

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

### Description:

**Model SSP-60324-D1** is an V band ranging sensor module that is designed and manufactured for medium range measurements of a moving target's speed, travel direction and distance. The sensor module has an operating frequency range of 59.75 to 60.25 GHz and takes a nominal bias of  $+8.0 V_{DC}/1,800$  mA. The sensor module is configured with a varactor tuned oscillator, an isolator, an amplifier, a directional coupler, a circulator, and a balanced I/Q 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 DC to  $+25 V_{DC}$  and provides  $\pm 250$  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
- Moving Target Direction Detection
- High Resolution Target Detection Systems
- Automotive Radar Systems

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Tx Frequency Range	59.75 GHz	60 GHz	60.25 GHz
Tx Frequency Tuning Bandwidth		$\pm 250$ MHz	
Tx Output Power		+24 dBm	
Rx Frequency Range	59.75 GHz	60 GHz	60.25 GHz
Rx IF Frequency Range	DC		1 GHz
I/Q Phase Unbalance		$\pm 15^\circ$	
Rx Conversion Loss		14 dB	
Frequency Stability		-6.0 MHz/ $^\circ$ C	
Power Stability		-0.05 dB/ $^\circ$ C	
Varactor Tuning Voltage		0 to $+25 V_{DC}$	
Varactor Tuning Speed		1 $\mu$ S	
Gunn Bias Voltage*		$+4.5 V_{DC}$	$+5.5 V_{DC}$
Gunn Bias Current		350 mA	
Amplifier Bias Voltage		$+8 V_{DC}$	$+15 V_{DC}$
Amplifier Bias Current		1,400 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  $+8 V_{DC}$ .



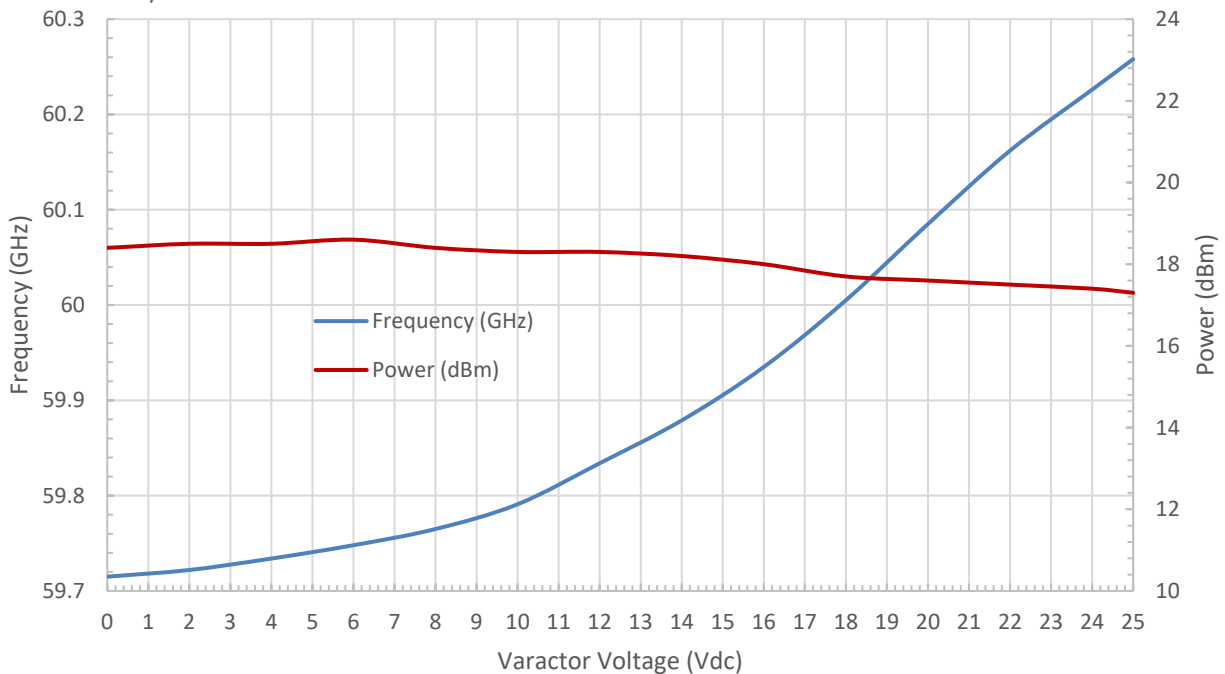
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### Mechanical Specifications:

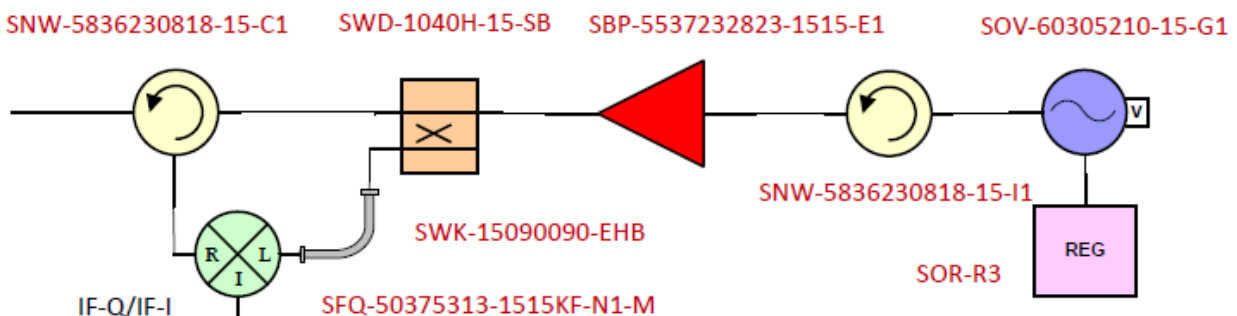
Item	Specification
Tx/Rx Port	WR-15 Waveguide with UG-385/U Anti-Cocking Flange
IF Ports	SMA (F), SMA(F)
DC Bias Port (Vg)	Solder Pins
Varactor Tuning Port (Vv)	SMA (F)
Material	Aluminum and Brass
Finish	Gold Plated
Weight	5 Oz
Size	8.0" (L) X 4.0" (W) X 1.96" (H)
Outline	SP-NWEV-D2-A

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

Bias: +5.0 Vdc/820 mA



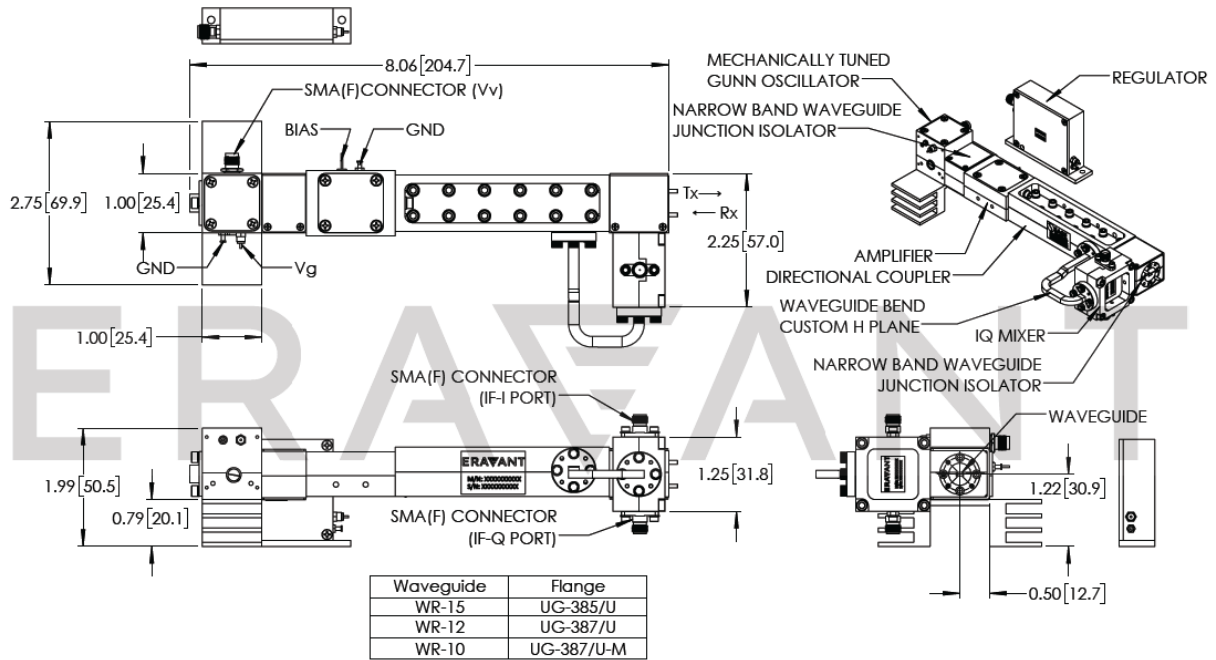
### Block Diagram:





## V Band Ranging Sensor Module, Dual Channel, 60 GHz, ±250 MHz

**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.
- 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.
- 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. **Eravant 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.)

