



## V-Band Quadrature Mixer or Phase Detector, 58 to 62 GHz

### Description:

**Model SFQ-58362310-1515SF-E1-M** is an V Band quadrature mixer that covers the frequency range of 58 to 62 GHz. The typical conversion loss of the quadrature mixer is 10 dB with an LO driving power of +10 dBm. The typical LO to RF port isolation is 40 dB. Since the IF port of the quadrature mixer is DC coupled, the mixer can be used as a phase detector. In addition, the mixer can be readily configured into an image rejection mixer or single sideband modulator by adding an external IF quadrature coupler.



### Features:

- Compact Package
- Low Conversion Loss
- High Port Isolations
- IF Port DC Coupled for Phase Detection

### Applications:

- IEEE 802.11.ad WiGig Systems
- Phase Detection
- Speed and Ranging Radar Systems
- Communication Systems

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
RF Frequency Range	58 GHz		62 GHz
LO Frequency Range	58 GHz		62 GHz
RF Input P <sub>-1dB</sub>		+5 dBm	
LO Pumping Power		+10 dBm	+15 dBm
IF Frequency Range	DC	3 GHz	5 GHz
Conversion Loss		10 dB	12 dB
I/Q Phase Unbalance		±15°	
I/Q Amplitude Unbalance		±1.0 dB	
LO to RF Port Isolations	20 dB	40 dB	
DC Bias		+5 V <sub>DC</sub> /1mA	
Specification Temperature		+25 °C	
Operating Temperature	0 °C		+50 °C

### Mechanical Specifications:

Item	Specification
RF & LO Ports	WR-15 Waveguide with UG-385/U Anti-Cocking Flange
IF-I & IF-Q Ports	SMA(F) & SMA (F)
DC Bias Port	Solder Pin
Case Material	Aluminum
Finish	Gold Plated
Weight	1.8 Oz
Size	1.25" (L) X 1.25" (W) X 0.88" (H)
Outline	FQ-VEM-A

