range (GHz)	Coupling (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB Max)	**Directivity (dB Min.)	VSWR Primary Line	Power (Watts)
318.2000-X	0.5-2.0	X ± 1.0	± 0.75	0.4	18	1.20:1	600
318.2001-X	1.0-2.0	X ± 1.0	± 0.75	0.4	18	1.20:1	600
318.2002-X	1.0-4.0	X ± 1.0	± 0.60	0.4	15	1.20:1	600
318.2003-X	1.0-8.0	X ± 1.0	± 1.30	1.2	12	1.80:1	300
318.2004-X	1.0-11.0	X ± 1.0	± 2.00	0.5	15	1.35:1	250
318.2005-X	1.5-4.5	X ± 1.0	± 0.60	0.4	18	1.25:1	600
318.2006-X	2.0-4.0	X ± 1.0	± 0.75	0.4	18	1.20:1	600
318.2007-X	2.0-8.0	X ± 1.0	± 0.60	0.4	16	1.35:1	400
318.2008-X	2.6-5.2	X ± 1.0	± 0.75	0.4	18	1.25:1	600
318.2009-X	4.0-8.0	X ± 1.0	± 0.75	0.4	18	1.35:1	600
318.2010-X	4.0-12.0	X ± 1.0	± 0.80	0.5	15	1.35:1	200
318.2011-X	5.0-11.0	X ± 1.0	± 0.80	0.5	15	1.35:1	250
318.2012-X	5.8-6.40	X ± 1.0	± 1.30	1.2	12	1.80:1	500
318.2013-X	6.0-18.0	X ± 1.0	± 1.30	1.2	12	1.80:1	100
318.2014-X	7.0-11.0	X ± 1.0	± 0.50	0.5	16	1.35:1	300
318.2015-X	8.0-12.4	X ± 1.0	± 1.30	1.2	12	1.80:1	300
318.2016-X	12.0-18.0	X ± 1.0	± 1.00	1.0	12	1.70:1	100

*Replace X with coupling value from -30 to -50 dB.

**Higher directivity designs available. Consult factory with requirements.

Stripline Directional Couplers

Narrow Band

SMA Connectors

MODELS

SPECIFICATIONS

	Frequency Range (GHz)	*Coupling (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB Max)		**Directivity (dB Min.)	VSWR		Power (Watts)		
				Excluding Coupled Power	True		Pri. Line	Sec. Line	Average Incident	Average Reflected	Peak (kW)
317.2009-	0.8-0.9	6 ± 0.75	± 0.50	0.50	1.80	20	1.25:1	1.25:1	50	2	1
6											
10											
20											
30	10 ± 0.75	± 0.50	0.50	1.20	20	1.25:1	1.25:1	50	5	1	
20	20 ± 0.75	± 0.50	0.50	0.55	20	1.25:1	1.25:1	50	50	1	
30	30 ± 0.75	± 0.50	0.50	0.55	20	1.25:1	1.25:1	50	50	1	
317.2023-	0.88-0.96	6 ± 1.00	± 0.50	0.20	1.80	25	1.25	1.25	50	2	3
6											
10											
20											
30	10 ± 1.00	± 0.50	0.20	0.80	25	1.25	1.25	50	5	3	
20	20 ± 1.00	± 0.50	0.20	0.20	25	1.25	1.25	50	50	3	
30	30 ± 1.00	± 0.50	0.20	0.20	25	1.25	1.25	50	50	3	
317.2010-	0.8-2.3	6 ± 1.25	± 0.50	0.35	2.00	20	1.25:1	1.25:1	50	2	1
6											
10											
20	10 ± 1.25	± 0.50	0.35	1.00	20	1.25:1	1.25:1	50	5	1	
20	20 ± 1.25	± 0.50	0.35	0.45	20	1.25:1	1.25:1	50	50	1	
317.2011-	0.8-3.0	6 ± 1.25	± 0.50	0.35	2.00	15	1.30:1	1.40:1	50	2	1
6											
10											
20	10 ± 1.25	± 0.50	0.35	1.00	16	1.30:1	1.30:1	50	5	1	
20	20 ± 1.25	± 0.50	0.35	0.45	16	1.30:1	1.30:1	50	50	1	
317.2022-	1.7-2.4	6 ± 1.00	± 0.50	0.35	2.00	22	1.30:1	1.30:1	50	2	3
6											
10											
20											
30	10 ± 1.00	± 0.50	0.35	0.90	22	1.30:1	1.30:1	50	5	3	
20	20 ± 1.00	± 0.50	0.30	0.40	22	1.30:1	1.30:1	50	50	3	
30	30 ± 1.00	± 0.50	0.30	0.40	22	1.30:1	1.30:1	50	50	3	
317.2012-	1.85-3.65	6 ± 1.25	± 0.75	0.20	1.80	20	1.25:1	1.25:1	50	2	3
6											
10											
20											
30	10 ± 1.25	± 0.75	0.20	0.80	20	1.25:1	1.25:1	50	5	3	
20	20 ± 1.25	± 0.75	0.20	0.20	20	1.25:1	1.25:1	50	50	3	
30	30 ± 1.25	± 0.75	0.20	0.20	20	1.25:1	1.25:1	50	50	3	
317.2013-	2.1-2.7	6 ± 1.00	± 0.60	0.20	1.80	22	1.15:1	1.15:1	50	2	1
6											
10											
20											
30	10 ± 1.25	± 0.75	0.20	0.70	22	1.15:1	1.15:1	50	5	1	
20	20 ± 1.25	± 0.75	0.20	0.20	22	1.15:1	1.15:1	50	50	1	
30	30 ± 1.25	± 0.75	0.20	0.20	22	1.15:1	1.15:1	50	50	1	
317.2014-	3.6-4.2	6 ± 1.00	± 0.30	0.55	2.00	15	1.35:1	1.45:1	50	2	3
6											
10											
20											
30	10 ± 1.00	± 0.30	0.55	1.10	15	1.35:1	1.40:1	50	5	3	
20	20 ± 1.00	± 0.30	0.50	0.55	15	1.30:1	1.40:1	50	50	3	
30	30 ± 1.00	± 0.30	0.50	0.55	15	1.30:1	1.40:1	50	50	3	
317.2015-	4.0-9.5	6 ± 1.50	± 0.75	0.50	2.00	16	1.50:1	1.50:1	50	2	1
6											
10											
20											
30	10 ± 1.50	± 0.75	0.50	1.30	16	1.50:1	1.50:1	50	5	1	
20	20 ± 1.50	± 0.75	0.40	0.45	16	1.50:1	1.50:1	50	50	1	
30	30 ± 1.50	± 0.75	0.40	0.45	16	1.50:1	1.50:1	50	50	1	
317.2016-	5.7-10.2	6 ± 1.25	± 0.75	0.40	2.00	15	1.40:1	1.40:1	50	2	3
6											
10											
20											
30	10 ± 1.25	± 0.75	0.40	1.00	15	1.40:1	1.40:1	50	5	3	
20	20 ± 1.25	± 0.75	0.40	0.45	15	1.40:1	1.40:1	50	50	3	
30	30 ± 1.25	± 0.75	0.40	0.45	15	1.40:1	1.40:1	50	50	3	

*Includes frequency sensitivity.

