

## Specification of Pt Thermal Sensor

### 1. Electrical Characteristics of SA10100627

- 1-1 Resistance value (at 0°C) : 100±0.12 ohm
- 1-2 Maximum applied current : 1mA
- 1-3 Insulation resistance : exceed 100M ohm at 500V DC (@ room temp.)
- 1-4 Thermal response time (90%) : 10 sec. max.(in air, 1m/sec.)
- 1-5 Self heating : 2.5 mW/°C(in air, 1m,sec.)
- 1-6 Operation temperature range : -50°C to 500°C

### 2. Outline Drawings

Please see attached figure.

### 3. Reliability Test

- 3-1 High temperature test  
Keep the Pt sensor in 500°C for 1000 hours
- 3-2 Low temperature test  
Keep the Pt sensor in -50°C for 1000 hours
- 3-3 Humidity test  
Keep the Pt sensor in 60°C and 90 to 95% RH for 1000 hours
- 3-4 Thermal shock test  
Keep the Pt sensor in 0°C ice water for at least 15 sec., then within 10 sec. directly put into 100°C hot water for at least 15 sec.. The above process should be proceeded for at least 10 cycles.

After each item test, valuation of item 1-1 should be within 0.12% and item 1-3 should exceed 100M ohm at 500VDC.

UNLESS OTHERWISE SPECIFIED  
TOLERANCES ON :

X = ±

X.X = ±

X.XX = ±

ANGLES ± HOLE DIA.±

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A

1.25±0.20(TYP.)

2.8±0.15

10±2(TYP.)

1.7±0.15

THE MATERIAL OF WIRE  
IS Ni WIRE, Ø0.22(TYP.)

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X = ±  
X.X = ±  
X.XX = ±  
ANGLES ± HOLE DIA.±

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| Temperature<br>(°C) | Nominal<br>Resistance(ohm) | Resistance<br>Deviation(ohm) | Temperature<br>Deviation(°C) |
|---------------------|----------------------------|------------------------------|------------------------------|
| -50                 | 80.31                      | 0.22                         | 0.55                         |
| -25                 | 90.19                      | 0.17                         | 0.43                         |
| 0                   | 100.00                     | 0.12                         | 0.30                         |
| 25                  | 109.73                     | 0.16                         | 0.43                         |
| 50                  | 119.40                     | 0.21                         | 0.55                         |
| 75                  | 128.99                     | 0.26                         | 0.68                         |
| 100                 | 138.51                     | 0.30                         | 0.80                         |
| 125                 | 147.95                     | 0.35                         | 0.93                         |
| 150                 | 157.33                     | 0.39                         | 1.05                         |
| 175                 | 166.63                     | 0.44                         | 1.18                         |
| 200                 | 175.86                     | 0.48                         | 1.30                         |
| 225                 | 185.01                     | 0.52                         | 1.43                         |
| 250                 | 194.10                     | 0.56                         | 1.55                         |
| 275                 | 203.11                     | 0.60                         | 1.68                         |
| 300                 | 212.05                     | 0.64                         | 1.80                         |
| 325                 | 220.92                     | 0.68                         | 1.93                         |
| 350                 | 229.72                     | 0.72                         | 2.05                         |
| 375                 | 238.44                     | 0.76                         | 2.18                         |
| 400                 | 247.09                     | 0.79                         | 2.30                         |
| 425                 | 255.67                     | 0.83                         | 2.43                         |
| 450                 | 264.18                     | 0.86                         | 2.55                         |
| 475                 | 272.61                     | 0.90                         | 2.68                         |
| 500                 | 280.98                     | 0.93                         | 2.80                         |

(1)Relationship of temperature with resistance

When  $t \geq 0^{\circ}\text{C}$

$$R_t = R_o (1 + At + Bt^2)$$

$$A = 3.9083\text{E-}03$$

$$B = -5.7750\text{E-}07$$

When  $t < 0^{\circ}\text{C}$

$$R_t = R_o [1 + At + Bt^2 + C(t-100)t^3]$$

$$A = 3.9083\text{E-}03$$

$$B = -5.7750\text{E-}07$$

$$C = -4.1830\text{E-}12$$

$$R_o = 1.000\text{E+}02$$

(2)Temperature deviation

$$\pm(a+b | t |) ^{\circ}\text{C}$$

$$a = 0.300$$

$$b = 0.005$$

(3)Specifications are subject to change without notice

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X =  $\pm$

X.X =  $\pm$

X.XX =  $\pm$

ANGLES  $\pm$  HOLE DIA.  $\pm$

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