

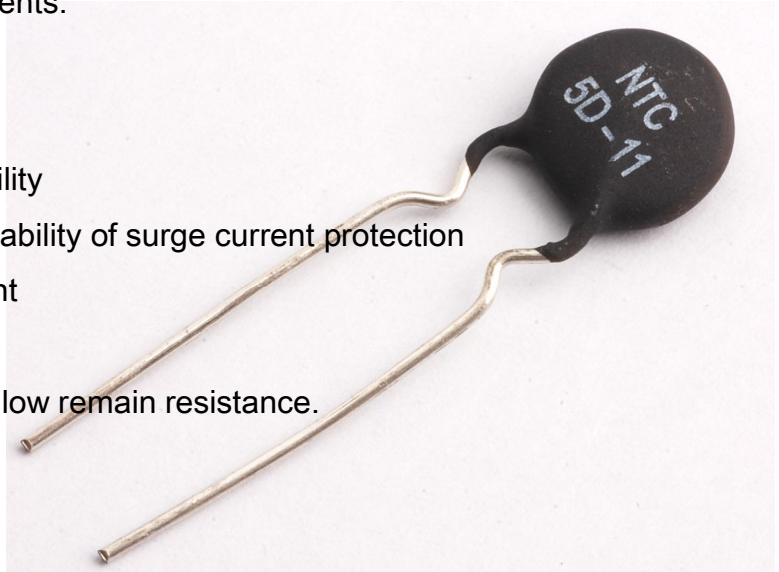
NTC THERMISTOR

Introduction:

NTC (Negative temperature coefficient) thermistor is a semiconductor made from metallic oxides. It exhibits an electrical resistance that has a very predictable change with temperature. The resistance varies significantly with temperature, more so than in standard resistors. They are extremely sensitive to temperature change, very accurate and interchangeable. They have a wide temperature envelope and can be hermetically sealed for use in humid environments.

Features:

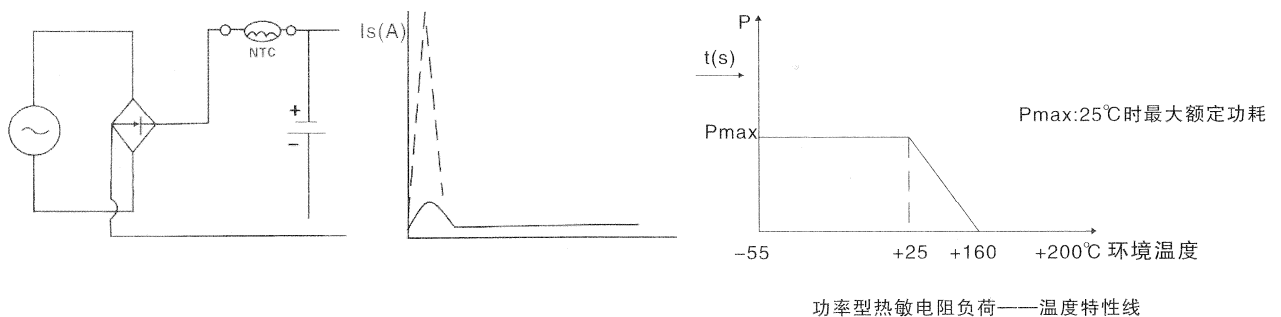
- * Longevity of service, high reliability
- * Small size, powerful, strong capability of surge current protection
- * Instant response to surge current
- * Wide operation range
- * Big material constant (B value), low remain resistance.