**Higher directivity designs available. Consult factory with requirements.

Stripline Directional Couplers

Narrow Band

SMA Connectors



MODELS

SPECIFICATIONS

	Frequency Range (GHz)	Coupling* (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB Max) Excluding		**Directivity (dB Min.)	VSWR (Max)		Power (Watts)		
				Coupled Power	True		Pri. Line (Watts)	Sec. Line	Average Incident	Average Reflected	Peak (kW)
317.2017-	5.8-6.4	6 ± 1.00	± 0.30	0.55	2.00	15	1.35:1	1.45:1	50	2	3
6											
10											
20											
30	30 ± 1.00	± 0.30	0.50	0.55	15	1.30:1	1.40:1	50	50	3	
317.2018-	10.9-12.75	6 ± 1.25	± 0.75	0.55	2.00	15	1.35:1	1.45:1	50	2	3
6											
10											
20											
30	30 ± 1.25	± 0.75	0.50	0.55	15	1.35:1	1.45:1	50	50	3	
317.2019-	14.0-14.5	6 ± 1.00	± 0.30	0.55	2.00	15	1.35:1	1.45:1	50	2	2
6											
10											
20											
30	30 ± 1.00	± 0.30	0.50	0.55	15	1.30:1	1.40:1	50	50	2	
317.2021-	17.0-22.0	6 ± 1.00	± 0.50	0.70	2.50	10	1.80	1.80	50	2	3
6											
10											
20											
30	30 ± 1.00	± 0.50	0.70	0.75	10	1.80	1.80	50	50	3	
317.2020-	18.5-19.5	6 ± 1.25	± 0.75	0.75	2.30	10	1.70:1	1.70:1	50	2	3
6											
10											
20											
30	30 ± 1.25	± 0.80	0.80	0.85	10	1.70:1	1.70:1	50	50	3	

*Includes frequency sensitivity.

**Custom Design for higher directivity available. Contact manufacturer for details.

Stripline Directional Couplers

Octave Bandwidth

50 watt - Type N Connectors

MODELS

SPECIFICATIONS

	Frequency Range (GHz)	*Coupling (dB)	Frequency Sensitivity (dB)	Insertion Loss (dB Max)		**Directivity (dB Min.)	VSWR		Power (Watts)		
				Excluding Coupled Power	True		Pri. Line	Sec. Line	Average Incident	Average Reflected	Peak (kW)
317.2000-	.225-0.4	6 ± 1.00	± 0.75	0.25	1.85	19	1.30	1.30	50	2	1
6/NF		10 ± 1.00	± 0.75	0.25	0.75	19	1.30	1.30	50	5	1
10/NF		20 ± 1.00	± 0.75	0.25	0.30	19	1.30	1.30	50	50	1
20/NF		30 ± 1.00	± 0.75	0.25	0.30	19	1.30	1.30	50	50	1
317.2001-	0.5-1.0	6 ± 1.00	± 0.75	0.20	0.80	22	1.30	1.30	50	2	3
6/NF		10 ± 1.25	± 0.75	0.20	0.80	22	1.30	1.30	50	5	3
10/NF		20 ± 1.25	± 0.75	0.20	0.25	22	1.30	1.30	50	50	3
20/NF		30 ± 1.25	± 0.75	0.20	0.25	22	1.30	1.30	50	50	3
30/NF		40 ± 1.25	± 0.75	0.20	0.25	22	1.30	1.30	50	50	3
40/NF											
317.2002-	1.0-2.0	6 ± 1.25	± 0.75	0.20	2.00	20	1.22	1.25	50	2	3
6/NF		10 ± 1.25	± 0.75	0.20	0.90	20	1.22	1.25	50	5	3
10/NF		20 ± 1.25	± 0.75	0.20	0.20	20	1.22	1.25	50	50	3
20/NF		30 ± 1.25	± 0.75	0.20	0.20	20	1.22	1.25	50	50	3
30/NF		40 ± 1.25	± 0.75	0.20	0.20	20	1.22	1.25	50	50	3
40/NF											
317.2003-	1.5-3.0	6 ± 1.25	± 0.85	0.25	1.85	17	1.40	1.40	50	2	1
6/NF		10 ± 1.25	± 0.85	0.25	0.75	17	1.40	1.40	50	5	1
10/NF		20 ± 1.25	± 0.85	0.25	0.30	17	1.40	1.40	50	50	1
20/NF		30 ± 1.25	± 0.85	0.25	0.30	17	1.40	1.40	50	50	1
30/NF											
317.2004-	1.85-3.65	6 ± 1.25	± 0.85	0.35	1.20	18	1.35	1.35	50	2	3
6/NF		10 ± 1.25	± 0.85	0.35	1.20	18	1.35	1.35	50	5	3
10/NF		20 ± 1.25	± 0.85	0.20	0.30	18	1.35	1.35	50	50	3
20/NF		30 ± 1.25	± 0.85	0.20	0.20	18	1.35	1.35	50	50	3
30/NF											
317.2005-	2.0-4.0	6 ± 1.25	± 0.75	0.20	1.80	18	1.40	1.40	50	2	3
6/NF		10 ± 1.25	± 0.75	0.20	0.90	18	1.40	1.40	50	5	3
10/NF		20 ± 1.25	± 0.75	0.20	0.30	18	1.40	1.40	50	50	3
20/NF		30 ± 1.25	± 0.75	0.20	0.30	18	1.40	1.40	50	50	3
30/NF											
317.2006-	2.6-5.2	6 ± 1.25	± 0.75	0.20	1.80	18	1.40	1.40	50	2	3
6/NF		10 ± 1.25	± 0.75	0.20	0.80	18	1.40	1.40	50	5	3
10/NF		20 ± 1.25	± 0.75	0.20	0.30	18	1.40	1.40	50	50	3
20/NF		30 ± 1.25	± 0.75	0.20	0.30	18	1.40	1.40	50	50	3
30/NF											
317.2007-	4.0-8.0	6 ± 1.25	± 0.85	0.35	2.00	17	1.50	1.50	50	2	3
6/NF		10 ± 1.25	± 0.85	0.35	1.20	17	1.50	1.50	50	5	3
10/NF		20 ± 1.25	± 0.85	0.35	0.35	17	1.50	1.50	50	50	3
20/NF		30 ± 1.25	± 0.85	0.35	0.35	17	1.50	1.50	50	50	3
30/NF											
317.2008-	7.0-12.4	6 ± 1.25	± 0.85	0.45	2.00	15	1.50	1.50	50	2	3
6/NF		10 ± 1.25	± 0.85	0.45	1.20	15	1.50	1.50	50	5	3
10/NF		20 ± 1.25	± 0.85	0.45	0.45	15	1.50	1.50	50	50	3
20/NF		30 ± 1.25	± 0.85	0.45	0.45	15	1.50	1.50	50	50	3
30/NF											

*Includes frequency sensitivity.

