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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 |
|---------|-----------|-----------------|
| | | |



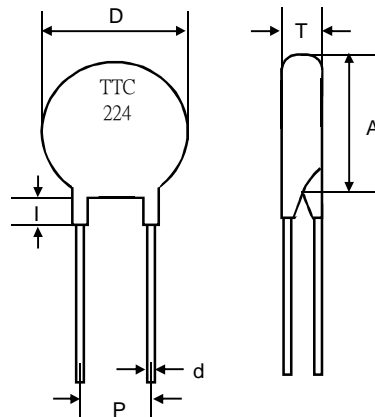
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Part Number Code

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 (KΩ) | (± %) | (K) | P _{max} (mW) | δ (mW/°C) | τ (sec.) | T _L ~T _U (°C) |
| TTC05224JSE502 | 220 | 5 | 4600 | 450 | Approx. 4.5 | Approx. 20 | -30 ~+125 |

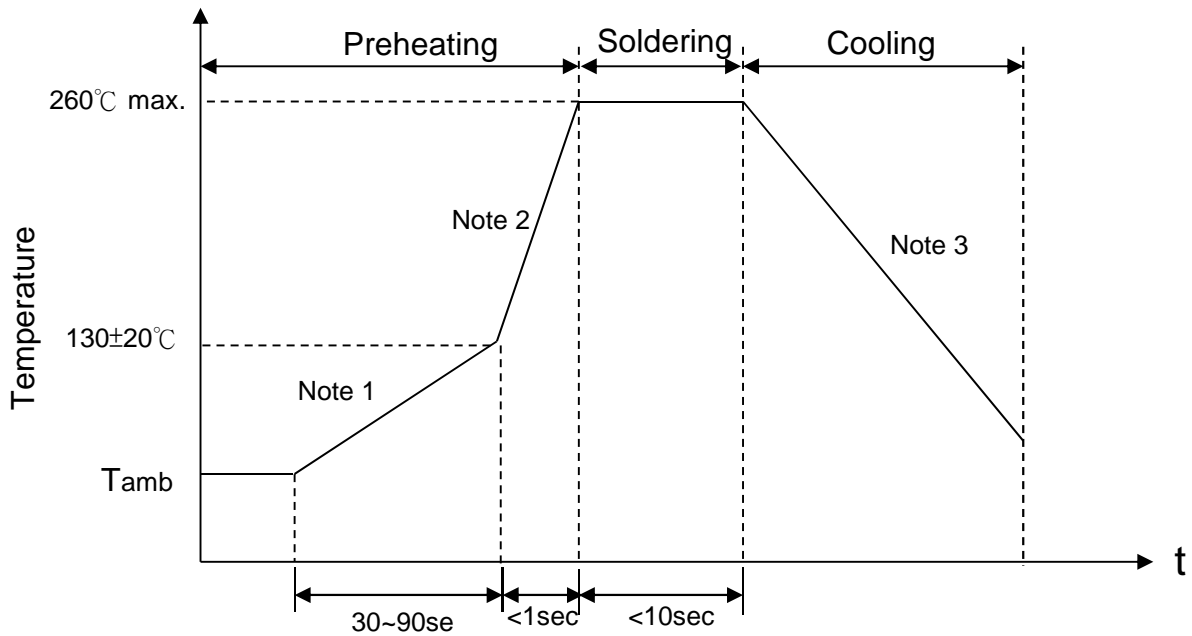


Reliability

| 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. Terminal diameter (mm) Force (Kg) ----- 0.3<d≤0.5 0.5 0.5<d≤0.8 1.0 | No visible damage | | | | | | | | | | | | | | | |
| 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. Terminal diameter (mm) Force (Kg) ----- 0.3<d≤0.5 0.25 0.5<d≤0.8 0.50 | No visible damage | | | | | | | | | | | | | | | |
| 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 ΔR ₂₅ /R ₂₅ ≤ 3 % | | | | | | | | | | | | | | | |
| High Temperature Storage | IEC60068-2-2 | 125 ± 5 °C , 1000 ± 24 hrs | No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 % | | | | | | | | | | | | | | | |
| Damp Heat, Steady State | IEC 60068-2-78 | 40 ± 2°C , 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 border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-30 ± 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>125 ± 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 | -30 ± 5 | 30 ± 3 | 2 | Room temperature | 5 ± 3 | 3 | 125 ± 5 | 30 ± 3 | 4 | Room temperature | 5 ± 3 | No visible damage ΔR ₂₅ /R ₂₅ ≤ 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 ΔR ₂₅ /R ₂₅ ≤ 5 % | | | | | | | | | | | | | | | |
| Insulation test | MIL-STD-202F-Method 302 | 1000 V _{DC} 1 min | No visible damage ≥ 500 MΩ | | | | | | | | | | | | | | | |

