



MS5837-30BA

Ultra-small, gel-filled, pressure sensor with stainless steel cap

The MS5837-30BA is a high-resolution pressure and temperature sensor from TE Connectivity (TE) with I²C bus interface. This sensor is optimized for water depth measurement systems with a resolution of 0.2 cm. 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 in depth measurement systems and thermometer function without any additional sensor. The MS5807-30BA can be interfaced to virtually any microcontroller. The communication protocol is simple, without the need of programming internal registers in the device. The gel protection and antimagnetic stainless-steel cap make the module water resistant.

Small dimensions of only 3.3 x 3.3 x 2.75 mm allow integration in mobile devices. Enhanced construction and design materials allow for enhanced chemical endurance in applications with harsh liquid media environments with limited exposure. This sensor module generation is based on leading MEMS technology from TE proven experience and know-how in high volume manufacturing of sensors modules.

FEATURES

- Ceramic and metal package: 3.3 x 3.3 x 2.75mm
- High resolution module: 0.2 cm (in water)
- Supply voltage: 1.5 to 3.6 V
- 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: 0 to 30 bar, -20 to +85 °C
- I²C interface
- No external components (internal oscillator)
- Water resistant sealing with 1.8 x 0.8mm O-ring
- High chemical endurance
- Shielded metal lid

APPLICATIONS

- Dive Computers
- Mobile Water Depth Measurement Systems
- Fitness Trackers
- Wearables

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 6425 ⁽¹⁾			50	bar
Maximum Soldering Temperature ⁽²⁾	T _{max}	40 sec max			250	°C
ESD rating		Human Body Model	-2		+2	kV
Latch up		JEDEC standard No 78	-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	20.09		µA
			4096	10.05		
			2048	5.02		
			1024	2.51		
			512	1.26		
			256	0.63		
Peak supply current		during conversion		1.25		mA
Standby supply current		at 25°C (V _{DD} = 3.0V)		0.01	0.1	µA
Power supply hold off for internal reset ⁽³⁾		V _{DD} < 0.1V	200			ms
VDD Capacitor		From V _{DD} to GND	100	470		nF

(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	
Conversion time ⁽⁴⁾	t _c	OSR	8192	14.80	16.44	18.08	ms
			4096	7.40	8.22	9.04	
			2048	3.72	4.13	4.54	
			1024	1.88	2.08	2.28	
			512	0.95	1.06	1.17	
			256	0.48	0.54	0.60	

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