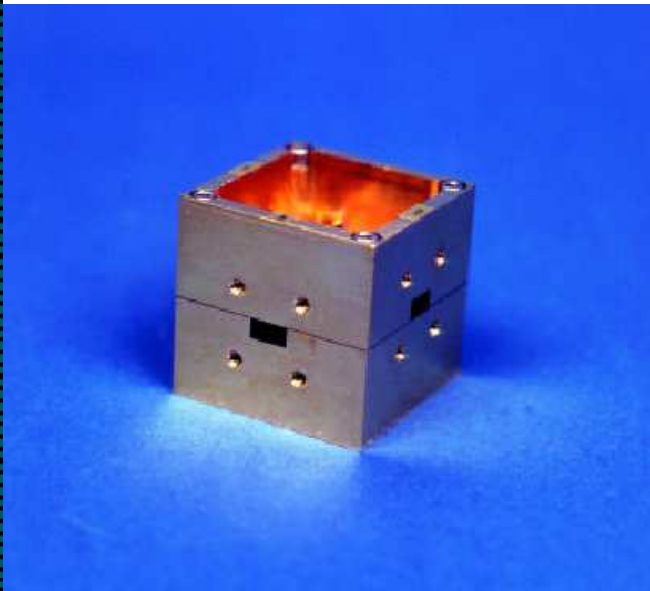


SERIES CGC

## CROSSGUIDE COUPLERS



### DESCRIPTION

Millitech series CGC compact crossguide directional couplers are offered in the frequency range of 18 to 170 GHz. The nominal coupling value is 20 dB, with directivity of 17 dB for lowband up to 110 GHz, and 12 dB for all highband units and all three-port units above 110 GHz. For complete coverage of each waveguide band, two models of crossguide couplers are offered. One model covers the lower 70% of the band and another the upper 70%. Hence, the two models have considerable overlap in frequency coverage. Either model provides nominal performance over the whole band, but meets the full specifications only over the specific portion of the waveguide band. These couplers are offered with the fourth port either internally terminated or unterminated (accessible).

These couplers feature low insertion loss, less than 0.5 dB in WR-28, 1.0 dB in WR-10, and 1.7 dB in WR-06. The coupling level is fairly constant over the applicable frequency range with a nominal flatness of  $\pm 1.5$  dB.

### FEATURES:

- Low insertion loss
- High directivity
- High and low band
- Compact design

### APPLICATIONS:

- Built-in test equipment
- Power sampling
- Phase-lock loops
- Subsystems

The coupling characteristics can be tailored to meet your requirements on special orders over narrow bandwidth. Other coupling values greater than 20 dB are available upon request.

Series CGC directional couplers are useful for sampling power from sources for phase or frequency locking and for built-in test applications. Their mechanical configuration allows them to be directly attached to other components with blind holes, without requiring additional waveguide sections. Their small size and high performance make them ideal for use in integrated assemblies where space is at a premium.

Millitech also offers series CL3 and CL4 high directivity directional couplers and series CMT and CSS power hybrids and dividers for applications where crossguide couplers are not suitable.

### ELECTRICAL SPECIFICATIONS

Model Number		CGC-42	CGC-28	CGC-22	CGC-19	CGC-15	CGC-12	CGC-10	CGC-08	CGC-06
Frequency band and range (GHz)		K 18-26.5	Ka 26.5-40	Q 33-50	U 40-60	V 50-75	E 60-90	W 75-110	F 90-140	D 110-170
Bandwidth (GHz) <sup>*1</sup>	Lowband	18-23.95	26.5-35	33-44	40-54	50-67	60-81	75-99	90-125	110-152
	Highband	20.55-26.5	30-40	38-50	46-60	57-75	69-90	85-110	105-140	128-170
Coupling value (dB) (typ) <sup>*2</sup>		20	20	20	20	20	20	20	20	20
Coupling flatness (±dB) (max) <sup>*3</sup>		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Insertion loss (dB) (max) <sup>*4</sup>		0.5	0.5	0.5	0.6	0.6	1.0	1.0	1.5	1.7
Directivity (dB) (min) <sup>*5 *6</sup>	Lowband	17	17	17	17	17	17	17	12	12
	Highband	12	12	12	12	12	12	12	12	12
Main line VSWR (max)		1.15:1	1.15:1	1.15:1	1.15:1	1.15:1	1.2:1	1.2:1	1.2:1	1.5:1
Secondary line VSWR (max)		1.2:1	1.2:1	1.2:1	1.2:1	1.2:1	1.25:1	1.25:1	1.25:1	1.5:1

\*1 – See series CL3/CL4 for fullband performance and greater directivity.

