KXTH5 Series

Accelerometers and Inclinometers

FEATURES

Very Small Package - 3x5x0.9mm 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

MARKETS

APPLICATIONS

Personal Navigation Devices

Inertial Navigation and Dead Reckoning

Cell Phones and Handheld PDAs

Gesture Recognition

Game Controllers & Computer Peripherals

Inclination and Tilt Sensing

Ultra-Mobile PCs/Laptops/Hard Disk

Free-fall Detection

Cameras and Video Equipment

Image Stabilization

Sports Diagnostic Equipment/Pedometers

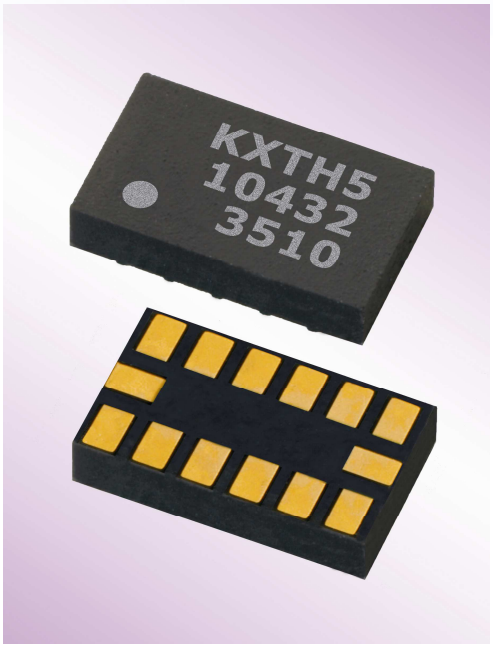
Static or Dynamic Acceleration

PROPRIETARY TECHNOLOGY

The KXTH5 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. Sensor bandwidth is user-definable. 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 3x5x0.9 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.



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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**	**KXTH5-4325**	**CONDITION**
Range [1]	g	±2.75	Factory programmable
Sensitivity	mV/g	364 typical (382 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	µg / √Hz	150 typical	
Bandwidth [2]	Hz	1000 typical	-3dB
Non-Linearity	% of FS	0.1 typical	% of full scale output
Ratiometric Error	%	0.3 typical	Vdd ± 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**	**KXTH5-4325**	**CONDITION**
Operating Temperature	°C	-40 to 85	Powered
Storage Temperature	°C	-55 to 150	Un-powered
Mechanical Shock	g	5,000 for 0.5 ms 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] Internal low pass filter.

ORDERING GUIDE

Product	Output	Axis(es) of Sensitivity	Range (g)	Sensitivity mV/g	Offset (V)	Operating Voltage (V)	Temperature (℃)	Package
KXTH5-4325	Multiplexed Analog	XYZ	2.75	364 typical	1.25	2.5	-40 to +85	3x5x0.9 LGA