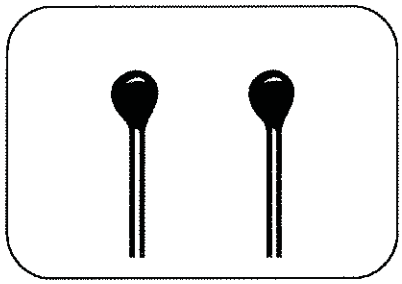
NTC Thermistor：TTS Series

Epoxy Bead Type for Temperature Sensing/Compensation

■ Features



1. RoHS compliant
2. Halogen-Free (HF) series are available
3. Body size: Φ1.8mm, Φ2.6mm
4. Radial lead resin coated
5. Long leads for easy sensor placement
6. Operating temperature range: -40℃~+100℃
7. Wide resistance range
8. Agency recognition: UL / cUL

■ Recommended Applications

1. Home appliances
2. Computers
3. Battery packs
4. Thermometers

■ Part Number Code

1	2	3	.4	5	6	7	8	9	10	11	12	13	14	15	16

Product Type

TTS	THINKING NTC Thermistor TTS Series

Size

1	Φ1.8mm x 6.0 mm (max.)
2	Φ2.6mm x 6.0mm (max.)

Definition of B Value

A	$B_{25/85}$
B	$B_{25/50}$

Zero Power Resistance at 25℃ (R_{25})

102	1KΩ
103	10KΩ
473	47KΩ

Tolerance of R_{25}

F	±1%
G	±2%
H	±3%
J	±5%
K	±10%

B Value

338	3380
34D	3435
395	3950
39H	3975
405	4050

Tolerance of B Value

1	±1%
2	±2%
3	±3%

Optional Suffix

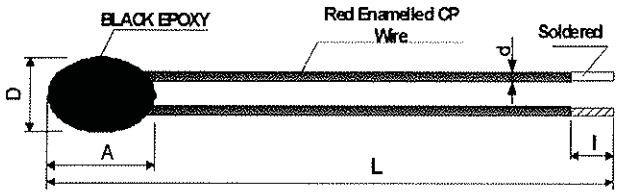
Y	RoHS Compliant
H	RoHS + HF Compliant

Appearance

R	Φ0.30mm Red Enamelled CP Wire
G	Φ0.30mm Sn Plated CP Wire
T	Φ0.30mm Blue Teflon CP Wire

■ Structure and Dimensions

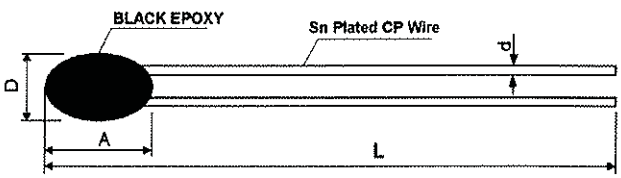
R Type



(Unit: mm)

Series	Dmax.	Amax.	d	L	l
TTS1	1.8	6.0	0.30±0.02	70±5	2±0.5
TTS2	2.6	6.0			

G Type



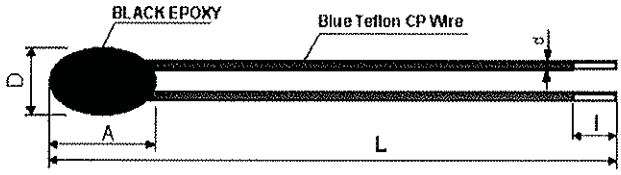
(Unit: mm)

Series	Dmax.	Amax.	d	L
TTS1	1.8	6.0	0.30±0.02	70±5
TTS2	2.6	6.0		

NTC Thermistor : TTS Series

Epoxy Bead Type for Temperature Sensing/Compensation

T Type



(Unit: mm)

Series	Dmax.	Amax.	d	L	l
TTS1	1.8	6.0	0.30±0.02	70±5	2±0.5

■ Electrical Characteristics

Part No.	Zero Power Resistance at 25°C	Tolerance of R_{25}	B Value		Tolerance of B value	Max. Power Dissipation at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range	Safety Approvals	
	R_{25} (KΩ)	(±%)	(K)		(±%)	P_{max}(mW)	δ(mW/°C)	τ (Sec.)	T_L~T_U(°C)	UL	cUL
TTS1A103□34D*	10	1, 2, 3, 5	25/85	3435	1, 2, 3	45	≧1	≦10	-40 ~ +100	√	√
TTS1A103□395*	10			3950						√	√
TTS1A103□39H*	10			3975						√	√
TTS1A103□425*	10			4250	2, 3					√	√
TTS1A223□370*	22			3700						√	√
TTS1A333□405*	33			4050	1, 2, 3					√	√
TTS1A104□436*	100			4360	2, 3					√	√
TTS1B104□410*	100		25/50	4100	1, 2, 3					√	√
TTS2A502□39H*	5	1, 2, 3, 5	25/85	3975	1, 2, 3					√	√
TTS2A103□34D*	10			3435						√	√
TTS2A103□396*	10			3960						√	√
TTS2A103□39H*	10			3975						√	√
TTS2A203□34D*	20			3435						√	√
TTS2A104□436*	100			4360	2, 3					√	√
TTS2B102□392*	1		25/50	3920	1, 2, 3					√	√
TTS2B502□39D*	5			3935						√	√
TTS2B104□410*	100			4100						√	√
TTS2B104□419*	100			4190	2, 3					√	√
TTS2B474□439*	470			4390						√	√