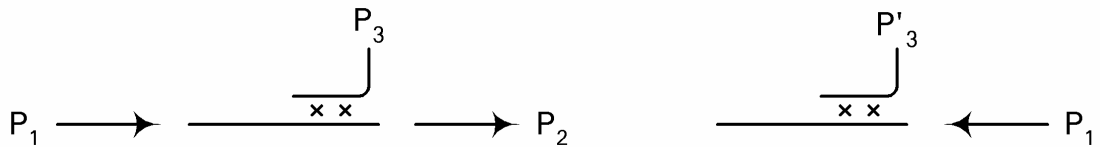
\*2 – Coupling value =  $-10 \log_{10} (P_3/P_1)$ .

\*3 – 3-port version only. Coupling flatness for 4-port version is  $\pm 2.5$  dB from K- to D-band.

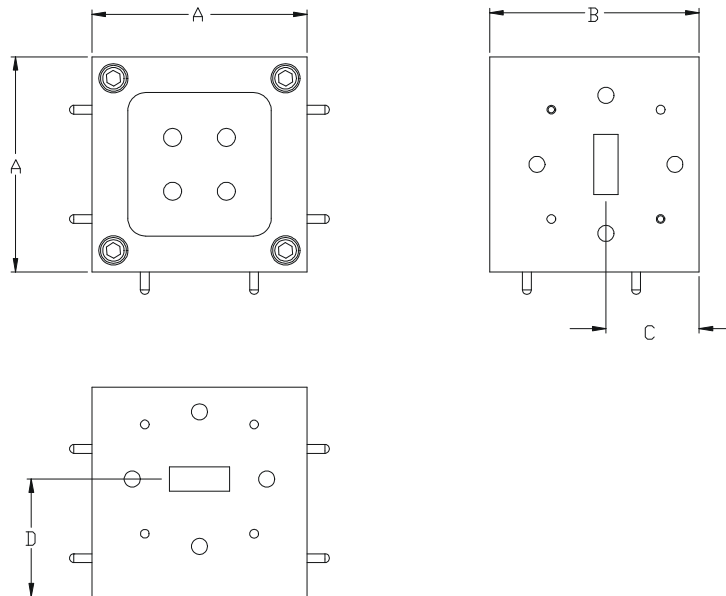
\*4 – Insertion loss =  $-10 \log_{10} [(P_2+P_3)/P_1]$ .

\*5 – 3-port version only. Directivity for 4-port version is 12 dB from K- to W-band and 7 dB for F- to D-band.

\*6 – Directivity =  $10 \log_{10} (P_3/P_1)$ .



### OUTLINE DRAWINGS\*



\*The outlines shown may not reflect the latest information. Please contact Millitech for current outline drawings.



### MECHANICAL SPECIFICATIONS

Model Number	CGC-42	CGC-28	CGC-22	CGC-19	CGC-15	CGC-12	CGC-10	CGC-08	CGC-06
A (in/mm)	1.50/38.1	1.50/38.1	1.50/38.1	1.50/38.1	1.00/25.4	1.00/25.4	1.00/25.4	1.00/25.4	1.00/25.4
B (in/mm)	1.46/3.70	1.46/3.70	1.46/3.70	1.46/3.70	1.03/26.1	1.03/26.1	1.03/26.1	1.03/26.1	1.03/26.1
C (in/mm)	0.64/16.26	0.66/16.8	0.67/17.0	0.6/17.3	0.48/12.2	0.48/12.2	0.49/12.5	0.49/12.5	0.50/12.7
D (in/mm)	0.81/20.57	0.80/20.3	0.78/19.81	0.79/20.0	0.55/14.0	0.54.13.72	0.54/13.7	0.53/13.46	0.53/13.5
Flange MIL.F-3922	/54.001*	/54-003*	/67B-006	/67B-007	/67B-008	/67B-009	/67B-010	/67B-M08	/67B-M06

\* With #4-40 threaded holes

### HOW TO ORDER

Specify Model Number CGC-XX-ABCØØØ
<b>XX</b> – Waveguide Band <b>WR</b> – number
<b>A</b> = Flange Type <b>R</b> – round (WR-28 through WR-06 only) <b>S</b> – square (WR-42 and WR-28 only)
<b>B</b> = Bandwidth (frequency coverage) <b>L</b> – lowband (lower 70% of waveguide band) <b>H</b> – highband (upper 70% of waveguide band)
<b>C</b> = Configuration <b>3</b> – 3 ports (fourth port terminated) <b>4</b> – 4 ports
<b>Ø</b> = Other Options <b>N</b> – nonstandard (please specify requirements)