

# ELVR SPECIAL MILLIBAR CALIBRATED SERIES

## Features

- Special Pressure Ranges
- Precision ASIC Conditioning
- Analog Output with Digital I2C and SPI Interface
- 3V and 5V Supply Voltage

## Applications

- Medical
- Industrial
- Medical Devices
- Medical Instrumentation
- Respiratory
- Portable / Hand-Held Equipment
- Environmental Controls
- Environmental Instrumentation
- Environmental Monitoring
- HVAC
- Industrial Controls
- Altimeters
- Chemical Analysis
- Meteorology

## Wetted Media

- Silicon
- RTV
- Gold
- Ceramic
- Epoxy
- Nylon Plastic
- Aluminum

Pressure Sensor Maximum Ratings		Environmental Specifications	
Supply Voltage (Vs)	2.7 to 5.5 Vdc	<b>Temperature Ranges</b>	
Analog-Output Current		Compensated:	Commercial 0°C to 70°C Industrial -20°C to 85°C
Sink	1 mA	Operating	-25°C to 85°C
Source	1 mA	Storage	-40°C to 125°C
		<b>Humidity Limits (non condensing)</b>	0 to 95% RH
SMT Assembly Specifications		Equivalent Circuit	
Average preheating temperature gradient	2.5 K/s		
Soak Time	ca. 3 min	See package drawings for pinouts.	
Time above 217°C	50 s		
Time above 230°C	40 s		
Time above 250°C	15 s		
Peak Temperature	260°C		
Cooling Temperature Gradient	-3.5 K/s		



## ELVR Special Millibar Calibrated Series Pressure Ranges

Pressure Range <sup>1</sup>				Proof Pressure <sup>2</sup>			Burst Pressure <sup>3</sup>		Common Mode Pressure <sup>4</sup>	
Pressure Range Code	Pmin	Pmax	Pressure Mode	kPa	mbar	kPa	mbar	kPa	mbar	kPa
	mbar									
M001D	-1.0	1.0	Differential	0.1	250	25	500	50	1035	104
MF02D	-2.5	2.5	Differential	0.25	250	25	500	50	1035	104
MF12D	-12.5	12.5	Differential	1.25	250	25	500	50	1035	104
M025D	-25	25	Differential	2.5	500	50	750	75	1035	104
M050D	-50	50	Differential	5	750	75	1,200	120	1035	104
M075D	-75	75	Differential	7.5	1,200	120	2,000	200	1035	104
M100D	-100	100	Differential	10	1,200	120	2,000	200	1035	104
M200D	-200	200	Differential	20	1,200	120	2,000	200	1035	104
MN17D	-10	70	Differential	-1 to 7	750	75	1,200	120	1035	104
MF25G	0	2.5	Gage	0.25	250	25	500	50	1035	104
MF12G	0	12.5	Gage	1.25	250	25	500	50	1035	104
M025G	0	25	Gage	2.5	500	50	750	75	1035	104
M050G	0	50	Gage	5	750	75	1,200	120	1035	104
M075G	0	75	Gage	7.5	1,200	120	2,000	200	1035	104
M100G	0	100	Gage	10	1,200	120	2,000	200	1035	104
M200G	0	200	Gage	20	1,200	120	2,000	200	1035	104

**Note 1:** Calibrated operating range

**Note 2:** Limit of differential pressure applied between any ports, beyond which performance may be permanently affected.

**Note 3:** Limit of mechanical integrity: Sensor element or package may rupture if differential pressure is applied beyond this limit.

**Note 4:** Maximum pressure that may be applied to both ports simultaneously while operating within specified differential limits.

## Performance Characteristics for ELVR Series Amplified Low Pressure Sensors

All parameters are measured at **5.0 volt** excitation and 25°C unless otherwise specified. Pressure measurements are with positive pressure applied to PORT B

### Analog Performance Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Specification Notes
<b>Full Scale Span (FSS)</b>	3.9	4.0	4.1	V	5
<b>Full Scale Output (FSO)</b>					
Min Pressure	-	0.25	-	V	-
Max Pressure	-	4.25	-	V	-
<b>Span Temperature Shift</b>					
M001x	-	-	±2.5	%FSS	2
MF02x	-	-	±2	%FSS	2
MF12x and above	-	-	±1	%FSS	2
<b>Offset Voltage @ zero differential pressure</b>					
MxxxG	0.15	0.25	0.35	V	-
MxxxD	2.15	2.25	2.35	V	-
<b>Offset Temperature Shift</b>					
M001x	-	-	±2.0	%FSS	-
MF02x	-	-	±1.5	%FSS	-
MF12x and above	-	-	±0.5	%FSS	-
<b>Offset Warm-up Shift</b>					
M001x, MF02x	-	±15	-	mV	-
MF12x and above	-	±5	-	mV	-
<b>Offset Position Sensitivity (±1 g)</b>					
M001x, MF02x	-	±15	-	mV	-
MF12x and above	-	±5	-	mV	-
<b>Offset Long Term Drift (one year)</b>					
M001x, MF02x	-	±15	-	mV	-
MF12x and above	-	±5	-	mV	-
<b>Linearity, Hysteresis error (all products)</b>					
	-	±0.05	±0.25	%FSS	4
<b>Response Delay</b>					
12-bit resolution	-	0.5	-	ms	1
14-bit resolution	-	1.0	-	ms	1
<b>Current Consumption (no load)</b>					
	-	5.0	-	mA	6



## Performance Characteristics for ELVR Series Amplified Low Pressure Sensors

All parameters are measured at **3.0 volt** excitation and 25°C unless otherwise specified. Pressure measurements are with positive pressure applied to PORT B

### Analog Performance Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Specification Notes
<b>Full Scale Span (FSS)</b>	1.9	2.0	2.1	V	5
<b>Full Scale Output (FSO)</b>					
Min Pressure	-	0.25	-	V	-
Max Pressure	-	2.25	-	V	-
<b>Span Temperature Shift</b>					
M001x	-	-	±2.5	%FSS	2
MF02x	-	-	±2	%FSS	2
MF12x and above	-	-	±1	%FSS	2
<b>Offset Voltage @ zero differential pressure</b>					
MxxxG	0.15	0.25	0.35	V	-
MxxxD	1.15	1.25	1.35	V	-
<b>Offset Temperature Shift</b>					
M001x	-	-	±2.0	%FSS	-
MF02x	-	-	±1.5	%FSS	-
MF12x and above	-	-	±0.5	%FSS	-
<b>Offset Warm-up Shift</b>					
M001x, MF02x	-	±15	-	mV	-
MF12x and above	-	±5	-	mV	-
<b>Offset Position Sensitivity (±1 g)</b>					
M001x, MF02x	-	±15	-	mV	-
MF12x and above	-	±5	-	mV	-
<b>Offset Long Term Drift (one year)</b>					
M001x, MF02x	-	±15	-	mV	-
MF12x and above	-	±5	-	mV	-
<b>Linearity, Hysteresis error (all products)</b>					
	-	±0.05	±0.25	%FSS	4
<b>Response Delay</b>					
12-bit resolution	-	0.5	-	ms	1
14-bit resolution	-	1.0	-	ms	1
<b>Current Consumption (no load)</b>					
	-	5.0	-	mA	6

