

AXO[®]305



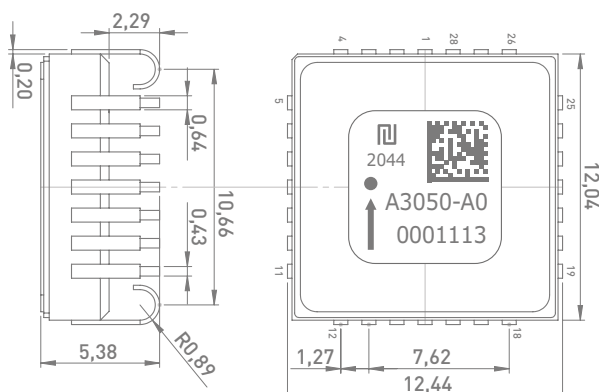
High performance ± 5 g MEMS accelerometer with digital interface

Superior bias and scale factor repeatability

AXO[®]305 is a single-axis, low noise, closed-loop digital MEMS accelerometer with ± 5 g input range that offers a digital, cost-effective and low-SWaP alternative to quartz accelerometers.

Its superior 1-year composite bias repeatability of 1 mg makes AXO[®]305 a perfect candidate for integration into high performance Inertial Measurement Units (IMU), Inertial Navigation Systems (INS) and Motion Reference Units (MRU) for land, railway, marine and subsea applications.

The hermetic ceramic SMD package combined with a 24 bits SPI interface eases the integration of AXO[®]305 and reduces the BOM. The built-in self-test ensures initial verification of the sensor's integrity and continuous in-operation functionality test.



12 x 12 x 5.5 mm³, 1.4 grams, J-Lead ceramic package

Key performances

- ± 5 g range, single-axis in-plane accelerometer
- 1 year composite bias repeatability: 1 mg
- Scale factor non linearity: 50 ppm
- Vibration rejection: 20 $\mu\text{g}/\text{g}^2$
- Noise density: 10 $\mu\text{g}/\sqrt{\text{Hz}}$
- Latency: 2 ms

Key features

- 24-bit digital SPI interface
- Initial and continuous self-test
- Factory-calibrated over temperature
- Hermetic ceramic SMD package
- Non classified under dual-use export control
- REACH and RoHS compliant

Applications

- IMU and INS for GNSS-assisted navigation of manned and unmanned ground vehicles
- MRU for ship motion control and dynamic positioning
- Platform, antenna, and crane stabilization
- Motion control of underwater vehicles
- IMU and INS for navigation of AUV and ROV
- IMU / INS for GNSS-assisted train positioning and navigation
- IMU for precision robotics



Key specifications

| Parameter | Typ. value | Unit | Note |
|---|-------------|-------------------|----------------------------------|
| Range | | | |
| Input range | ±5 | g | Saturation at 7 g |
| Scale Factor | | | |
| Digital Resolution | 1 | µg/LSB | |
| 1 year composite repeatability | 1000 | ppm | |
| Non linearity | 50 | ppm | |
| Residual temperature error (1σ) | 500 | ppm | Compensated |
| Bias | | | |
| 1 year composite repeatability | 1 | mg | |
| Instability (Allan Variance) | 3 | µg | |
| Residual temperature error (1σ) | 0.5 | mg | Compensated |
| Vibration Rectification Error (VRE) | 20 | µg/g ² | Under 4.12 g rms (20 to 2000 Hz) |
| Bandwidth, noise and output signal | | | |
| Bandwidth | 120 | Hz | Customizable upon request |
| Velocity Random Walk (VRW) | 0.005 | m/s/√h | |
| Noise spectral density | 10 | µg/√Hz | From 0 to 100 Hz |
| Data rate | 2500 | Hz | Configurable |
| Latency | 2 | ms | Customizable upon request |
| Operating Conditions | | | |
| Operational vibrations | 4.12 | g rms | DO-160G standard, curve C |
| Operational shock | 50 6 | g ms | Half sine |
| Survival shock | 2000 0.3 | g ms | |
| Operating temperature range | -40 to +85 | °C | |
| Reliability | | | |
| Mean Time Between Failure (MTBF) | > 1 000 000 | h | |
| Power and supply | | | |
| Power supply | 5 | V | |
| Current consumption | 25 | mA | |

Sensors are factory calibrated and compensated for temperature effects to provide a high-accuracy digital output over the temperature range. Raw data output can also be chosen to enable compensations at the IMU or at the system level.

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