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SPECIFICATION FOR APPROVAL

CUSTOMER _____

CERTIFIED
MODEL/TYPE

TTC-224

PART NO.

TTC05224JSE502(RoHS+HF)

APPLICATION _____

CUSTOMER P/N _____

ISSUE DATE

Nov.12.2020

REV. NO. _____

REV. DATE _____

FOR CUSTOMER APPROVAL	CHECKED BY
	<i>Haili Gong</i>
	APPROVED BY <i>Huaifang Zhang</i>





NTC Thermistor TTC05 Type

Part No.: TTC05224JSE502

REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT



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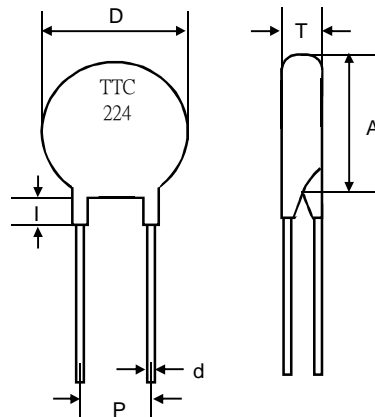
Part Number Code

Example :

TTC **05** **224** **J** **S** **E502**
(1) (2) (3) (4) (5) (6)

No.	Item	Digit	Specification
(1)	Product Type	TTC	Thinking NTC thermistor TTC type
(2)	Body Size	05	φ 5 mm
(3)	Zero Power Resistance at 25°C (R ₂₅)	224	$22 \times 10^4 = 220\text{K}\Omega$
(4)	Tolerance of R ₂₅	J	±5%
(5)	Appearance	S	Straight lead
(6)	Optional Suffix	E502	RoHS+HF compliance Original tapping

Structure and Dimensions



(unit : mm)

Body Size	D	P	d	A max.	T	l max.
φ 5mm	4~6.5	3.5 ± 0.5	0.5 ± 0.02	6.5	2.5~5	3

Electrical Characteristics

Part No.	Zero Power Resistance at 25°C	Tolerance of R_{25}	$B_{25/50}$ Value	Max. Power Rating at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	$R_{25}(\text{K}\Omega)$	(\pm %)	(K)	$P_{\text{max}}(\text{mW})$	$\delta (\text{mW}/^\circ\text{C})$	$\tau (\text{sec.})$	$T_L \sim T_U (^\circ\text{C})$
TTC05224JSE502	220	5	4600	450	Approx. 4.5	Approx. 20	-30 ~ +125



