



# P1602

## Pressure Sensor Die

### Description

The P1602 piezoresistive pressure sensors are offered in a miniature 0.04 in x 0.04 in (1 mm x 1 mm) die. When excited with 1 mA constant current, the P1602 produces a millivolt output that is proportional to input pressure. The P1602 is available as an absolute pressure sensor, where the applied pressure is referenced to an internal vacuum sealed within the die. With NovaSensor's SenStable® process, the P1602 will provide very low long-term stability errors and excellent repeatability.

### Applications

- Consumer: Portable tire gauges, altimeters, and barometers
- Industrial: Pneumatic controls, leak detection, manometers, portable pressure gauges, pressure switches, and controllers
- Automotive: Tire pressure, diagnostics, engine, and suspension control, MAP sensors
- Medical: Patient monitoring and clinical instrumentation

### Features

- Solid state, high reliability
- Low-cost, miniature size
- Standard pressure ranges: 0 to 15, 0 to 30, 0 to 50, 0 to 100 psia (1, 2.1, 3.4 and 6.9 bar)
- Nonlinearity < 0.2 %FSO
- SenStable, silicon fusion bonded sensor die

# P1602 Specifications

Parameter	Value	Units	Notes
<b>Electrical @ 71.6°F (22°C) unless noted</b>			
Excitation	1.00	mA	10 VDC maximum
Input Impedance	5000 ±20%	Ω	
Output Impedance	5000 ±20%	Ω	
<b>Environmental</b>			
Operating Temperature	-40 to 257	°F	(-40°C to 125°C)
Storage Temperature	-67 to 302	°F	(-55°C to 150°C) (undiced)
Maximum Overpressure	6X 2X		Rated pressure 3
<b>Mechanical</b>			
Weight	0.02	Grams	xx lb
Media Compatibility	Clean dry air, non-corrosive gases		
<b>Performance</b>			
<b>Parameters (1)</b>			
	<b>Value (6)</b>	<b>Units</b>	<b>Notes</b>
Zero Offset	±8	mV/V	
	±10	mV/V	2
Full-scale (FS) Output	65 to 115	mV	2
	75 to 125	mV	
	170 to 280	mV	3
Linearity	±0.2	%FSO	4
	±0.25	%FSO	3, 4
Pressure Hysteresis	±0.1	%FSO	
Temperature Coefficient of Zero	±30	μV/V/°C	5
Temperature Coefficient of Resistance	0.3	%/°C	5
Temperature Coefficient of Sensitivity	-0.2	%/°C	5
Thermal Hysteresis of Zero	±0.1	%FSO	6
Long Term Stability of FSO	0.2	%FSO	7

1. Values measured at 1.0 mA and 71.6°F (22°C) unless noted.
2. 100 Kpa pressure range.
3. 4295 psia (296.12 bar) pressure range.
4. Best fit straight line.
5. Between 32°F and 158°F (0°C and 70°C). Temperature coefficients are typical values.
6. Between 32°F and 158°F (0°C and 70°C).
7. Typical over one year.

## Shipping and Handling

Wafers are shipped in protective plastic containers. The wafers are sawn on sticky tape with rings. All sensor wafers are electrically probed, visually inspected. All rejects are marked by an ink dot. Each wafer will be labeled with the lot number, wafer number, device number, and the number of available sensor die.

## Warranty

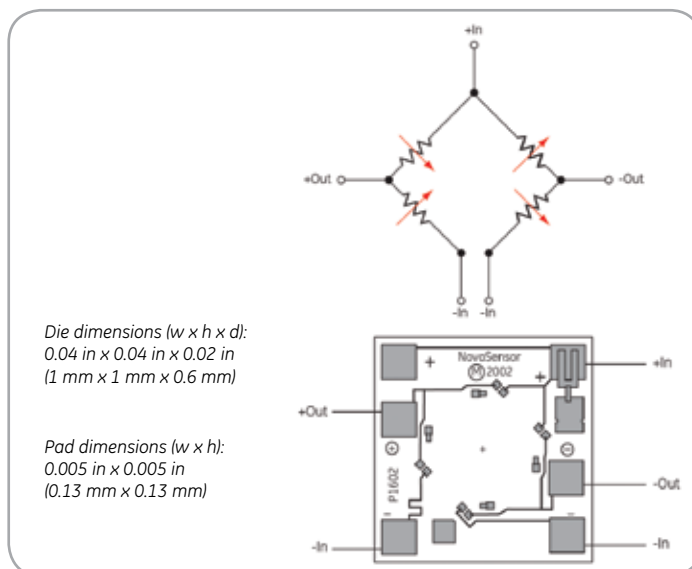
NovaSensor warrants its products against defects in material and workmanship for 12 months from the date of shipment. Products not subjected to misuse will be repaired or replaced. NovaSensor reserves the right to make changes without further notice to any products herein. NovaSensor makes no warranty, representation or guarantee regarding the suitability of its products for any particular application. NovaSensor does not assume any liability arising out of the application or use of any product or circuit and specifically disclaims, and all liability, without limitation consequential or incidental damages. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied statutory warranty of merchantability or fitness for particular purpose shall apply.

## Ordering Information

Part Number	Description
51393	15 psia (1 bar); ≈100 kPaA
51394	30 psia (2.06 bar); ≈200 kPaA
51395	50 psia (3.44 bar); ≈350 kPaA
51397	100 psia (6.89 bar); ≈700 kPaA
51399	150 psia (10.34 bar); ≈1035 kPaA
51406	300 psia (20.68 bar); ≈2070 kPaA
51407	500 psia (34.47 bar); ≈3450 kPaA
51408	1000 psia (68.94 bar); ≈6895 kPaA
51421	2500 psia (172.36 bar); ≈17,240 kPaA
51409	4295 psia (296.12 bar); ≈30,000 kPaA

Minimum Release Quantity:

2 wafers per pressure range or approximately 10,000 sensor die.



P1602 schematic and dimensions

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