



PRESSURE SENSORS

Product Number: SM5108C

HIGHLIGHTS

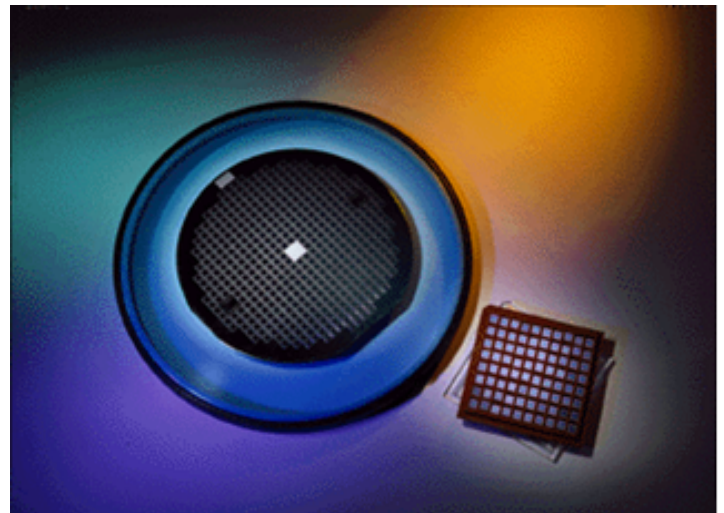
- High performance absolute pressure sensor die
- Ultra-small size
- Available for proprietary packaging
- Good fit for application specific sensor lines

TYPICAL APPLICATIONS

- Automotive Tire Pressure Monitoring Systems (TPMS)
- Barometric Sensing
- Pneumatic Gauges
- Weather Stations
- Hard Disk Drives (HDD)
- Engine Controls
 - Manifold Absolute Pressure (MAP)
 - Barometric Absolute Pressure (BAP)

FEATURES

- Remains stable after autoclave
- Constant Current or Constant Voltage Drive
- High millivolt output
- High volume, cost effective



DESCRIPTION

The SM5108C is a silicon micro-machined, piezoresistive pressure sensing die.

The die is extremely small (0.65 mm x 0.65 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 SM5108C is available as an absolute pressure sensor in full-scale ranges of 15, 30, 60, and 150 PSI. It is designed to be mounted on ceramic or PC board substrates by high-volume OEM manufacturers.

Wafers are electrically probed and visually inspected.

Minimum order quantities apply to this product.



Product Number: SM5108C

ABSOLUTE MAXIMUM RATING TABLE FOR SM5108C DIE

All parameters are specified at $V_{SUPPLY} = 5.00$ V DC supply at room temperature, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Excitation Voltage ^(a)	V_{SUPPLY}	—	5	10	V
2	Excitation Current ^(a)	I_{SUPPLY}	—	1.5	2.5	mA
3	Proof Pressure ^(b)	P_{PROOF}	3×	—	—	FS p_{RANGE}
4	Burst Pressure ^(b)	P_{BURST}	5×	—	—	FS p_{RANGE}
5	Operating Temperature ^(b)	T_{OP}	-40	—	+125	°C
6	Storage Temperature ^(b)	T_{STG}	-40	—	+150	°C

NOTES:

(a) Bridge may be driven with positive or negative voltage as long as V_{sub} is not connected.

(b) Tested on a sample basis

OPERATING CHARACTERISTICS FOR SM5108C DIE

All parameters are specified at $V_{SUPPLY} = 5.00$ V DC supply at room temperature, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
7	FS Span (15 PSI) ^(b)	V_{SPAN}	95	127	160	mV
8	FS Span (30, 60 PSI) ^(b)	V_{SPAN}	65	100	135	mV
9	FS Span (150 PSI) ^(b)	V_{SPAN}	100	150	200	mV
10	Zero Offset	V_{OFFSET}	-35		+35	mV
11	TC Span ^(b, c)	TCS	-24	-19	-15.5	%FS/100°C
12	TC Zero Offset ^(b, c)	TCZ	-7	-1	+7	%FS/100°C
13	TC Resistance ^(b, c)	TCR	+24	+27.5	+33	% R_B /100°C
14	Linearity ^(b, d)	NL	-0.2	-0.07	+0.2	%FS
15	Bridge Resistance	R_B	4	5	6	kΩ

NOTES:

(a) Bridge may be driven with positive or negative voltage as long as V_{sub} is not connected.

(b) Tested on a sample basis.

(c) Determined by measurements taken at 25°C and 75°C.

(d) Defined as best fit straight line.