## Performance Characteristics for ELVR Series Amplified Low Pressure Sensors

All parameters are measured at **5.0 volt** excitation and 25°C unless otherwise specified. Pressure measurements are with positive pressure applied to PORT B

### Digital Performance Characteristics in Decimal

Parameter	Minimum	Nominal	Maximum	Units	Specification Notes
<b>Full Scale Span (FSS)</b>	-	26214	-	Decimal	2
<b>Full Scale Output (FSO)</b>					
Min Pressure	-	1638	-	Decimal	5
Max Pressure	-	27852	-	Decimal	5
<b>Span Temperature Shift</b>					
M001x	-	-	±2.5	%FSS	2
MF02x	-	-	±2	%FSS	2
MF12x and above	-	-	±1	%FSS	2
<b>Offset Output @ zero differential pressure</b>					
MxxD	14090	14745	15400	Decimal	-
MxxG	983	1638	2294	Decimal	-
<b>Offset Temperature Shift</b>					
M001x	-	-	±2.0	%FSS	-
MF02x	-	-	±1.5	%FSS	-
MF12x and above	-	-	±0.5	%FSS	2
<b>Offset Warm-up Shift</b>					
M001x, MF02x	-	66	-	Decimal	3
MF12x and above	-	33	-	Decimal	3
<b>Offset Position Sensitivity (±1 g)</b>					
M001x, MF02x	-	99	-	Decimal	-
MF12x and above	-	33	-	Decimal	-
<b>Offset Long Term Drift (one year)</b>					
M001x, MF02x	-	66	-	Decimal	-
MF12x and above	-	33	-	Decimal	-
<b>Linearity, Hysteresis error (all products)</b>					
	-	±0.05	±0.25	%FSS	4
<b>Response Delay</b>					
12-bit resolution	-	0.5	-	ms	1
14-bit resolution	-	1.0	-	ms	1
<b>Current Consumption</b>					
	-	5	-	mA	6



## Performance Characteristics for ELVR Series Amplified Low Pressure Sensors

All parameters are measured at **3.0 volt** excitation and 25°C unless otherwise specified. Pressure measurements are with positive pressure applied to PORT B

### Digital Performance Characteristics in Decimal

Parameter	Minimum	Nominal	Maximum	Units	Specification Notes
<b>Full Scale Span (FSS)</b>	21299	21845	22391	Decimal	2
<b>Full Scale Output (FSO)</b>					
Min Pressure	-	2731	-	Decimal	5
Max Pressure	-	24576	-	Decimal	5
<b>Span Temperature Shift</b>					
M001x	-	-	±2.5	%FSS	2
MF02x	-	-	±2	%FSS	2
MF12x and above	-	-	±1	%FSS	2
<b>Offset Output @ zero differential pressure</b>					
MxxD	12561	13653	14745	Decimal	-
MxxG	1638	2731	3823	Decimal	-
<b>Offset Temperature Shift</b>					
M001x	-	-	±2.0	%FSS	-
MF02x	-	-	±1.5	%FSS	-
MF12x and above	-	-	±0.5	%FSS	2
<b>Offset Warm-up Shift</b>					
M001x, MF02x	-	66	-	Decimal	3
MF12x and above	-	33	-	Decimal	3
<b>Offset Position Sensitivity (±1 g)</b>					
M001x, MF02x	-	99	-	Decimal	-
MF12x and above	-	33	-	Decimal	-
<b>Offset Long Term Drift (one year)</b>					
M001x, MF02x	-	66	-	Decimal	-
MF12x and above	-	33	-	Decimal	-
<b>Linearity, Hysteresis error (all products)</b>					
	-	±0.05	±0.25	%FSS	4
<b>Response Delay</b>					
12-bit resolution	-	0.5	-	ms	1
14-bit resolution	-	1.0	-	ms	1
<b>Current Consumption</b>					
	-	5	-	mA	6

### Specification Notes

**Note 1:** For any pressure applied the output response time to reach 90% of pressure applied.

**Note 2:** Shift is relative to 25°C between standard or industrial compensated temperature range endpoints.

**Note 3:** Shift is within the first hour of excitation applied to the device.

**Note 4:** Measured at one-half full scale rated pressure using best straight line curve fit.

**Note 5:** The span is the algebraic difference between full scale output voltage and the offset voltage.

**Note 6:** Parameter is characterized and not 100% tested.

## Device Options

The following is a list of factory programmable options. Consult the factory to learn more about the options.

### Interface

I2C and SPI interfaces are available with eight (8) lead packages only.

### Supply Voltage

Devices are characterized at either 3.0V or 5.0V depending on the options selected. It is suggested to select the option that most closely matches the application supply voltage for best possible performance.

### Speed/Power

There are two options of Speed/Power. These are Fast(F) and High Resolution(H).

Fast Mode(F) Is the fastest operating mode where the device operates with continuous sampling at the fastest internal speed 12 bit resolution, 0.5ms update rate.

High Resolution(H): Also operates with continuous samples however the ADC is set for longer duration for higher resolution. The conversion times are resultantly longer than the Fast(F) mode with 1 ms update rate.

### Coating

Parylene Coating: Parylene coating provides a moisture barrier and protection from some harsh media. Consult factory for applicability of Parylene for the target application and sensor type. This option is not available for pressure ranges below 25 mbar or for J-LEAD or L-LEAD SMT configurations.

### Soldering Recommendations

Vapor phase reflow processes are not compatible with this product..



# I2C Interface

## Introduction

The ELVR is capable of producing a digital output signal. The device runs a cyclic program, which will store a corrected pressure value about every 0.5 ms (F option) or 1 ms (H option) within the output registers of the internal ASIC. In order to use the sensor for digital signal readout, it should be connected to a bidirectional I2C-bus.

According to the I2C-bus specification, the bus is controlled by a master device, which generates the clock signal, controls the bus access and generates START and STOP conditions. The ELVR is designed to work as a slave, hence it will only respond to requests from a master device.

## Digital I2C interface

The ELVR complies with the following protocol in Figure 1.

**Bus not busy** : During idle periods both data line (SDA) and clock line (SCL) remain HIGH.

**START condition (S)** : HIGH to LOW transition of SDA line while clock (SCL) is HIGH is interpreted as START condition. START conditions are always generated by the master. Each initial request for a pressure value has to begin with a START condition.

**STOP condition (P)** : LOW to HIGH transition of SDA line while clock (SCL) is HIGH determines STOP condition. STOP conditions are always generated by the master. More than one request for the current pressure value can be transmitted without generation of intermediate STOP condition.

**DATA valid (D)**: State of data line represents valid data when, after START condition, data line is stable for duration of HIGH period of clock signal. Data on line must be changed during LOW period of clock signal. There is one clock pulse per bit of data.

**Acknowledge (A)**: Data is transferred in pieces of 8 bits (1 byte) on serial bus, MSB first. After each byte the receiving device – whether master or slave – is obliged to pull data line LOW as acknowledge for reception of data. Master must generate an extra clock pulse for this purpose. When acknowledge is missed, slave transmitter becomes inactive. Master must then either send last command again or generate STOP condition in that case.

