BLC Series - Basic Compact Sensor Series

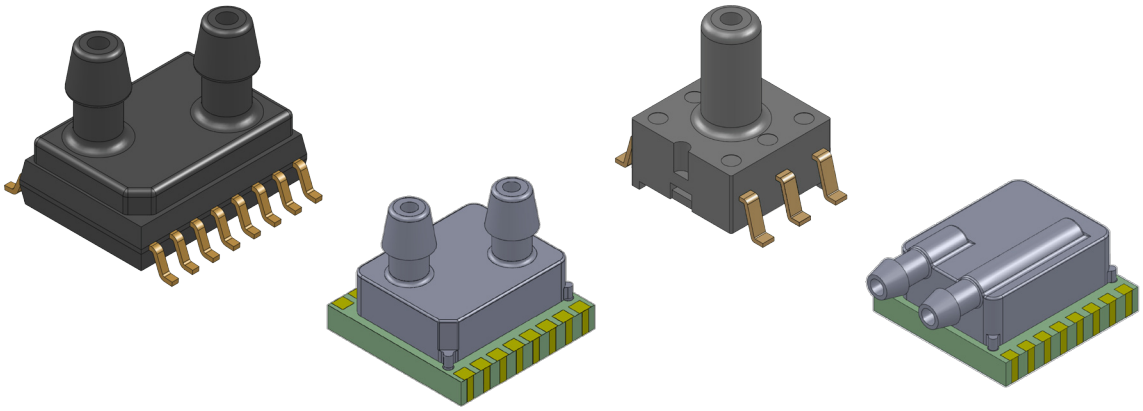


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Introduction

The BLC Series Basic Low Pressure Compact Sensor is based on All Sensors' CoBeam² ™ Technology. The device provides a high output signal at a low operating voltage and reduces 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 CoBeam² Technology itself reduces package stress susceptibility resulting in improved overall long term stability. The technology also vastly improves position sensitivity compared to conventional single die devices.

This series is intended for use with non-corrosive, non-ionic working fluids such as air, dry gases and the like. The output is also ratiometric to the supply voltage and is operable from 0.9 to 1.8 volts DC.

https://www.allsensors.com/products/blc-series

For All Sensors Corporation's most recent quality certification documents, please visit www.allsensors.com

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Features

- Pressure Ranges from 0 to 30 inH2O, 5 PSI to 150 PSI, and 5 PSIA to 150 PSIA
- µPower Low Supply Voltage (0.9V to 1.8V)
- 0.1% Linearity Typical
- Improved Front to Back Linearity
- Less Position Sensitivity
- Improved Warm-Up Shift Distribution

Applications

- Medical Breathing
- Environmental Controls
- HVAC
- Portable / Hand-Held Devices

Pressure Sensor Maximum Ratings

Supply Voltage (Vs)	6 Vdc
Common Mode Pressure	5 psig
Lead Temperature (soldering 2-4 sec.)	270°C
Maximum Device Temperature	245°C

Environmental Specifications

Temperature Ranges	
Operating	-25°C to 85°C
Storage	-40°C to 125°C
Humidity Limits (non condensing)	0 to 95% RH

Standard Pressure Ranges

Low Pressure Products

Device	Operating Range [A]		Proof Pressure		Burst Pressure	
BLC-L01D	± 1 inH2O	248.84 Pa	100 inH2O	24.88 kPa	300 inH2O	74.65 kPa
BLC-L05D	± 5 inH2O	1,244.20 Pa	200 inH2O	49.77 kPa	300 inH2O	74.65 kPa
BLC-L10D	± 10 inH2O	2,488.40 Pa	200 inH2O	49.77 kPa	300 inH2O	74.65 kPa
BLC-L20D	± 20 inH2O	4,976.80 Pa	200 inH2O	49.77 kPa	500 inH2O	124.42 kPa
BLC-L30D	± 30 inH2O	7,465.20 Pa	200 inH2O	49.77 kPa	500 inH2O	124.42 kPa

