

# ULTRA-HIGH PERFORMANCE GYRO MODULE



## STIM202

## PRODUCT BRIEF

### FEATURES

- $\pm 400^\circ/\text{s}$  input range
- 1, 2 or 3 axis capability
- Electronic axis alignment
- $0.5^\circ/\text{h}$  in-run bias stability
- $0.2^\circ/\sqrt{\text{h}}$  angular random walk
- $18^\circ/\text{h/g}$  linear acceleration effect
- 1500g shock capability
- 55g module weight



### DESCRIPTION

STIM is a cluster of 1, 2 or 3 high accurate MEMS-based gyros housed in a miniature package. Each axis is factory calibrated for bias and sensitivity, and compensated for temperature effects to provide high-accuracy 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 Sensoror ButterflyGyro™ with full digital operation.

#### Input range and output formats

The STIM202 full-scale angular rate input range is  $400^\circ/\text{s}$ . 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

in extreme environments, the STIM202 provides a vibration isolated internal assembly to avoid rectification errors.

#### Interface

The unit is powered by a single +5V supply 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.

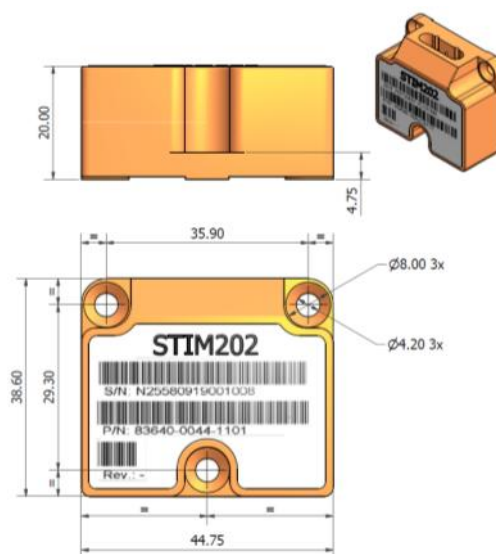
Typical applications for the product is attitude heading reference systems (AHRs), flight recorders, platform stabilization (e.g. antennas, cameras, gimbals, etc.), high performance industrial applications, unmanned aerial vehicles (UAVs), autonomous underwater vehicles (AUVs), space applications, etc.

## SPECIFICATIONS

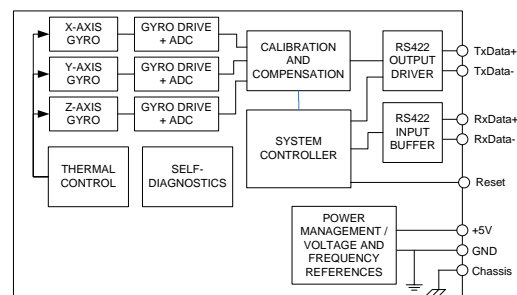
Parameter	Min	Nom	Max	Unit
Weight		55		g
Input range		±400		°/s
Resolution		24		bit
Operating temperature	-40		85	°C
Power supply	4.5	5.0	5.5	V
Supply current		200		mA
Start-up time			10	s
Sampling frequency			1000	SPS
Storage temperature	-50		90	°C
Dynamic overload			5000	°/s
Mechanical shock			1500	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 (1σ)		±30		°/h rms
Linear acceleration effect			18	°/h/g
RS422 bit rate			921600	bit/s
Input resistance (termination ON)		120		Ω
Input resistance (termination OFF)		125		Ω
<b>RESET PIN (NRST)</b>				
Logic levels	CMOS and TTL compatible			
Minimum hold time for reset	5			ms

## MECHANICAL DIMENSIONS

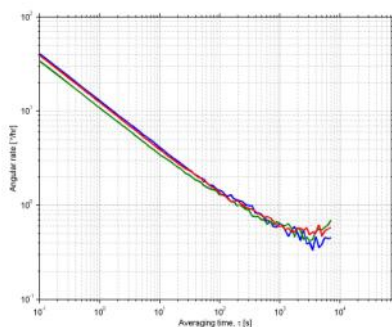
All dimensions in mm.



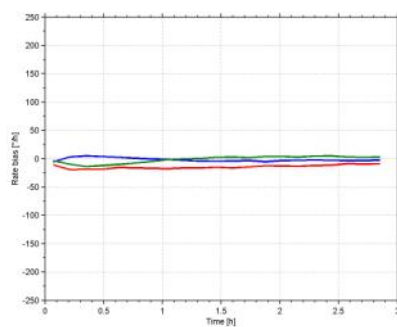
## FUNCTIONAL BLOCK DIAGRAM



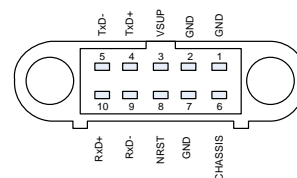
## ALLAN VARIANCE



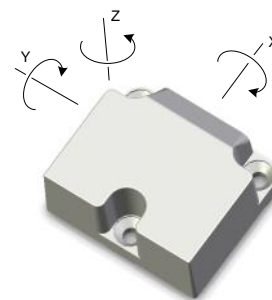
## BIAS STABILITY



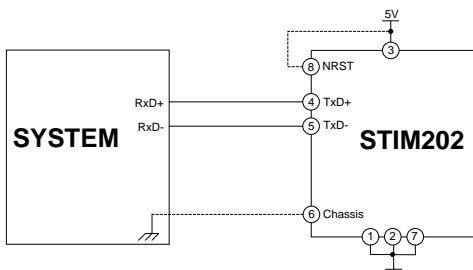
## PIN OUT



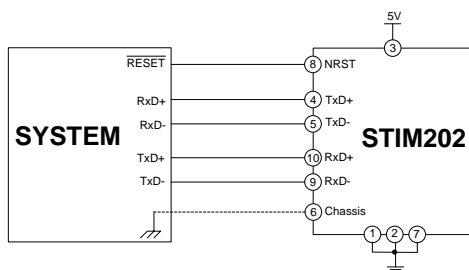
## AXIS DEFINITIONS



## ELECTRICAL CONNECTIONS



## TRANSMIT ONLY



## FULL FUNCTION