

## Q-Band Harmonic Mixer, 6th Harmonics. Spectrum Analyzer

### Description:

**Model SFH-22SFSF-A3-2** is a Q-Band balanced harmonic mixer that is specially designed for use with spectrum analyzer series with separate LO and IF ports. The mixer employs high performance, GaAs Schottky diodes and a balanced configuration to produce a superior RF performance. With an IF range of DC to 1.6 GHz, the harmonic mixer uses the harmonic number 6 of a 5.0 to 12.0 GHz LO at +16 dBm to translate 33.0 to 50.0 GHz. The harmonic mixer has a typical conversion loss of 25 dB. The mixer can be used as other even harmonic numbers, such as 4, 8, and 10, etc. with various conversion loss performance. In general, the lower the harmonics, the lower the conversion loss.



### Features:

- Full Waveguide Band Operation
- No External Bias Required
- Even Harmonic Detection
- Calibrated for 6<sup>th</sup> Harmonic Detection

### Applications:

- Spectrum Analyzers
- Frequency Meters
- Phase Locked Loops

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
RF Frequency	33 GHz		50 GHz
LO Frequency	5 GHz		12.0 GHz
IF Frequency	DC		1.6 GHz
RF Power		- 20 dBm	+19 dBm
LO Power		+16 dBm	+19 dBm
Number of Harmonics		6	
Conversion Loss		25 dB	
Specification Temperature		+25 °C	
Operation Temperature	0 °C		+50 °C

### Mechanical Specifications:

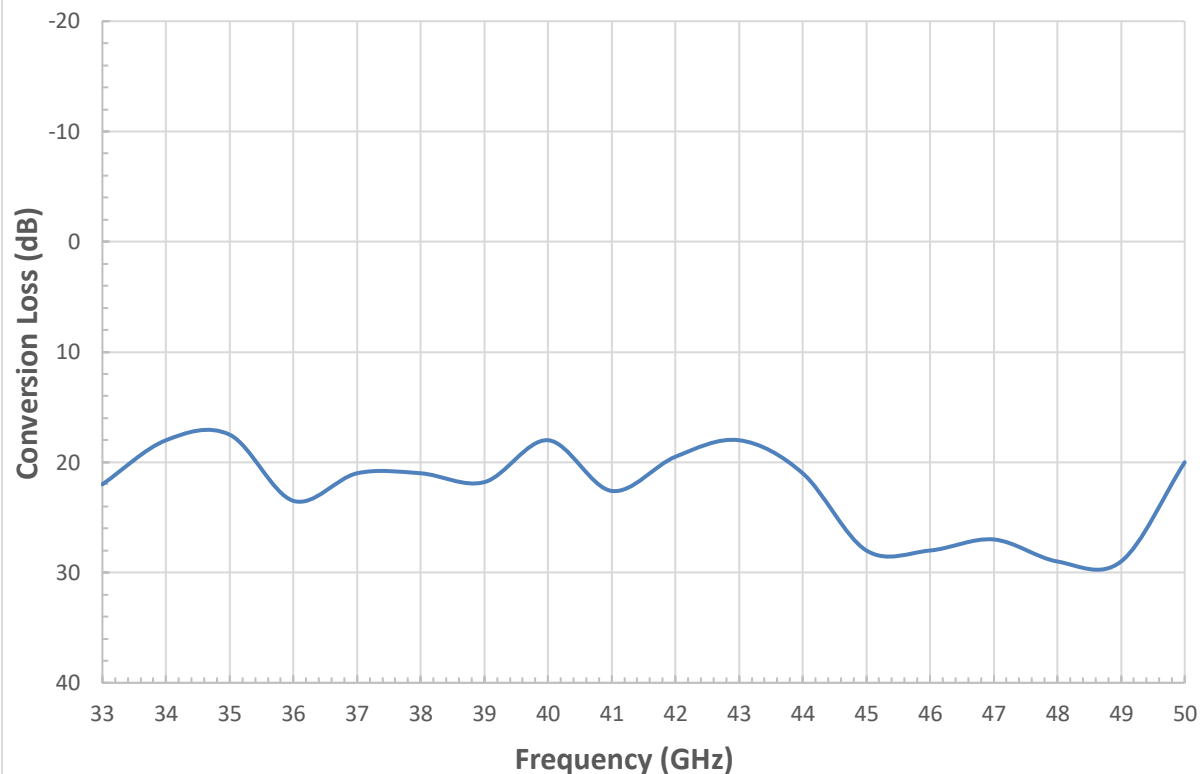
Item	Specification
RF Port	WR-22 Waveguide with UG-383/U Flange
LO Port	SMA (F)
IF Port	SMA (F)
Case Material	Brass
Finishing	Gold Plated
Weight	5.5 Oz
Outline	FH-Q2



