

Automotive Inertial Measurement Unit

Pitch, Roll and Yaw Rotation Rates
X, Y and Z Accelerations

Advanced Automotive Sensor Technology

Honeywell's series of 6 Degree of Freedom (6DF) Inertial Measurement Units provide excellent performance over a large temperature range and in high vibration environments. These MEMS-based sensors measure pitch, roll and yaw rate, and X, Y and Z accelerations for future automotive safety applications.

Each 6DF sensor consists of three MEMS rotational rate sensors, a MEMS three axis accelerometer and a CAN interface. The CAN devices include advanced self testing for protection against misleading information. All 6DF sensors have factory programmable operation ranges and output bandwidths to meet evolving customer requirements. Honeywell provides a broad base of sensor compensation, sensor fusion and application software for automotive and commercial applications.

The critical sensing technology for HG1164 control sensors is contained in the Honeywell GG1178 rotation rate sensor, fabricated from bulk silicon using proprietary deep reactive ion etching processes. This device uses the physical properties of the Coriolis Effect and a capacitive sensing mechanism. Honeywell provides GG1178 sensors in a variety of physical configurations with interfaces tailored to the customer's stability control requirements.



Features

- Broad Dynamic Range
- Low Noise, High Resolution
- Excellent Temperature Performance
- Patented Self-test Function
- User-defined Low-pass Filter
- Low Sensitivity to Vibration
- Wide Temperature Range
- Robust to Vibration and Shock
- Designed for Automotive Applications
- Safety Critical Integrity

Applications

- Rotation Rate Sensor
- Vehicle Stability Control
- Vehicle Roll Detection
- Adaptive Cruise Control
- Automotive Control Systems

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Specifications

Characteristic Rotation Rate	Min	Nom	Max	Unit
Measurement Range	-75		75	°/sec
Overload Range (<60 ms recovery)	-1000		1000	°/sec
Sensitivity Error	-4		4	%
Linearity	-1		1	%
Offset (total)	-2.5		2.5	°/sec
Offset Drift (over temp range)	-1		1	°/sec
Offset Drift Speed (t > 3 min)	-0.2		0.2	°/sec/min
Resolution (10 ms samples)			0.1	°/sec (RMS)
Noise			0.2	°/sec
Cross Axis Sensitivity	2		2	%
Turn On Time			750	ms

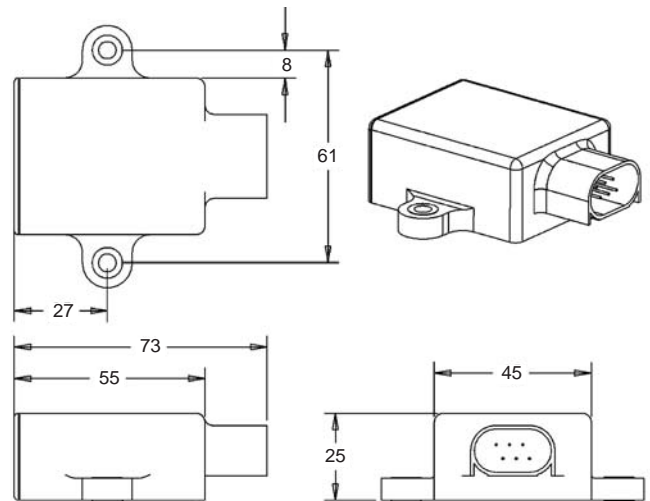
Characteristic Acceleration	Min	Nom	Max	Unit
Measurement Range	-17		17	m/s ²
Overload Range (<60 ms recovery)	-100		100	m/s ²
Sensitivity Error	-5		5	%
Linearity	-4		4	%
Offset (entire)	-1		1	m/s ²
Offset Drift (over temp)	-0.35		0.35	m/s ²
Offset Drift (over 60K interval)	-0.2		0.2	m/s ²
Offset Drift Speed	-0.1		0.1	m/s ² /min
Resolution			0.05	m/s ²
Noise			0.1	m/s ² (RMS)
Cross Axis Sensitivity	-5		5	%
Turn On Time			250	ms

* Higher performance and custom ranges available by request

Operational Conditions

	Low	High	Low
Power	8	16	Vdc
Current		200	mA
Temperature	-40	+85	°C
Vibration		>3.2	gRMS

Mechanical Package



Advanced Electronics

Honeywell International Inc.
 3660 Technology Drive
 Minneapolis, MN 55418 USA
 Tel: 612.951.7554
 Fax: 612.951.7438
 www.honeywell.com/ts

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