

Model SE105 Flip-Chip Absolute Pressure Sensor Dies

Description

Model SE105 is designed as a piezoresistive pressure sensor die with a flip-chip structure. It is developed for the pressure measurements of absolute pressure reference.

The sensor die is manufactured through 6" wafer silicon-on-silicon process by MEMS technology. Thanks to the unique flip-chip 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 a 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.

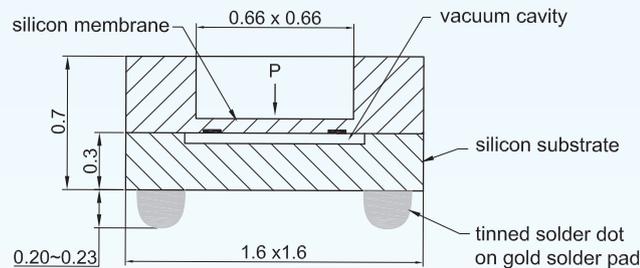
Features

- suitable for harsh environment
- easy bonding
- excellent non-linearity up to: $\pm 0.15\%$ fs
- designed for absolute pressure applications

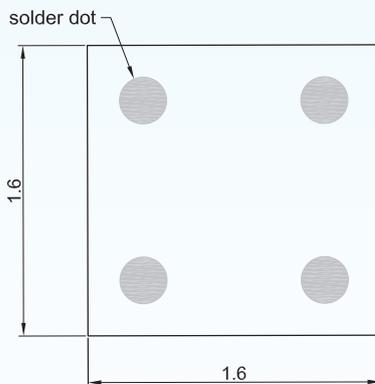
Applications

- 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

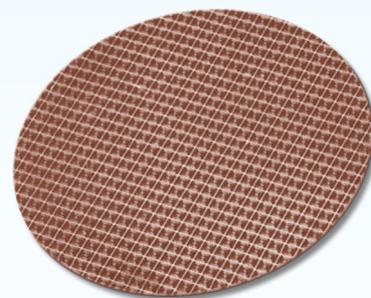
Dimensions



cross-section of absolute pressure sensor die



terminal pad layout



6" SE105 wafer

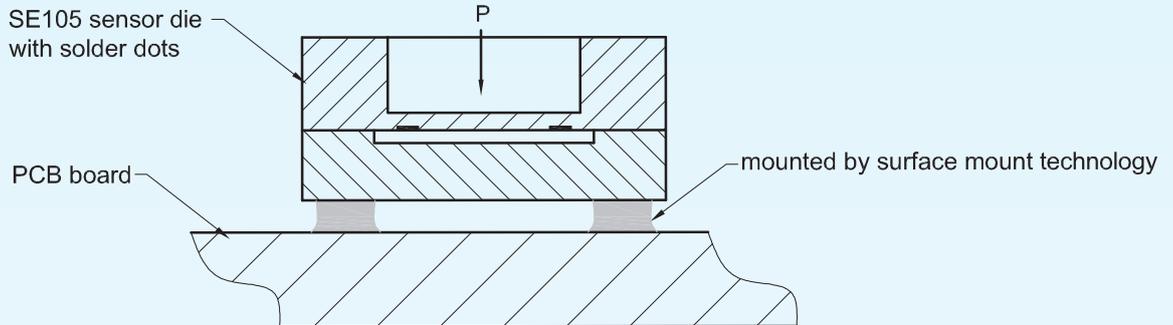
Note: All dimensions are in mm.

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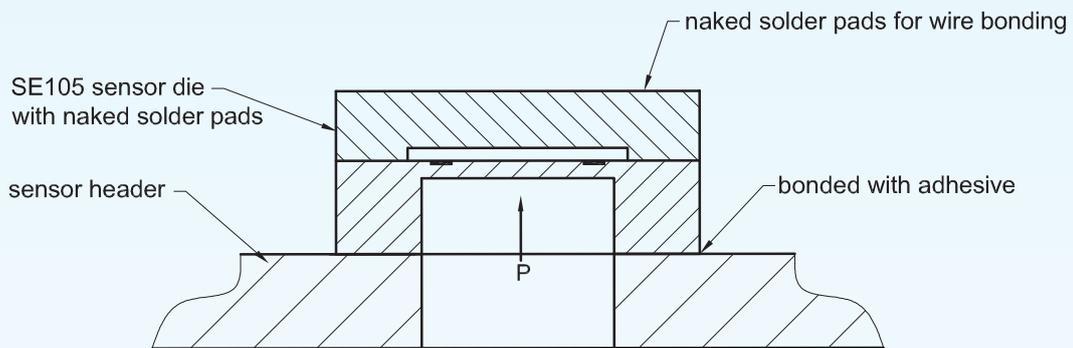
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Examples of Installation

