

Matched Hybrid Tees (Magic Tees)

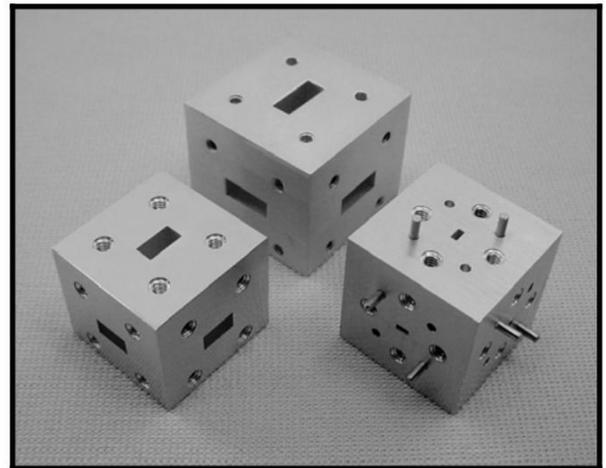
Bulletin No. PCT

FEATURES

- ❖ High isolation
- ❖ Low insertion loss
- ❖ Excellent port balance
- ❖ Wide bandwidth
- ❖ Rugged mechanical construction

APPLICATIONS

- ❖ Power splitting & combining
- ❖ Phase & frequency discriminating



PCT Series

DESCRIPTION

PCT series waveguide matched hybrid tees (Magic Tees) are available in microwave and millimeterwave frequency bands up to 110 GHz. These hybrid tees are matched power dividers or combiners for many system applications. These hybrid tees are four port couplers. A signal inputting to H-plane port is equally split into two amplitude balanced, in phase signals at colinear ports (H-arms) and isolated from the E-plane port, while a signal inputting to E-plane port is equally split into two amplitude balanced, 180° out of phase signals at colinear ports (H-arms) and isolated from the E-plane port. The in-phase and equal amplitude signals inputting into two colinear ports can result combined signal at H-plane port and cancelled signal at E-plane port. This feature is widely used in the monopulse antenna feed structure and phase testing setup. The typical operating bandwidth of the matched hybrid tees is up to 80% of waveguide bandwidth while it can cover full waveguide bandwidth with slight performance degradation at band edge. The matched hybrid tees are readily to be used to configure 4, 8 and 16 way power dividers.

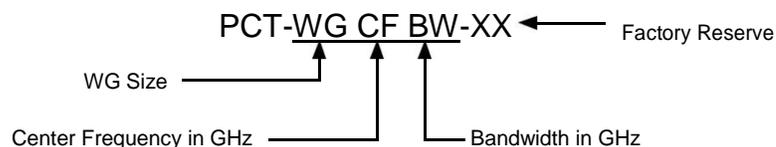
SPECIFICATIONS

Frequency Band	K	KA	Q	U	V	E	W
Waveguide Size	WR-42	WR-28	WR-22	WR-19	WR-15	WR-12	WR-10
Frequency Range (GHz)	18 to 26.5	26.5 to 40	33 to 50	40 to 60	50 to 75	60 to 90	75 to 110
Insertion Loss (dB, Typ)*	0.3	0.3	0.4	0.4	0.4	0.5	0.5
Ports Isolation (dB, Min)	20	20	20	20	20	20	20
Amplitude Un-Balance (dB, Max)	± 0.1	± 0.1	± 0.2	± 0.2	± 0.2	± 0.3	± 0.3
VSWR (Typ)	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1
Outline Drawing	WT-E-1	WT-E-1	WT-E-1	WT-E-1	WT-E-1	WT-E-1	WT-E-1

* Insertion loss is defined as the power loss in addition to the coupling loss. Contact factory for other waveguide size.

