



Power Sensing Solutions for a Better Life

# VG380ZA

VERTICAL GYROSCOPE

The MEMSIC VG380ZA is a miniature fully-calibrated Vertical Gyroscope designed for demanding embedded applications that require a complete dynamic measurement solution in a robust low-profile package. The VG380ZA provides a standard SPI bus for cost-effective board-to-board communications.



UAV Flight Control



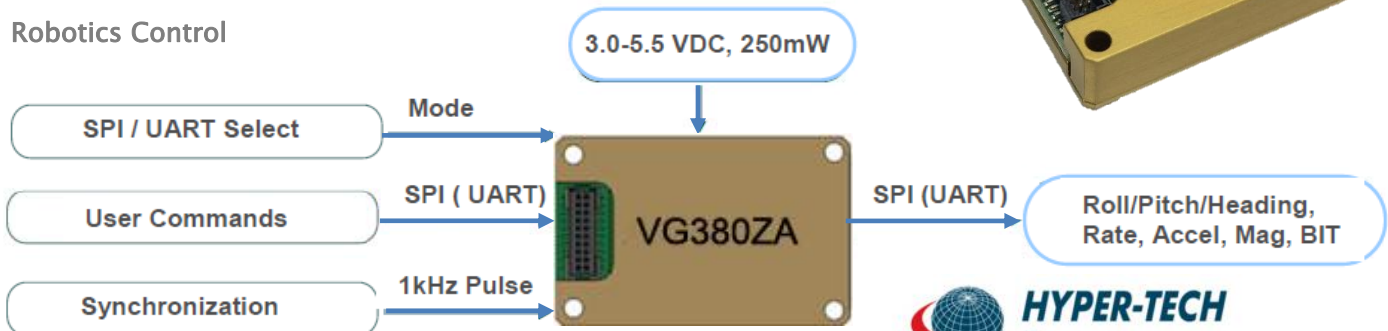
Uncertified Avionics

The MEMSIC VG380ZA integrates highly-reliable MEMS 6DOF inertial sensors with extended Kalman filtering in a miniature factory-calibrated module to provide consistent performance through the extreme operating environments in a wide variety of dynamic control and navigation applications.

## Applications

- Unmanned Vehicle Control
- Uncertified Avionics
- Platform Stabilization
- Robotics Control

- ### Features
- Complete 6DOF Inertial System
  - Roll/Pitch Outputs
  - SPI (or UART) Interface
  - Update Rate, 1Hz to 200Hz
  - 1KHz Clock Sync Input
  - Miniature Package, 24 x 37 x 9.5 mm
  - Lightweight < 17 g
  - Low Power Consumption < 250 mW
  - Wide Temp Range, -40C to +85C
  - High Reliability, MTBF > 50k hours



## Performance

## VG380ZA (-200, -400)

Attitude	
Range: Roll, Pitch (°)	± 180, ± 90
Accuracy (°)	< 0.2 <sup>4</sup> , < 1.0 <sup>3</sup>
Resolution (°)	< 0.02
Angular Rate	
Range: Roll, Pitch (°/sec)	± 200 (± 400 High Range Model)
Bias Instability (°/hr) <sup>1,2</sup>	< 10
Bias Stability Over Temp (°/sec) <sup>2</sup>	< 0.1
Resolution (°/sec)	< 0.02
Scale Factor Accuracy (%)	< 0.1
Non-Linearity (%FS)	< 0.1
Angle Random Walk (°/√hr) <sup>2</sup>	< 0.75
Bandwidth (Hz)	5-50 (user-configurable)
Acceleration	
Range: X, Y, Z (g)	± 4 (± 8 High Range Model)
Bias Instability (mg) <sup>1,2</sup>	< 0.02
Bias Stability Over Temp (mg) <sup>2</sup>	< 5
Resolution (mg)	< 0.5
Scale Factor Accuracy (%)	< 0.1
Non-Linearity (%FS)	< 0.1
Velocity Random Walk (m/s/√hr) <sup>2</sup>	< 0.05
Bandwidth (Hz)	5-50 (user-configurable)

## Specifications

Environment	
Operating Temperature (°C)	-40 to +85
Non-Operating Temperature (°C)	-55 to +105
Enclosure	Aluminum (Gold Anodized)
Electrical	
Input Voltage (VDC)	3.0 to 5.5
Power Consumption (mW)	< 250
Digital Interface	SPI or UART (user-configurable)
Output Data Rate	1Hz to 200Hz (user-configurable)
Input Clock Sync	1kHz Sync Pulse
Physical	
Size (mm)	24.15 x 37.7 x 9.5
Weight (gm)	< 17
Interface Connector	20-Pin (10 x 2) 1.0 mm pitch header

## Ordering Information

Model	Description
VG380ZA-200	Vertical Gyroscope (200dps Range)
VG380ZA-400	Vertical Gyroscope (400dps Range)
EVAL-KIT DMU380ZA-200	Evaluation Kit for DMU380 Family (Std Range)
EVAL-KIT DMU380ZA-400	Evaluation kit for DMU380 Family (High Range)

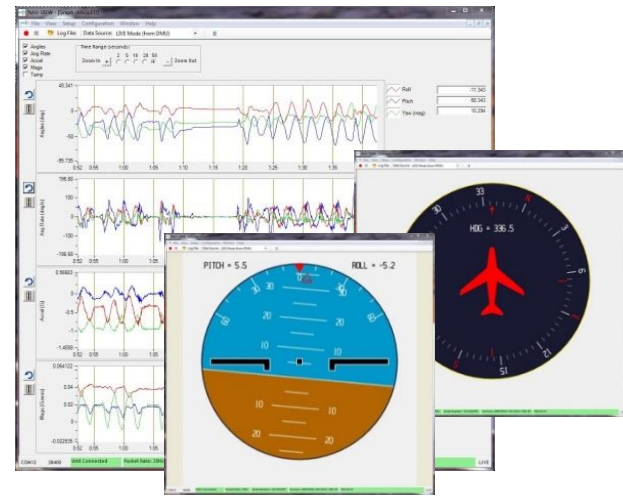
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<sup>1</sup> Allan Variance Curve, constant temperature. <sup>2</sup> 1-sigma error. <sup>3</sup> RMS error under all dynamics.

<sup>4</sup> RMS error under static conditions over full temperature range.

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## VERTICAL GYROSCOPE



NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all of the VG380ZA Attitude Reference System parameters.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the VG380ZA to optimize the system performance for highly dynamic applications.

## Other Components

The DMU380ZA evaluation kits include an VG380ZA, evaluation board, and USB cable allowing direct connection to a PC for use with NAV-VIEW display and configuration software.



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