Application:

Thermistors are widely used as

- * Inrush current limiters
- * Temperature sensors
- * Self-resetting overcurrent protectors
- * Self regulating heating elements
- * Conversion power, switch mode power supply, UPS power protection
- * Energy saving lights, electronic ballast filament protection
- * Electronic circuit, power supply circuit protection



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How to select:

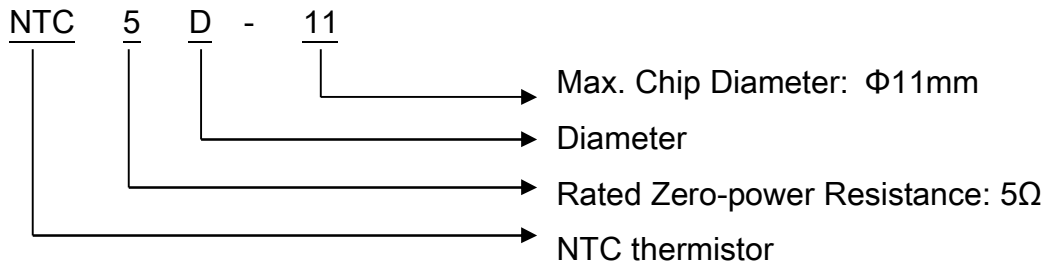
1. Maximum operating current > Actual operating current in the power loop
2. Rated zero power resistance at 25°C

$$R \geq \frac{\sqrt{2} E}{I_m} \quad \text{Of which, E: loop voltage, } I_m: \text{ Surge current}$$

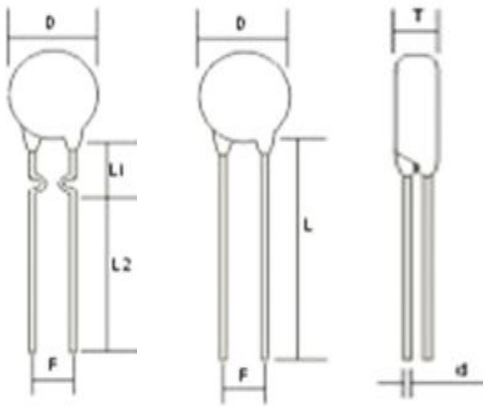
For conversion power, reversion power, switch power, UPS power, $I_m = 100$ times operating current.

For filament, heater, $I_m = 30$ times operating current.

Marking:



Dimension:



| 規格 | 尺寸 (mm) | | | | | | |
|--------|---------|--------|-------------|-----------|--------|---------------|------------|
| Φ | D max. | T max. | $d \pm 0.5$ | $F \pm 1$ | L min. | $L_1 \pm 1.5$ | L_2 min. |
| 5 | 7 | 4.5 | 0.43/0.55 | 2.5/5 | 25 | 8/5 | 15.5/18.5 |
| 7 | 9 | 5 | 0.55 | 5 | 25 | 8/5 | 15.5/18.5 |
| 9 | 11 | 6 | 0.55/0.75 | 5/7.5 | 25 | 8/5 | 15.5/18.5 |
| 11 | 13 | 6.5 | 0.55/0.75 | 5/7.5 | 25 | 8/5 | 15.5/18.5 |
| 13 | 15.5 | 7 | 0.75 | 7.5 | 25 | 8/5 | 15.5/18.5 |
| 15 | 17.5 | 7 | 0.75 | 7.5 | 25 | 8/5 | 15.5/18.5 |
| 20 | 22.5 | 7 | 1 | 10 | 25 | / | 15.5/18.5 |
| 25 | 27.5 | 8 | 1 | 10 | 25 | / | 15.5/18.5 |

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Specification:

| Parameter Dia (Φ) | Zero Power Resistance | Max. Steady State Current | Max. Current Remain Resistance | B _{25/85} | Thermal Time Constant | Thermal Dissipation Constant | Operating Temperature |
|-------------------------|--------------------------|------------------------------|--------------------------------------|--------------------|-----------------------------|------------------------------------|--------------------------|
| | R25 (Ω) | (A) | (mΩ) | (K) | (s) | (mW/°C) | (°C) |
| 5D-5 | 5 | 1 | 0.5841 | 2700 | <18 | >6 | -40 ~ 150 |
| 10D-5 | 10 | 0.7 | 1.039 | 2700 | | | |
| 15D-5 | 15 | 0.6 | 1.53 | 2800 | | | |
| 20D-5 | 20 | 0.6 | 2.02 | 2800 | | | |
| 22D-5 | 22 | 0.6 | 2.06 | 2800 | | | |
| 30D-5 | 30 | 0.5 | 2.227 | 2800 | | | |
| 33D-5 | 33 | 0.5 | 2.436 | 2800 | | | |
| 50D-5 | 50 | 0.4 | 2.653 | 3000 | | | |
| 60D-5 | 60 | 0.3 | 2.753 | 3000 | | | |
| 3D-7 | 3 | 3 | 0.206 | 2700 | <30 | >9 | -40~+150 |
| 5D-7 | 5 | 2 | 0.2864 | 2700 | | | |
| 8D-7 | 8 | 1 | 0.7353 | 2800 | | | |
| 10D-7 | 10 | 1 | 0.7885 | 2800 | | | |
| 12D-7 | 12 | 0.7 | 1.18 | 2800 | | | |
| 16D-7 | 16 | 0.7 | 1.56 | 3000 | | | |
| 20D-7 | 20 | 0.6 | 1.9877 | 3000 | | | |
| 22D-7 | 22 | 0.6 | 1.95 | 3000 | | | |
| 30D-7 | 30 | 0.5 | 3.7059 | 3000 | | | |
| 33D-7 | 33 | 0.2 | 3.8878 | 3000 | | | |
| 50D-7 | 50 | 0.2 | 6.465 | 3000 | | | |
| 2.5D-9 | 2.5 | 4 | 0.1397 | 2700 | <35 | >11 | -40~+170 |
| 3D-9 | 3 | 4 | 0.1456 | 2700 | | | |
| 4D-9 | 4 | 3 | 0.2541 | 2700 | | | |
| 5D-9 | 5 | 3 | 0.2641 | 2700 | | | |
| 6D-9 | 6 | 2 | 0.3582 | 2700 | | | |
| 7D-9 | 7 | 2 | 0.3265 | 2800 | | | |
| 8D-9 | 8 | 2 | 0.3731 | 2800 | | | |
| 10D-9 | 10 | 2 | 0.398 | 2800 | | | |
| 12D-9 | 12 | 1 | 0.989 | 2800 | | | |
| 16D-9 | 16 | 1 | 1.041 | 3000 | | | |
| 20D-9 | 20 | 1 | 1.173 | 3000 | | | |
| 22D-9 | 22 | 1 | 1.2346 | 3000 | | | |
| 30D-9 | 30 | 1 | 1.32 | 3000 | | | |
| 33D-9 | 33 | 1 | 1.431 | 3000 | | | |
| 50D-9 | 50 | 1 | 1.48 | 3100 | | | |
| 60D-9 | 60 | 0.8 | 1.641 | 3100 | | | |
| 80D-9 | 80 | 0.8 | 2.187 | 3200 | | | |
| 120D-9 | 120 | 0.8 | 3.281 | 3200 | | | |
| 200D-9 | 220 | 0.5 | 5.469 | 3200 | | | |

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Specification:

