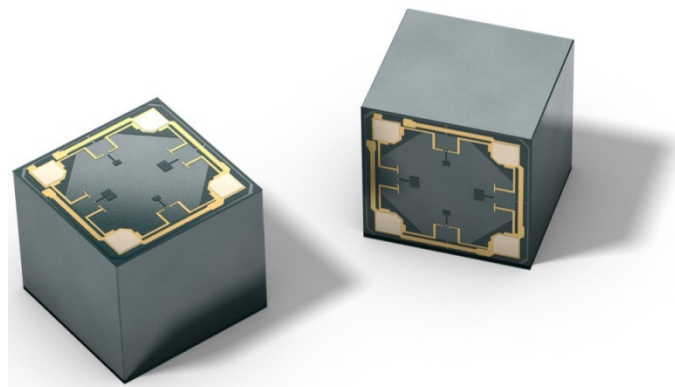


OEM Silicon Pressure Die

SM5108E Series

FEATURES

- High performance absolute pressure sensor die at low cost
- 0.690 x 0.690 x 0.400 mm size
- 100 millivolt output



DESCRIPTION

The SM5108E is an all silicon micro-machined, piezoresistive pressure sensing chip. The die is extremely small (0.69 mm x 0.69 mm) and has been optimized to provide the highest possible accuracy for a die of this size. Performance is achieved through careful resistor placement and mechanical configuration. The small die results in a significant cost saving when compared to larger sensor die.

This sensor is intended for high volume, cost sensitive applications, such as consumer tire pressure gauges or robust stable performance disposable pressure gauges. The SM5108E is available as an absolute pressure sensor in a full-scale range of 30, 60 & 100 PSI. It is designed to be mounted on ceramic or PC board substrates by high-volume OEM manufacturers.

Wafers are probed and visually inspected.

Minimum order quantities apply to this product.

Medical	Industrial	Automotive
Wound therapy	Barometric Sensing	Engine Control
Blood Pressure Monitoring	Pneumatic Gauges	Automotive Tire Pressure Monitoring (TPMS)
	Hand-Held Meters	Barometric pressure

Absolute Maximum Ratings

All parameters are specified at VSUPPLY = 5.00 V supply voltage at 25°C, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Maximum	Units
1	Excitation Voltage ^(a,b)	V _{DD}	-	6.5	V
2	Operating Temperature	T _{OP}	-40	+125	°C
3	Storage Temperature ^(a)	T _{STG}	-55	+150	°C
4	ESD Rating, Human Body Model	V _{ESD}	-	2000	V
5	Static Acceleration Level Withstand	SAW	-	2500	g
6	Mechanical Shock Withstand	MSW	-	2000	g

Notes:

- a. Bridge shall be driven with the positive voltage applied to the V+ pad.
- b. Voltage must not exceed 6.5 V under any operating conditions

No.	Product Number	Operating Pressure	Proof Pressure (P _{PROOF}) ^(c)	Burst Pressure (P _{BURST}) ^(c)
7	SM5108E-030-A	0 to 30 PSI	90 PSI	150 PSI
8	SM5108E-060-A	0 to 60 PSI	180 PSI	300 PSI
9	SM5108E-100-A	0 to 100 PSI	300 PSI	500 PSI

Notes:

- c. Tested on a sample basis.

Operating Characteristics For SM5108E Die

The operating characteristics are based on packaged die. The sensor performance may vary depending on the die attach and gel coating materials and the assembly process. The die attach and gel coating materials and the assembly process should minimize the stress transferred to the sensor die. All parameters are specified at VSUPPLY = 5.00 V supply voltage at 25°C, unless otherwise noted.

Operating Characteristics - Specifications

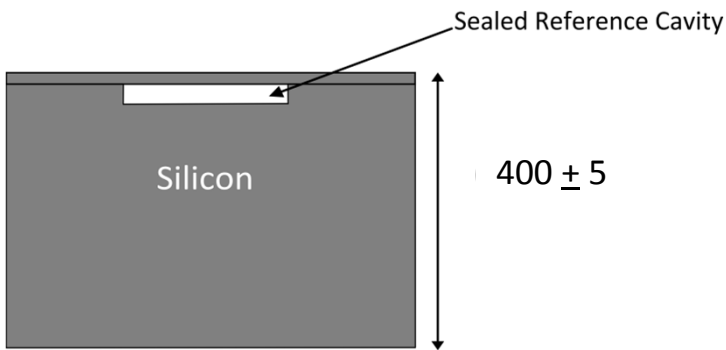
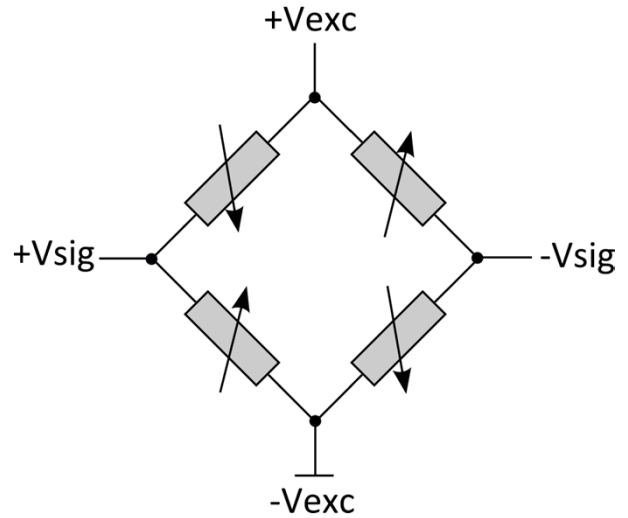
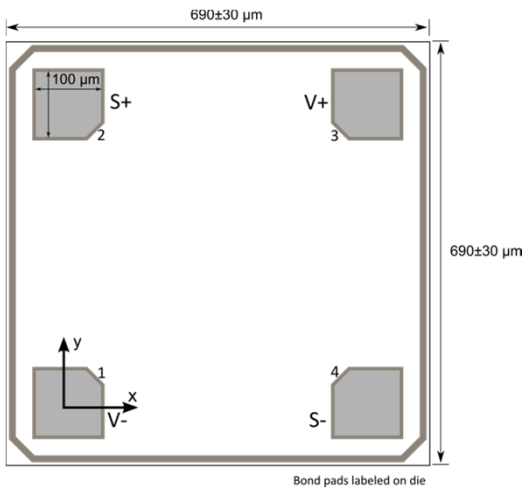
All parameters are specified at Vdd = 5.0 V supply voltage at 25°C, unless otherwise noted.

