

# KXCJA Accelerometer

Ultra-thin 3x3x0.7mm Accelerometer



## FEATURES

- Ultra-thin at just 0.7mm
- Low current consumption in all modes:
  - <1  $\mu\text{A}$  in standby,
  - 10  $\mu\text{A}$  at normal resolution, and
  - 135  $\mu\text{A}$  at high resolution
- User-configurable, embedded wake-up function to conserve battery power
- Internal voltage regulator to maintain constant internal operating voltages throughout the 1.8 - 3.6V input supply range

## APPLICATIONS

- User Interface
- Power Management
- Active/Inactive Monitoring
- Device Orientation
- Inclination and Tilt Sensing
- Gesture Recognition
- Pedometer/Activity Monitoring

## FOR

- Smartphones and Mobile Devices
- Laptops
- Gaming and Virtual Reality
- Health and Fitness

## PRODUCT OVERVIEW

The KXCJA is the thinnest tri-axis accelerometer available on the market today. This ultra-thin 3x3x0.7mm low-power accelerometer offers up to 14-bit resolution for greater precision. User-selectable parameters include  $\pm 2\text{g}$ , 4g or 8g ranges and Output Data Rates (ODR) with programmable low-pass filter.

Pin-to-pin compatible with Kionix's KXCJ9 and KXT19, the KXCJA also features the Kionix XAC sense element, our most advanced sense element, for outstanding stability over temperature, shock and post-reflow performance.



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The performance parameters below are programmed and tested at 2.6 volts and T = 25°C. The device can accept supply voltages from 1.8V to 3.6V. Due to internal voltage regulators, there should be minimal change with supply voltage variations.

PERFORMANCE SPECIFICATIONS			
PARAMETERS	UNITS	KXCJA-1019	CONDITION
Range	g	±2.0, ±4.0, ±8.0	User-selectable full-scale output range
Sensitivity <sup>1</sup>	counts/g	64, 32, 16	8-bit
		1024, 512, 256	12-bit
		1024 typical	14-bit <sup>2</sup>
0g Offset vs. Temp	mg/°C	0.2	-40°C to +85°C
Sensitivity vs. Temp	%/°C	0.03	-40°C to +85°C
Mechanical Resonance <sup>3</sup>	Hz	3500 (xy) 1800 (z) typical	-3dB
Output Data Rate (ODR) <sup>4</sup>	Hz	0.781 min; 50 typical; 1600 max	
Bandwidth (-3dB) <sup>5</sup>	Hz	800	RES = 0
		ODR/2	RES = 1
Non-Linearity	% of FS	0.6 typical	% of full scale output
Cross-axis Sensitivity	%	2.0 typical	
I <sup>2</sup> C Communication Rate	MHz	3.4 max	
Power Supply	V	1.8V – 3.6V	
Current Consumption <sup>6</sup>	µA	135 typical	High resolution (RES = 1)
		10 typical	Low resolution (RES = 0)
		0.9 typical	Disabled
ENVIRONMENTAL SPECIFICATIONS			
PARAMETERS	UNITS	KXCJA-1019	CONDITION
Operating Temperature	°C	-40 to 85	Powered
Storage Temperature	°C	-55 to 150	Un-powered
Mechanical Shock	g	5,000, 0.5 ms 10,000, 0.2 ms	Powered or un-powered, halversine
ESD	V	2,000	Human body model

## NOTES

<sup>1</sup> Resolution and acceleration ranges are user selectable via I2C.

<sup>2</sup> 14-bit Resolution is only available in the 8g Full Power mode.

<sup>3</sup> Resonance as defined by the dampened mechanical sensor.

<sup>4</sup> User selectable through I2C.

<sup>5</sup> User selectable; dependent on ODR and RES.

<sup>6</sup> Current varies with Output Data Rate (ODR).