

# AXO<sup>®</sup>315T1

High-temperature MEMS  
accelerometer for 175°C  
oil & gas applications



## Product overview

AXO315T1 is a single-axis, high temperature, closed-loop MEMS accelerometer that offers a digital, cost-effective, and low-SWaP alternative to quartz accelerometers for precise inclination measurement in directional drilling applications exposed to temperatures up to 175°C. Its superior vibration rejection enabled by an innovative closed-loop architecture makes AXO315T1 a perfect candidate for integration into directional modules used for drilling tools guidance under harsh vibrations and shocks.

## Key performances

- ±14 g input range
- Operating temperature: -30 to +175°C
- Bias temperature error: 1.7 mg
- Scale factor temperature error: 500 ppm
- Lifetime: >1000 hours @ 175°C
- Vibration rejection: 20  $\mu\text{g/g}^2$
- Noise density: 10  $\mu\text{g}/\sqrt{\text{Hz}}$

## Key features

- 24-bit digital SPI interface
- Initial and continuous self-test
- Hermetic ceramic SMD package
- Non classified under dual-use export control
- REACH and RoHS compliant

## Applications

- Measurement While Drilling (MWD)
- Logging While Drilling (LWD)
- Directional drilling
- Wireline





Parameter	Typ. value	Unit	Note
<b>Range</b>			
Input range	±14	g	
<b>Operating conditions</b>			
Operating temperature	-30 to +175	°C	
<b>Bias</b>			
Instability at room temperature	3	µg	
Instability at +175°C	10	µg	
Residual temperature error	1.7	mg	Over full temperature range, after a 5th order external compensation
Vibration rectification error	20	µg/g <sup>2</sup>	
<b>Scale Factor</b>			
Residual temperature error	500	ppm	Over full temperature range
Non linearity	80	ppm	
<b>Noise</b>			
Noise density at room temperature	10	µg/√Hz	Over the full bandwidth
Noise density at +175°C	20	µg/√Hz	Over the full bandwidth
VRW at room temperature	0.004	m/s/√h	
VRW at +175°C	0.007	m/s/√h	
<b>Vibrations and shocks</b>			
Random vibrations	20	g rms	50 to 2000 Hz
Sine vibrations	50	g peak	Sine sweep 50 to 800 Hz
Shocks (survival)	2000	g	0.3 ms
<b>Frequency response</b>			
Bandwidth	150	Hz	
Data rate	2500	Hz	
Latency	2	ms	
<b>Power and supply</b>			
Power supply	5	V	
Current consumption	25	mA	
<b>Reliability</b>			
Powered lifetime	> 1000	h	At 175°C

Production. Specification subject to change without notice. 2025 © Tronics' Microsystems SA. All rights reserved. MCD083-B



info.tronics@tdk.com  
www.tronics.tdk.com

tronics