

TITLE PRODUCT SPECIFICATION FOR SINGLE AXIS SILICON VIBRATING STRUCTURE GYRO	DOC. NUMBER CRS02-01-PS	REV. C
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Changes from Revision A:

1. Incorporation of EMI filters
2. Isolation of case from 0V supply
3. Linearity specification

Changes from Revision B

1. Mandatory conformal coat of PCB
2. Revised phase lag specification
3. Revised quiescent noise specification

NOTICE

Applications that require extra reliability and quality possibly affecting the safety of living things (e.g. transport, combustion, security, etc.) or any applications, which are thought to be beyond the focus of the product, should be consulted with SSS first.

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BASE	1						
B. Dev.	1						
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WARNING**Limitations**

The product to which this specification refers is in continued development and is subject to change in design and performance. Some changes to performance parameters may occur as a result of ageing processes.

The following limitations must be applied to avoid damage.

Electrical

Absolute maximum supply voltage +V = 6.0 V

The unit has no protection against reverse polarity connection of the power supply.

The positive rail is protected against transients of up to +6V.

Product revision A: Supply return is connected to the case internally

Product revision B onward: Absolute maximum voltage (connector pins to case) 100VDC

Mechanical

Do not drop from more than 300mm onto a hard surface.

Do not over-tighten fixing bolts.

Environmental

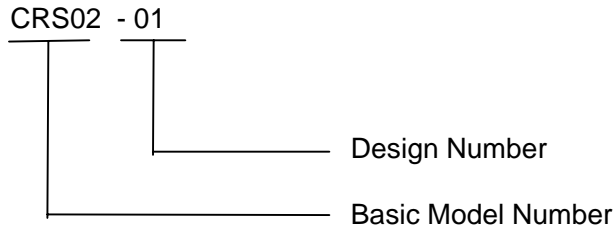
-25 degC to +85 degC operation.

1. DESCRIPTION

The silicon vibrating structure gyroscope (Si-VSG) is a solid state single axis rate sensor. It is a stand alone unit with dc supplies and dc output proportional to the rate of rotation.

The gyro is operated with the unipolar power supply.

2. MODEL NUMBER



3. MECHANICAL DESCRIPTION

3.1 EXTERNAL DIMENSIONS

The dimensions of the gyro unit including the electronics for signal processing are:

Height	: Nominal 24.9mm (0.98 inch)	Maximum 25.3mm (0.996 inch)
Length	: Nominal 57.9mm (2.28 inch)	Maximum 58.3mm (2.295 inch)
Width	: Nominal 24.9mm (0.98 inch)	Maximum 25.3mm (0.969 inch)

Note: Dimensions in inches are for reference only.
An installation drawing is given in Figure 1.

3.2 MASS

The sensor, including its electronics, has a total mass of 25 g typical (30g max).
The center of mass is within +/-1cm in all axis.

3.3 Conformal coating

The PCB within the sensor is conformally coated with an acrylic moisture barrier, except in those positions where direct electrical contact to the PCB is required during operation.

4. POWER SUPPLY REQUIREMENTS

Operating voltage	+4.85 to +5.15V
Noise and Ripple	DC to 100Hz :<15mV rms
Operating current	< 35 mA (Typ), 40mA Max.

The unit has no protection against reverse polarity connection of the power supply and the positive rail is protected against transients of up to +6V with respect to supply return. Product revision B incorporates filters in series with each of the supply and output pins, which are referenced to the conductive casing. No pin should be allowed to exceed 100V with respect to the case.

A connection scheme is given in Figure 2.

5. PERFORMANCE

Rate Range	+/- 150 deg/s.
Output Type	Analogue voltage (Non ratiometric) Output impedance : 100 ohms typ.
Output current	0.5mA (Min.)
Sensor resonance	No resonant modes below 4.5kHz
Scale Factor	12.75 mV/deg/s
Setting tolerance (ambient)	+/-4% of nominal
Variation with temperature	+/-3% of ambient value -25 degC to +85 degC
Non Linearity	<+/-0.6% of full scale. Non Linearity is the maximum deviation from the best straight line (least squares fit).
Bias (Zero Offset)	
Bias setting tolerance (ambient)	2.4 to 2.6 Volts
Bias change over temp. range	+/- 10 deg/s -25 degC to +85 degC
Bias drift vs. time	<+/- 0.55 deg/s in 1 sec to 31 sec or any 30sec period
Bias sensitivity to static linear acceleration	<+/- 0.1 deg/s/g on any axis
Total bias variation (All above errors)	<+/- 18 deg/s
Cross axis sensitivity	
Sensitivity to cross axis rotation	Less than 5% of cross axis rotation rate. Relative to mounting datum, all axis
Cross axis sensitivity change	Less than 0.3%
Band Width	±85Hz
Typical Noise under quiescent conditions	0.716 deg/s (rms) (1 to 100 Hz)
Maximum Noise under quiescent conditions	0.988 deg/s (rms) (1 to 100 Hz)
Ready time, from application of power	0.6 seconds

6. FREQUENCY RESPONSE

Phase at 10 Hz	<=15 degree (Lagging)
Gain peaking	<+3 dB

7. INTERCONNECTIONS

The interconnections are defined below :

Pin Number	Function
1	+VDC
2	Rate Output
3	NC
4	NC
5	Supply return / Rate return
CASE	Filters ground (Revision B only)

8. ENVIRONMENTAL CONDITIONS

The gyro performance specifications of Section 5 are not degraded unless otherwise stated when subjected to the following environment.

