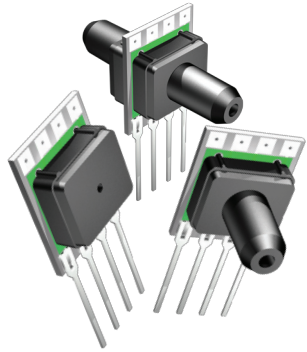


# Miniature Pressure Sensors

Prime Grade  
Pressure Sensors



## Features

- 0 to 0.3 PSI to 0 to 100 PSI Pressure Ranges
- Highest accuracy version
- Temperature Compensated
- Calibrated Zero and Span

## Applications

- Medical Instrumentation
- Environmental Controls
- HVAC

## General Description

The Miniature series pressure sensors are based upon a proprietary technology to reduce the size of the sensor and yet maintain a high level of performance. This model provides a calibrated millivolt output with superior output characteristics. In addition the sensor utilizes a silicon, micromachined, stress concentration enhanced structure to provide a very linear output to measured pressure.

These calibrated and temperature compensated sensors give an accurate and stable output over a wide temperature range. This series is intended for use with non-corrosive, non-ionic working fluids such as air, dry gases and the like. The PRIME GRADE is the highest accuracy version of the millivolt output pressure sensors.

The output of the device is ratiometric to the supply voltage and operation from any D.C. supply voltage.

## Pressure Sensor Characteristics Maximum Ratings

|                                          |         |
|------------------------------------------|---------|
| Supply Voltage, $V_s$                    | 16 Vdc  |
| Common-mode pressure                     | 50 psig |
| Lead Temperature<br>(soldering 2-4 sec.) | 270°C   |

## Environmental Specifications

|                    |                                 |
|--------------------|---------------------------------|
| Temperature Ranges |                                 |
| Compensated        | 0 to 70° C                      |
| Operating          | -25 to 85° C                    |
| Storage            | -40 to 125° C                   |
| Humidity Limits    | 0 to 95% RH<br>(non condensing) |

## Approvals

|                                                                     |      |                                                                     |      |                                                                     |      |                                                                     |      |
|---------------------------------------------------------------------|------|---------------------------------------------------------------------|------|---------------------------------------------------------------------|------|---------------------------------------------------------------------|------|
| MKT                                                                 | DATE | MFG                                                                 | DATE | ENG                                                                 | DATE | QA                                                                  | DATE |
| <input type="checkbox"/> As Is <input type="checkbox"/> With Change |      | <input type="checkbox"/> As Is <input type="checkbox"/> With Change |      | <input type="checkbox"/> As Is <input type="checkbox"/> With Change |      | <input type="checkbox"/> As Is <input type="checkbox"/> With Change |      |

All Sensors

DS-0110 Rev E

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## Standard Pressure Ranges

| No Pressure Port: CFNS | Single Pressure Port: CPNS | Dual Pressure Port: CPPS |                            |                |
|------------------------|----------------------------|--------------------------|----------------------------|----------------|
| Part Number            | Part Number                | Part Number              | Operating Pressure         | Proof Pressure |
| 0.3 PSI-G-PRIME-MINI   | 0.3 PSI-GF-PRIME-MINI      | 0.3 PSI-D-PRIME-MINI     | 0 to 0.3 PSI               | 3 PSI          |
| 10 INCH-G-PRIME-MINI   | 10 INCH-GF-PRIME-MINI      | 10 INCH-D-PRIME-MINI     | 0 to 10 inH <sub>2</sub> O | 5 PSI          |
| 1 PSI-G-PRIME-MINI     | 1 PSI-GF-PRIME-MINI        | 1 PSI-D-PRIME-MINI       | 0 to 1 PSI                 | 10 PSI         |
| 5 PSI-G-PRIME-MINI     | 5 PSI-GF-PRIME-MINI        | 5 PSI-D-PRIME-MINI       | 0 to 5 PSI                 | 20 PSI         |
| 15 PSI-A-PRIME-MINI    | 15 PSI-AF-PRIME-MINI       |                          | 0 to 15 PSIA               | 60 PSIA        |
| 15 PSI-G-PRIME-MINI    | 15 PSI-GF-PRIME-MINI       | 15 PSI-D-PRIME-MINI      | 0 to 15 PSI                | 60 PSI         |
| 30 PSI-A-PRIME-MINI    | 30 PSI-AF-PRIME-MINI       |                          | 0 to 30 PSIA               | 60 PSIA        |
| 30 PSI-G-PRIME-MINI    | 30 PSI-GF-PRIME-MINI       | 30 PSI-D-PRIME-MINI      | 0 to 30 PSI                | 60 PSI         |
| 100 PSI-A-PRIME-MINI   | 100 PSI-AF-PRIME-MINI      |                          | 0 to 100 PSIA              | 150 PSIA       |
| 100 PSI-G-PRIME-MINI   | 100 PSI-GF-PRIME-MINI      |                          | 0 to 100 PSI               | 150 PSI        |

