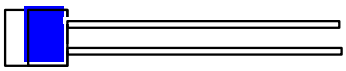

PTFC102BC1G0

Platinum Temperature Sensor

- **Platinum Temperature Sensor**
- **Conformal to DIN EN 60751**
- **Global interchangeability**
- **Wide temperature range**
- **Fast response time**
- **Special Class B (F0.3) tolerance for -196°C measurements**
- **Small outline dimensions**
- **Blister box packing**

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 glass coating. The connection wires are protected with glass on the welding area.

The connection wires are 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.

To avoid hysteresis, the element is pre aged in liquid nitrogen. The element is designed, to perform measurements at -196°C (liquid nitrogen).

The usage of Platinum as resistive material guarantees high long term stability.

Due to 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.

Sensors are packed as bulk goods in blister box.

Features

- R_0: 1000 ⎵
- TCR 3850ppm/K
- Application temperature -200°C…200°C
- resistance tolerance ±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 at -196°C (liquid N)
- Medical
- Industrial applications

Sensor properties

Parameter	Symbol	Condition	Min	Typical	Max	Unit
Nominal Resistance at 0 °C	R_0	Class B (F0.3)	998.80	1000.0	1001.20	Ω
Nominal Resistance at -196 °C	R-196		196.90	202.50	208.10	Ω
Temperature Tolerance at -196 °C	⇆↑↑		-1.3	0	+1.3	K
Temperature Coefficient of Resistance	TCR	0 °C, 100 °C		3850		ppm/°C
Temperature Range		Class B (F0.3)	-200		200	°C
Selfheating Coefficient in air, flow: 1 m/s				0.5		°C/mW
Response Time Water Flow: 0.4 m/s	$◀_{W,0.9}$			0.2		s
Response Time Air Flow: 1 m/s	$◀_{A,0.9}$			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			-200		150	°C

Calculation Formulas

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

For T ≥ 0 °C: $R_{(T)} = R_{(0)} \cdot (1+a \cdot T + b \cdot T^2)$

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

Polynomial coefficients: a = 3.9083E-03 b = -5.775E-07 c = -4.183E-12

Tolerances: class F0.3 (B): ± (0.3+0.005*|T/°C|) °C (-200 … +200 °C)