

SFB-12-E2

E-Band Externally Biased Balanced Mixer

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. The externally biased mixer is used when high LO power is not available. Externally biased mixer works with low local oscillator (LO) power of 0 to +5 dBm when external bias of +5 V_{DC} is applied. As a trade-off, LO to RF isolation is lower compared to non-biased mixers.



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 (IF<6 GHz)		8 dB	
Conversion Loss (IF=DC-30 GHz)		9 dB	13 dB
RF Input P _{1dB}		-10 dBm	
LO to RF Isolation		20 dB	
Combined Damage RF to 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

Item	Specification
RF	WR-12 Waveguide with UG-387/U Anti-Cocking Flange
LO	WR-12 Waveguide with UG-387/U Anti-Cocking Flange
IF	K (F)
External Bias	SMA (F)
Case Material	Aluminum
Finish	Gold Plated
Weight	0.8 Oz
Outline	FB-EE-2-A

ECCN

EAR99

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

Mechanical Specifications:

SUPPLEMENTAL DETAILS

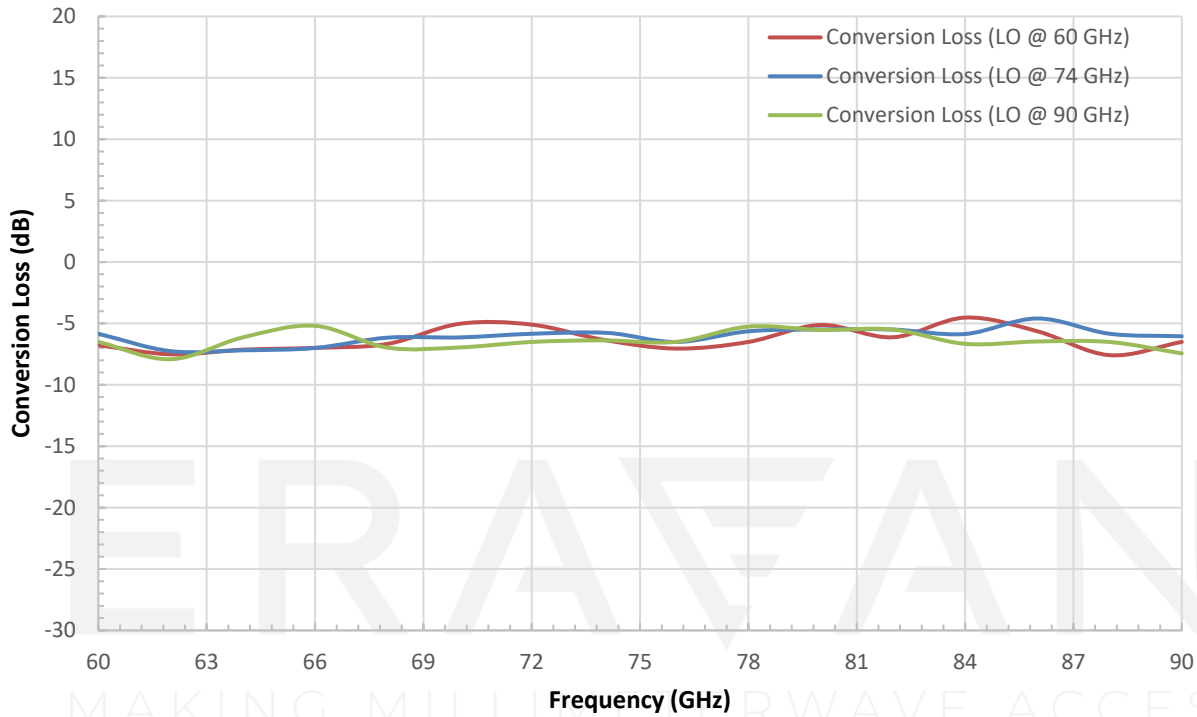
- LO to RF Isolation of Externally Biased Mixer



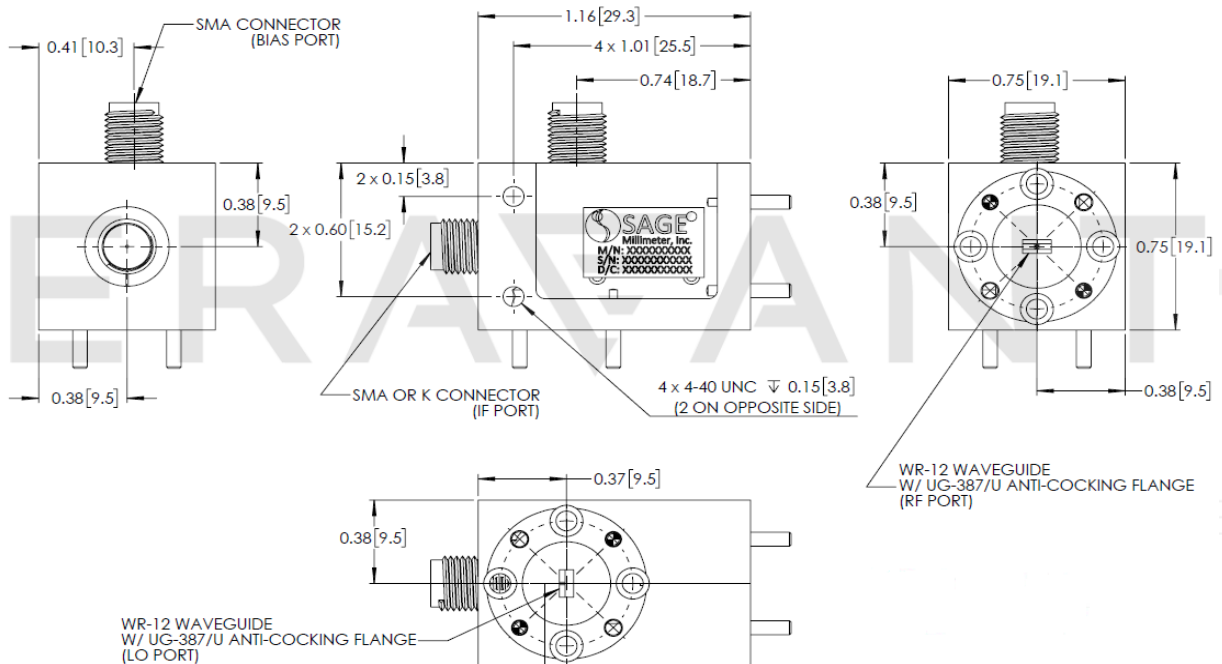
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Typical Conversion Loss vs. Frequency

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:

- The test data provided is collected from a sample lot. Actual data may vary slightly from unit to unit. All testing is performed under +25 °C room 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.
- To protect mixer from accidental static discharge, overbias and/or reverse bias, it is highly recommended to use voltage regulator (**M/N: SOR-05-SM-R1**) with this mixer.
- When sufficient LO power is available, always use non-biased mixers to get optimum conversion loss and LO to RF isolation. Externally biased mixers should be used only if 13 dBm LO power is not available.
- Eravant 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 should be at least 5 dB lower than input P_{-1dB}.**
- 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 VDC), 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 may damage or destroy the unit.
- For 1.35 mm, 1.85 mm, 2.4 mm, 2.92 mm, and SMA connectors proper torque, 8.0 ± 0.15 inch-pounds (0.90 ± 0.02 Nm), should be applied. Eravant torque wrench model [SCH-08008-S1](#) is highly recommended.

Appendix: The Outline of Externally Biased Mixer Voltage Regulator (SOR-05-SM-R1).

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