

# ULTRA-HIGH PERFORMANCE GYRO MODULE



STIM277H

PRODUCT BRIEF

- Small size, low weight and low cost
- Hermetic package with no paint and separate label
- ITAR free
- Insensitive to magnetic fields
- 10 °/h bias error over temperature gradients
- 0.3 °/h bias instability
- 0.15 °/√h angular random walk
- ±400 °/s angular rate input range
- 2000 samples per second
- Backwards compatible with STIM210
- 1500 g shock capability

**STIM277H** is a tactical grade 3-axis gyro module in a hermetic package. It is based on the well established STIM210, the STIM277H is packaged in clean room and the aluminum enclosure has a glass-to-metal sealed electrical micro-d connector and a laser welded lid to secure long term hermetic operation. All parts are tested for fine and gross leak to conform to MIL-STD-883J, Class H. The STIM277H enclosure is also free of paint and the label is supplied separately.

Each gyro axis is factory calibrated for bias and sensitivity, and compensated for temperature effects. Sensoror's proven gyro sensor technology has been in production for more than two decades. It performs exceptionally well across many applications due to its very low vibration and shock sensitivity. The gyro is qualified according to high-performance aircraft vibration standard.

### Input range, orthogonality and output formats

The STIM277H full-scale angular rate input range is 400 °/s and the output is capped at ±480 °/s. The 3-axis modules feature electronic axis alignment, improving orthogonality between axes to 0.2 mrad and has a scale factor non-linearity 25 ppm over full-scale. Selectable output formats are angular rate,

increment angle, average angular rate and integrated angle, at sample rates up to 2000 samples per second.

### Reliability and robustness

STIM277H modules have been qualified to an equivalent of 20 years operating life. They also have an MTBF at 70k operating hours at 52 °C (according to MIL-HDBK 217), which is outperforming current FOG systems. Tuning of excitation and detection frequencies, as well as perfectly balanced vibrational masses, result in very low vibration and shock sensitivity in any direction.

### 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 3.75 Mbits/s.

### Device configurations and self diagnostics

The use of a 32-bit RISC ARM microcontroller provides flexibility in device configuration. Choices for output unit, sample rate, 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



(39 mm x 45 mm x 22 mm)

on demand and access detailed diagnostics information.

### Evaluation kits

STIM277H evaluation kits for PCIe and USB connectivity are available. The PCIe kit is the recommended choice for extensive 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.

### Application areas

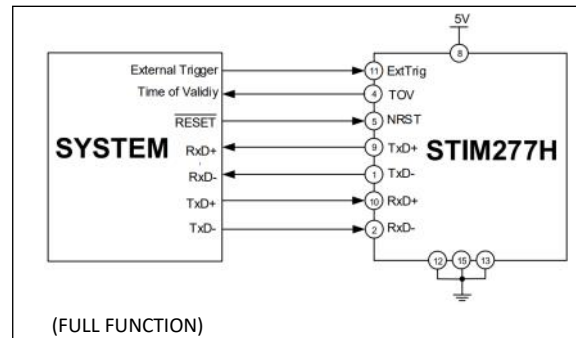
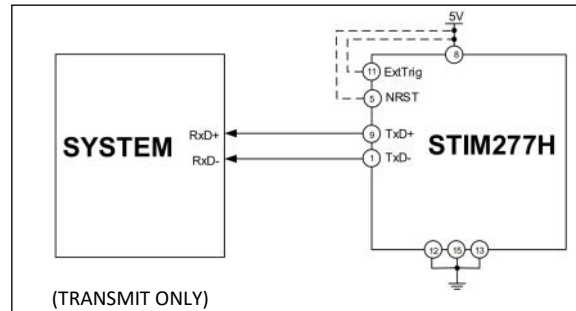
STIM277H is a good fit for satellite attitude & orbit control systems (AOCS) and launchers. Other applications are Industrial, Aerospace and Defense markets, for various platform stabilizations, pointing and navigation systems (e.g. antennas, cameras and gimbals), attitude heading reference systems (AHRs), inertial navigation systems (INSs) for UAVs, AUVs, AGVs, UGVs and ROVs, smart munitions, 3D mapping systems, range finders, trains, robotics and more. For many applications STIM277H directly replaces FOGs and improves system solutions with respect to robustness, reliability, size, weight, power and cost.



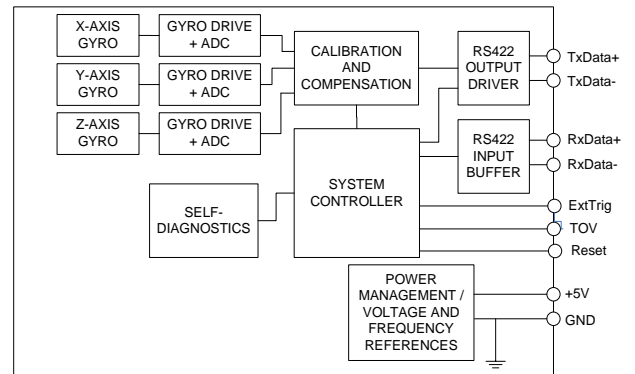
SPECIFICATIONS

Parameter	Min	Nom	Max	Unit
Weight		52		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		1.3	1.5	W
Start-up time			1	s
Sample rate			2000	SPS
Mechanical shock			1500	g
Bias instability		0.3		°/h
Angular random walk		0.15		°/√h
Bias error over temperature gradients		±10		°/h rms
Bandwidth (-3dB)		262		Hz
Group delay		1.6		ms
Non-linearity (condition: ±200 °/s)		15		ppm
Scale factor accuracy		500		ppm
RS422 bit rate			3.75	Mbits/s
Linear acceleration effect				
Bias		7		°/h/g
Scale factor		400		ppm/g
Logic levels NRST, EXT TRIGGER and TOV pins		CMOS and TTL compatible		

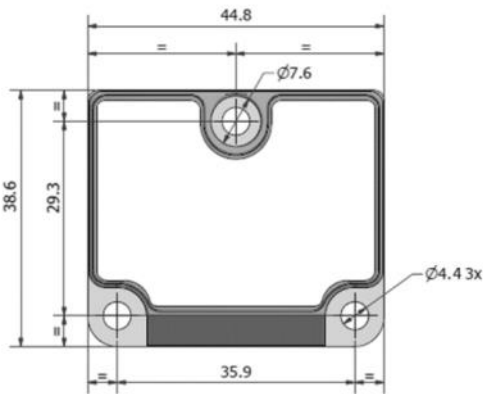
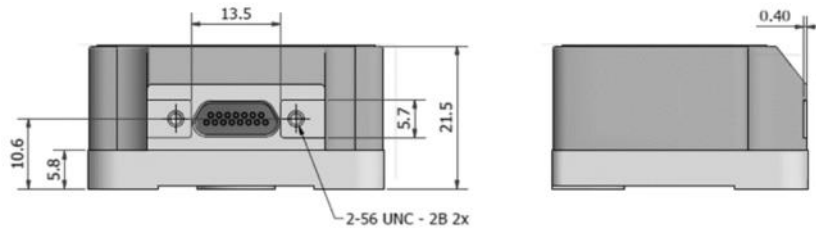
ELECTRICAL CONNECTIONS



FUNCTIONAL BLOCK DIAGRAM

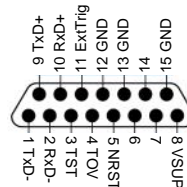


MECHANICAL DIMENSIONS



Volume < 2,0 cu. in (33 cm<sup>3</sup>)

PINOUT



AXIS DEFINITIONS

