

### Features

- $R_0$ : 100  $\Omega$
- TCR 3850ppm/K
- Application temperature -200°C...200°C
- Resistance tolerance  $\pm 0.12\%$
- Size 2.0 x 2.3 x 1.1 mm<sup>3</sup> (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

## PTFC101BC1G0

### Platinum Temperature Sensor

Pt100, 2.0x2.3, Class C, PTFC101BC1G0

#### 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

## PTFC101BC1G0

Platinum Temperature Sensor

### Sensor properties

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Nominal Resistance at 0 °C	R <sub>0</sub>	Class B (F 0.3)	99.88	100.00	100.12	Ω
Nominal Resistance at -196 °C	R <sub>-196</sub>		19.69	20.25	20.81	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 (F 0.3)	-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 <sub>W,0.9</sub>			0.2		s
Response Time Air Flow: 1 m/s	τ <sub>A,0.9</sub>			10		s
Measuring Current		Class B (F 0.3)			1.4	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:  $R(T) = R(0) \cdot [1 + a \cdot T + b \cdot T^2 + c \cdot (T - 100^\circ\text{C}) \cdot T^3]$

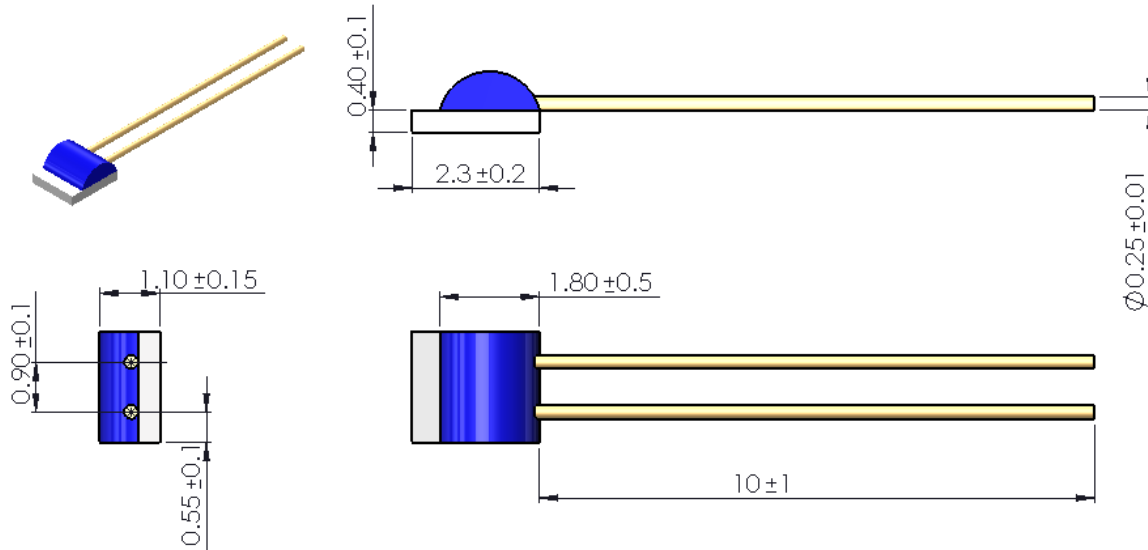
Polynomial coefficients:  $a = 3.9083\text{E-}03$        $b = -5.775\text{E-}07$        $c = -4.183\text{E-}12$

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

# PTFC101BC1G0

Platinum Temperature Sensor

## Mechanical Dimensions



## Ordering Information

Description	Part Number	Alias	Configuration information
Pt100, 2.0x2.3, Class B, PTFC101BC1G0	10213359-00	NB-PTCO-381	100 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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