



Phase Shifters
and Attenuators



Waveguide Terminations



Power Dividers/Combiners



Flexible Cables

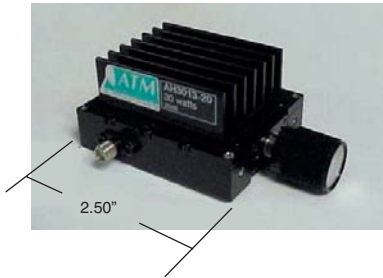


Standard Gain Horns



Waveguide Products

HIGH POWER VARIABLE ATTENUATORS



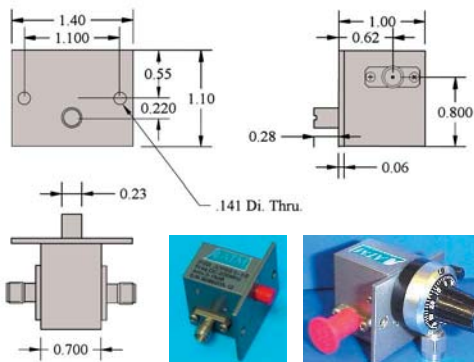
30 WATTS*

RF CONN: SMA female
INS LOSS: 0.5dB max
VSWR: 1.5 max
RF POWER: 30 W avg
5 Kw peak

*Up to 250 Watts Available

Freq. (GHZ)	Atten. Range (dB)	Flatness (+/- dB)	Model No.
0.5 - 1.0	6	N/A	AH30V082-6
0.8 - 1.6	10	N/A	AH30V083L-10
0.9 - 1.75	10	N/A	AH30V083L1-10
1.0 - 2.0	10	N/A	AH30V083-10
2.0 - 4.2	10	N/A	AH30V084-10
4.0 - 8.0	10	N/A	AH30V085-10
7.9 - 12.7	10	N/A	AH30V086-10
11.7 - 18.0	10	N/A	AH30V087-10

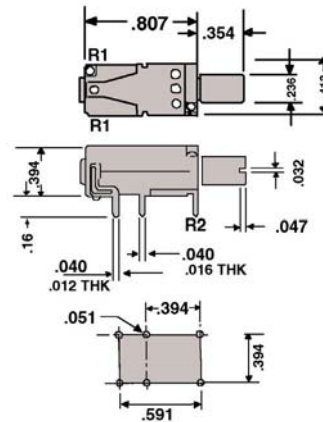
DC - 1 GHz VARIABLE ATTENUATORS



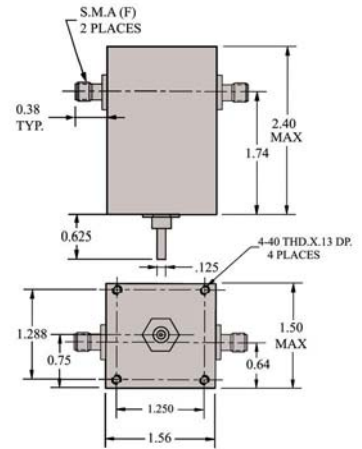
Standard Model

Dial Option*

AF03 Series



PC Series



AF04 & AF05 Series

*Multi-Turn, SMA Connectors, Low Insertion Loss

Freq (MHz)	Atten (dB)	I.L. (dB max)	Flatness (+/- dB)	VSWR (max)	Model No. (50 Ohm)	Model No. (75 Ohm)
DC-100	0-15	0.5	0.5	1.3	AF030-15	AF030-15/75
DC-200	0-15	0.5	0.5	1.4	AF031-15	AF031-15/75
DC-500	0-15	0.5	1.0	1.8	AF032-15	AF032-15/75
DC-1000	0-10	1.0	1.5	2.0	AF033-10	N/A

Multi-Turn PC Mounted

DC-300	0-15	0.5	1.0	1.5	AV0PC2-15-50	AV0PC2-15-75
DC-850	0-15	0.5	1.5	2.0	AV0PC3-15-50	AV0PC3-15-75

*Multi-Turn, SMA Connectors, Low Insertion Loss

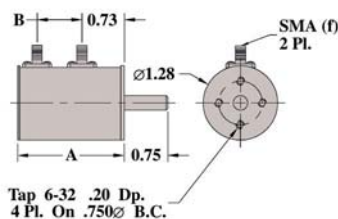
Freq (MHz)	Atten (dB)	I.L. (dB max)	Flatness (+/- dB)	VSWR (max)	Model No. (50 Ohm)	Model No. (75 Ohm)
DC-100	0-30	1.0	1.0	1.5	AF040-30	AF040-30/75
DC-200	0-30	1.0	1.5	1.5	AF041-30	AF041-30/75
DC-500	0-30	1.0	1.5	1.8	AF042-30	AF042-30/75
DC-1000	0-30	3.0	N/A	2.0	AV043-30	N/A

Single-Turn, SMA, Low Insertion Loss, w/Calibration Dial

DC-100	0-30	1.0	1.0	1.5	AF050-30	AF050-30/75
DC-200	0-30	1.0	1.5	1.5	AF051-30	AF051-30/75
DC-500	0-30	1.0	1.5	1.5	AF052-30	AF052-30/75

*For Turns Counting Dial change P/N from AF0 to AF8

ROTARY STEP ATTENUATORS



Model	Frequency Range	Attenuator Range	Attenuation Accuracy	VSWR	Insertion Loss	D _{im} (In) A B
AS013-10-1	DC-2200 MHz	0-10 dB in 1 dB steps	±2 dB max. DC-1000 MHz ±4 dB max. 1000-2000 MHz	1.2:1 max. DC-1000 MHz 1.4:1 max. 1000-2000 MHz	0.2dB max DC-1000 MHz 0.4 dB max. 1000-2000 MHz	1.83 0.77
AS013-60-10	DC-2200 MHz	0-60 dB in 10 dB steps	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-2000 MHz	1.2:1 max. DC-1000 MHz 1.4:1 max. 1000-2000 MHz	0.3 dB max. DC-1000 MHz 0.5 dB max. 1000-2000 MHz	2.40 1.36
AS113-110-1 Dual Concentric	DC-2200 MHz	0-110 dB in 1dB steps	± 0.3 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-1500 MHz ± 0.5 dB or 4% 1500-2000 MHz	1.3:1 max. DC-1000 MHz 1.5:1 max. 1000-1500 MHz 1.7:1 max. 1500-2000 MHz	.75 dB max. DC-1000 MHz 1.25 dB max. 1000-2000 MHz	4.0 2.3

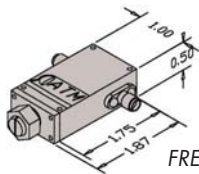
• Impedance: 50 Ohms

• RF Input Power: 1W avg., 1KW peak

• SMA Female Others Available

CONTINUOUSLY VARIABLE ATTENUATORS

06 SERIES VARIABLE ATTENUATORS



FREQUENCY FLAT MODELS

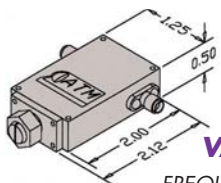
Freq (GHz)	Atten Range (dB)	Flatness (+/- db)	Model No.
2.0-4.0	10	1.5	AF064-10
3.6-6.5	10	0.8	AF065C-10
3.6-4.3	20	0.5	AF06C1-20
5.8-6.5	20	0.5	AF06C2-20
5.85-14.5	20	0.5/B	AF06CK-20
4.0-8.0	10	2.0	AF065-10
7.2-8.4	20	1.0	AF065X-20
8.0-12.4	10	1.0	AF066-10
10.7-12.7	20	0.8	AF066X-20
10.7-14.5	20	1.5	AF066K-20
13.0-14.5	30	0.5	AF067K-30
12.4-18.0	10	1.0	AF067-10
17.0-18.6	20	1.0	AF067J-20
8.0-18.0	20	1.8	AF066H-20
14.0-26.0	20	1.0	AF068-20

LEVEL ADJUST MODELS

2.0-4.2	10	N/A	AV064-10
3.7-4.2	20	N/A	AV065-20
7.9-12.7	30	N/A	AV066-30
11.7-18.0	30	N/A	AV067-30
14.0-26.5	20	N/A	AV068-20
26.5-40	20	N/A	AV069-20

MULTIBAND MODELS

2.0-8.0	10	N/A	AV064F-10
4.0-12.4	20	N/A	AV065G-20
4.0-18.0	10	N/A	AV065H-10
6.0-18.0	30	N/A	AV066H-30



07 SERIES VARIABLE ATTENUATORS

FREQUENCY FLAT MODELS

Freq (GHz)	Atten Range (dB)	Flatness (+/- db)	Model No.
2.0-4.0	10	1.5	AF074-10
3.6-6.5	20	0.8	AF075C-20
3.6-4.3	20	0.5	AF07C1-20
5.8-6.5	20	0.5	AF07C2-20
5.85-14.5	20	0.5/B	AF07CK-20
4.0-8.0	10	2.0	AF075-10
7.2-8.4	20	1.0	AF075X-20
7.9-8.4	20	0.5	AF076X2-20
8.0-12.4	10	1.0	AF076-10
10.7-12.7	20	0.8	AF076X-20
10.7-14.5	20	1.5	AF076K-20
12.4-18.0	10	1.0	AF077-10
17.0-18.6	20	1.0	AF077J-20
8.0-18.0	20	1.5	AF076H-20

LEVEL ADJUST MODELS

1.0-2.0	10	N/A	AV073-10
1.5-2.0	15	N/A	AV073-15
2.0-4.0	20	N/A	AV074-20
2.0-8.0	20	N/A	AV074F-20
3.6-4.3	30	N/A	AV07C1-30
4.0-8.0	30	N/A	AV075-30
4.0-12.4	30	N/A	AV075G-30
8.0-12.4	40	N/A	AV076-40
8.0-18.0	40	N/A	AV076H-40

Attenuator Drive Options



Motor Drive



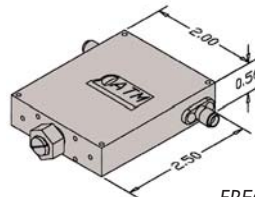
Knob Control



Turns Counting Dial



Direct Reading (calibrated in dB)



