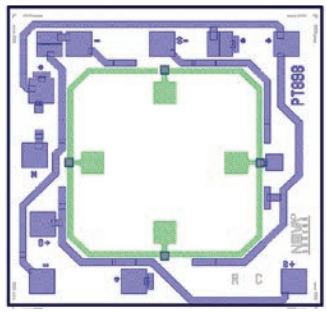
NOVA® SENSOR
AN AMPHENOL COMPANY

PT898

Pressure & Temperature Sensor Die



The PT898 piezoresistive sensor die is designed for pressure and temperature measurements using a single chip. When excited by either constant voltage or constant current, a PT898 pressure sensor produces a differential millivolt output signal directly proportional to the applied pressure. With NovaSensor's SenStable® process, PT898 die features excellent long-term stability and repeatability (< 0.1% / year typical). The on-chip temperature sensor powered by constant current allows for high accuracy measurement of temperature and for improvement of pressure measurement accuracy.

Applications

- Process control systems
- Transportation
- Pneumatic Controls
- Hydraulic Systems
- Aerospace

Features

- Highly reliable, solid state silicon pressure and temperature sensor die
- Pressure ranges: 250 to 15,000 psi
- Temperature range: -40…150°C
- On-chip temperature sensor
- Die dimensions (L x W x H): 1.86 mm x 1.86 mm x 2.0 mm with glass pedestal
- Flexible bond pads configuration allows for wire bonding either to only one-side or along perimeter of the die
- Media Compatibility: Clean dry air, noncorrosive gases and liquids, other fluids compatible with silicon and borosilicate glass

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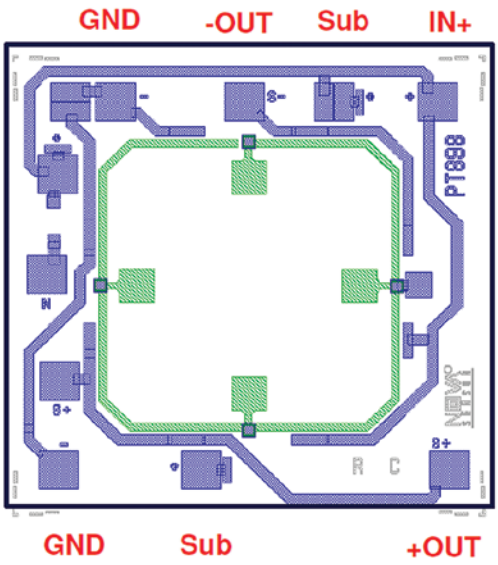
PT898 Pressure Sensor Specifications

Parameter		Value			Units	Notes
General						
Pressure	Differential and	250, 500, 1000			psig / psia	
	Absolute only	2500, 3000, 5000, 7500, 10000, 15000			psia	
Maximum Pressure		3X pressure				1
Environmental						
Electrostatic damage (ESD) Class 1						MIL-STD 883 method 3015
Temperature Range	Operating	–40 to 150			°C	–40°F to 302°F
	Storage	–55 to 160			°C	–47°F to 320°F
Mechanical						
Die Dimensions: With glass (L x W x H)		1.86 mm x 1.86 mm x 1.20 mm				
Weight		0.014 grams				
Metallization		Titanium-Aluminum				
Media Compatibility		Clean dry air, noncorrosive gases and liquids, other fluids compatible with silicon and borosilicate glass				
Electrical Performance – Pressure Sensor						
Parameter	**Range**	**Min**	**Typical**	**Max**	**Units**	**Notes**
Recommended Current Excitation Voltage		-	1.0	1.6	mA	-
		-	5.0	10	V	-
Input and Output Impedance		4000	5000	6000	Ohm	2
Zero Offset		-5	within ±2.5	+5	mV/V	2, 3
Sensitivity & Full Scale Output (FSO or Span)		See PT896 Ordering Information Table				2
Linearity	250 to 5000 psi	-0.15	within ±0.10	+0.15	%FSO	2, 4
	7500 to 150000 psi	-0.20	within ±0.15	+0.20		2, 4, 5
Zero Pressure Repeatability		-0.05	within ±0.01	+0.05	%FSO	2
Thermal Coefficient of Zero (TCO)		-10	within ±3	+10	µV/V/°C	6, 7
Thermal Coefficient of Resistance (TCR)		0.31	0.36	0.41	%/°C	6, 7
Thermal Coefficient of Sensitivity (TCS)		-0.23	-0.20...-0.21	0.18	%/°C	6, 7
Zero Thermal Hysteresis		-0.2	within ±0.02	+0.2	%FSO	6, 7
FSO Thermal Hysteresis		-0.2	within ±0.03	+0.2	%FSO	6, 7
Electrical Performance – Temperature Sensor						
Recommended excitation		10	20	100	µA	8
Temperature Range		-40	-	150	°C	-
Output at 25°C		570	610	600	mV	9
Sensitivity		-2.40	-2.20	-1.90	mV/°C	10
FSO		350	400	430	mV	10
Linearity		-0.6	within ±0.2	0.60	%	4, 10
Pressure Sensitivity		-	within ±0.1	-	%FSO	11

