Automotive Electronics
Product Information
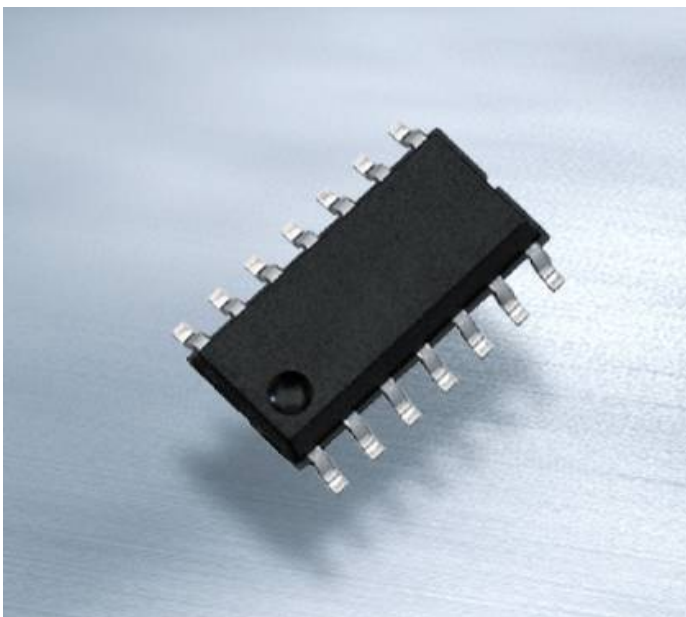## 4th Generation Micro-Machined Accelerometers

BOSCH
Invented for life

Application

Worldwide, Bosch acceleration sensors are used in vehicles of a many OEMs. They measure the acceleration magnitude in case of a collision and, sometimes in combination with angular rate sensors, activate occupant restraint systems, such as front and side airbags, increase seatbelt tension and – in the case of open-top convertibles – deploy rollover bars automatically when there is a danger of the vehicle rolling over. The SMB46x sensors are designed for crash sensing in automotive applications.

Features

The SMB46x are in- plane, dual channel (x, y axes) sensors with a measurement range of ±25g up to ±96g. They provide acceleration data for evaluation by a microcontroller. The digital SPI interface allows bidirectional data transmission. The 4th generation of accelerometers requires a 3.3V power supply.
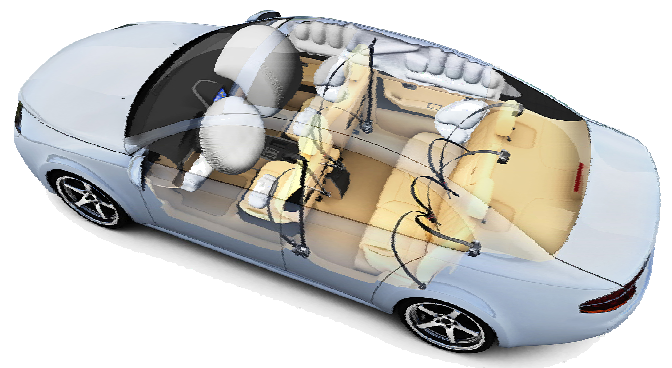
Acceleration Sensor in SOIC14n

Customer Features

▸ Well protected against EMC and mechanical stress. The system runs more reliably.
▸ Improved monitoring of the SPI interface in comparison to analog interfaces.
▸ Identical protocol for acceleration sensors, yaw sensors, pressure sensors   ease of use of different sensors.
▸ Triggerable by µC
▸ On-board self-test

Technical Parameters

Product	Range	Sensitivity	Package
SMB460	±96g	x,y	SOIC16w
SMB461[1)]	±50g	x,y	SOIC14n
SMB465[2)]	±25/35/50/70g	x,y	SOIC14n

Parameter	Remark	Min	Nom	Max	Unit
Supply Voltage			3.3	3.6	V
Supply current drain	IDD		6	8	mA
Tolerance of sensitivity [3)]				+5	%
Nonlinearity of sensitivity				+2	%
Cross axis sensitivity [4)]				+5	%
3dB corner frequency			378		Hz
Interface SMB460/461 SMB465	Bosch SPI open SPI				

[1)] coming mid 2010
[2)] coming mid 2009
[3)] In % of nominal sensitivity; over lifetime & temperature range.
[4)] Output signal due to acceleration in any axis perpendicular to the sensing axis.

Working Principle
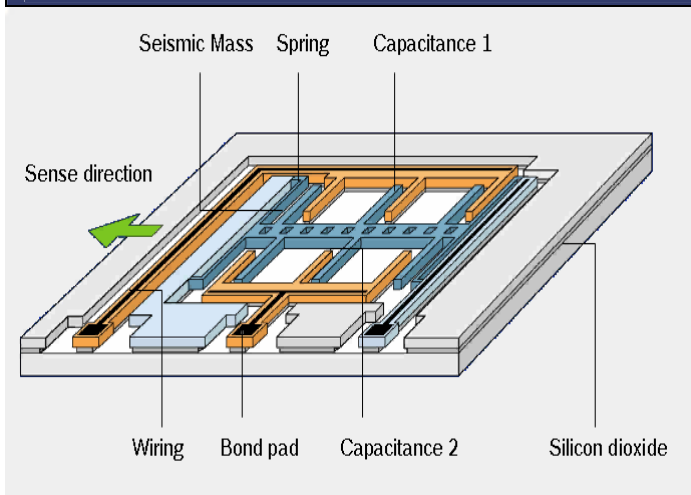
Working Principle

The 4th generation of acceleration sensors uses silicon micro-machined mechanical elements. The sensors are designed for integration into electronic control units (ECUs). They measure the deceleration of a vehicle during a collision and send appropriate signals to the central airbag control unit. This then decides on the activation of the restraint systems. The micro mechanical acceleration sensors can measure acceleration in the x- and y- direction.

Interface

The sensor is offered with different SPI protocols: the open SPI and the Bosch SPI, which is compatible with the Airbag10 system ASICs from Bosch.

Package

The SMB460 is packaged in a SOIC16w housing, whereas a small and compact SOIC14n package is used for the SMB461 and SMB465. All SMB46x sensors are RoHS compliant

Portfolio

The SMB46x acceleration sensors are part of a larger sensor portfolio. The portfolio consisting of pressure sensors, acceleration sensors, yaw rate sensors and CO_2 sensors for occupant safety systems, navigation applications, active suspension systems, tire pressure monitoring, A/C systems, or motor management.