High Pressure Products

Device	Operating Range [A]		Proof Pressure		Burst Pressure	
BLC-005D	± 5 psi	34.47 kPa	10 psi	68.95 kPa	15 psi	103.42 kPa
BLC-015D	± 15 psi	103.42 kPa	30 psi	206.84 kPa	45 psi	310.26 kPa
BLC-030D	± 30 psi	206.84 kPa	60 psi	413.69 kPa	90 psi	620.53 kPa
BLC-100D	± 100 psi	689.48 kPa	200 psi	1,378.95 kPa	225 psi	1,551.32 kPa
BLC-150D	± 150 psi	1,034.20 kPa	225 psi	1,551.32 kPa	225 psi	1,551.32 kPa
BLC-015A	0 to 15 psia	1.03 barA	30 psi	2.06 barA	45 psi	3.10 barA
BLC-030A	0 to 30 psia	2.06 barA	60 psi	4.14 barA	90 psi	6.20 barA
BLC-100A	0 to 100 psia	6.89 barA	200 psi	13.79 barA	225 psi	15.51 barA
BLC-150A	0 to 150 psia	10.34 barA	225 psi	15.51 barA	225 psi	15.51 barA

Note A: Operating range in Pa is expressed as an approximate value.

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Performance Characteristics for BLC Series

ALL PARAMETERS ARE MEASURED AT 1.8V 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	4.05	-	6.93	mV	4
L05D	16.20	-	29.70	mV	4
L10D	16.20	-	39.60	mV	4
L20D	16.20	-	39.60	mV	4
L30D	12.15	-	44.55	mV	4
005D	18.00	23	28.00	mV	4
015D	12.00	18	24.00	mV	4
030D	25.00	35	45.00	mV	4
100D	35.00	42.5	50.00	mV	4
150D	35.00	42.5	50.00	mV	4
015A	45.00	62.5	80.00	mV	4
030A	25.00	35	45.00	mV	4
100A	25.00	37.5	50.00	mV	4
150A	25.00	37.5	50.00	mV	4
Offset Voltage					
L01D, L05D, L10D, L20D, L30D (@ Zero Diff. Pressure)	-	-	±10.0	mV	-
005D, 015D, 030D, 100D, 150D, 030A, 100A, 150A, 015A (@ 0 PSIA)	-	-	±15.0	mV	-
Offset Temperature Shift (0°C-70°C)	-	±30.0	-	µ V/°C	1
Offset Warm-up Shift	-	±30.0	-	µ V	2, 6
Offset Position Sensitivity (1g)	-	±20.0	-	µ V	-
Linearity, Hysteresis Error					
L01D, L05D, L10D, L20D, L30D	-	-	±0.50	%FSS	3
005D, 015D, 030D, 100D, 150D, 015A, 030A, 100A, 150A	-	-	±0.30	%FSS	3
Response Time (10% to 90% Pressure Response)	-	100	-	µ S	-
Front to Back Linearity	-	0.25	-	%FSS	5
Temperature Effect on Resistance (0°C-70°C)	-	2,800	-	ppm/°C	-
Temperature Effect on Span (0°C-70°C)	-	-2,000	-	ppm/°C	-
Input Resistance					
L01D, L05D, L10D, L20D, L30D (@ Zero Diff. Pressure)	-	3.4	-	k Ω	-
005D, 015D, 030D, 100D, 150D, 030A, 100A, 150A	-	5.0	-	k Ω	-
015A (@ 0 PSIA)	-	5.5	-	k Ω	-
Output Resistance					
L01D, L05D, L10D, L20D, L30D (@ Zero Diff. Pressure)	-	3.4	-	k Ω	-
005D, 015D, 030D, 100D, 150D, 030A, 100A, 150A	-	5.0	-	k Ω	-
015A (@ 0 PSIA)	-	5.5	-	k Ω	-

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: $\text{Lin}_{FB} = \left(\left| \frac{\text{Span}_{PortB}}{\text{Span}_{PortA}} \right| - 1 \right) \cdot 100\%$

Soldering Recommendations

1) Solder parts as a second operation only.
2) For D4, LD2, and LD4 package post reflow, wait for 72 hrs before performing any calibration operations.
3) For all other packages post reflow, wait for 36 hrs 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 critcal interfaces within the package, and is not covered by warranty.

