

天瑞电子
TianRui Electronic

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NTC THERMISTOR TEMPERATURE SENSOR

DONGGUAN TIANRUI ELECTRONIC CO.,LTD



Office environment



Effective management



Well-trained staff



Strict QC



Advanced equipment

COMPANY INTRODUCTION

TianRui Electronics Industrial is a professional manufacturer integrated by developing, producing and sales of NTC thermistor and temperature sensor.

It is located in Botou Industria zone,Chashan,Town,Dongguan, Guangdong,China(Mainland)

TianRui was founded in 2001, covering about 1800 square meters. After over ten years of growth, TianRui has its own sizable factory and complete production testing equipments, and passed ISO9001-2008 quality management system certification. The products comply with EU ROHS environmental protection directive.

As customized product, NTC sensor is widely used in temperature measurement for induction cooker, rice cooker, microwave oven, water machine, electric kettle, heater, air conditioner, refrigerator, water dispenser, disinfection cabinet, washing machine, coffee maker and so on household appliances. Besides, the sensors are applicable to automobile, Internet of things, battery, intelligent closetool, electric blanket, power overheated protection, lamps and lanterns, power tools, medical temperature measurement, industrial temperature measurement, garden temperature control and breeding industry etc.

TIANRUI adheres to "development achieved by management, profits gotten by quality", advanced enterprise culture and process management, to make continuously improvement.

In strict accordance with controlling production process, TianRui has twelve cellular production lines, providing senior application engineer and powerful test team, to ensure terminal product defective rate within 5PPM. We make customers request as the starting point, accurately grasp the consumer demand to supply cost-effective NTC products, by continuously innovation and keeping technique and production process optimization, and constantly improving quality.

Based on superior products and services, TIANRUI has gained recognition of many global enterprises, including Electrolux German EGO, Videocon and Panasonic etc.

Meanwhile, we provide reliable NTC sensor for domestic well-known appliance brands such as Midea, Galanz, Changhong and become superior supplier of many famous enterprises, such as Xinbao, Topband, Weili, Vanward and Kinglong motor.

● Business Type

Manufacturer
Trading Company

● Primary Competitive Advantages

High quality
Competitive price
Excellent service
Reliability
Reputation
High customer satisfaction

● OEM Services Provided

Yes

● Safety Approval

RoHS

● Quality system

ISO9001

● NTC factory

Employees:80-100
Engineering:3
QA/QC:7

● Temperature sensor factory

Employees:80-100
Engineering:4
QA/QC:8

● Our main customers:

 Electrolux



 Panasonic



美的  Midea

Galanz 格兰仕

 Donlin 东菱

TOPBAND 拓邦

 Vanward 万和



 Canbo 康宝

WEKING 威王

 KLM 金龙汽车集团
MINI LONG MOTOR GROUP



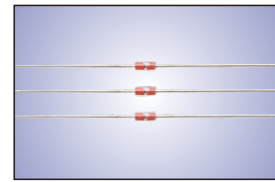
 CHANGHONG 长虹



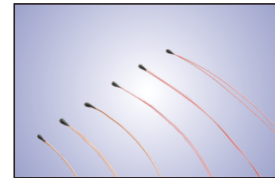
 VIDEOCON



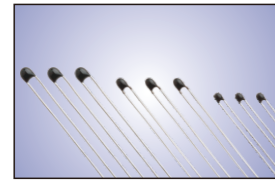
产品展示



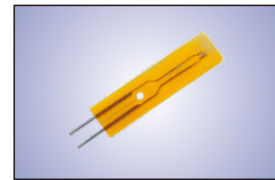
MF58 Series



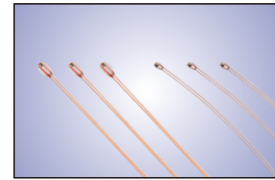
MF5A4 Series



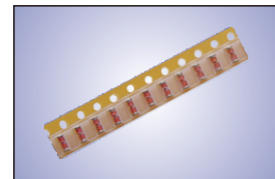
MF5A2,3 Series

SMD 0402 Series
SMD 0603 Series
SMD 0805 Series
SMD 1206 Series

MF5E Series



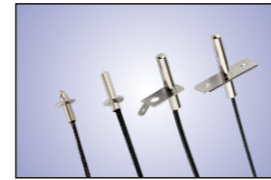
MF5B1,2 Series

MF72 Series
Power NTC Thermistor

MF58-1 Series



MF11,12 Series

TR-A Series
NTC Temperature sensorTR-B Series
NTC Temperature sensorTR-C Series
NTC Temperature sensorTR-D Series
NTC Temperature sensorTR-F & TR-R Series
NTC Temperature sensorTR-G Series
NTC Temperature sensorTR-H Series
NTC Temperature sensorTR-N Series
NTC Temperature sensorTR-X Series
NTC Temperature sensor

Thermistor info

Thermistor is a semiconductor ceramic made from Mn, Cu, Co, Ni and so on oxide of the transition metals, which is sintered at the temperature of 1200°C to 1400°C . It is formed combined with our advanced semiconductor processing technics, with features of various specifications ,high precision, excellent stability and good interchangeable. The basic physical characteristics are resistance value, B value, thermal dissipation coefficient, time constant.

Terminology

● Zero-Power Resistance

The zero-power resistance is the dc resistance value of a thermistor measured at a specified temperature with power dissipated by the thermistor low enough that any farther decrease in power will result in not more than 0.1 % change in resistance.

● Resistance value: R (Ω)

The mathematical expression,which relates the resistance and the absolute temperature of a thermistor,is as follows:

$$R_2=R_1 \times \text{EXP}[B \times (1/T_2-T_1)]$$

Where: R₁ and R₂ are the value of resistance at the absolute temperature T₁ and T₂

● Beta (°K), (expressed in ° Kelvin)

The material constant of a thermistor . Unless otherwise specified . Beta is derived from thermistor resistance measurements obtained at 25° and 50°C.

$$B = \frac{\text{Ln}R_1 - \text{Ln}R_2}{\frac{1}{T_1} - \frac{1}{T_2}}$$

● Temperature Coefficient Of Resistance(alpha α_r)

Zero-power coefficient of resistance is the ratio at the specified temperature (T) of the rate of change of zero-power resistance with temperature to the zero-power resistance of the thermistor

$$\alpha_r = \frac{1}{R_r} \cdot \left(\frac{dR_r}{dT} \right)$$

● Dissipation Coefficient: δ (mW/°C)

Dissipation coefficient is obtained by dividing power consumption of thermistor by the change of the environment temperature

$$\delta = W / (T - T_0) = I^2 R / (T - T_0)$$

Notes: W: Consumption power of thermistor (mW)

T: Temperature at the thermal balance

T₀: Ambient environment temperature

I: Current of thermistor at the temperature of T

R: Resistance of thermistor at the temperature of T (Ω)

● Thermal Time Constant

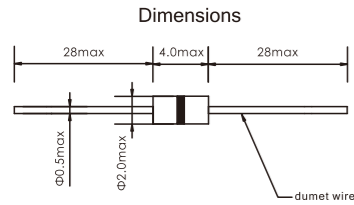
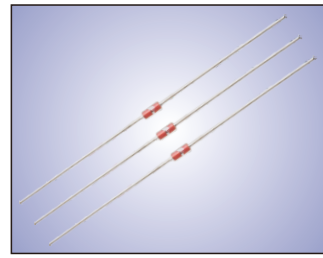
The thermal time constant is the time required for a thermistor to change 63.2% of the total difference between its initial and final body temperature when subjected to a step function change in temperature under zero-power conditions.

● Maximum Power Rating

The maximum power rating of a thermistor is the maximum power , which a thermistor will dissipate for an extended period of time with acceptable stability of its characteristics.

● Maximum Operating Temperature

The maximum operating temperature is the maximum body temperature at which the thermistor will operate for an extended period of time with acceptable stability of its characteristics.This temperature can be the result of internal or external heating,or both,and should not exceed the maximum value specified.



