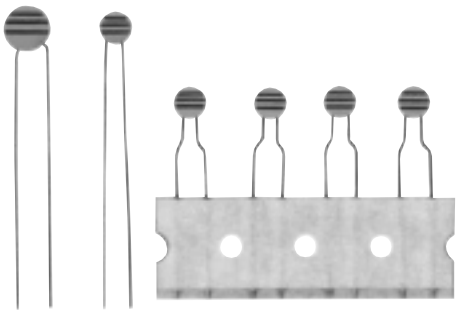
# Disc Type NTC Thermistors

Type: **ERTD**



The “Type ERTD” are disc type negative temperature coefficient thermistors. Resistances are available from 8 Ω to 150 kΩ and B Values are from 3000 K to 5000 K.
The thermistors are designed for temperature detections and temperature compensations etc., featuring excellent electrical and thermal stability.

## ■ Features

- Wide selection of temperature coefficient
- Excellent electrical and thermal stability

## ■ Recommended Applications

- Temperature detection
- Temperature compensation for measuring instruments
- Temperature compensation for deflection coil in TV

## ■ Explanation of Part Numbers

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | R | T | D | | | | | | | | |

| Product Code | |
|---|---|
| ERT | NTC Thermistors |

| Shape | |
|---|---|
| D | Disc Type |

| Disc Dim | |
|---|---|
| 2 | $\phi$5.0 mm |
| 3 | $\phi$7.5 mm |

| Lead Style | |
|---|---|
| F | Straight Lead |
| Z | “Z” Crimped Lead |

| Center B Value (K) | |
|---|---|
| E | 2501–3000 |
| F | 3001–3500 |
| G | 3501–4000 |
| H | 4001–4500 |
| I | 4501–5000 |

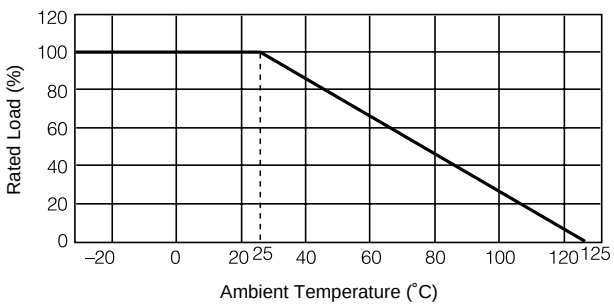
| Resistance Tolerance | |
|---|---|
| J | ± 5 % |
| K | ±10 % |
| L | ±15 % |

| Resistance $R_{25}$ (Ω) |
|---|
| The first two digits are significant figures of resistance and the third one denotes number of zeros following them. Decimal point is expressed by R as 1.4 =1R4. |

| Option | |
|---|---|
| S | Standard |
| T | Taping Type |

## ■ Derating Curve for the NTC Thermistor

For the NTC Thermistor operated in ambient temperatures above 25 ˚C, power rating shall be derated in accordance with the right figure.




Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.