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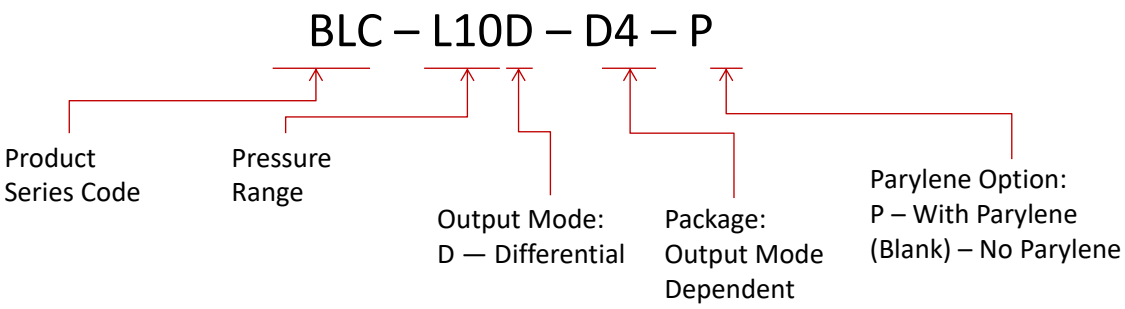
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How to Order

Refer to Table 2 for standard part numbers offered which includes the pressure range and package.

Example P/N with options: BLC-L10D-D4-P

Table 1 - Part Numbering Scheme:



Where:
Pressure Range (D4 Package – Differential Only): L01D, L05D, L10D, L20D, L30D, 005D, 015D, 030D, 100D, 150D
Pressure Range (LD2, and LD4 Packages – Differential Only): L01D, L05D, L10D, L20D, L30D
Pressure Range (U2 Package – Gage Only): L01D, L05D, L10D, L20D, L30D, 005D, 015D, 030D, 100D, 150D
Pressure Range (U4 Package – Absolute Only): 015A, 030A, 100A, 150A

Example Part Numbers:

BLC-L10D-D4-P has a Parylene coating
BLC-L10D-D4 does not have a Parylene coating

Table 2 - Standard Part Number Configurations

D and LD Packages (Differential)	Low Pressure Products	BLC - L01 - D - D4	BLC - L01 - D - LD2	BLC - L01 - D - LD4
		BLC - L05 - D - D4	BLC - L05 - D - LD2	BLC - L05 - D - LD4
		BLC - L10 - D - D4	BLC - L10 - D - LD2	BLC - L10 - D - LD4
		BLC - L20 - D - D4	BLC - L20 - D - LD2	BLC - L20 - D - LD4
		BLC - L30 - D - D4	BLC - L30 - D - LD2	BLC - L30 - D - LD4
	High Pressure Products	BLC - 005 - D - D4		
		BLC - 015 - D - D4		
		BLC - 030 - D - D4		
		BLC - 100 - D - D4		
		BLC - 150 - D - D4		
U Packages (Gage)	Low Pressure Products	BLC - L01 - D - U2		
		BLC - L05 - D - U2		
		BLC - L10 - D - U2		
		BLC - L20 - D - U2		
		BLC - L30 - D - U2		
	High Pressure Products	BLC - 005 - D - U2		
		BLC - 015 - D - U2		
		BLC - 030 - D - U2		
		BLC - 100 - D - U2		
		BLC - 150 - D - U2		
U Package (Absolute)	High Pressure Products	BLC - 015 - A - U4		
		BLC - 030 - A - U4		
		BLC - 100 - A - U4		
		BLC - 150 - A - U4		

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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 inH2O and above and is not available for the U4 package option.

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Product Identification for D4, U2, and U4 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.”

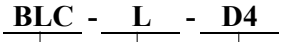
If parylene coated, the part will be marked with a “P” on the top. Please refer to package drawings.

Example: BLC-L10D-D4

Figure 1: Product Labeling



Figure 2: Part Marking



Series

Option
BLC

Pressure Type Identifier

Pressure Range Identifier Option	Pressure Type Identifier Option	Pressure Range
1	L	1 inH2O
5	L	5 inH2O
10	L	10 inH2O
20	L	20 in H2O
30	L	30 inH2O
5	H	5 PSI
15	H	15 PSI
30	H	30 PSI
100	H	100 PSI
150	H	150 PSI

Package

Option	Description
D4	SOIC, Dual Top Port, Differential Pressure
U2	SMT, Single Top Port, Gage Pressure
U4	SMT, No Port, Absolute Pressure

