MICROWAVE ENGINEERING CORPORATION
RECTANGULAR WAVEGUIDE
TABLE OF CONTENTS

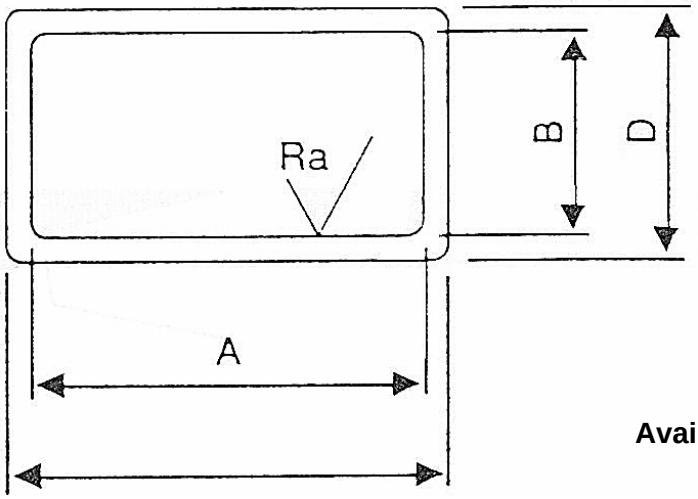
DATA SHEET No. B002a

MICROWAVE ENGINEERING CORPORATION
1551 Osgood Street, North Andover, MA 01845 • Tel (978) 685-2776 • Fax (978) 975-4363 • Website: http://www.microwaveeng.com/ • Email: sales@microwaveeng.com

STANDARD RECTANGULAR WAVEGUIDE

DATA SHEET No. T110

Waveguide Size Europe And USA			Internal Dimensions Ax B				External Dimensions C x D				Wall Thickness		Internal Surface Finish (Ra)	
R	Wg	Wr	mm	tol.t	inches	tol.±	mm	tol.±	Inches	tol.±	mm	Inch	µ meter	µ inches
14	6	650	165.10x82.55	0.20	6.500x3.250	.008	169.16x86.61	.20	6.660x3.410	.008	2.03	0.08	40	1.6
22	8	430	109.22x54.61	0.14	4.300x2.150	.006	113.28x58.67	0.15	4.460x2.310	0.006	2.03	0.08	40	1.6
26	9A	340	86.36x43.18	0.11	3.400x1.700	.005	90.42x47.24	0.13	3.560x1.860	0.005	2.03	0.08	40	1.6
32	10	284	72.14x34.04	0.08	2.840x1.340	.004	76.20x38.10	0.1	3.000x1.500	0.004	2.03	0.08	25	1
40	11A	229	58.17x29.083	0.06	2.290x1.145	.003	61.42x32.33	0.08	2.418x1.273	0.003	1.625	0.064	25	1
48	12	187	47.55x22.149	0.05	1.872x0.872	.003	50.80x25.40	0.08	2.000x1.000	0.002	1.625	0.064	25	1
58	13	159	40.39x20.139	0.05	1.590x0.795	.002	43.64x23.44	0.05	1.718x0.923	0.002	1.625	0.064	25	1
70	14	137	34.85x15.799	0.04	1.372x0.622	.002	38.10x19.05	0.05	1.500x0.750	0.002	1.625	0.064	25	1
84	15	112	28.499x12.624	0.03	1.122x0.497	.002	31.75x15.88	0.05	1.250x0.625	0.001	1.625	0.064	25	1
100	16	90	22.86 x10.16	0.03	0.900x0.400	.001	25.40x12.70	0.03	1.000x0.500	0.001	1.27	0.05	25	1
120	17	75	19.05x9.525	0.02	0.750x0.375	.001	21.59x12.06	0.03	0.850x0.475	0.001	1.27	0.05	25	1
140	18	62	15.799x7.899	0.02	0.622x0.311	.0008	17.83x9.930	0.03	0.702x0.391	0.001	1.016	0.04	25	1
180	19	51	12.954x6.477	0.02	0.510x0.255	.0008	14.99x8.510	0.03	0.590x0.335	0.001	1.016	0.04	25	1
220	20	42	10.668x4.318	0.02	0.420x0.170	.0008	12.70x6.350	0.03	0.500x0.250	0.001	1.016	0.04	25	1
280	21	34	8.636x4.318	0.02	0.340x0.170	.0008	10.57x6.350	0.03	0.420x0.250	0.001	1.016	0.04	25	1
320	22	28	7.112x3.556	0.02	0.280x0.140	.0008	9.14x5.590	0.03	0.360x0.220	0.001	1.016	0.04	25	1
400	23	22	5.690x2.845	0.02	0.224x0.112	.0008	7.72x4.880	0.03	0.304x0.192	0.001	1.016	0.04	25	1
500	24	19	4.775x2.388	0.02	0.188x0.094	.0008	5.81x4.420	0.03	0.268x0.174	0.001	1.016	0.04	25	1
620	25	15	3.759x1.880	0.02	0.148x0.074	.0008	5.79x3.910	0.03	0.228x0.154	0.001	1.016	0.04	25	1
740	26	12	3.099x1.549	0.02	0.122x0.061	.0008	5.13x3.580	0.03	0.202x0.141	0.001	1.016	0.04	25	1
900	27	10	2.540x1.270	0.02	0.100x0.050	.0008	4.57x3.300	0.03	0.160x0.130	0.001	1.016	0.04	25	1



Length: 3050 mm (Other upon request)
Alloy: 6063 (Other upon request)

Straightness and twist:
DIN 17615

Availability form stock ensures a swift delivery worldwide

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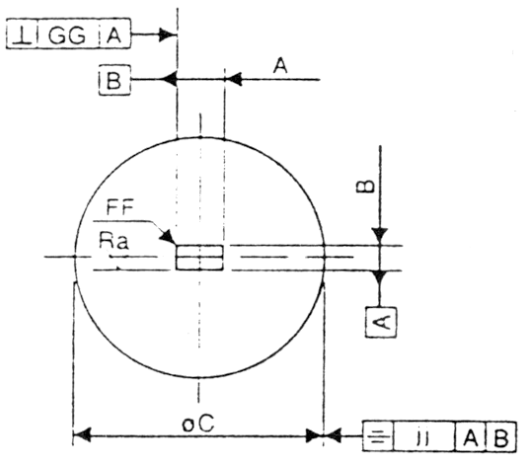
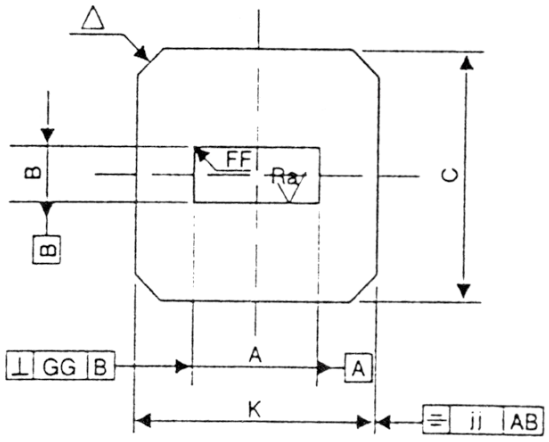
RECTANGULAR FLANGE STOCK

DATA SHEET No. T112

Waveguide Size	Dimensions							µ inch/µ m	4 places
WR	A	B	C	K	FF	GG	JJ	Ra	delta
			min	min	max				
187	1.872 ± .0030 47.55 ± .0800	0.872 ± .0030 22.149 ± .0800	2.5 63.5	3.50 88.9	0.030 0.800	0.002 0.050	0.008 0.200	4.0 1.0	R0.25 R6.35
159	1.590 ± .0020 40.39 ± .0500	0.795 ± .0020 20.193 ± .0500	2.44 61.9	3.19 81.0	0.030 0.800	0.002 0.050	0.008 0.200	4.0 1.0	R0.25 R6.35
137	1.372 ± .0020 34.85 ± .0500	0.622 ± .0020 15.799 ± .0500	1.94 49.2	2.69 68.3	0.030 0.800	0.002 0.050	0.800 0.200	4.0 1.0	R0.15 R3.8
112	1.122 ± .0015 28.499 ± .0400	0.497 ± .0015 12.62 ± .0400	1.88 47.8	1.88 47.8	0.030 0.800	0.002 0.050	0.004 0.100	4.0 1.0	0.20X45 5X45
90	0.900 ± .0010 22.86 ± .0300	0.400 ± .0010 10.16 ± .0300	1.63 41.4	1.63 41.4	0.030 0.800	0.002 0.050	0.004 0.100	4.0 1.0	0.137X45 3.5X45
75	0.750 ± .0010 19.05 ± .0300	0.375 ± .0010 9.525 ± .0300	1.5 38.1	1.5 38.1	0.030 0.800	0.002 0.050	0.004 0.100	4.0 1.0	0.13X45 3.5X45
62	0.622 ± .0008 15.799 ± .0200	0.311 ± .0008 7.899 ± .0200	1.31 33.3	1.31 33.3	0.016 0.400	0.002 0.050	0.004 0.100	4.0 1.0	0.13X45 3.5X45
51	0.510 ± .0008 12.954 ± .0200	0.255 ± .0008 6.477 ± .0200	1.31 33.3	1.31 33.3	0.016 0.400	0.002 0.050	0.004 0.100	4.0 1.0	R0.56 R14.25
42	0.420 ± .0008 10.668 ± .0200	0.170 ± 0008 4.318 ± .0200	0.875 22.2	0.875 22.2	0.016 0.400	0.002 0.050	0.004 0.100	4.0 1.0	R0.56 R14.25
34	.0340 ± .0008 8.636 ± .0200	0.170 ± .0008 4.318 ± .0200	0.875 22.2	0.875 22.2	0.016 0.400	0.002 0.050	0.002 0.050	4.0 1.0	R0.46 R11.70
28	0.280 ± .0008 7.112 ± .0200	0.140 ± .0008 3.556 ± .0200	0.750 19.1	0.750 19.1	0.016 0.400	0.002 0.050	0.002 0.050	4.0 1.0	
22	0.224 ± .0008 5.690 ± .0200	0.112 ± .0008 2.845 ± .0200	Ø1.125 Ø28.6		0.008 0.200	0.001 0.030	0.002 0.050	4.0 1.0	
19	0.188 ± .0008 4.775 ± .0200	0.094 ± .0008 2388 ± .0200	Ø1.125 Ø28.6		0.008 0.200	0.001 0.030	0.002 0.050	4.0 1.0	
10	0.10 ± .0016 2.54 ± .0400	0.05 ± .0016 1.27 ± .0400	Ø0.75 Ø19.1		0.008 0.200	0.001 0.030	0.002 0.050	4.0 1.0	





Length: 1000 mm
(Other upon request)

Alloy: 6063
(Other upon request)

Straightness ad twist:
DIN: 17615

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RECTANGULAR WAVEGUIDE AND FLANGES

DATA SHEET No. T71C

WAVEGUIDE				FLANGES																
				MIL DESIGNATIONS						MIL & EIA DESIGNATIONS										
				COVER		CHOKE		CONTACT		UNPRESSURIZED CONTACT			PRESSURIZED CONTACT							
													GROOVED			FLAT				
MEC DESIG-NATION	FREQUENCY RANGE (GHz)	EIA DESIG-NATION	INNER DIMENSIONS (INCHES)	UG()/U	M3922/( )-( )	UG()/U	M3922/( )-( )	UG()/U	M3922/( )-( )	UG()/U	M3922/( )-( )	CMR()	UG()/U	M3922/( )-( )	CPR()G	UG()/U	M3922/( )-( )	CPR()F	MATERIAL ALLOY
L	1.12 – 1.70	WR650	6.500 x 3.250	- - - -	- - - -	- - - -	- - - -	418B 417B	58-008 58-007	- - - -	- - - -	- - - -	1343 1362	024 023	- - - -	1720 1714	002 001	- - - -	6061AL BRASS
LM	1.45 – 2.20	WR510	5.100 x 2.550	- - - -	- - - -	- - - -	- - - -	- - - -	- - -	- - - -	- - - -	- - - -	1719 1718	028 025	- - - -	1717 1715	004 003	- - - -	6061AL BRASS
LA	1.70 – 2.60	WR430	4.300 x 2.150	- - - -	- - - -	- - - -	- - - -	437B 435B	58-010 58-009	- - - -	- - - -	- - - -	1345 1344	028 027	- - - -	1711 1716	006 005	- - - -	6061AL BRASS
LS	2.20 – 3.30	WR340	3.400 x 1.700	- - - -	- - - -	- - - -	- - - -	554B 553B	58-012 58-011	- - - -	- - - -	- - - -	1347 1346	030 029	- - - -	1713 1712	008 007	- - - -	6061AL BRASS
S	2.60 – 3.95	WR284	2.840 x 1.340	584 53	56-002 56-001	585A 54B	61-001 61-002	- - - -	- - - -	1484 1469	64-002 64-001	284 284	1349 1348	032 031	284 284	1725 1724	010 009	284 284	6061AL BRASS
S2A	2.60 – 3.95	M85/4-017 M85/4-015	2.840 x 0.670	- - - -	- - - -	- - - -	- - - -	- - - -	75-06 75-05	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
S2	2.60 – 5.85	M85/4-007 M85/4-001	2.840 x 1.004	- - - -	- - - -	- - - -	- - - -	- - - -	75-02 75-01	- - - -	- - - -	- - - -	- - 1906	- - - -	- - - -	- - 1905	- - - -	- - - -	6061AL BRASS
B	3.30 – 4.90	WR229	2.290 x 1.145	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	229 229	1351 1350	034 033	229 229	1727 1726	012 011	229 229	6061AL BRASS
G	3.95 – 5.85	WR187	1.872 x 0.872	407 149A	57-001 57-002	406B 148C	62-001 62-002	- - - -	- - - -	1480 1475	63-005 63-001	187 187	1353 1352	036 035	187 187	1729 1728	014 013	187 187	6061AL BRASS
D	4.90 – 7.05	WR159	1.590 x 0.795	- - - -	- - - -	- - - -	- - - -	- - 1907	- - - -	- - - -	- - - -	159* 159	1355 1354	038 037	159 159	1731 1730	016 015	159 159	6061AL BRASS
J	5.85 – 8.20	WR137	1.372 x 0.622	441 344	55-002 55-001	440B 343B	60-002 60-001	- - 150	- - - -	1481 1476	63-006 63-002	137 137	1357 1356	040 039	137 137	1733 1732	018 017	137 137	6061AL BRASS
J2	5.85 – 12.4	M85/4-008 M85/4-003	1.372 x 0.487	- - - -	- - - -	- - - -	- - - -	- - - -	75-04 75-03	- - 511	- - - -	- - - -	- - 1909	- - - -	- - - -	- - 1908	- - - -	- - - -	6061AL BRASS
H	7.05 – 10.0	WR112	1.122 x 0.497	138 51	53-004 53-002	137B 52B	59-009 59-007	- - - -	- - - -	1482 1477	63-007 63-003	112 112	1359 1358	042 041	112 112	1735 1734	020 019	112 112	6061AL BRASS
H2	7.05 – 10.0	½ Ht. WR112	1.122 x 0.249	½ Ht 138	- -	- -	- -	- - - -	- - - -	- -	- -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL
W	7.0 – 11.0	WR102	1.020 x 0.510	- - 1493	70-002 70-001	- - 1494	69-002 69-001	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	002 - -	- - - -	6061AL BRASS
W2	7.0 – 11.0	½ Ht. WR102	1.020 x 0.255	- -	75-09	- -	- -	- - - -	- - - -	- -	- -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
X	8.2 – 12.4	WR90	0.900 x 0.400	135 39	53-003 53-001	136B 40B	59-008 59-006	- - - -	- - - -	1483 1478	63-008 63-004	90 90	1361 1360	044 043	90 90	1737 1736	022 021	90 90	6061AL BRASS
M	10.0 – 15.0	WR75	0.750 x 0.375	WR75* WR75*	53-008 53-007	WR75* WR75*	59-011 59-010	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
P	12.4 – 18.0	WR62	0.622 x 0.311	1665 419	53-006 53-005	1666 541A	59-002 59-001	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
N	15.0 – 22.0	WR51	0.510 x 0.255	WR51* WR51*	70-011 70-010	WR51* WR51*	69-005 69-004	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
K	18.0 – 26.5	WR42	0.420 x 0.170	597 595	54-002 54-001	598A 596A	59-004 59-003	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
Y	22.0 – 33.0	WR34	0.340 x 0.170	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - 1530	63-010 63-009	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	6061AL BRASS
A	26.5 – 40.0	WR28	0.280 x 0.140	599	54-003	600A	59-005	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	BRASS

*** No MIL designation**

**** Most Cover Flanges as listed above are THRU type. However, BUTT type will be supplied unless otherwise specified.**

Contact mec for further information.