08 SERIES FREQUENCY FLAT MODELS



Freq (GHz)	Atten Range (dB)	Flatness (+/- db)	Model No.
0.7-0.8	10	0.75	AF082L2-10
0.8-1.0	15	1.5	AF082L1-15
0.8-1.0	20	1.5	AF082L1-20
0.95-1.45	15	1.7	AF083L1-15
1.5-2.0	20	1.5	AF083L2-20
2.0-4.0	20	1.5	AF084-20
2.8-6.5	20	1.5	AF084F-20
3.4-4.2	20	1.0	AF085C3-20
3.6-6.5	30	1.2	AF085C-30
3.6-4.3	30	0.7	AF085C1-30
5.8-6.5	30	0.7	AF085C2-30
4.0-8.0	20	1.0	AF085-20
7.2-8.4	30	0.7	AF085X-30
8.0-12.4	20	1.0	AF086-20
10.7-12.7	30	1.0	AF086X-30
10.7-14.5	30	1.5	AF086K-30
12.4-18.0	20	1.0	AF087-20

LEVEL ADJUST MODELS

0.7-1.0	10	N/A	AV082-10
0.8-1.6	15	N/A	AV083L-15
0.9-1.75	15	N/A	AV083-15B
1.0-2.0	20	N/A	AV083-20
2.0-4.2	20	N/A	AV084-20
4.0-8.0	30	N/A	AV085-30
7.9-12.7	30	N/A	AV086-30
11.7-18.0	30	N/A	AV087-30

MULTIBAND MODELS

0.9-8.0	20	N/A	AV083F-20
1.0-4.0	20	N/A	AV083E-20
1.0-8.0	30	N/A	AV083F-30
2.0-18.0	10	N/A	AV084H-10
4.0-18.0	20	N/A	AV085H-20
6.0-18.0	60	N/A	AV086H-60

GENERAL SPECIFICATIONS FOR ALL UNITS

- RF CONN: SMA female
- INS LOSS: 0.5dB max
- VSWR: 1.5 max
- RF POWER*: 5 W avg, 3 Kw peak
- ATTEN RGE: Many other models to 60dB

*Higher Power Models Available - Contact Factory

ATTENUATOR DRIVE OPTIONS

Our Standard is a Screw Driver Shaft with a Lock Nut
The Part Number begins with AVO or AFO

For a Knob Control Option change the AVO
or the AFO in the P/N to AV9 or AF9

Example: AF064-10 = AF964-10

For a Turns Counting Dial Option use AV8 or AF8

For a Direct Reading Tape Drive Option use
AF7 for Full Frequency Range Calibration or
AV7 for Single Frequency Calibration

(Specify Spot Frequency with Order)

For 28 Volt Motor Drive add -28 to the Model Number

PHASE SHIFTERS

Mechanical Adjustment with Screw Driver Shaft and Lock.
For Digital Counting Dial add "D" suffix to the Model Number
Phase Shift is linear with frequency and continuously variable.

RF Power: 100 Watt Average
3 KW Peak
RF Connectors: SMA Female or Type N Female



P150 and P250 series

Standard Size
5.5" X 2" X 1"

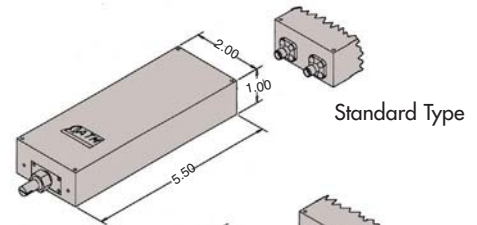
Model No.* (SMA)	Model No.* (Type N)	Freq (GHz)	Phase Adjust (min)	I.L. (dB max)	VSWR (max)
P1503	P2503	DC-2.3	60°/GHz	0.5	1.5
P1504	P2504	DC-4.3	60°/GHz	0.5	1.5
P1505	P2505	DC-8.2	60°/GHz	0.6	1.5
P1506	P2506	DC-12.7	60°/GHz	0.7	1.5
P1507	P2507	DC-18.6	60°/GHz	1.0	1.6

SATCOM MODELS

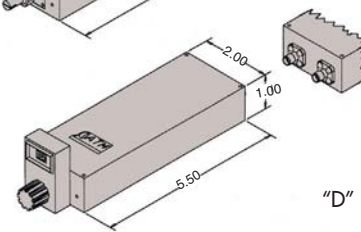
P150C-180	P250C-180	5.85-6.5	0-180	0.6	1.5
P150C-360	P250C-360	5.85-6.5	0-360	0.6	1.5
P150X-180	P250X-180	7.9-8.4	0-180	0.7	1.5
P150X-360	P250X-360	7.9-8.4	0-360	0.7	1.5
P150K-180	P250K-180	12.0-14.5	0-180	1.0	1.6
P150K-360	P250K-360	12.0-14.5	0-360	1.0	1.6
P150CK-180	P250CK-180	5.85-14.5	0-180	**	**
P150CK-360	P250CK-360	5.85-14.5	0-360	**	**
P1508-360	N/A	18.0-26.5	0-360	1.5	1.8
P1509-360	N/A	26.5-40	0-360	2.5	2.0

**See above P/N's For specifications in each band

* For a Digital Counting Dial add "D" suffix to model number



Standard Type



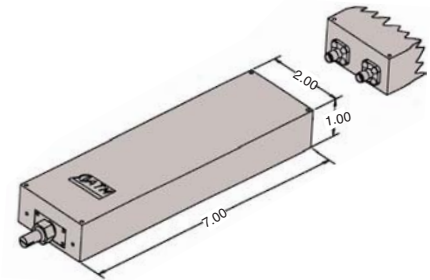
"D" Option

P160 and P260 series

Standard Size
7" X 2" X 1"

Model No.* (SMA)	Model No.* (Type N)	Freq (GHz)	Phase Adjust (min)	I.L. (dB max)	VSWR (max)
P1603	P2603	DC-2.3	90°/GHz	0.5	1.5
P1604	P2604	DC-4.3	90°/GHz	0.5	1.5
P1605	P2605	DC-8.2	90°/GHz	0.6	1.5
P1606	P2606	DC-12.7	90°/GHz	0.7	1.5
P1607	P2607	DC-18.6	90°/GHz	1.0	1.6

* For a Digital Counting Dial add "D" suffix to model number



series

P1210, P2210, P1100 and P2100

Standard Size
180° 12" X 2" X 1"
360° 24" X 3" X 1.2"

Model No.* (SMA)	Model No.* (Type N)	Freq (GHz)	Phase Adjust (min)	I.L. (dB max)	VSWR (max)
P1213	P2213	DC-2.3	180°/GHz	0.6	1.3
P1214	P2214	DC-4.3	180°/GHz	0.7	1.5
P1102	P2102	DC-1.0	360°/GHz	0.5	1.3
P1103	P2103	DC-2.5	360°/GHz	0.8	1.5

* For a Digital Counting Dial add "D" suffix to model number

Phase Shifter Drive Options

Standard Models are supplied with lock nut & Knob
For Digital Counting Dial add "D" suffix to Model number
For Direct Reading Dial add "DRE" suffix to Model number
For 28 Volt Motor Driver add-28 to the Model number

Phase Shifter Drive Options



Standard Type



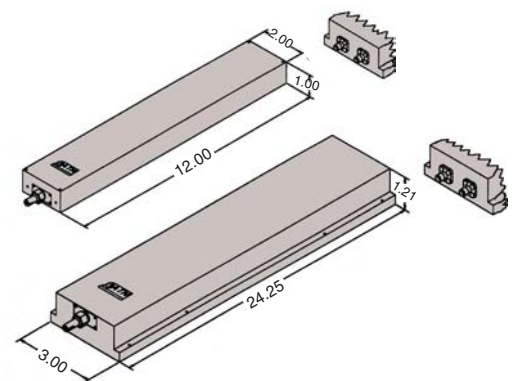
Digital Counting Dial



Direct Reading



Motor Drive



2WAY - 4WAY - 8WAY POWER DIVIDERS & COMBINERS

Stripline Construction
Connectors SMA and Type N
Compact and Lightweight
RF Power 30 Watt with all
ports matched



OCTAVE BAND - 2 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.5-1.0	22	1.25	1.15	0.40	P212	P222
1.0-2.0	20	1.25	1.15	0.35	P213	P223
2.0-4.0	20	1.30	1.20	0.40	P214	P224
4.0-8.0	20	1.35	1.25	0.50	P215	P225
8.0-12.4	20	1.35	1.30	0.50	P216	**
12.0-18.0	19	1.40	1.35	0.60	P217	**

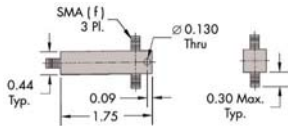
MULTIBAND MODELS 2 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.5-4.0	20	1.3	1.2	0.50	P212E	**
0.8-2.4	20	1.25	1.2	0.35	P212D	P222D
2.0-8.0	20	1.35	1.35	0.40	P214F	P224F
2.0-18.0	18	1.4	1.4	1.00	P214H	**
6.0-18	19	1.4	1.35	0.60	P215H	P225H

SATCOM & SPECIAL BAND 2 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.85-1.65	22	1.25	1.20	0.40	P213L	P223L
3.65-6.5	20	1.35	1.25	0.40	P215C	P225C
3.65-4.3	22	1.25	1.20	0.40	P215C1	P225C1
5.85-6.5	22	1.25	1.20	0.40	P215C2	P225C2
7.2-8.4	20	1.35	1.30	0.50	P215X	P225X
7.2-7.75	20	1.30	1.30	0.50	P215X1	P225X1
7.9-8.4	20	1.30	1.30	0.50	P215X2	P225X2
10.7-12.7	20	1.40	1.35	0.60	P216X-1	P226X-1
10.7-14.5	18	1.45	1.40	0.60	P216K-1	P226K-1
13.7-14.5	20	1.40	1.35	0.60	P217K-1	P227K-1
13.5-21.5	15	1.70	1.70	0.60	P218	N/A

