

# COMPENSATED AND CALIBRATED LOW PRESSURE SENSOR



Product Number: SM5652

## HIGHLIGHTS

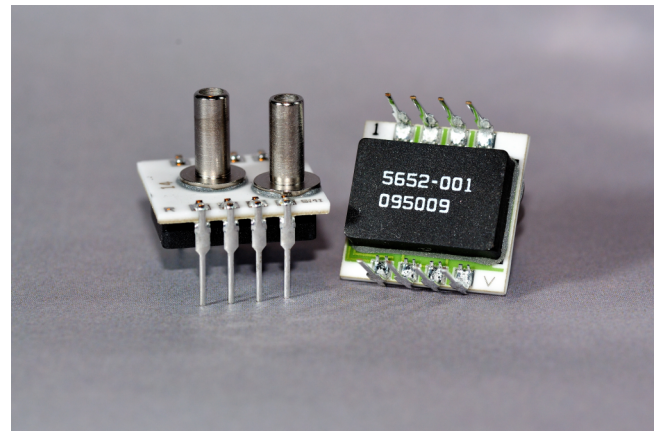
- Low pressures for sensitive applications
- Constant voltage driven
- Dual inline package (DIP)
- Fully temperature compensated and calibrated

## TYPICAL APPLICATIONS

- Medical equipment
- Respiration
- HVAC
- Level detection
- Flow measurement
- Industrial control

## TECHNICAL FEATURES

- 0.15, 0.3, 0.8 & 1.5 PSI (1.0, 2.1, 5.5 & 10.3 kPa)
- Easy-to-use dual inline package (DIP)
- Zero offset calibration
- High-performance, stable, packaged silicon chip
- Wide 0-60°C compensated temperature range
- RoHS & REACH Compliant



## DESCRIPTION

The SM5600 Series of OEM pressure sensors are laser trimmed for enhanced performance, temperature-compensated, low-pressure sensors in dual in-line packages for printed circuit board mounting. These sensors offer improved performance, as well as the option for constant voltage excitation. With the ability to detect pressure ranges as low as 0.15 PSI, the SM5652 is ideal for applications requiring extreme sensitivity from respiration to air filter obstructions.

The SM5600 Series pressure sensors are constructed by attaching a highly stable piezoresistive pressure sensor chip to a ceramic substrate. Thick film resistors on the ceramic are laser trimmed during manufacturing to provide zero offset calibration, temperature compensation for zero offset, and temperature compensation for sensitivity.

Various pressure port configurations are available for flexibility in matching this product to specific applications.

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**ABSOLUTE MAXIMUM RATING TABLE FOR SM5652**All parameters are specified at  $V_{\text{SUPPLY}} = 10.00 \text{ V}$  DC supply at 25°C, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Excitation Voltage	$V_{\text{SUPPLY}}$	0	10	20	V
2	Operating Temperature <sup>(d)</sup>	$T_{\text{OP}}$	-40		+125	°C
3	Storage Temperature <sup>(d)</sup>	$T_{\text{STG}}$	-40		+125	°C
4	Media Compatibility <sup>(d)</sup>					

**NOTES:**

(d) Tested on a sample basis.

No.	Product Number	Operating Pressure	Proof Pressure ( $P_{\text{PROOF}}$ ) <sup>(d)</sup>	Burst Pressure ( $P_{\text{BURST}}$ ) <sup>(d)</sup>
5	SM5652-001-D	-0.15 to 0.15 PSI	±1.5 PSI	±2.25 PSI
6	SM5652-003-D	-0.30 to 0.30 PSI	±3.0 PSI	±4.5 PSI
7	SM5652-003-G	0 to 0.30 PSI	±3.0 PSI	±4.5 PSI
8	SM5652-008-D	-0.80 to 0.80 PSI	±8 PSI	±12 PSI
9	SM5652-015-D	-1.50 to 1.50 PSI	±15 PSI	±22.5 PSI