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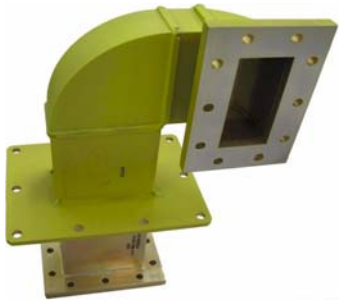
RECTANGULAR WAVEGUIDE STRAIGHT SECTIONS, BENDS AND TWISTS
10 / 120 / 130 / 150 SERIES

DATA SHEET No. T16E 1 of 2

- LOW VSWR
- LOW INSERTION LOSS
- PRECISION FABRICATION



DESCRIPTION

MEC's Straight Sections of Rectangular Waveguide are useful for field and laboratory applications where lowest loss and VSWR are required. The waveguide conforms to MIL-W-85. Straight Sections can be supplied up to 12 feet long. Bends and Twists may be used alone or in combination for systems packaging. Straights, Bends and Twists are normally supplied with UG cover flanges; however choke, CPR, CMR and other flanges may be requested. VSWR of Standard Waveguide models is 1.03 typical, 1.05 max. over the full waveguide band while insertion loss is essentially that of straight waveguide. Units are available in aluminum or copper. Finish is chromate conversion per MIL-C-5541, Class 3 for aluminum and corrosion-resistant coatings for all others, painted with gray enamel.

SPECIFICATIONS

FREQUENCY (GHz)	WAVEGUIDE SIZE	STRAIGHT SECTION	E PLANE BEND		H PLANE BEND		TWIST		MATERIAL
		MODEL NO.	MODEL NO.	A	MODEL NO.	A	MODEL NO.	A	
STANDARD WAVEGUIDE									
1.0 – 1.45	WR770	E10	E120	24.0	E130	24.0	E150	—	A
1.12 – 1.70	WR650	L10	L120	15.0	L130	15.0	L150	24.0	A
1.45 – 2.20	WR510	LM10	LM120	15.0	LM130	15.0	LM150	24.0	A
1.70 – 2.60	WR430	LA10	LA120	15.0	LA130	15.0	LA150	24.0	A
2.20 – 3.30	WR340	LS10	LS120	12.0	LS130	12.0	LS150	24.0	A
2.60 – 3.95	WR284	S10	S120	4.75	S130	6.50	S150	11.0	A,C
3.30 – 4.90	WR229	B10	B120	5.00	B130	8.00	B150	12.0	A,C
3.95 – 5.85	WR187	G10	G120	3.00	G130	4.50	G150	8.0	A,C
4.90 – 7.05	WR159	D10	D120	4.25	D130	4.25	D150	7.0	A,C
5.85- 8.20	WR137	J10	J120	2.38	J130	2.75	J150	6.0	A,C
7.05 – 10.0	WR112	H10	H120	1.50	H130	2.63	H150	6.0	A,C
7.0 – 11.0	WR102	W10	W120	2.31	W130	2.63	W150	6.0	A,C
8.2 – 12.4	WR90	X10	X120	1.50	X130	1.69	X150	6.0	A,C
10.0 – 15.0	WR75	M10	M120	1.50	M130	1.69	M150	6.0	A,C
12.4 – 18.0	WR62	P10	P120	1.69	P130	1.84	P150	6.0	A,C
15.0 – 22.0	WR51	N10	N120	1.50	N130	1.50	N150	4.0	A,C
18.0 – 26.5	WR42	K10	K120	1.50	K130	1.50	K150	3.5	A,C
22.0 – 33.0	WR34	Y10	Y120	1.50	Y130	1.50	Y150	3.0	A,C
26.5 – 40.0	WR28	A10	A120	1.38	A130	1.44	A150	3.0	A,C
REDUCED HEIGHT									
2.60 – 5.85	M85/4 - 001	S2-10	S2-120*	5.00	—	—	S2-150*	11.0	C
5.85 – 12.4	M85/4 – 003	J2-10	J2-120	2.38	—	—	J2-150*	8.0	C
MEC FLATGUIDE									
8.0 – 18.0	(F750)M85/4–003	F10	F120 §	3.00	F130†	3.75	F150§	5.00	A
7.0 – 18.0	(F700)M85/4-029,-027	F11	F120§	3.00	F131†	4.25	F151§	6.00	A,C
4.0 – 10.4	(F400)M85/4-023	F12	F122§	2.50	F132†	4.75	F152§	9.00	A

*VSWR § VSWR<1.08 † VSWR<1.12

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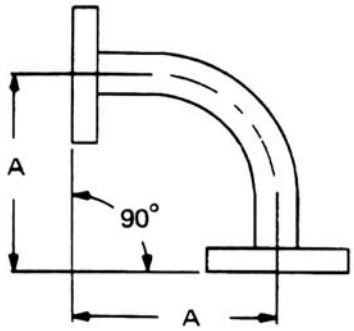
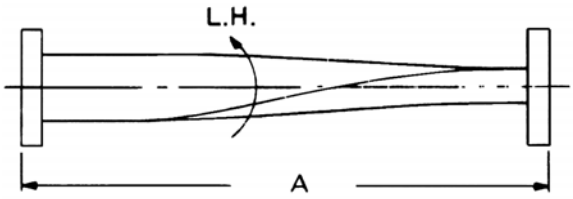
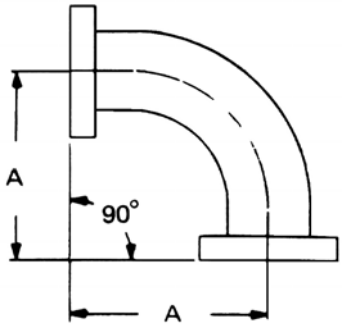


120 SERIES
E BEND



150 SERIES
TWIST



130 SERIES
H BEND

ORDERING INFORMATION

(1) For 10 Series STRAIGHT SECTIONS, add suffixes to model number as follows:
- **(a) LENGTH: Specify face-to-face length in inches.**
- **(b) MATERIAL: A for Aluminum; C for Copper**
- **(c) FLANGES: 1 for Cover; 2 for Choke; 3 for CMR; 4 for CPRF, 5 for CPRG, 6 for U/G Gasket, no choke tapped holes. See Data Sheet T5C for Reduced Height & MEC FLATGUIDE Flanges.**

(2) For Series 120/130 BENDS and Series 150 TWISTS, add suffixes to model numbers as follows:
- **(a) ANGLE: Suffix desired angle in degrees if other than 90°.**
- **(b) MATERIAL: A for Aluminum; C for Copper.**
- **(c) FLANGES: Cover flanges are standard. For others, specify as above.**

(3) Coin silver available above 18 GHz on request.

(4) Heavy Wall and Extra Heavy Wall small radius copper bends also available: e.g. WR90 H Bend with "A" dimension = 1.50" and wall thickness = 0.200".

(5) Mitered Bends are available to provide even shorter "A" dimensions: e.g. X120-M and X130-M have leg lengths of only 1.0". Specify "M" for mitered bends.

(6) Other sizes, configurations and combinations available on request. MEC has one of the largest waveguide facilities to satisfy unique customer requirements. See Data Sheet B20C.

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RECTANGULAR WAVEGUIDE TRANSITIONS 30 SERIES

DATA SHEET No. T37C

- LOWEST VSWR
- SHORT LENGTH

DESCRIPTION

MEC precision fabricated 30 Series Transitions have been designed to connect different size waveguide components in a minimum of space while maintaining a VSWR of 1.04 or less in those cases where the frequency bands overlap. Standard units are furnished in aluminum with cover or contact flanges. Finish is chromate conversion per MIL-C5541, Class 3, painted with gray epoxy enamel on external non-mating surfaces.

ORDERING INFORMATION

FREQUENCY BAND	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE
L	1.12 - 1.70	WR-650	UG-4188/U
LM	1.45 - 2.20	WR-510	UG-1717/U
LA	1.70 - 2.60	WR-430	UG-4378/U
LS	2.20 - 3.30	WR-340	UG-554A/U
S	2.60 - 3.95	WR-284	UG-584/U
B	3.30 - 4.90	WR-229	CMR-229
G	3.95 - 5.85	WR-187	UG-407/U
D	4.90 - 7.05	WR-159	CMR-159
J	5.85 - 8.20	WR-137	UG-441 /U

FREQUENCY BAND	FREQUENCY RANGE (GH:)	WAVEGUIDE SIZE	EQUIVALENT FLANGE
H	7.05-10.0	WR-112	UG-138/U
W	7.0-11.0	WR-102	UG-1493/U*
X	8.2 - 12.4	WR-90	UG-135/U
M	10.0-15.0	WR-75	WR-75
P	12.4-18.0	WR-62	UG-1665/U
N	15.0-22.0	WR-51	WR-51
K	18.0 - 26.5	WR-42	UG-597/U
Y	22.0 - 33.0	WR-34	UG-1530/U*
A	26.5 - 40.0	WR-28	UG-599/U*

***Aluminum**

1) To formulate model number, select desired lower frequency band from above table and add as prefix to series No. "30". Then select higher frequency band and add as suffix to designate the two waveguide sizes to be interconnected by the transition. Also specify actual frequency range and VSWR desired.

EXAMPLES: X30-M specifies a WR-90 to WR-75 transition.
W30-P specifies a WR-102 to WR-62 transition.

2) Special sizes, configurations, and combinations are available on request, as well as other flanges (e.g. UG choke, CPR, CMR).

3) Custom designed step transitions available on special request.

4) Transitions to circular waveguide also available.

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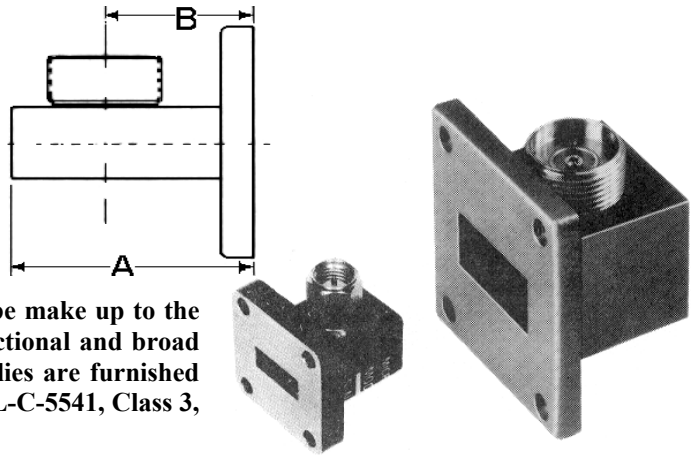
STANDARD RECTANGULAR WAVEGUIDE-TO-COAXIAL ADAPTERS
40 SERIES

DATA SHEET No. T6F

- **LOWEST VSWR, 1.04 MAXIMUM**
- **LOW INSERTION LOSS**
- **COMPLETE LINE 1.0 –40.0 GHz**



DESCRIPTION

The 40 Series Adapters allow transmission of power between waveguide and coax in either direction with very low reflection. This is achieved by using broadband matching techniques. VSWR over the full band is 1.04 max. for most models, or as limited by the coaxial connector used. High power adapters can be make up to the power rating of the connector requested. Custom designs for fractional and broad band, in-line, half height or other specials are available. Assemblies are furnished with an aluminum housing. Finish is chromate conversion per MIL-C-5541, Class 3, painted with gray epoxy enamel.

SPECIFICATIONS

MODEL NO.	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIPMENT FLANGE	DIMENSIONS (IN.)	
				A. MAX	B ± .03
STANDARD ADAPTERS					
E40	1.0-1.45	WR-770	WR-770	5.50	3.44
L40	1.12-1.70	WR-650	UG-418B/U	4.50	3.06
LM40	1.45-2.20	WR-510	UG-1717/U	4.80	3.27
LA40	1.70-2.60	WR-430	UG-1711/U	3.70	2.62
LS40	2.20-3.30	WR-340	UG-554A/U	2.65	1.62
S40	2.60-3.95	WR-284	UG-584/U	2.75	1.75
B40	3.30-4.90	WR-229	CMR-229	2.00	1.32
G40	3.95-5.85	WR-187	UG-441/U	2.00	1.31
D40	4.90-7.05	WR-159	CMR-159	1.75	1.26
J40	5.85-8.20	WR-137	UG-441/U	1.50†	1.04
H40	7.05-10.0	WR-112	UG-138/U	1.44	.80
W40	7.0-11.0	WR-102	M3922/70-002	1.25	.63
X40	8.2-12.4	WR-90	UG-135/U	1.20	.63
M40*	10.0-15.0	WR-75	M3922/53-008	1.25	.63
P40*	12.4-18.0	WR-62	UG-1665/U	1.20	.68
N40+	15.0-22.0	WR-51	M3922/70-011	1.10	.75
K40+□	18.0-26.5	WR-42	UG-597/U	.90	.45††
Y40□	22.0-33.0	WR-34	M3922/63-010	.90	.45
A40□	26.5-40.0	WR-28	UG-599/UΔ	.90	.60
T40∇	33.0-50.0	WR-22	UG-303/U	.90	.60

***TNC VSWR ≤1.1 to 16 GHz & ≤1.2 from 16 to 18 GHz**
∇ Brass
+SMA VSWR ≤ 1.01+ .005 *f* (GHz) to 26 GHz
□SSMA VSWR ≤1.09+. 007 *f*(GHz)to 40 GHz
ΔAluminum
†1.62 for-14
††.47 for-17

ORDERING INFORMATION

(1)SEE CONNECTOR CHARE
(2)VSWR Maximum: A for 1.04 B for 1.06 C for 1.10 P (see High Power Option)
(3)HIGH POWER Option: -P for high average power determined by connector as follows:

VSWR	
1.20 max.	SC to 8.2 GHz - 800w.
1.15 typ.	N to 8.2 GHz – 600 W. Derate Linearly to 300 W at 18 GHz
	TNC to 18 GHz – 200 W.
	SMA to 18 GHz – 50 W.

(4)FRACTIONAL BANDWIDTH: L for lower half M for middle half H for upper half

EXAMPLE: Model x40-7AL=WR90 to 7 mm coaxial adapter with VSWR of 1.04 max. over the frequency range 8.2–10.0 GHz.