■ Ratings and Characteristics

| Part No. | Zero-Power Resistance at 25 °C(Ω) | B Value** (K) | Maximum Permissible Power(W) | Heat Dissipation Constant (mW/°C) | Thermal Time Constant (s) | Resistance Ratio $R_{25}/R_{50}$ | Table A/B Curve No. |
|---|---|---|---|---|---|---|---|
| ERTD2FE□*200S | 20 | 3000 | | | | 2.18 | — |
| ERTD2FF□*400S | 40 | 3200 | | | | 2.30 | — |
| ERTD2FG□*750S | 75 | 3700 | | | | 2.62 | 1 |
| ERTD2FF□*101S | 100 | 3500 | | | | 2.48 | — |
| ERTD2FG□*101S | 100 | 3700 | | | | 2.62 | 2 |
| ERTD2FG□*171S | 170 | 3700 | | | | 2.62 | 3 |
| ERTD2FF□*251S | 250 | 3500 | | | | 2.48 | — |
| ERTD2FG□*251S | 250 | 3900 | | | | 2.76 | 4 |
| ERTD2FG□*301S | 300 | 3900 | | | | 2.76 | — |
| ERTD2FF□*351S | 350 | 3500 | | | | 2.48 | 5 |
| ERTD2FG□*601S | 600 | 4000 | | | | 2.83 | 6 |
| ERTD2FG□*801S | 800 | 3900 | 0.4 | 4.5 | 20 | 2.76 | 7 |
| ERTD2FG□*102S | 1000 | 3700 | | | | 2.61 | — |
| ERTD2FG□*142S | 1400 | 3900 | | | | 2.76 | — |
| ERTD2FG□*202S | 2000 | 4000 | | | | 2.83 | 8 |
| ERTD2FG□*332S | 3300 | 4000 | | | | 2.83 | 9 |
| ERTD2FH□*462S | 4600 | 4100 | | | | 2.90 | — |
| ERTD2FH□*802S | 8000 | 4100 | | | | 2.90 | 10 |
| ERTD2FH□*103S | 10000 | 4100 | | | | 2.90 | — |
| ERTD2FH□*153S | 15000 | 4200 | | | | 2.98 | 11 |
| ERTD2FH□*333S | 33000 | 4500 | | | | 3.22 | 12 |
| ERTD2FH□*503S | 50000 | 4500 | | | | 3.22 | 13 |
| ERTD2FI□*154S | 150000 | 4800 | | | | 3.48 | 14 |
| ERTD3FE□*8R0S | 8 | 3000 | | | | 2.18 | 15 |
| ERTD3FF□*130S | 13 | 3200 | | | | 2.30 | 16 |
| ERTD3FF□*160S | 16 | 3200 | | | | 2.30 | — |
| ERTD3FF□*200S | 20 | 3200 | | | | 2.30 | — |
| ERTD3FF□*300S | 30 | 3200 | | | | 2.30 | — |
| ERTD3FF□*400S | 40 | 3200 | | | | 2.30 | — |
| ERTD3FG□*750S | 75 | 3700 | 0.6 | 7.0 | 27 | 2.62 | — |
| ERTD3FG□*800S | 80 | 3700 | | | | 2.62 | — |
| ERTD3FG□*131S | 130 | 3700 | | | | 2.62 | — |
| ERTD3FG□*501S | 500 | 4000 | | | | 2.83 | — |
| ERTD3FH□*402S | 4000 | 4100 | | | | 2.90 | — |
| ERTD3FH□*203S | 20000 | 4500 | | | | 3.22 | — |
| ERTD3FI□*803S | 80000 | 5000 | | | | 3.70 | 17 |

*Resistance Tolerance Code

| J | K | L |
|---|---|---|
| ±5 % | ±10 % | ±15 % |

● Operating Temperature Range: −30 to +125 °C

**Tolerance of "B value": ±10 %

$$B=\frac{\ell n\ (R_{25}/R_{50})}{1/298.15-1/323.15}$$

$R_{25}$=Resistance at 25.0 °C

$R_{50}$=Resistance at 50.0 °C

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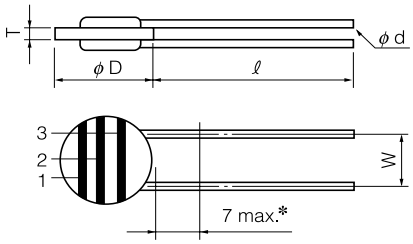
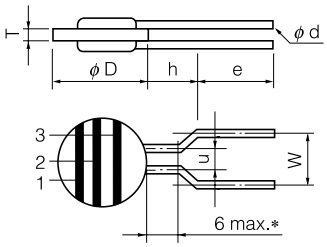
■ Dimensions in mm (not to scale)

