



24.125 GHz Ranging Sensor Head, Dual Channel, Medium Range

Description:

Model SSD-24303-22M-D1 is a K Band, microstrip antenna-based ranging sensor head that is designed and manufactured for **medium 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 ± 75 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 package. Sensor heads with a single receiver are offered under model number **SSD-24303-22M-S1** 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 14.8° (V) | |
| Antenna Side Lobes | | | -20 dBc |
| Antenna Gain | | 22 dBi | |
| Antenna Polarization | Linear, Vertical | | |
| RF Center Frequency | | 24.125 GHz | |
| FMCW Tuning Bandwidth | ± 75 MHz | ± 100 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 _{DC} | |
| Frequency Stability | | -0.3 MHz/°C | |
| Power Stability | | -0.03 dB/°C | |
| DC Supply Voltage | | +5.0 V _{DC} /250 mA | +5.5 V _{DC} |
| Varactor Bias | 0 | | +20 V |
| Specification Temperature | | +25°C | |
| Operating Temperature | -30°C | | +60°C |





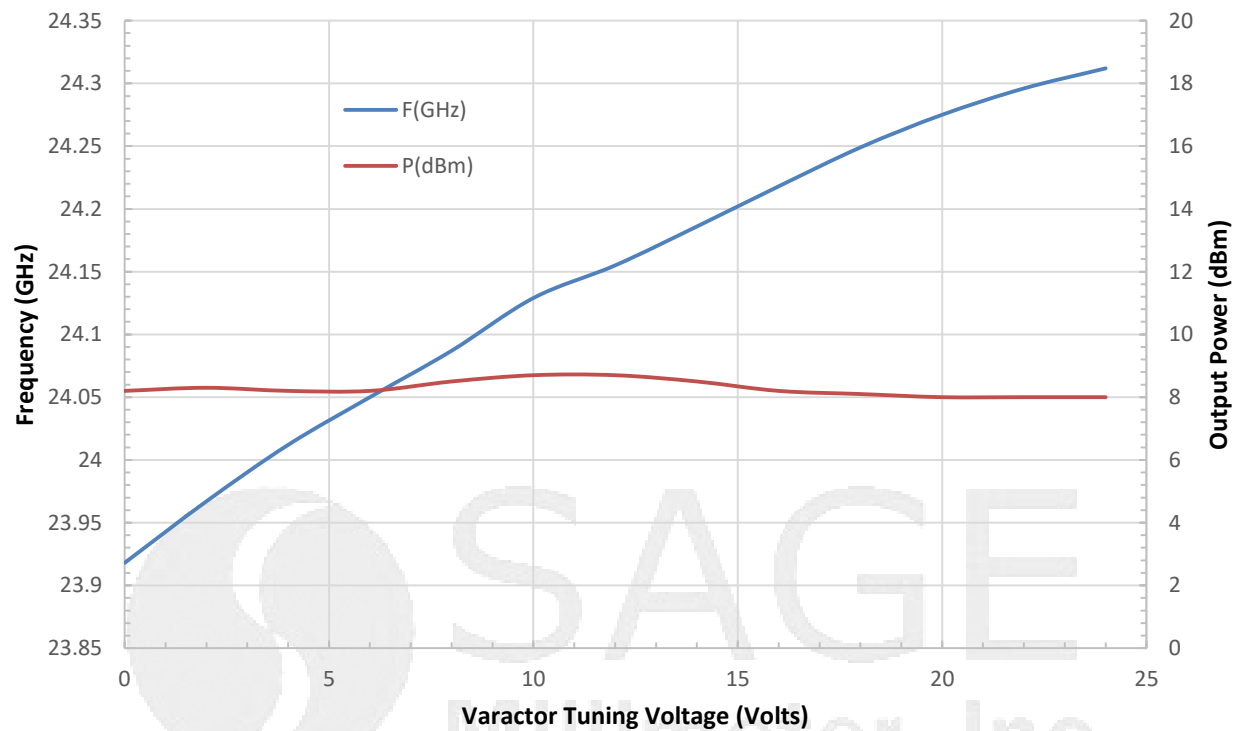
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Mechanical Specifications:

| Item | Specification |
|----------------------------|---|
| Gunn Oscillator Bias Port | Solder Pad |
| Varactor Tuning Port | Solder Pad |
| Mixer IF _I Port | Solder Pad |
| Mixer IF _Q Port | Solder Pad |
| Size | 6.90" (W) X 2.30" (L) X 1.22" (H) |
| Material | Die Casted Zinc (Housing), Aluminum Plate (Antenna) |
| Finish | Chem Film |
| Weight | 7.6 Oz |
| Outline | SD-MK-25D |

Typical Varactor Tuned Oscillator Performance

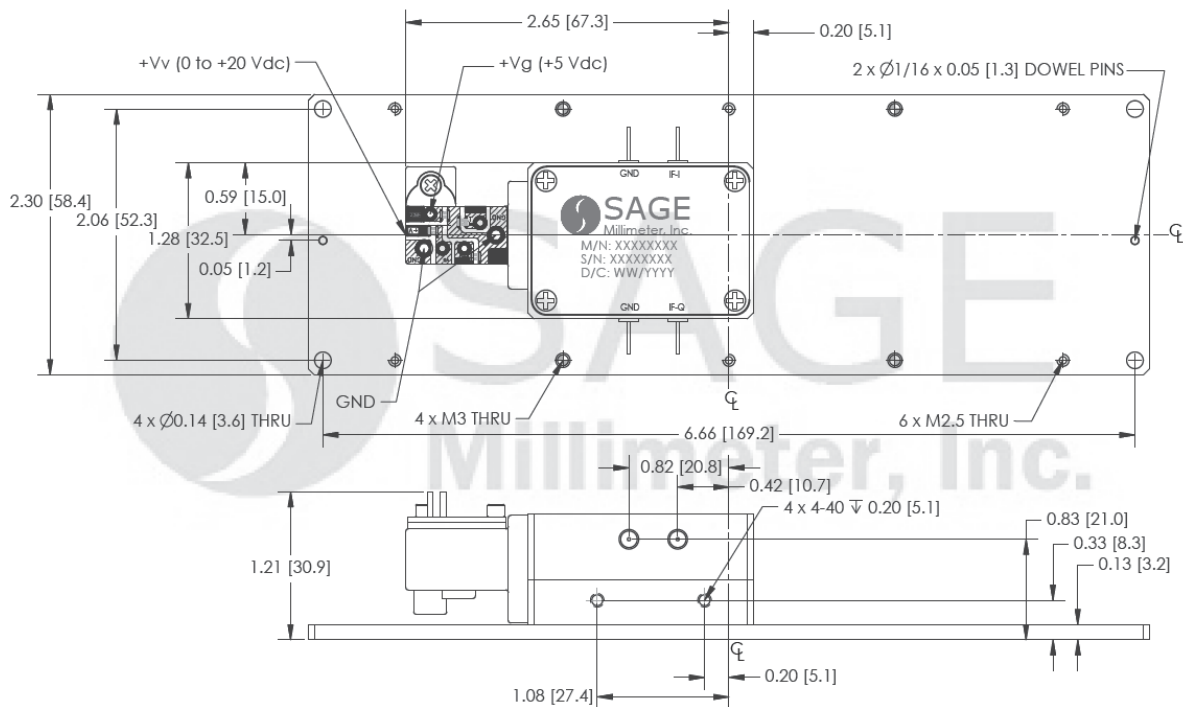
Gunn Bias: +5.0 V_{DC}/183 mA





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



Note:

- All data presented is collected from a 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

