

# AXO<sup>®</sup>301



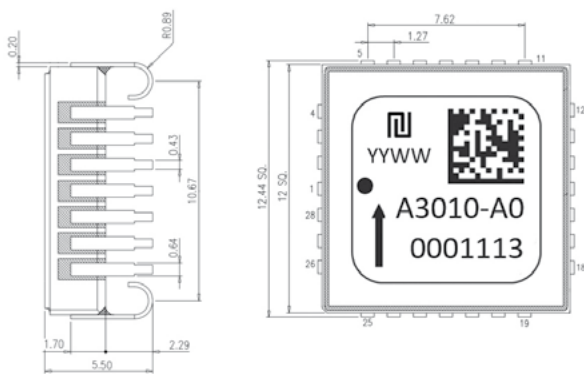
## High resolution $\pm 1$ g MEMS accelerometer with digital interface

### High resolution and high stability in vibrating environments

AXO<sup>®</sup>301 is a high accuracy, single-axis closed-loop MEMS accelerometer that offers a performance-equivalent and cost-effective alternative to quartz and servo-accelerometers at a fraction of their size, weight and power. It overpasses all commercially available MEMS accelerometers.

AXO<sup>®</sup>301 is perfectly suited to acceleration and deceleration measurements for applications operating in highly vibrating environments, such as land and railway positioning and navigation systems.

The 24-bit digital SPI interface eases the integration of AXO<sup>®</sup>301 into high performance IMU and INS. 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 grams, J-Lead ceramic package

### Key performances

- $\pm 1$  g range, single-axis in-plane accelerometer
- Resolution: 50  $\mu$ g
- 1 year composite bias repeatability: 1 mg
- 1 year composite scale factor repeatability: 600 ppm
- Bandwidth: 15 Hz (configurable upon request)
- Vibration rejection: 20  $\mu$ g/g<sup>2</sup>
- 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

- IMU for train odometry and Automated Train Control
- INS for GNSS-assisted land & railway positioning and navigation
- Train performance testing
- Train tilt sensing
- Dynamic inclinometers



## Key specifications

Parameter	Typ. value	Unit	Note
<b>Range</b>			
Acceleration range	±1	g	Saturation at 8 g
<b>Scale Factor</b>			
1 year composite repeatability	600	ppm	
Non linearity	80	ppm	
Residual temperature error	± 400	ppm	Compensated
<b>Bias</b>			
1 year composite repeatability	1	mg	
Instability (Allan Variance)	4	µg	
Residual temperature error	± 0.5	mg	Compensated
Vibration rectification error (VRE)	20	µg/g <sup>2</sup>	Under 3.8 g rms (10-500Hz)
<b>Bandwidth, noise and output signal</b>			
Bandwidth	15	Hz	Customizable upon request
Velocity Random Walk	0.006	m/s/√h	
Noise spectral density	8	µg/√Hz	
Broadband resolution	50	µg rms	
Data rate	900	Hz	User-configurable
Latency	20	ms	Customizable upon request
<b>Operating Conditions</b>			
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	
<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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