MF58 Thermistors

Glass shell diode

Features:

Glass-coated, heat resistance, small size, high stability and reliability
Suitable for auto insert machine. Economical

Applications:

Electric rice cooker , electric oven , disinfector, water dispenser, dish washer, etc.
Chemical equipment and food processing equipment
Mobile battery and charger

Part number guide:

TR MF58 - 502 - F - 3950 F
① ② ③ ④ ⑤ ⑥

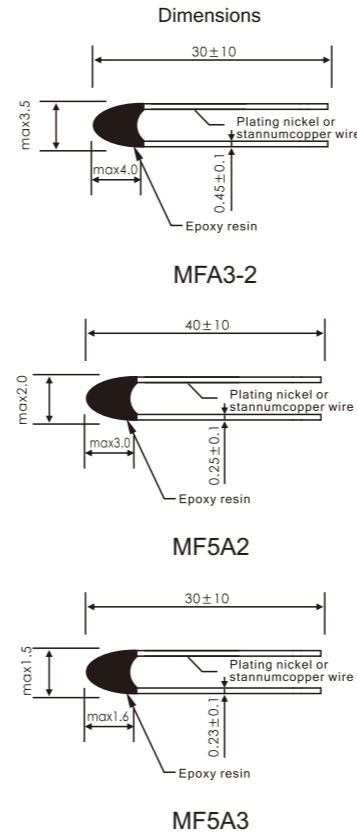
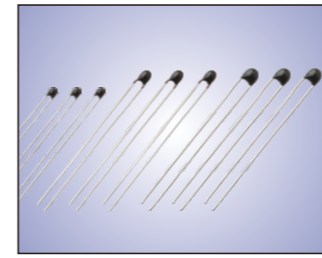
Where:

- ① NTC Thermistor
- ② Glass-coated;
- ③ Rated zero-power resistance at 25°C.
For example: 502 means $R_{25^\circ\text{C}} = 5\text{K}\Omega$
- ④ Resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)
- ⑤ B Value ($B_{25/50^\circ\text{C}}$): 3950K
- ⑥ B Value tolerance: F ($\pm 1\%$), G ($\pm 2\%$); H ($\pm 3\%$)

Typical Products Specifications:

Part number	$R_{25^\circ\text{C}}$ (K Ω)	$B_{25/50^\circ\text{C}}$ (K)	Dissipation Coefficient (mW/°C)	Time Constant (S)	Operating Temperature Range (°C)
MF58-202-3470□	2	3470	In still air 2.5max	In still air 17max	-40~+150°C
MF58-502-3500□	5	3500			-40~+150°C
MF58-103-3435□	10	3435			-40~+150°C
MF58-103-3600□	10	3600			-40~+150°C
MF58-473-3950□	47	3950			-40~+250°C
MF58-503-3950□	50	3950			-40~+250°C
MF58-104-3990□	100	3990			-40~+300°C
MF58-154-4100□	150	4100			-40~+300°C
MF58-204-4300□	200	4300			-40~+300°C
MF58-105-4400□	1000	4400			-40~+300°C

- "□" indicates the resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)
- B Value :determined by rated zero-power resistance at 25°C and 50°C, tolerance: $\pm 1\%$.
- Special specifications are customized by your request.



MF5A2,3 Thermistor

Epoxy resin coated

Features:

Epoxy coated, small size
Quick response, high precision
Good stability

Applications:

Temperature sensor
Electronic perpetual calendar and temperature meter
Temperature compensation

Part number guide:

TR MF5A 2 - 502 G 3950 G
① ② ③ ④ ⑤ ⑥ ⑦

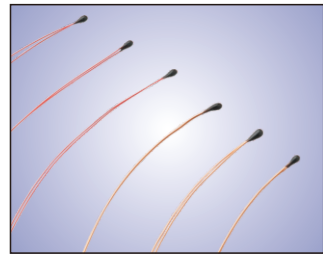
Where:

- ① NTC Thermistor
- ② Epoxy-coated
- ③ Type number
- ④ Rated zero-power resistance at 25°C.
For example: 502 means $R_{25^\circ\text{C}} = 5\text{K}\Omega$
- ⑤ Resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)
- ⑥ B Value ($B_{25/50^\circ\text{C}}$): 3950K
- ⑦ B Value tolerance: F ($\pm 1\%$), G ($\pm 2\%$); H ($\pm 3\%$)

Typical Products Specifications:

Part number	$R_{25^\circ\text{C}}$ (K Ω)	$B_{25/50^\circ\text{C}}$ (K)	Dissipation Coefficient (mW/°C)	Time Constant (S)	Operating Temperature Range (°C)
MF5A2-103-3435□	10	3435	In still air 2.5max	In still air 16max	-40~+125 °C
MF5A2-103-3470□	10	3470			
MF5A2-473-3950□	47	3950			
MF5A2-503-3950□	50	3950			
MF5A2-104-3990□	100	3990			
MF5A2-104-4100□	100	4100			

- "□" indicates the resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)
- B Value :determined by rated zero-power resistance at 25°C and 50°C, tolerance: $\pm 1\%$.
- Special specifications are customized by your request.



MF5A4 Thermistor

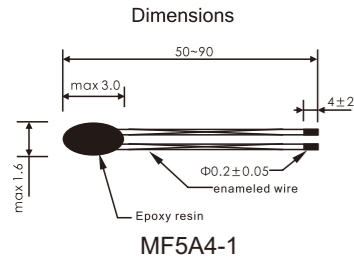
Enameled wire coated

Features:

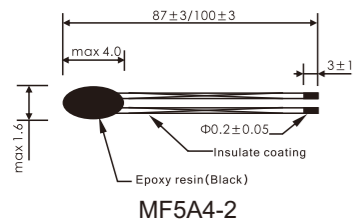
- Epoxy coated, small size, high precision
- High reliability, quick response
- Polyester enameled wire for good heat resistance and high insulation performance

Applications:

- Electronic clinical thermometer and microwave therapy instrument
- Temperature meter and electronic dishwasher



MF5A4-1



MF5A4-2

Material:

Package	Color	Wire
Epoxy resin	Black	Enameled wire

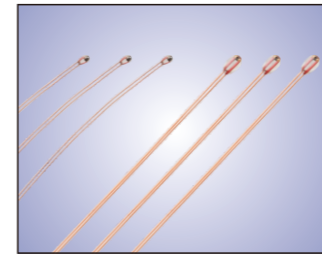
Part number guide:

MF5A	4	503	F	3950
NTC temperature measure thermistor	Suitable for digital thermometer	Resistance 50X10 ³ =50KΩ	Resistance tolerance ±1%	B-value (25/50) 3950K

Resistance rated table:

Rating zero power resistance R ₃₇ (1-32)±0.09%(37.00℃)							
Rate 1	29.111KΩ	Rate 9	29.535KΩ	Rate17	29.964KΩ	Rate25	30.401KΩ
Rate 2	29.164KΩ	Rate10	29.588KΩ	Rate18	30.019KΩ	Rate26	30.456KΩ
Rate 3	29.216KΩ	Rate11	29.641KΩ	Rate19	30.073KΩ	Rate27	30.511KΩ
Rate 4	29.269KΩ	Rate12	29.695KΩ	Rate20	30.128KΩ	Rate28	30.566KΩ
Rate 5	29.322KΩ	Rate13	29.749KΩ	Rate21	30.182KΩ	Rate29	30.622KΩ
Rate 6	29.375KΩ	Rate14	29.802KΩ	Rate22	30.237KΩ	Rate30	30.677KΩ
Rate 7	29.428KΩ	Rate15	29.856KΩ	Rate23	30.291KΩ	Rate31	30.731KΩ
Rate 8	29.481KΩ	Rate16	29.910KΩ	Rate24	30.346KΩ	Rate32	30.785KΩ

When the test temperature precision over ±0.01℃, the resistance will drift slightly. Temperature drifts beyond the precision of the amplitude increases.



MF5B1,2 Thermistor

Glass coated

Features:

- Glass-coated, heat resistance, small size
- High stability and reliability
- Suitable for auto insert machine
- Quick temperature response

Applications:

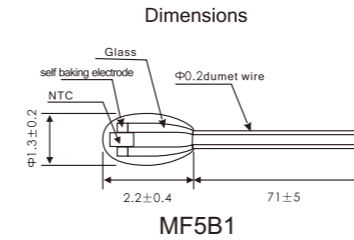
- Temperature Sensors, Digital clinical thermometer
- Temperature measurement and control for chemical equipment
- Mobile battery and charger

Part number guide:

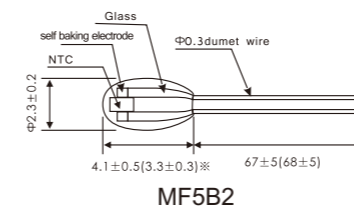
TR MF58 1,2 - 502 F 3950 F
① ② ③ ④ ⑤ ⑥ ⑦

Where:

- ① NTC Thermistor
- ② Glass-coated
- ③ Shape: pearl-shape
- ④ Rated zero-power resistance at 25℃.
For example: 502 means R_{25℃} = 5KΩ
- ⑤ Resistance tolerance: F (±1%), G (±2%); H (±3%); J (±5%); K (±10%)
- ⑥ B Value (B_{25/50℃}): 3950K
- ⑦ B value tolerance: F (±1%); G (±2%); H (±3%)



MF5B1



MF5B2

Typical Products Specifications:

Part number	R _{25℃} (KΩ)	B _{25/50℃} (K)	Dissipation Coefficient (mW/℃)	Time Constant (S)	Operating Temperature Range (℃)
MF5B 2 -502-3470□	5	3270	In still air 2.1max	In still air 6max	-40~+150℃
MF5B 2 -103-3380□	10	3380			-40~+150℃
MF5B 2 -502-3470□	5	3470			-40~+150℃
MF5B 2 -103-3470□	10	3470			-40~+150℃
MF5B 2 -103-3700□	10	3700			-40~+150℃
MF5B 2 -202-3920□	2	3920			-40~+150℃
MF5B 2 -502-3950□	5	3950			-40~+150℃
MF5B 2 -103-3950□	10	3950			-40~+150℃
MF5B 2 -503-3950□	50	3950			-40~+250℃
MF5B 2 -104-4100□	100	4100			-40~+300℃

- "□" indicates the resistance tolerance: F (±1%); G (±2%); H (±3%); J (±5%); K (±10%)
- B Value :determined by rated zero-power resistance at 25℃ and 50℃, tolerance: ±1% .
- Special specifications are customized by your request.