Straight Lead Type
F Type




*Coating extension on leads

Crimped Lead Type
Z Type



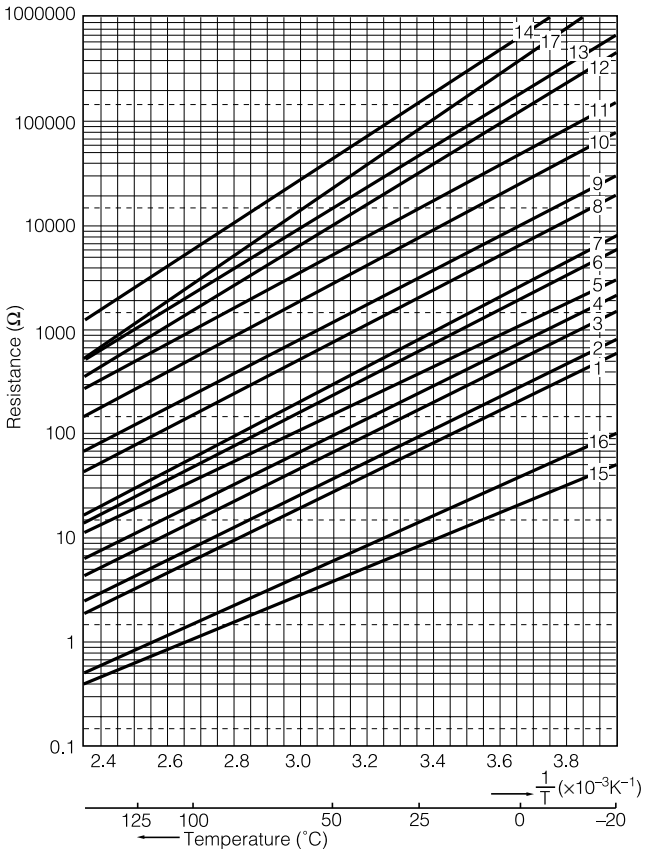

## F Type

| | ϕD | T | ℓ | W | ϕd |
|---|---|---|---|---|---|
| D2 | 5.0±0.5 | 1.3±0.5 | 30.0 min. | 2.5±1.0 | 0.4 |
| D3 | 7.5±0.5 | 1.4±0.5 | 30.0 min. | 5.0±1.0 | 0.5 |

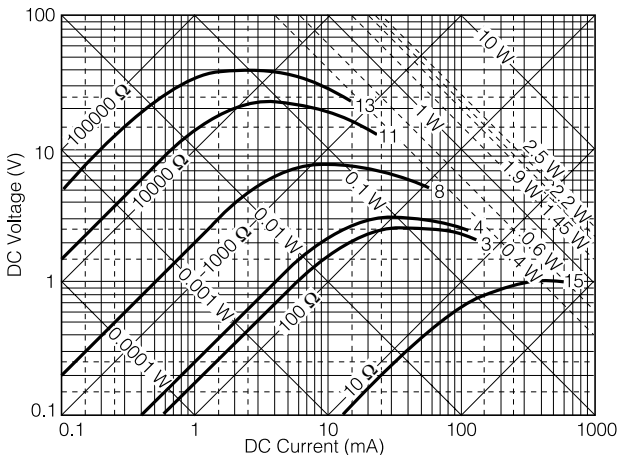
## Z Type

| | ϕD | T | u | e | h | W | ϕd |
|---|---|---|---|---|---|---|---|
| D2 | 5.0±0.5 | 1.3±0.5 | 3.0 max. (nom.2.5) | 4.5±1.0 | 6.0 max. (nom.5.0) | 5.0±1.0 | 0.5 |

■ Resistance vs. Temperature (Table A)




■ Voltage vs. Current (Table B)

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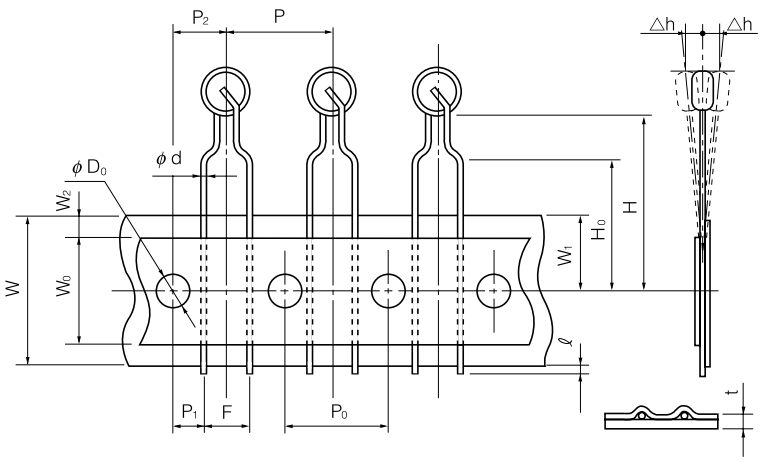
## ■ Resistance Color Code

| Color \ Code | 1(1st Digit) | 2(2nd Digit) | 3(Multiplier) |
|---|---|---|---|
| Black | 0 | 0 | $10^0$ |
| Brown | 1 | 1 | $10^1$ |
| Red | 2 | 2 | $10^2$ |
| Orange | 3 | 3 | $10^3$ |
| Yellow | 4 | 4 | $10^4$ |
| Green | 5 | 5 | $10^5$ |
| Blue | 6 | 6 | $10^6$ |
| Purple | 7 | 7 | $10^7$ |
| Gray | 8 | 8 | $10^8$ |
| White | 9 | 9 | $10^9$ |
| Gold | — | — | $10^{-1}$ |
| Silver | — | — | $10^{-2}$ |

