



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

### Description:

**Model SSD-24303-27M-DW** is a K Band, microstrip antenna-based ranging sensor head that is designed and manufactured for **short 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 V<sub>DC</sub>/250 mA. The frequency modulation bandwidth of ±100 MHz minimum is realized via a tuning voltage of 0 to +20 Volts. The sensor heads are configured with a microstrip antenna, T/R diplexer, a dual channel (I/Q) receiver and a transmitter/receiver oscillator in an integrated die-cast housing. Sensor heads with a single receiver are offered under model number **SSD-24303-27M-SW** and can only detect the range and speed of a target.



### Features:

- 24.125 GHz FMCW Operation
- Low Flick 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		4.6° (H) x 6.8° (V)	
Antenna Side Lobes			-20 dBc
Antenna Gain		27 dBi	
Antenna Polarization	Linear, Vertical		
RF Center Frequency		24.125 GHz	
FMCW Tuning Bandwidth	±100 MHz	±150 MHz	
FMCW Tuning Voltage		0 to +20 Volts	
Transmitting Power		+3 dBm	
Receiver I/Q Phase Δ	60°		120°
Receiver I/Q Amplitude Δ		0 dB	3 dB
IF Frequency Range	DC		100 MHz
IF Offset Voltage		-0.5 V <sub>DC</sub>	
Frequency Stability		-1.5 MHz/°C	
Power Stability		-0.03 dB/°C	
DC Supply Voltage		+5 V <sub>DC</sub> /250 mA	+5.5 V <sub>DC</sub>
Varactor Bias	0		+20 V
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



