

## F-Band Balanced Mixer

### Description:

**Model SFB-08-N1** is an F-Band balanced mixer that utilizes high performance GaAs Schottky beam-lead diodes and a balanced circuit configuration to offer superior RF performance. The mixer supports the full waveguide band operation for both LO and RF frequencies from 90 to 140 GHz with an extremely broad IF output from DC to 40 GHz. The mixer offers a conversion loss of 12 dB typical and a high RF to LO port isolation of 30 dB.



### Features:

- Full Waveguide Band Coverage
- Low Conversion Loss
- High IF Frequency up to 40 GHz

### Applications:

- Radar Systems
- Communication Systems
- Test Equipment

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
RF Frequency Range	90 GHz		140 GHz
LO Frequency Range	90 GHz		140 GHz
IF Frequency Range	DC		40 GHz
LO Pumping Power		+13 dBm	+17 dBm
Conversion Loss		12 dB	15 dB
RF Input P <sub>1dB</sub>		-3 dBm	
RF to LO Isolation		30 dB	
Combined RF and LO Power			+20 dBm
Specification Temperature		+25°C	
Operation Temperature	-40°C		+85°C

Note: The RF input P-1 dB is LO pumping power related. The value shown is at LO power +13 dBm. The higher the LO power, the higher the input P-1dB

### Mechanical Specifications:

Item	Specification
RF	WR-08 Waveguide with UG-387/U-M Flange
LO	WR-08 Waveguide with UG-387/U-M Flange
IF	K(F)
Case Material	Aluminum
Finish	Gold Plated
Weight	0.8 Oz
Size	1.16" (L) X 0.75" (W) X 0.75" (H)
Outline	FB-NF