ULTRA WIDE BAND 2 WAY MODELS



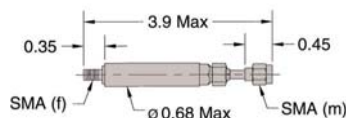
Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.5-18		Specs In Table Below			—	P223HT
0.5-20		Specs In Table Below			P213HT	N/A

ULTRA WIDE BAND 2 WAY MODELS SPECS

Freq. Range (GHz)	Insertion Loss (dB Max)	Isolation (dB Min.)	VSWR In (Max.)	VSWR Out (Max.)	Phase Balance (Deg. Max)	Amplitude Balance (dB Max)	Input Power (W Max.)
0.5-1	0.70	6	2.00:1	2.00:1	1	0.20	10
1-1.5	0.50	10	1.70:1	1.50:1	1	0.20	10
1.5-2	0.50	15	1.60:1	1.40:1	1	0.20	10
2-4	0.40	20	1.50:1	1.30:1	1	0.20	10
4-8	0.50	17	1.50:1	1.40:1	1.5	0.20	10
8-15	0.80	15	1.70:1	1.50:1	2	0.30	10
15-16	0.80	15	1.70:1	1.60:1	3	0.30	10
16-18	0.90	14	1.80:1	1.90:1	4	0.40	10
18-20	1.10	7	2.00:1	2.00:1	4	0.40	10

LINE STRETCHERS

50 Ohms
SMA M/F
0.5 Inch Travel
Locking Device Included



Model No. (SMA)	Freq. (GHz)	Phase Adjust (min)	I.L. (dB max)	VSWR (max)
P1903	DC-2.3	15°/GHz	0.5	1.5
P1904	DC-4.3	15°/GHz	0.5	1.5
P1905	DC-8.2	15°/GHz	0.6	1.5
P1906	DC-12.7	15°/GHz	0.7	1.5
P1907	DC-18.6	15°/GHz	1.0	1.6

OCTAVE & WIDE BAND 4 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.5-1.0	22	1.45	1.30	0.90	P412	P422
1.0-2.0	20	1.40	1.25	0.80	P413	P423
2.0-4.0	20	1.35	1.35	0.60	P414	P424
4.0-8.0	20	1.45	1.35	0.60	P415	P425
8.0-12.4	18	1.45	1.35	0.80	P416	**
12.0-18.0	18	1.50	1.40	0.90	P417	**
0.5-4.0	15	1.50	1.40	1.00	P412E	**
2.0-18.0	15	1.60	1.40	2.00	P414H	**
6.0-18.0	18	1.60	1.40	0.90	P415H	**

SATCOM & SPECIAL BAND 4 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.85-1.65	22	1.25	1.20	0.40	P413L	P423L
3.65-6.5	20	1.35	1.25	0.40	P415C	P425C
3.65-4.3	22	1.25	1.20	0.40	P415C1	P425C1
5.85-6.5	22	1.25	1.20	0.40	P415C2	P425C2
7.2-8.4	20	1.35	1.30	0.50	P415X	P425X
7.2-7.75	20	1.30	1.30	0.50	P415X1	P425X1
7.9-8.4	20	1.30	1.30	0.50	P415X2	P425X2
10.7-12.7	20	1.40	1.35	0.60	P416X-1	P426X-1
10.7-14.5	18	1.45	1.40	0.60	P416K-1	P426K-1
13.7-14.5	20	1.40	1.35	0.60	P417K-1	P427K-1

OCTAVE & WIDE BAND 8 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.5-1.0	18	1.45	1.30	0.90	P812	P822
1.0-2.0	18	1.45	1.35	0.80	P813	P823
2.0-4.0	18	1.45	1.35	0.80	P814	P824
4.0-8.0	17	1.45	1.40	1.0	P815	P825
8.0-12.4	16	1.60	1.50	1.4	P816	**
12.0-18.0	15	1.60	1.50	2.0	P817	**
8.0-18.0	15	1.60	1.50	2.0	P815H	**

SATCOM & SPECIAL BAND 8 WAY MODELS

Freq (GHz)	Isolation (dB min)	VSWR Max* In	VSWR Max* Out	Insertion Loss (dB)	Model No. (SMA)	Model No. (Type N)
0.85-1.65	18	1.45	1.40	0.8	P813L	P823L
3.65-6.5	17	1.45	1.45	0.8	P815C	P825C
3.65-4.3	18	1.40	1.40	0.8	P815C1	P825C1
5.85-6.5	18	1.45	1.40	0.8	P815C2	P825C2
7.2-8.4	16	1.45	1.40	0.9	P815X	P825X
7.2-7.75	16	1.45	1.40	0.9	P815X1	P825X1
7.9-8.4	16	1.45	1.40	0.9	P815X2	P825X2
10.7-12.7	17	1.45	1.40	1.0	P816X-1	P826X-1
10.7-14.5	17	1.45	1.40	1.0	P816K-1	P826K-1
13.7-14.5	17	1.45	1.40	1.0	P817K-1	P827K-1

* Type N Models are .05 higher in VSWR than SMA Models

**Type N Units available in narrower bands

90° HYBRID 3dB

The Hybrid Directional Coupler splits power equally between its two output ports. The two outputs are 90 degrees out of phase with each other. Stripline in aluminum housing

Connectors: SMA, or Type N, 4 ports

Figure	A	B	C	D	E	F
1	3.06	0.50	0.84	1.370	2.56	0.38
2	1.78	0.50	0.64	0.500	1.28	0.38
3	1.15	0.50	0.314	0.58	0.66	0.38
4	1.00	0.50	0.314	0.50	0.50	0.38
5	1.00	0.58	0.392	0.50	0.50	0.38
6	8.50	0.72	0.65	7.20	8.00	0.50
7	6.50	0.72	0.65	5.20	6.00	0.50
8	2.60	0.75	0.67	1.260	2.03	0.44
9	1.72	0.60	0.61	0.500	1.22	0.50

SMA FEMALE CONN. (4) PLACES

*Type NF Conn. = 0.95"

**2 Mounting Holes 0.105 Dia. Thru

SMA FEMALE CONN. (4) PLACES

**2 Mounting Holes 0.105 Dia. Thru

OCTAVE BAND MODELS

RF Power 50W Avg 2kW peak

Freq (GHz)	VSWR (max)	ISO (dB min)	Coupling Limits (dB)	Model No. (SMA)	Model No. (Type N)	Figure
0.5-1.0	1.10	28	3.1±0.6	H912	H922	1
1.0-2.0	1.10	28	3.1±0.6	H913	H923	2
2.0-4.0	1.20	22	3.1±0.6	H914	N/A	3
2.6-5.2	1.25	20	3.1±0.6	H914K	N/A	4
4.0-8.0	1.25	18	3.2±0.7	H915	N/A	4
6.0-12.4	1.30	18	3.2±0.7	H916	N/A	4
7.6-16.0	1.40	15	3.4±0.9	H916H	N/A	5
12.0-18.0	1.45	15	3.4±1.0	H917	N/A	5

BROADBAND MODELS

RF Power 30W Avg 2kW peak

Freq (GHz)	VSWR (max)	ISO (dB min)	Coupling Limits (dB)	Model No. (SMA)	Model No. (Type N)	Figure
0.5-2.0	1.30	15	3.3±0.8	H912D	H922D	6
0.8-2.5	1.30	15	3.3±0.8	H912E	H922E	7
2.0-8.0	1.30	17	3.3±0.8	H914F	H924F	8
4.0-12.4	1.35	17	3.3±0.8	H915G	H925G	9
7.0-18.0	1.50	13	3.4±1.0	H915H	H925H	9

DIRECTIONAL COUPLERS

Design: Stripline
RF Power: 50 Watt average
3 KW peak
Standard Coupling: 10, 20, and 30dB
Coupling Flatness: ± 1.0 dB full band
RF Connectors: SMA and Type N.



OCTAVE BAND MODELS

Freq (GHz)	VSWR Thru	Max** Coup	Directivity (dB min)	I. L.† (dB)	Model No. (SMA)	Model No. (Type N)
0.5-1.0	1.10	1.10	25	0.2	C112-*	C212-*
1 - 2	1.10	1.10	25	0.2	C113-*	C213-*
2 - 4	1.15	1.15	22	0.2	C114-*	C214-*
2.6-5.2	1.25	1.25	20	0.2	C114F-*	C214F-*
4 - 8	1.25	1.25	20	0.25	C115-*	C215-*
7 -12.4	1.30	1.30	17	0.3	C116-*	C216-*
7.5-16	1.35	1.40	15	0.5	C116H-*	C216H-*
12.4-18	1.30	1.40	15	0.5	C117-*	C217-*

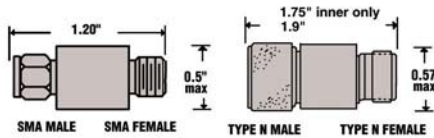
MULTIBAND MODELS

0.5-2.0	1.20	1.20	23	0.4	C122D-*	C222D-*
0.6-3.0	1.20	1.20	23	0.4	C123E-*	C222E-*
1 - 4	1.20	1.20	23	0.4	C123E-*	C223E-*
2 - 8	1.25	1.25	20	0.4	C124F-*	C224F-*
4 - 12.4	1.25	1.25	17	0.5	C125G-*	C225G-*
6 - 18	1.35	1.35	15	0.7	C126H-*	C226H-*
1 - 18	1.40	1.50	15	0.9	C123H-*	C223H-*
4 - 18	1.35	1.40	18	0.6	C125H-*	C225H-*

* Add coupling in dB. Example C115-20. † Insertion loss excludes coupling loss
** Type N models are spec .05 higher in VSWR than SMA models

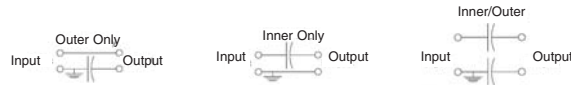
DC BLOCKS

Inner, Outer, Inner/Outer



Specifications

Freq. Rge: 10 MHz - 18 GHz
VSWR: 1.35 max
Blocking Volt: 200 volts
Ins. Loss: 0.5 dB max



Block Type	SMA Model	Type N Model
Outer Block:	P/N B120H	P/N B150H
Inner Block:	P/N B220H	P/N B250H
Outer/Inner Block:	P/N B320H	P/N B350H

FIXED ATTENUATORS

Standard Values are 3, 6, 10 and 20dB
Other Values, 1 thru 30dB, are available



Freq Rge (GHz)	RF Power (CW)	VSWR (max)	Model No. (SMA M/F)	Model No. (Type N M/F)
DC-6.5	2	1.2	2105-dB	2205-dB
DC-12.4	2	1.25	2106-dB	2206-dB
DC-18.0	2	1.35	2107-dB	2207-dB
DC-26.0	2	1.40	2108-dB*	N/A
DC-40.0	2	1.4	2109-dB*	N/A
DC-6.5	5	1.2	0515-dB	0525-dB
DC-18.0	5	1.35	0517-dB	0527-dB
DC-6.5	10	1.25	1015-dB	1025-dB
DC-18.0	10	1.40	1017-dB	1027-dB
DC-6.5	25	1.20	2515-dB	2525-dB
DC-18.0	25	1.4	2517-dB	2527-dB
DC-6.5	50	1.3	5015-dB	5025-dB
DC-18.0	50	1.45	5017-dB	5027-dB

*Unit available with 2.9mm connector only.

