SM5102 OEM Silicon Pressure Die

PRESSURE SENSORS

Product Number: SM5102

HIGHLIGHTS

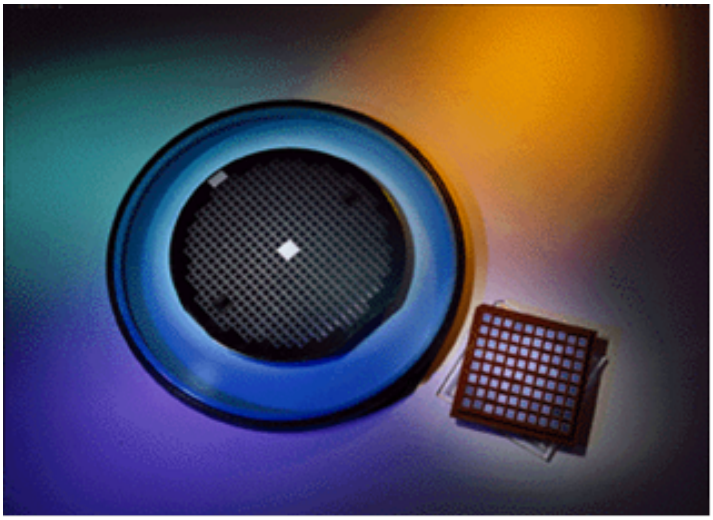
→ Small profile
→ High volume, low cost for OEM use
→ Mountable on ceramic or PCB substrates
→ Available for proprietary and custom packaging

TYPICAL APPLICATIONS

→ Altimeters and Barometers
→ Tire Gauges
→ Medical Instrumentation
→ Industrial Controls
→ Home Appliances
→ Weather Stations
→ Diving Modules
→ Engine Controls
  - Manifold Absolute Pressure (MAP)
  - Barometric Absolute Pressure (BAP)

FEATURES

→ High Volume, Low Cost
→ Gage and Absolute Configurations
→ Constant Current or Constant Voltage Drive
→ Millivolt Output
→ Available in 5, 15, 30, 60, and 100 PSI Ranges
→ Ratiometric with Supply Voltage up to 10 V



DESCRIPTION

The SM5102 is a silicon micro-machined, piezoresistive pressure sensing chip. These devices are available in full-scale ranges from 5 to 100 PSI and are ideal for OEM and high-volume applications.

Provided in die form, these sensors can be mounted on ceramic or PC board substrates as part of an OEM system. They also may be packaged into proprietary or application specific sensor lines.

