SFB-22-E2

Rev 1.0

Q-Band Externally Biased Balanced Mixer

Description:

Model SFB-22-E2 is a Q Band, externally biased balanced mixer. The mixer supports the full waveguide band operation for both LO and RF frequencies from 33 to 50 GHz with an extremely broad IF output from DC to 17 GHz. The mixer offers a typical conversion loss of 9 dB and a high RF to LO port isolation. The main advantage of using an externally biased mixer is that it only requires a local oscillator (LO) power of 0 to +5 dBm when a bias of +5 V_{DC} is applied. This eliminates the need for an expensive local oscillator, making system integrations more affordable.

Features:

- Full Waveguide Band Coverage
- Low LO Power Requirement
- Low Conversion Loss
- High IF Frequency up to 17 GHz

Applications:

- Radar Systems
- Communication Systems
- Test Equipment

Electrical Specifications:

Parameter	Minimum	Typical	Maximum
RF Frequency	33 GHz		50 GHz
LO Frequency	33 GHz		50 GHz
IF Frequency	DC		17 GHz
Required LO Pumping Power	+0 dBm	+3 dBm	+10 dBm
Conversion Loss		8 dB	12 dB
Input P-1 dB		-10 dBm	
RF to LO Isolation		30 dB	
Combined Damage RF and LO Power			+13 dBm
External Bias Voltage		+5 V_{DC}/2 mA	+5 V_{DC}/5 mA
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

Mechanical Specifications:

Item	Specification
RF Port	WR-22 Waveguide with UG-387/U Flange
LO Port	WR-22 Waveguide with UG-387/U Flange
IF Port	SMA (F)
External Bias	SMA (F)
Case Material	Aluminum
Finish	Gold Plated
Weight	1.8 Oz
Size	1.50” (L) X 1.13” (W) X 1.13” (H)
Outline	FB-EQ-2

