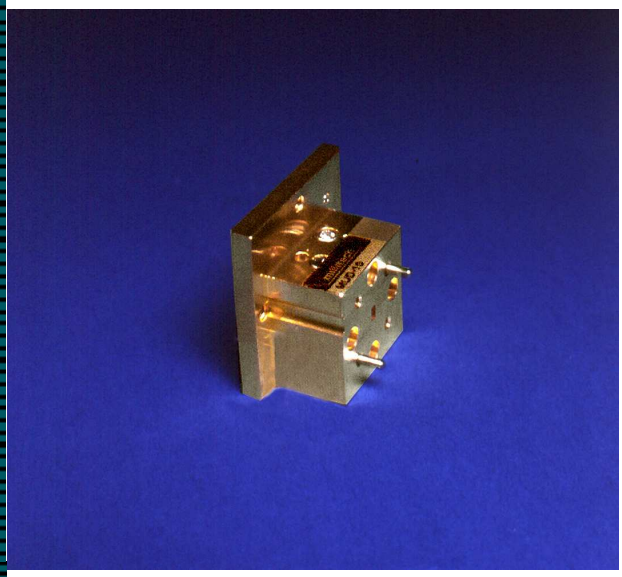
millitech®

Millimeter-Wave Technology & Solutions

SERIES MUD

FULLBAND FREQUENCY DOUBLERS



FEATURES:

- Fullband performance
- Low input power requirement
- Output power flatness
- Wide input power range

APPLICATIONS:

- Frequency extension
- Test equipment / laboratory use
- Transceivers

DESCRIPTION

Millitech series MUD frequency doublers are balanced resistive-mode multipliers covering full waveguide bands. Power flatness for a given input power level for these units is typically ± 2.0 dB across the band.

These doublers are offered in both a standard and a high power version. The standard version operates with 10 to 18 dBm input power and typically provides -10 to +5 dBm of output power depending on frequency and input power. The high power version operates with +20 to +23 dBm of input power and provides 3 to 10 dBm output power depending on frequency and input power. (see performance tables on the following page)

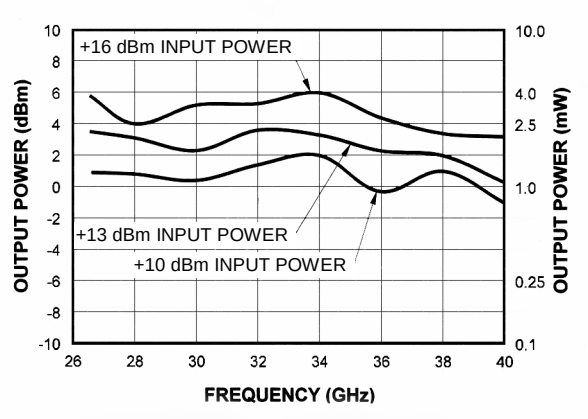
Both versions operate over a wide range of input power levels, and can be tested at customer-specified power levels. These frequency doublers can be optimized to produce higher output power over narrower-than-full waveguide bandwidth. They are compact in size, typically less than a cubic inch, and require no external DC bias.

Series MUD doublers are particularly useful for extending the use of test equipment into millimeter-wave bands. They are capable of generating enough power to pump biased mixers or detectors, or to lock injection-lockable oscillators and amplifiers.

Millitech, Inc. • 29 Industrial Dr. East • Northampton, MA 01060
Ph. (413) 582-9620 • Fax (413) 582-9622
Email: info@millitech.com • Web Site: www.millitech.com

TYPICAL PERFORMANCE

Series MUD – 28 Standard Version



ELECTRICAL SPECIFICATIONS

Model Number	MUD-28	MUD-22	MUD-15	MUD-10	MUD-06
Output frequency band and range (GHz)*1	Ka 26.5-40	Q 33-50	V 50-75	W 75-110	D*3 110-170
Input frequency range (GHz)	13.25-20	16.5-25	25-37.5	37.5-55	55-85
Third harmonic content (dBc) (typ)	-25	-25	-25	-25	-25
Standard Version					
Input power range (dBm) (min/max)	10/18	10/18	10/18	10/18	7/14
Conversion loss (dB) @ 16 dBm input (typ)*1	17	18	20	22	20*2
High Power Version					
Input power range (dBm) (min/max)	20/23	20/23	20/23	20/23	---
Conversion loss (dB) (typ)*1	15	15	16	16	---

*1 – Power output specifications apply over waveguide band. Output power can be optimized over narrower frequency range.
*2 – Series MUD-06 tested at 13 dBm input power (maximum allowed input power is 16 dBm).
*3 – Performance is over 50% waveguide bandwidth, please specify.