## ■ Taping Dimensions in mm (not to scale)

Taping Type




| | |
|---|---|
| P | 12.7±1.0 |
| $P_0$ | 12.7±0.3 |
| $P_1$ | 3.85±0.70 |
| $P_2$ | 6.35±1.30 |
| $\phi$d | 0.50±0.05 |
| F | 5.0±1.0 |
| $\Delta$h | 0±5.0 |
| W | $18.0^{+1.0}_{-0.5}$ |
| $W_0$ | 12.5 min. |
| $W_1$ | $9.00^{+0.75}_{-0.50}$ |
| $W_2$ | 3.0 max |
| H | 21.0±2.0 |
| $H_0$ | 16.0±0.5 |
| $\ell$ | 2.0 max. |
| $\phi D_0$ | 4.0±0.3 |
| t | 0.5±0.2 |

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# Disc Type NTC Thermistors

## Precautions for Handling

### ⚠ Precautions for Safety

The Disc Type NTC Thermisters (hereafter referred to as “The NTC Thermistors”) may fail in burnout, flaming or glowing in the worst case, when subjected to severe conditions of electrical, environmental and/or mechanical stresses.
Following “⚠ Precautions for Safety” and “Application Notes” shall be taken in your major consideration. If you have a question about the “Precautions for Handling”. Please contact our engineering section or factory.

### 1. ⚠ Precautions for Safety

1.1 Operating Power

The NTC Thermistors, shall not be operated beyond the specified Maximum Permissible Power in the Catalog or the individual Specifications, otherwise , result in burnout and damages due to the thermal run away. (if operated in ambient temperatures above 25 °C, power rating shall be derated in accordance with the derating curve.)

1.2 Operating Temperature Range

The NTC Thermistors shall not be operated beyond the specified Operating Temperature Range of in the Catalog or the individual Specifications.
(Do not touch the heated part of the NTC Themistors by hand at large power consumption.)

1.3 Plastic Molding and Potting

In a case of plastic molding or potting, the NTC Thermistors may be damaged or deteriorated by extremly large mechanical stresses such as expanding and shrinking forces caused by the heat treatment of the plastics applied, depending on curing conditions and type of plastics.

1.4 Environmental Conditions

The NTC Thermistors shall not be operated and/or stored under following environmental conditions;
a) To be exposed to directly water or drops of water.
b) To be exposed to directly to sunlight.
c) Under conditions of dew formation.
d) To be exposed directly to oil, gasoline or organic solvent and/or atomospheres of them.
e) Under conditions of deoxidized or corrosive atomospheres such as chlorine, hydrogen sulfide, sulphur oxide and craked gas from vinyle chloride etc.
f) Under server conditions of extreme vibrations or shocks.

1.5 Mounting

Don‘t touch other parts to thermistor, because outer coating is not for assuring insulation when mounting the thermistor.

1.6 Fail-Safe Design for Equipment

In application of the Termistoes, equipment shall be protected against deterioration‘s and failures of the Termistors.

### 2. Application Notes

2.1 Soldering Flux

Rosin-based and non-activated type soldering flux is recommended.

2.2 Post Soldering Cleaning

In a case of solvent cleaning, outer coating material of the NTC Thermistors may met into the solvent, depending on the cleaning condition and type of cleaning solvent.

2.3 Abnormal Mechanical Stresses

The NTC Thermistors may be damaged or deteriorated, when dropped or exposed to a large impact. Excessive shock and impact shall not be applied.

2.4 Soldering

(1) When soldering thermistor, the soldering time shall be as short as possible to minimize the exposure time of the element to the melting point of solder.
Take into account of the solder-heat resistance of the product brfore use.
(2) In soldering the device, the body and outer coating section shall not be touched by molten solder and/or heatid iron tip.

2.5 Long Term Storage

(1) The NTC Thermistors shall not be stored under severe conditions of high temperatures and high humidities.
(2) The NTC Thermistors shall not be stored under conditions of corrosive atomosphere such as hydrogen sulfide, surfur oxide and chlorine and ammonia etc.
(3) The NTC Thermistors shall not be exposed to directly sunlight.
(4) The NTC Thermistors shall not be stored under dew formation.
(5) Store them indoors under 40 °C max. and 75 %RH max.
Use them within one year and check the solderability before use.