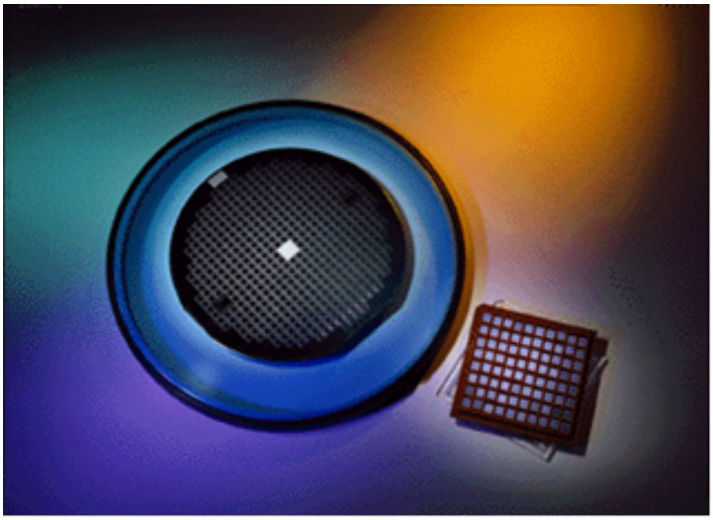
# SM5103 OEM Silicon Pressure Die

PRESSURE SENSORS

Product Number: SM5103

## HIGHLIGHTS

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



## TYPICAL APPLICATIONS

→ Air Flow
→ Liquid Level Detection
→ HVAC
→ Respiratory Equipment
→ Gas Analysis
→ Engine Control / Exhaust Gas Recirculation (EGR)
→ Hospital Beds
→ Seat Contour Controls

## FEATURES

→ Low Pressure Ranges from 0 - 0.3 PSI to 0 - 1.5 PSI
→ High Performance at Low Pressures
→ Constant Current or Constant Voltage Drive
→ High Sensitivity Output
→ Ratiomatric with Supply Voltage up to 10 V

## DESCRIPTION

The SM5103 is a silicon micro-machined, piezoresistive pressure sensing chip. These devices are available in full-scale ranges from 0.3 to 1.5 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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## Product Number: SM5103

ABSOLUTE MAXIMUM RATING TABLE FOR SM5103 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] | $p_{PROOF}$ | 10× | — | — | FS $p_{RANGE}$ |
| 4 | Burst Pressure[b] | $p_{BURST}$ | 15× | — | — | 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 SM5103 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 (0.3, 0.8 PSI) [b, c, e] | $V_{SPAN}$ | 25 | 50 | 75 | mV |
| 8 | FS Span (1.5 PSI) [b, c] | $V_{SPAN}$ | 25 | 50 | 75 | mV |
| 9 | Zero Offset | $V_{OFFSET}$ | -50 | -5 | +50 | mV |
| 10 | TC Span[b] | TCS | -24 | -19 | -15 | %FS/100°C |
| 11 | TC Zero Offset[b] | TCZ | -7 | -1 | +7 | %FS/100°C |
| 12 | TC Resistance[b, c] | TCR | 25 | 28 | 33 | %$R_B$/100°C |
| 13 | Linearity[b, d] | NL | -2.5 | ±0.15 | 2.5 | %FS |
| 14 | Bridge Resistance | $R_B$ | 2.7 | 3.4 | 4.0 | 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.
(e) Higher sensitivity offered. Please contact Sales @ sales@si-micro.com

