

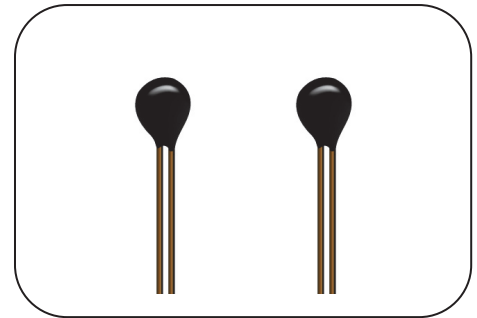
NTC Thermistor : TTS Series



Epoxy Bead Type for Temperature Sensing/Compensation

■ Features

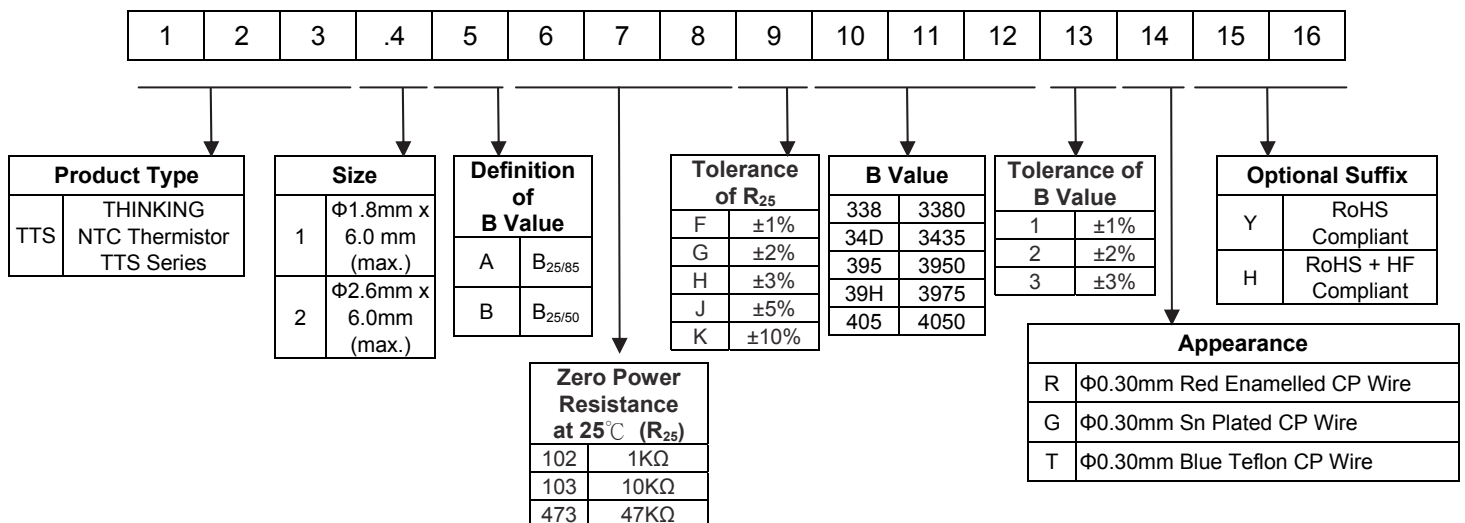
1. RoHS compliant
2. Halogen-Free (HF) series are available
3. Body size: $\Phi 1.8\text{mm}$, $\Phi 2.6\text{mm}$
4. Radial lead resin coated
5. Long leads for easy sensor placement
6. Operating temperature range: $-40^{\circ}\text{C} \sim +100^{\circ}\text{C}$
7. Wide resistance range
8. Agency recognition: UL / cUL



■ Recommended Applications

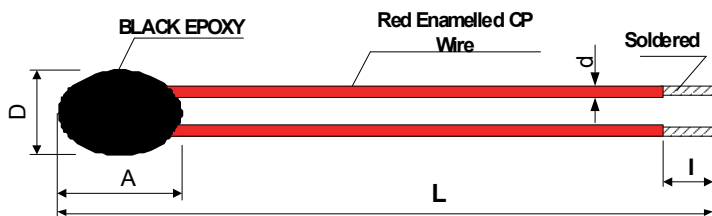
1. Home appliances
2. Computers
3. Battery packs
4. Thermometers

■ Part Number Code



■ Structure and Dimensions

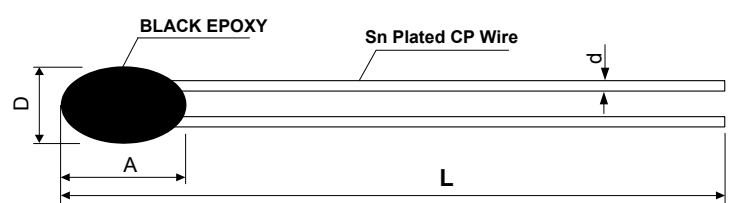
R Type



(Unit: mm)

