Honeywell

Installation Instructions for the TruStability® Board Mount Pressure Sensors

Issue 5

50063864

TSC Series, Compensated/Unamplified

±60 mbar to ±10 bar | ±6 kPa to ±1 MPa | ±1 psi to ±150 psi
Millivolt Analog Output

NSC Series, Uncompensated/Unamplified

±2.5 mbar to ±10 bar | ±250 Pa to ±1 MPa | ±1 inH_2O to ±150 psi
Millivolt Analog Output

Honeywell's TruStability® TSC Series and NSC Series are piezoresistive silicon pressure sensors offering a ratiometric analog output for reading pressure over the specified full scale pressure span and temperature range.

TSC Series:

- Temperature compensated and unamplified.
- Compensation makes it easier to integrate the sensor into a system by eliminating the need to calibrate the system over temperature and also offers reduced part-to-part variation.
- Compensated temperature range is 0 °C to 85 °C [-32 °F to 185 °F].
- Operating temperature range is -40 °C to 85 °C [-40 °F to 185 °F].
- Measures differential or gage pressures

NSC Series:

- Uncompensated and unamplified.
- Allows customers the flexibility of performing their own calibration while still benefiting from the industry-leading stability, accuracy, and repeatability that the Honeywell TruStability® Pressure Sensors provide.
- Operates as specified from -40 °C to 85 °C [-40 °F to 185 °F].
- Measures absolute, differential or gage pressures.

The absolute versions have an internal vacuum reference and an output value proportional to absolute pressure. Differential versions allow measurement of pressure between two pressure ports. Gage versions are referenced to atmospheric pressure and provide an output proportional to pressure variations from atmosphere.

The TSC Series and NSC Series sensors are intended for use with non-corrosive, non-ionic gases, such as air. Port 1 can also be used for non-corrosive, non-ionic liquids on sensors rated above 60 mbar | 6 kPa | 1 psi.

The TSC and NSC Series offer numerous package styles and mounting options, making it easier for device manufacturers to integrate the product into their applications. These sensors offer infinite resolution on the pressure signal. Frequency response is also typically limited only by the end user's system. All products are designed and manufactured according to ISO 9001.

Table 1. Absolute Maximum Ratings[1]

Characteristic	Min.	Max.	Unit
Supply voltage (V_{supply})[2]: pressure ranges ≥60 mbar | 6 kPa | 1 psi pressure ranges ≤40 mbar | 4 kPa | 20 inH_2O	 -12.0 0	 12.0 7	Vdc
Storage temperature	-40 [-40]	85 [185]	°C [°F]
Soldering time and temperature: lead solder temperature (SIP, DIP) peak reflow temperature (SMT)		 4 s max. at 250 °C [482 °F] 15 s max. at 250 °C [482 °F]	

[1]Absolute maximum ratings are the extreme limits the device will withstand without damage.

[2]Incorrect application of supply voltage or ground to the wrong pin may cause electrical failure.

Table 2. Operating Specifications

Characteristic	Min.	Typ.	Max.	Unit
Supply voltage (V_{supply}):[1, 2] pressure ranges ≥60 mbar | 6 kPa | 1 psi pressure ranges ≤40 mbar | 4 kPa | 20 H_2O	 1.5 2.7	 5.0 5.0	 12.0 6.5	Vdc
Supply current (at 5.0 Vdc supply) TSC Series NSC Series	 — —	 0.6 1.5	 1 2.2	mA
Operating temperature range[3]	-40 [-40]	—	85 [185]	°C [°F]
Compensated temperature range[4]	0 [32]	—	85 [185]	°C [°F]
Startup time	—	—	5	ms
TSC Series output resistance	—	2.5	—	kOhm

[1]Ratiometricity of the sensor (the ability of the device output to scale to the supply voltage) is achieved within the specified operating voltage.

[2]Incorrect application of supply voltage or ground to the wrong pin may cause electrical failure.

[3]Operating temperature range: The temperature range over which the sensor will produce an output proportional to pressure.

[4]Compensated temperature range: The temperature range over which the sensor will produce an output proportional to pressure within the specified performance limits.