Soldering Recommendation

Wave Soldering Profile



Note 1 : $(1 \sim 3)^\circ\text{C}/\text{sec}$

Note 2 : Approx. $200^\circ\text{C}/\text{sec}$

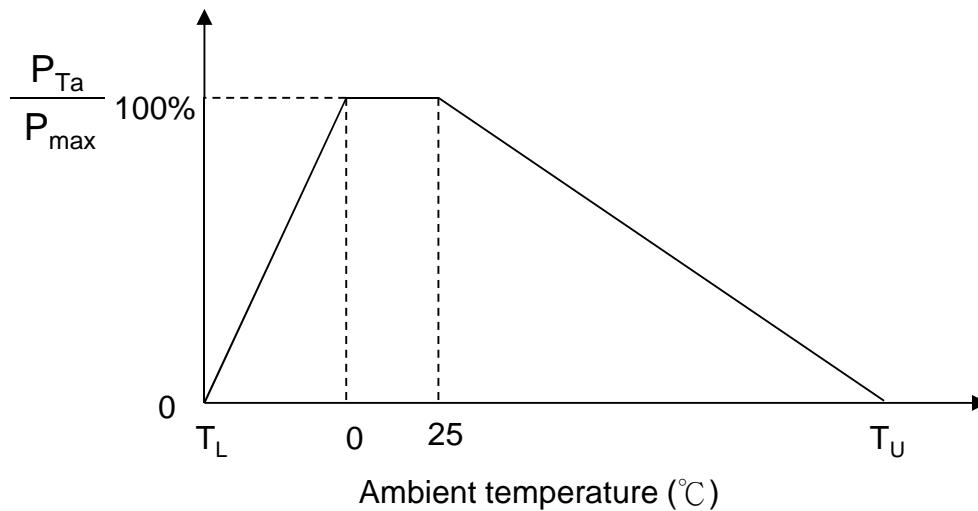
Note 3 : $5^\circ\text{C}/\text{sec max}$

Time

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.

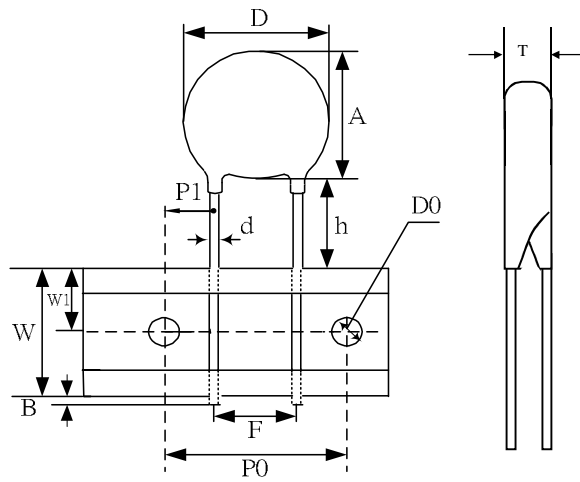
Warehouse Storage Conditions of Products

(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



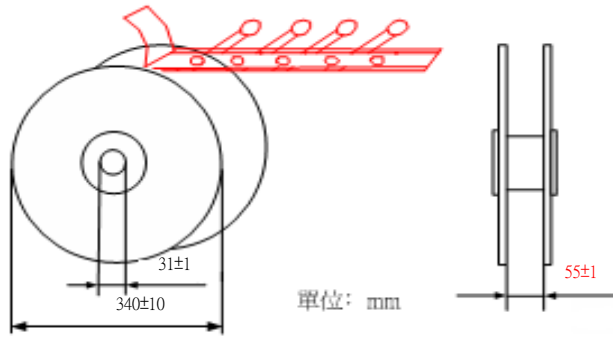
(Unit:mm)

| Item | F | P0 | P1 | h | W | W1 | B | A | D | T | d | DO |
|------|------|------|-----|----|----|------|-----|-----|-------|-------|-------|-----------|
| (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.

