SM5106 OEM Silicon Pressure Die

PRESSURE SENSORS

Product Number: SM5106

HIGHLIGHTS

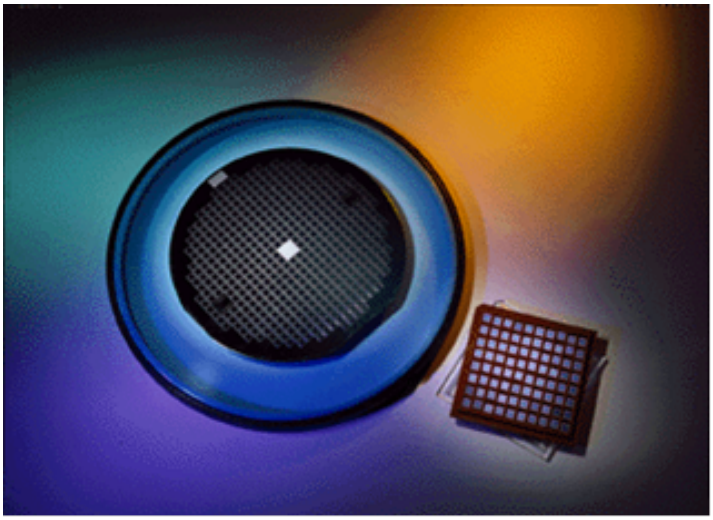
→ Small Profile
→ High Volume for OEM use
→ Mountable on Ceramic or PCB Substrates
→ Available for proprietary and custom packaging

TYPICAL APPLICATIONS

→ Tire Pressure Monitor Systems (TPMS)
→ Pneumatic Gages
→ Hand-held Meters
→ Home Appliances
→ Engine Control
→ Seat Contour Controls
→ Altimeters
→ Barometers

FEATURES

→ Available in 15, 30, 60 & 150 PSI Ranges
→ Cost Effective
→ Constant Current or Constant Voltage Drive
→ High Sensitivity Output
→ Ratiometric with Supply Voltage up to 10V.



DESCRIPTION

The SM5106 is a very small (1.60 mm × 1.60 mm) silicon micro-machined piezoresistive pressure sensing die that has been optimized to provide the highest possible accuracy for a die of this size. This 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 applications where cost is a critical factor, such as consumer tire pressure gauges. The SM5106 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 OEM manufacturers.

Die are electrically probed, diced, inspected, and shipped on tape.

TÜV MANAGEMENT SERVICE ISO / TS 16949

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ABSOLUTE MAXIMUM RATING TABLE FOR SM5106 DIE

All parameters are specifed 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}	3x	—	—	FS p_{RANGE}
4	Burst Pressure[b]	p_{BURST}	5x	—	—	FS p_{RANGE}
5	Operating Temperature[b]	T_{OP}	-40	—	+125	°C
6	Storage Temperature[b]	T_{STG}	-40	—	+125	°C

NOTES:
(a) Bridge may be driven with positive or negative voltage as long as Vsub is not connected.
(b) Tested on a sample basis

OPERATING CHARACTERISTICS FOR SM5106 DIE

All parameters are specifed 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}	75	100	125	mV
8	FS Span (30 PSI)[b]	V_{SPAN}	85	110	130	mV
9	FS Span (60 PSI)[b]	V_{SPAN}	85	125	150	mV
10	FS Span (150 PSI)[b]	V_{SPAN}	100	145	195	mV
11	Zero Offset	V_{OFFSET}	-35	8	+35	mV
12	TC Span[b]	TCS	-24	-19	-15	%FS/100°C
13	TC Zero Offset[b]	TCZ	-7	-1	+7	%FS/100°C
14	TC Resistance[b, c]	TCR	+24	+27	+33	$\%R_B$/100°C
15	Linearity[b, d]	NL	-0.45	-0.15	+0.45	%FS
16	Bridge Resistance	R_B	4	5	6	kΩ

NOTES:
(a) Bridge may be driven with positive or negative voltage as long as Vsub 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