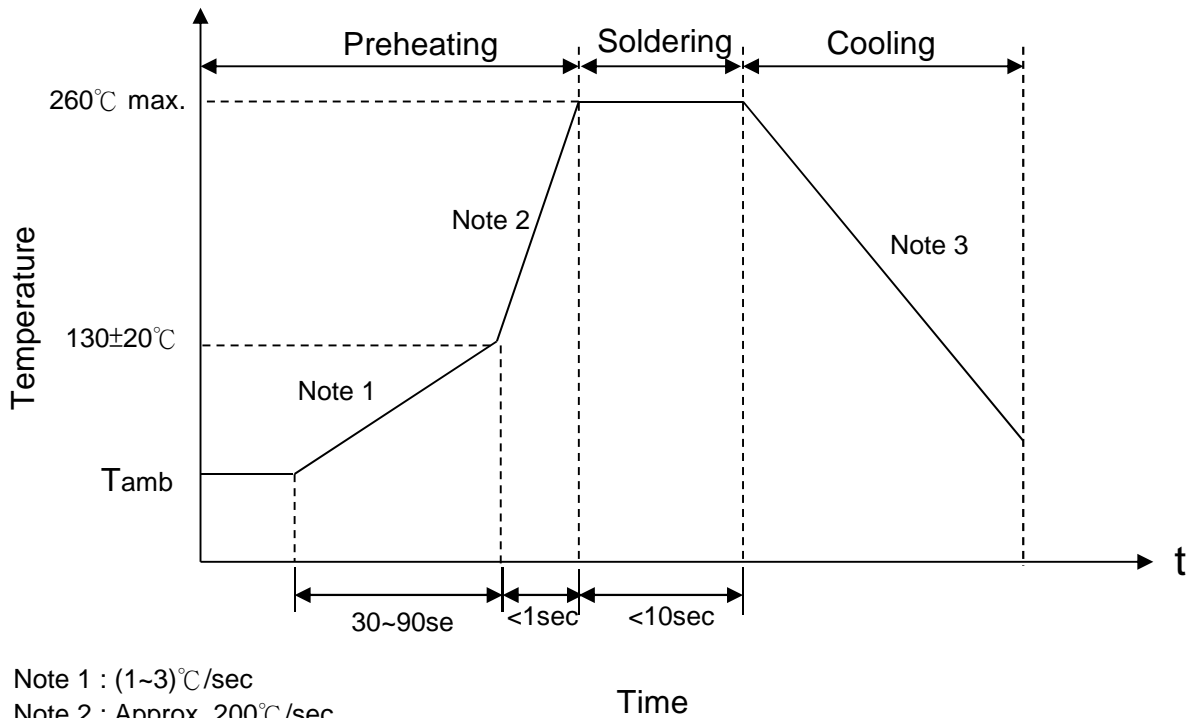
Reliability

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 style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force (Kg)</td> </tr> <tr> <td style="text-align: center;">0.3<d≤0.5</td> <td style="text-align: center;">0.5</td> </tr> <tr> <td style="text-align: center;">0.5<d≤0.8</td> <td style="text-align: center;">1.0</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	0.3<d≤0.5	0.5	0.5<d≤0.8	1.0	No visible damage									
Terminal diameter (mm)	Force (Kg)																	
0.3<d≤0.5	0.5																	
0.5<d≤0.8	1.0																	
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 style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force (Kg)</td> </tr> <tr> <td style="text-align: center;">0.3<d≤0.5</td> <td style="text-align: center;">0.25</td> </tr> <tr> <td style="text-align: center;">0.5<d≤0.8</td> <td style="text-align: center;">0.50</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	0.3<d≤0.5	0.25	0.5<d≤0.8	0.50	No visible damage									
Terminal diameter (mm)	Force (Kg)																	
0.3<d≤0.5	0.25																	
0.5<d≤0.8	0.50																	
Solderability	IEC60068-2-20	245 ± 3 °C , 3 ± 0.3 sec	Inspection shall be carried out with the assistance of a magnifier capable of giving a magnification of 4 x to 10 x . At least 95% of terminal electrode is covered by new solder. The dipped surface shall be covered with a smooth and bright solder coating with no more than small amounts of scattered imperfections such as pin-holes or un-wetted or de-wetted areas. These imperfections shall not be concentrated in one area.															
Resistance to Soldering Heat	IEC60068-2-20	260 ± 3 °C , 10 ± 1 sec	No visible damage $ \Delta R_{25}/R_{25} \leq 3\%$															
High Temperature Storage	IEC60068-2-2	125 ± 5 °C , 1000 ± 24 hrs	No visible damage $ \Delta R_{25}/R_{25} \leq 5\%$															
Damp Heat, Steady State	IEC 60068-2-78	40 ± 2°C , 90 ~ 95 % RH , 1000 ± 24 hrs	No visible damage $ \Delta R_{25}/R_{25} \leq 3\%$															
Rapid Change of Temperature	IEC6008-2-14	The conditions shown below shall be repeated 5 cycles <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">-30 ± 5</td> <td style="text-align: center;">30 ± 3</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Room temperature</td> <td style="text-align: center;">5 ± 3</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">125 ± 5</td> <td style="text-align: center;">30 ± 3</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Room temperature</td> <td style="text-align: center;">5 ± 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-30 ± 5	30 ± 3	2	Room temperature	5 ± 3	3	125 ± 5	30 ± 3	4	Room temperature	5 ± 3	No visible damage $ \Delta R_{25}/R_{25} \leq 3\%$
Step	Temperature (°C)	Period (minutes)																
1	-30 ± 5	30 ± 3																
2	Room temperature	5 ± 3																
3	125 ± 5	30 ± 3																
4	Room temperature	5 ± 3																
Endurance	IEC60539-1 4.26.3	25 ± 5 °C , Pmax. , 1000 ± 24 hrs	No visible damage $ \Delta R_{25}/R_{25} \leq 5\%$															
Insulation test	MIL-STD-202F-Method 302	1000 V _{DC} 1 min	No visible damage $\geq 500\text{ M}\Omega$															

Products have been tested at Thinking Electronic Industrial Co.,Ltd. Laboratory recognized by UL (Underwriters Laboratories Inc.) under CTDTP (Client Test Data Program).