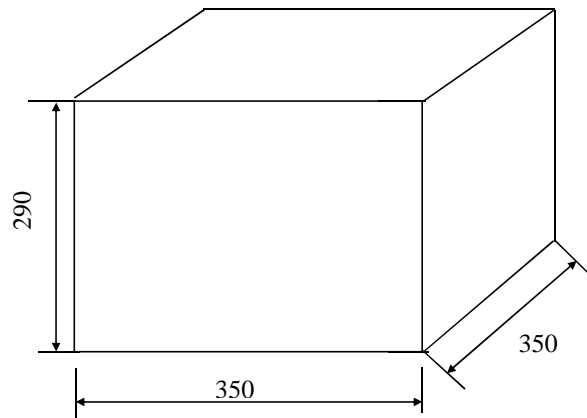
Standard Packing

(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

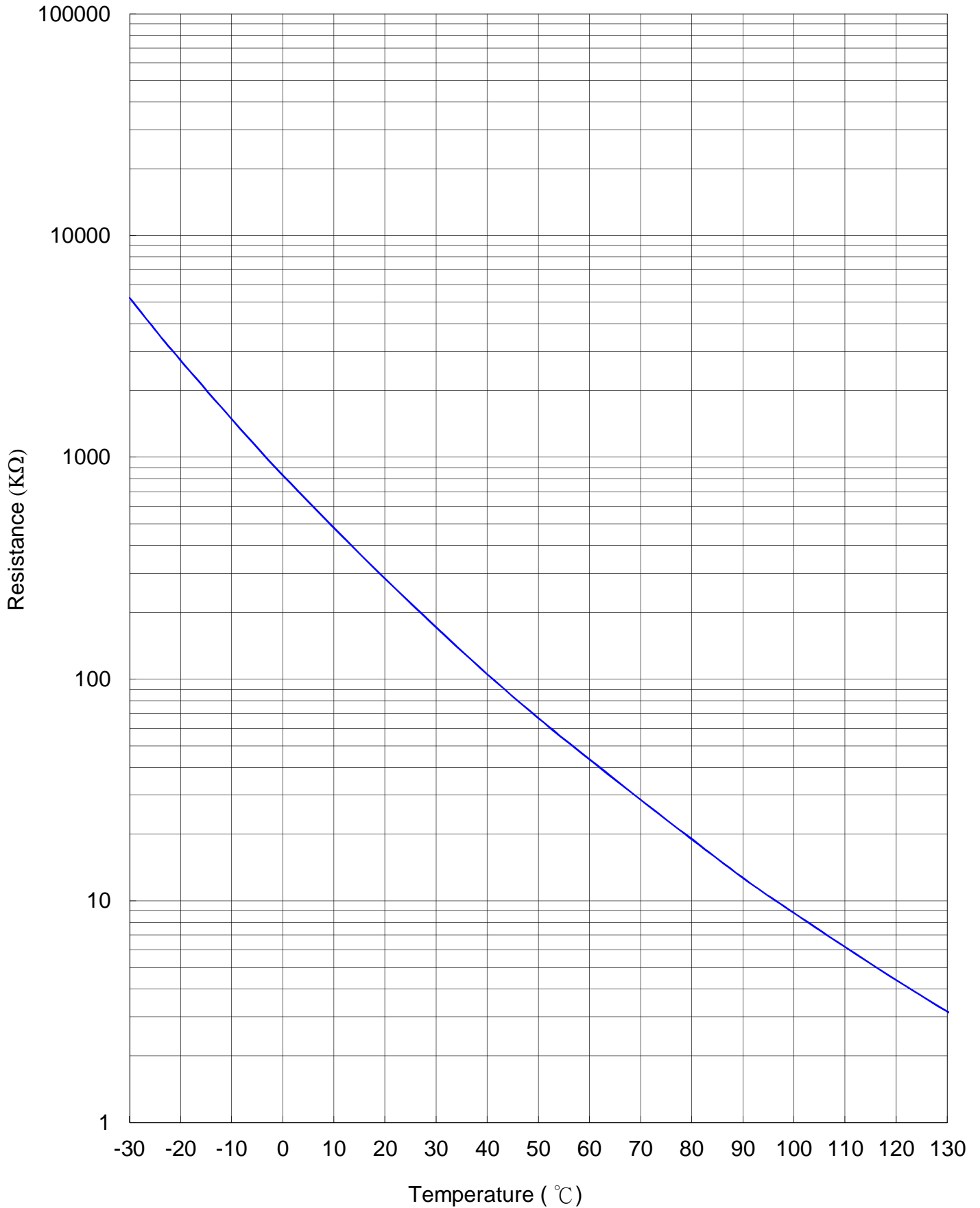
- (1) IATF 16949 certificate
- (2) ISO 9001 certificate