MF11 MF12 Thermistors

Features:

MF11: High precision

MF12: Broad range of resistance, the maximum rated resistance can reach 5MΩ good stability.

Application:

Temperature measurement, temperature compensation in measuring equipments and transistor circuit.

Part number guide:

TR MF11 502 - G 3950 F

① ② ③ ④ ⑤ ⑥

Where:

- ① NTC Thermistor
- ② Compensation NTC
- ③ Rated zero-power resistance at 25°C.
For example: 502 means $R_{25°C} = 5KΩ$
- ④ Resistance tolerance: G ($\pm 2\%$); H ($\pm 3\%$); ($\pm 5\%$); K ($\pm 10\%$); L ($\pm 20\%$)
- ⑤ B Value ($B_{25/50°C}$): 3950K
- ⑥ B value tolerance; F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$)

Typical Products Specifications:

MF11		MF12	
B Value (25/50°C)(K)	Rated resistance at 25°C(Ω)	B Value (25/50°C)(K)	Rated resistance at 25°C(Ω)
2700	3.3~33	4250	6800~68000
2830	6.8~68	4450	15000~150000
2950	15~150	4670	33000~330000
3100	33~330	4800	68000~680000
3250	68~680	5050	150000~5000000
3400	150~1500		
3570	330~3300		
3740	680~6800		
3900	1500~15000		
4050	3300~33000		

Rated zero-power resistance tolerance: G ($\pm 2\%$); H ($\pm 3\%$); T ($\pm 5\%$); K ($\pm 10\%$); L ($\pm 20\%$)

B value tolerance: $\pm 5\%$

Measuring power $\leq 0.1mW$ Rated Power: 0.5W

Operating temperature: $-55\sim+125^\circ C$

Dissipation Coefficient $r \geq 6mW/^\circ C$; Time constant $\leq 30S$

MF72 Power NTC Thermistor



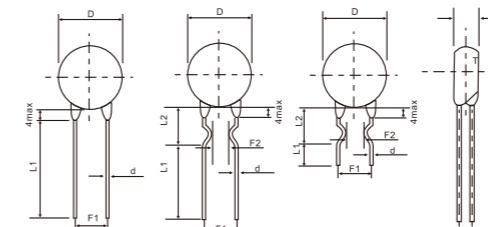
Characteristics:

- ① Small size strong power and strong capability of surge current protection
- ② Fast response to surge current
- ③ Big material constant (B value), Small remain resistance
- ④ Longevity of service, High reliability
- ⑤ Integral series, extensive operating range

Applications

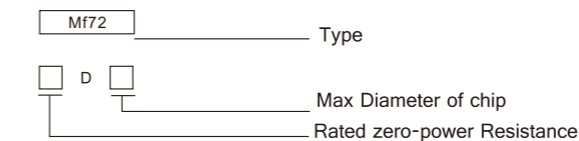
- ① Cover: protection power - supply, switch power, ups power
- ② Electronic energy saving lamps, electronic ballast and all kinds of electric heater
- ③ All kinds of RT .display
- ④ Bulb and other lighting lamps

Dimensions:



Straight lead Curved lead

Specification:



Dim(mm)	Sym	D	T	d	F1	F2	Straight lead	Curved lead
Part No		+1 -2	max	± 0.05	± 1	± 1.5	Lmin	L1 min L2 ± 2
MF72-□D5		6.5	5	0.65/0.45	05/2.5	3	25	17/5 8
MF72-□D7		8.5	5	0.6	5	3	25	17/5 8
MF72-□D9		10.5	5.5	0.8/0.6	7.5/5	5/3	25	17/5 8
MF72-□D11		12.5	5.5	0.8	7.5/5	5/3	25	17/5 8
MF72-□D13		14.5	6	0.8	7.5	5	25	17/5 8
MF72-□D15		16.5	6	0.8	10/7.5	5	25	17/5 8
MF72-□D20		21.5	7	1.0	10/7.5	/	25	/ /
MF72-□D25		26.5	8	1.0	10	/	25	/ /

Main Techno-Parameter

Part No	R ₂₅ (Ω)	Max. Steady State Current	Approx. R of Max. Cue. (Ω)	Dissi. Coef (mW/°C)	Thermal time Constant(S)	Operating Temp. (°C)
2.5D11	2.5	5	0.095	13	43	
3D11	3	5	0.100	13	43	
4D11	4	4	0.150	13	44	
5D11	5	4	0.156	13	45	
6D11	6	3	0.240	13	45	
8D11	8	3	0.255	14	47	
10D11	10	3	0.275	14	47	
12D11	12	2	0.462	14	48	
16D11	16	2	0.470	14	50	
20D11	20	2	0.512	15	52	
22D11	22	2	0.563	15	52	
30D11	30	1.5	0.667	15	52	
33D11	33	1.5	0.734	15	52	
50D11	50	1.5	1.021	15	52	
60D11	60	1.5	1.215	15	52	
80D11	80	1.2	1.656	15	52	
1.3D13	1.3	7	0.062	13	60	
1.5D13	1.5	7	0.073	13	60	
2.5D13	2.5	6	0.088	13	60	
3D13	3	6	0.092	14	60	
4D13	4	5	0.120	15	67	
5D13	5	5	0.125	15	68	
6D13	6	4	0.170	15	65	
7D13	7	4	0.188	15	65	
8D13	8	4	0.194	15	60	
10D13	10	4	0.206	15	65	
12D13	12	3	0.316	16	65	
15D13	15	3	0.335	16	60	
16D13	16	3	0.338	16	60	
20D13	20	3	0.372	16	65	
30D13	30	2.5	0.517	16	65	
47D13	47	2	0.810	17	65	
12D13	120	1.5	2.124	16	65	
1.3D15	1.3	8	0.048	18	68	
1.5D15	1.5	8	0.052	19	69	
3D15	3	7	0.075	18	76	
5D15	5	6	0.112	20	76	
6D15	6	5	0.155	20	80	
7D15	7	5	1.173	20	80	
8D15	8	5	0.178	20	80	
10D15	10	5	0.180	20	75	
12D15	12	4	0.250	20	75	
15D15	15	4	0.268	21	85	
16D15	16	4	0.276	21	70	
20D15	20	4	0.288	17	86	
30D15	30	3.5	0.438	18	75	
47D15	47	3	0.680	21	86	
120D15	120	2.5	1.652	22	87	
0.7D20	0.7	12	0.018	25	112	
1.3D20	1.3	9	0.037	24	113	
3D20	3	8	0.055	24	113	
5D20	5	7	0.087	23	112	
6D20	6	6	0.113	25	114	
8D20	8	6	0.142	25	115	
10D20	10	6	0.162	24	113	
12D20	12	5	0.195	24	114	
16D20	16	5	0.212	25	113	
0.7D25	0.7	13	0.014	30	151	
1.5D25	1.5	10	0.027	30	152	
3D25	3	9	0.044	32	150	
5D25	5	8	0.070	32	151	
8D25	8	7	0.114	33	151	
10D25	10	7	0.130	32	150	
12D25	12	6	0.156	32	150	
16D25	16	6	0.160	35	152	

Remark: Unless the particular indication, the allowable tolerance of R₂₅ is $\pm 20\%$.

SMD NTC Thermistor

Features:

- Small size, fit for high density PCB
- Quick response, high precision
- Good solder ability
- Glass surface protect. High structural stability and reliability

Applications:

- Equipment related to mobile communication TCXOs (temperature compensated type quartz oscillator), RF circuits (power amp circuits. Temperature monitoring circuits), LCD panel.
- Temperature compensated crystal oscillator, which is the key device for mobile phones.
- Temperature sensor for CPU
- IC and Semiconductor protecting
- Player Driver, telecom exchanger, etc.

