

Model SE106 Sensor Dies for Flow Meter Application

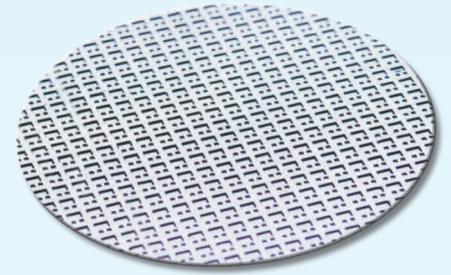
Description

The SE106 is a piezoresistive sensor die especially designed for flow meter applications. Hence this model is able to measure differential pressure, static (line or system) pressure, and temperature of pipeline at the same time.

In order to measure two kinds of pressures simultaneously, the SE106 consists of two silicon diaphragms, one for differential pressure measurement and the other for static pressure measurement. Its temperature measurement is achieved by using the on-chip thermistor.

The SE106 is available in silicon-on-glass structure with the dimensions of 3.45mm x 4.05mm x 1.4mm. The glass constraint is inevitable for this model.

Before packaging, each SE106 sensor die is tested and inspected.



SE106 wafer

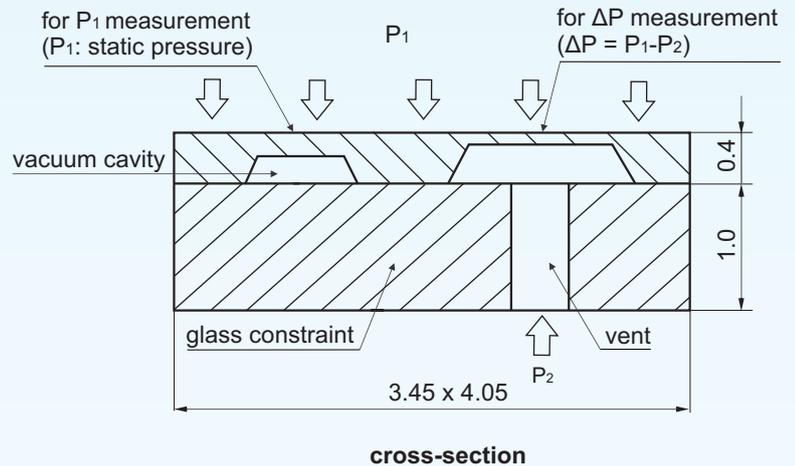
Features

- static pressure, differential pressure, and temperature measurements at the same time
- differential pressure ranges up to 10bar
- static pressure up to 160bar
- non-linearity up to 0.25%fs
- for either voltage or current excitation

Applications

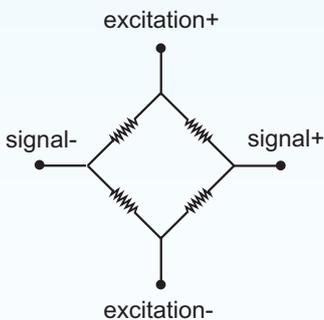
- flow meter instrumentation
- process control

Dimensions

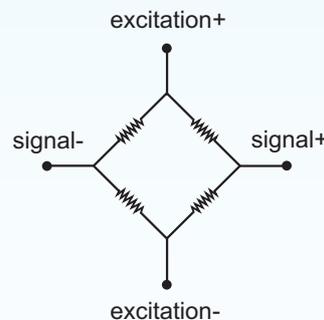


Note: All dimensions are in mm.

