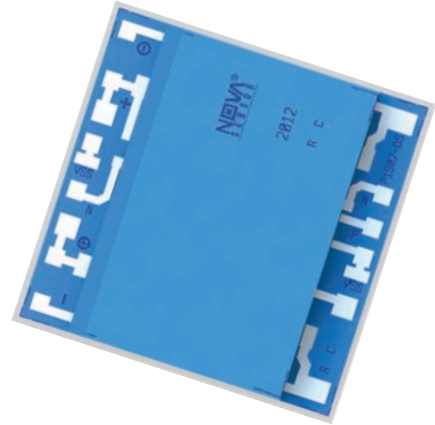


PT1907

Pressure & Temperature Sensor Die



NovaSensor PT1907 is a piezoresistive sensor die that is designed for combined pressure and temperature measurements in harsh media.

Pressure is applied from the backside of the die, which eliminates direct contact between the topside of the sensor circuitry and the applied media. This allows PT1907 to measure pressure and temperature in aggressive liquids and gases, including strong bases, most acids, and all automotive fluids.

A vacuum reference cavity made with a silicon cap on top of the die is used for absolute pressure measurement.

Made possible by the NovaSensor SenStable[®] process, PT1907 also features excellent long-term stability, repeatability (<0.1% / year typical), and overload capability.

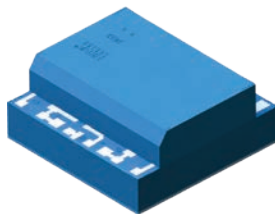
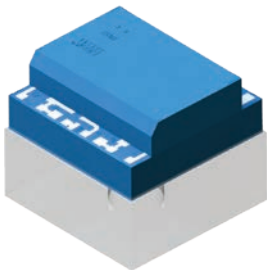
The integrated on-chip temperature sensor allows for high accuracy measurement of temperature and improves accuracy of pressure measurement.

Applications

- Automotive systems
- Process control systems
- Aerospace
- Pressure and temperature measurements in aggressive media

Features

- Harsh media compatibility
- Highly reliable, solid state silicon pressure sensor die pressurized from back (cavity) side
- Pressure Ranges: 60, 120, 180, 300, 450, 600 and 1000 PSIA
- Temperature Range: -40°C to 150°C
- On-chip temperature sensor
- Die Dimensions (L x W x H):
 - 1.9 mm x 1.9 mm x 1.6 mm (with glass)
 - 2.0 mm x 2.0 mm x 0.8 mm (without glass)
- High Resolution: Pressure 18-bit, Temperature 14-bit (0.01°C)
- Layout of bond pads allows for wire bonding, either to one side only or two sides of the die



PT1907 with glass pedestal PT1907 without glass pedestal

PT1907 Specifications

Pressure Sensor

Parameter	Value	Units	Notes
General			
Pressure Range	60, 120,180, 300, 450, 600, 1000	PSIA	
Maximum Overpressure	2X		Rated Pressure
Backside Burst Pressure	10X >6000	PSI	2, 6
Electrical @ 25°C (Unless noted)			
Excitation (DC)	1	mA	10VDC Max
	5	Volt	
Bridge Resistance	5000 ±20%	Ω	
Environmental			
Operating Temperature Range	-40 to 150	°C	2
Storage Temperature Range	-55 to 160	°C	
Mechanical			
Dimensions	1.9 x 1.9 x 1.6	mm with glass	8
	2.0 x 2.0 x 0.8	mm without glass	
Bond Pad Dimensions	0.10 x 0.10	mm L x W	9
Media Compatibility	Silicon and Borosilicate Glass		
Performance Parameters ⁽¹⁾			
Zero Offset	± 10	mV/V	
FSO	160 ± 45	mV	3
Pressure Linearity	± 0.1	%Span	4, 7
Pressure Hysteresis	+/- 0.1	%Span	5, 7
Temperature Coef. of Zero	+/- 10	µV/V/°C	5, 7
Temperature Coef. of Resistance	0.27	%/°C	5, 7
Temperature Coef. of Sensitivity	- 0.19	%/°C	5, 7
Thermal Hysteresis of Zero	+/- 0.2	% Span	5, 7

