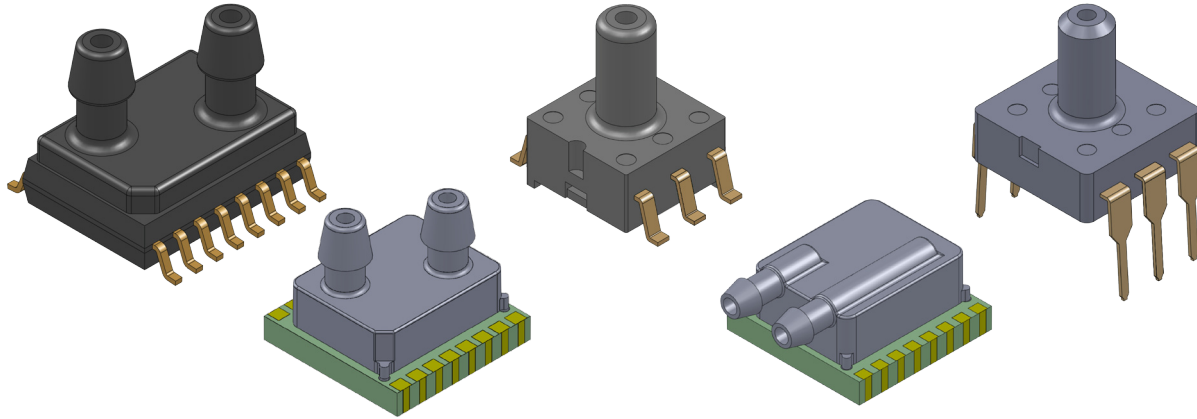




## BLCR Series - Basic Low Pressure Compact Sensor Series



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### Introduction

The BLCR Series Basic Sensor is based on a Dual Die Reference technology to reduce all output offset or common mode errors. It also incorporates All Sensors CoBeam<sup>2</sup> Technology to reduce the overall supply voltage while maintaining comparable output levels to traditional equivalent basic sensing elements. This lower supply voltage gives rise to improved warm-up shift while the CoBeam<sup>2</sup> Technology itself reduces package stress susceptibility resulting in improved overall long term stability. The technology also vastly improves position sensitivity to nearly unmeasurable levels.

This series is intended for use with non-corrosive, non-ionic working fluids such as air and dry gases. The output is also ratiometric to the supply voltage and is operable from 1.8 to 3.3 volts DC.

<https://www.allsensors.com/products/blcr-series>



For All Sensors Corporation's most recent quality certification documents, please visit [www.allsensors.com](http://www.allsensors.com)



## BLCR - Basic Output Low Pressure Compact Sensors

Features		Applications	
<ul style="list-style-type: none"> <li>• Pressure Ranges from 1 to 30 inH2O</li> <li>• Low Supply Voltage (1.8V to 3.3V)</li> <li>• 0.1% Linearity Typical</li> <li>• Improved Front to Back Linearity</li> <li>• Less Position Sensitivity</li> <li>• Improved Warm-Up Shift Distribution</li> <li>• Reduced TCO</li> </ul>		<ul style="list-style-type: none"> <li>• Medical Breathing</li> <li>• Environmental Controls</li> <li>• HVAC</li> </ul>	
Pressure Sensor Maximum Ratings		Environmental Specifications	
<b>Supply Voltage (Vs)</b>	6 Vdc	<b>Temperature Ranges</b>	
<b>Common Mode Pressure</b>	5 psig	Operating	-25°C to 85°C
<b>Lead Temperature (soldering 2-4 sec.)</b>	270°C	Storage	-40°C to 125°C
<b>Maximum Device Temperature</b>	245°C	<b>Humidity Limits (non condensing)</b>	0 to 95% RH

