

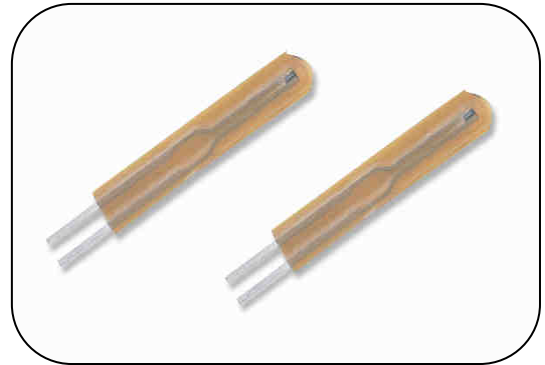
NTC Thermistor: TTF Type

Insulation Film Type for Temperature Sensing/Compensation



■ Features

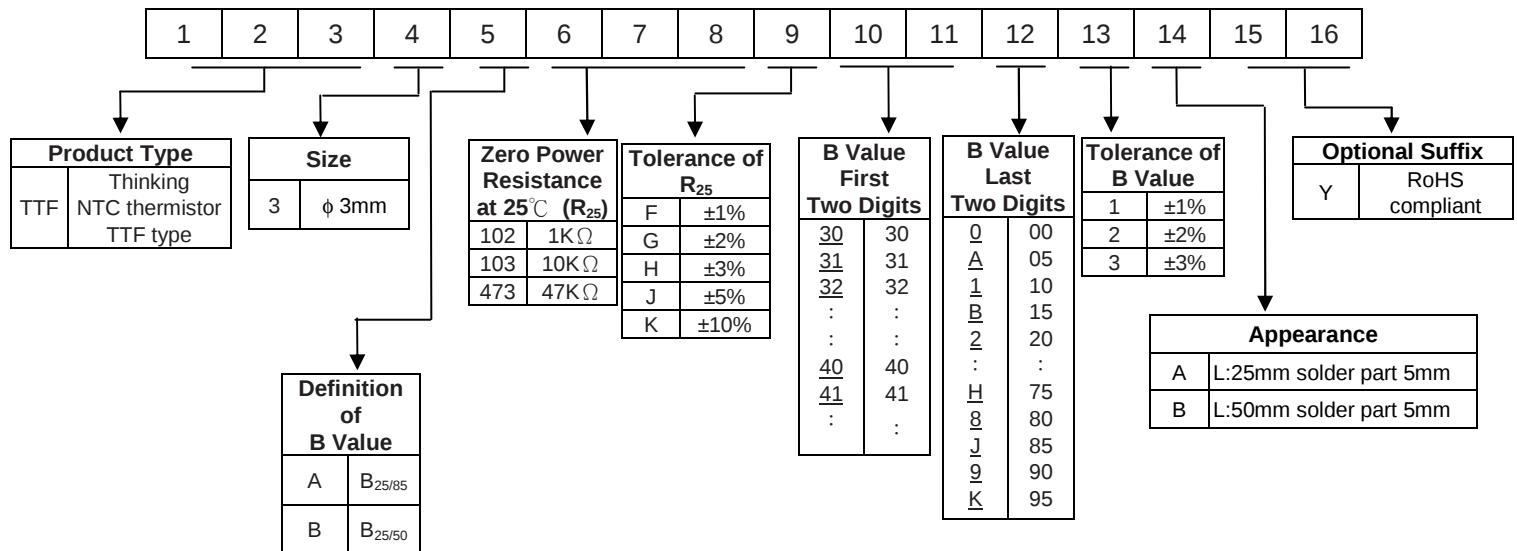
1. RoHS compliant
2. Radial leaded insulation film coated
3. -40 ~ +100°C operating temperature range
4. Agency recognition: UL /cUL