**Slave address**: The I2C-bus master-slave concept requires a unique address for each device. The ELVR has a preconfigured slave address, see table 2. The sensor will then listen to both slave addresses. After generating a START condition the master sends the address byte containing a 7 bit address followed by a data direction bit (R/W). A "0" indicates a transmission from master to slave (WRITE), a "1" indicates a data request (READ).

**DATA operation** : The sensor starts to send 2 data bytes containing the current pressure value as a 15 bit value placed in the output registers.

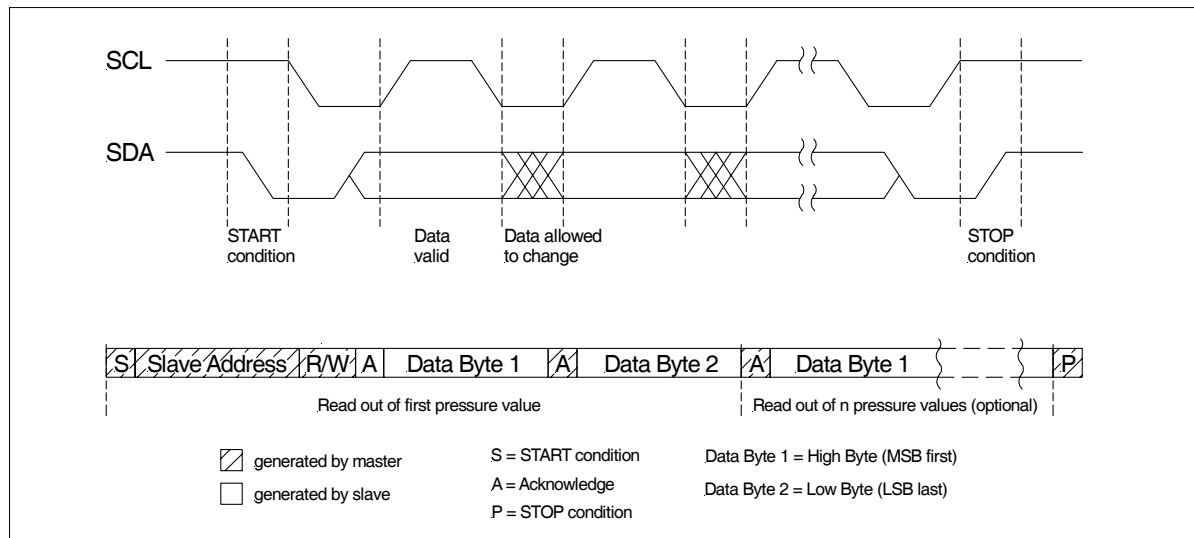


Figure 1: I<sup>2</sup>C bus protocol

## I<sup>2</sup>C BUS INTERFACE (Cont'd)

### I<sup>2</sup>C Interface Parameters

Parameter	Symbol	Minimum	Nominal	Maximum	Unit	Specification Notes
Input High Level	-	90	-	100	% of V <sub>s</sub>	6
Input Low Level	-	0	-	10	% of V <sub>s</sub>	6
Output Low Level	-	-	-	10	% of V <sub>s</sub>	6
Pull-Up Resistor	-	500	-	-	Ω	6
Load Capacitance @ SDA	C <sub>SDA</sub>	-	-	400	pF	6
Input Capacitance @ SDA/SCL	C <sub>I2C_IN</sub>	-	-	10	pF	6
Signal Clock Frequency	F <sub>SCL</sub>	100*	-	400	kHZ	6
Bus Free Time Between STOP and START Condition	t <sub>BUF</sub>	1.3	-	-	μs	6
Hold Time (Repeated) START Condition, to First Clock Pulse	t <sub>HD,STA</sub>	0.8	-	-	μs	6
Low Period of SCL	t <sub>Low</sub>	1.3	-	-	μs	6
High Period of SCL	t <sub>High</sub>	0.6	-	-	μs	6
Setup Time Repeated START Condition	t <sub>SU,STA</sub>	1	-	-	μs	6
Data Hold Time	t <sub>HD,DAT</sub>	0	-	-	μs	6

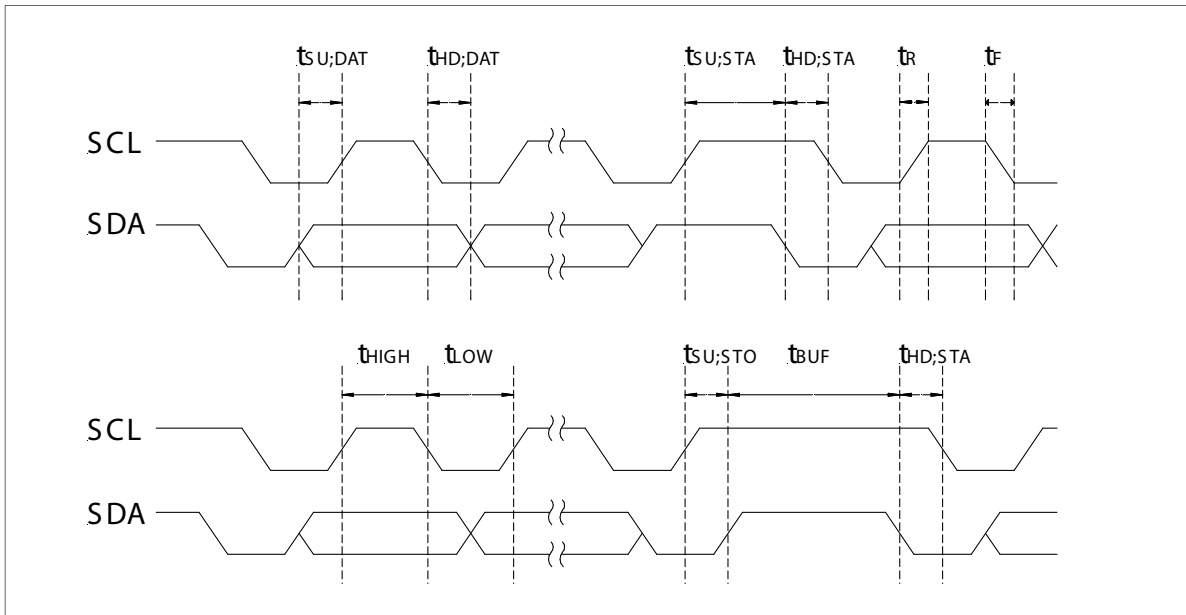


Figure 2. Timing Characteristics



# SPI - SERIAL PERIPHERAL INTERFACE

## Introduction

The ELVR series is capable of producing a digital output signal. The device runs a cyclic program, which will store a corrected sensor value about every 0.5 ms (F option) or 1 ms (H option) within the output registers of the internal ASIC. This cyclic program runs independent from the bus communication. In order to use the pressure sensor for digital signal readout, it should be connected to a SPI Master device.

SPI specifies four signals: The clock (CLK) is generated by the master and input to all slaves. MOSI carries data from master to slave. MISO carries data from slave to master. A slave select line (SS) allows individual selection of a slave device.

