NTC Thermistor：TTS Type

Bead Type for Temperature Sensing/Compensation

■ Features

1. RoHS compliant
2. Body size ϕ1.6mm~ϕ2.5mm
3. Radial lead resin coated
4. Long leads for easy sensor placement
5. -40 ~ +100℃ 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

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

Product Type	
TTS	Thinking NTC thermistor TTS type

Size	
1	ϕ1.6mmx 3 mm (max)
2	ϕ2.5mmx 4mm (max)

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 First Two Digits	
30	30
31	31
32	32
:	:
:	:
40	40
41	41
:	:

B Value Last Two Digits	
0	00
A	05
1	10
B	15
2	20
:	:
H	75
8	80
J	85
9	90
K	95

Tolerance of B Value	
1	±1%
2	±2%
3	±3%

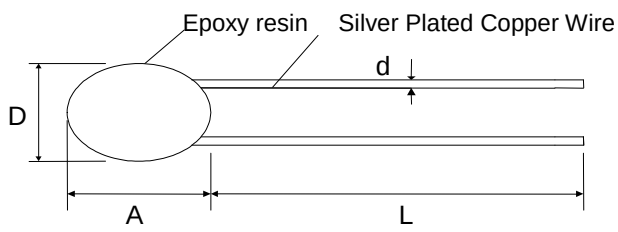
Optional Suffix	
Y	RoHS compliant

Definition of B Value	
A	$B_{25/85}$
B	$B_{25/50}$

Appearance	
C	ϕ0.25mm Silver plated Copper wire
D	ϕ0.3 mm Silver plated Copper wire
E	ϕ0.23mm enameled Copper wire
F	ϕ0.3mm enameled Copper wire
M	ϕ0.23mm enameled manganin wire
P	ϕ0.5mm enameled manganin wire
N	ϕ0.23mm enameled constantan wire

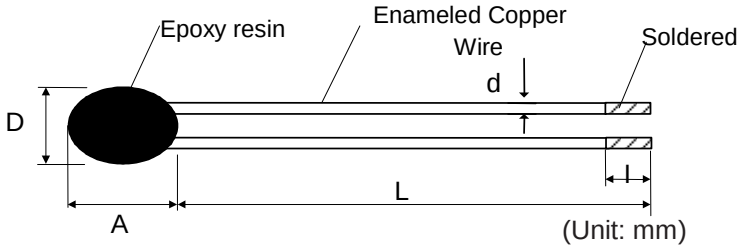
■ Structure and Dimensions

C Type



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

E Type



(Unit: mm)

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

NTC Thermistor： TTS Type

Bead Type for Temperature Sensing/Compensation

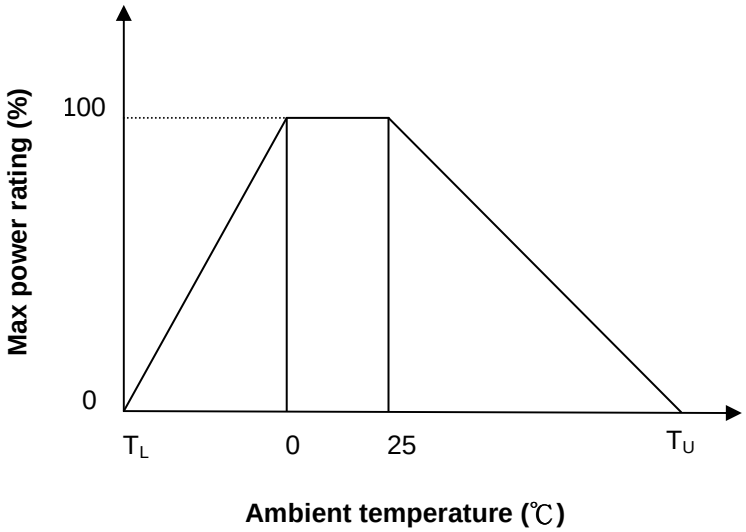
■ Electrical Characteristics

Part No.	Zero power Resistance at 25℃	Tolerance of R_{25}	B Value		Tolerance of B value	Max. Power Rating at 25℃	Dissipation Factor	Thermal Time Constant	Operating Temperature Range	Safety Approvals	
	R_{25} (KΩ)	(±%)	(K)		(±%)	P_{max}(mW)	δ(mW/℃)	τ(Sec.)	T_L~T_U(℃)	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 R_{25} , * = Tolerance of B value

Note 2: UL/cUL File No E138827

■ Power Derating Curve



T_U：Maximum operating temperature (℃)

