

## SERIES MUT

**FULLBAND FREQUENCY TRIPLERS**

**FEATURES:**

- Fullband performance
- Small size
- Flat output over frequency

**APPLICATIONS:**

- Frequency extension
- Test equipment/Laboratory use
- Phase-lock loops

**DESCRIPTION**

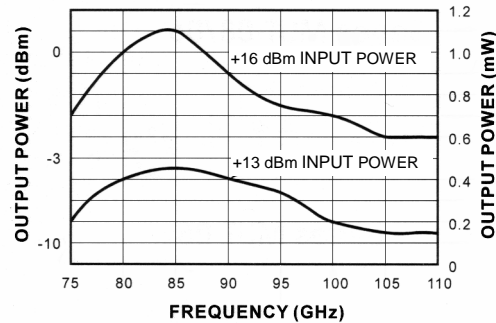
Millitech series MUT frequency triplers are balanced resistive - mode multipliers covering full waveguide bands. Power flatness over the full waveguide band for a given input power level is typically  $\pm 2.0$  dB.

These triplers 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 0 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)

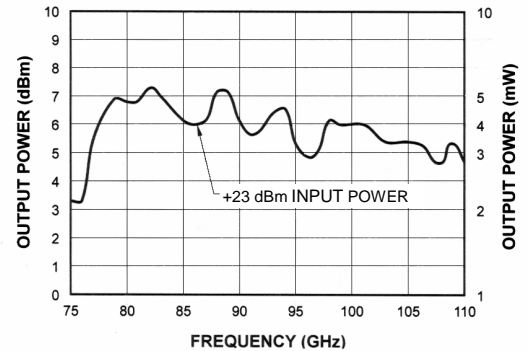
Both versions operate over a wide range of input power levels, and can be tested at customer-specified power levels. These frequency doublers can be optimized to produce higher output power over narrower-than-full waveguide bandwidth. They are compact in size, typically less than a cubic inch, and require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

Series MUT triplers 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.

### TYPICAL PERFORMANCE



Series MUT-10 Low Power Version



Series MUT-10 High Power Version

### ELECTRICAL SPECIFICATIONS

Model Number	MUT-22	MUT-19	MUT-15	MUT-10	MUT-08	MUT-06	MUT-05
Frequency band and range (GHz)	Q 33-50	U 40-60	V 50-75	W 75-110	F <sup>*2</sup> 90-140	D <sup>*2</sup> 110-170	G <sup>*2</sup> 140-220
Input frequency range (GHz)	11-16.67	13.33-20	16.67-25	25-36.67	30-46.67	36.67-56.67	46.67-73.33
Input VSWR (typ)	2.5:1	2.5:1	2.5:1	2.5:1	*3	*3	---
Second harmonic content (dBc) (typ)	-30	-30	-30	-30	*3	*3	---
Fourth harmonic content (dBc) (typ)	-20	-20	-20	-20	*3	*3	---
<b>Standard Version</b>							
Input power range (dBm) (min/max) <sup>*1</sup>	10/18	10/18	10/18	10/18	7/16	7/16	7/16
Conversion loss (dB) @ 16 dBm input (typ) <sup>*2</sup>	20	21	22	24	*3	*3	23
<b>High Power Version</b>							
Input power range (dBm) (min/max)	20/23	20/23	20/23	20/23	---	---	---
Conversion loss (dB) (typ) <sup>*2</sup>	15	15	16	16	---	---	---

\*1 – Series MUT-08, MUT-06 and MUT-05 tested at 13 dBm typical input power (maximum allowed input power is 16 dBm).

\*2 – Performance is over 50% waveguide bandwidth, please specify.

\*3 – Please contact Millitech for details.

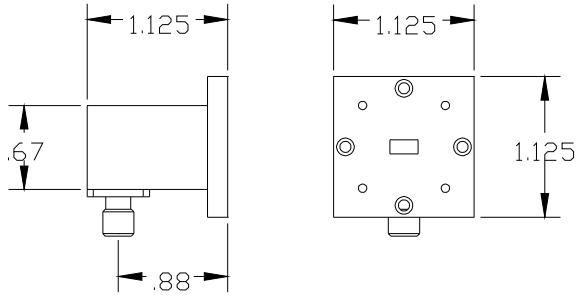
### MECHANICAL SPECIFICATIONS

Model Number	MUT-22	MUT-19	MUT-15	MUT-10	MUT-05
Input connector/flange	SMA-F	SMA-F	K-female	/54-003* (WR-28)	/67B-008(WR-15)
Output flange MIL.F-3922	/67B-006	/67B-007	/67B-008	/67B-010	/67B-M05

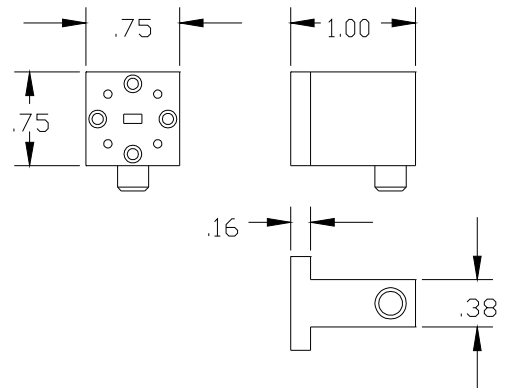
\*With #4-40 threaded holes.

OUTLINE DRAWINGS\*

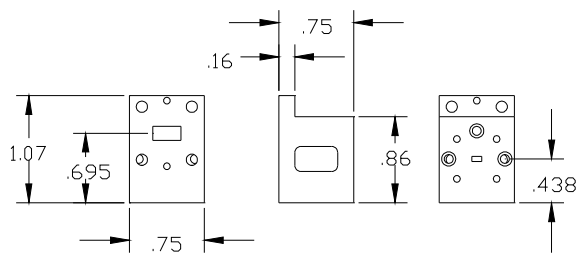
MUT - 22/19



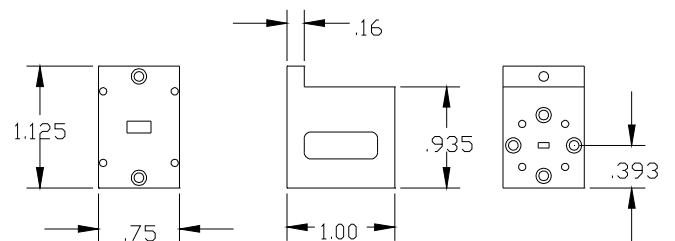
MUT - 15



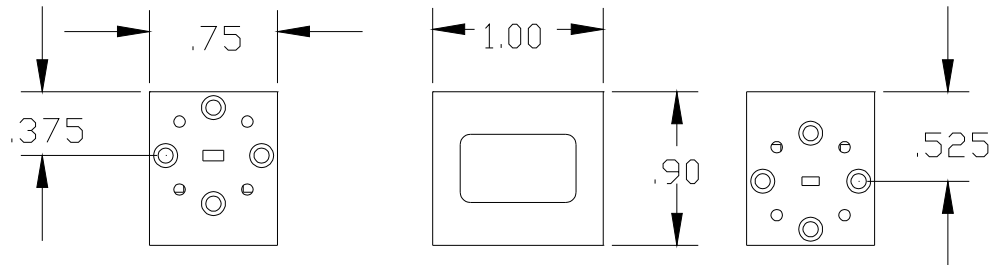
MUT - 10



MUT - 08/06



## MUT - 05



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

**HOW TO ORDER**

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

**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 MUT in WR-15

**Specify:** MUT-15-LFØØØ