**Higher directivity designs available. Consult factory with requirements.

Stripline Directional Couplers Octave Bandwidth

MODELS

SPECIFICATIONS

	Frequency Range (GHz)	Coupling** (dB)	Frequency Sensitivity (dB)	Insertion Loss (db Max) Excluding Coupled Power		Directivity (db Min.)	VSWR(Max)		Power(Watts)			
				True			Pri. Line (Watts)	Sec. Line	Average Incident	Average Reflected	Peak (kW)	
317.2021-												
6S	0.5-1.0	6 ± 1.25	± 0.60	0.20	0.80	25	1.15:1	1.15:1	50	2	3	
10S		10 ± 1.25	± 0.75	0.20	0.80	25	1.15:1	1.15:1	50	5	3	
20S		20 ± 1.25	± 0.75	0.20	0.20	25	1.15:1	1.15:1	50	50	3	
30S		30 ± 1.25	± 0.75	0.20	0.20	25	1.20:1	1.15:1	50	50	3	
317.2022-												
6S	1.0-2.0	6 ± 1.00	± 0.60	0.20	1.80	25	1.15:1	1.15:1	50	2	3	
10S		10 ± 1.25	± 0.75	0.20	0.90	25	1.10:1	1.10:1	50	5	3	
20S		20 ± 1.25	± 0.75	0.20	0.20	25	1.10:1	1.10:1	50	50	3	
30S		30 ± 1.25	± 0.75	0.20	0.20	25	1.10:1	1.10:1	50	50	3	
317.2023-												
6S	2.0-4.0	6 ± 1.00	± 0.60	0.20	1.80	22	1.15:1	1.15:1	50	2	3	
10S		10 ± 1.25	± 0.75	0.20	0.70	22	1.15:1	1.15:1	50	5	3	
20S		20 ± 1.25	± 0.75	0.20	0.20	22	1.15:1	1.15:1	50	50	3	
30S		30 ± 1.25	± 0.75	0.20	0.20	22	1.15:1	1.15:1	50	50	3	
317.2024-												
6S	2.6-5.2	6 ± 1.00	± 0.60	0.20	1.80	18	1.25:1	1.25:1	50	2	3	
10S		10 ± 1.25	± 0.75	0.20	0.80	20	1.25:1	1.25:1	50	5	3	
20S		20 ± 1.25	± 0.75	0.20	0.25	20	1.25:1	1.25:1	50	50	3	
30S		30 ± 1.25	± 0.75	0.20	0.25	20	1.25:1	1.25:1	50	50	3	
317.2025-												
6S	4.0-8.0	6 ± 1.00	± 0.60	0.25	2.00	18	1.30:1	1.30:1	50	2	3	
10S		10 ± 1.25	± 0.75	0.25	1.00	20	1.30:1	1.30:1	50	5	3	
20S		20 ± 1.25	± 0.75	0.25	0.30	20	1.25:1	1.30:1	50	50	3	
30S		30 ± 1.25	± 0.75	0.25	0.25	20	1.25:1	1.30:1	50	50	3	
317.2026-												
6S	7.0-12.4	6 ± 1.00	± 0.50	0.40	2.00	15	1.35:1	1.40:1	50	2	3	
10S		10 ± 1.25	± 0.50	0.40	1.00	17	1.35:1	1.40:1	50	5	3	
20S		20 ± 1.00	± 0.50	0.30	0.30	17	1.35:1	1.40:1	50	50	3	
30S		30 ± 1.00	± 0.50	0.30	0.30	17	1.35:1	1.40:1	50	50	3	
317.2027-												
6S	7.5-16.0	6 ± 1.10	± 0.60	0.60	2.00	12	1.35:1	1.40:1	50	5	2	
10S		10 ± 1.50	± 0.75	0.60	1.00	12	1.35:1	1.40:1	50	5	2	
20S		20 ± 1.25	± 0.75	0.50	0.50	15	1.35:1	1.40:1	50	50	2	
30S		30 ± 1.25	± 0.75	0.50	0.50	15	1.35:1	1.40:1	50	50	2	
317.2028-												
6S	12.4-18.0	6 ± 1.00	± 0.50	0.55	2.00	15	1.35:1	1.45:1	50	2	1	
10S		10 ± 1.00	± 0.50	0.55	1.10	15	1.35:1	1.40:1	50	5	1	
20S		20 ± 1.00	± 0.50	0.50	0.55	15	1.30:1	1.40:1	50	50	1	
30S		30 ± 1.00	± 0.50	0.50	0.55	15	1.30:1	1.40:1	50	50	1	
317.2029-												
6S	18.0-26.5	6 ± 1.30	± 0.80	0.90	2.00	10	1.70:1	1.80:1	50	2	1	
10S		10 ± 1.20	± 0.70	0.90	1.50	11	1.60:1	1.70:1	50	5	1	
20S		20 ± 1.20	± 0.70	0.80	0.80	11	1.60:1	1.70:1	50	50	1	
30S		30 ± 1.20	± 0.70	0.80	0.80	11	1.60:1	1.70:1	50	50	1	
317.2030-												
6S	11.7-12.2	6 ± 1.00	± 0.75	0.60	2.00	17	1.40:1	1.45:1	50	2	1	
10S		10 ± 1.00	± 0.75	0.60	1.00	17	1.40:1	1.45:1	50	5	1	
20S		20 ± 1.00	± 0.75	0.50	0.55	17	1.40:1	1.45:1	50	50	1	
30S		30 ± 1.00	± 0.75	0.50	0.55	17	1.40:1	1.45:1	50	50	1	
317.2031-												
6S	1.5-3.0	6 ± 1.30	± 0.75	0.90	2.00	17	1.30:1	1.30:1	50	2	1	
10S		10 ± 1.00	± 0.75	0.90	1.50	17	1.30:1	1.30:1	50	5	1	
20S		20 ± 1.00	± 0.75	0.80	0.80	17	1.30:1	1.30:1	50	50	1	
30S		30 ± 1.00	± 0.75	0.50	0.55	17	1.30:1	1.30:1	50	50	1	
317.2032-												
6S	0.225-0.4	6 ± 1.25	± 0.75	0.20	1.80	22	1.20:1	1.20:1	50	2	1	
10S		10 ± 1.00	± 0.75	0.20	0.90	22	1.20:1	1.20:1	50	5	1	
20S		20 ± 1.00	± 0.75	0.20	0.20	22	1.20:1	1.20:1	50	50	1	
30S		30 ± 1.00	± 0.75	0.20	0.20	22	1.20:1	1.20:1	50	50	1	

*Includes frequency sensitivity.

Directional Detectors

BROADBAND - SMA CONNECTORS



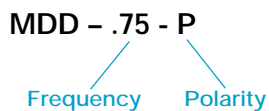
SPECIFICATIONS

MODELS	Frequency Range (GHz)	Minimum Sensitivity** (mV / mW)	Minimum Directivity (dB)	Flatness (dB)	VSWR
MDD-.75-X*	0.5-1.0	700	25	±0.2	1.15:1
MDD-1.5-X	1.0-2.0	700	25	±0.2	1.15:1
MDD-3.0-X	2.0-4.0	700	25	±0.2	1.15:1
MDD-5.0-X	2.0-8.0	500	20	±0.3	1.25:1
MDD-6.0-X	4.0-8.0	600	20	±0.3	1.25:1
MDD-9.7-X	7.0-12.4	500	17	±0.4	1.30:1
MDD-15.0-X	12.0-18.0	400	15	±0.3	1.30:1
MDD-12.0-X	6.0-18.0	500	15	±0.7	1.50:1
MDD-22.25-X	18.0-26.5	300	13	±1.0	2.00:1

*Replace suffix "X" with "N" for negative or "P" for positive output.