### Standard Pressure Ranges

#### Low Pressure Products

Device	Operating Range <sup>A</sup>		Proof Pressure		Burst Pressure	
BLCR-L01D	± 1 inH2O	0.25 kPa	100 inH2O	24.91 kPa	150 inH2O	37.36 kPa
BLCR-L05D	± 5 inH2O	1.25 kPa	200 inH2O	49.82 kPa	300 inH2O	74.72 kPa
BLCR-L10D	± 10 inH2O	2.49 kPa	200 inH2O	49.82 kPa	300 inH2O	74.72 kPa
BLCR-L20D	± 20 inH2O	4.98 kPa	200 inH2O	49.82 kPa	500 inH2O	124.54 kPa
BLCR-L30D	± 30 inH2O	7.47 kPa	200 inH2O	49.82 kPa	800 inH2O	199.27 kPa

Note A: Ranges in kPa are expressed as an approximate value.

## Performance Characteristics for BLCR Series

ALL PARAMETERS ARE MEASURED AT 3.3 VOLT EXCITATION AND ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED. PRESSURE MEASUREMENTS ARE WITH POSITIVE PRESSURE APPLIED TO PORT B (THE ONLY PORT FOR THE SINGLE PORT CONFIGURATION).

Parameter	Min	Typ	Max	Units	Notes
Output Span (FSS)					
L01D	4.5	8.0	11.5	mV	4
L05D	13.5	24.0	34.5	mV	4
L10D	18.0	32.0	46.0	mV	4
L20D	22.0	38.0	55.0	mV	4
L30D	25.0	42.0	60.0	mV	4
Offset Voltage @ Zero Diff. Pressure	-	-	±10.0	mV	-
Offset Temperature Shift (0°C-70°C)	-	±4.0	-	μV/°C	1
Offset Warm-up Shift	-	±10.0	-	μV	-
Offset Position Sensitivity (1g)	-	±20.0	-	μV	2, 6
Linearity, Hysteresis Error	-	0.10	±0.5	%FSS	3
Response Time (10% to 90% Pressure Response)	-	100.0	-	μS	-
Front to Back Linearity	-	0.25	-	%FSS	5
Temperature Effect on Resistance (0°C-70°C)	-	2800	-	ppm/°C	-
Temperature Effect on Span (0°C-70°C)	-	-2000	-	ppm/°C	-
Input Resistance	-	1.7	-	kΩ	-
Output Resistance	-	1.7	-	kΩ	-

### Specification Notes

NOTE 1: SHIFT IS RELATIVE TO 25°C.

NOTE 2: SHIFT IS WITHIN THE FIRST HOUR OF EXCITATION APPLIED TO THE DEVICE.

NOTE 3: MEASURED AT ONE-HALF FULL SCALE RATED PRESSURE USING BEST STRAIGHT LINE CURVE FIT.

NOTE 4: THE SPAN IS THE ALGEBRAIC DIFFERENCE BETWEEN FULL SCALE OUTPUT VOLTAGE AND THE OFFSET VOLTAGE.

NOTE 5: FRONT-BACK LINEARITY COMPUTED AS: 
$$\text{Lin FB} = \left( \left| \frac{\text{Span}_{\text{PortB}}}{\text{Span}_{\text{PortA}}} - 1 \right| \right) \cdot 100\%$$

NOTE 6: TYPICAL WARM UP CHARACTERISTICS AS SHOWN BELOW.

