



## V Band Ranging Sensor Module, Single Channel, 60 GHz, $\pm 250$ MHz

### Description:

**Model SSP-60318-S1** is a V band ranging sensor module based on FMCW radar principles. This sensor module is designed and manufactured for measurements of a moving or stationary target's speed and distance. The sensor module has a center frequency of 60.0 GHz and takes a nominal bias of  $+8.0 V_{DC}/750$  mA. The frequency modulation bandwidth of  $\pm 250$  MHz is realized via a tuning voltage of 0 to +25 Volts. The sensor module is configured with a Varactor 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:

- 76.5 GHz FMCW 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	59.75 GHz	60.0 GHz	60.25 GHz
Tx Output Power		+18 dBm	
FMCW Tuning Bandwidth		$\pm 250$ MHz	
Rx Frequency Range	59.75 GHz	60.0 GHz	60.25 GHz
Rx IF Frequency Range	DC		1 GHz
Rx Conversion Loss		11 dB	
Varactor Voltage		0 to +25 Volts	
Varactor Tuning Speed		1 $\mu$ S	
Frequency Stability		-6.0 MHz/ $^{\circ}$ C	
Power Stability		-0.04 dB/ $^{\circ}$ C	
Oscillator Bias Voltage*		+4.5 $V_{DC}$	+5.5 $V_{DC}$
Oscillator Bias Current		350 mA	
Amplifier Bias Voltage		+8.0 $V_{DC}$	+12.0 $V_{DC}$
Amplifier Bias Current		400 mA	
Specification Temperature		+25 $^{\circ}$ C	
Operating Temperature	0 $^{\circ}$ C		+50 $^{\circ}$ C

\*Note: If the SOR-R3 regulator is used, the required DC bias voltage to regulator input is +8  $V_{DC}$ .





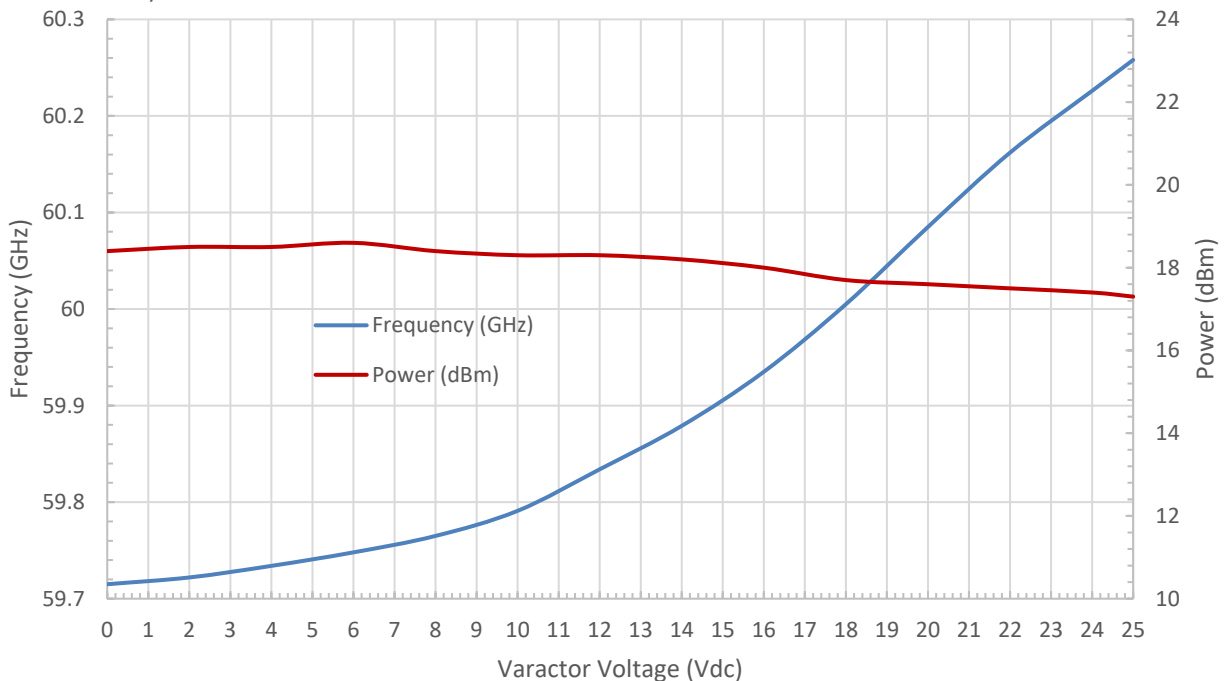
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### Mechanical Specifications:

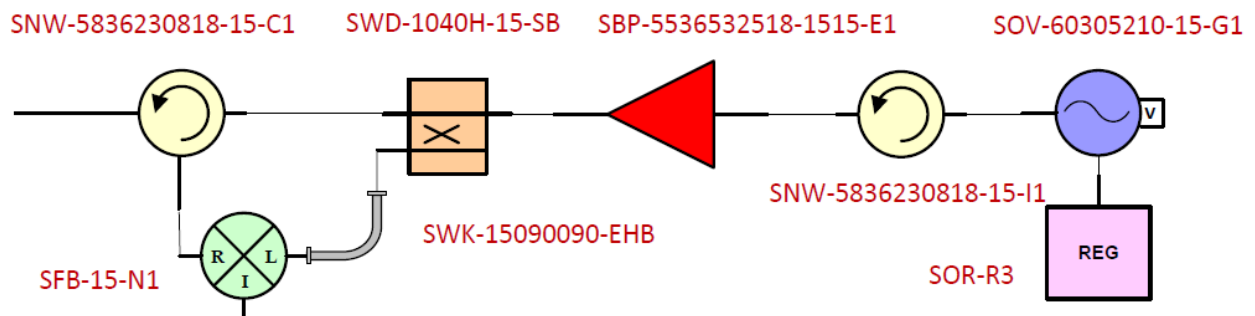
Item	Specification
Tx/Rx Port	WR-15 Waveguide with UG-385/U Anti-Cocking Flange
IF Port	SMA (F)
DC Bias (Vg)	Solder Pins
Varactor Bias Port (Vv)	SMA (F)
Case Material	Aluminum and Brass
Finish	Gold Plated
Size	8.0" (L) X 4.0" (W) X 1.96" (H)
Weight	5.0 Oz
Outline	SP-NWEV-S2-A

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

Bias: +5.0 Vdc/820 mA

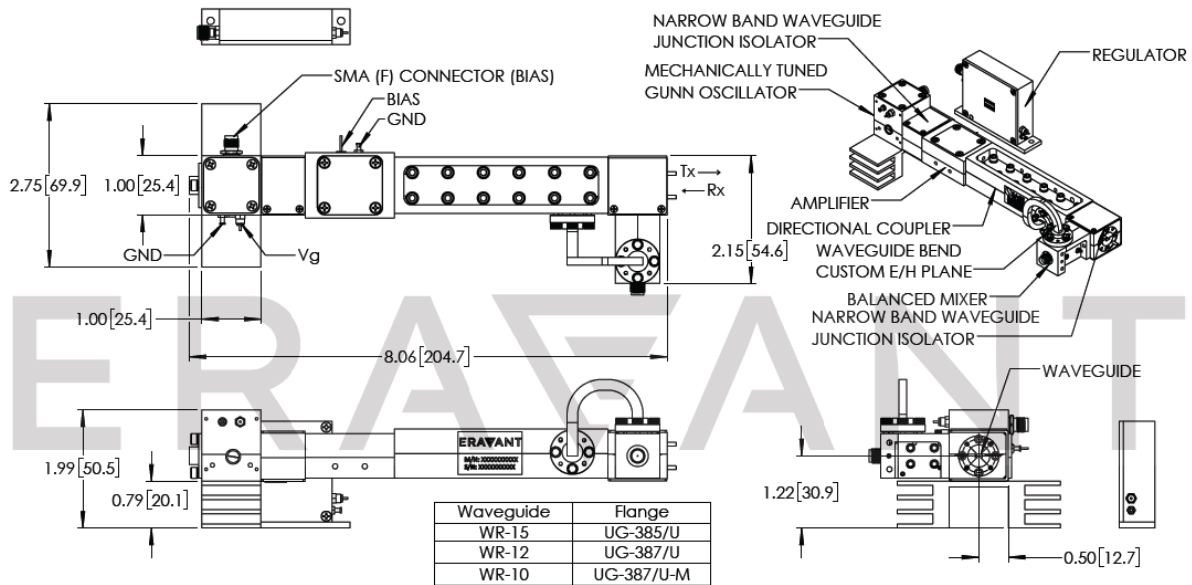


### Block Diagram:



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



**Note:**

- All data are presented using a limited sample lot. Actual data may vary unit to unit.
- All testing was performed under +35 °C case temperature.
- Eravant 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.
- Proper torque, 8.0 ± 0.4 inch-pounds (0.90 ± 0.02 Nm), should be applied. **Eravant torque wrench, model SCH-08008-S1, is highly recommended.**
- 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.



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