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

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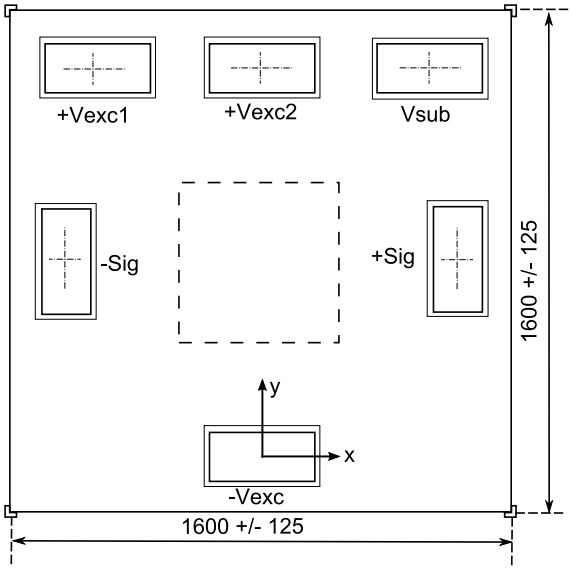
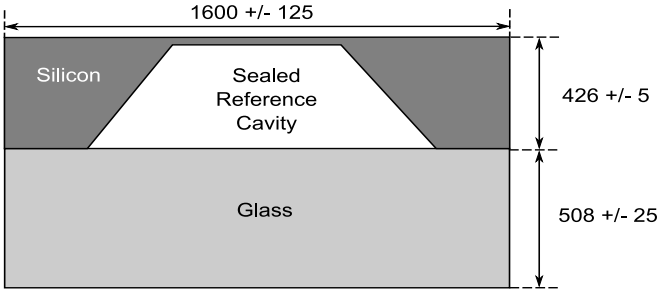
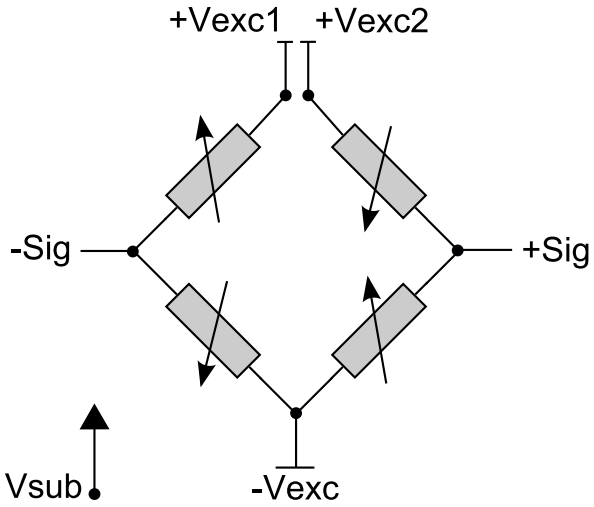
SM5106 Diagrams and Dimensions





SM5106 Pad-Out



Typical Operation		
PAD DESCRIPTION	TYPE	VALUE
+Vexc1	Power	+5 V
+Vexc2	Power	+5 V
Vsub	Power	+5 V
+Sig	Analog Out	–
-Vexc	Power	0 V
-Sig	Analog Out	–

Pad Sizes 300 x 125
Coordinates (x, y)

-Vexc: (0, 0)
-Sig: (-607.5, 612.5)
+Sig: (612.5, 612.5)
+Vexc1 (-510, 1220)
+Vexc2: (0, 1220)
Vsub: (520, 1220)

All dimensions are in Micron.

Ordering Information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity (MOQ)
SM5106-015-A	15 PSI / 103.4 kPa	Absolute	2 Wafers ≈ 4,000 Die Per Wafer (Actual die quantity subject to +/- 10% yield variance)
SM5106-030-A	30 PSI / 206.8 kPa		
SM5106-060-A	60 PSI / 413.6 kPa		
SM5106-150-A	150 PSI / 1034 kPa		

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

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Product Number: SM5106

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