KXTI9 Accelerometer

3x3x0.9mm Accelerometer with FIFO/FILO Buffer

FEATURES

- Small Package - 3x3x0.9mm LGA
- User-selectable g Range
- User-selectable Output Data Rate
- Enhanced integrated Directional Tap/Double-Tap™, Activity-monitoring, and Device-orientation Algorithms
- Digital I²C
- 8-bit or 12-bit Resolution
- FIFO/FILO Memory Buffer
- Digital High-Pass Filter Outputs
- Low Power Consumption
- Lead-free Solderability
- Excellent Temperature Performance
- High Shock Survivability
- Factory Programmable Offset and Sensitivity
- Self-test Function

APPLICATIONS

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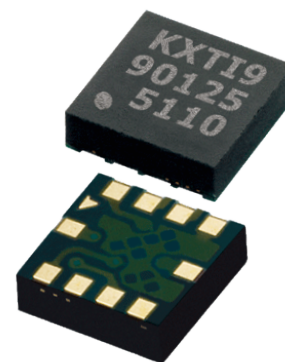- Pedometer/Activity Monitoring

FOR

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

PRODUCT OVERVIEW

The Kionix KXTI9 is a low power, high performance tri-axis accelerometer with digital I²C output. The KXTI9 features user selectable parameters including 8 or 12 bit modes, g-ranges from +- 2, 4 or 8g, and Output Data Rates from 12.5 Hz to 800 Hz. A 252 byte FIFO/FILO buffer offers programmable watermark interrupt and provides a triggered low resolution or high resolution mode.

Pin and register compatible with Kionix' popular KXTF9, the KXTI9 features enhanced embedded Screen Rotation, Directional Tap/Double Tap, Orientation Detection and Low Power Motion Interrupt.

The KXTI9 has internal voltage regulators that allow operation from 1.8 V to 3.6 V and is delivered in a 3x3x0.9mm, 10-pin, LGA package with an operating temperature range of -40°C to +85°C.

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	KXTI9-1001	CONDITION
Range	g	±2.0, ±4.0, ±8.0	User-selectable full-scale output range
Sensitivity[1]	counts/g	64, 32, 16	8-bit
		1024, 512, 256	12-bit
0g Offset vs. Temp	mg/°C	±0.7 (xy) ±0.4 (z) typical	-40°C to +85°C
Sensitivity vs. Temp	%/°C	±0.01 (xy) ±0.03 (z) typical	-40°C to +85°C
Mechanical Resonance[2]	Hz	3500 (xy) 1800 (z) typical	-3dB
Output Data Rate (ODR)[3]	Hz	12.5 min; 800 max	
Bandwidth (-3dB)[4]	kHz	1.59	RES = 0
	Hz	ODR/2	RES = 1
Non-Linearity	% of FS	1.0 typical	% of full scale output
Cross-axis Sensitivity	%	2.0 typical	
I^2C Communication Rate	kHz	400 max	
Power Supply	V	2.6 typical	1.8V – 3.6V
Current Consumption	µA	325 typical	RES = 1; Operating
		165 typical	RES = 0; ODR = 400Hz; Directional Tap™
		100 typical	RES = 0; ODR ≤ 25Hz; Low Power
		10 typical	Standby

ENVIRONMENTAL SPECIFICATIONS

PARAMETERS	UNITS	KXTI9-1001	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

[1] Resolution and acceleration ranges are user selectable via I2C.
[2] Resonance as defined by the dampened mechanical sensor.
[3] User selectable through I2C.
[4] User selectable; dependent on ODR and 8-bit or 12-bit resolution.