Table 3. Environmental Specifications

Characteristic	Parameter
Humidity	0% to 95% RH, non-condensing
Vibration	MIL-STD-202F, Method 214A, Condition 1E (15 g, 10 Hz to 2 kHz)
Shock	MIL-STD-202F, Method 213B, Condition F (100 g, 6 ms duration)
Life[1]	1 million pressure cycles minimum
Solder reflow	J-STD-020-D MSL1 (unlimited shelf life when stored at less than 30 °C and 85 %RH)

[1]Life may vary depending on the specific application in which the sensor is utilized.

Table 4. Wetted Materials[1]

Component	Port 1 (Pressure Port)	Port 2 (Reference Port)
Ports and covers	high temperature polyamide	high temperature polyamide
Substrate	alumina ceramic	alumina ceramic
Adhesives	epoxy, RTV	epoxy, RTV
Electronic components	silicon	silicon, glass, gold

[1]Contact Honeywell Customer Service for detailed material information.

CAUTION
PRODUCT DAMAGE

- Ensure liquid media is applied to Port 1 only; Port 2 is not compatible with liquids.
- Ensure liquid media contains no particulates. All TruStability® sensors are dead-ended devices. Particulates can accumulate inside the sensor, causing damage or affecting sensor output.
- Recommend that the sensor be positioned with Port 1 facing downwards; any particulates in the system are less likely to enter and settle within the pressure sensor if it is in this position.
- Ensure liquid media does not create a residue when dried; build-up inside the sensor may affect sensor output. Rinsing of a dead-ended sensor is difficult and has limited effectiveness for removing residue.
- Ensure liquid media are compatible with wetted materials. Non-compatible liquid media will degrade sensor performance and may lead to sensor failure.

Failure to comply with these instructions may result in product damage.

Figure 1. DIP Package Dimensional Drawings (For reference only: mm [in])