Part number guide:

TRSM D 0402 - 502 - G 3950 F
 ① ② ③ ④ ⑤ ⑥

Where:

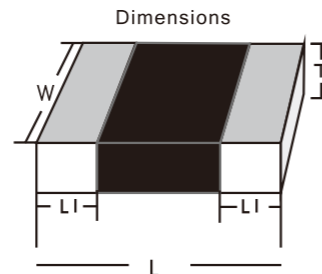
- ① Chip NTC Thermistor, SMD shape
- ② Type number
- ③ Resistance value at 25 °C ($R_{25^{\circ}\text{C}}$) - Example: 503 means 50K Ω .
- ④ Resistance tolerance: F($\pm 1\%$); G($\pm 2\%$); H($\pm 3\%$); J($\pm 5\%$); K($\pm 10\%$)
- ⑤ B Value ($B_{25/50^{\circ}\text{C}}$): 3950K
- ⑥ B Value tolerance: F ($\pm 1\%$), G ($\pm 2\%$); H ($\pm 3\%$)

Typical Products Specifications:

Part number	$R_{25^{\circ}\text{C}}$ (K Ω)	$B_{25/50}$ (K)
SMD □-101■-2700◇	0.1	2700
SMD □-221■-2900◇	0.22	2900
SMD □-331■-3000◇	0.33	3000
SMD □-471■-3100◇	0.47	3100
SMD □-681■-3150◇	0.68	3150
SMD □-102■-3200◇	1.0	3200
SMD □-222■-3250◇	2.2	3250
SMD □-332■-3300◇	3.3	3300
SMD □-472■-3350◇	4.7	3350
SMD □-682■-3400◇	6.8	3400
SMD □-103■-3435◇	10	3435

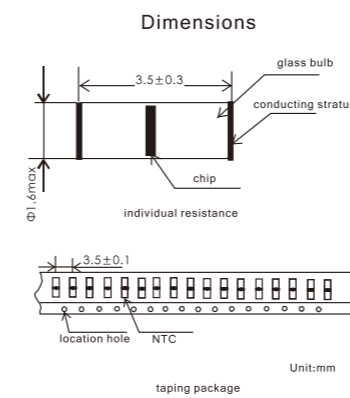
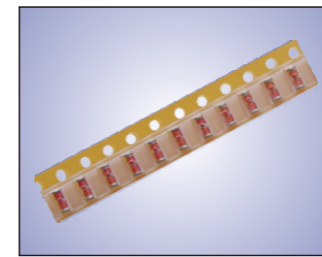
Part number	$R_{25^{\circ}\text{C}}$ (K Ω)	$B_{25/50}$ (K)
SMD □-103■-3900◇	10	3900
SMD □-153■-3500◇	15	3500
SMD □-223■-3600◇	22	3600
SMD □-333■-3800◇	33	3800
SMD □-473■-3900◇	47	3900
SMD □-683■-3950◇	68	3950
SMD □-104■-4100◇	100	4100
SMD □-224■-4200◇	220	4200
SMD □-334■-4300◇	330	4300
SMD □-474■-4500◇	470	4500
SMD □-564■-4500◇	560	4500

- indicates the resistance tolerance: F($\pm 1\%$); G($\pm 2\%$); H($\pm 3\%$); J($\pm 5\%$); K($\pm 10\%$)
- B Value: determined by rated zero-power resistance at 25°C and 50°C, tolerance: $\pm 1\%$
- Special specifications are customized by your request.



Size

SIZE	L	W	T	L1
1206	3.20 \pm 0.20	1.60 \pm 0.20	1.30max	0.20~0.80
0805	2.00 \pm 0.20	1.25 \pm 0.20	1.20max	0.20~0.50
0603	1.60 \pm 0.15	0.80 \pm 0.15	0.95max	0.20~0.50
0402	1.00 \pm 0.10	0.50 \pm 0.01	0.60max	0.15~0.30



MF58-1 Thermistor

SMD taping package

Features:

- Glass coated, heat resistance, small size, high stability and reliability
- SMD taping package, suitable for auto insert machine

Applications:

- Temperature compensation, digital clinical thermometer, temperature measurement
- Control for chemical equipment and induction cooker, water heater, sterilizing cabinet
- Mobile battery and charger

Part number guide:

TR MF 58 - 1 3950 - 103 F
 ① ② ③ ④ ⑤ ⑥ ⑦

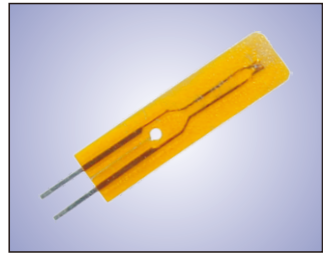
Where:

- ① NTC Thermistor
- ② Compensation NTC
- ③ Glass-coated
- ④ SMD taping package
- ⑤ B Value ($B_{25/50^{\circ}\text{C}}$): 3950K
- ⑥ Rated zero-power resistance at 25°C.
For example: 103 means $R_{25^{\circ}\text{C}} = 10\text{K}\Omega$
- ⑦ Resistance tolerance: F($\pm 1\%$); G($\pm 2\%$); H($\pm 3\%$); J($\pm 5\%$); K($\pm 10\%$)

Typical Products Specifications:

Part number	$R_{25^{\circ}\text{C}}$ (K Ω)	$B_{25/50^{\circ}\text{C}}$ (K)	Dissipation Coefficient (mW/ $^{\circ}\text{C}$)	Time Constant (S)	Operating Temperature Range ($^{\circ}\text{C}$)
MF581-103-3380□	10	3380	In still air 2.5max	In still air $\tau_{17\text{max}}$	-40~+150 $^{\circ}\text{C}$
MF581-103-3435□	10	3435			-40~+150 $^{\circ}\text{C}$
MF581-103-3950□	10	3950			-40~+150 $^{\circ}\text{C}$
MF581-503-3950□	50	3950			-40~+250 $^{\circ}\text{C}$
MF581-503-3990□	50	3990			-40~+250 $^{\circ}\text{C}$
MF581-104-3950□	100	3950			-40~+300 $^{\circ}\text{C}$
MF581-104-3990□	100	3990			-40~+300 $^{\circ}\text{C}$
MF581-204-4260□	200	4260			-40~+300 $^{\circ}\text{C}$

- indicates the resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)
- B Value :determined by rated zero-power resistance at 25°C and 50°C, tolerance: $\pm 1\%$.
- Special specifications are customized by your request.



MF5E Thermistor

Insulating film coated

Features:

- Insulating film coated,fast thermal speed, high sensitivity
- High stability and reliability
- High insulation performance
- High precision
- Safety
- Small size,light weight,rugged,easy to install automated

Applications:

Temperature measurement , temperature compensation in measuring equipments and transistor circuit
Widely used in computers , printers , switching power supply , cell phone batteries ,chargers,temperature control switches,household appliances and other small devices.

Part number guide:

TR MF 5E - 3380 - 103 F
① ② ③ ④ ⑤ ⑥

Where:

- ① NTC Thermistor
- ② Compensation NTC
- ③ Insulating film coated
- ④ B Value ($B_{25/50^{\circ}\text{C}}$): 3380K
- ⑤ Rated zero-power resistance at 25°C.
For example: 103 means $R_{25^{\circ}\text{C}} = 10\text{K}\Omega$
- ⑥ Resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)

Typical Products Specifications:


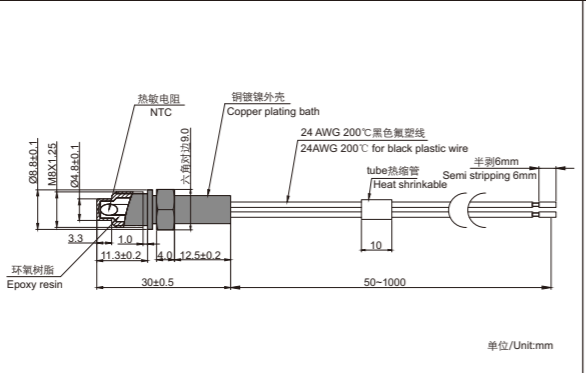
Part number	$R_{25^{\circ}\text{C}}$ (K.Ω)	$B_{25/50^{\circ}\text{C}}$ (K)	Dissipation Coefficient (mW/°C)	Time Constant (S)	Operating Temperature Range (°C)
MF581-103-3380□	10	3380	In still air 0.7 max	In still air 5 max	-30~+125 °C
MF581-103-3435□	10	3435			
MF581-103-3950□	10	3950			
MF581-503-3950□	50	3950			
MF581-104-3950□	100	3950			
MF581-104-3990□	100	3990			
MF581-204-4260□	200	4260			


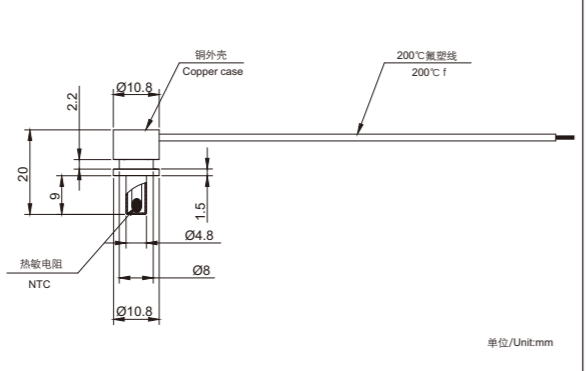
- indicates the resistance tolerance: F ($\pm 1\%$); G ($\pm 2\%$); H ($\pm 3\%$); J ($\pm 5\%$); K ($\pm 10\%$)
- B Value :determined by rated zero-power resistance at 25°C and 50°C, tolerance: $\pm 1\%$.
- Special specifications are customized by your request.


