



## E Band Ranging Sensor Module, Single Channel, 76.5 GHz, ± 250 MHz

### Description:

**Model SSP-77323-S1** is an E band ranging sensor module that is designed and manufactured for medium range measurements of a moving target's speed and distance. The sensor module has an operating frequency range of 76.25 to 76.75 GHz and takes a nominal bias of +8.0 V<sub>DC</sub>/1,100 mA. The sensor module is configured with a varactor tuned oscillator, an isolator, an amplifier, 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. The varactor has tuning voltage range of 0 to +25 V<sub>DC</sub> and provides ±250 MHz tuning bandwidth. Various antennas can be integrated with the module to form sensor heads for many system applications.



### Features:

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

### Applications:

- True Ranging Radar Systems
- High Resolution Target Detection Systems
- Automotive Radar Systems

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Tx Frequency Range	76.25 GHz	76.50 GHz	76.75 GHz
Tx Frequency Tuning Bandwidth		±250 MHz	
Tx Output Power		+23 dBm	
Rx Frequency Range	76.25 GHz	76.50 GHz	76.75 GHz
Rx IF Frequency Range	DC		1 GHz
Rx Conversion Loss		10 dB	
Frequency Stability		-6.0 MHz/°C	
Power Stability		-0.05 dB/°C	
Varactor Tuning Voltage		0 to +25 V <sub>DC</sub>	
Varactor Tuning Speed		1 μs	
Gunn Bias Voltage*		+8 V <sub>DC</sub>	+8.5 V <sub>DC</sub>
Gunn Bias Current		350 mA	
Amplifier Bias Voltage		+8 V <sub>DC</sub>	+15 V <sub>DC</sub>
Amplifier Bias Current		750 mA	
Specification Temperature		+25°C	
Operating Temperature	0°C		+50°C

\*Note: If the SOR-R3 regulator is used, the required DC bias voltage to regulator input is +8 V<sub>DC</sub>.





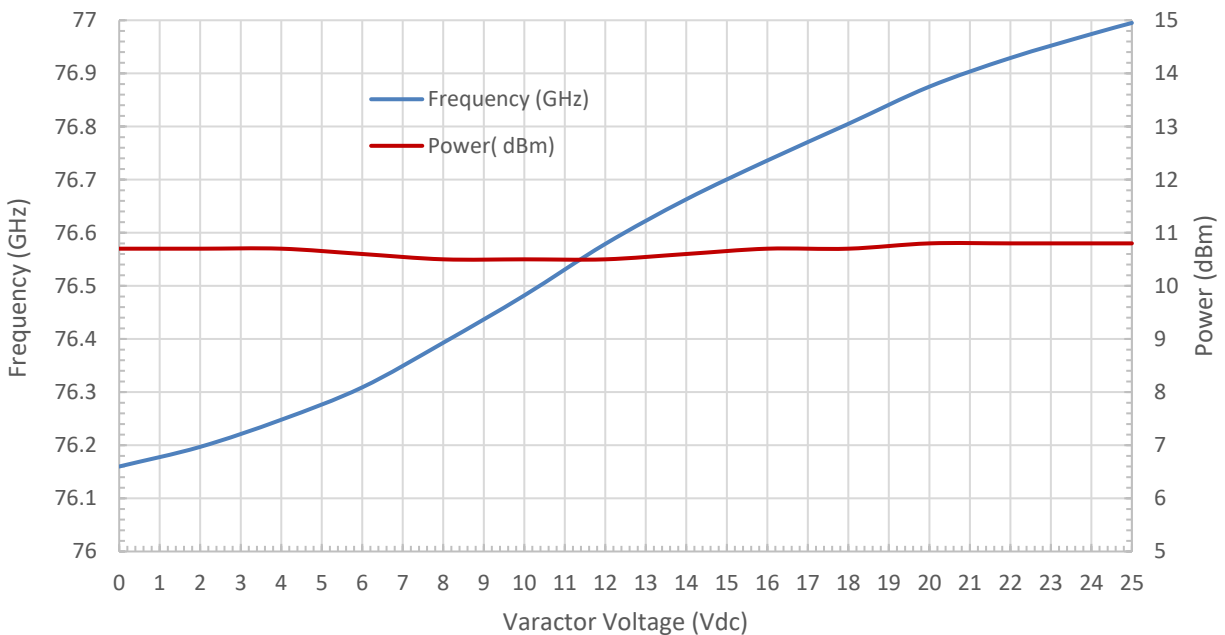
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### Mechanical Specifications:

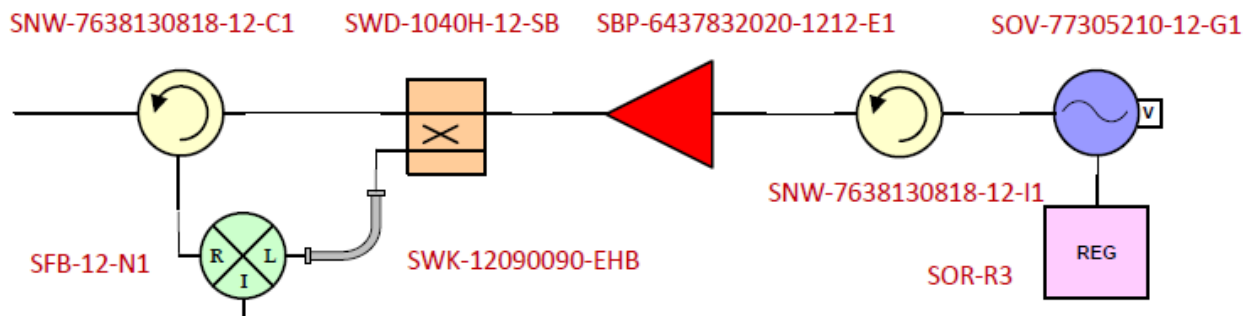
Item	Specification
Tx/Rx Port	WR-12 Waveguide with UG-387/U Anti-Cocking Flange
IF Port	SMA (F)
DC Bias Port (Vg)	Solder Pins
Varactor Bias Port (Vv)	SMA (F)
Material	Aluminum and Brass
Finish	Gold Plated
Weight	5 Oz
Size	8.0" (L) X 4.0" (W) X 1.96" (H)
Outline	SP-NWEV-S2-A

### TX Frequency and Power Output vs. Varactor Voltage

Bias: +4.5 Vdc/950 mA



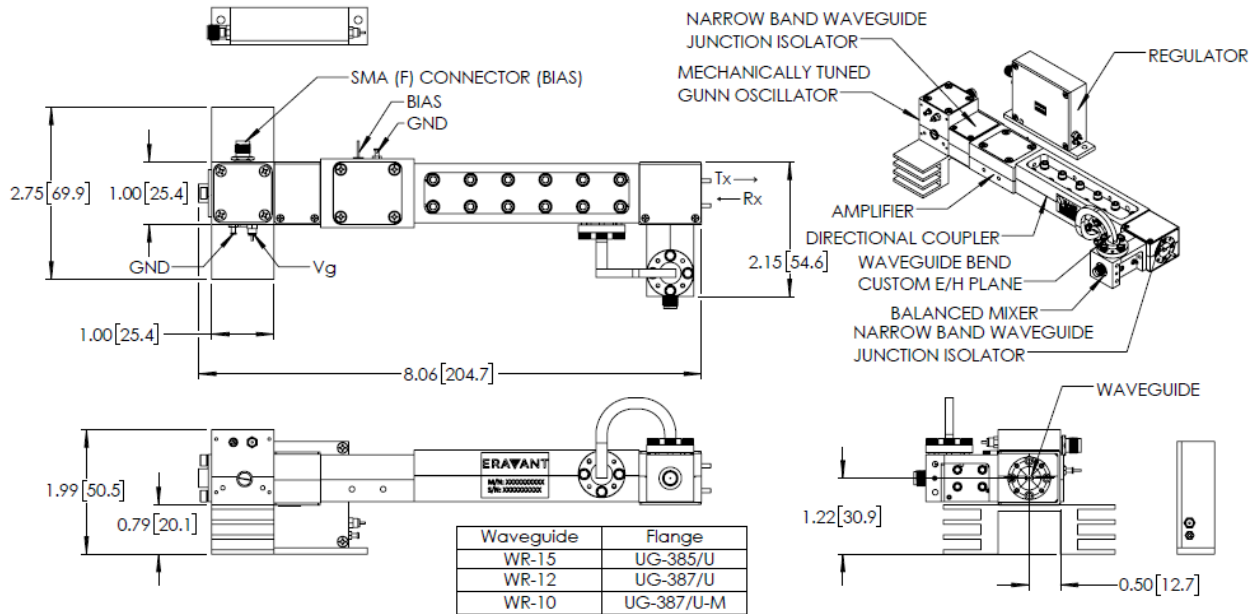
### Block Diagram:





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



**Note:**

- All data presented is collected from a sample lot. Actual data may vary unit to unit slightly.
- All testing as performed under +25°C case temperature.
- Other mechanical configurations are available under different model numbers.
- 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 ± 0.15 inch-pounds (0.90 ± 0.02 Nm), should be applied. **SAGE Millimeter torque wrench, model SCH-08008-S1, is highly recommended.**



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The Outline of the Gunn Oscillator Regulator Model [SOR-R3](#). (Unless otherwise specified, all dimensions are in inches.)

