

# BEI GYROCHIP™ HORIZON

Micromachined Angular Rate Sensor



## Applications

- Antenna Stabilization Systems
- GPS Augmentation
  - Vehicle Location Systems
  - Navigation Systems
  - Precision Farming
- Factory Automation
- Medical/Orthopedic
- Instrumentation

## Description

The BEI GyroChip™ Horizon is a compact, high reliability, solid-state angular rotation sensor designed for use by original equipment manufacturers (OEM). It features a monolithic quartz sensing element, internal power regulation, and a simple interface which provides a high-level 0 to +5 Vdc output signal. Designed to operate from a +12 Vdc power supply, it also provides a +2.5 Vdc reference to allow for differential monitoring of the output.

## Features

- Micromachined Sensor
- Compact, Lightweight Design
- High Reliability
- Low Cost
- DC Input, DC Output Operation
- Internal Power Regulation
- Low Drift
- Fast Start-Up

## Operation

The BEI GyroChip™ Horizon utilizes a one piece, micromachined, vibrating quartz tuning fork sensing element. Applying the Coriolis effect, a rotational motion about the sensor's input axis produces a voltage proportional to the rate of rotation. Use of piezoelectric quartz material simplifies the active element, resulting in exceptional stability over temperature and product life.

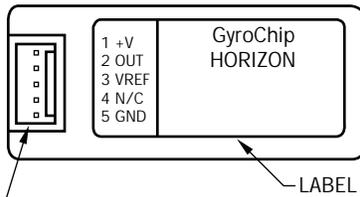


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BEI TECHNOLOGIES, INC.

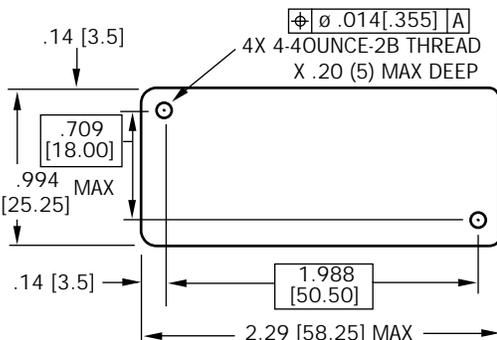
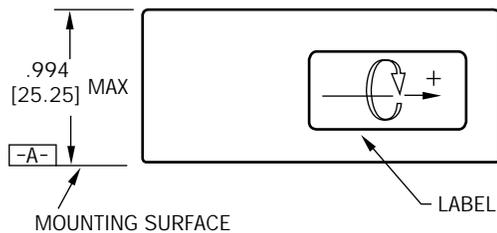
For applications assistance or more information on any of  
Systron Donner Inertial Division's micromachined inertial sensors,  
Call 1-800-227-1625.

# BEI GYROCHIP™ HORIZON

Micromachined Angular Rate Sensor



5 PIN SQUARE POST-HEADER .025 [0.63] POSTS  
MATES TO AMP MTA-100 CONNECTOR  
(OR MOLEX 2695 CONNECTOR)



## NOTES:

- HORIZON IS SUPPLIED WITH A MATING CONNECTOR (AMP MTA-100 OR MOLEX 2695).
- ANGULAR RATE AS SHOWN WILL PRODUCE A MORE POSITIVE OUTPUT.
- UNIT OF MEASURE IS IN INCHES/[MM].

Connector Pin	Assignment
1	+VDC Input
2	Rate Output
3	Ref. Voltage +2.5 Vdc
4	No Connection, Leave Open
5	Power and Signal Ground

## PARAMETER

## SUMMARY SPECIFICATION

Part Number

HZ1-90-100A

## Power Requirements

Input Voltage	+8 to +15 Vdc
Input Current	<20 mA

## Performance

Standard Range	$\pm 90^\circ/\text{sec}$
Full Range Output (Nominal)	+0.5 to +4.5 Vdc
Scale Factor Calibration (at 22°C)	$\leq 2\%$ of Value
Scale Factor over Temperature (Dev. from 22°C)	$\leq 0.08\%/^\circ\text{C}$
Bias Calibration (at 22°C)	$+2.5 \pm 0.045$ Vdc
Bias Variation over Temperature (Dev. from 22°C)	$< 4.5^\circ/\text{sec}$
Short Term Bias Stability (100 sec at const. temp)	$\leq 0.05^\circ/\text{sec}$
Long Term Bias Stability (1 year)	$\leq 1.0^\circ/\text{sec}$
G Sensitivity	$\leq 0.06^\circ/\text{sec/g}$
Start-Up Time	$< 1.0$ sec
Bandwidth ( $-90^\circ$ )	$> 18$ Hz
Non-Linearity	$\leq 0.05\%$ of F. R.
Threshold/Resolution	$\leq 0.004^\circ/\text{sec}$
Output Noise (DC to 100Hz)	$\leq 0.025^\circ/\text{sec}/\sqrt{\text{Hz}}$
Operating Life	10 years, typical

## Environments

Operating Temperature	-25 to +70°C
Storage Temperature	-55°C to +100°C
Vibration Operating	2 g <sub>rms</sub> 20 Hz to 2 kHz random
Vibration Survival	10 g <sub>rms</sub> 20 Hz to 2 kHz random
Shock	200 g

## Weight

$\leq 60$  grams

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BEI TECHNOLOGIES, INC.

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