| TITLE | DOC. NUMBER | REV. |
|---|---|---|
| **PRODUCT SPECIFICATION FOR SINGLE AXIS SILICON VIBRATING STRUCTURE GYRO** | SST – 0011 | . |

**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.

| REV. | MODIFY No. | REVISED PAGES | DATE | CHECKED |
|---|---|---|---|---|
| B | SCN-0111 | P1,4,5 | 00/04/12 | |
| A | SCN-0084 | P1,2,3,4,5 | 00/02/17 | |

| | DATE | APPROVED | CHECKED | PREPARED |
|---|---|---|---|---|
| **Silicon Sensing Systems Ltd.** | 99.10.22 | | | |

## 1. DESCRIPTION

The silicon vibrating structure gyroscope (Si-VSG) is a solid state single axis rate sensor. It is a stand alone unit and dc output is proportional to the rate of rotation and supply voltage.
The new concept ring-shaped micro-machined resonator shows distinguished resistance against external shocks and vibrations over a wide range of temperature.

## 2. MODEL NUMBER

CRS03 - 01 Pin output
CRS03 - 02 Connector output

CRS03 Basic Model Number
–xx Design Number

## 3. MECHANICAL DESCRIPTION

The nominal dimensions are shown in Fig.1 & 2.

## 4. PERFORMANCE

| | Parameter | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Absolute Maximum Ratings | Supply voltage | 0.00 | 5.00 | 6.00 | V | |
| | Storage temperature | - 40 | | 85 | deg C | |
| Operating conditions | Supply voltage | 4.75 | 5.00 | 5.25 | V | |
| | Power supply noise | | | 15.00 | mVrms | 0.5 to 100Hz |
| | Temperature | - 40 | 23 | 85 | deg C | |
| | Humidity | 5 | | 95 | %RH | Non-condensing |

The following specifications apply for Vdd=5.00V and Temp=23deg C unless otherwise specified.

| Parameter | Limit | Unit | Notes |
|---|---|---|---|
| Rate range | +/- 100 | deg/sec | Reference |
| Rate range | +/- 1.745 | rad/sec | |
| Scale Factor | 20 | mV/(deg/sec) typ. | Reference |
| Scale Factor | 22.92 | % of Vdd/(rad/sec) typ. | |
| Initial Scale Factor accuracy | +/- 1 | % typ. | |
| Initial Scale Factor accuracy | +/- 3 | % | |
| Scale Factor variation with temp. | +/- 3 | % typ. | Operating temp. range |
| Scale Factor variation with temp. | +/- 5 | % | Operating temp. range |
| Scale Factor ratiometric error | +/- 1 | % | Operating voltage range |
| Bias | 50 | % typ. of Vdd | |
| Bias initial error | +/- 60 | mV | |
| Bias variation with temp. | +/- 60 | mV | Operating temp. range |
| Bias ratiometric error | +/- 20 | mV | Operating voltage range |
| Non linearity | < 0.5 | % of FS typ. | |
| Non linearity | < 3 | % of FS | |
| Quiescent noise | < 1 | mVrms typ. (3.10Hz) | |
| Band width | > 10 | Hz | Gain.- 3dB. |
| Cross axis sensitivity | < 5 | % | |
| Power up time | < 0.5 | sec | From Vdd = 4.50V |
| Current dissipation | < 50 | mA | |
| Output Impedance | 100 | . typ. | |
| Available output current | > 0.5 | mA | |

## 5. TYPICAL RATE OUTPUT

$$Vo = \frac{1}{2} \times Vdd + \left( Ra \times SF \times \frac{Vdd}{5} \right) \text{ (Unit:Volts typ.)}$$

where
Vo: Rateout (V), Vdd: Supply voltage (V), Ra: Applied rate (deg/s), SF: Scale Factor (V/ (deg/s))

## 6. RATIOMETRIC ERROR

### 6.1 Bias ratiometric error

Bias ratiometric error are calculated as follows;

$$Errb = Vb - \left( \mathrm{Vb}_5 \times \frac{Vdd}{5} \right) \text{ (V)}$$

where
Errb: Bias ratiometric error (V), Vb: Bias at Vdd (V), $Vb_5$: Bias at 5.00V (V),Vdd: Supply voltage (V)

