



UNCOMPENSATED SO-16 LOW PRESSURE SENSOR SM9D/SM9G SERIES

The low pressure SM9D/G series is available in pressure ranges of 0.15, 0.6 & 1.5 PSI full-scale in gauge and differential configurations. All parts in this series are uncompensated die mounted in a rugged plastic package designed for surface mounting. The surface mount small outline package (SO-16) is available horizontal and vertical configuration for differential pressure and in vertical configuration for gage pressure.

Features

- Uncompensated millivolt analog output
- Differential or gage pressure options
- Vertical or horizontal porting configurations
- Pressure ranges: 0.15, 0.6 & 1.5 PSI
- Variable supply voltage
- Built in ESD protection

Applications

- Patient Monitoring
- Wound Therapy
- Handheld Meters
- Pneumatic Gauges
- Pressure Switches
- Sports Equipment
- Appliances

UNCOMPENSATED SO-16 PRESSURE SENSOR

SM9D/SM9G Series

1. Absolute Maximum Ratings

All parameters are specified at $V_{DD} = 5.00$ V DC SUPPLY at 25°C, unless otherwise noted

Characteristic	Symbol	Min	Typ	Max	Units
Supply Voltage ^(a, c)	V_{DD}	-	-	6.5	V
Supply Current ^(a, c)	I_{VDD}	-	-	1.6	mA
Operating Temperature Range ^(b)	T_{OP}	-40	-	+85	°C
Storage Temperature ^(b)	T_{STG}	-40	-	+125	°C
ESD Voltage (HBM)	V_{ESD}	4	-	-	kV

Product	Operating Pressure	Proof Pressure (P_{PROOF}) ^(d, e)	Burst Pressure (P_{BURST}) ^(d, f)
SM9X-BXX-X-001S-000	0.15 PSI	1.5 PSI	3.0 PSI
SM9X-BXX-X-006S-000	0.6 PSI	4.8 PSI	6.0 PSI
SM9X-BXX-X-015S-000	1.5 PSI	12.0 PSI	15.0 PSI

2. Operating Characteristics Table

All parameters are specified at $V_{DD} = 5.0$ V DC SUPPLY at 25°C, unless otherwise noted.

Characteristic	Symbol	Min	Typ	Max	Units
Span ^{(0.15 PSI) (g)}	V_{SPAN}	30	45	60	mV
Span ^{(0.60, 1.5 PSI) (g)}		50	90	120	
Zero Offset	V_{ZERO}	-55	0	+55	mV
TC Span ^(g, i, j)	TCS	-0.24	-0.21	-0.15	%FS/°C
TC Zero Offset ^(g, i, j) – SM9G	TCZ	-200	-70	+60	µV/°C
TC Zero Offset ^(g, i, j) – SM9D	TCZ	-60	+70	+200	µV/°C
TC Resistance ^(h, i, j)	TCR	0.17	0.20	0.23	% R_B /°C
Topside Linearity ^(g, j)	NL	-0.15	±0.1	0.15	%FS
Backside Linearity ^(g, j)		-0.35	±0.2	0.35	
Bridge Resistance	R_B	4.0	5.0	6.0	kΩ

Notes:

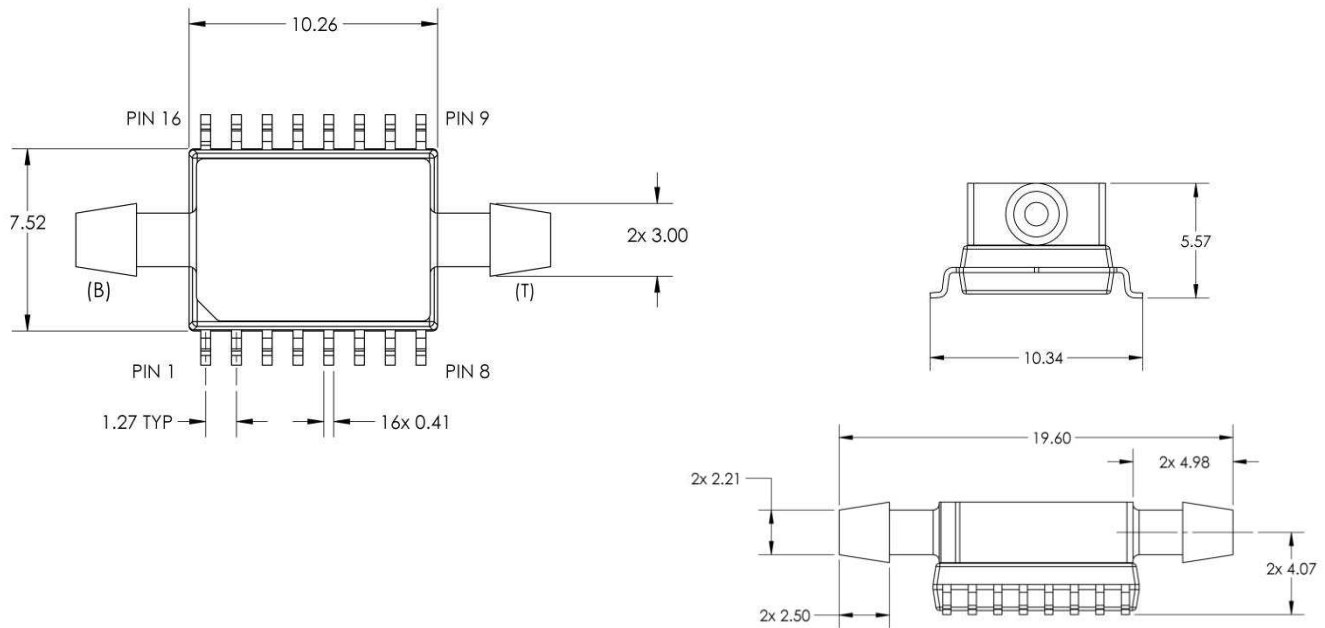
- The device can only be driven with the supply voltage connected to the pins as shown. The positive output will increase with increasing pressure applied to the package.
- Tested on a sample basis.
- Never exceed 6.5 V supply voltage under any operating conditions.
- Tested on a sample basis.
- Proof 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.
- Burst pressure is the pressure at which the device suffers catastrophic failure resulting in pressure loss through the device.
- Tested on a sample basis.
- The device can only be driven with the supply voltage connected to the pins as shown.
- Determined by measurements taken between -40°C and 85°C.
- Defined as best fit straight line.

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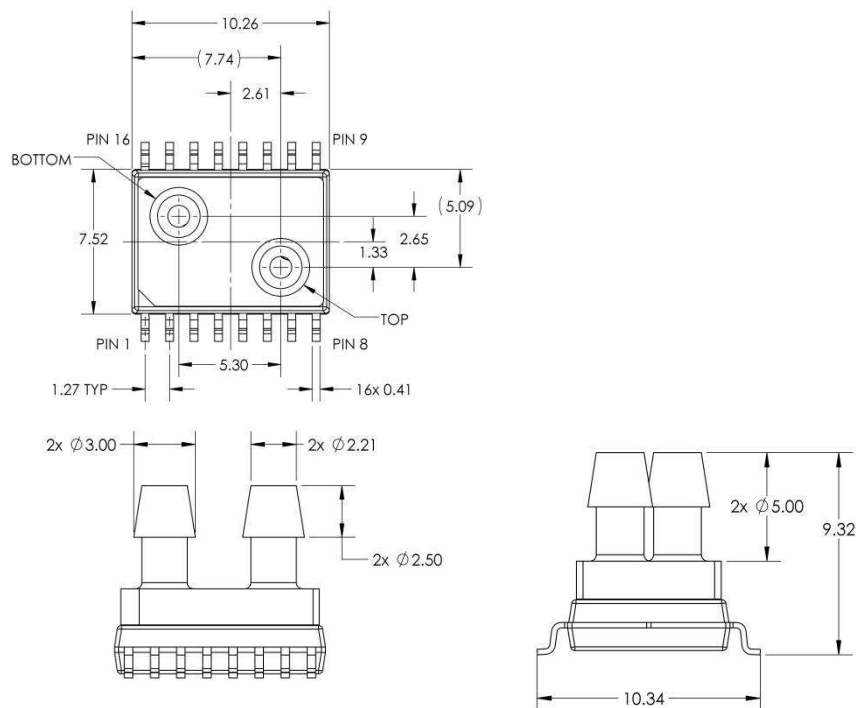
SM9D/SM9G Series

