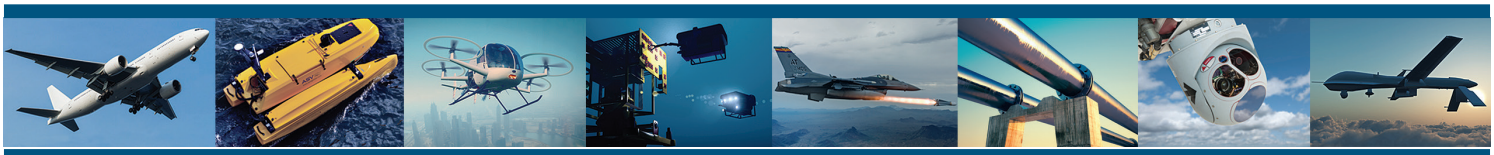
SDG500

Quartz MEMS Angular Rate Sensor

emcore®



DATASHEET | MAY 2022

Transforming Navigation

Applications

- Attitude Control for Small Business & Regional Aircraft
- Antenna, Optical Platform Stabilization & Pointing
- Instrumentation
- Motion Control
- Robotics & Robotic Vehicles

Key Performance Features

- Outstanding Vibration & Noise Performance
- Exceptional Bias Stability
- Compact Size, No Wear-Out Mechanisms
- High Reliability & Long Life
- DC Voltage Input/High-Level Analog DC Voltage Output
- Adaptable – No Software Required

Ideal for High Performance Commercial Applications

The SDG500 single-axis angular rate sensor provides exceptional performance versus similar sensors in its class, with a lower noise capability superior to silicon-based gyros. The SDG500 utilizes our proven Quartz MEMS sensing technology and fully-contained electronics in a durable, compact size.

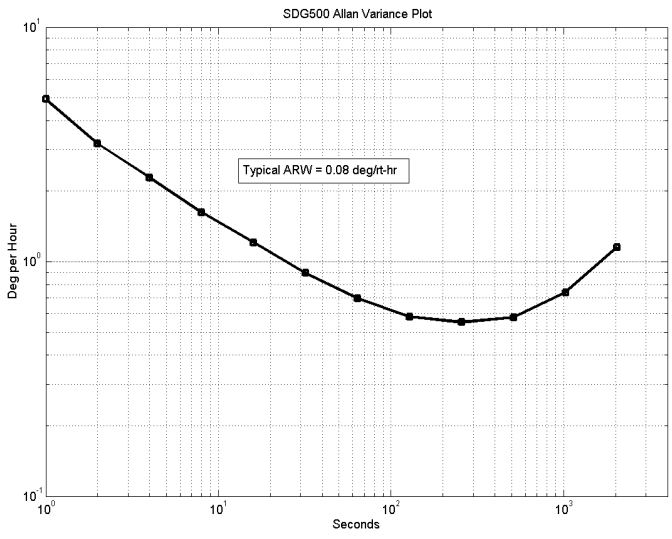
SYSTRON DONNER QUARTZ MEMS

By applying design techniques found only in more expensive rate sensors, excellent bias stability, temperature performance, noise, and vibration performance levels have been achieved.

Performance Highlights

Parameter	SDG500-00100-100
Standard Range Full Scale	± 100°/sec
Full Scale Output (Nominal)	± 5.0 Vdc
Scale Factor (at 25°C, Typical)	0.050 ± 0.001 Vdc/°/sec
Scale Factor Over Temperature	≤ 0.1%/°C
Bias Calibration (at 25°C)	≤ 1.5°/sec
Bias Variation over Temperature (Dev. from 25°C)	≤ 5°/sec
Bias Stability (In-Run at Constant Temp., Std. Dev.)	< 6°/hr. typical
Bandwidth (-90°, incl. temp. effect)	50 ± 15 Hz