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

G Type



(Unit: mm)

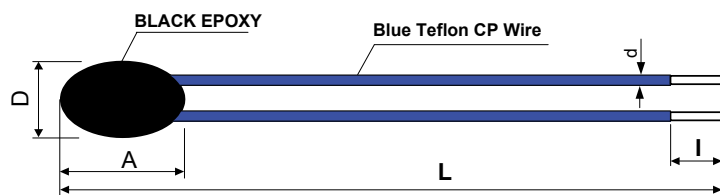
Series	Dmax.	Amax.	d	L
TTS1	1.8	6.0	0.30 ± 0.02	70 ± 5
TTS2	2.6	6.0		

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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
TTS1A103□34D*	10	1, 2, 3, 5	25/85	1, 2, 3	45	≥ 1	≤ 10	-40 ~ +100	√	√						
TTS1A103□395*	10								√	√						
TTS1A103□39H*	10								√	√						
TTS1A103□425*	10								√	√						
TTS1A223□370*	22								√	√						
TTS1A333□405*	33								√	√						
TTS1A104□436*	100								√	√						
TTS1B104□410*	100								√	√						
TTS2A502□39H*	5	1, 2, 3, 5	25/85	1, 2, 3					45	≥ 1	≤ 10	-40 ~ +100	√	√		
TTS2A103□34D*	10												√	√		
TTS2A103□396*	10												√	√		
TTS2A103□39H*	10												√	√		
TTS2A203□34D*	20												√	√		
TTS2A104□436*	100												√	√		
TTS2B102□392*	1												25/50	1, 2, 3	√	√
TTS2B502□39D*	5														√	√
TTS2B104□410*	100				√	√										
TTS2B104□419*	100				2, 3	√	√									
TTS2B474□439*	470	√	√													

Note 1: □ = Tolerance of R₂₅

* = Tolerance of B value

Note 2: UL/cUL File No: E138827

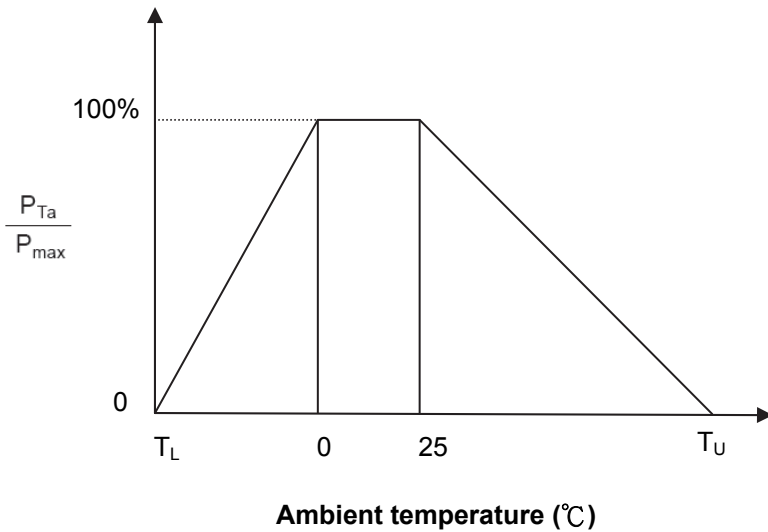
Note 3: Special specifications are available upon request.

NTC Thermistor : TTS Series



Epoxy Bead Type for Temperature Sensing/Compensation

Max. Power Dissipation Derating Curve



T_U : Maximum operating temperature (°C)

T_L : Minimum operating temperature (°C)

For example:

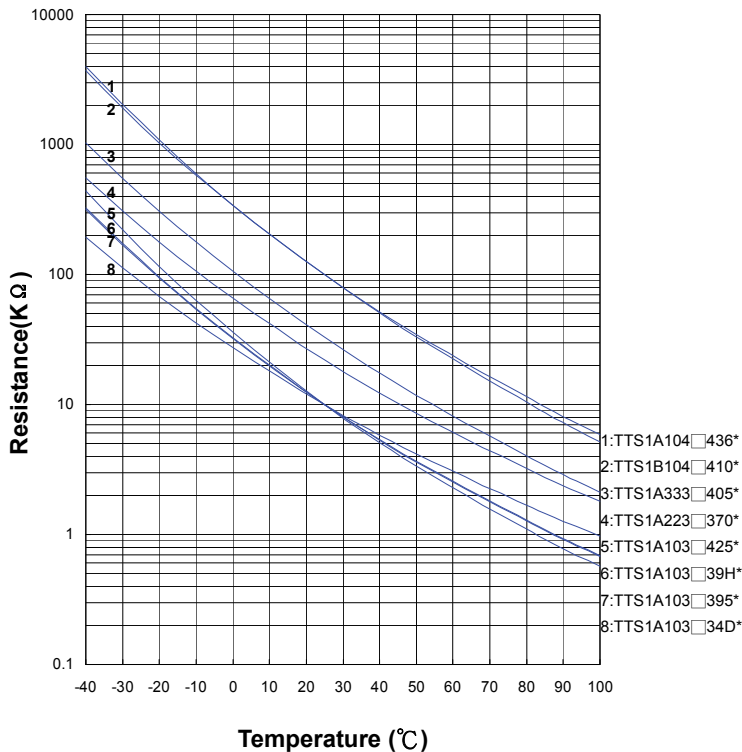
Ambient temperature(T_a) = 55°C

Maximum operating temperature(T_U) = 100°C

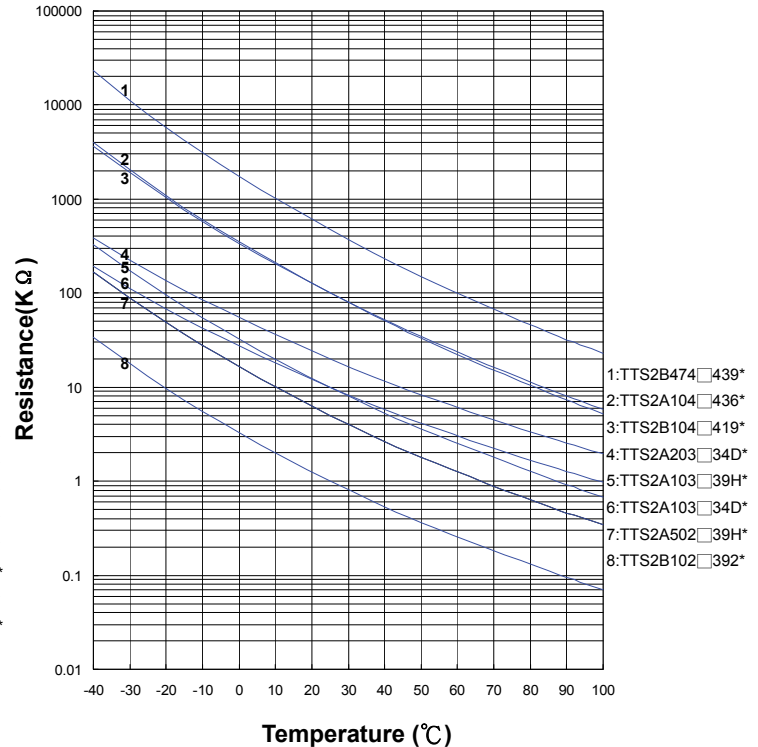
$$P_{Ta} = (T_U - T_a) / (T_U - 25) \times P_{max} = 60\% P_{max}$$