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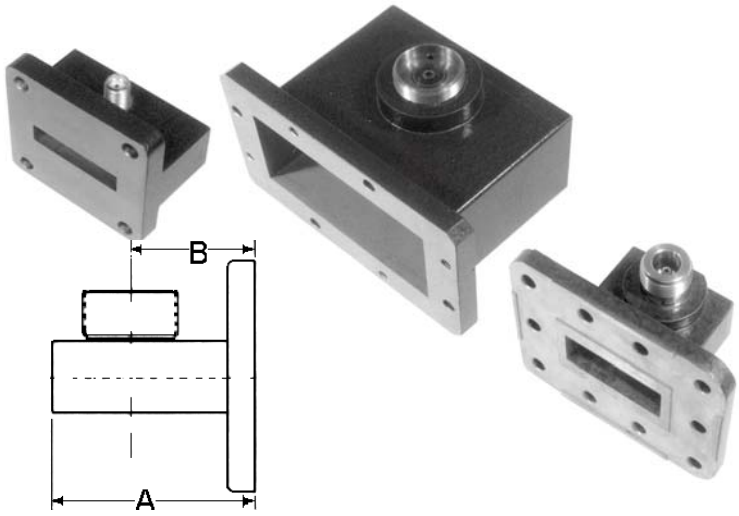
SPECIAL RECTANGULAR WAVEGUIDE-TO-COAXIAL ADAPTERS 40 SERIES - SPECIALS

DATA SHEET No. T5D

- LOWEST VSWR
- LOW INSERTION LOSS
- NARROW AND BROAD BANDWIDTHS



DESCRIPTION

MEC offers a wide range of Adapters for specialized applications requiring non-standard rectangular waveguides and/or frequency bands. They allow transmission of power in either direction with the lowest possible reflection. This is achieved by using broadband matching techniques. High power adapters are available up to the power rating of the connector requested. Requirements for other bands, waveguide heights and in-line adapters can also be satisfied. Assemblies are furnished with an aluminum housing. Finish is chromate conversion per MIL-C-5541, Class3, painted with gray epoxy enamel.

SPECIFICATIONS

MODEL NO.	FREQUENCY RANGE (GHz)	WAVEGUIDE		EQUIVALENT FLANGE	DIMESIONS (IN.)		MAXIMUM VSWR	
		SIZE	I.D. (INCHES)		A.MAX	B ± .03		
STANDARD WAVEGUIDE COMMUNICATIONS AND NARROW BAND								
B40M	3.7 - 4.2	WR-229	2.290 x1.145	CMR-229	2.00	1.32	A for 102	
D40M	5.925 – 6.425	WR-159	1.590 x 0.795	CMR-159	1.75	1.26		
J40L	5.925 – 6.425	WR-137	1.372 x 0.622	CMR-137	1.50†	1.04	B for 1.05	
H40L	7.25 – 8.4	WR-112	1.122 x 0.497	CMR-112	1.44	.80		
X40L	10.7 – 11.7	WR-90	0.900 x 0.400	CMR-90	1.20	.63	C for 1.10	
M40L	10.7 – 11.7	WR-75	0.750 x 0.375	M3922/53-008	1.25	.63		
N40L	17.0 – 19.0	WR-51	0.510 x 0.255	M3922/70-011	1.10	.75	P for 1.20	
STANDARD WAVEGUIDE EXTENDED FREQUENCY BAND								
S41	2.3 – 4.1	WR-284	2.840 x 1.340	UG-584/U	2.75	1.75	A for 1.10	
D41	4.1 – 7.0	WR-159	1.590 x 0.795	CMR-159	1.75	1.26	B for 1.20	
X41	7.5 – 13.0	WR-90	0.900 x 0.400	UG-135/U	1.20	.63	P for 1.30	
P41	11.5 – 18.0	WR-62	0.622 x 0.311	UG-1665/U	1.20	.68		
REDUCED HEIGHT FULL FREQUENCY BAND								
S2-40	2.60 – 3.95	M85/4-017	2.840 x 0.670	M3922/75-06	2.50	1.50	A for 1.04 B for 1.06 C for 1.10 D for1.20 P for 1.30	
J2-40	5.85 – 8.20	M85/4-008	1.372 x 0.487	M3922/75-04	1.50	1.10		
H2-40	7.05 – 10.0	M85/4-031	1.122 x 0.249	M3922/75-10	1.05	.57		
W2-40	7.0 – 11.0	M85/4-026	1.020 x 0.255	M3922/75-09	1.16	.62		
REDUCED HEIGHT EXTENDED FREQUENCY BAND								
S2-42	2.60 – 5.85	M85/4-007	2.840 x 1.004	M3922/75-02	2.50	1.57	A for 1.25	
J2-42	5.85 – 12.4	M85/4-008	1.372 x 0.487	M3922/75-04	1.50	1.10	P for 1.30	
MEC FLATGUIDE®								
F40	8.0 – 16.0	(F750)M85/4-033	0.847 x 0.312	(F750C1)M3922/75-18	5.10	4.53	A for 1.15	P for 1.30
F41	7.0 – 17.0	(F700)M85/4-029	0.965 x 0.320	(F700C1)M3922/75-22	5.50	5.00	A for 1.25	
F42	5.2 – 10.4	(F400)M85/4-023	1.668 x 0.506	(F400C1)M3922/75/24	8.50	7.50	A for 1.15	

†1.62 for –14

ORDERING INFORMATION

Add suffixes to model number as follows:

1. **SEE CONNECTOR CHART**
2. **VSWR: A, B, C, D or P (High Power Option)**
3. **HIGH POWER OPTIONS: -P (see Data Sheet T6E for connectors & power levels)**

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RECTANGULAR WAVEGUIDE
ISO ADAPTERS
i40 SERIES

DATA SHEET No.T96

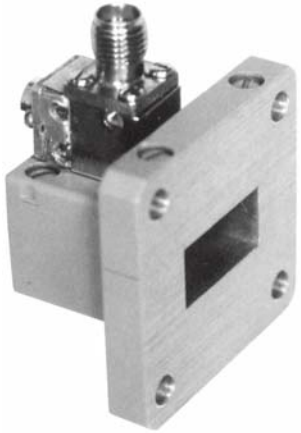
- LOW VSWR
- HIGH ISOLATION
- FULL BAND WIDTH

DESCRIPTION

MEC is pleased to offer a complete line of Rectangular Waveguide ISO adapters. These adapters are offered in all common waveguide sizes and can be used to isolate signals from either the coaxial or waveguide transmission line. Typical models are similar in size to MEC 40 Series adapters and have an SMA female Coax connector. The i40 Series ISO adapters are available in full band or an optimized narrow band. Contact factory for your specific requirements.

SPECIFICATIONS

MODEL NO.	FREQUENCY RANGE	WAVEGUIDE SIZE	ISOLATION* FULL BAND	VSWR	IL
Li40	1.12- 1.70	WR650	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
LMi40	1.45-2.20	WR510	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
LAi40	1.70-2.60	WR430	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
LSi40	2.20-3.30	WR340	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Si40	2.60-3.95	WR284	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Bi40	3.30-4.90	WR229	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Gi40	3.95-5.85	WR187	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Di40	4.90-7.05	WR159	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Ji40	5.85 - 8.20	WR137	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Hi40	7.05- 10.0	WR112	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Wi40	7.0- 11.0	WR102	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Xi40	8.2- 12.4	WR90	20 dB typical – 17 dB min	1.2:1 max	0.5 dB max
Mi40	10.0- 15.0	WR75	20 dB typical – 17 dB min	1.2:1 max	0.6 dB max
Pi40	12.4- 18.0	WR62	20 dB typical – 17 dB min	1.2:1 max	0.6 dB max



ORDERING INFORMATION

1) SPECIFY Waveguide size
2) DEFINE Frequency Band
3) SPECIFY COAX OUTPUT if other than SMA female is required.

COVER FLANGES ARE STANDARD

***SPECIFY Direction of Isolation**

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RECTANGULAR WAVEGUIDE TO COAX END LAUNCH ADAPTERS
E40 SERIES

DATA SHEET No. T19D

- **FULL BAND**
- **LOW VSWR**
- **HIGH POWER**

DESCRIPTION

MEC state-of-the-art End Launch adapters fulfill the need for inline units with broadband capability. Their unique design achieves low profile with short length, low loss and VSWR.

Of special significance is the inherent ability of these units to operate over the full W/G band at high power levels, making them ideal for EW/ECM applications where transmission line routing is at a premium.

SPECIFICATIONS

MODEL NO.	FREQUENCY (GHz)	WAVEGUIDE SIZE	VSWR (MAX)	BODY LENGTH (IN.)
SE40	2.6 – 3.95	WR 284	1.2	9.0
BE40	3.3 – 4.9	WR 229	1.2	7
GE40	3.95 – 5.85	WR 187	1.2	6
DE40	4.9 – 7.05	WR 159	1.2	5
JE40	5.85 – 8.2	WR 137	1.2	4.0
HE40	7.05 – 10.0	WR 112	1.2	3.5
H2E40	7.05 – 10.0	½ height WR 112	1.1	3.0
XE40	8.2 – 12.4	WR 90	1.3	3.0
ME40	10-15	WR-75	1.3	3.0
PE40	12.4 – 18	WR 62	1.4	2.5
KE40	18 – 26.5	WR 42	1.5	2.0
AE40	26. – 40.	WR 28	1.5	2.0

CONNECTOR SPECIFICATION INFORMATION

CONNECTOR TYPE	FEMALE SUFFIX	MALE SUFFIX	MAX FREQUENCY (GHz)	POWER (W) AT MAX FREQUENCY
SC	-SC	-SCM	8	800
TNC	-T	-TM	18	400
N	-N	-NM	18	300
SMA	-3	-3M	26	50
APC-7	-7		18	10
* For other connectors and details, refer to Data Sheet T100				

ORDERING

(1) Select Model number based on band required

(2) To specify connector, add suffixes to model number form table. Also note max. frequency and power limits shown.

(3) To specify pressure port, add suffix –P.

(4) Other frequency bands, mounting provisions, and package arraignments available upon request

EXAMPLE: H2D40-N is the Model number for the half height WR 112 end Launch adapter with type N connector, over all length is 3.5 inches.

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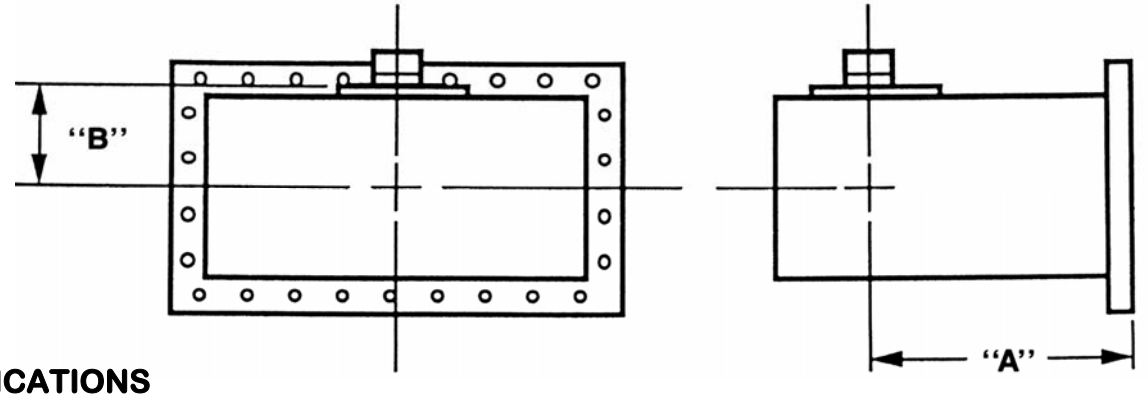
COAXIAL TO WAVEGUIDE TRANSITIONS
WX SERIES

DATA SHEET No.T88A

- **WIDE RANGE OF CONNECTORS**
- **LOW VSWR**



SPECIFICATIONS

COAXIAL SIZE	PART NUMBER				"A"
	WR 1800	WR 1500	WR 1150	WR 975	
7/8-50 OHM	WX810-XXX	WX510-XXX	WX110-XXX	WX910-XXX	6.00
1 5/8-50 OHM	WX820-XXX	WX520-XXX	WX120-XXX	WX920-XXX	6.00
3 1/8-50 OHM	WX830-XXX	WX530-XXX	WX130-XXX	WX930-XXX	6.00
4 1/16-50 OHM	WX840-XXX	WX540-XXX	WX140-XXX	WX940-XXX	6.00
6 1/8-50 OHM	WX860-XXX	WX560-XXX	WX160-XXX	WX960-XXX	6.00
6 1/8-50 OHM	WX865-XXX	WX565-XXX	WX165-XXX	WX965-XXX	6.00
8 3/16-50 OHM	WX885-XXX	WX585-XXX	WX185-XXX		12.00
9 3/16-50 OHM	WX890-XXX	WX590-XXX			12.00
9 3/16-50 OHM	WX895-XXX	WX595-XXX			12.00
"B"	5.50	4.75	3.88	3.44	

XXX DESIGNATES CENTER FREQUENCY MHz
OXX DESIGNATES TV CHANNEL

POWER HANDLING:	Compatibility to coaxial line
VSWR:	1.035:1 for any 2% band
	1.10:1 for any 10% band
COAXIAL PORT:	will mate with EIA female
MATERIAL:	outer 6061-T6 aluminum
	inner copper-silver plated brass
FINISH:	outer 6061-T6 aluminum
	(chromate conversion)

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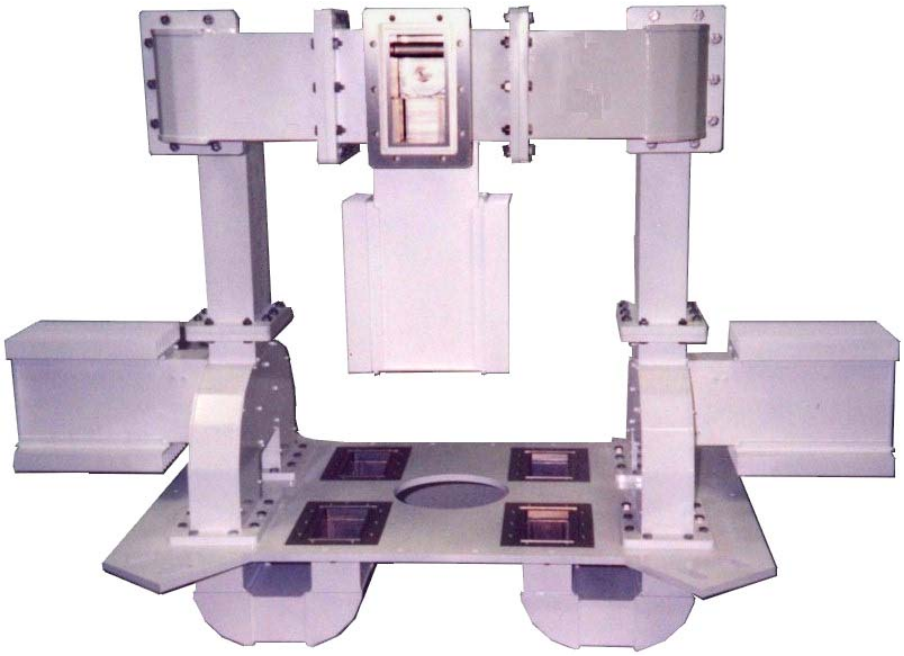
POWER COMBINER/DIVIDER
(LA100-207)

DATA SHEET No. T153

- **HIGH POWER**
- **LOW LOSS**
- **RUGGED CONSTRUCTION**



MEC model LA100-207 is an S-Band (WR430) 4 horn combiner/divider used for satellite up-link communications. This design features an input magic tee with integral high power load, waveguide plumbing with fabricated E and H bends, two output tees with integral H-bends on co-linear arms and high power loads. There are 4 in phase outputs. The complete assembly is mounted on a common flange.

Contact MEC with your specific requirements. Our engineering staff will be glad to discuss your needs.

