ULTRA-HIGH PERFORMANCE GYRO MODULE

STIM202

PRODUCT BRIEF

- **Small size, low weight and low cost**
- **ITAR free**
- **Insensitive to magnetic fields**
- **0.4 °/h bias instability**
- **0.17 °/√h angular random walk**
- **±400 °/s angular rate input range**
- **1500 g shock capability**

(39 mm x 45 mm x 20 mm)

STIM202 is a multi-axis gyro module with 3 axes of highly accurate MEMS gyros. Each axis is factory calibrated for bias and sensitivity, and compensated for temperature effects over the full temperature operating range.

For many applications STIM202 replaces FOG's and improve system solutions directly with respect to robustness, reliability, size/weight, power and cost. STIM202 industrialization is realized by combining the well proven Sensonor ButterflyGyro™ technology with full digital operation.

Input range, orthogonality and output formats

The STIM202 full-scale angular rate input range is 400 °/s and the output is capped at ±480 °/s. 3-axis modules feature electronic axis alignment, improving orthogonality between axis (down to 1 mrad). Selectable output formats are angular rate, increment angle, average angular rate and integrated angle, at sampling rates up to 1000 samples per second.

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.

Power and Interface

The unit is powered by a single 5 V supply and communicates via a Plug-and-Play high-level RS422 interface at bit rates up to 921600 bit/s.

Device configurations and self diagnostics

The use of a 32-bit RISC ARM microcontroller provides flexibility in device configuration. Choices for output unit, sampling frequency, LP filter cut-off frequency, RS422 transmission bit rate, line termination ON/OFF, etc. can be done in device Service Mode.
The Service Mode also provides the ability to perform single measurements on demand and access detailed diagnostics information.

Evaluation kits

STIM202 evaluation kits for PCI and USB connectivity are available. The PCI kit is the recommended choice for thorough characterization. The USB kit is the alternative solution, e.g. for smaller, portable laptop setups, providing an excellent choice for quick gyro module configurations and shorter measurement series.

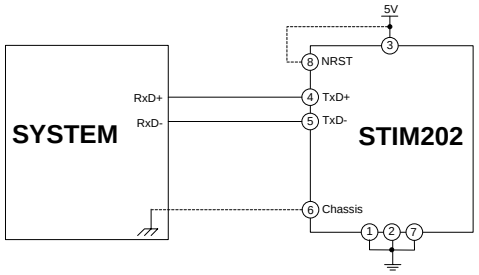
Applications

Typical STIM202 applications are attitude heading reference systems (AHRSs), platform stabilization and pointing systems (antennas, cameras, gimbals,..), high performance industrial applications, unmanned aerial vehicles (UAVs), autonomous underwater vehicles (AUVs), automated ground vehicles (AGVs), space applications, and more. STIM202 can also open new markets, where adequate solutions previously have not yet been possible to realize.

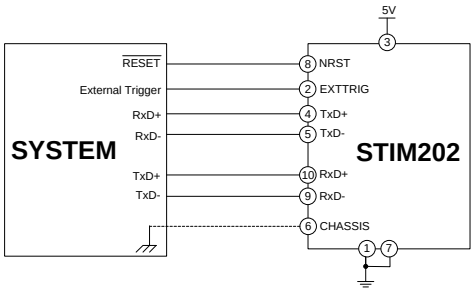
SPECIFICATIONS

Parameter	Min	Nom	Max	Unit
Weight		55		g
Input range		±400		°/s
Resolution		24		bits
Operating temperature	-40		85	°C
Storage temperature	-50		90	°C
Power supply	4.5	5.0	5.5	V
Power consumption		1.2	1.5	W
Start-up time		3 [2)]		s
Sample Rate			1000	SPS
Dynamic overload			5000	°/s
Mechanical shock			1500	g
Bias instability (Root Allan Variance)		0.4		°/h
Angular random walk (Root Allan Variance)		0.17		°/√h
Bandwidth (-3 dB)			262	Hz
Scale Factor accuracy		±0.2		%
Non-linearity (at ±250 °/s)		25		ppm
Bias error over temperature gradients		±30		°/h rms
Linear acceleration effect				
Bias		14		°/h/g
Scale factor		400		ppm/g
RS422 bit rate			921600	bit/s
Input resistance (termination ON)		120		Ω
Input resistance (termination OFF)		125		kΩ
Logic levels NRST and EXT TRIGGER pins		CMOS and TTL compatible		

ELECTRICAL CONNECTIONS

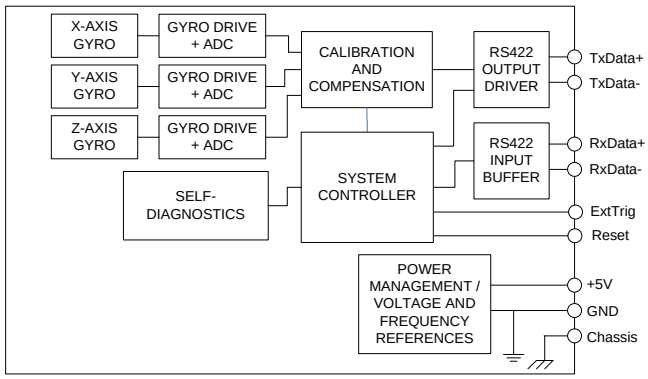


(TRANSMIT ONLY)



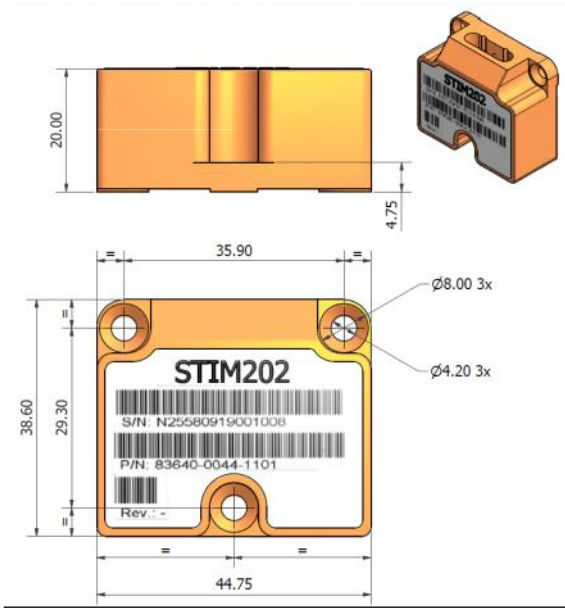
(FULL FUNCTION)

FUNCTIONAL BLOCK DIAGRAM

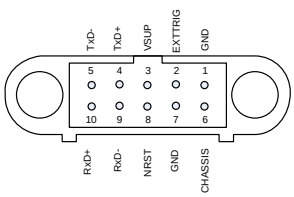


MECHANICAL DIMENSIONS

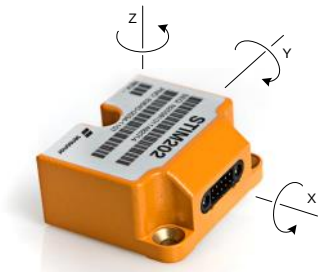
All dimensions in mm.



PIN OUT



AXIS DEFINITIONS



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