

# AXO<sup>®</sup>314



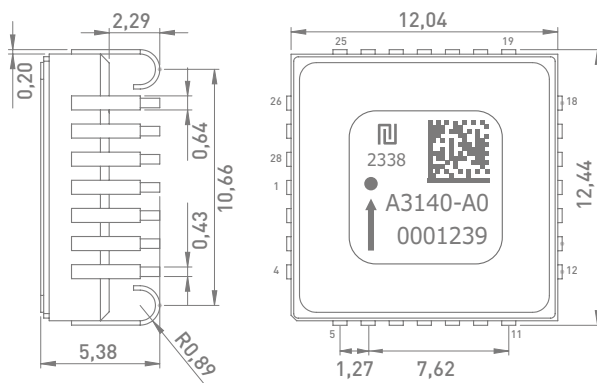
## High performance $\pm 14$ g MEMS accelerometer with digital interface

### High performance and stability for precision navigation and positioning

AXO<sup>®</sup>314 is a high performance, closed-loop, single-axis in-plane digital MEMS accelerometer which offers a digital and cost-effective alternative to quartz accelerometers at a fraction of their size, weight and power consumption. With a 1 year composite bias repeatability of 1 mg, it overpasses all commercially available MEMS accelerometers.

AXO<sup>®</sup>314 is the perfect candidate for integration into high performance Inertial Measurement Units (IMU) and Inertial Navigation Systems (INS) operating in highly vibrating environments, such as land, railway and air transportation.

The hermetic ceramic SMD package combined with a 24 bits SPI interface eases the integration of AXO<sup>®</sup>314 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 mm<sup>3</sup>, 1.4 g, J-Lead ceramic package

### Key performances

- $\pm 14$  g range, single-axis in-plane accelerometer
- 1 year composite bias repeatability: 1 mg
- 1 year composite scale factor repeatability: 600 ppm
- Vibration rejection: 20  $\mu\text{g}/\text{g}^2$
- Noise: 15  $\mu\text{g}/\sqrt{\text{Hz}}$
- Temperature range: from  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$

### 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 and positioning of UAV & UGV
- Aerial survey and mapping
- Survey and drilling guidance of mining instruments
- MRU for motion control of marine and subsea vehicles
- IMU for Track Geometry Measurement Systems
- Industrial robotics



## Key specifications

| Parameter                                 | Typ. value  | Unit              | Note                            |
|---|-------------|-------------------|---------------------------------|
| <b>Range</b>                              |             |                   |                                 |
| Input range                               | ±14         | g                 | Saturation at 15 g              |
| <b>Scale Factor</b>                       |             |                   |                                 |
| Digital Resolution                        | 2           | µg/LSB            |                                 |
| 1 year composite repeatability            | 600         | ppm               |                                 |
| Non linearity                             | 50          | ppm               |                                 |
| Residual temperature error (1σ)           | 500         | ppm               | Compensated                     |
| <b>Bias</b>                               |             |                   |                                 |
| 1 year composite repeatability            | 1           | mg                |                                 |
| Instability (Allan Variance)              | 4           | µg                |                                 |
| Residual temperature error (1σ)           | 0.5         | mg                | Compensated                     |
| Vibration Rectification Error (VRE)       | 20          | µg/g <sup>2</sup> | Under 4.12 g rms (20 to 2000Hz) |
| <b>Bandwidth, noise and output signal</b> |             |                   |                                 |
| Bandwidth                                 | 300         | Hz                | Customizable upon request       |
| Velocity Random Walk (VRW)                | 0.006       | m/s/√h            |                                 |
| Noise spectral density                    | 15          | µg/√Hz            |                                 |
| Data rate                                 | 2500        | Hz                | User-configurable               |
| Latency                                   | 1           | ms                |                                 |
| <b>Operating Conditions</b>               |             |                   |                                 |
| 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                |                                 |
| <b>Reliability</b>                        |             |                   |                                 |
| Mean Time Between Failure (MTBF)          | > 1 000 000 | h                 |                                 |
| <b>Power and supply</b>                   |             |                   |                                 |
| 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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