

NTC Temperature Sensors Profile

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● Company Profile

Located in Dongguan city, we are a high-technology enterprise which specialized in production of all series negative temperature coefficient(NTC) thermistor,NTC sensors,positive temperature coefficient(PTC) thermistors and zinc oxide varistors.We are one of the largest NTC manufacturers in china.

We were awarded"National Hi-tech Enterprise", and have the main products NTC thermistors and NTC temperature sensors. NTC Thermistor series application includes of surge current,temperature compensation,precision temperature test and temperature control with complete types and specifications. NTC temperature sensors are widely used in such fields as industrial electroni equipment,communication,electric power,transportation,medical apparatus,household applications,testing instruments,power equipments,smart home control,green energy,energy conservation and environmental protection and military industry etc. We are the key NTC temperature sensors enterprise in domestic.Depending on the unique process method and advanced technology,our products keep the advantages of high precision,reliability and stability,becoming the industry leading level.

We have been passed ISO9001:2008 quality management system,TS16949 quality management system,ISO14001:2004 environment management system and GB/T29490 intellectual property management system. Company have AAA credit rating, As the industry key enterprise,appointed by the industry association,is invovled in the drafting of the National "Thirteen five plan".

We are executive director of CECA and ECAM.The company has built the first research centre "Engineering research centre for NTC thermal sensitive ceramic material project",which advanced agmong in domestic.Now our product have 8 "Hi-tech products",exceed 60 patents including more than 20 "patents of invention". Many science and technology projects were funded by the National Torch Plan and Innovation Fund,and new technological product prize .Main products were approved by CQC,UL,CUL and TUV.Our product exported to Europe,North America and other countries.

高品质、高性能测温型NTC热敏电阻是
NTC温度传感器的核心和心脏

The heart and core of NTC temperature sensor
lies on high quality, high performance temperature
measurement NTC thermistor



CQC认证



MF58系列
MF58 series



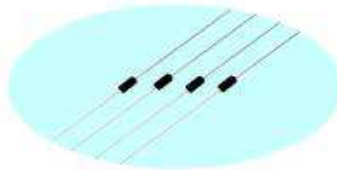
MF51系列
MF51 series



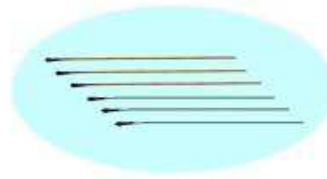
MF55系列
MF55 series



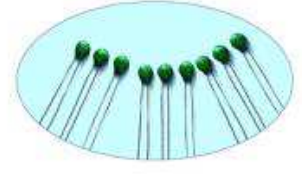
MF52系列
MF52 series



MF54系列
MF54 series



MF51E 系列
MF51E series



MF11 系列
MF11 series



MF59系列
MF59 series



MF57系列
MF57 series



芯片系列
Chip series



CMF片式系列
CMF SMD series



MF58系列产品是国内首家通过了UL标准中10万次耐久测试的产品
MF58 series have undergone 100,000 cycles during the Endurance test in UL test

测温型NTC热敏电阻系列产品
Temperature measurement NTC thermistors

通过 UL CUL CQC 等国际国内安规认证

Passed by UL, CUL, CQC international and domestic safe certification

- Company's high level research institution

Company has built the first reserch center "The engineering research center for NTC thermal sensitive ceramic material project",which advanced in domestic,is approved by science and Technology commission,it provides influential and professional personnel practice,training and scientific research base.The center widely carries out researches on NTC sensitive ceramic materials,new products,new technology,new equipments,scale



production,transformation of scientific achievements.

The area of research center reaches 2000 square meters,it has more than 50 sets of test equipment and instrument which support powerful guarantee for high quality chip technology,temperature measurement NTC core element,continuously tech improve of NTC temperature sensors.

Company have more than 60 authorized and accepted patents including 20 patents of invention.







