MF52 珠状精密型 NTC

NTC 热敏电阻器是一种以过渡金属氧化物为主要原材料制造的半导体陶瓷元件。它具有电阻值随着温度的变化而相应变化的特性。即在一定的测量功率下，电阻值随着温度上升而下降。利用这一特性，可将 NTC 热敏电阻器及其温度传感器应用在测控温，温度补偿，和抑制浪涌电流等场合。

Thermistor is a ceramic semiconducting element made from exorbitant oxides materal. 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.

NTC 热敏电阻器及其温度传感器的主要参数：

零功率电阻值 R_T

在规定温度下，采用引起电阻变化相对于总的测量误差来说可以忽略不计的测量功率测的的电阻值

额定零功率电阻值 R_{25}

也称标称电阻值，通常是指 25℃时测得的零功率电阻值

B 值

B 值是负温度系数热敏电阻器的热敏指数，他被定义为两个温度下零功率电阻值的自然对数之差与这两个温度导数之差的比值

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

式中：R_{T1}-温度为 T1 时的零功率电阻值

R_{T2}-温度为 T2 时的零功率电阻值

除非特别指出，B 值是由 25℃（298.15K）和 50℃(323.15K)的零功率电阻值计算而得到的，B 值在工作温度范围内并不是一个严格的常数。

零功率电阻温度系数α_T

指在规定温度下，热敏电阻器的零功率电阻值随着温度的变化率与它的零功率电阻值之比。

Main techno-Parameter of NTC Thermistor:

Zero Power Resistance R_T

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

Rated Zero Power Resistance R_{25}

Also Known as Nominal Resistance,is the zero power resistance measured at 25℃

B Value

B Value is the thermel 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 temperatures' reciprocal.

In the equation: RT1-The zero power resistance at T1

RT2-The zero power resistance at T2

Unless the particular indication, B value is figured out from the zero power resistance at 25℃（298.15K） and 50℃(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 the ratio of the zero power resistance change rate with temperature to the zero power resistance itself.Namely：

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

式中：α_T-温度为 T 时的零功率电阻温度系数

R_T-温度为 T 时的零功率电阻值

T-温度（以 K 表示）

B-B 值

α_T-the temperature coefficient of zero power resistance at T

R_T-the zero power resistance at T

T-temperature

B-B value

耗散系数 δ

在规定的环境温度下，热敏电阻器耗散功率变化与其相应温度变化之比，即

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

在工作温度范围内，δ随着环境温度的变化而变化。

Dissipation coefficient δ

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

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

热时间常数 τ

在零功率条件下，当温度发生突变时，热敏电阻体温度变化了始末两个温度差的 63.2%所需的时间。

τ 与热敏电阻器的热容量 C 成正比，与其耗散系数 δ 成反比，即：

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

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 δ ,namely:

电阻-温度特性

热敏电阻器的零功率电阻值与其电阻体温度之间的依赖关系。

Resistance-Temperature Characteristic

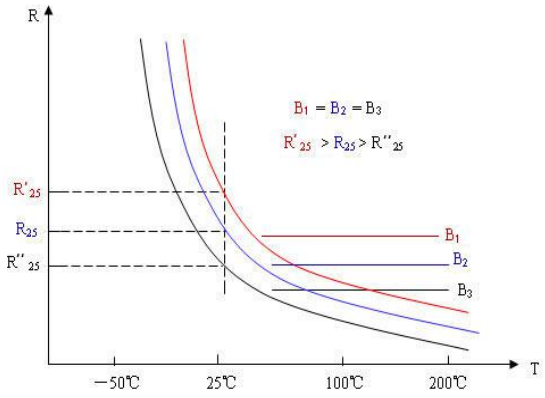
The reliant relationship between the zero power resistance of thermistor and its temperature.

R 值与 B 值关系

热敏电阻器的零功率电阻值与其电阻体温度之间的依赖关系。

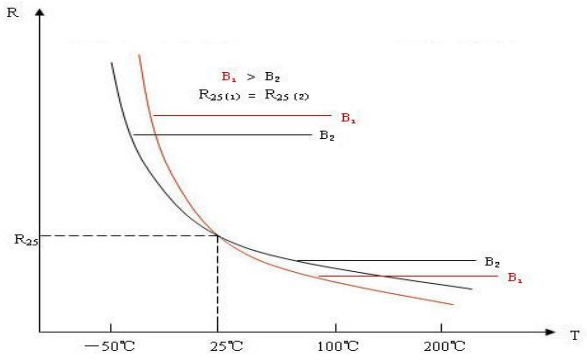
R-T curve NTC thermisor

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



B 值相同，阻值不同的 R-T 特性曲线示意图

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



相同阻值，不同 B 值的 R-T 特性曲线示意图

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

MF52 珠状精密型 NTC 热敏电阻器系列
MF52 Pearl-Shape Temp Measurement NTC Thermistor

应用范围

- 空调设备
- 暖气设备
- 电子体温计
- 液位传感器
- 汽车电子
- 电子台历
- 手机电池

Applications

- Air-Conditioner Equipments
- Heating Apparatus
- Electric Thermometer
- Liquid level sensor
- Automoblie electronic
- Electric table-board
- Battery of MobilenTelephone