## SPI Modes

A pair of parameters called clock polarity (CPOL) and clock phase (CPHA) determine the edges of the clock signal on which the data are driven and sampled. Each of the two parameters has two possible states, which allows for four possible combinations, all of which are incompatible with one another.

The ELVR series supports all clock phase (CPHA)=0 and polarity (CPOL)=0. CPOL which means that data transmission starts with the rising first clock edge (see Figure 3).

## Slave select

The falling edge of the SS line indicates the beginning of the transfer. Additionally the SS line must not be negated and reasserted between the three bytes to be transmitted.

## Data operation

The MOSI line should always be set to high level. So there is no data transmission from master to slave. Because of internal configuration the slave will answer the first byte with an FFxh. The second and third byte contain the 15 bit pressure information (see Figure 4).

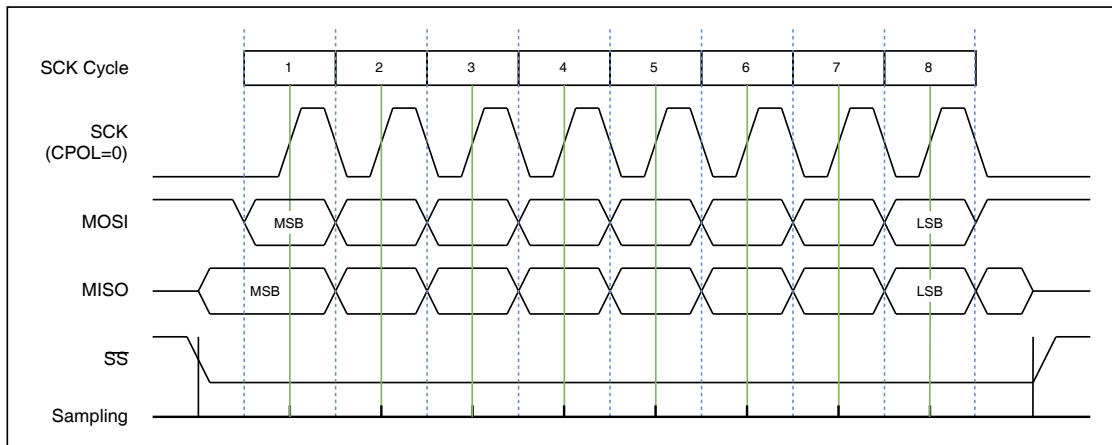


Figure 3: Example of a standard 1 byte SPI data transfer for CPHA=0 and CPOL=0

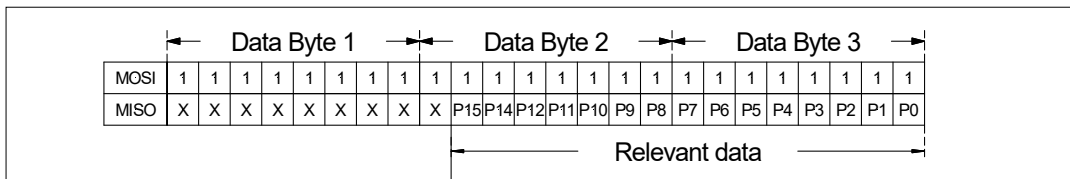


Figure 4: 3 byte data stream between ELVR sensor and master containing the pressure value as a 15 bit value.

## SPI - SERIAL PERIPHERAL INTERFACE (Cont'd)

### Interface Parameters

Parameter	Symbol	Minimum	Nominal	Maximum	Unit	Specification Notes
Input High Level	-	90	-	100	% of $V_s$	6
Input Low Level	-	0	-	10	% of $V_s$	6
Output Low Level	-	-	-	10	% of $V_s$	6
Pull-Up Resistor	-	500	-	-	$\Omega$	6
Load Capacitance @ MISO	$C_{MISO}$	-	-	400	pF	6
Input Capacitance @ Each Pin	$C_{SPL\_IN}$	-	-	10	pF	6
Signal Clock Frequency	$f_{SCK}$	100*	-	640	kHz	6
MISO Hold Time after SCK Sample Slope	$t_{SPL\_HD\_MISO}$	200	-	-	ns	6
MOSI Setup Time Before SCK Sample Slope	$t_{SPL\_SU\_MOSI}$	$2/f_{CLK}$	-	-	-	6
/SS Setup Time Before SCK Sample Slope	$t_{SPL\_SU\_SS}$	10	-	-	ns	6
/SS Hold Time After SCK Sample Slope	$t_{SPL\_HD\_SS}$	$1/f_{CLK}$	-	-	-	6

**Note:** All Sensors recommends communication speeds of at least 100 kHz (max. 640 kHz). Please contact your nearest All Sensors sales office for further information.

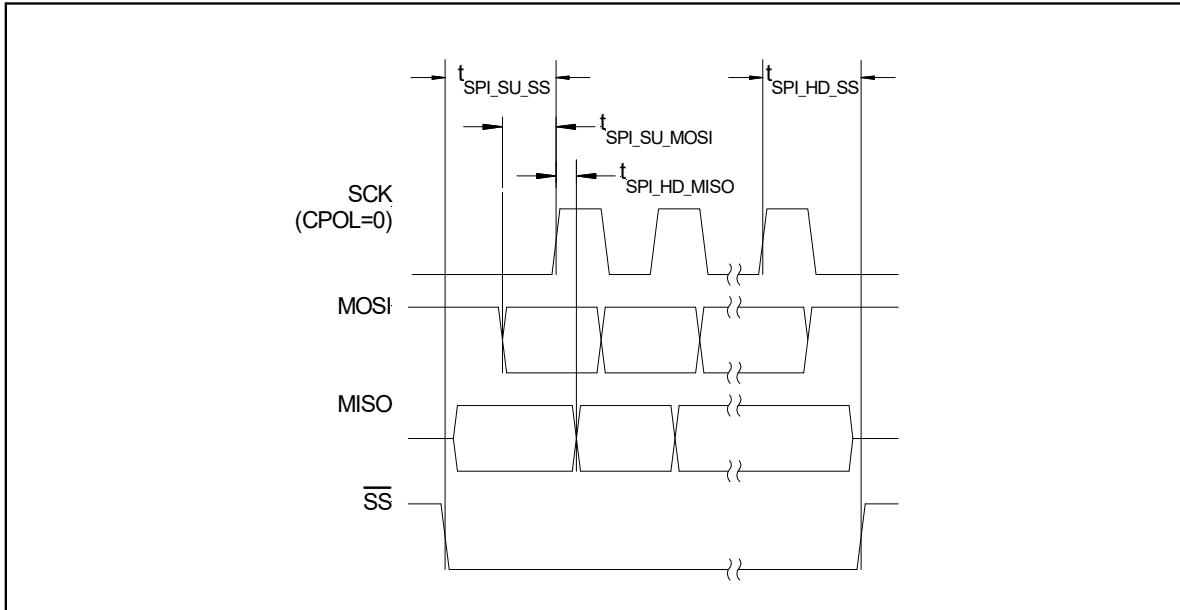


Figure 5: Timing characteristics



## How to Order

Refer to Table 1 for configuring a standard base part number which includes the pressure range, package and temperature range. Table 2 shows the available configuring options. The option identifier is required to complete the device part number. Refer to Table 3 for the available device package options.