### Soldering Recommendations

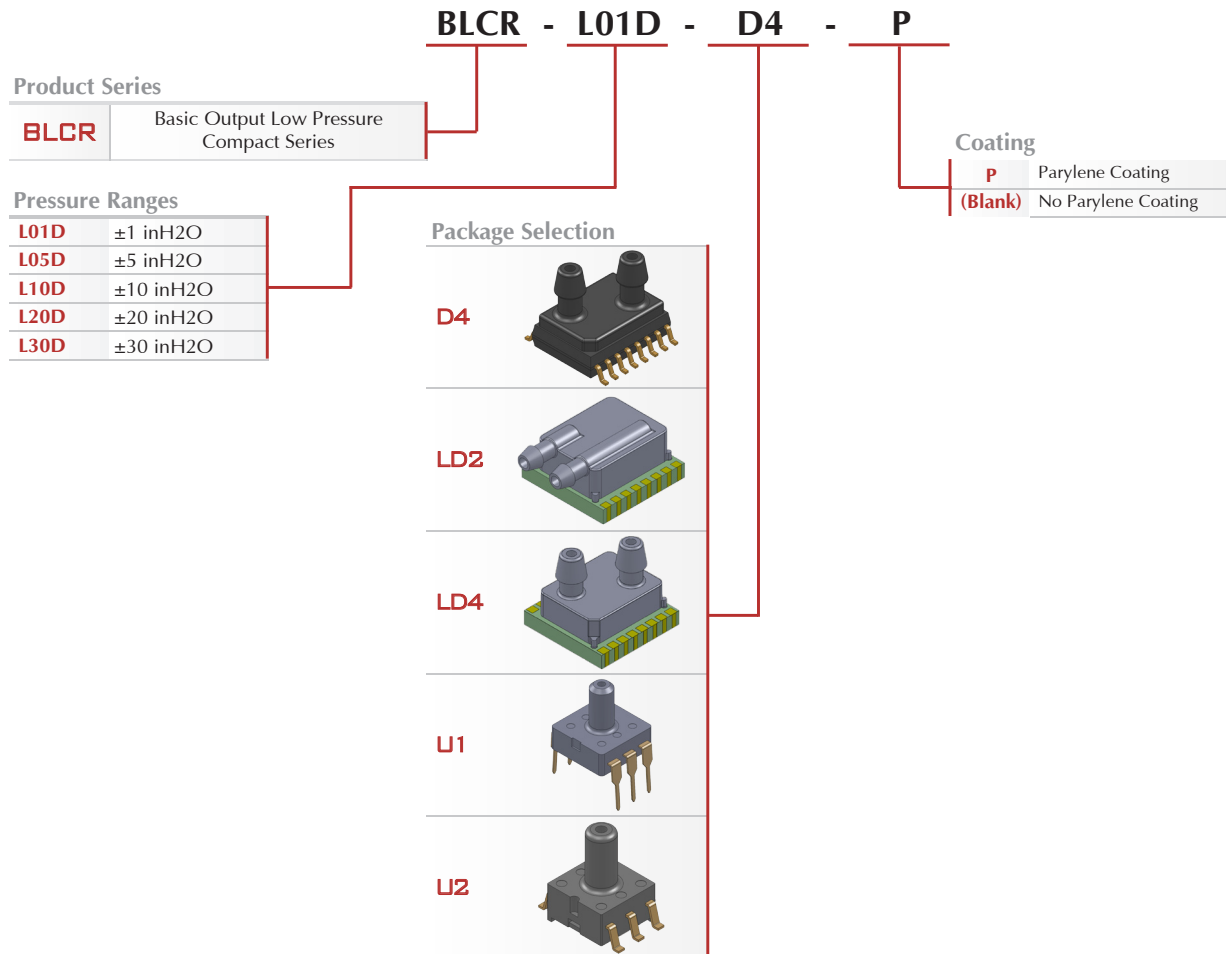
- 1) Solder parts as a second operation only.
- 2) For D4 package post reflow, wait for 72 hours before performing any calibration operations.
- 3) For all other packages post reflow, wait for 36 hours before performing any calibration operations.
- 4) Perform spot cleaning as necessary only by hand. **DO NOT** wash or submerge device in cleaning liquid.
- 5) Max 270°C lead temperature (soldering 2-4 sec.)

If these devices are to be subjected to solder reflow assembly or other high temperature processing, they must be baked for 1 hour at 125°C within 24 hours prior to exposure. Failure to comply may result in cracking and/or delamination of critical interfaces within the package, and is not covered by warranty.



## How To Order

For example, **BLCR-L01D-D4-P** defines an All Sensors' BLCR Basic Output Low Pressure Compact Series sensor, 1 inH<sub>2</sub>O differential pressure range, D4 package, with Parylene coating.



