

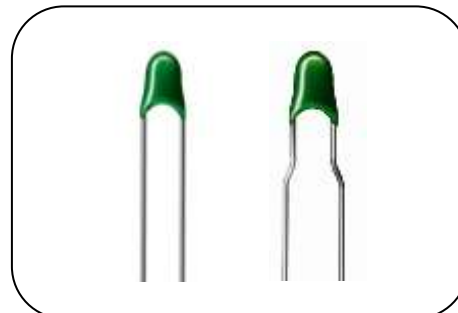
# NTC Thermistor : TTC3 Series



## Φ3 mm Lead Type for Temperature Sensing/Compensation

### ■ Features

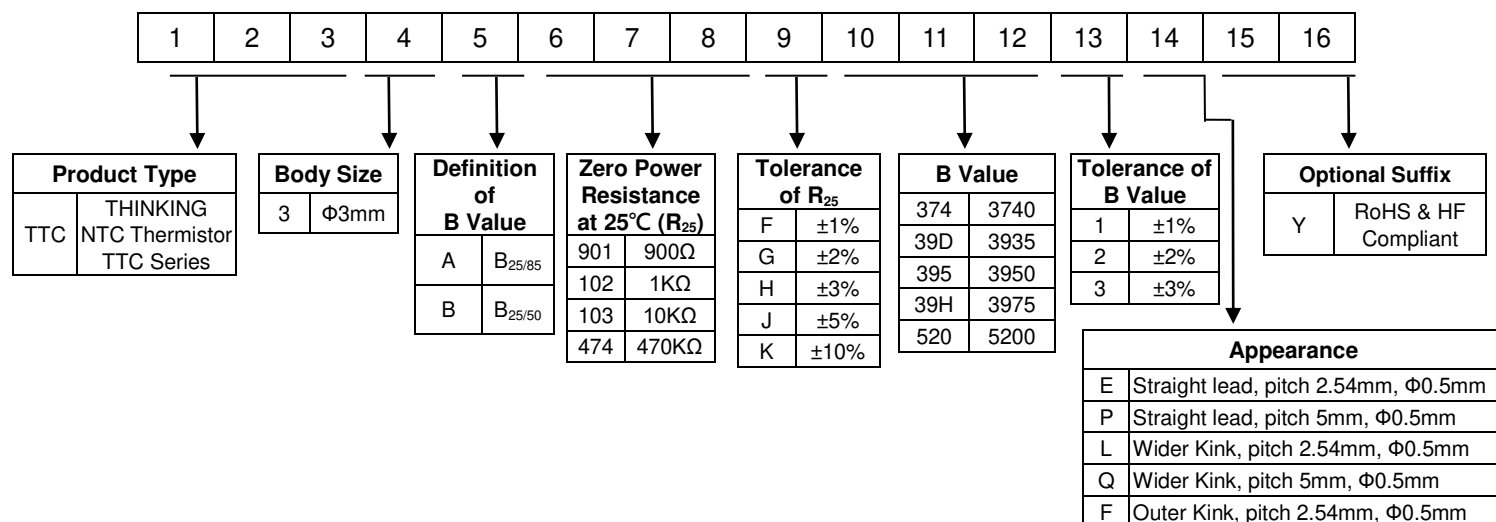
1. RoHS compliant
2. Halogen-Free(HF) series are available
3. Body size: Φ3mm
4. Radial lead resin coated
5. Operating temperature range: -40°C~+125°C
6. Wide resistance range
7. Cost effective
8. Agency recognition: UL / cUL / TUV / CQC