Example P/N with options: ELVR-M001D-F1RJ-C-NI3F

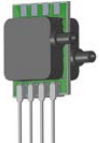

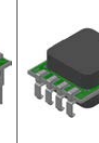
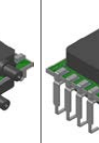

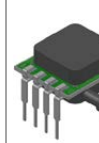

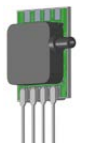

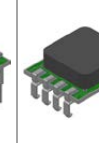
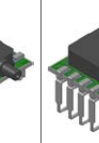
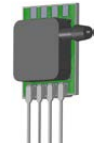
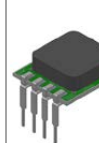

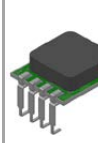
Table 1 - How to configure a base part number

ORDERING INFORMATION	SERIES		PRESSURE RANGE		PACKAGE				TEMPERATURE RANGE				
	ID	Description	ID	Description	Base ID	Port Orientation ID	Lid Style ID	Lead Type ID	ID	Description			
ORDERING INFORMATION	ELVR	M001D	±1 mbar	F	1	Dual Port Same Side	R	Long Non-Barbed	T	SIL (see note 7)	C	Commercial	
		MF02D	±2.5 mbar				S	Long Barbed	D	DIP			I
		MF12D	±12.5 mbar		N	Single Port				J	J-Lead SMT		
		M025D	±25 mbar							L	L-Lead SMT		
		M050D	±50 mbar										
		M075D	±75 mbar										
		M100D	±100 mbar										
		M200D	±200 mbar										
		MN17D	-10 to 70 mbar										
		MF25G	2.5 mbar										
		MF12G	12.5 mbar										
		M025G	25 mbar										
M050G	50 mbar												
M075G	75 mbar												
M100G	100 mbar												
M200G	200 mbar												
Example	ELVR	M001D		F	1		R		J		C		

Table 2 - How to configure an option identifier

ORDERING INFORMATION	COATING		INTERFACE			SUPPLY VOLTAGE		DIGITAL RESOLUTION, UPDATE RATE													
	ID	Description	ID	Description	Address	ID	Description	ID	Description												
ORDERING INFORMATION	N	No Coating	A	Analog Only (see note 7)	N/A	3	3.0V	F	Fast Mode												
										P	Parylene Coating (see note 8)	I	I2C & Analog	0x78	5	5.0V	H	High Resolution (14bit, 1ms)			
																			T	Option- SPI & Analog	N/A
																			2	Option- I2C & Analog	0x28
																			3	Option- I2C & Analog	0x38
																			4	Option- I2C & Analog	0x48
																			5	Option- I2C & Analog	0x58
6	Option- I2C & Analog	0x68																			
Example	N		I			3		F													

TABLE 3: Available F-Series Package Configurations

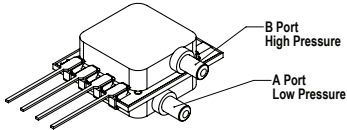
Port Orientation	Non-Barbed Lid				Barbed Lid			
	Lead Style				Lead Style			
	SIL	DIP	SMT-J	SMT-L	SIL	DIP	SMT-J	SMT-L
Dual Port Same Side	 F1RT	 F1RD	 F1RJ	 F1RL	 F1ST	 F1SD	NOT OFFERED	 F1SL
Single Port	 FNRT	 FNRD	 FNRJ	 FNRL	 FNST	 FNSD	 FNSJ	 FNLS

Specification Notes (Cont.)

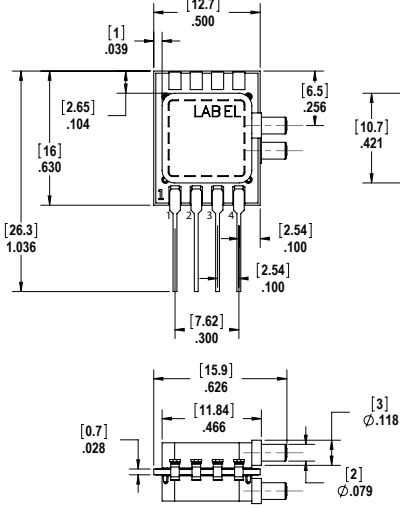
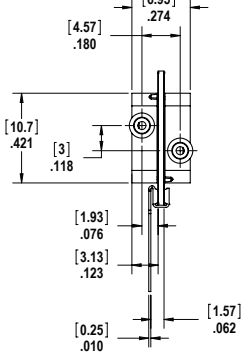
**NOTE 7: LEADFRAME "T" HAS ONLY ANALOG OUTPUT CAPABILITY. ALL LEAD TYPES EXCEPT FOR "T" HAVE SIMULTANEOUS DIGITAL AND ANALOG OUTPUT CAPABILITY.**

**NOTE 8: PARYLENE COATING NOT OFFERED IN J-LEAD OR L-LEAD SMT CONFIGURATION. PARYLENE COATING IS NOT OFFERED FOR PRESSURE RANGES BELOW 10 INH2O.**

# Package Drawings

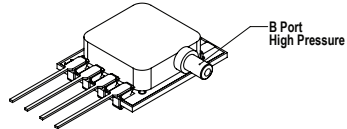


Pin	Definition
1	Vs
2	Gnd
3	Vout
4	Do not connect

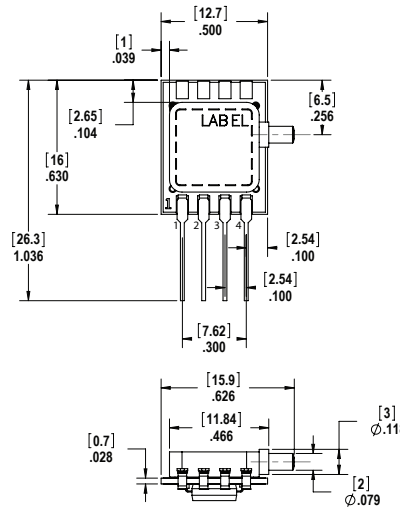
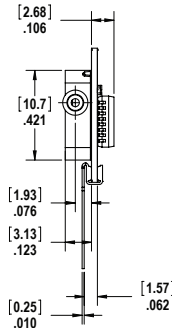