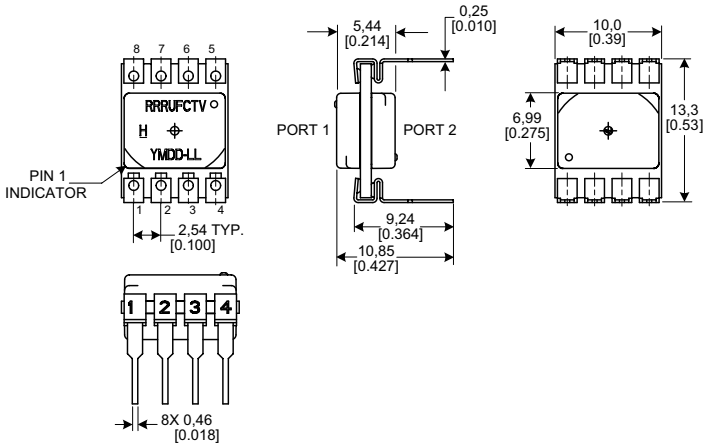
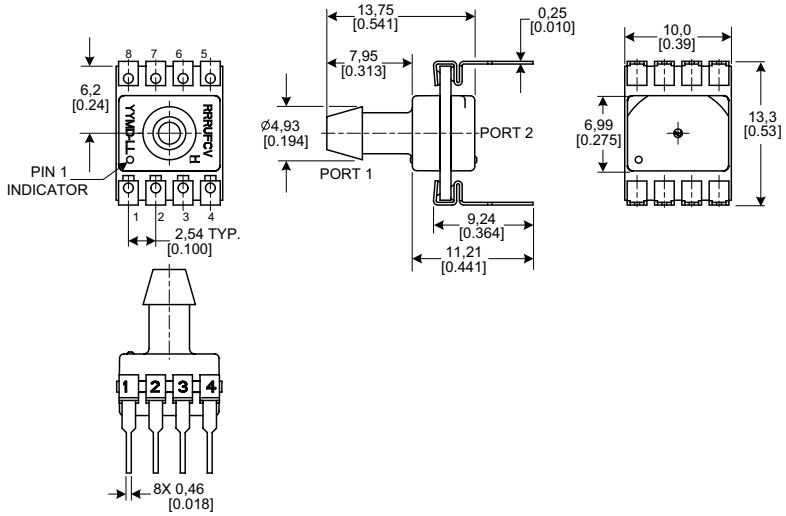
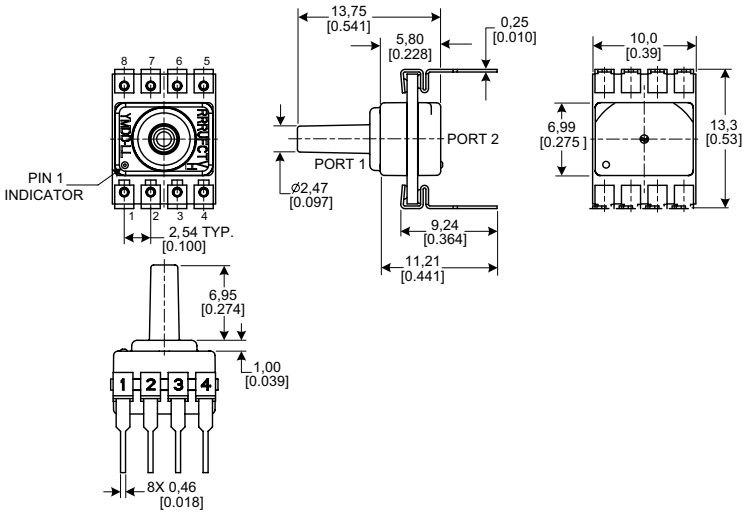
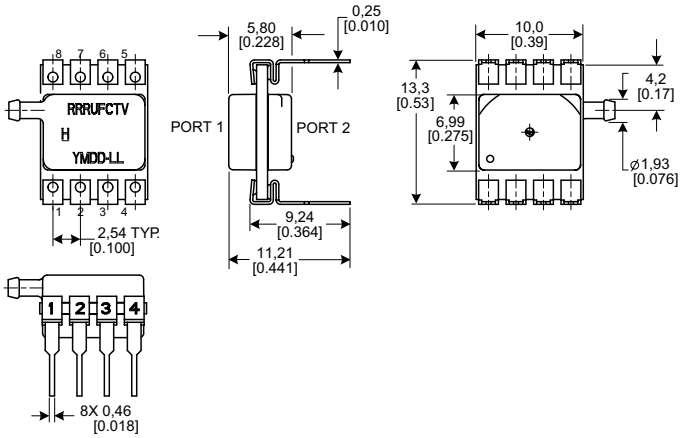
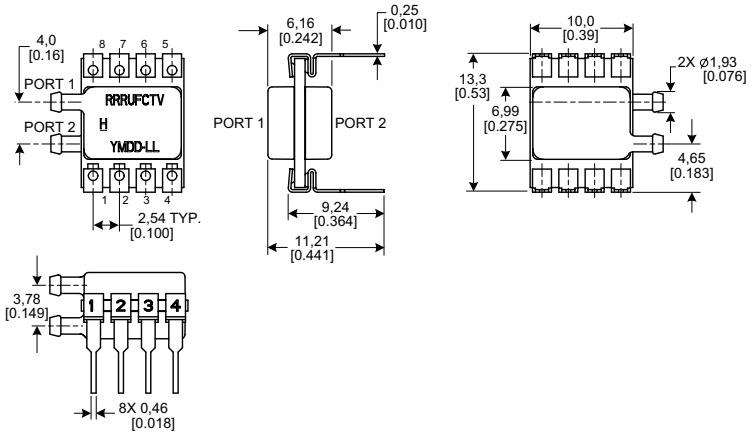
	Dimensions
DIP NN: No ports 	
DIP AN: SIngle axial barbed port 	
DIP LN: Single axial barbless port 	

Figure 1. DIP Package Dimensional Drawings (continued)

	Dimensions
DIP RN: Single radial barbed port	



DIP RR: Dual radial barbed ports, same side	



DIP DR: Dual radial barbed ports, opposite sides	

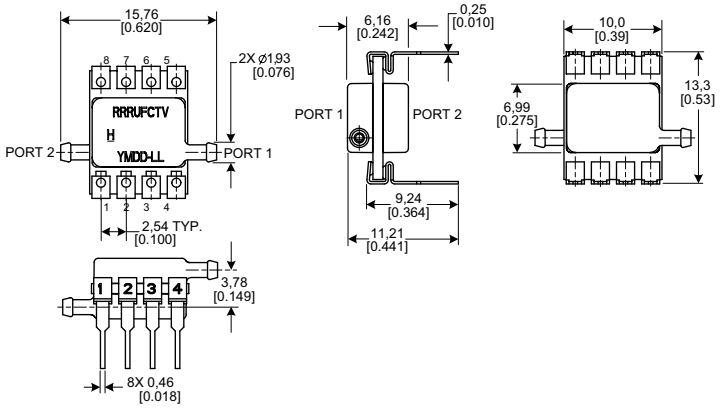


Figure 1. DIP Package Dimensional Drawings (continued)

