



Engine management sensors **New Bosch SMP480 barometric pressure sensor is 75 percent smaller** Made possible by Bosch MEMS technology

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- ▶ Takes up only one quarter of the space of its predecessor
- ▶ Very high measurement accuracy and long-term stability
- ▶ Digital interface for pressure and temperature

The new Bosch SMP480 barometric pressure sensor is extraordinarily small. It takes up just one-quarter of the space of its predecessor. This makes it easier than ever to include it in the electronic control units used in automotive technology. This is the first time the Stuttgart-based automotive supplier has released a pressure sensor in its SMP range that uses a 12-bit digital interface to provide pressure and temperature data, instead of producing an analog measurement signal. This digital barometer's pressure signal tolerance over its lifetime is less than 1.0 kPa – the best accuracy currently available in the market. The SMP480, which features a ten-pin premold SMD housing and is RoHS-compliant, is already being delivered in large quantities.

Pressure sensors make cars more eco-friendly

Barometric pressure sensors are a key component in engine management for diesel and gasoline engines. They are designed to measure the current ambient pressure accurately and with low drift. Atmospheric pressure is a function of height above sea level as well as of weather conditions. The engine management system uses the sensor measurement data to ensure the optimum air-fuel mixture, irrespective of whether the vehicle is traveling along a coastal road or a road up in the mountains. The benefit of this constant rebalancing of the mixture ratio is that it reduces fuel consumption as well as emissions of CO₂ and other pollutants.

Silicon sensor membrane

The core of the SMP480 is its sensor element. This is made up of a monocrystalline silicon membrane – manufactured using the advanced porous silicon membrane (APSM) process – which hermetically seals a reference vacuum. Four strain gages are implanted in the membrane in a bridge circuit. Changes caused by atmospheric pressure in the curvature of the membrane, even those measuring just a few thousandths of a millimeter, are converted into an electrical signal. Signal conditioning and A-D conversion are performed by an ASIC adjacent to the sensor element within the housing.

A success story with over 1.6 billion MEMS sensors

Bosch sets the pace in MEMS (micro-electro-mechanical systems) technology. The company has manufactured over 1.6 billion MEMS sensors since production began in 1995. This makes Bosch the global market leader in MEMS sensors. Its product portfolio comprises pressure sensors, acceleration sensors, yaw-rate sensors, mass flow sensors, torque sensors, and microphones for a variety of automotive and consumer electronics applications. Additional information on the Bosch sensor program can be accessed at www.bosch-sensors.com.

Technical data – SMP480 (sample of typical values)	
Measurement range	40 kPa to 115 kPa
Pressure tolerance	≤ 1.0 kPa
Temperature tolerance	≤ 3 K in the range 25 to 85 °C
Interface	SPI, 12-bit precision for pressure and temperature
Operating voltage	3.3 V(DC)
Power consumption	≤ 8.0 mA
Permissible ambient temperature	-40 to +130 °C
Housing	Premold 10-pin ■ 6.9 mm x 5.7 mm x 2.4 mm (l x b x h)

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Automotive Technology is the largest Bosch Group business sector. In 2010, its sales came to 28.1 billion euros, or 59 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The roughly 167,000 Automotive Technology associates worldwide work in seven areas of business: injection technology for internal combustion engines, powertrain peripherals, alternative drive concepts, active and passive safety systems, assistance and comfort functions, in-car information and communication, as well as services and technology for the automotive aftermarket. Bosch has been responsible for important automotive innovations, such as electronic engine management, the ESP® anti-skid system, and common-rail diesel technology. In fiscal 2011, the Bosch Automotive Technology business sector expects its sales to reach some 30 billion euros by the end of the year, with a workforce of 177,000.

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, some 285,000 associates generated sales of 47.3 billion euros in fiscal 2010. For 2011, the company forecasts sales of more than 50 billion euros and a headcount of a good 300,000 by the end of the year. The Bosch Group comprises Robert Bosch GmbH and its more than 350 subsidiaries and regional companies in over 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 3.8 billion euros for research and development in 2010, and applied for over 3,800 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, and www.125.bosch.com.