HIGH POWER DIRECTIONAL COUPLERS

Design: Stripline
RF Power: 200 Watt average
3 KW peak
Standard Coupling: 10, 20, and 30dB
Coupling Flatness: ± 1.0 dB full band
RF Connectors: SMA and Type N.

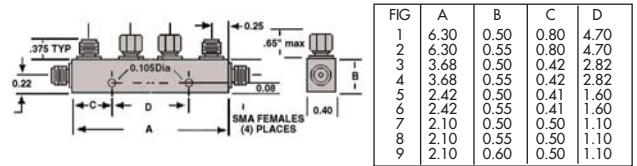


OCTAVE BAND MODELS

Freq (GHz)	VSWR Thru	Max** Coup	Directivity (dB min)	I. L.† (dB)	Model No. (SMA)	Model No. (Type N)
0.5-1.0	1.10	1.10	25	0.2	CH112-*	CH212-*
1 - 2	1.10	1.10	25	0.2	CH113-*	CH213-*
2 - 4	1.15	1.15	22	0.2	CH114-*	CH214-*
2.6-5.2	1.25	1.25	20	0.2	CH114F-*	CH214F-*
4 - 8	1.25	1.25	20	0.25	CH115-*	CH215-*

* Add coupling in dB. Example CH115-20. † Insertion loss excludes coupling loss
** Type N models are spec .05 higher in VSWR than SMA models

DUAL DIRECTIONAL COUPLERS



Model No.	Freq. Rge GHz	Coupling ± 0.5 (dB)	Freq. Sens. \pm (dB)	Ins. Loss (dB) max.*	Directivity (dB) min.	VSWR max Main Sec.	FIG
C132-10		10					1
C132-20	0.5-1.0	20	0.75	0.20	22	1.15 1.10	1
C132-30		30					2
C133-10		10					3
C133-20	1.0-2.0	20	0.75	0.25	22	1.15 1.10	3
C133-30		30					4
C134-10		10		0.40			5
C134-20	2.0-4.0	20	0.75	0.30	20	1.20 1.15	5
C134-30		30		0.30			6
C134F-10		10					7
C134F-20	2.6-5.2	20	0.75	0.20	18	1.35 1.25	7
C134F-30		30					8
C135-10		10					7
C135-20	4.0-8.0	20	0.75	0.25	18	1.35 1.25	7
C135-30		30					8
C136-10		10		0.40			7
C136-20	7.0-12.4	20	0.50	0.30	16	1.35 1.30	7
C136-30		30		0.30			8
C136H-10		10		0.60			7
C136H-20	10.0-16.0	20	0.75	0.50	15	1.40 1.40	9
C136H-30		30		0.50			9
C137-20	12.4-18.0	20	0.60	0.50	15	1.40 1.40	9
C137-30		30		0.50			9

* Excluding Coupled Loss Power

COAXIAL TERMINATIONS



Freq. (GHz)	RF Power (watts)	VSWR (max)	Model No. (SMA-m)	Model No. (Type N-m)
DC-18.0	1	1.15	T0117	N/A
DC-18.0	2	1.25	T0217	T0227
DC-40.0	2	1.20	T02K9*	N/A
DC-8.0	5	1.20	T0515	T0525
DC-18.0	5	1.25	T0517	T0527
DC-8.0	10	1.20	T1015	T1025
DC-18.0	10	1.35	T1017	T1027
DC-8.0	25	1.20	T2515	T2525
DC-18.0	25	1.35	T2517	T2527
DC-8.0	50	1.25	T5015	T5025
DC-18.0	50	1.25	T5017	T5027
DC-8.0	100	1.35	T10015	T10025

*Unit available with 2.9mm connector only.



0.5-18 GHz PIN DIODE SWITCHES SP1T — SP2T — SP3T — SP4T

SP1T reflective

SP2T reflective

SP3T reflective

SP4T reflective

Model No.	S1517D	S2317D	S3317D	S4317D
Frequency	0.5-18.0 GHz	0.5-18.0 GHz	0.5-18.0 GHz	0.5-18.0 GHz
Insertion Loss	2.5 dB	2.5 dB	3.0 dB	3.0 dB
Isolation	80 dB, 2-18.0 GHz, 37 dB 5-2.0 GHz	60 dB	55 dB	55 dB
VSWR input	1.8:1 max	2.0:1 max	2.0:1 max	2.0:1 max
VSWR output	1.8:1 max	2.0:1 max	2.0:1 max	2.0:1 max
Switching speed (off-on)	20 ns max (50% TTL to 90% RF)	250 ns max (50% TTL to 10% RF)	250 ns max (50% TTL to 10% RF)	250 ns max (50% TTL to 10% RF)
Switching speed (on-off)	20 ns max (50% TTL to 90% RF)	250 ns max (50% TTL to 10% RF)	250 ns max (50% TTL to 10% RF)	250 ns max (50% TTL to 10% RF)
Control logic TTL	1 line, logic 1 path on	2 line, logic 1 path on	3 line, logic 1 path on	4 line, logic 1 path on
DC Power	+15VDC at 40 mA, -15VDC at 40 mA	+5VDC at 40 mA, -15VDC at 40 mA	+5VDC at 60 mA, -15VDC at 40 mA	+5VDC at 150 mA, -15VDC at 50 mA
RF Power	+10 dBm spec compliant, +30 dBm survival (CW)	+10 dBm spec compliant +30 dBm survival (CW)	+10 dBm spec compliant +30 dBm survival (CW)	+10 dBm spec compliant +38 dBm survival (CW)
Peak Power	75 Watt, 1 μ s pulse width	75 Watt, 1 μ s pulse width	75 Watt, 1 μ s pulse width	75 Watt, 1 μ s pulse width

ELECTRO/MECHANICAL SINGLE POLE DOUBLE THROW SWITCHES



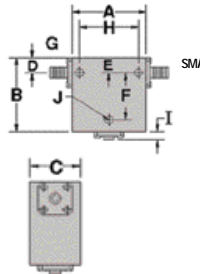
Model S2810H Specifications

Operating freq. (GHz):	DC-3	3 - 8	8 - 12	12.4 - 18	18 - 22
VSWR (maximum):	1.2:1	1.3:1	1.4:1	1.5:1	1.6:1
Insertion Loss (max):	0.2 dB	0.3 dB	0.4 dB	0.5 dB	0.6 dB
Isolation (min.):	80 dB	70 dB	60 dB	60 dB	55 dB
Actuating voltage:	24-30 VDC (28 VDC nominal)				
Actuating current:	160 mA maximum at 28 VDC and 72 F				
Impedance:	50 ohms				
Switching time:	15 ms maximum				
*Operating mode:	Failsafe				
Operating Temp:	-35 °C to +85 °C				
Operating life:	1,000,000 cycles				

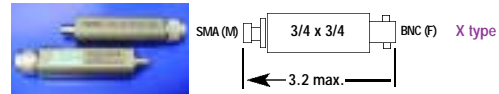
For Latching Type with Contacts add /L/C after Part Number Ex: S2810H=S2810H/L/C
SMA Female Standard

CIRCULATOR / ISOLATOR

Outline Number	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F	Dim. G	Dim. H	Dim. I	Dim. J
1	2.60	2.60	0.75	0.28	0.37	2.00	0.30	2.00	.17	4-40 x .15
2	1.62	1.72	0.69	0.35	0.35	1.25	0.12	1.38	.17	4-40 x .15
3	1.25	1.25	0.70	0.25	0.25	0.80	.125	1.00	.17	2-56 x .14
4	1.00	1.00	0.50	0.25	0.25	-	.09	0.82	.17	2-56 x .13
5	0.75	0.75	0.50	0.25	0.25	-	.062	.625	.17	2-56 x .13
6	0.50	0.50	.375	0.19	0.19	-	.08	0.34	.17	0-80 x .10
7	0.50	0.62	0.50	0.25	0.19	-	.08	0.34	.17	0-80 x .13

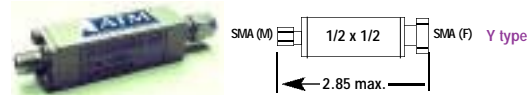


MICROWAVE NOISE GENERATORS



15.5 dB Noise Figure Meter Compatible Noise Sources

Model No.	Freq (GHz)	Noise Output (ENR -dB)	VSWR(max) ON/OFF	Calibration Frequencies
NX1512X	1-2	15.5 +/-0.5	1.20:1	1, 1.5, 2 GHz
NX1524X	2-4	15.5 +/-0.5	1.20:1	
NX1548X	4-8	15.5 +/-0.5	1.20:1	
NX15812X	8-12	15.5 +/-0.5	1.35:1	
NX151218X	12-18	15.5 +/-0.5	1.35:1	1 GHz steps



High Noise Output Noise Sources

Model No.	Freq (GHz)	Noise Output (ENR -dB)	Flatness dB	Calibration Frequencies
NX3212Y	1-2	30-35	\pm 1	1, 1.5, 2 GHz
NX3224Y	2-4	30-35	\pm 1	
NX3248Y	4-8	30-35	\pm 1	
NX32812Y	8-12	28-33	\pm 1	
NX321218Y	12-18	28-33	\pm 1	1 GHz steps

