SE10255018, The Platinum Resistance temperature sensor (PT-RTD) SMD

Features / Applications :



■ Features:

- Low drift
- Long service life
- Wide temperature range
- Wide range of resistance values
- Temperature linear control
- High precision
- Fast response time
- RoHS compliant

■ Appliances:

- Home Appliances: Air conditioner, Refrigerator, Calorimeter
- Industrial Equipment: Temperature controller
- Medical: Precision thermometer
- Electronics: Over-Temperature protection

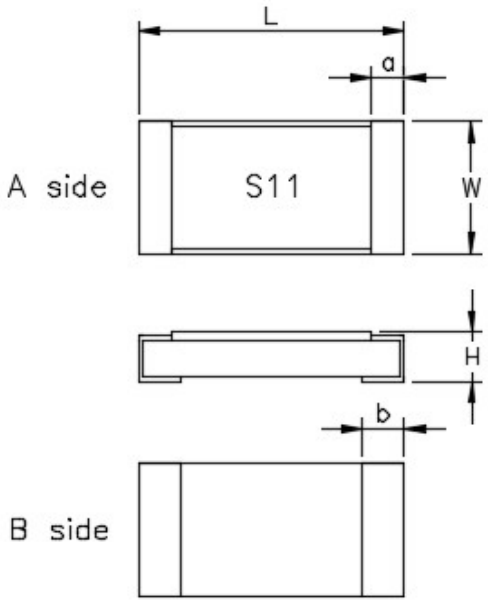
Electrical Specifications :

Characteristics	Feature
Resistance value at 0℃	1000±4.8 ohm
Temperature deviation	Class D : ±0.48%
Temperature coefficient of resistance (TCR)	3750ppm/℃
Operation temperature range	-55℃~ +125℃
Maximum applied current	1 mA
Thermal response time (90%)	6 seconds max. (In air of 1 m/sec.)
Dissipating constant	3.5mW/℃ (In air of 1 m/sec.)

Outline Drawing :

Unit: mm

Dimension



Code	Dimensions
L	3.2±0.2
W	1.6±0.2
H	0.5±0.1
a	0.4±0.2
b	0.5±0.25

*Marking: S11

Type Designation :

SE	102	5	5	XXX
(1)	(2)	(3)	(4)	(5)

Where

(1) Series No: SE= Applicable temperature range 125℃

(2) Ice point resistance : 102=10X10²=1000 ohm

(3) TCR/Class: 5 = 3750/D

(4) Package type : 5 = surface mount

(5) Serial No

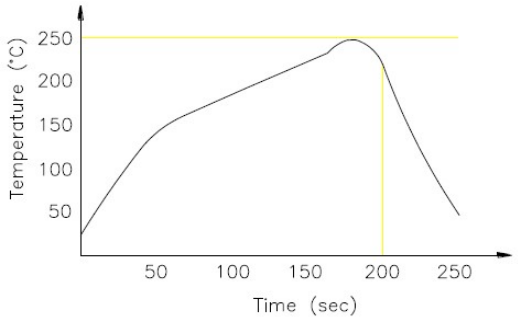
Characteristics :

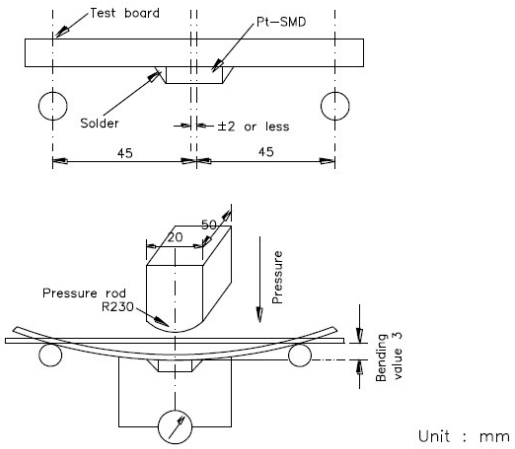
Electrical

Item	Specification and Requirement	Test Method
Insulation resistance	>1000 Megohms	Test voltage: 100 VDC for 1 minute at room temperature.
Voltage proof	△R(0 degree):≤0.48% Without damage by flashover, fire or breakdown, etc.	Test voltage: 100 VAC r.m.s for 1 minute.
Intermittently overload	△R(0 degree):≤0.48%	Input current 2.5 time the applied current for 1 sec. with pauses of 25 sec. for 1000 cycles.
ESD	△R(0 degree):≤0.48%	Human body, 2KV.

