

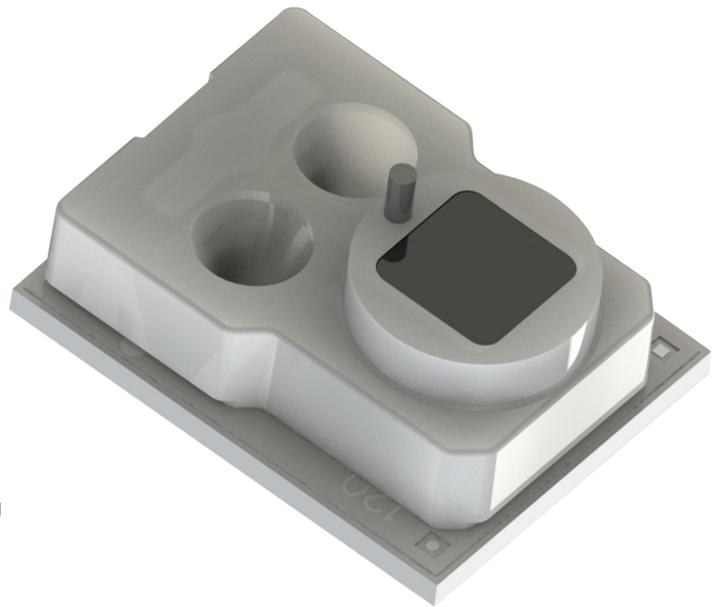


**The Merit Sensor Blood Pressure sensor** is ideal for high-volume, disposable medical applications including blood pressure monitoring. The BPT Series sensor is passively compensated (which reduces temperature effects), is protected by a dielectric gel, contains an NPT temperature sensor, and can easily be installed into a customer’s pressure device housing.

**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. Design, engineering and manufacturing of Merit Sensor products takes place in state-of-the-art wafer fabrication facility in Utah, US.

**TECHNOLOGY:** Merit Sensor utilizes a piezoresistive wheatstone bridge with a chemically etched silicon diaphragm. All products are RoHS compliant.

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



**FEATURES**

- Functional pressure range of -500 to 1000mmHg
- Excellent burst pressure
- Compliant with AAMI BP22 specifications from -30 to 300 mmHg
- Dielectric gel barrier
- Fully tested from 0 to 300 mmHg in production
- Small, disposable package
- Passively compensated, reducing temperature effects
- Solid state piezoresistive sensor
- Top side pressure entry
- Easy to install into customer’s disposable blood pressure device housing
- Compatible with automated assembly equipment
- Compatible in air, gas and liquid
- Shipped in tape and reel
- Automated testing and assembly
- Lead-free configuration
- Engineering, design, and manufacturing under one roof in Utah, USA
- Certain specifications tested per ISO 60601-1. See note 12.

**BP Series Special Part Numbers**

**BPT0001**

**APPLICATIONS**

- Disposable blood pressure measurement
- Kidney dialysis machines
- Infusion pumps
- Surgical procedures