● NTC Thermistor Glossary

Thermistor is a ceramic semiconducting element made from exorbitant oxides material. It has the feature that the resistance changes according to the ambient temperature. Namely, their resistance declines with the rising of ambient temperature at a determinate measuring power. With this feature NTC thermistor and temperature sensor can be applied in the situation of temperature measurement and control, compensation and surge current protection.

● Main Techno-Parameter of NTC Thermistor

❖ Zero Power Resistance value R_T

At rated temperature, it is the resistance value measured by the measuring power which causes the resistance change that can be ignored relative to the whole measuring error.

Rated Zero Power Resistance value R_{25}

Also known as nominal resistance, is the zero power resistance value measured at 25°C

❖ B value

B value is the thermal exponent of negative temperature coefficient thermistor, which is defined as the ratio of the difference between the napierian logarithm of zero power resistance at two temperatures to the difference between the two temperatures' reciprocal.

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

In the equation:

R_{T1} -the zero power resistance at T_1

R_{T2} -the zero power resistance at T_2

Unless the particular indication, B value is figured out from the zero power resistances at 25°C (298.15K) and 50°C (323.15K) and B value is not a rigorous constant in the range of operating temperature.

❖ Temperature Coefficient of Zero Power Resistance α_T

At rated temperature, it is ratio of the zero power resistance change rate with temperature to the zero power resistance itself. Namely:

$$\alpha_T = \frac{1}{R} \frac{dR_T}{dT} = -\frac{B}{T^2}$$

α_T - the temperature coefficient of zero power resistance at T

R_T - the zero power resistance at T

T - temperature (showed by K)

B - B value

❖ Dissipation Coefficient δ

At rated ambient temperature, it is the ratio of consumption power change rate of thermistor to the change of the corresponding temperature, namely:

$$\delta = \frac{\Delta P}{\Delta T}$$

In the range of operating temperature, δ has a little change with the ambient.

❖ Thermal Time Constant τ

At zero power, it is measured as time in seconds which needed for thermistor temperature change of 63.2% difference between initial and final thermistor temperature when the temperature breaks.

τ is in direct ratio to thermal capacity C of thermistor and in inverse ratio to the dissipation coefficient, namely:

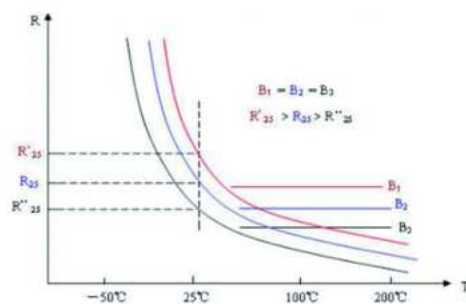
$$\tau = \frac{C}{\delta}$$

❖ Resistance-temperature Characteristic

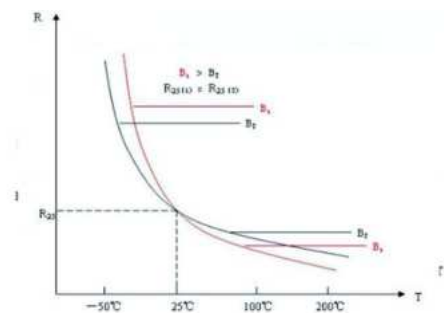
The reliable relationship between the zero power resistance of thermistor and its temperature.

The relationship between R value and B value

The reliable relationship between the zero power resistance of thermistor and its temperature



R-T curve based on same B value, different resistance.



