



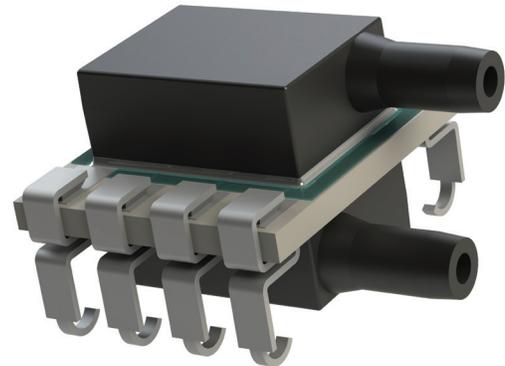
LP Series - Analog is a surface mountable pressure sensor package with a compensated analog output suitable for ultra-low pressure sensing applications.

COMPANY: Merit Sensor is a leader in piezoresistive pressure sensing and partners with clients to create high performing solutions for a variety of applications and industries.

SENTIUM: Merit Sensor products incorporate a proprietary Sentium® technology developed to provide superior stability.

TECHNOLOGY: Merit Sensor utilizes a piezoresistive Wheatstone bridge in a design that anodically bonds glass to a chemically etched silicon diaphragm. All products are RoHS compliant.

CAPABILITIES: Merit Sensor designs, engineers, fabricates, dices, assembles, tests and sells die and packaged products from a state-of-the-art facility near Salt Lake City, Utah



FEATURES

Pressure Range	0.04 to 15 psi (2.5 mbar to 1 bar; 250 Pa to 100 kPa; 1 in H <sub>2</sub> O to 415 in H <sub>2</sub> O)
Output	Amplified Analog
Type	Gage, Differential and Absolute
Media	Clean, Dry Air and Non-corrosive Gases
Packaging	Tape and Reel
Customization	Supply Voltage, Temperature Calibration Range, Output Range, Accuracy Specification, Update Rate, etc.

BENEFITS

Performance	Enjoy best-in-class performance due to Merit's proprietary Sentium technology
Cost	Save money over time with high-performing die
Security	Feel confident doing business with an experienced company backed by a solid parent company (NASDAQ: MMSI)
Speed	Get to market quickly with creative and flexible solutions
Service	Experience prompt, personal and professional support

**1410 Family Part Number Configurator**

1410-XXX X -XX-XX

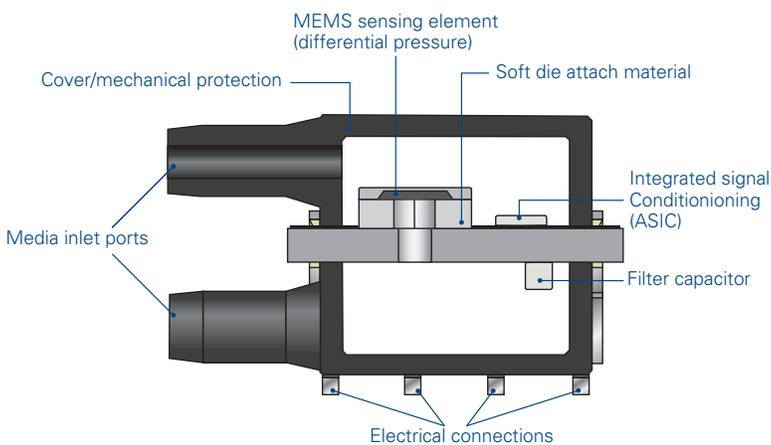
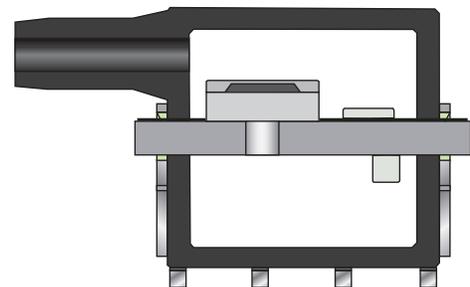
<b>Pressure</b>		<b>Pin Type</b>
P04 = 250 Pa		1 = J-lead
P07 = 500 Pa		
P15 = .15psi		
P30 = .30psi		
1P0 = 1.0psi		
15P = 15psi		
<b>Reference</b>		<b>Port</b>
D = Differential		1 = Dual horizontal, facing same direction
G = Gage		2 = Single Horizontal
A = Absolute		
<b>Calibrated Supply Voltage</b>		<b>Output Range</b>
1 = 5.0V		2 = 10 to 90 %Vs
2 = 3.3V		

