Pressure sensor I **SMP581**

Small package

Enables dynamic seat adjustment

Function

The SMP581 is designed to measure the current ambient barometric pressure, which continuously fluctuates based on altitude, weather conditions and ambient temperature.

A piezo-resistance Wheatstone bridge on the SMP581 membrane transforms pressure into electrically measurable resistance. Signal conditioning and processing is performed by the ASIC.

Application

Engine Control Unit
Barometric pressure sensors are vital for ICE powertrain engine control units:
- Measure ambient pressure variations
- Optimize performance and fuel efficiency
- Enable accurate air-fuel mixture calculation

Seating
Dynamic seat adjustments for more comfortable driving. SMP581 measures the air pressure in pneumatic seats. The sensor data is used for form-adjustable lumbar supports, side bolsters and seat massage functions.

Key Features

- Small package size
- High measurement accuracy and long-term stability
- Digital interface for pressure and temperature output
- Very low current consumption of <15 µA in power-down mode
- Self-test capability
- Lead-free soldering
- Wettable flanks enabling AOI
- ASIL rating according to ISO26262 is ASIL-QM

Precise & Stable

Accurate calculation of air-fuel mixture

Technical features

Package	(DFN8) 3 x 3 x1.54 mm	
Supply voltage	3.3 - 5 V	
Supply current	< 15 µA (power-down)	
Operating temperature	-40 to +125 °C	
Digital resolution	10 or 12 bit	
	ECU	**Seating**
SPI frame length	16 | 32 bit	16 bit
Communication mode	out-of-frame in-frame	out-of-frame
Pressure range	40 – 115 kPa	60 – 165 kPa 60 – 200 kPa

Pressure sensor characteristics

Parameter	typ	Unit
Noise (32 bit)	3	LSB
Noise (16 bit)	1	LSB
Sensitivity (32 bit ECU)	51.48	LSB/kPa
Sensitivity (16 bit ECU)	13.64	LSB/kPa
Sensitivity (16 bit Seat)	9.743	LSB/kPa
	Accuracy over T: 0 to +85°C	
Accuracy	0.5	kPa

For the lifetime specification and additional parameters please see the corresponding TCD

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