ULTRA-SMALL PRESSURE SENSOR

PRESSURE SENSORS

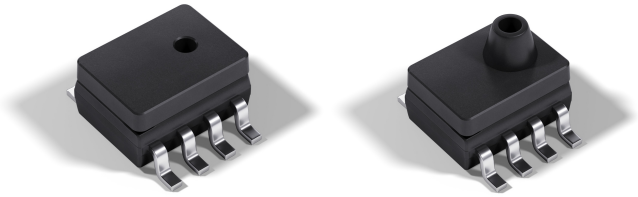
Product Number: SM5420C

HIGHLIGHTS

- Small, low cost, robust SO8 package
- For high-volume applications

TYPICAL APPLICATIONS

- Automotive tire pressure (TPMS)
- Engine control
- Barometric sensing
- Altitude correction detection
- Pneumatic gauges
- Hand-held meters
- Home appliances



SOIC8 Packaged Pressure Sensor

BASICS

- Absolute pressure
- PCB mountable
- Ported or non-ported configurations
- Tape and reel

FEATURES

- 15, 30, 60, & 100 PSI (103, 207, 414 & 689 kPa)
- Wide temperature range (-40° to +125°C)
- Suitable for automated assembly
- Constant current or constant voltage drive
- High millivolt output
- Automotive Qualified (AEC-Q100)
- RoHS & REACH Compliant

DESCRIPTION

The SM5420C is a small outline SO-8 packaged pressure sensor that incorporates SMI's new SM5108C MEMS piezoresistive pressure sensing die. The SM5420C has been optimized to provide the highest possible accuracy for a package of this size. Performance is achieved through careful resistor placement and mechanical configuration along with advanced MEMS processing.

The packaged sensor is intended for high volume applications where cost is a critical factor, such as consumer and automotive products. The SM5420C is available as an absolute pressure sensor in full-scale range of 15, 30, 60, 100 PSI (103, 207, 414 and 689 kPa). It is designed to be surface-mounted on ceramic or PC board substrates by high-volume OEM manufacturers.

The SM5420C is available in a ported and non-ported option that is designed to be immersed in the media being measured. The port position has been chosen to minimize pressure pulses directly impacting the face of the sensor die for added long-term reliability in hostile environments.

The standard configuration offers a protective gel over the die. A non-gelled version is also available for high volumes where the maximum stability is required, such as in barometric, weather station sensing applications. The SM5420C is shipped in stick or on tape & reel.

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Product Number: SM5420C

ABSOLUTE MAXIMUM RATING TABLE FOR SM5420C SENSOR

All parameters are specifed at VSUPPLY = 5.00 V DC supply at 25°C, unless otherwise noted. All parts are covered with gel.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Excitation Voltage[a]	V_{SUPPLY}	0.0	5.0	10.0	V
2	Excitation Current[a, c]	I_{SUPPLY}	0.0	1.0	1.6	mA
3	Operating Temperature[b]	T_{OP}	-40	—	+125	°C
4	Storage Temperature[b]	T_{STG}	-55	—	+150	°C

NOTES:

(a) The device can only be driven with the supply voltage connected to the pins as shown. The positive output will increase with increasing pressure applied to the package.
(b) Tested on a sample basis.
(c) Constant current operation.

No.	Product Number	Operating Pressure	Proof Pressure (P_{PROOF})[b]	Burst Pressure (P_{BURST})[b]
5	SM5420C-015-A	0 to 15 PSI	45 PSI	75 PSI
6	SM5420C-030-A	0 to 30 PSI	90 PSI	150 PSI
7	SM5420C-060-A	0 to 60 PSI	180 PSI	220 PSI
8	SM5420C-100-A	0 to 150 PSI	220 PSI	220 PSI

NOTES:

(b) Tested on a sample basis.

OPERATING CHARACTERISTICS FOR SM5420 SENSOR - SPECIFICATIONS

All parameters are specifed at VSUPPLY = 5.00 V DC supply at 25°C, unless otherwise noted. All parts are covered with gel.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
9	Span (15 PSI)[f]	V_{SPAN}	95	127	160	mV
10	Span (30, 60 & 100 PSI)[f]	V_{SPAN}	65	100	135	mV
11	Zero Offset	V_{ZERO}	-35	0	35	mV
13	TC Span [b, e]	TCS	-0.240	-0.190	-0.155	%FS/°C
14	TC Zero Offset [b, e]	TCZ	-0.07		+0.07	%FS/°C
15	TC Resistance [b, e]	TCR	+0.240	+0.275	+0.330	$\%R_B$/°C
16	Linearity[15 PSI] [b, f]	NL	-0.4		+0.4	%FS
17	Linearity [30, 60, 100 PSI] [b, f]	NL	-0.2		+0.2	%FS
18	Bridge Resistance	R_B	4	5	6	kΩ
19	Input Capacitance[b]	C_{IN}	—	< 2	—	pF

NOTES:

(b) Tested on a sample basis.
(e) Determined by measurements taken at 0°C and 75°C.
(f) Defined as best fit straight line.