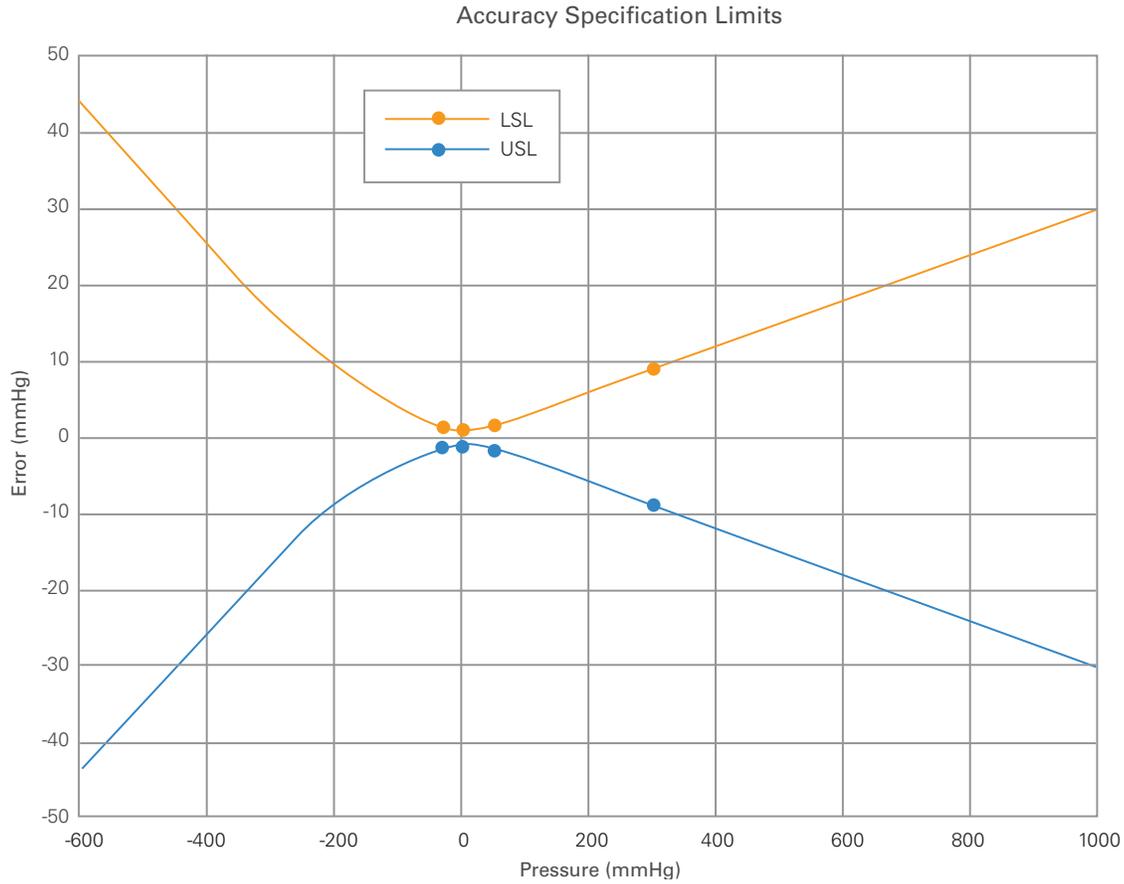
**SPECIFICATIONS**

Parameter	Minimum	Typical	Maximum	Units	Notes
<b>General</b>					
Pressure Range	-500		1000	mmHg	
Overpressure	125			PSI	Per AAMI BP22
<b>Electrical (22°C unless otherwise stated)</b>					
Pressure Sensor Input Excitation (In)	1		10	VDC	Calibration verified at 6 VDC
Risk Current			2	µA	5
Temperature Sensor Supply Current			10	µA	
Input Impedance	1,200		3000		
Output Impedance	285		315		
Dielectric Breakdown	4kV			VAC	5, 12
<b>Environmental 10</b>					
Temp (Operating)	0		50	°C	
Temperature (Storage)	-25		70	°C	
Humidity	10		90	%	(Non Condensing)
Light Sensitivity			1	mmHg	5 - Per AAMI BP22
Operating Product Life	30			Days	8
Shelf Life	3			Years	
Sterilization (ETO)	3			Cycles	7
<b>Mechanical</b>					
Weight			2	Grams	
Volume Displacement			.02	mm <sup>3</sup>	
Media Interface					Medical grade, dielectric gel, parylene, Polycarbonate
<b>Performance - Pressure 1</b>					
Offset	-25	0	25	mmHg	
Sensitivity	4.95	5	5.05	µV/V/mmHg	
Calibration	97.5	100	102.5	mmHg	2
Symmetry	-5		5	%	
Accuracy (-500 to -250 mmHg)	9% of Reading + 10mmHg		-9% of Reading - 10mmHg		5
Accuracy (-250 to -50 mmHg)	5		-5	% of Reading	5
Accuracy (-50 to -30 mmHg)	6% of Reading + .5mmHg		-6% of Reading - .5mmHg		5
Accuracy (-30 to 0 mmHg)	1% of Reading - 1mmHg		-1% of Reading + 1mmHg		5, 6 - Per AAMI BP22
Accuracy (0 to 50 mmHg)	-1% of Reading - 1mmHg		1% of Reading + 1mmHg		6 - Per AAMI BP22
Accuracy (50 to 300mmHg)	-3		3	% of Reading	6 - Per AAMI BP22
Accuracy (300 to 1000mmHg)	-3		3	% of Reading	5
Temp Coeff – Zero	-0.3	0	0.3	mmHg/°C	3, 5
Temp Coeff – Sensitivity	-0.1	0	0.1	%/°C	3, 5
Frequency Response	200			Hz	5
Phase Shift			5	Degrees	5
Offset Drift			2	mmHg/30 days	4, 5, 8
<b>Performance - Temperature</b>					
Resistance @37°C		6015.63		Ω	Temperature Sensor (β25/50=3935.5ppm/K)
Accuracy (0..50°C)	-0.5	0	+0.5	°C	
Accuracy (30..40°C)	-0.3	0	+0.3	°C	5, 11

