

Telematics and infotainment

SMA130 acceleration sensor for motion detection



BOSCH

Invented for life



PRODUCT BENEFITS

- ▶ Target applications
 - Telematics and tolling systems
 - Navigation (dead reckoning) and eCall
 - Vehicle dynamics data logging
 - Car key module and car alarm
- ▶ Extremely flexible application options
- ▶ Cost-effective
- ▶ Ultra compact sensor design gives small footprint
- ▶ Low power consumption – also at system level
- ▶ Billion-fold applied technology (due to CE background)
- ▶ RoHS compliant and AEC-Q100 qualification

- 1 12-pin LGA package,
2 mm × 2 mm × 0.95 mm

ultra compact

acceleration sensor for automotive applications allows easiest integration.

TASK

The SMA130 detects acceleration in three perpendicular axes and allows tilt, motion, vibration or shock sensing regardless of the mounting orientation of the sensor. In addition to data on vehicle acceleration, which is relevant for features such as eCall service or car alarm systems, the SMA130 can also improve the accuracy of the navigation system with dead reckoning.

FUNCTION

The SMA130 is a digital 14 bit 3-axis acceleration sensor (a_{xyz}) with different measurement ranges. The sensing element consists of movable comb-like seismic masses suspended from silicon spring bars and fixed counter-electrodes. As a result of external forces acting on the vehicle, deflections of the seismic masses along the sensitive axis generate changes in the capacity of the system. Numerous programming options, a low signal noise and a very small footprint make the SMA130 a highly versatile and easily applied acceleration sensor.

economical

through its 5 power-safe modes, which give a very low power consumption.

TECHNICAL CHARACTERISTICS

Measurement ranges ¹² (sensitivity)	±2 g	4,096 LSB/g
	±4 g	2,048 LSB/g
	±8 g	1,024 LSB/g
	±16 g	512 LSB/g
Digital resolution	14 bit	
Non-linearity ³	±0.5 %	
Sensitivity temperature drift ³⁴	0.015 % /K	
Zero-point offset ²³	±50 mg	
Offset temperature drift ³⁴	±1 mg/K	
Band width ¹	8 Hz to 500 Hz	
Output noise density, rms ²³	0.12 mg /√Hz	

OPERATING CONDITIONS

Supply voltage (VDD)	1.62 to 3.6 V
Supply current (normal operation)	130 μA
Supply current (power-safe modes)	1 μA to 66 μA
Operating temperature	-40 °C to +85 °C
Interfaces	SPI and I ² C

¹ Programmable

² At +25 °C

³ Valid at full scale in 2 g setting

⁴ Over temperature (-40 °C to +85 °C); reference +25 °C

⁵ Features five power-safe modes