

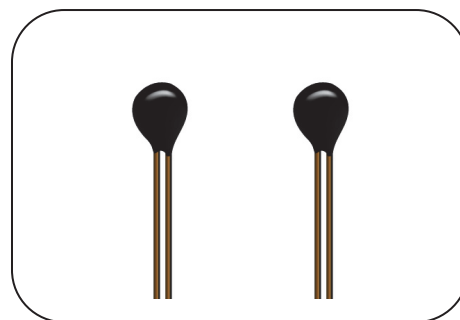
# NTC Thermistor : TTS Series



## 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

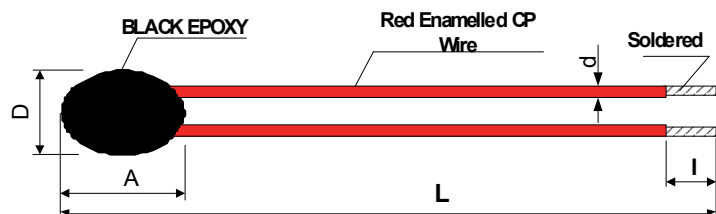
1. Home appliances
2. Computers
3. Battery packs
4. Thermometers

### ■ Part Number Code

1		2		3		.4		5		6		7		8		9		10		11		12		13		14		15		16							
<b>Product Type</b>		THINKING NTC Thermistor TTS Series		<b>Size</b>		1 Φ1.8mm x 6.0 mm (max.)		2 Φ2.6mm x 6.0mm (max.)		<b>Definition of B Value</b>		A B <sub>25/85</sub>		B B <sub>25/50</sub>		<b>Tolerance of R<sub>25</sub></b>		F ±1% G ±2% H ±3% J ±5% K ±10%		<b>B Value</b>		338 3380 34D 3435 395 3950 39H 3975 405 4050		<b>Tolerance of B Value</b>		1 ±1% 2 ±2% 3 ±3%		<b>Optional Suffix</b>		Y RoHS Compliant H RoHS + HF Compliant		<b>Appearance</b>		R Φ0.30mm Red Enamelled CP Wire G Φ0.30mm Sn Plated CP Wire T Φ0.30mm Blue Teflon CP Wire			

### ■ Structure and Dimensions

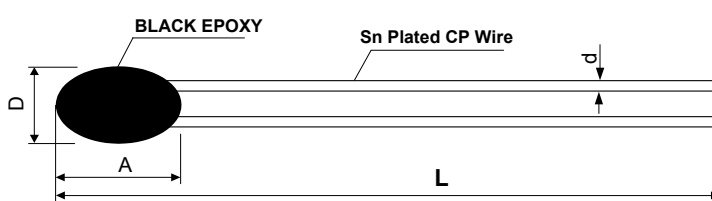
#### R Type



(Unit: mm)

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

#### G Type



(Unit: mm)

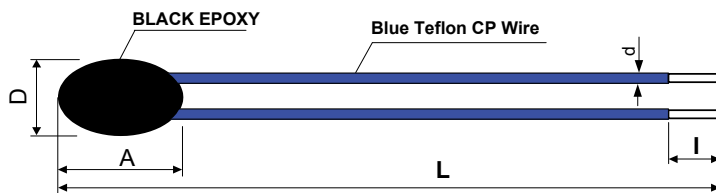
Series	Dmax.	Amax.	d	L
TTS1	1.8	6.0	0.30 $\pm$ 0.02	70 $\pm$ 5
TTS2	2.6	6.0		

# NTC Thermistor : TTS Series

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### T Type



(Unit: mm)

Series	Dmax.	Amax.	d	L	I
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 <sub>25</sub>	B Value		Tolerance of B value	Max. Power Dissipation at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range	Safety Approvals	
	R <sub>25</sub> (KΩ)	( ±%)	(K)		(±%)	P <sub>max</sub> (mW)	δ(mW/°C)	τ (Sec.)	T <sub>L</sub> ~T <sub>U</sub> (°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<sub>25</sub>

\* = Tolerance of B value

Note 2: UL/cUL File No: E138827

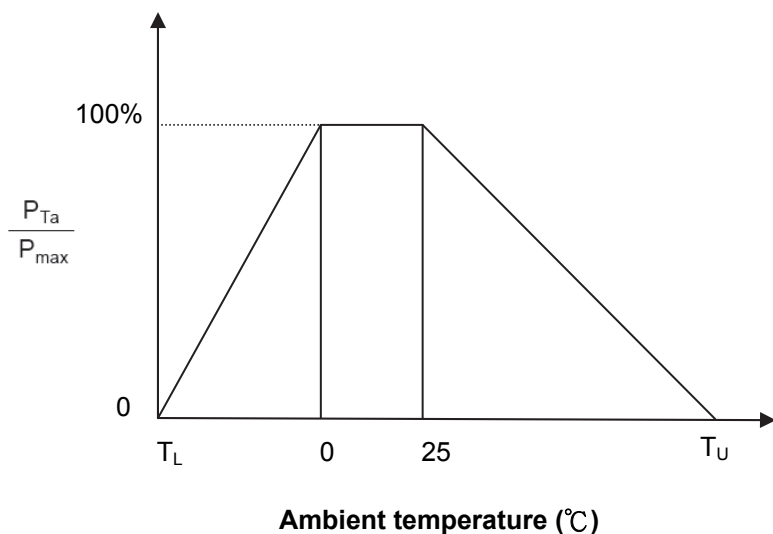
Note 3: Special specifications are available upon request.

