



产品承认书

SPECIFICATION FOR APPROVAL

客 户 : _____

Customer

产品名称 : _____ NTC功率型热敏电阻

Product Name

产品型号 _____ NTC 2.5D-9/P=5 直脚编带

Product Model

客户料号 : _____ NTC2.5D-9SMFSOE

Customer P/N

修改日期 : _____

REV.DATE

东莞市成希电子有限公司			客户承认		
拟订	审核	核准	承认	审核	核准
傅映霞2025-5-26	李丹 2025-5-26	徐滢涛2025-5-26			



1. 产品特点 **Feature of Power Thermistor**

- (1) 体积小，功率大，抑制浪涌电流能力强。

Power NTC thermistors are in small size but with a high power that to restrain the Surge current.

- (2) 反应速度快，可靠性高，寿命长。

Power NTC thermistors possess the electronic character of fast reflection, high reliability and long-life for use.

- (3) 材料系数(B 值)大，残余电阻小。

The material has a high constant as “B value” with small remained resistance.

- (4) 工作范围宽，产品系列全。

Power NTC thermistors have a large application range integrate products series.

2. 应用领域 **Rage of Application**

- (1) 开关电源、适配器。

Switch mode power supply, Adapter.

- (2) 转换器、LED 驱动电路。

Transformer, LED driver circuit.

- (3) 电子镇流器、电加热器。

Electronic rectifier, electronic heater.

- (4) 电动机。

Electric motor.

- (5) 显象管、显示器、白炽灯及其它照明灯具的灯丝保护。

It has a protected function for RT , display, lighting device and circuit of different electronic equipment.

3. 热敏电阻产品代码 Part Number:

NTC

NTC 功率型热敏电阻
NTC THERMISTOR

2.5

D

-9

M

额定功率阻值Ω
RATED POWER RESISTANCE

代码	阻值
3	3 Ω
10	10 Ω
2.5	2.5 Ω

产品直径 mm

代码	直径
-5	5mm
-9	9mm
-20	20mm

产品形状 SHAPE
D 圆片形 DISK

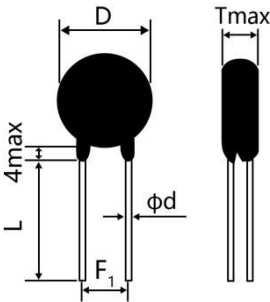
阻值偏差 TOL

代码	偏差
K	10%
M	20%

4. 引线形状图 Lead Shape:

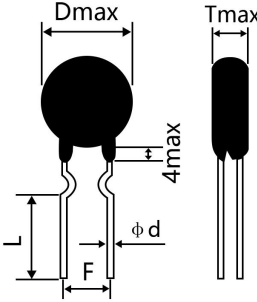
Bulk Straight

标准外形 (S Type)



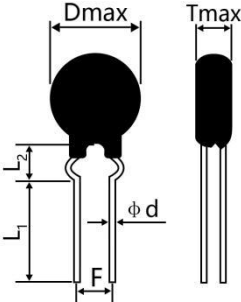
K Forming

内弯脚 (I Type)



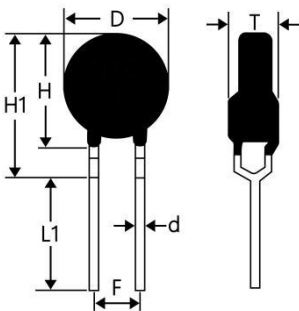
K Forming

外弯脚 (O Type)



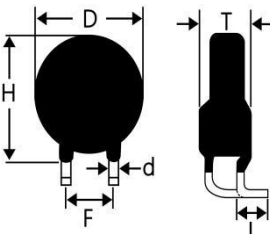
Y Forming

Y型脚 (Y Type)



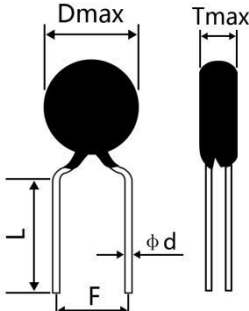
Cutting Bending

折弯脚 (CL Type)



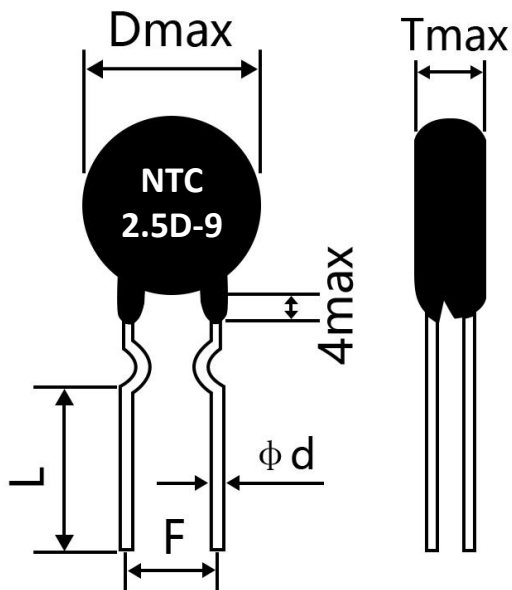
Tower Straight

塔肩型 (T Type)