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Product Identification for LD2 and LD4 Packages

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

Example: BLC-L01D-LD2

Figure 3: Product Labeling

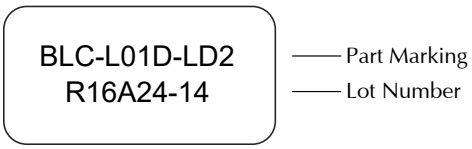


Figure 4: Part Marking

BLC - L01D - LD2

Series

Option
BLC

Pressure Range

Pressure Range	Pressure Code
1 inH2O	L01D
5 inH2O	L05D
10 inH2O	L10D
20 inH2O	L20D
30 inH2O	L30D

Package

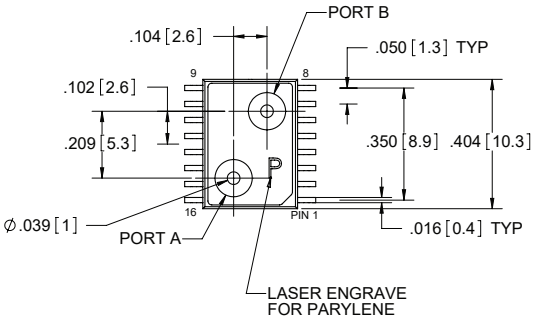
Option	Description
LD2	PCB, Dual Side Port, Differential Pressure
LD4	PCB, Dual Top Port, Differential Pressure

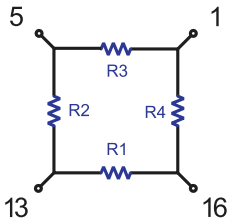
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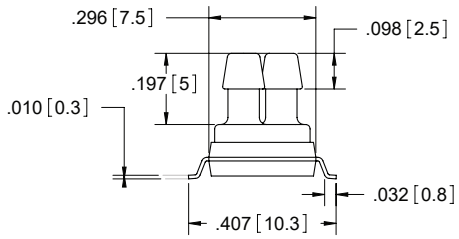
Package Drawings

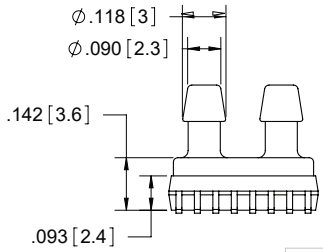
D4 Package





Pin	Definition
1	-Vout
2	N/C
3	N/C
4	N/C
5	GND
6	N/C
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	N/C
13	+Vout
14	N/C
15	N/C
16	Vs





NOTES
1) Dimensions are in inches [mm].
2) For suggested pad layout, see drawing: PAD-22.

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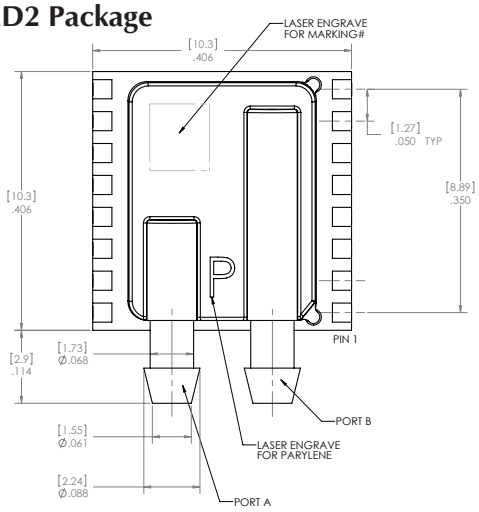
TITLE: D-Series Package

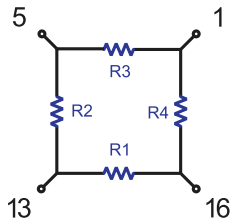
SIZE A | FILE NAME D4 Package

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Package Drawings (cont'd.)

