

Features

- R_0 : 1000 Ω
- TCR 3850ppm/K
- Application temperature -200°C...200°C
- Resistance tolerance $\pm 0.12\%$
- Size 2 x 2.3 x 1.1 mm³
(width/length/height)
- Gold coated nickel wire, 10 mm length,
0.25 mm diameter

Applications

- Specific temperature feedback control
down to -196°C (liquid nitrogen)
- Medical
- Industrial applications
- Sensing element for plug-in probes

PTFC102BC1G0

Platinum Temperature Sensor

Pt1000, 2.0x2.3, Class C, PTFC102BC1G0

Product Description

This sensor is a resistance temperature detector (RTD) using a platinum resistor as sensing element. This platinum resistor consists of a structured platinum film on a ceramic substrate, passivated by a glass cover. The connection wires are protected with glass ceramic on the welding area. The material for the connection wire is gold coated nickel wire.

The characteristic curve of this Platinum RTD complies with DIN EN 60751. Within the extended temperature range between -200 °C and -50 °C the characteristic curve of this Platinum RTD can be calculated using the same mathematical expression as between -50 °C and 0 °C.

The usage of Platinum as resistive material guarantees high long term stability. To avoid hysteresis, the element is pre aged in liquid nitrogen. The element is designed, to perform measurements at -196°C (liquid nitrogen).

Due to relative small outline and low mass this RTD has a low time constant; therefore it is a suitable solution for fast and precise feedback control systems.

The sensor is designed for temperature applications between -200°C and 200°C.

Sensors are packed as bulk goods in blister box.

- Platinum Temperature Sensor
- Conformal to DIN EN 60751
- Global interchangeability
- Wide temperature range
- Fast response time
- Extended Class B (F0.3) tolerance to -200° C
- Small outline dimensions
- Gold coated nickel lead wires

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Platinum Temperature Sensor

Sensor properties

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Nominal Resistance at 0 °C	R ₀	Class B (F0.3)	998.80	1000.00	1001.20	Ω
Nominal Resistance at -196 °C	R ₋₁₉₆		196.90	202.50	208.10	Ω
Temperature Tolerance at -196 °C	Δθ		-1.3		+1.3	K
Temperature Coefficient of Resistance	TCR	0 °C, 100 °C		3850		ppm/°C
Tolerance Temperature Range *		Class B (F0.3)	-200		200	°C
Self-Heating Coefficient in air, flow: 1 m/s				0.5		°C/mW
Response Time Water Flow: 0.4 m/s	τ _{W,0.9}			0.2		s
Response Time Air Flow: 1 m/s	τ _{A,0.9}			10		s
Measuring Current		Class B (F0.3)			0.4	mA
Lead wire Au-coated Ni-wire		Diameter length		0.25 10		mm mm
Pre-aging conditions			-196		150	°C

*possible operating temperature range is, -200°C to +600°C for elements with Au-coated Ni wire.

Specified accuracy is not guaranteed if the sensor is exposed to temperatures outside the specified tolerance temperature range.

Calculation Formulas

The calculation formulas of this Pt-RTD are defined in DIN EN 60751 as following:

For $T \geq 0$ °C: $R(T) = R(0) \cdot (1 + a \cdot T + b \cdot T^2)$

For $T < 0$ °C: $R(T) = R(0) \cdot [1 + a \cdot T + b \cdot T^2 + c \cdot (T - 100^\circ\text{C}) \cdot T^3]$

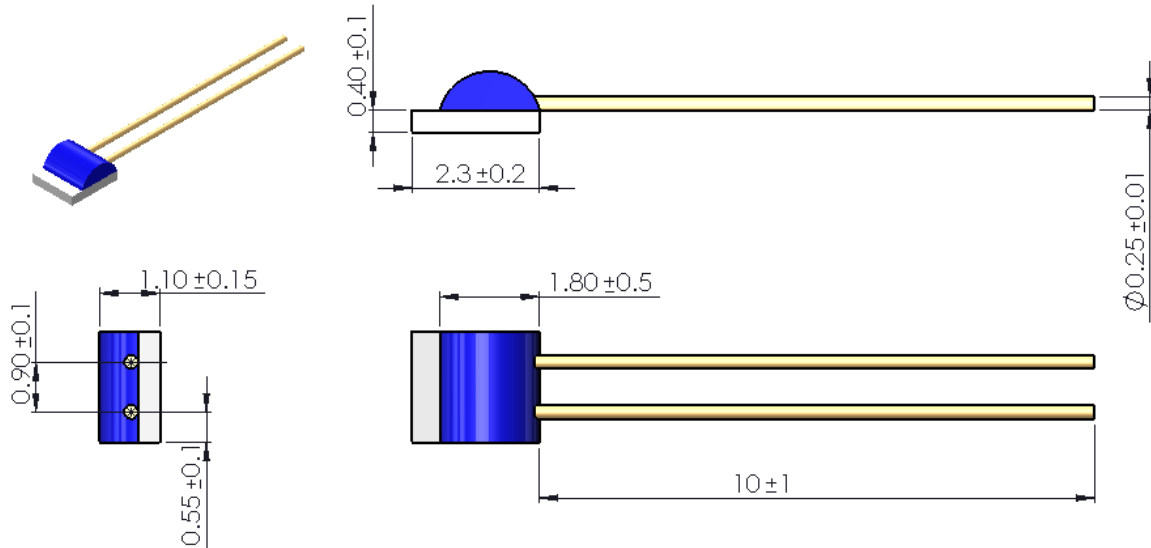
Polynomial coefficients: $a = 3.9083\text{E-}03$ $b = -5.775\text{E-}07$ $c = -4.183\text{E-}12$

Tolerances: Class B (F 0.3): $\pm (0.3 + 0.005 \cdot |T/^\circ\text{C}|)$ °C (-200 ... +200 °C)

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Platinum Temperature Sensor

Mechanical Dimensions



Ordering Information

Description	Part Number	Configuration information
Pt1000, 2.0x2.3, Class B, PTFC102BC1G0	NB-PTCO-295	1000 Ohms, 2.0 mm x 2.3 mm x 1.1 mm, F 0.3 (B) cryo, 10mm Au-coated Ni-wire

Packing and Minimum Order Quantity

Packing	PCS per Packing Unit	MOQ
Transparent Blister Box 80(120)mm x 50(60)mm x 20mm	500 (bulk)	500

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