特点

- 测试精度高
- 体积小,反应速度快
- 能长时间稳定工作
- 互换性，一致性好
- 规模化生产，性价比高

Characteristic

- High testing precision
- Small size，Fast Response
- Steady Operating For Long time
- Good quality of coherence and interchange
- Scale production,high ratio of features to cost

产品标识说明 Specification

MF52	A	103	G	3380	E

B 值允许偏差代号（根据需要标注） E：±0.5%，F：±1%	The allowable tolerance of(label by requirment) E：±0.5%，F：±1%
B 值：为 3380K	B value; namedly 3380K
阻值允许偏差代号：F：±1%，G：±2%，H：±3%，J：±5%，K：±10%	Resistance Tolerance Code: Namely F;±1%，G;±2%，H;±3%，J;±5%，K;±10%
标称电阻值：103 为 10KΩ	Rated Resistance:103 namely 10KΩ
不同外形结构和尺寸代号：A 型引线为镀锡铜线或者镀锡铜包钢线	Diffierent Configuration and Code:Model A is Cu or Cp wire
型号：珠状精密型型 NTC 热敏电阻器	Type: Temp-measurement chip in glass NTC thermistor

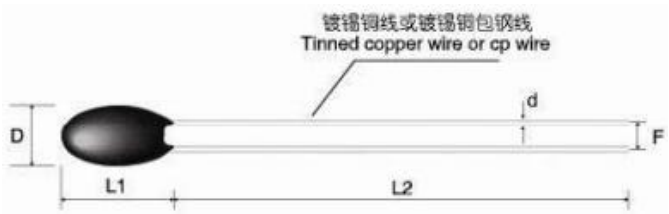
主要技术参数 Main Techno-Parameter

型号 Part No.	标称阻值 R25（KΩ） Rated Resistance R25 (KΩ)	B 值（25/50℃）（K） B Value(25/50℃) (K)	额定功率（mW） Rated Power (mW)	耗散系数（mW/℃） Dissi.Coef. (mW/℃)	热时间常数（S） Thermal time Constant(S)	工作温度（℃） Operating Temp.(℃)
MF52□□□3100	0.1～20	3100	≤50	≥2.0 静止空气中 In still air	≤12 静止空气中 In still air	-40～+125℃
MF52□□□3270	0.2～20	3270				
MF52□□□3380	0.5～50	3380				
MF52□□□3470	0.5～50	3470				
MF52□□□3600	1～100	3600				
MF52□□□3950	5～100	3950				
MF52□□□4000	5～100	4000				
MF52□□□4050	5～200	4050				
MF52□□□4150	10～250	4150				
MF52□□□4300	20～1000	4300				
MF52□□□4500	20～1000	4500				

外形结构和尺寸 Dimensions(mm)

A 型：（引线为镀锡铜线或镀锡铜包钢线）

(Tin.nickle Cu or Cp wire)



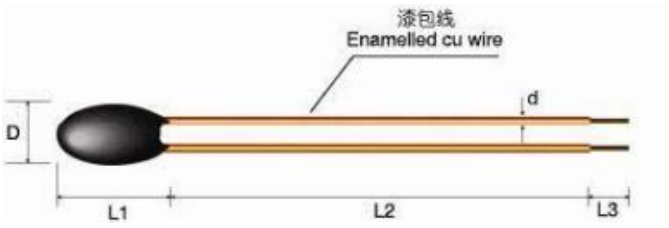
常规尺寸表

Normal dimension table

代号 Code	Dmax	L1max	L2min	d ±0.05	F ±0.5
A1	2.5	4.0	25	0.3	1.7
A2	3	4.5	25	0.45	2.2

B 型：（引线为锡包线）

(Enamelled cu wire)



