



SM5310/SM5350

SM5410/SM5450

Low Cost Packaged Pressure Sensors

- **SURFACE MOUNT AND DIP PRESSURE SENSORS LOW-COST PACKAGED DIE**

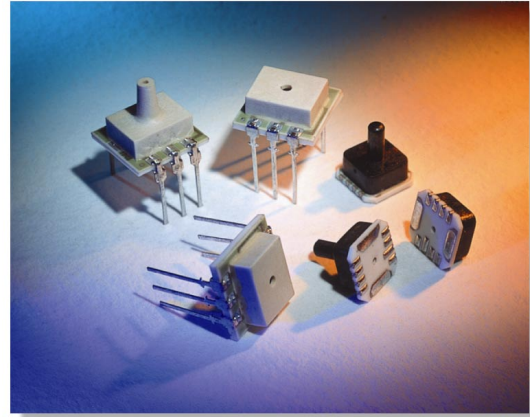
DESCRIPTION

Silicon Microstructures provides its two most popular pressure sensor die in surface mount and 6-pin dual in-line package (DIP) configurations. All parts in these series are uncompensated high-performance die mounted on a substrate with a plastic cap and either pins for through-board assembly or pads for surface mounting.

Both package types provide a low-cost way for OEM manufacturers to incorporate pressure sensors at costs close to raw die prices, without the need to handle, attach, or wire bond silicon sensor die.

Options include pressure range, surface mount or DIP mounting, absolute or gage configuration, and a choice of cap configurations. The result is a versatile product line suitable for a wide range of OEM applications.

The low-pressure series (models **SM5350** and **SM5450**) incorporate Silicon Microstructures unique low-pressure die to achieve high performance in pressure ranges down to 0.15 PSI full-scale.



FEATURES

- Low pressure (from 0-0.15 to 0-100 PSI FS)
- Easy to Use
- Compact and Light-weight
- High-performance, Stable Silicon Chip and Package
- Easily Embedded in OEM Equipment
- Molded Pressure Port Option for Attachment to 1/8 Inch Tubing
- High-volume, Low Cost

APPLICATIONS

- Altimeters
- Barometric Correction
- Tire Gauges
- Digital Pressure Gauges
- Environmental Monitoring
- Appliances
- Consumer and Sports
- HVAC
- Medical Instrumentation and Monitoring
- Pressure Differential and Flow Monitoring
- Hand-held Gauges

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SELECTIONS

Model SM5310

Standard Pressure Range, Surface Mount

For general purpose applications, the **SM5310** series has the smallest footprint and covers the range from 0-5 psi to 0-100 psi full scale.

The top cap is available with either a molded port for attaching 1/8 inch plastic tubing or with a hole. The cap with hole provides a low profile for measuring barometric pressure, measuring pressure in the electronics enclosure or "O" ring sealing to another surface.

It is also available in both absolute and gage configurations. In absolute configuration, the pressure is applied to the top of the sensor (through either the molded port or the hole in the cap). A reference vacuum chamber is formed in the die during manufacturing.

In gage configuration, pressure is applied to the top cap (either through plastic tubing over the molded port or an "O" ring seal to the cap) and the gage reference pressure is applied through a hole in the bottom of the substrate. The mating board must be designed to leave a clear path to this hole for accurate gage measurements.

Model SM5350

Low Pressure Range, Surface Mount

The model **SM5350** uses Silicon Microstructures unique low-pressure die, which is a true low-pressure structure (not just a

derated standard die). As a result, it has very good stability, linearity and dynamic range down to 015 PSI full scale.

This die is larger than the standard pressure die and therefore the footprint is larger than the model SM5310. It uses the same substrate as the models **SM5410** and **SM5450**.

It is also available with the option of a molded port for tubing or a cap with hole.

Low-pressure parts are typically used in gage configuration, and the model **SM5350** is only available as a gage part.

Model SM5410

Standard Pressure Range, Dual In-line Pins (DIP)

The model **SM5410** DIP configuration is similar to the model **SM5310** surface mount except that it uses a slightly larger substrate to accommodate six pins for through-board printed circuit mounting.

It is also available with or without a pressure port, and in absolute or gage configurations.

Models **SM5310** and **SM5410** are available in 5, 15, 30, 60, and 100 PSI full scale ranges.

Model SM5450

Low Pressure Range Dual In-line Pins (DIP)

The model **SM5450** is identical to the **SM5350** with the addition of six pins to allow through-board printed circuit mounting.

Models **SM5350** and **SM5450** are available in 0-0.15, 0-0.3, 0-0.8, 0-1.5, and 0-3.0 psi full scale ranges.



