



KXTC8 Series

Accelerometers and Inclinometers

FEATURES

- Small Package - 4x4x1.3mm LGA
- Analog Output
- Low Power Consumption
- Factory-Programmable Internal Low-Pass Filter
- Low Noise
- Lead-free Solderability
- Excellent Temperature Performance
- High Shock Survivability
- User Definable Bandwidth
- Factory Programmable Offset and Sensitivity
- Self-test Function

PROPRIETARY TECHNOLOGY

The **KXTC8** 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 $\pm 2g$ to $\pm 6g$ ranges. Several pre-set internal low-pass filters can eliminate the need for external filter capacitors. If the pre-set values are not optimal for an application, the sensor bandwidth is user-definable with the use of external capacitors.

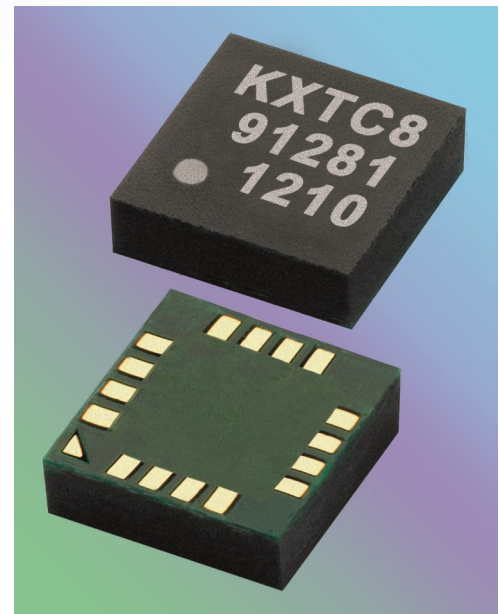
These high-performance silicon micromachined linear accelerometers and inclinometers consist of a sensor element and an ASIC packaged in a 4x4x1.3mm Land Grid Array Dual (LGA). The sensor element is fabricated from single-crystal silicon with proprietary Deep Reactive Ion Etching (DRIE) processes, and 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, using a standard CMOS manufacturing process, detects and transforms changes in capacitance into an analog output voltage, which is proportional to acceleration. The sense element design utilizes common mode cancellation to decrease errors from process variation and environmental stress.

MARKETS

APPLICATIONS

- Cell Phones and Handheld PDAs*
 - Gesture Recognition
- Ultra-Mobile PCs/Laptops/Hard Disk Drives*
 - Free-fall Detection
- Game Controllers & Computer Peripherals*
 - Inclination and Tilt Sensing
- 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 3.3 volts. However, the device can be factory programmed to accept supply voltages from 1.8V to 3.6V. Performance parameters will change with supply voltage variations.

PERFORMANCE SPECIFICATIONS			
PARAMETERS	UNITS	KXTC8-2850	CONDITION
Range	g	±2.86	Factory programmable
Sensitivity	mV/g	462 typical	
0g Offset vs. Temp.	mg/°C	±0.7 typical	
Sensitivity vs. Temp	%/°C	±0.01 (xy) ±0.03(z) typical	
Noise Density (on filter pins)	$\mu\text{g} / \sqrt{\text{Hz}}$	130 typical	
Mechanical Resonance ¹	Hz	3500 (xy) 1800 (z)	-3dB
Bandwidth (-3dB) ²	Hz	No low pass	Factory programmable
Non-Linearity	% of FS	0.2 typical	% of full scale output
Ratiometric Error	%	±0.2	V _{dd} = 3.3V ± 5%
Cross-axis Sensitivity	%	2.0 typical	
Power Supply	V	3.3	Standard
Current Consumption	μA	230 typical	Operating (full power)
	μA	5 typical	Standby
ENVIRONMENTAL SPECIFICATIONS			
PARAMETERS	UNITS	KXTC8-2850	CONDITION
Operating Temperature	°C	-40 to +85	Powered
Storage Temperature	°C	-55 to 150	Un-powered
Mechanical Shock	g	5000 for 0.5ms 10,000 for 0.2ms	Powered or un-powered, halversine
ESD	V	2000	Human body model

NOTES

¹ Resonance as defined by the dampened mechanical sensor.

² Factory programmable to have a switched capacitor low pass filter at 2kHz, 1kHz, 500Hz, 100Hz, 50Hz, or no low pass filter. Optionally, the user can define with external capacitors. Maximum defined by the frequency response of the sensors.

ORDERING GUIDE

Product	Axes of Sensitivity	Range (g)	Sensitivity (mV/g)	Offset (V)	Operating Voltage (V)	Temperature (°C)	Package
KXTC8-2850	XYZ	±2.86	462	1.65	3.3	-40 to +85	4x4x1.3mm LGA