Frequency GHz	ISO (dB)		Loss(dB)		VSWR		Power (Watts)			Model Number		Outline No.
	typ.	Min.	Typ.	Max.	Typ.	Max.	PK	CW	CW	Circulator	Isolator	
1.0-2.0	20	17	0.35	0.5	1.25	1.35	100	25	1	ATc1-2	ATI1-2	1
2.0-4.0	20	18	0.35	0.5	1.25	1.30	200	50	1	ATc2-4	ATI2-4	2
2.6-5.2	20	18	0.35	0.5	1.25	1.30	300	50	1	ATc2.6-5.2	ATI2.6-5.2	3
3.0-6.0	20	18	0.35	0.5	1.25	1.30	400	50	1	ATc3-6	ATI3-6	3
4.0-8.0	20	18	0.35	0.5	1.25	1.30	400	50	1	ATc4-8	ATI4-8	4
5.0-10.0	20	18	0.35	0.5	1.25	1.30	400	50	1	ATc5-10	ATI5-10	4
6.0-12.0	20	18	0.40	0.6	1.25	1.30	500	50	1	ATc6-12	ATI6-12	5
6.2-18.0	13	12	0.80	1.0	1.56	1.67	200	60	1	ATc6.2-18	ATI6.2-18	6
8.0-12.4	20	18	0.40	0.5	1.25	1.30	200	60	1	ATc8-12.4	ATI8-12.4	7
8.0-18.0	16	14	0.60	0.7	1.40	1.50	200	60	1	ATc8-18	ATI8-18	7
12.0-18.0	20	18	0.50	0.6	1.25	1.30	200	60	1	ATc12-18	ATI12-18	7

Note: ATM Standard Parts come with SMA Female Connectors In and Out
For Male In and Female Out use M/F after Part Number
For Female In and Male Out use F/M after Part Number
Example: ATc1-2/M/F

OPTIONS:
1. X or Y housing may be selected for either series by changing of a model no. suffix
2. For other packages or connectors consult factory
3. Output between 6 dB and listed high output levels of ENRare available on special order

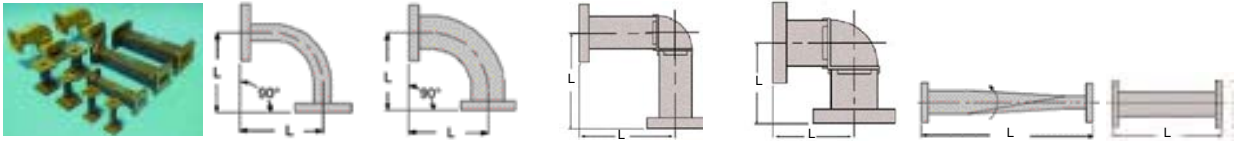
Specifications
Input power +28VDC at 20 mA max

WAVEGUIDE ASSEMBLIES: STRAIGHT SECTIONS, BENDS, MITERS AND TWISTS

Bends of 30, 45, 60, 90 degrees available
 Mitered Bends available for tight bend requirements
 90 Degree Twists Clockwise are standard.
 Other Angles and Counter Clockwise Twists are available.

Rectangular Waveguide sizes include WR22 through WR650
 Double Ridge Waveguide sizes are: WRD750, WRD650,
 WRD580, WRD475, WRD180, WRD110

*Model Numbers are constructed as follows:
 WR#-Model#-Length, Inches-Material-Flange-Flange
Example: 90° E BEND: 284-510A-8x8-6-6
 Material Code: A - Aluminum, C - Copper
 Flange Code: 1=CPRG, 2=CPRF, 6=Cover, 7=Choke
 For Double Ridge: C3=Cover, G3=Grooved



WG Size	Freq GHz	90 Degree E Bend	90 Degree H Bend	90 Degree E Miter Bend	90 Degree H Miter Bend	90 Degree Twist	Straight Sections
WR650	1.00 - 1.70	650-500A-10x10-2-2	650-510A-12x12-2-2	650-520A-4x4-2-2	650-530A-5x5-2-2	650-340A-24-2-2	650-120A-12-2-2
WR430	1.70 - 2.60	430-500A-8x8-2-2	430-510A-10x10-2-2	430-520A-3x3-2-2	430-530A-4x4-2-2	430-340A-16-2-2	430-120A-12-2-2
WR340	2.20 - 3.30	340-500A-8x8-2-2	340-510A-10x10-2-2	N/A	N/A	340-340A-15-2-2	340-120A-12-2-2
WR284	2.60 - 3.95	284-500A-6x6-6-6	284-510A-6x6-6-6	284-520A-4x4-6-6	284-530A-3.75x3.75-6-6	284-340A-12-6-6	284-120A-10-6-6
WR229	3.30 - 4.90	229-500B-4x4-2-2	229-510B-4x4-2-2	229-520B-3x3-2-2	229-530B-2.21x2.21-2-2	229-340B-12-2-2	229-120B-6-2-2
WR187	3.95 - 5.85	187-500A-3x3-6-6	187-510A-3x3-6-6	187-520A-3x3-6-6	187-530A-1.87x1.87-6-6	187-340A-8-6-6	187-120A-6-6-6
WR159	4.09 - 7.05	159-500B-2.5x2.5-2-2	159-510B-2.5x2.5-2-2	159-520B-3x3-2-2	159-530B-1.75x1.75-2-2	159-340B-6-2-2	159-120B-6-2-2
WR137	5.85 - 8.20	137-500B-2.5x2.5-2-2	137-510B-2.5x2.5-2-2	137-520B-3x3-2-2	137-530B-1.82x1.82-2-2	137-340B-6-2-2	137-120B-6-2-2
WR112	7.05 - 10.0	112-500B-2x2-6-6	112-510B-2x2-6-6	112-520B-2x2-6-6	112-530B-1.6x1.6-6-6	112-340B-6-6-6	112-120B-6-6-6
WR102	7.00 - 11.0	102-500A-2x2-6-6	102-510A-2x2-6-6	102-520A-2x2-6-6	102-530A-1.47x1.47-6-6	102-340A-6-6-6	102-120A-6-6-6
WR90	8.20 - 12.4	90-500A-2x2-6-6	90-510A-2x2-6-6	90-520A-2x2-6-6	90-530A-1.34x1.34-6-6	90-340A-5-6-6	90-120A-6-6-6
WR75	10.0 - 15.0	75-500B-1.75x1.75-6-6	75-510B-1.75x1.75-6-6	75-520B-2x2-6-6	75-530B-1.16x1.16-6-6	75-340B-4-6-6	75-120B-6-6-6
WR62	12.4 - 18.0	62-500B-1.75x1.75-6-6	62-510B-1.75x1.75-6-6	62-520B-1.5x1.5-6-6	62-530B-.88x.88-6-6	62-340B-4-6-6	62-120B-6-6-6
WR51	15.0 - 22.0	51-500B-1.5x1.5-6-6	51-510B-1.5x1.5-6-6	51-520B-1.5x1.5-6-6	51-530B-.95x.95-6-6	51-340B-4-6-6	51-120B-6-6-6
WR42	18.0 - 26.5	42-500B-1x1-6-6	42-510B-1x1-6-6	42-520B-1x1-6-6	42-530B-.77x.77-6-6	42-340B-3-6-6	42-120B-3-6-6
WR34	22.0 - 33.0	34-500B-1x1-6-6	34-510B-1x1-6-6	N/A	N/A	34-340B-3-6-6	34-120B-3-6-6
WR28	26.5 - 40.0	28-500B-1x1-6-6	28-510B-1x1-6-6	28-520B-1x1-6-6	28-530B-.77x.77-6-6	28-340B-3-6-6	28-120B-3-6-6

FLEXIBLE WAVEGUIDE

Standard lengths are 1, 2, & 3 feet
 Neoprene Rubber Jacket is standard
 on Flexible-Twistable Waveguide
 Flexible Non-Twistable Waveguide
 is supplied without jacket



Rectangular Waveguide Flex

WG Size	Freq (GHz)	Flex-Twist* w/ Jacket	Flexible* No Jacket
WR 284	2.60 - 3.95	284-125-L-6-7	284-124-L-6-7
WR 229	3.30 - 4.90	229-125-L-1-1	229-124-L-1-1
WR 187	3.95 - 5.85	187-125-L-6-7	187-124-L-6-7
WR 159	4.90 - 7.05	159-125-L-1-1	159-124-L-1-1
WR 137	5.85 - 8.20	137-125-L-1-1	137-124-L-1-1
WR 112	7.05 - 10.0	112-125-L-6-7	112-124-L-6-7
WR 90	8.20 - 12.4	90-125-L-6-7	90-124-L-6-7
WR 75	10.0 - 15.0	75-125-L-6-7	75-124-L-6-7
WR 62	12.4 - 18.0	62-125-L-6-7	62-124-L-6-7
WR 51	15.0 - 22.0	51-125-L-6-7	51-124-L-6-7
WR 42	18.0 - 26.5	42-125-L-6-7	42-124-L-6-7
WR 28	26.5 - 40.0	28-125-L-6-7	28-124-L-6-7

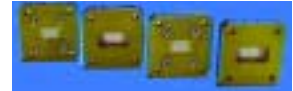
Double Ridge Waveguide Flex

WRD 750	7.50 - 18.0	750-124-L-6-6
WRD 475	4.75 - 11.0	475-124-L-6-6

Flange Code: 1=CPRG; 6=Cover; 7=Choke
 *Replace L in above P/Ns with required length.
Example: 112-125-Length Inches-Flange-Flange

WAVEGUIDE WINDOWS

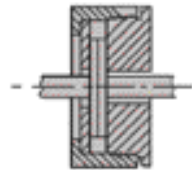
Teflon Fiberglass
 Copper Perimeters-Plated
 MIL Environment



