



KXTH9 Series

Accelerometers and Inclinometers

FEATURES

- Ultra-small Package - 3x3x0.9mm LGA
- Low Power Consumption
- Multiplexed Analog Output
- Factory-programmable Internal Low Pass Filter
- Ultra-low Noise Density
- Lead-free Solderability
- Excellent Temperature Performance
- High Shock Survivability
- Factory-programmable Offset and Sensitivity
- Auxiliary Input to Multiplexer
- Self-test Function

PROPRIETARY TECHNOLOGY

The **KXTH9** series is designed to provide a high signal-to-noise ratio with excellent performance over temperature. These sensors can accept supply voltages between 1.8V and 3.6V. Sensitivity is factory programmable allowing customization for applications requiring from 1.5g to 6.0g ranges. The auxiliary input to the multiplexer minimizes the need for external A/D converters.

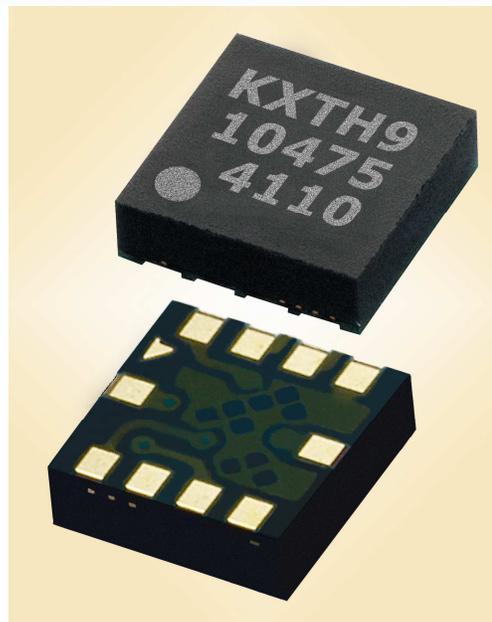
These high-performance silicon micromachined linear accelerometers and inclinometers consist of a sensor element and an ASIC packaged in a 3x3x0.9 mm Land Grid Array (LGA). The sensor element is fabricated from single-crystal silicon with proprietary Deep Reactive Ion Etching (DRIE) processes, and is protected from the environment by a hermetically-sealed silicon cap at the wafer level.

The sensor element functions on the principle of differential capacitance. Acceleration causes displacement of a silicon structure resulting in a change in capacitance. An ASIC, fabricated using a standard CMOS manufacturing process, detects and transforms changes in capacitance into an analog output voltage, which is proportional to acceleration.

MARKETS

APPLICATIONS

- Ultra-mobile PCs/Laptops/Hard Disk Drives*
- Free-fall Detection
- Cell Phones and Handheld PDAs*
- Gesture Recognition and User Interface Function
- Game Controllers & Computer Peripherals*
- Inclination and Tilt Sensing
- Personal Navigation Devices*
- Inertial Navigation and Dead Reckoning
- Cameras and Video Equipment*
- Image Stabilization
- Sports Diagnostic Equipment/Pedometers*
- Static or Dynamic Acceleration



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PERFORMANCE SPECIFICATIONS

The performance parameters below are programmed and tested at 2.5 volts. However, the device can be factory programmed to accept supply voltages from 1.8 V to 3.6 V. Performance parameters will change with supply voltage variations.

PERFORMANCE SPECIFICATIONS			
PARAMETERS	UNITS	KXTH9-2083	CONDITION
Range ¹	g	±2.5	Factory programmable
Sensitivity	mV/g	400 typical (412 max)	
0g Offset vs. Temp	mg/°C	±0.6 typical	-40°C to +85°C
Sensitivity vs. Temp	%/°C	±0.01 (xy) typical ±0.04 (z) typical	-40°C to +85°C
Noise	mg / √Hz	150 typical	
Bandwidth ²	Hz	50 typical	-3dB
Non-Linearity	% of FS	0.1 typical	% of full scale output
Ratiometric Error	%	0.3 typical	V _{dd} =2.5V±5%
Cross-axis Sensitivity	%	2.0 typical	
Power Supply	V	2.5	Standard
Current Consumption	μA	350 typical	Operating
	μA	5 typical	Standby
ENVIRONMENTAL SPECIFICATIONS			
PARAMETERS	UNITS	KXTH9-2083	CONDITION
Operating Temperature	°C	-40 to 85	Powered
Storage Temperature	°C	-55 to 150	Un-powered
Mechanical Shock	g	5,000 for 0.5ms 10,000 for 0.2ms	Powered or un-powered halversine
ESD	V	3,000	Human body model

NOTES

¹ Custom ranges from 1.5g to 6.0g available.

² Factory-programmable internal low pass filter.

ORDERING GUIDE

Product	Output	Axis(es) of Sensitivity	Range (g)	Sensitivity mV/g	Offset (V)	Operating Voltage (V)	Temperature (°C)	Package
KXTH9-2083	Multiplexed Analog	XYZ	2.5	400 typical	1.25	2.5	-40 to +85	3x3x0.9 LGA