### ■ Recommended Applications

1. Home appliances
2. Computers
3. Digital meters
4. Switch mode power supplies
5. Adapters

### ■ Part Number Code

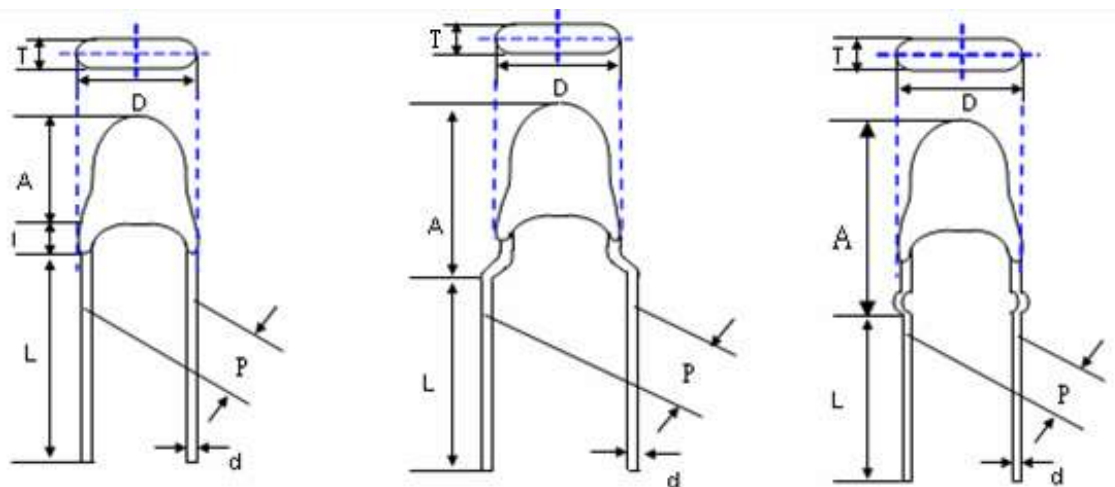


# NTC Thermistor : TTC3 Series



## Φ3 mm Lead Type for Temperature Sensing/Compensation

### ■ Structure and Dimensions



**Straight Lead**

**Wider Kink**

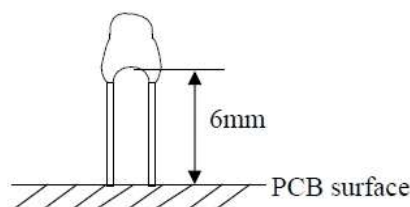
**Outer Kink**

(Unit: mm)

| Lead Type     | Pitch | D     | d         | P         | A          | I <sub>max.</sub> | L         | T     |
|---------------|-------|-------|-----------|-----------|------------|-------------------|-----------|-------|
| Straight Lead | 2.54  | 2.5~4 | 0.48~0.52 | 2.04~3.04 | 2.5~5      | 3                 | 30~40     | 1.5~3 |
|               | 5     | 2~6.5 |           | 4.5~5.5   | 7 (max)    | 3                 | 30~40     | 1.5~5 |
| Wider Kink    | 2.54  | 2~4   |           | 2.04~3.04 | 6 (max)    | --                | 30~40     | 1.5~3 |
|               | 5     | 2~4   |           | 4.5~5.5   | 10 (max)   | --                | 30~40     | 1.5~3 |
| Outer Kink    | 2.54  | 2~4   |           | 2.04~3.04 | 13.5 (max) | --                | 24.5~34.5 | 1.5~3 |

Note\*:

Caution: It has be better to keep the minimum distance as 6mm between the bottom of the thermistor body and PCB surface to prevent component damage.



