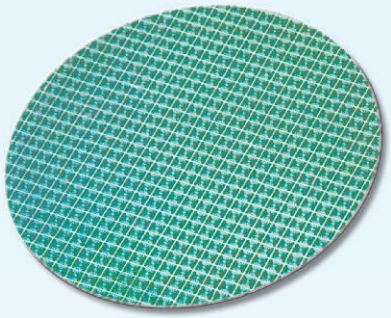
Model SE103
Pressure Sensor Dies

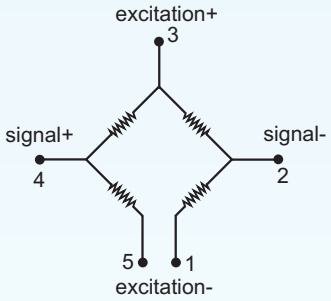
Made from high quality silicon wafer of 4" diameter, BCM SE103 sensor dies are in mass production by means of Micro-Electro-Mechanical System (MEMS) technology. Based on piezoresistive effect, BCM SE103 pressure sensor dies can measure the pressure concerned on its surface. The back side of a SE103 die is a pressure chamber, it can be sealed with glass to measure sealed gauge pressure or absolute pressure. If the sealed glass is with a vent, the dies are used to measure gauge or differential pressure.

The pressure ranges of SE103 are from 0~200 mbarG up to 0~1000 barA, in the form of gauge(or differential (diff.)) pressure or absolute pressure. The measuring accuracy is up to 0.25%fso (fso = full scale output). The output signal is Wheatstone bridge output in millivolt. For bridge excitation, constant current (1 mA) or constant voltage (5~10 Vdc) excitation method is available on request.

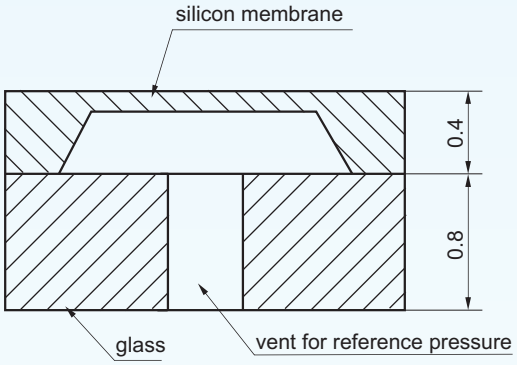


SE103 pressure sensing element wafer

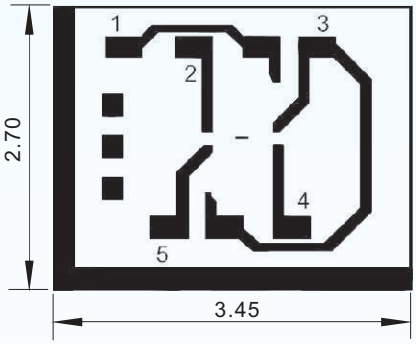
Wheatstone bridge circuit:



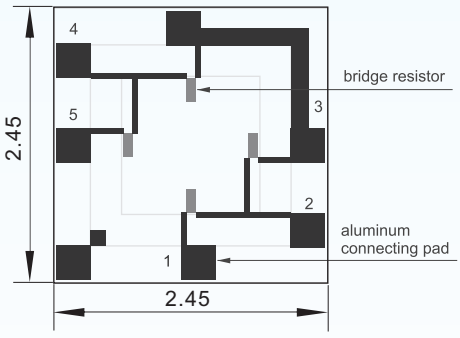
sketch of the cross-section of SE103:



terminal pads layout:



2.70 x 3.45 (for maximum pressure ≤ 25 bar)



2.45 x 2.45 (for maximum pressure ≥ 40 bar)

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Model SE103
Pressure Sensor Dies