### Where:

Pressure Range (D4, LD2, LD4 Packages - Differential Only): L01D, L05D, L10D, L20D, L30D

Pressure Range (U1, U2 Packages - Gage Only): L01D, L05D, L10D, L20D, L30D

### Example:

BLCR-L01D-D4-P      With Parylene Coating  
 BLCR-L01D-D4      No Parylene Coating

### Parylene Coating:

Parylene coating provides a moisture barrier and protection from some harsh media.

Unlike other pressure sensor suppliers offering a Parylene coating, All Sensors performs this process in-house and uses an advanced production system to achieve the highest accuracy and reliability. This avoids transferring products out of and back to the pressure sensor manufacturing facility, provides complete quality control and improves the delivery time to customers. Specially designed masking techniques allow All Sensors to apply a cost-effective, high-volume Parylene coating in-house.

Consult factory for applicability of Parylene for the target application and sensor type.

This option is only available for pressure ranges of ±10 inH<sub>2</sub>O and above.

## Product Identification for D4, U1, and U2 Packages

Products are labeled via laser marking, as seen in Figure 1.

Figure 2 details how to interpret the part marking code. Low pressure ranges from 1 to 30 inH2O are specified with code "L" and high pressure ranges from 5 to 150 psi are specified with code "H"

The pressure range will be indicated on the same line as the wafer number before the starting character "B."

If parylene coated, the part will be marked with a "P" on the top. Please refer to package drawings.

### Example: BLCR-L10D-D4

Figure 1: Product Labeling

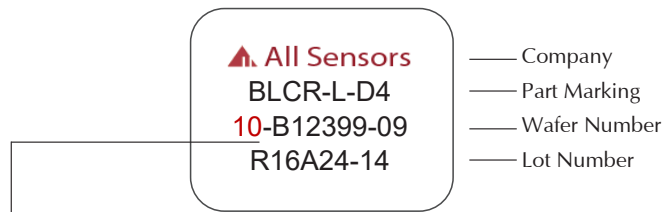
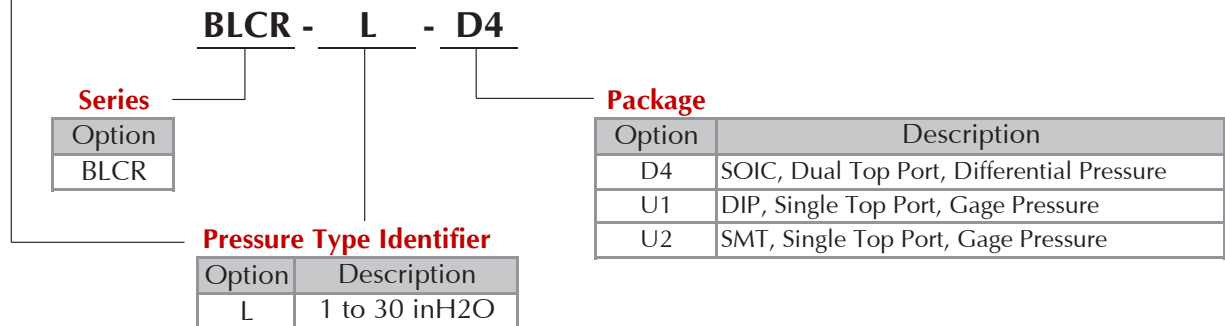


Figure 2: Part Marking



## Product Identification for LD2 and LD4 Packages

Products are labeled via laser marking, as seen in Figure 3.

If parylene coated, the part will be marked with a "P" on the top. Please refer to package drawings.

