

# Packaged Ultra-Low Pressure Sensor



Product Number: SM5470 Series

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## HIGHLIGHTS

- Ultra-Low pressure sensor
- Analog output
- Variable supply voltage
- JEDEC SOIC-16 Package
- Compact size
- Fast response time
- Horizontal or Vertical porting

## TYPICAL APPLICATIONS

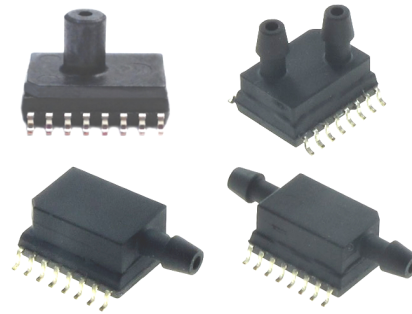
- Water level measurement
- Air flow measurement
- CPAP machines
- Industrial equipment
- Appliances
- HVAC
- Medical instrumentation and monitoring
- Differential & Gauge pressure measurement
- Hand-held gauges
- Respiratory equipment
- Pressure Transmitters

## BASICS

- Differential or gauge pressure
- PCB mountable
- Vertical & horizontal port configurations

## FEATURES

- Pressure ranges from 0.15 to 1.5 psi (1 to 10 kPa)
- High-performance, stable silicon chip and package
- Easily embedded in OEM equipment
- High-volume, cost effective
- Available in tape and reel
- RoHS & REACH Compliant
- Multiple porting options available upon request



SOIC16 Packaged Pressure Sensor

## DESCRIPTION

Silicon Microstructures provides its most popular pressure sensor die in a surface mount dual in-line package (SO-16) configuration. All parts in this series are uncompensated high performance die mounted in an injection-molded package designed for surface mounting.

The low pressure series SM5470 incorporates Silicon Microstructures unique low pressure die to achieve high performance in pressure ranges from 0.15 PSI (1 kPa) to 1.5 PSI (10 kPa) full-scale in gauge and differential configuration.

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### ABSOLUTE MAXIMUM RATING TABLE FOR SM5470 SENSOR

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

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Excitation Voltage <sup>(a)</sup>	$V_{SUPPLY}$	—	—	10	V
2	Excitation Current <sup>(a)</sup>	$I_{SUPPLY}$	—	1.5	3.0	mA
3	Proof Pressure <sup>(b)</sup>	$P_{PROOF}$	5×	—	—	FS pRANGE
4	Burst Pressure <sup>(b)</sup>	$P_{BURST}$	15×	—	—	FS pRANGE
5	Operating Temperature	$T_{OP}$	-40	—	+85	°C
6	Storage Temperature	$T_{STG}$	-40	—	+125	°C
7	Packaged Pressure	—	—	—	30	PSI

#### NOTES:

(a) 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.

(b) Tested on a sample basis

### OPERATING CHARACTERISTICS FOR SM5470 SENSOR - SPECIFICATIONS

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

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units	
8	Span (FS $P_{RANGE}$ ) <sup>(b)</sup>	$V_{SPAN}$	20	40	80	mV	
9	Zero Offset	$V_{ZERO}$	-50	-5	+50	mV	
10	TC Span <sup>(b, c)</sup>	TCS	-24	-19	-15	%FS/100°C	
11	TC Zero Offset <sup>(b, c)</sup>	TCZ	-20	—	+20	%FS/100°C	
12	TC Resistance <sup>(b, c)</sup>	TCR	24	28	32	% $R_B$ /100°C	
13	Linearity <sup>(d)</sup>	NL	0.15 PSI	-2.5	—	+2.5	%FS
			0.30 PSI	-0.5	—	+0.5	%FS
			0.80, 1.50 PSI	-0.3	—	+0.3	%FS
14	Bridge Resistance	$R_B$	2.7	3.3	4.0	kΩ	