LD2 Package



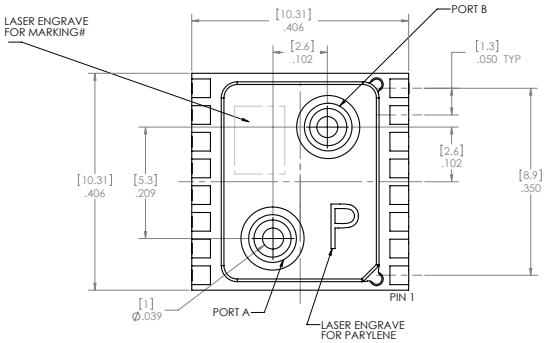


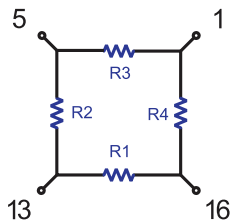
Pin	Definition
1	-Vout
2	N/C
3	N/C
4	N/C
5	GND
6	N/C
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	N/C
13	+Vout
14	N/C
15	N/C
16	Vs

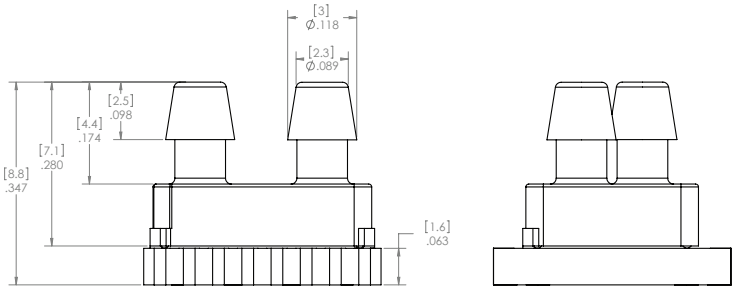
NOTES
1) Dimensions are in inches [mm].
2) For suggested pad layout, see drawing: PAD-22

ALL SENSORS
TITLE: LD-Series Package
SIZE A | FILE NAME LD2 Package

LD4 Package







Pin	Definition
1	-Vout
2	N/C
3	N/C
4	N/C
5	GND
6	N/C
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	N/C
13	+Vout
14	N/C
15	N/C
16	Vs

NOTES
1) Dimensions are in inches [mm].
2) For suggested pad layout, see drawing: PAD-22.

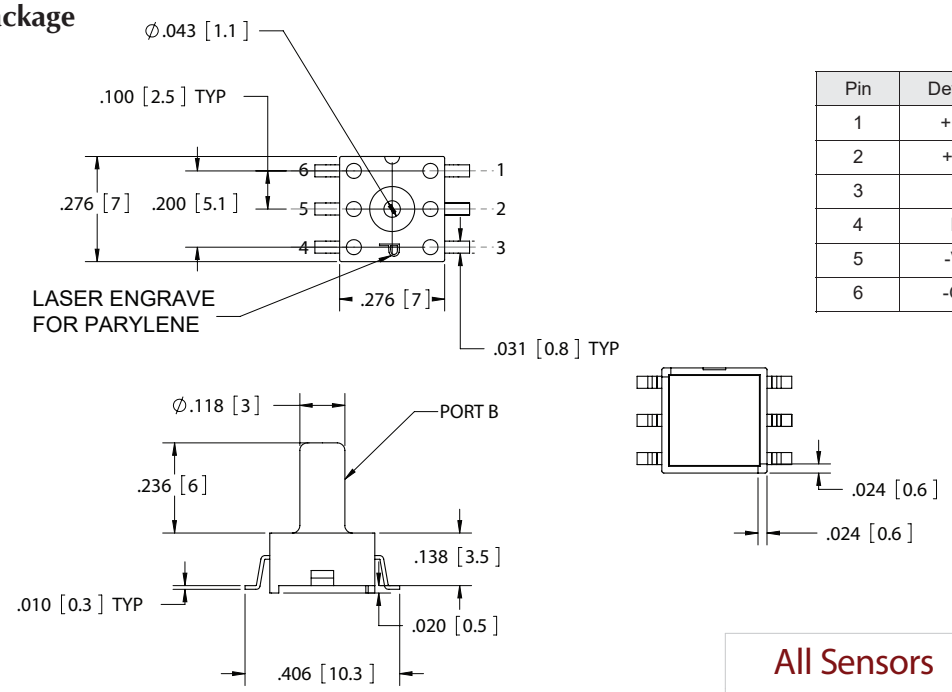
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TITLE: LD-Series Package
SIZE A | FILE NAME LD4 Package

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Package Drawings (cont'd.)

U2 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-24.
3) Pins 1 and 6 must be connected for Gnd.