R-T curve based on different B value, same resistance

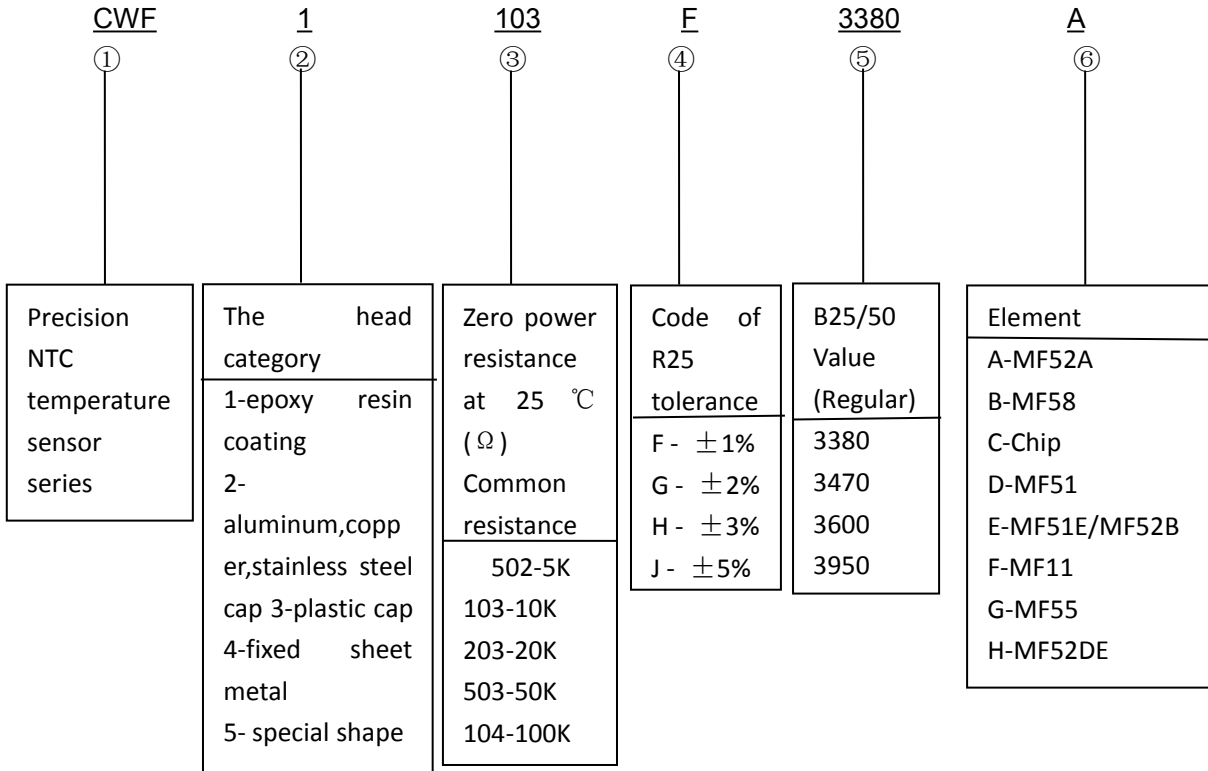
- Workshop of high quality and high performance NTC Thermistor

We have the unique process and leader core technology with proprietary intellectual property rights of ceramic powder equipment, made of chips, high performance NTC Automatic batch production.

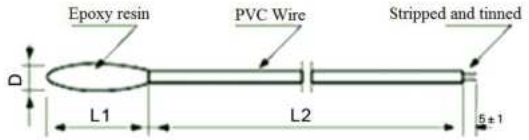
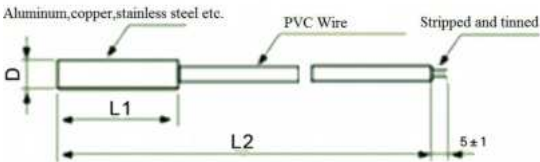
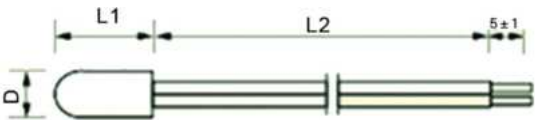
We have more than 12 series of high performance NTC thermistors automatic production line, products have the advantages of large production, high quality, good coherence, high reliability, besides it can be made of many kinds of NTC temperature sensors, it also can be supplied to other factories of NTC sensors, and exported in large quantities to overseas.