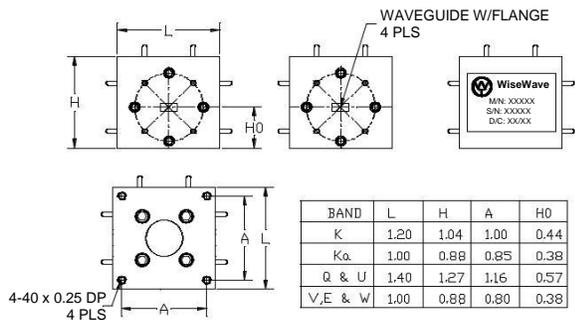
HOW TO ORDER

Specify Model Number



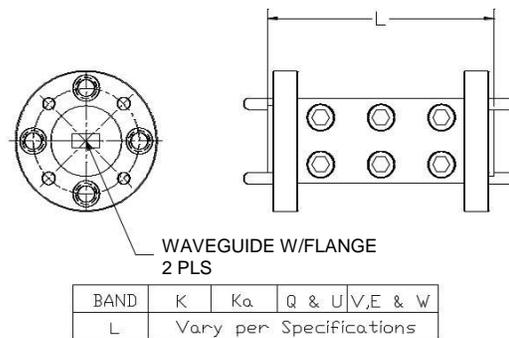
Passive Component Outline Drawings #1

WT-E-1



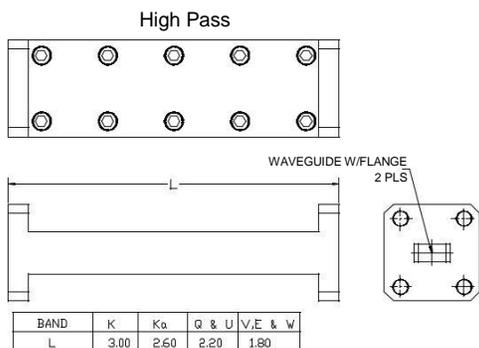
Dimensions are in inches

WT-E-2



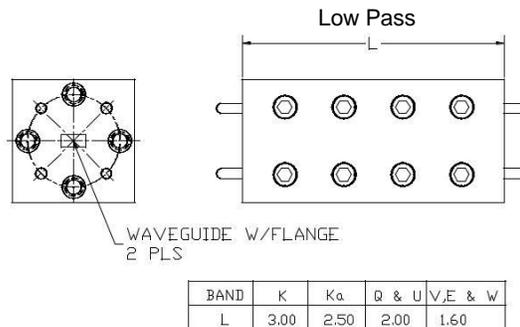
Dimensions are in inches

WT-E-3



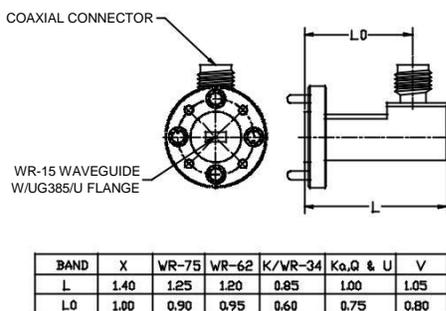
Dimensions are in inches

WT-E-4



Dimensions are in inches

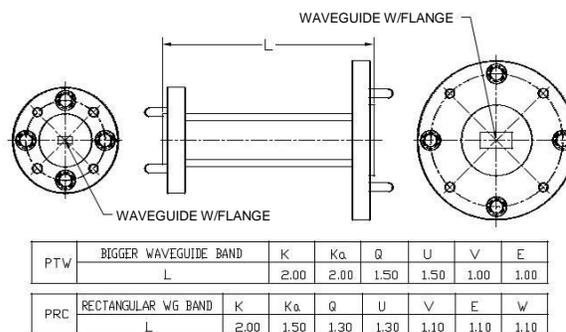
WT-E-5



NOTES:
BOTH MALE AND FEMALE COAXIAL CONNECTORS ARE AVAILABLE FOR ALL BANDS

Dimensions are in inches

WT-E-6



Dimensions are in inches

The flange pattern shown is for illustration purpose. Refer to Technical Reference Section for flange pattern details. The outline drawings shown are standard versions. Contact factory for your specific package requirements.

Passive Component Outline Drawings #2

WT-E-7

BAND	K	Ka	Q	U	V	E	W
L	1.20	1.00	1.30	1.30	1.00	1.00	1.00
W	1.20	1.00	1.30	1.30	1.00	1.00	1.00
H	1.06	0.90	1.25	1.23	0.83	0.82	0.81

Dimensions are in inches

WT-E-8

Band	X	VR-75	Ku	K	Ka	Q	U	V	E	W
L	5.46	4.80	4.66	4.24	3.46	3.26	2.66	2.56	2.56	2.46
A	1.73	1.65	1.58	1.52	1.23	1.23	0.98	0.98	0.98	0.98
D	0.45	0.43	0.35	0.21	0.18	0.15	0.13	0.11	0.10	0.09
H	3.46	3.30	3.16	3.04	2.46	2.46	1.96	1.96	1.96	1.96

Dimensions are in inches

WT-E-9

BAND	Q	U	V	E	W
L	5.50	5.50	3.50	3.50	3.50
W	1.30	1.30	1.00	1.00	1.00
H	1.25	1.23	0.83	0.82	0.81
A	0.80	0.80	0.60	0.60	0.60

Dimensions are in inches

WT-E-10

Band	X	VR-75	Ku	K	Ka	Q	U	V	E	W
L	19.50	16.50	13.00	11.00	10.00	8.00	6.50	6.00	5.50	5.00
A	1.90	1.85	1.75	1.50	1.40	1.20	1.20	1.00	1.00	1.00
B	0.95	0.95	0.90	0.70	0.60	0.70	0.70	0.60	0.60	0.60
D	0.45	0.43	0.35	0.21	0.18	0.15	0.13	0.11	0.10	0.09

Dimensions are in inches

WT-E-11

Dimensions are in inches

WT-E-12

Dimensions are in inches

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