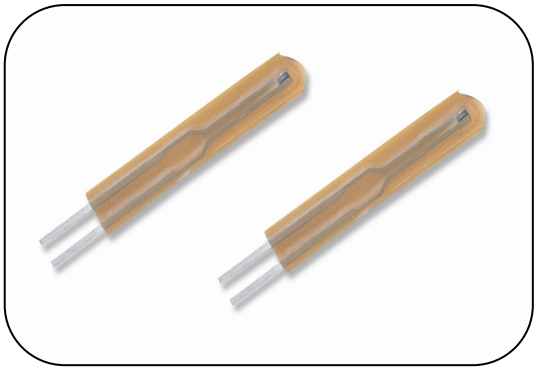
NTC Thermistor： TTF Series

Insulation Film Type for Temperature Sensing/Compensation

■ Features

1. RoHS compliant
2. Radial leaded insulation film coated
3. -40 ~ +100℃ 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 No. Code

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

Product Code

TTF	Thinking NTC Thermistor TTF Type

Body Size

3	W3.6mm

Define of Beta Value

A	$B_{25/85}$
B	$B_{25/50}$

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%

Beta Value First Two Digits

30	30
31	31
32	32
:	:
:	:
40	40
41	41
:	:

Beta 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 Beta Value

1	±1%
2	±2%
3	±3%

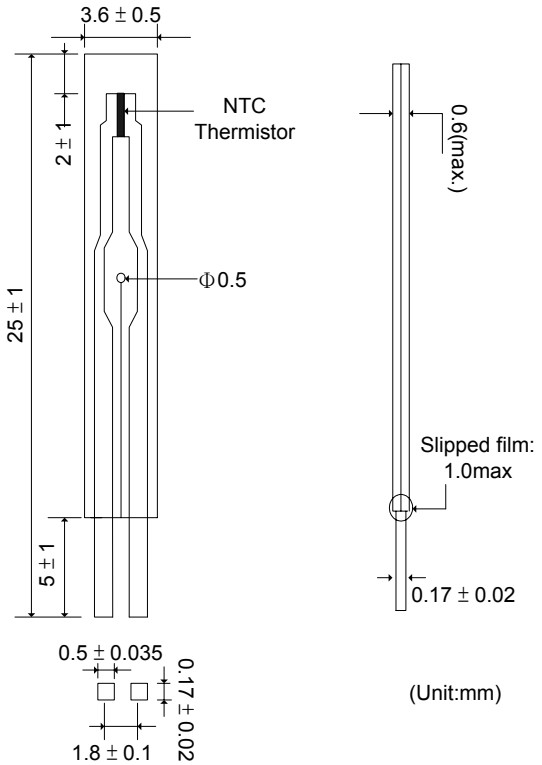
Internal Control Code

Y	RoHS Control

Appearance

A	L:25mm Solder Part 5mm
B	L:50mm Solder Part 5mm

■ Dimensions



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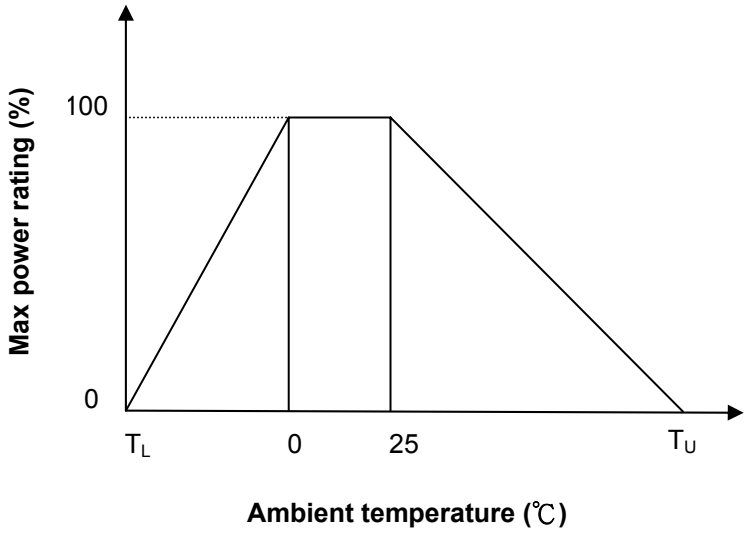
■ Characteristics