**All units based on -20dB coupling.

Ordering information



Diode Detectors



- ▶ Flat Frequency Response
- ▶ Broadband
- ▶ Positive or Negative Polarity

SPECIFICATIONS

MODELS*	Frequency (GHz)	Low Level Sensitivity (mV / μ W)	Flatness (dB)	VSWR	Connector	
					(Input)	(Output)
DT-1-X	0.01-12.4	0.5	± 0.3	1.25:1	SMA (M)	SMA (F)
DT-2-X	0.01-12.4	0.5	± 0.3	1.25:1	SMA (M)	SMC (M)
DT-3-X	0.01-18.5	0.5	± 0.5	1.25:1	SMA (M)	SMA (F)
DT-4-X	0.01-18.5	0.5	± 0.5	1.25:1	SMA (M)	SMC (M)
DT-5-X	0.01-26.5	0.5	± 1.0	1.30:1	SMA (M)	SMA (F)
DT-6-X	0.01-26.5	0.5	± 1.0	1.30:1	SMA (M)	SMC (M)
DT-7-X	0.001-2.0	0.5	± 0.3	1.30:1	BNC (M)	BNC (F)
DT-8-X	0.001-4.0	0.5	± 0.3	1.30:1	BNC (M)	BNC (F)
DT-9-X	0.01-12.4	0.5	± 0.5	1.40:1	SMA (M)	BNC (F)
DT-10-X	0.01-12.4	0.5	± 0.5	1.40:1	TYPE N (M)	BNC (F)
DT-11-X	0.01-18.5	0.5	± 0.5	1.50:1	SMA (M)	BNC (F)
DT-12-X	0.01-18.5	0.5	± 0.5	1.50:1	TYPE N (M)	BNC (F)

*Replace the suffix "X" with "P" for positive or "N" for negative polarity.

Comblines Cavity Filters

Microwave Devices produces a full line of high “Q,” low-loss combline cavity filters. The combline design provides high performance and is well suited to demanding environmental conditions. Our combline filters cover the frequency range of 0.5–18 GHz, with bandwidths from .1 to 50%. Standard designs are available with 3 to 12 sections, and are equipped with SMA connectors. Noncontiguous multiplexers are also available.



Typical electrical specifications that can be enhanced include insertion loss, VSWR, power handling, and spurious response suppression. Call us regarding nonstandard parameters.

SPECIFICATIONS

Frequency (GHz)	3 dB BW (%)	VSWR	Impedance	Sections	Shock	Vibration	Temperature
0.5–18.0	.1–50	1.5:1	50 Ohms	3–12	10G	10G	-55 to 85°C

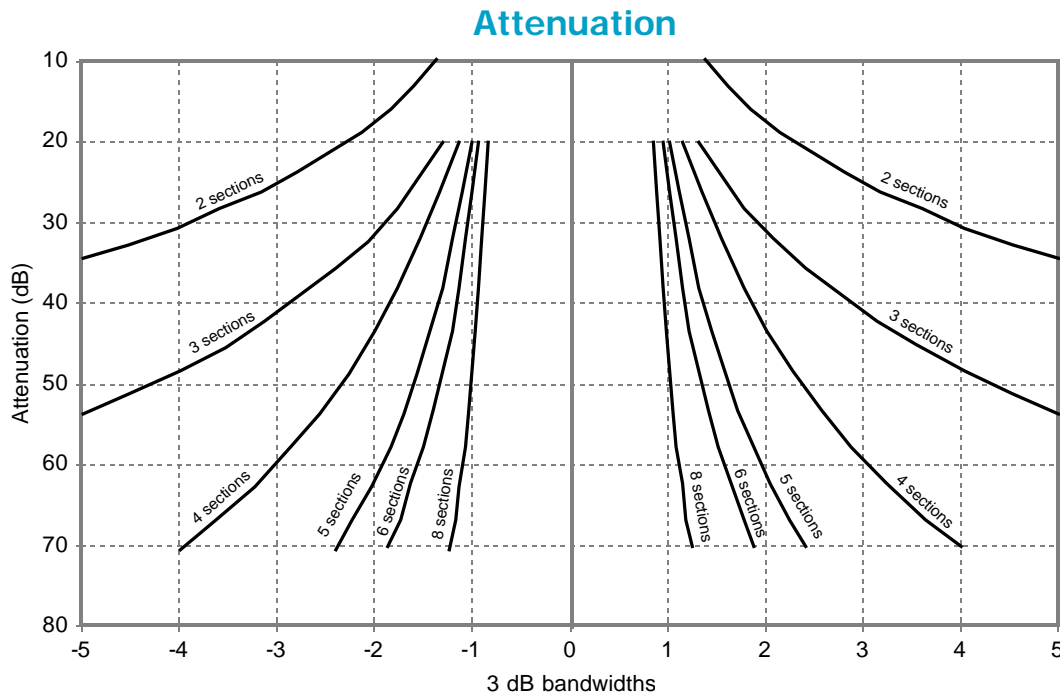
Insertion Loss

Comblines filters offer system designers extremely low insertion loss in the medium to wide bandwidth ranges. Typical losses are less than 1 dB for most designs with bandwidths greater than 5%. An approximation for insertion loss is 0.1 dB per section.

Attenuation

The curves in the graph on the following page are used to estimate stopband attenuation. These curves show attenuation at multiples of the filter’s 3 dB bandwidth.

Comblines Cavity Filters



While the size of combline filters can be optimized to suit most requirements, the following equation can be used to approximate standard lengths (L).

$$L = (N) \times (Y) + 0.4 \quad \text{Where } N = \text{Number of sections; } Y = \text{Bandwidth (\%)} \text{ value from table}$$

Frequency (GHz)	Bandwidth (%)			Frequency (GHz)	Width (inches)	Height (inches)
	5-15	15-25	25-35			
0.5-4.0	0.50	0.40	0.30	0.5-4.0	0.8	1.2
4.0-5.5	0.45	0.35	0.25	4.0-5.5	0.8	1.0
5.5-7.0	0.40	0.30	0.20	5.5-7.0	0.8	0.8
7.0-18.0	0.30	0.25	0.20	7.0-18.0	0.6	0.6

Tapped mounting holes, the location and size of which are determined at the time of design, are provided on the bottom surface of the filter. Contact the factory for applications requiring nonstandard lengths or connector configurations.

RF Cable Assemblies



Microwave Devices offers perhaps the most extensive line of cable assemblies in the industry today. Our product line includes not only RF cables, but also Fiber Optic, and multi-conductor type assemblies as well. We use only the highest quality, best performing cable and connectors in our assemblies. Our cables are custom built according to your specifications, using standard connectors, or, if a connector does not exist to fit your needs, MDI will design a connector to satisfy your requirement. We offer very fast turnaround and all cables are 100% tested. Please use the tables on the following pages to determine a model number for your cable. If your cable type or connector is not shown, please contact the factory.