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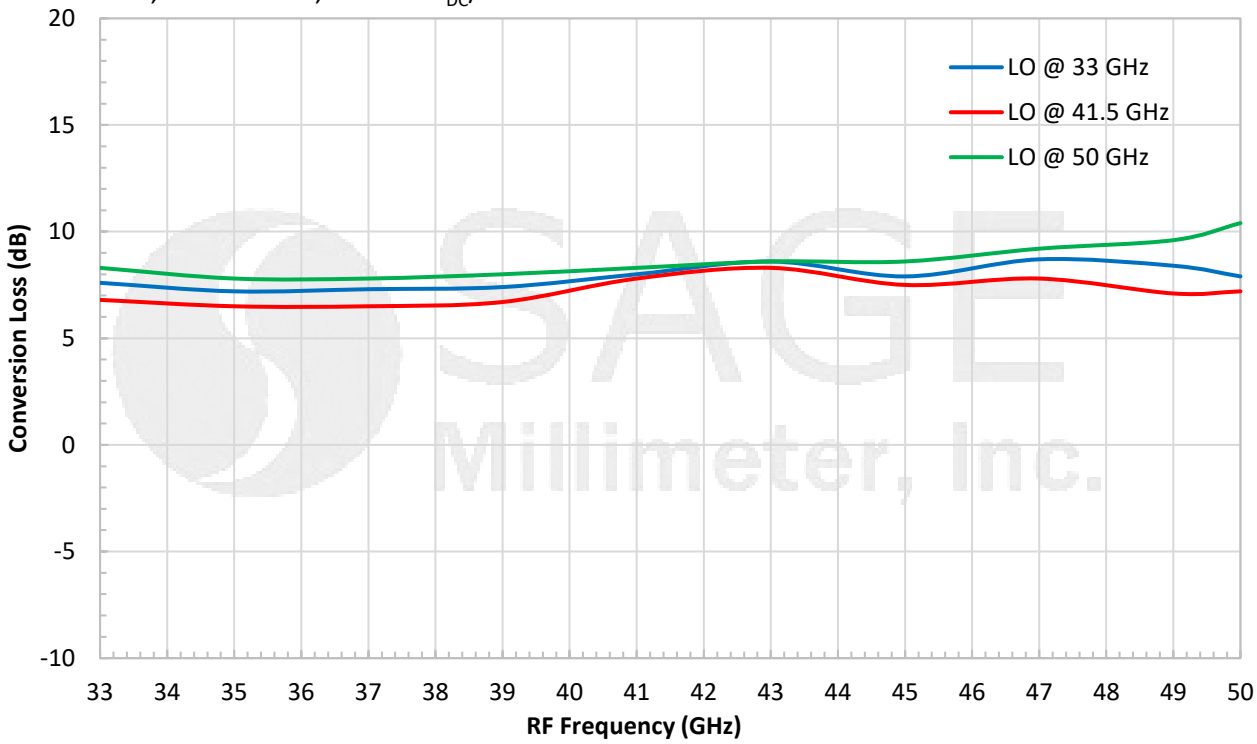
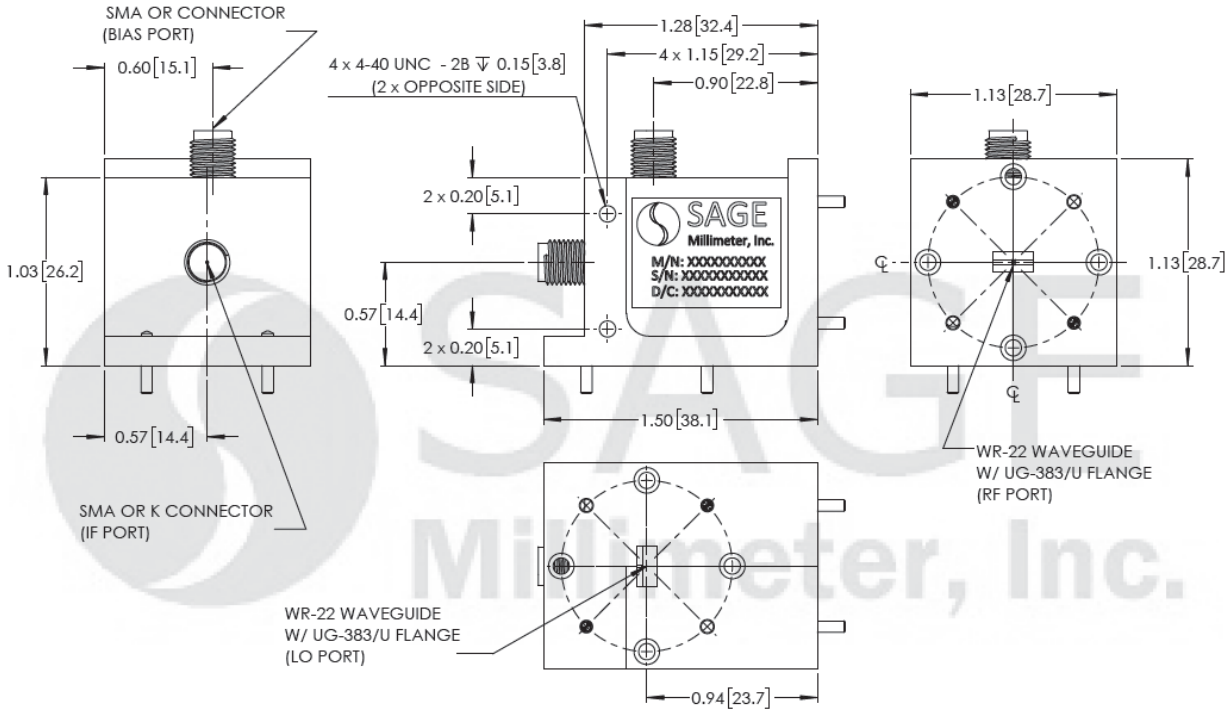
Typical Conversion Loss vs. Frequency

RF: -20 dBm; LO: +3 dBm; Bias: +5 V_{DC}/1 mA



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.
- 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 mixer is a small signal device. The typical RF input level is – 10 dBm or lower.**
- The device is static sensitive. Always follow ESD rules when working with the device.
- The IF port of the externally biased mixer is DC coupled. Due to the external bias, it has a small DC offset voltage (+0.7 V_{DC}), which could upset the connecting device performance or even damage the device. 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 ± 0.15 inch-pounds (0.92 ± 0.05 Nm), should be applied. **SAGE Millimeter torque wrench, model SCH-08008-S1, is highly recommended.**

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