MERIT SENSOR™

PRELIMINARY

DATA SHEET

LP2 Series

The **LP2 Series** is a go-to solution for ultra-low-pressure sensing. This innovative sensor combines high stability with affordability, making it a standout product in the market.

The LP2 sensor is designed with full compensation for temperature and pressure nonlinearity, ensuring highly accurate pressure readings across various environmental conditions. This advanced feature means it self-corrects for temperature shifts, providing you with reliable data in all situations. Equipped with multiple communication interfaces and voltage ranges in a single package, it facilitates seamless integration and simplifies design upgrades

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 a best-in-class operating temperature range and 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, sells and services die and packaged products from a state-of-the-art facility near Salt Lake City, Utah

FEATURES

- Wide pressure range options: from 150 to 7000Pa
- Total Error band better than 1.5%FS (before reflow and without autozero)
- Pressure Type: Differential or gage
- Electrical Connection: SMD solder pads, 1.27mm standard spacing
- Output: Digital I2C and SPI, Analog ratiometric 10% to 90% Vs
- Burst pressure: 10 to 100 times maximum operating pressure (depending on pressure range)
- Low power mode
- Wide Supply Voltage: 2.7V to 5.5V
- Compensated temperature range: -10C to 60C
- Operating temperature range: -40 to 85C
- Autozero and output signal averaging*

APPLICATIONS

- **Industrial:** Air Flow / HVAC / VAV
- **Medical:** Equipment for diagnosis and analysis / Ventilators
- **Consumer:** Sleep Apnea / CPAP Machines
- **Other:** Dry non-corrosive gas pressure applications

* For more information about Autozero and output averaging function please contact Merit Sensor.

LP2 Part Number Configurator

1440-XXXX-XXXX-XXX*

Full Scale Pressure
- 0150 = 150Pa (0.6 inH2O)
- 0500= 500Pa (2 inH2O)
- 2500= 2500Pa (10 inH2O)
- 7000= 7000Pa Gage (1PSI)

Pressure Type
- G = Gage
- D = Differential

Comm. Address[1]
- 0 = 0x28

Output Modes
- S = I2C and Analog
- F = I2C / SPI / Analog /EOC / Sensor Reset

Calibrated Supply Voltage
- 1 = 5V
- 2 = 3.3V
- 3 = 2.7V

Operational Mode
- 0 = Cyclic (continuous operation)
- 1 = Sleep (ultra-low power)

Notes:
[1]Other I2C addresses available upon request
*The final "XX" in the part number configurator is reserved for future use

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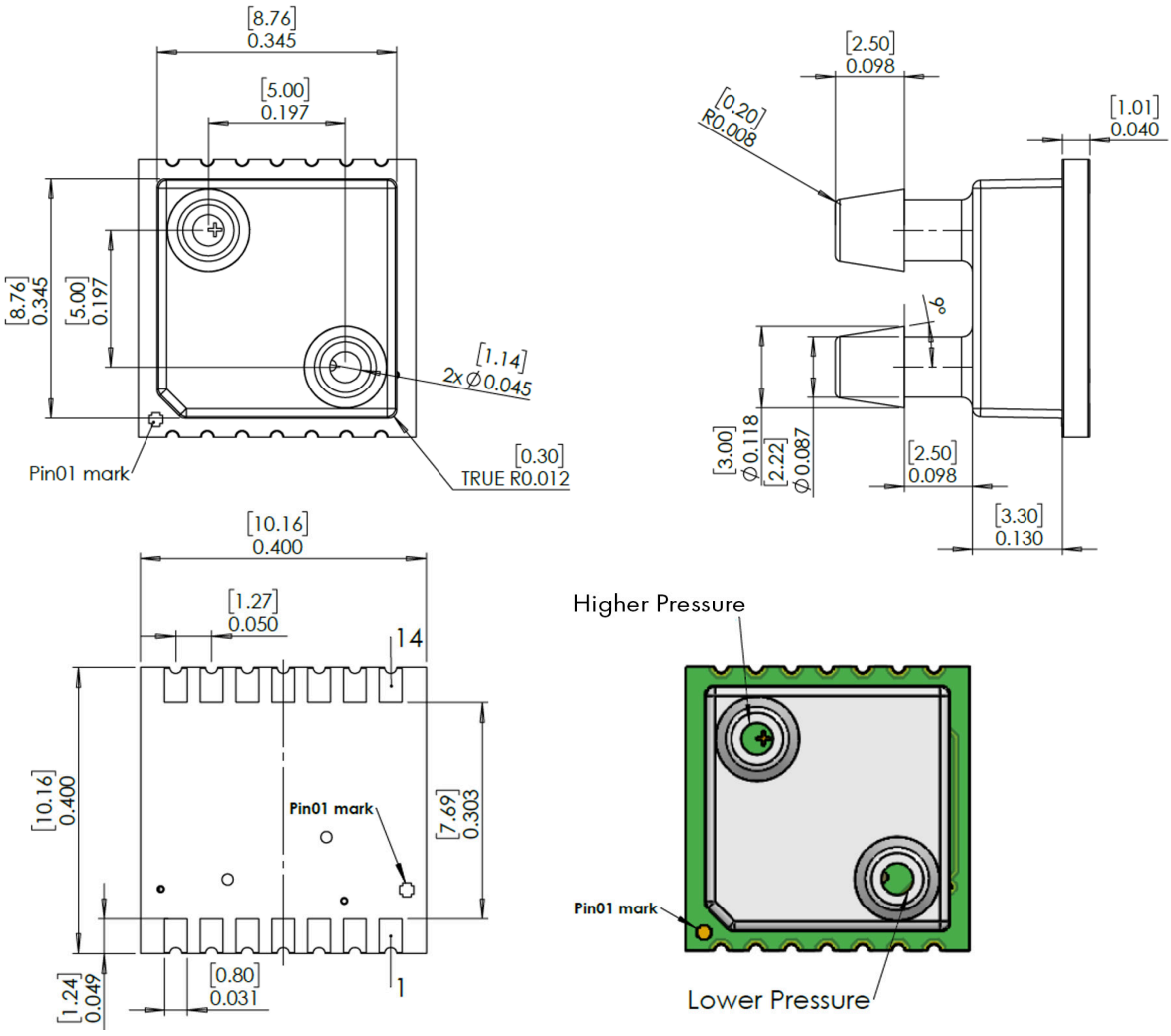
SPECIFICATIONS