### Example: BLCR-L01D-LD2

Figure 3: Product Labeling

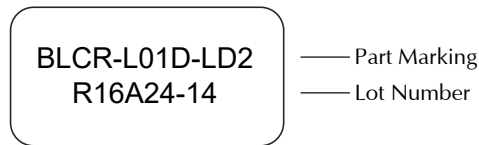
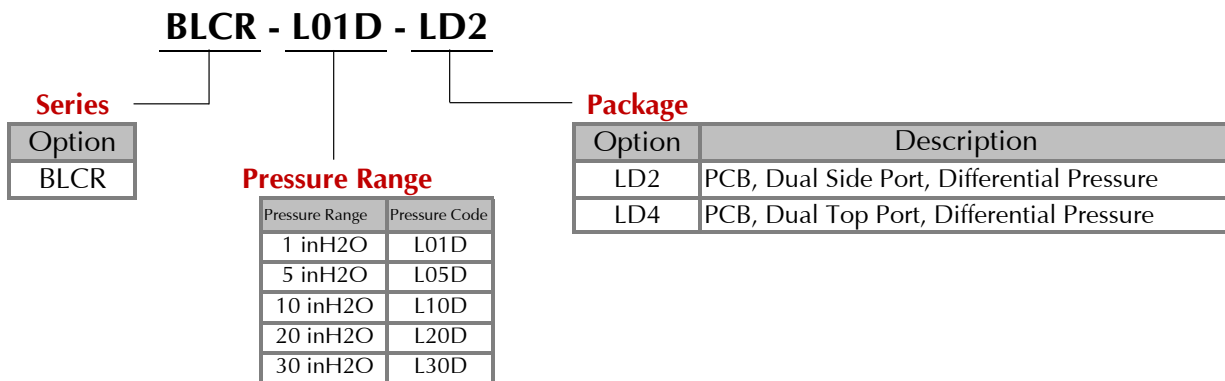
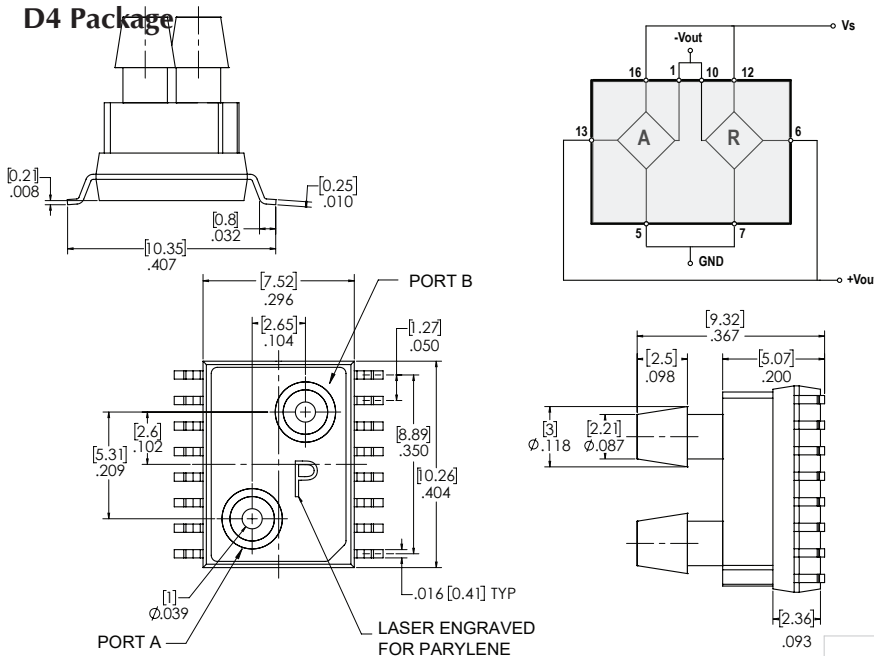


Figure 4: Part Marking



# Package Drawings

## D4 Package



Pin	Definition
1	-OutA
2	N/C
3	N/C
4	N/C
5	GndA
6	-OutR
7	GndR
8	N/C
9	N/C
10	+OutR
11	N/C
12	+VsR
13	+OutA
14	N/C
15	N/C
16	+VsA

### NOTES

- 1) Dimensions are in inches [mm].
- 2) Pins 12 and 16 must be connected for Vs input.
- 3) Pins 5 and 7 must be connected for Gnd.
- 4) Pins 1 and 10 must be connected for -Vout.
- 5) Pins 6 and 13 must be connected for +Vout.
- 6) For suggested pad layout, see drawing PAD-22.