Notes:

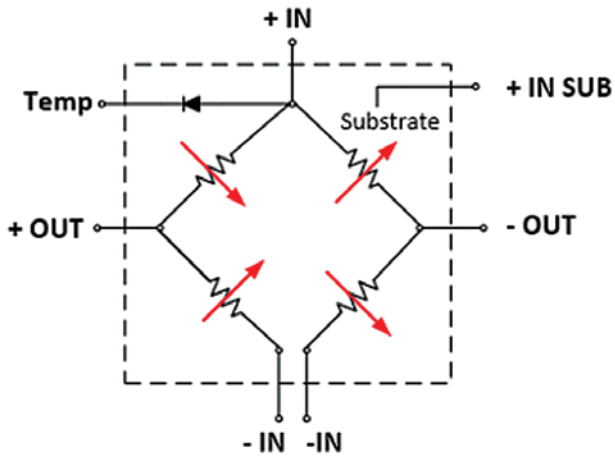
1. 2X rated pressure for 5000 psi and higher. Die can be used in applications requiring higher overpressure rating after additional characterization.
2. Tested using 1.0 mA excitation at 25°C.
3. 0 kPaA for absolute sensors, 0 kPaG for differential or gage sensors.
4. Best fit straight line.
5. Typical pressure non-linearity is provided based on testing at 6,000 psi.
6. Parameter is evaluated between 86°F and 176°F (30°C and 80°C) by testing samples from each wafer, typical range.
7. Between -48°F and 302°F (–40°C and 150°C) with respect to 25°C, typical range.
8. 20 µA constant current excitation is recommended.
9. Tested using 20 µA excitation at 25°C.
10. Sensitivity, FSO and Linearity of temperature sensor provided for -40…+140ºC range using 20 µA excitation.

PT898 Diagram and Schematic



1. PT898 die is an open bridge die
2. Sub needs to be wire banded to IN+

PT898 Wire Bond Diagram



PT898 Wire Bond Schematic Diagram

PT898 Ordering Information

PN	Range		Gage/ Absolute	Sensitivity (µV/V/PSI)	FSO (mV)			P122 Ref	FSO (mV)
	PSI	MPa			Min	Typical	Max		
71680	250	1.72	G	80-108	100	110-120	135	51009	100-135
71681	250	1.72	A	80-108	100	110-120	135	51013	100-135
71682	500	3.45	G	64-88	160	175-185	210	n/a	
71683	500	3.45	A	64-88	160	175-185	210	51268	180-240
71684	1000	6.89	G	36-48	205	205-215	210	51202	205-275
71685	1000	6.89	A	36-48	205	205-215	210	51003	205-275
71686	2500	17.2	A	16-22	215	245-255	275	51004	205-275
71687	5000	34.5	A	8-11	215	225-235	275	51005	205-275
71688	7500	51.7	G	5.5-7.3	215	220-230	275	n/a	
71689	10000	68.9	A	4.1-5.5	215	230-240	275	51031	205-275
71690	15000	103.4	A	3.2-4.3	240	270-280	320	n/a	
71777	250	1.72	G	56-83	70	80-90	104	51197	70-104
71778	3000	20.7	A	19.3-23.3	290	305-315	350	51243	240-290
71779	5000	34.5	A	9.4-11.4	235	250-260	285	51558	235-285
71780	1000	6.89	A	47-59	235	255-265	285	51559	235-295
71781	2500	17.2	A	19-24	235	255-265	285	51560	235-285
71782	250	1.72	A	92-116	115	125-135	145	51561	115-145

All products are supplied on 6” wafers. Minimum release quantity: 2700 die.

Shipping and Handling

The standard products are available on tape with metal frame and are shipped in protective plastic containers. Electrical rejects and visual rejects are inked. Each wafer will have the following information: Lot #, Wafer #, Part #, and the number of good (yielded) die.

Warranty

NovaSensor warrants its products against defects in material and workmanship for 12 months from date of shipment. Products not subject to misuse will be repaired or replaced. THE FOREGOING IS IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES. 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, nor does NovaSensor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims and all liability, including without limitation consequential or incidental damages.

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