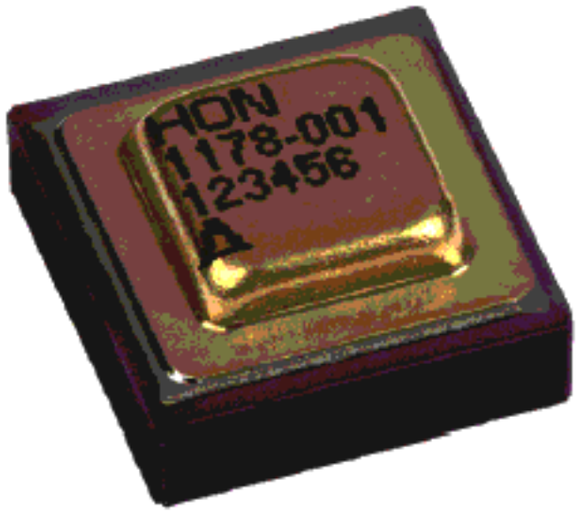
Honeywell

MEMS Rotational Rate Sensors

GG1178 - Digital or Analog Output

Advanced Information

Honeywell's GG1178 family of rotation sensors are high-performance silicon micromachined angular rate sensors for multiple applications. They provide a low noise output signal with excellent performance over a large temperature range and in high vibration environments.



A GG1178 rate sensor utilizes a MEMS, Micro Electro Mechanical System, sense element and a CMOS ASIC in a ceramic 14-pin LCC package. The sensing element is fabricated from bulk silicon using proprietary deep reactive ion etching (DRIE) processes. It makes use of the physical properties of the Coriolis Effect and a capacitive sensing mechanism. The sensing element utilizes differential capacitance and device symmetry to significantly reduce errors from acceleration and off-axis rotations. Rotating the sensor shifts an oscillating silicon structure, measurably changing the differential capacitance. The ASIC detects and transforms changes in capacitance into an analog or digital output proportional to angular rate.

The device sensitivity (scale factor) is factory programmable from ±75°/sec to ±300°/sec. Output bandwidth is also factory programmable between 30 and 125 Hz.

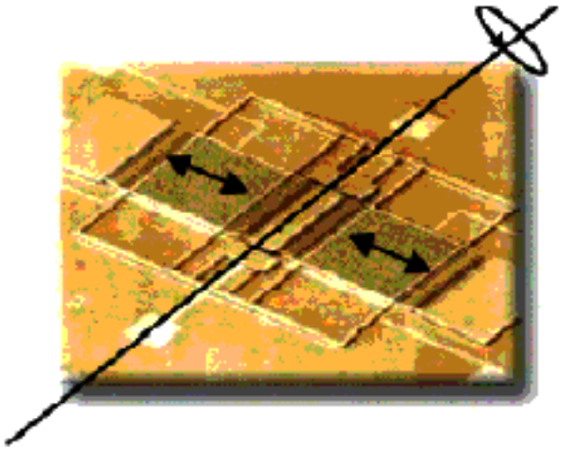
Features

- Broad Dynamic Range
- Low Noise, High Resolution
- Excellent Temperature Performance
- Compact 14-pin LCC SMT Package
- Factory-Defined Low-Pass Filter
- Low Sensitivity to Vibration
- Wide Temperature Range
- Robust to Vibration and Shock

Applications

- GPS Aided Navigation
- Agricultural Equipment
- Camcorder Stabilization
- Medical Orthotic
- Down Hole Energy Steering
- Automobile Stability Control

Advanced MEMS Silicon Sensor Structure



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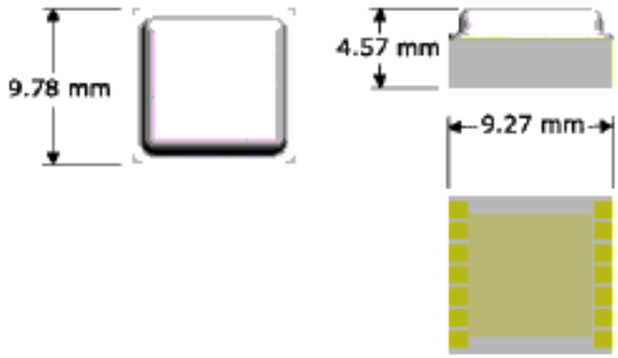
Specifications

Requirement	GG1178AU01	GG1178AU02	GG1178AU04	Units
Operating Range	±75	±150	±300	°/s
Output Bandwidth *(factory programmable)*	31, 62, or 125	31, 62, or 125	31, 62, or 125	Hz
Sensitivity *(PDM/analog)*	26.7	13.3	6.7	mV/°/s
Total Sensitivity Error	<±2.0	<±2.0	<±2.0	%
Total Zero Offset	<±2.0	<±4.0	<±8.0	°/s
Cross Coupling	<±2.0	<±2.0	<±2.0	%
Least Squares Linearity	0.20	0.20	0.20	% of FS
G Sensitivity	<±0.1	<±0.075	<±0.05	°/s/G
Output Resolution	14	14	14	Bits
Signal Noise	0.10	0.20	0.20	°/s (RMS)
In-run Bias Stability	1	1	1	°/second

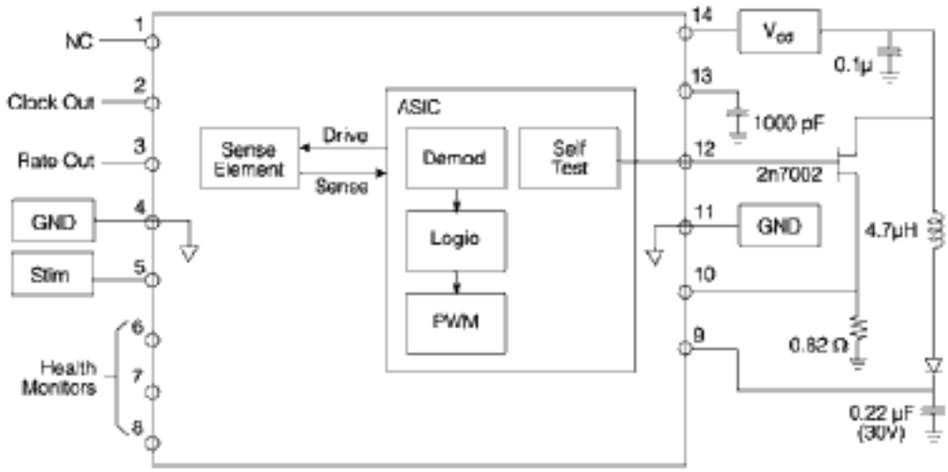
Operational Conditions

	Low	High	Units
Power	4.75	5.25	Vdc
Current		35	mA
Temperature	-40	+125	°C
Vibration		>3.2	gRMS

14-Pin Leadless Chip Carrier (LCC) Package



Functional Diagram



Find out more

For more information on Honeywell's MEMS Rotational Rate Sensors visit us online at www.pressuresensing.com or contact us at 800-323-8295 or 763-954-2474. Customer Service Email: ssec.customer.service@honeywell.com.

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