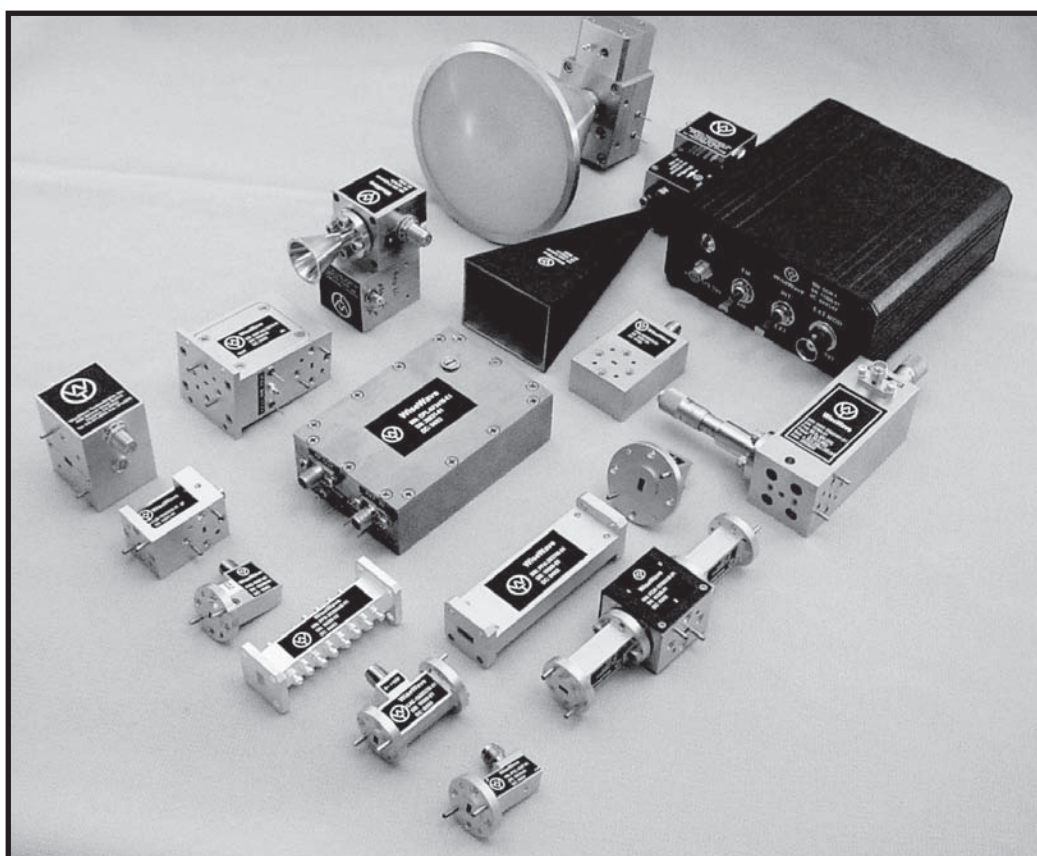


9. Technical Reference

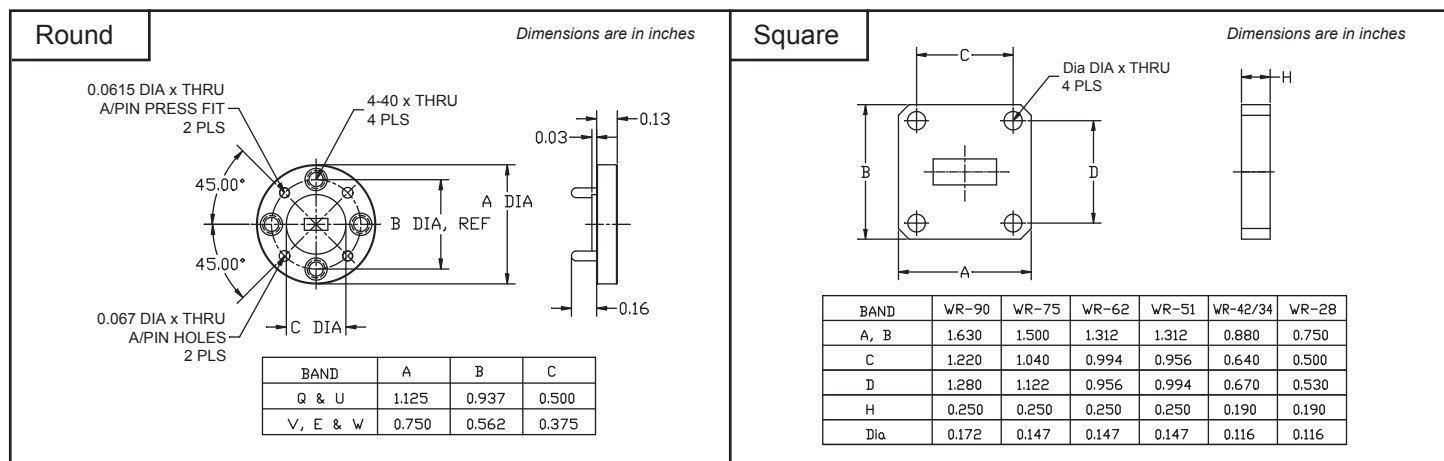
Rectangular Waveguide and Flange Designations	9-98
Circular Waveguide and Flange Designations	9-99
Coax Connectors	9-99
mW and dBm.....	9-100
Model Number Index	9-101



