



KXP94 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

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 **KXP94** series is designed to provide a high signal-to-noise ratio with excellent performance over temperature. These sensors can accept supply voltages between 2.5V and 5.25V. Sensitivity is factory programmable allowing customization for applications requiring from $\pm 1.5g$ to $\pm 6.0g$ 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 analog output is also accessed through an on-board 4-channel multiplexer. The sense element design utilizes common mode cancellation to decrease errors from process variation and environmental stress.

MARKETS

APPLICATIONS

Notebook and Ultra Mobile Personal Computers (UMPC)

- Hard Disk Drive Protection
- Screen Orientation

Personal Navigation Devices

- Inertial Navigation & Dead Reckoning

Cell Phones and Handheld PDAs

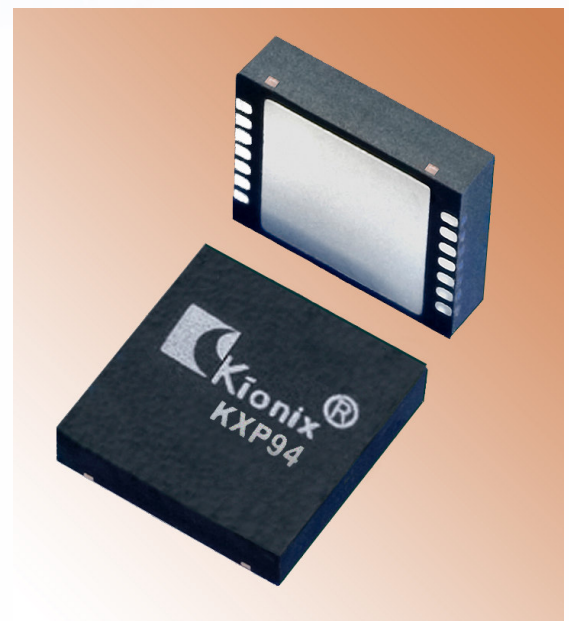
- Gesture Recognition

Cameras, Video Equipment & Personal Media Players

- Inclination
- Free-fall Detection
- Image Stabilization
- Tilt Sensing
- Screen Orientation

Industrial

- Vibration Analysis
- Platform Stabilization
- Accident & Theft Prevention
- Drill Orientation



KXP94 Series

Accelerometers and Inclinometers

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 2.5 V to 5.25 V. Performance parameters will change with supply voltage variations.

PERFORMANCE SPECIFICATIONS				
PARAMETERS	UNITS	KXP94-1050	KXP94-2050	CONDITION
Range ¹	g	±2.0		Factory programmable
Sensitivity	mV/g	560 typical (577 max)	660 typical (680 max)	12-bit operation
0g Offset vs. Temp.	mg/°C	±0.4 typical		
Sensitivity vs. Temp	%/°C	±0.005 typical		
Noise Density	$\mu\text{g} / \sqrt{\text{Hz}}$	80 typical		
Bandwidth ²	Hz	800 typical (1000 max)		-3dB
Non-Linearity	% of FS	0.1 typical		% of full scale output
Ratiometric Error	%	0.3 typical		3.3V ± 5%
Cross-axis Sensitivity	%	2.0 typical		
Power Supply	V	2.8	3.3	Standard
Current Consumption	mA	0.95 typical		Operating
	μA	5 max		Standby
ENVIRONMENTAL SPECIFICATIONS				
PARAMETERS	UNITS	KXP94-1050	KXP94-2050	CONDITION
Operating Temperature	°C	-40 to 85		Powered
Storage Temperature	°C	-55 to 150		Un-powered
Mechanical Shock	g	5000		Powered or un-powered, 0.5 msec halversine
ESD	V	3000		Human body model

NOTES

¹ Custom ranges from 1.0g to 6.0g available.

² Internal low pass filter. Lower frequencies are user definable with external capacitors.

ORDERING GUIDE

Product	Axis(es) of Sensitivity	Range (g)	Sensitivity	Offset	Operating Voltage (V)	Temperature (°C)	Package
KXP94-1050	XYZ	2	560 (mV/g)	1.4 V	2.8	-40 to +85	5x5x1.2 DFN
KXP94-2050	XYZ	2	660 (mV/g)	1.65V	3.3	-40 to +85	5x5x1.2 DFN