**NOTES**  
 1) Dimensions are in inches [mm].  
 2) For suggested pad layout, see drawing: PAD-01.

<b>All Sensors</b>	
TITLE:	F-Series Package
SIZE	FILE NAME
<b>A</b>	F1RT Package



Pin	Definition
1	Vs
2	Gnd
3	Vout
4	Do not connect

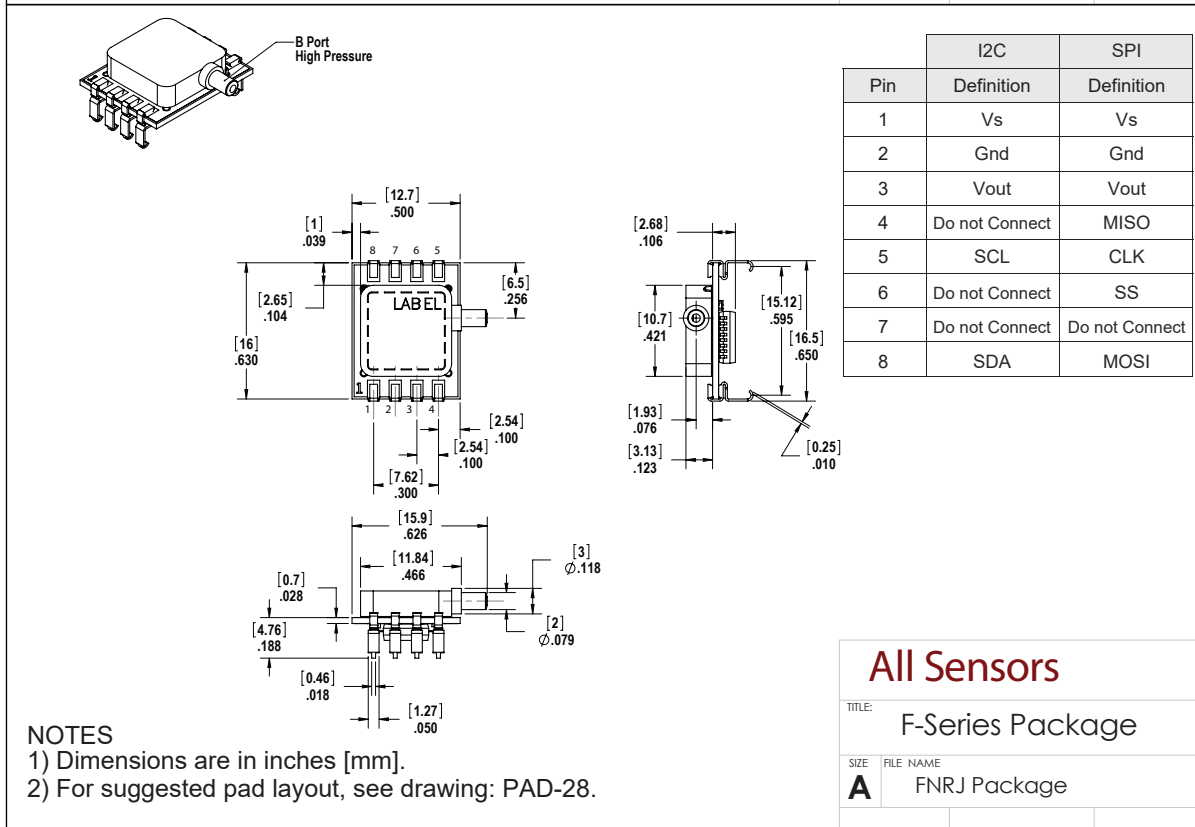
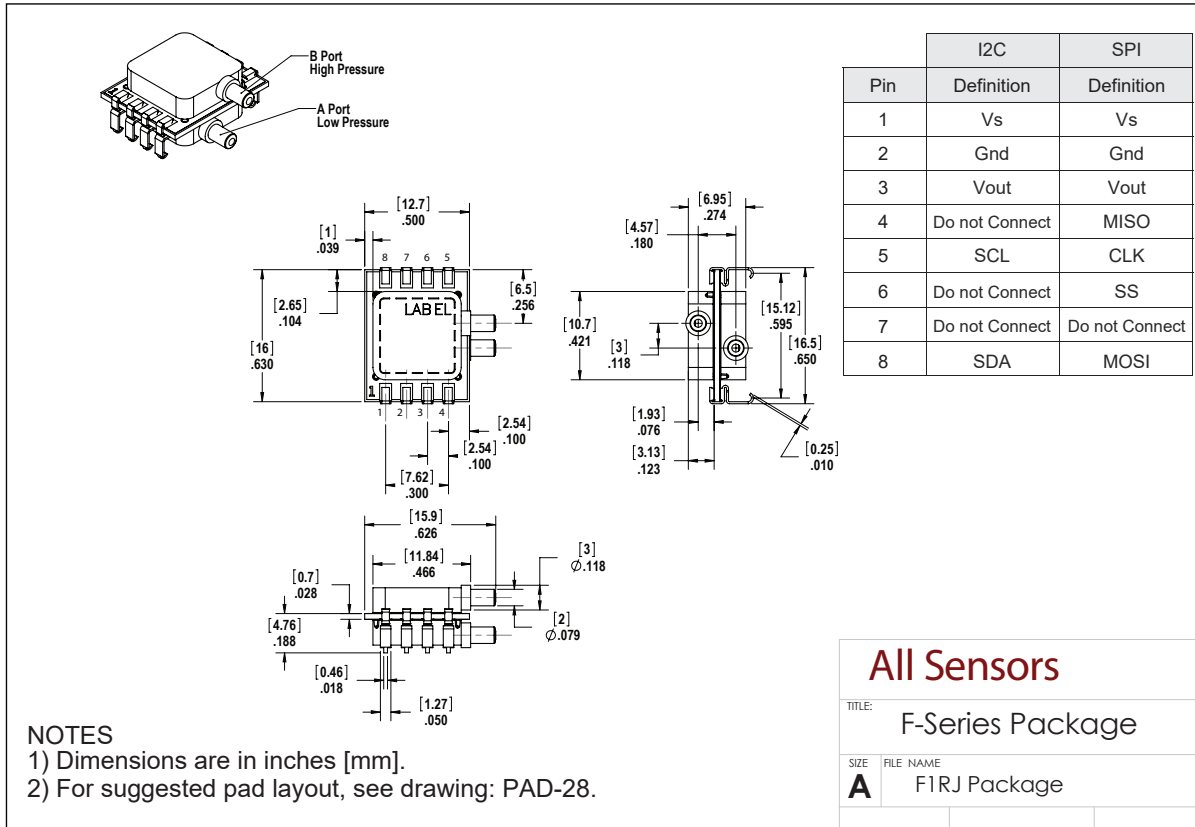



**NOTES**  
 1) Dimensions are in inches [mm].  
 2) For suggested pad layout, see drawing: PAD-01.

<b>All Sensors</b>	
TITLE:	F-Series Package
SIZE	FILE NAME
<b>A</b>	FNRT Package

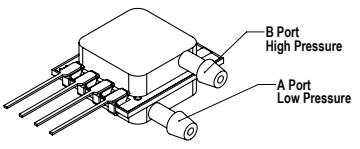


Package Drawings (Cont'd)

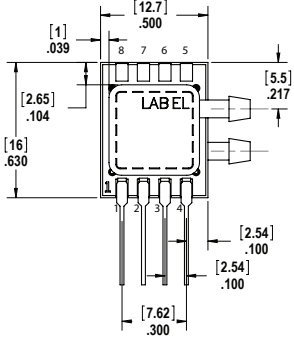
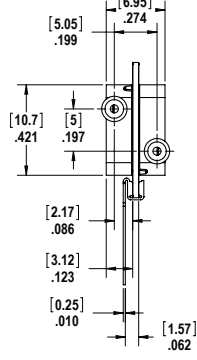
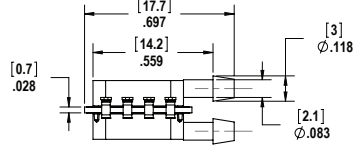




