



## 24.125 GHz Ranging Sensor Head, Dual Channel, Long Range

### Description:

**Model SSD-24307-22L-D1** is K Band, lens antenna-based ranging sensor head that is designed and manufactured for **long range** measurements of a moving or stationary target's range, speed and direction. The sensor head has a center frequency of 24.125 GHz and takes a nominal bias of +5.0 VDC/250 mA. The frequency modulation bandwidth of  $\pm 75$  MHz minimum is realized via a tuning voltage of 0 to +20 Volts. The sensor heads are configured with a lens corrected antenna, T/R diplexer, a dual channel (I/Q) receiver and a transmitter/receiver oscillator in an integrated package. Sensor heads with a single receiver are offered under model number **SSD-24307-22L-S1** and can only detect the range and speed of a target.



### Features:

- 24.125 GHz Operation
- Low Flicker Noise and High Sensitivity
- Low Harmonic Emission

### Applications:

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

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Antenna 3 dB Beamwidth		12°	
Antenna Side Lobes		-20 dB	
Antenna Gain		22 dBi	
Antenna Polarization	Right-Handed Circular		
RF Frequency Range		24.125 GHz	
FMCW Tuning Bandwidth	$\pm 75$ MHz	$\pm 100$ MHz	
FMCW Tuning Voltage		0 to +20 Volts	
Transmitting Power		+10 dBm	
Receiver I/Q Phase $\Delta$	80°		100°
Receiver I/Q Amplitude $\Delta$	0 dB		2 dB
IF Frequency Range	DC		100 MHz
IF Offset Voltage		$\pm 0.25 V_{DC}$	
Frequency Stability		-0.8 MHz/°C	
Power Stability		-0.03 dB/°C	
DC Supply Voltage		+5 $V_{DC}$ /250 mA	+5.5 $V_{DC}$
Specification Temperature		+25°C	
Operating Temperature	-40°C		+85°C





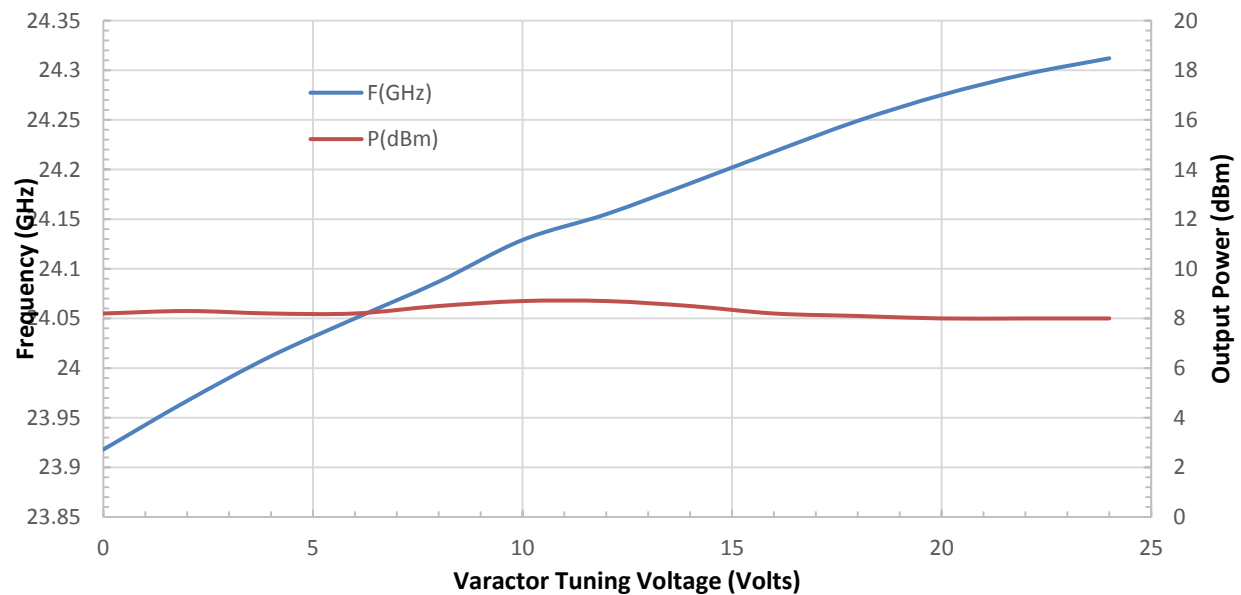
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### Mechanical Specifications:

Item	Specification
Gunn Oscillator Bias Port	Solder Pad
Varactor Bias Port	Solder Pad
Mixer IF <sub>I</sub> Port	Solder Pin
Mixer IF <sub>Q</sub> Port	Solder Pin
Mixer IF Ground	Solder Pin
Size	3.24" (W) X 3.24" (H) X 4.02" (L)
Material	Die Casted Zinc (Sensor Module), Aluminum (Mixer Housing & Horn)
Finish	Chem Film
Weight	5.0 Oz
Outline	SD-LK-22D

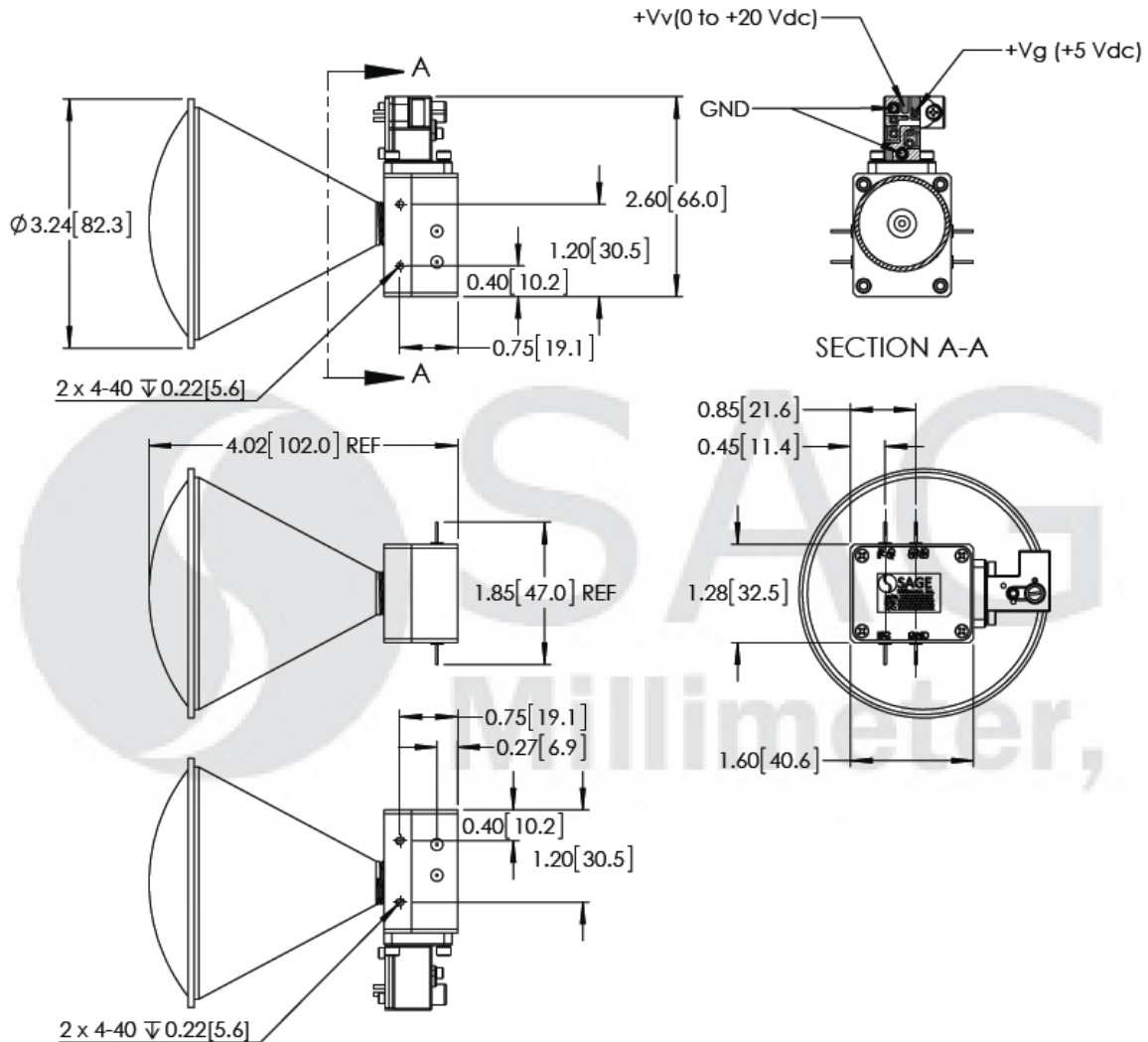
### Typical Varactor Tuned Oscillator Performance

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



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



**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:**

- The device is static sensitive. Always follow ESD rules when working with the device.
- Wrong bias or reverse bias on the sensor will damage the device.
- Exceeding absolute maximum ratings shown will damage the device. Use additional heatsink or fan if necessary.