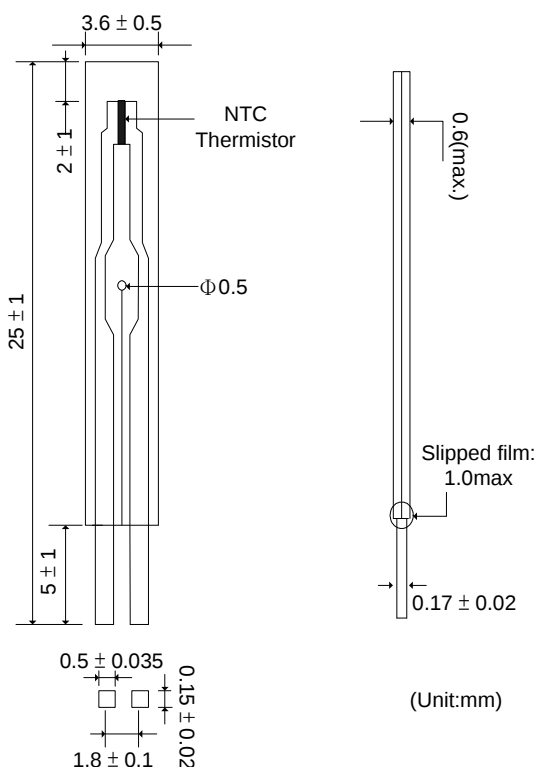
■ Recommended Applications

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

■ Part Number Code



■ Structure and Dimensions



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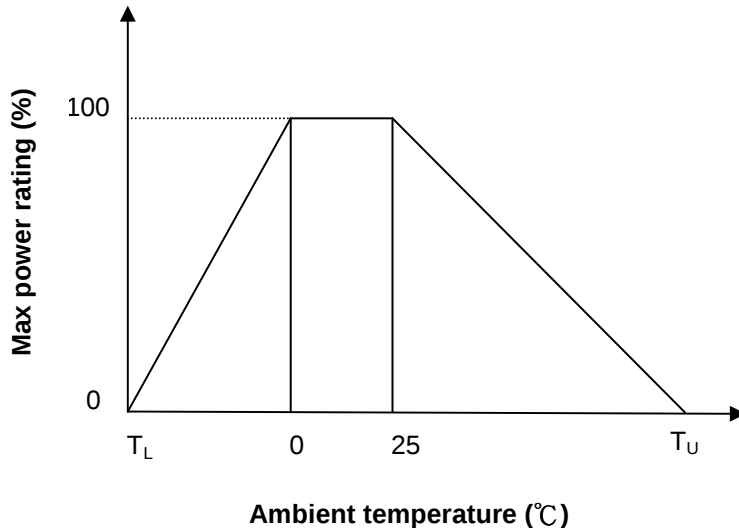
■ Electrical Characteristics

Part No.	Zero Power Resistance at 25℃	Tolerance of R ₂₅	B _{25/85} 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
TTF3A502□34D*	5	1、2、3、5、10	3435	1、2、3	3.5	Approx. 0.7	Approx. 5	-40 ~ +100	√	√
TTF3A103□34D*	10								√	√
TTF3A203□34D*	20								√	√
TTF3A303□34D*	30								√	√
TTF3A473□34D*	47								√	√
TTF3A473□39H*	47		3975						√	√
TTF3A473□419*	47		4190						√	√
TTF3A503□34D*	50		3435						√	√
TTF3A104□34D*	100		3975						√	√
TTF3A104□39H*	100		4050						√	√
TTF3A224□405*	220								√	√

Note 1: □ = Tolerance of R₂₅

Note 2: * = Tolerance of B value

■ 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

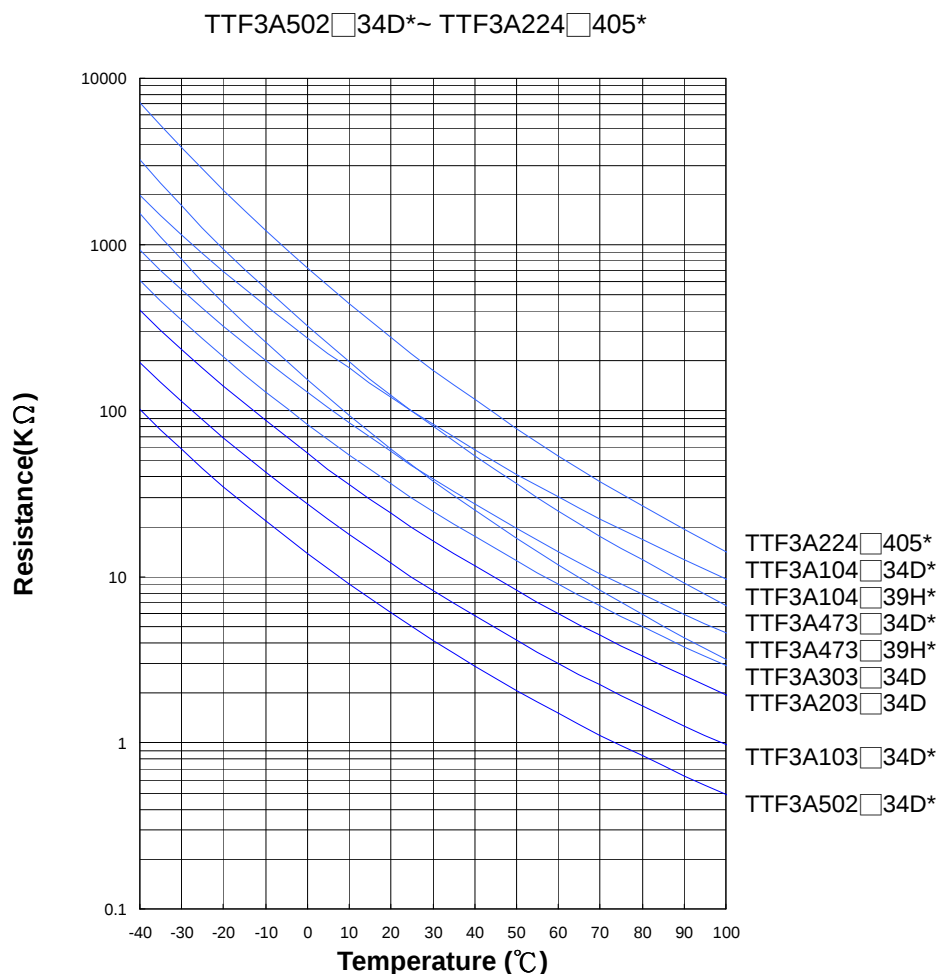
$P_{Ta} = (T_U - T_a) / (T_U - 25) \times P_{max} = 60\% P_{max}$

