



Silicon Sensing is a joint venture between Atlantic Inertial Systems and Sumitomo Precision Products

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Silicon Sensing – Company Overview

- Silicon Sensing jointly owned by Atlantic Inertial Systems and Sumitomo Precision Products
- Atlantic Inertial Systems has approaching 100 years of experience in motion sensing starting as Sperry Gyroscope in 1913
- Atlantic Inertial Systems is the leading supplier of inertial sensors and subsystems to a wide variety of military and commercial markets. Our sensors incorporate a complete range of technologies from precision rotating devices to the affordable silicon MEMS products
- Silicon Sensing is the home of the silicon MEMS gyro technology and its products
- Silicon Sensing has offices in Plymouth, UK and Amagasaki, Japan
- Atlantic Inertial Systems, previously BAE Systems Inertial Products division, is owned by US private equity investment company J.F. Lehman & Company
- Following slides give an update on the technology and products at Silicon Sensing

Vibrating Structure Gyroscopes



VSG - 1
1985



VSG - 2
1995



VSG - 3
1998



VSG - 4
2005

Silicon Sensing's solid state VSGs all work by detecting Coriolis forces. These are forces which can be observed whenever linear motion occurs in a rotating frame. The closed loop technology provides excellent scale factor and performance over a wide rate ranges.

The technology has a very rugged design and construction and delivers better performance than many of its competitors.

VSG-1 Ceramic Cup
VSG-2 Metal Ring

VSG-3 Silicon Ring Inductive Drive and Pick-off
VSG-4 Silicon Ring Capacitive Drive and Pick-off

CRS03 Update

- **Applications**
 - **Antenna stabilisation**
 - **Model helicopter**
 - **Commercial avionics**
 - **Automotive after-market**
- **Mature product.**
- **Current production rate 180k/year and rising by 15% per year**
- **Key characteristics**
 - **Single-axis rate sensor**
 - **Rate sensing from 80 °/s to 600 °/s**
 - **10Hz bandwidth**
 - **Temperature range -40 °C to +85 °C**
 - **Compact footprint, 29mm x 29 mm x 18mm**
- **Low cost**
- **Now RoHS compliant**
- **Additional test equipment introduced to increase throughput**
- **Good stock level for short lead time**
- **Available in various packaging configurations and rate ranges**



[Click here for the webpage for CRS03](#)

CRS05 Update

- Applications

- Automotive
- Truck Stability Control
- Platform Stabilisation
- Commercial Avionics

- PPAP issued January 2005

- Key characteristics

- Single-axis rate sensing 50 °/s standard, variants for volume users
- Raster output optional
- Greater than 75 Hz bandwidth
- Temperature range $-40\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$
- Compact footprint, 45 mm x 19 mm x 14 mm

- Low cost

- Developed for automotive so not RoHS compliant

- In volume production

- 50°/s, 75°/s , 200°/s variants available



[Click here for the webpage for CRS05](#)

SiRRS01 Update

- **SiRRS01**
 - Unmanned vehicle guidance and navigation
 - Platform stabilisation
 - Telemetry Systems
- High performance and rugged gyro
- Key characteristics
 - Single-axis rate sensor
 - Rate sensing from 50°/s to 1,500 °/s
 - Low bias instability <3 °/hr
 - Hermetically sealed
 - Robust - high shock and vibration resistance
 - Built In Test
 - Temperature output and modelling data



[Click here for the webpage for SiRRS01](#)

CRS10 Update

- VSG-4 sensor technology
- Unpackaged single axis angular rate sensor
- Applications
 - Automotive
 - Platform stabilisation
 - Commercial Avionics
 - Navigation aiding
- Key characteristics
 - Digital (SPI bus) and analogue output
 - Improved performance
 - Programmable rate range up to 300°/s
 - Programmable bandwidth
 - Temperature range -40°C to +125°C
 - Compact size 23 x 17 x 6.8 mm
 - Available with SMT connector and bracket
- Now in production



[Click here for the webpage for CRS10](#)