3. Diagrams & Dimensions

Dual Horizontal Porting Configuration: SM9D-BB



Dual Vertical Porting Configuration: SM9D-BC



Notes:

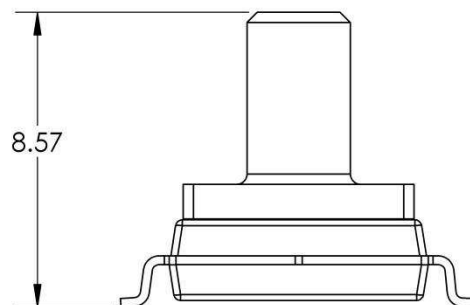
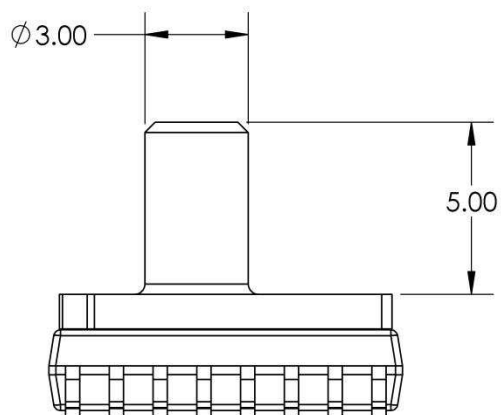
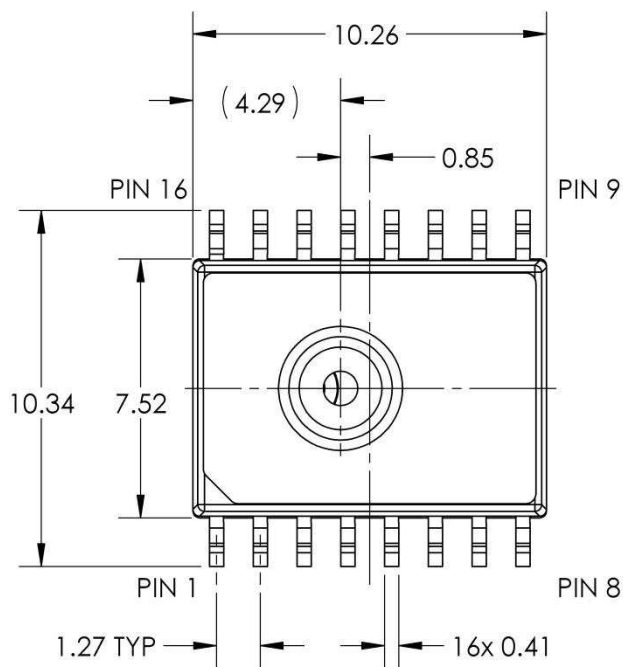
- All dimensions in units of [mm]
- Moisture Sensitivity Level (MSL): Level 3

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- Positive pressure applied to the topside of the die [T] is resulting in a positive change in output.

Single Vertical Porting Configuration: SM9G-BG



Notes:

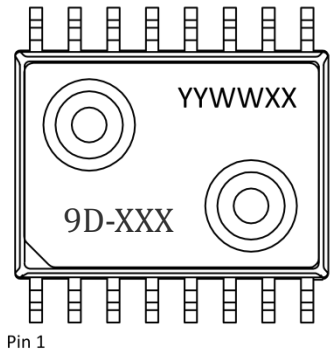
- All dimensions in units of [mm]
- Moisture Sensitivity Level (MSL): Level 3
- Positive pressure applied to the port is resulting in a positive change in output. Pressure is applied to the backside of the die

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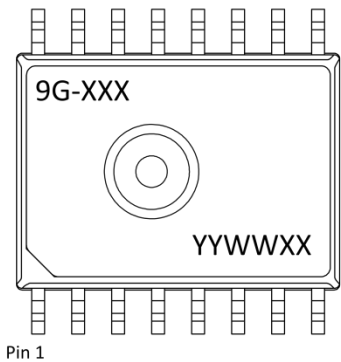
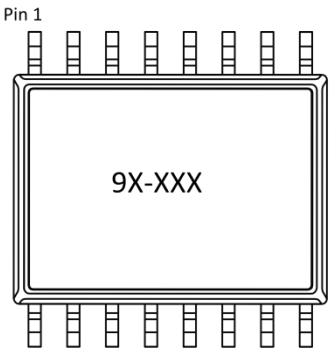
SM9D/SM9G Series

