

## W Band Doppler Sensor Module, Single Channel, 94 GHz

### Description:

**Model SSM-94313-S1** is a W band Doppler sensor module that is designed and manufactured for medium range measurements of a moving target's speed. The sensor module has an operating frequency range of 93 to 95 GHz and takes a nominal bias of +12.0 V<sub>DC</sub>/250 mA. The sensor module is configured with a mechanically tuned oscillator, an isolator, a directional coupler, a circulator and a balanced mixer. The directional coupler is used to sample the LO power to pump the mixer, and the circulator is used as a TX/RX diplexer. Various antennas can be integrated with the module to form sensor heads for many system applications.



### Features:

- 94.0 GHz Operation
- Low FM/AM Noise and High Sensitivity
- Low Harmonic Emission
- Common Tx/Rx Port

### Applications:

- Doppler Radar Systems
- Military Surveillance Systems

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Tx Frequency Range	93.00 GHz	94.00 GHz	95.00 GHz
Tx Frequency Tuning Bandwidth*		±250 MHz	
Tx Output Power		+13 dBm	
Rx Frequency Range	93.00 GHz	94.00 GHz	95.00 GHz
Rx IF Frequency Range	DC		1 GHz
Rx Conversion Loss		10 dB	
Frequency Stability		-6.0 MHz/°C	
Power Stability		-0.04 dB/°C	
Oscillator Bias Voltage		+12 V <sub>DC</sub>	+15 V <sub>DC</sub>
Oscillator Bias Current		250 mA	350 mA
Specification Temperature		+25°C	
Operating Temperature	0°C		+50°C

\*The center frequency is factory preset per user's request

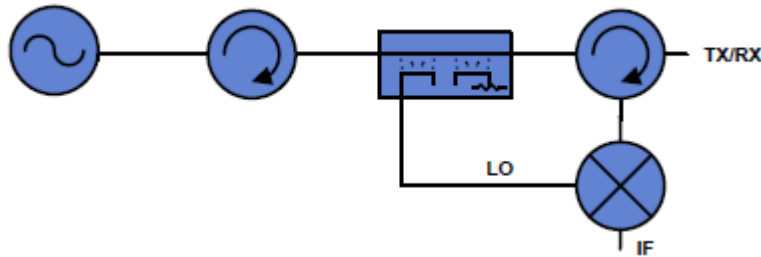


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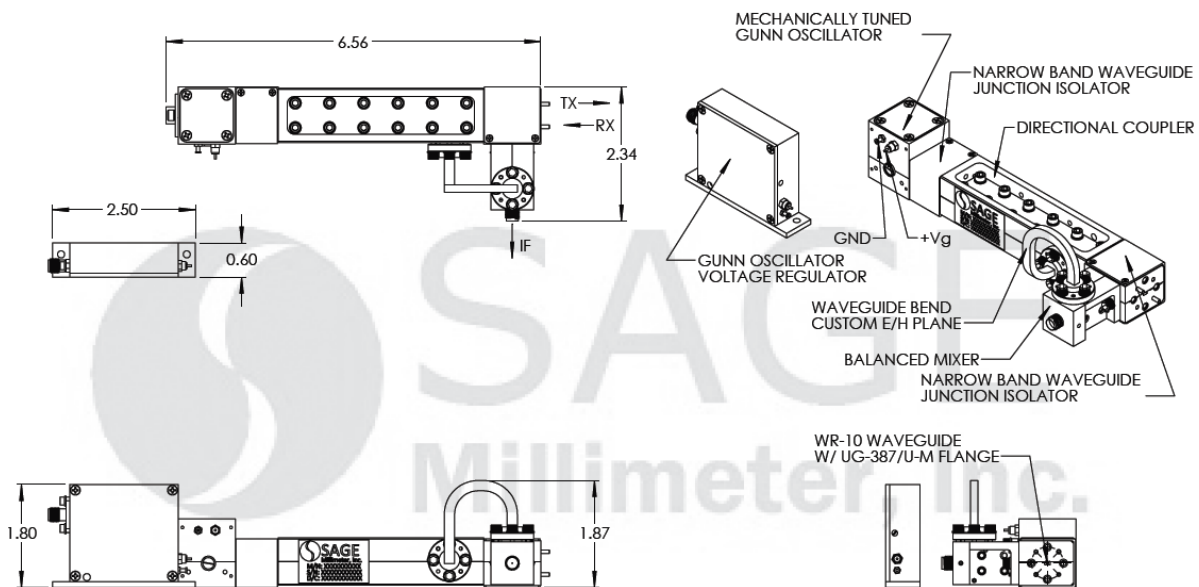
### Mechanical Specifications:

Item	Specification
Tx/Rx Port	WR-10 Waveguide with UG-387/U-M Flange
IF Port	SMA (F)
DC Bias	Solder Pins
Case Material	Aluminum and Brass
Finish	Gold Plated
Size	2.34" (W) X 1.87" (H) X 6.56" (L)
Weight	5.0 Oz
Outline	SM-NW-S1

### Block Diagram:



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





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### Note:

- The voltage regulator is provided for Gunn oscillator protection.
- The heatsink shown in the photo is not required for this model.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

### Caution:

- Exceeding absolute maximum ratings shown 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 possibly damage the device.
- The case temperature of the device shall never exceed +50°C. Use a proper heatsink or fan if necessary.
- 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.**