RF Cable Assemblies Ordering Information

<u>CONNECTOR</u>	<u>CODE</u>
<u>3mm</u>	<u>01</u>
<u>7/16</u>	<u>02</u>
<u>7mm</u>	<u>03</u>
<u>bantam tt251</u>	<u>31</u>
<u>BNC 50 OHM</u>	<u>04</u>
<u>BNC 75 OHM</u>	<u>05</u>
<u>DB15</u>	<u>25</u>
<u>DB25</u>	<u>22</u>
<u>DB37</u>	<u>21</u>
<u>DB9</u>	<u>23</u>
<u>F</u>	<u>06</u>
<u>FC/APC</u>	<u>27</u>
<u>FC/PC</u>	<u>28</u>
<u>FME</u>	<u>07</u>
<u>HIROSE PO73-J-2.5CV</u>	<u>34</u>
<u>LC/PC</u>	<u>32</u>
<u>MB</u>	<u>08</u>
<u>MCX</u>	<u>09</u>
<u>MM</u>	<u>10</u>
<u>MMCX</u>	<u>11</u>
<u>N 50 OHM</u>	<u>12</u>
<u>N 75 OHM</u>	<u>13</u>
<u>RJ12</u>	<u>24</u>
<u>RJ45</u>	<u>20</u>
<u>SC/PC</u>	<u>33</u>
<u>SMA</u>	<u>14</u>
<u>SMB</u>	<u>15</u>
<u>ST/PC</u>	<u>29</u>
<u>TNC 50 OHM</u>	<u>16</u>
<u>TNC 75 OHM</u>	<u>17</u>
<u>UHF</u>	<u>18</u>
<u>UHF mini</u>	<u>19</u>
<u>UNTERMINATED</u>	<u>26</u>
<u>2.92mm</u>	<u>35</u>
<u>2.4mm</u>	<u>41</u>
<u>GPO™</u>	<u>42</u>

<u>CONNECTOR STYLE</u>	<u>CODE</u>
<u>STRAIGHT MALE</u>	<u>A</u>
<u>STRAIGHT FEMALE</u>	<u>B</u>
<u>RIGHT-ANGLE MALE</u>	<u>C</u>
<u>RIGHT-ANGLE FEMALE</u>	<u>D</u>
<u>BULKHEAD MALE</u>	<u>E</u>
<u>BULKHEAD FEMALE</u>	<u>F</u>
<u>UNTERMINATED</u>	<u>X</u>

List of Cable Types

CABLE TYPE

CODE

12 FIBER SINGLEMODE SIMPLEX DISTRIBUTION CABLE
 16 PAIR 26 AWG 1249 016A
 26 AWG SOLID 8 CONDUCTOR
 8771 belden 3 conductor sheild drain
 9 PAIR 24 AWG BELDEN 9539
 BELDEN 8218
 CAT5 BLUE SOLID
 CAT5 RED SOLID
 CAT5 SHIELDED BELDEN 1624P
 CAT5 UTP BLUE
 CAT5 UTP RED
 CAT WHITE SOLID
 CAT5 YELLOW SOLID
 FIBER 1.6mm SINGLE MODE (YELLOW)
 FIBER 3mm SINGLE MODE (YELLOW)
 FIBER 62.5 MULTIMODE DUPLEX (ORANGE)
 FIBER 9/125 SINGLEMODE DUPLEX (YELLOW)
 RG 8 BELDEN 9914
 RG142 BELDEN 83242
 RG174 BELDEN 8216 010
 RG178
 RG179 M17/094-RG179
 RG214 TIMES MICROWAVE M17/75RG214
 RG223
 RG316 BELDEN 83284
 RG316 DB M17/152-00001
 RG316 DB BELDEN
 RG400 TIMES FIBER RG400/U
 RG402 SEMI .141 BELDEN 1673A
 RG405 SEMI .085 BELDEN 1671A
 RG58 BELDEN 9311
 RG59 BELDEN 543945
 RG6 BELDEN 82248
 SF142 TIMES MICROWAVE 308-011-142SFB-T
 SS402 HARBOUR SS402
 SS405 HARBOUR SS405
 TELEPHONE 8 CONDUCTOR 28-008-PV-ROUND
 STEEL FLEX
 OTHER (PLEASE SPECIFY)

BG
 AQ
 BC
 BD
 AR
 BH
 AY
 AZ
 AA
 AB
 AC
 AW
 AX
 BF
 BA
 BI
 BJ
 BE
 AD
 AV
 AE
 AU
 AS
 BB
 AF
 AG
 BK
 AT
 AH
 AI
 AJ
 AK
 AL
 AM
 AN
 AO
 AP
 SE
 OT

CUSTOM

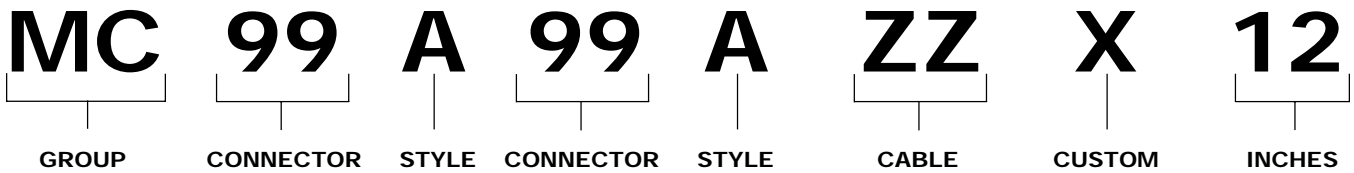
PLAIN
CUSTOM

CODE

X
C

Ordering Information

Using the code below, replace the appropriate letters and numbers with the corresponding digits from pages 51 & 52 which apply to your cable and connector type:



GROUP

ASSEMBLY

COAXIAL

FIBER

MULTICONDUCTOR

CODE

MA

MC

MF

MM

Adapters

In Series - Between Series



In Series Adapters

SPECIFICATIONS

MODEL	Connector Type	Frequency Range	VSWR (Max)
70-500-1	SMA - F/F	18.0 GHz	1.15:1
70-500-2	SMA - M/M	18.0 GHz	1.15:1
70-500-3	SMA - M/F	18.0 GHz	1.15:1
70-500-4	N - F/F	18.0 GHz	1.12:1
70-500-5	N - M/M	18.0 GHz	1.12:1
70-500-6	N - M/F	18.0 GHz	1.12:1
70-500-7	BNC - F/F	8.0 GHz	1.25:1
70-500-8	BNC - M/M	8.0 GHz	1.25:1
70-500-9	BNC - M/F	8.0 GHz	1.25:1
70-500-10	TNC - F/F	18.0 GHz	1.20:1
70-500-11	TNC - M/M	18.0 GHz	1.20:1
70-500-12	TNC - M/F	18.0 GHz	1.20:1
70-500-13	2.4mm - F/F	50.0 GHz	1.20:1
70-500-14	2.4mm - M/M	50.0 GHz	1.20:1
70-500-15	2.4mm - M/F	50.0 GHz	1.20:1
70-500-16	2.92mm - F/F	40.0 GHz	1.25:1
70-500-17	2.92mm - M/M	40.0 GHz	1.25:1
70-500-18	2.92mm - M/F	40.0 GHz	1.25:1
70-500-19	7/16 - F/F	7.5 GHz	1.20:1
70-500-20	7/16 - M/M	7.5 GHz	1.20:1
70-500-21	7/16 - M/F	7.5 GHz	1.20:1

