# SFD-114174-06SF-P1

Rev. 1.0

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

### Description:


**Model SFD-114174-06SF-P1** is a D 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.

### Features:

- Full Waveguide 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 | 110 GHz | | 170 GHz |
| Sensitivity* | | 300 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-06 Waveguide with UG-387/U-M Flange |
| DC Port | SMA (F) |
| Case Material | Aluminum |
| Finish | Gold Plated |
| Weight | 0.4 Oz |
| Outline | FD-D1 |

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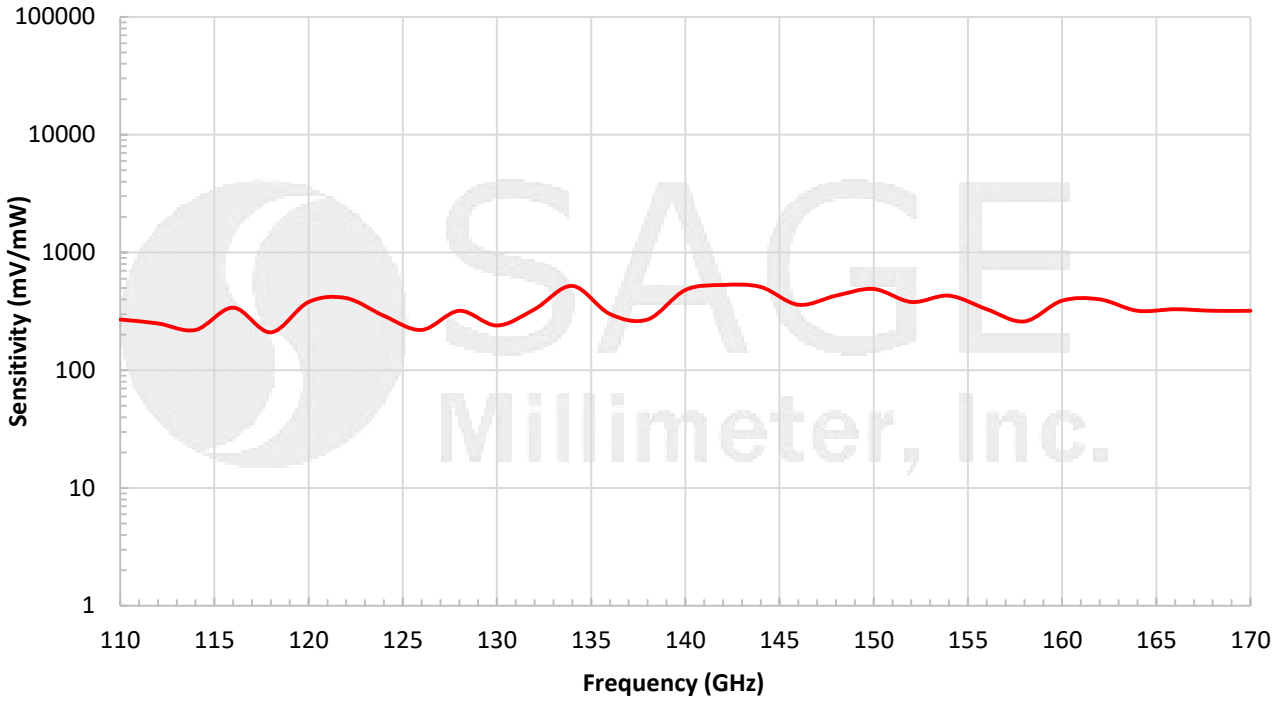
Phone: 424-757-0168 | Fax: 424-757-0188 | Email: sales@sagemillimeter.com

