

NTC Thermistor: TTS Type



Bead Type for Temperature Sensing/Compensation

■ Features

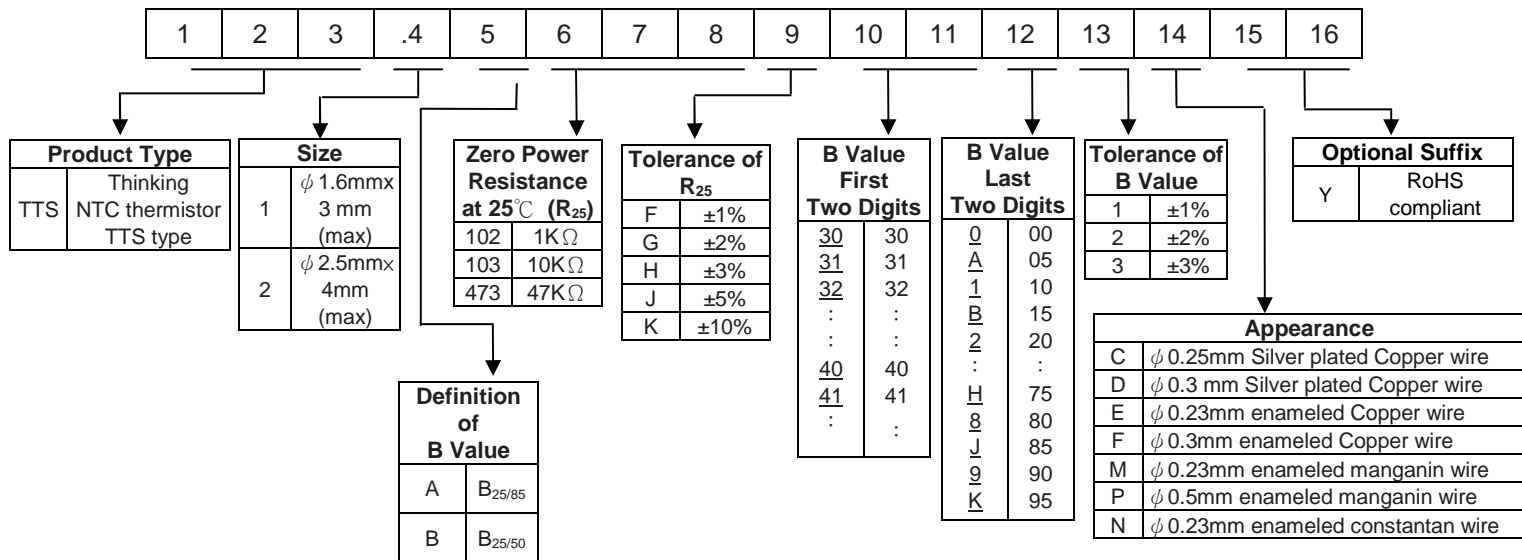
1. RoHS compliant
2. Body size ϕ 1.6mm~ ϕ 2.5mm
3. Radial lead resin coated
4. Long leads for easy sensor placement
5. -40 ~ +100°C operating temperature range
6. Wide resistance range
7. Agency recognition: UL /cUL



■ Recommended Applications

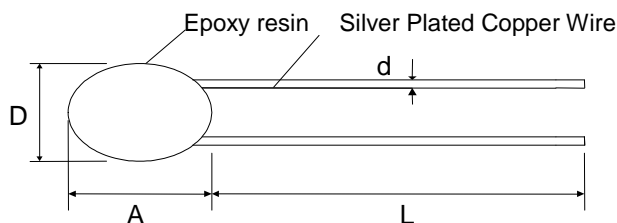
1. Home appliances (air conditioner, refrigerator, electric fan, electric cooker, washing machine, microwave oven, drinking machine, CTV, radio.)
2. Thermometer