R-T Characteristic Curves

TTS1A103□34D*~ TTS1B104□436*



TTS2B102□392*~ TTS2B474□439*



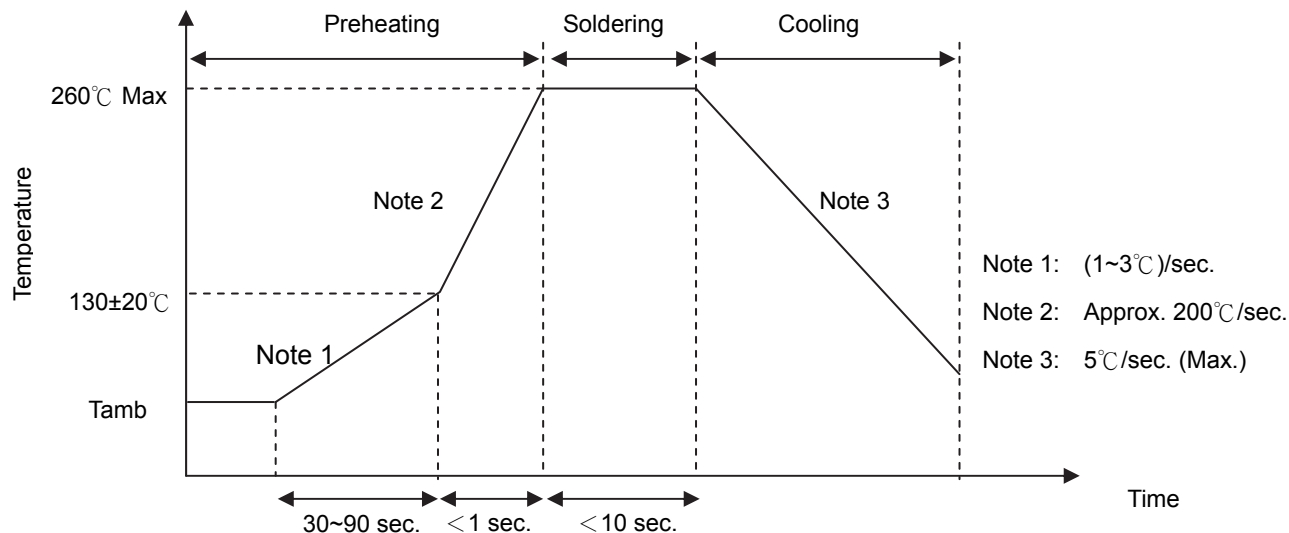
NTC Thermistor : TTS Series

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°C (max.)
Soldering Time	3 sec. (max.)
Distance from Thermistor	10 mm (min.)

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■ Reliability

Item	Standard	Test conditions / Methods	Specifications															
Tensile Strength of Terminations	IEC 60068-2-21	<p>Gradually apply the specified force and keep the unit fixed for 10±1 sec.</p> <table border="1"> <thead> <tr> <th>Terminal diameter (mm)</th> <th>Force (Kg)</th> </tr> </thead> <tbody> <tr> <td>$d \leq 0.25$</td> <td>0.10</td> </tr> <tr> <td>$0.25 < d \leq 0.3$</td> <td>0.25</td> </tr> <tr> <td>$0.3 < d \leq 0.5$</td> <td>0.5</td> </tr> </tbody> </table>	Terminal diameter (mm)	Force (Kg)	$d \leq 0.25$	0.10	$0.25 < d \leq 0.3$	0.25	$0.3 < d \leq 0.5$	0.5	No visible damage							
Terminal diameter (mm)	Force (Kg)																	
$d \leq 0.25$	0.10																	
$0.25 < d \leq 0.3$	0.25																	
$0.3 < d \leq 0.5$	0.5																	
Bending Strength of Terminations	IEC 60068-2-21	<p>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.</p> <table border="1"> <thead> <tr> <th>Terminal diameter (mm)</th> <th>Force (Kg)</th> </tr> </thead> <tbody> <tr> <td>$d \leq 0.25$</td> <td>0.05</td> </tr> <tr> <td>$0.25 < d \leq 0.3$</td> <td>0.125</td> </tr> <tr> <td>$0.3 < d \leq 0.5$</td> <td>0.25</td> </tr> </tbody> </table>	Terminal diameter (mm)	Force (Kg)	$d \leq 0.25$	0.05	$0.25 < d \leq 0.3$	0.125	$0.3 < d \leq 0.5$	0.25	No visible damage							
Terminal diameter (mm)	Force (Kg)																	
$d \leq 0.25$	0.05																	
$0.25 < d \leq 0.3$	0.125																	
$0.3 < d \leq 0.5$	0.25																	
Solderability	IEC 60068-2-20	245 ± 3°C, 3 ± 0.3 sec.	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC 60068-2-20	260 ± 3°C, 10 ± 1 sec.	No visible damage $\Delta R_{25}/R_{25}$ ≤ 3 %															
High Temperature Storage	IEC 60068-2-2	100 ± 5°C, 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ ≤ 5 %															
Damp Heat, Steady State	IEC 60068-2-78	40 ± 2°C, 90~95% RH, 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ ≤ 3 %															
Rapid Change of Temperature	IEC 60068-2-14	<p>The conditions shown below shall be repeated 5 cycles.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 ± 5</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> <tr> <td>3</td> <td>100 ± 5</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 5	30 ± 3	2	Room temperature	5 ± 3	3	100 ± 5	30 ± 3	4	Room temperature	5 ± 3	No visible damage $\Delta R_{25}/R_{25}$ ≤ 3 %
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 5	30 ± 3																
2	Room temperature	5 ± 3																
3	100 ± 5	30 ± 3																
4	Room temperature	5 ± 3																
Max. Power Dissipation	IEC 60539-1	25 ± 5°C, Pmax., 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ ≤ 5 %															

■ Packaging

- Bulk Packing: 500 pcs/bag

■ Warehouse Storage Conditions of Products

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