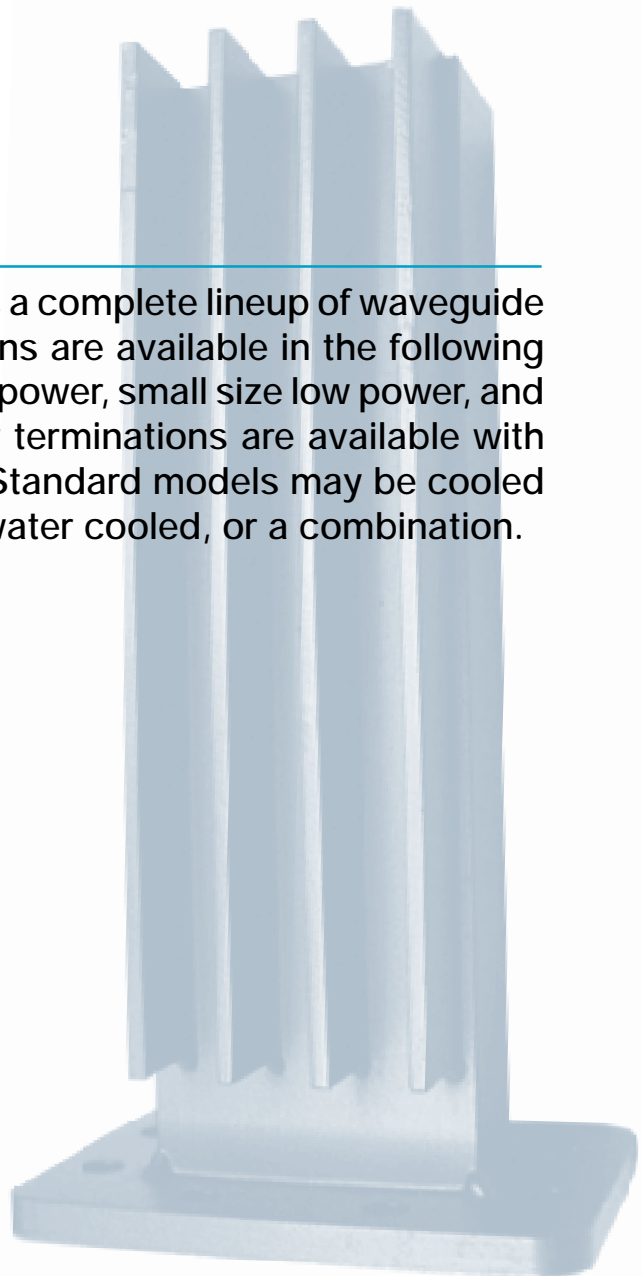
Waveguide Products

MDI's wide selection of waveguide products is among the most complete offered anywhere. From differential phase high power circulators, to couplers, filters, isolators, adapters, iso-adapters, ferrite switches, terminations, and interconnecting assemblies, you will find what you need. In both rigid or flex waveguide, we specialize in custom assemblies built to your specifications and also offer standard models. MDI excels at high power, high frequency waveguide products, and our products are pressurized where required, and available in Aluminum, Brass, Copper, or Invar materials.

In addition to producing individual components, MDI also integrates waveguide assemblies into one package, thereby avoiding extra flange connections and enhancing electrical performance.

Waveguide Terminations

Microwave Devices produces a complete lineup of waveguide terminations. Our terminations are available in the following configurations: precision low power, small size low power, and high power. The high power terminations are available with different modes of cooling. Standard models may be cooled by forced air, liquid cooled, water cooled, or a combination.



Precision Low Power Waveguide Terminations

SPECIFICATIONS

MODELS	Frequency Range (GHz)	Waveguide Size	Flange	Power Ave. Max (Watts)	VSWR
WT430	1.70 - 2.60	WR430	UG437B/U	10	1.15:1
WT340	2.10 - 3.00	WR340	UG437B/U	10	1.05:1
WT284	2.65 - 3.95	WR284	UG584/U	5	1.05:1
WT229	3.30 - 4.90	WR229	CMR229	5	1.05:1
WT187	3.95 - 5.85	WR187	UG407/U	5	1.05:1
WT159	4.90 - 7.05	WR159	CMR159	4	1.05:1
WT137	5.85 - 8.20	WR137	UG441/U	3	1.05:1
WR112	7.05 - 10.00	WR112	UG138/U	2	1.05:1
WR90	8.20 - 12.40	WR90	UG135/U	2	1.05:1
WR75	10.00 - 15.00	WR75	M3922/53-008	2	1.05:1
WR62	12.40 - 18.00	WR62	UG1665/U	1.5	1.05:1
WR42	18.00 - 26.50	WR42	UG595/U	1.5	1.05:1
WR28	26.50 - 40.00	WR28	UG599/U	1.0	1.05:1

Short Length-Low Power Waveguide Terminations

SPECIFICATIONS

MODELS	Frequency Range (GHz)	Waveguide Size	Flange	Ave. Power Max (Watts)	VSWR	Length (inches)
WST430	1.70 - 2.60	WR430	UG437B/U	10	1.15:1	3.00
WST284	2.65 - 3.95	WR284	UG584/U	5	1.15:1	2.50
WST229	3.30 - 4.90	WR229	CMR229	5	1.15:1	2.25
WST187	3.95 - 5.85	WR187	UG407/U	5	1.15:1	2.00
WST159	4.90 - 7.05	WR159	CMR159	4	1.15:1	1.75
WST137	5.85 - 8.20	WR137	UG441/U	3	1.15:1	1.50
WST112	7.05 - 10.00	WR112	UG138/U	2	1.15:1	1.00
WST90	8.20 - 12.40	WR90	UG135/U	2	1.15:1	1.00
WST75	10.00 - 15.00	WR75	M3922/53-008	2	1.15:1	.75
WST62	12.40 - 18.00	WR62	UG1665/U	1.5	1.15:1	.75
WST42	18.00 - 26.50	WR42	UG595/U	1.5	1.15:1	.75
WST28	26.50 - 40.00	WR28	UG599/U	1.0	1.15:1	.75

Note: Improved VSWR available over narrower bandwidths. Other flange types available upon request.

Waveguide Terminations



High Power

SPECIFICATIONS

MODELS	Frequency Range (GHz)	Waveguide Size	Ave Power (Watts)	VSWR* Max	Length Inches
6WH430	1.70 - 2.60	WR430	5000	1.10:1	36.0
6WH340	2.20 - 3.30	WR340	5000	1.10:1	36.0
6WH284	2.60 - 3.95	WR284	5000	1.10:1	34.0
6WH229	3.30 - 4.90	WR229	5000	1.10:1	30.0
6WH187	3.95 - 5.85	WR187	3000	1.10:1	24.0
6WH159	4.90 - 7.05	WR159	3000	1.10:1	24.0
6WH137	5.85 - 8.20	WR137	2000	1.10:1	20.0
6WH112	7.05 - 10.00	WR112	1000	1.10:1	14.0
6WH90	8.20 - 12.40	WR90	1000	1.10:1	14.0
6WH75	10.00 - 15.00	WR75	800	1.10:1	10.0
6WH62	12.40 - 18.00	WR62	500	1.10:1	10.0
6WH42	18.00 - 26.50	WR42	250	1.10:1	8.0
6WH28	26.50 - 40.00	WR28	200	1.10:1	6.0

- Note: 1. VSWR is typical over the entire band. VSWR may be optimized over narrower frequency ranges.
2. For higher power ratings, see informational chart on the following page.

