

**Description**

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

**Features**

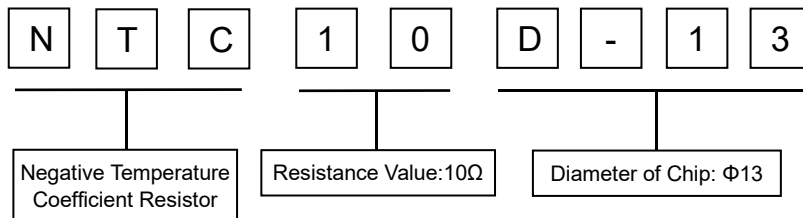
- Small size, large power, strong capacity of suppression of inrush current
- Fast response
- Big material constant(B value),small residual resistance
- Long life and high reliability
- Complete series, wide applications



**Applications**

- Switching power-supply, switch power ,ups power
- Electronic energy saving lamps electronic ballast and all kinds of electric heater
- All kinds of RT, display
- Bulb and other lighting lamps

**Part Number Code**



**Materials**

Item	name
Wrapper	Modified phenolic resin
Down-lead	CP Wire
Coating color	Black

### Parameters of Technology

Model	R <sub>25</sub> (Ω)	Max. steady State current (A)	Residual Resistance (Ω)	Dissipation factor (mw/°C)	Thermal time Constant (s)	Max. allowable capacity value 240V/120V (μF)	B (K)	Operating Temperature (°C)
NTC5D-5	5	1	0.35	≈6	≈20	150/560	2700	-40~+150
NTC8D-5	8	0.7	0.77	≈6	≈20	100/390	2700	
NTC10D-5	10	0.7	0.77	≈6	≈20	68/270	2700	
NTC20D-5	20	0.5	0.997	≈6	≈20	39/150	2800	
NTC33D-5	33	0.5	1.88	≈6	≈20	39/150	2950	
NTC5D-7	5	2	0.28	≈9	≈30	100/390	2700	
NTC8D-7	8	1	0.54	≈9	≈30	100/390	2700	
NTC10D-7	10	1	0.62	≈9	≈30	100/390	2700	
NTC12D-7	12	1	0.82	≈9	≈30	82/330	2700	
NTC16D-7	16	0.7	1.00	≈9	≈30	82/330	2800	
NTC20D-7	20	0.6	1.11	≈9	≈30	82/330	2800	
NTC22D-7	22	0.6	1.11	≈9	≈30	68/270	2800	
NTC33D-7	33	0.5	1.49	≈9	≈30	68/270	2950	
NTC3D-9	3	4	0.12	≈11	≈35	220/820	2600	
NTC5D-9	5	3	0.21	≈11	≈35	220/820	2700	
NTC6D-9	6	2	0.32	≈11	≈35	220/820	2700	
NTC8D-9	8	2	0.40	≈11	≈35	150/560	2700	
NTC10D-9	10	2	0.46	≈11	≈35	150/560	2700	
NTC12D-9	12	1	0.66	≈11	≈35	150/560	2700	
NTC15D-9	15	1	0.80	≈11	≈35	150/560	2800	
NTC16D-9	16	1	0.80	≈11	≈35	82/330	2800	
NTC20D-9	20	1	0.88	≈11	≈35	82/330	2800	
NTC22D-9	22	1	0.95	≈11	≈35	82/330	2800	
NTC33D-9	33	1	1.12	≈11	≈35	68/270	2950	
NTC50D-9	50	1	1.25	≈11	≈35	68/270	2950	
NTC100D-9	100	0.8	3.02	≈11	≈35	68/270	3200	
NTC120D-9	120	0.8	3.02	≈11	≈35	68/270	3200	
NTC2.5D-11	2.5	5	0.10	≈14	≈50	680/2700	2700	
NTC3D-11	3	5	0.10	≈14	≈50	680/2700	2700	
NTC5D-11	5	4	0.16	≈14	≈50	470/1800	2700	
NTC8D-11	8	3	0.25	≈14	≈50	470/1800	2800	
NTC10D-11	10	3	0.28	≈14	≈50	220/820	2800	
NTC12D-11	12	2	0.46	≈14	≈50	220/820	2800	
NTC15D-11	15	2	0.47	≈14	≈50	150/560	2800	
NTC16D-11	16	2	0.47	≈14	≈50	150/560	2800	
NTC20D-11	20	2	0.51	≈14	≈50	100/390	2950	
NTC22D-11	22	2	0.56	≈14	≈50	100/390	2950	
NTC33D-11	33	1.5	0.67	≈14	≈50	100/390	2950	
NTC47D-11	47	1.5	1.02	≈14	≈50	100/390	2950	
NTC50D-11	50	1.5	1.02	≈14	≈50	100/390	2950	

