

Sensoror



www.sensoror.com

Sensoror designs and manufactures high-precision tactical grade gyro sensors, gyro modules and IMUs for demanding applications. The company serves a global customer base in the Defense, Industrial, Aerospace and Commercial markets with ITAR-free solutions utilized in a wide range of applications.

Sensoror operates its own wafer fabrication facility for production of the key sensor components in its products. Assembly, test and calibration are all in-house processes to secure the product performance. The tight integration between sensor fabrication, testing and assembly is what puts the company in a position to offer the highest performing sensors in the market.

Sensoror is a global leader in MEMS technology and has more than 30 years of experience developing and manufacturing reliable sensor solutions for demanding applications involving high vibration, high shock and harsh environments.

● STIM210

STIM210 is a small, tactical grade, affordable, robust and reliable, ultra high performance (Bias Stability 0.3°/h, ARW 0.15°/√h) MEMS gyro module with up to 3 axes. An integrated 32-bit microcontroller enables flexible user configuration. Electronic axis alignment is standard.

- ◆ Miniature package
- ◆ ITAR free
- ◆ Excellent performance in vibration and shock
- ◆ Excellent environmental robustness
- ◆ 1, 2 or 3 axes offered in same package
- ◆ Electronically calibrated axis alignment
- ◆ RS422 interface
- ◆ 24 bits resolution
- ◆ Single-crystal silicon technology
- ◆ Low bias drift
- ◆ Low noise
- ◆ 5 different sampling rates available
- ◆ 5 different bandwidths available
- ◆ LP filter -3dB frequency can be set individually for each axis
- ◆ RS422 protocol, bit rate and line termination
- ◆ Selectable output unit: angular rate [deg/s] or incremental angle [deg]
- ◆ Continuous self-diagnostics.



● STIM300

STIM300 is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU). It contains 3 highly accurate MEMS gyros, 3 high stability accelerometers and 3 inclinometers. The IMU is factory calibrated and compensated over its entire operating temperature range.

STIM300 is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that STIM300 can offer.

- ◆ Weight: <0,12 lbs (<55g)
- ◆ Volume: <2,2 cu. in. (35cm³)
- ◆ ITAR free
- ◆ Insensitive to magnetic fields
- ◆ Solid state - high reliability
- ◆ Low gyro bias instability (0.3°/h)
- ◆ Continuous self-diagnostics
- ◆ Low gyro noise (0.15°/√h)
- ◆ ±10g acceleration input range
- ◆ Low accelerometer bias instability (0.05mg)
- ◆ 3 inclinometers for accurate leveling
- ◆ Compensated digital output, RS422
- ◆ Customer configurable output format, sampling rate and filter settings.



● STIM318

STIM318 is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU) with greatly improved accelerometer performance. It contains 3 highly accurate MEMS gyros and 3 ultra-high stability accelerometers. The IMU is factory calibrated and compensated for temperature effects over its entire operating temperature range.

STIM318 is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that STIM318 can offer.

- ◆ ITAR free
- ◆ Low gyro bias instability (0.3°/h)
- ◆ Low gyro noise (0.15°/√h)
- ◆ Low accelerometer bias instability (0.003mg)
- ◆ Low accelerometer noise (0.015 m/s/√h)
- ◆ ±10g acceleration input range
- ◆ User programmable bias trim offset
- ◆ Customer configurable output format, sampling rate and filter settings
- ◆ Compensated digital output, RS422
- ◆ Continuous self-diagnostics
- ◆ Solid state - high reliability
- ◆ Insensitive to magnetic fields
- ◆ Weight: <0,13 lbs (<57g)
- ◆ Volume: <2,2 cu. in. (35cm³)



HERMETICALLY SEALED PRODUCTS (conform to MIL-STD-883J, CLASS H)

● STIM277H

STIM277H is a small, tactical grade, affordable, robust and reliable, ultra high performance (Bias Stability 0.3°/h, ARW 0.15°/√h) 3 axis MEMS gyro module built into a hermetic package. The package is a hermetic aluminum enclosure with 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**.

An integrated 32-bit microcontroller enables flexible user configuration. Electronic axis alignment is standard.

- ◆ Hermetic package
- ◆ SurTec 650 surface treated
- ◆ ITAR free
- ◆ Excellent performance in vibration and shock
- ◆ Excellent environmental robustness
- ◆ Electronically calibrated axis alignment
- ◆ RS422 interface
- ◆ 24 bits resolution
- ◆ Single-crystal silicon technology
- ◆ Low bias drift
- ◆ Low noise
- ◆ 5 different sampling rates available
- ◆ 5 different bandwidths available
- ◆ LP filter -3dB frequency can be set individually for each axis
- ◆ RS422 protocol, bit rate and line termination
- ◆ Selectable output unit: angular rate [deg/s] or incremental angle [deg]
- ◆ Continuous self-diagnostics.



● STIM377H

STIM377H is a small, tactical grade, low weight, high performance non-GPS aided Inertial Measurement Unit (IMU) in a hermetic package. The package is a hermetic aluminum enclosure with 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**.

STIM377H contains 3 highly accurate MEMS gyros, 3 high stability accelerometers and 3 inclinometers. The IMU is factory calibrated and compensated over its entire operating temperature range.

STIM377H is a cost-effective ITAR free solution for systems that only had FOGs as an alternative when reaching for the performance level of that STIM377H can offer.