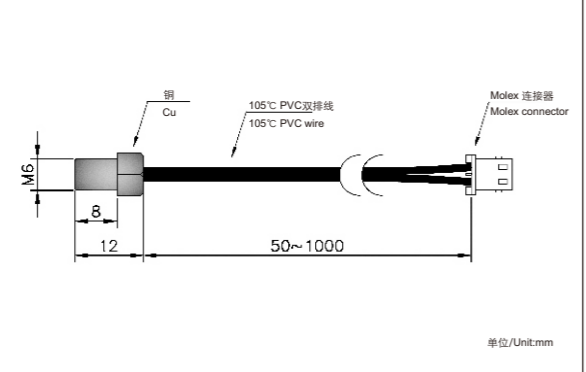
NTC Temperature Sensors


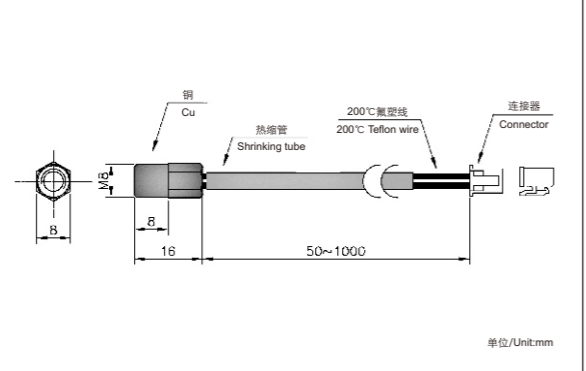
PICTURE	DIMMEISION	SPECIFICATION
<p>TR-A11</p>	<p>单位/Unit:mm</p>	<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 50\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -20~150°C ●Application: water heater, wall hanging stove, electric kettle, coffee maker, etc.
<p>TR-A68</p>	<p>单位/Unit:mm</p>	<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 50\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -20~150°C ●Application: water heater, wall hanging stove, etc.
<p>TR-A18-8</p>	<p>单位/Unit:mm</p>	<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 100\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -20~150°C ●Application: water heater, wall hanging stove, etc.
<p>TR-A19-4</p>	<p>单位/Unit:mm</p>	<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 10\text{K}\Omega \pm 1\%$ $B_{25/50} = 3600\text{K} \pm 1\%$ ●Operating temperature : -20~125°C ●Application: water heater, wall hanging stove, electric kettle, coffee maker, fish tank, etc.

NTC Temperature Sensors


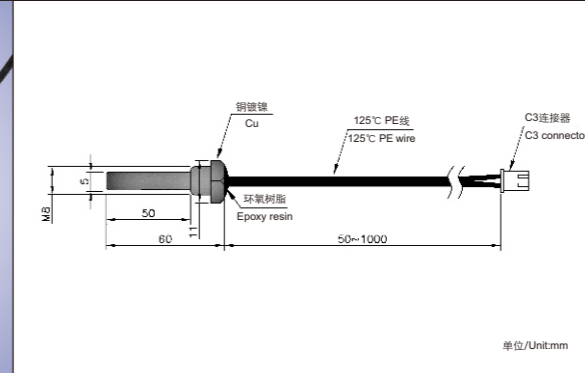
PICTURE	DIMMEISION	SPECIFICATION
		<ul style="list-style-type: none"> ●Standard NTC: R_{200℃} = 8KΩ ± 5% B_{125/250} = 5300K ± 1% ●Operating temperature : -30~+500℃ ●Application: automobile, industrial temperature measurement, etc.


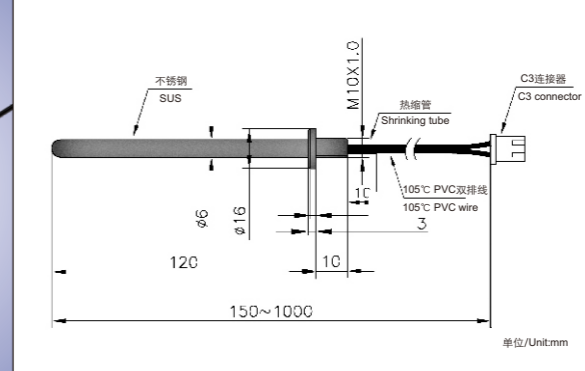
		<ul style="list-style-type: none"> ●Standard NTC: R_{100℃} = 3.3KΩ ± 2.5% B_{0/100} = 3970K ± 2% ●Operating temperature : -30~+150℃ ●Application: automobile, industrial temperature measurement, etc.
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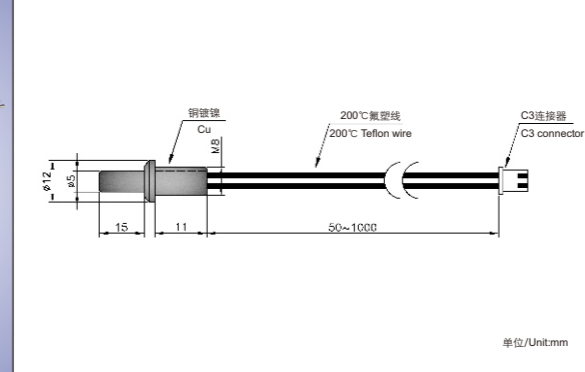
		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 10KΩ ± 2% B_{25/85} = 3435K ± 1% ●Operating temperature : -20~150℃ ●Application: coffee maker, bottle warmer, tea maker, water heater, food processor, etc.
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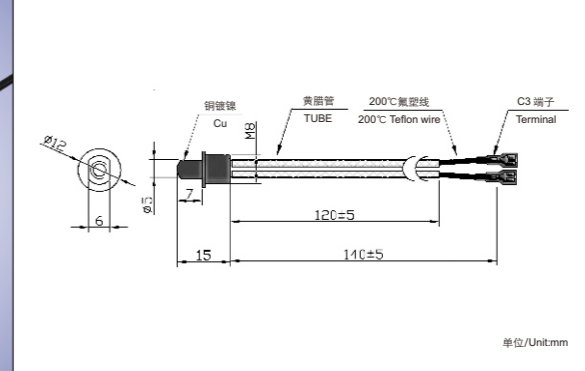
		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~150℃ ●Application: oil expeller, coffee maker, tea maker, water heater, yogurt maker, etc.
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NTC Temperature Sensors


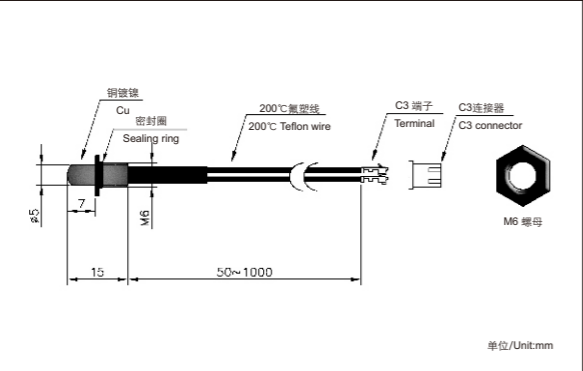
PICTURE	DIMMEISION	SPECIFICATION
		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 10KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~150℃ ●Application: water heater, water tank, industrial temperature measurement, etc.