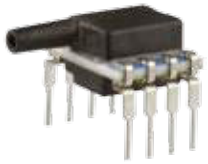
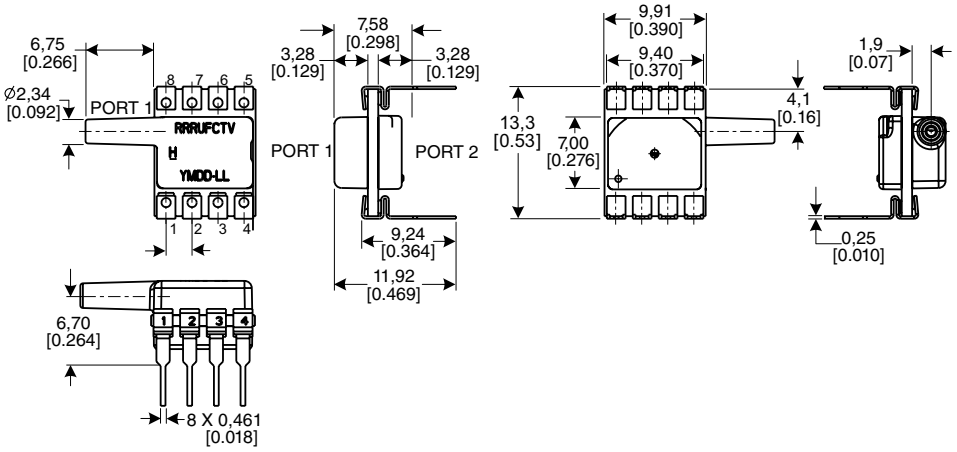
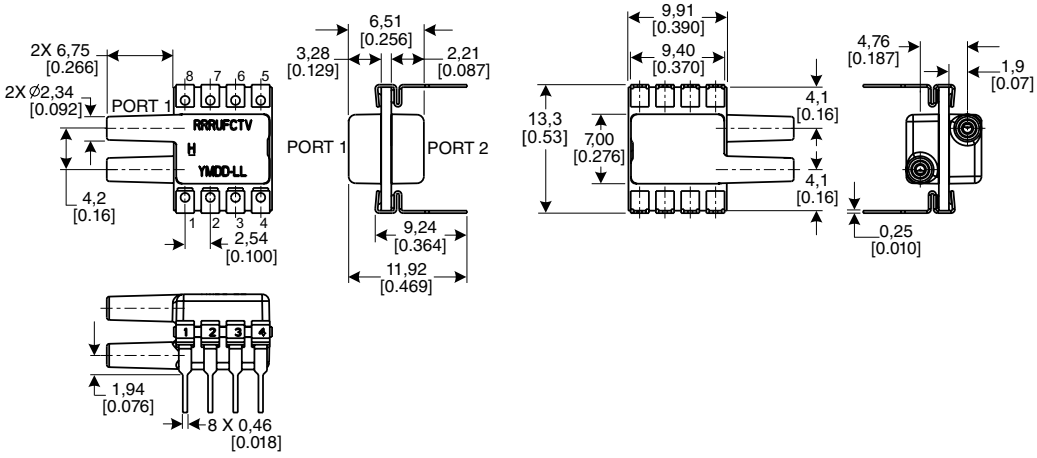
	Dimensions
DIP JN: Single radial barbless port 	
DIP JJ: Dual radial radial barbless ports, same side 	

Figure 2. SMT Package Dimensional Drawings (For reference only: mm [in])