### Performance Characteristics for: 0.3 PSI-G-PRIME-MINI , 0.3 PSI-GF-PRIME-MINI , 0.3 PSI-D-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 19.0    | 20.0    | 21.0    | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

### Performance Characteristics for: 10 INCH-G-PRIME-MINI , 10 INCH-GF-PRIME-MINI , 10 INCH-D-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 19.0    | 20.0    | 21.0    | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

### Performance Characteristics for: 1 PSI-G-PRIME-MINI , 1 PSI-GF-PRIME-MINI , 1 PSI-D-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 17.82   | 18.0    | 18.18   | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

Performance Characteristics for: 5 PSI-G-PRIME-MINI , 5 PSI-GF-PRIME-MINI , 5 PSI-D-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 59.4    | 60.0    | 60.6    | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.1     | 0.25    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

Performance Characteristics for: 15 PSI-A-PRIME-MINI , 15 PSI-AF-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero absolute pressure     | --      | --      | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.1     | 0.3     | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

Performance Characteristics for: 15 PSI-G-PRIME-MINI , 15 PSI-GF-PRIME-MINI , 15 PSI-D-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

Performance Characteristics for: 30 PSI-A-PRIME-MINI , 30 PSI-AF-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero absolute pressure     | --      | --      | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |



#### Performance Characteristics for: 30 PSI-G-PRIME-MINI , 30 PSI-GF-PRIME-MINI , 30 PSI-D-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 89.1    | 90.0    | 90.9    | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

#### Performance Characteristics for: 100 PSI-A-PRIME-MINI, 100 PSI-AF-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 99.0    | 100.0   | 101.0   | mV    |
| Offset Voltage @ zero absolute pressure     | --      | --      | ±0.5    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

#### Performance Characteristics for: 100 PSI-G-PRIME-MINI , 100 PSI-GF-PRIME-MINI

| Parameter, note 1                           | Minimum | Nominal | Maximum | Units |
|---------------------------------------------|---------|---------|---------|-------|
| Output Span, note 4                         | 99.0    | 100.0   | 101.0   | mV    |
| Offset Voltage @ zero differential pressure | --      | --      | ±0.3    | mV    |
| Offset Temperature Shift (0°C-70°C), note 2 | --      | --      | ±250    | uV    |
| Linearity, hysteresis error, note 3         | --      | 0.15    | 0.30    | %FSS  |
| Span Temperature Shift (0°C-70°C), note 2   | --      | --      | ±1.0    | %FSS  |

#### Specification Notes

NOTE 1: ALL PARAMETERS ARE MEASURED AT 12.0 VOLT EXCITATION, FOR THE NOMINAL FULL SCALE PRESSURE AND ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED. PRESSURE MEASUREMENTS ARE WITH POSITIVE PRESSURE APPLIED TO PORT B.

NOTE 2: SHIFT IS RELATIVE TO 25°C.

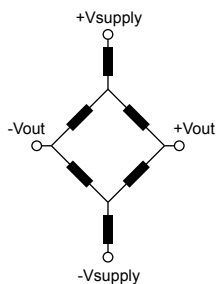
NOTE 3: MEASURED AT ONE-HALF FULL SCALE RATED PRESSURE USING BEST STRAIGHT LINE CURVE FIT.