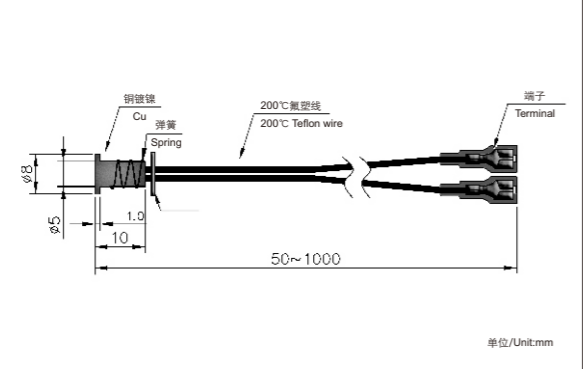
		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 50KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~150℃ ●Application: soybean milk maker, food processor, etc.
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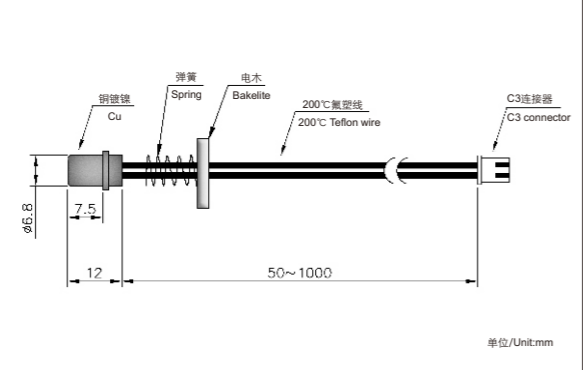
		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~150℃ ●Application: soybean milk maker, electric kettle, food processor, etc.
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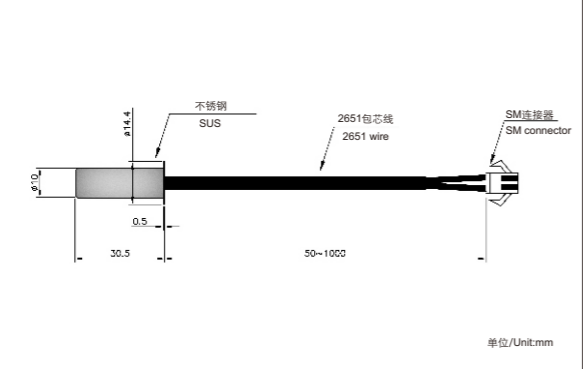
		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -30~250℃ ●Application: health pot, electric kettle, coffee maker
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NTC Temperature Sensors


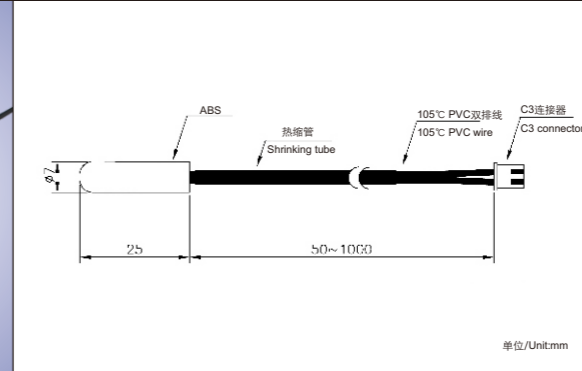
PICTURE	DIMMEISION	SPECIFICATION
		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 100\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -30~250°C ●Application: health pot, airfryer, etc.


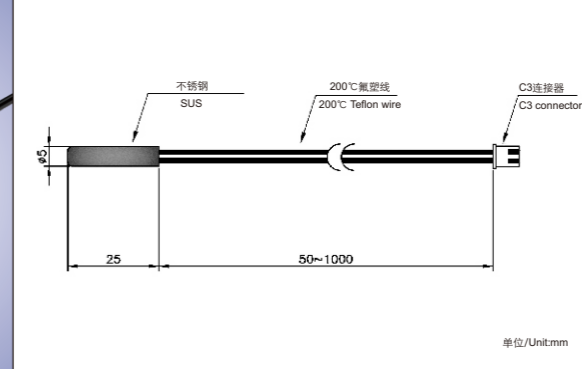
		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 100\text{K}\Omega \pm 1\%$ $B_{25/50} = 3990\text{K} \pm 1\%$ ●Operating temperature : -30~180°C ●Application: tea maker, health pot, coffee maker, food processor, etc.
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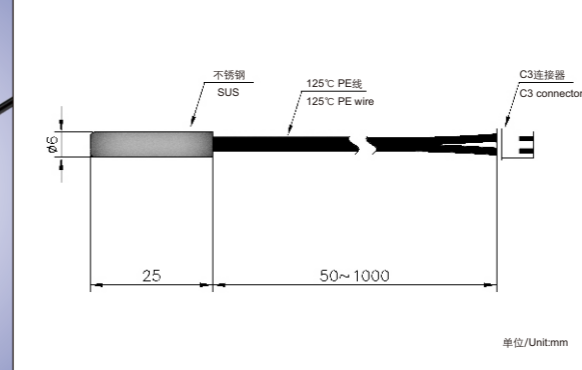
		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 50\text{K}\Omega \pm 2\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -30~150°C ●Application: tea maker, health pot, coffee maker, etc.
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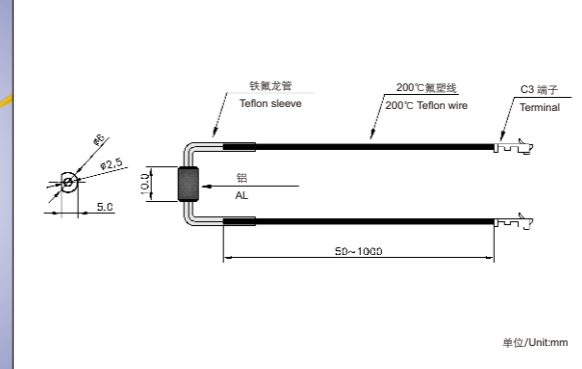
		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 10\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -30~100°C ●Application: clothes dryer, washing machine, etc.
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NTC Temperature Sensors


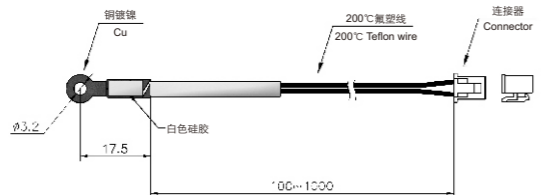

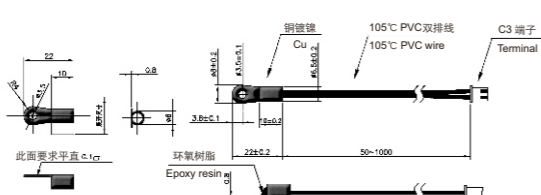

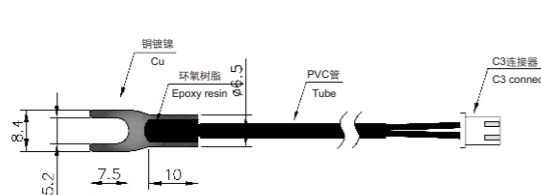

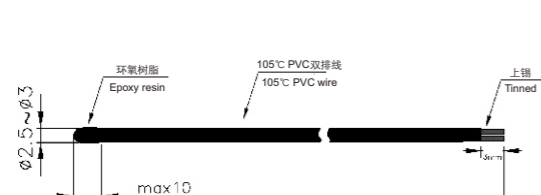
		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 10\text{K}\Omega \pm 2\%$ $B_{25/85} = 3435\text{K} \pm 1\%$ ●Operating temperature : -30~100°C ●Application: wine cooler, refrigerator, etc.
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		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 50\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -20~150°C ●Application: heat-pump water heater, foot tub, air conditioner, etc.
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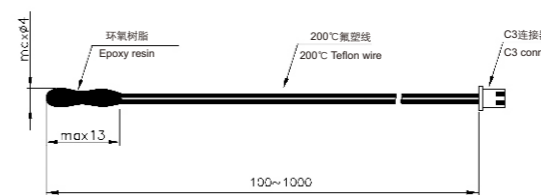

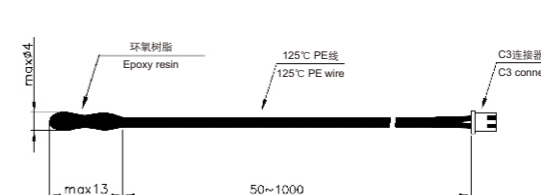

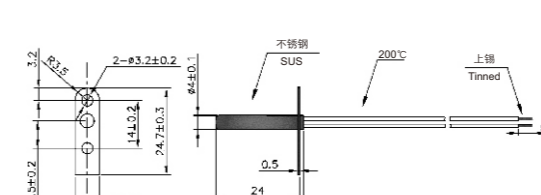

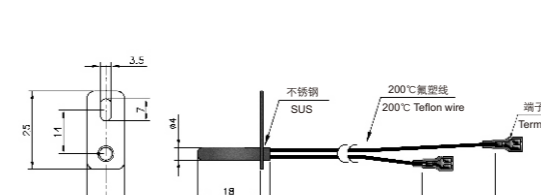
		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 50\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -20~150°C ●Application: water heater, air conditioner, foot tub, etc.
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		<ul style="list-style-type: none"> ●Standard NTC: $R_{25^{\circ}\text{C}} = 100\text{K}\Omega \pm 1\%$ $B_{25/50} = 3950\text{K} \pm 1\%$ ●Operating temperature : -30~250°C ●Application: toaster, oven, coffee maker, etc.
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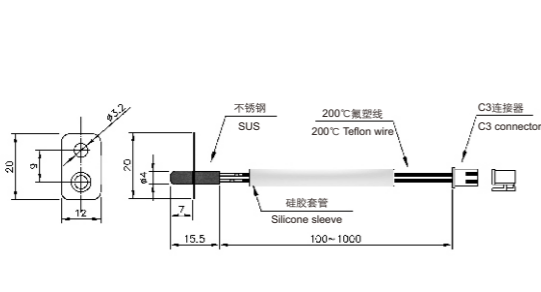