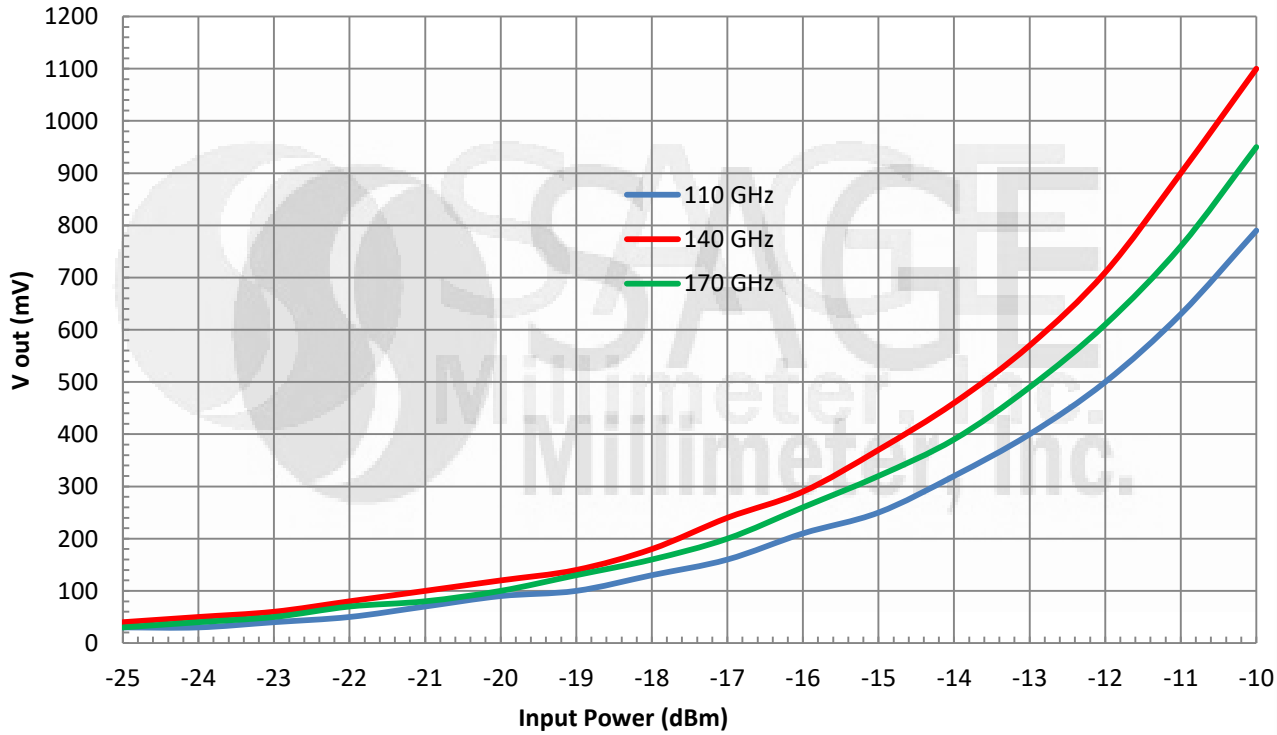
## D-Band Amplitude Detector, Small Signal, Positive

### Typical Performance vs. Frequency

$P_{in}$ = -20 dBm




### Typical Detected Voltage vs. Input Power

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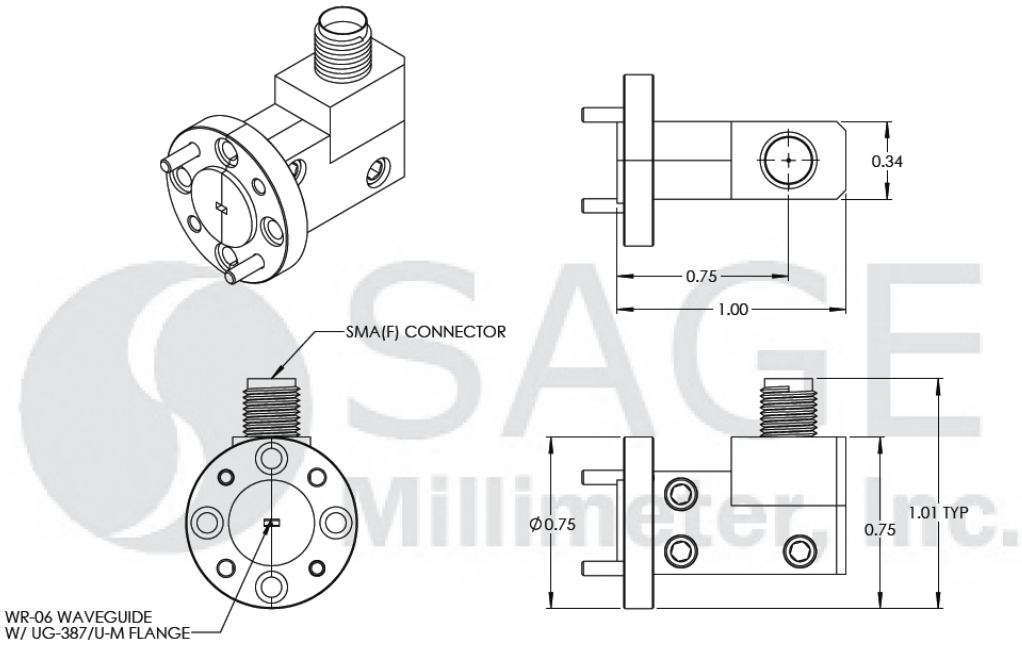
## D-Band Amplitude Detector, Small Signal, Positive

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




**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-114174-06SF-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 ± 0.15 inch-pounds (0.92 ± 0.05 Nm), should be applied. **SAGE Millimeter torque wrench, model SCH-08008-S1, is highly recommended.**

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