Rectangular Waveguide and Flange Designations

Bands	U.S.A. (EIA) (JAN)	U.K. WG I.E.C.	Operating Frequency Range (GHz)	Cut-off Frequency (GHz)	Waveguide Inner Size (Inches)	Cover Flange* MIL-F-3922/ UG	Flange Type
X	WR-90 RG-52/ U	WG-16 R100	8.2 to 12.4	6.56	0.900 x 0.400	53-001 UG-39/ U	Square
	WR-75 RG-346/ U	WG-17 R120	10.0 to 15.0	7.87	0.750 x 0.375	53-007 -	Square
Ku	WR-62 RG-91/ U	WG-18 R140	12.4 to 18.0	9.48	0.622 x 0.311	53-005 UG-419/ U	Square
	WR-51 RG-352/ U	WG-19 R180	15.0 to 22.0	11.57	0.510 x 0.255	70-010 -	Square
K	WR-42 RG-53/ U	WG-20 R220	18.0 to 26.5	14.05	0.420 x 0.170	54-001 UG-595/ U	Square
	WR-34 RG-53/ U	WG-21 R260	22.0 to 33.0	17.33	0.340 x 0.170	- UG-1530/ U	Square
Ka	WR-28 RG-96/ U	WG-22 R320	26.5 to 40.0	21.08	0.280 x 0.140	54-003 UG-599/ U	Square
Q (B)	WR-22 RG-97/ U	WG-23 R400	33.0 to 50.0	26.34	0.224 x 0.112	67B-006 UG-383/ U	Round
U	WR-19 RG-358/ U	WG-24 R500	40.0 to 60.0	31.36	0.188 x 0.094	67B-007 UG-383/ U-M	Round
V	WR-15 RG-98/ U	WG-25 R620	50.0 to 75.0	39.86	0.148 x 0.074	67B-008 UG-385/ U	Round
E	WR-12 RG-99/ U	WG-26 R740	60.0 to 90.0	48.35	0.122 x 0.061	67B-009 UG-387/ U	Round
W	WR-10 RG-359/ U	WG-27 R900	75.0 to 110.0	59.01	0.100 x 0.050	67B-010 UG-387/ U-M	Round
F	WR-8 RG-138/ U	WG-28 R1200	90.0 to 140.0	73.84	0.080 x 0.040	- UG-387/ U-M	Round
D	WR-6 RG-276/ U	WG-29 R1400	110.0 to 170.0	90.84	0.065 x 0.0325	- UG-387/ U-M	Round

***Note:** The flange material is brass. The flange number is different if the material is aluminum.



Circular Waveguide and Flange Designations

Bands	Frequency Range (GHz)		Circular Waveguide Diameter (Inches)	Cover Flange* MIL-F-3922 UG	Flange Type
X	Low	8.2 to 9.97	1.094	53-001 UG-39/ U	Square
	Medium	8.5 to 11.6	0.938		
	High	9.97 to 12.4	0.797		
Ku	Low	12.4 to 15.9	0.688	53-005 WG-419/U	Square
	Medium	13.4 to 18.0	0.594		
	High	15.9 to 18.0	0.500		
K	Low	18.0 to 20.5	0.455	54-001 UG-595/U	Square
	Medium	20.0 to 24.5	0.396		
	High	24.0 to 26.5	0.328		
Ka	Low	26.5 to 33.0	0.315	54-003 UG-599/U	Square
	Medium	33.0 to 38.5	0.250		
	High	38.5 to 40.0	0.219		
Q (B)	Low	33.0 to 38.5	0.250	67B-008 UG-383/ U	Round
	Medium	38.5 to 43.0	0.219		
	High	43.0 to 50.0	0.188		
U	Low	40.0 to 43.0	0.210	67B-007 UG-383/U-M	Round
	Medium	43.0 to 50.0	0.188		
	High	50.0 to 60.0	0.165		
V	Low	50.0 to 58.0	0.165	67B-008 UG-385/U	Round
	Medium	58.0 to 68.0	0.141		
	High	68.0 to 75.0	0.125		
E	Low	68.0 to 75.0	0.136	67B-009 UG-387/U	Round
	Medium	66.0 to 88.0	0.125		
	High	88.0 to 90.0	0.094		
W	Low	75.0 to 88.0	0.112	67B-010 UG-387/U-M	Round
	High	88.0 to 110.0	0.094		
F	Low	90.0 to 115.0	0.089	- UG-387/U-M	Round
	High	115.0 to 140.0	0.075		
D	Low	110.0 to 140.0	0.073	- UG-387/U-M	Round
	High	140.0 to 160.0	0.059		