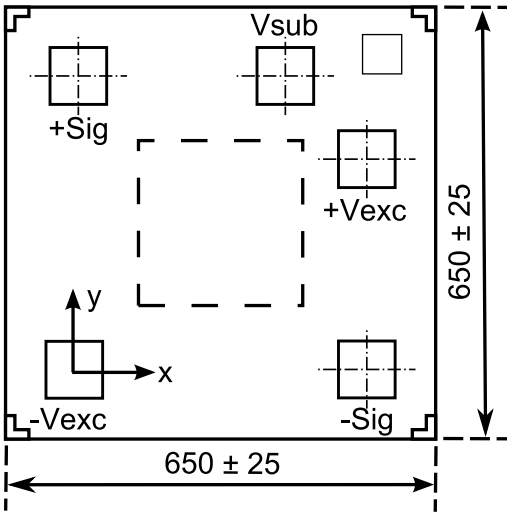
QUALIFICATION STANDARDS

→ Automotive Qualified to AECQ-100

→ For qualification specifications, please contact Sales at sales@si-micro.com

Product Number: SM5108C

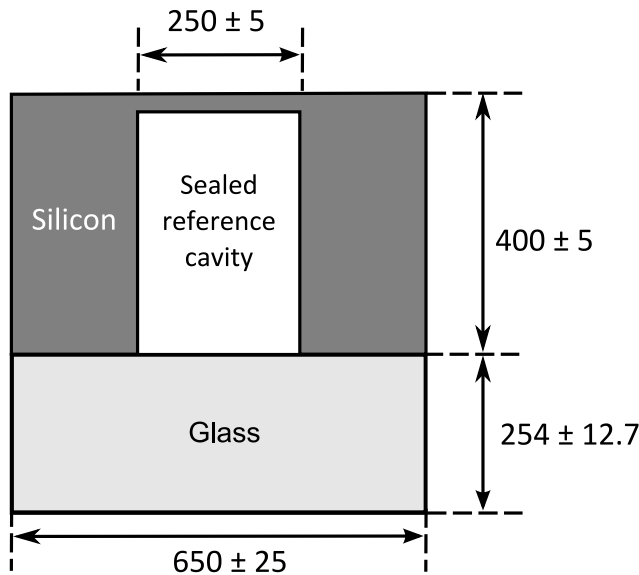
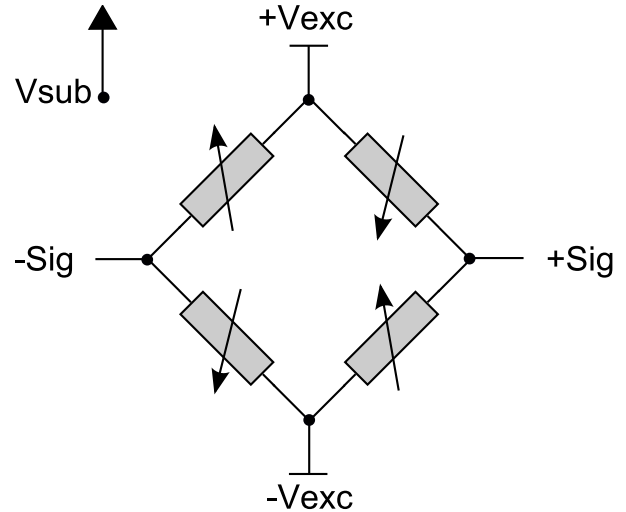
SM5108C Diagrams and Dimensions



Top-View of SM5108C

(650 micron square as sawn) Total Thickness = 650 micron
Protected under USA Mask Copyright. All Rights Reserved

SM5108C Pad-Out



Typical Operation		
PAD DESCRIPTION	TYPE	VALUE
Vsub	Power	+5 V
+Vexc	Power	+5 V
+Sig	Analog Out	-
-Vexc	Power	0 V
-Sig	Analog Out	-

Pad Size = 90 x 90
Coordinates: (x, y)

- Vexc (0, 0)
- Sig (450, 0)
- +Sig (0, 450)
- +Vexc (450, 335)
- Vsub (325, 450)

All dimensions are in MICRON

Ordering information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity
SM5108C-015-AX	15 PSI / 103.4 kPa	Absolute	2 Wafers ≈ 20,000 Die Per Wafer (Actual die quantity subject to +/- 10% yield variance)
SM5108C-030-AX	30 PSI / 206.8 kPa		
SM5108C-060-AX	60 PSI / 413.6 kPa		
SM5108C-150-AX	150 PSI / 1034 kPa		

For samples, please contact the Sales Department @ sales@si-micro.com

Product Number: SM5108C

Silicon Microstructures Warranty and Disclaimer:

Silicon Microstructures, Inc. reserves the right to make changes without further notice to any products herein and to amend the contents of this data sheet at any time and at its sole discretion.

Information in this document is provided solely to enable software and system implementers to use Silicon Microstructures, Inc. (SMI) products and/or services. No express or implied copyright licenses are granted hereunder to design or fabricate any silicon-based microstructures based on the information in this document.

SMI makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does SMI assume any liability arising out of the application or use of any product or silicon-based microstructure, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in SMI's data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. SMI does not convey any license under its patent rights nor the rights of others. SMI makes no representation that the circuits are free of patent infringement. SMI products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SMI product could create a situation where personal injury or death may occur. Should Buyer purchase or use SMI products for any such unintended or unauthorized application, Buyer shall indemnify and hold SMI and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SMI was negligent regarding the design or manufacture of the products.

SMI warrants goods of its manufacture as being free of defective materials and faulty workmanship. SMI standard product warranty applies unless agreed to otherwise by SMI in writing. Please refer to your order acknowledgement or contact SMI directly for specific warranty details. If warranted goods are returned to SMI during the period of coverage, SMI will repair or replace, at its option, without charge those items it finds defective. The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall SMI be liable for consequential, special, or indirect damages.

While SMI may provide application assistance to aid its customers' design process, it is up to each customer to determine the suitability of the product for its specific application. The information supplied by SMI is believed to be accurate and reliable as of this printing. However, SMI assumes no responsibility for its use. SMI assumes no responsibility for any inaccuracies and/or errors in this publication and reserves the right to make changes to any products or specifications herein without further notice.

Silicon Microstructures, Inc.™ and the Silicon Microstructures, Inc. logo are trademarks of Silicon Microstructures, Inc. All other service or product names are the property of their respective owners.

© Silicon Microstructures, Inc. 2001-2013. All rights reserved.