**ALL SENSORS**

TITLE: D-Series Package

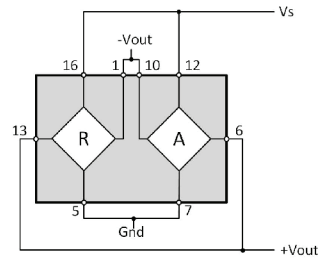
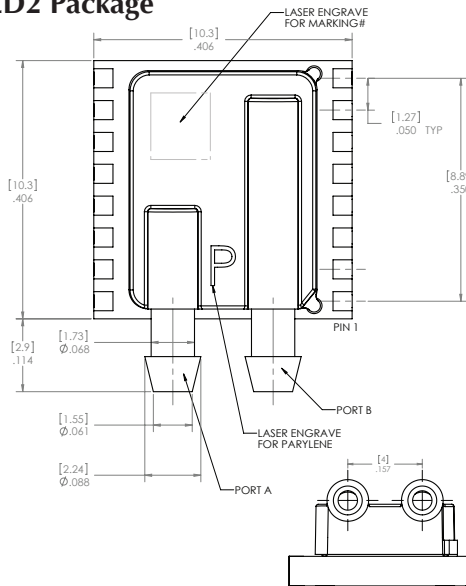
SIZE: **A** FILE NAME: D4 Package

a 16035 Vineyard Blvd. Morgan Hill, CA 95037 p 408 225 4314 f 408 225 2079 e www.allsensors.com all sensors



## Package Drawings (cont'd.)

### LD2 Package



Pin	Definition
1	+OutR
2	N/C
3	N/C
4	N/C
5	GndR
6	+OutA
7	GndA
8	N/C
9	N/C
10	-OutA
11	N/C
12	VsA
13	-OutR
14	N/C
15	N/C
16	VsR

#### NOTES

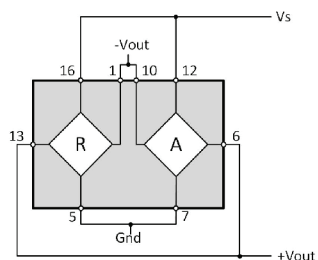
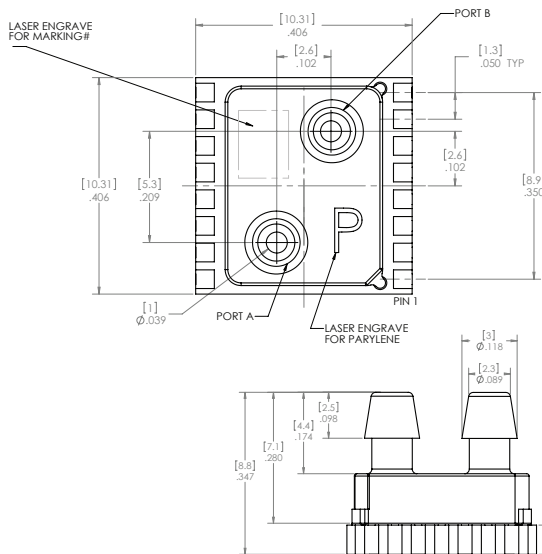
- 1) Dimensions are in inches [mm].
- 2) Pins 12 and 16 must be connected for Vs input.
- 3) Pins 5 and 7 must be connected for Gnd.
- 4) Pins 1 and 10 must be connected for -Vout.
- 5) Pins 6 and 13 must be connected for +Vout.
- 6) For suggested pad layout, see drawing PAD-22.

