

CRM100 Series



Precision Navigation and Pointing Gyroscope

CRM100 and CRM200 form a series of chip-level silicon MEMS gyroscopes from Silicon Sensing, offering low-noise angular rate measurements in a small surface mounted package. The CRM100 mounts flat on a board, whereas the CRM200 version is mounted on its side, which when combined, enables the three degrees of freedom measurements (roll, pitch and yaw) to be made with a single board.

Each device comprises a single-axis piezoelectric resonating ring gyroscope with a dedicated control ASIC in a single hermetically sealed ceramic chip scale package. Measurement data can be output via analogue and digital (SPI®) interfaces. Device temperature is available from the digital interface, along with built in test (BIT) status. User-configurable rate range options are offered, from 75°/s to 900°/s, and high rate range versions (up to 2700°/s) are also available. Bandwidth up to 160Hz is controlled by choosing a suitable capacitor.

At the heart of the chip scale package is a silicon ring, mounted on a pedestal, and a controlling ASIC. The ring resonates at its natural frequency whenever power is applied to the device. Any device rotation rate is detected as a change to the resonating pattern and output as an analogue voltage proportional to rate, or within the SPI® data stream.

Silicon Sensing Systems is a market leader in silicon MEMS gyroscopes, accelerometers and inertial measurement systems, specialising in high performance, reliability and affordability. With a strong heritage in inertial sensing that can be traced back over 100 years, all sensors are based on in-house patented designs which are produced in its own state of the art MEMS foundry. Silicon Sensing has delivered over 40 million sensors to thousands of satisfied customers worldwide, and continues to drive performance through technical expertise and continuous innovation.

KEY FEATURES

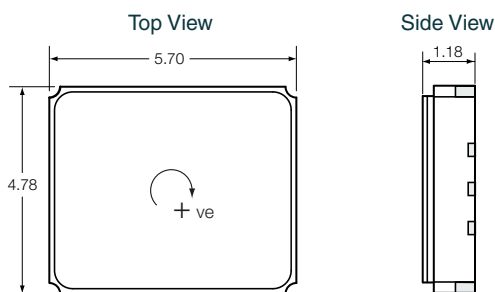
- Flat and vertical variants available
- Configurable rate ranges - $\pm 75^\circ/s$, $\pm 150^\circ/s$, $\pm 300^\circ/s$, $\pm 900^\circ/s$
- High rate range versions (up to $\pm 2,700^\circ/s$) also available
- Hermetically sealed for temperature and humidity resistance
- User adjustable bandwidth (to 160Hz)
- Analogue and digital (SPI®) outputs
- Digital output includes built in test (BIT) results
- Analogue and digital outputs: angular rate and temperature
- High bandwidth low noise
- Small (CRM100: 5.7 x 4.8 x 1.2mm, CRM200: 6.3 x 5.5 x 2.7mm)
- Temperature range -40°C to +85°C
- Low power consumption: 4mA at 3.3V
- RoHS and REACH compliant

APPLICATIONS

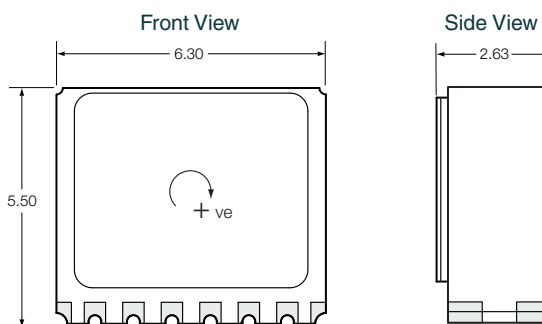
- Aerospace and industrial
- AHRS and flight instruments
- Machine control
- Drilling guidance
- Surveying and mapping
- Airborne, land and marine navigation
- Transportation
- Inertial measurement units

CRM100 Series

CRM100/102



CRM200/202

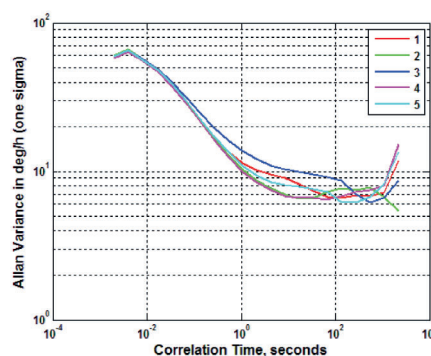


All dimensions in millimeters

Typical Data

Parameter	Specification	
	CRM100	CRM102
Part Number	CRM200	CRM202
Output	Digital (SPI®) and Analogue (ratiometric)	
Rate range	75°/s, 150°/s, 300°/s 900°/s (set by user)	225°/s, 450°/s, 900°/s 2,700°/s (set by user)
Scale Factor		
Nominal	12mV/°/s, 6.0mV/°/s, 3.0mV/°/s, 1.0mV/°/s	4.0mV/°/s, 2.0mV/°/s, 1.0mV/°/s, 0.33mV/°/s
Tolerance at 25°C (1σ)	0.33%	
Variation over temperature (1σ)	±0.5%	±1%
Non-linearity (1σ)	0.05%	
Bias		
Setting error 25°C	V _{dd} /2 ±6mV	
Variation over temperature (1σ)	±1.0°/s	±12°/s
Bias instability	12°/hr	20°/hr
Bandwidth and Noise		
Bandwidth (nominal)	Up to 160Hz (set by customer using an external capacitor)	
Noise spectral density	0.018°/s/√Hz	0.05°/s/√Hz
Angle random walk	0.2°/√hr	0.8°/√hr
Environmental Properties		
Temperature (full performance)	-40°C to +85°C	-20°C to +85°C
Temperature (reduced performance)	-40°C to +105°C	N/A
Operational shock	500g 1ms ½ sine (powered) 100g 6ms (powered)	
Vibration	10g rms 10 - 5kHz (powered)	
Properties		
Start-up time	<0.3s	
Supply voltage	2.7V to 3.6V	
Power	0.013W	
Mass	0.1 grams	

Allan Variance



For full technical datasheets please visit:
www.siliconsensing.com



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