

NTC Thermistor: TTF Type

Insulation Film Type for Temperature Sensing/Compensation



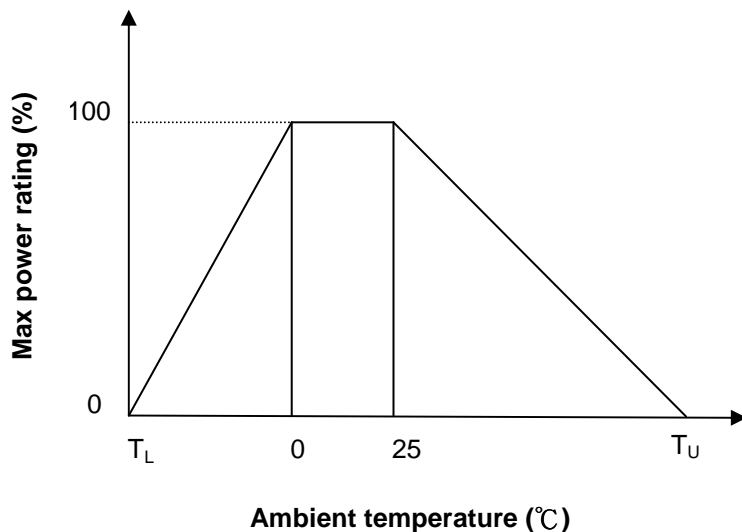
■ Electrical Characteristics

Part No.	Zero Power Resistance at 25°C	Tolerance of R ₂₅	B _{25/85} Value	Tolerance of B value	Max. Power Rating 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、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								√	√
TTF3A473□419*	47								√	√
TTF3A503□34D*	50								√	√
TTF3A104□34D*	100								√	√
TTF3A104□39H*	100								√	√
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