Mechanical

Item	Specification and Requirement	Test Method
Solderability	△R(0 degree):≤0.48% Without distinct damage in appearance.	A new uniform coating of solder shall cover minimum of 95% of the surface being immersed. Temperature of solder: 245±5℃ Immersion duration: 2±0.5 sec
Solvent resistance	Marking shall be legible. Without mechanical damage and distinct damage in appearance.	Immersion cleansing. At room temperature for 90 sec in isopropyl Alcohol.
Drop test	△R(0 degree):≤0.48%	The Pt-SMD can resist to a 75 cm drop on a 6mm thick steel sheet with no damage on it's characteristics, repeat three times.

Item	Specification and Requirement	Test Method
Resistance to soldering heat	△R(0 degree):≤0.48% Without distinct deformation in appearance.	Shall be satisfied in the following methods. (1) Solder bath method Dipped into solder at 270±5℃ for 10±1 seconds. (2) Reflow soldering method Peak temperature: 240±5℃ for 3 to 5 sec. Temperature : 220±5℃ for 40 sec. The Pt-SMD shall be stored at standard atmospheric conditions for 1 hours, after which the measurements shall be made. 
Vibration test	The Pt-SMD can resist to a vibration test with no damage on it's characteristic. Valuation of resistance should be within 0.48%.	Entire of frequency range: 10 Hz to 55 Hz to 10 Hz for 1 minute. Vibration amplitude : 1.5 mm For a period of 2 hours in each of 3 mutual perpendicular directions.
Shock test	The Pt-SMD can resist to a shock test with no damage on it's characteristic. Valuation of resistance should be within 0.48%.	Peak acceleration: 50G Duration of the pulse: 11 ms Each 3 times in each direction of 3 mutually perpendicular axis.

Item	Specification and Requirement	Test Method
Substrate bending	Electrical characteristics shall be satisfied. If there are electrodes on both surfaces, it shall satisfy 1000±4.8 ohm on whichever surface it may be fixated on. Valuation of resistance should be within 0.48%.	Bent width: 3mm 30 sec. 

Endurance

Item	Specification and Requirement	Test Method
Rapid change of temperature	△R(0 degree):≤0.48% Without distinct damage in appearance.	Perform 5 cycles as follows: (1) -55±5℃cycles for 30 min. (2) Standard atmospheric conditions 2 to 3 min. (3) 125±5℃ for 30 min. (4) Standard atmospheric conditions 2 to 3 min.
Dump heat with load	△R(0 degree):≤0.48% Without distinct damage in appearance. The marking shall be legible.	60±5℃ with relative humidity of 90% to 95%. Input current 1mA for 1.5 hours on 30 minutes off, 1000+48/-0 hours.
Endurance 70℃	△R(0 degree):≤0.48% Without distinct damage in appearance. The marking shall be legible.	Input current 1mA for 1.5 hours on 30 minutes off, 1000+48/-0 hours at 70±5℃
Low temperature test	△R(0 degree):≤0.48% Without distinct damage in appearance.	Keep the PT sensor in -55℃ for 1000 hours.
High temperature test	△R(0 degree):≤0.48% Without distinct damage in appearance.	Keep the PT sensor in 125℃ for 1000 hours.

Temperature and resistance relationship:

■ The temperature and resistance relationships used in this standard are as follows:

When T < 0℃ :

$Rt = R0 [1 + aT + bT^2 + cT^3 (T – 100)]$

When T ≧ 0℃ :

$Rt=R0 (1+ aT + bT^2)$

Where

Rt: resistance at a certain temperature T

R0: resistance at 0℃

a, b, c : coefficient (refer to the following table)

Coefficient for TCR=3750 PPM/℃

Temperature	a	b	c
T < 0℃	3.90830E-03	-6.01875E-07	-6.14500E-12
T ≧ 0℃	3.90830E-03	-6.01875E-07	0

