MERIT SENSOR™

DATA SHEET

BP Series – Extended Prange

The Merit Sensor Blood Pressure sensor is ideal for low cost, high-volume, disposable medical applications including blood pressure monitoring. The BP Series sensor is passively compensated (which reduces temperature effects), is protected by a dielectric gel, 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

- Pressure range has been validated from -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, low-cost 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
- Custom options available
- Engineering, design, and manufacturing under one roof in Utah, USA.

RoHS Compliant

APPLICATIONS

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

BP Series Special Part Numbers

BP0006 / BP0007

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SPECIFICATIONS

Parameter	Minimum	Typical	Maximum	Units	Notes
General					
Pressure Range	-500		1000	mmHg	
Overpressure	125			PSI	Typical burst of +800 PSI
Electrical (22°C unless otherwise stated)					
Input Excitation (In)	1		10	VDC	Calibrated to 6 VDC
Risk Current			2	µA	5
Input Impedance	1,200		3000	Ω	
Output Impedance	285		315	Ω	
Dielectric Breakdown	1,500			Vrms	5, 9
Environmental 10					
Temp (Comp/Operating)	15		40	°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
Mechanical					
Weight			2	Grams	
Volume Displacement			.02	mm^3	
Media Interface					Medical grade, dielectric gel
Gel Tube Interface Material					Polycarbonate
Performance 1					
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 mmHg)	-35		35	mmHg	5, 11
Accuracy (-250 mmHg)	-12.5		12.5	mmHg	5, 11
Accuracy (-50 mmHg)	-2.5		2.5	mmHg	5, 11
Accuracy (-30 mmHg)	-1.3		1.3	mmHg	5, 6 - Per AAMI BP22, 11
Accuracy (0 mmHg)	-1		1	mmHg	6 - Per AAMI BP22, 11
Accuracy (50 mmHg)	-1.5		1.5	mmHg	5, 6 - Per AAMI BP22, 11
Accuracy (300 mmHg)	-9		9	mmHg	6 - Per AAMI BP22, 11
Accuracy (1000 mmHg)	-30		30	mmHg	5, 11
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

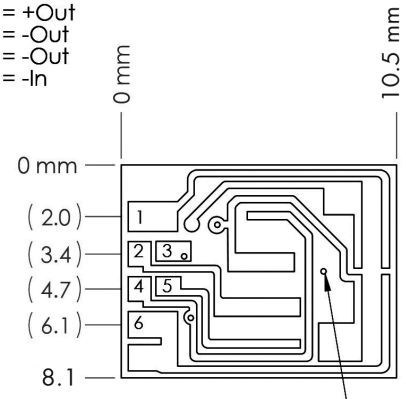
NOTES:

1. Assumes 6 VDC, 22°C and after 20 second warm-up unless otherwise specified.
2. Output of sensor with no pressure applied and a150 KΩ resistor shorted across + IN to + OUT.
3. Over a temperature range of 15°C to 40°C.
4. Normalized offset/bridge voltage – 8 hours after 20 second warm-up.
5. Previously qualified in customers final package, not tested in production.
6. Combined effect of sensitivity, repeatability, nonlinearity and hysteresis errors (only applies after zeroing the offset).
7. Sterilization performed by customer.
8. Testing performed with air at atmospheric pressure and 25°C
9. 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.
10. 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).
11. Accuracy equations found at the end of this document.

DIMENSIONS (millimeters)

Standard Bond Pad Metallization = Ag/Pt

Pin-out Table for solder pads
1 = +In
2 = +Out
3 = +Out
4 = -Out
5 = -Out
6 = -In



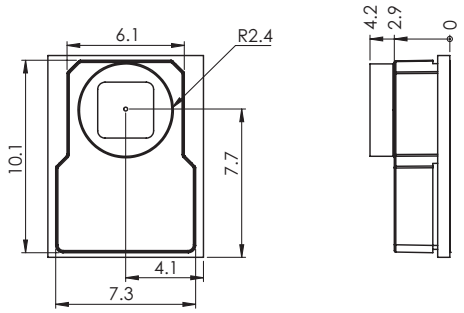
Note: Pads 2 & 3 must be shorted
Pads 4 & 5 must be shorted

Note: All dimensions in millimeters

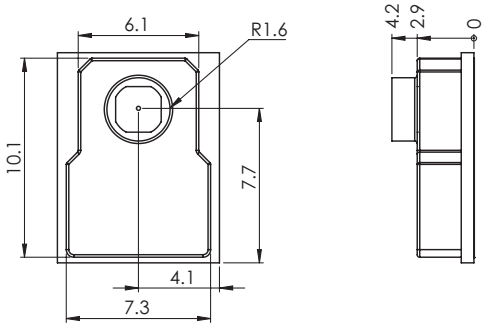
Note: Vent hole must not be blocked

Gel cup placement centered on ceramic ±0.38mm in each axis

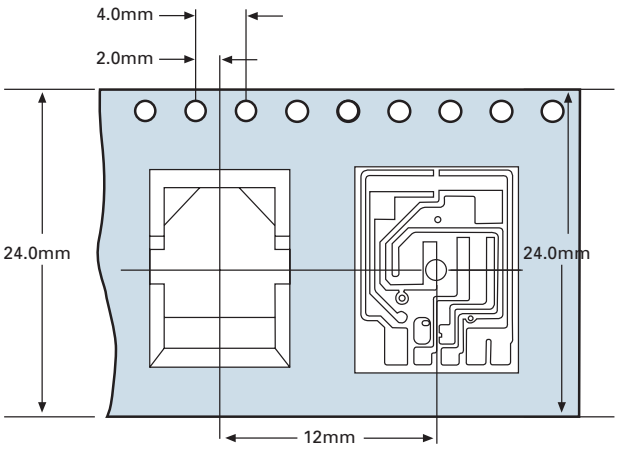
BP0006

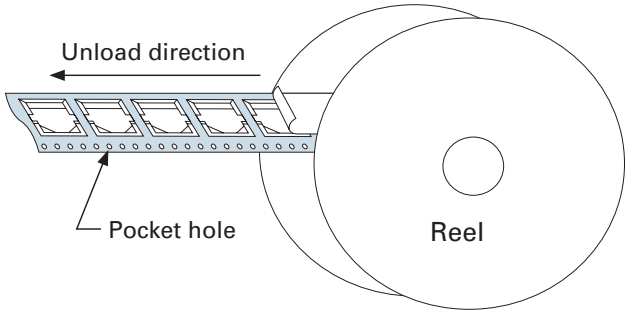


BP0007



PACKAGING AND SHIPPING





Tape and Reel Orientation

ACCURACY EQUATIONS

Parameter	Minimum	Typical	Maximum	Units	Notes
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

Merit Sensor is based in Salt Lake City, Utah

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