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

TÜV MANAGEMENT SERVICE ISO / TS 16949

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ABSOLUTE MAXIMUM RATING TABLE FOR SM5102 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	3	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}	-55	—	+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 SM5102 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 (5 PSI)[b, c]	V_{SPAN}	75	100	125	mV
8	FS Span (15 PSI)[b, c]	V_{SPAN}	115	145	175	mV
9	FS Span (30 PSI)[b, c]	V_{SPAN}	130	165	195	mV
10	FS Span (60 PSI)[b, c]	V_{SPAN}	130	180	220	mV
11	FS Span (100 PSI)[b, c]	V_{SPAN}	130	200	250	mV
12	Zero Offset	V_{OFFSET}	-50	0	+50	mV
13	TC Span[b]	TCS	-24	-19	-15.5	%FS/100°C
14	TC Zero Offset[b]	TCZ	-7	-1	+7	%FS/100°C
15	TC Resistance[b, c]	TCR	24	27.5	33	$\%R_B$/100°C
16	Linearity[b, d]	NL	-0.3	±0.05	0.3	%FS
17	Bridge Resistance	R_B	2.80	3.45	4.00	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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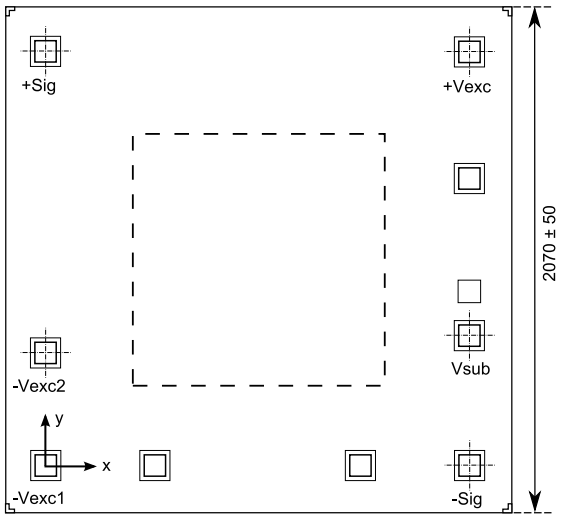
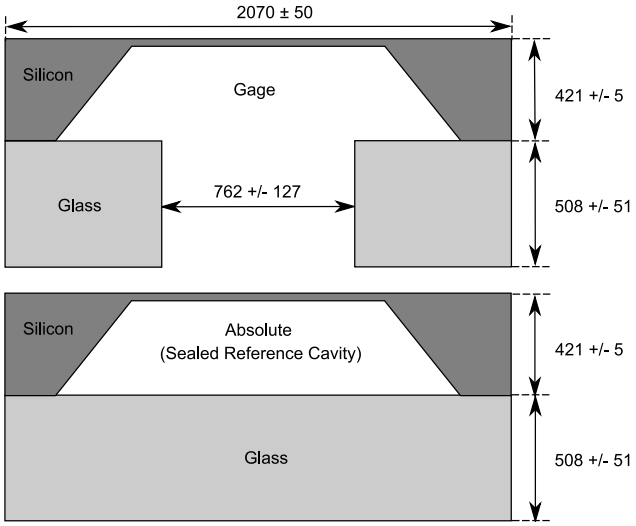
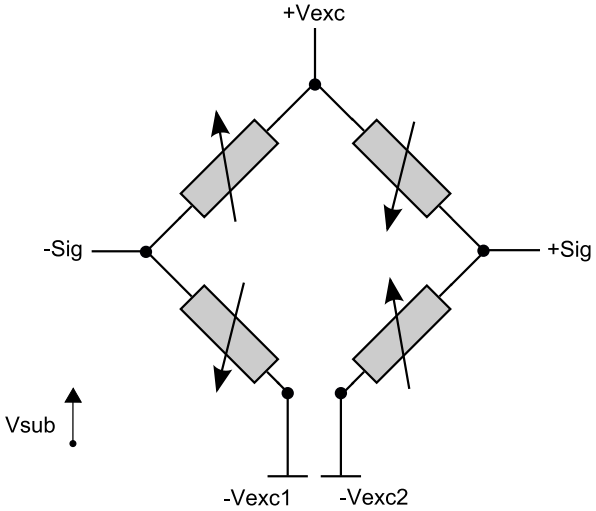
SM5102 Diagrams and Dimensions





SM5102 Pad-Out



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

Pad Sizes = 100 x 100

Coordinates	(x, y)
-Vexc1:	(0, 0)
-Sig:	(1750, 0)
-Vexc2:	(0, 429)
Vsub	(1750, 496)
+Sig	(0, 1692)
+Vexc	(1750, 1692)

All dimensions are in Micron

Ordering information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity (MOQ)
SM5102-005-GX	5 PSI / 34.5 kPa	Gage	2 Wafers
SM5102-015-GX	15 PSI / 103.4 kPa	Gage	
SM5102-015-AX	15 PSI / 103.4 kPa	Absolute	
SM5102-030-GX	30 PSI / 206.8 kPa	Gage	
SM5102-030-AX	30 PSI / 206.8 kPa	Absolute	
SM5102-060-GX	60 PSI / 413.4 kPa	Gage	
SM5102-060-AX	60 PSI / 413.4 kPa	Absolute	
SM5102-100-GX	100 PSI / 689 kPa	Gage	
SM5102-100-AX	100 PSI / 689 kPa	Absolute	

≈ 2,200 Die Per Wafer
(Actual die quantity subject to +/- 10% yield variance)

For samples, please contact: sales@si-micro.com

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