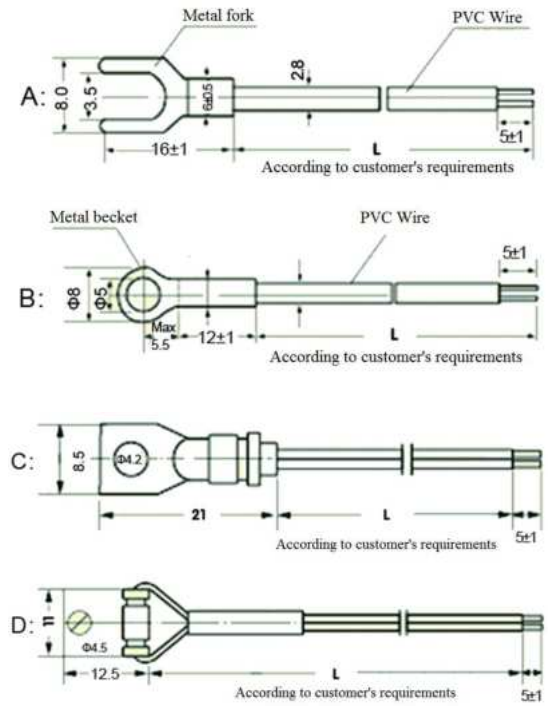
● Part Numer System



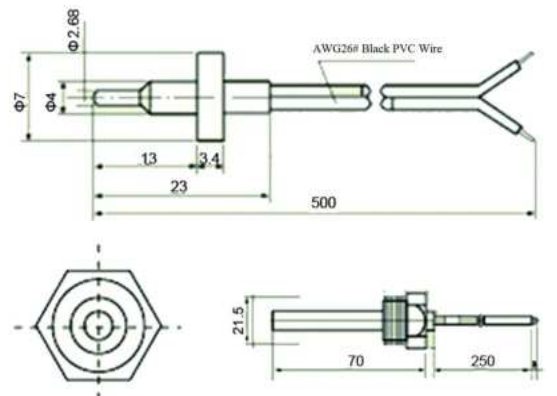
- Product Model Simple figure

<p>CWF1 Epoxy resin coating</p>	 <p>The diagram shows a cylindrical component with a diameter D. It is divided into three sections: a hemispherical end with length $L1$, a central section with length $L2$, and a final section with length 5 ± 1. Labels indicate 'Epoxy resin' on the hemispherical end, 'PVC Wire' in the middle section, and 'Stripped and tinned' at the end.</p>
<p>CWF2 Aluminum,copper,stainless steel cap</p>	 <p>The diagram shows a cylindrical component with a diameter D. It is divided into three sections: a cylindrical end with length $L1$, a central section with length $L2$, and a final section with length 5 ± 1. Labels indicate 'Aluminum,copper,stainless steel etc.' on the end section, 'PVC Wire' in the middle section, and 'Stripped and tinned' at the end.</p>
<p>CWF3 Plastic cap</p>	 <p>The diagram shows a cylindrical component with a diameter D. It is divided into three sections: a hemispherical end with length $L1$, a central section with length $L2$, and a final section with length 5 ± 1.</p>

