



## E-Band Amplitude Detector, Small Signal, Positive

### Description:

**Model SFD-603903-12SF-P1** is an E Band amplitude detector that can be used for full or narrow band applications. The detector is zero biased and intended for small signal detection purposes. With a distinct circuitry design and careful diode selection, the detector exhibits high sensitivity and extremely flat output characteristics across the full waveguide operating bandwidth. The detector is designed to have a 10 MHz video bandwidth and a 1 MΩ video output impedance. The minimum detectable signal level is approximately -50 dBm. On the other hand, the return loss of this type of detector is poor in general. The model **STD-12SF-PI** is recommended if the high return loss is desired.



### Features:

- Broad or Narrow Band Operation
- High Sensitivity Without Tuning
- High Sensitivity Stability Over Broad Temperature Range

### Applications:

- Radar Systems
- Communication Systems
- Test instrumentations

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Frequency	60 GHz		90 GHz
Sensitivity*		900 mV/mW	
Sensitivity Flatness		±2.0 dB	
RF Input Power		-20 dBm	
RF Power Handling			+17 dBm
Video Bandwidth		10 MHz	
Detection Speed, Raise Time (50 Ohm Load)		5 Nano Second	
Output Voltage Polarity		Positive	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

\*Note: The sensitivity is for the input signal level -20 dBm or below.

### Mechanical Specifications:

Item	Specification
RF Port	WR-12 Waveguide with UG-387/U Flange
DC Port	SMA (F)
Case Material	Aluminum
Finish	Gold Plated
Weight	0.4 Oz
Outline	FD-E1