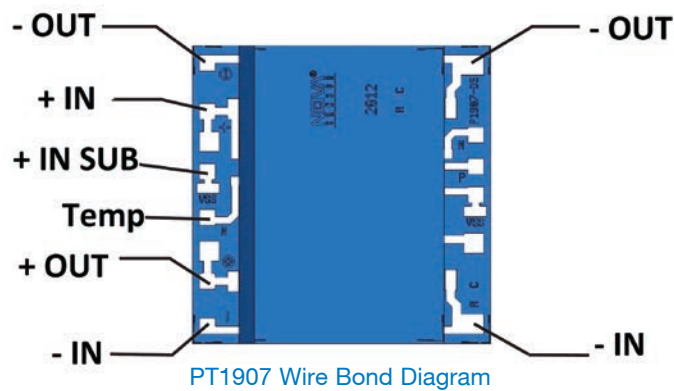
Notes:

- All values measured at 25°C and 5V excitation, unless otherwise noted. Samples from each wafer are used to verify bridge resistance, offset, span, linearity and die performance in the temperature range between 0°C and 70°C.
- Backside burst pressure and operating temperature for sensor utilizing PT1907 die can be lower than corresponding parameters for the die.
- Typical span is equal to 160mV at 300psi.
- Best fit in straight line.
- Between 0°C and 70°C.
- 10X of rated pressure for 60 to 300psi Die, >6000psi for 450 to 1000psi Die.
- Typical value.
- Die for high pressure (>300psi) has no glass pedestal.
- Aluminium bond pads
- All values measured at 25°C and 20 µA excitation, unless otherwise noted.
- 100% probed for zero output at 25°C.
- FSO and non-linearity is qualified in the temperature range between -40°C to 140°C.
- 10-25 µA excitation is recommended.

PT1907 Specifications (cont.)

Temperature Sensor

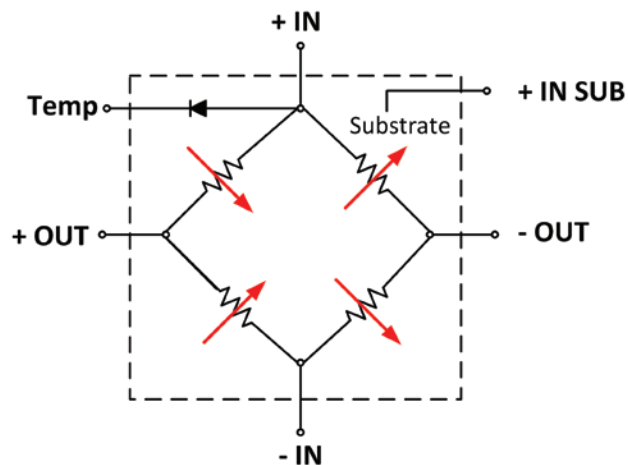
Parameter	Value	Units	Notes
General			
Temperature Range	-40 to 150	°C	
Electrical			
Excitation (DC)	10-100	μA	13
Performance Parameters ⁽¹⁰⁾			
Zero	625	mV	7,11
Sensitivity	-2.15 ±0.15	mV/°C	7,12
FSO	390	mV	7,12
Non-Linearity (BFSL)	+/- 0.6	%	7,12
Pressure Sensitivity	<10	μV/PSI	7



PT1907 Wire Bond Diagram

Note: (a) 6 wires bonds are required when using temp sensor, 5 wires when not using temp sensor.

(b) Both +IN and +IN SUB need to be connected to the highest potential in the circuitry.



PT1907 Schematic

Ordering Information

Contact Amphenol sales.

Shipping and Handling

All wafers are shipped in protective containers. The wafers are sawn on sticky tape. All wafers are electrically probed and visually inspected. Electrical and visual rejects are marked with ink dots. Each wafer has the following information: part number, lot number, wafer number, and the number of good parts.

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 of fitness for a particular purpose shall apply.

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