

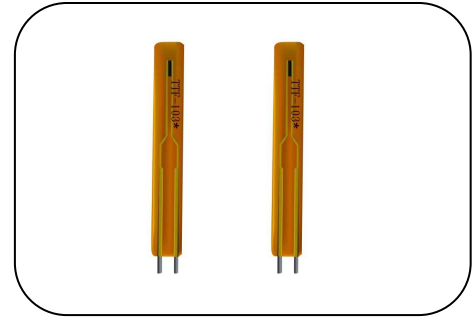
NTC Thermistor: TTF Series



Insulation Film Type for Temperature Sensing/Compensation

■ Features

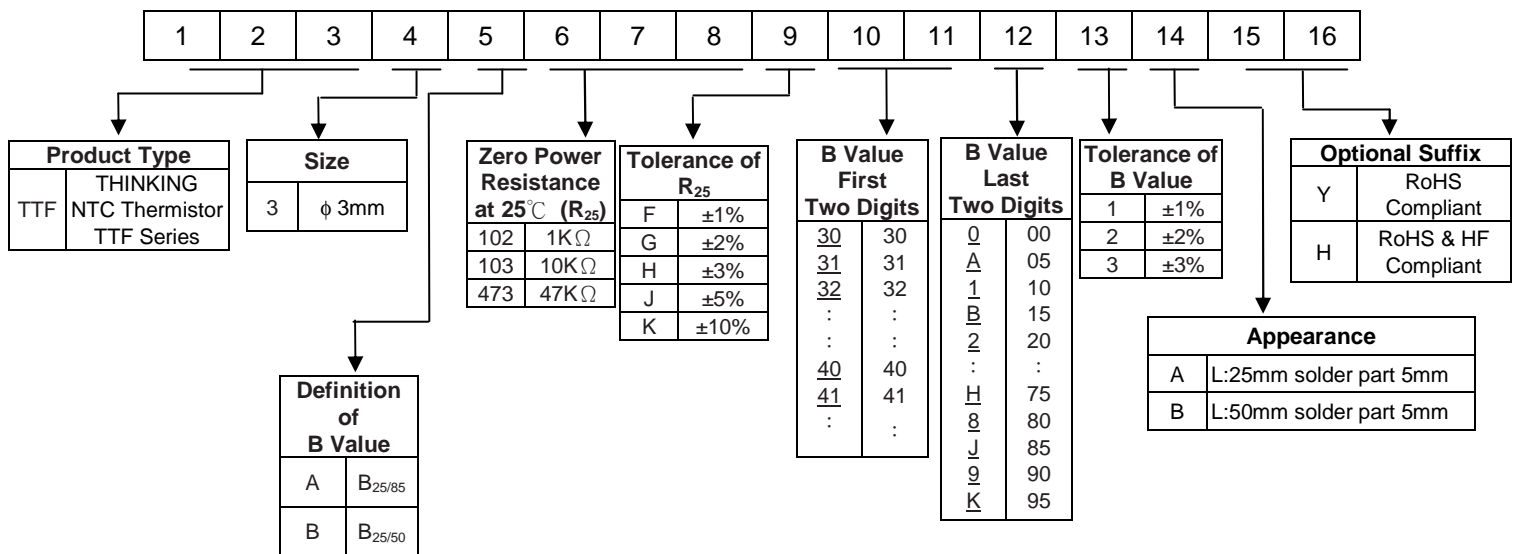
1. RoHS compliant & Halogen-Free (HF) series are available
2. Radial leded insulation film coated
3. Operating temperature range: -40 ~ +100°C
4. Agency recognition: UL/cUL