# 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:

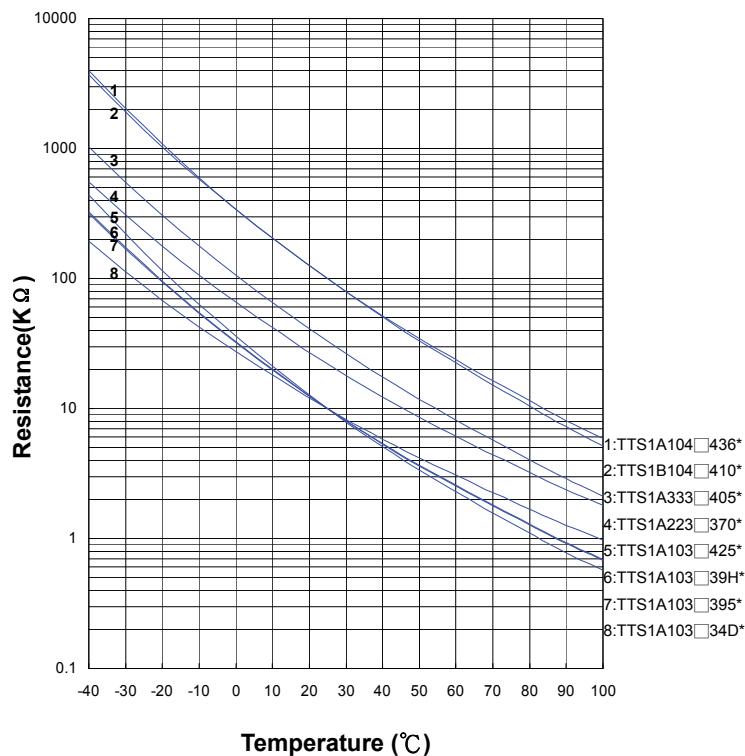
Ambient temperature( $T_a$ ) = 55°C

Maximum operating temperature( $T_U$ ) = 100°C

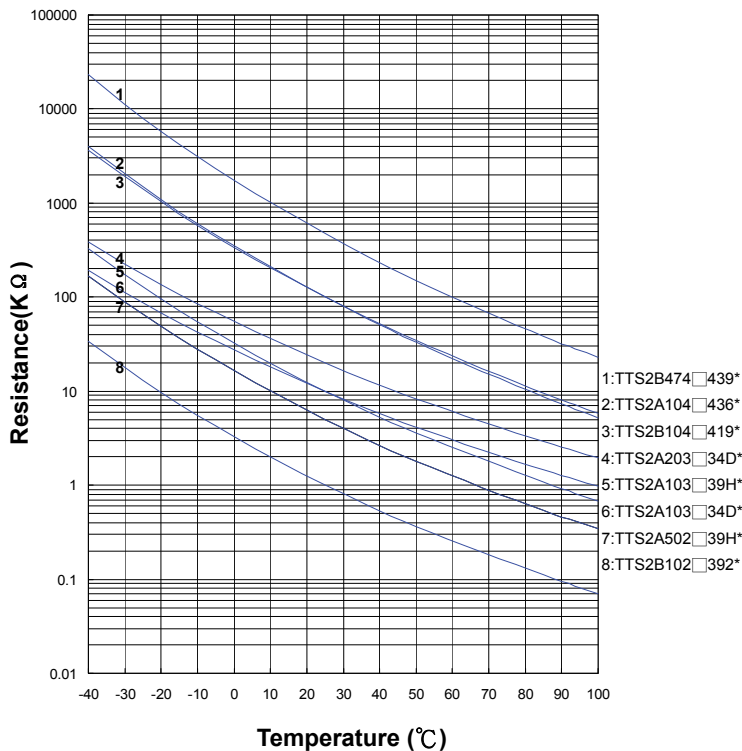
$$P_{Ta} = (T_U - T_a) / (T_U - 25) \times P_{max} = 60\% P_{max}$$