WG Size (GHz)	Freq (max)	VSWR (KW-PK)	Power No.	Model
WR 284	2.60 - 3.95	1.06	2000	284-230-
WR 229	3.30 - 4.90	1.07	1800	229-230-
WR 187	3.95 - 5.85	1.06	1500	187-230-
WR 159	4.90 - 7.05	1.05	1000	159-230-
WR 137	5.85 - 8.20	1.07	750	137-230-
WR 112	7.05 - 10.0	1.10	500	112-230-
WR 90	8.20 - 12.4	1.10	300	90-230-
WR 75	10.0 - 15.0	1.09	200	75-230-
WR 62	12.4 - 18.0	1.08	150	62-230-
WR 51	15.0 - 22.0	1.10	100	51-230-
WR 42	18.0 - 26.5	1.12	75	42-230-
WR 34	22.0 - 33.0	1.13	60	34-230-
WR 28	26.5 - 40.0	1.18	45	28-230-

WAVEGUIDE QUICK DISCONNECT

Fast Waveguide Connection
 Easy Installation
 Connects Waveguide by several turns
 of a threaded ring
 Connects and Disconnects Waveguide
 without use of screws and nuts

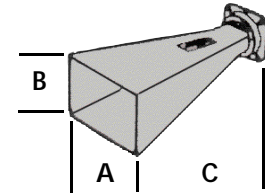


WG Size (WR)	Flanges Type	Model No.
137	CPR	QD-137
112	COVER/CHOKE	QD-112
90	COVER/CHOKE	QD-90
75	COVER/CHOKE	QD-75
42	COVER	QD-42
28	COVER	QD-28
(WRD)		
580	COVER	QD-580



Lightweight
Corrosion Protection
Low VSWR
Other gains, brackets, coax (SMA, N) connectors available

STANDARD GAIN HORN



WG Size (WR)	Freq (GHz)	Model No. (10dB Gain)	Model No. (15dB Gain)	Model No. (20dB Gain)	10dB Gain			15dB Gain			20dB Gain		
					C	B	A	C	B	A	C	B	A
WR 650	1.12 - 1.70	650-440-2	650-441-2	N/A	15.98	6.07	12.14	21.77	16.24	21.93	N/A	N/A	N/A
WR 430	1.70 - 2.60	430-440-2	430-441-2	430-442-2	10.5	4.00	8.00	14.50	10.75	14.50	40.5	16.0	22.0
WR 340	2.20 - 3.30	340-440-2	340-441-2	340-442-2	9.0	3.43	5.71	15.63	6.69	9.45	35.00	11.81	18.79
WR 284	2.60 - 3.95	284-440-6	284-441-6	284-442-6	7.50	3.46	4.33	15.34	5.83	7.96	29.75	10.67	15.57
WR 229	3.30 - 4.90	229-440-2	229-441-2	229-442-2	6.45	2.36	3.62	10.40	4.41	6.00	23.50	8.60	12.25
WR 187	3.95 - 5.85	187-440-6	187-441-6	187-442-6	5.50	2.12	2.89	9.40	3.57	4.88	13.136	6.30	8.51
WR 159	4.09 - 7.05	159-440-2	159-441-2	159-442-2	4.28	1.58	2.68	8.00	3.15	4.33	11.73	7.64	9.80
WR 137	5.85 - 8.20	137-440-2	137-441-2	137-442-2	3.15	1.48	2.02	6.51	2.50	3.42	12.19	4.57	6.26
WR 112	7.05 - 10.0	112-440-6	112-441-6	112-442-6	2.55	1.18	1.63	6.65	2.15	2.93	10.78	3.64	4.97
WR 102	7.00 - 11.0	102-440-6	102-441-6	102-442-6	3.00	1.14	1.58	6.00	2.23	3.04	11.13	3.94	5.57
WR 90	8.20 - 12.4	90-440-6	90-441-6	90-442-6	2.01	1.15	1.58	5.46	1.95	2.66	10.06	3.62	4.87
WR 75	10.0 - 15.0	75-440-6	75-441-6	75-442-6	1.94	0.92	1.26	4.69	1.33	2.25	8.00	2.98	3.88
WR 62	12.4 - 18.0	62-440-6	62-441-6	62-442-6	1.61	0.68	0.93	3.46	1.72	2.19	5.75	2.11	2.88
WR 51	15.0 - 22.0	51-440-6	51-441-6	51-442-6	1.43	0.56	0.77	2.84	1.00	1.36	4.88	1.93	2.51
WR 42	18.0 - 26.5	42-440-6	42-441-6	42-442-6	1.25	0.44	0.60	2.37	0.85	1.14	4.00	1.56	2.13
WR 34	22.0 - 33.0	34-440-6	34-441-6	34-442-6	1.13	0.39	0.53	2.12	0.70	0.95	3.56	1.29	1.76
WR 28	26.5 - 40.0	28-440-6	28-441-6	28-442-6	1.00	0.315	0.42	1.87	0.55	0.76	3.12	1.01	1.38



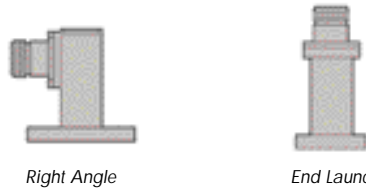
WAVEGUIDE TO COAX ADAPTERS

Full Waveguide Frequency Range
VSWR over Frequency Range 1.25 max.

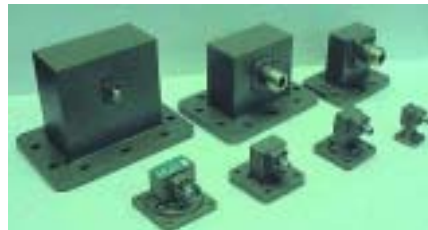
Rectangular Waveguide

* K connectors & Square Flange
Flange Code: 2=CPRF; 6=Cover

Example: 137-252-1
Other Flange Types Available

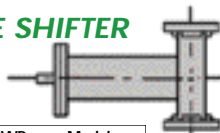


Waveguide Size	Freq (GHz)	Model No. (SMA)	Model No. (Type N)	Model No. (SMA)	Model No. (Type N)
WR 650	1.12 - 1.70	650-251-2	650-253-2	N/A	N/A
WR 430	1.70 - 2.60	430-251-2	430-253-2	N/A	N/A
WR 284	2.60 - 3.95	284-251-6	284-253-6	284-201-2	284-203-2
WR 229	3.30 - 4.90	229-251-2	229-253-2	229-201-2	229-203-2
WR 187	3.95 - 5.85	187-251-6	187-253-6	187-201-2	187-203-2
WR 159	4.90 - 7.05	159-251-2	159-253-2	159-201-2	159-203-2
WR 137	5.80 - 8.20	137-251-2	137-253-2	137-201-2	137-203-2
WR 112	7.05 - 10.0	112-251-6	112-253-6	112-201-2	112-203-2
WR 90	8.20 - 12.4	90-251-6	90-253-6	90-201-2	90-203-2
WR 75	10.0 - 15.0	75-251-6	75-253-6	75-201-2	75-203-2
WR 62	12.4 - 18.0	62-251-6	62-253-6	62-201-2	62-203-2
WR 51	15.0 - 22.0	51-251-6	N/A	N/A	N/A
WR 42	18.0 - 26.5	42-251-6	N/A	N/A	N/A
WR 34	22.0 - 33.0	34-251-6*	N/A	N/A	N/A
WR 28	26.5 - 40.0	28-25K-6*	N/A	N/A	N/A



WAVEGUIDE PHASE SHIFTER

Mechanical phase adjustment
Driver shaft and lock
Motor drive available



WG Size WR	Freq (GHz)	Min. Phase Adjust	VSWR Max	Model No.
159	5.90 - 6.40	360	1.15	159-410-2-2
137	5.90 - 6.40	360	1.15	137-410-2-2
112	7.90 - 6.40	360	1.15	112-410-6-6
75	14.0 - 14.5	360	1.15	75-410-2-2
62	14.0 - 14.5	360	1.15	62-410-6-6

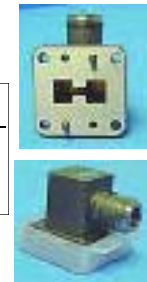
Flange Code: 2=CPRG; 6=Cover; 7=Choke

DOUBLE RIDGE WAVEGUIDE/COAX ADAPTERS

Waveguide Size	Freq (GHz)	Model No. (SMA)	Model No. (Type N)
WRD 750	7.50 - 18.0	750-251-C3	750-253-C3
WRD 650	6.50 - 18.0	650-251-C3	650-253-C3
WRD 580	5.80 - 16.0	580-251-C3	580-253-C3
WRD 475	4.75 - 11.0	475-251-C3	475-253-C3

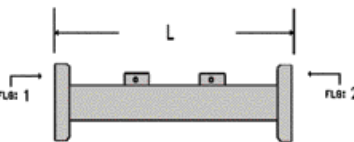
Flange Code: C3=Cover, G3 = Grooved (WRD)
Example: 580-253-G1

Other Flange Types Available



WAVEGUIDE FIXED ATTENUATORS

Description:
ATM offers a series of rectangular waveguide attenuators covering the waveguide sizes WR-28 through WR-650. The assembly construction includes a precision element for optimum electrical performance.

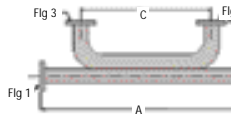


Ordering Information: Typical Part #: 137-600 B -10 -1 -1
Basic Model #: _____
Material: A=Alum, B=Brass
Attenuation: 3dB, 6dB, 10dB, 20dB, 30dB, 40dB
Flange 1: 1=CPRG, 2=CPRF, 6=Cover, 7=Choke, 8=Special
Flange 2: See above

Basic Model No.	WG Size	Freq (GHz)	Length Inches	Power Watt
284-600	WR284	2.60 - 3.95	10	11
229-600	WR229	3.30 - 4.90	9	9
187-600	WR187	3.95 - 5.85	8.5	7
159-600	WR159	4.90 - 7.05	8	5
137-600	WR137	5.95 - 8.20	6	4
112-600	WR112	7.05 - 10.0	5	3
90-600	WR90	8.20 - 12.4	4	2
75-600	WR75	10.0 - 15.0	3.5	1
62-600	WR62	12.4 - 18.0	3	1
51-600	WR51	15.0 - 22.0	3	1
42-600	WR42	18.0 - 26.5	3	1
34-600	WR34	22.0 - 33.0	3	1
28-600	WR28	26.5 - 40.0	3	1



BROADWALL DIRECTIONAL COUPLERS



Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Ideal for High Power Combiner/Divider
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating

Electrical Specifications:
 VSWR (MAX.) PRIMARY: 1.05 (1.10 for WR42, WR28)
 SECONDARY: 1.10 (1.15 for WR42, WR28)
 NOM. COUPLING (dB): ± .50 (± .75 for WR42, WR28)
 FREQ. SENS. (dB): ± .6 (± .75 for WR42, WR28)
 DIRECTIVITY (dB): 40 typical, 30 min.

