SYSTRON DONNER INERTIAL

MEMS Micromachined Angular Rate Sensor

QRS116

Applications

The QRS116 has a wide variety of military applications

- **Stabilization**
- **Control**
- **Guidance**
- **Navigation**
- **Instrumentation**

Description

The QRS116 meets state-of-the-art systems requirements for very high accuracy, very low noise angular rate sensing. The QRS116 is a form, fit, function enhancement to the popular, highly reliable QRS11. Using a next generation version of Systron Donner's unique quartz micromachined sense element, the QRS116 delivers excellent bias stability, signal to noise ratio and vibration performance characteristics in a small, lightweight package. With no moving parts and no scheduled maintenance, the QRS116 will provide reliable service and low total cost of ownership.

Key Performance Features

- **DC Input/High Level DC Output**
- **Outstanding Bias stability**
- **Internal Electronics**
- **High MTBF**
- **Fast Start-Up**
- **Unprecedented Angle Random Walk**

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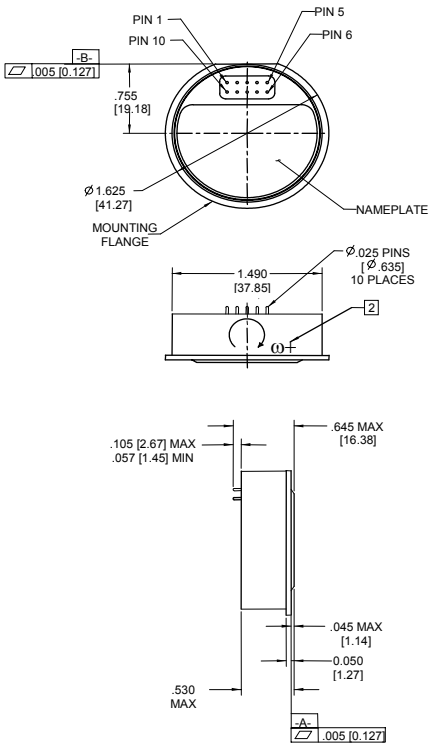

Notes:
1. QRS116 is supplied with two mounting rings, mounting screws & mating test connector.
2. Angular rate applied as shown will produce a more positive output (not marked on unit)
3. Unit of measure is inches/[mm]
4. Initiated BIT - Grounding Self Test Input produces a step change of +1.0 to +1.5 VDC @ Rate Output
5. BIT Output < - 1.5 Vdc when "ready"
6. Allen Variance 100 second correlation time

QRS116 INPUTS / OUTPUTS
Self Test Input [4]
+Vdc Input
Power Ground
BIT Output [5]
Internal Temperature Sensor
Rate Output
Signal Ground
-Vdc Input
Case Ground

PARAMETER	SUMMARY SPECIFICATIONS
Part Number	QRS116-0100-100
Performance Level	Standard
Power Requirements	
Input Voltage	+ and – 5 Vdc ± 5 % regulation
Input Current	< 20 mA (each supply)
Performance*	
Standard Range Full Scale **	± 100°/sec.
Full Scale Output	± 2.5 Vdc
Scale Factor Calibration (at 22°C)	≤ 1% of value
Scale Factor over Temperature (Dev. from 22°C)	≤ 0.03%/°C
Bias Variation with Temperature - Modeled with 3rd order polynomial (1 sigma)	20 deg/hr.
Short Term Bias Stability - Note 6 (1 sigma)	3 deg/hr
G Sensitivity	< 0.02 °/sec/g
Start-Up Time	< 1.5 sec.
Bandwidth (-90°)	> 60 Hz
Non-Linearity (% Full Range)	< 0.05%
Threshold/Resolution	< 0.004 °/sec.
Output Noise (DC to 100 Hz)	≤ 0.002 °/sec./√Hz
Environments	
Operating Temperature	-55°C to +85°C
Storage Temperature	-55°C to +100°C
Vibration Operating***	10 g_{rms} 20 Hz to 2 kHz Random - flat spectrum
Vibration Survival	20 g_{rms} 20 Hz to 2 kHz random
Shock	1,000g, any axis
Weight	≤ 60 grams
Temperature Sensor	
Temperature Sensor - Offset @ +22°C	0 ± 0.5 Vdc @ 22°C
Scale .Factor	0.007 to 0.012 V/°C

* Performance levels indicated are "Typical" unless otherwise noted
** Other rate ranges available, consult factory
*** Consult factory for other vibration level requirements

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