# NTC Thermistor : TTC3 Series



## Φ3 mm Lead Type for Temperature Sensing/Compensation

### Electrical Characteristics

| Part No.      | Zero Power Resistance at 25°C | Tolerance of R <sub>25</sub><br>(±%) | B Value<br>(K) | Tolerance of B value<br>(±%) | Max. Power Dissipation at 25°C<br>P <sub>max</sub> (mW) | Dissipation Factor<br>δ(mW/°C) | Thermal Time Constant<br>τ (Sec.) | Operating Temperature Range<br>T <sub>L</sub> ~T <sub>U</sub> (°C) | Safety Approvals |     |     |
|---------------|-------------------------------|--------------------------------------|----------------|------------------------------|---|--------------------------------|-----------------------------------|--|------------------|-----|-----|
|               | R <sub>25</sub> (KΩ)          |                                      |                |                              |   |                                |                                   |  | UL<br>cUL        | TUV | CQC |
| TTC3A901□39D* | 0.9                           | 1, 2, 3, 5                           | 25/85          | 2, 3                         | 150   | ≥ 2.5                          | ≤ 18                              | -40~+125   | √                | √   | √   |
| TTC3A102□39D* | 1                             |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A152□39D* | 1.5                           |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A202□39H* | 2                             |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A222□39H* | 2.2                           |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A272□39H* | 2.7                           |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A302□39H* | 3                             |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A332□39H* | 3.3                           |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A472□39H* | 4.7                           |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A482□395* | 4.8                           |                                      |                |                              |   |                                |                                   |  | √                | √   |     |
| TTC3A482□39H* | 4.8                           |                                      |                |                              |   |                                |                                   |  | √                | √   |     |
| TTC3A502□39H* | 5                             |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A682□39H* | 6.8                           |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A103□34D* | 10                            |                                      |                |                              |   |                                |                                   |  | √                | √   | √   |
| TTC3A103□374* | 10                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A103□39H* | 10                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A123□374* | 12                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A153□374* | 15                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A203□374* | 20                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A203□426* | 20                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A223□374* | 22                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A333□409* | 33                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A473□409* | 47                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A503□39H* | 50                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A503□406* | 50                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A683□419* | 68                            |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A104□419* | 100                           |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A104□436* | 100                           |                                      |                | √                            |   |                                |                                   |  | √                | √   |     |
| TTC3A154□437* | 150                           | √                                    | √              | √                            |   |                                |                                   |  |                  |     |     |
| TTC3A204□385* | 200                           | √                                    | √              |                              |   |                                |                                   |  |                  |     |     |
| TTC3A224□437* | 220                           | √                                    | √              | √                            |   |                                |                                   |  |                  |     |     |
| TTC3A334□457* | 330                           | √                                    | √              | √                            |   |                                |                                   |  |                  |     |     |
| TTC3A474□457* | 470                           | √                                    | √              | √                            |   |                                |                                   |  |                  |     |     |
| TTC3A474□520* | 470                           | √                                    | √              | √                            |   |                                |                                   |  |                  |     |     |
| TTC3B202□350* | 2                             | 25/50                                | 3500           | 2, 3                         | √   | √                              | √                                 |  |                  |     |     |
| TTC3B473□39D* | 47                            |                                      |                | 1, 2, 3                      | √   | √                              | √                                 |  |                  |     |     |
| TTC3B503□440* | 50                            |                                      |                | 2, 3                         | √   | √                              | √                                 |  |                  |     |     |
| TTC3B434□507* | 430                           |                                      |                | √                            | √   |                                |                                   |  |                  |     |     |
| TTC3B474□520* | 470                           |                                      |                | 3                            | √   | √                              | √                                 |  |                  |     |     |

Note 1: □ = Tolerance of R<sub>25</sub>

\* = Tolerance of B value

Note 2: UL/cUL File No: E138827, TUV File No: R50050155

CQC File No: CQC04001011945, CQC04001011966

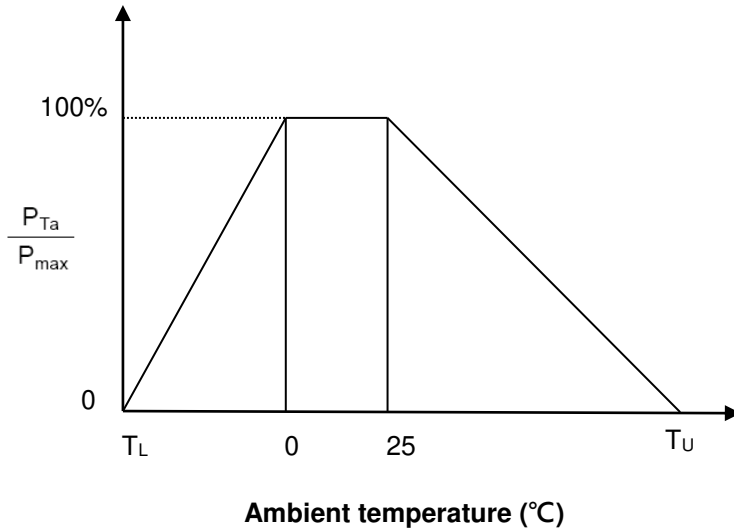
Note 3: Special specifications are available upon request.

# NTC Thermistor : TTC3 Series



## Φ3 mm Lead Type for Temperature Sensing/Compensation

### Max. Power Dissipation Derating Curve



$T_U$  : Maximum operating temperature (°C)

$T_L$  : Minimum operating temperature (°C)