Ordering Information: Typical Part #: 137-310 B -10 -1 -1 -1

Basic Model #:

Material: A=Alum, B=Brass, C=Copper, D=Special

Coupling (dB): 3, 6, 10, 20, 30, 40

Flange 1: 1=CPRG, 2=CPRF, 6=Cover, 7=Choke, 8=Special

Flange 2: See above

Flange 3: See above

Flange 4: See above

Basic Model No.	WG Size	Freq (GHz)	Dimension A (inches)	Dimension B (inches)	Dimension C (inches)
650-310	WR650	1.12 - 1.70	37	8.00	29.0
430-310	WR430	1.70 - 2.60	35	6.00	27.0
284-310	WR284	2.60 - 3.95	31	6.00	24.0
229-310	WR229	3.30 - 4.90	28	5.00	21.0
187-310	WR187	3.95 - 5.85	25	4.00	19.0
159-310	WR159	4.90 - 7.05	23	3.00	17.5
137-310	WR137	5.95 - 8.20	20	3.00	15.5
112-310	WR112	7.05 - 10.0	18	2.50	14.0
90-310	WR90	8.20 - 12.4	17	2.00	13.5
75-310	WR75	10.0 - 15.0	15	1.50	12.0
62-310	WR62	12.4 - 18.0	13	1.25	10.5
51-310	WR51	10.0 - 15.0	12	1.25	9.50
42-310	WR42	18.0 - 26.5	11	1.25	8.50
34-310	WR34	22.0 - 33.0	9	1.00	8.50
28-310	WR28	26.5 - 40.0	10	1.00	8.00

WAVEGUIDE COMBINER-DIVIDER

Short slot hybrid configuration
 Symmetrical 4 port device
 90 degree phase shift



WG Size WR	Freq (GHz)	VSWR Max	Isolation Min. dB	Model No.
159	5.80-6.50	1.15	26	159-410-2-2-2-2
137	5.80-6.50	1.15	26	137-410-2-2-2-2
112	7.90-9.00	1.15	26	112-410-6-6-6-6
75	13.0-15.0	1.15	26	75-410-2-2-2-2
62	13.5-15.6	1.15	26	62-410-6-6-6-6

Flange Code: 2=CPRG; 6=Cover; 7=Choke

LOOP COUPLERS

Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Ideal for High Power Sensing
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating

Electrical Specifications:
 VSWR: 1.1 max.
 NOM. COUPLING: +/- 1.00 dB
 FREQ. SENS.: +/- 1.00 dB max.
 DIRECTIVITY: 15 dB min.

Ordering Information: Typical Part #: 75-307 B -30 -6 -6

Basic Model #:

Material: A=Alum, B=Brass, C=Copper, D=Special

Coupling (dB): 30, 40, 50, 60 (Std.) others available

Flange 1: 1=CPRG, 2=CPRF, 6=Cover, 7=Choke, 8=Special

Flange 2: See above

Basic Model No. (SMA F)	Basic Model No. (N Type F)	WG Size	Freq (GHz)	Dim. A (inches)	Dim. B (inches)	Dim. C (inches)
430-307	430-308	WR430	1.70 - 2.60	4.5	1.0	1.63
284-307	284-308	WR284	2.60 - 3.95	4.5	1.0	1.63
229-307	229-308	WR229	3.30 - 4.90	4.0	1.0	1.38
187-307	187-308	WR187	3.95 - 5.85	3.5	1.0	1.13
159-307	159-308	WR159	4.90 - 7.05	3.5	1.0	0.88
137-307	137-308	WR137	5.95 - 8.20	3.0	1.0	0.88
112-307	112-308	WR112	7.05 - 10.0	3.0	1.0	0.88
90-307	90-308	WR90	8.20 - 12.4	3.0	1.0	0.88
75-307	75-308	WR75	10.0 - 15.0	3.0	1.0	0.88
62-307	62-308	WR62	12.4 - 18.0	3.0	1.0	0.88
51-307	WR51	15.0 - 22.0	3.0	1.0	0.88	
42-307	WR42	18.0 - 26.5	2.5	1.0	0.63	
34-307	WR34	22.0 - 33.0	2.5	1.0	0.63	
28-307	WR28	26.5 - 40.0	2.5	1.0	0.63	

BROADWALL DIRECTIONAL COUPLERS

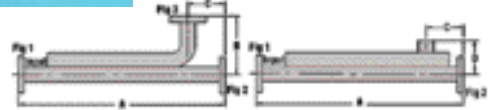
Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi

- Ideal for High Power Combiner/Divider
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating



Electrical Specifications:
 VSWR (MAX.) PRIMARY: 1.05 (1.10 for WR42, WR28)
 SECONDARY: 1.10 (1.15 for WR42, WR28)
 NOM. COUPLING (dB): ± .50 (± .75 for WR42, WR28)
 FREQ. SENS. (dB): ± .6 (± .75 for WR42, WR28)
 DIRECTIVITY (dB): 40 typical, 30 min.



Ordering Information: Typical Part #: 137-304 B -10 -1 -1 -1

Basic Model #:

Material: A=Alum, B=Brass, C=Copper, D=Special

Coupling (dB): 3, 6, 10, 20, 30, 40

Flange 1: 1=CPRG, 2=CPRF, 6=COVER, 7=CHOKE, 8= SPECIAL

Flange 2: See above

Flange 3: See above

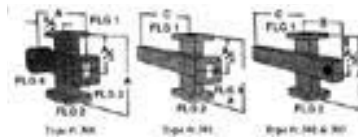
Basic Model No.	WG Size	Freq (GHz)	Dimension A (inches)	Dimension B (inches)	Dimension C (inches)
650-Type #	WR650	1.12 - 1.70			
430-Type #	WR430	1.70 - 2.60			
284-Type #	WR284	2.60 - 3.95	50.25	9.18	2.66
229-Type #	WR229	3.30 - 4.90	42.00	6.81	1.00
187-Type #	WR187	3.95 - 5.85	34.62	6.44	1.81
159-Type #	WR159	4.90 - 7.05	32.50	5.25	0.88
137-Type #	WR137	5.95 - 8.20	26.50	3.06	1.56
112-Type #	WR112	7.05 - 10.0	18.62	3.06	0.94
90-Type #	WR90	8.20 - 12.4	16.68	1.94	0.81
75-Type #	WR75	10.0 - 15.0	15.00	2.50	1.25
62-Type #	WR62	12.4 - 18.0	13.75	2.18	0.66
51-Type #	WR51	15.0 - 22.0	11.50	1.25	0.66
42-Type #	WR42	18.0 - 26.5	9.50	1.25	0.75
34-Type #	WR34	22.0 - 33.0	9.00	1.25	0.75
28-Type #	WR28	26.5 - 40.0	8.00	1.12	0.75

CROSSGUIDE DIRECTIONAL COUPLERS

Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Ideal for High Power Combiner/Divider
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating

Electrical Specifications:
 VSWR PRIMARY: 1.05 max.
 COAX SECONDARY: 1.25 max.
 NOM. COUPLING: ± 0.50 dB
 FREQ. SENS.: ± 1.00 dB max.
 DIRECTIVITY: 20 dB min.



Type #s:
 300 = 4WG Ports
 301 = 3WG Ports
 302 = 2WG Ports,
 1 Type N (F) Coax Port
 303 = 2WG Ports,
 1 SMA (F) Coax Port

Ordering Information: Typical Part #: 137-300 B -30 -1 -1 -1

Basic Model #:

Material: A=Alum, B=Brass, C=Copper, D=Special

Coupling (dB): 30, 40, 50

Flange 1: 1=CPRG, 2=CPRF, 6=Cover, 7=Choke, 8=Special

Flange 2: See above

Flange 3: See above

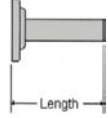
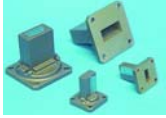
Flange 4: See above

Basic Model No.	WG Size	Freq (GHz)	Dim A (inches)	Dim B (inches)	Dim C (inches)
430-Type #	WR430	1.70 - 2.60	7.50	5.00	8.00
284-Type #	WR284	2.60 - 3.95	7.50	3.75	5.00
229-Type #	WR229	3.30 - 4.90	7.00	3.50	4.75
187-Type #	WR187	3.95 - 5.85	6.50	3.25	4.50
159-Type #	WR159	4.90 - 7.05	6.00	3.00	4.00
137-Type #	WR137	5.95 - 8.20	6.00	3.00	4.00
112-Type #	WR112	7.05 - 10.0	4.20	2.10	3.00
90-Type #	WR90	8.20 - 12.4	4.00	2.00	2.75
75-Type #	WR75	10.0 - 15.0	3.75	1.87	2.50
62-Type #	WR62	12.4 - 18.0	3.50	1.75	2.37
51-Type #	WR51	15.0 - 22.0	3.10	1.50	2.25
42-Type #	WR42	18.0 - 26.5	2.20	1.10	1.50
34-Type #	WR34	22.0 - 33.0	2.20	1.10	1.50
28-Type #	WR28	26.5 - 40.0	2.00	1.00	1.50

SHORT TERMINATION

Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating
- VSWR: 1.10 max
- ATM series 710 Terminations utilizes Medium Power Elements to achieve low VSWR and stable electrical characteristics



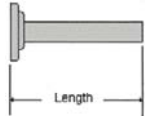
Ordering Information: Typical Part #: 137-710 B -2
Basic Model #: _____
Material: A=Alum, B=Brass, C=Copper, D=Special
Flange 1: 1=CPRG, 2=CPRF, 6=COVER, 7=CHOKE, 8=SPECIAL