#### NOTES:

(b) Tested on a sample basis

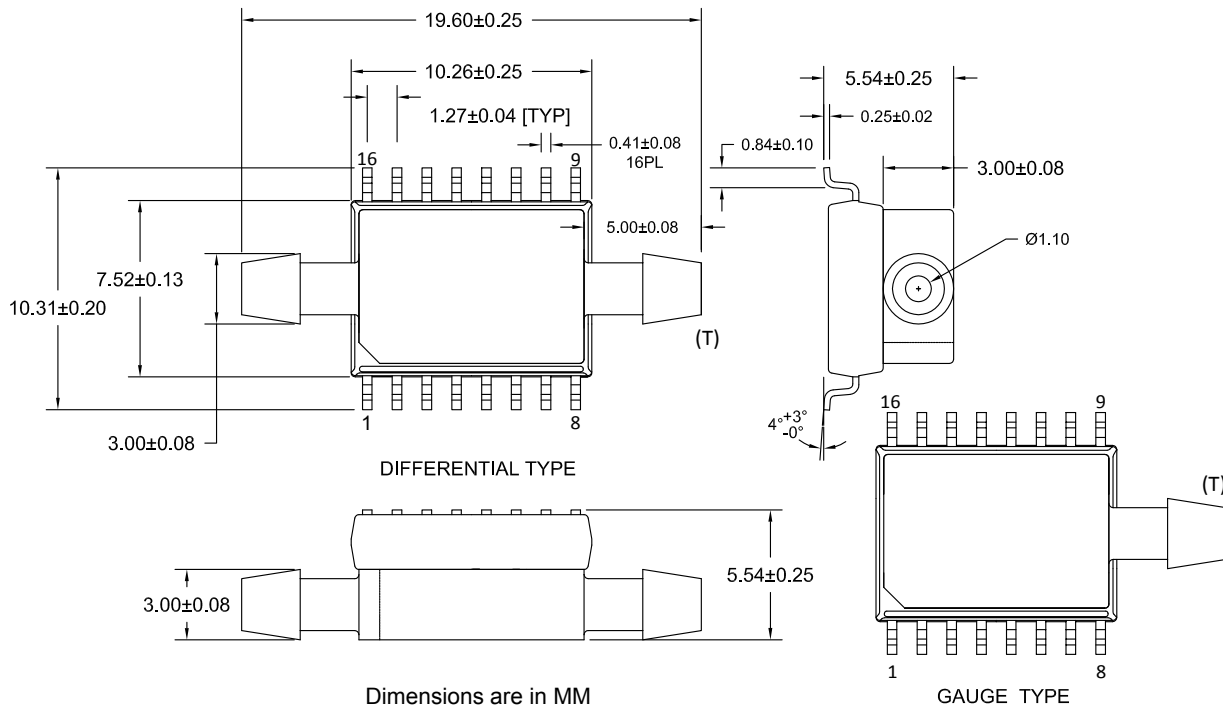
(c) Determined by measurements taken at 0°C and 70°C.

(d) Defined as best fit straight line.

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Pin-Out		Typical Operation				
	PIN	DESCRIPTION	PIN	DESCRIPTION	TYPE	VALUE
	3	+Vexc1/Vsub	3	+Vexc/Vsub	Power	+5 V
	5	-Sig	5	-Sig	Analog Out	-
	12	-Vexc	12	-Vexc	Power	0 V
	13	-Vexc	13	-Vexc	Power	0 V
	14	+Sig	14	+Sig	Analog Out	-
	16	+Vexc	16	+Vexc	Power	+5 V

