



## Features

- 3.3 volt supply
- Compensated digital output (I<sup>2</sup>C)
- Ultra-low pressure sensing (250 Pa)
- Gauge and differential types
- For use in clean, dry air and non-corrosive gas environments
- RoHS compliant\*

## Applications

- Industrial:
  - HVAC systems
  - Process monitoring
  - Packaging automation
- \*\*Medical Devices (low/medium risk):
  - Diagnostic equipment
  - Analysis equipment

## BPS125 Series - 12 mm Digital Low Pressure Sensor

### Electrical Characteristics

Supply Voltage (V <sub>s</sub> ) .....	3.0 V minimum, 3.3 V typical, 3.6 V maximum
Supply Current @ 5 V .....	1.2 mA minimum, 2 mA typical, 3.5 mA maximum

### Performance Characteristics

Operating Temperature .....	-40 °C to +85 °C (-40 °F to +185 °F)
Storage Temperature .....	-55 °C to +100 °C (-67 °C to +212 °F)
Pressure Range .....	250 to 500 Pa, 0.15 to 1.0 PSI (1 " H <sub>2</sub> O to 2 " H <sub>2</sub> O, 1.03 to 6.89 kPa)
Output .....	Digital I <sup>2</sup> C (1)
Effective ADC Resolution .....	13 bit
Accuracy @ 25 °C .....	±0.25 % FS
Total Error Band over 0 °C to 60 °C (+32 °F to +140 °F) .....	± 1.5 % FS
Long Term Stability .....	± 0.5 % FS
Startup Time .....	15 ms maximum
Digital Update Time .....	8.5 ms typical
Proof Pressure .....	5X full scale pressure
Burst Pressure .....	10 psi

(1) I<sup>2</sup>C address is set to (0x28). Alternative addresses are available. Consult the factory for custom options.

### Product Characteristics

Media Compatibility .....	Non-corrosive dry gasses
Moisture Sensitivity Level .....	1
ESD Classification (HBM) .....	2 kV
Marking .....	Partial model number, media compatibility, pressure type, pressure rating, lot code
Standard Packaging .....	250 pcs./13-inch reel
Weight .....	1.307 grams (0.046 oz)

### Transfer Function Formula

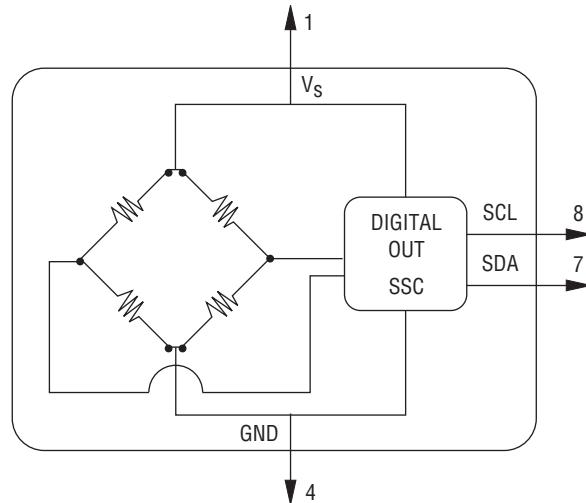
$$P_{\text{psi}} = (P_{\text{max}} - P_{\text{min}}) \cdot \left( \frac{P_{\text{counts}} - 0.1 \cdot \text{Max}}{0.8 \cdot \text{Max}} \right) + P_{\text{min}}$$

#### Where

- P<sub>psi</sub> = Measured Pressure in PSI
- P<sub>counts</sub> = Pressure Counts
- P<sub>min</sub> = Minimum Pressure
- P<sub>max</sub> = Maximum Pressure
- Max = 16384 = 14 Bits

Consult factory for custom options such as supply voltage, temperature calibration range, output range accuracy specification, and update rate.

### Basic Circuit Schematic



Note: Power supply decoupling included.



### WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\* RoHS3 Directive 2015/863 Amendments of Annex II on March 31, 2015

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Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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# BPS125 Series - 12 mm Digital Low Pressure Sensor

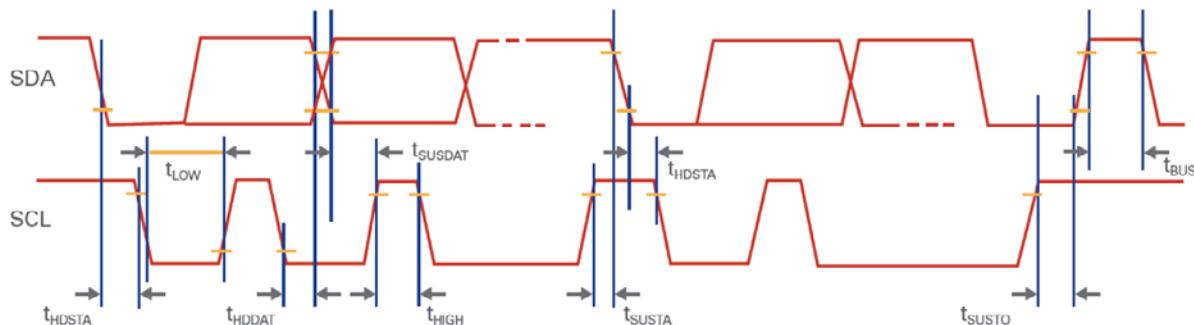
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## I<sup>2</sup>C Parameters

SCL Clock Frequency f <sub>SCL</sub> .....	100 to 400 kHz
Start Condition Hold Time Relative to SCL Edge t <sub>HDSTA</sub> .....	0.1 $\mu$ s
Minimum SCL Clock Low Width <sup>1</sup> t <sub>LOW</sub> .....	0.6 $\mu$ s
Minimum SCL Clock High Width <sup>1</sup> t <sub>HIGH</sub> .....	0.6 $\mu$ s
Start Condition Setup Time Relative to SCL Edge t <sub>SUSTA</sub> .....	0.1 $\mu$ s
Data Hold Time on SDA Relative to SCL Edge t <sub>HDDAT</sub> .....	0.0 $\mu$ s
Data Setup Time on SDA Relative to SCL Edge t <sub>SUDAT</sub> .....	0.1 $\mu$ s
Stop Condition Setup Time on SCL t <sub>SUSTO</sub> .....	0.1 $\mu$ s
Bus Free Time Between Stop Condition and Start Condition t <sub>BUS</sub> .....	2 $\mu$ s

<sup>1</sup> Combined low and high widths must equal or exceed minimum SCLK period.

## I<sup>2</sup>C Parameters



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## I<sup>2</sup>C Communication

Communication to the Model BPS125 is read only. To read the pressure counts, the master performs a read request by asserting a start condition, sending the 7-bit address of the part (0x28), and sets the read/write bit. The master then waits for an acknowledgement. The acknowledgement is sent by the pressure sensor along with 2 bits of status and bits 13:8 of the pressure counts, the master acknowledges the first 8 bits, and the pressure sensor sends the remaining 8 bits of data. The master then does not acknowledge and sends a stop condition, signaling the end of the transaction.



S	Start Conditioning	#	Device Slave Address	#	Data Bit	Status Bits	
RW	Read/Write Bit	A	Acknowledge Bit	N	No Acknowledge Bit	0 0	Normal Operation, Good Packet
ST	Stop Condition	SB	Status Bits			0 1	Device in Command Mode
						1 0	Stale Data
						1 1	Diagnostic Condition Exists

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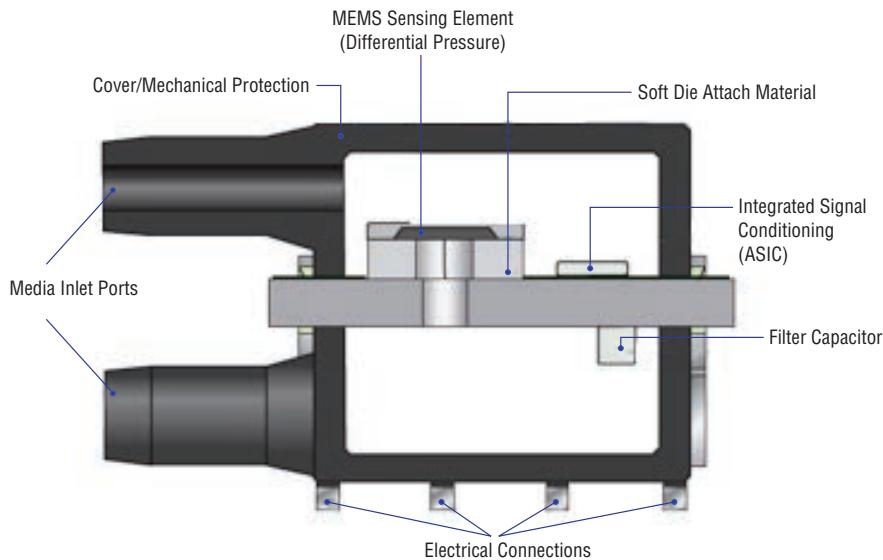
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# BPS125 Series - 12 mm Digital Low Pressure Sensor

