

## The Most Sensitive MEMS Acceleration Sensor: **Bosch Sensortec's new acceleration sensor recognizes movements from 0.00025 g** New top model BMA180 already in series production

October 2009  
PI 6828 BST Wü/hb

- ▶ Highest sensitivity: Accelerations in all directions can be reliably and exactly detected up to 0.00025 g/0.25° tilt change
- ▶ All important parameters and characteristics are programmable
- ▶ Best value in its size class for offset, linearity, and drift, too

The new, triaxial BMA180 acceleration sensor from Bosch Sensortec establishes the benchmark for micromechanical systems (MEMS) for consumer electronics, like laptops and mobile phones. The component, measuring only 3 x 3 x 0.9 mm in its LGA housing, reacts more sensitively to even the smallest of movements than every other comparable acceleration sensor: In the 2-g measuring range, minimal accelerations of 0.00025 g and tilt changes in the field of gravity of only 0.25° can be reliably detected using its 14-bit measurement dynamic. With its extraordinarily high sensitivity and an extremely good linearity, the BMA180 covers the entire scope of applications for g sensors - from simple step counters in pedometers up to precision applications, such as in GPS navigation support and in digital spirit levels. Bosch Sensortec has already begun mass production of the new top model g-sensor.

### **The BMA180 provides unique features**

Product developers have the benefit of programming the technical characteristics according to their specific needs. For instance, the measuring range can be switched between 1 g and 16 g in seven steps - even during operations. Within a measuring range, the variation in sensitivity is extremely low: in the 2-g range, it is only 1.5% with a temperature drift TCS (temperature coefficient of sensitivity) of 0.01%/Kelvin. The internal digital filter's programming, with 8 x low-pass, 1 x high-pass, and 1 x band-pass, offers designers numerous options for internal signal conditioning.

As is appropriate for high signal resolution, the integrated automatic zero balancing functions with the highest exactitude, the residual zero-g offset remains below 5 mg. This is especially relevant for navigation applications: when using a BMA180, they can achieve an extremely high degree of accuracy in determining position that exceeds every other acceleration sensor by several magnitudes. The offset temperature drift (TCO) is minimal, at 0.25 mg/Kelvin. This is easily perceived in all applications that involve large temperature variations: for example, a video projector equipped with a BMA180 and electromechanical leveling can project an image on the projection surface that remains undistorted, despite the increasing heat.

Independent from factory calibration, values such as sensitivity, offset, TCO and TSO can be calibrated within the final product so that the good characteristics of the sensor can be fully utilized in every application.

<b>Technical data -- BMA180 (excerpt, typical values)</b>	
Measurement ranges	7, of max. $\pm 1$ g up to max. $\pm 16$ g
Min. noise density ■ max. resolution	150 $\mu\text{g}/\sqrt{\text{Hz}}$ ■ $\pm 0,25$ mg (in the 2-g range)
Min. offset (incl. offset tuning)	$\pm 5$ mg
Offset drift	$\pm 0,25$ mg/K
AD converter	14 bit, can be switched to 12 bit
Operating temperature	-40 to +85 °C
Supply voltage	+1.62 to +3.6 V(DC)
Power consumption, when operating ■ in sleep mode	650 $\mu\text{A}$ to 975 $\mu\text{A}$ ■ 0,5 $\mu\text{A}$
Data interfaces	I <sup>2</sup> C and 4-wire SPI, interrupt signal

### **About Bosch Sensortec**

Bosch Sensortec GmbH, a 100 percent subsidiary of Robert Bosch GmbH, offers micromechanical sensors and their application for consumer electronics, security systems and logistics. Its product portfolio to date includes triaxial acceleration sensors as well as pressure sensors. The company was founded in early 2005 and is headquartered near Reutlingen to the south of Stuttgart (Germany). For more information about Bosch Sensortec, visit [www.bosch-sensortec.com](http://www.bosch-sensortec.com).

## **About Bosch**

Bosch has been active in the field of MEMS since 1988, being one of the pioneers in this technology. Today, hundreds of engineers of the Bosch Group work in the field of MEMS. A wide selection of products - from pressure and acceleration sensors to yaw-rate sensors - is manufactured for the automotive industry. Annual production at Bosch is more than 200 million sensors.

**Press photo:** 1-BST-16100

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*Additional information can be accessed at [www.bosch.com](http://www.bosch.com).*