**SPECIFICATIONS**

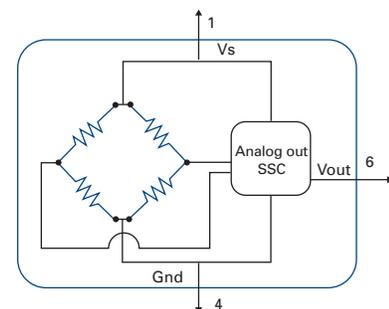
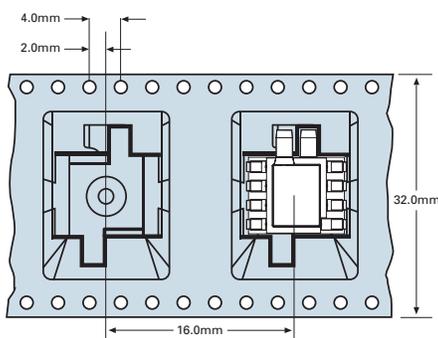
Parameter	Minimum	Typical	Maximum	Units	Notes
<b>Electrical</b>					
Supply Voltage (Vs)	4.5	5	5.5	V	Depending on calibrated supply voltage
Supply Voltage (Vs)	3.0	3.3	3.6	V	
Supply Current	1.25	2	2.4	mA	(1)
Output Current			1.9	mA	
Min Output Load Resistance	5			kΩ	(2)
Operating Temperature	-40		85	°C	
Storage Temperature	-55		100	°C	
<b>Performance</b>					
DAC Resolution			12	Bit	
Ratiometric Output Range (Vout)		10 to 90		%Vs	
Accuracy	-1.5		1.5	%FS	(3) (4)
Lifetime Drift	-0.5		0.5	%FS	
Startup Time			8	ms	
Analog Update Time		25		ms	
Proof Pressure	5X				(5)
Burst Pressure	10X				
<b>Transfer Function Formula</b>					
$P_{psi} = (P_{max} - P_{min}) \cdot \left( \frac{V_{out} - V_{min}}{V_{max} - V_{min}} \right) + P_{min}$				<b>Where</b> <i>P<sub>psi</sub></i> = Measured Pressure in PSI <i>P<sub>Max</sub></i> = Maximum Pressure <i>P<sub>Min</sub></i> = Minimum Pressure <i>V<sub>min</sub></i> = Minimum Volatage (Usually 10% Vs) <i>V<sub>max</sub></i> = Maximum Volatage (Usually 90% Vs) <i>V<sub>out</sub></i> = Output voltage (pin 6)	
<b>Media Compatibility</b>					
For Use With Non-corrosive Dry Gasses					
Solder temperature: max 250 °C, 5 seconds max					

**Notes:**

- (1) @ 5V input voltage
- (2) Must be added at the point of use
- (3) Over 0°C to 60°C
- (4) Applicable if Vs = ±5% of calibrated supply voltage
- (5) Full scale pressure

**CROSS SECTION FOR DIFFERENTIAL AND GAGE**

**CROSS SECTION FOR ABSOLUTE**

**ELECTRICAL**

Note: Power supply decoupling and output filtering included


**PACKAGING AND SHIPPING**


**DIMENSIONS FOR STANDARD OPTIONS (in millimeters)**

Dimensions for reference only. Engineering drawings (with tolerance) available upon order.