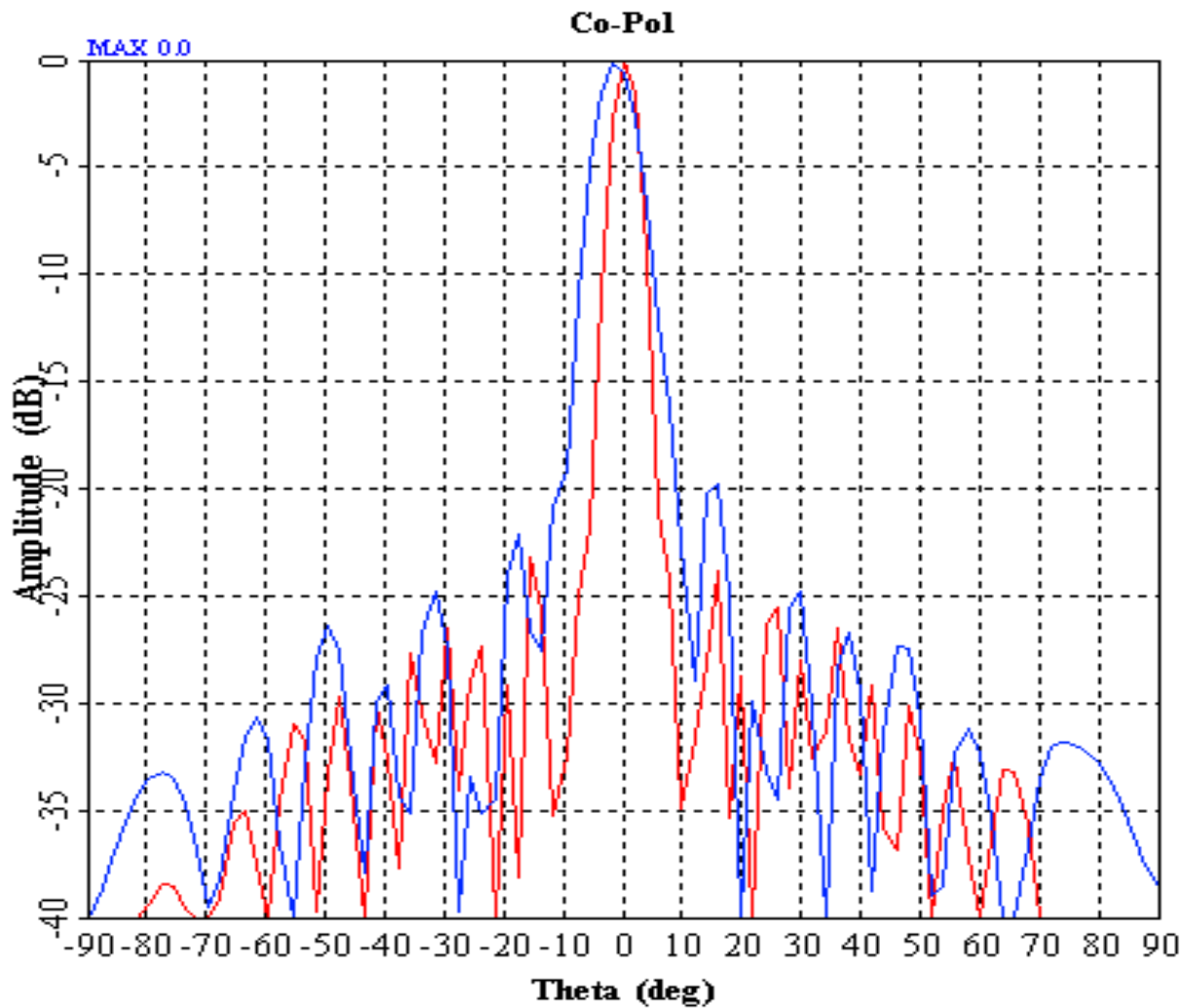


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### Mechanical Specifications:

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
Material	Die Casted Zinc (Housing), Aluminum Plate (Antenna)
Finish	Chem Film
Weight	6.0 Oz
Size	6.90" (W) X 4.53" (L) X 1.20" (H)
Outline	SD-MK-27DW