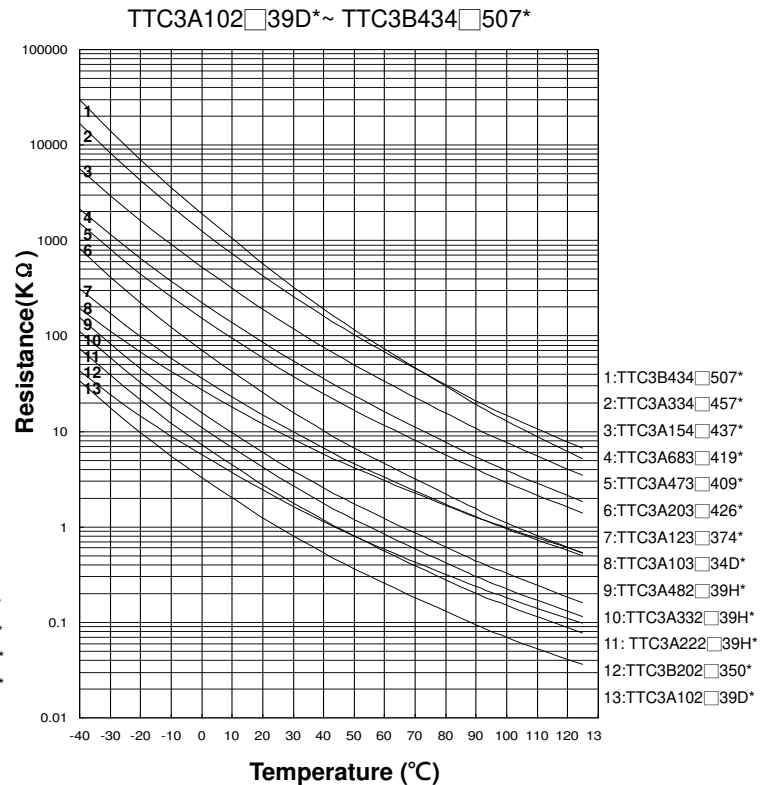
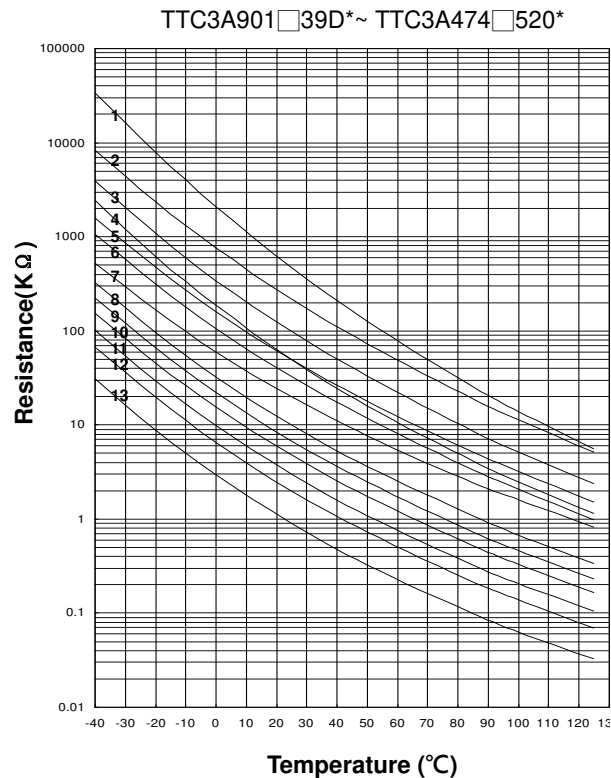
For example:

Ambient temperature( $T_a$ ) = 55°C

Maximum operating temperature( $T_U$ ) = 125°C

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

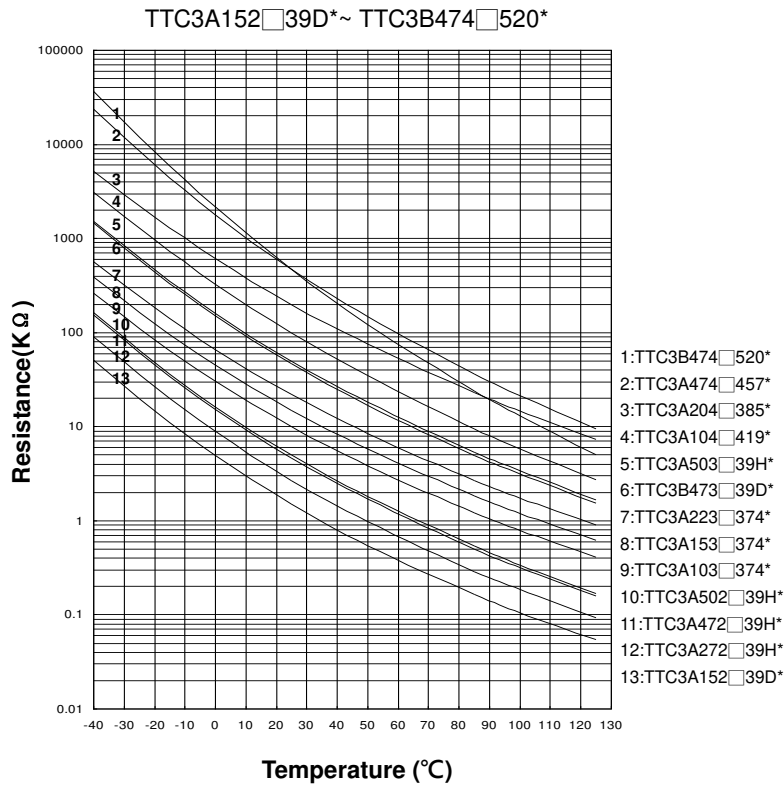
### R-T Characteristic Curves



# NTC Thermistor : TTC3 Series

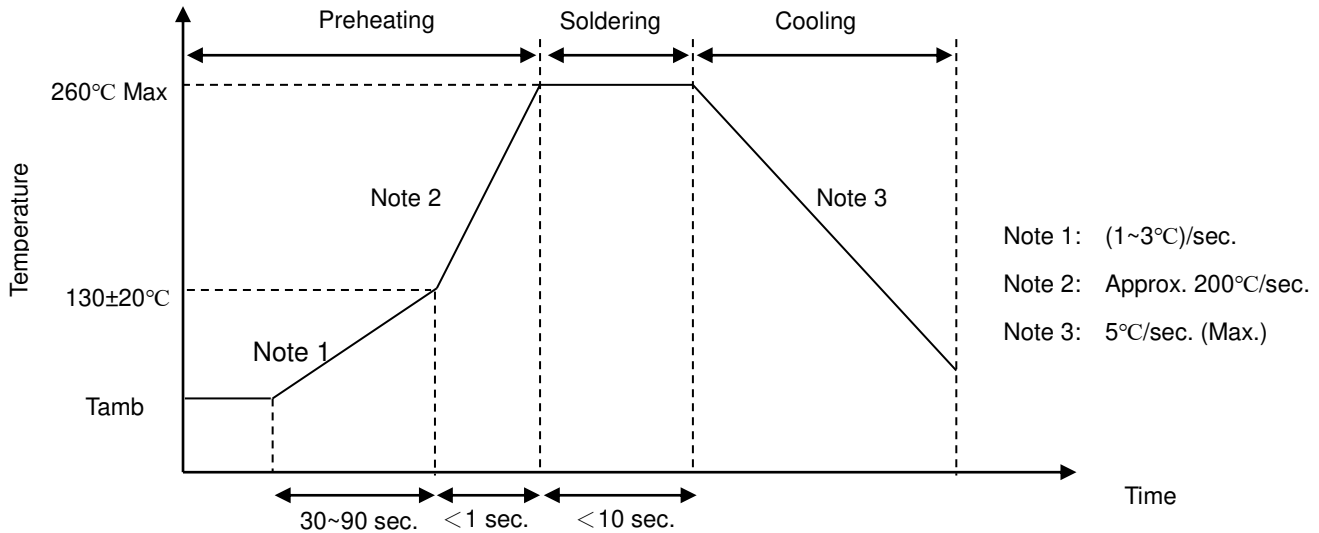


Φ3 mm Lead Type for Temperature Sensing/Compensation



## ■ Soldering Recommendation

### ● Wave Soldering Profile



### ● 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.)   |

# NTC Thermistor : TTC3 Series



## Φ3 mm Lead Type for Temperature Sensing/Compensation

### ■ Reliability

| Item                             | Standard              | Test conditions / Methods   | Specifications  |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
|----------------------------------|-----------------------|---|---|------------------|------------------|------|-------------------|--------|---|------------------|-------|---|---------|--------|---|------------------|-------|---|
| Tensile Strength of Terminations | IEC 60068-2-21        | <p>Gradually apply the specified force and keep the unit fixed for 10±1 sec.</p> <table border="0"> <tr> <td style="text-align: center;">Terminal diameter<br/>(mm)</td> <td style="text-align: center;">Force<br/>(Kg)</td> </tr> <tr> <td style="text-align: center;">0.3&lt;d≤ 0.5</td> <td style="text-align: center;">0.5</td> </tr> </table>  | Terminal diameter<br>(mm)   | Force<br>(Kg)    | 0.3<d≤ 0.5       | 0.5  | No visible damage |        |   |                  |       |   |         |        |   |                  |       |   |
| Terminal diameter<br>(mm)        | Force<br>(Kg)         |   |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| 0.3<d≤ 0.5                       | 0.5                   |   |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| Bending Strength of Terminations | IEC 60068-2-21        | <p>Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, and then return to the original position. Repeat the procedure in the opposite direction.</p> <table border="0"> <tr> <td style="text-align: center;">Terminal diameter<br/>(mm)</td> <td style="text-align: center;">Force<br/>(Kg)</td> </tr> <tr> <td style="text-align: center;">0.3&lt;d≤ 0.5</td> <td style="text-align: center;">0.25</td> </tr> </table> | Terminal diameter<br>(mm)   | Force<br>(Kg)    | 0.3<d≤ 0.5       | 0.25 | No visible damage |        |   |                  |       |   |         |        |   |                  |       |   |