8.1 CLIMATIC ENVIRONMENT

Operating Temperature	-25 degC to +85 degC (Full Performance Specification) The sensor can operate over the range of -40 degC to +85 degC, but the performance will be limited and not guaranteed.
Storage Temperature	-40 degC to +85 degC
Operating Temperature Change Rate	Less than +/-3 degC /min
Operating Barometric Pressure	8.5 to 14.9 psi
Storage Barometric Pressure	1.6 to 14.9 psi
Humidity	5 to 95 %RH Non-condensing. Product revision B onward: the sensor is conformally coated as protection against light dewing only. This product is not intended for constant moist environments.

8.2 MECHANICAL ENVIRONMENT

Operating / Storage Shock	200g's 1ms half sine Approximation
Operating / Storage Vibration	2 g rms 20Hz to 2kHz (Random)

8.3 EMI

2V/m 26MHz to 1GHz	Bias change within noise margin
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9. LIFE

9.1 OPERATING

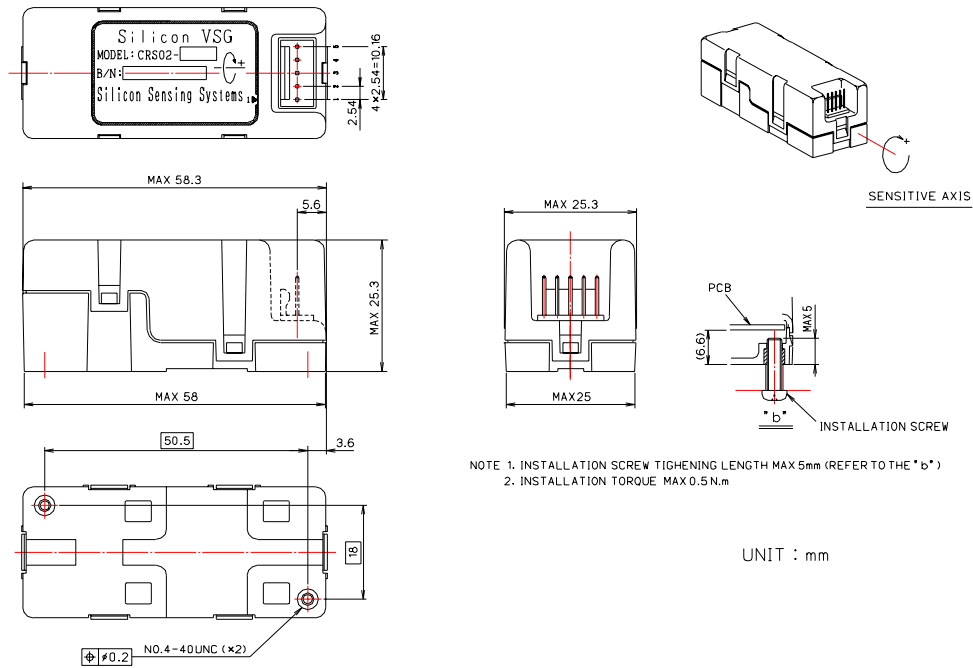
The gyro will have a MTBF of 100,000 hours, under operation at 25 degC in a normal environment.

9.2 STORAGE

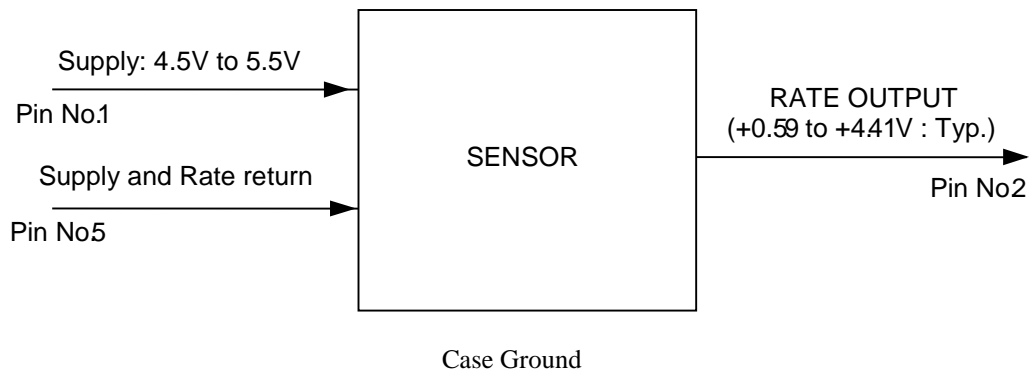
The storage life of the gyro is greater than 10 years.

10. MAINTENANCE

The gyro is designed to have a long operating and storage life without requiring maintenance.



**FIGURE 1
 INSTALLATION DRAWING**



Note: Case is internally connected to Supply / Rate return for Rev A parts only.

**FIGURE 2
CONNECTION SCHEME**