

# ULTRA-SMALL PRESSURE SENSOR



Product Number: SM5420C

## HIGHLIGHTS

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

## TYPICAL APPLICATIONS

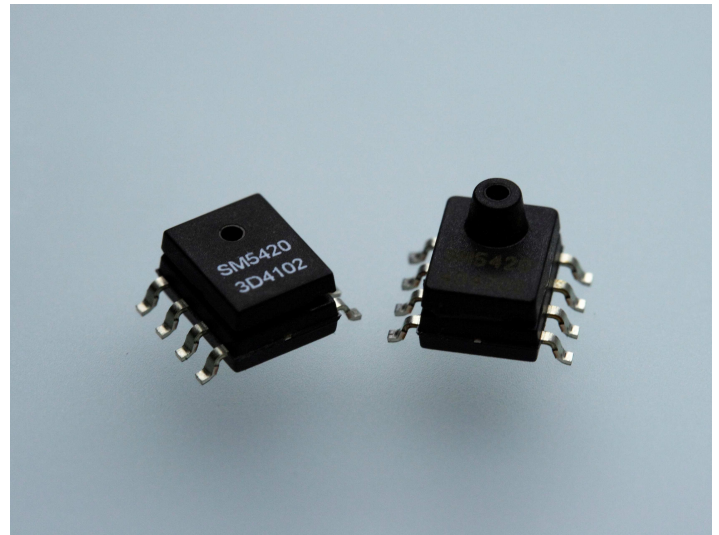
- Automotive tire pressure (TPMS)
- Engine control
- Barometric sensing
- Altitude correction detection
- Pneumatic gauges
- Hand-held meters
- Home appliances

## BASICS

- Absolute pressure
- PCB mountable
- Ported or non-porting 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



SOIC8 Packaged Pressure Sensor

## 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-porting option. Either option can be used to sense environmental pressure or measure pressure in a manifold configuration with an O-ring seal. 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 tape & reel.



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## ABSOLUTE MAXIMUM RATING TABLE FOR SM5420C SENSOR

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

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Excitation Voltage <sup>(a)</sup>	$V_{SUPPLY}$	0.0	5.0	10.0	V
2	Excitation Current <sup>(a)</sup>	$I_{SUPPLY}$	0.0	1.0	1.6	mA
3	Proof Pressure <sup>(b)</sup>	$P_{PROOF}$	3×	—	—	FS pRANGE
4	Burst Pressure <sup>(b)</sup>	$P_{BURST}$	5×	—	—	FS pRANGE
5	Operating Temperature <sup>(b)</sup>	$T_{OP}$	-40	—	+125	°C
6	Storage Temperature <sup>(b)</sup>	$T_{STG}$	-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.

## OPERATING CHARACTERISTICS FOR SM5420 SENSOR - SPECIFICATIONS

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

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
7	Span (15 PSI) <sup>(e)</sup>	$V_{SPAN}$	95	127	160	mV
8	Span (30, 60 & 100 PSI) <sup>(e)</sup>	$V_{SPAN}$	65	100	135	mV
9	Zero Offset	$V_{ZERO}$	-35	0	35	mV
10	TC Span <sup>(b, e)</sup>	TCS	-0.24	-0.19	-0.155	%FS/°C
11	TC Zero Offset <sup>(b, e)</sup>	TCZ	-0.07	-0.01	+0.07	%FS/°C
12	TC Resistance <sup>(b, c, e)</sup>	TCR	0.24	0.275	0.33	% $R_B$ /°C
13	Linearity <sup>(d)</sup>	NL	-0.2	-0.07	0.2	%FS
14	Bridge Resistance	$R_B$	4.0	5.0	6.0	kΩ
15	Input Capacitance <sup>(b)</sup>	$C_{IN}$	—	< 2	—	pF

## NOTES:

(c) Determined by measurements taken at 0°C and 70°C.