CWF4 Fixed sheet metal



CWF5 Special shape



- NTC Temperature sensor -- a glance at workshop



温度传感器——生产车间现场一瞥

NTC temperature sensor --a glance at workshop



一流品质 科学管理 不断创新 用户满意

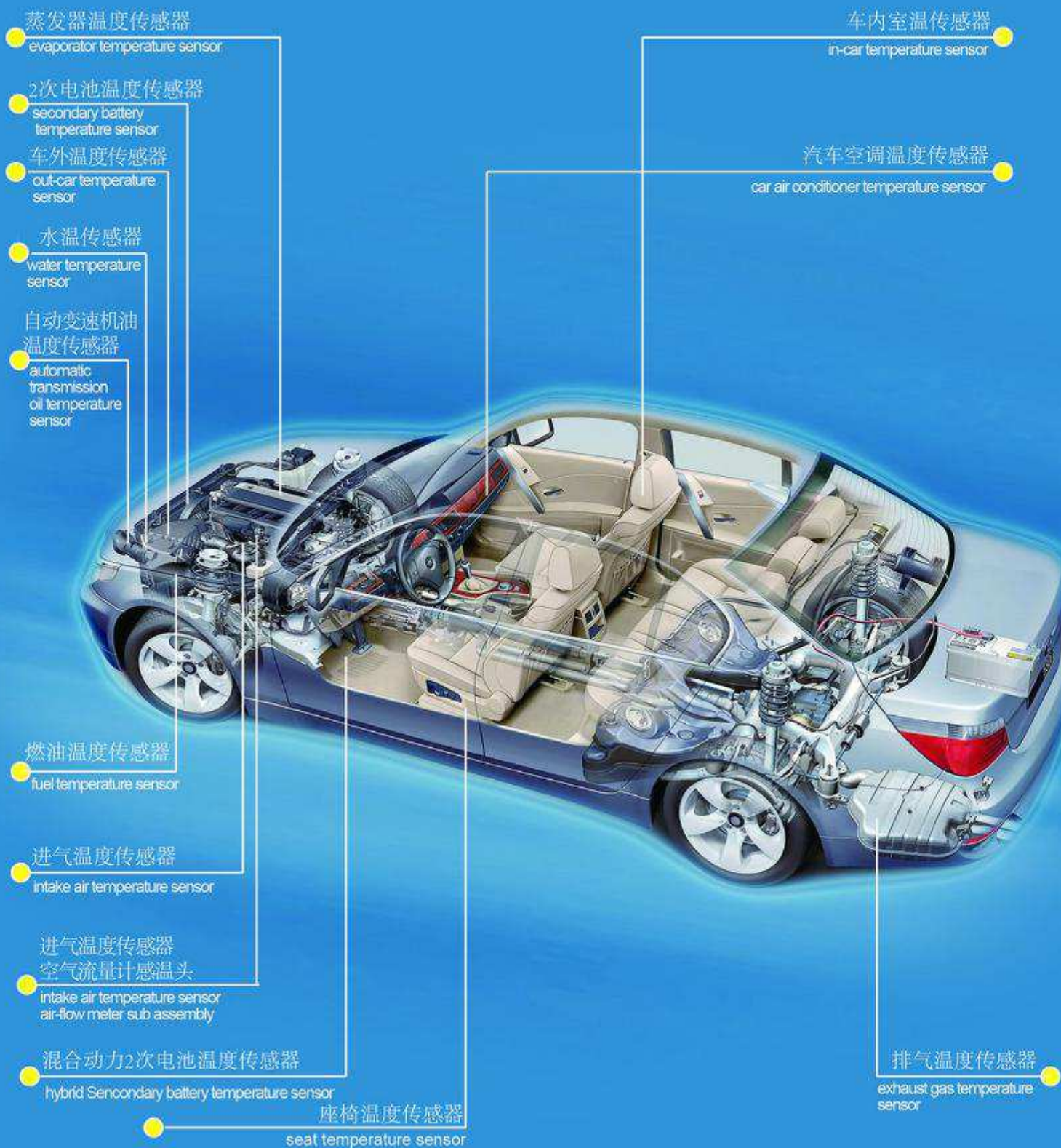
First class quality Scientific management Unremitting innovation Customer satisfaction