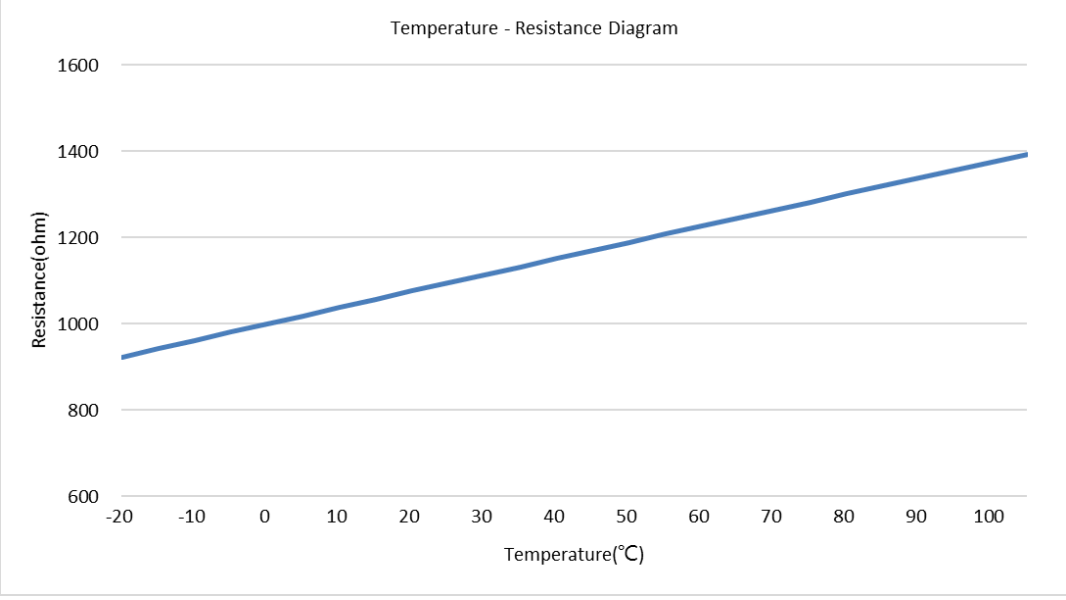
■ Temperature deviation

±(a+b |t|)℃

a= 1.28

b= 0.014

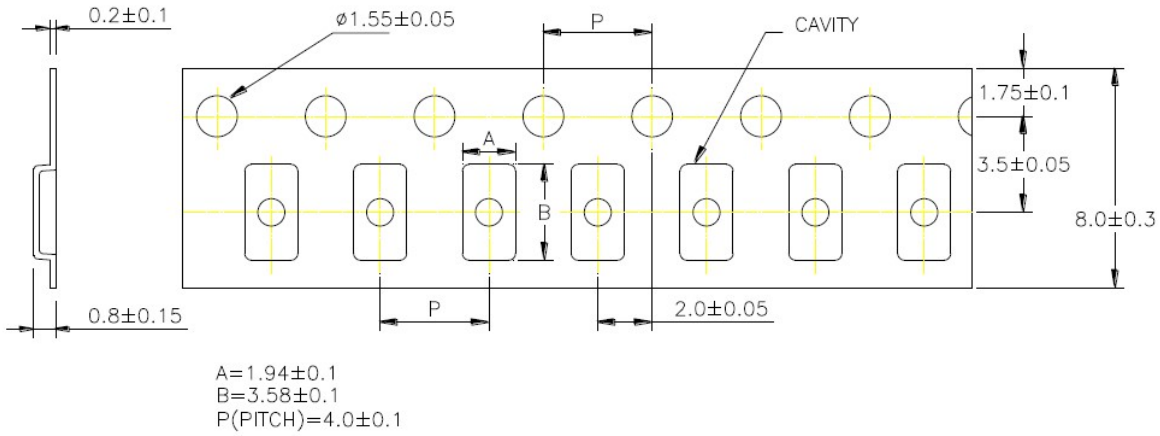
■ Temperature – Resistance Diagram



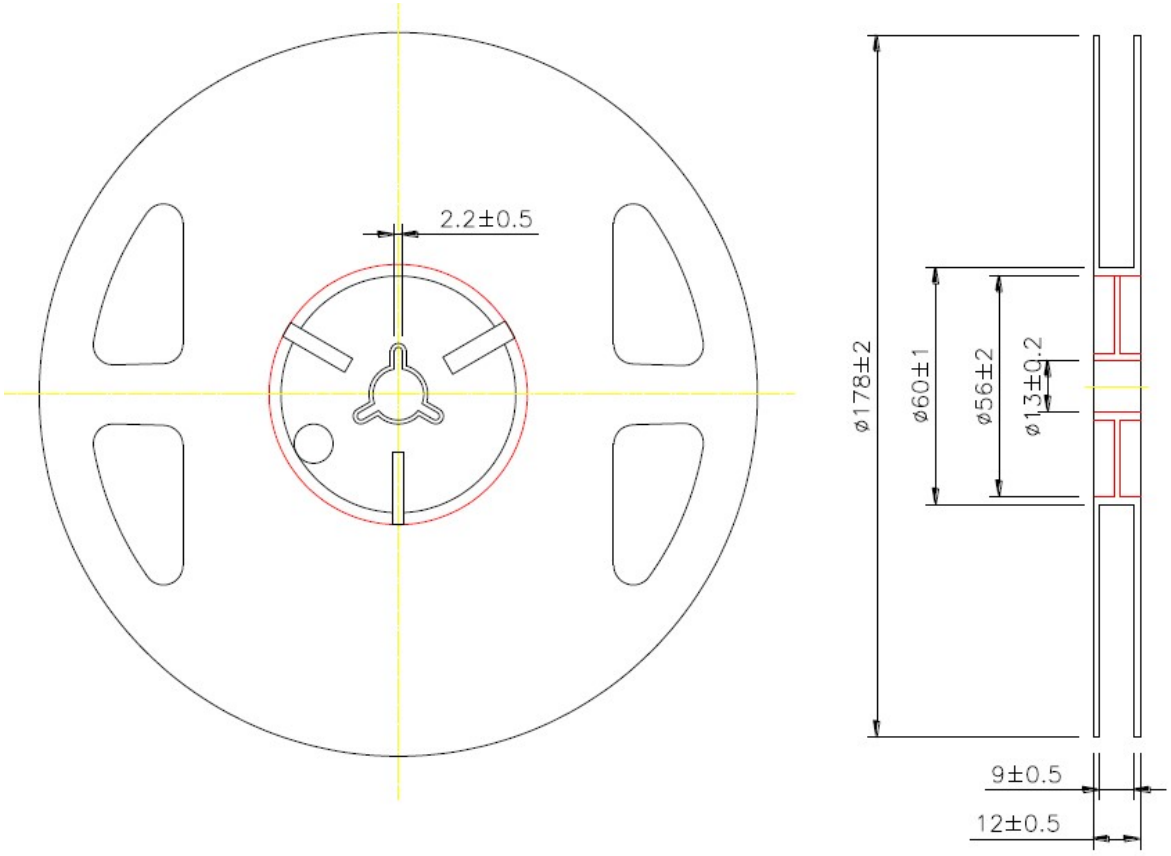
Packaging :