| Parameter Dia (Φ) | Zero Power Resistance | Max. Steady State | Max. Current Remain Resistance | B _{25/85} | Thermal Time Constant | Thermal Dissipation Constant | Operating Temperature |
|-------------------------|--------------------------|-------------------------|--------------------------------------|--------------------|-----------------------------|------------------------------------|--------------------------|
| | R25 (Ω) | (A) | (mΩ) | (K) | (s) | (mW/°C) | (°C) |
| 1D-11 | 1 | 5 | 0.1205 | 2600 | < 55 | > 13 | -40~+170 |
| 1.5D-11 | 1.5 | 5 | 0.126 | 2600 | | | |
| 2.5D-11 | 2.5 | 5 | 0.126 | 2700 | | | |
| 3D-11 | 3 | 5 | 0.1263 | 2700 | | | |
| 4D-11 | 4 | 4 | 0.2005 | 2700 | | | |
| 5D-11 | 5 | 4 | 0.2052 | 2700 | | | |
| 6D-11 | 6 | 3 | 0.2977 | 2700 | | | |
| 7D-11 | 7 | 3 | 0.2824 | 2800 | | | |
| 8D-11 | 8 | 3 | 0.2591 | 2800 | | | |
| 10D-11 | 10 | 3 | 0.2676 | 2800 | | | |
| 12D-11 | 12 | 2 | 0.3467 | 2800 | | | |
| 15D-11 | 15 | 2 | 0.485 | 3000 | | | |
| 16D-11 | 16 | 2 | 0.5 | 3000 | | | |
| 20D-11 | 20 | 2 | 0.59 | 3000 | | | |
| 22D-11 | 22 | 2 | 0.5903 | 3000 | | | |
| 25D-11 | 25 | 1.5 | 0.602 | 3000 | | | |
| 30D-11 | 30 | 1.5 | 0.722 | 3000 | | | |
| 33D-11 | 33 | 1.5 | 0.795 | 3000 | | | |
| 47D-11 | 47 | 2 | 1.165 | 3200 | | | |
| 50D-11 | 50 | 2 | 1.241 | 3200 | | | |
| 60D-11 | 60 | 1 | 1.489 | 3200 | | | |
| 80D-11 | 80 | 1 | 1.986 | 3200 | | | |
| 120D-11 | 120 | 0.8 | 2.979 | 3200 | | | |
| 1.3D-13 | 1.3 | 7 | 0.0889 | 2700 | < 70 | > 13 | -40~+200 |
| 1.5D-13 | 1.5 | 7 | 0.0895 | 2700 | | | |
| 2.5D-13 | 2.5 | 6 | 0.1079 | 2700 | | | |
| 3D-13 | 3 | 6 | 0.145 | 2700 | | | |
| 4D-13 | 4 | 5 | 0.1456 | 2700 | | | |
| 4.7D-13 | 4.7 | 5 | 0.1469 | 2800 | | | |
| 5D-13 | 5 | 5 | 0.1497 | 2800 | | | |
| 6D-13 | 6 | 4 | 0.2111 | 2800 | | | |
| 7D-13 | 7 | 4 | 0.232 | 3000 | | | |
| 8D-13 | 8 | 4 | 0.2746 | 3000 | | | |
| 10D-13 | 10 | 4 | 0.2792 | 3000 | | | |
| 12D-13 | 12 | 3 | 0.4833 | 3000 | | | |
| 15D-13 | 15 | 3 | 0.4867 | 3100 | | | |
| 16D-13 | 16 | 3 | 0.4545 | 3100 | | | |
| 18D-13 | 18 | 3 | 0.511 | 3200 | | | |
| 20D-13 | 20 | 3 | 0.568 | 3200 | | | |
| 22D-13 | 22 | 3 | 0.625 | 3200 | | | |
| 25D-13 | 25 | 2 | 0.581 | 3200 | | | |
| 30D-13 | 30 | 2 | 0.696 | 3200 | | | |
| 33D-13 | 33 | 2 | 0.765 | 3200 | | | |
| 47D-13 | 47 | 2 | 1.091 | 3200 | | | |
| 50D-13 | 50 | 2 | 1.161 | 3200 | | | |
| 60D-13 | 60 | 2 | 1.392 | 3200 | | | |
| 80D-13 | 80 | 1.5 | 1.856 | 3200 | | | |
| 120D-13 | 120 | 1 | 2.785 | 3200 | | | |

