



**SILICON
MICROSTRUCTURES
INCORPORATED**

SM5651/SM5652

**Low Pressure, Constant Current DIP
Low Pressure, Constant Voltage DIP**

- **LOW PRESSURE TRANSDUCER FULLY TEMPERATURE COMPENSATED AND CALIBRATED DUAL-IN-LINE PACKAGE**

DESCRIPTION

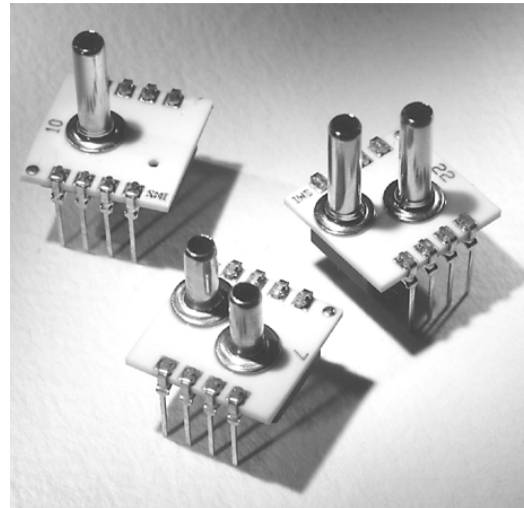
The **SM5650** Series of OEM pressure sensors are fully calibrated, temperature compensated low-pressure sensors in dual in-line packages for printed circuit board mounting. These sensors offer improved performance as well as the option for either constant current or constant voltage excitation. Higher pressure ranges are also available (See **SM5611/SM5612 Datasheet**), resulting in the broadest selection of standard pressure ranges in the industry.

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. In the Model **SM5651**, an additional resistor is trimmed to normalize the output of an external differential amplifier to provide span calibration when the sensor is driven by a constant current supply. In the Model **SM5652**, a constant voltage supply can be used and the normalized output span of each sensor can then be easily amplified.

The model **SM5651** is designed for constant current excitation.

The model **SM5652** is designed for constant voltage excitation.

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



FEATURES

- Low pressure (from 0-0.15 PSI FS to 0-3.0 PSI FS)
- Constant voltage and constant current versions
- Easy to use dual in-line package (DIP)
- Wide 0-60°C compensated temperature range
- Span calibration to $\pm 2\%$ for low pressure
- Zero offset calibration
- High performance, stable packaged silicon chip
- Gage and differential pressure configurations

APPLICATIONS

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

SM5651/SM5652

CHARACTERISTICS FOR SM5651/SM5652 - SPECIFICATIONS

Test Conditions: Model SM5651 w/excitation = 1.500mA @ 25 °C, Model SM5652 w/excitation = 10.00Vdc @ 25 °C, unless otherwise specified.

	Min.	Typ.	Max.	Units	Notes
Excitation					
Current (SM5651)	0.00	1.50	3.00	mA	
Voltage (SM5652)	0.00	10.00	20.00	V	
Output					
Span (SM5651)	25.0	45.0	75.0	mV	1
Span (SM5652)	24.5	25.0	25.5	mV	1, 2
Offset	-2.00	+0.20	2.00	mV	
Temperature Performance					
TC Span	-0.65	+0.20	0.65	%FS	3
TC Offset	-1.00	+0.20	1.00	%FS	3
Temp Hysteresis	-0.30	+0.05	0.30	%FS	4
Accuracy					
Linearity	-0.30	+0.05	0.30	%FS	5
Repeatability	-0.30	+0.05	0.30	%FS	
Pressure Hysteresis	-0.30	+0.05	0.30	%FS	
Sensitivity Matching	-2.00	-0.20	+2.00	%FS	1, 6
Impedance (SM5651)					
Z Input	1.80	3.00	3.80	kΩ	
Z Output	2.70	3.30	3.80	kΩ	
Impedance (SM5652)					
Z Input	4.50	8.00	25.00	kΩ	
Z Output	2.00	2.50	3.80	kΩ	
Temperature Range					
Calibration	0		60	°C	
Operating	-40		125	°C	
Storage	-55		125	°C	
Dynamic Characteristics					
Proof Pressure	10X			FS Pressure	
Burst Pressure	15X			FS Pressure	

Notes:

- Positive Pressure is defined as entry on the bottom side of the die; gain, during factory calibration, is set using negative pressure
- For the SM5652, 0.15 PSI range, span is 23.75 (min) to 26.25 (max).
- Measured over a temperature range of 0 to 60 °C.
For 0.15 PSI, TC Span=±2.0%FS; TC Offset=±2.0%FS; For 0.3 PSI, TC Span=±0.75%FS
- For 0.30 PSI, Hysteresis=±0.45%FS;
For 0.15 PSI, Hysteresis=±0.65%FS
- Best fit straight line; measured from top-side of die
For 0.30 PSI, Linearity=±0.5%FS;
For 0.15 PSI, Linearity=±2.5%FS
- Sensitivity matching relates to part-to-part matching
For 0.15 PSI, Sensitivity Matching=5.0%FS

Model 5651 Pin-out

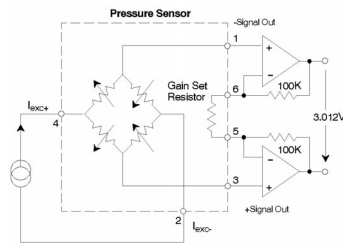
- Signal Out
- lexc
- +Signal Out*
- +lexc
- Gainset Resistor
- Gainset Resistor

Model 5652 Pin-Out

- Signal Out
- Vexc
- +Signal Out*
- +Vexc
- Do Not Connect
- Do Not Connect

*Output increases as pressure is increased on Positive Differential Tube or Absolute Tube

DO NOT connect to "Do Not Connect" pins



Circuit Configuration for SM5651

ORDERING INFORMATION:

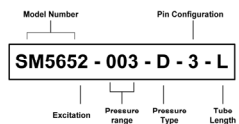
Excitation
1. Constant Current
2. Constant Voltage

Pin Configuration
3. Pins opposite direction of tube
5. Surface Mountable Pins, opposite side of the tube

Tube Length
L: Long (0.480" ± 0.005")
N: No Tube
S: Short (0.330" ± 0.005")

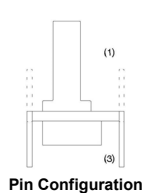
Pressure Type
D: Differential (2 Tubes)
G: Gauge (1 Tube)

Other configurations available on large orders. Consult SMI for details.

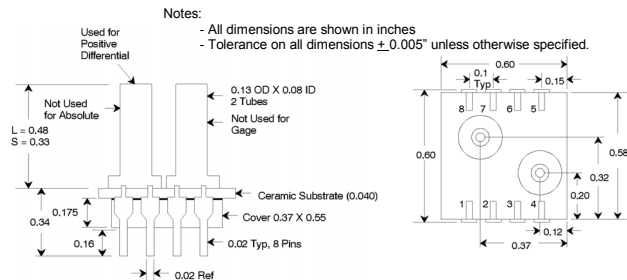


Pressure Ranges

PSI	5651/ 5652
0.15	001
0.30	003
0.80	008
1.50	015
3.00	030



Pin Configuration



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