Low Pressure Digital Sensor

SM6331-BCE-S-005-001
Differential Pressure Sensor

FEATURES

- Pressure range from -5 to 5 kPa; differential output
- 1.0%FS accuracy
- 16-bit digital, pressure calibrated and temperature compensated output
- I^2C Digital Interface
- Compensated temperature range: -20 to 85°C
- Robust JEDEC SOIC-16 package for automated assembly
- Manufactured according to ISO9001 and ISO/TS 16949 standards

DESCRIPTION

The SM6331 is a digital, ultra-low pressure MEMS sensor offering state-of-the-art pressure transducer technology and CMOS mixed signal processing technology to produce a digital, fully conditioned, multi-order pressure and temperature compensated sensor in JEDEC standard SOIC-16 package with a dual vertical porting option. It is available in a differential pressure configuration.

Combining the pressure sensor with a signal-conditioning ASIC in a single package simplifies the use of advanced silicon micro-machined pressure sensors. The pressure sensor can be mounted directly on a standard printed circuit board and a high level, calibrated pressure signal can be acquired from the digital interface. This eliminates the need for additional circuitry, such as a compensation network or microcontroller containing a custom correction algorithm.

The SM6331 is shipped in sticks or tape & reel.

Medical	Industrial
Sleep Apnea	Airflow Measurement
CPAP	Pneumatic Gauges
Ventilators	Pressure Switches
Gas Flow Instrumentation	Safety Cabinets
Air Flow Monitors	Life Sciences
	Gas Flow Instrumentation
	HVAC

+1-(408) 577-0100 / sales@si-micro.com / www.si-micro.com

1. Absolute Maximum Ratings

All parameters are specified at Vdd = 3.3 V supply voltage at 25°C, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Supply Voltage	V_{DD}	3.0		5.5	V
2	Supply Current	I_{VDD}		3.2		mA
3	Compensated Temperature[b]	T_{COMP}	-20		+85	°C
4	Operating Temperature[a]	T_{OP}	-40		+105	°C
5	Storage Temperature[a]	T_{STG}	-40		+125	°C
6	Proof Pressure[a, c]	P_{Proof}			+/-30	kPa
7	Burst Pressure[a, d]	P_{Burst}			+/-40	kPa

Notes:

a. Tested on a sample basis.

b. Clean, dry gas compatible with wetted materials. Wetted materials include silicon, epoxy, RTV (silicon), gold, aluminum and mold compound.

c. Proof pressure is defined as the maximum pressure to which the device can be taken and still perform within specifications after returning to the operating pressure range

d. Burst pressure is the pressure at which the device suffers catastrophic failure resulting in pressure loss through the device.

2. ESD

No.	Description	Symbol	Minimum	Maximum	Units
2.1	ESD HBM Protection at all Pins	$V_{ESD(HBM)}$	-2	2	kV

3. External Components

No.	Description	Symbol	Min.	Typ.	Max.	Units
1	Supply bypass capacitor*	C_{VDD}		100		nF
2	I2C Data and clock pull up resistors*	R_P		4.7		kOhm

4. OPERATING CHARACTERISTICS TABLE

All parameters are specified at Vdd = 3.3 V DC supply voltage at 25°C, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
9	Supply Voltage	V_{DD}	3.0	3.3	3.6	V
10	Supply Current	I_{VDD}		3		mA
11	Digital Pressure Output @ P_{MIN} (-5.5 kPa)	OUT_{MIN}		-26,214		Counts
12	Digital Pressure Output @ P_{MAX} (5.5kPa)	OUT_{MAX}		+26,214		Counts
13	Digital Full Scale Span	FS		52,428		Counts
14	Resolution (Digital Output)			16		Bits
15	Update Rate			2000		S/sec
16	Bandwidth	BW		125		Hz
17	Digital Output Accuracy[e]	ACC	-1		+1	%FS

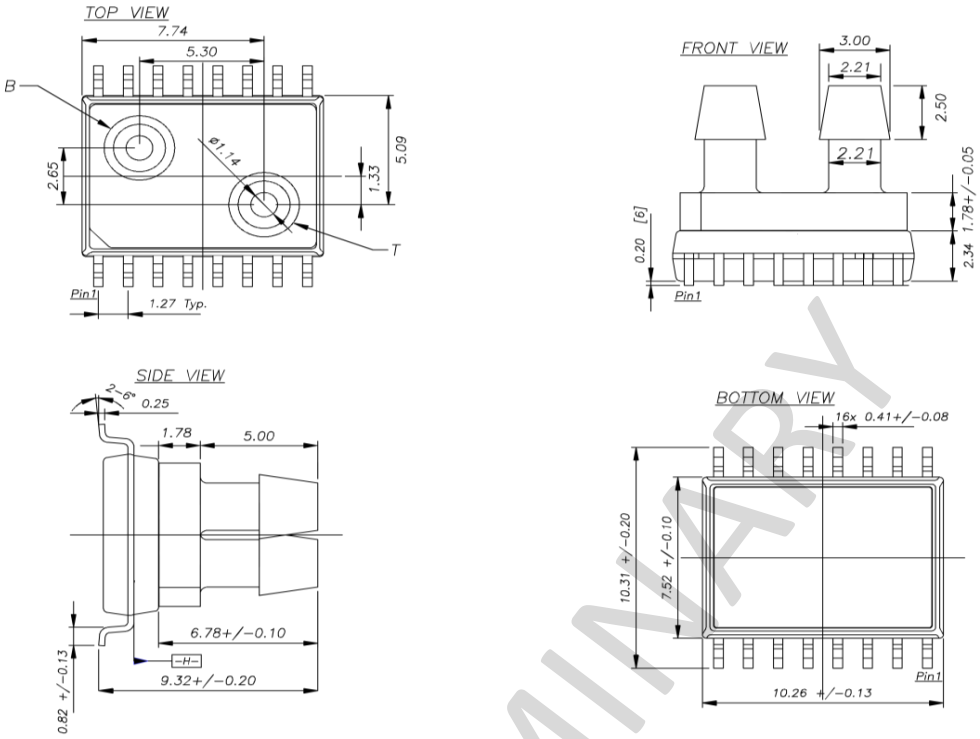
Notes:

e. The accuracy specification applies over all operating conditions. This specification includes the combination of linearity, repeatability, and hysteresis errors over pressure, temperature, and voltage.

Qualification Standards

REACH Compliant
RoHS Compliant
PFOS/PFOA Compliant
For qualification specifications, please contact Sales at sales@si-micro.com

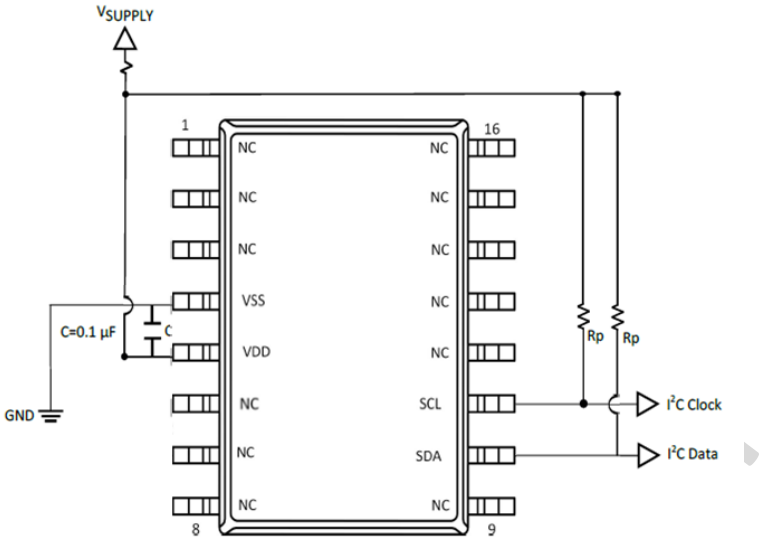
SOIC-16 Dual Vertical Package Dimensions



Notes:

- All dimensions in units of [mm]
- Moisture Sensitivity Level (MSL): Level 3
- Wetted materials: silicon, RTV (silicone), gold, aluminum, epoxy and mold compound.
- Tolerance on all dimensions ±0.13 mm unless otherwise specified.
- [B] is tube connected to bottom side of sensor die.
- [T] is tube connected to top side of sensor die. Topside pressure is positive pressure. An increase in topside pressure will result in an increase in sensor output

SM6331 Applications Circuit



NOTES:

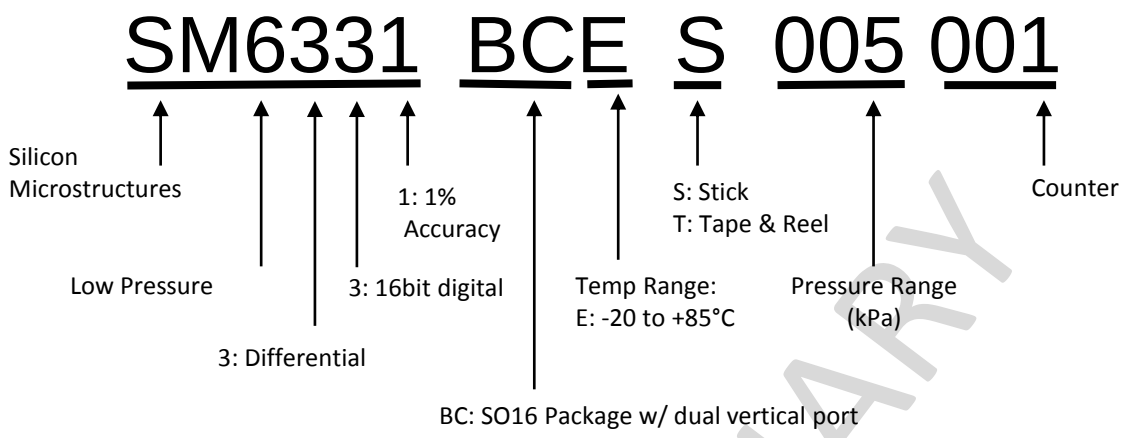
- The bypass capacitor C should be placed in close proximity to the device.

Package Labeling	
Pin No.	Pin Function
1	NC (No Connect)
2	NC
3	NC
4	**VSS**
5	**VDD**
6	NC
7	NC
8	NC
9	NC
10	**SDA**
11	**SCL**
12	NC
13	NC
14	NC
15	NC
16	NC

NOTES:

- Do not connect to NC pins

Part Number Legend



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