SPECIFICATIONS:

Model Number	**LA100-207**
Frequency	transmit 1.75-1.85 GHz
	receive 2.20-2.30 GHz,
Power	3 KW CW
Insertion Loss	<0.25 dB
VSWR	<1.2:1
Phase balance	+/- 2 deg
Amplitude balance	+/- 0.2 dB
Input/Output Ports	WR430

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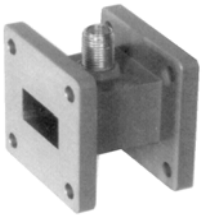
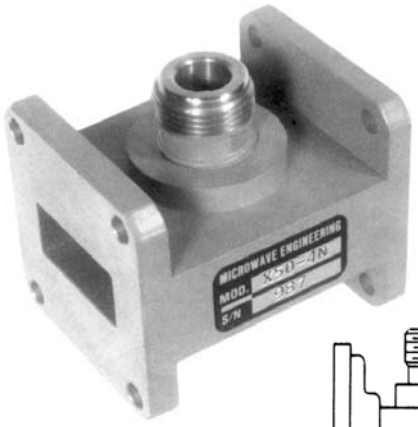
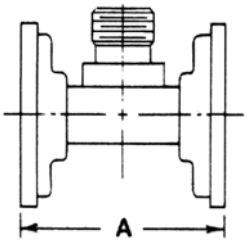
RECTANGULAR WAVEGUIDE POWER SAMPLERS
50 SERIES

DATA SHEET No. T47D

- FLAT COUPLING
- FULL WAVEGUIDE BAND
- LOWEST VSWR, 1.02 TYPICAL







DESCRIPTION

MEC Power Samplers provide an economical non-directional means of monitoring the power in a matched waveguide system. The units are available with coupling values of 30 to 60 dB and frequency sensitivity of ± 1.0 dB maximum (± 0.5 dB typical) over the full bandwidth. Main line VSWR is 1.04 maximum. The sampling port is normally supplied with type N, SMA, or 7mm output connectors. Other types and coupling levels are available upon request. Cover flanges are provided on the main line unless otherwise specified. Assemblies have aluminum housings with chromate conversion per MIL-C-5541, Class 3, painted with gray epoxy enamel on external non-mating surfaces.

SPECIFICATIONS

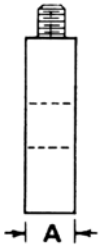
MODEL NO.	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	DIM. A (INCHES)
E50	1.0-1.45	WR-770	3.00
L50	1.12-1.70	WR0-650	3.00
LM50	1.45-2.20	WR-510	3.00
LA50	1.70-2.60	WR-430	3.00
LS50	2.20-3.30	WR-340	3.00
S50	2.60-3.95	WR-284	3.00
B50	3.3-4.9	WR-229	2.00
G50	3.95-5.85	WR-187	3.00
D50	4.90-7.05	WR-159	2.50
J50	5.85-8.20	WR-137	2.00

MODEL NO.	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	DIM. A (INCHES)
H50	7.05-10.0	WR-112	2.00
W50	7.0-11.0	WR-102	2.00
X50	8.2-12.4	WR-90	2.00
M50	10.0-15.0	WR-75	2.00
P50	12.4-18.0	WR-62	2.00Δ
N50	15.0-22.0	WR-51	1.00
K50**	18.00-26.50	WR-42	1.00
Y50*	22.0-33.0	WR-34	1.00
A50*	26.5-40.0	WR-28	1.00

* Available Only with SSMA Connector, K-Connector or 2.4mm
** Available With SMA up to 26.0 GHz. SSMA, K-Conn., or 2.4>26GHz
Δ P50( )-3 length is 1.00"

ORDERING INFORMATION

(1) Add the following suffixes to model number to specify coupling and connector:
(a) COUPLING: -30 for 30 dB -40 for 40 dB -50 for 50 dB -60 for 60dB
(b) CONNECTOR: "N" for type N female "3" for SMA female "7" for precision 7mm*
EXAMPLE: X50-43 is a WR-90 Waveguide 40dB sampler shown with SMA Female Connector.
(2) Units above 7 GHz are also available in the flange sampler shown at right with tapped holes. Specify 50S. Length (A) is 0.75" for type N and 0.55" for SMA.



EXAMPLE: X50S-40-3

***Refer to Data Sheet T100 for a complete list of available connectors**

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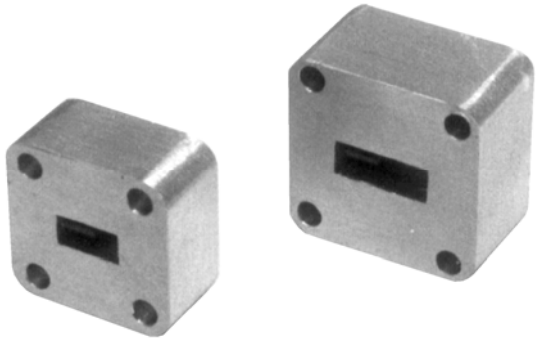
MINIATURE ATTENUATOR PADS
60 S SERIES

DATA SHEET No. T77B

- FULL WAVEGUIDE BAND
- ULTRA-FLAT FREQUENCY RESPONSE
- VERY LOW VSWR
- MINIATURE (FLANGE SIZE)



DESCRIPTION

MEC's Miniature Attenuator Pads feature ultra-flat frequency response and very low VSWR in extremely short flange-size packages. Typical attenuation flatness over the full waveguide band is ±0.2 dB (±0.3 dB max.) with typical VSWR of 1.10 (1.15 max.). These minimal-size units are available in 1 dB steps from 1 to 10 dB and are ideal for inclusion in systems where length is critical. Housing is aluminum with chromate conversion and gray epoxy enamel finish.

SPECIFICATIONS

MODEL NO.	FREQUENCY (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE	INSERTION LENGTH* (IN. MAX.)
H60 S	7.05 – 10.0	WR112	UG-138/U	1.25
W60 S	7.0 – 11.0	WR102	M3922/70-002	1.25
X60 S	8.2 – 12.4	WR90	UG-135/U	1.25
M60 S	10.0 – 15.0	WR75	M3922/53-008	1.00
P60 S	12.4 – 18.0	WR62	UG-1665/U	.75
K60 S	18.0 – 26.5	WR42	UG-597/U	.50
A60 S	26.5 – 40.0	WR28	UG-599/U	.375

Aluminum

*Length longer if more than 6 dB

ORDERING INFORMATION

(1) To specify desired attenuation, add suffix to model number. EXAMPLE: A60 S-3 specifies a 3 dB attenuator in WR28 waveguide operating from 26.5 to 40.0 GHz.

(2) Special values of attenuation and other waveguide sizes are available on request.

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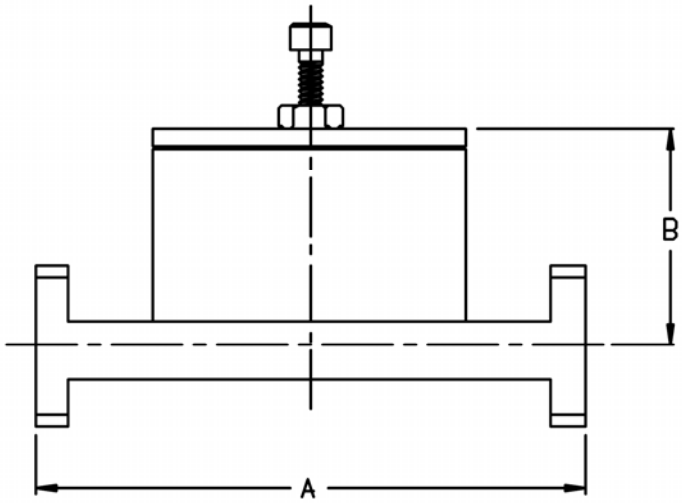
WAVEGUIDE VARIABLE ATTENUATORS
60V Series

DATA SHEET No. T150

- **BROAD ATTENUATION RANGE**
- **LOW LOSS**
- **LOW VSWR**
- **FULL BAND**

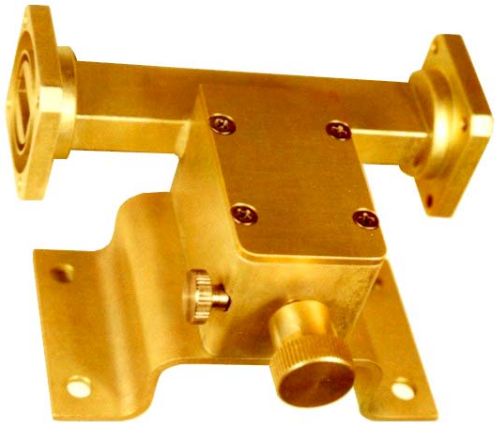


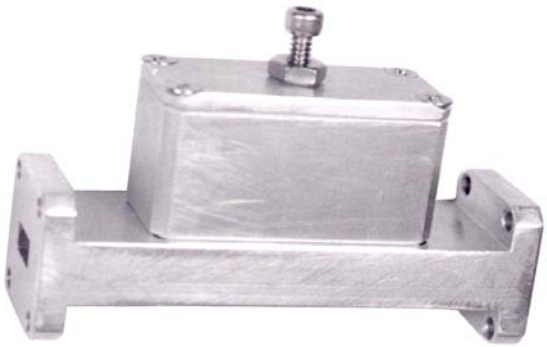
DESCRIPTION

MEC's 60V series of waveguide variable attenuators are available in attenuation ranges of 0-40 dB. Narrow or broad band versions may be ordered. Full band flatness is as low as ± 0.5 dB from 0-10 dB attenuation and ± 0.7 dB from 10-20 dB attenuation. Full band flatness degrades at higher attenuation levels, however narrower bandwidths can hold ± 0.5 dB flatness up to 40 dB attenuation.

Calibrated vernier drives are available upon request. A locking screw is standard on the drive mechanism. These components may be converted from variable to a fixed version by simply switching the attenuator block. Our high precision machining guarantees unit to unit repeatability within 0.1 dB.

The table below is a representative sample of MEC's available designs of variable attenuators. Contact MEC with your specific requirements. Our engineering staff will be glad to discuss your needs.





MODEL NUMBER	W/G SIZE	FREQ. (GHz)	ATTENUATION (dB)	FLATNESS (dB)		VSWR	INSERTION LOSS (dB)	A (Inches)	B (Inches)
X60-V	WR90	8.2-12.4	0-20	0-10 dB Atten. 10-20 dB Atten.	± 1.0 ± 3.0	1.1:1	0.2 Max	10	1.34
P60-118	WR62	12.4-18	0-40	0-10 dB Atten. 10-20 dB Atten. 20-40 dB Atten.	± 0.5 ± 0.7 ± 2.0	1.1:1	0.2 Max	3.9	2.2
Y60-V	WR34	26-33	0-20	0-10 dB Atten. 10-20 dB Atten.	± 0.5 ± 0.7	1.1:1	0.2 Max	3.0	1.2

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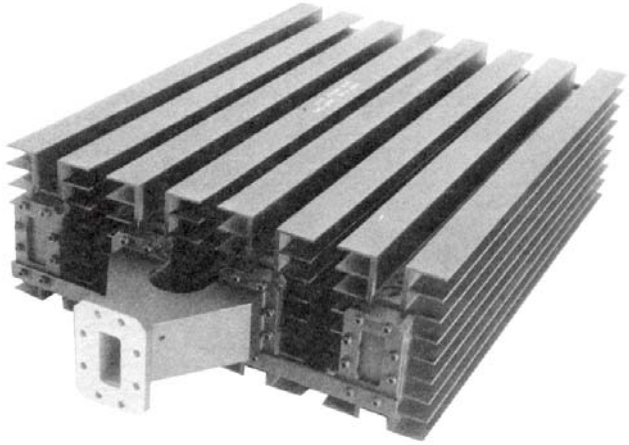
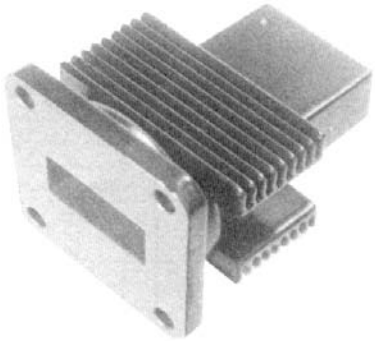

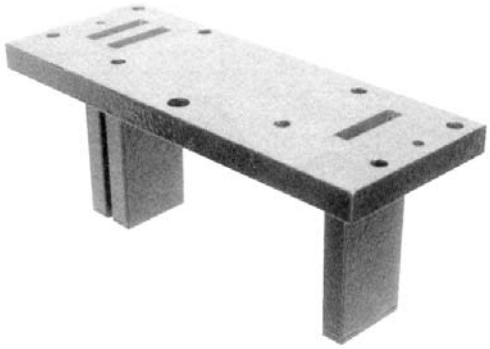
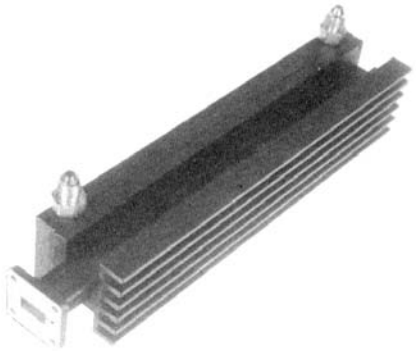

Microwave Engineering Corporation's extensive line of rectangular waveguide terminations supplies world-wide needs from 1 to 50 GHz. The following pages describe our standard product line and a few of our many specials. Other terminations can be readily supplied to satisfy your unique requirements. We're as near as your phone.

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LOW POWER MATCHED TERMINATIONS

- LOW VSWR
- FULL BANDWIDTH
- LIGHTWEIGHT
- COMPACT


80-LU
80-LA


80-L

DESCRIPTION

MEC Rectangular Waveguide Standard Length 80-L, Ultra-short 80-LU, Communications and Narrow Band 80-LA Terminations consists of precision aluminum waveguide containing rugged material especially selected and designed to absorb incident power with very low reflection.
These units are ideal for laboratory and field measurements and production setups requiring high quality terminations. Additional features are short length and light weight. Typical applications include VSWR measurement of waveguide components, low power dummy antennas and matched terminations for directional couplers, hybrids and other devices.
All units have a Chemical Film finish per MIL-C-5541, Class 3, followed by gray epoxy enamel. A power sampling probe can be supplied as a separate unit with any of the terminations. Typical flatness is ± 0.5 dB across the entire band for sampling levels from 30 to 50 dB.