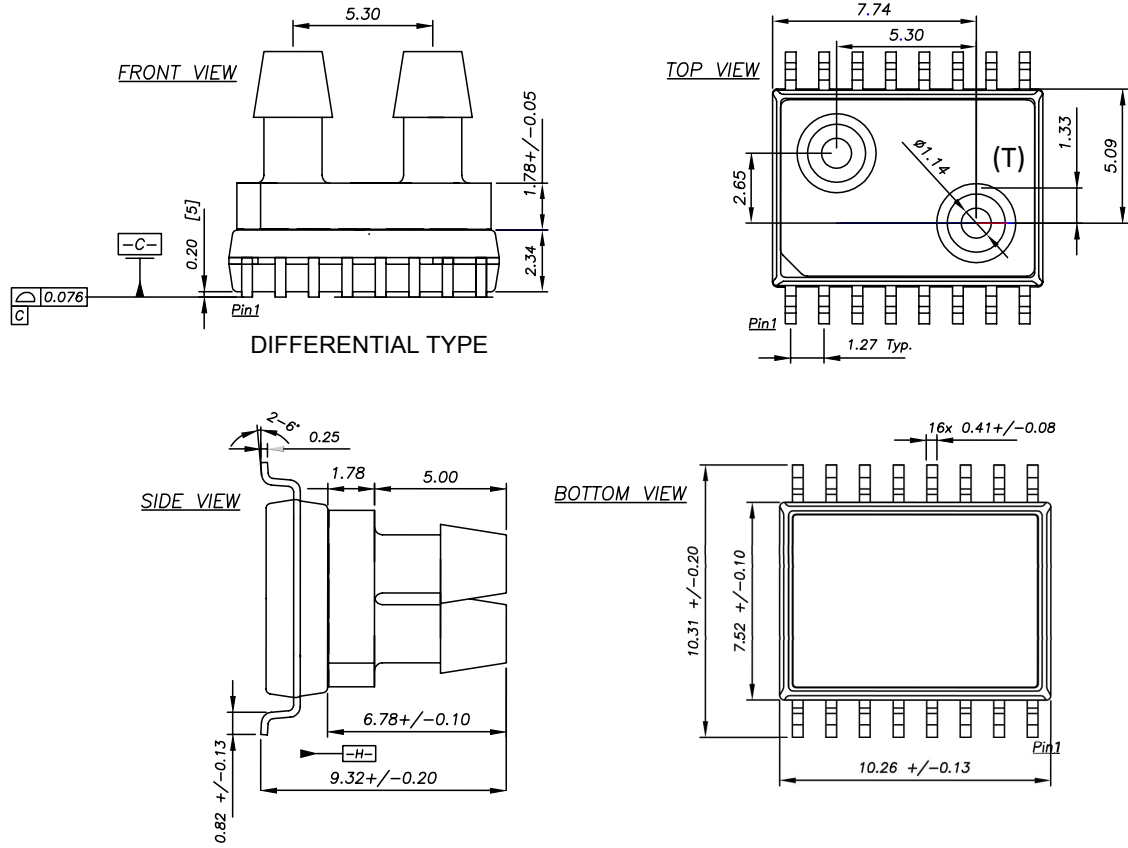
## Horizontal Port (B)



**NOTES:**

((T) is tube connected to top side of the sensor die.  
 For correct sensor output, the higher pressure needs to be connected to this port.

## Vertical Port (C)



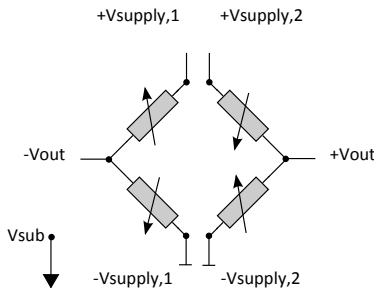
DIMENSIONS ARE IN MM

NOTES:

((T) is tube connected to top side of the sensor die.  
For correct sensor output, the higher pressure needs to be connected to this port.

