■NTC熱敏電阻器
NTC THERMISTOR

• 概述

這是一種負温度系數電阻器，其阻值隨環境温度的升高而降低，這種熱敏電阻是由2 種或4種鐵，鎳、鈷、錳或銅的金屬氧化物經過成型并在高温(1200℃至1500℃）下燒結而制得。

• NTC熱敏電阻的主要技術參數

＊ 零功率電阻值Rt
在規定温度下，采用引起電阻變化相對于總的測量誤差來説可以忽略不計的測量功率測得電阻值。

＊ 額定零功率電阻值R_{25}
熱敏電阻器的設計電阻值，通常是指25℃時測得的零功率電阻值并標志在熱敏電阻器上面。

＊ B值
B 值是負温度系數熱敏電阻器的熱敏指數，它被定儀爲兩個温度下零功率電阻值的自然對數之差與這兩個温度倒數之差的比值：即：

$$B=\ln\frac{R_{T1}}{R_{T2}}/(\frac{1}{T_1}-\frac{1}{T_2})=\frac{T_1T_2}{T_2-T_1}\ln\frac{R_{T1}}{R_{T2}}$$

式中：R_{T1}－温度爲T1時的零功率電阻值
R_{T2}－温度爲T2時的零功率電阻值
除非特别指出，B值是由25℃(298.15K）和50℃（323.15K）的零功率電阻值計算而得到的，B值在工作温度範圍内并不是一個嚴格的常數。

＊ 零功率電阻温度系數α_T
指在規定温度下，熱敏電阻器的零功率電阻隨温度的變化率與它的零功率電阻之比，即：

$$\alpha_T=\frac{1}{R_T}\frac{DR_T}{DT}=-\frac{B}{T_2}$$

式中：α_T－温度爲T時的零功率電阻温度系數
R_T-温度爲T時的零功率電阻
T－温度(以K表示)
B－B值

OUTLINE

This is a Negative Temperature Coefficient Resistor Whose resistance changes with ambient temperature changes. Thermistor comprises 2or 4 kinds of metal oxides of iron, nickel,cobalt, manganese and copper, being shaped and Sintered at high temperature(1200℃ to 1500℃)

Critical Technical Parameters of NTC Thermistor

Rt---Resistance Value at Zero-power
It's a resistance which is got at a fixed temperature on a basis of a testing power which causes resistance to Vary in a range which can be ignored in relation to the total testing eror.

R25---Resistance Value at Rated Zero-power
The design resistance of the thermistor usually refers to the resistance value got at Zero-power at 25℃, which is usually indicated on the thermistor.

B Value
B value stands for the thermal exponent at a negative temperature coefficient. It's defined as a ratio of the balance between the natural logarithms of resistance values at zero-power to the balance between the reciprocals of the two temperatures.The formula is as below:

$$B=\ln\frac{R_{T1}}{R_{T2}}/(\frac{1}{T_1}-\frac{1}{T_2})=\frac{T_1T_2}{T_2-T_1}\ln\frac{R_{T1}}{R_{T2}}$$

In this formula: R_{T1} is the resistance at Zero-power when the temperature is T_1
R_{T2} is the resisrtance at Zero-power when the temperature is T_2 Unless otherwise specified, B value is got by calculating the Zero-power resistances at 25℃ (298.15K) and50℃ (323.15K) . It's not a firm constant within the range of working temperature.

Resistance-to-Temperature Coefficient at Zero-power
It refers to the ratio of changes of a thermistor. Resistance value at Zero-powerwhen The temperature, to the resistance value at Zero-power The formula is as below:

$$\alpha_T=\frac{1}{R_T}\frac{DR_T}{DT}=-\frac{B}{T_2}$$

In this formula, "α" stands for the resistance-temperature coefficient at Zero-power when the temperature is T:
R_T stands for the resistance value at Zero-power when the temperature is T
T stands for thetemperature(in K)
B stands for B value

＊ 最大穩態電流 I_{max}

在環境温度爲25℃時充許施加在熱敏電阻器上的最大連續電流。

Max. steady state current. $I_{max.}$.

The maximum allowable continuous current passing through thermistor at 25℃.

＊ 耗散系數 δ

在規定的環境温度下，熱敏電阻器耗散功率變化與其相應温度變化之比，即：δ = △P/△T，在工作温度範圍内，δ隨環境温度變化而有所變化。

Dissipation Coefficient δ

It's the ratio of the changes with a thermistor dissipation power, in a pre-set ambient temperature, to the changes with the temperature. The formula is as below: δ =△P/△T，δ changes in response when the ambient temperature changes, within the ranges of the working temperature.

＊ 熱時間常數 τ

在零功率條件下，當温度發生突變時，熱敏電阻體温度變化了始末兩個温度差的63.2% 所需的時間。τ與熱敏電阻器的熱容量C 成正比，與其耗散系數δ成反比，即：τ =C / δ

Thermal Time Constant

At Zero-power and when amutatio occurs with the temperature, the time "t", which is-spent for finishing 63.2% of the gap between the beginning temperature and the ending temperature in the thermistor. is directly proportional to"c",the heat capacity of the thermistor, and is inversely proportional to δ, the dissip ation constant. That is " τ =C/δ " .

■ 應用範圍

適用于轉換電源、開關電源、UPS電源、各類電加熱器、電子節能燈、電子鎮流器、各種電子裝置電源電路的保護以及彩色顯示管、白熾燈及其它照明燈具的燈絲保護。

APPLICATIONS

Conversion power supply, switch power, UPS power, Kinds of electric heter, electronic energy-saving lamps, electronic ballast etc all kinds of power cicuit proterction of electronic equipments, filament proterction of CRT, bulb and other lighting lamps.