**OPERATING CHARACTERISTICS FOR SM5652 - SPECIFICATIONS**All parameters are specified at  $V_{\text{SUPPLY}} = 10.00 \text{ V}$  DC supply at 25°C, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
10	Zero Offset	$V_{\text{ZERO}}$	-2.0	+0.2	+2.0	mV
11	Pressure Hysteresis <sup>(d)</sup>	$H_{\text{P,ZERO}}$	-0.30	0.05	0.30	%FS
12	Resistance Input	$R_{\text{B}}$	9.0	20	30	kΩ
13	Resistance Output	$R_{\text{B,OUT}}$	2.0	2.5	3.8	kΩ
14	Compensated Temp. Range <sup>(c)</sup>	$T_{\text{COMP}}$	0		60	°C

All Pressures

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
15	Span (FS $p_{\text{RANGE}}$ ) <sup>(a),(b)</sup>	$V_{\text{SPAN}}$	23.75	25.0	26.25	mV
16	Thermal Accuracy - Span <sup>(c)</sup>	TCS	-2.0	0.2	2.0	% FS
17	Thermal Accuracy - Zero Offset <sup>(c)</sup>	TCZ	-2.0	0.2	2.0	% FS
18	Temperature Hysteresis <sup>(d)</sup>	$H_{\text{T}}$	-0.65	0.05	0.65	%FS
19	Linearity <sup>(d)</sup>	NL	-2.50	0.05	2.50	%FS
20	Repeatability <sup>(d)</sup>	REP	-0.30	0.05	0.30	%FS

0.15 PSI / 1.0 kPa

**NOTES:**

(a) Positive Pressure is defined as entry on the bottom side of the die; gain, during factory calibration, is set using negative pressure.

(b) Values given for top side.

(c) Measured over a temperature range of 22°C to 58°C.

(d) Tested on a sample basis.

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0.3 PSI / 2.1 kPa

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
21	Span (FS $p_{\text{RANGE}}$ ) <sup>(a),(b)</sup>	$V_{\text{SPAN}}$	24.5	25.0	25.5	mV
22	Thermal Accuracy - Span <sup>(c)</sup>	TCS	-0.75	0.2	0.75	% FS
23	Thermal Accuracy - Zero Offset <sup>(c)</sup>	TCZ	-1.0	0.2	1.0	% FS
24	Temperature Hysteresis <sup>(d)</sup>	$H_T$	-0.45	0.05	0.45	%FS
25	Linearity <sup>(d)</sup>	NL	-0.50	0.05	0.50	%FS
26	Repeatability <sup>(d)</sup>	REP	-0.30	0.05	0.30	%FS

**NOTES:**

(a) Positive Pressure is defined as entry on the bottom side of the die; gain, during factory calibration, is set using negative pressure.

(b) Values given for top side.

(c) Measured over a temperature range of 22°C to 58°C.

(d) Tested on a sample basis.

0.8 PSI / 5.5 kPa &amp; 1.5 PSI / 10.3 kPa

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
27	Span (FS $p_{\text{RANGE}}$ ) <sup>(a),(b)</sup>	$V_{\text{SPAN}}$	24.5	25.0	25.5	mV
28	Thermal Accuracy - Span <sup>(c)</sup>	TCS	-0.65	0.2	0.65	% FS
29	Thermal Accuracy - Zero Offset <sup>(c)</sup>	TCZ	-1.0	0.2	1.0	% FS
30	Temperature Hysteresis <sup>(d)</sup>	$H_T$	-0.30	0.05	0.30	%FS
31	Linearity <sup>(d)</sup>	NL	-0.30	0.05	0.30	%FS
32	Repeatability <sup>(d)</sup>	REP	-0.30	0.05	0.30	%FS

**NOTES:**

(a) Positive Pressure is defined as entry on the bottom side of the die; gain, during factory calibration, is set using negative pressure.

(b) Values given for top side.