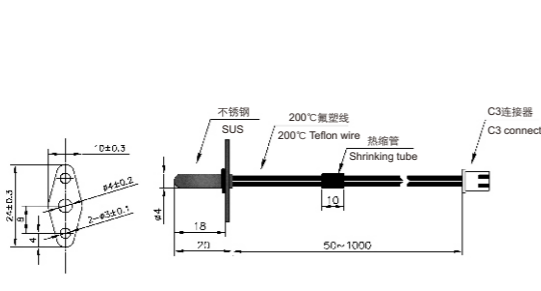

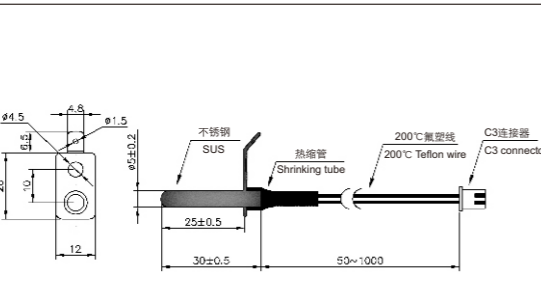

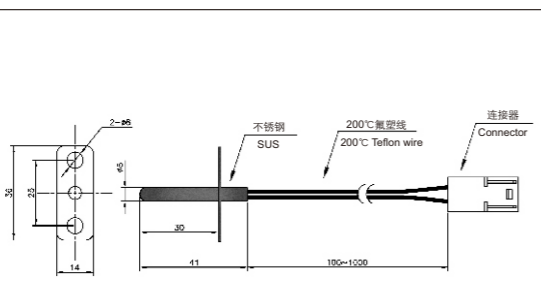
NTC Temperature Sensors

PICTURE	DIMMEISION	SPECIFICATION
 <p>TR-D102 1</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~250℃ ●Application: oil expeller, toaster, microwave oven, etc.
 <p>TR-D43</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 2% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~150℃ ●Application: induction cooker, transducer, lithium battery, electric motor, etc.
 <p>TR-D145</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 10KΩ ± 1% B_{25/50} = 3435K ± 1% ●Operating temperature : -30~125℃ ●Application: lithium battery, transducer, surface temperature measurement, etc.
 <p>TR-F120-1</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 10KΩ ± 5% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~125℃ ●Application: lithium battery, air conditioner, power tool, etc.


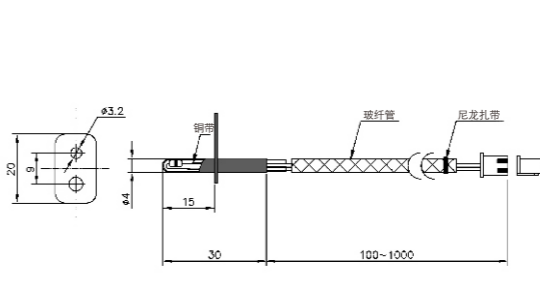

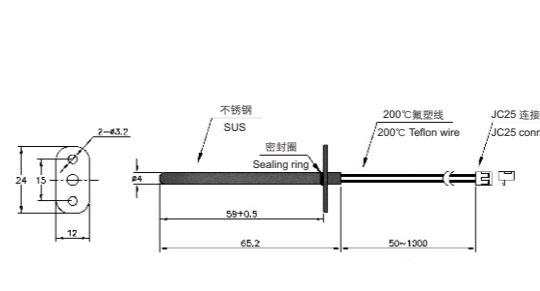

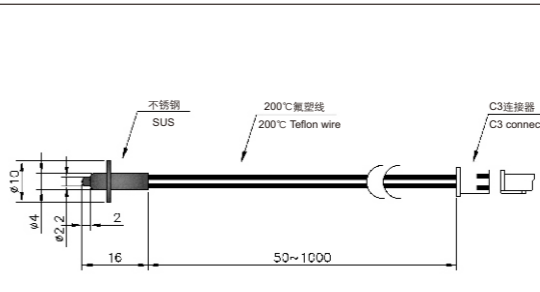

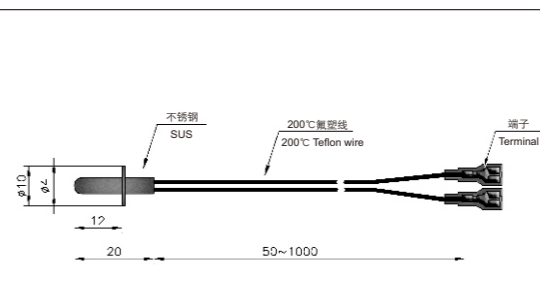
NTC Temperature Sensors

PICTURE	DIMMEISION	SPECIFICATION
 <p>TR-F19-1</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 5KΩ ± 1% B_{25/50} = 3470K ± 1% ●Operating temperature : -30~150℃ ●Application: lithium battery, electric heater, industrial temperature measurement, etc.
 <p>TR-F27-6</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 10KΩ ± 1% B_{25/50} = 3380K ± 1% ●Operating temperature : -20~125℃ ●Application: water dispenser, lithium battery, electric car, refrigerator, wine cooler, air conditioner, electric heater, toilets, electric motor, etc.
 <p>TR-G100</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -30~180℃ ●Application: microwave oven, rice cooker, coffee maker, etc.
 <p>TR-G113-2</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -30~150℃ ●Application: health pot, electric kettle, coffee maker, food processor, etc.


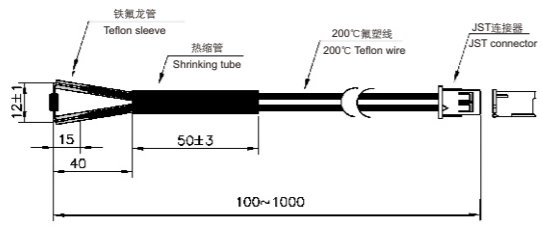

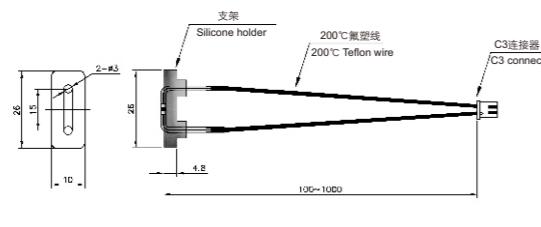

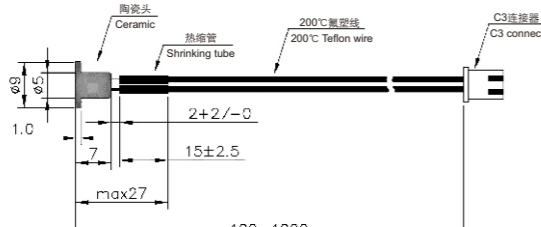

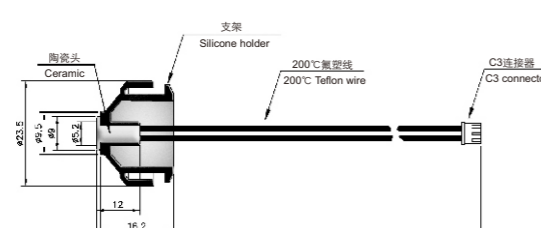
NTC Temperature Sensors

PICTURE	DIMMEISION	SPECIFICATION
 <p>TR -G144</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~250℃ ●Application: oil expeller, toaster, microwave oven, etc.
 <p>TR-G163</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -30~150℃ ●Application: rice cooker, toaster, etc.
 <p>TR -G183</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 50KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -30~150℃ ●Application: rice cooker, microwave oven, etc.
 <p>TR -G45-1</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{45℃} = 4.358K ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~200℃ ●Application: clothes dryer, washing machine, oven, etc.