■ Part Number Code



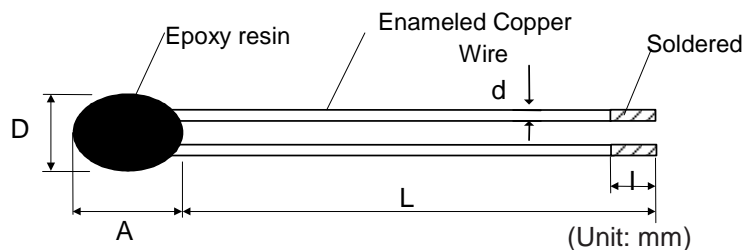
■ Structure and Dimensions

C Type



Part No.	Dmax.	Amax.	d	L
TTS1	1.6	3.0	0.25 \pm 0.02	40 \pm 2
TTS2	2.5	4.0		

E Type



Part No.	Dmax.	Amax.	d	L	l
TTS1	1.6	3.0	0.23 \pm 0.02	80 \pm 4	4 \pm 1
TTS2	2.5	4.0			

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■ Electrical Characteristics

Part No.	Zero power Resistance at 25°C	Tolerance of R ₂₅ (±%)	B Value		Tolerance of B value (±%)	Max. Power Rating at 25°C P _{max} (mW)	Dissipation Factor δ(mW/°C)	Thermal Time Constant τ(Sec.)	Operating Temperature Range T _L ~T _U (°C)	Safety Approvals	
	R ₂₅ (KΩ)		(K)	(K)						UL	cUL
TTS#B502□327*	5	1、2、3、 5、10	25/50	3270	1、2、3	45	≥1	≤10	-40 ~ +100	√	√
TTS#B502□347*	5		25/50	3470						√	√
TTS#B502□365*	5		25/50	3650						√	√
TTS#B502□395*	5		25/50	3950						√	√
TTS#B103□338*	10		25/50	3380						√	√
TTS#B103□347*	10		25/50	3470						√	√
TTS#B103□395*	10		25/50	3950						√	√
TTS#A103□34D	10		25/85	3435						√	√
TTS#A103□39H	10		25/85	3975						√	√
TTS#B203□395*	20		25/50	3950						√	√
TTS#A203□34D*	20		25/85	3435						√	√
TTS#A303□395*	30		25/85	3950						√	√
TTS#B473□395*	47		25/50	3950						√	√
TTS#B503□395*	50		25/50	3950						√	√
TTS#A503□34D*	50		25/85	3435						√	√
TTS#A833□40B*	83		25/85	4015						√	√
TTS#A104□34D*	100		25/85	3435						√	√
TTS#B104□410*	100		25/50	4100						√	√
TTS#A104□425*	100		25/85	4250						√	√
TTS#B474□439*	470		25/50	4390						√	√
TTS#A504□427*	500	25/85	4270	√	√						
TTS#B504□430*	500	25/50	4300	√	√						

Note 1: # = Body Size , □ = Tolerance of R₂₅ , * = Tolerance of B value

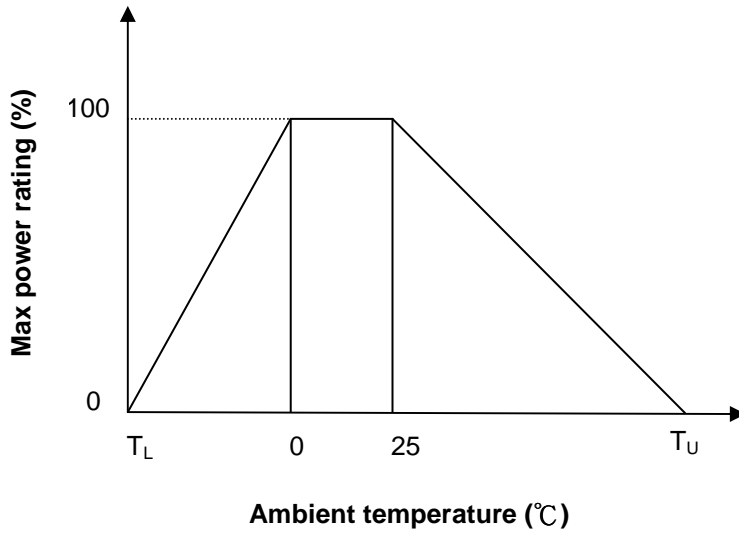
Note 2: UL/cUL File No E138827

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■ Power Derating Curve



T_U : Maximum operating temperature (°C)

