

BDS SERIES PRESSURE SENSOR



Features

- Dual Sensing Elements (Absolute & Differential)
- Top constraint absolute sensing element for helium applications
- Parylene coating available upon request
- RoHS Compliant

Applications

- Gas Flow Measurement

General Description

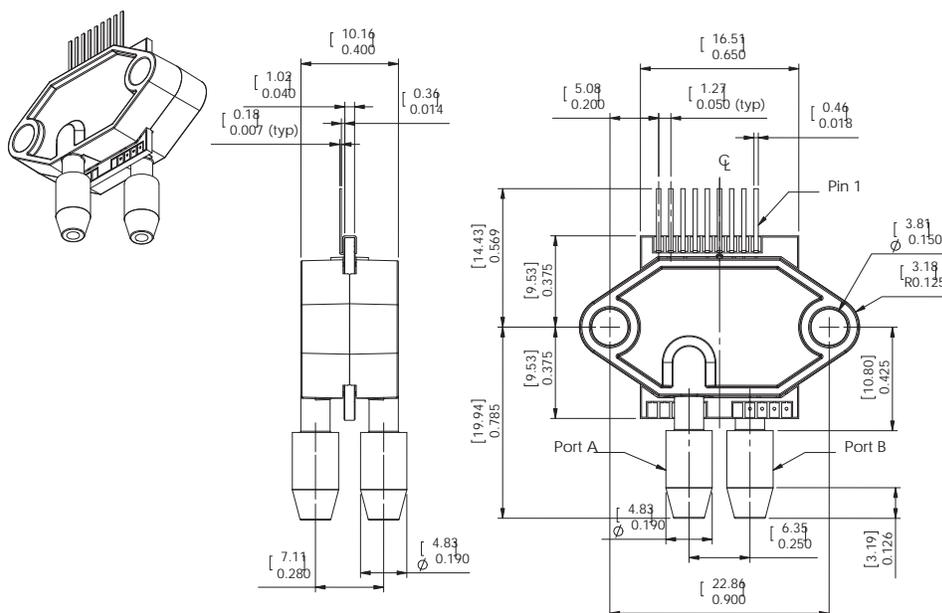
The BDS Basic Pressure Sensor was designed with the idea of combining two sensing elements into one package. This sensor is designed to provide a precise flow measurement by combining a differential and absolute sensing element in the same package. By combining the differential and absolute sensing element, engineers can save cost and space in today's smaller devices.

The BASIC series pressure sensors are based upon a proprietary technology to reduce the size of the sensor and yet maintain a high level of performance. Output offset errors due to position sensitivity; packaging stress and long term drift are all significantly reduced when compared to conventional silicon sensors. In addition, the sensor utilizes a silicon, micromachined, stress concentration enhanced structure to provide a very linear output to measured pressure.

This series is intended for use with non-corrosive, non-ionic working fluids such as air, dry gases and the like.

The output of the device is ratiometric to the supply voltage.

Physical Dimensions



PINOUT

- Pin 1: DP_Gnd +
- Pin 2: DP_Gnd -
- Pin 3: DP_+Out
- Pin 4: AP_Gnd
- Pin 5: DP_Vs
- Pin 6: AP_-Out
- Pin 7: DP_-Out
- Pin 8: AP_Vs
- Pin 9: AP_+Out

Approvals

MKT	DATE	MFG	DATE	ENG	DATE	QA	DATE
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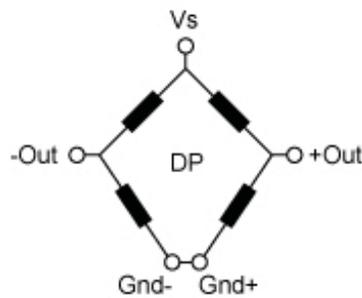
Pressure Sensor Characteristics Maximum Ratings

Supply Voltage VS	6 Vdc
Lead Temperature (soldering 2-4 sec.)	270°C

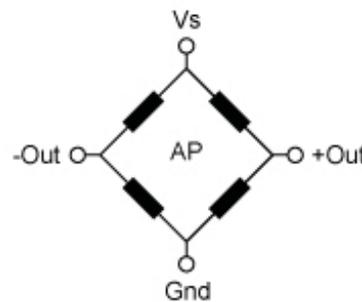
Environmental Specifications

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

Equivalent Circuit



Differential Sensor (DP)



Absolute Sensor (AP)

Standard Pressure Range

Device Type	Operating Pressure	Nominal	Sensitivity ⁽¹⁾			Proof Pressure	Burst Pressure
			Std Dev.	Units			
BDS-L10D030A	--	--	--	--	--	--	--
Absolute	0 - 30 PSIA	7.5	±1.25	mV/PSI	90 PSI	150 PSI	
Differential	0 - 10 inH2O	3.0	±0.40	mV/inH2O	15 PSI	30 PSI	
BDS-L10D100A	--	--	--	--	--	--	--
Absolute	0 - 100 PSIA	3.0	±0.28	mV/PSI	150 PSI	150 PSI	
Differential	0 - 10 inH2O	3.0	±0.40	mV/inH2O	15 PSI	30 PSI	