**NOTES:**

- Assumes 6 VDC, 22°C and after 20 second warm-up unless otherwise specified.
- Output of sensor with no pressure applied and a150 KΩ resistor shorted across + IN to + OUT.
- Over a temperature range of 15°C to 40°C.
- Normalized offset/bridge voltage – 8 hours after 20 second warm-up.
- Previously qualified in customers final package, not tested in production.
- Combined effect of sensitivity, repeatability, nonlinearity and hysteresis errors (only applies after zeroing the offset).
- Sterilization performed by customer.
- Testing performed with air at atmospheric pressure and 25°C
- A voltage of 1,500 Vrms was applied across the dielectric gel while the gel was being monitored for dielectric breakdown. No transducers demonstrated dielectric breakdown, indicating that the transducers will continue to protect the patient from electric current up to the designated voltage.
- The transducer shall meet the requirements for all parameters in the specification when operated at atmospheric pressure: 425 to 850 torr (8.22 to 16.44 psi).
- Resistance to Temperature Equations found at the end of this document.
- Tested in customer's package per ISO 60601-1.

**PRESSURE ACCURACY GRAPH**



**RESISTANCE TO TEMPERATURE EQUATIONS**

Steinhart-Hart Equation:

$$T \text{ in } ^\circ\text{C} = \frac{1}{A + B (\ln(R)) + C (\ln(R))^3} - 273.15$$

Coefficients:

a = 1.127949215854 E-3

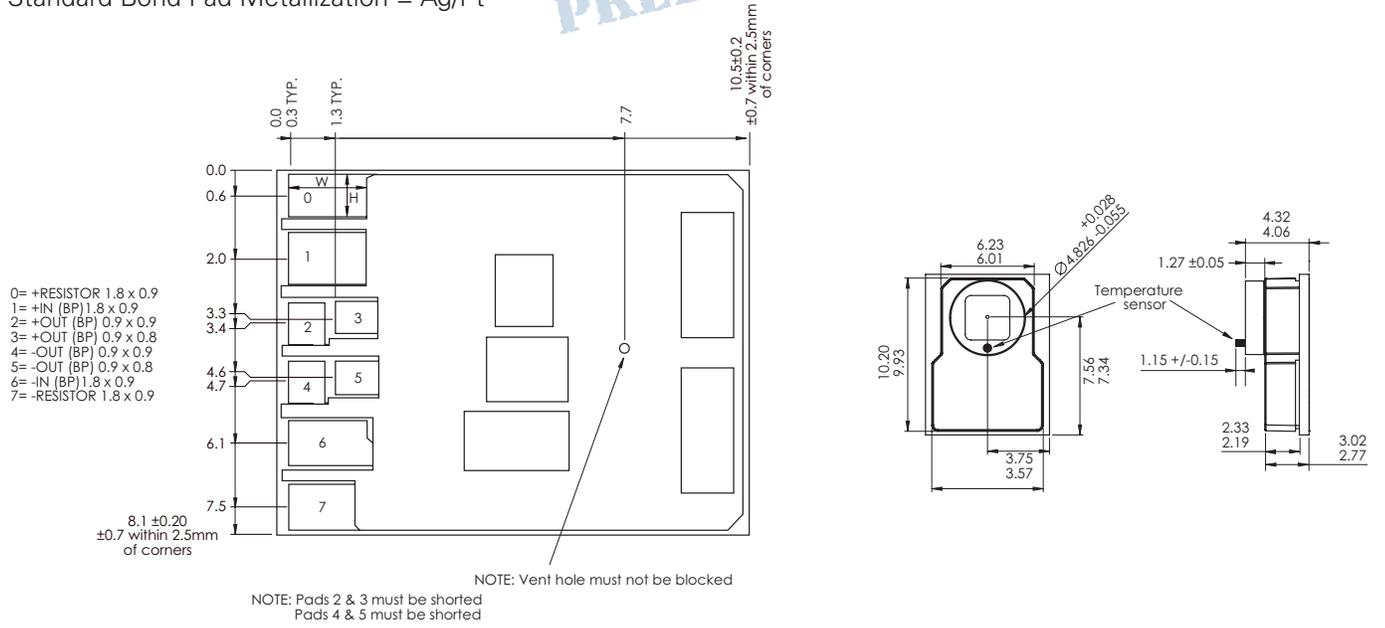
b = 2.34311097551 E-4

c = 0.86946676 E-7

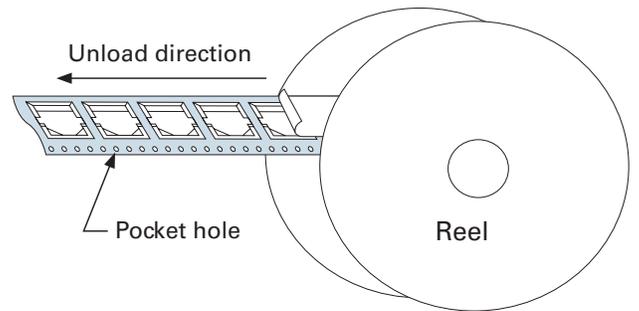
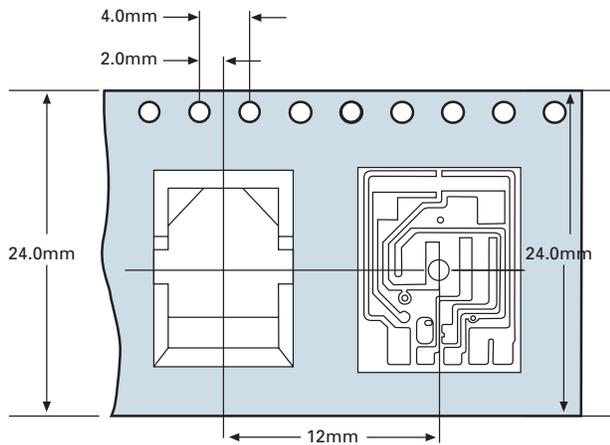
## DIMENSIONS (millimeters)

Standard Bond Pad Metallization = Ag/Pt

**PRELIMINARY**



## PACKAGING AND SHIPPING



Tape and Reel Orientation



**MERIT SENSOR™**

Sales +1 801.208.4722 • Customer Service +1 801.208.4700 • Fax +1 801.208.4798 • sensors@merit.com • www.MeritSensor.com

1600 W. Merit Parkway • South Jordan, Utah • 84095 • USA