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RoHS

89BSD

Digital Output

SPECIFICATIONS

- **Stainless Steel with O-Ring Seal**
- **Pressure/Temperature Read-Out**
- **Digital Output (24-bit ΔΣ ADC)**
- **ASIC Calibrated**
- **Absolute, Sealed Gage**
- **9mm Diameter**

The 89BSD is a 9mm diameter small profile, media compatible, piezoresistive silicon pressure sensor packaged in a 316L stainless steel housing. This low power 24-bit ΔΣ ADC digital output pressure sensor supports an I^2C interface protocol and is designed for threaded O-ring mounting. A custom ASIC is used for temperature compensation and offset correction. The sensing package utilizes silicone oil to transfer pressure from the 316L stainless steel diaphragm to the sensing element. A flex cable allows the 89BSD to connect to a smaller connection terminal where size is of primary concern.

The 89BSD is designed for high performance, low pressure applications.

For a similar sensor with a plastic threaded fitting, refer to the LM pressure transducer

FEATURES

- Threaded/Weldable
- I²C Interface
- Low Power: <1µA
- Standby Power: <0.15µA
- Supply Voltage: 1.8 to 3.6V_{DC}

APPLICATIONS

- Level Controls
- Tank Level Measurement
- Corrosive Fluids and Gas Measurement Systems
- Sealed Systems
- Manifold Pressure Measurement
- Barometric Pressure Measurement
- Dive Computers

STANDARD RANGES

Range	BarA	BarS
0 to 006	•	•
0 to 012	•	•
0 to 018	•	•
0 to 028	•	•
0 to 030	•	•

Intermediate pressure ranges available, contact factory

PERFORMANCE SPECIFICATIONS

Supply Voltage: 3Vdc
Ambient Temperature: 25°C (unless otherwise specified)

PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
ADC			24	bit	
Input Voltage Range	1.8		3.6	V	2
Supply Current		See Table 1		mA	
Pressure Accuracy		±0.3		%Span	3
Pressure Resolution		See Table 3		%Span	4
Total Error Band		See Graph 1		%Span	
Conversion Time		See Table 2		ms	4
Long Term Stability		±0.2		%Span/yr	
Compensated Temperature	-20		+85	°C	
Temperature Resolution		See Table 3		°C	
Temperature Accuracy	-2		+2	°C	
Operating Temperature	-40		+85	°C	
Storage Temperature	-40		+125	°C	
Pressure Overload			2X	Rated	5
Pressure Burst			3X	Rated	6
Interface Type		I^2C			7
Media, Pressure Port	Liquids and gases compatible with 316/316L Stainless Steel				

Notes

1. Coefficients must be read by microcontroller software and are to be used in a mathematical calculation for converting D1 and D2 into compensated pressure and temperature values. For calculation methods and coefficients, see application note APP-01006.
2. Output is not ratiometric to supply voltage.
3. Accuracy: Combined linearity, hysteresis and repeatability.
4. Oversampling ratio: 256 / 512 / 1024 / 2048 / 4096. See Table 2.
5. 2X or 500psi, whichever is less. The maximum pressure that can be applied without changing the transducer's performance or accuracy.
6. 3X or 600psi, whichever is less. The maximum pressure that can be applied to a transducer without rupture of either the sensing element or transducer.
7. Output protocol is I^2C only. CSB is tied to GND, setting I^2C address: 0x77 (1110111)
8. Device marking: All units are marked with part number, pressure range type, lot number, serial number and date code.
9. Recommend Molex connector 52746-071 (or equivalent) to mate with FPC cable
10. Shipping: Devices are shipped individually packaged in a plastic vial with anti-static foam. For devices without fittings, diaphragms are protected by a static dissipative cap.
11. Direct mechanical contact with diaphragm is prohibited. Diaphragm surface must remain free of defects (scratches, punctures, dents, fingerprints, etc) for device to operate properly. Caution is advised when handling parts with exposed diaphragms. Use protective cap whenever devices are not in use.

