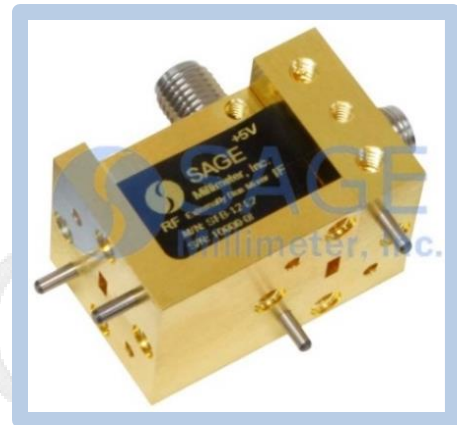




E-Band Externally Biased Balanced Mixer

Description:

Model SFB-12-E2 is an E-Band, externally biased balanced mixer. The mixer supports the full waveguide band operation for both LO and RF frequencies from 60 to 90 GHz with an extremely broad IF output from DC to 30 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 30 GHz

Applications:

- 5G Systems
- Radar Systems
- Communication Systems
- Test Equipment

Electrical Specifications:

Parameter	Minimum	Typical	Maximum
RF Frequency	60 GHz		90 GHz
LO Frequency	60 GHz		90 GHz
IF Frequency	DC		30 GHz
LO Pumping Power	+0 dBm	+3 dBm	+10 dBm
Conversion Loss		9 dB	13 dB
RF Input P-1 dB		-10 dBm	
RF to LO Isolation		30 dB	
Combined Damage RF and LO Power			+13 dBm
External Bias Voltage/Current		+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-12 Waveguide with UG-387/U Anti-Cocking Flange
LO Port	WR-12 Waveguide with UG-387/U Anti-Cocking Flange
IF Port	K(F)
External Bias Port	SMA (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-EE-2-A

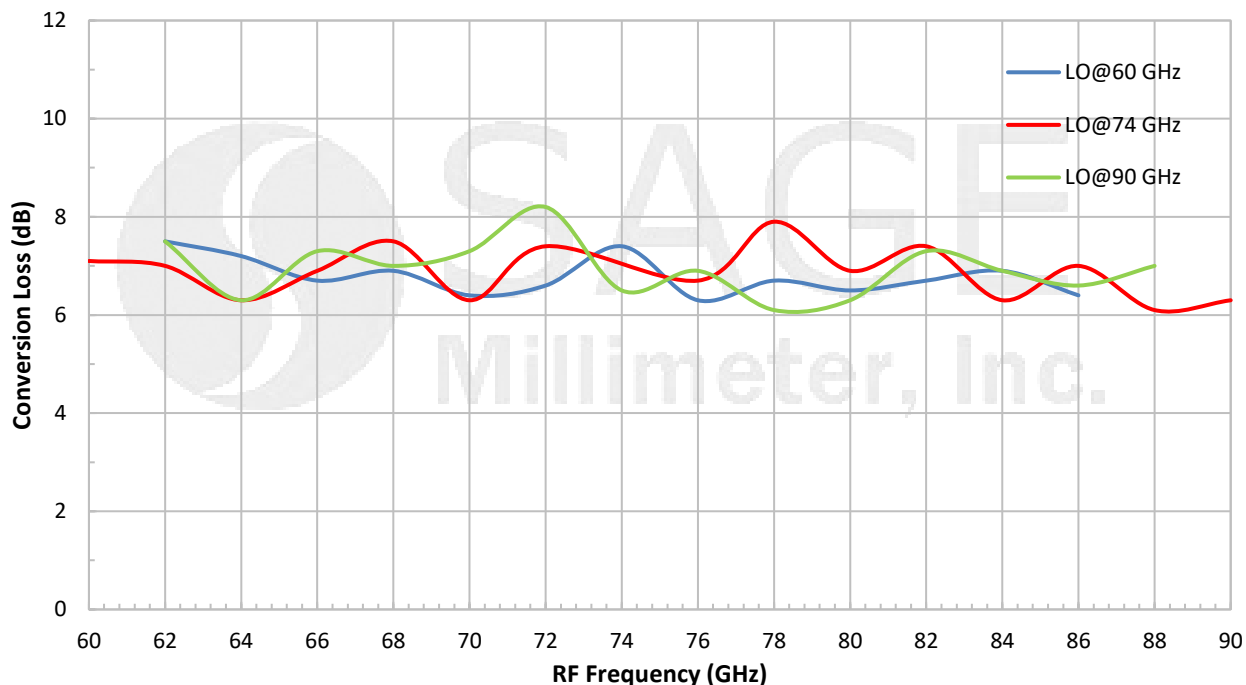




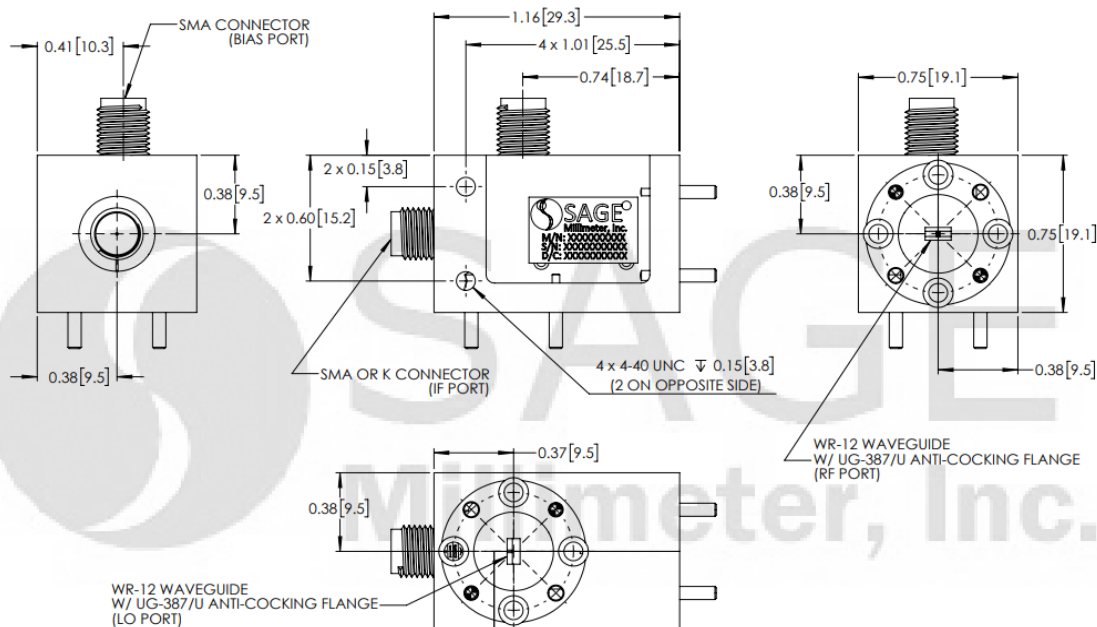
E-Band Externally Biased Balanced Mixer

Typical Conversion Loss vs. RF Frequency

LO: +3 dBm, RF: -20 dBm, Bias: +5 V_{DC}/0.8 mA



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



NOTE:
CONNECTORS MAY BE DESIGNATED TO BE FEMALE OR MALE



E-Band Externally Biased Balanced Mixer

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 in which the input port is DC coupled. SAGE Millimeter's DC Block with model number SCB-050-KMKF-U2 is recommended.
- 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.**

Appendix: The Outline of the DC Block, Model SCB-050-KMKF-U2