| Terminal diameter<br>(mm)        | Force<br>(Kg)         |   |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| 0.3<d≤ 0.5                       | 0.25                  |   |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| Solderability                    | IEC 60068-2-20        | 245±3 °C, 3±0.3 sec.  | At least 95% of terminal electrode is covered by new solder       |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| Resistance to Soldering Heat     | IEC 60068-2-20        | 260 ± 3°C, 10 ± 1 sec.  | No visible damage<br>  Δ R <sub>25</sub> /R <sub>25</sub>   ≤ 3 % |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| High Temperature Storage         | IEC 60068-2-2         | 125 ± 5°C , 1000 ± 24 hrs   | No visible damage<br>  Δ R <sub>25</sub> /R <sub>25</sub>   ≤ 5 % |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| Damp Heat, Steady State          | IEC 60068-2-78        | 40 ± 2°C , 90~95% RH , 1000 ± 24 hrs  | No visible damage<br>  Δ R <sub>25</sub> /R <sub>25</sub>   ≤ 3 % |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| Rapid Change of Temperature      | IEC 60068-2-14        | <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>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    | -40 ± 5           | 30 ± 3 | 2 | Room temperature | 5 ± 3 | 3 | 125 ± 5 | 30 ± 3 | 4 | Room temperature | 5 ± 3 | No visible damage<br>  Δ R <sub>25</sub> /R <sub>25</sub>   ≤ 3 % |
| Step                             | Temperature (°C)      | Period (minutes)  |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| 1                                | -40 ± 5               | 30 ± 3  |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| 2                                | Room temperature      | 5 ± 3   |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| 3                                | 125 ± 5               | 30 ± 3  |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| 4                                | Room temperature      | 5 ± 3   |   |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |
| Max. Power Dissipation           | IEC 60539-1<br>4.26.3 | 25 ± 5°C, Pmax. , 1000 ± 24 hrs   | No visible damage<br>  Δ R <sub>25</sub> /R <sub>25</sub>   ≤ 5 % |                  |                  |      |                   |        |   |                  |       |   |         |        |   |                  |       |   |

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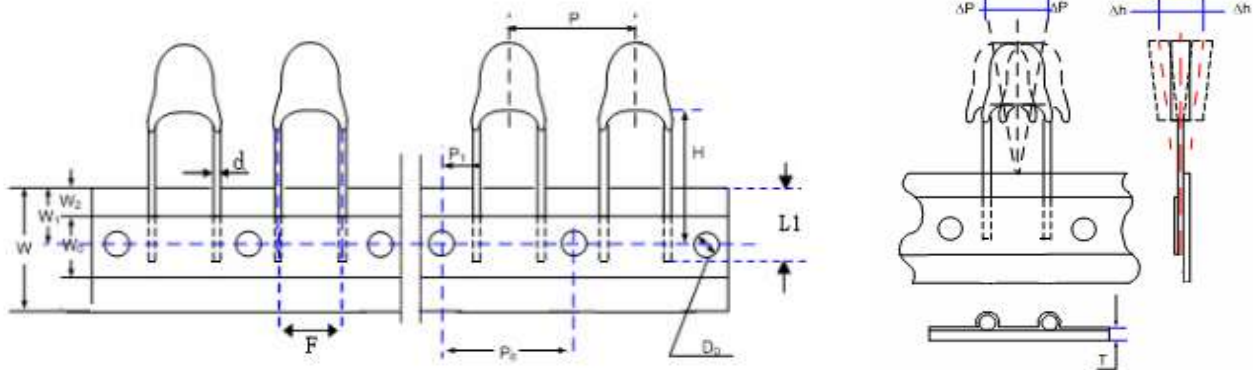


