KXD94 Series

Accelerometers and Inclinometers

FEATURES

Small Package - 5x5x1.2mm DFN
Multiplexed Analog Output
Internal 1KHz Low Pass Filter
Low Noise
Lead-free Solderability
Excellent Temperature Performance
High Shock Survivability
Low Power Consumption
User Definable Bandwidth
Factory Programmable Offset and Sensitivity
Self-test Function

MARKETS

APPLICATIONS

Automotive

Active Suspension
Stability Control
Telematics/GPS

Industrial

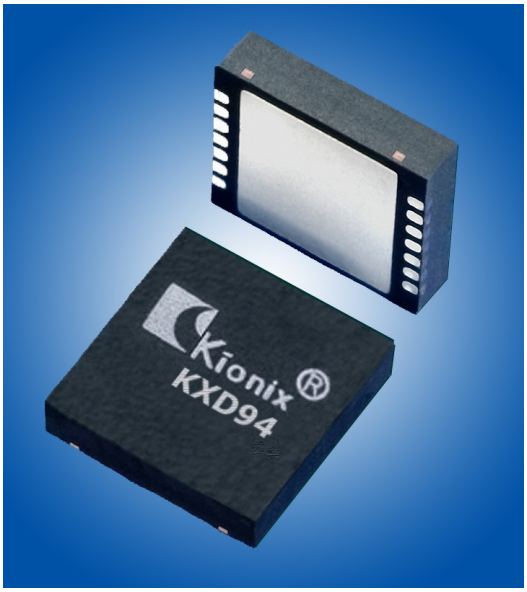
Platform Stabilization
Drill Orientation
Event Detection
Vibration Analysis
Appliance Monitoring

PROPRIETARY TECHNOLOGY

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 KXD94 series is designed to provide a high signal-to-noise ratio with excellent performance over temperature. These sensors can accept supply voltages between 2.5 – 5.25V. Sensitivity is factory programmable for applications requiring from ±5.0g to ±15.0g ranges. Sensor bandwidth is user-definable.

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, temperature, and environmental stress.



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PERFORMANCE SPECIFICATIONS

The performance parameters below are programmed and tested at 5.0 volts.

PERFORMANCE SPECIFICATIONS				
PARAMETERS	**UNITS**	**KXD94-2802**	**KXD94-7228**	**CONDITION**
Range	g	±10	±13	Factory programmable
0g Offset vs. Temp.	mg/°C	±1.0 typical		
Sensitivity vs. Temp	%/°C	±0.01		
Noise Density	$\mu g / \sqrt{Hz}$	100 typical		On filter pins
Bandwidth [1]	Hz	800 typical		-3dB
Non-Linearity	% of FS	0.1 typical		% of full scale output
Ratiometric Error	%	±0.2 (XY) ±0.1 (Z)	±0.5 typical	5.0V ± 5%
Cross-axis Sensitivity	%	2.0 typical		
Power Supply	V	5.0 typical		Standard
Current Consumption	mA	1.20 typical	1.10 typical	Operating
	µA	5 max		Standby
ENVIRONMENTAL SPECIFICATIONS				
PARAMETERS	**UNITS**	**KXD94-2802**	**KXD94-7228**	**CONDITION**
Operating Temperature	°C	-40 to +85 (Consumer/ Industrial)	-40 to +125 (Automotive)	Powered
Storage Temperature	°C	-55 to 150		Unpowered
Mechanical Shock	g	5000		Powered and unpowered, 0.5 msec halversine
ESD	V	3000		Human body model

NOTE

[1] Internal 1 KHz low pass filter. Lower frequencies are user definable with external capacitors.

ORDERING GUIDE

Product	Axis(es) of Sensitivity	Range (g)	Sensitivity (mV/g)	Offset (V)	Operating Voltage (V)	Temperature (°C)	Package
KXD94-2802	XYZ	10	200	2.5	5.0	-40 to +85	5x5x1.2 DFN
KXD94-7044	X	13	150	2.5	5.0	-40 to +125	5x5x1.2 DFN
KXD94-7138	X	5	400	2.5	5.0	-40 to +125	5x5x1.2 DFN
KXD94-7228	XYZ	13	150	2.35 (X) 2.5 (Y, Z)	5.0	-40 to +125	5x5x1.2 DFN