**Device Pinout**
**P1** = Vs

**P2** = N/C

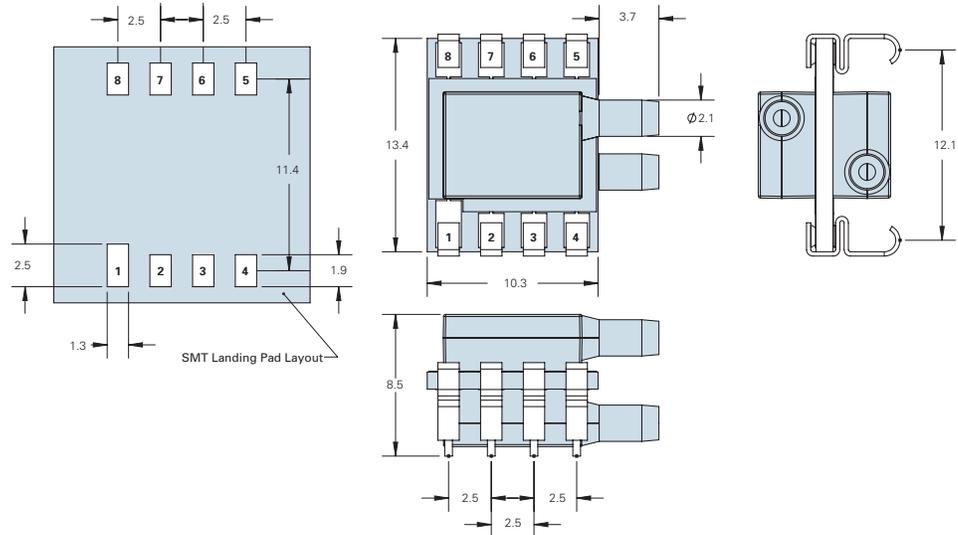
**P3** = N/C

**P4** = Ground

**P5** = N/C

**P6** = Vout

**P7** = N/C

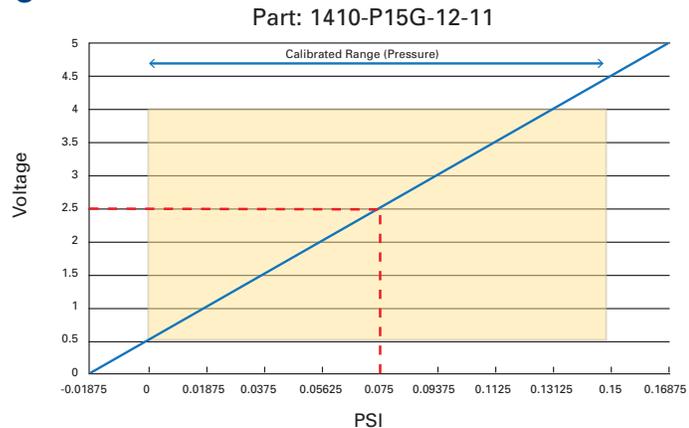
**P8** = N/C

**Example 1: 0.0 to 0.15 PSI Gage 0-60°C**

Part: 1410-P15G-12-11

 $P_{min} = 0.0 \text{ psi}$ ,  $P_{max} = 0.15 \text{ psi}$ 
 $V_{out} = 2.5 \text{ V}$ 
 $V_{minCompV} = 0.5 \text{ V}$ ,  $V_{maxCompV} = 4.5 \text{ V}$ 

$$P_{psi} = (P_{max} - P_{min}) \cdot \left( \frac{V_{out} - V_{min}}{V_{max} - V_{min}} \right) + P_{min}$$

$$PSI = (0.15 - 0.0) \cdot \left( \frac{2.5 - 0.5}{4.5 - 0.5} \right) + 0$$

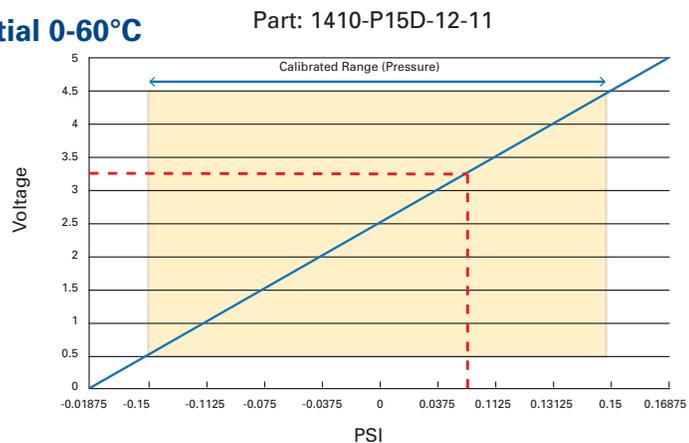
 $PSI = .075$ 

**Example 2: -0.15 to 0.15 PSI Differential 0-60°C**

Part: 1410-P15D-12-11

 $P_{min} = -0.15 \text{ psi}$ ,  $P_{max} = 0.15 \text{ psi}$ 
 $V_{out} = 3.25 \text{ V}$ 
 $V_{minCompV} = 0.5 \text{ V}$ ,  $V_{maxCompV} = 4.5 \text{ V}$ 

$$P_{psi} = (P_{max} - P_{min}) \cdot \left( \frac{V_{out} - V_{min}}{V_{max} - V_{min}} \right) + P_{min}$$

$$PSI = (0.15 - (-0.15)) \cdot \left( \frac{3.25 - 0.5}{4.5 - 0.5} \right) + (-0.15)$$

 $PSI = .05625$ 




*Merit Sensor is based in Salt Lake City, Utah*