## Φ3 mm Lead Type for Temperature Sensing/Compensation

### ■ Packaging

#### ● Taping Specification

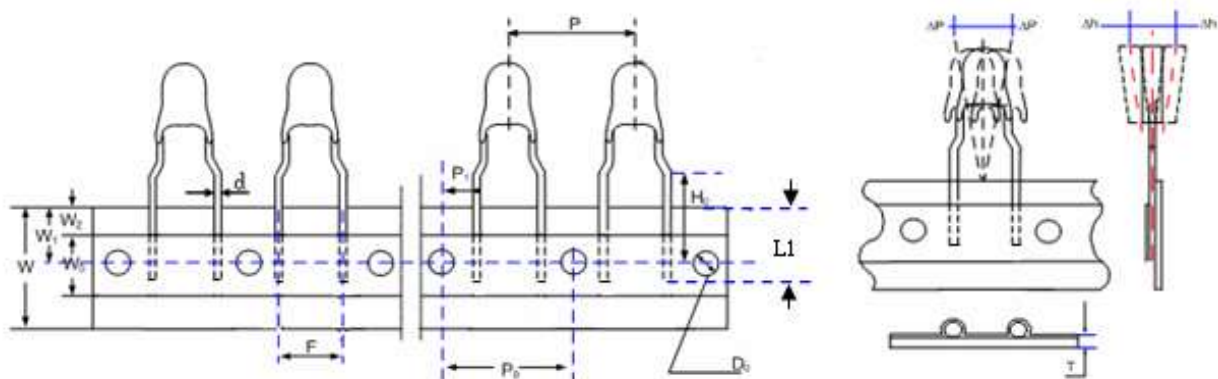
#### Straight Lead



(Unit: mm)

| Taping Dimension     | P <sub>0</sub> | F    | P    | P <sub>1</sub> | H     | d     | W <sub>0</sub> | W <sub>1</sub> | W <sub>2</sub> | W           | ΔP   | Δh   | L <sub>1</sub> | D <sub>0</sub> | T    |
|----------------------|----------------|------|------|----------------|-------|-------|----------------|----------------|----------------|-------------|------|------|----------------|----------------|------|
|                      | ±0.3           | ±0.5 | ±1   | ±0.7           | +2/-0 | ±0.02 | ±1.5           | +0.75<br>/-0.5 | Max.           | +1/<br>-0.5 | Max. | Max. | ±1             | ±0.2           | ±0.2 |
| P <sub>0</sub> =12.7 | 12.7           | 2.54 | 12.7 | 5.08           | 18    | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |
|                      | 12.7           | 5    | 12.7 | 3.85           | 18    | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |
| P <sub>0</sub> =15.0 | 15             | 2.54 | 15   | 6.23           | 18    | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |
|                      | 15             | 5    | 15   | 5              | 18    | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |

#### Wider Kink



(Unit: mm)

| Taping Dimension     | P <sub>0</sub> | F    | P    | P <sub>1</sub> | H <sub>0</sub> | d     | W <sub>0</sub> | W <sub>1</sub> | W <sub>2</sub> | W           | ΔP   | Δh   | L <sub>1</sub> | D <sub>0</sub> | T    |
|----------------------|----------------|------|------|----------------|----------------|-------|----------------|----------------|----------------|-------------|------|------|----------------|----------------|------|
|                      | ±0.3           | ±0.5 | ±1   | ±0.7           | ±0.5           | ±0.02 | ±1.5           | +0.75<br>/-0.5 | Max.           | +1/<br>-0.5 | Max. | Max. | ±1             | ±0.2           | ±0.2 |
| P <sub>0</sub> =12.7 | 12.7           | 2.54 | 12.7 | 5.08           | 16             | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |
|                      | 12.7           | 5.00 | 12.7 | 3.85           | 16             | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |

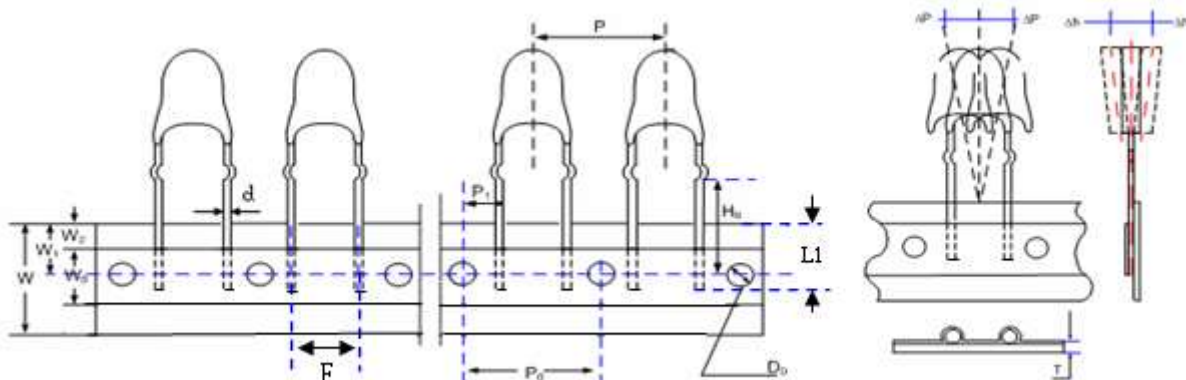


# NTC Thermistor : TTC3 Series



## Φ3 mm Lead Type for Temperature Sensing/Compensation

### Outer Kink



(Unit: mm)

| Taping Dimension     | P <sub>0</sub> | F    | P    | P <sub>1</sub> | H <sub>0</sub> | d     | W <sub>0</sub> | W <sub>1</sub> | W <sub>2</sub> | W           | ΔP   | Δh   | L <sub>1</sub> | D <sub>0</sub> | T    |
|----------------------|----------------|------|------|----------------|----------------|-------|----------------|----------------|----------------|-------------|------|------|----------------|----------------|------|
|                      | ±0.3           | ±0.5 | ±1   | ±0.7           | ±0.5           | ±0.02 | ±1.5           | +0.75<br>/-0.5 | Max.           | +1/<br>-0.5 | Max. | Max. | ±1             | ±0.2           | ±0.2 |
| P <sub>0</sub> =12.7 | 12.7           | 2.54 | 12.7 | 5.08           | 16             | 0.5   | 12             | 9              | 3              | 18          | 1    | 2    | 10             | 4              | 0.6  |

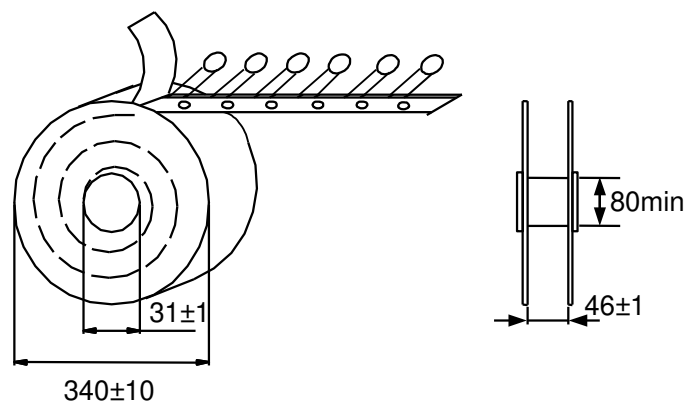
### Quantity

#### ● Bulk Packing

| Series | Quantity (pcs/bag) |
|--------|--------------------|
| TTC3   | 500                |

#### ● Reel Packing

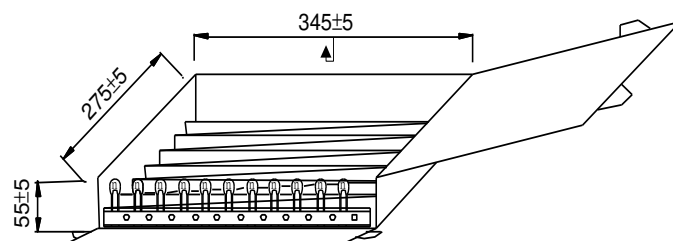
| Series | Quantity (pcs/reel) |
|--------|---------------------|
| TTC3   | 2,500               |



(Unit: mm)

#### ● Ammo Packing

| Series | Quantity (pcs/box) |
|--------|--------------------|
| TTC3   | 2,500              |



### Warehouse Storage Conditions of Products

#### ● Storage Conditions:

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

#### ● Period of Storage : 1 year