**ALL SENSORS**

TITLE: LD-Series Package

SIZE FILE NAME  
**A** LD2 Package

### LD4 Package



Pin	Definition
1	+OutR
2	N/C
3	N/C
4	N/C
5	GndR
6	+OutA
7	GndA
8	N/C
9	N/C
10	-OutA
11	N/C
12	VsA
13	-OutR
14	N/C
15	N/C
16	VsR

#### NOTES

- 1) Dimensions are in inches [mm].
- 2) Pins 12 and 16 must be connected for Vs input.
- 3) Pins 5 and 7 must be connected for Gnd.
- 4) Pins 1 and 10 must be connected for -Vout.
- 5) Pins 6 and 13 must be connected for +Vout.
- 6) For suggested pad layout, see drawing PAD-22.

**ALL SENSORS**

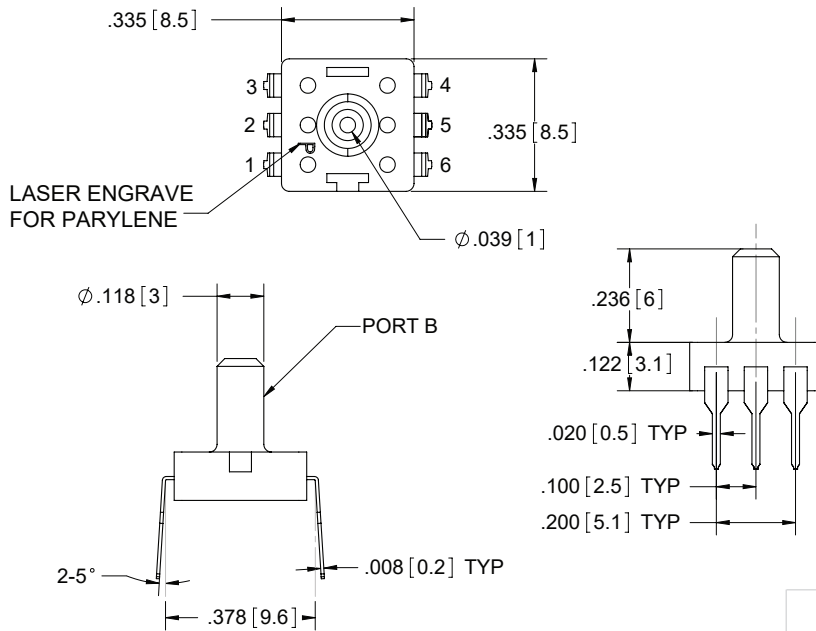
TITLE: LD-Series Package

SIZE FILE NAME  
**A** LD4 Package



## Package Drawings (cont'd.)

### U1 Package



Pin	Definition
1	+GND
2	+Vout
3	Vs
4	N/C
5	-Vout
6	-GND

#### NOTES

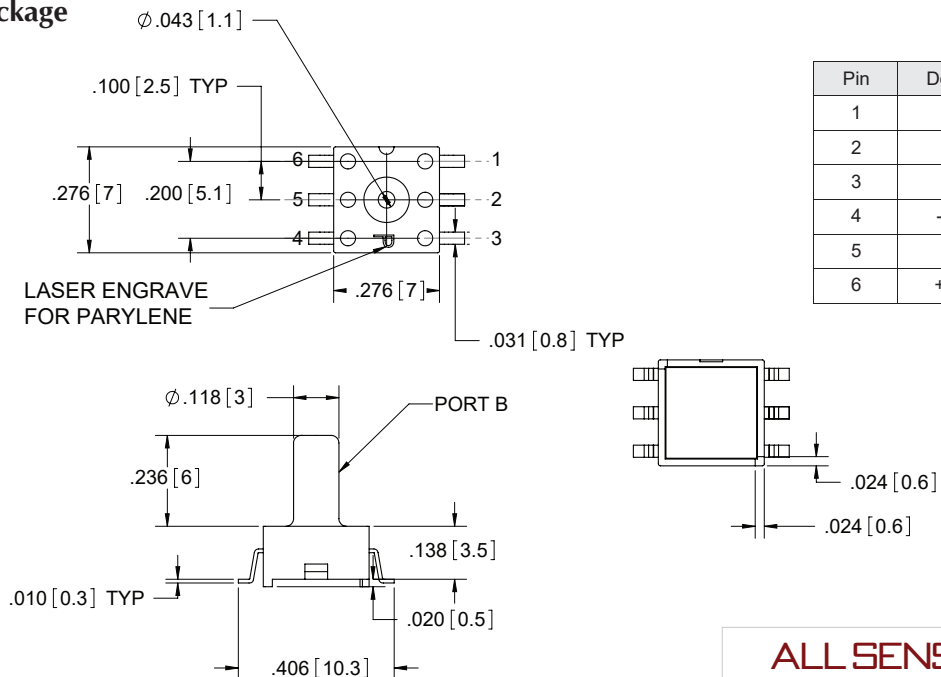
- 1) Dimensions are in inches [mm].
- 2) For suggested pad layout, see drawing: PAD-23.
- 3) Pins 1 and 6 must be connected for Gnd.