QUALIFICATION STANDARDS

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



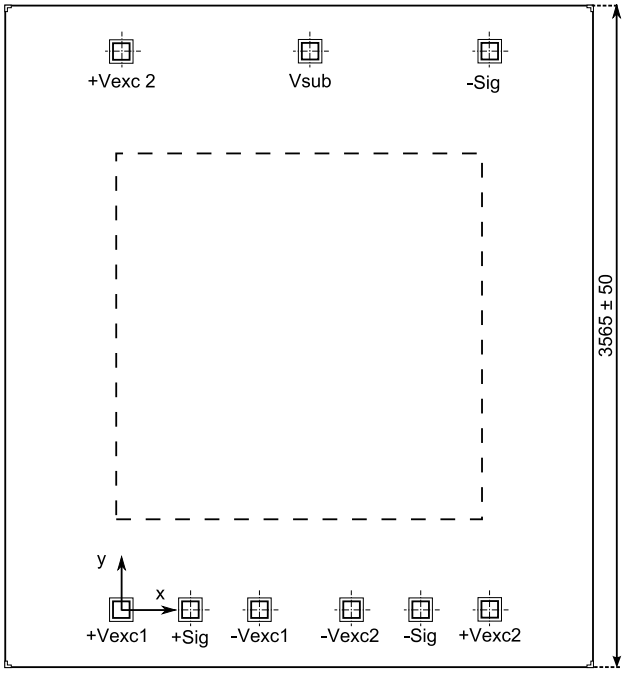
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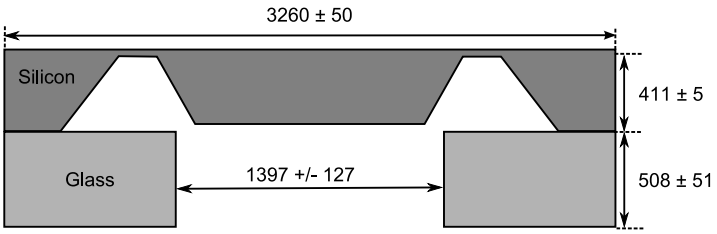


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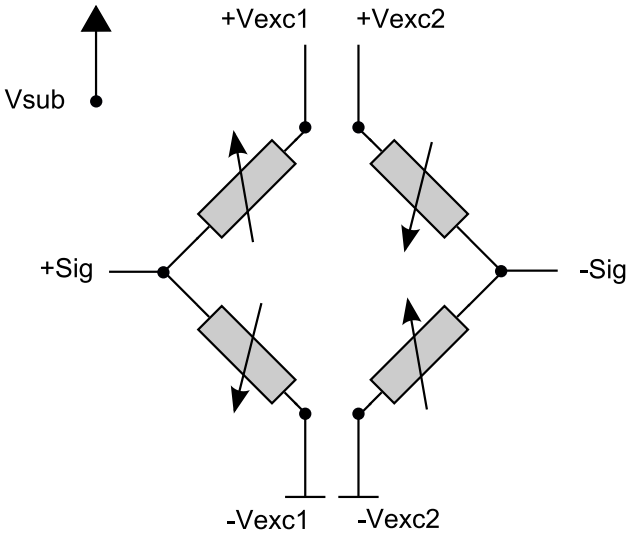
## SM5103 Diagrams and Dimensions




All dimensions are in micron

## SM5103 Pad-Out




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

Pad Sizes: 100 x 100
Coordinates: (x, y)

**Top Pads**

| | |
|---|---|
| +Vexc2: | (0, 3000) |
| Vsub: | (1000, 3000) |
| -Sig: | (2000, 3000) |

**Bottom Pads**

| | |
|---|---|
| +Vexc1: | (0, 0) |
| +Sig: | (375, 0) |
| -Vexc1: | (750, 0) |
| -Vexc2: | (1250, 0) |
| -Sig: | (1625, 0) |
| +Vexc2: | (2000, 0) |

## Ordering information

| Order Code | Full-Scale Pressure Range | Pressure Type | Minimum Order Quantity (MOQ) |
|---|---|---|---|
| SM5103-003-GX | 0.3 PSI / 2.068 kPa | Gage | 2 Wafers<br>≈ 850 Die Per Wafer<br>(Actual die quantity subject to +/- 10% yield variance) |
| SM5103-008-GX | 0.8 PSI / 5.515 kPa | | |
| SM5103-015-GX | 1.5 PSI / 10.34 kPa | | |

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



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## Product Number: SM5103

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