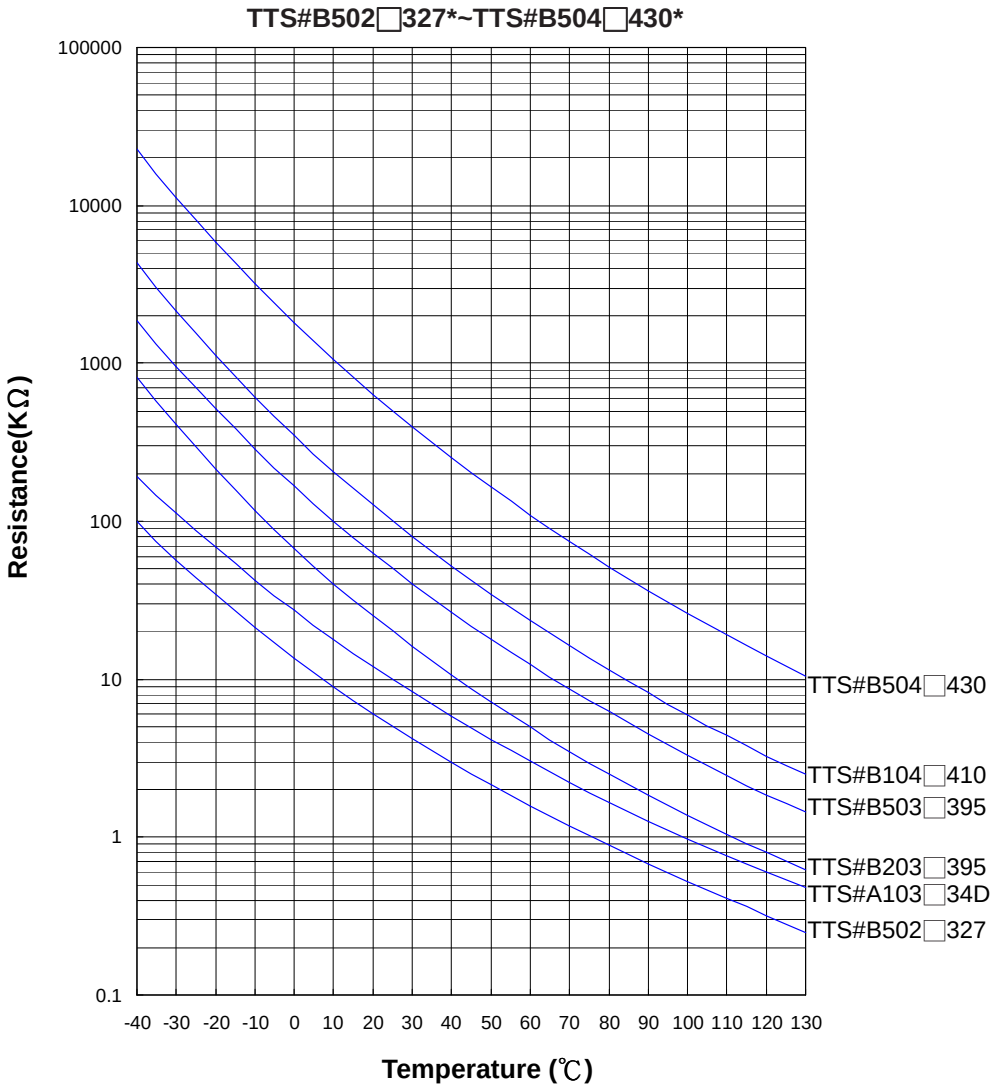
T_L：Minimum operating temperature (℃)

For example：Ambient temperature(Ta)=55℃

Maximum operating temperature(T_U)＝100℃

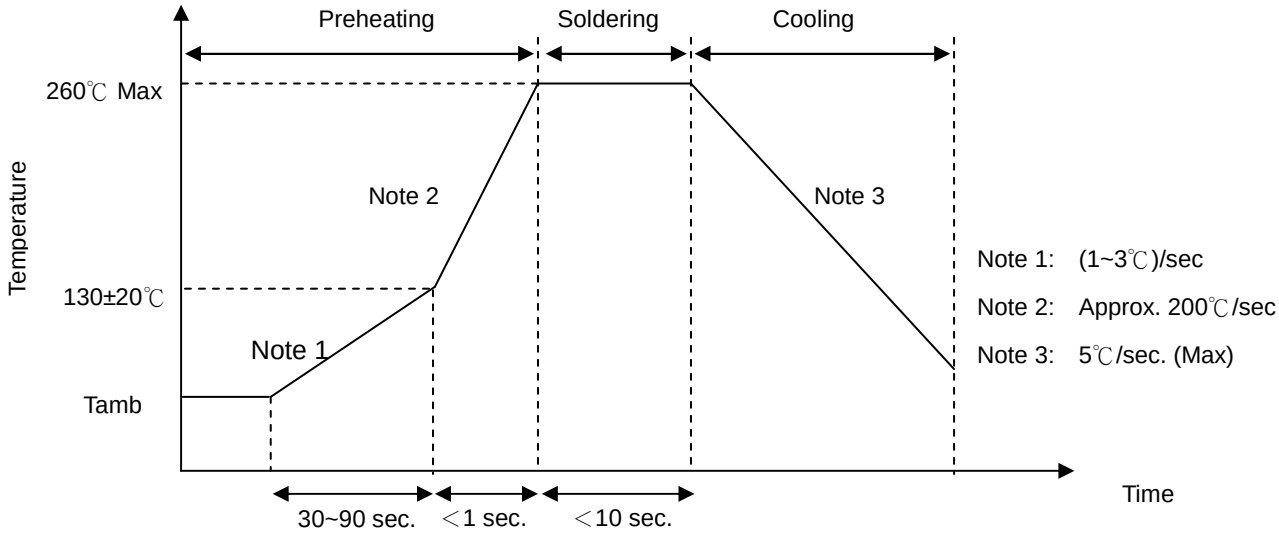
$P_{Ta}=(T_U-Ta)/(T_U-25)\times Pmax$＝60% Pmax

■ R-T Characteristic Curves (representative)



■ 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	2 mm (min.)

■ 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 applying the force specified and keeping 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°, then return to the original positi on. 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>235 ± 5℃ ， 2 ± 0.5 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 ± 5℃ ， 10 ± 1 sec</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\ \%$</td></tr>
<tr><td>High Temperature Storage</td><td>IEC60068-2-3</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>IEC60068-2-3</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>IEC60068-2-14</td><td>The conditions shown below shall be repeated 5 cycles

<table>
<tr><th>Step</th><th>Temperature (℃)</th><th>Period (minutes)</th></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>
</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\ \%$</td></tr>
<tr><td>Life Test</td><td>IEC 60539-1</td><td>25 ± 5℃, Pmax. X 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 5\ \%$</td></tr>
</table>

Packaging

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

■ 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