Waveguide Terminations

TABLE OF MAXIMUM POWER RATING

Waveguide Size	Frequency Range (GHz)	VSWR*	Forced Air (Convection)	Liquid Cooled (Forced)	Water Load
WR430	1.70 - 2.60	1.15:1	10 kW	15 kW	30 kW
WR340	2.20 - 3.30	1.15:1	10 kW	13 kW	25 kW
WR284	2.60 - 3.95	1.15:1	9 kW	12 kW	20 kW
WR187	3.95 - 5.85	1.15:1	7.5 kW	12 kW	20 kW
WR137	5.85 - 8.20	1.15:1	7.5 kW	10 kW	17 kW
WR112	7.05 - 10.00	1.15:1	5 kW	7 kW	15 kW
WR90	8.20 - 12.40	1.15:1	5 kW	7 kW	15 kW
WR75	10.00 - 15.00	1.2:1	3 kW	5 kW	10 kW
WR62	12.40 - 18.00	1.2:1	3 kW	4 kW	10 kW
WR42	18.00 - 26.50	1.3:1	2 kW	2.5 kW	7 kW
WR28	26.50 - 40.00	1.3:1	1.5 kW	2.5 kW	5 kW

**Typical VSWR for full band unit- (can be optimized for narrower bandwidths).*

Forced air power rating can be increased 150% with coolant, 300% as a water load.

Flow rate for forced coolant models should be at least 3 Gal/minute (4 Gal/minute preferred).

Waveguide Adapters



The MDI standard waveguide adapter line offers full waveguide bandwidth frequency coverage transitions with SMA, type N, TNC, and 2.92mm connectors. VSWR of 1.05:1 is standard over 15% bandwidth, and 1.15:1 over the entire bandwidth. Higher power end-launched adapters are also available.

SPECIFICATIONS

MODELS	Waveguide Size	Frequency (GHz)	Insertion Loss (dB)	VSWR
WA650-X	WR650	1.12 - 1.70	0.10	1.15:1
WA430-X	WR430	1.70 - 2.60	0.10	1.15:1
WA284-X	WR284	2.60 - 3.95	0.10	1.15:1
WA229-X	WR229	3.30 - 4.95	0.10	1.15:1
WA187-X	WR187	3.95 - 5.85	0.10	1.15:1
WA159-X	WR159	4.90 - 7.05	0.10	1.15:1
WA137-X	WR137	5.85 - 8.20	0.10	1.15:1
WA112-X	WR112	7.05 - 10.0	0.10	1.15:1
WA90-X	WR90	8.20 - 12.4	0.10	1.15:1
WA75-X	WR75	10.0 - 15.0	0.10	1.15:1
WA62-X	WR62	12.4 - 18.0	0.10	1.15:1
WA51-X	WR51	15.0 - 22.0	0.10	1.15:1
WA42-X	WR42	18.0 - 26.5	0.10	1.25:1
WA28-X	WR28	26.5 - 40.0	0.10	1.25:1

Ordering information

WA360-X-1 — Flange
C for Cover Flange
U for specific UG type

Model / Connector Type
N for N
S for SMA
T for TNC
2.9 for 2.92mm





Waveguide Directional Couplers

MDI's unique Waveguide Directional Couplers are among the smallest and lightest devices of this type available in the industry. They incorporate minimum size and weight features, and in addition, the coaxial type secondary arms eliminate the need for transitions or adapters.

The secondary or coupled outputs are available in any conventional coaxial connector or we will design a custom connector to meet your needs.

These couplers offer the up most in versatility with coupling values ranging from 10 to 70 dB, in any increment. The mainline is equipped with choke or cover flanges as required. Water cooling for extremely high power applications can be provided, and mainlines may be pressurized upon request. All couplers are available with any number of coupled ports in either direction.

SPECIFICATIONS

MODELS	Frequency (GHz)	Coupling (dB)	Directivity (dB)	VSWR (mainline)
WR430	1.70 - 2.60	20 - 70	20	1.10:1
WR340	2.10 - 3.00	10 - 70	20	1.10:1
WR284	2.60 - 3.95	10 - 70	20	1.10:1
WR229	3.30 - 4.90	10 - 70	20	1.10:1
WR187	3.95 - 5.85	10 - 70	20	1.10:1
WR159	4.90 - 7.05	10 - 70	20	1.10:1
WR137	5.85 - 8.20	10 - 70	20	1.10:1
WR112	7.05 - 10.00	10 - 70	20	1.10:1
WR102	7.00 - 11.0	10 - 70	20	1.10:1
WR90	8.20 - 12.4	10 - 70	20	1.10:1
WR75	10.0 - 15.0	10 - 70	20	1.10:1
WR62	12.4 - 18.0	10 - 70	20	1.10:1
WR51	15.0 - 22.0	10 - 70	20	1.10:1
WR42	18.0 - 26.5	10 - 70	20	1.10:1
WR34	22.0 - 33.0	10 - 70	20	1.10:1
WR28	26.5 - 40.0	10 - 70	20	1.10:1
WR22	33.0 - 50.0	10 - 70	20	1.10:1
WR19	40.0 - 60.0	10 - 70	20	1.10:1

Most designs easily cover 25% of the bandwidth. Consult factory for full bandwidth models, cross guide, or broadwall couplers.

Waveguide Isolators / Circulators

Standard Bandwidth

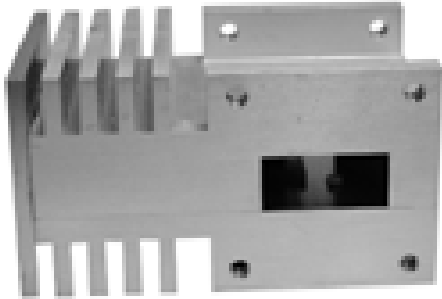
SPECIFICATIONS

Models	Frequency Range (GHz)	Waveguide Size	Isolation (dB)	Insertion Loss (dB)	VSWR
WX2.8/2	2.70 - 2.90	WR284	23	0.25	1.15:1
WX3.0/2	2.90 - 3.10	WR284	23	0.25	1.15:1
WX3.2/2	3.10 - 3.30	WR284	23	0.25	1.15:1
WX3.95/5	3.70 - 4.20	WR229	23	0.25	1.15:1
WX4.60/6	4.40 - 5.00	WR187	23	0.20	1.15:1
WX6.15/5	5.90 - 6.40	WR159	23	0.20	1.15:1
WX6.80/6	6.50 - 7.10	WR137	23	0.20	1.15:1
WX7.80/1.2	7.20 - 8.40	WR112	23	0.20	1.15:1
WX9.05/1.1	8.50 - 9.60	WR90	23	0.20	1.15:1
WX9.5/1.0	9.00 - 10.0	WR90	23	0.20	1.15:1
WX11.2/1.0	10.7 - 11.7	WR75	23	0.20	1.15:1
WX11.95/2.5	10.7 - 13.2	WR75	20	0.30	1.20:1
WX12.45/1.5	11.7 - 13.2	WR75	20	0.30	1.20:1
WX14.5/2.0	13.5 - 15.5	WR62	20	0.30	1.20:1
WX14.25/5	14.0 - 14.5	WR62	23	0.25	1.15:1
WX18.7/2.0	17.7 - 19.7	WR51	20	0.30	1.20:1
WX22.0/2.0	21.0 - 23.0	WR42	20	0.30	1.20:1
WX28.25/3.5	26.5 - 30.0	WR28	20	0.40	1.20:1
WX35.5/2.0	34.5 - 36.5	WR28	20	0.40	1.20:1
WX40.45/2.9	39.0 - 41.9	WR22	20	0.50	1.20:1
WX42.0/1.0	41.5 - 42.5	WR19	20	0.50	1.20:1
Full Band Models					
WX8.53/2.95	7.05 - 10.00	WR112	18	0.40	1.30:1
WX10.2/4.4	8.00 - 12.40	WR90	18	0.40	1.30:1
WX12.5/5	10.00 - 15.00	WR75	18	0.40	1.30:1
WX15.2/5.6	12.40 - 18.00	WR62	18	0.40	1.30:1
WX22.25/8.5	18.00 - 26.50	WR42	18	0.40	1.30:1
WX33.25	26.50 - 40.0	WR28	15	0.50	1.45:1

Note: Change "X" in model number to I for isolator or C for circulator.

