



## K Band Ranging Sensor Module, Dual Channel, 24.125 GHz

### Description:

**Model SSP-24303-D1** is a K band ranging sensor module based on FMCW radar principles. This sensor module is designed and manufactured for **short range** measurements of a moving target's speed and direction. The sensor module has a center frequency of 24.125 GHz and takes a nominal bias of +5.0 VDC/250 mA. The frequency modulation bandwidth of  $\pm 100$  MHz minimum is realized via a tuning voltage of 0 to +20 Volts. The sensor modules are configured with a T/R diplexer, a dual channel (I/Q) receiver and a transmitter/receiver oscillator in a die-cast housing. Various antennas can be integrated with the module to form sensor heads for many system applications.



### Features:

- 24.125 GHz FMCW Operation
- Low Flick Noise and High Sensitivity
- Low Harmonic Emission
- Directional Detection Capable

### Applications:

- Traffic Management Systems
- True Ranging Systems
- Military Surveillance Systems

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
TX Center Frequency		24.125 GHz	
TX Power		+3 dBm	
FMCW Tuning Bandwidth	$\pm 100$ MHz	$\pm 150$ MHz	
FMCW Tuning Voltage		0 to +20 Volts	
RX I/Q Phase $\Delta$		80 to 100°	60 to 120°
RX I/Q Amplitude $\Delta$		0 to 3 dB	
IF Frequency Range	DC		100 MHz
IF Offset Voltage		-0.5 to -1.0 V <sub>DC</sub>	
Frequency Stability		-0.8 MHz/°C	
Power Stability		-0.03 dB/°C	
DC Supply Voltage		+5.0 V <sub>DC</sub> /250 mA	+5.5 V <sub>DC</sub>
Specification Temperature		+25°C	
Operating Temperature	-40°C		+85°C





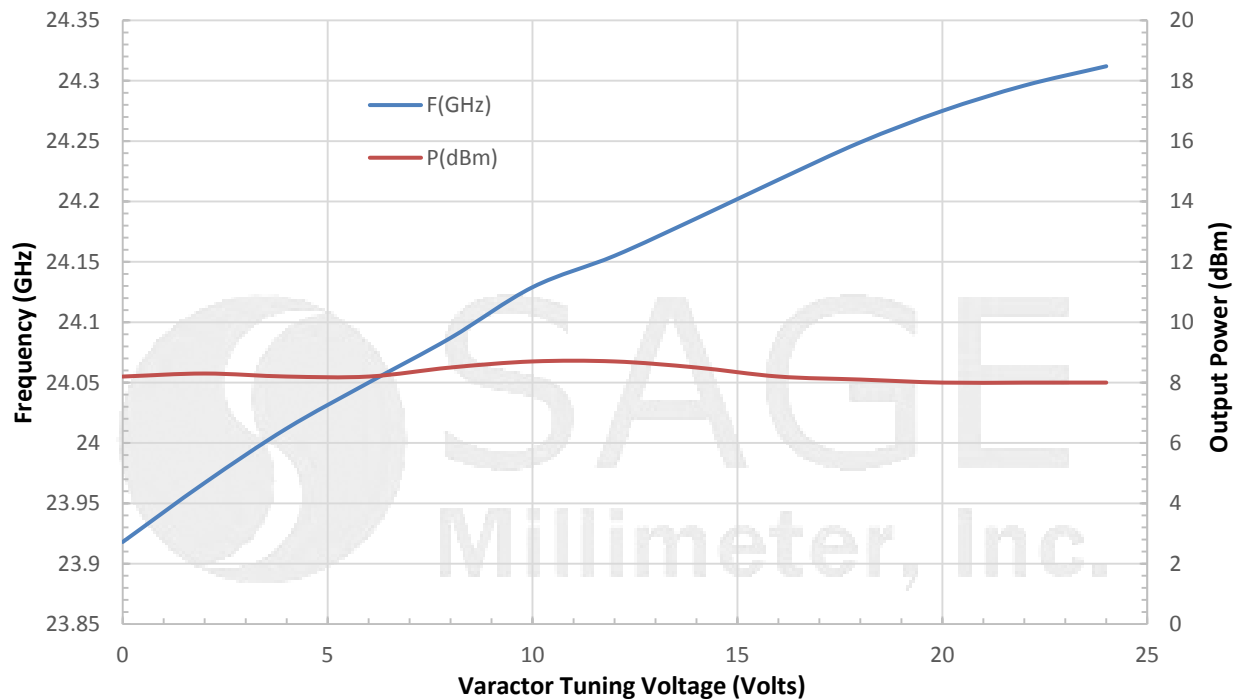
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### Mechanical Specifications:

Item	Specification
Gunn Oscillator Bias Port	Solder Pad
Varactor Tuning Port	Solder Pad
Mixer IF <sub>I</sub> Port	Solder Pad
Mixer IF <sub>Q</sub> Port	Solder Pad
RF Port	WR-42 Waveguide with UG595/U Flange
Size	1.00" (W) X 1.02" (H) X 1.10" (L)
Case Material	Die Casted Zinc
Finish	Chem Film
Weight	1.0 Oz
Outline	SP-DK-D1

### Typical Performance of Varactor Tuned Oscillator

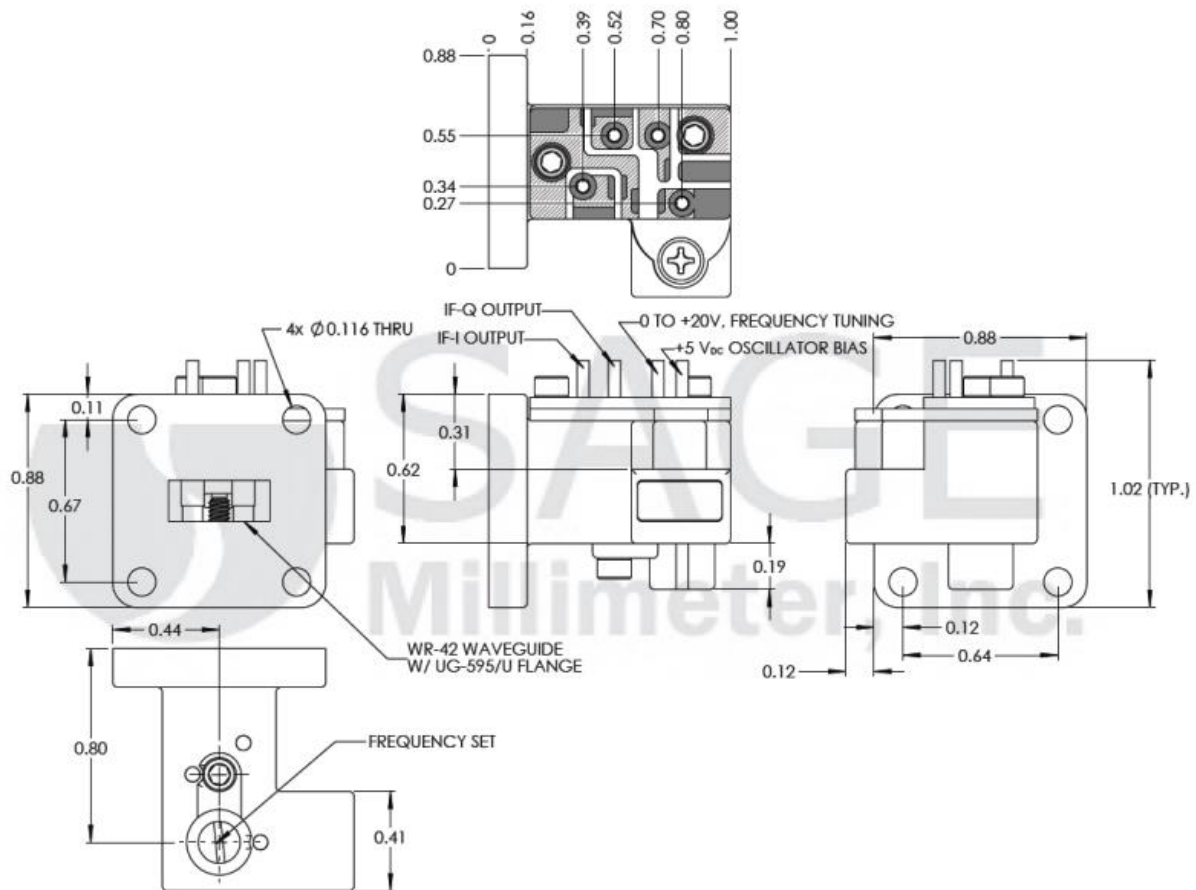
Gunn Bias: +5.0 V<sub>DC</sub>/183 mA





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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 +25°C case temperature.
- 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 into the waveguide will cause performance degradation and possible device damage.
- The case temperature of the device shall never exceed +85°C. Use proper heatsink or fan if necessary.