All Sensors

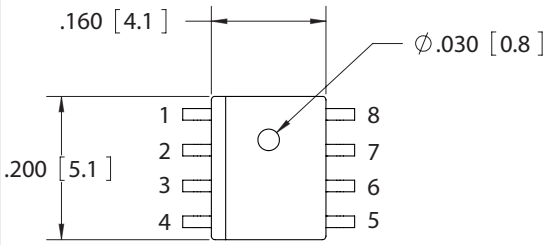
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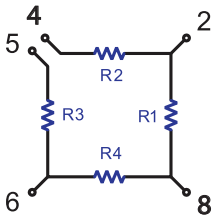
SIZE A | FILE NAME U2 Package

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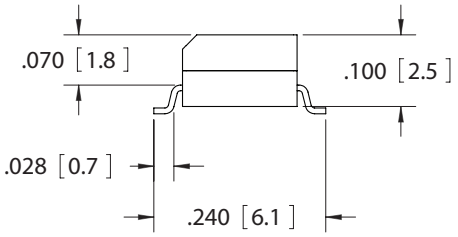
Package Drawings (cont'd.)

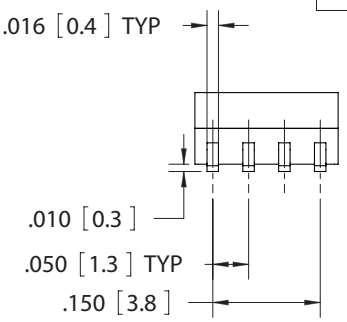
U4 Package





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





NOTES
1) Dimensions are in mm [inches].
2) Offered for absolute only.
3) For suggested pad layout, see drawing: PAD-26
4) Pins 4 and 5 must be connected for Gnd.

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TITLE: U-Series Package

SIZE A | FILE NAME U4 Package

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Packaging

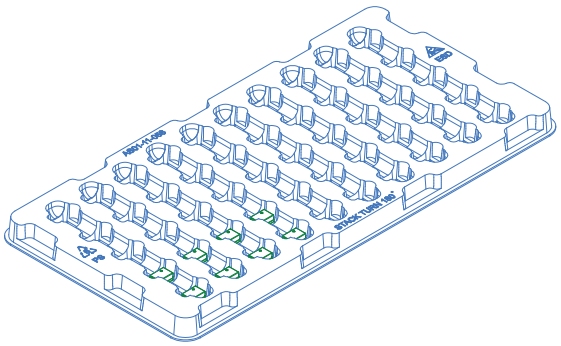
TUBE



ARROW INDICATES SIDE OF PACKAGE WHERE PIN 1 IS LOCATED

Packages: D4, U2, U4

TRAY



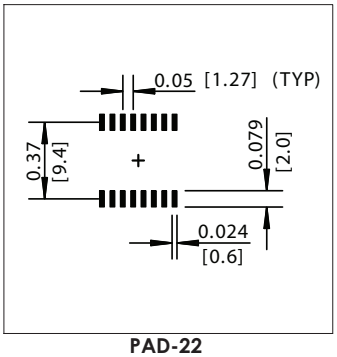
Packages: LD2 and LD4

Notes
1) Contact factory for alternate packing options.

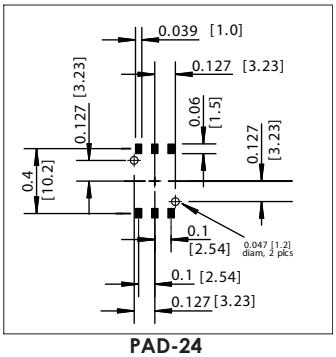
Pressure Tubing Recommendations

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
U2	3/32"	5/32"	Silicone	Polyurethane

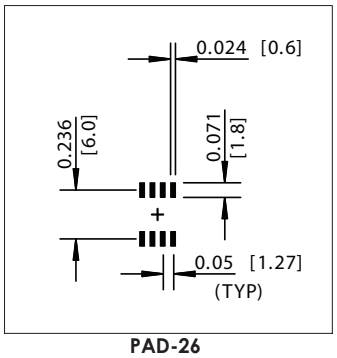
Suggested Pad Layouts



PAD-22



PAD-24



PAD-26

Dimensions are in inches [mm].

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