Model SE102
High-Overload-Pressure Sensor Dies

Description

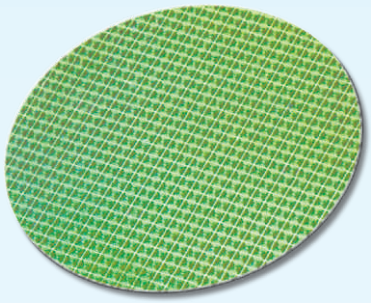
The model SE102 is a pressure sensor die of high overload pressure (HOP), i.e., high proof pressure and high burst pressure, which is based on piezoresistive working principle. The HOP sensor die is manufactured by the 6" silicone micro-machining process, and it features silicon-on-silicon structure. Thanks to the unique design of its pressure diaphragm, the SE102 possesses both high sensitivity and extraordinary overload pressures.

This model is designed for absolute, gauge or differential pressure measurements. For gauge or differential pressure reference, there are two types of structure available. One is the silicon-on-silicon structure, i.e., with the silicon constraint, while the other is without the silicon constraint.

As a non-signal-conditioning sensor die, the standard SE102 is available in an open-bridge circuit with five solder pads for both bridge adjustment and temperature compensation.

Before packing, each SE102 sensor die is individually tested and qualified to its specifications.

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



6" SE102 wafer

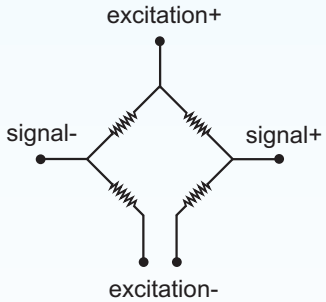
Features

- excellent non-linearity up to: ±0.15%fs
- designed for gauge or differential pressure applications
- small foot-print, high product rate per wafer for low cost application
- high sensitivity and extraordinary proof and burst pressure

Applications

- medical: clinical devices and patient monitoring systems (e.g. dialysis instruments)
- automotive: tire pressure monitoring, 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

Wheatstone Bridge Circuit Diagram



open-bridge circuit diagram

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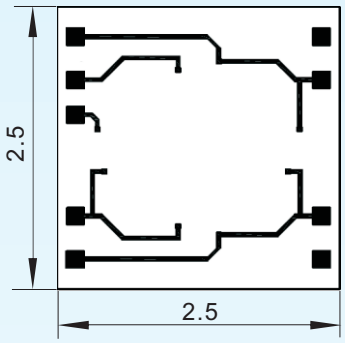
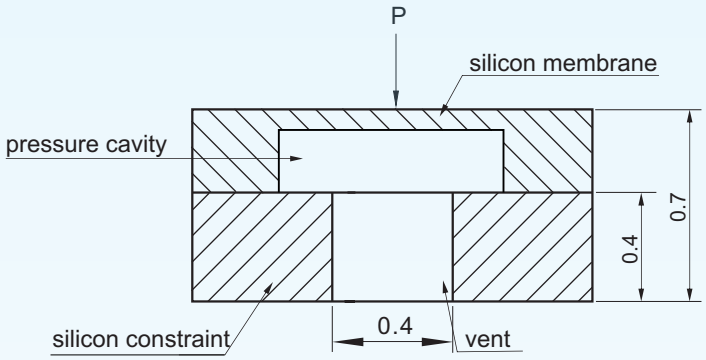
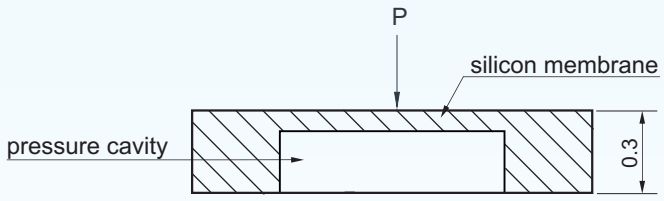
Lateral Dimensions and Terminal Pads Layout



Cross-section



silicon constraint with vent
for gauge and differential pressure measurements



without silicon constraint
for gauge and differential pressure measurements

Note: All dimensions are in mm.

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Technical Data

Parameters		Units	Specifications	Notes
pressure ranges		bar	0~0.4, ~1	1
pressure reference			gauge	
proof pressure		%fs	1000	2 & 3
burst pressure		%fs	1500	2 & 3
full scale output (fso)		mV	⩾ 80	4 & 5
excitation	voltage	Vdc	5 (typical), or any voltage in the range of 1.2, ..., 12Vdc	
	current	mA	1 (typical), or any current in the range of 0.2, ..., 2mA	
zero offset		mV	⩽ ±25	5
non-linearity (NL)		%fs	⩽ ±0.15	6
hysteresis (HY)		%fs	⩽ ±0.05	
repeatability (RP)		%fs	⩽ ±0.05	
long-term stability		%fs/year	⩽ ±0.2	
bridge resistance		kΩ	6±1	
storage temperature range		°C	-55 ~ +150	
operating temperature range		°C	-40 ~ +125	
temp. coeff. (TC) of bridge resistance		%/°C	0.11 ±0.02	7
TC of zero offset		%fso/°C	⩽ ±0.03	8
TC of SPAN		%fso/°C	⩽ |-0.21|	8
thermal HY of zero offset		%fso/°C	⩽ ±0.05	
dimensions		mm	2.5 x 2.5 x 0.7	

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. The specification listed in the table applies the case that the pressure is introduced from the topside of sensor die as indicated with “P” in the drawing on the previous page. If the pressure is introduced from the opposite side of sensor die, this specification will be different. Please consult BCM SENSOR.
4. Measured at full scale pressure.
5. Measured at 5Vdc excitation.
6. Calculated according to Terminal Base Line (the endpoint method).
7. Calculated as a rate of resistance change between -40°C and 125°C, and normalized by the resistance at 25°C.
8. 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.

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Ordering Information

ordering code: SE102-0.4-A-0.15%fs-OB-C-Y-(*)

pressure ranges	
0.4 = 0~0.4 bar	customized range available
1 = 0~1 bar	on request for large orders

pressure reference
G = gauge

non-linearity (NL)
0.15%fs

bridge type
OB = open-bridge circuit

die structure
C = with silicon constraint of 0.5mm thickness
N = without silicon constraint (only available on request for large orders)

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

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

Examples of Ordering Code

- standard sensor die:

  SE102-0.4-G-0.15%fs-OB-C-Y

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

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