

W Band Doppler Sensor Module, Single Channel, 110 GHz

Description:

Model SSM-11405-S2 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 109.5 to 110.5 GHz and takes a nominal bias of +12.0 V_{DC}/250 mA.

The voltage regulator is included to provide the protection for the Gunn oscillator. An additional DC bias of +5 V_{DC} is required for external mixer.

The sensor module is configured with a mechanically tuned oscillator, an isolator, a directional coupler, a circulator and an externally biased 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:

- 110 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	109.5 GHz	110.0 GHz	110.5 GHz
Tx Frequency Tuning Bandwidth*		±250 MHz	
Tx Output Power		+5 dBm	
Rx Frequency Range	109.5 GHz	110.0 GHz	110.5 GHz
Rx IF Frequency Range	DC		1 GHz
Rx Conversion Loss		12 dB	
Frequency Stability		-6.0 MHz/°C	
Power Stability		-0.04 dB/°C	
Oscillator Bias Voltage		+12 V _{DC}	+15 V _{DC}
Oscillator Bias Current		250 mA	350 mA
Mixer Bias Voltage		+5 V _{DC}	+6 V _{DC}
Mixer Bias Current		2 mA	3 mA
Specification Temperature		+25°C	
Operating Temperature	0°C		+50°C

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



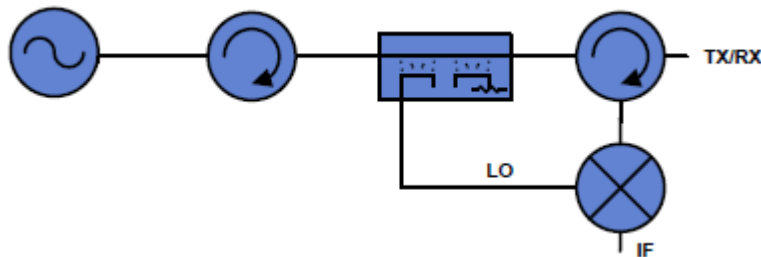


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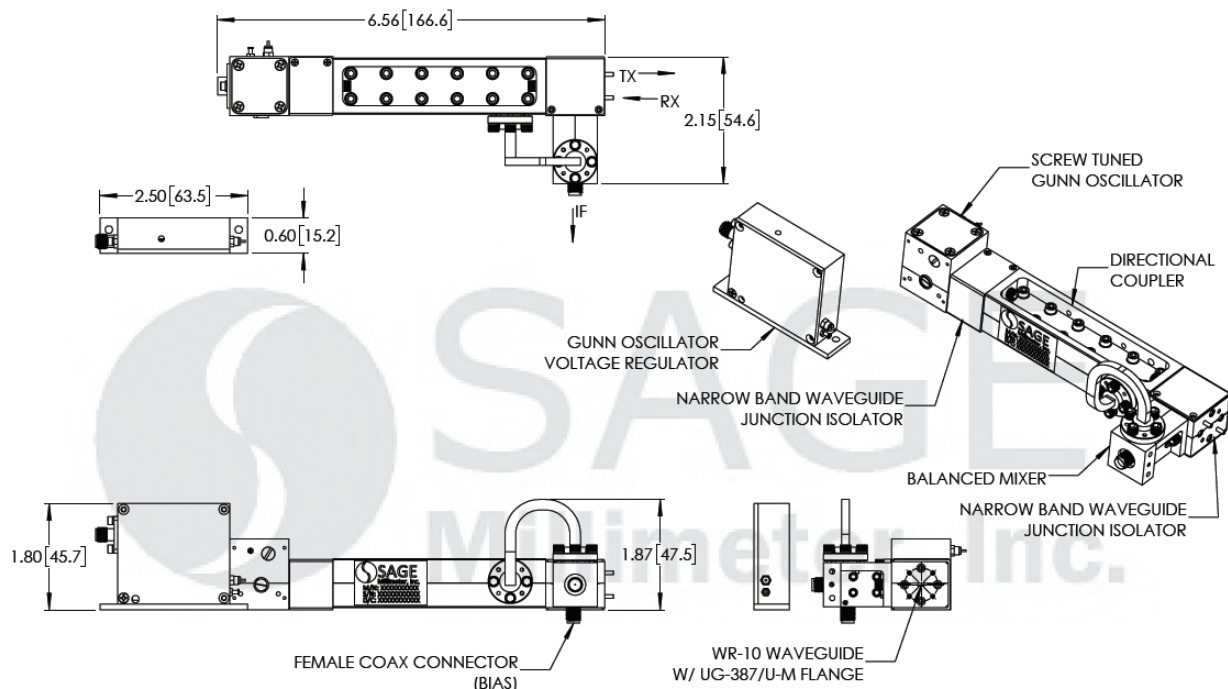
Mechanical Specifications:

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
Weight	5.0 Oz
Size	2.15" (W) X 1.87" (H) X 6.56" (L)
Outline	SM-NW-S-E

Block Diagram:



Mechanical Outline: (Unless otherwise specified, all dimensions are in inches [millimeters])





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Note:

- The voltage regulator is provided for Gunn oscillator protection.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

Caution:

- Exceeding absolute maximum ratings shown will damage the device.
- The bias to externally biased mixer shall not never exceed $+6 V_{DC}$ as the mixer diode will be over driven and damaged.
- 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 $+50^{\circ}C$. Use a proper heatsink or fan if necessary.
- 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.**