NOTE 4: THE SPAN IS THE ALGEBRAIC DIFFERENCE BETWEEN FULL SCALE OUTPUT VOLTAGE AND THE OFFSET VOLTAGE.

**Pressure Response: for any pressure applied the response time to get to 90% of pressure applied is typically less than 100 useconds.**

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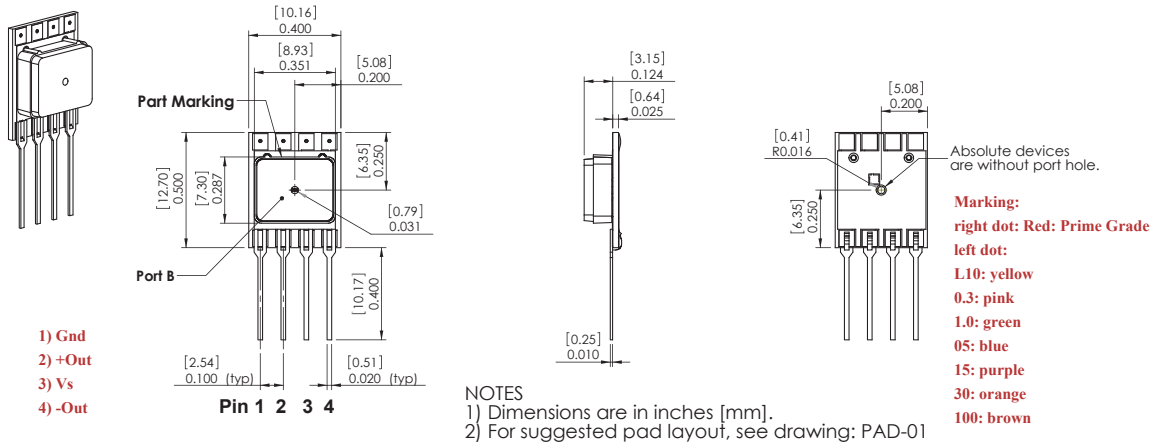
#### Equivalent Circuit



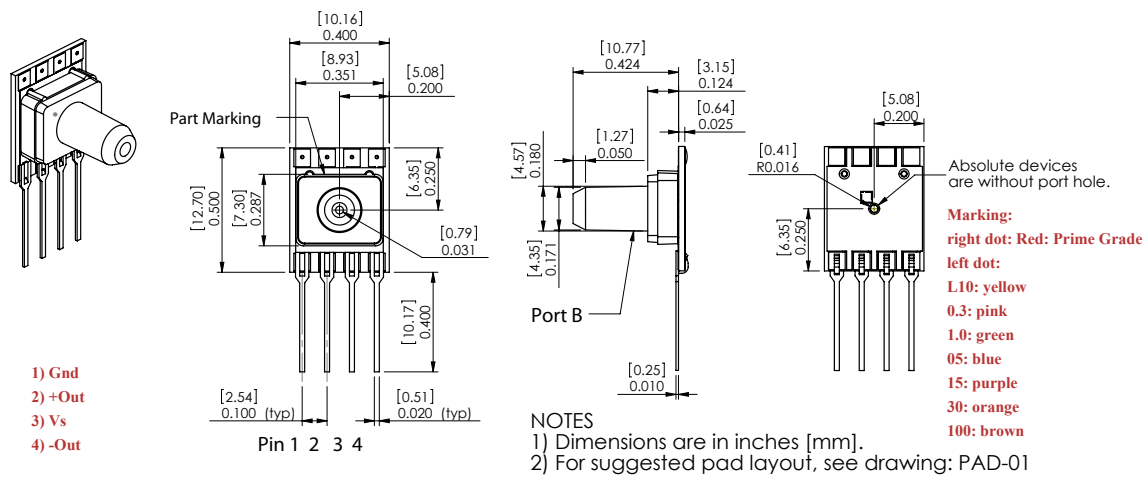
Input Resistance      5.0 k ohm  
Output Resistance      3.0 k ohm

## Packages

### CFNS Package



### CPNS Package



### CPPS Package