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|-------------------------|-----------------------|---------------------------|--------------------------------|---------|-----------------------|------------------------------|-----------------------|
| | R 25 (Ω) | (A) | (mΩ) | (K) | (s) | (mW/°C) | (°C) |
| 1.3D-15 | 1.3 | 8 | 0.0825 | 2700 | < 90 | > 16 | -40~+200 |
| 1.5D-15 | 1.5 | 8 | 0.0843 | 2700 | | | |
| 2.5D-15 | 2.5 | 7 | 0.1353 | 2700 | | | |
| 3D-15 | 3 | 7 | 0.1363 | 2700 | | | |
| 4D-15 | 4 | 6 | 0.1985 | 2700 | | | |
| 5D-15 | 5 | 6 | 0.1268 | 2800 | | | |
| 6D-15 | 6 | 5 | 0.1882 | 2800 | | | |
| 7D-15 | 7 | 5 | 0.1909 | 3000 | | | |
| 8D-15 | 8 | 5 | 0.2011 | 3000 | | | |
| 10D-15 | 10 | 5 | 0.2087 | 3000 | | | |
| 12D-15 | 12 | 4 | 0.2672 | 3000 | | | |
| 15D-15 | 15 | 4 | 0.305 | 3200 | | | |
| 16D-15 | 16 | 4 | 0.306 | 3200 | | | |
| 18D-15 | 18 | 4 | 0.3375 | 3200 | | | |
| 20D-15 | 20 | 4 | 0.3466 | 3200 | | | |
| 22D-15 | 22 | 4 | 0.3812 | 3200 | | | |
| 25D-15 | 25 | 3 | 0.433 | 3200 | | | |
| 30D-15 | 30 | 3 | 0.519 | 3200 | | | |
| 33D-15 | 33 | 3 | 0.571 | 3200 | | | |
| 40D-15 | 40 | 3 | 0.587 | 3200 | | | |
| 47D-15 | 47 | 3 | 0.69 | 3200 | | | |
| 50D-15 | 50 | 3 | 0.734 | 3200 | | | |
| 60D-15 | 60 | 3 | 0.881 | 3200 | | | |
| 80D-15 | 80 | 2 | 1.175 | 3200 | | | |
| 120D-15 | 120 | 1.5 | 1.763 | 3200 | | | |
| 0.7D-20 | 0.7 | 11 | 0.1045 | 2700 | < 90 | > 16 | -40~+200 |
| 1D-20 | 1 | 10 | 0.1105 | 2700 | | | |
| 1.3D-20 | 1.3 | 9 | 0.1312 | 2700 | | | |
| 2.2D-20 | 2.2 | 8 | 0.1292 | 2800 | | | |
| 2.5D-20 | 2.5 | 8 | 0.1469 | 2800 | | | |
| 3D-20 | 3 | 8 | 0.1519 | 2800 | | | |
| 5D-20 | 5 | 7 | 0.1576 | 3000 | | | |
| 6D-20 | 6 | 6 | 0.1891 | 3000 | | | |
| 8D-20 | 8 | 6 | 0.1981 | 3000 | | | |
| 10D-20 | 10 | 6 | 0.21 | 3000 | | | |
| 12D-20 | 12 | 5 | 0.2133 | 3200 | | | |
| 16D-20 | 16 | 5 | 0.2216 | 3200 | | | |
| 20D-20 | 20 | 4 | 0.277 | 3200 | | | |
| 30D-20 | 30 | 4 | 0.4157 | 3200 | | | |
| 33D-20 | 33 | 4 | 0.4495 | 3200 | | | |
| 60D-20 | 60 | 4 | 0.8172 | 3200 | | | |
| 0.7D-25 | 0.7 | 13 | 0.0581 | 2700 | < 160 | > 27 | -40~+200 |
| 1D-25 | 1 | 11 | 0.0831 | 2700 | | | |
| 1.3D-25 | 1.3 | 10 | 0.1078 | 2700 | | | |
| 1.5D-25 | 1.5 | 10 | 0.1246 | 2700 | | | |
| 2.5D-25 | 2.5 | 9 | 0.135 | 2800 | | | |
| 3D-25 | 3 | 9 | 0.162 | 2800 | | | |
| 5D-25 | 5 | 8 | 0.153 | 3000 | | | |
| 8D-25 | 8 | 7 | 0.2075 | 3000 | | | |
| 10D-25 | 10 | 7 | 0.2593 | 3300 | | | |
| 12D-25 | 12 | 6 | 0.311 | 3300 | | | |
| 16D-25 | 16 | 6 | 0.4148 | 3300 | | | |