SPECIFICATIONS

MODEL NO	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE	MAX. AV. PWR. (WATTS)	VSWR (MAX.)	LENGTH (IN. MAX.)
			STANDARD LENGTH			
L80-L	1.12-1.70	WR-650	UG-418B/U	25	1.03	30
LM80-L	1.45-2.20	WR-510	UG-1717/U	15	1.03	27
LA80-L	1.70-2.60	WR-430	UG-437B/U	10	1.025	23
LS80-L	2.20-3.30	WR-340	UG-554A/U	5	1.025	17
S80-L	2.60-3.95	WR-284	UG-584/U	5	1.025	12
S2-80-L	2.60-5.85	RG-109/U	M3922/75-01	5	1.025	12
B80-L	3.30-4.90	WR-229	CMR-229	5	1.02	8
G80-L	3.95-5.85	WR-187	UG-407/U	5	1.02	8
D80-L	4.90-7.05	WR-159	CMR-159	4	1.02	6
J80-L	5.85-8.20	WR-137	UG-441/U	3	1.02	6
J2-80-L	5.85-12.4	RG-110/U	M3922/75-03	2	1.02	6
H80-L	7.05-10.0	WR-112	UG-138/U	2	1.02	5
W80-L	7.0-11.0	WR-102	M3922/70-002	2	1.02	5
X80-L	8.2-12.4	WR-90	UG-135/U	2	1.02	4
M80-L	10.0-15.0	WR-75	M3922/53-008	2	1.02	4
P80-L	12.4-18.0	WR-62	UG-1665/U	1.5	1.02	3
N80-L	15.0-22.0	WR-51	M3922/70-011	1.5	1.02	3
K80-L	18.0-26.5	WR-42	UG-597/U	1.5	1.03	3
Y80-L	22.0-33.0	WR-34	M3922/63-010	1	1.03	3
A80-L	26.5-40.0	WR-28	UG-599/U*	1	1.03	3
T80-L	33.0-50.0	WR-22	UG-383/U*	1	1.05	3
			ULTRA-SHORT			
S80-LU	2.60-3.95	WR-284	UG-584/U	5	1.06	8
S2-80-LU	2.60-5.85	RG-109/U	M3922/75-01	5	1.06	8
B80-LU	3.30-4.90	WR-229	CMR-229	5	1.05	4
G80-LU	3.95-5.85	WR-187	UG-407/U	5	1.05	4
D80-LU	4.90-7.05	WR-159	CMR-159	4	1.05	3
J80-LU	5.85-8.20	WR-137	UG-441/U	3	1.05	3
J2-80-LU	5.85-12.4	RG-110/U	M3922/75-03	2	1.05	3
H80-LU	7.05-10.0	WR-112	UG-138/U	2	1.05	0.5
W80-LU	7.0-11.0	WR-102	M3922/70-002	2	1.05	2.5
X80-LU	8.2-*12.4	WR-90	UG-135/U	2	1.05	1.5
M80-LU	10.0-15.0	WR-75	M3922/53-008	2	1.05	1.5
P80-LU	12.4-18.0	WR-62	UG-1665/U	1.5	1.05	1.5
N80-LU	15.0-22.0	WR-51	M3922/70-011	1.5	1.05	1.5
K80-LU	18.0-26.5	WR-42	UG-597/U	1.5	1.06	1.5
Y80-LU	22.0-33.0	WR-34	M3922/63-010	1	1.06	1.5
A80-LU	26.5-40.0	WR-28	UG-599/U*	1	1.10	1.5
T80-LU	33.0-50.0	WR-22	UG-383/U	1	1.10	1.5
			COMMUNICATIONS AND NARROW BAND			
B80-LAM	3.7-4.2	WR-229	CMR-229	5		4
D80-LAM	5.925-6.425	WR-159	CMR-159	4		3
J80-LAL	5.925-6.425	WR-137	UG-441/U	3		3
H80-LAL	7.25-8.4	WR-112	UG-138/U	2	1.01	2.5
X80-LAL	10.7-11.7	WR-90	UG-135/U	2		1.5
M80-LAL	10.7-11.7	WR-75	M3922/53-008	2		1.5
N80-LAL	17.0-19.0	WR-51	M3922/70-011	1.5		1.5

ORDERING INFORMATION

(1) For Power Sampling, add suffix "PS" to model number and specify sampling level (from 30 to 50 dB) desired.
(2) Half-height terminations, other frequency ranges, other flanges, and unique mounting arrangements also available.
(3) 80-LU Series also available from 2.60 through 50 GHz with smaller bandwidth and improved VSWR. Add suffix "L" "M", or "H" for low, middle, or high half of band.

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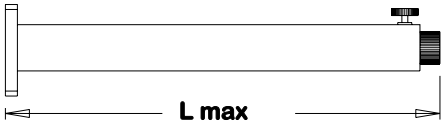
MEDIUM POWER & SLIDING TERMINATIONS

- LOW VSWR
- ADJUSTABLE PHASE



DESCRIPTIONS

80-LS Sliding Terminations consist of a well-matched, tapered sliding load in a precision aluminum waveguide housing. The load can be moved over more than one-half wavelength at the lowest frequency. Optional micrometer drive is available for band H through A. Applications include simulating a perfect termination for precise measurement of VSWR, impedance, directivity or isolation. By reversing the phase of the sliding termination it is possible to subtract it from other small reflections in the system under test.

80-M Medium Power Terminations are convection-cooled and similar to the low power series, but designed to handle higher power levels. Features include low VSWR and light weight. Typical applications include system or test bench set-ups and as moderate power dummy loads.

Both series are available with optional sampling probes supplied as separate units from 30 to 50 dB with typical flatness of ± 0.5 dB. Finish is Chemical Film per MIL-C-5541, Class 3, followed by gray epoxy enamel for the sliding loads and black enamel for the medium power termination.

SPECIFICATIONS

MODEL NO.	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE	MAX. AV. PWR. (WATTS)	VSWR (MAX.)	LENGTH (IN. MAX.)
SLIDING TERMINATIONS						
L80-LS	1.12-1.70	WR-650	UG-418B/U	25	1.03	48
LM80-LS	1.45-2.20	WR-510	UG-1717/U	15	1.03	45
LA80-LS	1.70-2.60	WR-430	UG-437B/U	10	1.025	40
LS80-LS	2.20-3.30	WR-340	UG-554A/U	5	1.025	34
A80-LS	2.60-3.95	WR-284	UG-584/U	5	1.025	28
S2-80-LS	2.60-5.85	RG-109/U	M3922/75-01	5	1.025	28
B80-LS	3.30-4.90	WR-229	CMR-229	5	1.02	22
G80-LS	3.95-5.85	WR-187	UG-407/U	5	1.02	18
D80-LS	4.90-7.05	WR-159	CMR-159	4	1.02	16.5
J80-LS	5.85-8.20	WR-137	UG-441/U	3	1.02	13.5
J2-80-LS	5.85-12.4	RG-110/U	M3922/75-03	2	1.02	13.5
H80-LS	7.05-10.0	WR-112	UG-138/U	2	1.02	11
W80-LS	7.0-11.0	WR-102	M3922/70-002	2	1.02	10
X80-LS	8.2-12.4	WR-90	UG-135/U	2	1.02	9
M80-LS	10.0-15.0	WR-75	M3922/53-008	2	1.02	7.5
P80-LS	12.4-18.0	WR-62	UG-1665/U	1.5	1.02	7
N80-LS	15.0-22.0	WR-51	M3922/70-011	1.5	1.02	7
K80-LS	18.0-26.5	WR-42	UG-597/U	1.5	1.03	5.5
Y80-LS	22.0-33.0	WR-34	M3922/63-010	1	1.03	5
A80-LS	26.5-40.0	WR-28	UG-599/U*	1	1.03	5
MEDIUM POWER TERMINATIONS						
L80-M	1.12-1.70	WR-650	UG-418B/U	50	1.05	40
LM80-M	1.45-2.20	WR-510	UG-1717/U	50		40
LA80-M	1.70-2.60	WR-430	UG-437B/U	50		30
LS80-M	2.20-3.30	WR-340	UG-554A/U	50		30
S80-M	2.60-3..95	WR-284	UG-584/U	50		30
S2-80-M	2.60-5.85	RG-109/U	M3922/75-01	50		22
B80-M	3.30-4.90	WR-229	CMR-229	50		30
G80-M	3.95-5.85	WR-187	UG-407/U	50		24
D80-M	4.90-7.05	WR-159	CMR-159	50		24
J80-M	5.85-8.20	WR-137	UG-441/U	50		20
J2-80-M	5.85-12.4	RG-110/U	M3922/75-03	50		13.4
H80-M	7.05-10.0	WR-112	UG-138/U	50		12
W80-M	7.0-11.0	WR-102	M3922/70-002	50		12
X80-M	8.2-12.4	WR-90	UG-135/U	50		12
M80-M	10.0-15.0	WR-75	M3922/53-008	50		10.5
P80-M	12.4-18.0	WR-62	UG-1665/U	40		9.4
N80-M	15.0-22.0	WR-51	M3922/70-011	40		9.4
K80-M	18.0-26.5	WR-42	UG-597/U	30		7.5
Y80-M	22.0-33.0	WR-34	M3922/63-010	20		7.5
A80-M	26.5-40.0	WR-28	UG-599/U*	15		7.5

***Aluminum**

ORDERING INFORMATION

Add suffix "PS" to model number for Power Sampling and specify level (30 to 50 dB).
Customized mounting, half-height models, other flanges and frequencies available on request.

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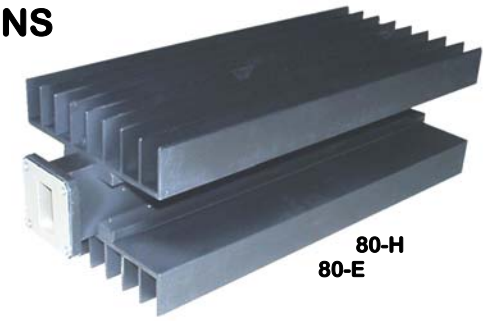
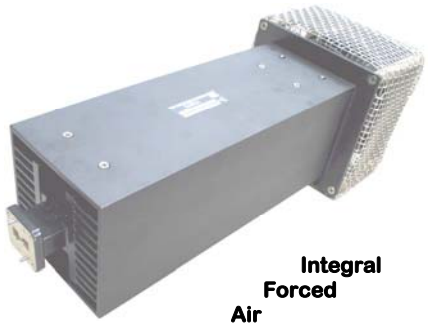
HIGH POWER & EXTRA HIGH POWER TERMINATIONS

- CONVECTION COOLING
- FAN COOLED



80-H
80-E



Integral
Forced
Air
Cooling

DESCRIPTION

MEC Rectangular Waveguide High Power 80-H and Extra High Power 80-E Terminations are constructed of finned aluminum waveguide containing high temperature absorbing material in intimate contact with the waveguide walls for good heat transfer. Standard units of 1,000 W or less are cooled by free air convection; for ratings greater then 1,000 W, forced air must be used. For higher powers, shorter lengths, or lower temperature rise, an integrally mounted fan and ducted housing may be supplied to provide forced air cooling. VSWR is 1.05 max for operation over the full waveguide frequency band for 80-H series and 1.06 max for 80-E series.

Designed to withstand conditions of extreme temperature and thermal shock, these terminations are ideal for us in high power systems as dummy antennas to permit testing, tuning, and maintenance without radiating RF power.

Finish is Chemical Film per MIL-C-5541, Class 3 followed by high temperature black epoxy enamel.

A power sampling probe can be supplied as a separate unit to monitor power. Typical sampling flatness is ± 0.5 dB across the entire band for levels from 30 to 50 dB.

SPECIFICATIONS

MODEL NO.	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE	MAXIMUM POWER AVERAGE (WATTS) 80-H	MAXIMUM POWER AVERAGE (WATTS) 80-E	MAXIMUM POWER PEAK (KW) @ 30 PSIG DRY AIR ‡	LENGTH (IN. MAX)
L80-H, L80-E	1.12-1.70	WR-650	UG-418B/U	1,000	1,500	20,000	40
LM80-H, LM80-E	1.45-2.20	WR-510	UG-1717/U	1,000	1,500	15,000	40
LA80-H, LA80-E	1.70-2.60	WR-430	UG-437B/U	1,000	1,500	10,000	30
LS80-H, LS80-E	2.20-3.30	WR-340	UG-554A/U	1,000	1,500	7,000	30
S80-H, S80-E	2.60-3.95	WR-284	UG-584/U	1,000	1,500	4,000	30
S2-80-H, S2-80-E	2.60-5.85	RG-109/U	M3922/75-01	1,000	1,500	2,000	22
B80-H, B80-E	3.30-4.90	WR-229	CPR-229F	1,000	1,500	3,000	30
G80-H, G80-E	3.95-5.85	WR-187	UG-407/U	1,000	1,500	1,800	24
D80-H, D80-E	4.90-7.05	WR-159	CPR-159F	1,000	1,500	1,000	24
J80-H, J80-E	5.85-8.20	WR-137	CPR-137F	1,000	1,500	1,000	20
J80-H*, J80-E*	5.90-6.50	WR-137	CPR-137F	1,000	1,500	1,000	24
J2-80H, J2-80-E	5.85-12.4	RG-110/U	M3922/75-03	500	1,000	750	13.4
H80-H, H80-E	7.05-10.0	WR-112	UG-138/U	500	1,000	750	12
W80-H, W80-E	7.0-11.0	WR-102	M3922/70-002	500	1,000	700	12
X80-H, X80-E	8.2-12.4	WR-90	UG-135/U	500	1,000	350	12
M80-H, M80-E	10.0-15.0	WR-75	M3922/53-008	400	800	300	10.5
P80-H, P80-E	12.4-18.0	WR-62	UG-1665/U	250	500	250	9.4
N80-H, N80-E	15.0-22.0	WR-51	M3922/70-011	175	350	175	9.4
K80-H, K80-E	18.0-26.5	WR-42	UG-597/U	125	250	100	7.5
Y80-H, Y80-E	22.0-33.0	WR-34	M3922/63-010	112	225	85	7.5
A80-H, A80-E	26.5-40.0	WR-28	UG-599/U**	100	200	80	7.5

Notes: (1) For ratings greater than 1,000 W, forced air must be used (2) VSWR on all units is 1.05 max., 3 *Narrow band (4) ‡ Pressurized units are supplied on special request (5) **Aluminum

ORDERING INFORMATION

(1) Order by Model No, and specify actual frequency range, VSWR and pressurization required.
(2) Add suffix "PS" to Model No. for Power Sampling and specify level (30 to 50 dB).
(3) For Integral Forced Air cooling, contact MEC.
(4) Half-height terminations, unique mounting arrangements, other flanges and frequencies available on request.

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LIQUID COOLED TERMINATIONS

- **LOW VSWR**
- **GREATEST HEAT TRANSFER**

DESCRIPTION

MEC's 80-W Series of Rectangular Waveguide Liquid Cooled Terminations operate with VSWR of 1.05 max. Thirteen models cover the full waveguide frequency bands from 2.60 to 40.0 GHz As dummy loads they ideally meet the demands of today's extremely high-powered systems to permit operational check-out without radiating RF power. Construction utilizes high-temperature absorbing material in intimate contact with the waveguide walls for good heat transfer. All units are designed to operate in any position with a coolant inlet pressure of 100 psig (max.) and temperature of 150° F (max.). Units are aluminum with MS33656E4 ¼" flared tube fittings for the liquid coolant connections. Finish is Chemical Film per MIL-C-5541, Class 3, followed by high-temperature black epoxy enamel. A power sampling probe can be supplied as a separate unit to monitor power. Typical sampling flatness is ± 0.5 dB across the entire band for levels from 30 to 50 dB.

SPECIFICATIONS

MODEL NO.	FREQUENCY RANGE (GHz)	WAVGUIDE SIZE	EQUIVALENT FLANGE	MAXIMUM POWER		MINIMUM FLOW RATE (GPM)	LENGTH (IN. MAX)
				AVERAGE (WATTS)	PEAK (KW) @ 30 PSIG DRY AIR ‡		
S80-W	2.60-3.95	WR-284	UG-584/U	15,000	4,000	5.1	30
B80-W	3.30-4.90	WR-229	CPR-229F	15,000	3,000	5.1	30
G80-W	3.95-5.85	WR-187	UG-407/U	10,000	1,800	3.4	24
D80-W	4.90-7.05	WR-159	CPR-159F	10,000	1,000	3.4	24
J80-W	5.85-8.20	WR-137	CPR-137F	5,000	1,000	1.7	20
H80-W	7.05-10.0	WR-112	UG-138/U	4,000	750	1.4	12
W80-W	7.0-11.0	WR-102	M3922/70-002	4,000	700	1.4	12
X80-W	8.2-12.4	WR-90	UG-135/U	3,000	350	1.0	12
M80-W	10.0-15.0	WR-75	M3922/53-008	3,000	300	1.0	10.5
P80-W	12.4-18.0	WR-62	UG-1665/U	1,500	250	0.5	9.4
N80-W	15.0-22.0	WR-51	M3922/70-011	1,500	175	0.5	9.4
K80-W	18.0-26.5	WR-42	UG-597/U	1,000	100	0.34	7.5
A80-W	26.5-40.0	WR-28	UG-599/U*	500	80	0.17	7.5

‡ Pressurized units are supplied on special request. ***Aluminum**

VSWR: 1.05 max.
COOLANT:

Where: Q= Minimum flow rate in GPM
Max. inlet temperature: 150°F.
Max. inlet pressure: 100 psig

The flow rate is determined from the following formula.
Typical demineralized water or Coolant.

$$Q = \frac{6.8P}{Cp\,\Delta T}$$

P = Max. CW power in Kilowatts.
Cp = Specific heat of coolant
ΔT = Coolant temperature rise in °F.

