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AXO[®]301



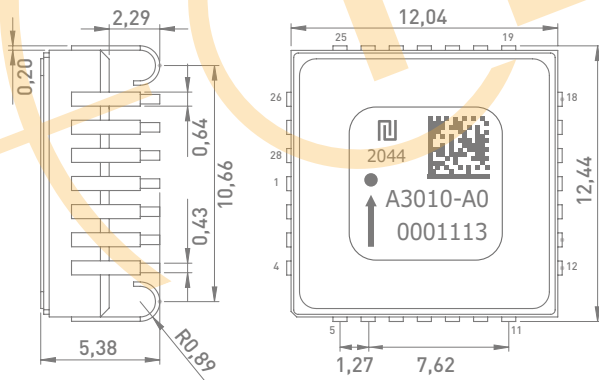
High resolution ± 1 g MEMS accelerometer with digital interface

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

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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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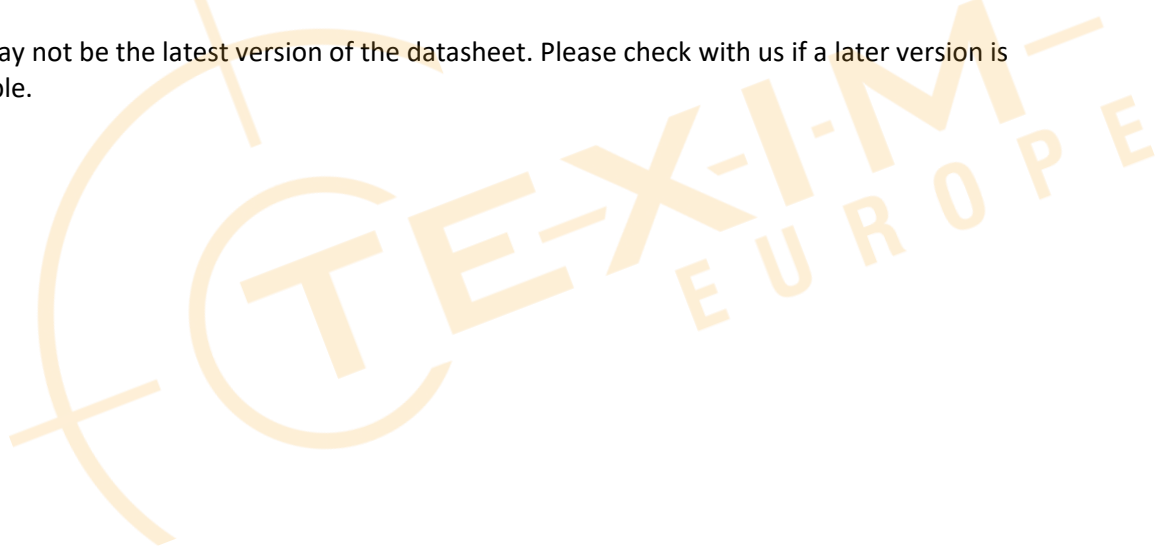
It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.





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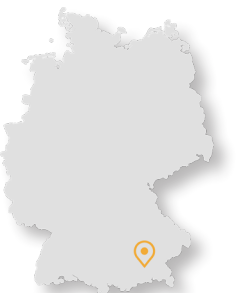
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