MECHANICAL SPECIFICATIONS

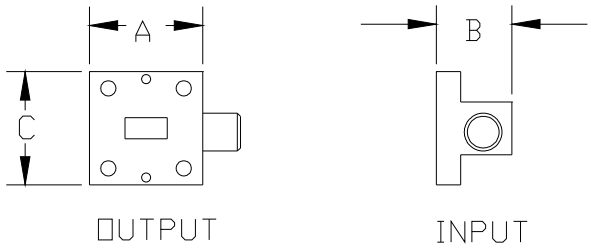
Model Number	MUD-28	MUD-22	MUD-15	MUD-10	MUD-06
A (in/mm)	0.750/19.10	0.750/19.10	0.750/19.10	1.125/28.60	0.750/19.10
B (in/mm)	0.500/12.70	0.500/12.70	1.000/25.40	0.600/15.20	0.750/19.10
C (in/mm)	0.750/19.10	0.750/19.10	0.959/24.40	1.125/28.60	0.860/21.80
Weight (oz/g)	1.8/5.1	1.8/5.1	3.3/94	2.1/60	1.8/52
Input connector/flange	K-female*1	K-female*1	/54-003*2 (WR-28)	/67B-007 (WR-19)	/67B-009 (WR-12)
Output flange MIL.F - 3922	/54-003*2	/67B-006	/67B-008	/67B-010	/67B-M06

*1 – Female K connector is standard. If male connector is preferred, please specify when ordering.
*2 – With #4-40 threaded holes.

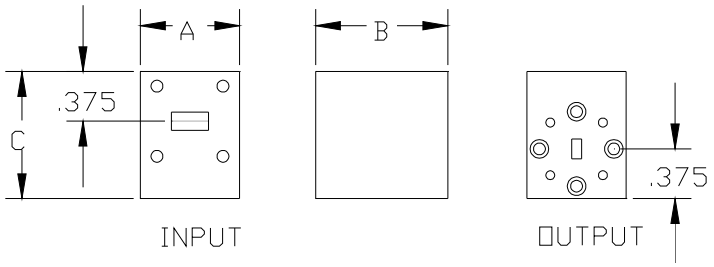
Millitech, Inc. • 29 Industrial Dr. East • Northampton, MA 01060
Ph. (413) 582-9620 • Fax (413) 582-9622
Email: info@millitech.com • Web Site: www.millitech.com

OUTLINE DRAWINGS*

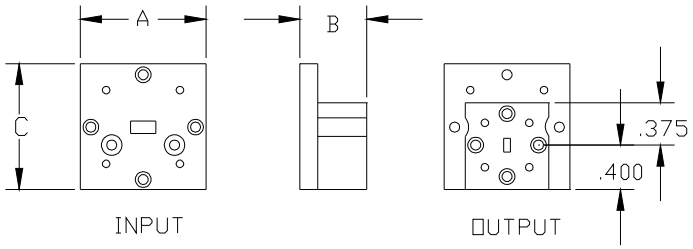
MUD – 28/22



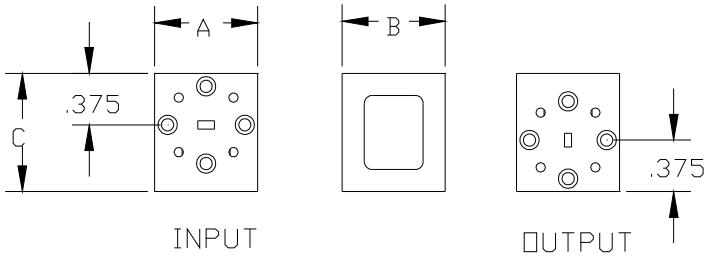
MUD - 15



MUD – 10



MUD - 06



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

Millitech, Inc. • 29 Industrial Dr. East • Northampton, MA 01060
Ph. (413) 582-9620 • Fax (413) 582-9622
Email: info@millitech.com • Web Site: www.millitech.com

How To Order

Specify Model Number MUD-XX-ABØØØ
XX = Waveguide Band **WR** – number
A = Input Power Level (measurement conditions for test data, input power in dBm) **H** – higher power version **L** – standard version **N** – non-standard (please specify)
B = Bandwidth **F** – fullband (standard) **N** – narrowband*
***Specify frequency range for narrowband units**

Note: Millitech will supply data for the input power level requested. Data at additional input power levels provided upon request.

Example:

To Order: a fullband, standard version series MUD in WR-15

Specify: MUD-15-LFØØØ

Millitech, Inc. • 29 Industrial Dr. East • Northampton, MA 01060
Ph. (413) 582-9620 • Fax (413) 582-9622
Email: info@millitech.com • Web Site: www.millitech.com