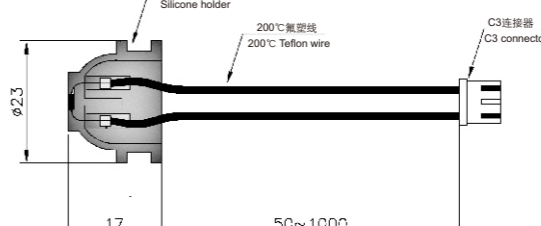

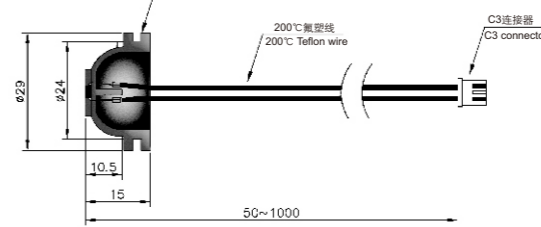

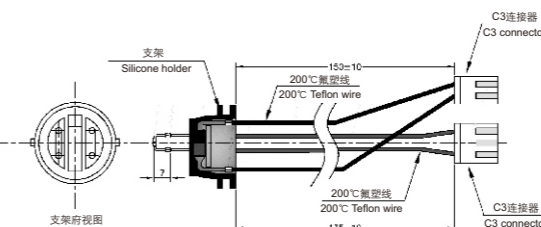

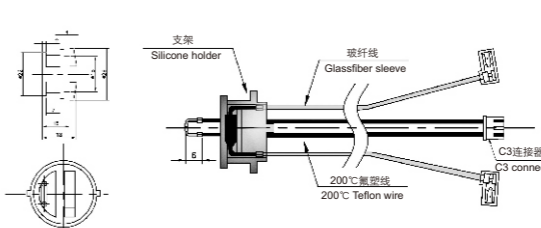
NTC Temperature Sensors

PICTURE	DIMMEISION	SPECIFICATION
 <p>TR -G5</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ●Operating temperature : -20~250℃ ●Application: oil expeller, toaster, microwave oven, etc.
 <p>TR -G40-1</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 4200K ± 1% ●Operating temperature : -30~150℃ ●Application: soybean milk maker, electric kettle, industrial water tank, etc.
 <p>TR -G6-5</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3990K ± 1% ●Operating temperature : -30~150℃ ●Application: electric kettle, coffee maker, food processor, soybean milk maker, etc.
 <p>TR -G92-B</p>		<ul style="list-style-type: none"> ●Standard NTC: R_{25℃} = 10KΩ ± 1% B_{25/50} = 4200K ± 1% ●Operating temperature : -30~150℃ ●Application: coffee maker, electric kettle, soybean milk maker, etc.

NTC Temperature Sensors

PICTURE	DIMMEISION	SPECIFICATION
 <p>TR-R119-7</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{25℃} = 50KΩ ± 1% B_{25/50} = 3950K ± 1% ● Operating temperature : -30~250℃ ● Application: induction cooker, rice cooker, etc.
 <p>TR-X33</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ● Operating temperature : -30~250℃ ● Application: toaster, oven, etc.
 <p>TR-X40</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{200℃} = 0.55KΩ ± 2.5% B_{100/200} = 4300K ± 1% ● Operating temperature : -30~250℃ ● Application: induction cooker, coffee maker
 <p>TR-X52-6</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3990K ± 1% ● Operating temperature : -20~250℃ ● Application: induction cooker, etc.

NTC Temperature Sensors

PICTURE	DIMMEISION	SPECIFICATION
 <p>TR-X54</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{25℃} = 100KΩ ± 1% B_{25/50} = 3950K ± 1% ● Operating temperature : -20~250℃ ● Application: induction cooker, etc.
 <p>TR-X24</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{100℃} = 0.55KΩ ± 2.5% B_{100/200} = 4300K ± 1% ● Operating temperature : -30~280℃ ● Application: induction cooker, etc.
 <p>TR-X50</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{25℃} = 100KΩ ± 2% B_{25/50} = 3990K ± 1% ● Operating temperature : -20~250℃ ● Application: induction cooker, etc.
 <p>TR-X15</p>		<ul style="list-style-type: none"> ● Standard NTC: R_{25℃} = 100KΩ ± 2% B_{25/50} = 3990K ± 1% ● Operating temperature : -20~250℃ ● Application: induction cooker, etc.

Typical R-T Table

R _{25°C}	5KΩ	10KΩ	10KΩ	10KΩ	47KΩ	50KΩ	50KΩ	100KΩ	100KΩ	100KΩ	100KΩ	200KΩ	
T(°C)	B	3470K	3380K	3600K	3960K	3950K	3950K	3990K	3930K	3950K	3990K	4100K	4200K
-30		63.75	111.3	119.6	201.8	819.9	858.7	955.9	1916	1833	1824	2036	4102
-25		48.42	86.51	96.85	144.0	607.1	647.5	696.4	1312	1338	1336	1384	3047
-20		37.18	67.74	76.98	104.9	455.0	489.0	513.0	967.8	989.4	990.3	984.9	2245
-15		28.84	53.43	59.90	77.86	342.6	370.0	382.0	728.2	740.2	742.9	733.8	1636
-10		22.59	42.45	46.43	58.84	260.8	280.6	287.4	557.7	559.8	563.3	561.3	1199
-5		17.85	33.92	36.37	44.41	199.5	214.4	218.2	426.3	427.9	431.6	434.7	899.5
0		14.23	27.28	28.71	33.70	154.2	165.0	167.3	327.5	330.2	334.0	339.2	684.1
5		11.37	22.07	22.93	25.97	119.8	128.0	129.3	254.4	255.6	257.9	263.2	526.7
10		9.160	17.96	18.44	20.19	93.97	100.1	100.8	199.2	199.7	201.0	205.2	408.8
15		7.435	14.70	14.94	15.85	74.04	78.87	79.21	157.2	157.3	158.0	160.7	319.8
20		6.075	12.09	12.19	12.54	58.81	62.58	62.71	124.9	124.9	125.2	126.5	252.0
25		5.000	10.00	10.00	10.00	47.00	50.00	50.00	100.0	100.0	100.00	100.00	200.0
30		4.127	8.313	8.235	8.014	37.79	40.24	40.15	80.57	80.35	80.08	79.87	159.1
35		3.427	6.944	6.817	6.473	30.54	32.59	32.45	65.33	65.02	64.59	64.19	127.3
40		2.863	5.828	5.672	5.268	24.84	26.55	26.39	53.30	52.97	52.46	51.91	102.4
45		2.406	4.914	4.742	4.327	20.30	21.76	21.59	43.73	43.43	42.88	42.21	82.86
50		2.032	4.161	3.984	3.578	16.87	17.93	17.76	36.08	35.83	35.27	34.52	67.40
55		1.714	3.538	3.406	2.974	14.03	14.86	14.70	29.97	29.62	29.03	28.45	55.34
60		1.452	3.021	2.911	2.484	11.85	12.37	12.23	25.01	24.63	24.04	23.55	45.63
65		1.237	2.590	2.487	2.084	9.695	10.35	10.22	20.96	20.59	20.01	19.59	37.77
70		1.058	2.229	2.125	1.757	7.976	8.694	8.573	17.64	17.30	16.75	16.36	31.39
75		0.910	1.925	1.815	1.487	6.704	7.337	7.224	14.91	14.61	14.10	13.72	26.18
80		0.785	1.669	1.551	1.264	5.664	6.217	6.112	12.64	12.40	11.92	11.56	21.92
85		0.681	1.451	1.326	1.079	4.800	5.290	5.192	10.76	10.57	10.12	9.771	18.42
90		0.592	1.266	1.108	0.9246	4.087	4.515	4.416	9.174	9.050	8.637	8.268	15.45
95		0.517	1.108	0.9331	0.7943	3.491	3.869	3.773	7.850	7.782	7.401	7.027	13.02
100		0.454	0.974	0.7923	0.6831	2.995	3.327	3.236	6.747	6.718	6.369	5.997	11.03

SELECTING GUIDE

Providing the parameters of thermistor

Providing the parameters of temperature sensor

ITEM	SPECIFICATION	ITEM	SPECIFICATION
R resistance at 25°C	_____ K Ωhm, _____ %	Product type	TR _____
B value 25°C/50°C	_____ K, _____ %	Resistance specification	R value _____ °C _____ K± _____ % B value _____ / _____ K± _____ %
Operating temperature	_____ °C~ _____ °C	Wire	_____ AWG _____ °C Color _____ Length _____ mm
Type	<input type="checkbox"/> Glass encapsulated, diode style <input type="checkbox"/> Glass encapsulated, one sink heat type <input type="checkbox"/> Epoxy encapsulated <input type="checkbox"/> SMD0420; 0603; 0805; 1206 <input type="checkbox"/> MF11,MF12 <input type="checkbox"/> Others	Connection of wire tail	
Applications		Operating temperature	_____ °C
Annual Usage		Withstand voltage	_____ V.AC _____ min
Remarks		Target temperature	_____ °C
		Applications	
		Annual Usage	
		Remarks	

*It is much better for you to give us your drawing paper and samples. We will make it for you upon your request. Please contact us for more information.