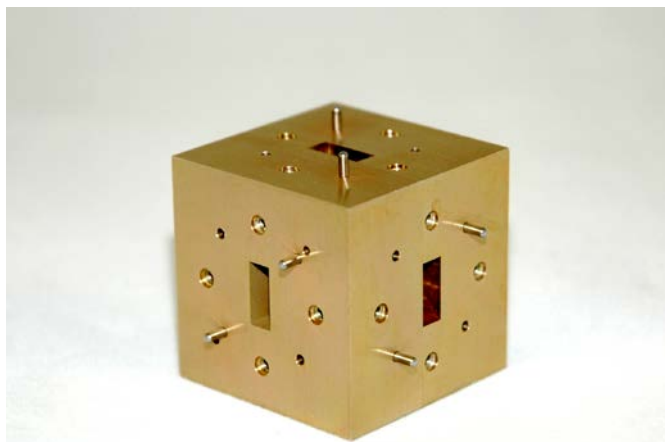


MAGIC TEE HYBRID COUPLERS



DESCRIPTION

Millitech series CMT magic tee hybrid couplers are matched power dividers for a variety of applications ranging from power combining to general purpose power splitting. These couplers are four-port transmission line components with a port configuration as shown in Figure 1. A signal input to either the series arm (E-plane) or shunt arm (H-plane) will undergo equal power division into the two collinear ports. Power transmitted into the series arm (E-plane) will split so that the signals in each of the collinear transmission lines will be 180° out of phase. Power transmitted into the shunt arm (H-plane) will split so that the signals at each of the collinear transmission lines will be in-plane.

The couplers are available in two types: (1) covering 60% bandwidth in the specified

FEATURES:

- Excellent port-to-port balance
- Low insertion loss
- Compact port arrangement
- Excellent matching/high isolation

APPLICATIONS:

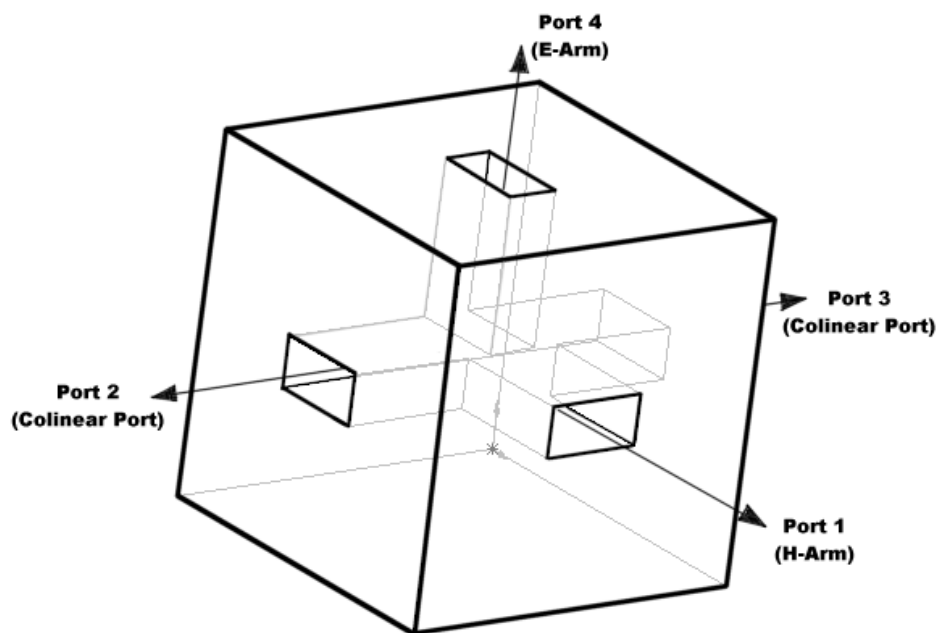
- General purpose power-splitters
- Power combining
- Phase/Frequency discriminators

band, (2) covering 90% of the waveguide bandwidth.

60% bandwidth magic tee hybrid couplers are available between 18 and 170 GHz. 90% bandwidth magic tee hybrid couplers are available between 18 and 110 GHz. They are extremely useful in applications where balanced power division and high isolation are required over a broad bandwidth. Typically these would include millimeter-wave bridge circuits for impedance and phase measurement, power dividers/combiners for balanced mixers, and phase/frequency discriminators.