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

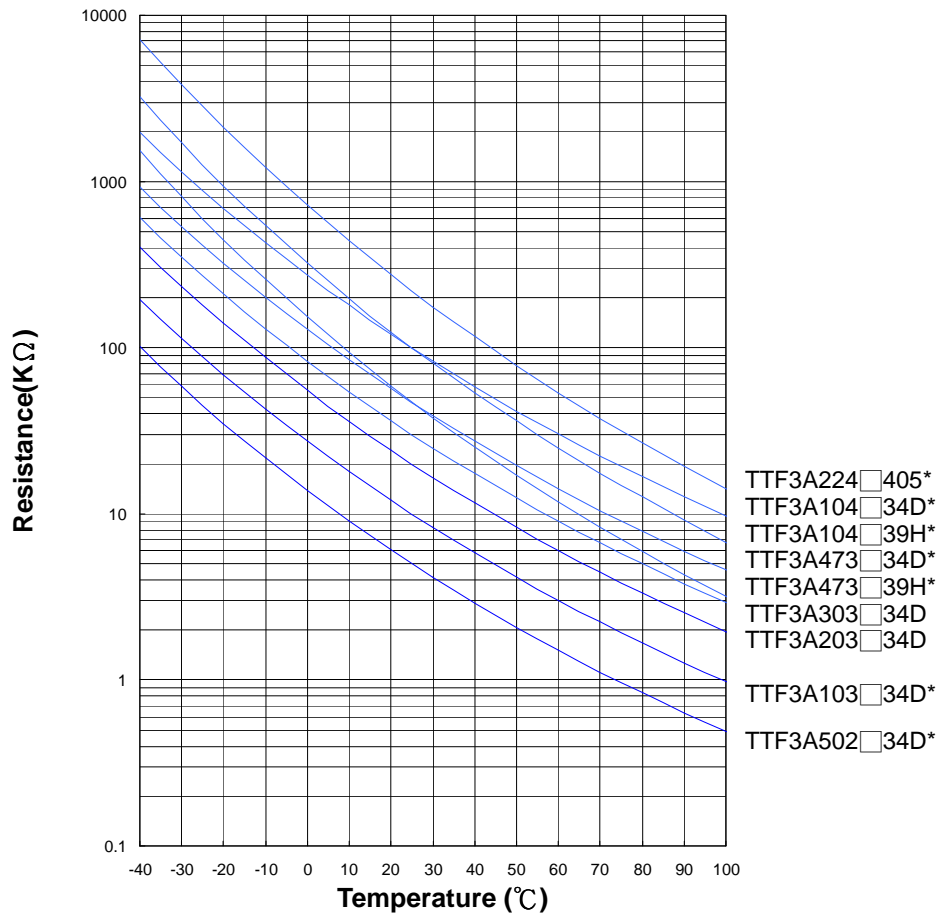
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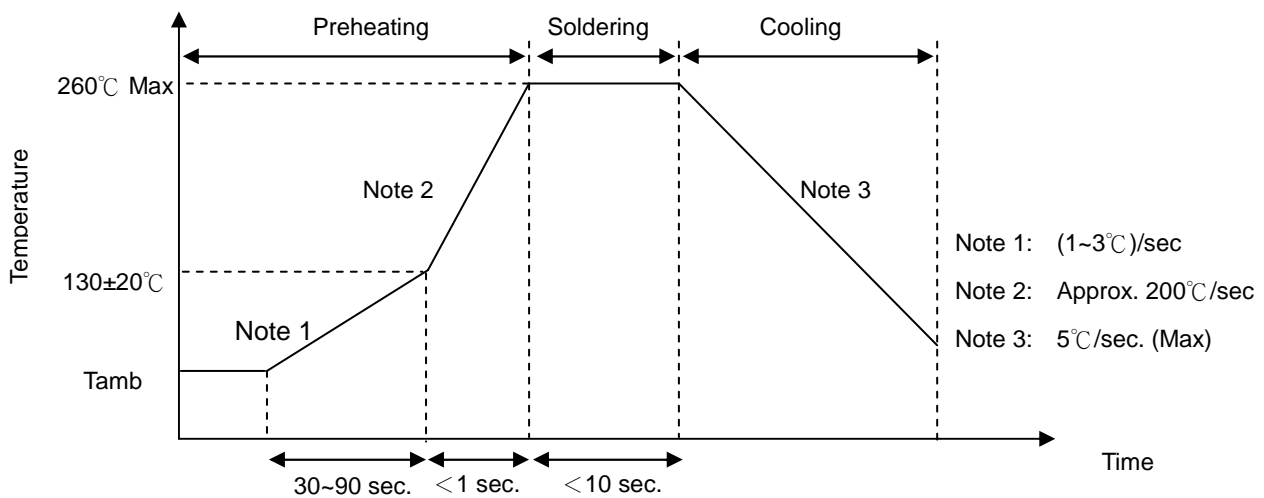
■ R-T Characteristic Curves (representative)

TTF3A502□34D*~ TTF3A224□405*



■ 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	<p>Gradually applying the force specified and keeping the unit fixed for 10±1 sec..</p> <table> <tr> <td>Terminal cross-sectional area (mm²)</td> <td>Force (Kg)</td> </tr> <tr> <td>$0.07 < S \leq 0.2$</td> <td>0.5</td> </tr> </table>	Terminal cross-sectional area (mm ²)	Force (Kg)	$0.07 < S \leq 0.2$	0.5	No visible damage											
Terminal cross-sectional area (mm ²)	Force (Kg)																	
$0.07 < S \leq 0.2$	0.5																	
Bending Strength of Terminals	IEC60068-2-21	<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> <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 (mm ²)	Force (Kg)	$0.07 < S \leq 0.2$	0.25	No visible damage											
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Solderability	IEC60068-2-20	235 ± 5°C , 2 ± 0.5 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC60068-2-20	260 ± 5°C , 10 ± 1 sec	No visible damage $\Delta R_{25}/R_{25}$ ≤ 3 %															
High Temperature Storage	IE600C68-2-2	100 ± 5°C , 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ ≤ 5 %															
Damp Heat, Steady State	IEC60068-2-3	40 ± 2°C , 90~95% RH , 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ ≤ 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 $\Delta R_{25}/R_{25}$ ≤ 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																
Life Test	IEC 60539-1	25 ± 5°C, Pmax. , 1000 ± 24 hrs	No visible damage $\Delta R_{25}/R_{25}$ ≤ 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 : $\leq 75\%RH$
 3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage : 1 year