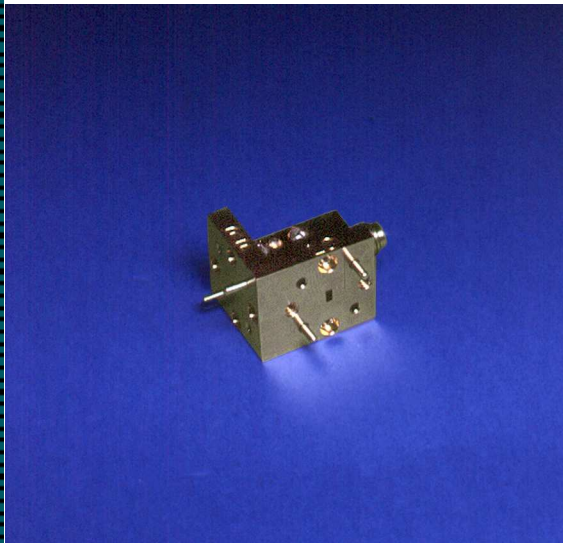


## SERIES MXP

**BALANCED MIXERS**

**FEATURES:**

- Low noise figure and conversion loss
- Low LO drive power
- Matched IF amplifier and LO offered
- Small, rugged package

**APPLICATIONS:**

- Radars and radiometry
- Electronic warfare/ELINT
- Communications
- Test equipment

**DESCRIPTION**

Millitech series MXP balanced mixers are high performance broadband mixers in a very compact size. They offer low conversion loss and low noise figure over a wide range of IF and local oscillator frequencies. Series MXP covers frequencies from 18 to 110 GHz in seven waveguide bands. LO agility (swept LO) and extremely broadband IF are attainable.

MXP single-balanced mixers use GaAs Schottky Barrier Diodes and can operate with relatively low local oscillator power, generally 9 to 13 dBm. Custom models can be made to your specification. Special designs with LO input waveguide in a higher or lower waveguide band can be provided. Additionally, special low-noise balanced mixers in the 110 to 220 GHz range can be ordered in WR-08, WR-06 and WR-05. Please consult Millitech for your needs.

External waveguide filters, LO reject filters, and compact 90° waveguide twists allow the user to change the mixer waveguide orientation (LO, RF or both) without taking much additional space. Detachable low-noise IF amplifiers are offered as options with these mixers.

When only a limited local oscillator power (0 to +3 dBm) is available, DC biasable series MXB mixers are recommended. Millitech also offers a harmonic mixer to operate with fractional LO frequencies (series MHP and series MSH).

**ELECTRICAL SPECIFICATIONS**

Model Number	Local Oscillator		Conversion Loss (dB) (max)			Noise Figure (dB) (max) (includes IF amplifier contribution) <sup>*1</sup>				Fullband <sup>*2</sup> RF & LO	
	Frequency Range (GHz)	WG Band	Fixed LO		Swept LO <sup>*2</sup>	DSB			SSB	Conversion Loss (dB) (max)	Noise Figure (dB) (max)
			IF 0.1-2 GHz	IF 0.1-18 GHz	IF 0.1-4 GHz	0.1-2 GHz	2-4 GHz	4-8 GHz	8-18 GHz		
MXP-42-R	18-26.5	WR-42	6.5	---	8.0	4.5	5.0	6.5	---	8.0	8.0
MXP-42-L	13-18	K- Connector	6.5	7.0	8.0	4.5	5.0	6.5	---	---	---
MXP-28-R	26.5-40	WR-28	7.0	---	9.0	5.0	5.5	7.0	13.5	9.5	9.5
MXP-22-R	33-50	WR-22	7.5	---	9.0	5.0	6.0	7.5	13.5	9.5	9.5
MXP-19-R	40-60	WR-19	7.5	80	9.5	5.0	6.0	7.5	14.0	10.0	10.0
MXP-15-R	50-75	WR-15	8.0	8.0	9.5	6.5	7.0	8.0	14.5	---	---
MXP-12-R	60-90	WR-12	8.5	8.5	10.0	7.0	7.0	8.5	15.0	11.0	11.0
MXP-10-R	75-110	WR-10	8.5	9.0	10.0	7.0	7.0	8.5	15.0	12.0	12.0
MXP-08 <sup>*3</sup>		WR-08	---	---	---	---	---	---	---	---	---
MAP-06 <sup>*3</sup>		WR-06	---	---	---	---	---	---	---	---	---
MXP-05 <sup>*3</sup>		WR-05	---	---	---	---	---	---	---	---	---

\*1 - Mixer will be tested using IF amplifiers with the following characteristics:

IF Amplifier Frequency	Noise Figure
0.1-2 GHz	1.5 dB
2-4 GHz	2.0 dB
4-8 GHz	3.5 dB
8-18 GHz	5.0 dB

\*2 - When RF is fullband and LO is swept, IF will be maintained at a fixed frequency.

\*3 - Please consult Millitech for specifications.

