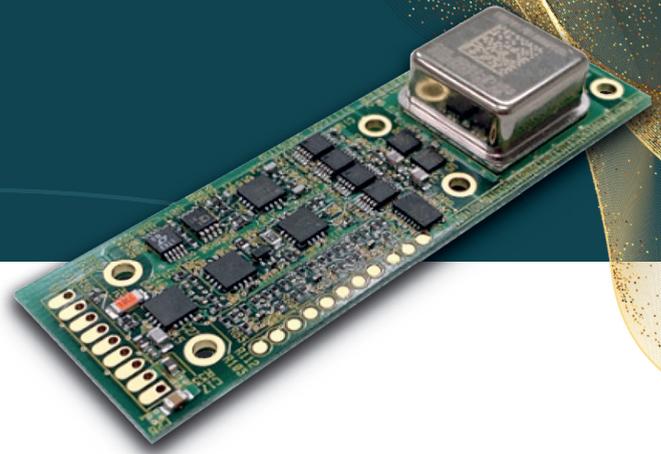


# CRS39A



## High Performance MEMS Gyroscope

**CRS39A is a class leading high performance standalone analogue gyroscope designed for mounting within a 25mm diameter cylinder. Utilising the latest iteration of Silicon Sensing's inductive resonating ring gyroscopes, CRS39A is driven using discrete electronics to achieve a viable, cost effective alternative to Fibre Optic Gyro (FOG) and Dynamically Tuned Gyro (DTG) performance.**

CRS39A offers the pinnacle of Silicon MEMS gyroscope technology, packaged in a form factor designed to suit the demanding needs of industrial applications, such as down hole MWD. The sensing ring represents decades of refinement, offering ultra-high reliability alongside industry leading performance. Multiple on-board temperature sensors allow the performance to be further tuned based on the operating environment. The resonant frequency of the ring is also taken into consideration to maintain optimisation with aging, temperature and shock effects with respect to the host environment, leading to an ultimate product where performance in bias instability, angle random walk and low noise are of critical importance.

For whatever application, the unique and patented silicon ring technology gives advanced and stable performance over time and temperature, overcoming mount sensitivity problems associated with simple beam or tuning fork based sensors.

CRS39A is a single board version of the successful CRS39-03 and offers additional mounting holes for a more robust installation.

CRS39A provides an improved performance and hysteresis over the established CRS39-03.

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.

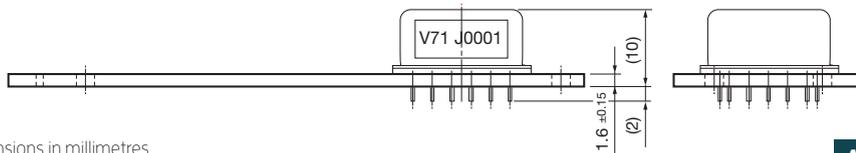
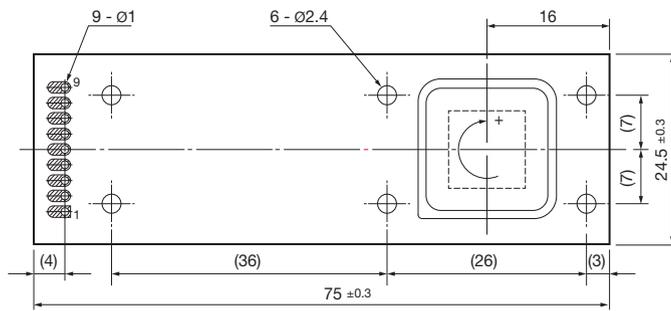
### KEY FEATURES

- Proven and robust silicon MEMS inductive resonating ring gyroscopes
- FOG-like performance
- DTG-like size and performance
- Low Bias Instability (0.03°/hr)
- Excellent Angle Random Walk (0.004°/√hr)
- Ultra low noise (<0.006°/srms, 10Hz)
- Optimised for low rate range environments (e.g. North finding)
- Precision analogue output
- Temperature range from -10°C to +110°C
- Reduced power to 0.15W
- High shock and vibration rejection
- Three temperature sensors and MEMS frequency output for precision thermal compensation
- Single board version of the successful CRS39-03
- RoHS compliant
- Improved hysteresis
- First class customer technical support

### APPLICATIONS

- Down hole drilling and surveying
- Platform stabilisation
- Precision surveying and north finding
- Maritime guidance and control
- Gyro-compassing and heading control
- Autonomous vehicles, UAVs and ROVs
- Rail track monitoring
- Robotics

# CRS39A

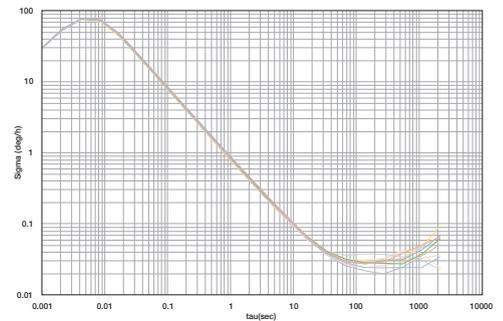


All dimensions in millimetres

## Typical Data

Parameter	Specification
Output	Analogue (non-ratiometric)
Rate range	$\pm 25^\circ/\text{s}$
<b>Scale Factor</b>	
Nominal	80mV/ $^\circ/\text{s}$
Tolerance at 45°C (1 $\sigma$ )	$\pm 0.17\%$
Variation over temperature (1 $\sigma$ )	$\pm 0.17\%$
Non-linearity (1 $\sigma$ )	$\pm 0.017\%$ of full scale
<b>Bias</b>	
Setting error 45°C (1 $\sigma$ )	$\pm 0.04^\circ/\text{s}$
Variation over temperature (1 $\sigma$ )	$\pm 85^\circ/\text{hr}$
Bias instability	0.03 $^\circ/\text{hr}$
<b>Bandwidth and Noise</b>	
Bandwidth (nominal)	25Hz $\pm$ 10Hz
Noise to 10Hz	0.006 $^\circ/\text{s}$ rms
Wideband noise	0.03 $^\circ/\text{s}$ rms
Angle random walk	0.004 $^\circ/\sqrt{\text{hr}}$
<b>Environment Properties</b>	
Temperature	-10°C to 110°C
Operational shock	250g, 1.7ms
Shock (powered survival)	1000g, 1ms
<b>Properties</b>	
Start-up time	< 1.0s
Supply voltage	+4.9V to +5.25V
Power	0.15W
Mass	15 grams

## Allan Variance



## Pin Connections

<b>1</b> Vcc	<b>6</b> REFL
<b>2</b> GND	<b>7</b> TMP2
<b>3</b> Rate	<b>8</b> FREQ
<b>4</b> Ref	<b>9</b> FG
<b>5</b> TMP1	

For full technical datasheets please visit:  
[www.siliconsensing.com](http://www.siliconsensing.com)



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CRS39A-00-0100-131 Rev 1 DCR No. 710018465