

# Model SE105 Flip-Chip Pressure Sensor Dies

## Description

The model SE105 is a flip-chip pressure sensor die based on piezoresistive working principle. It is designed for the pressure measurements of absolute, gauge or differential reference.

The sensor die is manufactured by the 6" silicon micro-machining process. Thanks to the unique flip-chip silicon-on-silicon structure, comparing with the conventional sensor die structure, the SE105 features various superiority: suitable for more harsh environment (because its Wheatstone bridge circuitry cannot be approached by pressure medium), and simplified die bonding process (because the traditional wire bonding process is eliminated and the SE105 can be easily attached onto the circuit as a surface mounting device).

As a non-signal-conditioning sensor die, the standard SE105 is available in an closed-bridge circuit with 4 solder pads for both bridge adjustment and temperature compensation.

Before packing, each SE105 sensor die is individually tested and qualified to its specifications.

3 types of packaging are available as options to fit different marketing demands.

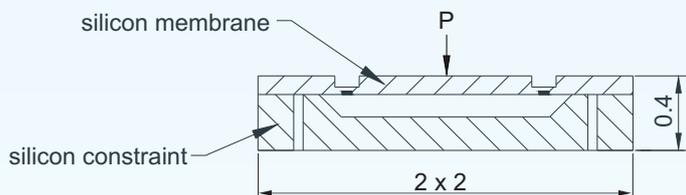
## Features

- suitable for harsh environment
- easy bonding
- excellent non-linearity up to:  $\pm 0.2\%$ fs
- designed for absolute, gauge or differential pressure applications

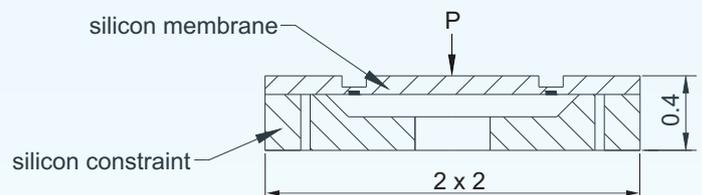
## Applications

- medical: clinical devices and patient monitoring systems (e.g., dialysis instruments)
- automotive: engine control, and suspension adjustment system
- consumer: consumer electronics, barometers (or altimeters), and depth gauges (e.g., diving watches)
- automation: mass production of pressure sensors, pressure switches, and pressure controllers

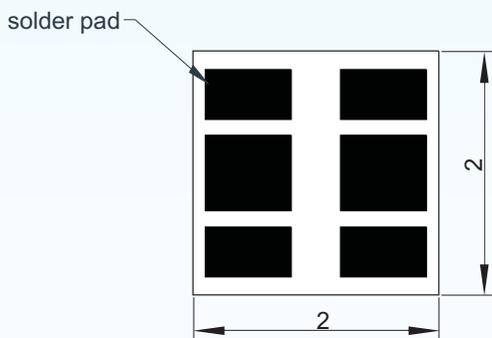
## Dimensions



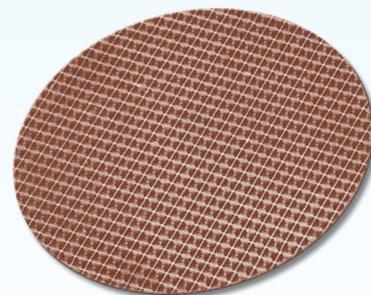
cross-section of absolute pressure sensor die  
(standard)



cross-section of gauge pressure sensor die  
(available on request)



terminal pad layout



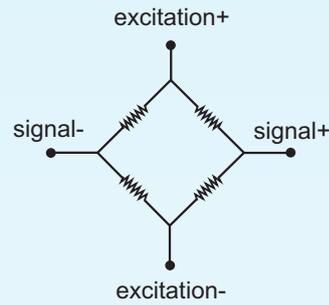
6" SE105 wafer

Note: All dimensions are in mm.

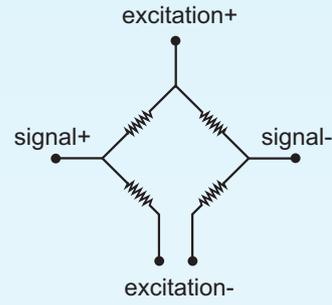
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## Wheatstone Bridge Circuit Diagram



closed-bridge circuit diagram  
(standard)



open-bridge circuit diagram  
(available on request)

## Technical Data

Parameters		Units	Specifications	Notes
pressure ranges		bar, A or G	0~1, ~7, ~10, ~12, ~28, ~35	1
pressure reference			absolute (standard), gauge (available on request)	
proof pressure		%fs	200, 300 for range of 1bar	2
burst pressure		%fs	300, 400 for range of 7bar, 500 for range of 1bar	2
full scale output (fso)		mV	100±30	3 & 4
excitation	voltage	Vdc	5 (typical), or any voltage in the range of 1, ..., 10Vdc	
	current	mA	1 (typical), or any current in the range of 0.2, ..., 2mA	
zero offset		mV	≤ ±25	4
non-linearity (NL)		%fs	±0.2 (typical: ±0.15), ±0.25 (standard)	5
hysteresis (HY)		%fs	≤ ±0.1	
repeatability (RP)		%fs	≤ ±0.1	
long-term stability		%fs/year	≤ ±0.1	
bridge resistance		kΩ	5±1	
storage temperature range		°C	-55 ~ +150	
operating temperature range		°C	-40 ~ +125	
temp. coeff. (TC) of bridge resistance		%/°C	0.12 ±0.02	6
TC of zero offset		%fso/°C	≤ ±0.05	7
TC of SPAN		%fso/°C	≤  -0.27	7
thermal HY of zero offset		%fso/°C	≤ ±0.1	
dimensions		mm	2.0 x 2.0 x 0.4	

General conditions for measurements: temperature = 25°C, humidity = 40%RH.

Notes: 1. Customized pressure ranges available on request. Consult BCM SENSOR.

2. fs refers to full scale pressure or rated pressure.

3. Measured at full scale pressure.

4. Measured at 5Vdc excitation.

5. Calculated according to Terminal Base Line (the endpoint method).

6. Calculated as a rate of resistance change between -40°C and 125°C, and normalized by the resistance at 25°C.

7. Calculated as a rate of output change between -40°C and 125°C, and normalized by the output at 25°C, when the die is not temperature compensated.

The listed specifications and dimensions are subject to change without prior notice.

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## Ordering Information

ordering code: SE105-10-A-0.25%fs-CB-Y-(\*)

pressure ranges	
1 = 0~1 bar	28 = 0~28 bar
7 = 0~7 bar	35 = 0~35 bar
10 = 0~10 bar	customized range available as an option
12 = 0~12 bar	

pressure reference	
A = absolute (standard)	G = gauge (available on request)

non-linearity (NL)
0.2%fs
0.25%fs (standard)

bridge type
CB = close bridge circuit (standard)
OB = open-bridge circuit (available as an option)

package
X = individually packaged die in plastic package
Y = diced wafer on tape
Z = non-diced wafer on tape

customized parameter
“(*)” is necessary only if any customized parameter is required, otherwise it is neglectable.

## Examples of Ordering Code

- standard sensor die:      model-pressure range-pressure reference-NL-bridge type-package  
**SE105-10-A-0.25%fs-CB-Y**

