

# INTEGRATED PRESSURE TRANSDUCER

Honeywell's Integrated Pressure Transducer (IPT) provides high accuracy pressure data in an industry-standard SPI digital format. The core of the IPT is a proven Honeywell silicon piezoresistive pressure sensor with both pressure and temperature-sensitive elements. The IPT is small and lightweight and can be easily integrated by the user into a wide variety of applications that require high performance in a small package. Applying the coefficients stored in the on-board EEPROM to the normalized IPT pressure and temperature output yields highly accurate and stable pressure readings over the -40 to 85°C compensated temperature range.

## FEATURES AND BENEFITS

### HIGH ACCURACY OVER A WIDE TEMPERATURE RANGE

- $\pm 0.04\%$  FS Total Error Band (absolute pressure units)  $\pm 0.10\%$  FS Total Error Band (gauge/differential pressure) from -40 to +85°C. <sup>(1)</sup>

### DIGITAL SPI OUTPUT – INDUSTRY STANDARD INTERFACE

- Ready communication between  $\mu$ Controller/ $\mu$ Processor and the IPT.

### STORED CORRECTION COEFFICIENTS IN EEPROM

- Ready to use: No additional pressure and temperature calibration necessary.
- No additional signal compensation needed to achieve a highly accurate pressure reading.

### SMALL AND VERSATILE

- Volume  $\sim 1 \text{ in}^3$  (16 cm<sup>3</sup>)
- Lightweight – Less than 10 grams
- Media Interface – Handles most dry gas media

## APPLICATIONS

- Air Data Computers
- Altimeters
- Cabin Air Pressure
- Engine Test Systems
- Flight Test Systems
- Meteorology
- Flow and Pressure Calibrators
- Instrumentation and Analytical Equipment
- Research and Developments



**Honeywell**

## SPECIFICATIONS

### PERFORMANCE <sup>(1)</sup>

|                     |   |
|---------------------|---|
| Total Error         | (from -40 to 85°C); ±0.04%FS absolute; ±0.10%FS gauge, differential; ±0.20%FS 1 psi gauge |
| Temperature Range   | Operating -40 to 85°C (-40 to 185°F); Storage: -55 to 125°C (-67 to 257°F)                |
| Long Term Stability | 0.025% FS max per year typical  |

### MECHANICAL

|                        |   |
|------------------------|---|
| Pressure Ranges & Type | See Ordering Information  |
| Pressure Units         | PSI <sup>(2)</sup>  |
| Media Compatibility    | Suitable for non-condensing, non-corrosive, and non-combustible gases |
| Weight <sup>(3)</sup>  | ≈ 8.0 grams (absolute); ≈ 9.7 grams (gauge, differential)             |

### ELECTRICAL

|                     |   |
|---------------------|---|
| Output              | 24-bit pressure value; 16-bit temperature value; 256 x 8 EEPROM configuration |
| Power Requirements  | Supply Voltage: 4 to 12 VDC   |
| Current Consumption | 6 mA typical, 7.5 mA max  |
| Interface           | 3.3V SPI (mode 1,1) SCLK ≤5 Mhz   |
| Sample Rate         | 166 samples/second  |

### ENVIRONMENTAL <sup>(3)</sup>

|                  |  |
|------------------|--|
| Overpressure     | 3x FS  |
| Burst Pressure   | 3x FS  |
| Mechanical Shock | DO-160E Section 7.0, Category A, Figure 7.2, Operational Standard        |
| Thermal Shock    | Storage Temperature Cycling per JESD22-104, Section 5.0: -55°C to +125°C |
| Vibration        | DO-160E Section 8, Category H, Aircraft Type 2, Aircraft Zones 1 & 2     |
| RoHS             | Compliant  |

<sup>(1)</sup> Total Error is the sum of worst-case linearity, repeatability, hysteresis, thermal effects, and calibration errors over the operating temperature range. Accuracy is only achieved after applying the correction coefficients and algorithm as shown in section 3.2. of User's Manual (FS = Full Scale). For total error calculations of differential units, "Full Scale" is the pressure difference between the minimum and maximum pressures. For example, full scale for a 1 psid IPT is 2 psi (-1 to +1 psi). Pressure range 1psi gauge has total error of ±0.20% FS.