(c) Measured over a temperature range of 22°C to 58°C.

(d) Tested on a sample basis.

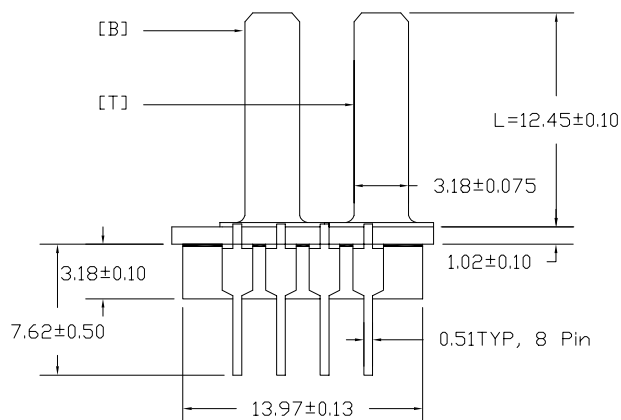
## Qualification Standards

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

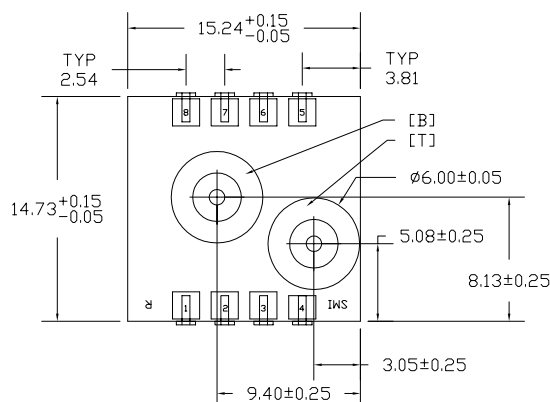


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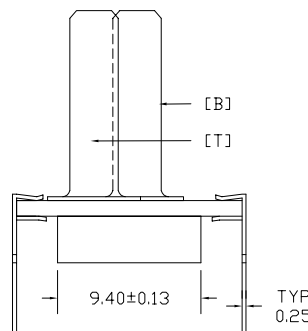
## Package Dimensions & Pin-Out



Side View



Top View



PIN	DESCRIPTION
1	Sig-
2	-Vexc
3	Sig+
4	+Vexc
5	NC
6	NC
7	NC
8	NC

All dimensions are shown in millimeters

### NOTES:

- Do not connect to NC pins.
- External connections to NC pins will cause part malfunction.
- [B] is tube connected to bottom side of sensor die.
- [T] is tube connected to top side of sensor die.
- Tube [B] is used for positive differential pressure.
- Not to exceed 5kg force on tubes.

### Pressure Type:

D: Differential (2 Tubes)  
G: Gauge (1 Tube, [B] tube only)

### Tube Length:

L: Long (12.45 mm ± 0.10 mm)  
S: Short (8.25 mm ± 0.10 mm)

## Ordering Information

Order Code	Pressure Type	Full-Scale Pressure Range	Tube Length
5652-001-D-3-LR	Differential	0.15 PSI / 1.0 kPa	Long
5652-001-D-3-SR	Differential	0.15 PSI / 1.0 kPa	Short
5652-003-D-3-LR	Differential	0.3 PSI / 2.1 kPa	Long
5652-003-D-3-SR	Differential	0.3 PSI / 2.1 kPa	Short
5652-003-G-3-SR	Gauge	0.3 PSI / 2.1 kPa	Short
5652-008-D-3-SR	Differential	0.8 PSI / 5.5 kPa	Short
5652-008-G-3-SR	Gauge	0.8 PSI / 5.5 kPa	Short
5652-015-D-3-LR	Differential	1.5 PSI / 10.3 kPa	Long
5652-015-D-3-SR	Differential	1.5 PSI / 10.3 kPa	Short

For samples, please contact [sales@si-micro.com](mailto:sales@si-micro.com).

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