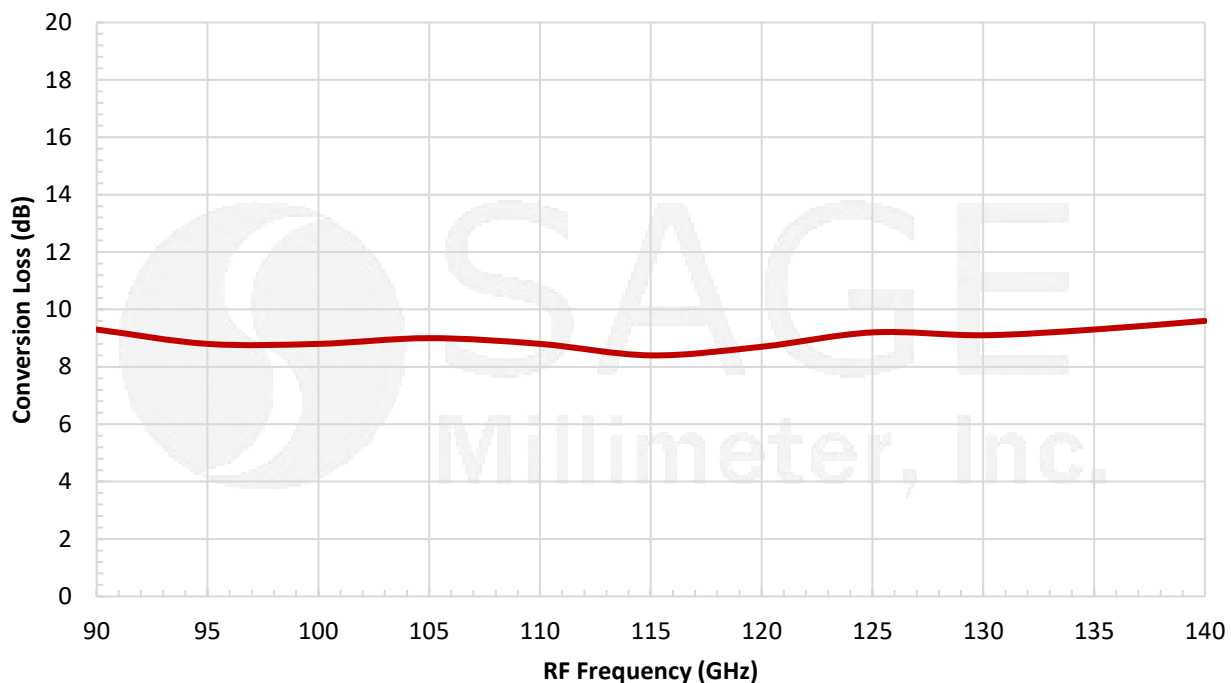




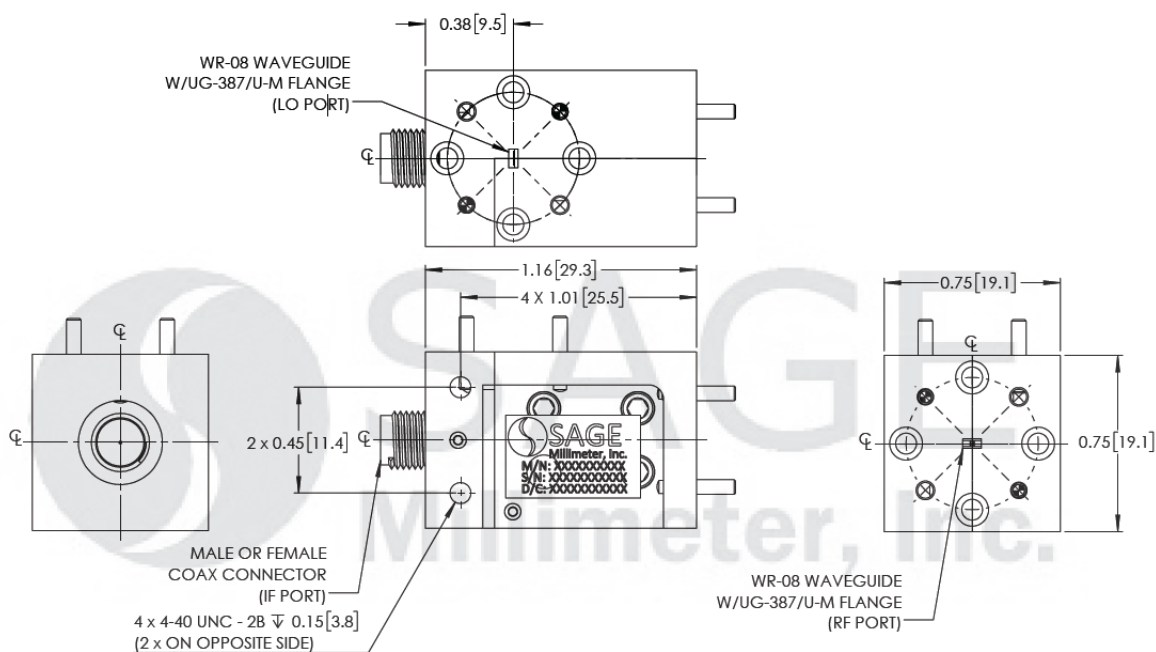
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### Typical Conversion Loss vs. Frequency

RF: -20 dBm; LO: 115 GHz/+12 dBm



**Mechanical Outline:** (Unless otherwise specified, all dimensions are in inches [millimeters])





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### Note:

- All data presented is collected from a sample lot. Actual data may vary unit to unit slightly.
- All testing was performed under +25 °C case temperature.
- A DC block at IF port may be required when connecting to a device, such as an IF low noise amplifier or a base band mixer which input port is DC coupled.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

### Caution:

- Exceeding absolute maximum ratings shown will damage the device.
- The device is static sensitive. Always follow ESD rules when working with the device.
- The IF port of the mixer is DC coupled. Use a DC block when connecting to other devices.
- **Never apply an external bias voltage to the IF port because the mixer will be damaged.**
- Any foreign objects in the waveguide will cause performance degradation and can possibly damage the device.
- Proper torque,  $8.0 \pm 0.15$  inch-pounds ( $0.92 \pm 0.05$  Nm), should be applied. **SAGE Millimeter torque wrench, model SCH-08008-S1, is highly recommended.**