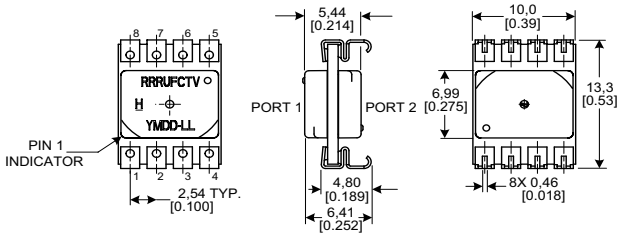
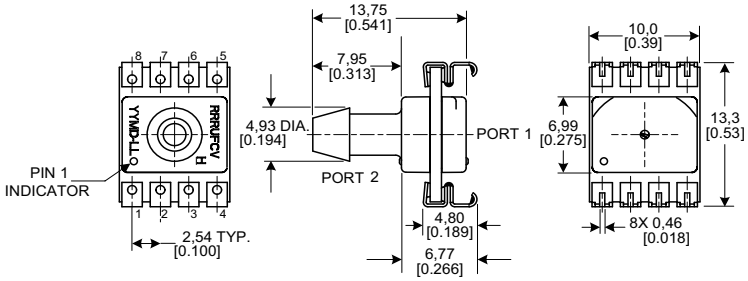
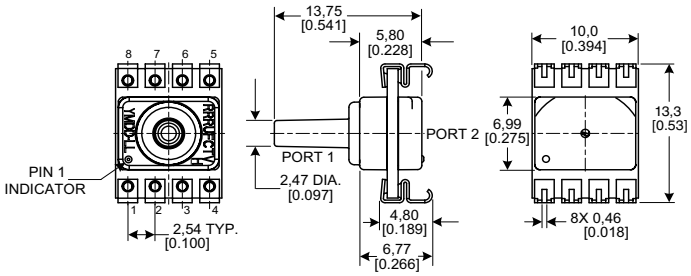
	Dimensions
SMT NN: No ports 	

Figure 2. SMT Package Dimensional Drawings (continued)

	Dimensions
SMT AN: Single axial barbless port	



SMT LN: Single axial barbless port	



SMT RN: Single radial barbed port	

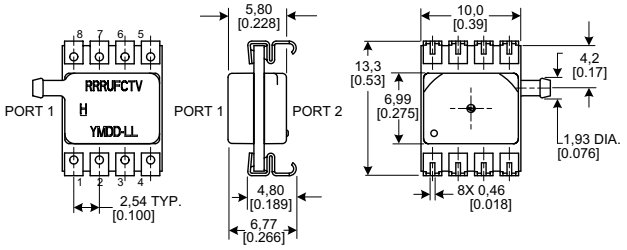


Figure 2. SMT Package Dimensional Drawings (continued)

	Dimensions
SMT RR: Dual radial barbed ports, same side	
SMT DR: Dual radial barbed ports, opposite sides	
SMT JN: Single radial barbless port	

Figure 2. SMT Package Dimensional Drawings (continued)

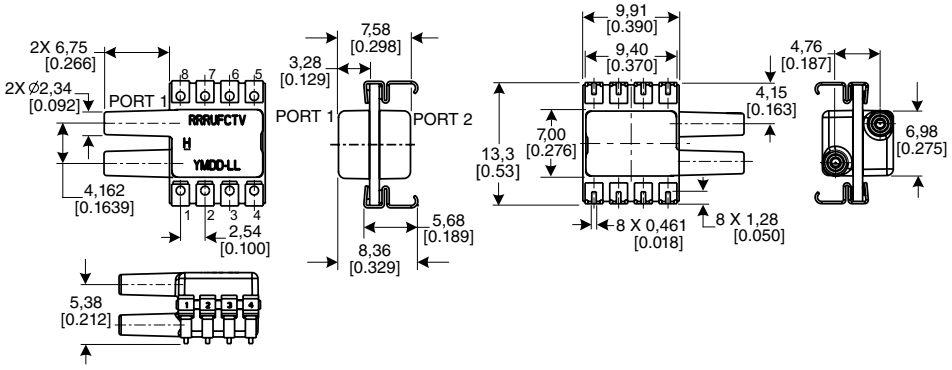
	Dimensions
SMT JJ: Dual radial barbless ports, same side 	

Figure 3. SIP Package Dimensional Drawings (For reference only: mm [in].)