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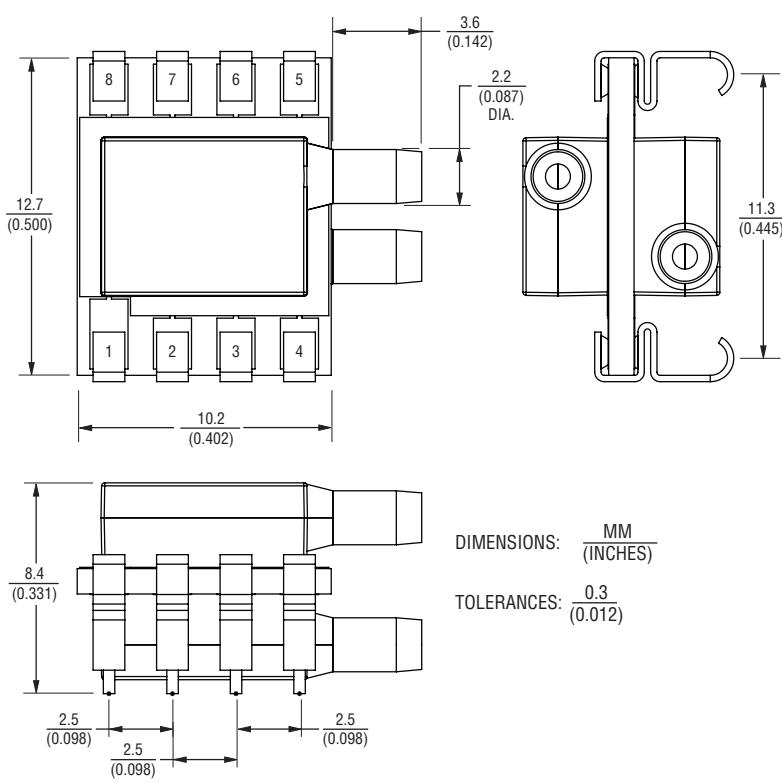
## Cross Section



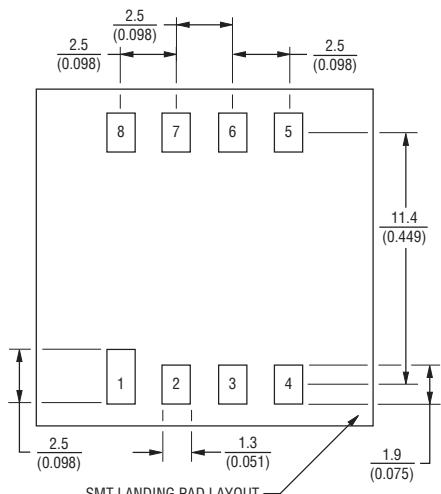
## Terminal Assignment

DEVICE PINOUT	
P1	V <sub>s</sub>
P2	N/C
P3	N/C
P4	VSS - Ground
P5	N/C
P6	N/C
P7	SDA - I <sup>2</sup> C Data
P8	SCL - I <sup>2</sup> C Clock

## Product Dimensions



## Recommended PCB Layout



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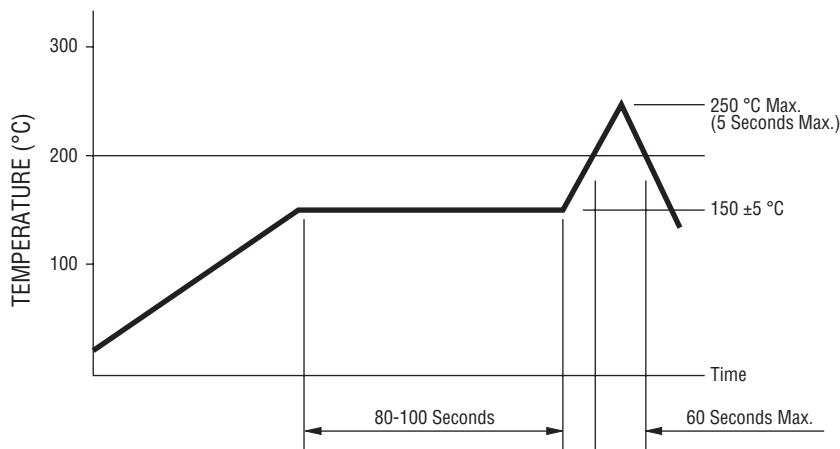
## BPS125 Series - 12 mm Digital Low Pressure Sensor