注：其它引线可联系业务定制。

5. 结构尺寸 Structure and Dimensions:



SIZE		
单位 (mm)	D : (max)	11.0mm
	T : (max)	5.5mm
	F : (±1.0)	5.0mm
	L : (±2.0)	20mm
	d : (±0.05)	0.6mm

6. 主要技术参数 Parameters of Technology:

额定零功率电阻值 (R25) : Ω Rated Zero-Power Resistance	2.5 ± 20%	详细见产品性能及测试 Details in Product Characteristics and Test
材料系数 (B _{25/50}) : B Material Constant	2600	
最大稳态电流: (A) .Max.Steady State Current	4	
耗散系数: (mW/°C) Thermal Dissipation Constant	11	
热时间常数: (s) Thermal Dissipation Constant	35	
工作温度范围: (°C) Operating Temperature Range	-40 ~ 175	

7. 存储条件 **Storage condition:**

1. 存储环境条件 STORAGE CONDITIONS:

1-1. 温度 Temperature: -10°C ~ +40°C

1-2. 湿度 Humidity: ≤70%RH

1-3. 地点 Place:

不要暴露在下列环境条件下，否则将导致性能衰退或参数飘移：

Do not exposing the components to the following conditions, otherwise, it may result in deterioration of characteristics.

1) 腐蚀性或易氧化气体 Corrosive gas or deoxidizing gas.

2) 易燃易爆气体 Flammable and explosive gases.

3) 油、水和化学溶液 Oil, water and chemical liquid.

4) 太阳光下 Under the sunlight.

1-4. 尽量保证开口最小化，立即重新封好，并贮存在密封、带有干燥剂的容器中。

Handling after seal open: After unpacking of the minimum package, reseal it promptly or store it inside a sealed container with

a drying agent.

请不要在下列条件下使用本元件，否则将可能导致产品性能衰退或产品损毁，甚至引发火灾：

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) 超过最大工作电流 Exceeding I_{max} .

2) 超过许可工作温度范围 Exceeding rated temperature range.

3) 散热不良（由于散热不良，本元件可能因部分过热而导致破坏）Inferior thermal dissipation (Due to badly inferior

thermal dissipation, some part of the components body will become overheated and then be damaged.)

8. 产品性能 Characteristics:

(1) 机械性能 Mechanical Characteristics

指标项目 Item	技术要求 Specification	测试条件/方法 Test Conditions & Methods
可焊性 Solder-ability	浸润部分上锡均匀, 上锡面积≥95% The terminals shall be uniformly tinned, and its area≥95%	将引出端沾助焊剂后, 浸入到温度为 240-245℃、深度为 15mm 的锡槽中锡面距 NTC 本体下端 6mm 处, 持续 2-3 秒。(参见 IEC68-2-20 /GB2423.28 试验 Ta) Dipping the NTC terminals to a depth of 15mm in a soldering bath of 240-245℃ and to the place of 6mm far from NTC body for 2-3s (See IEC68-2-20 /GB2423.28 Ta)
耐焊接热 Resistance To Soldering Heat	无可见损伤 No visible mechanical damage. $\Delta R/RN \leq 20\%$ ($\Delta R = RN - RN'$)	根据 IEC68-2-20 (GB2423 .28) 试验 Tb 进行试验。采用焊槽法, 将引出端沾助焊剂后, 浸入到温度为 265±5℃、深度为 15mm 的锡槽中,锡面距 NTC 本体下端 6mm 处, 维持 10±1 秒。在 25±2℃条件下恢复 4 - 5h 后, 复测额定零功率电阻 RN'。 Dipping the NTC terminals to a depth of 15mm in a soldering bath of 265±5℃ and to the place for 6mm below from NTC body for 10±1s.After recovering 4-5h under 25±2℃. The rated zero power resistance value RN' shall be measured. (See IEC68-2-20 /GB2423.28 Tb)
引出端强度 Strength of lead terminal	无损坏 No break out $\Delta R/RN \leq 20\%$ ($\Delta R = RN - RN'$)	根据 IEC68-2-21 (GB2423 .29) 试验 U 进行试验。 试验 Ua: 拉力 10N, 持续 10 S; 试验 Ub: 弯曲 90°, 拉力 5N, 持续 10 S; 扭转 180°, 拉力 5N, 持续 10 S。 在 25±2℃条件下恢复 4~5 h 后, 复测额定零功率电阻 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±2℃, the rated zero power resistance value RN' shall be measured. (See IEC68-2-21/GB2423.29 Ua / Ub)