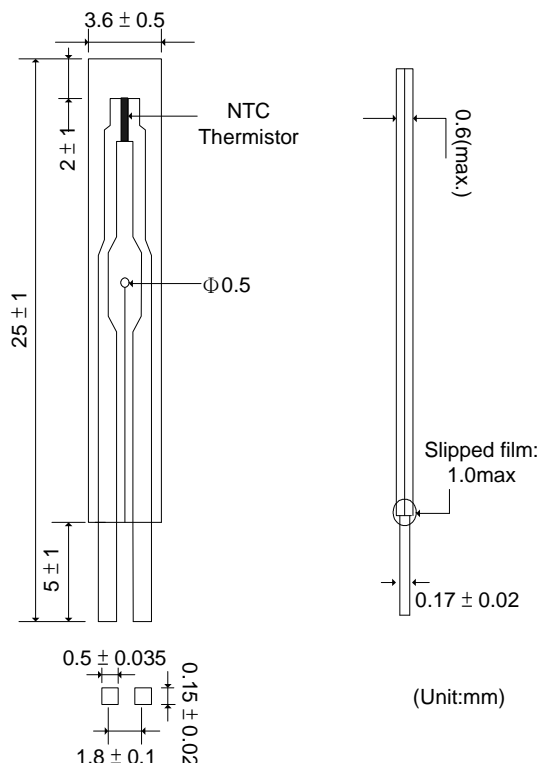
■ Recommended Applications

1. Home appliances
2. Computers
3. Battery packs

■ Part Number Code



■ Structure and Dimensions



NTC Thermistor: TTF Series

Insulation Film Type for Temperature Sensing/Compensation



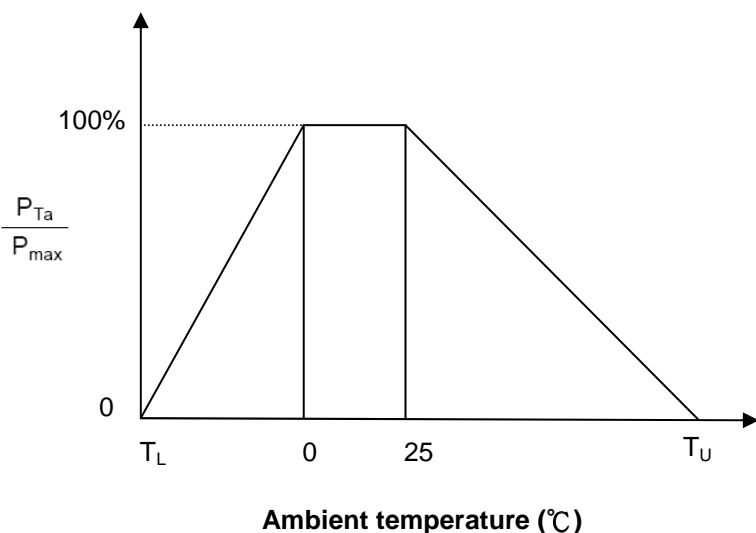
■ Electrical Characteristics

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
TTF3A502□34D*	5	1, 2, 3, 5	25/85	3435	3.5	Approx. 0.7	Approx. 5	-40 ~ +100	√	√
TTF3A103□34D*	10			3435					√	√
TTF3A203□34D*	20			3435					√	√
TTF3A223□34D*	22			3435					√	√
TTF3A303□39H*	30			3975					√	√
TTF3A104□34D*	100			3435					√	√

Note 1: □ = Tolerance of R₂₅

Note 2: * = Tolerance of B value

■ 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

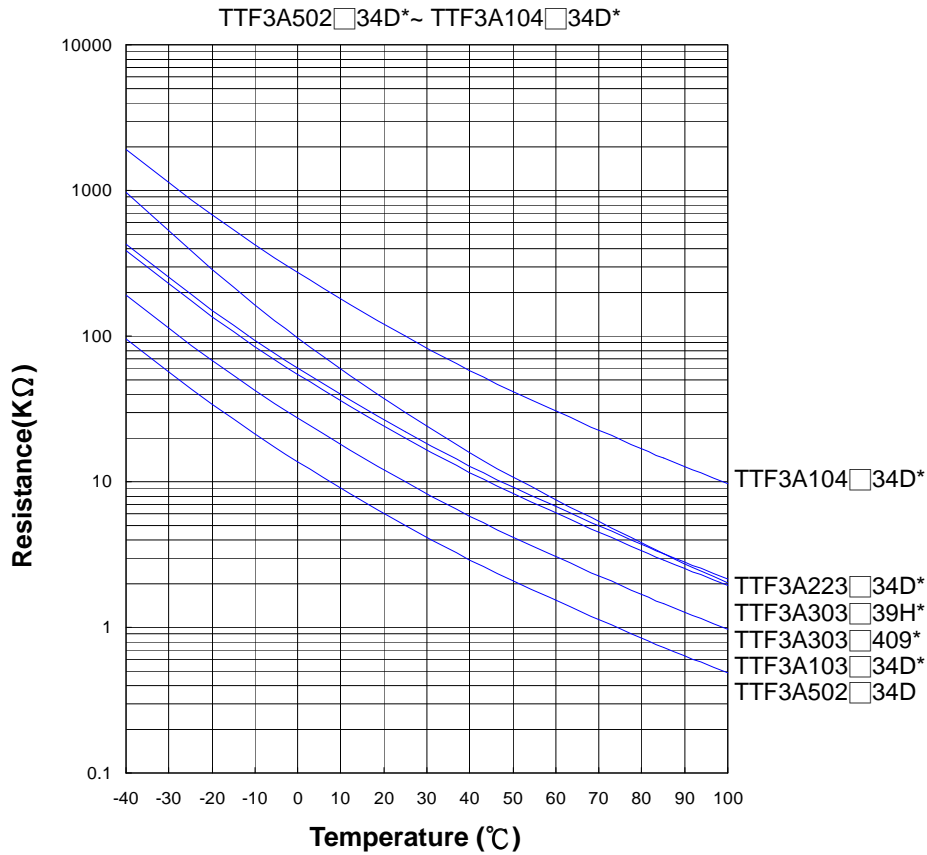
$P_{Ta} = (T_U - T_a) / (T_U - 25) \times P_{max} = 60\% P_{max}$

