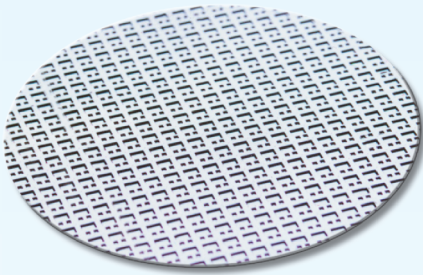


Model SE105 Multifunctional Pressure Sensor Dies

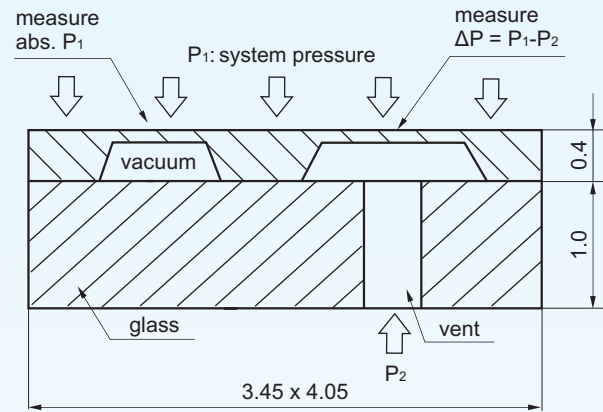
Based on piezoresistive effect, BCM SE105 Multifunctional piezoresistive silicon pressure sensor dies are made from super quality silicon wafer with 4" diameter. These dies are in mass production by means of Micro-Electro-Mechanical System (MEMS) technology.

The back side of the SE105 die has two silicon cups (pressure chambers), that is, two Wheatstone bridge circuits. The back side of the SE105 die is sealed with a glass cover with only one vent to one of the silicon cup (diff. cup). As a result, SE105 die is able to measure the system pressure (also called "line pressure" or "static pressure") and the differential pressure at the same time. Therefore, SE105 silicon sensor dies are perfect for applications such as air-flow and mass-flow measurements. Furthermore, the SE105 silicon sensor die is also equipped with an integrated temperature sensor, so as to measure the pressure media temperature as well.

SE105 sensor dies can be used to measure differential pressure ranging from 0.4 to 10 bar (see following specifications for details). The die possesses high accuracy up to 0.25%fso (fso = full scale output), the output signal is Wheatstone bridge circuit output in millivolt. A constant voltage 5V or constant current 1mA are standard excitation power for SE105 silicon sensor dies.



SE105 multi-functional pressure sensor wafer



sketch of cross section of SE 105

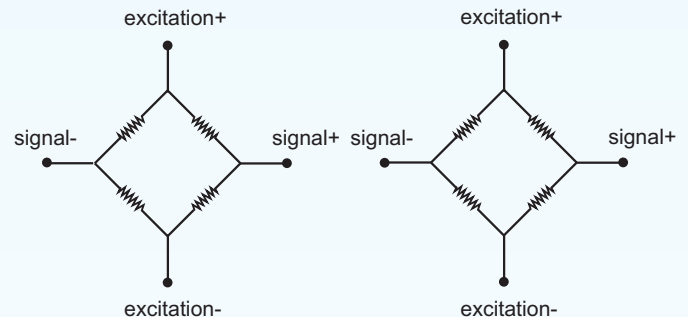
Features:

- two pressure chambers for measuring system and differential pressure at the same time
- integrated thermistor to measure the temperature of the pressure medium
- suitable for either constant current or voltage excitation

Typical applications:

- air-flow in industrial processes through differential pressure measurement
- mass-flow in industrial processes through differential pressure measurement

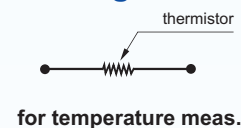
Wheatstone bridge circuits:



for system pressure (sys.) meas.

for diff. pressure meas.

Temperature testing circuits:



for temperature meas.

Model SE105 Multifunctional Pressure Sensor Dies



Specifications:

parameters		units	specifications
pressure ranges	(for diff. pressure meas.)	bar, differential	0 ~ 0.4, 0 ~ 1, 0 ~ 4, 0 ~ 10
	(for sys. pressure meas.)	bar, absolute	0 ~ 40, 0 ~ 100, 0~160
system pressure ranges (for differential pressure meas.)		bar ($\Delta P \geq 0.4$ bar)	50
		bar ($\Delta P > 0.4$ bar)	160
overload pressure		%FS	150 (for diff. pressure meas.), 200 (for sys. pressure meas.)
excitation	current (recommended)	mA	1± 0.5
	voltage	V	5 ± 0.5
full scale output	(for diff.&sys. pressure meas.)	mV	≥ 50
	(for temperature meas.)	Ω/°C	≥ 15
ZERO offset	(for diff. pressure meas.)	mV	≤ 20
	(for sys. pressure meas.)	mV	≤ 30
non-linearity (NL)		%FSO	± 0.5 (for 0.4 bar), ± 0.25 (other ranges)
hysteresis		%FSO	± 0.02 (standard), ± 0.1
repeatability		%FSO	± 0.05 (standard), ± 0.2
long term stability		%FSO / year	± 0.25
system pressure effect to diff. pressure		%FSO	0.5 %/100 bar (standard), 1 %/100 bar
thermistor resistance		KΩ	25 ± 5
bridge resistance	(for diff. pressure meas.)	KΩ	5 ± 1
	(for sys. pressure meas.)	KΩ	10 ± 2
TC of bridge resistance		10 ⁻³ /°C	< 1.4
temperature coefficient of offset (TCZ)		%FSO / 10°C	1
temperature coefficient of sensitivity (TCS)		%FSO / 10°C	1
operation temperature		°C	-40 ~ +125
PN junction break down		V (current = 10 μA)	> 20

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

Conditions: excitation = 1 mA, T = 25 °C, humidity = 60%RH. NL is calculated using the "least square method".

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Model SE105 Multifunctional Pressure Sensor Dies



Ordering Code System of SE105 Dies:

example: SE 105 - DAT - 1 - L2 - c - R25 - a - G10 - Cxxxx

multi-functions available for selection	
DA = "differential pressure + system pressure" measurements	
DT = "differential pressure + temperature" measurements	
AT = "system pressure + temperature" measurements	
DAT = "differential + system pressure + temperature" measurements	
pressure ranges available for diff. pressure and abs. pressure meas.	
040 = 0~0.4 bar D	10 = 0~10 bar D
1 = 0~1 bar D	100 = 0~100 bar A
4 = 0~4 bar D	160 = 0~160 bar A
system pressure (line pressure or static pressure)	
L1 = 50 bar	L2 = 160 bar
excitation	
c = current excitation, 1 ± 0.5 mA	
v = voltage excitation, 5 ± 0.5 V	
thermistor resistance	
R25 = (25 ± 20%) kΩ	
Rxx = customer specific request	
die dimensions	
a = 3.45 mm x 4.05 mm x 0.4 mm	
b = customer specific request	
die finishing	
G10 = glass base of 1.0 mm thickness	
N = die without glass base	
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 SE105 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: SE105 - DAT - 1 - L2 - c - R25 - a - G10 - C0116

Model SE105 silicon pressure sensor die of "relative pressure, system pressure, and temperature" measurement functions. The relative pressure range is 0~1 bar, the system pressure is 100 bar, current excitation, and the thermistor is of about 25 kΩ resistance. The die has a size of 3.45 mm X 4.05 mm X 0.4 mm, and is finished with glass of 1 mm thickness. The customer has indicated on January 16th his wished specification on his order sheet for the ordered die SE105, and this customer-wished specification has to be confirmed by BCM sales team on <<Order Confirmation>>.



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