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SM5310/SM5350 SM5410/SM5450

CHARACTERISTICS FOR SM5310/SM5350/SM5410/SM5450 - SPECIFICATIONS

All parameters measure at 5V excitation at room temperature, unless otherwise specified.

All Models

Parameter	Min.	Typ.	Max.	Units	Notes
Excitation Voltage	0	5.0	10.0	V	
Excitation Current	0	1.5	3.0	mA	
Offset	-50	0	50	mV	
TC Span	-15	-19	-24	%FS/100°C	1
TC Resistance	33	28	25	%/100°C	1
Bridge Impedance	2.7	3.3	4.0	kΩ	
Operating Temp	-40		85	°C	
Storage Temp	-55		125	°C	

SM5310 and SM5410 Standard Pressure Series Only

Span (FS Range)	Min.	Typ.	Max.	Units	Notes
5 PSI	75	100	125	mV	3
15 PSI	105	145	175	mV	3
30 PSI	115	165	195	mV	3
60 PSI	115	180	220	mV	3
100 PSI	115	200	250	mV	3
Linearity	-0.3	± 0.05	+0.3	%FS	4
TC Offset		± 7		%FS/100°C	1
Burst Pressure	5X			Rated FS Pressure	2

SM5350 and SM5450 Low Pressure Series Only

Span (FS Range)	Min.	Typ.	Max.	Units	Notes
0.15 PSI	25	50	75	mV	3
0.3 PSI	25	50	75	mV	3
0.8 PSI	25	50	75	mV	3
1.5 PSI	25	50	75	mV	3
3.0 PSI	25	50	75	mV	3
Linearity	-0.3	± 0.1	+0.3	%FS	4
TC Offset		± 12		%FS/100°C	1
Burst Pressure	15X			Rated FS Pressure	2

Notes:

1. Measured from 0 to 70°C
2. Sensor die will survive pressure specified for all ranges. Maximum package pressure is 225 PSI.
3. Measured at 5V, constant voltage excitation
4. Defined as best-fit straight line (BFSL); for 0.3 PSI full-scale, linearity is ± 0.5%FS. For 0.15 PSI full-scale, linearity is ± 5.0%FS.

ORDERING INFORMATION:

Model Number Pressure Type

SM5350-008-G-P

Pressure Range Cap Type

Pressure Type

A: Absolute
(SM5310 and SM5410 only)
G: Gage

Cap Type

P: Port (tube)
H: Hole

Std. Pressure Ranges

PSI	5310/ 5410
5	005
15	015
30	030
60	060
100	100

Low Pressure Ranges

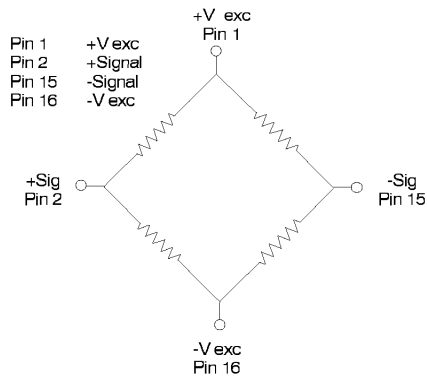
PSI	5350/ 5450
0.15	001
0.30	003
0.80	008
1.50	015
3.00	030

Rev 1.2 8_02

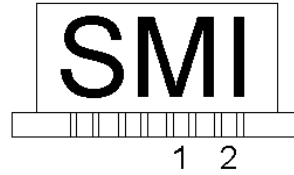
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SM5310/SM5350

SM5410/SM5450

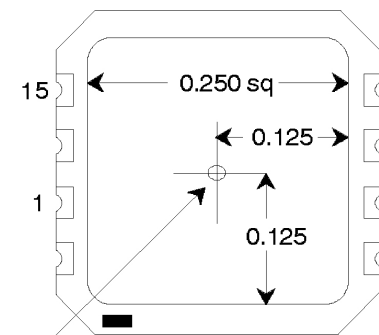


Model 5310 Pin-out
Model 5310 is a closed-bridge device



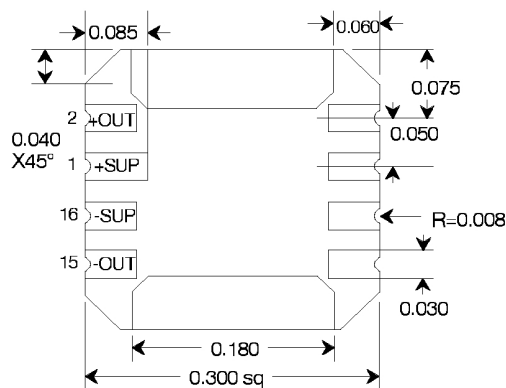
The text, "SMI", should align to the side of the substrate with pin 1, as shown.