<sup>(2)</sup> After applying the correction coefficients stored in EEPROM, the resultant pressure reading is expressed in PSI (pounds per square inch).

<sup>(3)</sup> Not including mounting hardware.

## ORDERING INFORMATION

### IPT INTEGRATED PRESSURE TRANSDUCER

#### FULL SCALE PRESSURE RANGE

|      | Absolute | Gauge                | Differential |
|------|----------|----------------------|--------------|
| 0001 | N/A      | 1 PSI <sup>(1)</sup> | ±1 PSI       |
| 0002 | N/A      | N/A                  | ±2 PSI       |
| 0005 | N/A      | 5 PSI                | N/A          |
| 0020 | 20 PSI   | 20 PSI               | N/A          |
| 0050 | 50 PSI   | N/A                  | N/A          |

| TYPE     |              | P1 PRESSURE           | P2 PRESSURE           |
|----------|--------------|-----------------------|-----------------------|
| <b>A</b> | Absolute     | 0 (vacuum) to FS      | n/A                   |
| <b>G</b> | Gauge        | Reference to FS       | Reference             |
| <b>D</b> | Differential | +FS to -FS rel. to P2 | +FS to -FS rel. to P1 |

#### DIGITAL INTERFACE VOLTAGE

|           |           |
|-----------|-----------|
| <b>33</b> | 3.3 Volts |
|-----------|-----------|

#### POWER SUPPLY

|          |                    |
|----------|--------------------|
| <b>R</b> | Regulated, 4-12Vdc |
|----------|--------------------|

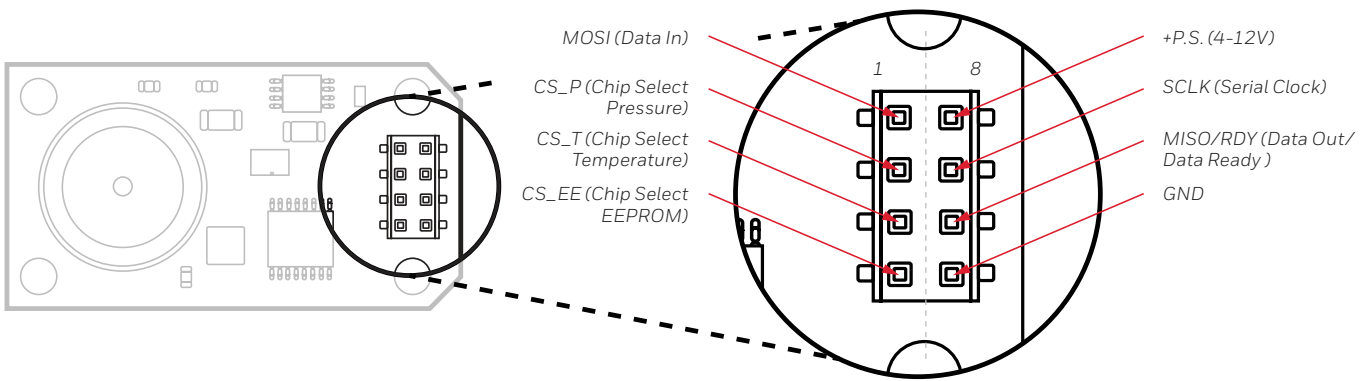
#### OPTIONS

|          |                                  |
|----------|----------------------------------|
| <b>A</b> | Demonstration Kit <sup>(4)</sup> |
| <b>E</b> | Certificate of Conformance       |