### 6.2 Scale Factor ratiometric error

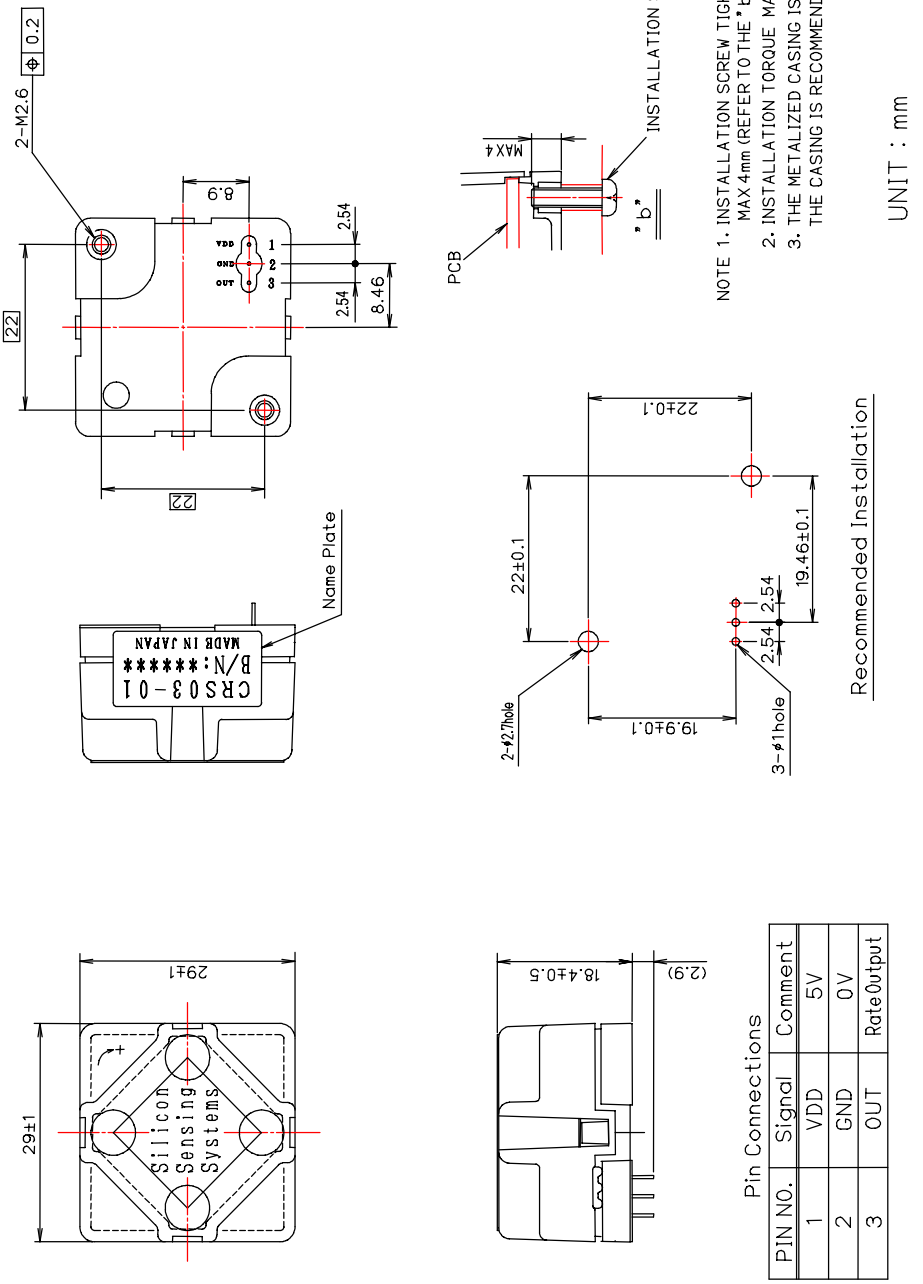
Scale Factor ratiometric error are calculated as follows;

$$Errs = \left[ SF - \left( SF_5 \times \left( \frac{Vdd}{5} \right) \right) \right] \times \frac{100}{SF} \text{ (\%)}$$

where
Errs: Scale Factor ratiometric error (%), SF: Scale Factor at Vdd (V/ (deg/s))
$SF_5$: Scale Factor at 5.00V (V/ (deg/s)), Vdd: Supply voltage (V)

## 7. SOLDERING

The product may not be subjected to beyond the maximum storage temperature (e.g. solder reflow chamber) at any time. Hand soldering is recommended.




