

ER-MG2-100 North-Seeking MEMS Gyro

Introduction

The ER-MG2-100 is a single-axis MEMS angular rate sensor (gyroscope) capable of measuring angular velocity up to a maximum of $\pm 100^\circ/\text{s}$ with digital output compliant to SPI slave mode 3 protocol. Angular rate data is presented as a 24-bit word.

The ER-MG2-100 is intended for north seeking applications. An advanced, differential sensor design rejects the influence of linear acceleration, enabling the ER-MG2-100 to operate in exceedingly harsh environments where shock and vibration are present.

The ER-MG2-100 is available in a hermetically sealed ceramic LCC surface mount package, and is capable of operating at 5V supply and a wide temperature range (-50°C to $+85^\circ\text{C}$).

Features

Proven and robust silicon MEMS gyro

0.02°/hr bias instability

0.005°/ $\sqrt{\text{hr}}$ Angular Random Walk

Digital output (SPI slave)

5V operation (4.75~5.25V supply)

Low power consumption (35 mA)

High shock and vibration rejection

Hermetically sealed ceramic LCC surface mount package (11 x 11 x 2mm)

Integrated temperature sensor

RoHS compliant

Specification

Parameters	ER-MG2-100	Unit
Range	100	deg/s
Resolution	24	bits
Data rate	2K	Hz
Group delay	20	ms
Bandwidth (-3dB)	12	Hz
Scale factor at 25°C	80000	lsb/deg/s
Scale factor repeatability (1σ)	<50	ppm
Scale factor vs temperature (1σ)	300	ppm
Scale factor non-linearity (1σ)	<200	ppm
Bias instability	<0.02	deg/hr
Bias stability (1σ 10s)	<0.1	deg/hr
Bias stability (1σ 1s)	<0.3	deg/hr
Bias repeatability (1σ)	<0.1	deg/hr
Angular random walk	<0.005	°/√h
Bias error over temperature (1σ)	3	deg/Hr
Bias temperature variations, calibrated (1σ)	<0.3	deg/Hr
Noise peak to peak	±0.003	deg/s
G-Sensitivity	<1	°/hr/g
Vibration rectification error	<1	°/hr/g (rms)
Startup time	1	s
Sensor resonant frequency	11K~13K	
Environment, power and physical		
Shock (operating)	500g, 1ms, half sine wave	
Shock (survival)	10000g, 1.0ms, half sine wave	
Vibration (operating)	12grms, 20Hz to 2KHz random vibration	
Operating temperature	-45°C~85°C	
Max storage (survival) temperature	-55°C~125°C	
Supply voltage	5±0.25V	
Current consumption	40mA	