Test Report

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

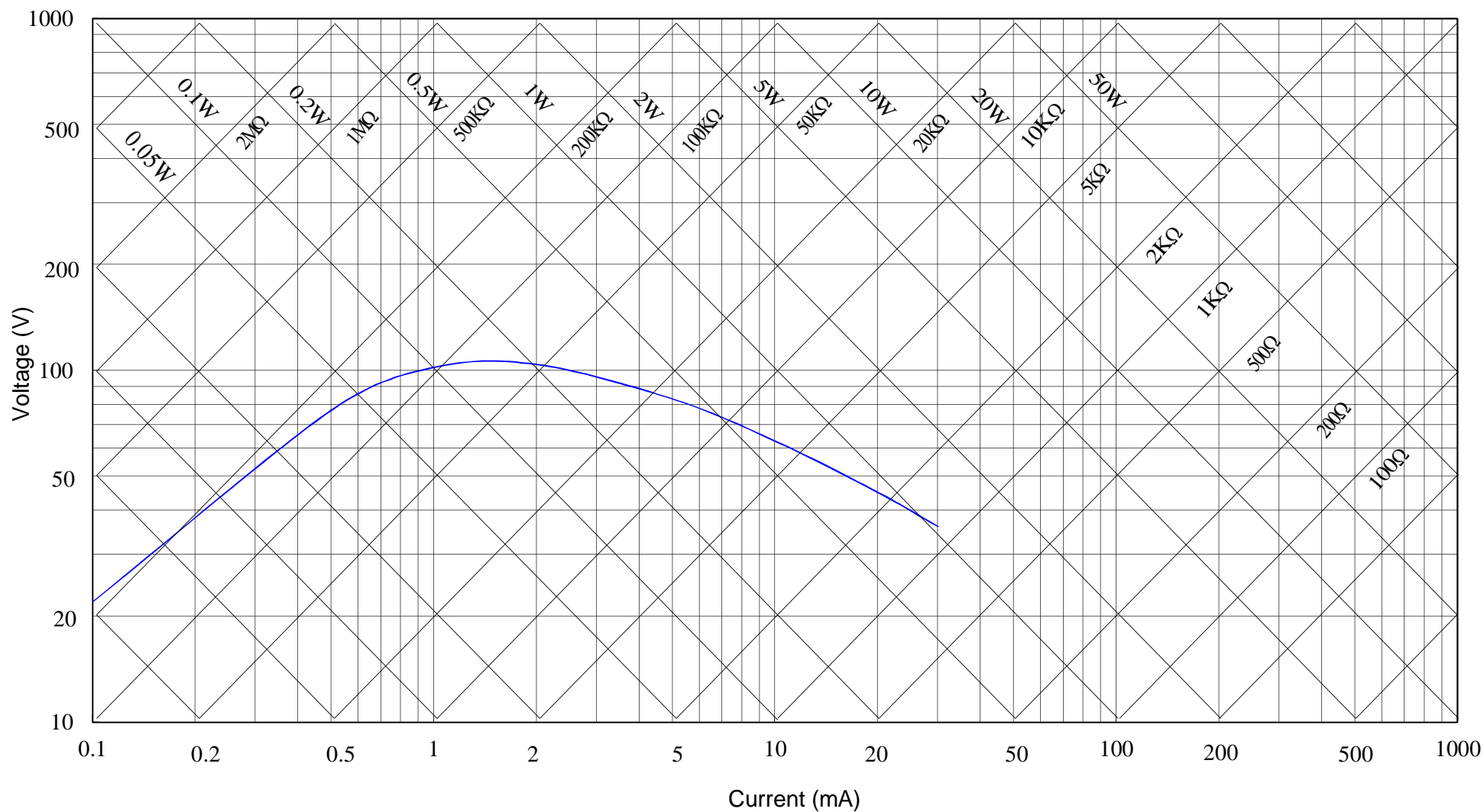
R-T Characteristic Curve

TTC05224JSE502



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

TTC05224JSE502



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