Performance Characteristic: BDS-L10D030A

Absolute Element

Parameter ⁽¹⁾	Minimum	Nominal	Maximum	Units
Offset Voltage (@1 atm)	+25	--	+125	mv
Temperature Effect on Offset ⁽²⁾	--	±3	--	uV/V/°C
Temperature Effect on Resistance ^(2,5)	1700	2600	3100	ppm/°C
Temperature Effect on Span ^(2,5)	-1500	-1900	-2400	ppm/°C
Linearity error ^(4,5)	--	±0.2	±0.5	% FSS
Hysteresis error	--	±0.01	--	% FSS
Input Resistance	2.0	2.5	3.0	kohms
Output Resistance	2.0	2.5	3.0	kohms
Long term stability ⁽³⁾	--	0.1	--	% FSS

Differential Element

Parameter ⁽¹⁾	Minimum	Nominal	Maximum	Units
Offset Voltage	--	±5.0	±25.0	mv
Temperature Effect on Offset ⁽²⁾	--	±3.0	--	uV/V/°C
Temperature Effect on Resistance ^(2,5)	2300	2600	3300	ppm/°C
Temperature Effect on Span ^(2,5)	-1700	-2200	-2700	ppm/°C
Linearity error ^(4,5)	--	±0.5	1.0	% FSS
Hysteresis error	--	±0.01	--	% FSS
Position Sensitivity ⁽⁵⁾	--	±0.01	±0.03	% FSS
Warm Up Shift	--	±10.0	--	uV
Input Resistance	1.3	1.6	2.5	kohms
Output Resistance	1.3	1.6	2.5	kohms
Long term stability ⁽³⁾	--	0.1	--	% FSS

Performance Characteristic: BDS-L10D100A

Absolute Element

Parameter ⁽¹⁾	Minimum	Nominal	Maximum	Units
Offset Voltage (@1 atm)	-20.0	--	+120	mv
Temperature Effect on Offset ⁽²⁾	--	±3.0	--	uV/V/°C
Temperature Effect on Resistance ^(2,5)	1200	2600	3100	ppm/°C
Temperature Effect on Span ^(2,5)	-1500	-1900	-2400	ppm/°C
Linearity error ^(4,5)	--	±0.2	±0.5	% FSS
Hysteresis error	--	±0.01	--	% FSS
Input Resistance	2.0	2.5	3.0	kohms
Output Resistance	2.0	2.5	3.0	kohms
Long term stability ⁽³⁾	--	0.1	--	% FSS

Differential Element

Parameter ⁽¹⁾	Minimum	Nominal	Maximum	Units
Offset Voltage	--	±5.0	±25.0	mv
Temperature Effect on Offset ⁽²⁾	--	±3.0	--	uV/V/°C
Temperature Effect on Resistance ^(2,5)	2300	2600	3300	ppm/°C
Temperature Effect on Span ^(2,5)	-1700	-2200	-2700	ppm/°C
Linearity error ^(4,5)	--	±0.5	±1.0	% FSS
Hysteresis error	--	±0.01	--	% FSS
Position Sensitivity ⁽⁵⁾	--	±0.01	±0.03	% FSS
Warm Up Shift	--	±10	--	uV
Input Resistance	1.3	1.6	2.5	kohms
Output Resistance	1.3	1.6	2.5	kohms
Long term stability ⁽³⁾	--	0.1	--	% FSS

Ordering Information

Part Number	Configuration		
	<u>Differential</u>	<u>Absolute</u>	
	<u>Sensor</u>	<u>Sensor</u>	<u>Package</u>
BDS-L10D030A-N9	10 inH ₂ O	30 PSIA	N9
BDS-L10D100A-N9	10 inH ₂ O	100 PSIA	N9

Specification Notes

NOTE 1: ALL PARAMETERS ARE MEASURED AT 5.0 VOLT EXCITATION, FOR THE NOMINAL FULL SCALE PRESSURE AND ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED. PRESSURE MEASUREMENTS ARE WITH POSITIVE PRESSURE TO PORT B.

NOTE 2: SHIFT IS RELATIVE TO 25°C.

NOTE 3: SHIFT IS WITHIN THE FIRST YEAR OF OPERATION.

NOTE 4: MEASURED AT ONE-HALF FULL SCALE RATED PRESSURE USING BEST STRAIGHT LINE CURVE FIT.

NOTE 5: PARAMETER IS CHARACTERIZED AND NOT 100% TESTED. MINIMUM AND MAXIMUM VALUES INDICATED AS A DESIGN REFERENCE.

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