**IPT 0020 A 33 R A**

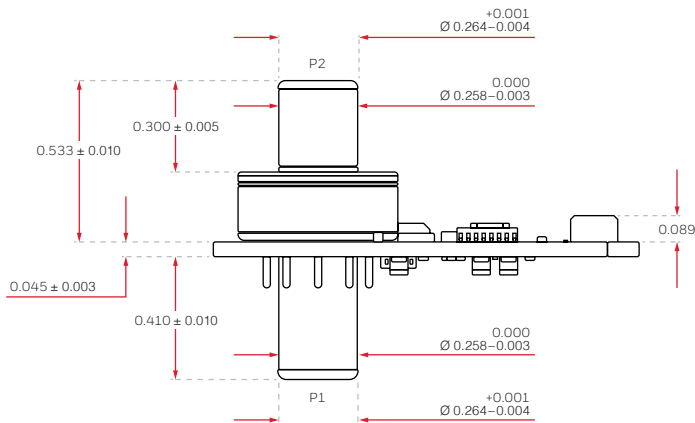
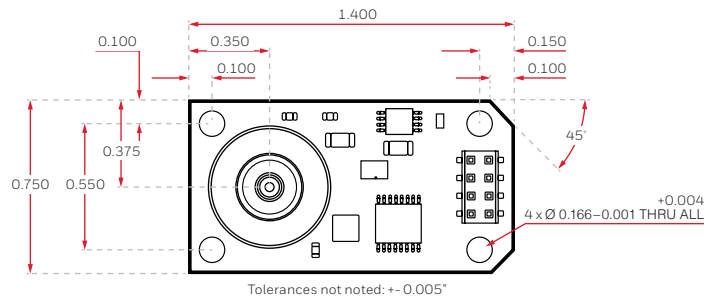
<sup>(4)</sup> Demonstration kit includes RS-232 Cable, Demo Board, AC adapter, MS Windows Software, and User's Manual.

## CONNECTOR DIMENSIONS

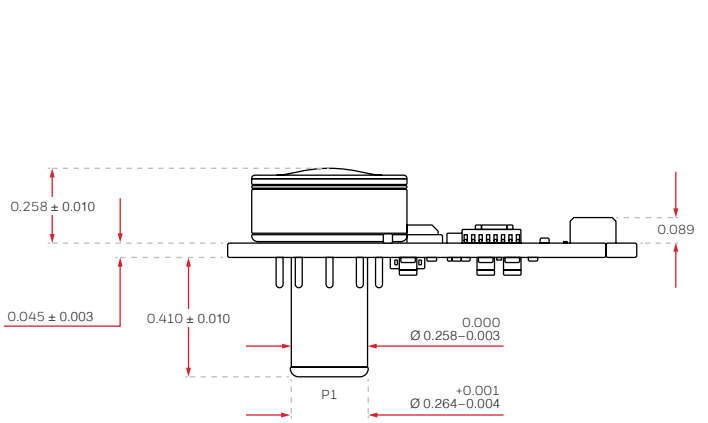
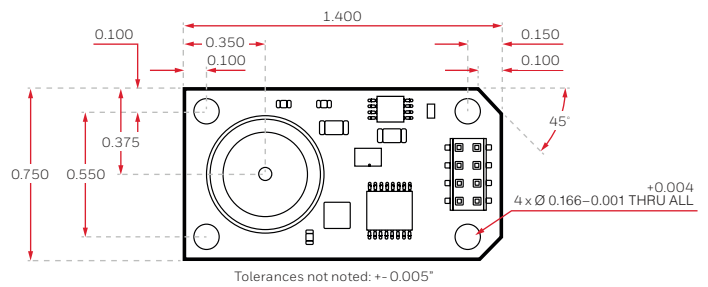


## IPT DIMENSIONS

### IPT0001D33R-E



### IPT0020A33R-E



### ESD (electrostatic discharge) sensitive device

Damage may occur when subjected to high energy ESD. Proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

### EOS (electrical overstress) sensitive device

Damage may occur when subjected to EOS. Do not exceed specified ratings to avoid performance degradation or loss of functionality.

### For more information

[aerospace.honeywell.com/en/learn/products/sensors/precision-pressure](http://aerospace.honeywell.com/en/learn/products/sensors/precision-pressure)

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