

# Altimeter / Barometer Module SMD500

## ultra low power, low voltage

Bosch Sensortec



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### General Description

The SMD500 marks a new generation of high precision digital pressure sensors for consumer applications.

Its ultra low-power, low voltage electronics are optimized for use in mobile phones, PDAs, GPS devices and outdoor equipment. With an altitude noise down to 0.25 m it offers superior performance. The I<sup>2</sup>C interface allows for easy system integration with a microcontroller.

Robert Bosch is the world market leader for pressure sensors in automotive applications. Based on the experience of over 100 million pressure sensors in the field, the SMD500 opens a new generation of micromachined pressure sensors.

### Typical Applications

- ▶ Outdoor navigation
- ▶ Dead reckoning
- ▶ Leisure and sports
- ▶ Weather forecast
- ▶ Vertical velocity indication (rise / sink speed)
- ▶ Security systems

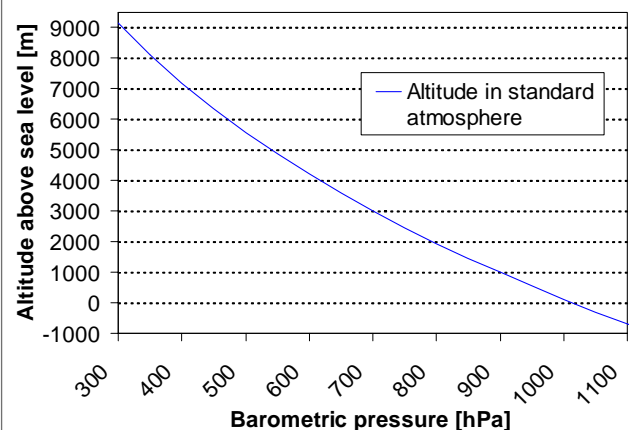
The SMD500 is based on piezoresistive technology for EMC robustness, high accuracy and linearity as well as long term stability.

### Altimeter / Barometer SMD500

#### Key Features

- ▶ Pressure range 300 ... 1100 hPa (+9000 ... -500 m)
- ▶ Supply voltage 2.0 ... 3.6 V
- ▶ Current consumption 5  $\mu$ A (std. avg. @ 1 sample / sec.)  
10  $\mu$ A (high resolution)
- ▶ Resolution 0.06 hPa (0.5 m) std. resolution  
(rms noise) 0.03 hPa (0.25 m) high resolution
- ▶ Sigma delta ADC
- ▶ Fully calibrated
- ▶ Temperature measurement included
- ▶ Digital two wire I<sup>2</sup>C interface
- ▶ Lead free and RoHS compliant

### Altitude above Sea Level vs. Barometric Pressure



Absolute Maximum Ratings	
Storage temperature	-55 ... +125 °C
Supply voltage	-0.3 ... 6.0 V
ESD Rating (HBM)	±2 kV
Overpressure	5000 hPa

Operating Conditions	
Temperature, operational full accuracy	-40 ... +85 °C -20 ... +60 °C
Supply voltage VDD	2.0 ... 3.6 V; typ 3.3 V
Standby current	0.1 µA typ.
Avg. current consumption @ 1Hz data refresh rate	5 µA typ. standard mode 10 µA typ. high res. mode
Pressure range	300 ... 1100 hPa
RMS noise expressed in pressure	0.06 hPa typ. standard 0.03 hPa typ. high res.
RMS noise expressed in altitude (@ 1 conversion)	0.5 m typ. standard 0.25 m typ. high res.
Absolute accuracy @ p = 300 ... 1100 hPa, -20 ... +60°C, VDD = 3.3 V, MCLK = 32768 Hz	pressure: ± 2.5 hPa max. ± 0.8 hPa typ. temperature: ± 1.5°C max.
Serial data clock	max. 400 kHz
Master clock frequency (selectable)	32768 Hz ± 3 % or 1 MHz ± 3 %
Pressure conversion time	34 ms @ 32768 Hz

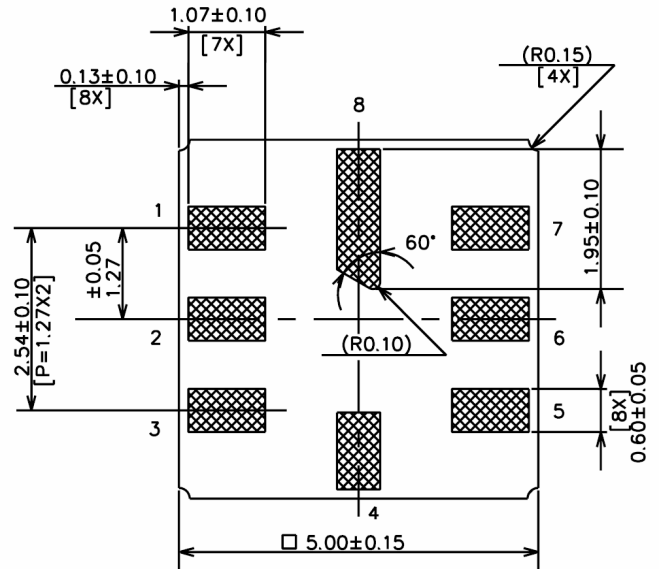
The SMD500 is designed to be connected directly to a microcontroller of a mobile device via the I<sup>2</sup>C bus.

The pressure and temperature data comes as 16 bit each and has to be compensated by the calibration data of the PROM of the SMD500.

## SMD500 pinout configuration

Top view LCC8 ceramic package

dimensions: 5.0 x 5.0 (± 0.25) x 1.6 mm<sup>3</sup> (± 0.15).



Pinout		
1	GND	ground
2	NC	do not connect
3	VDD	power supply digital
4	VDDA	power supply analog
5	MCLK	master clock input
6	SCL	I <sup>2</sup> C serial bus clock input
7	SDA	I <sup>2</sup> C serial bus data
8	XCLR	master clear (low active) input

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