MEMSIC *Power Sensing Solutions for a Better Life*

AHRS280ZA

ATTITUDE HEADING REFERENCE SYSTEM

The MEMSIC AHRS280ZA is a low cost miniature fully-calibrated Attitude & Heading Reference System designed for demanding embedded applications that require a complete dynamic measurement solution in a robust low-profile package. The AHRS280ZA provides a standard SPI bus for cost-effective board-to-board communications.

UAV Flight Control

Uncertified Avionics

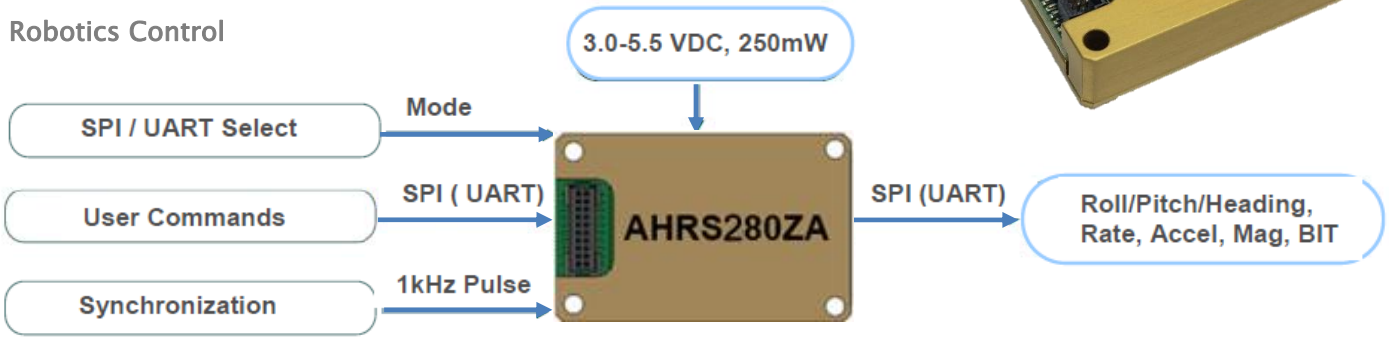
The MEMSIC AHRS280ZA integrates highly-reliable MEMS 6DOF inertial sensors and 3-axis magnetic sensors with extended Kalman filtering in a miniature factory-calibrated module to provide consistent performance through the extreme operating environments in a wide variety of dynamic control and navigation applications.

Features

- Complete 9DOF Inertial System
- Roll/Pitch/Heading 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

Applications

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



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ATTITUDE HEADING REFERENCE SYSTEM

Performance	AHRS280ZA (-200, -400)
Heading	
Range (º)	± 180
Accuracy (º)	< 1.0 [4], < 3.0 [3]
Resolution (º)	< 0.02
Attitude	
Range: Roll, Pitch (º)	± 180, ± 90
Accuracy (º)	< 1.0 [4] ,< 2.0 [3]
Resolution (º)	< 0.02
Angular Rate	
Range: Roll, Pitch, Yaw (º/sec)	± 200 (± 400 High Range Model)
Bias Instability (º/hr) [1,2]	< 20
Bias Stability Over Temp (º/sec) [2]	< 0.2
Resolution (º/sec)	< 0.02
Scale Factor Accuracy (%)	< 0.2
Non-Linearity (%FS)	< 0.2
Angle Random Walk (º/√hr) [2]	< 1.5
Bandwidth (Hz)	5-50 (user-configurable)
Acceleration	
Range: X, Y, Z (g)	± 4 (± 8 High Range Model)
Bias Instability (mg) [1,2]	< 0.05
Bias Stability Over Temp (mg) [2]	< 15
Resolution (mg)	< 0.5
Scale Factor Accuracy (%)	< 0.2
Non-Linearity (%FS)	< 0.2
Velocity Random Walk (m/s/√hr) [2]	< 0.1
Bandwidth (Hz)	5-50 (user-configurable)
Magnetic Field	
Range: X, Y, Z (Gauss)	± 4
Resolution (mGauss)	< 5
Noise Density (mGauss /√Hz) [2]	< 0.25
Bandwidth (Hz)	5

Specifications

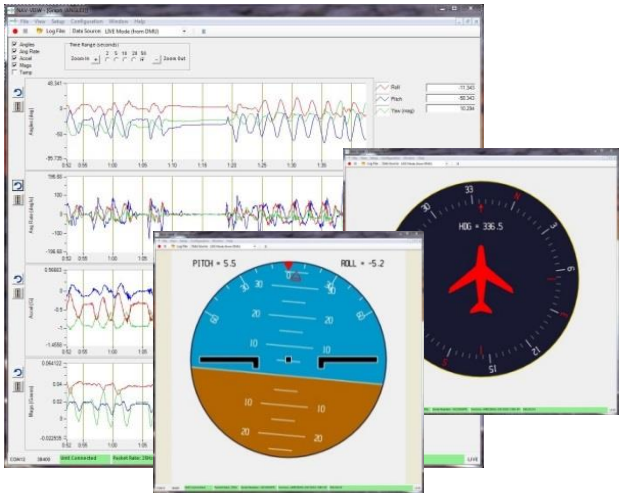
Environment	
Operating Temperature (ºC)	-40 to +85
Non-Operating Temperature (ºC)	-55 to +105
Enclosure	Aluminum (Gold Anodized)
Electrical	
Input Voltage (VDC)	3.0 to 5.5
Power Consumption (mW)	< 250
Digital Interface	SPI or UART (user-configurable)
Output Data Rate	1Hz to 200Hz (user-configurable)
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
AHRS280ZA-200	Attitude and Heading Reference System (Standard Range)
AHRS280ZA-400	Attitude and Heading Reference System (High Range)

[1] Allan Variance Curve, constant temperature. [2] 1-sigma error. [3] RMS error under all dynamics.
[4] RMS error under static conditions over full temperature range.

NAV-VIEW
Configuration and Display Software



NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all of the AHRS280ZA Attitude & Heading Reference System parameters.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the AHRS280ZA to optimize the system performance for highly dynamic applications.

NAV-VIEW software is available for download from MEMSIC's website at: www.memsic.com/support

Other Components

The DMU280ZA evaluation kits include an AHRS280ZA, evaluation board, and USB cable allowing direct connection to a PC for use with NAV-VIEW display and configuration software.

Support

For more detailed information please refer to the DMU280ZA Series User's Manual available online at: www.memsic.com/support

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