- ◆ Hermetic package
- ◆ Weight: <0,12 lbs (<55g)
- ◆ Volume: <2,2 cu. in. (35cm³)
- ◆ ITAR free
- ◆ Insensitive to magnetic fields
- ◆ Solid state - high reliability
- ◆ Low gyro bias instability (0.3°/h)
- ◆ Continuous self-diagnostics
- ◆ Low gyro noise (0.15°/√h)
- ◆ ±10g acceleration input range
- ◆ Low accelerometer bias instability (0.05mg)
- ◆ 3 inclinometers for accurate leveling
- ◆ Compensated digital output, RS422
- ◆ Customer configurable output format, sampling rate and filter settings.



PERFORMANCE			SENSOR STIM300	SENSOR STIM318	SENSOR STIM320
Parameter - Gyro	Conditions	Units	IMU	IMU	IMU
Input Rate (maximum)	Cut off 20% above	%s	± 400, ± 1200, ± 2000,	± 400, ± 1200, ± 2000,	± 400
Resolution		bits	24	24	24
Scale factor accuracy		ppm	500	500	500
Bandwidth (-3dB)		Hz	262	262	262
Sample rate	Max	Sample/s	2000	2000	2000
Group Delay	LP-filter -3bB=262Hz	ms	1.5	1.5	1.5
	LP-filter -3bB=131Hz	ms	3.0	3.0	3.0
	LP-filter -3bB=66Hz	ms	6.0	6.0	6.0
	LP-filter -3bB=33Hz	ms	12	12	12
	LP-filter -3bB=16Hz	ms	24	24	24
Bias Range		%h	± 250	± 250	± 250
Bias Trim Offset Range		%s	NA	± 1	± 1
Bia Run-Run		%h	4	4	4
Drift Rate Stability		%h	3	3	3
Bias error over temperature	Static temperatures	%h	≤ 9	≤ 9	≤ 9
Bias error over temperature gradients	≤ 1 °C/min	%h	≤ 10	≤ 10	≤ 10
Bias Instability	Allan variance @25°C	%h	≤ 0.3	≤ 0.3	≤ 0.3
Angle Random Walk (ARW)	Allan variance @25°C	%√h	0.15	0.15	0.1
Non-Linearity	± 200%/s	ppm	15	≤ 15-20	≤ 15-20
	± 400%/s	ppm	20		
Linear Acceleraton Effect Bias	With g-compensation	%h/g	1	1	1
	No g-compensation	%h/g	7	7	7
Linear Acceleraton Effect SF	With g-compensation	ppm/g	50	50	50
	No g-compensation	ppm/g	400	400	400
Orthogonality		± mrad	± 0,2	± 0,2	± 0,2
Misalignment		± mrad	± 1	± 1	± 1
Parameter - Accelerometers		Technology	MEMS	MEMS	MEMS
Fullscale		± g	±5/±10/±30/± 80,	±5/±10/±30/± 80,	±10/
Resolution		Bits	24	24	24
		ug	1,0/1,9/3,8/15,3	1,0/1,9/3,8/15,3	1,9
Scale Factor Accuracy		ppm	200/200/300/1000	200/200/300/1000	200
Scale Factor 1 year Stability		ppm	300	600	600
Non-linearity		ppm	100/100/100/1000	100/100/100/1000	100
Bandwidth (-3dB)		Hz	214/214/257/214	208/262/257/261	262
Sample Rate	Max	Samples/s	2000	2000	2000
Group Delay	LP-filter -3bB=262Hz	ms	6,5/6,5/6,5/6,5	3,1/3/2,8/2,7	3
	LP-filter -3bB=131Hz	ms	8/8/8/8	4,6/4,5/4,3/4,2	4,5
	LP-filter -3bB=66Hz	ms	11/11/11/11	7,6/7,5/7,3/7,2	7,5
	LP-filter -3bB=33Hz	ms	17/17/17/13	14/13/13/13	13
	LP-filter -3bB=16Hz	ms	29/29/29/29	26/25/25/25	25
Bias 1 Year Stability		mg	0,8/1,5/4,5/15	1,5/1,5/4/12	1,5
Bias 1 Year Stability, STIM318e		mg		0,6/1,2/4/12	1,2
Bias Trim Offset Range		mg	NA	50/100/300/1000	100
Bias Error Over Temperature	≤ 1 °C/min	mg rms	1/2/6/20	0,5/0,7/1,5/5	0,7
Bias Instability	Allan variance @25°C	mg	0,03/0,05/0,15/0,5	0,002/0,003/0,01/0,03	0,003
Velocity Random Walk	Allan variance @25°C	m/s/√H	0,04/0,07/0,21/0,7	0,008/0,015/0,04/0,15	0,015
Orthogonality		± mrad	±0,2/0,2/0,6/1	±0,2/0,2/0,2/0,6	±0,2
Misalignment		± mrad	±1/1/1,5	±1/1/1,5	±1
Electrical / Mechanical					
Data Interface		Digital	RS-422	RS-422	RS-422
Initialization Time (valid data)		secs	≤ 1	≤ 1	≤ 5
Dimensions (max)		mm	44.8 x 38.6 x 21.5	44.8 x 38.6 x 21.5	44.8 x 38.6 x 21.5
Weight (max)		g	55	57	57
Power Consumption		Watts	≤ 2	≤ 2	≤ 2
Input Voltage		+VDC	+5 ± 10%	+5 ± 10%	+5 ± 10%
PPS input		kbps	No	No	Yes
Environment					
Temperature Operating		°C	-40 to +85	-40 to +85	-40 to +85
Shock Operating		g	--	--	--
Vibration Operating		g	8 grms 20-2000 Hz	8 grms 20-2000 Hz	8 grms 20-2000 Hz
Shock Survival		g	1500 g, 0.5 msec	1500 g, 0.5 msec	1500 g, 0.5 msec