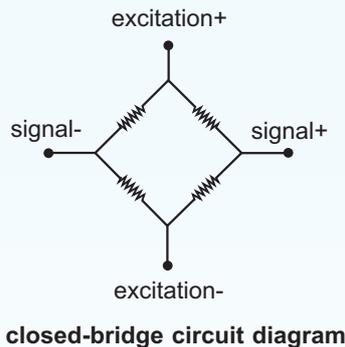
1) standard installation on a PCB board



2) installation on a sensor header



Wheatstone Bridge Circuit Diagram



Model SE105

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Technical Data

Parameters		Units	Specifications	Notes
pressure ranges		bar	0~2, ~10, ~20, ~50	1
pressure reference			absolute	
proof pressure		%fs	150	2
burst pressure		%fs	200	2
full scale output (fso)		mV	≥ 60	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	≤ ±0.1	
repeatability (RP)		%fs	≤ ±0.1	
long-term stability		%fs/year	≤ ±0.2	
bridge resistance (R)		kΩ	6±1	
storage temperature range		°C	-55 ~ +150	
operating temperature range		°C	-40 ~ +125	
temp. coeff. (TC) of bridge resistance		%R/°C	0.1 ±0.02	6
TC of zero offset		%fso/°C	≤ ±0.05	7
TC of SPAN		%fso/°C	≤ -0.23	7
thermal HY of zero offset		%fso	≤ ±0.2	8
material of solder pad			gold	
material of solder dot			tin	
temperature for surface mount process		°C	240	
dimensions		mm	1.6 x 1.6 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. 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 25°C and 85°C, and normalized by the resistance at 25°C.
7. Calculated as a rate of output change between 25°C and 85°C, and normalized by the output at 25°C, when the die is not temperature compensated.
8. Tested in the temperature range of 25°C ~ 85°C.

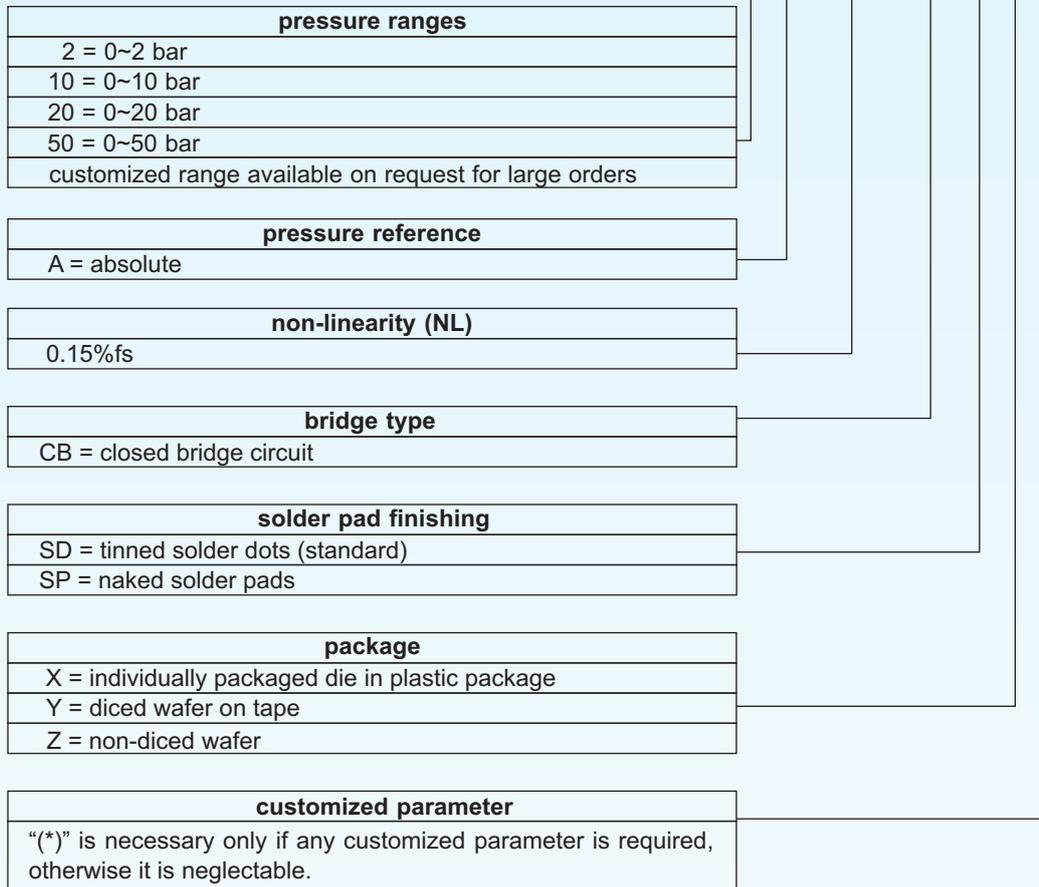
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Ordering Information

ordering code: SE105-50-A-0.15%fs-CB-SD-Y-(*)



Examples of Ordering Code

- standard sensor die: model-pressure range-pressure reference-NL-bridge type-solder pad finishing-package
SE105-50-A-0.15%fs-CB-SD-Y

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

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