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### Pin-Out (Gauge Port Only)

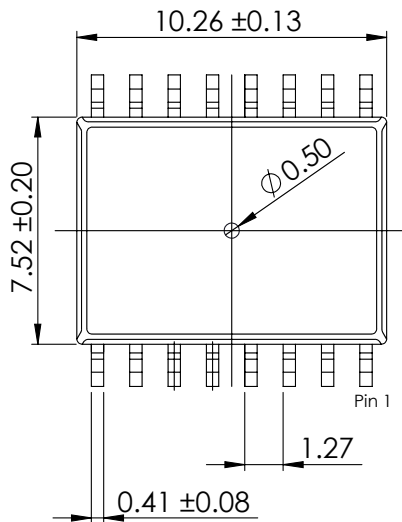


PIN	DESCRIPTION
3	+Vexc1/Vsub
5	+Sig
12	-Vexc
13	-Vexc
14	-Sig
16	+Vexc

### Typical Operation

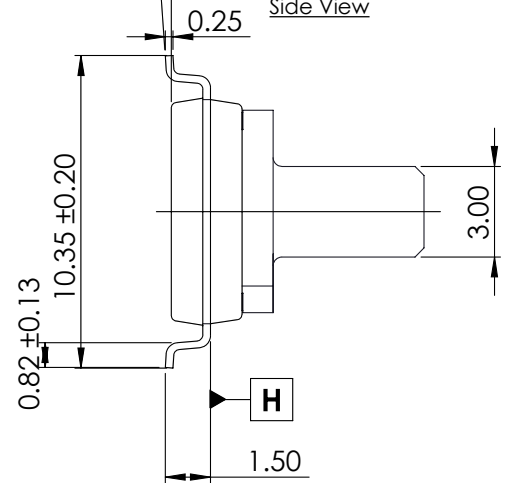
PIN	DESCRIPTION	TYPE	VALUE
3	+Vexc/Vsub	Power	+5 V
5	+Sig	Analog Out	-
12	-Vexc	Power	0 V
13	-Vexc	Power	0 V
14	-Sig	Analog Out	-
16	+Vexc	Power	+5 V

Bottom View

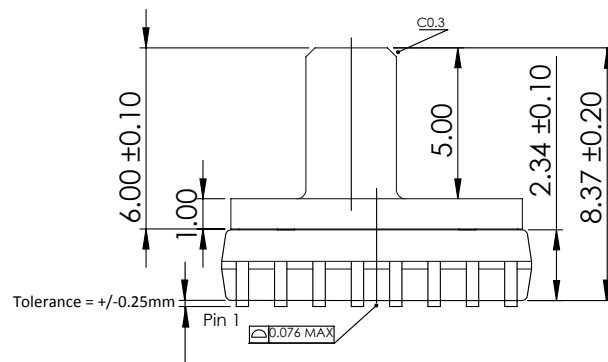
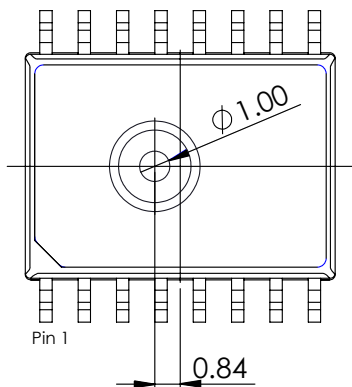


4.00° ± 4.00°

Side View



Top View



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## Ordering Information

Order Code	Full-Scale Pressure Range	Pressure Type	Port Type	Minimum Order Quantity
SM5470-001-D-B	0.15 PSI / 1 kPa	Differential	Horizontal	1,000 Pieces
SM5470-001-D-C		Differential	Vertical	
SM5470-001-G-B		Gauge	Horizontal	
SM5470-001-G-C		Gauge	Vertical	
SM5470-003-D-B	0.30 PSI / 2 kPa	Differential	Horizontal	
SM5470-003-D-C		Differential	Vertical	
SM5470-003-G-C		Gauge	Vertical	
SM5470-008-D-B	0.80 PSI / 5.5 kPa	Differential	Horizontal	
SM5470-008-D-C		Differential	Vertical	
SM5470-008-G-C		Gauge	Vertical	
SM5470-015-D-C	1.50 PSI / 10 kPa	Differential	Vertical	
SM5470-015-G-C		Gauge	Vertical	

Note: Other porting options available for pressure ranges above



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