The tabularized values are for Cp = 1 for water and a ΔT of 20°F.
For different coolants, temperature rises, or power levels, a different flow rate would be necessary

ORDERING INFORMATIONS

(1) Order by Model No, and specify actual frequency range, VSWR and internal waveguide pressurization required.
(2) Add suffix "PS" to Model No. for Power Sampling and specify level (30 to 50 dB).
(3) Half-height terminations, other frequency ranges, flange, coolant fittings and pressures, unique mounting arrangements quoted on request.

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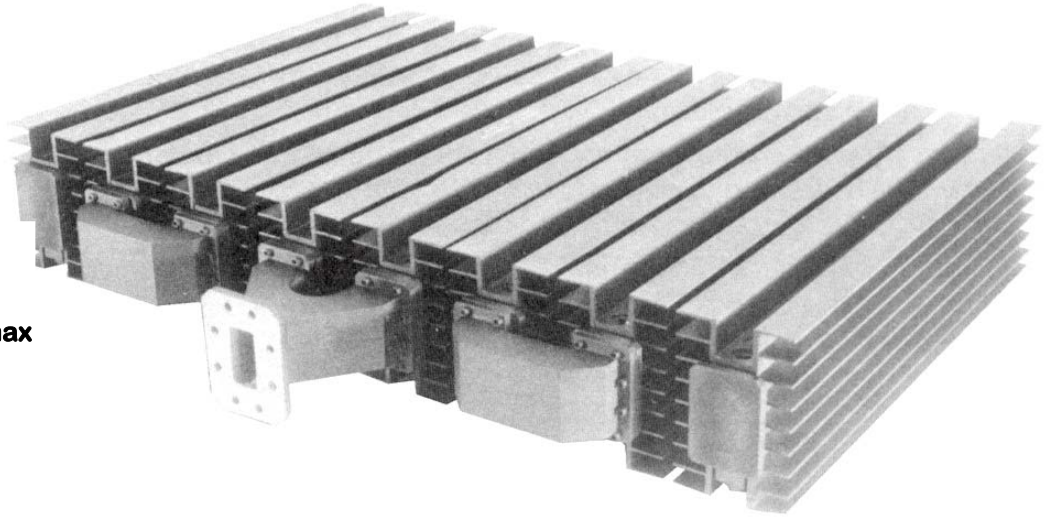
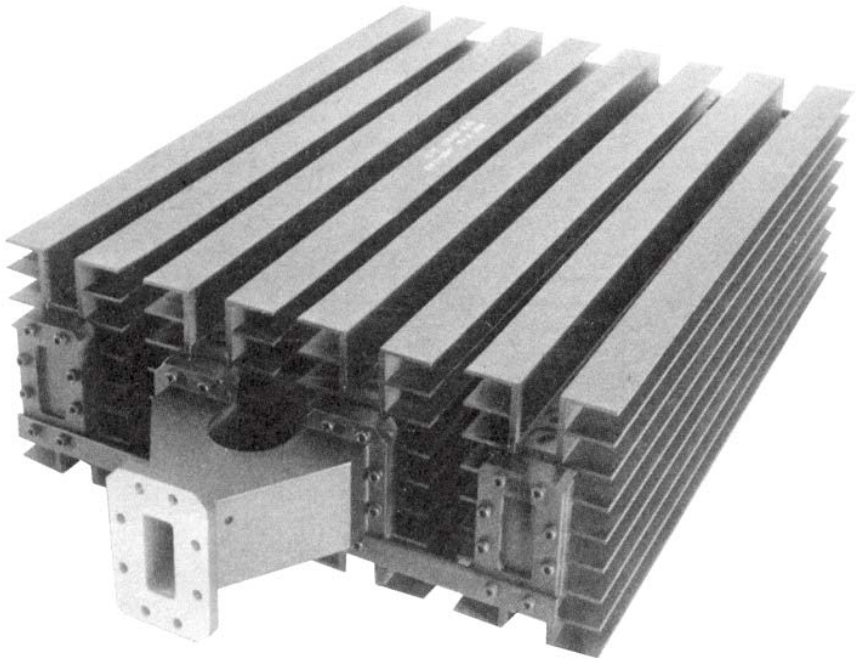
SUPER HIGH POWER TERMINATIONS
80-S SERIES

WR-159
5.925 – 6.425 GHz
12 KW average
VSWR: 1.05 typical, 1.1 max





WR-137
5.925 – 6.425 GHz
4.5 KW average
VSWR: 1.05 typical, 1.1 max

These state-of-the-art convection cooled super high power terminations exemplify but one of MEC's many innovative approaches to satisfy specific requirements. May we help with your applications? Inquiries are cordially invited.

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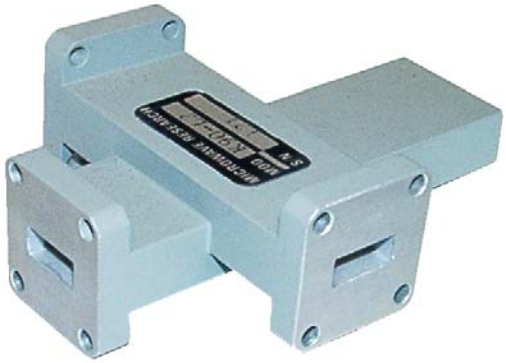
- **COMPACT**
- **LIGHTWEIGHT**
- **INTERNAL TERMINATION**

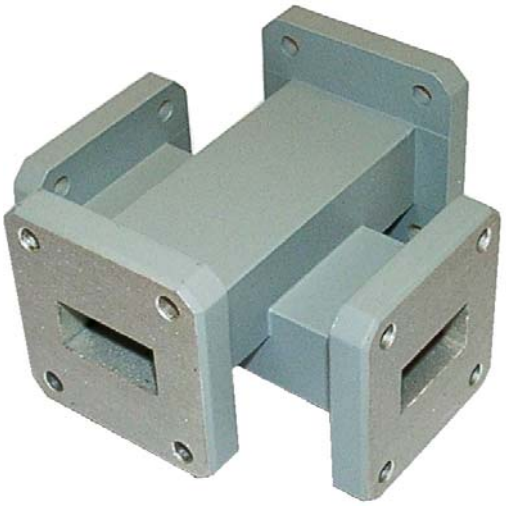


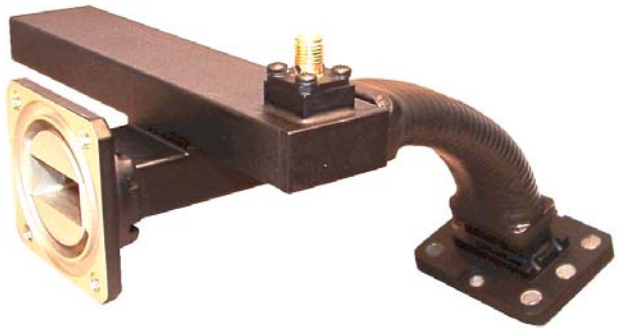
DESCRIPTION

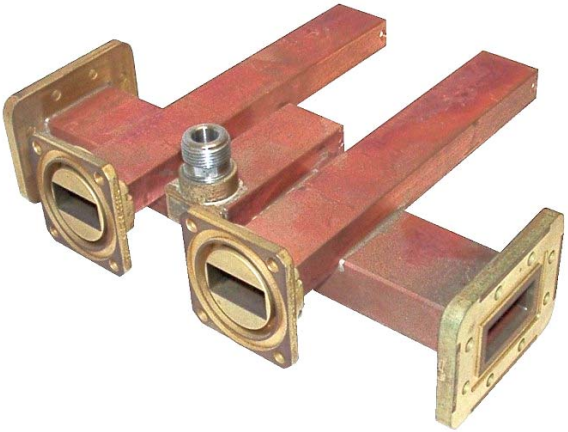
MEC 90 Series Cross Guide Couplers have specially-designed coupling apertures that produce flat coupling over the full waveguide frequency band. The couplers are symmetrical four-port devices; either arm may be used as the main line. They are also available with built-in terminations, integral coaxial adapters, and terminated dual secondary arms (dual directional couplers).

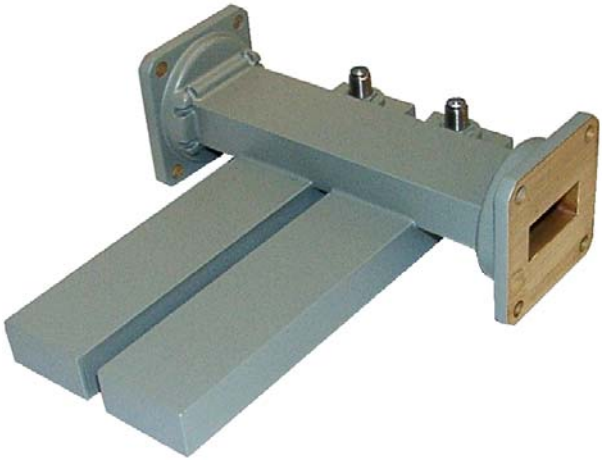
These rugged, moderate-directivity couplers are ideal where the high directivity of the longer broad-wall multi-hole couplers (160 Series) is not required. The units are well-suited for many microwave applications including injection, reflection measurement, attenuation, and isolation. Because of their compactness and simplicity of construction, they have found wide acceptance in production applications.

Assemblies are furnished with an aluminum housing. Finish is chromate conversion per MIL-C-5541, Class 3, painted with gray epoxy enamel.









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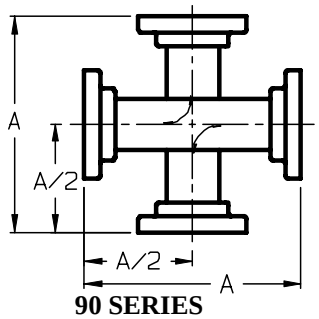
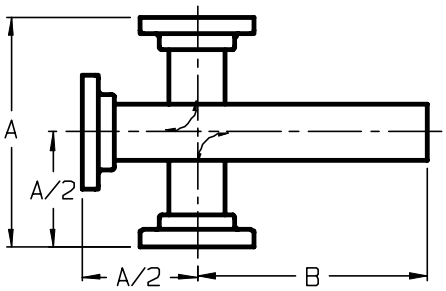
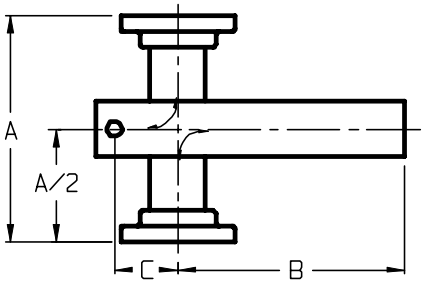
SPECIFICATIONS



90 SERIES



90L SERIES



90LC SERIES

Coupling: 20, 30, 40, 50 dB
Coupling Mean: ± 0.5 dB
Frequency Sensitivity:
20 = ± 1.2 dB max.
30 = ± 1.0 dB max.
40 = ± 0.8 dB max.
50 = ± 0.6 dB max.

Directivity: typically 18 dB min

VSWR:

Waveguide Ports*	Coaxial Ports
1.05 max.	1.20 max. std.; 1.10, 1.05 avail.

*1.10 max for 20 dB

MODEL NO.	FREQUENCY RANGE (GHz)	WAVELENGTH SIZE	FLANGE	DIMENSIONS (INCHES)		
				A ± .03	B max.	C ± .03
S90	2.60 - 3.95	WR-284	UG-584/U	7.00	10.5	2.92
B90	3.7 - 4.2	WR-229	CMR-229	6.00	6.2	2.53
G90	3.95 - 5.85	WR-187	UG-407/U	4.90	5.6	2.00
D90	5.925 - 6.425	WR-159	CMR-159	5.00	4.9	2.10
J90	5.85 - 8.20	WR-137	UG-441/U	4.00	4.3	1.83
H90	7.05 - 10.00	WR-112	UG-138/U	3.50	3.7	1.35
W90	7.0 - 11.0	WR-102	M3922/70-002	3.00	3.6	1.02
X90	8.2 - 12.4	WR-90	UG-135/U	3.00	3.0	.90
M90	10.0 - 15.0	WR-75	M3922/53-008	2.75	2.5	1.04
P90	12.4 -18.0	WR-62	UG-1665/U	2.75	2.3	.72
N90	15.0 -22.0	WR-51	M3922/70-011	2.50	1.8	.67
K90	18.0 - 26.5	WR-42	UG-597/U	1.80	1.8	.62
Y90	22.0 - 33.0	WR-34	M3922/63-010	1.80	1.7	.58
A90	26.5 - 40.0	WR-28	UG-599/UΔ	1.80	1.7	.55

ORDERING INFORMATION

(1) Add the following suffixes to the model number to specify built-in termination, coaxial connector, coupling level, and connector type:
(a) Built-in secondary arm termination:"-L"
(b) Coupling Output Connector: "-C"
(c) Coupling Level: "-20" for 20dB, "-30" for 30dB, "-40" for 40dB, "-50" for 50dB
(d) Connector type:
"-17" for SSMA female "-N" for type N female "-T" for TNC female
"-3" for SMA female "-7" for precision 7mm
For a complete listing of connectors available, refer to data sheet T100.

(2) Other flanges, coupling values, direction of coupling, multiple coupling arms, reduced height waveguide, and custom designs available on request.

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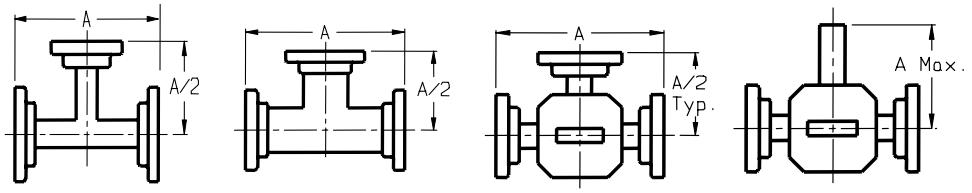
RECTANGULAR WAVEGUIDE
WELL-MATCHED TEES AND HYBRIDS
100 / 100-L / 100-E / 100-H SERIES

DATA SHEET No.T39C

- **LOW VSWR**
- **COMPACT**
- **FULL BANDWIDTH**

100-E Series | 100-H series | 100 Series | 100-L Series



DESCRIPTION

MEC offers a superior line of well-matched, broadband 4-port hybrid magic tees (model 100) and 3-port tees (100-E for E-Plane series tee). They can also be supplied with an integral medium power termination on the E arm (100-L). The 3-port tees may be used in power dividing networks or as combiners of high power tube outputs.

The magic tee hybrid is even more suitable as it offers high isolation. Common applications of the hybrid include balanced mixer operations and connecting a transmitter and receiver to a pair of fore and aft antennas on an aircraft. All units are aluminum with chromate conversion finish. Paint is gray epoxy enamel.

SPECIFICATIONS

VSWR: 1.3:1 at midband, 1.5:1 at band edges. Lower VSWR can be supplied over reduced bandwidths – e.g. 1.05 over 5%, 1.10 over 10% 1.20 over 20% frequency bandwidths.