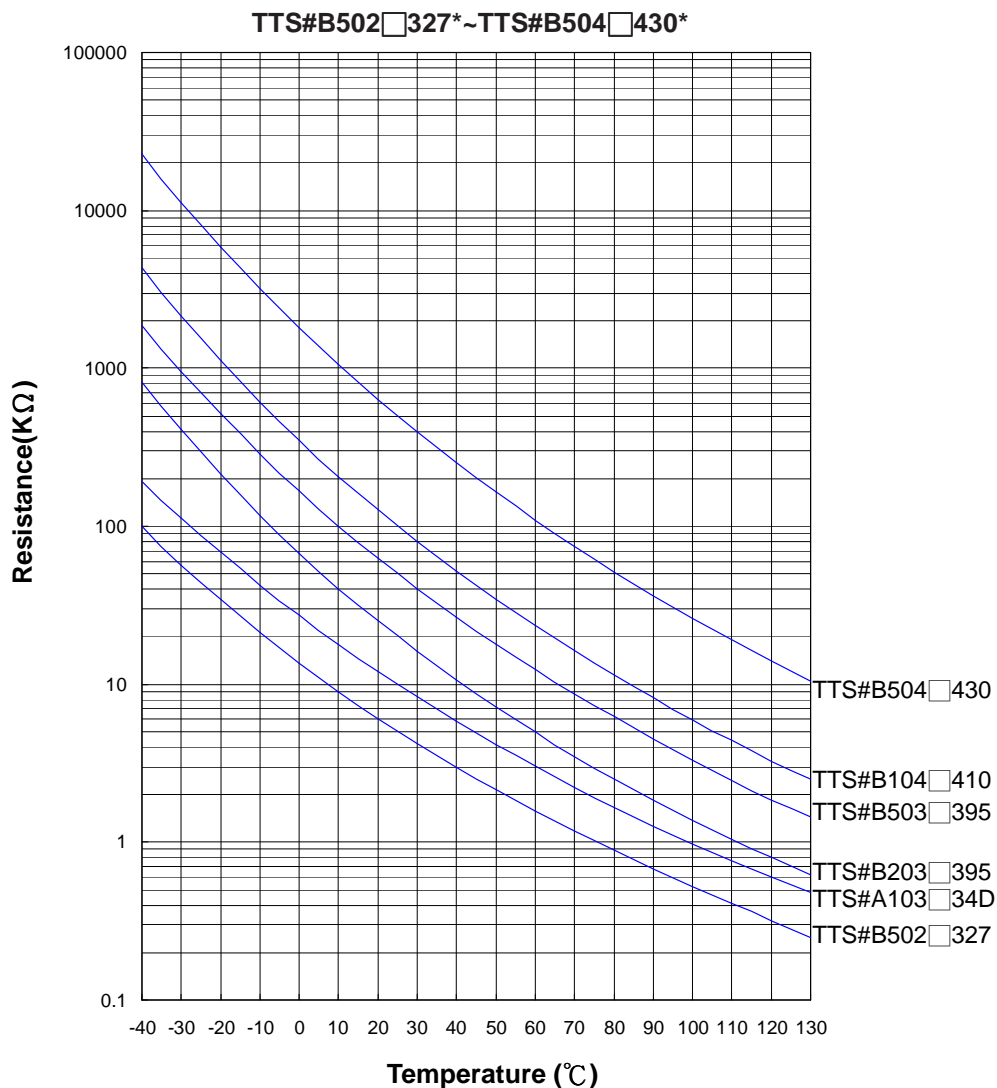
T_L : Minimum operating temperature (°C)

