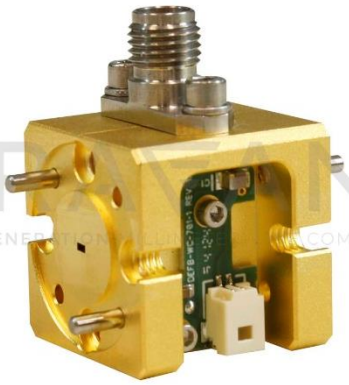
SFB-06-EB

D-Band Externally Biased Balanced Mixer

SFB-06-EB is a D-Band, externally Biased balanced mixer. The mixer supports the operation for LO from 110 to 170 GHz and RF frequencies from 110 to 170 GHz with an extremely broad IF output from DC to 40 GHz. The mixer offers a typical conversion loss of 13 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. This model features a built-in voltage regulator to eliminate the risk of damage due to overbias and reduce ESD discharge.



Electrical Specifications:

Parameter	Minimum	Typical	Maximum
RF Frequency	110 GHz		170 GHz
LO Frequency	110 GHz		170 GHz
IF Frequency	DC		40 GHz
LO Pumping Power	0 dBm	+3 dBm	+5 dBm
Conversion Loss		13 dB	
RF Input P_{1dB}		-10 dBm	
LO to RF Isolation		18 dB	
Combined RF and LO Power			+7 dBm
Bias		+5V_{DC}/1mA	
Specification Temperature		+25°C	
Operating Temperature	+0°C		+50°C

Mechanical Specifications:

Item	Specification
RF Port	WR-06 Waveguide with UG-387/U-M Anti-Cocking Flange
LO Port	WR-06 Waveguide with UG-387/U-M Anti-Cocking Flange
IF Port	K (F)
Bias	Molex Connector: 2035580207
Case Material	Aluminum
Finish	Gold Plated
Size	0.75” (W) x 0.75” (L) x 0.75” (H)
Outline	FB-ED-2-A-2

ECCN

EAR99

FEATURES

- Low Conversion Loss
- High IF Frequency up to 40 GHz
- Compact Package
- Built-in Voltage Regulator

