

AX301

Three-Axis Accelerometer Module Preliminary Specifications

Rev. P-B

Sentera Technology Corporation

The AX301 is a 3-axis accelerometer in a 40-pin DIP hybrid package with digital output. It uses the low-noise MEMS accelerometers to sense accelerations in the x, y and z axes. A low power microprocessor digitally filters the sensor data and compensates for the offset, scale factor, cross-axis sensitivity and misalignment of each sensing axis.

Applications

- Tilt measurement
- Vibration measurement
- Collision detection
- Machine health monitoring
- Human motion measurement
- Remote acceleration sensing

Features

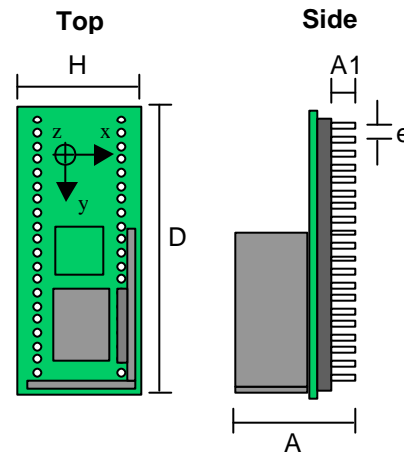
- **Small and Lightweight Package**
DIP-40 hybrid package allows easy insertion into system-level boards without the need for special connectors. Weighs less than 20 grams.
- **MEMS Technology**
Offers fast response at very low power.
- **Fully Compensated Outputs**
Factory calibrated for offset, scale factor, cross-axis sensitivity and misalignment of each accelerometer axis. Temperature compensated for improved bias stability.
- **Digital Outputs**
UART and SPI outputs for easy interfacing with system processor or peripherals.
- **Analog Supply Voltage Regulation**
Works with unregulated voltage supply between 6V to 10V.
- **User-Configurable FIR Filters**
Customize the bandwidth of the sensors by configuring the FIR filters.
- **Supports Power Cycling of Sensors**
For low power applications.

General Description

Sentera's AX301 tri-axial accelerometer module uses low noise MEMS accelerometers. The AX301 is capable of measuring accelerations in the range of +/- 2 g in the x, y and z axes. With a high sampling rate of 8 KHz and user-configurable FIR filters, the ADX301 can be easily customized to suit the frequency of a wide range of target applications.

Each AX301 is individually factory calibrated to ensure accuracy over the entire operating temperature range. Individual accelerometer offset and scale factor are compensated for by the microprocessor. Cross-axis sensitivity and misalignment compensation is also done in software to ensure that the sensing axes of the tri-axial accelerometer are aligned with the DIP hybrid package.

Package Drawing



| Symbol | Millimeters | Inches |
|--------|-------------|--------|
| H | 24.1 | 0.95 |
| D | 55.9 | 2.20 |
| A | 26.4 | 1.04 |
| A1 | 4.8 | 0.19 |
| e | 2.54 | 0.100 |

| Specification | | Remarks |
|---|---------------------|---|
| Digital Output Rate (Hz) | Up to 1000 | User configurable |
| Turn-on Time (msec) | < 10 | |
| Acceleration | | |
| • Range: X/Y/Z (g) | ±2 | Higher g ranges available |
| • Bias: X/Y/Z (mg) | ±15 | Over full temperature range |
| • Scale Factor Accuracy (%) | < 2 | Over full temperature range |
| • Non-linearity (% FS) | 0.5 | Typical |
| • Resolution (mg) | < 0.3 | |
| • Bandwidth (Hz) | Up to 500 | User configurable Higher bandwidth version available |
| • Noise Density ($\mu\text{g}/\text{Hz}^{1/2}$) | < 100 | |
| Environment | | |
| • Operating Temperature (°C) | 0 to 70 | Extended temperature range available |
| • Mechanical Shock (g) | 2000 | 0.5 ms |
| Electrical | | |
| • Analog Supply Voltage (V) | 6 to 10 unregulated | Or, 5V regulated. |
| • Digital Supply Voltage (V) | 3.3 | |
| • Current Consumption (mA) | 15 | Without power cycling |
| • Digital Output Format | UART and SPI | |

An evaluation kit for the AX301 is available. The evaluation kit includes the AX301, a demo system board, power supply and RS-232 serial cable. It also includes the PC application for configuring the AX301 and for viewing sensor data.

Optional Co-Processor(s)

The AX301 also comes with an optional co-processor(s) in the form of a digital signal processor and/or an ultra-low power microcontroller. These co-processors can be used to carry out additional algorithmic processing and/or communication protocols. Hence, an entire motion-processing sub-system can be realized on the same DIP-40 hybrid package. The co-processors are programmed via JTAG pins on the DIP-40 hybrid package. For more information on the co-processors and evaluation kits, please contact info@senteratechnology.com

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