Part no.	Zero power resistance at 25°C	Tolerance of resistance	B25/85 Value	Tolerance of B value	Max. power rating at 25°C	Thermal dissipation constant	Thermal time constant	Operating temperature range	Safety Approvals	
									UL	cUL
	R_{25} (KΩ)	(±%)	(K)	(±%)	P_{max}(mW)	δ(mW/°C)	τ(Sec.)	T_L~T_U(°C)		
TTF3A502□34D*	5	1、2、3、5、10	3435	1、2、3	3.5	0.7	5	-40 ~ +100	√	√
TTF3A103□34D*	10								√	√
TTF3A203□34D*	20								√	√
TTF3A303□34D*	30								√	√
TTF3A473□34D*	47								√	√
TTF3A503□34D*	50								√	√
TTF3A104□34D*	100								√	√
TTF3A104□39H*	100		3975						√	√
TTF3A473□39H*	47		3975						√	√
TTF3A473□419*	47		4190						√	√
TTF3A224□405*	220		4050						√	√

Note 1:□ = Tolerance of resistance
Note 2: * = Tolerance of B value

■ Maximum power rating (Pmax)



T_U：Maximum operating temperature

T_L：Minimum operating temperature

For example：Ambient temperature(Ta)=55℃

Maximum operating temperature(Tu)＝100℃

P_{Ta}=(Tu-Ta)/(Tu-25)xPmax＝60% Pmax

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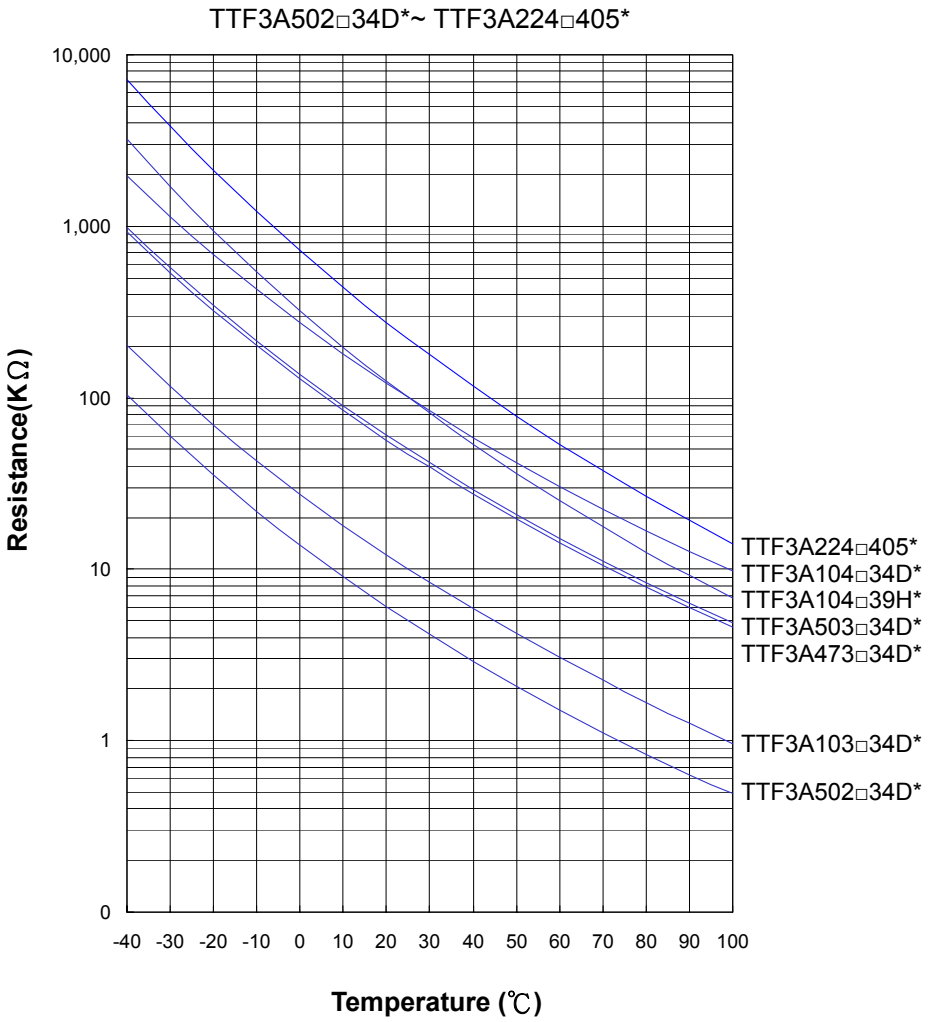
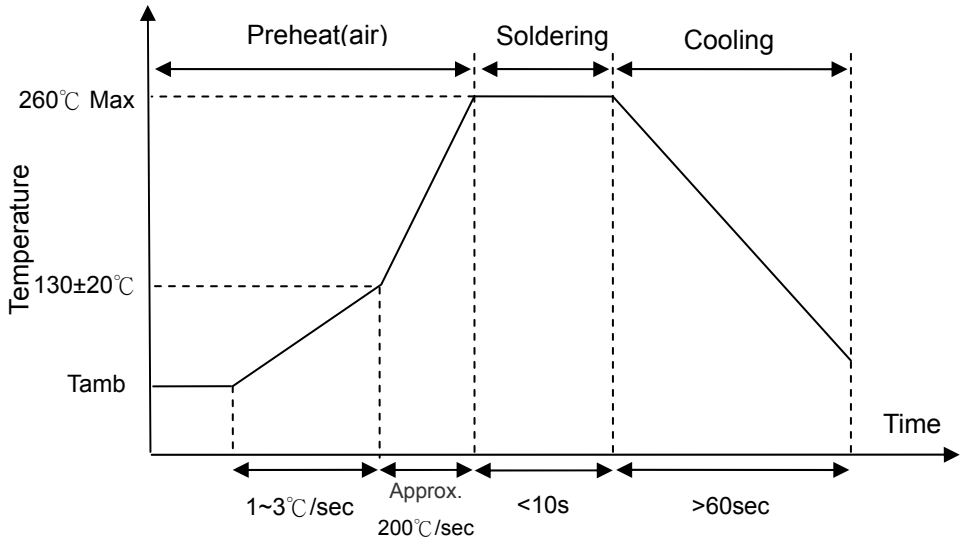
■ R-T characteristic curve (representative)