### Parameters of Technology

Model	R <sub>25</sub> (Ω)	Max. steady State current (A)	Residual Resistance (Ω)	Dissipation factor (mw/°C)	Thermal time Constant (s)	Max. allowable capacity value 240V/120V (μF)	B (K)	Operating Temperature (°C)
NTC1.5D-13	1.5	6.5	0.085	≈15	≈68	680/2700	2600	-40~+200
NTC2.5D-13	2.5	6	0.088	≈15	≈68	680/2700	2600	
NTC3D-13	3	6	0.092	≈15	≈68	680/2700	2600	
NTC4.7D-13	4.7	5	0.12	≈15	≈68	680/2700	2700	
NTC5D-13	5	5	0.125	≈15	≈68	680/2700	2700	
NTC8D-13	8	4	0.194	≈15	≈68	330/1200	2800	
NTC10D-13	10	4	0.206	≈15	≈68	330/1200	2800	
NTC16D-13	16	3	0.335	≈15	≈68	220/820	2800	
NTC18D-13	18	3	0.372	≈15	≈68	220/820	2800	
NTC20D-13	20	3	0.372	≈15	≈68	220/820	2800	
NTC30D-13	30	2.5	0.517	≈15	≈68	150/560	2950	
NTC47D-13	47	2	0.81	≈15	≈68	150/560	2950	
NTC1.3D-15	1.3	8	0.052	≈18	≈86	820/3300	2600	
NTC1.5D-15	1.5	8	0.071	≈18	≈86	820/3300	2600	
NTC2.5D-15	2.5	8	0.071	≈18	≈86	820/3300	2600	
NTC3D-15	3	7	0.075	≈18	≈86	820/3300	2600	
NTC5D-15	5	6	0.112	≈18	≈86	680/2700	2800	
NTC7D-15	7	5	0.173	≈18	≈86	680/2700	2800	
NTC8D-15	8	5	0.178	≈18	≈86	680/2700	2950	
NTC10D-15	10	5	0.18	≈18	≈86	560/2200	2950	
NTC15D-15	15	4	0.268	≈18	≈86	560/2200	2950	
NTC16D-15	16	4	0.268	≈18	≈86	560/2200	2950	
NTC18D-15	18	4	0.288	≈18	≈86	330/1200	2950	
NTC20D-15	20	4	0.288	≈18	≈86	220/820	2950	
NTC30D-15	30	3.5	0.438	≈18	≈86	220/820	2950	
NTC47D-15	47	3	0.68	≈18	≈86	220/820	3200	
NTC50D-15	50	3	0.72	≈18	≈86	220/820	3200	
NTC1.3D-20	1.3	9	0.037	≈24	≈113	820/3300	2600	
NTC1.5D-20	1.5	9	0.037	≈24	≈113	820/3300	2600	
NTC2.5D-20	2.5	8	0.049	≈24	≈113	820/3300	2700	
NTC3D-20	3	8	0.055	≈24	≈113	820/3300	2700	
NTC5D-20	5	7	0.087	≈24	≈113	820/3300	2800	
NTC8D-20	8	6	0.142	≈24	≈113	820/3300	2950	
NTC10D-20	10	6	0.162	≈24	≈113	820/3300	2950	
NTC16D-20	16	5	0.212	≈24	≈113	820/3300	3200	
NTC20D-20	20	4	0.231	≈24	≈113	820/3300	3200	

**Storage condition**

Temperature	-10°C ~ +40°C
Humidity	≤70%RH
Term	≤12 months (First-in/ First-out)
Place	<ol style="list-style-type: none"> <li>1. Do not exposing the components to the following conditions, otherwise, it may result in deterioration of characteristics</li> <li>2. Corrosive gas or deoxidizing gas</li> <li>3. Flammable and explosive gases</li> <li>4. Oil, water and chemical liquid</li> <li>5. Under the sunlight</li> </ol>

Notes: Do not apply the components under the following conditions, otherwise, it may result in deterioration of characteristics, destruction of components or in the worst case to catching fire: 1. Exceeding I<sub>max</sub> 2. Exceeding rated temperature range 3. Inferior thermal dissipation, Due to badly inferior thermal dissipation, some part of the components body will become overheated and then be damaged