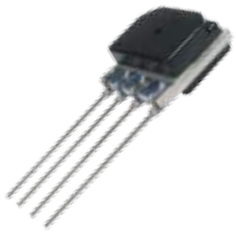
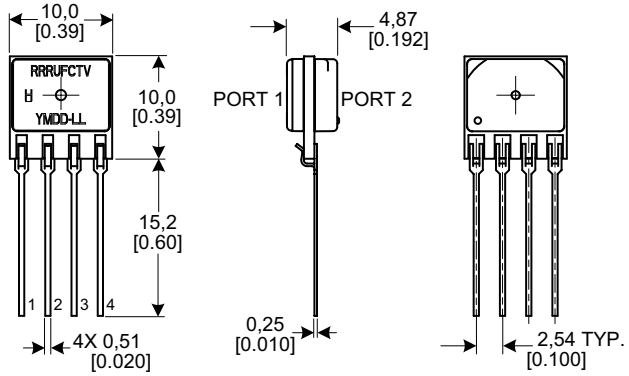
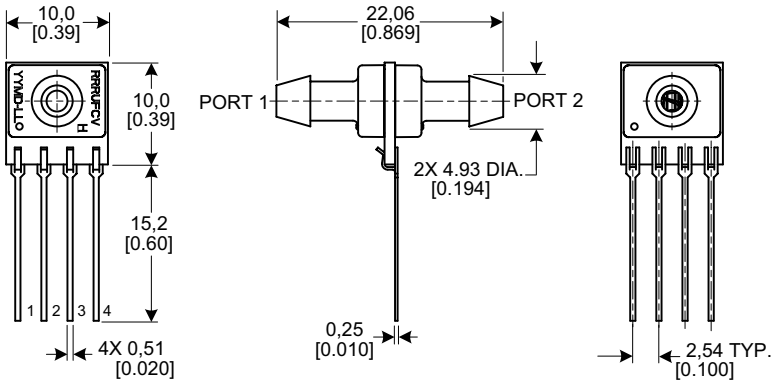
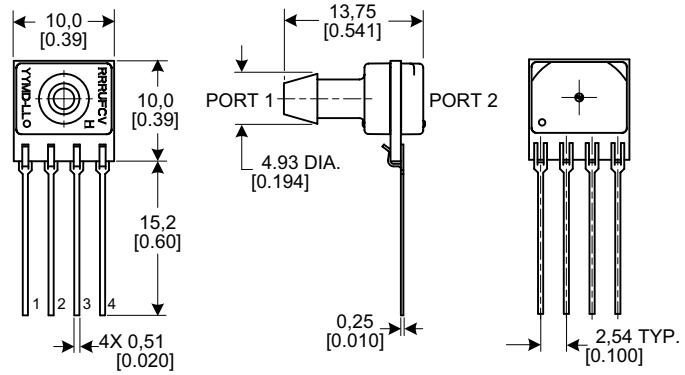
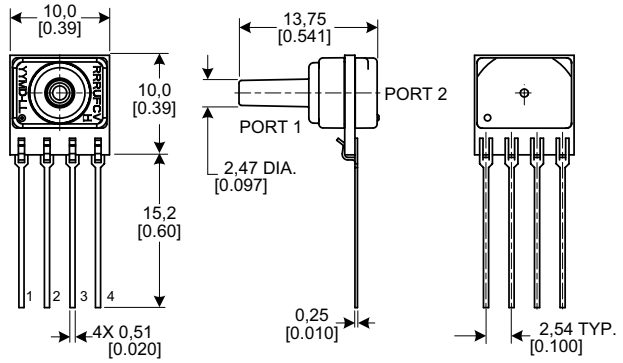
	Dimensions
SIP NN: No ports 	
SIP AA: Dual axial barbed ports, opposite sides 	

Figure 3. SIP Package Dimensional Drawings (continued)