QUALIFICATION STANDARDS

- REACH compliant
- RoHS compliant
- PFOS/PFOA compliant
- Qualified to meet AEC Q100 standards
- For qualification specifications please contact Sales at *sales@si-micro.com*

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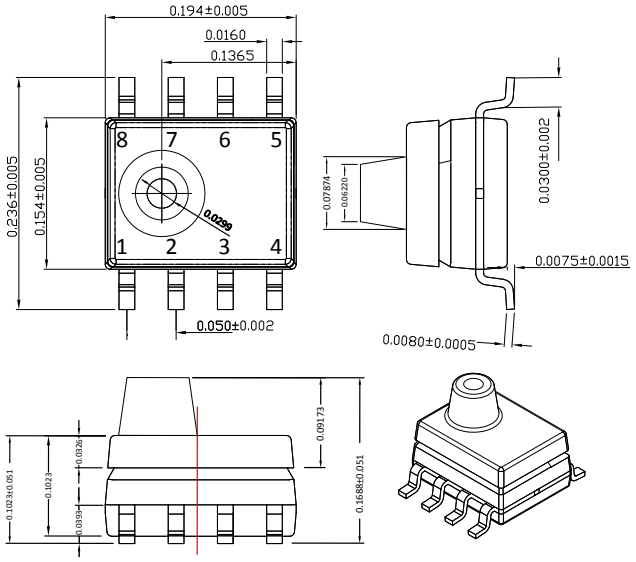
SMi PRESSURE SENSORS

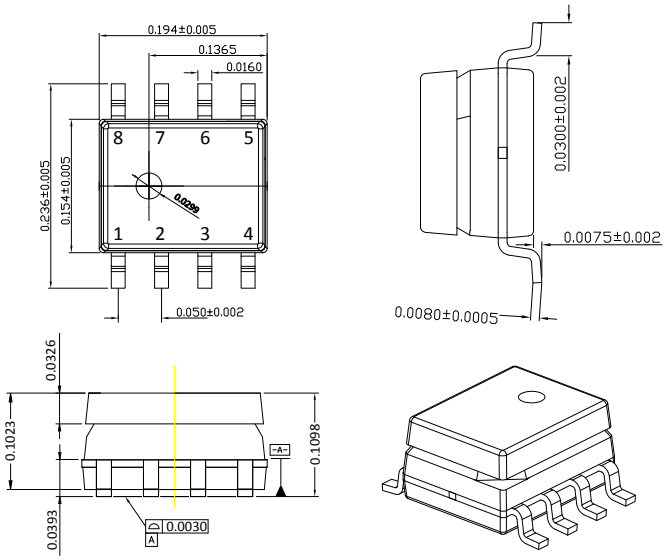
Product Number: SM5420C

Diagrams and Dimensions

P(ort) Configuration

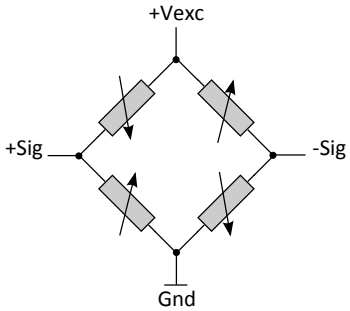


H(ole) Configuration



Note:
- All dimensions in inches
- MSL = 3

Pin-Out



PIN	DESCRIPTION
1	NC
2	+Sig
3	NC
4	Gnd
5	NC
6	-Sig
7	NC
8	+Vexc

Typical Operation

PIN	DESCRIPTION	TYPE	VALUE
2	+Sig	Analog Out	–
4	Gnd	Gnd	0 V
6	-Sig	Analog Out	–
8	+Vexc	Power	+5 V

Part Number Legend

SM 5420C 030 A H T

- SM: Silicon Microstructures
- 5420C: Product Series; Revision
- 030: Rated Pressure 030: 30 PSI
- A: Pressure Type A: Absolute
- H: Port Configuration H: Hole P: Port
- T: Shipping Configuration S - Sticks/Tubes T - T & R

Ordering Information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity
SM5420C-015-A-H-T	15 PSI / 103.4 kPa	Absolute	100 Units (1 stick)
SM5420C-015-A-P-T	15 PSI / 103.4 kPa		
SM5420C-030-A-H-T	30 PSI / 206.8 kPa		
SM5420C-030-A-P-T	30 PSI / 206.8 kPa		
SM5420C-060-A-H-T	60 PSI / 413.6 kPa		
SM5420C-060-A-P-T	60 PSI / 413.6 kPa		
SM5420C-100-A-H-T	100 PSI / 689.5 kPa		
SM5420C-100-A-P-T	100 PSI / 689.5 kPa		

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

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Product Number: SM5420C

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