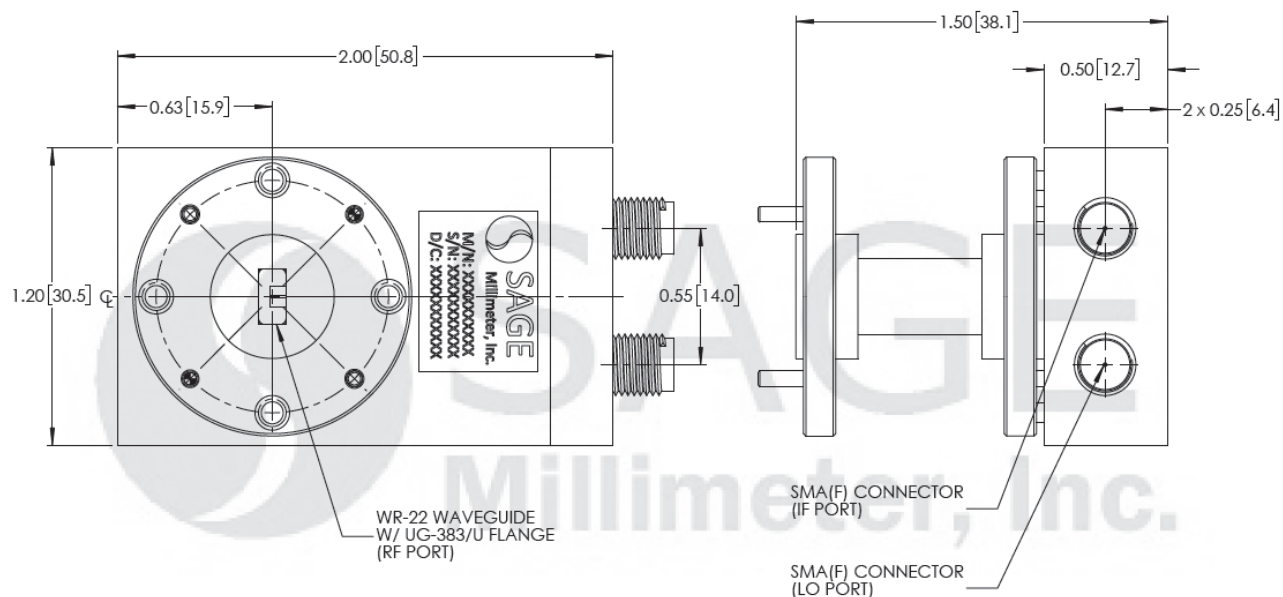
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### Conversion Loss vs Frequency

LO: 5.0 to 120 GHz/+16 dBm; IF: 1 GHz;  $P_{RF} = -25$  dBm



**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.
- The harmonic mixer is for small signal detection. The recommended the RF power range is -10 dBm or below.
- The Harmonic mixer work in any even harmonics of LO to yield the IF frequency in the range of DC to 1.6 GHz with different conversion loss.
- All testing was performed under **+25 °C** case temperature.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

### Caution:

- Exceeding absolute maximum ratings of the mixer will damage the device.
- Any foreign objects in the waveguide will degrade performance and/or damage the device.
- The mixer is a static sensitive device. Always follow ESD rules when working with the mixer.
- 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.**