Note 1: □ = Tolerance of R_{25}

* = Tolerance of B value

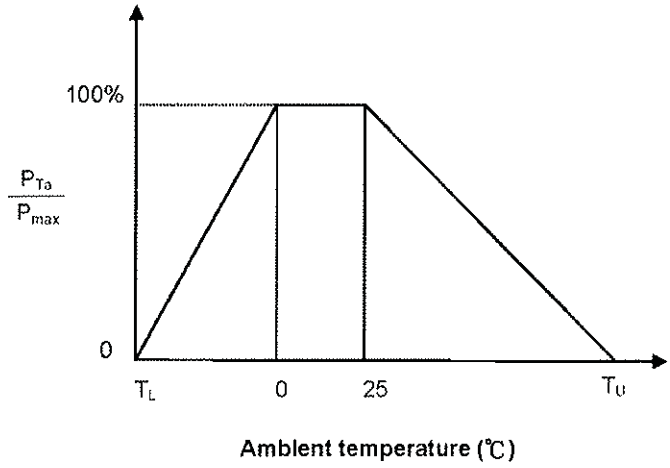
Note 2: UL/cUL File No: E138827

Note 3: Special specifications are available upon request.

NTC Thermistor：TTS Series

Epoxy Bead Type for Temperature Sensing/Compensation

■ Max. Power Dissipation Derating Curve



T_U : Maximum operating temperature (℃)

T_L : Minimum operating temperature (℃)

For example:

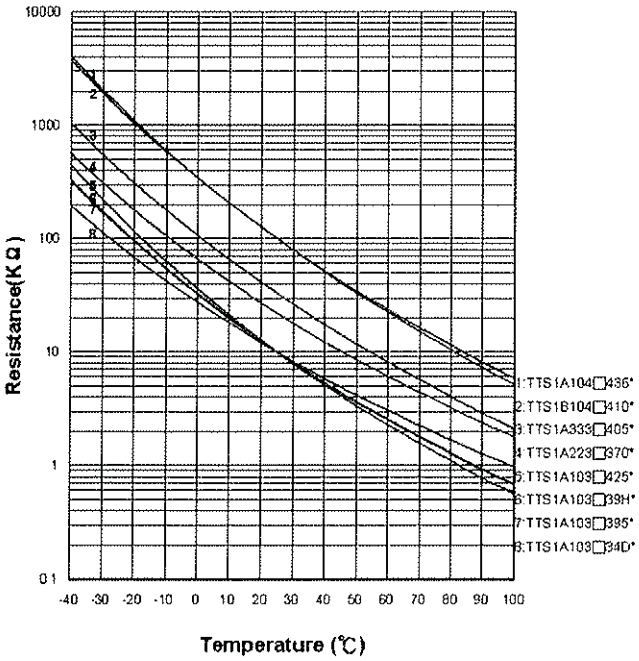
Ambient temperature(Ta) = 55℃

Maximum operating temperature(T_U) = 100℃

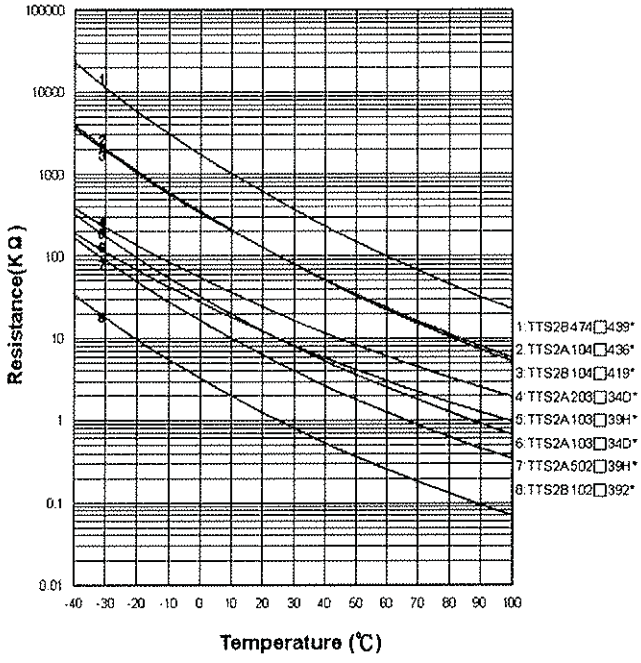
$P_{Ta}=(T_U-Ta)/(T_U-25)xPmax$ = 60% Pmax