Soldering Recommendation

Wave Soldering Profile



Note 1 : (1~3)°C/sec

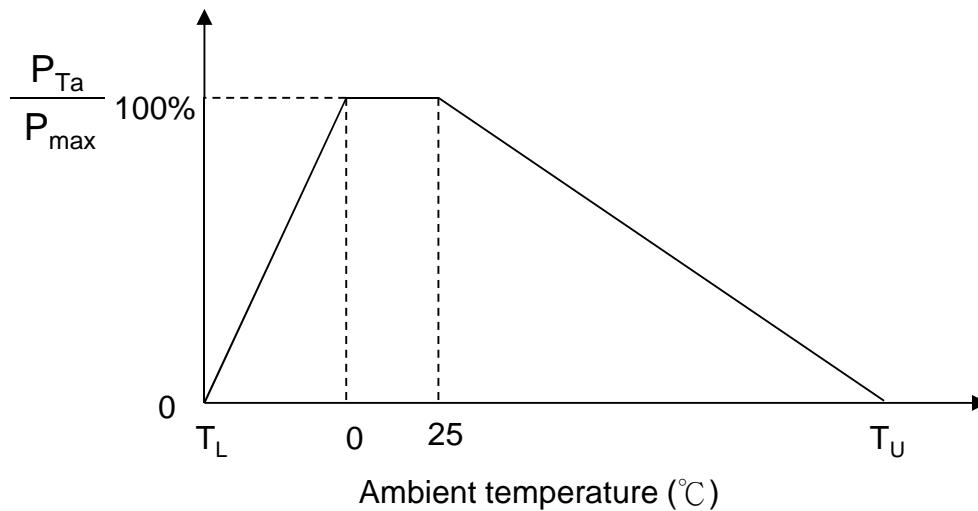
Note 2 : Approx. 200°C/sec

Note 3 : 5°C/sec max

Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Distance From Thermistor	2 mm (min.)

Max. Power Dissipation Derating Curve



Note: T_L = Minimum operating temperature (°C)

T_U = Maximum operating temperature (°C)

For example :

Ambient temperature(T_a)=55°C

Maximum operating temperature(T_u)=125°C

$P_{Ta} = (T_u - T_a) / (T_u - 25) \times P_{max} = 70\% P_{max}$

RoHS Compliant Declaration

We hereby declare that the components delivered to your company are compliant with RoHS directive 2015/863/EU.

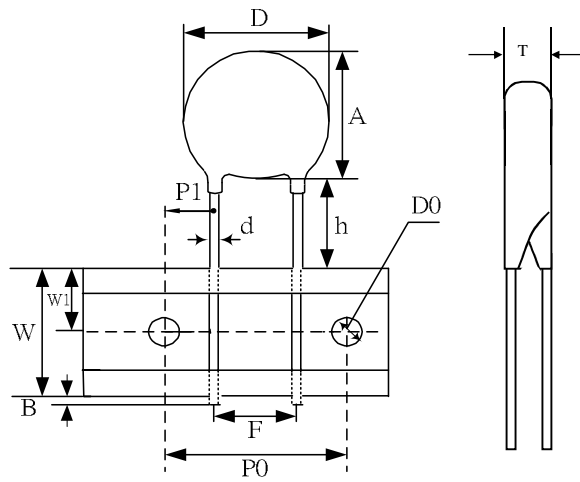
Warehouse Storage Conditions of Products

(I) Storage Conditions :

- 1.Storage Temperature : -10°C ~+40°C
- 2.Relative Humidity : $\leq 75\%RH$
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

Taping and Dimensions



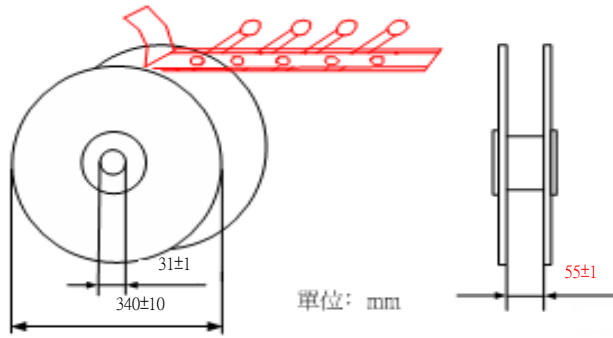
(Unit:mm)

Item	F	P0	P1	h	W	W1	B	A	D	T	d	D0
(mm)	±0.5	±1	±1	±1	±1	±0.5	max	max	/	/	±0.02	+0.5/-0.2
	3.5	12.7	4.6	16	18	9	1	6.5	4~6.5	2.5~5	0.5	4

Note: There is vacant space on the paper tape during the first time taping process.
This vacant space is caused by the removal of the NG product during each process.
But the total product quantity of each box / reel meets specification.

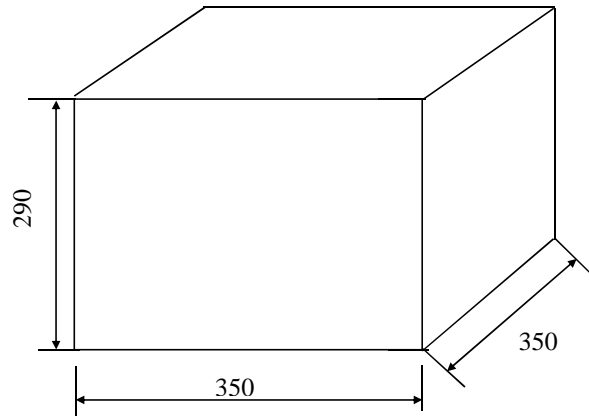
Standard Packing

(1) SPQ: 2500pcs /reel



(Unit:mm)

