KXSC4 Series

Accelerometers and Inclinometers

FEATURES

Small Package - 5x5x1.2 DFN

Low Current Consumption

Analog Output

Lead-free Solderability

High Shock Survivability

Excellent Temperature Performance

Low Noise Density

User-definable Bandwidth

Factory Programmable Offset and Sensitivity

Self-test Function

MARKETS

APPLICATIONS

Ultra-Mobile PCs/Laptops/Hard Disk Drives

Free-fall Detection

Cell Phones and Handheld PDAs

Gesture Recognition

Game Controllers & Computer Peripherals

Inclination and Tilt Sensing

Cameras and Video Equipment

Image Stabilization

Sports Diagnostic Equipment/Pedometers

Static or Dynamic Acceleration

Personal Navigation Devices

Inertial Navigation and Dead Reckoning

PROPRIETARY TECHNOLOGY

The KXSC4 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.

These high-performance silicon micromachined linear accelerometers and inclinometers consist of a sensor element and an ASIC packaged in a 5x5x1.2mm Dual Flat No-lead (DFN). 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.

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KXSC4 Series

PERFORMANCE SPECIFICATIONS

The performance parameters specified below reflect those of the KXSC4-2050, a standard product factory programmed for a 3.3 supply voltage and ±2g sensitivity. However, the KXSC4 can be factory programmed for supply voltages from 1.8V to 3.6V and sensitivity ranging from ±1.5g to ±6g. Performance parameters will change with supply voltage variations.

PERFORMANCE SPECIFICATIONS			
PARAMETERS	**UNITS**	**KXSC4-2050**	**CONDITION**
Range	g	±2.0	Factory programmable
Sensitivity	mV/g	660 typical	
0g Offset vs. Temp.	mg/°C	±0.4 typical	-40 to 85
Sensitivity vs. Temp	%/°C	±0.02 typical	-40 to 85
Noise	$\mu g / \sqrt{Hz}$	125 typical	
Mechanical Resonance [1]	Hz	3500 (xy) 1800 (z) typical	-3dB
LPF Bandwidth	Hz	50 default 100, 500, 1000, 2000, no filter (available settings)	Factory programmable
Non-Linearity	% of FS	0.2 typical	For 10-90% of range
Ratiometric Error	%	0.3 typical	
Cross-axis Sensitivity	%	2.0 typical	
Power Supply	V	3.3 typical	
Current Consumption	µA	230 typical	Operating
	µA	0.05 typical	Standby
ENVIRONMENTAL SPECIFICATIONS			
PARAMETERS	**UNITS**	**KXSC4-2050**	**CONDITION**
Operating Temperature	°C	-40 to +85	Powered
Storage Temperature	°C	-55 to +150	Unpowered
Mechanical Shock [2]	g	5000 10000	0.5 msec halversine 0.2 msec halversine
ESD	V	2000	Human body model

NOTE

[1] Resonance as defined by the dampened mechanical sensor.

[2] Powered and unpowered.

ORDERING GUIDE

Product	Axis(es) of Sensitivity	Range (g)	Sensitivity (mV/g)	Offset (V)	Operating Voltage (V)	Temperature (°C)	Package
KXSC4-2050	XYZ	±2	660	1.65	3.3	-40 to +85	5x5x1.2mm DFN