Table 1: Supply Current Characteristics

PARAMETERS	Symbol	Conditions		MIN	TYP	MAX	UNITS
Supply Current (1 Sample per second)	I_{DD}	OSR	4096 2048 1024 512 256		12.5 6.3 3.2 1.7 0.9		µA
Peak Supply Current		During Conversion			1.4		mA
Standby Supply Current		@ 25°C			0.02	0.14	µA

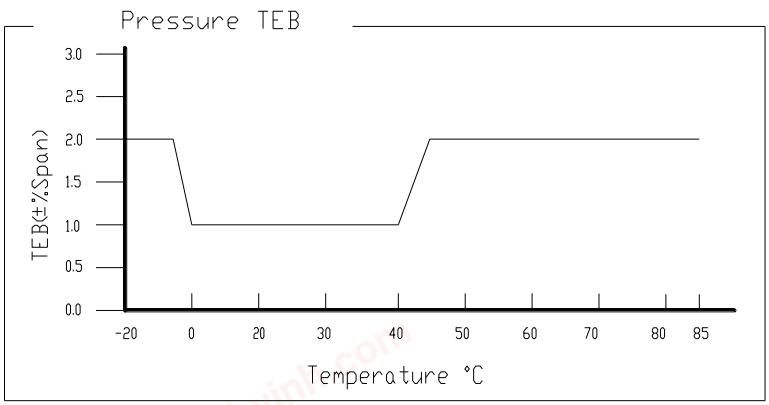
Table 2: Analog Digital Converter (ADC)

PARAMETERS	Symbol	Conditions		MIN	TYP	MAX	UNITS
Conversion Time	t_C	OSR	4096	7.40	8.22	9.04	ms
			2048	3.72	4.13	4.54	
			1024	1.88	2.08	2.28	
			512	0.95	1.06	1.17	
			256	0.48	0.54	0.60	

Table 3: Typical Resolution

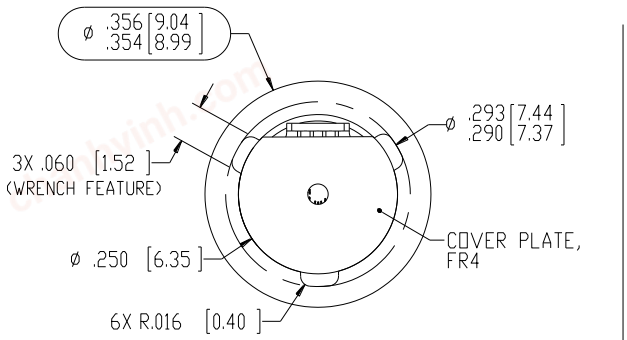
OSR	Typical Pressure Resolution (%Span)	Typical Temperature Resolution (°C)
4096	0.0015	0.002
2048	0.0025	0.003
1024	0.003	0.005
512	0.005	0.008
256	0.008	0.012

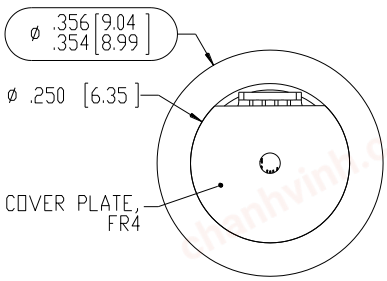
Graph 1:

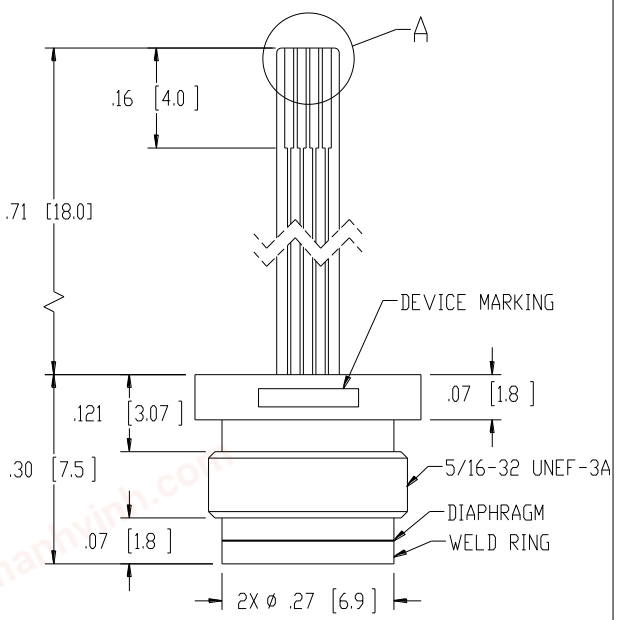


DIMENSIONS

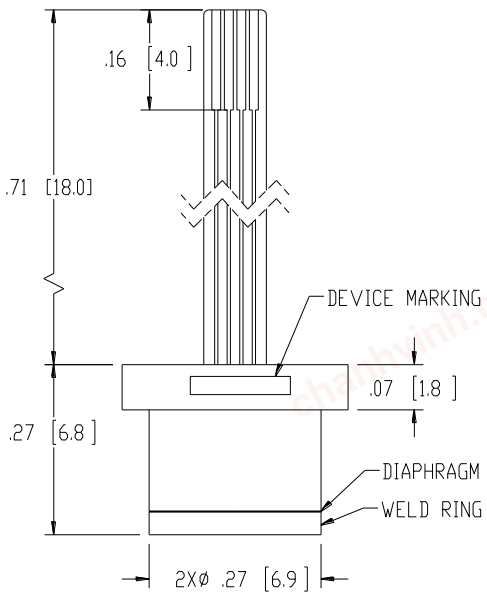
DIMENSIONS ARE IN INCHES [MM]



