

SiRRS01

Angular Rate Sensor



The SiRRS01 angular rate sensor has evolved from the highly successful Vibrating Structure Gyroscope developed by BAE Systems, which has been in service since 1990.

This MEMS implementation of our VSG technology, offers continued advancement in miniaturisation and reliability.

Designed to provide high performance operation under harsh environmental conditions, the SiRRS01 is ideally suited for a wide range of applications.

The SiRRS01 is underpinned by Silicon Sensing's commitment to the technical backup and long term support necessary for major procurement programmes.

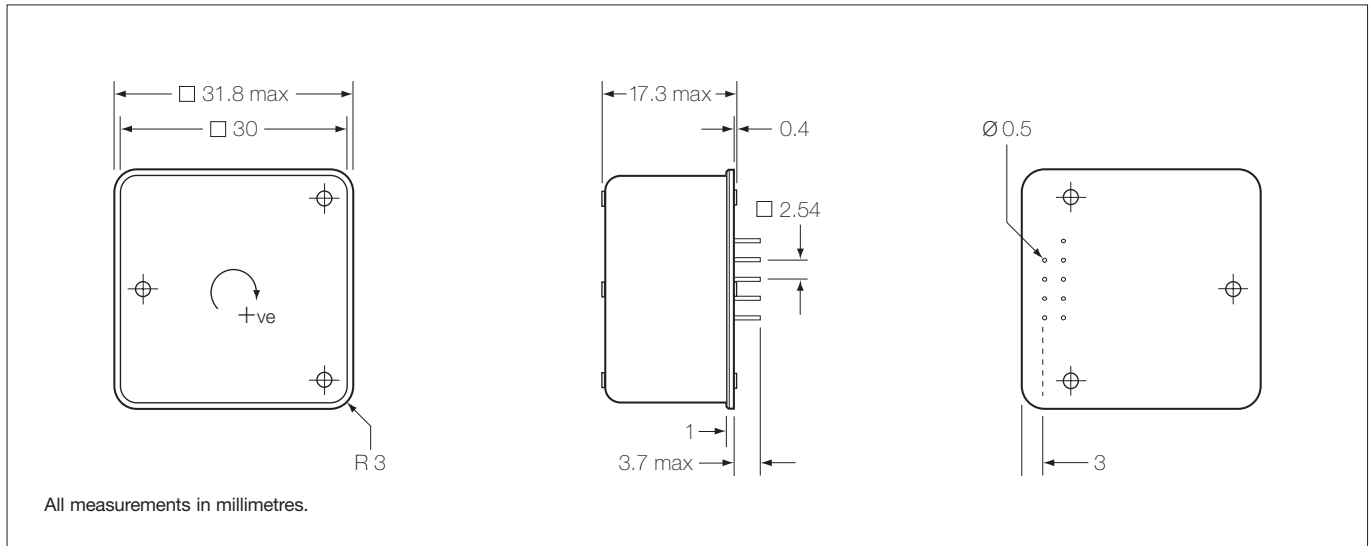
Key Features

- Micro machined silicon (MEMS) technology
- Affordable, robust and rugged design
- Hermetically sealed
- Excellent shock and vibration performance
- Long life and exceptional reliability
- Comprehensive Built In Test (BIT)
- Integrated temperature sensor
- Compact and lightweight
- Low power consumption
- Sensor modelling data available



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Typical Data

| | RRS01-01 |
|----------------------------------|---|
| Angular Rate Range | $\pm 110^\circ/\text{s}$ (other ranges available - see table) |
| Scale Factor | |
| Nominal | 18.18mV/ $^\circ/\text{s}$ |
| Variation over temperature range | $< \pm 3\%$ |
| Nonlinearity | $\pm 1\%$ of full scale |
| Repeatability | $\pm 0.05\%$ 1 σ |
| Bias | |
| Setting (at +20°C) | $< \pm 0.3^\circ/\text{s}$ |
| Variation over temperature range | $< \pm 3^\circ/\text{s}$ |
| Instability | $3^\circ/\text{hr}$ |
| Repeatability | $\pm 0.03^\circ/\text{s}$ 1 σ |
| Angular random walk | $< 0.2^\circ/\sqrt{\text{hr}}$ |
| g sensitivity | $< 7^\circ/\text{hr}/\text{g}$ |
| Bandwidth | $> 50\text{Hz}$ (90° phase) |
| Noise (in-band) | $< 0.35^\circ/\text{s}$ rms |
| Environment | |
| Operating temperature | -40°C to +75°C |
| Relative humidity | 100% |
| Shock (operational) | 60g (30ms, 1/2 sine) |
| Vibration (operational) | 10g rms (20Hz to 2kHz) |
| Mass | < 35 gram |
| Electrical | |
| Supply voltage | $\pm 5\text{V}$, 0V |
| Supply current | $< 50\text{mA}$ (each, steady state) |
| General | |
| Built In Test (BIT) | Command BIT, Alarm BIT |
| Start-up time | 300ms |
| Temperature output | 16.9mV/ $^\circ/\text{s}$ (0V at 25°C) |
| MTBF | 300,000 hr |
| RoHS Compliance | No |

| Part Number | Rate Range |
|-------------|----------------------------|
| RRS01-01 | $\pm 110^\circ/\text{s}$ |
| RRS01-03 | $\pm 300^\circ/\text{s}$ |
| RRS01-05 | $\pm 50^\circ/\text{s}$ |
| RRS01-07 | $\pm 1,500^\circ/\text{s}$ |
| RRS01-09 | $\pm 200^\circ/\text{s}$ |

Pin Connections

| | | |
|-------------|---|------------------|
| | 9 | Case Ground |
| -5V | 4 | 8 Rate Reference |
| Command BIT | 3 | 7 Rate Output |
| Alarm BIT | 2 | 6 0V |
| +5V | 1 | 5 Temperature |

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