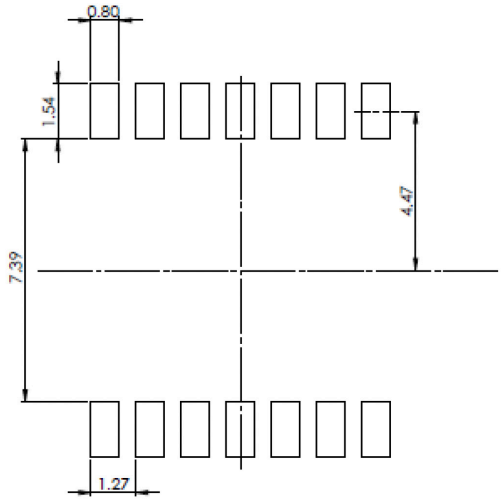
Parameter	Minimum	Typical	Maximum	Units	Notes
Electrical					
Supply Voltage (Vs)	2.7		5.5	V	
Supply Current	0.006	3	3.3	mA	Minimum current rated at sleep mode
ESD Protection			4000	V	According to the Human Body Model. As per ASIC`s datasheet.
EOC Pin	0		Vs	V	End of conversion. This pin is active for each new pressure calculation is performed.
Performance					
Output Range (Vout)	10		90	% of counts	2^24 counts
Resolution	16 (TBD)	18	22 (TBD)	bits	
Startup Time			2.5	ms	Power on to full operation time
Wake Up Time			2	ms	Sleep mode to full operation time
Update Time (digital mode)		5		ms	
Accuracy					
Digital mode	-1.5%	±0.5%	+1.5%	FSO	Accuracy includes all error for pressure and thermal hysteresis and linearity over the entire compensated temperature range. It does not include lifetime drift.
Analog output	-2.0%		2.0%		
Lifetime Drift	-1		1	%FS	1000 hours @85C
Static Proof Pressure	2.5x			FS	
Burst Pressure	10			PSI	Up to 1000Pa parts
Burst Pressure	50			PSI	Above 2500Pa parts
Environmental					
Operating Temperature	-40		85	°C	
Storage Temperature	-40		85	°C	
Weight				g	
Media Type	Dry non-corrosive gases				
Analog Interface					
Output Range (minimum to maximum pressure)	10		90	% Vsupply	
Clipping	5		95	% Vsupply	
Resolution		14		bits	
Output Current			12	mA	For optimal accuracy, the output current must be maintained below 1mA
Output update rate	1.33		1.58	kHz	
Digital Interface (for reference only)					
I²C™ voltage level HIGH	0.7x		1.0x	Vs	
I²C™ voltage level LOW	0		0.3x	Vs	
SCL clock frequency			400	kHz	
SPI Interface Clock	0.05	1	3	MHz	fSCL
SPI voltage level High	0.7x		1.0X	Vs	
SPI voltage level LOW	0.0		0.3	Vs	
Delay time [a] between SS-activation					
edge and first edge of SLCK, MOSI or MISO	1	50		nS	
Delay time [a] between SS- deactivation edge and last edge of SLCK, MOSI or MISO	1	50		nS	
Delay between SS-deactivation edge of last command and of SS-activation edge for next command	10			µS	

DIMENSIONS [MM]:



SUGGESTED LAND PATTERN (*FOR REFERENCE ONLY)

Dimensions in mm



*Note: The land pattern shall be tested on customers application and equipment before used in production

Merit Sensor is based in Salt Lake City, Utah

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