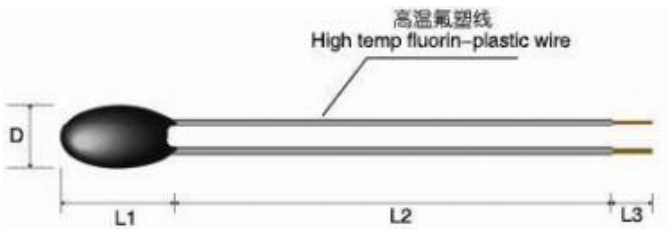
常规尺寸表

Normal dimension table

代号 Code	Dmax	L1max	L2min	L3 ±1	d ±0.05
B1	2	3.5	用户定制 By user determine	3	0.2
B2	3	4	用户定制 By user determine	3	0.3

C 型：（引线为高温氟塑线）

(High temp fluorin-plastic wire)



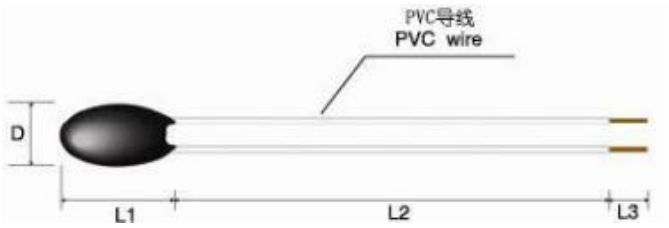
常规尺寸表

Normal dimension table

代号 Code	Dmax	L1max	L2min	L3 ±1	线材型号
C1	3	7.5	用户定制 By user determine	5	30#
C2	4	7.5	用户定制 By user determine	5	28#

D 型：（引线为 PVC 导线）

(PVC Wire)



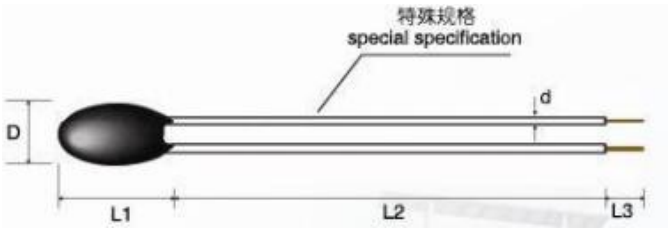
常规尺寸表

Normal dimension table

代号 Code	Dmax	L1max	L2min	L3 ±1	线材 型号
D1	3	7.5	用户定制 By user determine	5	30#
D2	4	7.5	用户定制 By user determine	5	28#

E 型：（引线和包封头均为特殊规格）

(Lead and head are all special specification)



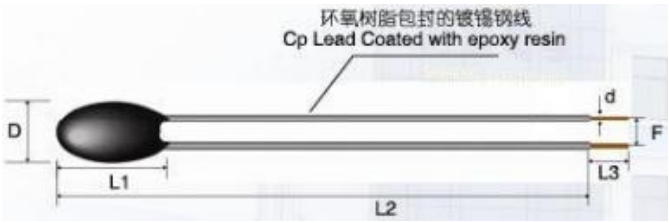
常规尺寸表

Normal dimension table

代号 Code	Dmax	L1max	L2min	L3 ±1	线材 型号
E1	用户定制 By user determine	用户定制 By user determine	用户定制 By user determine	5	用户定制 By user determine
E2	用户定制 By user determine	用户定制 By user determine	用户定制 By user determine	5	用户定制 By user determine

DE 型：（引线为环氧树脂包封的镀锡钢线）

(Cp Lead coated with epoxy resin)



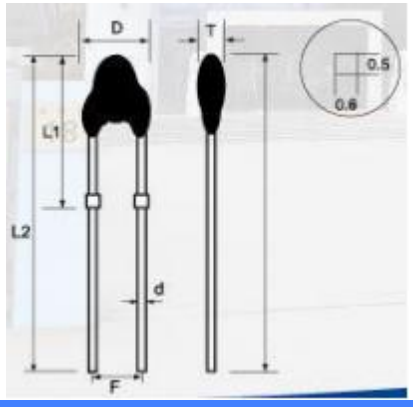
常规尺寸表

Normal dimension table

代号 Code	Dmax	L_{1max}	L_{2min}	L3	d ±0.05	F ±0.5
DE1	3	6.0	55	用户定制 By user determine	5	/
DE2	4	7.5	55	用户定制 By user determine	5	/

F 型：（引线为镀锡钢线）

(Tinned steel wire)



常规尺寸表

Normal dimension table

代号 Code	Dmax	L1max	L2 ±1.5	d ±0.1	F ±0.05	Tmax
F	3.8	9.5	17	0.6	2.5	3.5

Disclaimer

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.