(2): Carton : 4 Reel / Carton



(Unit:mm)

Safety Approvals (Certified Model/Type : TTC-224)



* UL 1434 / cUL recognized (File # E138827)



* TÜV recognized (File # R 50050155)



* CQC GB/T 6663.1-2007 recognized (File # CQC05001011994)

* CQC GB6663-86 recognized (File # CQC05001011991)

Certificates

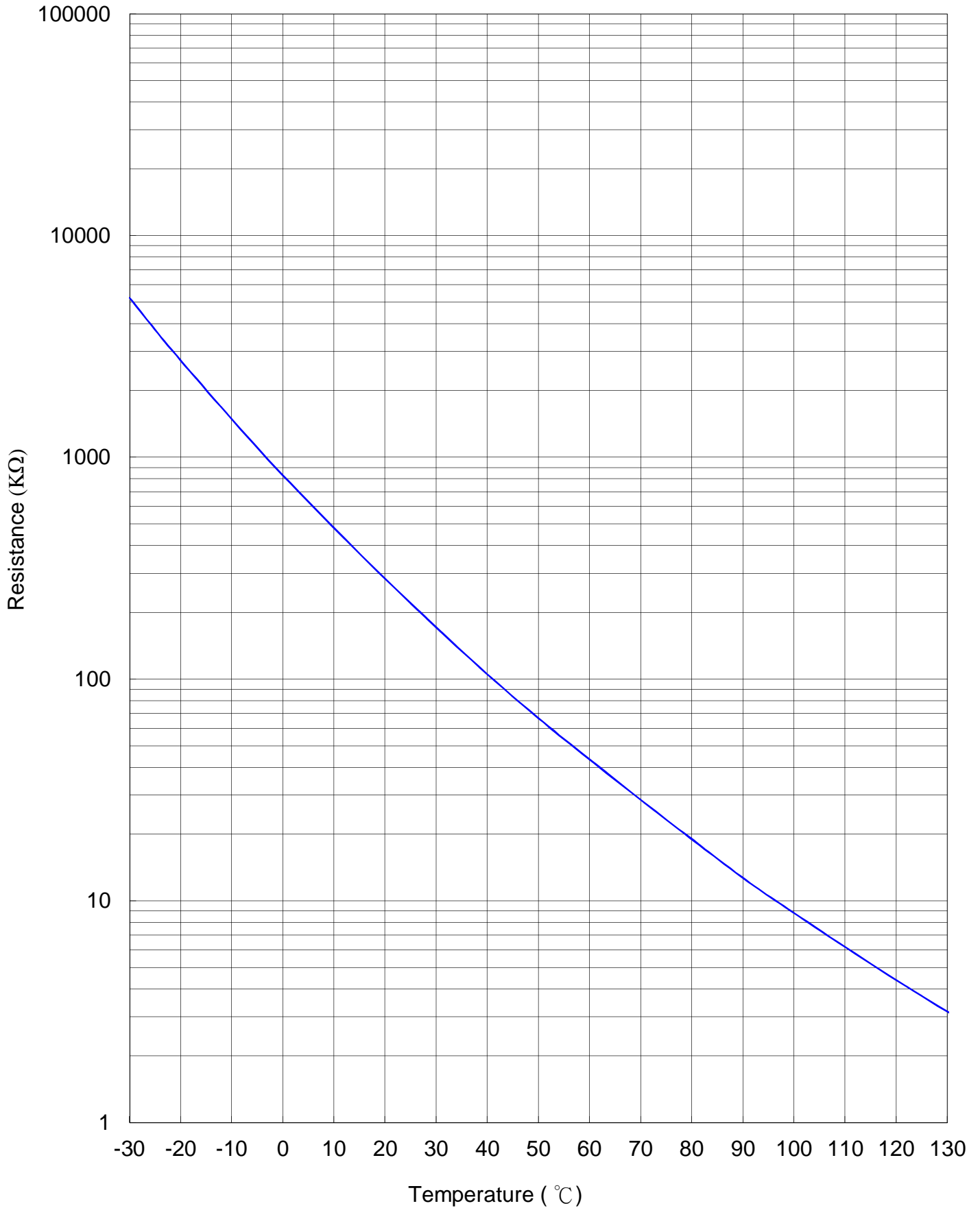
- (1) IATF 16949 certificate
- (2) ISO 9001 certificate

Test Report

- (1) RoHS test report
- (2) Halogen-free test report

R-T Characteristic Curve

TTC05224JSE502



V-I Characteristic Curve (Ambient $T_a=25\text{ }^\circ\text{C}$)

TTC05224JSE502