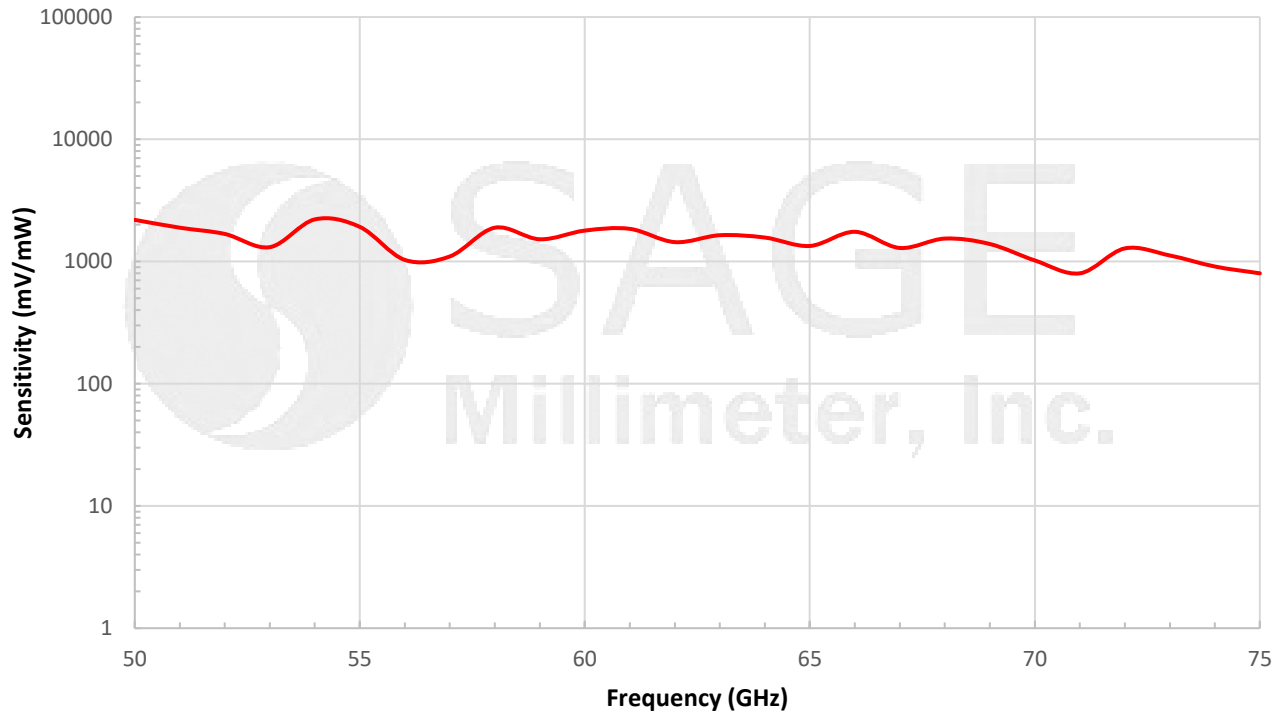




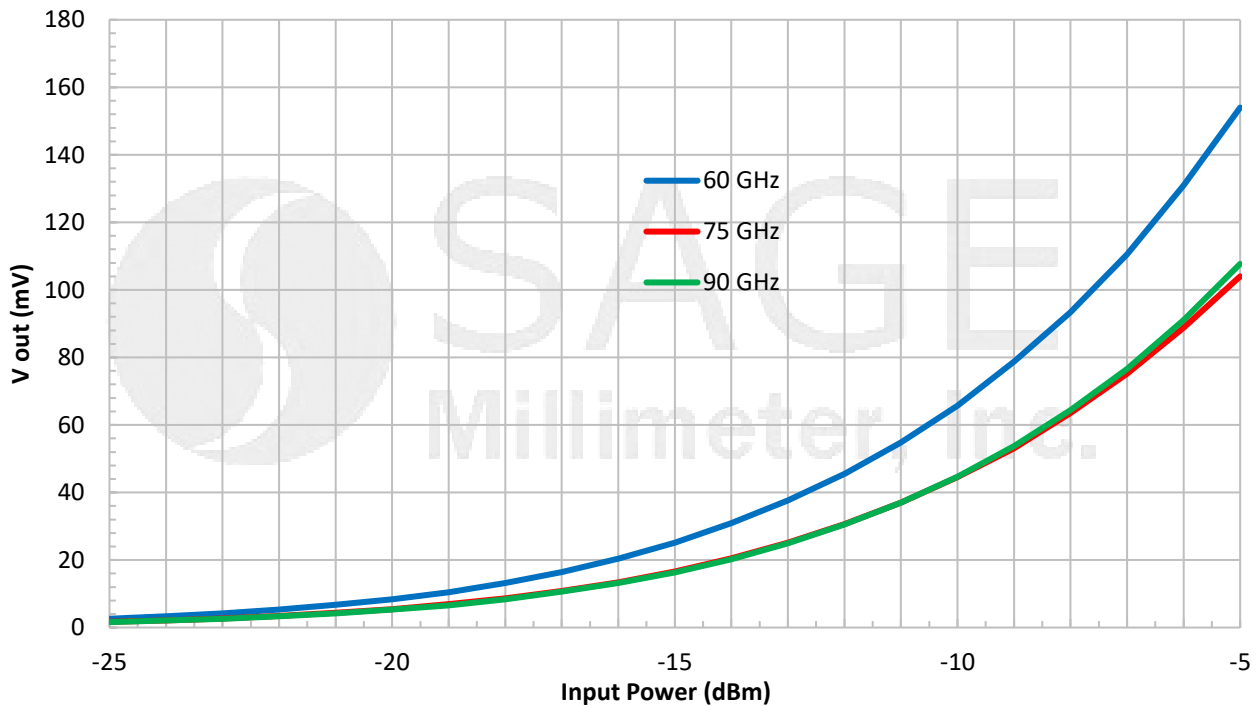
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### Typical Performance vs. Frequency