**COMMON OPERATING CHARACTERISTICS:**

- VSWR at RF port: 2:1 (typ)
- 1dB compression point : +3 dBm (min)
- LO drive power: +13 dBm (typ), +10 dBm (min)
- LO/RF isolation: 15 dB (typ)
- LO/IF isolation: 20 dB depending on the frequency scheme
- Maximum RF power: +15 dBm CW, +25 dBm pulse up to WR-10

**OUTLINE DRAWINGS\***

Figure 1

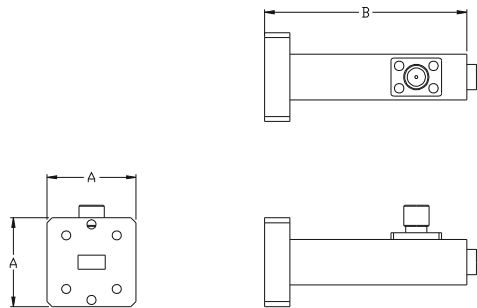


Figure 2

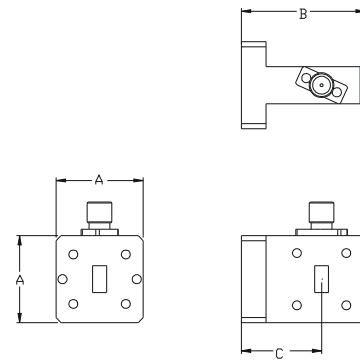


Figure 3

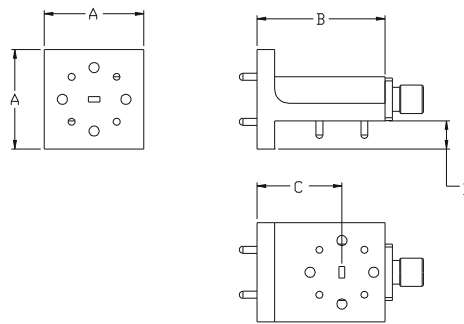
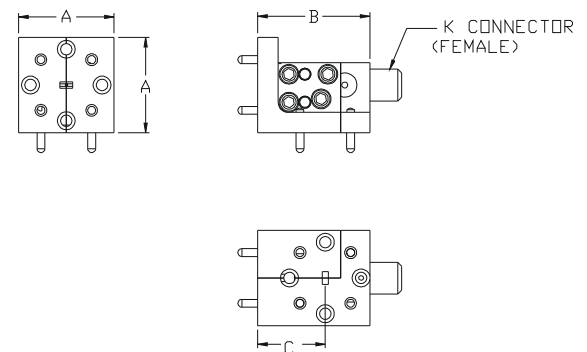


Figure 4



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

**MECHANICAL SPECIFICATIONS**

Model Number	Waveguide/Flange		A (in/mm)	B (in/mm)	C (in/mm)	D (in/mm)	Figure Number	Flange MIL.F-3922
	RF	LO						
MXP-42-R	WR-42/SQ.	WR-42SQ.	0.88/22.4	1.25/31.8	0.81/20.6	---	2	/54-001*
MXP-42-L	WR-42/SQ.	K-Conn/F	0.88/22.4	2.00/50.8	---	---	1	/54-001*
MXP-28-R	WR-28/SQ.	WR-28/SQ.	0.75/19.1	1.00/25.4	0.63/15.9	---	2	/54-003*
MXP-22-R	WR-22/RD.	WR-22/RD.	1.13/28.7	1.39/35.3	0.82/20.8	0.24/6.1	3	/67B-006
MXP-19-R	WR-19/RD.	WR-19/RD.	1.13/28.7	1.39/35.3	0.82/20.8	0.24/6.1	3	/67B-007
MXP-15-R	WR-15/RD.	WR-15/RD.	0.75/19.1	1.10/27.9	0.75/19.1	---	4	/67B-008
MXP-12-R	WR-12/RD.	WR-12/RD.	0.75/19.1	1.00/25.4	0.65/16.5	---	4	/67B-009
MXP-10-R	WR-10/RD.	WR-10/RD.	0.75/19.1	0.88/22.9	0.53/13.5	---	4	/67B-010

\*With #4-40 threaded holes.

**HOW TO ORDER**
**Specify Model Number**  
**MXP-XX-ABCDE**

**XX** = Waveguide Band  
**WR** – number

**A** = LO Band  
**R** – same as RF band  
**L** – lower waveguide band (band below RF band)  
 K-Connector (WR-42 only)

**B** = RF Range  
**F** – fullband  
**S** – specified bandwidth (please specify)  
**X** – fixed frequency (please specify)

**C** = IF Amplifier  
**S** – specified IF bandwidth (please specify, IF amplifier not included)  
**X** – fixed frequency (please specify, IF amplifier not included)  
**0** – 0.1-2 GHz (IF amplifier included)  
**1** – 0.1-1 GHz (IF amplifier included)  
**2** – 1-2 GHz (IF amplifier included)  
**3** – 2-4 GHz (IF amplifier included)  
**4** – 4-8 GHz (IF amplifier included)  
**5** – 8-18 GHz (IF amplifier included)  
**R** – other range (please specify, IF amplifier included)

**D** = LO Range  
**F** – fullband  
**S** – specified bandwidth (please specify)  
**X** – fixed frequency (please specify)

**E** = Measurement/Data Options (test conditions)

**Mixer offered without IF amplifier:**

- L** – tested for conversion loss alone.
- N** – tested for noise figure only using IF amplifier (see table below)

Frequency	Noise Figure
0.1 GHz to 2 GHz	1.5 dB
2 GHz to 4 GHz	2.0 dB
4 GHz to 8 GHz	3.5 dB
8 GHz to 18 GHz	5.0 dB

**Mixer offered with IF amplifier:**

- G** – tested for conversion gain
- N** – tested for noise figure