推行全员质量管理 实行精益生产

Carry out all staff Quality Management and implement Lean Production

汽车专用热敏电阻温度传感器

Automobile Applications of temperature sensors



汽车温度传感器方案

Automobile applications of temperature sensors



锂电池
温度传感器 (一)
Lithium battery
temperature sensor



锂电池
温度传感器 (二)
Lithium battery
temperature sensor



锂电池
温度传感器 (三)
Lithium battery
temperature sensor



锂电池
温度传感器 (四)
Lithium battery
temperature sensor



汽车充电桩
温度传感器
Auto charging
temperature sensor



汽车空调温度
传感器 (一)
Auto air condition
temperature sensor



汽车空调温度
传感器 (二)
Auto air condition
temperature sensor



汽车空调温度
传感器 (三)
Auto air condition
temperature sensor



自动变速箱油
温度传感器 (一)
Automatic transmission
oil temperature sensor



自动变速箱油
温度传感器 (二)
Automatic transmission
oil temperature sensor



水温传感器
Water temperature
sensor



高精度水温传感器
High precision water
temperature sensor



车内
测温传感器 (一)
In-car temperature sensor



车内
测温传感器 (二)
In-car temperature sensor



蒸发器
温度传感器
Evaporator
temperature sensor



座垫加热温度传感器
Cushion heating
temperature sensor

● Advantages and characteristics of Auto Temperature Sensor

- ✓ We have the heart of NTC temperature sensor--full sets of production line and core technology of pro-prietary intellectual property rights for high performance temperature measurement NTC thermistor.
- ✓ We have all kinds of NTC core element of NTC Temperature sensor--high performance temperature measurement thermistors are own production,complete series,structural diversity. Our products can meet the requirements of prevision measurement in different temperature area from low temperature,medium and low temperature to medium-high temperature.These products have passed many safety certifications of domestic and foreign.
- ✓ Resistance and temperature characteristics can meet customer's requirements entirely,and support best convenience to customers.
- ✓ Mature manufacturing technique of NTC temperature sensor,Large-scale mass production,product have the best ability of insulation sealing,Mechanical collision,resistance to bending,well-set.
- ✓ Small thermal time,fast response
- ✓ Multi category,complete series,many kinds of housing he configuration,easy to assemble
- ✓ We have high level inspection equipments which carry out strict and normative inspection process.
- ✓ Our products with high precision,high reliability,high stability,high interchangeable,high commonality are advanced in industry.

(Highest tolerance can be reach $\pm 0.02^{\circ}\text{C}$) (Years of drif rate $\leq 1\%$)

- Operating temperature and environment of NTC temperature sensor depend on specific performance of its core element and lead wire:

- Different NTC thermistor using in the NTC temperature sensors with the following different operating temperature:

Chip or MF52A,MF51E,MF55: temperature resist grade 125°C , actual temperature resist grade 150°C

MF58: temperature resist grade 200°C , actual temperature resist grade 250°C

MF51: temperature resist grade 200°C , actual temperature resist grade 250°C

Special MF51: temperature resist grade 250°C , actual temperature resist grade 300°C

Weldless chip:temperature resist grade 450°C , actual temperature resist grade 500°C

- Operating environment

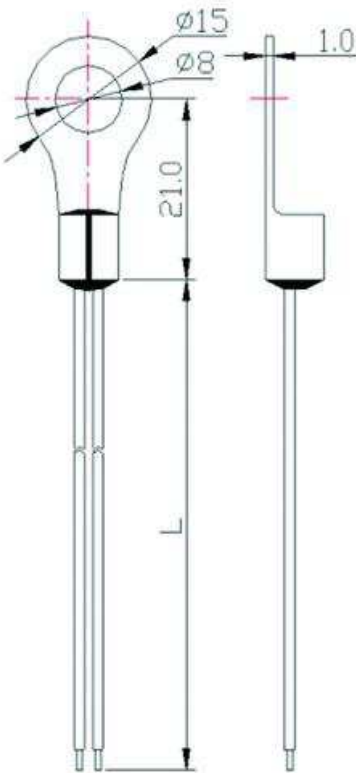
In the environment of high temperature,high humidity and high corrosion,we suggest to use glass sealed type thermistor as the core element.And MF51 type will be the best NTC thermistor in high humidity environment.

- Design considerations and procedure of temperature sensor:

1. Choose the shape according to customer's design or assemble requirements, and confirm the thermistor.
2. Confirm the thermistor element and other materials according to customers' requirement
3. Choose the suitable resistance,B value and tolerance
4. Choose suitable moisture-proof and insulation technology to meet customer's requirement
5. Choose suitable encapsulation structure to meet performance requirements of mechanical shock resistance
6. Meet customer's special requirements.