■ Dimensions

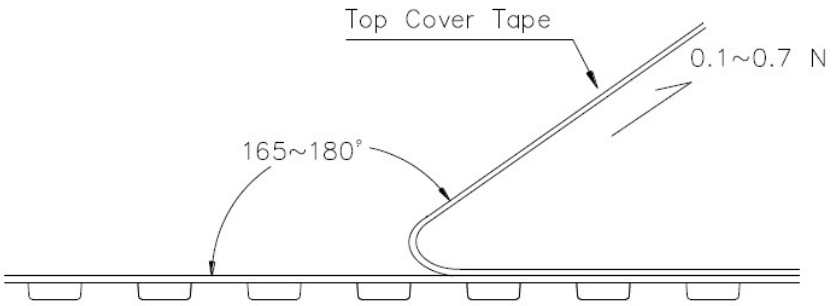
Tape packaging dimensions



Reel dimensions



■ Peel force of top cover tape



■ Numbers of taping

1000 pieces/reel

■ Marking

The following items shall be marked on the reel.

(1) Type designation

(2) Quantity

(3) Taping number

(4) Manufacturer's name

Order Information :

Part Number	Dimension (mm)	Nominal Resistance at 0°C	Operating Temperature Range
	Sensor Body		
SE10255018	1.6 x 3.2	1000±4.8Ω	-55℃~ +125℃

Resistance tolerance and Temperature Deviation table of PT 1000 Class D:

Temperature (℃)	Resistance (Ω)	Temperature deviation (±℃)	Resistance tolerance (±Ω)	Temperature (℃)	Resistance (Ω)	Temperature deviation (±℃)	Resistance tolerance (±Ω)
-55	788.46	2.05	7.97	125	1466.87	3.03	11.09
-50	807.87	1.98	7.68				
-45	827.24	1.91	7.39				
-40	846.57	1.84	7.11				
-35	865.87	1.77	6.82				
-30	885.13	1.70	6.54				
-25	904.36	1.63	6.26				
-20	923.55	1.56	5.98				
-15	942.71	1.49	5.70				
-10	961.84	1.42	5.43				
-5	980.93	1.35	5.15				
0	1000.00	1.28	4.80				
5	1019.04	1.35	5.14				
10	1038.04	1.42	5.39				
15	1057.02	1.49	5.65				
20	1075.96	1.56	5.91				
25	1094.88	1.63	6.16				
30	1113.76	1.70	6.42				
35	1132.62	1.77	6.67				
40	1151.44	1.84	6.92				
45	1170.24	1.91	7.17				
50	1189.00	1.98	7.43				
55	1207.74	2.05	7.68				
60	1226.44	2.12	7.92				
65	1245.12	2.19	8.17				
70	1263.76	2.26	8.42				
75	1282.38	2.33	8.67				
80	1300.96	2.40	8.91				
85	1319.52	2.47	9.16				
90	1338.04	2.54	9.40				
95	1356.54	2.61	9.65				
100	1375.00	2.68	9.89				
105	1393.43	2.75	10.13				
110	1411.84	2.82	10.37				
115	1430.21	2.89	10.61				
120	1448.56	2.96	10.85				