(d) Defined as best fit straight line.

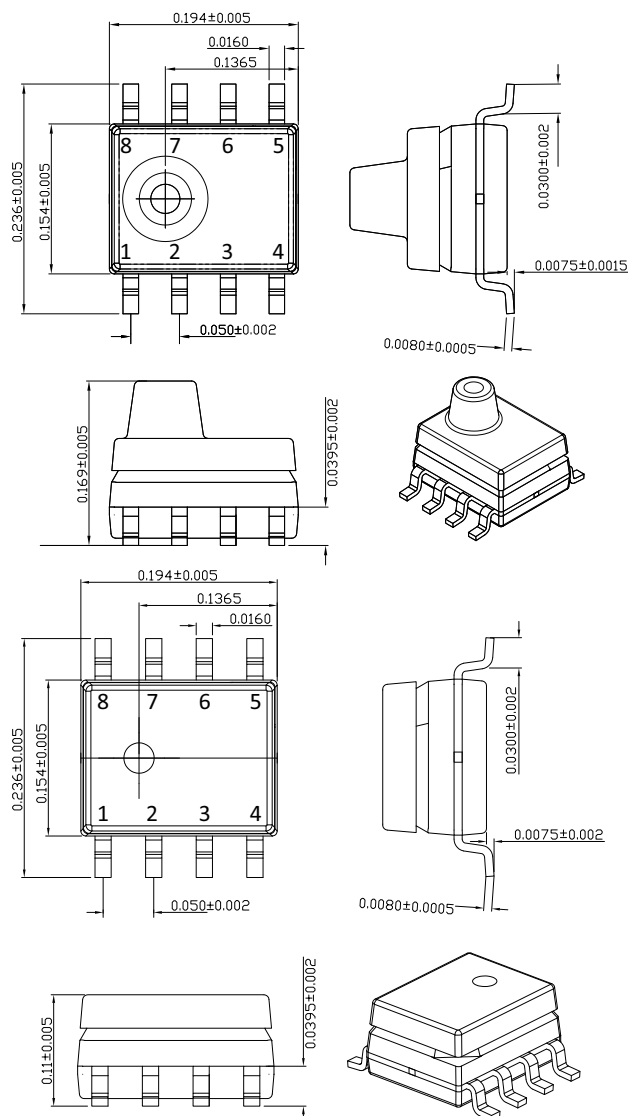
(e) For specifications regarding zero offset and span stability, please contact SMI Sales at +1-(408) 577-0100 or [sales@si-micro.com](mailto:sales@si-micro.com)

## 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](mailto:sales@si-micro.com)

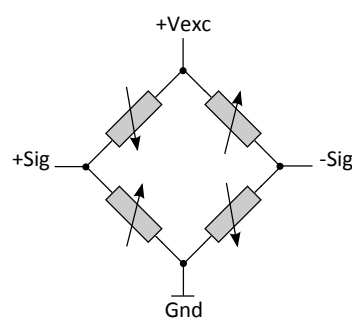
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## Diagrams and Dimensions



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

## Ordering information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity
SM5420C-015-A-H-T	15 PSI / 103.4 kPa	Absolute	2,000 units
SM5420C-015-A-P-T	15 PSI / 103.4 kPa	Absolute	1,500 units
SM5420C-030-A-H-T	30 PSI / 206.8 kPa	Absolute	2,000 units
SM5420C-030-A-P-T	30 PSI / 206.8 kPa	Absolute	1,500 units
SM5420C-060-A-H-T	60 PSI / 413.6 kPa	Absolute	2,000 units
SM5420C-060-A-P-T	60 PSI / 413.6 kPa	Absolute	1,500 units
SM5420C-100-A-H-T	100 PSI / 689.5 kPa	Absolute	2,000 units
SM5420C-100-A-P-T	100 PSI / 689.5 kPa	Absolute	1,500 units

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

Product Number: SM5420C

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