	Dimensions
SIP AN: Single axial barbed port	



SIP LN: Single axial barbless port	



SIP FF: Fastener mount, dual axial barbed ports, opposite sides	

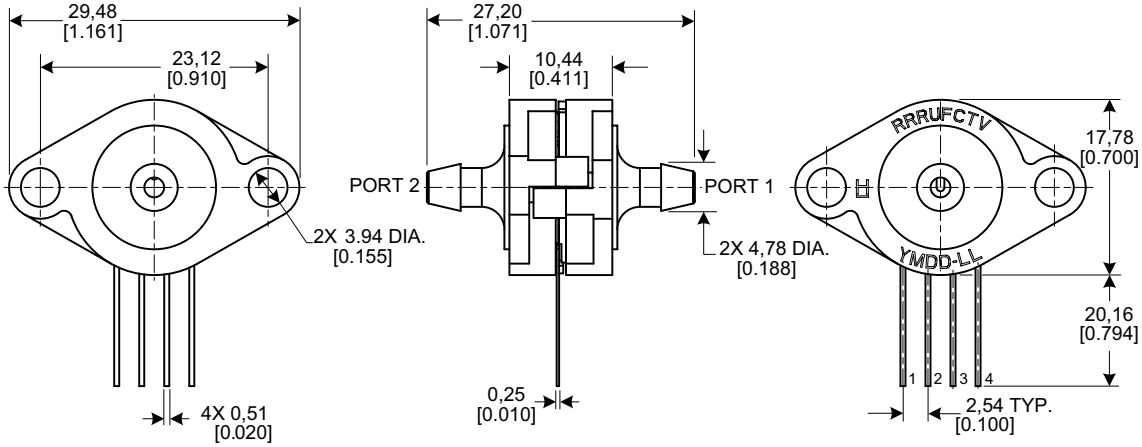
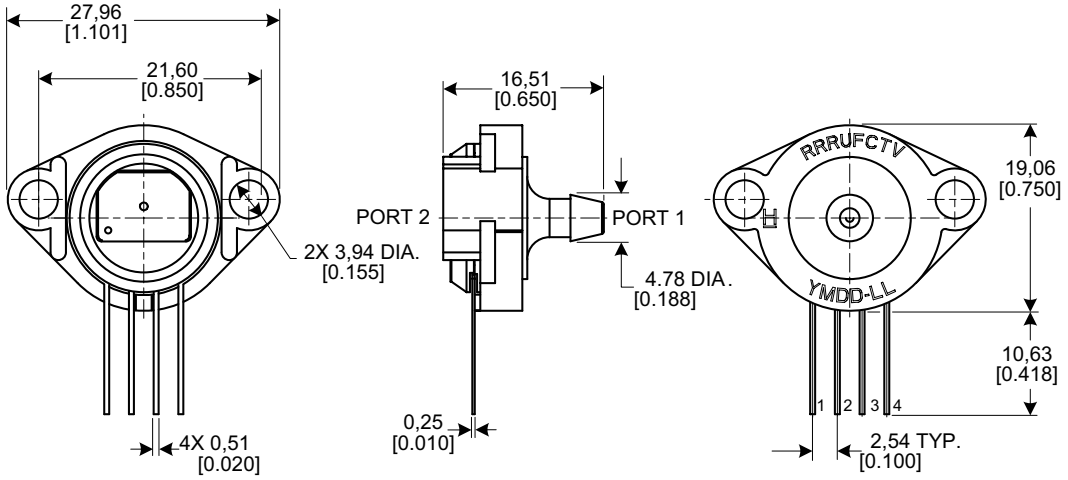


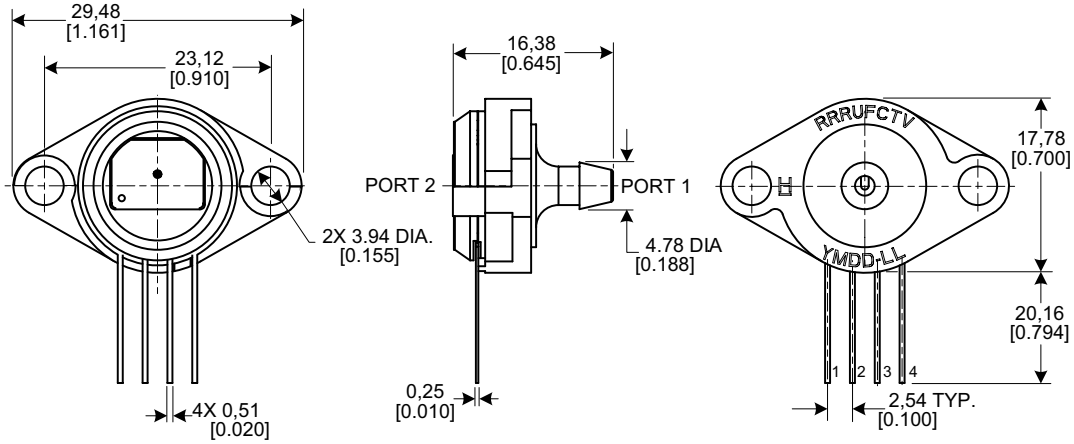
Figure 3. SIP Package Dimensional Drawings (continued)

Dimensions

SIP FN: Fastener mount, single axial barbed port



SIP GN: Ribbed fastener mount, single axial barbed port



SIP NB: Fastener mount, dual axial ports, same side