

# Small

# **Absolute Pressure Sensor**

## SM5420E Series

#### **FEATURES**

- Improved stability with integrated field shields
- Small SO8 surface-mount package
- 95 millivolt span
- Constant current or constant voltage drive
- Ported or non-ported configurations
- Wide operating temperature range (-40° to +125°C)
- Integrated die-level ESD protection
- Qualified using AEC-Q100 Grade 1 standards



#### **DESCRIPTION**

The SM5420E is a small outline SO8 packaged pressure sensor that incorporates SMI's new SM5108E MEMS piezoresistive pressure sensing die. The SM5420E has been optimized to provide the highest possible stability 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 SM5420E is available as an absolute pressure sensor in full-scale ranges of 30, 60 and 100PSI. It is designed to be surface-mounted on substrates by high-volume OEM manufacturers.

The SM5420E is available in a ported and non-ported option. The package is designed to be immersed in the media that is measured. The standard configuration offers a protective gel over the die. The SM5420E is shipped tape & reel.

Automotive	Industrial	Consumer
Tire Pressure Monitoring Systems (TPMS)	Handheld Meters	Sports Equipment
Engine Control	Pneumatic Gauges	Appliances
Barometric Sensing	Pressure Switches	
Altitude Correction Detection		



#### **ABSOLUTE MAXIMUM RATING TABLE**

All parameters are specified 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	Supply Voltage	V <sub>DD</sub>	0.0	-	6.5	V
2	Supply Current <sup>(a)</sup>	I <sub>DD</sub>	0.0	-	0.725	mA
3	Operating Temperature Range	Τ <sub>ΟΡ</sub>	-40	-	+125	°C
4	Storage Temperature Range	T <sub>STG</sub>	-55	-	+150	°C

#### Notes:

a. When used in constant current configuration

No.	Product Number	Operating Pressure	Proof Pressure (P <sub>PROOF</sub> ) <sup>(b)</sup>	Burst Pressure (P <sub>BURST</sub> ) <sup>(b)</sup>	
5	SM5420E-030-A-H-T	0-30 D21		150 DSI	
6	SM5420E-030-A-P-T	0-30 F31	50 831	120 121	
7	SM5420E-060-A-H-T	0 60 051	190 DSI	200 DSI	
8	SM5420E-060-A-P-T	0-00 F31	100 F31	200 F31	
9	SM5420E-100-A-H-T	0 100 051	200 DSI		
10	SM5420E-100-A-P-T	0-100 P31	200 P31	200 F31	

#### Notes:

b. Tested on a sample basis

### **OPERATING CHARACTERISTICS TABLE**

All parameters are specified at  $V_{DD}$  = 5.0 V DC supply at 25°C, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
11	Span <sup>(d)</sup>	V <sub>SPAN</sub>	65	95	135	mV
12	Zero Offset	V <sub>ZERO</sub>	-35	0	35	mV
13	TC Span <sup>(e, f)</sup>	TCS	-0.240	-0.200	-0.155	%FS/ºC
14	TC Zero Offset (e, f)	TCZ	-0.07		+0.07	%FS/ºC
15	TC Resistance <sup>(e, f)</sup>	TCR	+0.15		+0.27	%RB/°C
16	Linearity <sup>(30 PSI)</sup> (e, g)	NL	-0.2		+0.2	%FS
17	Bridge Resistance	R <sub>B</sub>	5	6	7	kΩ

#### Notes:

d. 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.

e. Tested on a sample basis.

f. Determined by measurements taken at -40°C and 125°C.

g. Defined as best fit straight line.



**Diagrams & Dimensions** 

## Port (P) Configuration

Hole (H) Configuration







#### NOTES:

- All dimensions are in inches
- MSL = 3



Typical Operation					
Pin No.	Description	Value			
2	+Sig	Analog Out	-		
4	Gnd	Gnd	0 V		
6	-Sig	Analog Out	-		
8	+Vexc	Power	+5 V		

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## **Ordering Information**

Order Code	Pressure Type	Full-Scale Pressure Range	Cap Configuration	Shipping Configuration
5420E-030-A-H-T		20 051	Hole	
5420E-030-A-P-T		30 7 31	Ported	
5420E-060-A-H-T	Absoluto	60 051	Hole	Tape & Reel
5420E-060-A-P-T	Absolute	100 PSI	Ported	(1,500 QTY for Ported Type) (2,000 QTY for Hole Type)
5420E-100-A-H-T			Hole	
5420E-100-A-P-T			Ported	

## **Part Number Legend**



M : mBar K : kPa None : PSI

## **Qualification Standards**

- REACH compliant
- RoHS compliant
- PFOS/PFOA compliant
- Qualified to meet AEC-Q100 Grade 1 standards
- For qualification specifications please contact Sales at sales@si-micro.com





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