

AXO[®]301



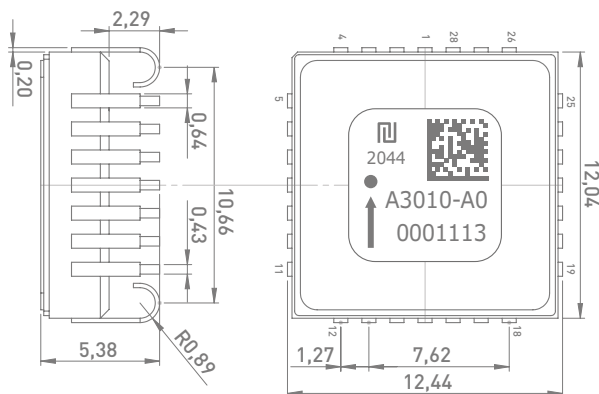
High resolution ± 1 g MEMS accelerometer with digital interface

High resolution and high stability in vibrating environments

AXO[®]301 is a single-axis, low noise, closed-loop MEMS accelerometer with ± 1 g input range that offers a digital, cost-effective, and low-SWaP alternative to quartz accelerometers.

AXO[®]301 is perfectly suited to acceleration and inclination measurements for applications operating in highly vibrating environments, such as high-end industrial and railway systems.

The 24-bit digital SPI interface eases the integration of AXO[®]301 into high performance inclinometers and motion control systems. 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

- ± 1 g range, single-axis in-plane accelerometer
- Broadband resolution: 50 μ g
- Scale factor non linearity: 80 ppm
- 1 year composite bias repeatability: 1 mg
- Bandwidth: 15 Hz (configurable upon request)
- Vibration rejection: 20 μ g/g²
- Compliant with EN61373 railway standard for vibrations and shocks

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

- Acceleration and deceleration measurement
- Train odometry and Automated Train Control
- Train performance testing
- Train tilt measurement
- Static and dynamic inclinometers
- Tilt sensors
- Motion control of construction machinery



Key specifications

Parameter	Typ. value	Unit	Note
Range			
Input range	±1	g	Saturation at 7 g
Scale Factor			
Digital Resolution	1	µg/LSB	
1 year composite repeatability	1000	ppm	
Non linearity	80	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 3.8 g rms (10-500Hz)
Bandwidth, noise and output signal			
Bandwidth	15	Hz	Customizable upon request
Velocity Random Walk (VRW)	0.005	m/s/√h	
Noise spectral density	9	µg/√Hz	
Broadband resolution	50	µg rms	Sensor resolution over the frequency range
Data rate	950	Hz	User-configurable
Latency	20	ms	Customizable upon request
Operating Conditions			
Operational vibrations	3.8	g rms	Random, 10 to 500 Hz (EN61373 standard)
Operational shock	100 6	g ms	Half-sine (EN61373 standard)
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 system level.

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