

Model SE102 High-Overload-Pressure Sensor Dies

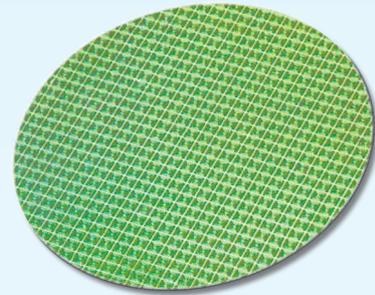
Description

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. It is designed for absolute, gauge or differential pressure measurements. The HOP sensor die is manufactured by the 6" silicon 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.

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

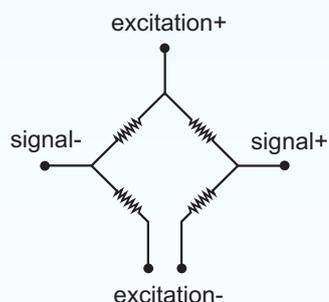
Features

- excellent non-linearity up to: $\pm 0.15\%$ fs
- designed for absolute, 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

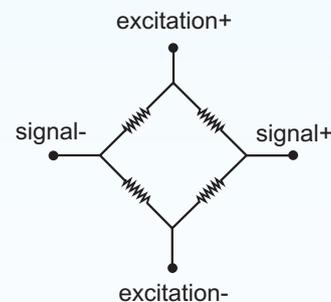
Applications

- 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
(standard)

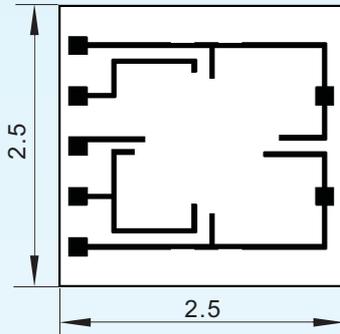


closed-bridge circuit diagram
(available as on request for mass production)

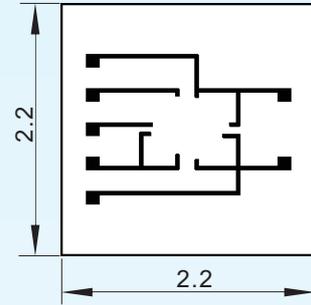
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Lateral Dimensions and Terminal Pads Layout

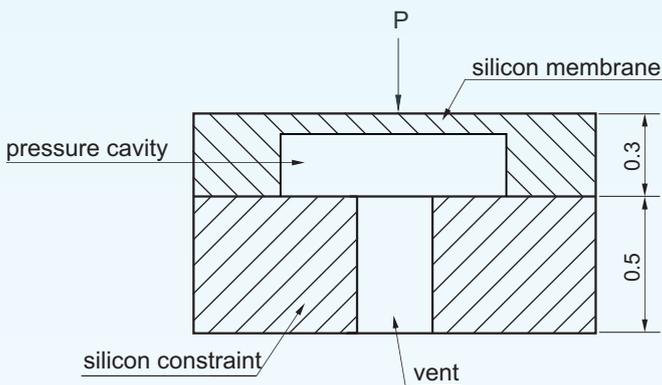


for rated pressure $\leq 1\text{bar}$

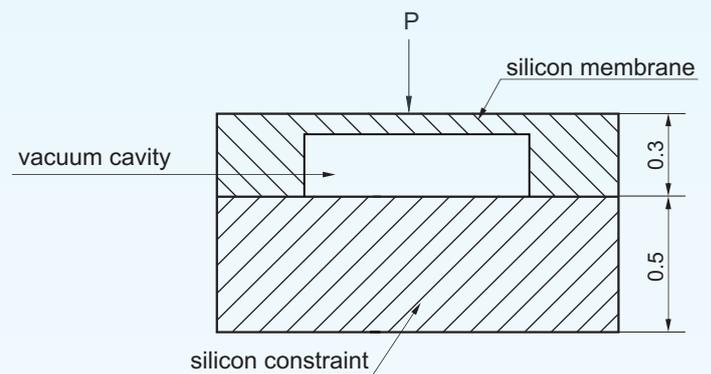


for rated pressure $\geq 2.5\text{bar}$

Cross-section



silicon constraint with vent
for gauge and differential pressure measurements



silicon constraint without vent
for absolute pressure measurements

Note: All dimensions are in mm.

Model SE102

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Technical Data

Parameters		Units	Specifications	Notes
pressure ranges & reference		bar, G or A	0~0.4, ~1, ~2.5, ~8	1
proof pressure		%fs	1500 (for 0.4bar), 1000 (for 1bar), 800 (for other ranges)	2
burst pressure		%fs	2000, 1200 (for 2.5bar and 8bar)	2
full scale output (fso)		mV	110±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	±0.15	5
hysteresis (HY)		%fs	≤ ±0.05	
repeatability (RP)		%fs	≤ ±0.05	
long-term stability		%fs/year	≤ ±0.1	
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	6
TC of zero offset		%fso/°C	≤ ±0.01	7
TC of SPAN		%fso/°C	≤ -0.22	7
thermal HY of zero offset		%fso/°C	≤ ±0.05	
dimensions		mm	2.5 x 2.5 x 0.8, 2.2 x 2.2 x 0.8	

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: SE102-2.5-0.15%fs-Y-(*)

pressure ranges			
0.4 = 0~0.4 bar	G, A	8 = 0~8 bar	G, A
1 = 0~1 bar	G, A	customized range available as an option	
2.5 = 0~2.5 bar	G, A		

non-linearity (NL)
0.15%fs

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-NL-package
 SE102-2.5-0.15%fs-Y