$P_{in} = -20$  dBm



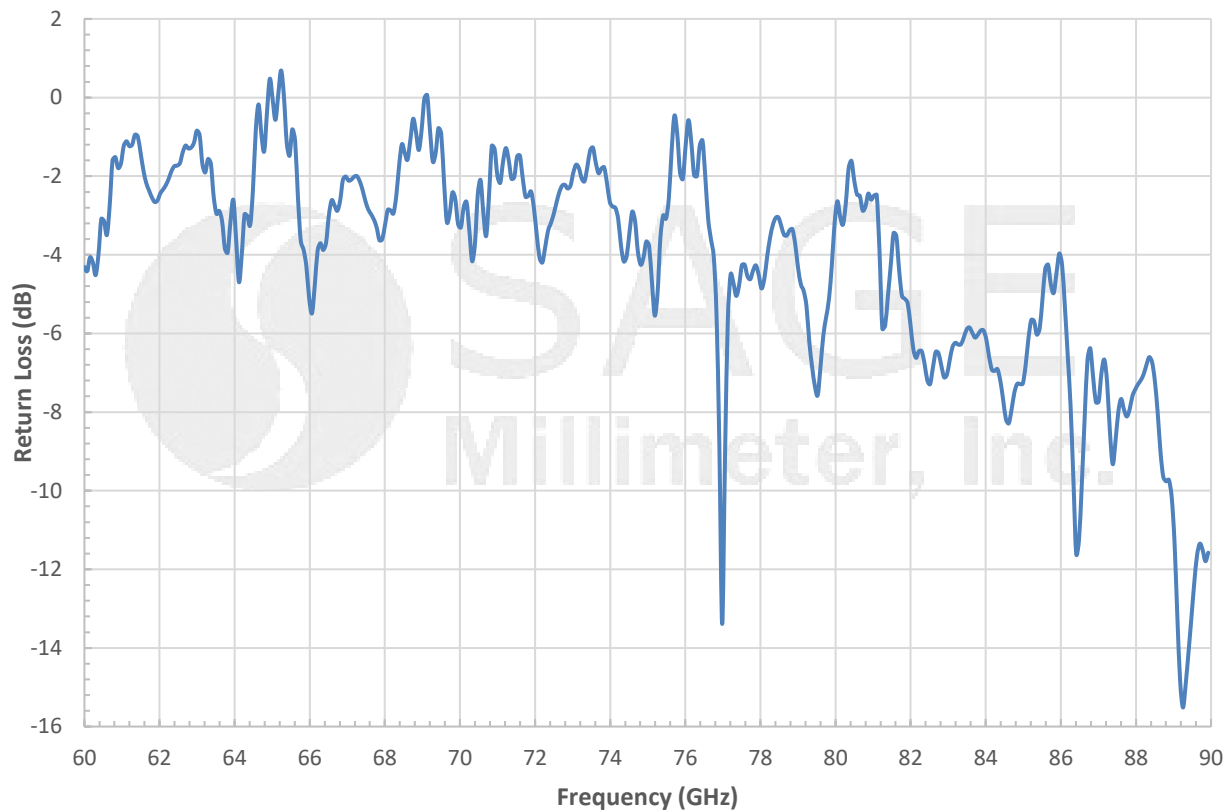
### Typical Detected Voltage vs. Input Power



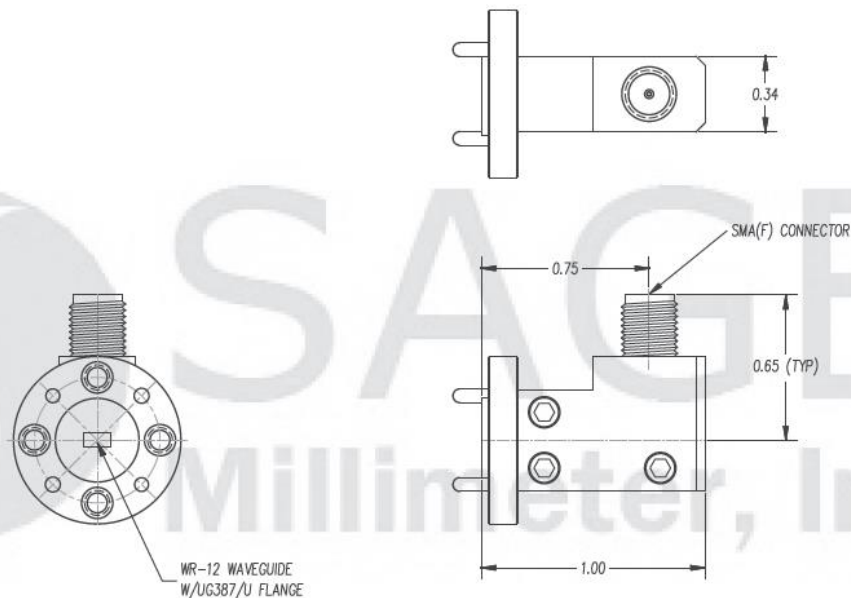


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### Typical Return Loss vs. Input Frequency



### Mechanical Outline: (Unless otherwise specified, all dimensions are in inches)





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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 negative output voltage polarity is offered under the model number **SFD-603903-12SF-N1**.
- The amplitude detector is a small signal detector. The sensitivity shown is for RF signal -20 dBm or lower.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

### Caution:

- Exceeding absolute maximum ratings will damage the device.
- The device is static sensitive. Always follow ESD rules when working with the device.
- Any foreign objects in the waveguide will cause performance degradation and can possibly damage the device.
- 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.**