**properties of products**

Mechanical Characteristics		
Item	Specification	Test Conditions & Methods
Solder-ability	The terminals shall be uniformly tinned, and its area ≥ 95%	Dipping the NTC terminals to a depth of 15mm in a soldering bath of 240-245°C and to the place of 6mm far from NTC body for 2-3s (See IEC68-2-20 /GB2423.28 Ta )
Resistance To Soldering Heat	No visible mechanical damage. ΔR/RN ≤ 20% (ΔR =   RN-RN'   )	Dipping the NTC terminals to a depth of 15mm in a soldering bath of 265±5°C and to the place for 6mm below from NTC body for 10±1s. After recovering 4-5h under 25±2°C. The rated zero power resistance value RN' shall be measured. (See IEC68-2-20 /GB2423.28 Tb)

Strength of lead terminal	No break out $\Delta R/RN \leq 20\%$ $(\Delta R =   RN - RN'   )$	Fasten the body and apply a force gradually to each lead until 10N and then keep for 10sec, Hold body and apply a force to each lead until 90° slowly at 5N in the direction of lead axis and then keep for 10sec, and do this in the opposite direction repeat for other terminal. After recovering 4~5h under $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $RN'$ shall be measured. (See IEC68-2-21/GB2423.29 Ua / Ub)
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Electrical Characteristics		
Item	Specification	Test Conditions & Methods
Rated Zero-Power Resistance $RN (\Omega)$	$RN \pm 20\%$	Ambient temp. Range: $25^\circ\text{C} \pm 2^\circ\text{C} (TA)$ . Testing voltage: 1.5VDC After placing for 1~2 hours under $TA$ , the resistance value shall be measured
Thermal Dissipation Constant $\delta (mW/^\circ\text{C})$	See the main technical parameter list	The thermal dissipation constant( $\delta$ ) could be calculated by the ratio of a change in power dissipation( $\Delta P$ ) of the thermistor to a change in temperature( $\Delta T$ ) of the thermistor at a specified ambient temperature
Thermal Time Constant $T(s)$	See the main technical parameter list	The time( $\tau$ ) shall be measured within which the temperature change of NTC thermistor is reached at 63.2% of the ambient temperature change under zero power condition
Material Constant B	$B = T_1 T_2 / (T_2 - T_1) \times \ln(R_1 / R_2)$	$R_1, R_2$ is zero-power resistance at $T_1, T_2$ $T_1 = 298.15 \text{ K}(25^\circ\text{C})$ $T_2 = 323.15 \text{ K}(50^\circ\text{C})$
Max. Steady State Current (A)	visible mechanical damage. $\Delta RN / RN \leq 20\%$ $(\Delta R =   RN - RN'   )$	ambient temperature: $25^\circ\text{C} \pm 2^\circ\text{C}$ Testing Time: min 100h
Reliability Test		
Item	Specification	Test Conditions & Methods
Temp. Cycling Testing	No visible mechanical damage. $\Delta RN / RN \leq 20\%$ $(\Delta R =   RN - RN'   )$	$T_a: -40 \pm 3^\circ\text{C} / 30\text{min} \rightarrow 25 \pm 2^\circ\text{C} / 5\text{min} \rightarrow T_b: 200 \pm 3^\circ\text{C} / 30\text{min} \rightarrow 25 \pm 2^\circ\text{C} / 5\text{min}$ Cycles: 5times After recovering 4~5 h under $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $RN'$ shall be measured.

Electrical Cycling Testing	No visible mechanical damage. $\Delta RN / RN \leq 20\%$ ( $\Delta R =   RN - RN'  $ )	Ambient temp. Range: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ . Cycles: 1,000times On / Off: 1m / 5m Test Current: 6.0A After recovering 4~5h under $25 \pm 2^{\circ}\text{C}$ , the rated zero power resistance value RN' shall be measured.
LoadLife ( Endurance ) Testing	No visible mechanical damage. $\Delta RN / RN \leq 20\%$ ( $\Delta R =   RN - RN'  $ )	Ambient temp. Range: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ; 6.0A/ 1,000 $\pm$ 24h After recovering 4~5 h under $25 \pm 2^{\circ}\text{C}$ , the rated zero power resistance value RN' shall be measured.
Humidity Testing	No visible mechanical damage. $\Delta RN / RN \leq 20\%$ ( $\Delta R =   RN - RN'  $ )	Ambient temp. range : $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , R.H.: $93 \pm 3\%$ , Energized time: $1000 \pm 24$ h After recovering 4~5 h under $25 \pm 2^{\circ}\text{C}$ , the rated zero power resistance value RN' shall be measured