Basic Model No.	WG Size	Freq (GHz)	Standard Flange	Power Avg. (W)	Length (inches)
650-710	WR650	1.12 - 1.70	CPRF (2)	50	7.00
430-710	WR430	1.70 - 2.60	CPRF (2)	40	7.00
340-710	WR340	2.20 - 3.30	CPRF (2)	40	6.00
284-710	WR284	2.60 - 3.95	COVER (6)	30	3.00
229-710	WR229	3.30 - 4.90	CPRF (2)	25	3.00
187-710	WR187	3.95 - 5.85	COVER (6)	25	2.50
159-710	WR159	4.90 - 7.05	CPRF (2)	20	2.00
137-710	WR137	5.95 - 8.20	CPRF (2)	15	1.75
112-710	WR112	7.05 - 10.00	COVER (6)	15	1.50
102-710	WR102	7.00 - 11.00	COVER (6)	15	1.50
90-710	WR90	8.20 - 12.40	COVER (6)	15	1.50
75-710	WR75	10.00 - 15.00	COVER (6)	15	1.25
62-710	WR62	12.40 - 18.00	COVER (6)	10	1.00
51-710	WR51	15.00 - 22.00	COVER (6)	10	1.00
42-710	WR42	18.00 - 26.50	COVER (6)	10	1.00
34-710	WR34	22.00 - 33.00	COVER (6)	5	0.75
28-710	WR28	26.50 - 40.00	COVER (6)	5	0.75
22-710	WR22	33.00 - 50.00	COVER (6)	5	0.75

MEDIUM POWER TERMINATION

Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating Low outgassing characteristics
- VSWR: 1.10 max
- ATM series 740 utilizes High Power Ceramic Elements fired at 1300 C for low VSWR and table electrical characteristics



Ordering Information: Typical Part #: 137-740 B -2
Basic Model #: _____
Material: A=Alum, B=Brass, C=Copper, D=Special
Flange 1: 1=CPRG, 2=CPRF, 6=COVER, 7=CHOKE, 8=SPECIAL

Basic Model No.	WG Size	Freq (GHz)	Standard Flange	Power Avg. (W)	Length (inches)
650-740	WR650	1.12 - 1.70	CPRF (2)	1500	13.00
430-740	WR430	1.70 - 2.60	CPRF (2)	1200	12.00
340-740	WR340	2.20 - 3.30	CPRF (2)	1200	12.00
284-740	WR284	2.60 - 3.95	COVER (6)	1200	11.00
229-740	WR229	3.30 - 4.90	CPRF (2)	1000	9.75
187-740	WR187	3.95 - 5.85	COVER (6)	750	8.38
159-740	WR159	4.90 - 7.05	CPRF (2)	625	8.00
137-740	WR137	5.95 - 8.20	CPRF (2)	500	8.00
112-740	WR112	7.05 - 10.00	COVER (6)	425	7.00
102-740	WR102	7.00 - 11.00	COVER (6)	325	6.50
90-740	WR90	8.20 - 12.40	COVER (6)	225	5.50
75-740	WR75	10.00 - 15.00	COVER (6)	200	4.50
62-740	WR62	12.40 - 18.00	COVER (6)	100	3.25
51-740	WR51	15.00 - 22.00	COVER (6)	100	3.25
42-740	WR42	18.00 - 26.50	COVER (6)	100	3.50
34-740	WR34	22.00 - 33.00	COVER (6)	75	3.25
28-740	WR28	26.50 - 40.00	COVER (6)	75	4.00
22-740	WR22	33.00 - 50.00	COVER (6)	25	2.50

VERY HIGH POWER WAVEGUIDE TERMINATION

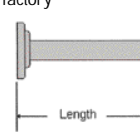
Model No	Waveguide Size	Freq (GHz)	Power Avg. (W)
650-760-6	WR650	1.12 - 1.70	8000
430-760-6	WR430	1.70 - 2.60	6500
284-760-6	WR284	2.60 - 3.95	5000
229-760-6	WR229	3.30 - 4.90	4000
187-760-6	WR187	3.95 - 5.85	3000
159-760-6	WR159	4.90 - 7.05	3000
137-760-6	WR137	5.85 - 8.20	3000
112-760-6	WR112	7.05 - 10.00	3000
90-760-6	WR90	8.20 - 12.40	1500
75-760-6	WR75	10.00 - 15.00	1400
62-760-6	WR62	12.40 - 18.00	1400
51-760-6	WR51	15.00 - 22.00	1200
42-760-6	WR42	18.00 - 26.50	1000
34-760-6	WR34	22.00 - 33.00	700
28-760-6	WR28	26.50 - 40.00	500



LOW POWER TERMINATION

Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating
- ATM series 720 Terminations utilize a Precision Conical Element to achieve very low VSWR.
- For short size on High Power Terminations contact factory



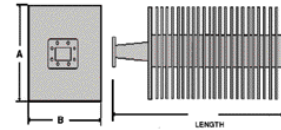
Ordering Information: Typical Part #: 137-720 B -2
Basic Model #: _____
Material: A=Alum, B=Brass, C=Copper, D=Special
Flange 1: 1=CPRG, 2=CPRF, 6=COVER, 7=CHOKE, 8=SPECIAL

Basic Model No.	WG Size	Freq (GHz)	Standard Flange	VSWR max.	Power Avg. (W)	Length (inches)
650-720	WR650	1.12 - 1.70	CPRF (2)	1.02	25	12.50
430-720	WR430	1.70 - 2.60	CPRF (2)	1.02	15	11.00
340-720	WR340	2.20 - 3.30	CPRF (2)	1.01	12	10.75
284-720	WR284	2.60 - 3.95	COVER (6)	1.01	10	10.50
229-720	WR229	3.30 - 4.90	CPRF (2)	1.01	10	7.50
187-720	WR187	3.95 - 5.85	COVER (6)	1.01	8	6.25
159-720	WR159	4.90 - 7.05	CPRF (2)	1.01	7	6.00
137-720	WR137	5.95 - 8.20	CPRF (2)	1.01	6	5.50
112-720	WR112	7.05 - 10.00	COVER (6)	1.01	4	5.00
102-720	WR102	7.00 - 11.00	COVER (6)	1.01	3	4.00
90-720	WR90	8.20 - 12.40	COVER (6)	1.01	4	4.00
75-720	WR75	10.00 - 15.00	COVER (6)	1.01	2	4.00
62-720	WR62	12.40 - 18.00	COVER (6)	1.01	1.5	4.00
51-720	WR51	15.00 - 22.00	COVER (6)	1.01	1.0	4.00
42-720	WR42	18.00 - 26.50	COVER (6)	1.01	0.5	2.50
34-720	WR34	22.00 - 33.00	COVER (6)	1.01	0.5	2.50
28-720	WR28	26.50 - 40.00	COVER (6)	1.02	0.5	2.00
22-720	WR22	33.00 - 50.00	COVER (6)	1.02	0.5	1.50

HIGH POWER TERMINATION

Description:

- Full waveguide frequency range
- Units pressure tested to 30 psi
- Finish is a unique corrosion-resistant 316 stainless steel epoxy coating
- All 745 series Terminations are manufactured from 6061 Aluminum
- Low outgassing characteristics
- VSWR: 1.10 max
- ATM series 745 utilizes High Power Ceramic Elements fired at 1300 C for low VSWR and stable electrical characteristics



Ordering Information: Typical Part #: 137-745 -2
Basic Model #: _____
Flange 1: 1=CPRG, 2=CPRF, 6=COVER, 7=CHOKE, 8=COVER/GROOVE

Basic Model No.	WG Size	Freq (GHz)	Standard Flange	Power Avg. (W)	Length (inches)	Dim. A	Dim. B
650-745	WR650	1.12 - 1.70	CPRF (2)	2500	13.00	8.00	8.00
430-745	WR430	1.70 - 2.60	CPRF (2)	2500	9.00	6.00	6.00
340-745	WR340	2.20 - 3.30	CPRF (2)	2500	12.00	6.00	6.00
284-745	WR284	2.60 - 3.95	COVER (6)	2400	12.00	6.00	5.00
229-745	WR229	3.30 - 4.90	CPRF (2)	2000	9.75	5.00	5.00
187-745	WR187	3.95 - 5.85	COVER (6)	1500	9.00	4.50	4.50
159-745	WR159	4.90 - 7.05	CPRF (2)	1300	9.00	4.50	4.50
137-745	WR137	5.95 - 8.20	CPRF (2)	1000	8.50	4.00	4.00
137-745A	WR137	5.95 - 8.20	CPRF (2)	1500	9.00	4.50	4.50
112-745	WR112	7.05 - 10.00	COVER (6)	850	8.00	4.00	4.00
102-745	WR102	7.00 - 11.00	COVER (6)	500	6.50	3.50	3.50
90-745	WR90	8.20 - 12.40	COVER (6)	500	5.50	3.50	3.50
75-745	WR75	10.00 - 15.00	COVER (6)	350	5.00	3.50	3.50
75-745A	WR75	10.00 - 15.00	COVER (6)	550	5.00	4.50	4.50
62-745	WR62	12.40 - 18.00	COVER (6)	250	4.50	3.00	3.00
51-745	WR51	15.00 - 22.00	COVER (6)	250	4.50	3.00	3.00
42-745	WR42	18.00 - 26.50	COVER (6)	250	4.50	2.25	2.25
34-745	WR34	22.00 - 33.00	COVER (6)	175	4.00	2.00	2.00
28-745	WR28	26.50 - 40.00	COVER (6)	175	4.00	2.00	2.00
22-745	WR22	33.00 - 50.00	COVER (6)	100	3.00	1.50	1.50

VERY HIGH POWER DOUBLE RIDGE WAVEGUIDE TERMINATION

Model No.	Waveguide Size	Freq (GHz)	Power Avg. (W)
750-750-C3	WRD750	7.50 - 18.00	700
650-750-C3	WRD650	6.50 - 18.00	800
580-750-C3	WRD580	5.80 - 16.00	1000
475-750-C3	WRD475	4.75 - 11.00	1000

High Power Rating
Flange Code: C3 = Cover (WRD)