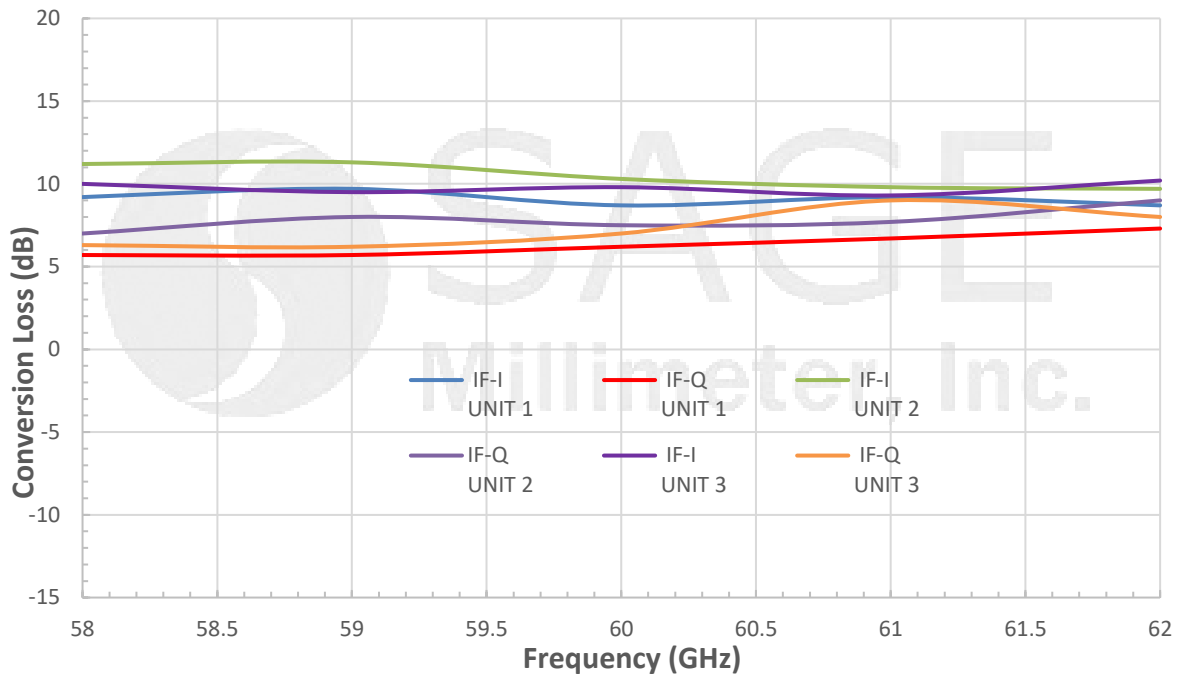




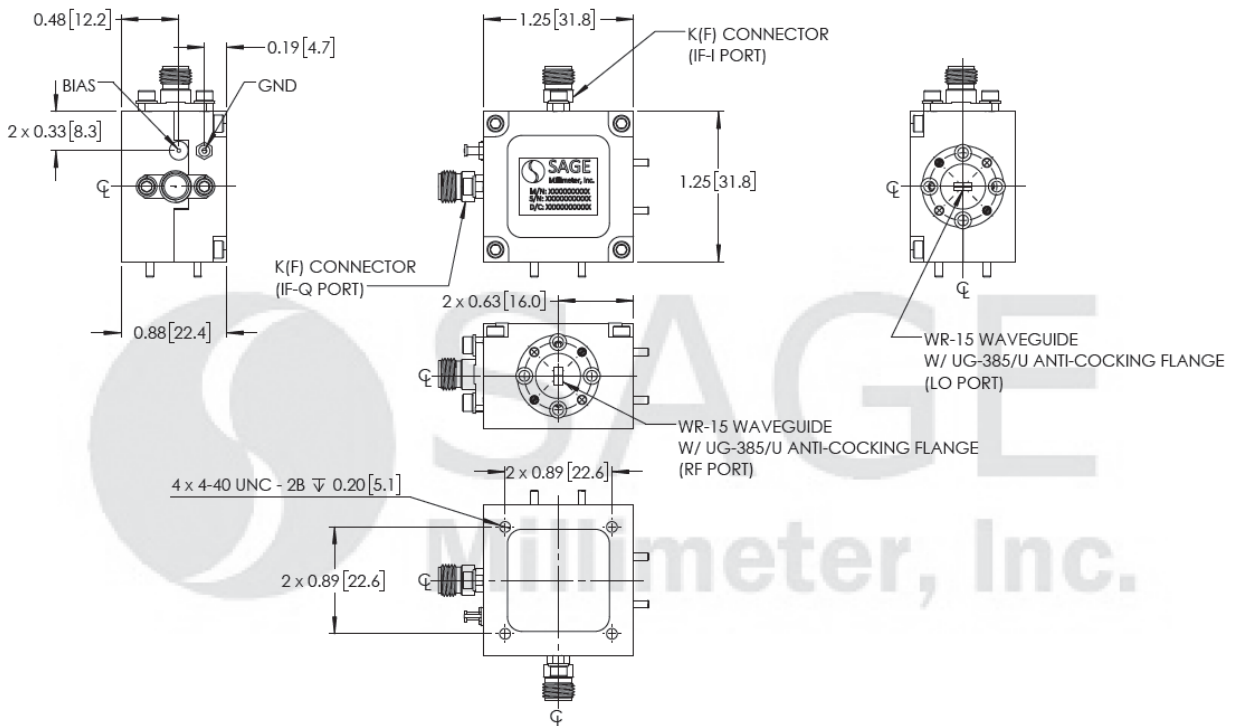
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### Typical Conversion Loss vs. Frequency

RF: -20 dBm, LO: +10 dBm, IF: 1 GHz, DC Bias: +5 V<sub>DC</sub>/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.
- The I/Q mixer can be configured as an image rejection mixer or used as an I/Q up-converter, single sideband modulator and phase detector.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

### Caution:

- Exceeding absolute maximum ratings will damage the device.
- The mixer is a static sensitive device. Always follow ESD rules when working with the device.
- The IF ports are DC coupled. Use DC blocks if necessary. **Do not apply an external bias voltage to the IF port.**
- 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.**
- Any foreign objects in the waveguide will cause performance degradation and possible device damage.