### Measured Co-pol E and H Plane Patterns

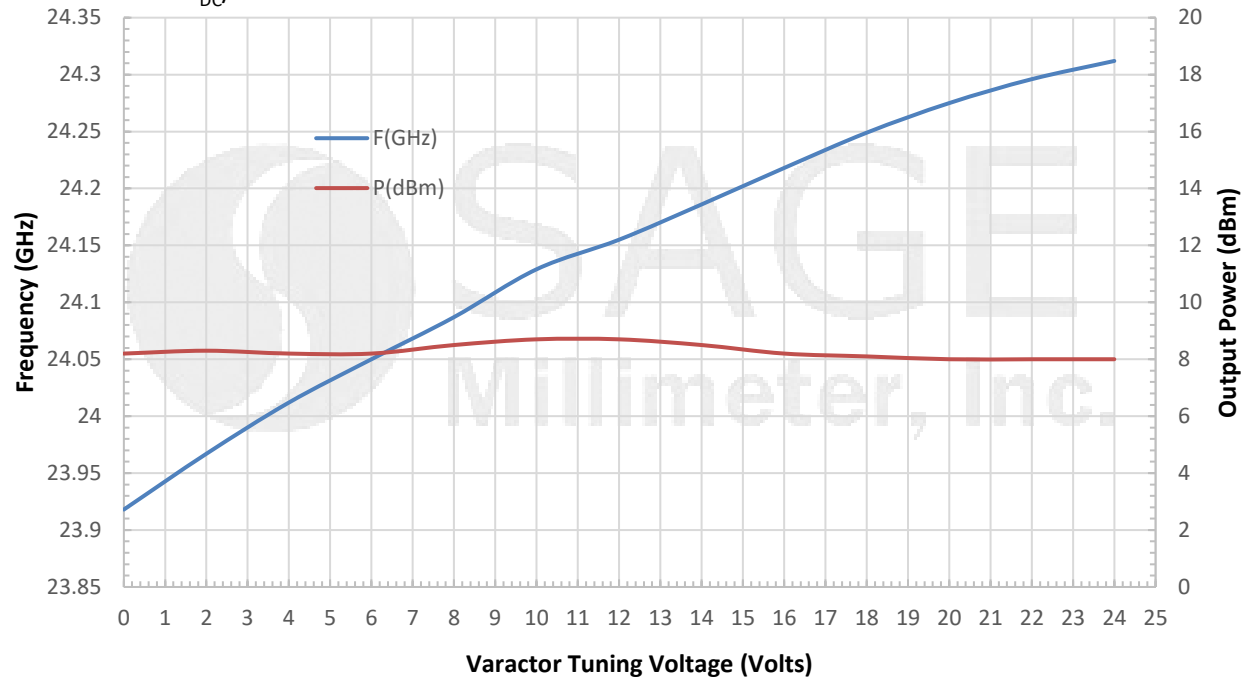




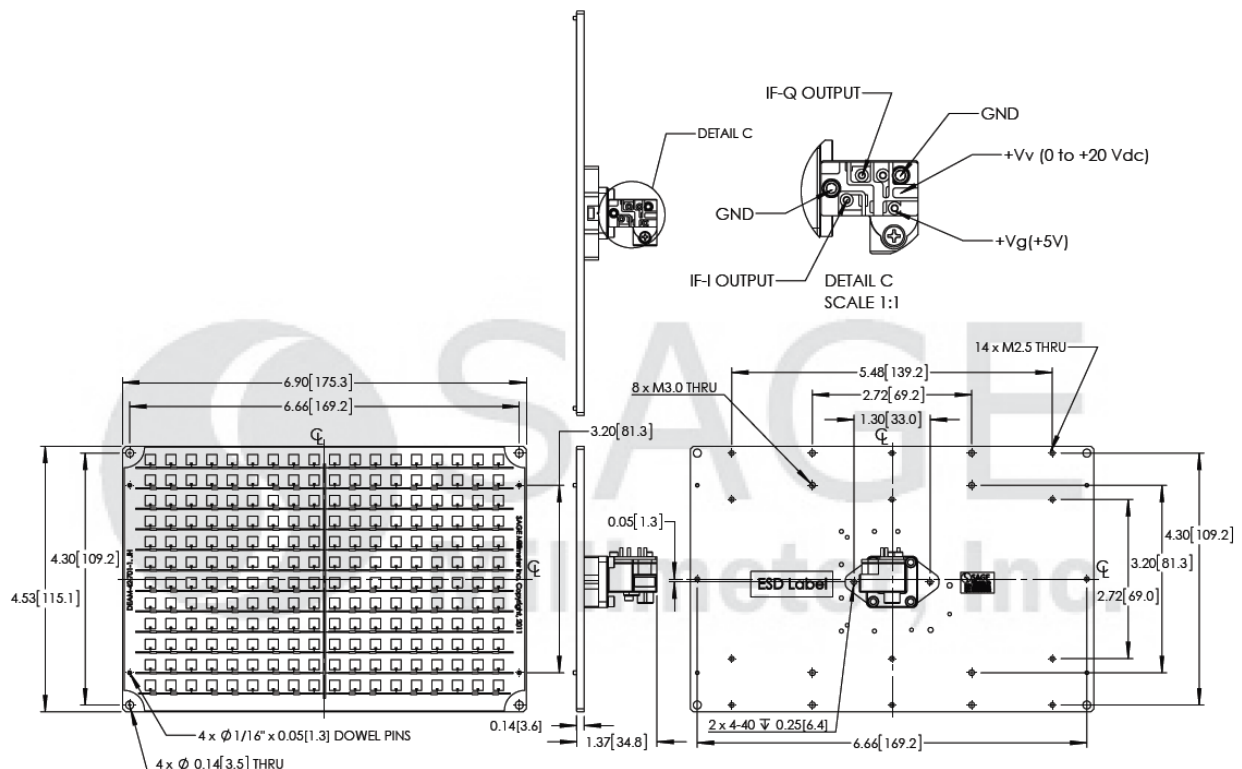
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### Typical Varactor Tuned Oscillator Performance

Gunn Bias: +5 V<sub>DC</sub>/183 mA



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



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### Note:

- All data presented is collected from a sample lot. Actual data may vary unit to unit, slightly.
- 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.
- Wrong bias or reverse bias on the sensor will damage the device.

