



MS5840-02BA

Low profile, gel-filled, ultra-compact watertight pressure sensor

DESCRIPTION

The MS5840 is an ultra-compact micro altimeter. It is optimized for altimeter and barometer applications. The altitude resolution at sea level is 13 cm of air.

The sensor module includes a high-linearity pressure sensor and an ultra-low power 24-bit $\Delta\Sigma$ ADC with internal factory-calibrated coefficients. It provides a precise digital 24-bit pressure and temperature value and different operation modes that allow the user to optimize for conversion speed and current consumption.

A high-resolution temperature output allows the implementation of an altimeter/thermometer function without any additional sensor. The MS5840 can be interfaced to any microcontroller with I²C-bus interface. The communication protocol is simple, without the need of programming internal registers in the device. The gel protection and antimagnetic stainless-steel cap makes the module water resistant.

Small dimensions of only 3.3 mm x 3.3 mm x 1.7 mm allows integration in mobile devices. This sensor module generation is based on leading MEMS technology and latest benefits from TE Connectivity (TE) proven experience and know-how in high volume manufacturing of altimeter modules, which has been widely used for over a decade.

FEATURES

- Ceramic - metal package, 3.3 x 3.3 x 1.7mm
- High-resolution module, 13 cm
- Supply voltage: 1.5 to 3.6 V
- Fast conversion down to 0.5 ms
- Low power, 0.6 μ A (standby $\leq$ 0.1 μ A at 25°C)
- Integrated digital pressure sensor (24 bit $\Delta\Sigma$ ADC)
- Operating range: 300 to 1200 mbar, -20 to +85 °C
- I²C interface
- No external components (internal oscillator)
- Protected against direct sunlight
- Lid connected to ground option

APPLICATIONS

- Adventure or multi-mode watches
- Mobile water depth measurement systems

PERFORMANCE SPECIFICATIONS**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Conditions	Min.	Typ.	Max	Unit
Supply voltage	V _{DD}		-0.3		+4	V
Storage temperature	T _S		-40		+85	°C
Overpressure	P _{max}	ISO 22810 ⁽¹⁾			10	bar
Maximum Soldering Temperature ⁽²⁾	T _{max}	40 sec. max			250	°C
ESD rating (lid to GND version)		Human Body Model	-2		+2	kV
Latch up		JEDEC JESD78 standard	-100		+100	mA

⁽¹⁾ Pressure ramp up/down min 60s⁽²⁾ Refer to application note 808**ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Conditions	Min.	Typ.	Max	Unit
Operating Supply voltage	V _{DD}		1.5	3.0	3.6	V
Operating Temperature	T		-20	+25	+85	°C
Supply current (1 sample per sec.)	I _{DD}	OSR 8192 4096 2048 1024 512 256		20.09 10.05 5.02 2.51 1.26 0.63		μA
Peak supply current		during conversion		1.25		mA
Standby supply current		at 25°C (V _{DD} = 3.0 V)		0.01	0.1	μA
Power supply hold off for internal reset ⁽³⁾		V _{DD} < 0.1V	200			ms
VDD Capacitor		from VDD to GND	100	470		nF
Resistor value between the lid and the GND		Version 02BA2x only		1000		Ω

⁽³⁾ Supply voltage power up must be continuous from GND to VDD without any step**ANALOG DIGITAL CONVERTER (ADC)**

Parameter	Symbol	Conditions	Min.	Typ.	Max	Unit
Output Word				24		bit
ADC Conversion time ⁽⁴⁾	t _c	OSR 8192 4096 2048 1024 512 256		16.44 8.22 4.13 2.08 1.06 0.54	17.2 8.61 4.32 2.17 1.10 0.56	ms

⁽⁴⁾ Maximum values must be used to determine waiting times in I2C communication