SDG500 Allan Variance Plot



NON ITAR

P +1 866.234.4976 E navigation-sales@emcore.com W emcore.com/nav

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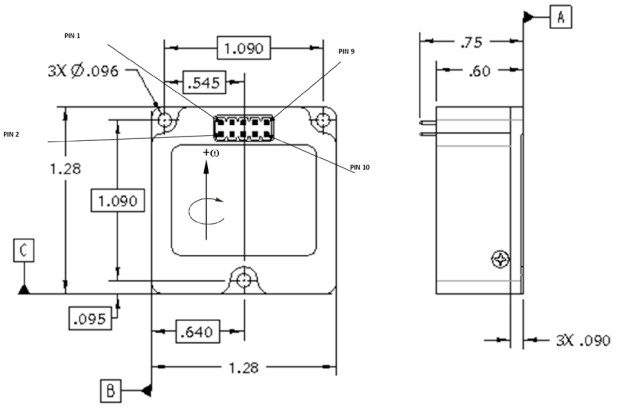
Transforming Navigation

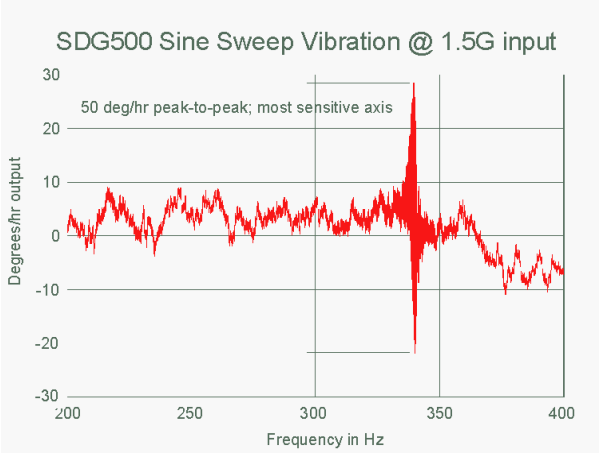
Performance Specifications

Parameter	SDG500-00100-100
Power Requirements	
Input Voltage	+ and – 10 to 15 Vdc
Input Current	< 20 mA (each supply, typical)
Performance	
Standard Range Full Scale	± 100°/sec
Full Scale Output (Nominal)	± 5.0 Vdc
Scale Factor (at 25°C, Typical)	0.050 ± 0.001 Vdc/°/sec
Scale Factor Over Temperature	≤ 0.1%/°C
Bias Calibration (at 25°C)	≤ 1.5°/sec
Bias Variation over Temperature (Dev. from 25°C)	≤ 5°/sec
Bias Stability (In-Run at Constant Temp., Std. Dev.)	< 6°/hr. typical
G Sensitivity	< 0.06°/sec/g
Start-Up Time	< 1.0 sec
Bandwidth (-90°, incl. temp. effect)	60 ± 15 Hz
Damping Ratio	0.7 ± 0.3
Non-Linearity, (% Full Range)	≤ 0.05%
Resolution/Threshold	< 0.004°/sec
Output Noise	≤ 0.005°/sec/√Hz (DC to 100 Hz)
Environments	
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +95°C
Vibration Operating* (20 – 2000 Hz, Flat Profile)	5 grms , 36°/hr/grms
Vibration Survival* (5.83 grms)	D0160E, Curve C1
Shock Survival (20g 11ms)	D0160E, Category B
Weight	≤ 25 grams

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

Dimensions/Scale





SDG500 PIN ASSIGNMENT

1. +Vdc input
2. Power Ground
3. Vdc Input
4. Temp Output
5. Signal Return
6. Rate Output
7. No Connection
8. Self Test Input
9. Case Ground
10. Built-In Test

For More Information

+1 866.234.4976 | navigation-sales@emcore.com | emcore.com/nav

EMCORE Corporation

2015 Chestnut Street
Alhambra, CA 91803 USA
P +1 626.293.3700
F +1 626.293.3429

emcore®

ISO9001 CERTIFIED

AS 9100 REGISTERED

SYSTRON DONNER QUARTZ MEMS

MADE IN USA

Released 05.05.2022