■ R-T Characteristic Curves

TTS1A103□34D*~ TTS1B104□436*



TTS2B102□392*~ TTS2B474□439*

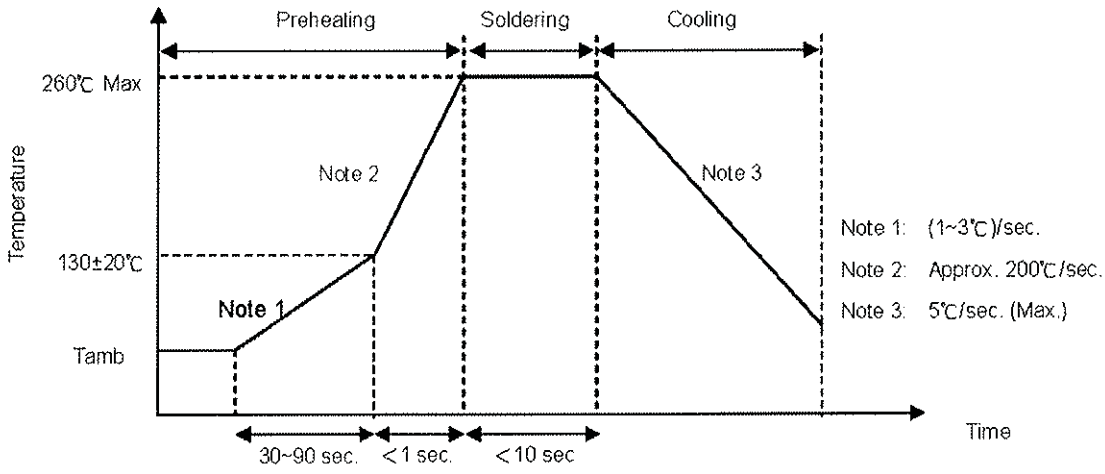


NTC Thermistor : TTS Series

Epoxy Bead Type for Temperature Sensing/Compensation

■ Soldering Recommendation

- **Wave Soldering Profile**



- **Recommended Reworking Conditions With Soldering Iron**

Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Soldering Time	3 sec. (max.)
Distance from Thermistor	10 mm (min.)

NTC Thermistor : TTS Series

Epoxy Bead Type for Temperature Sensing/Compensation

■ Reliability

<table>
<tr><th>Item</th><th>Standard</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>Tensile Strength of Terminations</td><td>IEC 60068-2-21</td><td>Gradually apply the specified force and keep the unit fixed for 10±1 sec.
Terminal diameter (mm) / Force (Kg)
d≦0 25 : 0 10
0.25<d≦0.3 : 0.25
0.3<d≦0.5 : 0.5</td><td>No visible damage</td></tr>
<tr><td>Bending Strength of Terminations</td><td>IEC 60068-2-21</td><td>Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, and then return to the original position. Repeat the procedure in the opposite direction.
Terminal diameter (mm) / Force (Kg)
d≦0.25 : 0.05
0.25<d≦0.3 : 0.125
0.3<d≦0.5 : 0.25</td><td>No visible damage</td></tr>
<tr><td>Solderability</td><td>IEC 60068-2-20</td><td>245 ± 3℃, 3 ± 0.3 sec</td><td>At least 95% of terminal electrode is covered by new solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC 60068-2-20</td><td>260 ± 3℃, 10 ± 1 sec.</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\%$</td></tr>
<tr><td>High Temperature Storage</td><td>IEC 60068-2-2</td><td>100 ± 5℃, 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 5\%$</td></tr>
<tr><td>Damp Heat, Steady State</td><td>IEC 60068-2-78</td><td>40 ± 2℃, 90~95% RH, 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\%$</td></tr>
<tr><td>Rapid Change of Temperature</td><td>IEC 60068-2-14</td><td>The conditions shown below shall be repeated 5 cycles.
Step 1: -40 ± 5 (℃), 30 ± 3 (minutes)
Step 2: Room temperature, 5 ± 3
Step 3: 100 ± 5, 30 ± 3
Step 4: Room temperature, 5 ± 3</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\%$</td></tr>
<tr><td>Max. Power Dissipation</td><td>IEC 60539-1</td><td>25 ± 5℃, Pmax., 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 5\%$</td></tr>
</table>

■ Packaging

- Bulk Packing: 500 pcs/bag

■ Warehouse Storage Conditions of Products

- Storage Conditions :
  1. Storage Temperature: -10℃~+40℃
  2. Relative Humidity: ≦75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage : 1 year