DMU

- Inertial Sensor Assembly utilising silicon MEMS technology
- Applications
 - Yaw stability
 - Adaptive headlight control
 - ACC
 - Telemetry
- Key characteristics
 - 6 Degrees of Freedom
 - 3 Axes (X, Y, Z) of Acceleration, $\pm 8g$ or $\pm 30g$
 - 3 Axes (P, Q, R) of Rate, $\pm 250^\circ/s$
 - Multiple Mounting Orientations
 - Built in Test (BIT) and Compensation
 - Controller Area Network (CAN) Interface
 - Digital Signal Processing (DSP) Algorithms



[Click here for the webpage for DMU](#)

New Product - DMU02

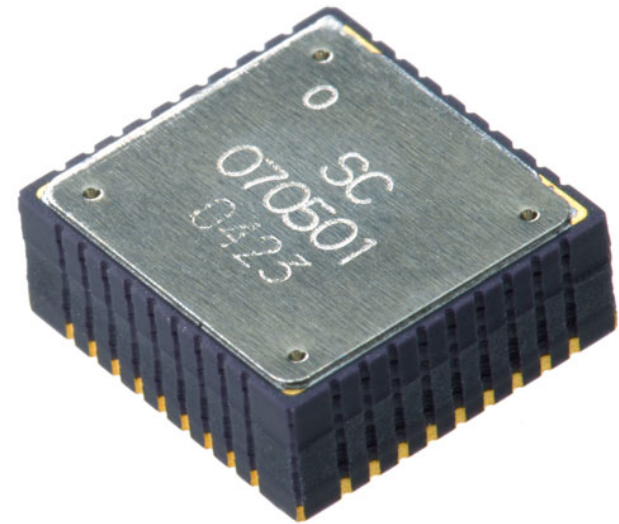
- Inertial Sensor Assembly utilising VSG4 silicon MEMS technology
- Applications
 - Automotive testing
 - General low-cost motion analysis
 - Robotics
 - Digital control systems
- Key characteristics
 - 6 Degrees of Freedom
 - 3 Axes (X, Y, Z) of Acceleration, $\pm 6g$
 - 3 Axes (P, Q, R) of Rate, $\pm 300^\circ/s$
 - Easy mounting via screws and dowels
 - Built in Test (BIT)
 - SPI digital Interface
 - High performance sensors



[Click here for the webpage for DMU02](#)

CRG20

- VSG-4 sensor technology
- Highly integrated single axis angular rate sensor
- LCC Package for direct PCB Mounting
- Applications
 - Automotive
 - Platform stabilisation
 - Commercial Avionics
 - Navigation aiding
- Key characteristics
 - Digital (SPI bus) and analogue output
 - Factory calibrated
 - Rate range up to 300°/s
 - 800°/s version
 - Programmable bandwidth and analogue rate
 - Two auxiliary ADC inputs
 - Temperature range -40°C to +125°C
 - Compact size 9.5 x 9.0 x 3.44 mm
- In full production - on 'Tape and Reel'



[Click here for the webpage for CRG20](#)

CRS09

- VSG-3 sensor technology
- Packaged Single Axis Rate Sensor
- New Head Design
- Discrete Electronics
- Applications
 - Replacement of FOGs
 - Platform stabilisation for Cameras, FLIRs
 - Civil Avionics
 - GPD aided location recognition
 - High performance IMU
- Key characteristics
 - Analogue output
 - Temperature sensors to allow for compensation
 - Two rate range variants
 - 100°/s and 200°/s version
 - Temperature range -40°C to +85°C
 - Low Noise
 - Compact size 63 x 63 x 19 mm
- In full production - high performance options too



[Click here for the webpage for CRS09](#)

Products from Atlantic Inertial Systems

- These products are available from Silicon Sensing's co-parent company; Atlantic Inertial Systems
- High performance, robust and reliable MEMS inertial measurement units and integrated MEMS INS / GPS
- Use VSG3 silicon MEMS gyro technology
- Various high-end commercial applications
 - Telemetry
 - Robotics
 - Navigation
 - Stabilisation

[Click here to go to the webpage for SiIMU02](#)

[Click here to go to the webpage for SiIMU04](#)

[Click here to go to the webpage for SiNAV02](#)



SiIMU02

SiIMU04



SiNAV02

(MEMS
INS/GPS)

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