Waveguide Circulators

High Power



SPECIFICATIONS

MODELS	Frequency Range (GHz)	Waveguide Size	Ave Power (Watts)	SPECS Iso/Loss/VSWR	Length Inches
WX3.0H	2.9 - 3.1	WR284	800	20/0.4/1.20:1	6.00 x 6.00 x 3.00
WX6.15H	5.9 - 6.4	WR159	700	20/0.4/1.20:1	4.00 x 4.00 x 2.44
WX8.15H	7.9 - 8.4	WR112	600	20/0.3/1.20:1	2.50 x 2.50 x 1.88
WX9.4H	9.3 - 9.5	WR90	500	20/0.3/1.20:1	2.30 x 2.30 x 1.63
WX12.45H	12.2 - 12.7	WR75	400	20/0.3/1.20:1	2.00 x 2.00 x 1.50
WX16.15H	16.0 - 16.3	WR62	350	20/0.3/1.20:1	1.75 x 1.75 x 1.50
WX24.5H	23.5 - 25.5	WR42	250	20/0.3/1.20:1	1.00 x 1.50 x .88
WX28.5H	27.5 - 29.5	WR28	150	20/0.3/1.20:1	1.00 x 1.25 x 0.75

- Note: 1. Units listed above are circulators. Isolators are available (with termination). Reverse power must be specified in peak and average. Replace "x" in the model number with C for circulator or I for isolator.
2. Flanges are aluminum UG type. Brass and/or choke flanges are available.
3. All units are pressurized to 15 PSI
4. Higher power units available.
5. Convection cooling required on all units. Consult factory for details.

Differential Phase Waveguide Circulator / Isolator

MODELS***

SPECIFICATIONS

	Frequency* Range (GHz)	Isolation (dB)	Insertion Loss (dB)	VSWR	Ave.** Power (watts)	Peak Power (watts)	Waveguide Size
WDC187	4.9 - 5.1	20	0.4	1.15:1	1000	750K	WR187
WDC159	5.4 - 5.9	20	0.4	1.15:1	1000	500K	WR159
WDC137	5.9 - 7.2	20	0.4	1.15:1	950	400K	WR137
WDC112	8.9 - 9.5	20	0.4	1.15:1	900	350K	WR112
WDC90	8.6 - 9.6	20	0.4	1.15:1	750	250K	WR90
WDC62	16.5 - 17.5	20	0.4	1.15:1	500	150K	WR62
WDC28	34.0 - 36.0	20	0.4	1.20:1	300	10K	WR28

*Custom Frequency ranges and power levels available. Consult Factory.

**Power ratings depend on pressurization and cooling system.

***Models listed are circulators. Isolators are available. Please specify reverse power (Ave.& Peak).



Waveguide Filters

Our WF series of waveguide, Bandpass and Harmonic filters excel in applications where high frequency, narrow bandwidth, and high "Q" is demanded. The WF series is designed and manufactured to provide high performance with maximum stability.

This series is available with standard designs of 2 to 12 resonant sections, a frequency range of 2-60 GHz, and bandwidths from 0.1 to 10%. Models are offered with standard waveguide flanges or SMA, 3.5mm, or 2.92mm connectors are also available within their respective frequency ranges.

Consult the specification table below for standard frequency information, or call us regarding specific requirements. Contact the factory for nonstandard frequency ranges, VSWR requirements, bandwidths, power handling capabilities, or flange configurations.

Waveguide Filters

SPECIFICATIONS

WAVEGUIDE TYPE

	WR430	WR340	WR284	WR229	WR187	WR159	WR137	WR112
Frequency (GHz)	1.7-2.60	2.10-3.00	2.60-3.95	3.30-4.90	3.95-5.85	4.90-7.05	5.85-8.20	7.05-10.00
Impedance: (Ohms)	50	50	50	50	50	50	50	50
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Bandwidth (%)	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10
Sections	2-12	2-12	2-12	2-12	2-12	2-12	2-12	2-12

SPECIFICATIONS

WAVEGUIDE TYPE

	WR102	WR90	WR75	WR62	WR51	WR42	WR34	WR28
Frequency (GHz)	7.0-11.0	8.20-12.4	10.0-15.0	12.4-18.0	15.0-22.0	18.0-26.5	22.0-33.0	26.5-40.0
Impedance: (Ohms)	50	50	50	50	50	50	50	50
VSWR	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.2:1
Bandwidth (%)	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10	0.1 - 10
Sections	2-12	2-12	2-12	2-12	2-12	2-12	2-12	2-12

SPECIFICATIONS

WAVEGUIDE TYPE

	WR22	WR19	WR15
Frequency (GHz)	33.0-50.0	40.0-60.0	50.0-60.0
Impedance: (Ohms)	50	50	50
VSWR	1.2:1	1.2:1	1.2:1
Bandwidth (%)	0.1 - 10	0.1 - 10	0.1 - 10
Sections	2-12	2-12	2-12

Measurement Equipment

Microwave Devices' family of measurement equipment provides uncommon versatility with accurate power and VSWR measurement capabilities over a broad operational bandwidth.

Our *MicroMatch* Wattmeters and VSWR meters offer accurate measurement of incident and reflected RF power and VSWR in coaxial transmission lines.

MDI's Station Guardians provide essential protection for transmitter and antenna systems against damage caused by abnormal load conditions.

Wattmeters / VSWR Meters



MDI's *MicroMatch* family of Wattmeters and VSWR meters offers versatile and accurate measurement capability in a series of compact instruments. These models provide multirange indications of RF power and VSWR in coaxial transmission systems.

Nominal impedance for all models is 50 ohms. Standard models are equipped with "N" type connectors.

SPECIFICATIONS

MODELS

	263	703	704	711	712	721	722	725
Frequency (MHz)	0.5 - 225	20 - 1000	46 - 1000	25 - 1000	25 - 1000	960 - 3000	960 - 3000	960 - 3000
Power (Watts)	1000	12	40	300	10	1.2	4	120
Accuracy	± 10%	± 5%	± 5%	± 5%	± 5%	± 5%	± 5%	± 5%
VSWR	n/a	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1	1.25:1

Station Guardians

Our series of Station Guardians provide critical monitoring and protection for transmission and antenna systems. These instruments simultaneously monitor and display both forward and reflected RF transmitted power and VSWR levels continuously on RF transmission lines. The system is equipped with both visual alarms to warn of abnormal system conditions, and may also be optionally equipped with switching relays to facilitate automatic standby switching.

The 410 series of indicators is mechanically similar to the SG-34 shown, except that it contains the meter and switching circuits only. It is available in a 19 inch rack-panel mount.



SPECIFICATIONS:

SG34 series

Power range (kW)

0.4 – 40

Accuracy (typical)

±5%*

Dimensions (inches)

3.5 by 19

410 series

Power range (kW)

0.012 – 40

Accuracy (typical)

±5%*

Dimensions (inches)

3.5 by 19

* Frequency range and accuracy determined by external directional coupler.

notes
