ULTRA-HIGH PERFORMANCE GYRO MODULE

STIM202

FEATURES

- ±400°/s input range
- 1, 2 or 3 axis capability
- Electronic axis alignment
- 0.5°/h in-run bias stability
- 0.2°/√h angular random walk
- 18°/h linear acceleration effect
- 1500g shock capability
- 55g module weight

DESCRIPTION

STIM is a cluster of 1, 2 or 3 high accurate in extreme environments, the STIM202 MEMS-based gyros housed in a miniature package. Each axis is factory calibrated for bias and sensitivity, and compensated for temperature effects to provide highaccuracy measurements.

For many applications the excellent performance of STIM202 will replace FOG's and improve system solution with respect to robustness, reliability, size/ weight, power and cost. This is accomplished by combining the well proven Sensonor ButterflyGyro™ with full digital operation.

Input range and output formats

The STIM202 full-scale angluar rate input range is 400°/s. Selectable output formats are angular rate or increment angle.

Reliability and robustness

Perfect tuning of excitation and detection frequencies, as well as perfectly balanced vibrational masses, result in very low sensitivity to vibration and shock. For use

provides a vibration isolated internal assembly to avoid rectification errors.

Interface

The unit is powered by a single +5Vsupply and communicates via a Plug & Play high-level RS422 interface.

Flexibility and self diagnostics

The use of a 32-bit RISC ARM microcontroller provides flexibility in configuration, e.g. for choices of output unit, sampling frequency, LP filter cut-off frequency, RS422 bit rate and line termination ON/OFF. The gyro module provides a diagnostic function, that will flag any type of errors in the system. For more advanced users, the STIM202 may be set in Service Mode, where all configuration parameters may be intermediately or permanently changed by overwriting current settings in the flash memory.

Service Mode also provides ability to perform single measurements and to access more diagnostic information.



Evaluation kits

Evaluation kits are available, supporting initial testing and device configuration. The starter kits are small, flexible and communicate via USB.

Additional PCI cards are offered for more extensive testing or characterization. The RS422 connection of the PCI card is directly compatible with the STIM202 communication cable included in the starter kit.

Applications

The STIM202 is designed to replace FOGs in general, and enables new areas of use.

Typical applications for the product is attitude heading reference systems (AHRSs), flight recorders, platform stabilization (e.g. antennas, cameras, gimbals, etc.), remote weapon systems (RWSs), turrents, mid range missiles and rockets, high performance industrial applications, unmanned aerial vehicles (UAVs), autonomous underwater vehicles (AUVs), space applications, etc.



PRODUCT BRIEF

SPECIFICATIONS

| Parameter | Min | Nom | Max | Unit |
|---|-------------------------|------|--------|---------|
| Weight | | 55 | | g |
| Input range | | ±400 | | °/s |
| Resolution | | 24 | | bit |
| Operating temperature | -40 | | 85 | °C |
| Power supply | 4.5 | 5.0 | 5.5 | V |
| Supply current | | 200 | | mA |
| Start-up time | | | 10 | s |
| Sampling frequency | | | 1000 | SPS |
| Storage temperature | -50 | | 90 | °C |
| Dynamic overload | | | 5000 | °/s |
| Mechanical shock | | | 1500 | g |
| In-run bias stability | | 0.5 | | °/h |
| Angular random walk | | 0.2 | | °/√h |
| Bandwidth (-3dB) | | | 262 | Hz |
| Non-linearity (BSL over +/- 200 °/s) | | | 200 | ppm |
| Scale Factor accuracy | | ±0.2 | | % |
| Bias temperature accuracy (1 σ) | | ±30 | | °/h rms |
| G sensitivity | | | 18 | °/h/g |
| RS422 bit rate | | | 921600 | bit/s |
| Input resistance (termination ON) | | 120 | | Ω |
| Input resistance (termination OFF) | | 125 | | Ω |
| RESET PIN (NRST) | | | | |
| Logic levels | CMOS and TTL compatible | | | |
| Minimum hold time for reset | 5 | | | ms |

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STIM202

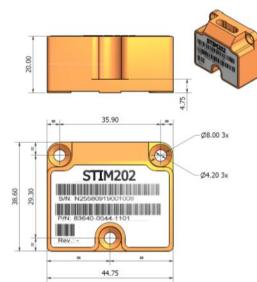
(8) NRST

4 TxD+

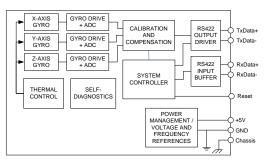
5 TxD-

MECHANICAL DIMENSIONS

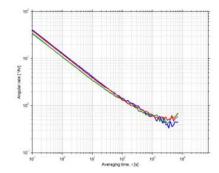
All dimensions in mm.



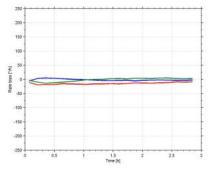
FUNCTIONAL BLOCK DIAGRAM



ALLAN VARIANCE



BIAS STABILITY



RESET

RxD

RxD-

TxD+

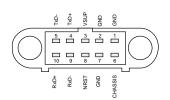
TxD

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SYSTEM

FULL FUNCTION





AXIS DEFINITIONS

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STIM202

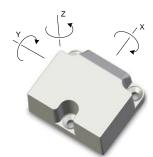
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TRANSMIT ONLY

SYSTEM

ELECTRICAL CONNECTIONS

RxD

RxD

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