

QRS11

More than 90,000 QRS11's in the field!

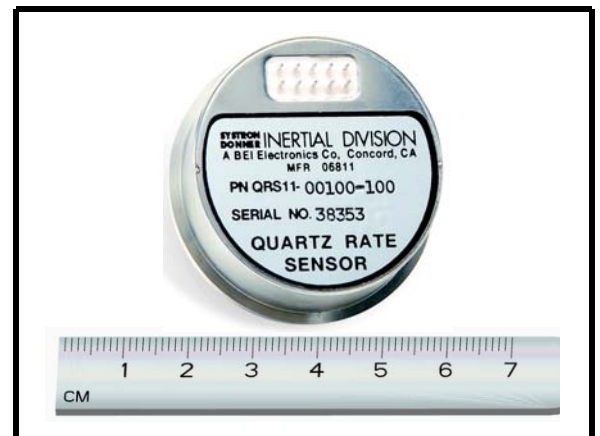
Applications

The QRS11 has a wide variety of applications.

- Stabilization
- Control
- Guidance
- Instrumentation
- Navigation

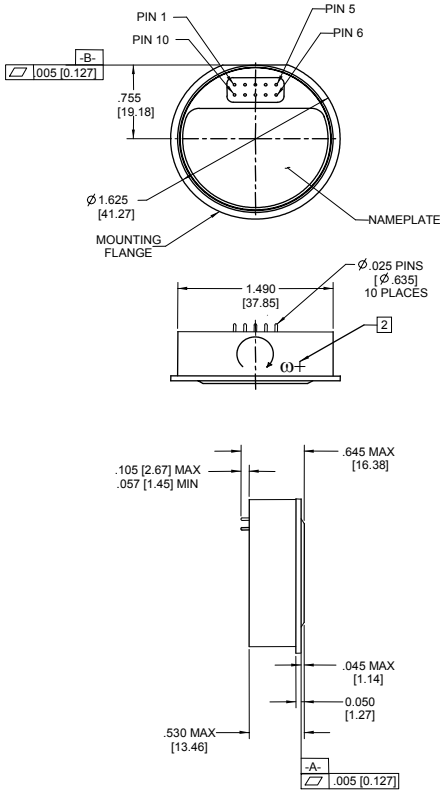
Description

The BEI GyroChip® Model QRS11 is a “MEMS” technology, solid-state “gyro on a chip.” This DC input/high-level DC output device is fully self contained, extremely small and lightweight. No external support electronics are required. Since the inertial sensing element is comprised of just one micromachined piece of crystalline quartz (no moving parts), it has a virtually “unlimited” life. The Model QRS11 is a mature product in high volume production since 1991. It is fully qualified and used on thousands of applications including numerous advanced aircraft, missile, space and commercial systems.



- DC Input/High Level DC Output
- Wide Bandwidth
- Internal Electronics
- High MTBF
- Fast Start-Up

Micromachined Angular Rate Sensor



Notes:

1. QRS11 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 [millimeters]
4. A DC voltage input of (± 1.0 Vdc Max) applied to the self-test will result in a proportional DC output voltage
5. TTL compatible BIT output signal of ≥ 2.4 Vdc (referenced to power ground) indicates a properly functioning unit.

QRS11 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	QRS11-00100-100	QRS11-00100-101
Performance Level	Standard	High
Power Requirements		
Input Voltage	+ and - 5 Vdc $\pm 3\%$ regulation	
Input Current	≤ 80 mA (each supply)	
Input Power Noise Limits	< 10 mV _{rms} wideband, except at 8.7 ± 0.5 kHz, < 1 mV _{rms}	
Performance		
Standard Range Full Scale	$\pm 100^\circ/\text{sec.}$	
Full Scale Output (Nominal)	± 2.5 Vdc	
Scale Factor Calibration (at 22°C Typical)	$\leq 1\%$ of value	
Scale Factor over Temperature (Dev. from 22°C Typical)	$\leq 0.03\%/^\circ\text{C}$	
Bias Calibration (at 22°C Typical)	$\leq 2.0^\circ/\text{sec.}^*$	$\leq 0.5^\circ/\text{sec.}^*$
Bias Variation over Temperature (Dev. from 22°C)	$\leq 1.80^\circ/\text{sec.}^*$	$\leq 0.35^\circ/\text{sec.}^*$
Short Term Bias Stability (100 sec at const. temp)	$< 0.01^\circ/\text{sec.}$, typical*	
Long Term Bias Stability (1 year)	$\leq 0.2^\circ/\text{sec.}^*$	
G Sensitivity (Typical)	$\leq 0.02^\circ/\text{sec/g}$	
Start-Up Time (Typical)	< 1 sec.	
Bandwidth (-90°)	> 60 Hz	
Non-Linearity (Typical) % Full Range	$\leq 0.05\%$	
Threshold/Resolution	$\leq 0.004^\circ/\text{sec.}^*$	
Output Noise (DC to 100 Hz)	$\leq 0.01^\circ/\text{sec.}/\sqrt{\text{Hz}}^*$	
Environments		
Operating Temperature	-40°C to $+80^\circ\text{C}$	
Storage Temperature	-55°C to $+100^\circ\text{C}$	
Vibration Operating	$8 g_{\text{rms}}$ 20 Hz to 2 kHz Random (Consult factory for other vibration level requirements)	
Vibration Survival	$20 g_{\text{rms}}$ 20 Hz to 2 kHz random 5 minutes/axis	
Shock	200g, any axis	
Weight	≤ 60 grams	
AVAILABLE OPTIONS		
<ul style="list-style-type: none"> • Special Non-Standard Ranges $< \pm 100^\circ/\text{sec.}$ and $> \pm 100^\circ/\text{sec.}$, Consult Factory • Extended Bandwidth • Low Noise • Extended Temperature Range • Flying Leads 		
*Values indicated are for $\pm 100^\circ/\text{sec.}$ range		

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