**Graph of Characteristics**

Figure 1 - Graph of Resistance vs. Temperature

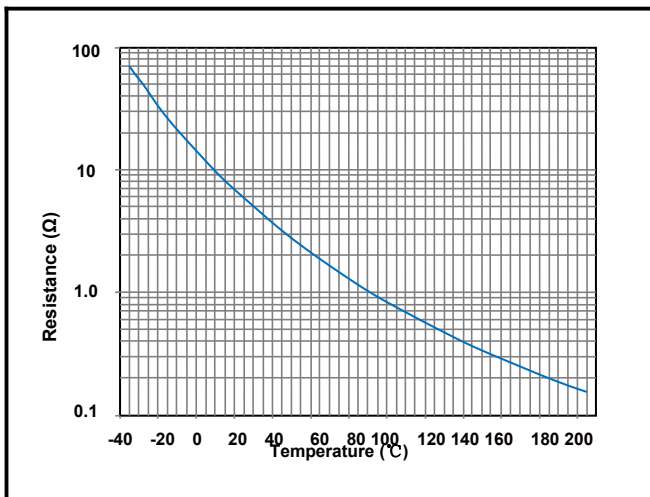
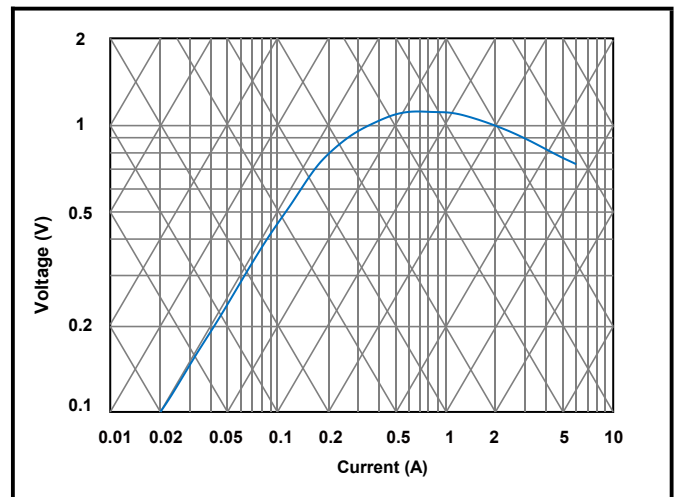
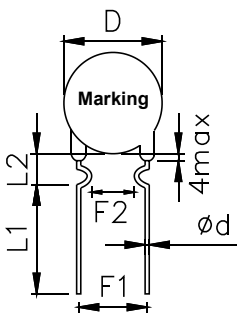


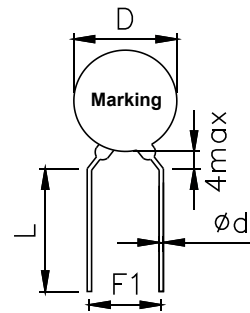
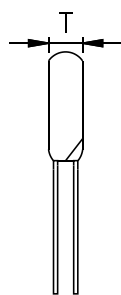
Figure 2 - Graph of Voltage vs. Current



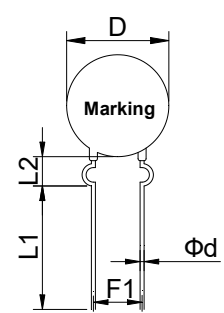
**Product Dimensions**



I Type (内弯脚)



S Type (直线脚)



O Type (外弯脚)

Dimension	Dimensions (mm)									
	Type	D(max)	T(max)	Φd±0.1	F1±1	F2±1.5	Straight Lead Wire		Curved Lead Wire	
							L ±1	L1±0.5	L2±2	
NTCxxD-5	S	7	5	0.55	5	/	3~30	/	/	
NTCxxD-7	I	9	5	0.55	5	3	3~30	3~25	4	
NTCxxD-9	I	11	5.5	0.75	7.5	5	3~30	3~25	4	
NTCxxD-11	I	13	5.5	0.75	7.5	5	3~30	3~25	4	
NTCxxD-13	I	15.5	6	0.75	7.5	5	3~30	3~25	4	
NTCxxD-15	I	17.5	6	0.75	7.5	5	3~30	3~25	4	
NTCxxD-20	S	22.5	7	1.00	10	/	3~30	/	/	

### Packaging

Dimension	Bag (pcs)	Inside the box (pcs)	carton (pcs)
NTCxxD-5 / NTCxxD-7	1000	3000	18000
NTCxxD-9 / NTCxxD-11	500	2000	12000
NTCxxD-13 / NTCxxD-15	250	1000	6000
NTCxxD-20	100	400	2400