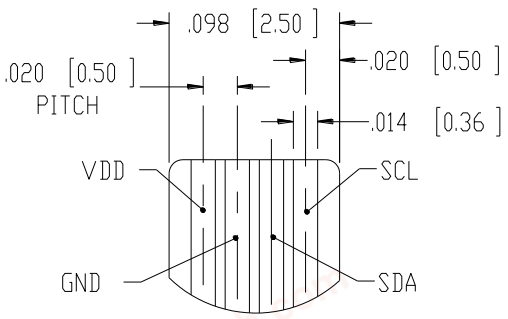




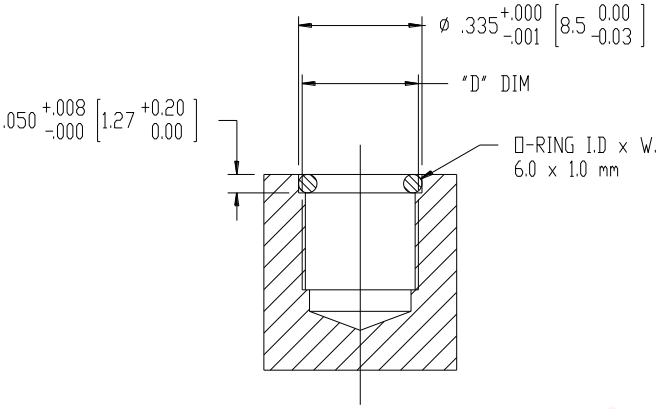
89BSD-XXXXX-A



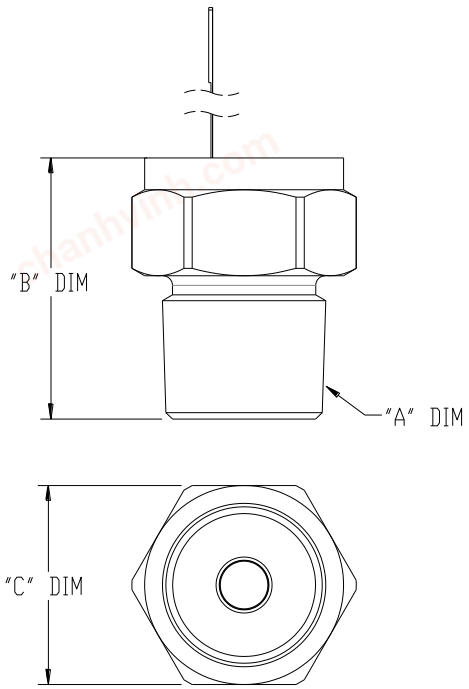
89BSD-XXXXX-B



DETAIL A
SCALE 8 : 1
RECOMMEND MOLEX CONNECTOR 52746-0471
(OR EQUVALENT) TO MATE WITH FPC CABLE

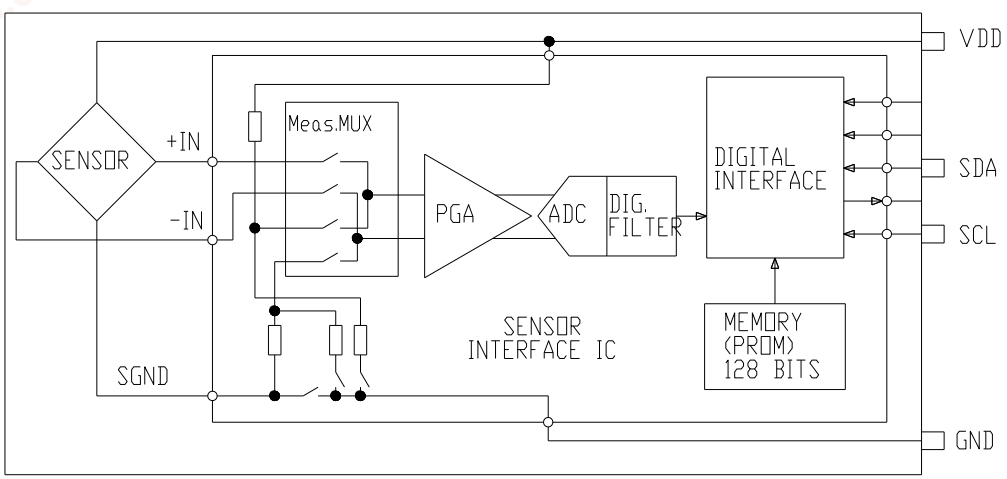


O-RING SEAL MOUNTING
RECOMMENDATIONS
FOR FITTING TYPES A & B

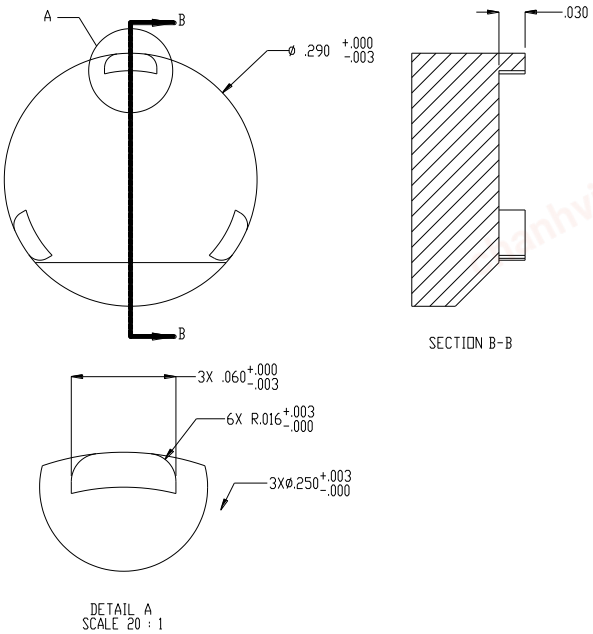


89BSD-XXXX-4, -5, -8

BLOCK DIAGRAM



RECOMMENDED WRENCH DIMENSIONS



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ORDERING INFORMATION

89BSD	—	030B	A	—	B
Model Name					

Pressure range [Bar]

006B	018B	030B
012B	028B	

Pressure Type

A = Absolute **S** = Seal gage

Fitting Type
See Fitting Type Table

*Intermediate Pressure Ranges Available

Fitting Type Table

Fitting Type	MEAS P/N	"A" DIM	"B" DIM	"C" DIM	"D" DIM
4	IC-D00348	1/4-18 NPT	.82 [20.8]	5/8 [15.9] HEX	N/A
5	IC-D00367	1/4-19 BSP	.82 [20.8]	3/4 [19] HEX	
8	IC-D00349	1/8-27 NPT	.71 [18.0]	5/8 [15.9] HEX	
A	No Fitting, Threaded Capsule, 5/16-32 UNEF-3A				5/16-32 UNEF-3B↧.25
B	No Fitting, No Thread Capsule				Ø.28↧.25
NOTE:	Fitting Type '-4' assembly shown All dimensions are for reference only				

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