For example : Ambient temperature(T_a)=55°C

Maximum operating temperature(T_U)= 100°C

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

■ R-T Characteristic Curves (representative)



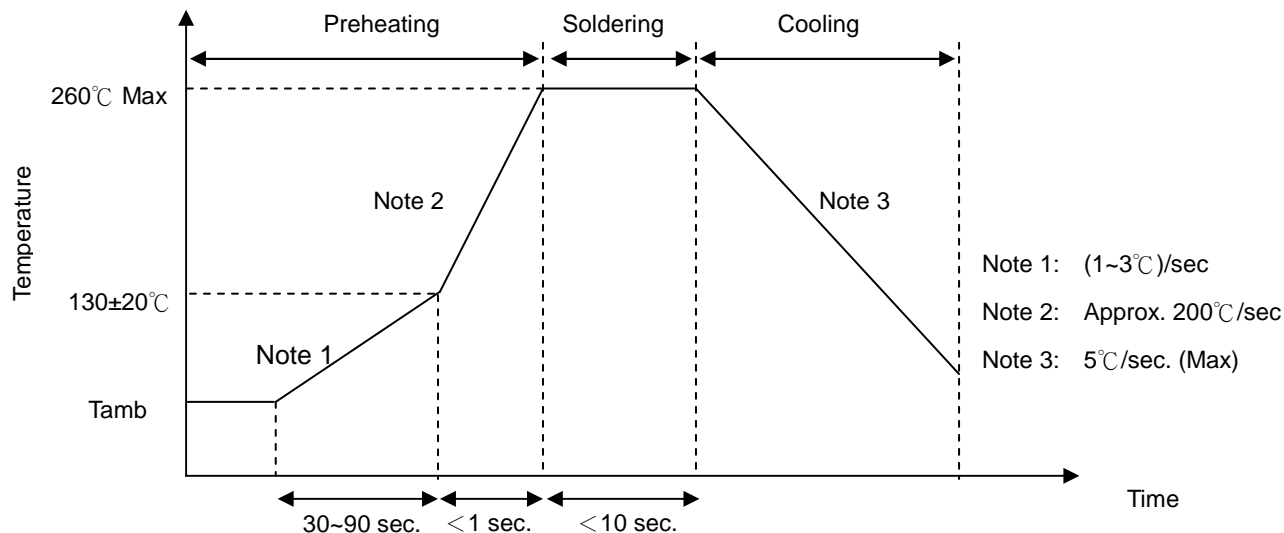
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■ Soldering Recommendation

● 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	2 mm (min.)

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■ Reliability

Item	Standard	Test conditions / Methods	Specifications															
Tensile Strength of Terminations	IEC 60068-2-21	<p>Gradually applying the force specified and keeping 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							
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$0.3 < d \leq 0.5$	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°, 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							
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Solderability	IEC 60068-2-20	$235 \pm 5^\circ\text{C}$, 2 ± 0.5 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC 60068-2-20	$260 \pm 5^\circ\text{C}$, 10 ± 1 sec	No visible damage $\Delta R_{25}/R_{25}$ $\leq 3\%$															
High Temperature Storage	IEC60068-2-3	$100 \pm 5^\circ\text{C}$, 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ $\leq 5\%$															
Damp Heat, Steady State	IEC60068-2-3	$40 \pm 2^\circ\text{C}$, 90~95% RH , 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ $\leq 3\%$															
Rapid Change of Temperature	IEC60068-2-14	<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 $\Delta R_{25}/R_{25}$ $\leq 3\%$
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																
Life Test	IEC 60539-1	$25 \pm 5^\circ\text{C}$, Pmax. X 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ $\leq 5\%$															

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Packaging

- **Bulk Packing:** 500 pcs/ bag

■ Storage Conditions of Products

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