Package Drawings (Cont'd)

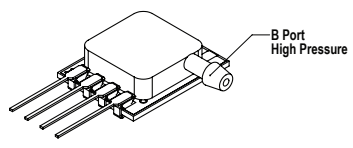


Pin	Definition
1	Vs
2	Gnd
3	Vout
4	Do not connect

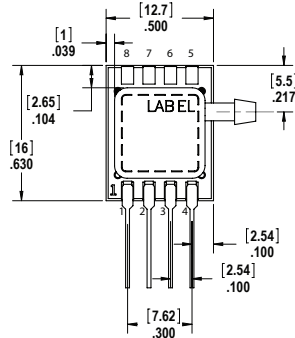
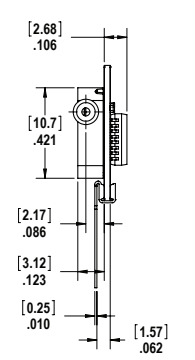
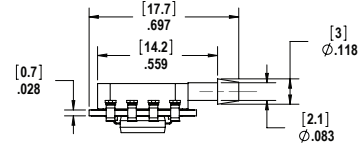




**NOTES**  
 1) Dimensions are in inches [mm].  
 2) For suggested pad layout, see drawing: PAD-01.

<b>All Sensors</b>	
TITLE:	F-Series Package
SIZE	FILE NAME
<b>A</b>	F1ST Package



Pin	Definition
1	Vs
2	Gnd
3	Vout
4	Do not connect

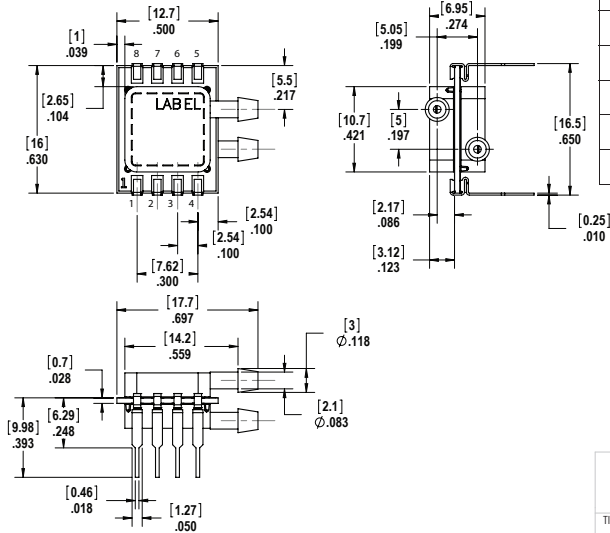
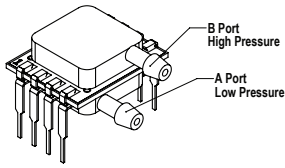




**NOTES**  
 1) Dimensions are in inches [mm].  
 2) For suggested pad layout, see drawing: PAD-01.

<b>All Sensors</b>	
TITLE:	F-Series Package
SIZE	FILE NAME
<b>A</b>	FNST Package



Package Drawings (Cont'd)



Pin	I2C	SPI
	Definition	Definition
1	Vs	Vs
2	Gnd	Gnd
3	Vout	Vout
4	Do not Connect	MISO
5	SCL	CLK
6	Do not Connect	SS
7	Do not Connect	Do not Connect
8	SDA	MOSI

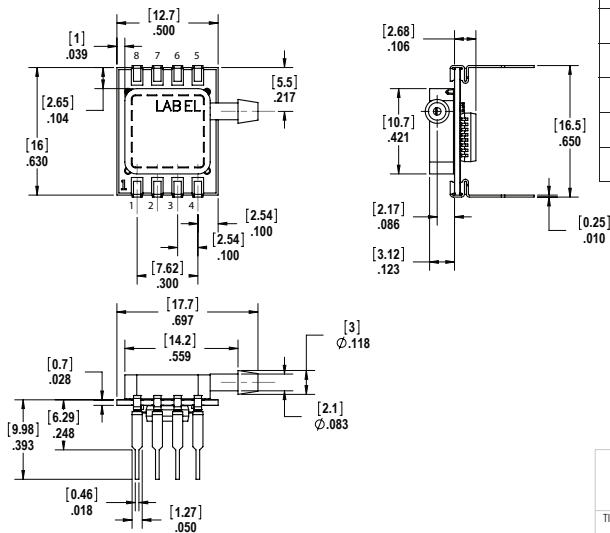
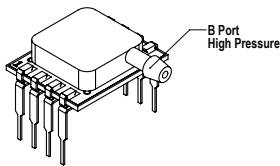
NOTES

- 1) Dimensions are in inches [mm].
- 2) For suggested pad layout, see drawing: PAD-27.

All Sensors

TITLE: F-Series Package

SIZE FILE NAME  
**A** F1SD Package



Pin	I2C	SPI
	Definition	Definition
1	Vs	Vs
2	Gnd	Gnd
3	Vout	Vout
4	Do not Connect	MISO
5	SCL	CLK
6	Do not Connect	SS
7	Do not Connect	Do not Connect
8	SDA	MOSI

NOTES

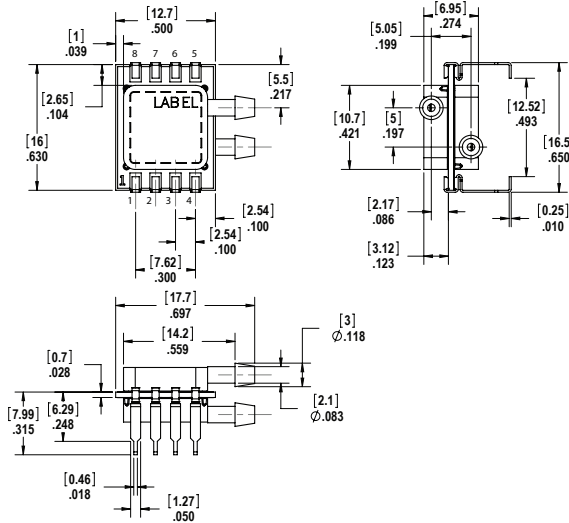
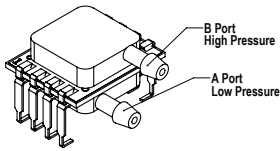
- 1) Dimensions are in inches [mm].
- 2) For suggested pad layout, see drawing: PAD-27.

All Sensors

TITLE: F-Series Package

SIZE FILE NAME  
**A** FN5D Package

Package Drawings (Cont'd)



NOTES

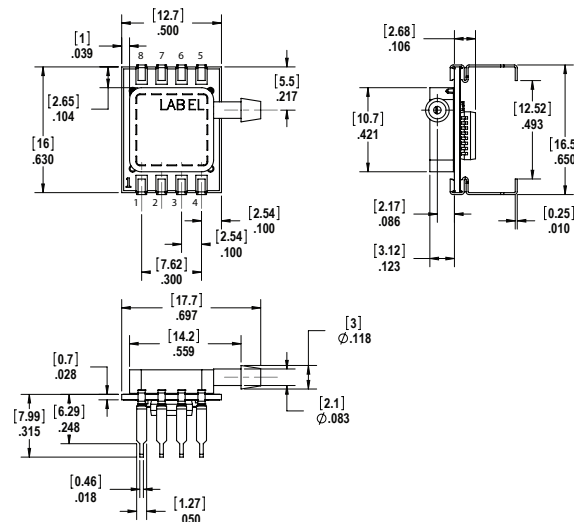
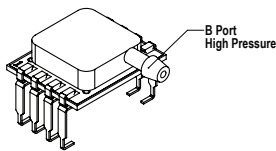
- 1) Dimensions are in inches [mm].
- 2) For suggested pad layout, see drawing: PAD-29.