## ■ R-T Characteristic Curves

TTS1A103□34D\*~ TTS1B104□436\*



TTS2B102□392\*~ TTS2B474□439\*



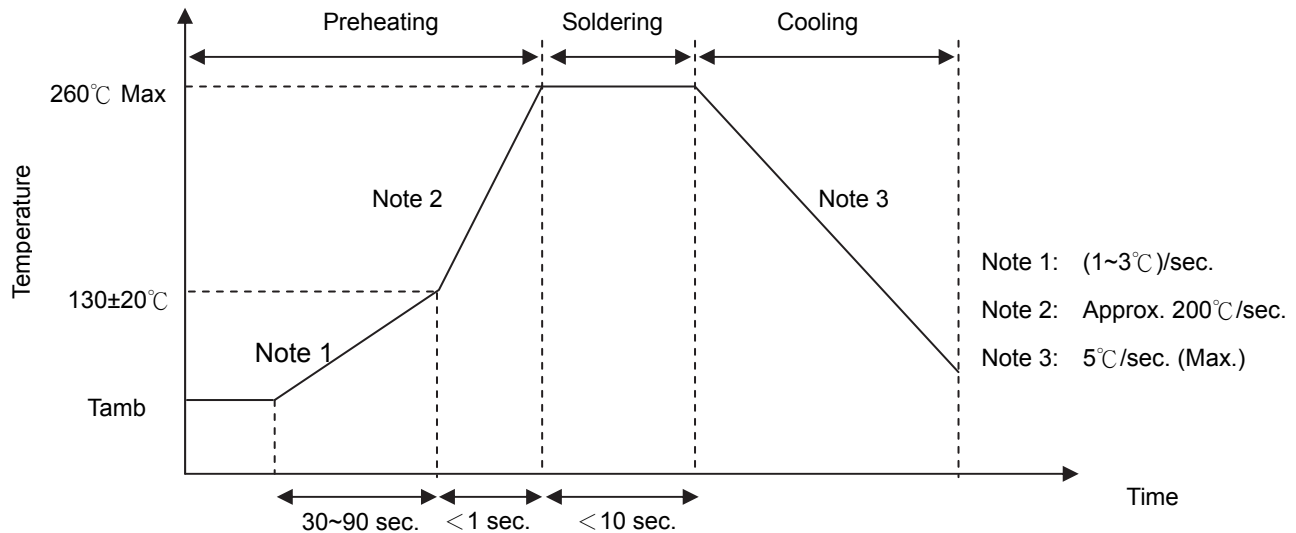
# NTC Thermistor : TTS Series

## 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.)

# NTC Thermistor : TTS Series



## Epoxy Bead Type for Temperature Sensing/Compensation

### ■ Reliability

Item	Standard	Test conditions / Methods		Specifications															
Tensile Strength of Terminations	IEC 60068-2-21	Gradually apply the specified force and keep the unit fixed for 10±1 sec. <table><tr><td>Terminal diameter</td><td>Force</td></tr><tr><td>(mm)</td><td>(Kg)</td></tr><tr><td><math>d \leq 0.25</math></td><td>0.10</td></tr><tr><td><math>0.25 &lt; d \leq 0.3</math></td><td>0.25</td></tr><tr><td><math>0.3 &lt; d \leq 0.5</math></td><td>0.5</td></tr></table>		Terminal diameter	Force	(mm)	(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	Force																		
(mm)	(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	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. <table><tr><td>Terminal diameter</td><td>Force</td></tr><tr><td>(mm)</td><td>(Kg)</td></tr><tr><td><math>d \leq 0.25</math></td><td>0.05</td></tr><tr><td><math>0.25 &lt; d \leq 0.3</math></td><td>0.125</td></tr><tr><td><math>0.3 &lt; d \leq 0.5</math></td><td>0.25</td></tr></table>		Terminal diameter	Force	(mm)	(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	Force																		
(mm)	(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   ΔR <sub>25</sub> /R <sub>25</sub>   ≤ 3 %															
High Temperature Storage	IEC 60068-2-2	100 ± 5°C , 1000 ± 24 hrs		No visible damage   ΔR <sub>25</sub> /R <sub>25</sub>   ≤ 5 %															
Damp Heat, Steady State	IEC 60068-2-78	40 ± 2°C , 90~95% RH, 1000 ± 24 hrs		No visible damage   ΔR <sub>25</sub> /R <sub>25</sub>   ≤ 3 %															
Rapid Change of Temperature	IEC 60068-2-14	The conditions shown below shall be repeated 5 cycles. <table><tr><td>Step</td><td>Temperature (°C)</td><td>Period (minutes)</td></tr><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></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   ΔR <sub>25</sub> /R <sub>25</sub>   ≤ 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   ΔR <sub>25</sub> /R <sub>25</sub>   ≤ 5 %															

### ■ Packaging

- Bulk Packing: 500 pcs/bag

### ■ Warehouse Storage Conditions of Products

- Storage Conditions :
  1. Storage Temperature:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
  2. Relative Humidity:  $\leq 75\% \text{RH}$
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage : 1 year