■ Soldering Recommendation

- **Wave Flow Soldering Profile**



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- **Reworking Conditions With Soldering Iron**

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

■ Reliability test

Item	Standard	Test Conditions / Methods	Specifications
Tensile Strength of Terminals	IEC68-2-21	Gradually applying the force specified below to each terminal and keeping the unit fixed for 10±1 sec Terminal cross-sectional area (mm2): 0.07<S≦0.2 — Force (Kg): 0.5	No visible damage
Bending Strength of Terminals	IEC68-2-21	Hanging the force specified below to each terminal and gradually bending each terminal by 90° in one direction, then 90° in the opposite direction, and again back to the origin. Terminal cross-sectional area (mm2): 0.07<S≦0.2 — Force (Kg): 0.25	No visible damage
Solderability	IEC68-2-20	235 ± 5℃ , 2 ± 0.5 sec	At least 95% of terminal electrode is covered by new solder
Resistance to Soldering Heat	IEC68-2-20	260 ± 5℃ , 10 ± 1 sec	No visible damage |△R/R| ≦ 3 %
High Temperature Storage	IEC68-2-2 UL1434	100 ± 5℃ , 1000 ± 24 HRS	No visible damage |△R/R| ≦ 5 %
Damp Heat	IEC68-2-3 UL1434	40 ± 2℃ , 90~95% RH , 1000 ± 24HRS	No visible damage |△R/R| ≦ 3 %
Thermal Shock	IEC68-2-14 UL1434	The thermal shock conditions shown below shall be repeated 5 cycles Step 1: -40 ± 5 — 30 ± 3 Step 2: Room temperature — 5 ± 3 Step 3: 100 ± 5 — 30 ± 3 Step 4: Room temperature — 5 ± 3	No visible damage |△R/R| ≦ 3 %
Life Test	CNS5550	25 ± 5℃, Pmax. , 1000 ± 24 HRS	No visible damage |△R/R| ≦ 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 condition of products

(I) Storage Conditions :-

1.Storage Temperature : -10℃~+40℃

2.Relative humidity : ≦75%RH

3.Thermistors must be kept away from sunlight and stored in a non-corrosive atmosphere.

(II) Period of Storage : 1 year