Part & Lot Number Identification

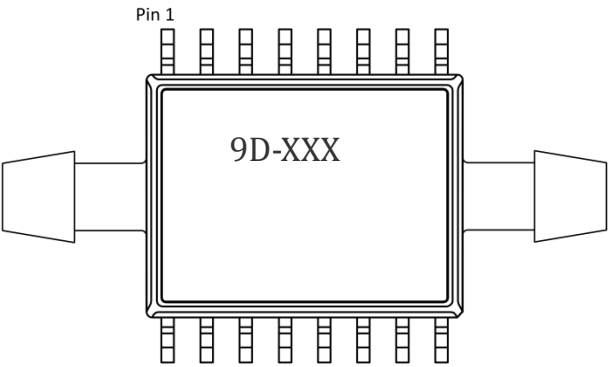
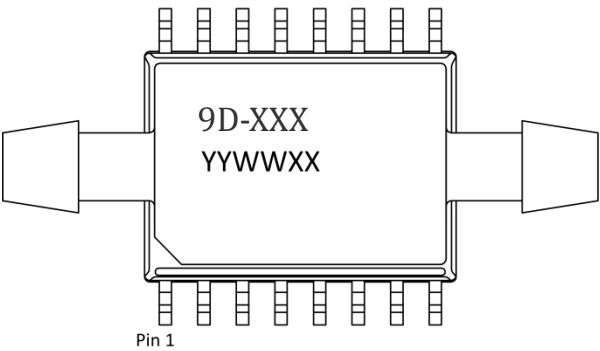
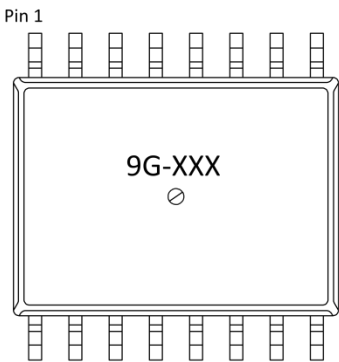
Top View



Bottom View



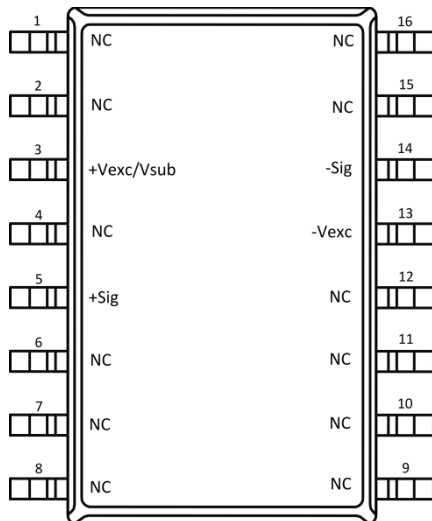
Only in Gage pressure



UNCOMPENSATED SO-16 PRESSURE SENSOR

SM9D/SM9G Series

SM9D Package Pin-Out (Dual Horizontal & Dual Vertical)

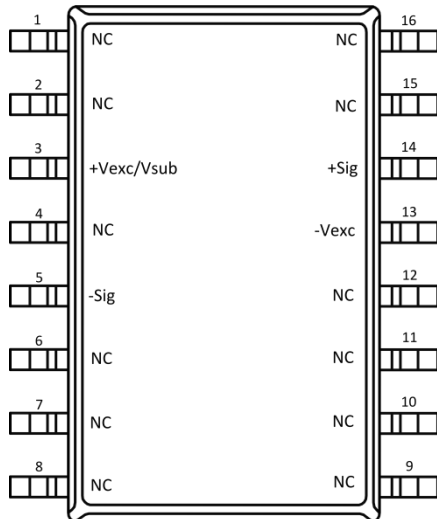


Typical Operation			
Pin	Description	Type	Value
3	+Vexc/Vsub	Power	Up to 5 V
5	+Sig	Analog Out	-
13	-Vexc	Power	Ground
14	-Sig	Analog Out	-

Notes:

- Do not connect to NC pins
- Applies dual ported vertical and horizontal packages
- Positive pressure applied to the topside of the die [T] is resulting in a positive change in output.