Power Split: 3.2± 0.2 dB (typ. tracking< 0.3 dB)

Phase Balance: within ± 5° **Hybrid Isolation:** 30 dB E to H arm, 15 dB colinear arms

FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE	HYBRID TEE	TERMINATED HYBRID TEE	SERIES TEE	SHUNT TEE	DIMENSION A (IN. ± .03)
2.60 – 3.95	WR-284	UG-584/U	S100	S100-L	S100-E	S100-H	7.00
3.30 – 4.90	WR-229	CMR-229	B100	B100-L	B100-E	B100-H	6.00
3.95 – 5.85	WR-187	UG-407/U	G100	G100-L	G100-E	G100-H	5.00
4.90 – 7.05	WR-159	CMR-159	D100	D100-L	D100-E	D100-H	5.00
5.85 – 8.20	WR-137	UG-441/U	J100	J100-L	J100-E	J100-H	4.50
7.05 – 10.0	WR-112	UG-138/U	H100	H100-L	H100-E	H100-H	3.25
7.0 – 11.0	WR-102	M3922/70-002	W100	W100-L	W100-E	W100-H	3.00
8.2 – 12.4	WR-90	UG-135/U	X100	X100-L	X100-E	X100-H	2.50
10.0 – 15.0	WR-75	WR-75	M100	M100-L	M100-E	M100-H	2.50
12.4 – 18.0	WR-62	UG-1665/U	P100	P100-L	P100-E	P100-H	2.50
15.0 – 22.0	WR-51	WR-51	N100	N100-L	N100-E	N100-H	2.00
18.0 – 26.5	WR-42	UG-595/U	K100	K100-L	K100-E	K100-H	2.00
26.5 – 40.0	WR-28	UG-599/U	A100	A100-L	A100-E	A100-H	2.00

ORDERING INFORMATION

(1) For reduced VSWR over narrow band, add suffix "N" (e.g. S100-N) and specify band and VSWR desired.
(2) Other flanges, materials, and tees such as folded, reduced height, and unequal split available on request.
(3) Other waveguide bands and sizes also available.

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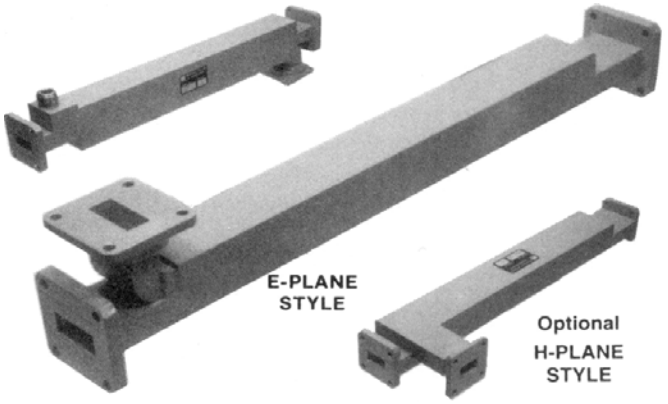
RECTANGULAR WAVEGUIDE BROAD-WALL MULTI-HOLE DIRECTIONAL COUPLERS
160 SERIES 200 SERIES

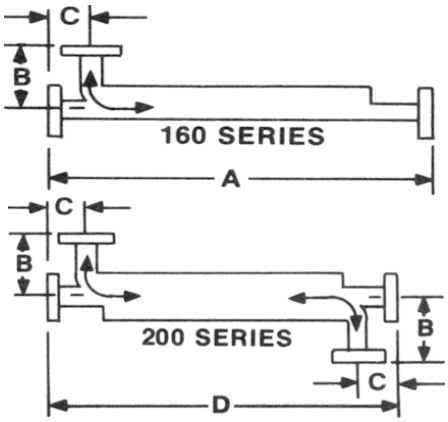
DATA SHEET No. T31D

- HIGH DIRECTIVITY
- FLAT COUPLING
- WAVEGUIDE OR COAXIAL PORTS



DESCRIPTION

These directional Couplers consist of rectangular waveguide primary and secondary lines with a common broad wall where high directivity coupling is achieved over the full waveguide band by a Tchebyscheff multi-hole coupling structure and a precision termination in the secondary arm. Waveguide cover flanges are provided on the main line while secondary lines are available with either cover flanges or coaxial connectors. Both single directional (160 Series) and dual directional (200 Series) couplers have minimum size consistent with electrical performance. These couplers are ideal in reflectometer set-ups to measure VSWR's as low as 1.04:1 over full waveguide bands. They are also well suited as samplers in leveling loops or as power dividers and combiners. Finish is chromate conversion per MIL-C-5541, Class 3 for aluminum, and corrosion-resistant coatings for all others when specified, painted with gray epoxy enamel.



SPECIFICATIONS

Directivity	40 dB Min.	VSWR 1.05 Max., Main Line
Coupling	10, 20, 30, 40, 50, dB	1.10 Max., Waveguide Secondary
Coupling	±0.4 dB	1.35 Max., Coaxial Secondary
Frequency Sensitivity		±0.5 dB Max.

Model Number		Frequency	Waveguide	Equivalent	Dimensions (Inches)			
Single	Dual	Range (GHz)	Size	Flange	A	B	C	D*
S160	S200	2.60 – 3.95	WR-284	UG-584/U	33.00	3.57	2.90	66.00
B160	B200	3.30 – 4.90	WR-229	CMR-229	33.00	3.49	1.62	66.00
G160	G200	3.95 – 5.85	WR-187	UG-407/U	26.00	2.98	2.40	26.00
D160	D200	4.90 – 7.05	WR-159	CMR-159	21.00	1.90	1.46	21.00
J160	J200	5.85 – 8.20	WR-137	UG-441/U	21.00	1.88	1.81	21.00
H160	H200	7.05 – 10.0	WR-112	UG-138/U	14.00	1.85	1.19	14.00
W160	W200	7.0 – 11.0	WR-102	M3922/70-002	14.00	1.55	1.10	14.00
X160	X200	8.2 – 12.4	WR-90	UG-135/U	13.00	1.67	1.05	13.00
M160	M200	10.0 – 15.0	WR-75	M3922/53-008	12.00	1.30	1.00	12.00
P160	P200	12.4 – 18.0	WR-62	UG-1665/U	11.00	1.14	0.91	11.00
N160	N200	15.0 – 22.0	WR-51	M3922/70-011	11.00	.97	0.91	11.00
K160	K200	18.0 – 26.5	WR-42	UG-597/U	9.00	.82	0.69	9.00
Y160	Y200	22.0 – 33.0	WR-34	M3922/63-010	8.50	.75	0.95	8.50
A160	A200	26.5 – 40.0	WR-28	UG-599/U**	***	***	***	***

* For dual 10 dB couplers, two single couplers are used back to back resulting in D =2A
** Aluminum
*** Contact MEC for A160/A200 dimensions

ORDERING INFORMATION

(1) Order by model number (by default the Model Numbers above are E Plane Style). Add a suffix H to the Model Number for the optional H – Plane coupled arm versions. Add an additional suffix as follows to designate coupling level:
-10 for 10 dB -20 for 20 dB -30 for 30 dB -40 for 40 dB -50 for 50 dB

(2) To specify coaxial secondary add suffix as follows:
-3 for SMA female -T for TNC female -N for type N female -7 for precision 7 mm -k for 2.9 mm -2.4 for 2.4mm
For a complete listing of connectors available, refer to data sheet T100

(3) Other coupling values from 3 dB and up are available. Over-all length may vary.

(4) Other frequencies, directivity, style and power options available.

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QUARTZ VACUUM WINDOWS

DATA SHEET No. T175

- HERMETIC
- LOW VSWR
- HIGH POWER

DESCRIPTION

These rectangular waveguide windows are ideal for vacuum and pressure-tight applications. The dielectric is high-temperature Quartz, brazed directly to a low-CTE KOVAR frame, to maintain the vacuum seal over a wide temperature range with no epoxy or adhesives. These windows withstand 15 PSI of differential pressure, in either direction. They handle high Peak, Average and CW power levels.

MODEL#	Waveguide Size	Frequency Range	VSWR*	Ω	Power rating (CW or Avg.)	Thickness
A270Q	WR-28	26.5-40	1.5	.5	400	.38
Y270Q	WR-34	25-32	1.4	.4	400	.38
K270Q	WR-42	18-26.5	1.3	.3	400	.25
N270Q	WR-51	18-22	1.3	.3	500	.38
P270Q	WR-62	12.4-18	1.3	.3	600	.38
M270Q	WR-75	10-15	1.2	.3	1000	.38
X270Q	WR-90	8.2-12.4	1.2	.3	1500	.38
W270Q	WR-102	7-11	1.2	.2	2000	.38
H270Q	WR-112	7.05-10	1.2	.2	2000	.25
J270Q	WR-137	5.85-8.2	1.2	.2	2000	.38
D270Q	WR-159	4.90-7.05	1.2	.2	2500	.38
G270Q	WR-187	3.95-5.85	1.2	.2	2500	.38
B270Q	WR-229	3.3-4.9	1.2	.2	2500	.38
S270Q	WR-284	2.6-3.95	1.2	.2	2500	.63
LS270Q	WR-340	2.2-3.3	1.2	.2	3000	.63
LA270Q	WR-430	1.7-2.6	1.2	.2	3000	.63

Notes: 1. Flange combinations include cover/cover, cover/groove or groove/groove pattern, with thru-holes in both UG, CPR and CMR styles.

2. Alternate configurations and additional high power cooling options are available upon request.

Ordering Data:

TYPICAL PART NO. (example) K270Q – 1 – 2 – S

MODEL NUMBER:

INPUT FLANGE *:

OUTPUT FLANGE *:

MATERIAL FINISH:

G-GOLD plated, S-SILVER plated, K-KOVAR base metal

* COVER: 1 GASKET: 2 CMR: 3 CPR F: 4 CPRG: 5

* Narrower bands with lower VSWR and IL available

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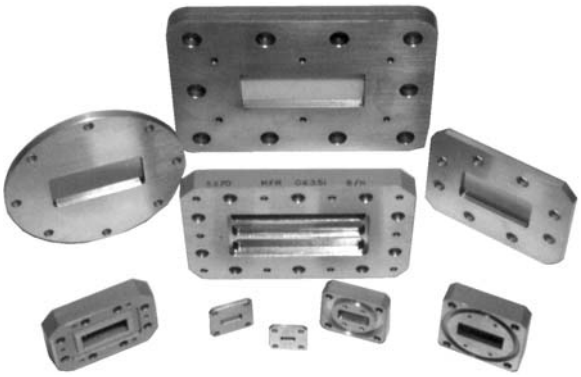
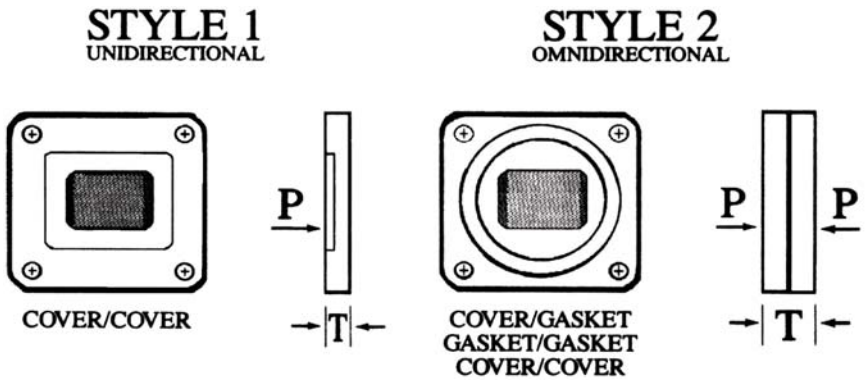
RECTANGULAR WAVEGUIDE PRESSURE WINDOWS 270 SERIES

DATA SHEET No. T87A

- LOW VSWR
- HIGHPOWER





DESCRIPTION

MEC Rectangular Waveguide Pressure Windows offer low Reflection Loss over complete waveguide bands. Working pressure is 30 lbs. Typically they have a gasket groove on one side and conform to standard flange dimensions. Clearance holes are supplied for installation between flanges. Windows may be manufactured out of aluminum or brass.

SPECIFICATIONS

MODEL NO.	FLANGE TYPE	STYLE	T (INCHES)
S270	UG-F/G	2	1/2
	CPR-F	2	1/2
	CPR-G	2	1/2
	CMR	2	1/2
B270	CPR-F	1	1/4
	CPR-G	2	3/8
	CMR	2	3/8
G170	UG-F	1	3/16
	UG-G	2	3/8
	CPR-F	1	3/16
	CPR-G	2	3/8
	CMR	2	3/8
D270	UG-F	1	3/16
	UG-G	2	3/8
	CPR-F	1	3/16
	CPR-G	2	3/8
	CMR	2	3/8
J270	UG-F	1	3/16
	UG-G	2	3/8
	CPR-F	1	3/16
	CPR-G	2	3/8
	CMR	2	3/8

MODEL NO.	FLANGE TYPE	STYLE	T (INCHES)
H270	UG-F	1	3/16
	UG-G	2	3/8
	CPR-F	1	3/16
	CPR-G	2	3/8
	CMR	2	3/8
W270	UG-F	1	3/16
	UG-G	2	3/8
X270	UG-F	1	3/16
	UG-G	2	3/8
	CPR-F	1	3/16
	CPR-G	2	3/8
	CMR	2	3/8
M270	UG-F	1	3/16
	UG-G	2	3/8
	CPR-F	1	3/16
	CPR-G	2	3/8
P270	UG-F	1	3/16
	UG-G	2	5/16
N270	UG-F	1	3/16
	UG-G	2	5/16
K270	UG-F	1	1/8
	UG-G	2	1/4
Y270	UG-F	1	1/8
	UG-G	2	1/4
A270	UG-F	1	1/8
	UG-G	2	1/4

ORDERING INFORMATION

(1) Ordering by model No., flange type, and style.
(2) Call for information about higher power and special applications

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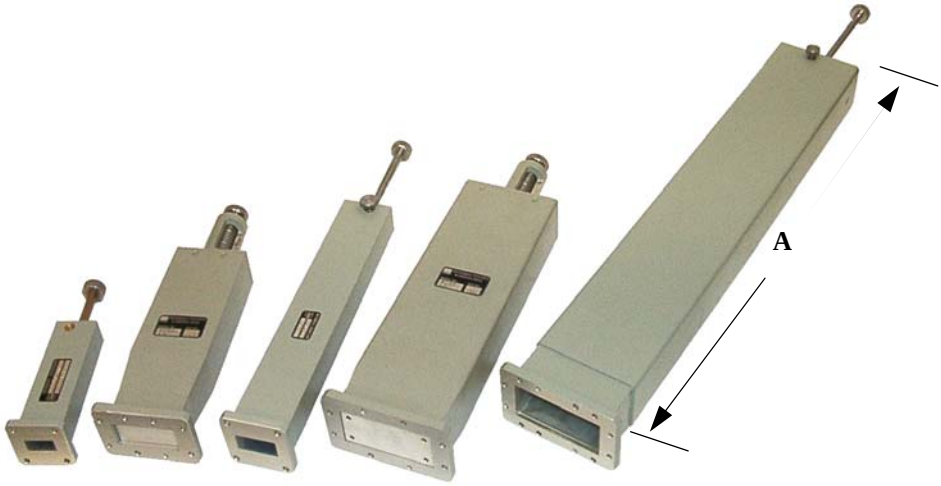
RECTANGULAR WAVEGUIDE SLIDING SHORT CIRCUITS 280-LSC SERIES

DATA SHEET No. T61B

- LOW LOSS
- FULL BAND
- NON-CONTACTING



DESCRIPTION

MEC 280-LSC Sliding Short Circuits are simple, low-loss devices which provide a movable short circuit in waveguide. The shorts are adjustable over more than half a guide wavelength at the lowest frequency of operation. Resettable movement is achieved via micrometer drive (P through A) or sliding shaft (LM through M) when scale or vernier is included.