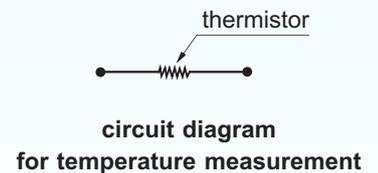
Circuit Diagrams



bridge circuit diagram
of differential pressure measurement



bridge circuit diagram
of static pressure measurement



Model SE106

Sensor Dies for Flow Meter Application



Technical Data

Parameter		Units	Specifications	Notes
differential pressure (ΔP) ranges		barD	0~0.2, ~0.4, ~1, ~4, ~10	1
static pressure (P_1)		barA	≤ 40 , ≤ 100 , ≤ 160	1 & 8
overload pressure limit	ΔP	%fs	500	2
	P_1	%fs	150	2 & 8
full scale output (fsO)	ΔP	mV	≥ 50	3 & 4
	P_1	mV	≥ 50	3 & 4
output of temperature measurement		$\Omega/^\circ\text{C}$	15	4
excitation	voltage	Vdc	5 (typical), 1, ..., 10	
	current	mA	1 (typical), 0.2, ..., 2	
zero offset	ΔP	mV	$\leq \pm 20$	4
	P_1	mV	$\leq \pm 30$	4 & 8
non-linearity (NL)		%fs	$\leq \pm 0.25$ (standard), $\leq \pm 0.5$	5
hysteresis (HY)		%fs	$\leq \pm 0.02$ (standard), $\leq \pm 0.1$	
repeatability (RP)		%fs	$\leq \pm 0.05$ (standard), $\leq \pm 0.2$	
accuracy of temperature measurement		$^\circ\text{C}$	$\leq \pm 0.5$	
long-term stability		%fs/year	$\leq \pm 0.25$	
bridge resistance	ΔP	k Ω	4~6	
	P_1	k Ω	8~12	8
temperature sensor		k Ω	25 \pm 5	
static pressure effect to differential pressure		%fs/100bar	0.5 (standard), 1	
operating temperature range		$^\circ\text{C}$	-40 ~ +125	
storage temperature range		$^\circ\text{C}$	-40 ~ +125	
temperature measuring range		$^\circ\text{C}$	-30 ~ +80	
temp. coeff. (TC) of bridge resistance		%/ $^\circ\text{C}$	0.14	6
TC of zero offset		%fso/ $^\circ\text{C}$	0.1	7
TC of SPAN	voltage excitation	%fso/ $^\circ\text{C}$	0.22	7
	current excitation	%fso/ $^\circ\text{C}$	0.06	7
thermal HY of zero offset		%fso/ $^\circ\text{C}$	$\leq \pm 0.1$	
PN junction breakdown voltage		V (@10 μA)	≥ 20	

General conditions for measurements: temperature = 25 $^\circ\text{C}$, humidity = 40%RH.

Notes: 1. For customized pressure ranges, consult BCM.

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 $^\circ\text{C}$ and 70 $^\circ\text{C}$, and normalized by the resistance at 25 $^\circ\text{C}$.

7. Calculated as a rate of output change between 25 $^\circ\text{C}$ and 70 $^\circ\text{C}$, and normalized by the output at 25 $^\circ\text{C}$, when the die is not temperature compensated.

8. The static (line or system) pressure is measured as absolute pressure measurement refers to the measurement.

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

BCM SENSOR TECHNOLOGIES BVBA

Model SE106

Sensor Dies for Flow Meter Application



Ordering Information

ordering code: **SE106-10-160-I-R25-X(*)**

differential pressure ranges			
040 = 0~0.4 bar	D	10 = 0~10 bar	D
1 = 0~1 bar	D	customized range	
4 = 0~4 bar	D	available as an option	

static pressure ranges			
40 = 0~40 bar	A	customized range available as an option	
100 = 0~100 bar	A		
160 = 0~160 bar	A		

non-linearity (NL)	
0.25%fs (standard)	
0.5%fs	

temperature sensor	
R25 = 25 ±5 kΩ (standard)	
customized resistance available as an option	

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

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

Examples of Ordering Code

- standard sensor die:
model-differential pressure range-static pressure range-NL-temperature sensor-package
SE106-1-100-0.25%fs-R25-X
- customized sensor die:
model-differential pressure range-static pressure range-NL-temperature sensor-package-customized parameter
SE106-10-160-0.25%fs-R30-Y(*)
(*): Y = diced wafer on tape

BCM SENSOR TECHNOLOGIES BVBA