锂电池温度传感器（一）

Lithium battery temperature sensor (一)



产品系列 Series

CWF 4

产品描述 Description

应用描述：适用于锂电池温控模块

Application: apply to Temperature control module of lithium battery

装配方式：螺栓连接

Assembly: fixed by thread

性能参数 Techno-parameter

25℃零功率阻值精度：±1%

Zero power resistance tolerance at 25℃: ±1%

B值精度：±1%

B-value tolerance: ±1%

端头材质：黄铜镀镍

Head material: Nickel plated brass

线材规格：PVC、XLPE

Wire material: PVC, XLPE

产品耐压：≥1500V/AC

Withstand voltage: ≥1500V/AC

使用温度：-40 ~ +125℃/+150℃

Operating temperature: -40 ~ +125℃/+150℃

产品特点 Characteristics

产品防潮、防水性高

Moisture proof, waterproof

装配方式简单、牢固

Easily assemble, stable

阻值、B值可依客户需求制定

Resistance, B-value by user determine

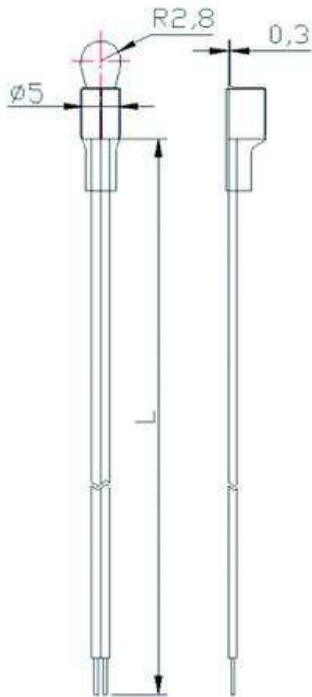
五金件与线材可做定制

Metal part and wire by user determine



锂电池温度传感器（二）

Lithium battery temperature sensor (二)



产品系列 Series

CWF 4

产品描述 Description

应用描述：适用于锂电池温控模块
Application: apply to Temperature control module of lithium battery

装配方式：激光焊接、超声波焊接
Assembly: laser welding、ultrasonic welding

性能参数 Techno-parameter

25°C零功率阻值精度：±1%
Zero Power Resistance tolerance at 25°C: ±1%

B值精度：±1%
B-value tolerance: ±1%

端头材质：黄铜镀镍
Head material: Nickel plated brass

线材规格：PVC、FEP
Wire material: PVC, FEP

产品耐压：≥1500V/AC
Withstand voltage: ≥1500V/AC

使用温度：-40 ~ +105°C / +150°C
Operating temperature: -40°C +125°C / +150°C

产品特点 Characteristics

装配方式简单、牢固
Easy assembly、stable

阻值、B值可依客户需求制定
Resistance, B-value by user determine

五金件与线材可做定制
Metal part and wire by user determine



锂电池温度传感器 (三)

Lithium battery temperature sensor(三)



产品系列 Series

CWF 5

产品描述 Description

应用描述：适用于锂电池温控模块

Application: apply to Temperature control module of lithium battery

装配方式：硅胶卡槽装配

Assembly:silicone slot assemble

性能参数 Techno-parameter

25℃零功率阻值精度：±1%

Zero Power Resistance tolerance at 25℃: ±1%

B值精度：±1%

B-value tolerance:±1%

端头材质：注塑硅胶

Head material: Injection molding silicone

线材规格：PVC、FEP

Wire material: PVC,FEP

产品耐压：≥1500V/AC

Withstand voltage: ≥1500V/AC

使用温度：-40 ~ +105℃/ +150℃

Operating temperature: -40~+105℃/+150℃

产品特点 Characteristics

装配方式简单、牢固

Easy assembly, stable

阻值、B值可依客户需求制定

Resistance, B-value by user determine

端头注塑外观与线材可做定制

Metal part and wire by user determine