NTC Thermistor: TTF Series

Insulation Film Type for Temperature Sensing/Compensation

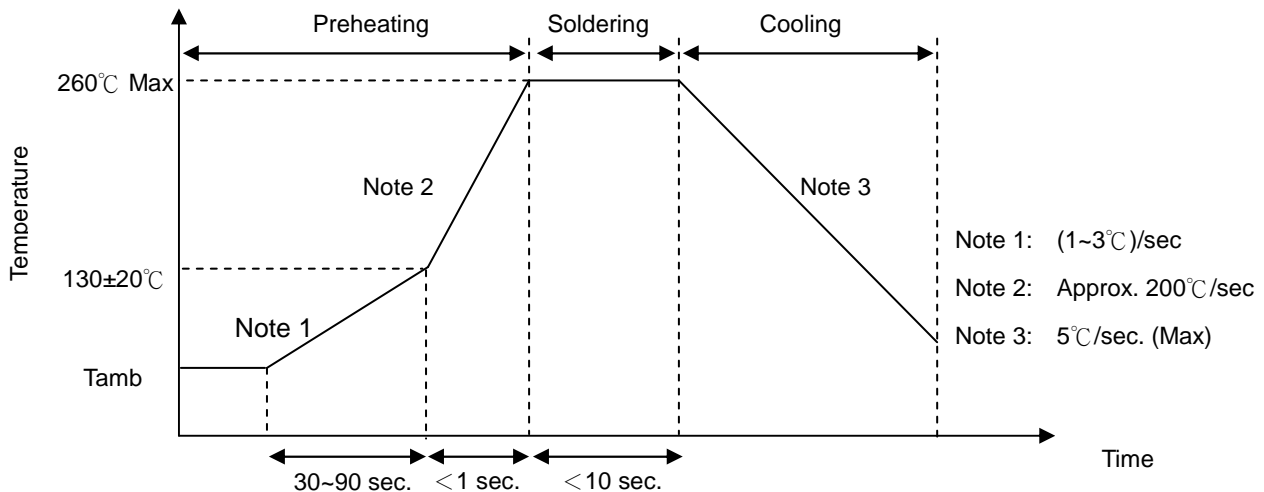


■ R-T Characteristic Curves



■ 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 Coating	Do not touch film bottom

NTC Thermistor: TTF Series

Insulation Film Type for Temperature Sensing/Compensation



■ Reliability

Item	Standard	Test conditions / Methods	Specifications															
Tensile Strength of Terminals	IEC60068-2-21	<p>Gradually apply the specified force and keep the unit fixed for 10±1 sec.</p> <table> <tr> <td>Terminal cross-sectional area (mm²)</td> <td>Force (Kg)</td> </tr> <tr> <td>$0.05 < S \leq 0.1$</td> <td>0.25</td> </tr> </table>	Terminal cross-sectional area (mm ²)	Force (Kg)	$0.05 < S \leq 0.1$	0.25	No visible damage											
Terminal cross-sectional area (mm ²)	Force (Kg)																	
$0.05 < S \leq 0.1$	0.25																	
Bending Strength of Terminals	IEC60068-2-21	<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> <tr> <td>Terminal cross-sectional area (mm²)</td> <td>Force (Kg)</td> </tr> <tr> <td>$0.05 < S \leq 0.1$</td> <td>0.125</td> </tr> </table>	Terminal cross-sectional area (mm ²)	Force (Kg)	$0.05 < S \leq 0.1$	0.125	No visible damage											
Terminal cross-sectional area (mm ²)	Force (Kg)																	
$0.05 < S \leq 0.1$	0.125																	
Solderability	IEC60068-2-20	245 ± 3°C, 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC60068-2-20	260 ± 3°C, 10 ± 1 sec	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
High Temperature Storage	IE600C68-2-2	100 ± 5°C, 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Damp Heat, Steady State	IEC60068-2-3	40 ± 2°C, 90~95% RH, 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 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 ΔR 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	IEC60539-1	25 ± 5°C, Pmax., 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															

■ Packaging

- Bulk Packing: 500 pcs/ bag

■ 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