Millitech also offers series CSS short slot hybrid couplers (90° phase difference between outputs) and a range of directional and crossguide couplers.

Figure 1. Port Configuration

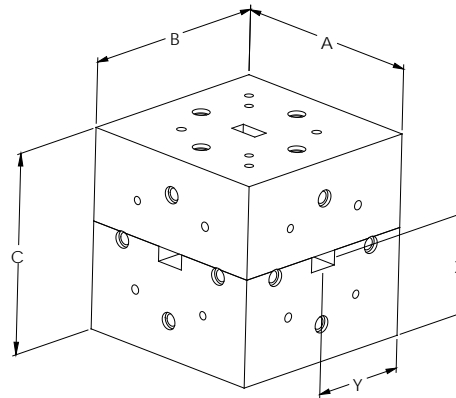


ELECTRICAL SPECIFICATIONS

Model Number	CMT-42	CMT-28	CMT-22	CMT-19	CMT-15	CMT-12	CMT-10	CMT-08	CMT-06
Frequency Band	K	Ka	Q	U	V	E	W	F	D
60% and 90% Bandwidth Versions *1									
Frequency Coverage 90% Bandwidth Version (GHz)	18-25	26.5-38	33-48	40-58	50-72	60-87	75-106	---	---
Bandwidth 60% Bandwidth Version (GHz Center)	5	8	10	12	15	18	21	30	36
Selectable Center Frequency Range 60% Bandwidth Version (GHz)	20.5-22.5	30.5-34	38-43	46-52	57.5-64.5	69-78	85.5-95.5	105-120	128-146
Insertion Loss (dB) (max)	0.5	0.5	0.7	0.8	1.0	1.0	1.0	1.2	1.2
VSWR (max)	H-Arm Ports	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1
	E-Arm Ports	1.6:1	1.6:1	1.6:1	1.6:1	1.6:1	1.6:1	1.6:1	1.6:1
Isolation (min)	E- to H-Arms	30	30	30	30	30	30	30	30
	Colinear Arms	20	20	20	20	20	20	20	20
Balance \pm dB (max)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

*1 – Percentage bandwidth denotes percent of full waveguide bandwidth

OUTLINE DRAWINGS



MECHANICAL SPECIFICATIONS

Model Number	CMT-42	CMT-28	CMT-22	CMT-19	CMT-15	CMT-12	CMT-10	CMT-08	CMT-06
A (in/mm)	1.5/38.10	1.5/38.10	1.5/38.10	1.5/38.10	1.2/30.48	1.2/30.48	1.2/30.48	1.2/30.48	1.2/30.48
B (in/mm)	1.5/38.10	1.5/38.10	1.5/38.10	1.5/38.10	1.2/30.48	1.2/30.48	1.2/30.48	1.2/30.48	1.2/30.48
C (in/mm)	1.5/38.10	1.5/38.10	1.5/38.10	1.5/38.10	1.2/30.48	1.2/30.48	1.2/30.48	1.2/30.48	1.2/30.48
Material	Aluminum	Aluminum	Aluminum	Aluminum	Brass	Brass	Brass	---	---
Finish	Chromate	Chromate	Chromate	Chromate	Gold Plate	Gold Plate	Gold Plate	---	---
Flange MIL.F-3922	/54-001*	/54-003*	/67B-006	/67B-007	/67B-008	/67B-009	/67B-010	/67M-M08	/67B-M06

* With #4-40 threaded holes

HOW TO ORDER

Specify Model Number CMT-XX-ABBØØ
XX = Waveguide Band WR – number
A = Flange Type R – round (WR-22 through WR-06 only) S – square (WR-42 and WR-28 only)
B = Bandwidth 60 – 60% (Please specify center frequency for 60% version only) 90 – 90% CB – custom bandwidth (Please specify the center frequency. Bandwidth cannot exceed 90%)
Ø = Other Options N – nonstandard (please specify requirements)

EXAMPLE

To Order: a WR-28 magic tee hybrid coupler with a bandwidth of 90%

Specify: CMT-28-S9000