Pin	I2C	SPI
	Definition	Definition
1	Vs	Vs
2	Gnd	Gnd
3	Vout	Vout
4	Do not Connect	MISO
5	SCL	CLK
6	Do not Connect	SS
7	Do not Connect	Do not Connect
8	SDA	MOSI

All Sensors

TITLE: F-Series Package

SIZE FILE NAME  
**A** F1SL Package



NOTES

- 1) Dimensions are in inches [mm].
- 2) For suggested pad layout, see drawing: PAD-29.

Pin	I2C	SPI
	Definition	Definition
1	Vs	Vs
2	Gnd	Gnd
3	Vout	Vout
4	Do not Connect	MISO
5	SCL	CLK
6	Do not Connect	SS
7	Do not Connect	Do not Connect
8	SDA	MOSI

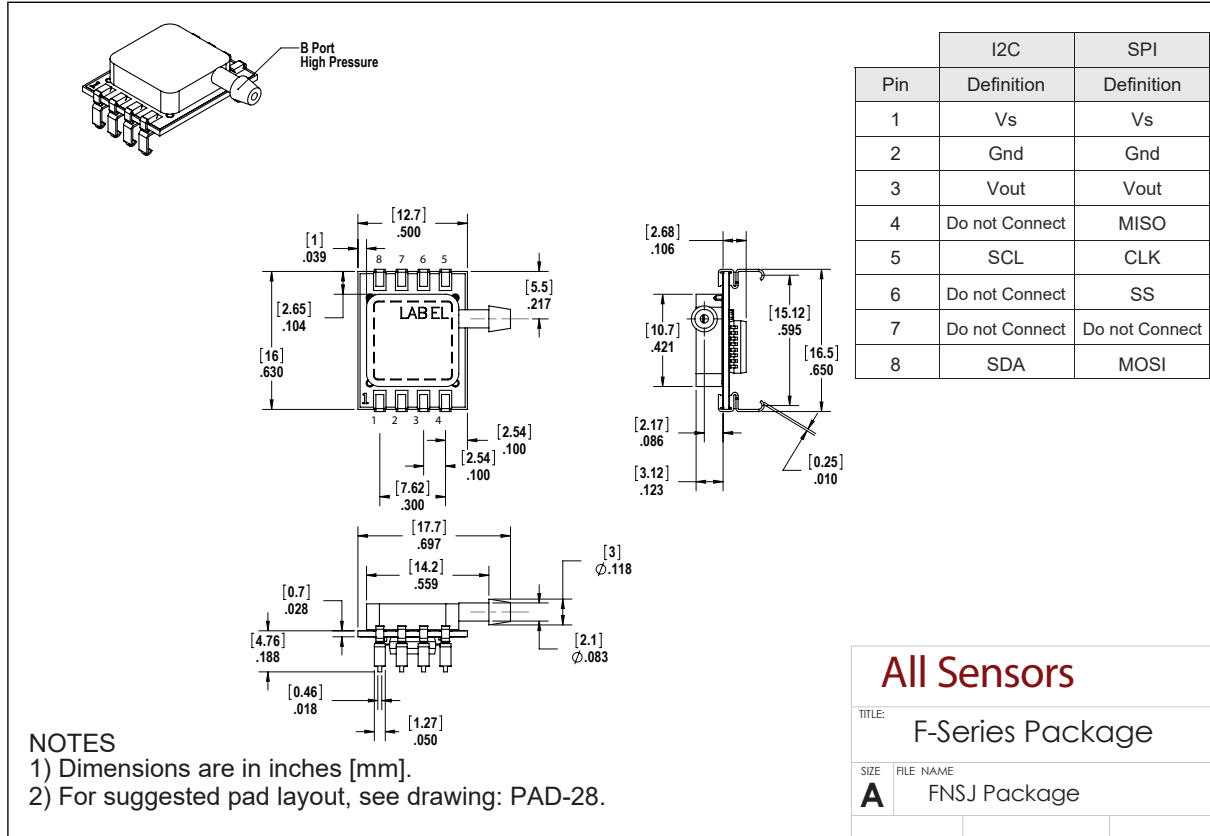
All Sensors

TITLE: F-Series Package

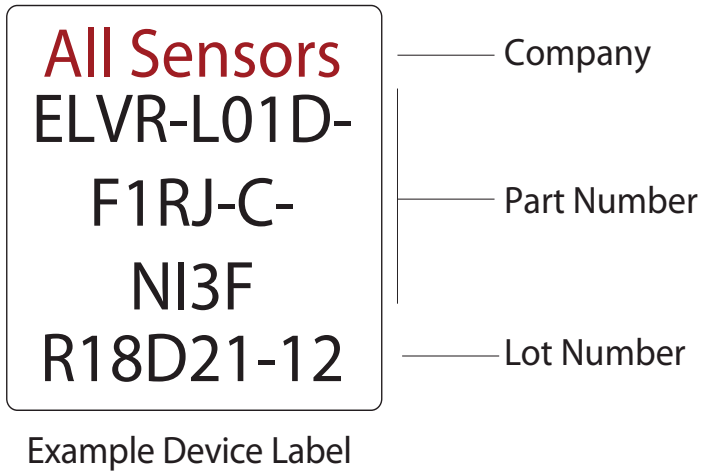
SIZE FILE NAME  
**A** FNSL Package



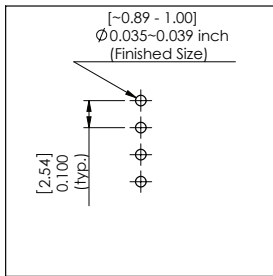
## Package Drawings (Cont'd)



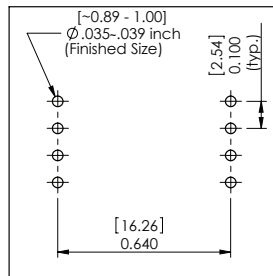
Product Labeling



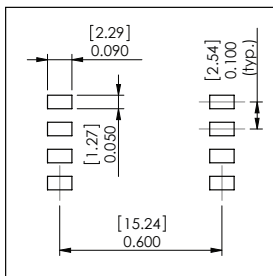
Suggested Pad Layouts



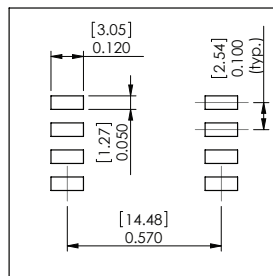
PAD-01



PAD-27



PAD-28



PAD-29

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