Models from LM through D contain two-stage non-contacting folded cavity short circuits. Those from J through A contain non-contacting shorting plungers of the circular, multi-choke type. Both are highly efficient. Return loss is typically less than 0.3dB over the full waveguide band. Waveguide is aluminum with chromate conversion finish per MIL-C-5541 Class 3. All units contain locking mechanisms. External non-mating surfaces are painted with gray epoxy enamel.

SPECIFICATIONS

MODEL NUMBER	FREQUENCY RANGE (GHz)	WAVEGUIDE SIZE	EQUIVALENT FLANGE	LENGTH A (INCHES) MAX.
LM280-LSC	1.45 - 2.20	WR-510	UG - 1717/U	22.0
LA280-LSC	1.70 - 2.60	WR-430	UG - 437B/U	17.0
LS280-LSC	2.20 - 3.30	WR-340	UG - 554A/U	13.0
S280-LSC	2.60 - 3.95	WR-284	UG - 584/U	10.0
B280-LSC	3.30 - 4.90	WR-229	CMR - 229	8.5
G280-LSC	3.95 – 5.85	WR-187	UG - 407/U	7.0
D280-lsc	4.90 – 7.05	WR-159	CMR – 159	5.5
J280-LSC	5.85 – 8.20	WR-137	UG – 441/U	4.5
H280-LSC	7.05 – 10.0	WR-112	UG – 138/U	4.0
W280-LSC	7.0 – 11.0	WR-102	M3922/70 – 002	4.0
X280-LSC	8.2 – 12.4	WR-90	UG – 135/U	4.0
M280-LSC	10.0 – 15.0	WR-75	M3922/53 – 008	4.0
P280-LSC	12.4 – 18.0	WR-62	UG – 1665/U	4.0
N280-LSC	15.0 – 22.0	WR-51	M3922/70 – 010	3.5
K280-LSC	18.0 – 26.5	WR-42	UG – 595/U	3.5
Y280-LSC	22.0 – 33.0	WR –34	UG – 1530/U	3.5
A280-LSC	26.5 - 40.0	WR-28	UG – 599/U	3.5

ORDERING INFORMATION

1) Order by model number. Add "S" or "V" if optional scale or vernier is desired with sliding shaft.
2) Other flanges, bands, and lengths available on request.
3) Fixed short circuits with waveguide cover flanges are also available. Add suffix "FSC" to model number.
EXAMPLE: P280 - FSC is a WR-62 waveguide fixed shorting plate with hole pattern the same as cover flange.

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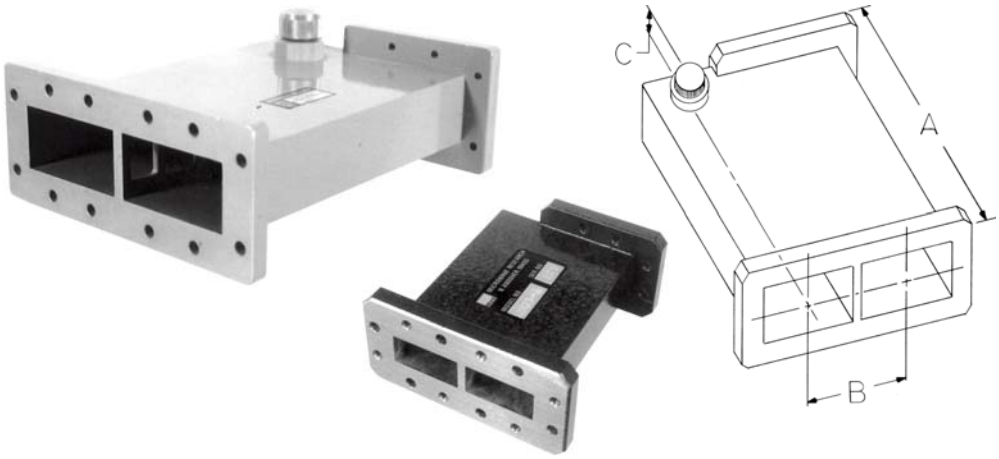
RECTANGULAR WAVEGUIDE SIDEWALL DIRECTIONAL COUPLERS
500 SERIES

DATA SHEET No. T17C

- **ULTRA-FLAT COUPLING**
- **HIGH ISOLATION**
- **WIDE COUPLING VALUES**



DESCRIPTION

MEC Ultra-Flat Sidewall Directional Couplers were developed for the standard communication frequency bands with weaker coupling values not previously available. The couplers are aluminum three-port devices and have been designed to minimize length as well as provide an extremely flat level of ± 0.1 dB coupling.

Directivity has been maintained at 20 dB minimum while VSWR is less than 1.06. Standard coupling values are 10, 20 and 30 dB nominal (± 2 dB). Other values or custom designs are available on request between 2.4 and 30 dB over a wide choice of frequency ranges. Finish is chromate conversion per MIL-C-5541, Class 3, painted with gray epoxy enamel.

SPECIFICATIONS

MODEL NO.	FREQUENCY (GHz)	COUPLING (dB)	WAVEGUIDE SIZE	INPUT FLANGE	DIMENSIONS (IN.)		
					A	B	C (MAX.)
B503	3.7 - 4.2	3	WR229	CMR229	9.50	2.440	1.3
B510, B520, B530	3.7 - 4.2	10, 20, 30	WR229	CMR229	9.50	2.440	1.3
D510, D520, D530	5.925 - 6.425	10, 20, 30	WR159	CMR159	5.25	1.740	1.1
J510L, J520L, J530L	5.925 - 6.425	10, 20, 30	WR137	CMR137	6.40	1.522	1.1
J510M, J520M, J530M	7.25 – 7.75	10, 20, 30	WR137	UG441/U	4.65	1.522	1.1
J510H, J520H, J530H	7.9 - 8.4	10, 20, 30	WR137	UG441/U	4.10	1.522	1.1
H510L, H520L, H530L	7.25 - 7.75	10, 20, 30	WR112	UG138/U	5.30	1.272	1.1
H510M, H520M, H530M	7.9 - 8.4	10, 20.30	WR112	UG138/U	4.60	1.272	1.1
H5024H, H503H, H504H	9.5 - 10.0	2.4, 3, 4	WR112	UG138/U	4.60	1.272	1.1
X503L	8.5 - 9.6	3	WR90	CMR90	3.00	1.020	1.1
X503M, X5033M, X5036M	9.5 - 10.0	3, 3.3, 3.6	WR90	CMR90	3.00	1.020	1.1
X504M, X5045M	9.5 - 10.0	4, 4.5	WR90	CMR90	3.00	1.020	1.1
X503H	10.7 - 11.7	3	WR90	CMR90	3.00	1.020	1.1
X510H*, X520H, X530H	10.7 - 11.7	10, 20, 30	WR90	CMR90	3.00	1.020	1.1
M510*, M520, M530	10.7 - 11.7	10, 20, 30	WR75	M3922/53-008	3.58	.800	1.1

***VSWR 1.15 max., Directivity 15 dB typical**

ORDERING INFORMATION

A. For other coupling values, specify as follows:

1. Designate the band by letter.

2. Insert "5".

3. Insert coupling value desired.

EXAMPLE: Model J517M is a 17 dB nominal (± 2 dB) coupler in WR137 waveguide with flatness ± 0.1 dB, operating over the 7.25 - 7.75 GHz band.

B. For exact coupling values, please specify.

C. Termination may be placed in opposite wall if desired.

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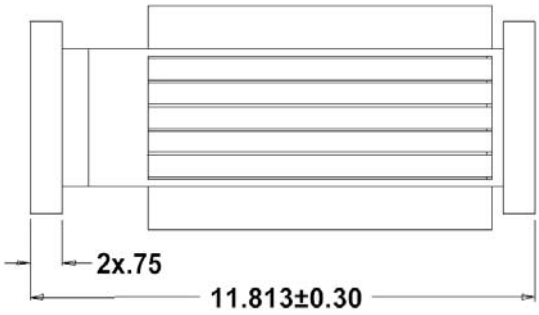
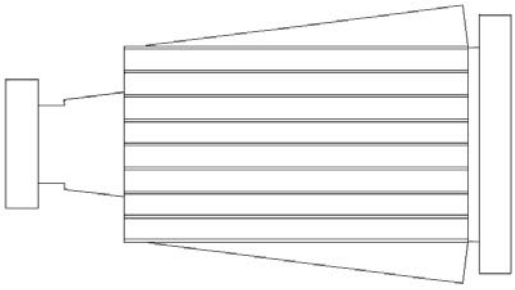
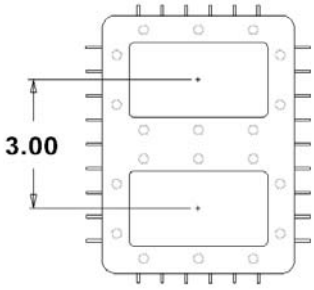
SUPER HIGH POWER IN PHASE DIVIDER
(S100E-215)

DATA SHEET No. T149

- SUPER HIGH POWER
- LOW LOSS
- COOL OPERATING
- TEMPERATURE
- HIGH EFFICIENCY FINS
- RUGGED CONSTRUCTION







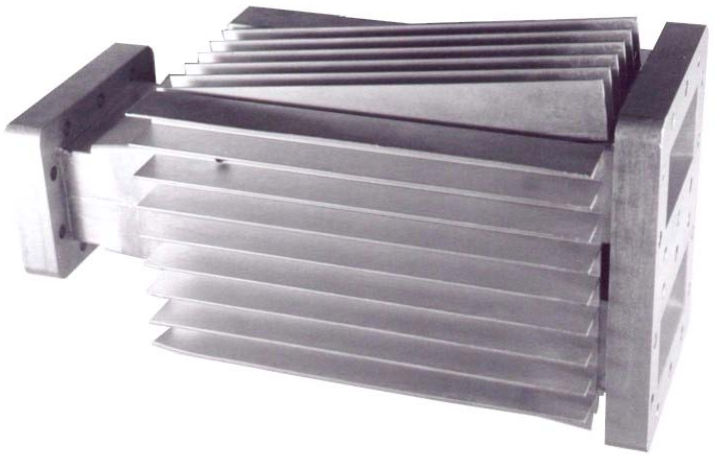
DESCRIPTION

MEC's S70L-345 is a WR284 Super High Power in Phase Power Divider. It operates at S-band and handles 5 MW peak, 40 KW average. High conductivity aluminum alloy material is used which helps lower the insertion loss (typically 0.03 dB). The low loss, high precision machining, and high efficiency cooling fins all aid in lowering the operating temperatures. Temperature rise is less than 70 degrees F above ambient at 35 KW average input power. All above factors contribute towards problem free operation at the extremely high power levels. Its rugged construction makes it suitable for extreme shipboard environments.

Contact MEC with your specific requirements. Our engineering staff will be glad to discuss your high power needs.

SPECIFICATIONS:

Model Number	S100E-215
Frequency	2.9-3.1 GHz
VSWR	1.05:1 Max
Insertion Loss	0.05 dB Max, .03 Typ
Peak Power	5 MW
Average Power	40 KW
Case Temperature	70° Max above Ambient @35 KW average power
Pressure	37.5 PSIG Max
Input/Output Port	WR284



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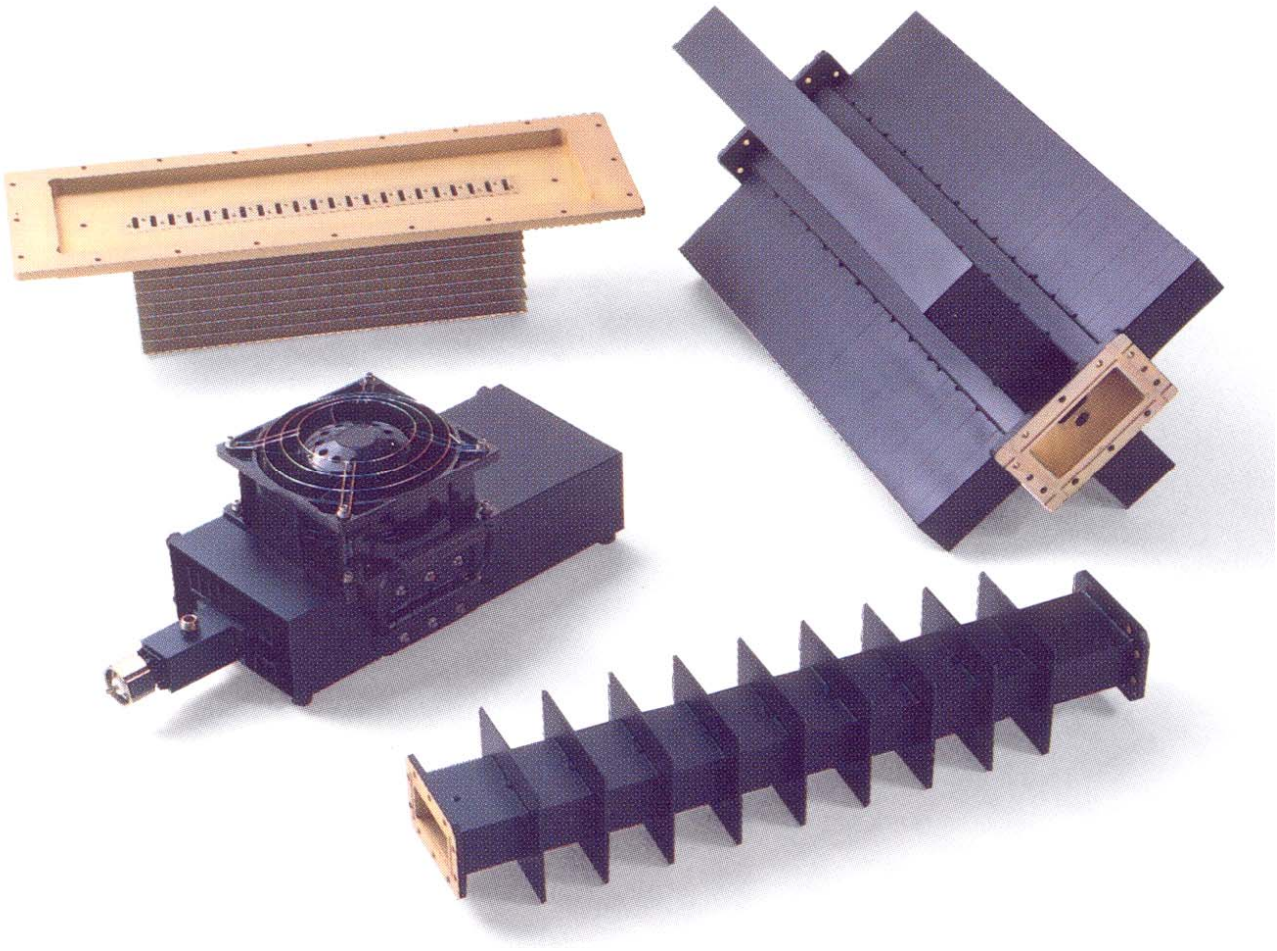

MEC has mastered the exacting science of high power handling, from .2 to 40GHz in coax and waveguide. Examples include:

- **Dummy loads ranging from passive radiating finned models to fan and liquid cooled.**
- **Absorptive filters which prolong transmitter life by preventing overheating due to spurious harmonics.**
- **Mismatches, fixed or variable amplitude and/or phase, to test for breakdown under simulated standing waves.**
- **Assorted high power components, such as waveguide to coax adapters, couplers, pressure windows and customized test kits.**

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