***Note:** The flange material is brass. The flange number is different if the material is aluminum.

Coax Connectors

Connector Type	Frequency Range (GHz)	Ducommun Technologies' Designations	
N	DC to 18.0	NF - Female Connector	NM - Male Connector
7 mm or APC-7	DC to 18.0	7F - Female Connector	7M - Male Connector
SMA	DC to 18.0	SF - Female Connector	SM - Male Connector
Super SMA	DC to 27.0	SF - Female Connector	SM - Male Connector
3.5 mm	DC to 26.5	3F - Female Connector	3M - Male Connector
2.92 mm or K	DC to 40.0	KF - Female Connector	KM - Male Connector
2.4 mm	DC to 50.0	2F - Female Connector	2M - Male Connector
1.85 mm or V	DC to 65.0	VF - Female Connector	VM - Male Connector
1 mm	DC to 110.0	1F - Female Connector	1M - Male Connector

Return Loss, VSWR, Reflection Coefficient and Mis-match Loss

Return Loss (dB)	VSWR	Reflection Coefficient	Mismatch Loss (dB)	Return Loss (dB)	VSWR	Reflection Coefficient	Mismatch Loss (dB)
1	17.39	0.89	6.87	21	1.20	0.09	0.03
2	8.72	0.79	4.33	22	1.17	0.08	0.03
3	5.85	0.71	3.02	23	1.15	0.07	0.02
4	4.42	0.63	2.20	24	1.13	0.06	0.02
5	3.57	0.56	1.65	25	1.12	0.06	0.01
6	3.01	0.50	1.26	26	1.11	0.05	0.01
7	2.61	0.45	0.97	27	1.09	0.04	0.01
8	2.32	0.40	0.75	28	1.08	0.04	0.01
9	2.10	0.35	0.58	29	1.07	0.04	0.01
10	1.92	0.32	0.46	30	1.07	0.03	0.00
11	1.78	0.28	0.36	31	1.06	0.03	0.00
12	1.67	0.25	0.28	32	1.05	0.03	0.00
13	1.58	0.22	0.22	33	1.05	0.02	0.00
14	1.50	0.20	0.18	34	1.04	0.02	0.00
15	1.43	0.18	0.14	35	1.04	0.02	0.00
16	1.38	0.16	0.11	36	1.03	0.02	0.00
17	1.33	0.14	0.09	37	1.03	0.01	0.00
18	1.29	0.13	0.07	38	1.03	0.01	0.00
19	1.25	0.11	0.06	39	1.02	0.01	0.00
20	1.22	0.10	0.04	40	1.02	0.01	0.00

mW and dBm

mW	dBm	mW	dBm	mW	dBm
0.001	-30.0	1	0.0	30	14.8
0.005	-23.0	2	3.0	40	16.0
0.01	-20.0	3	4.8	50	17.0
0.02	-17.0	4	6.0	60	17.8
0.03	-15.2	5	7.0	70	18.5
0.04	-14.0	6	7.8	80	19.0
0.05	-13.0	7	8.5	90	19.5
0.06	-12.2	8	9.0	100	20.0
0.07	-11.5	9	9.5	200	23.0
0.08	-11.0	10	10.0	300	24.8
0.09	-10.5	11	10.4	400	26.0
0.1	-10.0	12	10.8	500	27.0
0.2	-7.0	13	11.1	600	27.8
0.3	-5.2	14	11.5	700	28.5
0.4	-4.0	15	11.8	800	29.0
0.5	-3.0	16	12.0	900	29.5
0.6	-2.2	17	12.3	1,000	30.0
0.7	-1.5	18	12.6	10,000	40.0
0.8	-1.0	19	12.8	100,000	50.0
0.9	-0.5	20	13.0	1,000,000	60.0