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### How To Order

Model Series ————— BPS125 - A D 0P07 - 2 D G  
Digital  
Media Compatibility —————  
A = Air/Gas  
Pressure Type —————  
G = Gauge  
D = Differential  
Pressure —————  
0P04 = 250 Pa  
0P07 = 500 Pa  
0P15 = 0.15 PSI  
0P30 = 0.30 PSI  
01P0 = 1.0 PSI  
Terminal Pins —————  
2 = Surface Mount Terminals  
Port Style —————  
D = Dual Port, Horizontal  
Packaging Designator —————  
G = 250 pcs. per 13-inch Reel

### Solder Profile



Processing Method: Reflow soldering with infrared heat or forced air convection (only once).

#### Notes:

1. No clean solder paste is recommended.
2. Aqueous wash is not recommended.
3. Use of water soluble soldering flux should be avoided due to possible corrosion.
4. Multiple passes through the soldering process is not recommended.
5. Other SMD processes and profiles should be verified by the customer.

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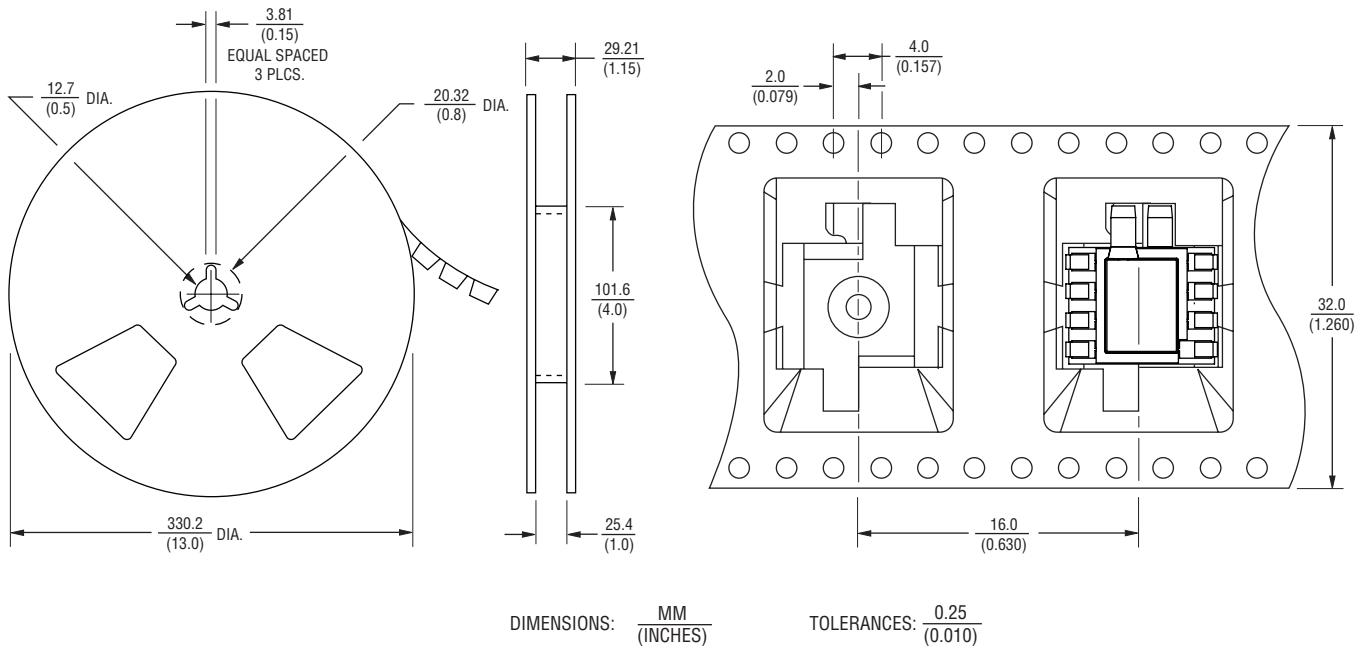
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## Packaging Specification

250 pieces per 13-inch reel.  
Meets specifications of EIA-481-1 or EIA-481-2.



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