Press Release

New Bosch MEMS acceleration sensors
Fifth generation of sensitive crash detectors
SMA58x and SMA59x in SOIC14n housing

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- Total of four measurement ranges, from ±120 g to ±480 g
- Programmable via SPI or PSI5 interface
- PSI5 interface with optimized bus performance

Bosch has introduced the next generation of peripheral acceleration sensors for passenger protection systems in vehicles – the fifth since 1996. The key features of the new digital sensors include a wide measurement range of between ±120 g and ±480 g and the choice of communication via the SPI or the PSI5-V1.3 interface. Peripheral sensors are located at the outermost points of a vehicle's engine compartment, at the sides, or at the rear, thus enabling them to recognize a collision quickly. However, the new fifth-generation models can do more than simply register a crash. In just a few milliseconds, they transfer to the airbag control unit all the data needed by the electronics system to determine with absolute certainty whether a collision is minor or serious. The control unit checks the plausibility of the incoming sensor data before deciding which vehicle restraint systems (e.g. front, head or side airbag and seat-belt pretensioners) to activate.

Four measurement ranges, two sensors, straightforward integration
Apart from their measurement ranges, the two new sensors are of virtually identical design. The SMA58x can be switched from ±120 g to ±240 g and is designed to be integrated into the peripheral side collision sensors. The SMA59x, with twice the measurement range, is specially designed for front collisions. Both sensors measure along the Y axis. The 10-bit measured-value resolution and measurement range limit values are used to calculate sensitivity values of between 1 LSB/g and 4 LSB/g.

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Thanks to the PSI5-V.1.3 bus interface, the sensors can be easily integrated, provided the airbag control unit also features a Peripheral Sensor Interface 5. Up to four bus users can then be operated in parallel or in series. To ensure the databus continues to function smoothly under such conditions, the new acceleration sensors feature an I_{DATA} pin, which is used to select filters or attenuators with customer-specific dimensions. This wiring is integrated into the housing of the peripheral sensors along with the sensor chip.

Bosch engineers have equipped the SMA58x and the SMA59x with an ultra effective offset controller. This automatically makes both slow and fast offset adjustments. As a result, the sensors are very resilient to physical disturbances such as vibrations or significant fluctuations in ambient temperature. Two selectable low-pass filters with cut-off frequencies of 213 Hz and 416 Hz are also used to enhance signal conditioning.

Background information on MEMS technology

Bosch has shaped the development of MEMS technology (micro-electro-mechanical systems) from the outset. The company has manufactured well over two billion MEMS sensors since production began in 1993. Production volumes reach new highs year after year. In 2011 alone, around half a billion sensors rolled off the production lines in Reutlingen, making Bosch the global market leader. Its product portfolio comprises pressure sensors, acceleration sensors, yaw-rate sensors, and inertial sensors as well as MEMS microphones and terrestrial magnetic field sensors for a variety of automotive and consumer electronics applications. More information on Bosch vehicle sensors is available at www.bosch-sensors.com.

Technical data – SMA58x/SMA59x (extract ▪ typical values)	
Measurement ranges	SMA58x: ±120 g and ±240 g SMA59x: ±240 g and ±480 g
Sensor axis	Y
Measured-value resolution	10 bits
Linearity deviation	±2%
Permissible ambient temperature	-40 °C to +125 °C
Supply voltage	Max. 11 V
Current drain	Max. 8 mA
Housing	SOIC14n ▪ 8.6 mm x 3.9 mm
Certificates	Environment: RoHS
Delivery capability	Series production under way, sample on request

Press image: 1-AE-18370

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The Bosch Group is a leading global supplier of technology and services. In the areas of automotive and industrial technology, consumer goods, and building technology, more than 300,000 associates generated sales of 51.5 billion euros in fiscal 2011. The Bosch Group comprises Robert Bosch GmbH and its roughly 350 subsidiaries and regional companies in some 60 countries. If its sales and service partners are included, then Bosch is represented in roughly 150 countries. This worldwide development, manufacturing, and sales network is the foundation for further growth. Bosch spent some 4.2 billion euros for research and development in 2011, and applied for over 4,100 patents worldwide. With all its products and services, Bosch enhances the quality of life by providing solutions which are both innovative and beneficial.

Additional information can be accessed at www.bosch.com, www.bosch-press.com.