Dimensions (in inches) -- SM5310

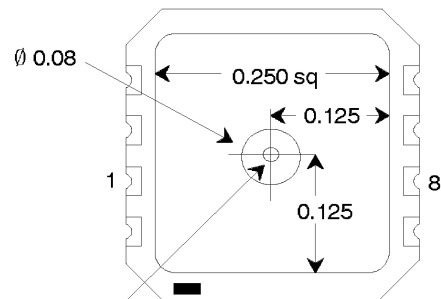


SM5310 with Hole (Top View)

Pin 1 indicator shown. Ejection mark on cap is NOT an indicator of pin 1.

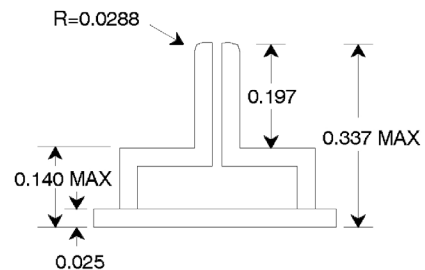


SM5310 (Bottom View)



SM5310 with Port (Top View)

Pin 1 indicator shown. Ejection mark on cap is NOT an indicator of pin 1.



SM5310 with Port (Side View)

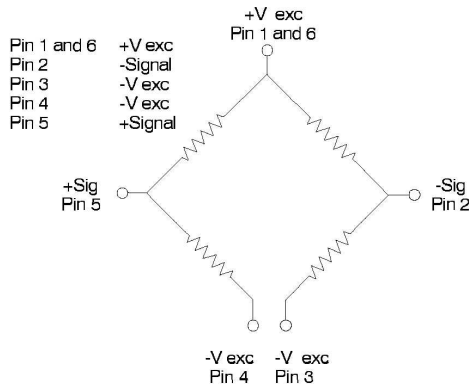


SM5310 with Hole (Side View)



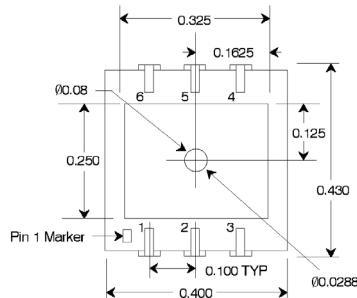
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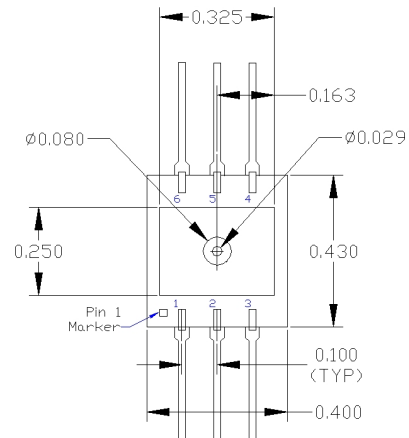


Model 5350/5410/5450 Pin-Out

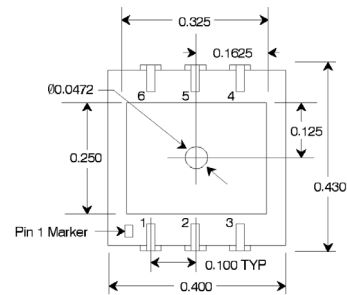
Model SM5350/SM5410/SM5450 are open bridge devices. Pins 1 and 6 are tied together in the package and MUST be connected to the most positive excitation. Pins 3 and 4 may be directly connected to the most negative excitation either directly or thru offset resistors.



SM5410/SM5450 with Hole (Top View)

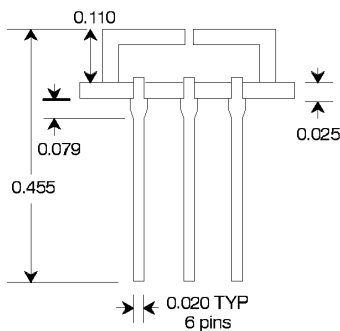


SM5350 with Port (Top View)

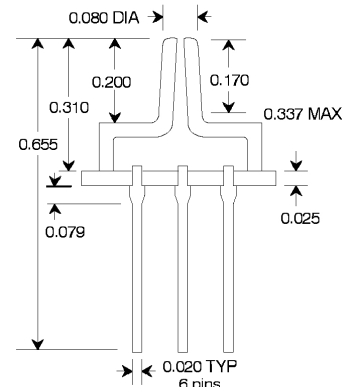


SM5410/SM5450 with Hole (Top View)

All Dimensions in inches



SM5410/SM5450 with Hole (Side View)



SM5410/SM5450 with Port (Side View)

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