SDG1400

Quartz MEMS Angular Rate Sensor

emcore®

DATASHEET | DECEMBER 2023

A New Era in Navigation

Applications

- Platform Stabilization
- Optical Camera Stabilization
- Antenna Stabilization & Pointing
- High Speed Ride & Tilt Control
- Robotic Control
- Instrumentation

Key Performance Features

- Exceptional Bias Stability
- Low Gyro Noise
- Improved Vibration Performance
- DC Voltage Input/High-Level Analog DC Voltage Output
- Rugged Construction in a Very Small Form Factor
- High Reliability & Long Life
- RoHS Compliant

Ideal for High Performance Commercial & Industrial Applications

The SDG1400 is a single-axis angular rate sensor that provides exceptional performance with EMCORE's proven Quartz MEMS sensing element and fully self-contained electronics.

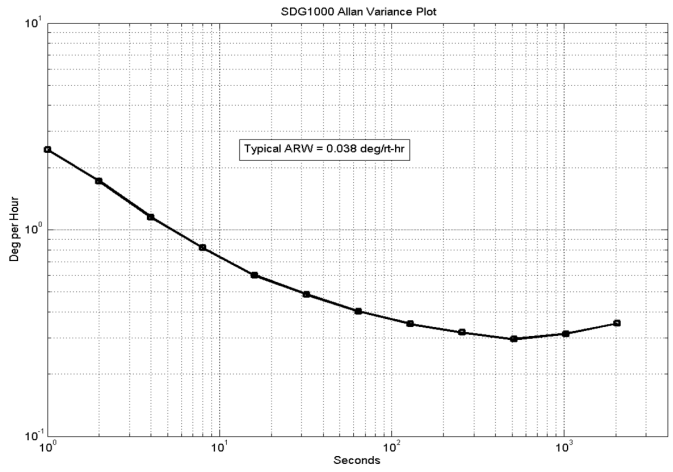
SYSTRON DONNER QUARTZ MEMS

By applying design techniques found only in more expensive rate sensors, excellent Bias Stability, Temperature Performance, Noise, and Vibration performance levels have been achieved. The availability of the internal temperature sensors enable bias modeling.

Performance Highlights

Parameter	SDG1400-200-200
Standard Range Full Scale	± 200°/sec.
Full Scale Output (Nominal)	± 5.0 Vdc
Scale Factor (at 25°C)	0.025 ± 0.004 Vdc/°/sec
Scale Factor Over Temperature (Dev. from 25°C)	≤ 0.06%/°C
Bias Calibration (at 25°C)	≤ 1 deg/sec.
Bias Variation over Temperature (Dev. from 25°C)	≤ 1 deg/sec.
Bias Stability (In-Run at Constant Temp., Std. Dev.)	< 6°/hr. typical
Bandwidth (-90°, incl. temp. effect)	50 ± 10 Hz

SDG1400 Allen Variance Plot



NON ITAR

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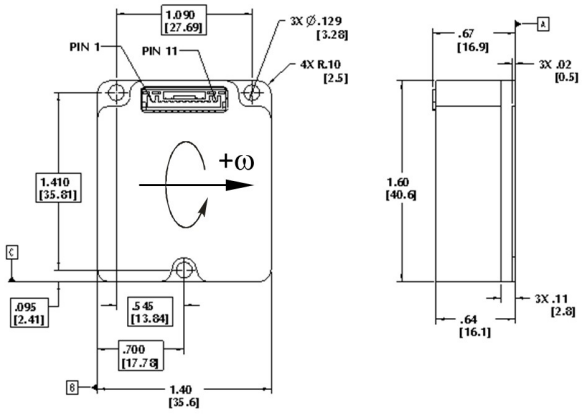
Performance Specifications

Parameter	SDG1400-200-200
Power Requirements	
Input Voltage	+ and – 10 to 16 Vdc
Input Current	< 15 mA (each supply, typical)
Performance	
Standard Range Full Scale	± 200°/sec.
Full Scale Output (Nominal)	± 5.0 Vdc
Scale Factor (at 25°C)	0.025 ± 0.004 Vdc/°/sec
Scale Factor Over Temperature (Dev. from 25°C)	≤ 0.06%/°C
Bias Calibration (at 25°C)	≤ 1 deg/sec.
Bias Variation over Temperature (Dev. from 25°C)	≤ 1 deg/sec.
Bias Stability (In-Run at Constant Temp., Std. Dev.)	< 6°/hr. typical
G Sensitivity	< 36°/hr/g
Start-Up Time	≤ 1.0 sec
Bandwidth (-90°, incl. temp. effect)	50 ± 10 Hz
Damping Ratio	0.7 ± 0.2
Non-Linearity, (% Full Range)	≤ 0.03%
Output Noise (DC to 100 Hz)	≤ 0.1°/√hr (< 0.0017°/sec/√ Hz) Hz)
Environments	
Operating Temperature	-55°C to +85°C
Storage Temperature	-55°C to +95°C
Vibration Operating* (20 – 2000 Hz, Flat Profile)	5 g_{rms}
Vibration Rectification*	<3.6°/hr/g_{rms}
Vibration Survival*	20 g_{rms}
Shock Survival	200 g, 2 ms, ½ sine pulse
Weight	< 60 grams

* Please see user's guide for more information regarding vibration tolerance and sensitivity.

Dimensions/Scale



SDG1400 PIN ASSIGNMENT

1	–	–	Power Ground	7	–	–	Built-In Test
2	–	–	+Vdc Input	8	–	–	Temp 2 Output
3	–	–	-Vdc Input	9	–	–	No Connection
4	–	–	Temp 1 Output	10	–	–	Leave Open
5	–	–	Signal Return	11	–	–	Case Ground
6	–	–	Rate Output				

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For More Information

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emcore®

ISO9001 CERTIFIED

AS9100 REGISTERED

SYSTRON DONNER QUARTZ MEMS

MADE IN USA

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