**ALL SENSORS**

TITLE: U-Series Package

SIZE FILE NAME  
**A** U1 Package

### U2 Package



Pin	Definition
1	VsA
2	-Vout
3	VsR
4	-VoutR
5	GND
6	+VoutA

#### NOTES

- 1) Dimensions are in inches [mm].
- 2) For suggested pad layout, see drawing: PAD-24.
- 3) Pins 1 and 6 must be connected for Gnd.

**ALL SENSORS**

TITLE: U-Series Package

SIZE FILE NAME  
**A** U2 Package

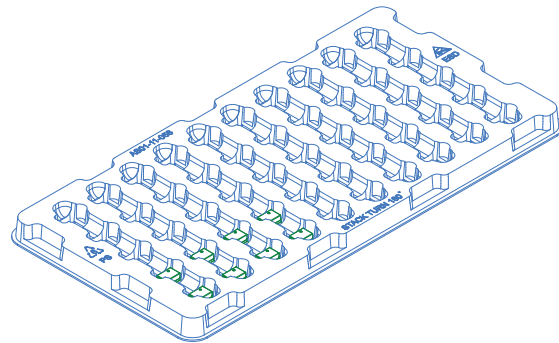
## Packaging



ARROW INDICATES SIDE OF PACKAGE WHERE PIN 1 IS LOCATED

Packages: U1, U2, D4

## TRAY



Packages: LD2 and LD4

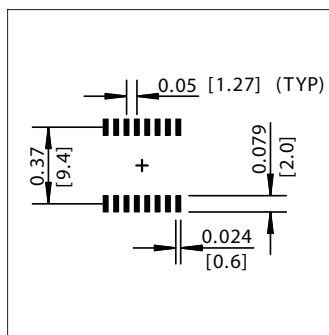
### Notes

1) Contact factory for alternate packing options.

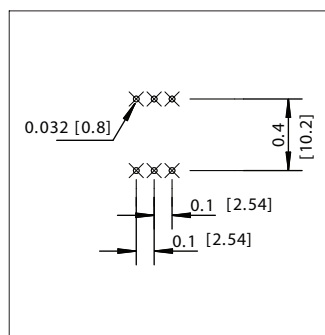
## Pressure Tubing Recommendations

Tubing Recommendations				
Package Type	ID	OD	Material	
			Low Pressure	High Pressure
D4	3/32"	5/32"	Silicone	Polyurethane
LD2	1/16"	1/8"	Silicone	Polyurethane
LD4	3/32"	5/32"	Silicone	Polyurethane
U1	3/32"	5/32"	Silicone	Polyurethane
U2	3/32"	5/32"	Silicone	Polyurethane

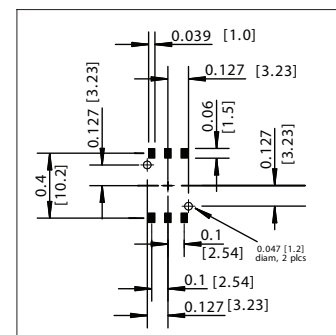
## Suggested Pad Layouts



PAD-22



PAD-23



PAD-24

Dimensions are in inches [mm].

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