TDK

AXO®305

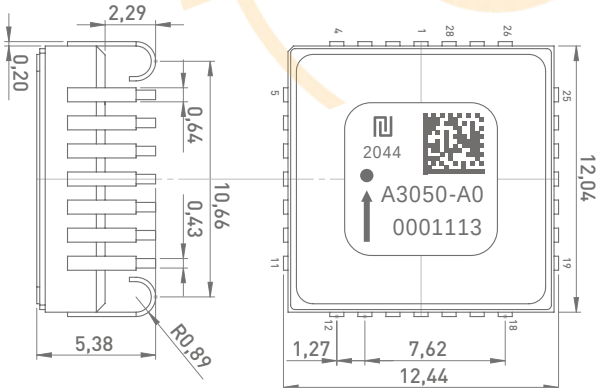
High performance ± 5 g MEMS accelerometer with digital interface

Superior bias and scale factor repeatability

AXO®305 is a single-axis, high performance, 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: 80 ppm
- Vibration rejection: 20 µg/g²
- Noise density: 8 µg/√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

tronics

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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	600	ppm	
Non linearity	80	ppm	
Residual temperature error (1σ)	400	ppm	Compensated
Bias			
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/g²	Under 4.12 g rms (20 to 2000Hz)
Bandwidth, noise and output signal			
Bandwidth	120	Hz	Customizable upon request
Velocity Random Walk (VRW)	0.006	m/s/√h	
Noise spectral density	8	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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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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