17 and 47 UltraStable™

DESCRIPTION

The 17 and 47 UltraStable™ are high performance, temperature compensated, piezoresistive silicon pressure sensors packaged in a TO-8 configuration. It uses Measurement Specialties’ proprietary UltraStable™ die to provide excellent performance and long-term stability over wide temperatures.

Gage and absolute pressure ranges from 0-15 to 0-250 psi are available. Integral temperature compensation is provided over a range of -20°C to +85°C using laser-trimmed resistors. An additional laser-trimmed resistor is included to normalize pressure sensitivity variations by programming the gain of an external differential amplifier. This provides sensitivity interchangeability of ±1%.

Please refer to 13 and 43 for information on products with operating pressures less than 0-15 psi.

FEATURES

- TO-8 Package
- -20°C to +85°C Compensated Temperature Range
- ±0.1% Non Linearity
- 1.0% Interchangeable Span (provided by gain set resistor)
- Solid State Reliability

APPLICATIONS

- Medical Instruments
- Process Control
- Factory Automation
- Altitude Measurement
- Vacuum Measurement
- Handheld Calibrators

STANDARD RANGES

<table>
<thead>
<tr>
<th>Range</th>
<th>psig</th>
<th>psia</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 15</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>0 to 30</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>0 to 50</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>0 to 100</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>0 to 250</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>
## PERFORMANCE SPECIFICATIONS

**Supply Current:** 1.5 mA  
**Ambient Temperature:** 25°C (unless otherwise specified)  

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span</td>
<td>75</td>
<td>100</td>
<td>150</td>
<td>mV</td>
<td>1</td>
</tr>
<tr>
<td>Zero Pressure Output</td>
<td>-2</td>
<td>2</td>
<td></td>
<td>mV</td>
<td></td>
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<tr>
<td>Pressure Non Linearity</td>
<td>-0.1</td>
<td>±0.05</td>
<td>0.1</td>
<td>%Span</td>
<td>2</td>
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<tr>
<td>Pressure Hysteresis</td>
<td>-0.1</td>
<td>±0.01</td>
<td>0.1</td>
<td>%Span</td>
<td></td>
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<tr>
<td>Input Resistance</td>
<td>2200</td>
<td>4000</td>
<td>5800</td>
<td>Ω</td>
<td></td>
</tr>
<tr>
<td>Output Resistance</td>
<td>4200</td>
<td></td>
<td></td>
<td>Ω</td>
<td></td>
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<tr>
<td>Temperature Error – Span</td>
<td>-0.5</td>
<td>±0.3</td>
<td>0.5</td>
<td>%Span</td>
<td>3</td>
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<tr>
<td>Temperature Error – Zero</td>
<td>-0.5</td>
<td>±0.1</td>
<td>0.5</td>
<td>%Span</td>
<td>3</td>
</tr>
<tr>
<td>Temperature Coefficient – Resistance</td>
<td></td>
<td>0.15</td>
<td></td>
<td>%/ºC</td>
<td>3</td>
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<tr>
<td>Thermal Hysteresis – Zero</td>
<td>±0.05</td>
<td></td>
<td></td>
<td>%Span</td>
<td>3</td>
</tr>
<tr>
<td>Short Term Stability (Offset &amp; Span)</td>
<td>±0.05</td>
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<td>%Span</td>
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<tr>
<td>Long Term Stability (Offset &amp; Span)</td>
<td>±0.1</td>
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<td>%Span</td>
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<tr>
<td>Supply Current</td>
<td>0.5</td>
<td>1.5</td>
<td>2.0</td>
<td>mA</td>
<td>5</td>
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<tr>
<td>Response Time (10% to 90%)</td>
<td>1.0</td>
<td></td>
<td></td>
<td>mS</td>
<td>6</td>
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<tr>
<td>Output Noise (10Hz to 1kHz)</td>
<td>1.0</td>
<td></td>
<td></td>
<td>µV p-p</td>
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<tr>
<td>Pressure Overload</td>
<td>-20</td>
<td>+85</td>
<td></td>
<td>°C</td>
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<tr>
<td>Operating Temperature</td>
<td>-40</td>
<td>+125</td>
<td></td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-50</td>
<td>+150</td>
<td></td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>3</td>
<td></td>
<td></td>
<td>grams</td>
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<tr>
<td>Solder Temperature</td>
<td>250ºC</td>
<td>Max 5 Sec.</td>
<td></td>
<td></td>
<td>7</td>
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<tr>
<td>Media</td>
<td>Non-Corrosive Dry Gases Compatible with Silicon, Pyrex, RTV, Gold, Nickel, and Aluminum</td>
<td></td>
<td></td>
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</tbody>
</table>

**Notes**  
1. Ratiometric to supply current. For 250 psi devices, the minimum span value is 62 mV.  
2. Best fit straight line.  
3. Maximum temperature error between -20°C and +85°C with respect to 25°C.  
4. Short term stability over 7 days with constant current and temperature.  
5. Long term stability over a one year period with constant current and temperature.  
6. For a zero-to-full scale pressure step change.  
7. 2X maximum for 250 psi device.
**DIMENSIONS**

Dimensions are in inches [mm].

**CONNECTIONS**

1. OUTPUT (+)
2. OUTPUT (-)
3. GAIN SET RESISTOR
4. FACTORY TEST POINTS (MUST BE Kept OPEN)
5. SUPPLY (+)
6. SUPPLY (-)
7. PRESSURE SENSOR EQUVALENT CIRCUIT
8. SUPPLY (+)
9. OUTPUT (-)
10. OUTPUT (+)
11. GAIN SET RESISTOR
12. FACTORY TEST POINTS (MUST BE Kept OPEN)
APPLICATION SCHEMATIC

ORDERING INFORMATION

17 - 015 G
Type (G = Gage, A = Absolute)
Pressure Range
Model

47 - 015 G
Type (G = Gage, A = Absolute)
Pressure Range
Model

NORTH AMERICA
Measurement Specialties
45738 Northport Loop West
Fremont, CA 94538
Tel: 1-800-767-1888
Fax: 1-510-498-1578
Sales: pfg.cs.amer@meas-spec.com

EUROPE
Measurement Specialties (Europe), Ltd.
26 Rue des Dames
78340 Les Clayes-sous-Bois, France
Tel: +33 (0) 130 79 33 00
Fax: +33 (0) 134 81 03 59
Sales: pfg.cs.emea@meas-spec.com

ASIA
Measurement Specialties (China), Ltd.
No. 26 Langshan Road
Shenzhen High-Tech Park (North)
Nanshan District, Shenzhen 518057
China
Tel: +86 755 3330 5088
Fax: +86 755 3330 5099
Sales: pfg.cs.asia@meas-spec.com

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