Specifications:

parameters		units	specifications
pressure ranges*	gauge pressure	barG	0/0.2, /0.35, 0/1, /2.5, /4, /6, /10, /16, /25
	absolute pressure	barA	0/1, /2.5, /4, /6, /10, /16, /25, /40, /60, /100, /250, /400, /600, /1000
overload pressure		%fs	200 (≤ 100 bar), 150 (> 100 bar), not over 1000 bar
full scale output		mV	35 ± 5 (≤ 0.35 bar), 80 ± 20 (> 0.35 bar)
excitation	current (recommended)	mA	0.5, ..., 1.5
	voltage	Vdc	5, ..., 10
ZERO offset		mV	≤ ± 40
non-linearity (NL)		%fso	± 0.25 (typical), ± 0.5, ± 1
hysteresis (HY)		%fso	≤ ± 0.1
repeatability (RP)		%fso	≤ ± 0.2
long term stability		%fso/year	≤ ± 0.2
short term stability		%fso/8 hours	≤ ± 0.1
bridge resistance		kΩ	5 ± 1
storage temperature		°C	-45 ~ +125
operating temperature		°C	-45 ~ +100
TC of bridge resistance		10^{-3}/°C	1.15 ± 0.25
TC of sensitivity		%fso/°C	< ± 0.1
TC of offset		%fso/°C	< ± 0.1
thermal hysteresis of offset		%fso/°C	< ± 0.02
PN junction break down voltage		V (@ 10 µA)	≥ 20
dimensions		mm	2.70 x 3.45 x 0.4 (≤ 25 bar),2.45 x 2.45 x 0.4 (≥ 40 bar)

The listed specifications and dimensions are subject to change without prior notice.
Conditions: excitation = 1 mA, T = 25 °C, NL is calculated using the "least square method".
*: Please refer to the ordering code for the available pressure ranges.

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Ordering Code System of SE103 Dies:

example: SE103 - 60 - A - II - c - a - G8 - Cxxxx

pressure ranges & available pressure types			
020= 0 ~ 0.2 bar	G	25 = 0 ~ 25 bar	G, A
035= 0 ~ 0.35 bar	G	40 = 0 ~ 40 bar	A
1 = 0 ~ 1 bar	G, A	60 = 0 ~ 60 bar	A
2.5 = 0 ~ 2.5 bar	G, A	100 = 0 ~ 100 bar	A
6 = 0 ~ 6 bar	G, A	250 = 0 ~ 250 bar	A
4 = 0 ~ 4 bar	G, A	400 = 0 ~ 400 bar	A
10 = 0 ~ 10 bar	G, A	600 = 0 ~ 600 bar	A
16 = 0 ~ 16 bar	G, A	1000 = 0 ~ 1000 bar	A

pressure types	
G = gauge pressure	A = absolute pressure

non-linearity (NL)		
I = 0.25%fs	II = 0.5%fs	III = 1%fs

excitation
c = current excitation (0.5, ..., 1.5 mA)
v = voltage excitation (5, ..., 10 Vdc)

die dimensions
a (P ≥ 40 bar) = 2.45 mm x 2.45 mm x 0.4 mm
b (P ≤ 25 bar) = 2.70 mm x 3.45 mm x 0.4 mm

die finishing
G8 = 0.8 mm thickness of glass base
N = die without glass

Cxxxx: This code starts with a “C” and is followed by 4 digits, this is a customized code given by the customer who will indicate, by using this code, his desired or wished specification requested to the die SE103 on his order sheet. The customer can use the 4 digits to indicate the month and date when he requests this customized specification. The sales team of BCM will confirm this customized specification when sending BCM's <<Order Confirmation>>.

Ordering Code Explanation: SE103 - 60 - A - II - c - a - G8

Model SE103 silicon pressure sensor die, for absolute pressure measurement of 0~60 bar. The NL of this die is 0.5%fs. The bridge will be excited by constant current. The die dimensions are 2.45 mm x 2.45 mm x 0.4 mm and the die is finished with glass base of 0.8 mm thickness.

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