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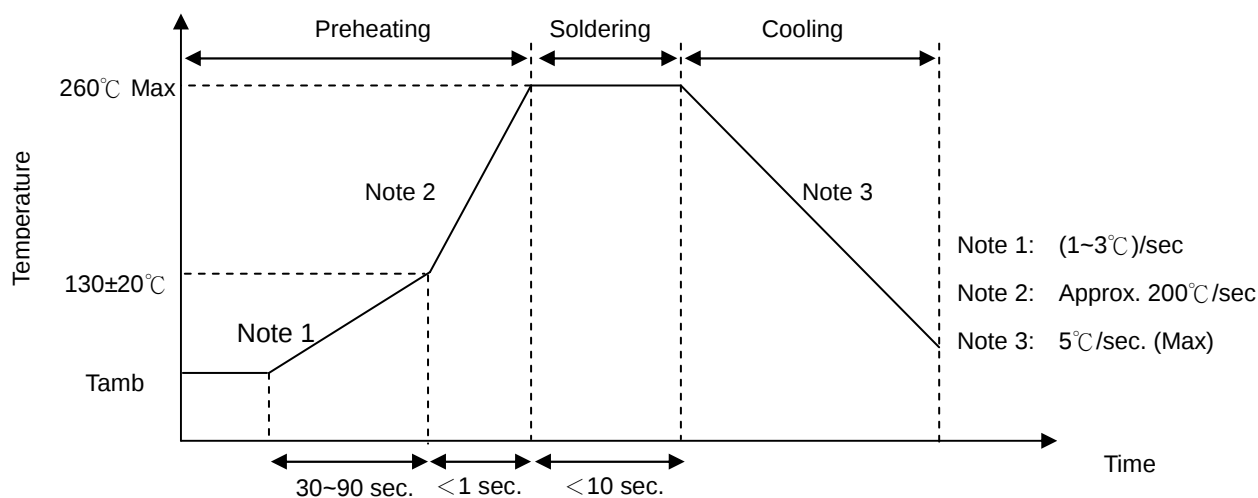


■ R-T Characteristic Curves (representative)



■ Soldering Recommendation

● Wave Soldering Profile



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- Recommended Reworking Conditions With Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Distance from Coating	Can't touch film bottom

Reliability

Item	Standard	Test conditions / Methods		Specifications															
Tensile Strength of Terminals	IEC60068-2-21	Gradually applying the force specified and keeping the unit fixed for 10±1 sec.. <table><tr><td>Terminal cross-sectional area (mm2)</td><td>Force (Kg)</td></tr><tr><td>$0.07<S\leq 0.2$</td><td>0.5</td></tr></table>		Terminal cross-sectional area (mm2)	Force (Kg)	$0.07<S\leq 0.2$	0.5	No visible damage											
Terminal cross-sectional area (mm2)	Force (Kg)																		
$0.07<S\leq 0.2$	0.5																		
Bending Strength of Terminals	IEC60068-2-21	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. <table><tr><td>Terminal cross-sectional area (mm2)</td><td>Force (Kg)</td></tr><tr><td>$0.07<S\leq 0.2$</td><td>0.25</td></tr></table>		Terminal cross-sectional area (mm2)	Force (Kg)	$0.07<S\leq 0.2$	0.25	No visible damage											
Terminal cross-sectional area (mm2)	Force (Kg)																		
$0.07<S\leq 0.2$	0.25																		
Solderability	IEC60068-2-20	235 ± 5℃ , 2 ± 0.5 sec		At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC60068-2-20	260 ± 5℃ , 10 ± 1 sec		No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
High Temperature Storage	IE600C68-2-2	100 ± 5℃ , 1000 ± 24 hrs		No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Damp Heat, Steady State	IEC60068-2-3	40 ± 2℃ , 90~95% RH , 1000 ± 24 hrs		No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
Rapid Change of Temperature	IEC60068-2-14	The conditions shown below shall be repeated 5 cycles <table><tr><td>Step</td><td>Temperature (℃)</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 (℃)	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 (℃)	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 ± 5℃, Pmax. , 1000 ± 24 hrs		No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Insulation Test	MIL-STD-202F-Method 302	500 V _{DC} 1 min		No visible damage ≥ 100 MΩ															
Hi-pot Test	MIL-STD-202F-Method 301	1000 V _{AC} 10mA 1 min		No visible damage															

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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 : $\leq 75\% \text{RH}$
 3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage : 1 year