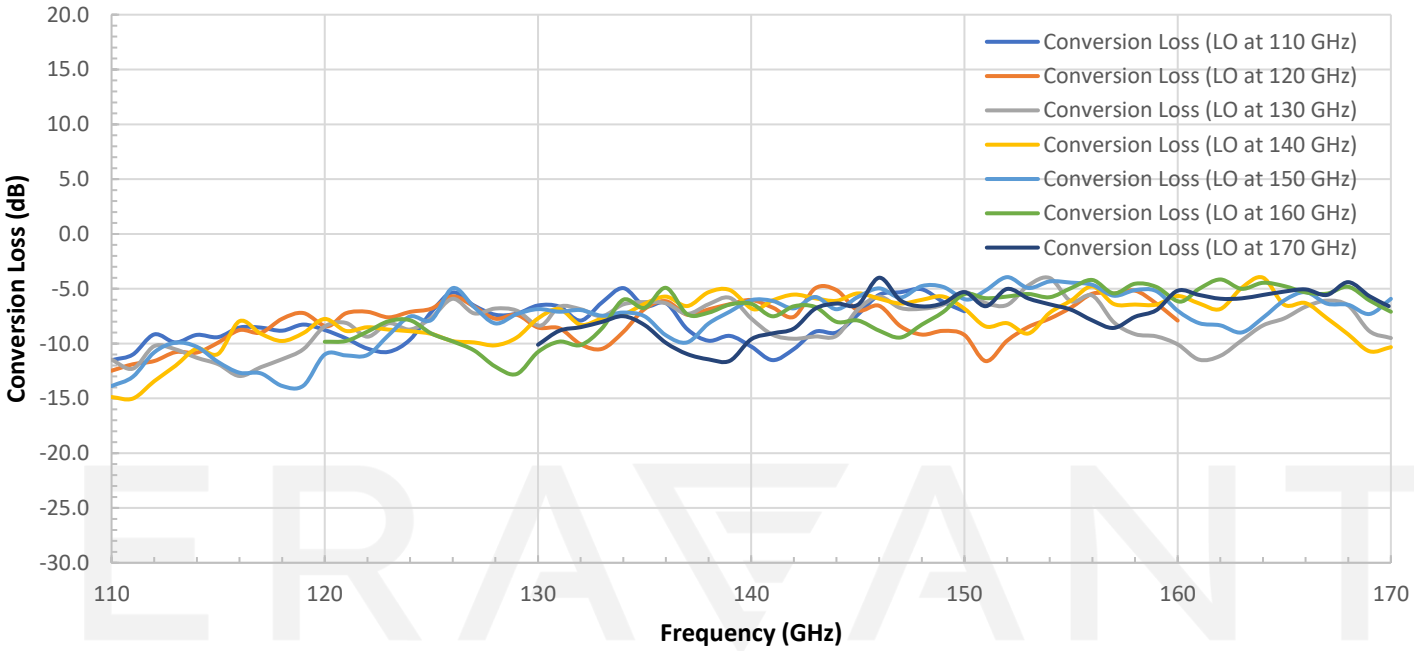
APPLICATIONS

- Radar Systems
- Communication Systems
- Test Equipment

SUPPLEMENTAL DETAILS

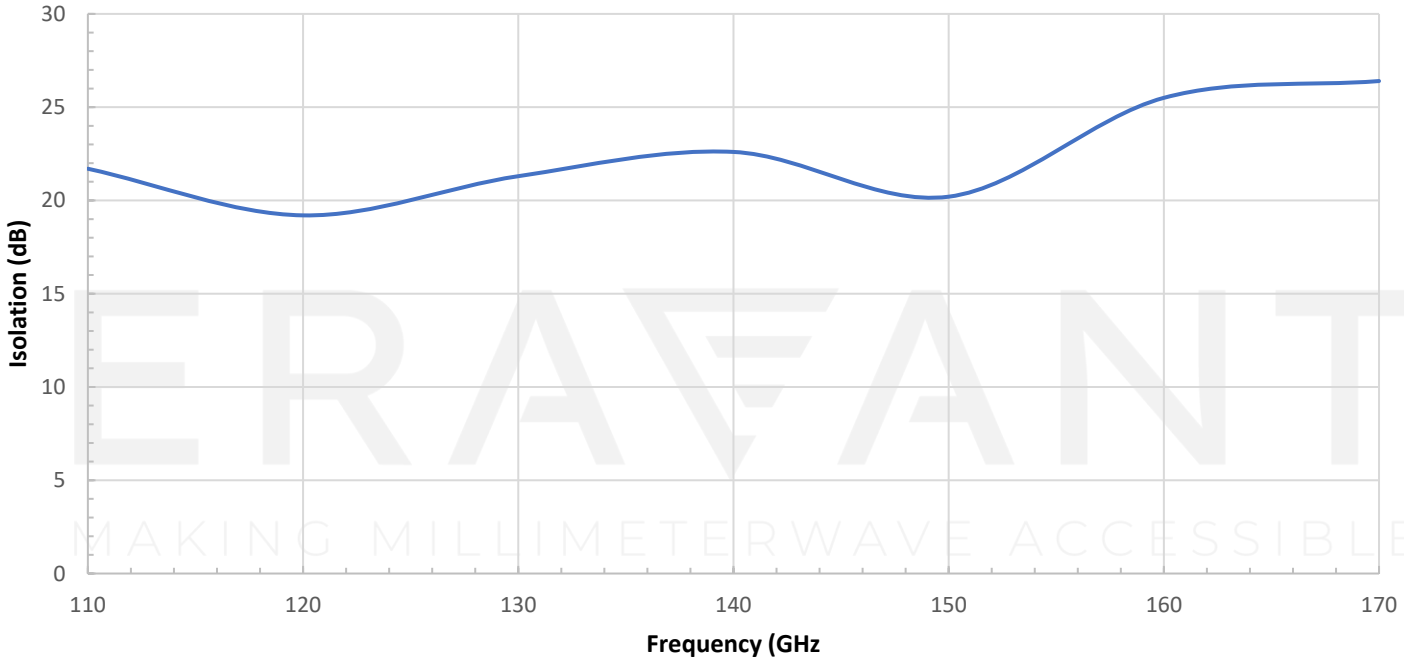
Conversion Loss vs. Frequency

RF: -20 dBm; LO: +2.0 dBm, Bias: 4V

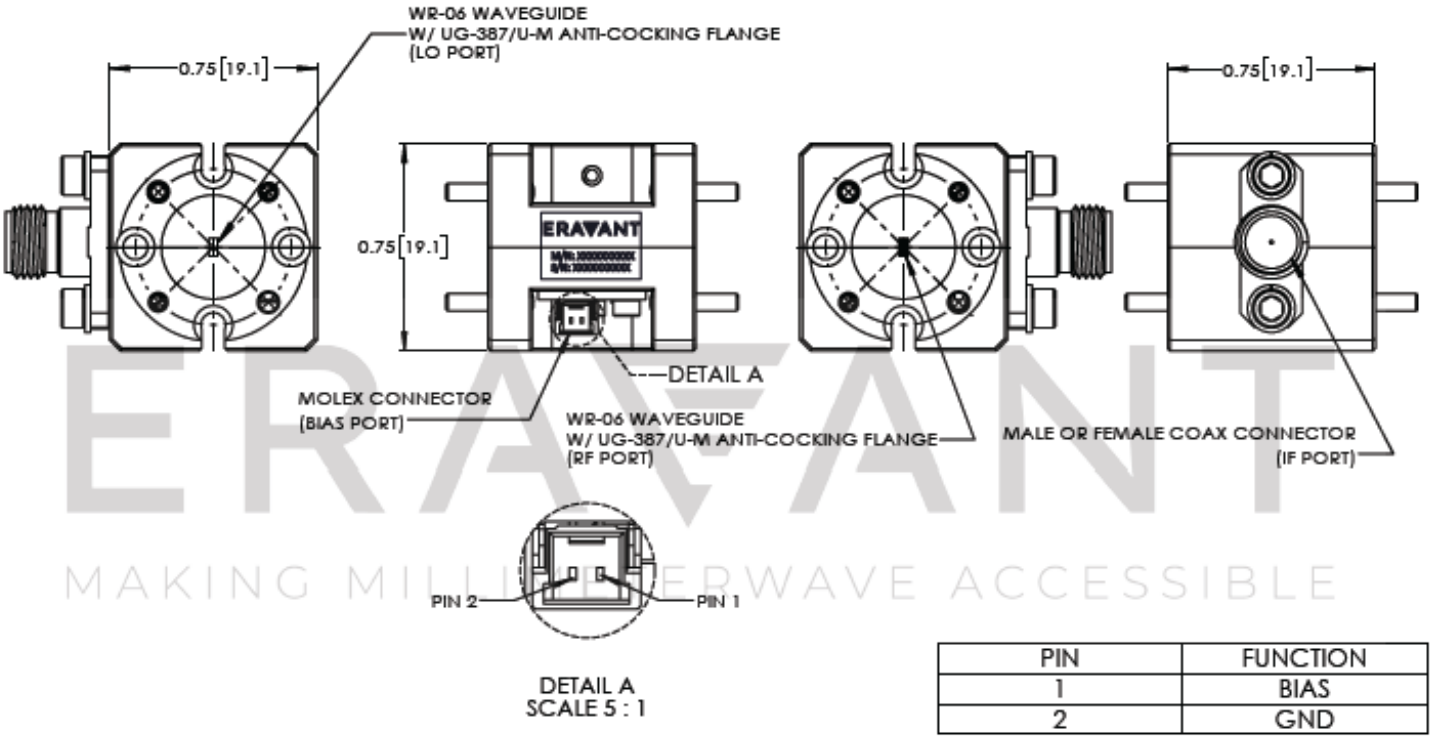


Typical LO to RF Isolation

LO: +2 dBm



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



PIN	FUNCTION
1	BIAS
2	GND

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.
- 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.
- 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.
- Eravant recommends the use of ESD wrist and ankle straps, grounded ESD dissipative surfaces, and air ionizers when handling 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. The mixer will be damaged. Eravant model, SCB-050-KFKM-U2, is highly recommended**.
- 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 should be applied: 8.0 ± 0.15 inch-pounds (0.90 ± 0.02 Nm). Torque wrench model SCH-08008-S1 is highly recommended.