No.	Characteristic Over Pressure	Symbol	Minimum	Typical	Maximum	Units	
11	Span (FS P _{RANGE}) ^(d,e)	V _{SPAN}	30 PSI	65	100	135	mV
			60 PSI	45	100	153	
			100 PSI	38	100	155	
12	Zero Offset	V _{ZERO}	-35	-	35	mV	
13	Pressure Nonlinearity, Max Absolute Value at 25°C ^(e,f)	NL	0	±0.12	0.2	%/FS	
14	Pressure Nonlinearity, Max Absolute Value Between -40°C and +125°C ^(e,f)		0	+0.16	0.2	%/FS	
15	Input Resistance	R _B	5.0	6.2	7.0	kΩ	
16	Pressure Hysteresis ^(e) Maximum Absolute Value	P _{HYST}	0	0.1	0.25	%/FS	
17	TC Span ^(e,g)	TCS	-0.24	-0.2	-0.155	%FS/°C	
18	TC Zero Offset ^(e,g)	TCZ	-0.14	-1.6	0.14	%FS/°C	
19	TC Resistance ^(e,g)	TCR	1750	2100	2650	ppm/°C	
20	Temperature Zero Offset Hysteresis ^(e,g) Maximum Absolute Value	T _{HYST}	0	0.13	0.6	%/FS	

Notes:

- d. Span is the difference between the output at the maximum operating pressure and the output at zero pressure. It is then normalized to the supply voltage.
- e. Tested on a sample basis
- f. Defined as best fit straight line.
- g. Determined by measurements taken over -40°C to 125°C.

SM5108E Diagrams and Dimensions



All dimensions are in microns.

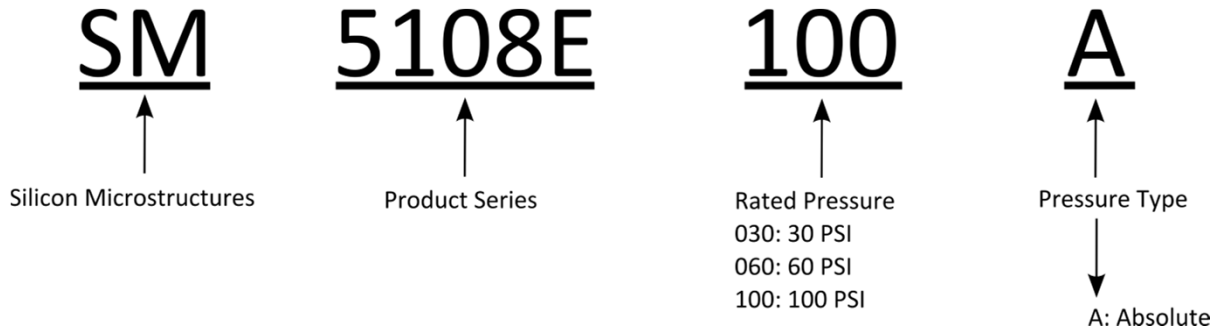
Typical Operation					Pad Coordinate	
PAD #	PAD DESCRIPTION	PAD LABEL	TYPE	VALUE	Coordinate X-Axis (μm)	Coordinate Y-Axis (μm)
1	-Vexc	V-	Negative Power	0 V	0	0
2	+Vsig	S+	Positive Analog Out	-	0	459
3	+Vexc	V+	Positive Power	+5 V	459	459
4	Vsig	S-	Negative Analog Out	-	459	0

Bond pad opening size = 100x100 μm

Ordering Information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity
SM5108E-030-A	30 PSI	Absolute	1 Wafer (1 wafer = 46,000 ±10%)
SM5108E-060-A	60 PSI		
SM5108E-100-A	100 PSI		

Part Number Legend



Qualification Standards

REACH Compliant
 RoHS Compliant
 PFOS/PFOA Compliant
 For qualification specifications, please contact Sales at sales@si-micro.com



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