■抑制浪涌電流負温度系數(NTC)熱敏電阻器
Surge-Arrestor NTC Thermistor

- **特性**

＊ 體積小、功率大、抑制浪涌電流能力强
＊ 反應速度快
＊ B值大，殘余電阻小、壽命長、可靠性高、系列安全，工作圍寬。

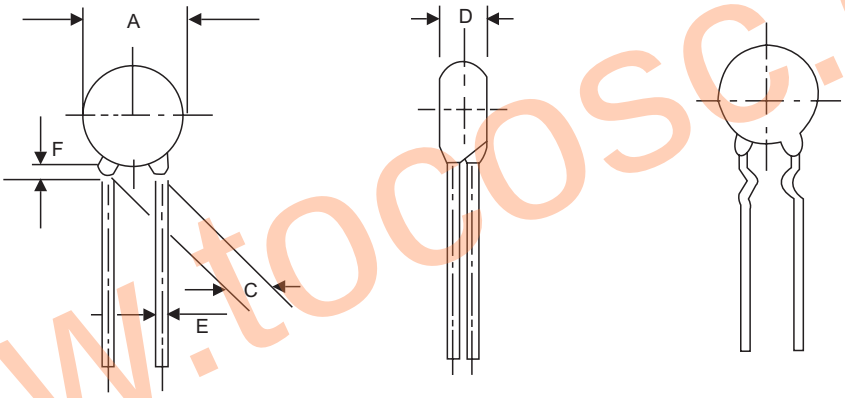
FEATURES

Small in size,high-powered, and very capable of bringing down the surge current;
Quick in reaction;
High in B value and low in residual current;
Long service life and high reliability;
High coefficient of safety and wide range of application.

- **訂貨方式 HOW TO ORDER**

NTC	10	D 13
負温度系數熱敏電阻器 Negative Temperature Cofficient Resistor	電阻值10Ω Resistance Value:10Ω	瓷片直徑φ13 Diameter of Chip: φ13

- **外型尺寸 DIMENSIONS (mm)**



尺寸(mm)

規格 Type	A_{MAX}	C±1	D_{MAX}	E±0.05	F_{MAX}
D-20	22	7.5/10	7	1.0	4
D-15	16.5	7.5	6	1.0	4
D-13	14.5	7.5	6	0.8	4
D-11	12.5	7.5	5	0.8	4
D-9	10.5	7.5	5	0.8	4
D-7	8.5	5.0	5	0.5	4

＊ 注：對于芯片直徑≤ φ13，工作電流≤2A的規格，E可取0.6。

Remarks:"E"value may be 0.6 for resistors for which the chip's diameter is≤13 and the working current is≤2A.

• 電性能 SPECIFICATIONS & PROPERTIES

型號 Model	R25℃ ±20%(Ω)	最大穩態電流(A) Max. Steady-current(A)	最大電流時近似電阻值(Ω) Approx R of Max.Cur.(Ω)	耗散系數 Power Dissipation coe-fficient(mW/℃)	時間常數 Time Constant (s)
NTC 5D-7	5	2	0.241	10	30
NTC 8D-7	8	1.5	0.436	9	28
NTC 10D-7	10	1	0.572	9	27
NTC 16D-7	16	0.7	0.897	9	27
NTC 22D-7	22	0.6	1.083	8	27
NTC 2.5D-9	2.5	4	0.128	11	35
NTC 3D-9	3	4	0.133	11	35
NTC 5D-9	5	3	0.236	11	35
NTC 8D-9	8	2	0.382	11	34
NTC 10D-9	10	2	0.467	11	34
NTC 16D-9	16	1	0.688	11	32
NTC 22D-9	22	1	0.899	11	30
NTC 25D-9	25	1	0.914	12	30
NTC 35D-9	35	1	1.103	12	30
NTC 50D-9	50	1	1.265	11	30
NTC 60D-9	60	1	1.521	11	30
NTC 80D-9	80	0.8	2.108	11	30
NTC 100D-9	100	0.8	2.576	11	30
NTC 120D-9	120	0.8	3.115	11	30
NTC 200D-9	200	0.5	5.900	10	32
NTC 300D-9	300	0.5	9.150	10	32
NTC 2.5D-11	2.5	5	0.120	13	46
NTC 3D-11	3	5	0.126	13	45
NTC 5D-11	5	4	0.228	13	45
NTC 8D-11	8	3	0.301	13	45
NTC 10D-11	10	3	0.395	14	47
NTC 16D-11	16	2	0.488	14	50
NTC 2.5D-13	2.5	6	0.099	13	60
NTC 3D-13	3	6	0.112	14	60
NTC 5D-13	5	5	0.136	15	68
NTC 8D-13	8	4	0.256	15	65
NTC 10D-13	10	4	0.271	15	65
NTC 16D-13	16	3	0.368	16	60
NTC 3D-15	3	7	0.094	18	76
NTC 4D-15	4	6	0.128	20	76
NTC 5D-15	5	6	0.132	20	76
NTC 8D-15	8	5	0.196	20	80
NTC 10D-15	10	5	0.255	20	85
NTC 16D-15	16	4	0.307	19	77
NTC 3D-20	3	8	0.079	24	100
NTC 5D-20	5	7	0.106	23	87
NTC 8D-20	8	6	0.157	23	105
NTC 10D-20	10	6	0.194	23	118