Pin Connections

| PIN NO. | Signal | Comment |
|---|---|---|
| 1 | VDD | 5V |
| 2 | GND | 0V |
| 3 | OUT | Rate Output |

Fig.1 CRS03-01

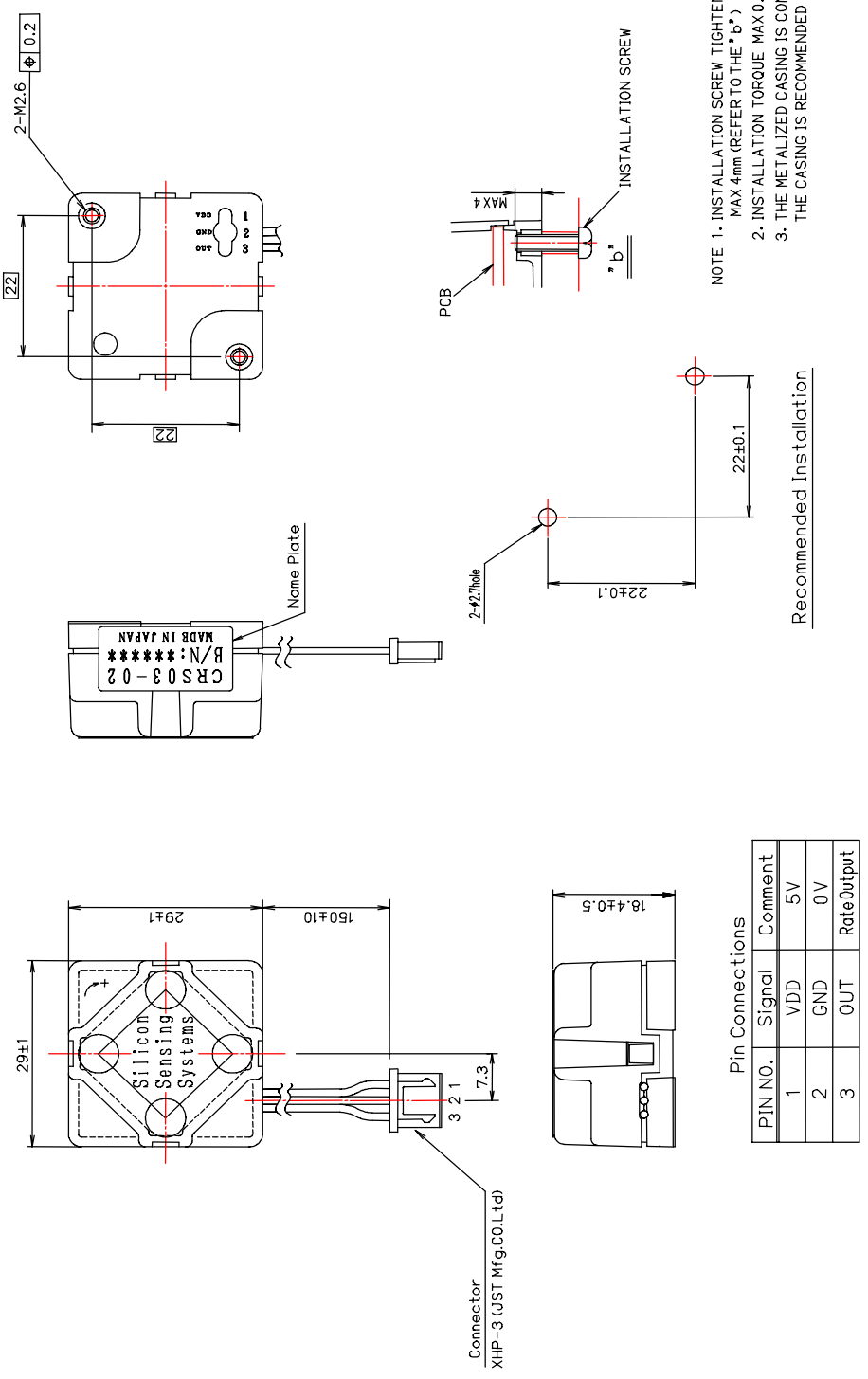



Fig.2 CRS03-02

Pin Connections

| PIN NO. | Signal | Comment |
|---|---|---|
| 1 | VDD | 5V |
| 2 | GND | 0V |
| 3 | OUT | RateOutput |