SM9G Package Pin-Out (Single Vertical)



Typical Operation			
Pin	Description	Type	Value
3	+Vexc/Vsub	Power	Up to 5 V
5	-Sig	Analog Out	-
13	-Vexc	Power	Ground
14	+Sig	Analog Out	-

Notes:

- Do not connect to NC pins
- Applies dual ported vertical and horizontal packages
- Positive pressure applied to the port results in a positive change in output. Pressure is applied to the backside of the die.

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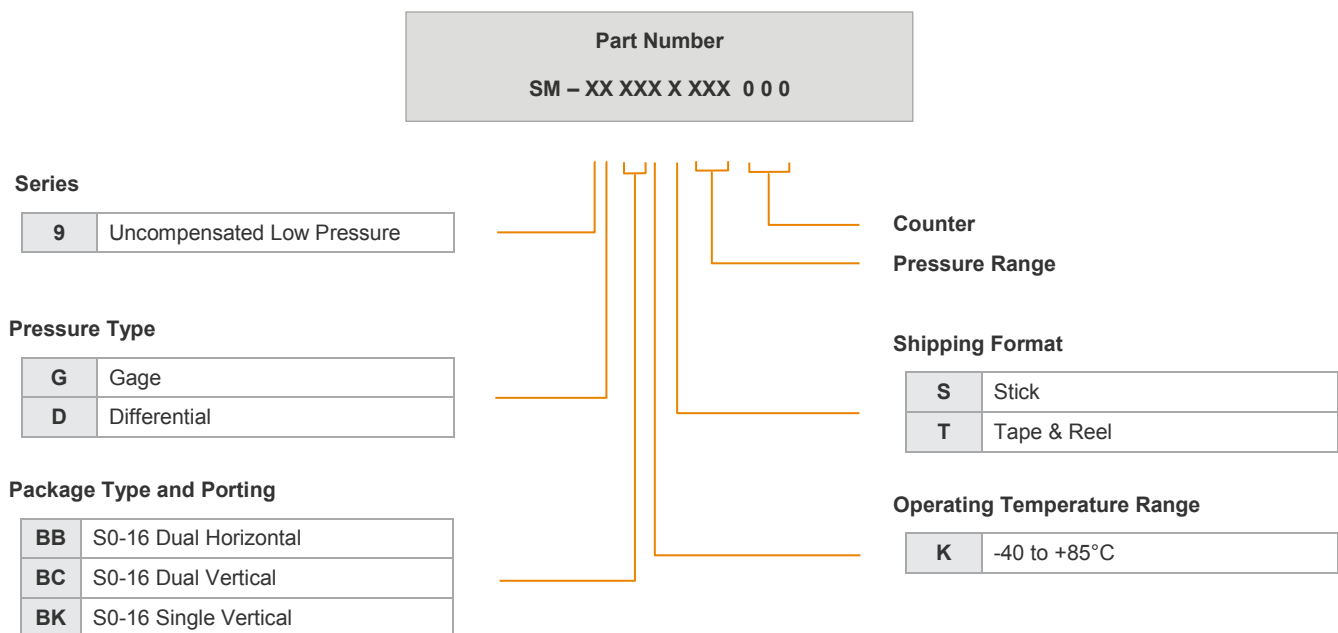
4. Ordering Information

Order Code	Pressure Type	Full-Scale Pressure Range	Cap Configuration	Shipping Configuration ^(a)
SM9D-BCK-T-001S-000	Differential	0.15 PSI	Dual Vertical	Tape & Reel 350 devices per reel
SM9D-BCK-T-006S-000		0.60 PSI		
SM9D-BCK-T-015S-000		1.50 PSI		
SM9D-BBK-T-001S-000	Differential	0.15 PSI	Dual Horizontal	Tape & Reel 500 devices per reel
SM9D-BBK-T-006S-000		0.60 PSI		
SM9D-BBK-T-015S-000		1.50 PSI		
SM9G-BGK-T-001S-000	Gage	0.15 PSI	Single Vertical	Tape & Reel 400 devices per reel
SM9G-BGK-T-006S-000		0.60 PSI		
SM9G-BGK-T-015S-000		1.50 PSI		

Notes:

- a) All parts also available in shipping configuration Sticks, see section 5. Part Numbering Key for ordering information.

5. Part Numbering Key



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6. Qualification Standards

REACH Compliant
RoHS Compliant
PFOS/PFOA Compliant
For qualification specifications



GLOBAL

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