(2) 电气性能 Electrical Characteristics

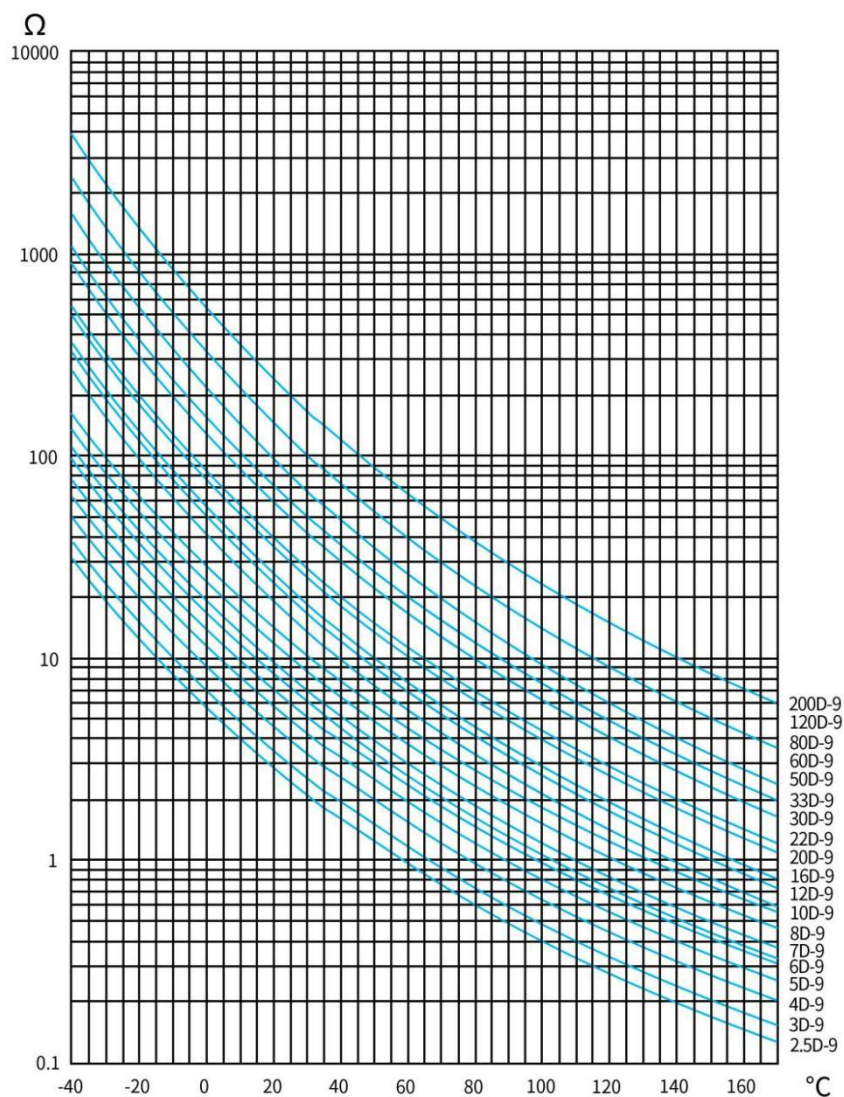
指标项目 Item	技术要求 Specification	测试条件/方法 Test Conditions & Methods
额定零功率电阻 Rated Zero-Power Resistance RN (Ω)	$2.5 \pm 20\%$	环境温度 TA: $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ 测试电压: 1.5VDC 在常温 TA 条件下, 放置 1~2 小时 后测得阻值RN。 Ambient temp. Range: $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ (TA). Testing voltage: 1.5VDC After placing for 1~2 hours under TA, the resistance value shall be measured.
热耗散系数δ(MW/°C) Thermal Dissipation Constant	11	在特定的环境温度下, 热耗散系数(δ)为热敏电阻电功率消耗(ΔP)与本体温度变化量 (ΔT)的比值。 The thermal dissipation constant(δ) could be calculated by the ratio of a change in power dissipation(ΔP) of the thermistor to a change in temperature(ΔT) of the thermistor at a specified ambient temperature
热时间常数τ(S) Thermal Time Constant	35	热时间常数(τ)为在零功率条件下, 热敏电阻的温度下降到其最初温度与最终温度之差为63.2% 时所需要的时间 The time(τ 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
材料常数 Material Constant B	$2600 \pm 10\%$ $B = T_1 T_2 / (T_2 - T_1) \times \ln(R_1 / R_2)$	R1 , R2 分别为 T1 , T2温度下的零功率电阻 R1 , R2 is zero-power resistance at T1 , T2 T1 = 298.15 K(25°C) T2 = 323.15 K(50°C)
最大稳态电流 (A)	无可见损伤 visible mechanical damage. $\Delta R_N / R_N \leq 20\%$ $(\Delta R = R_N - R_N')$	环境温度: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 测试电流: 4.0A Ambient temp. Range. $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Testing Current.

(3) 可靠性试验 Reliability Test

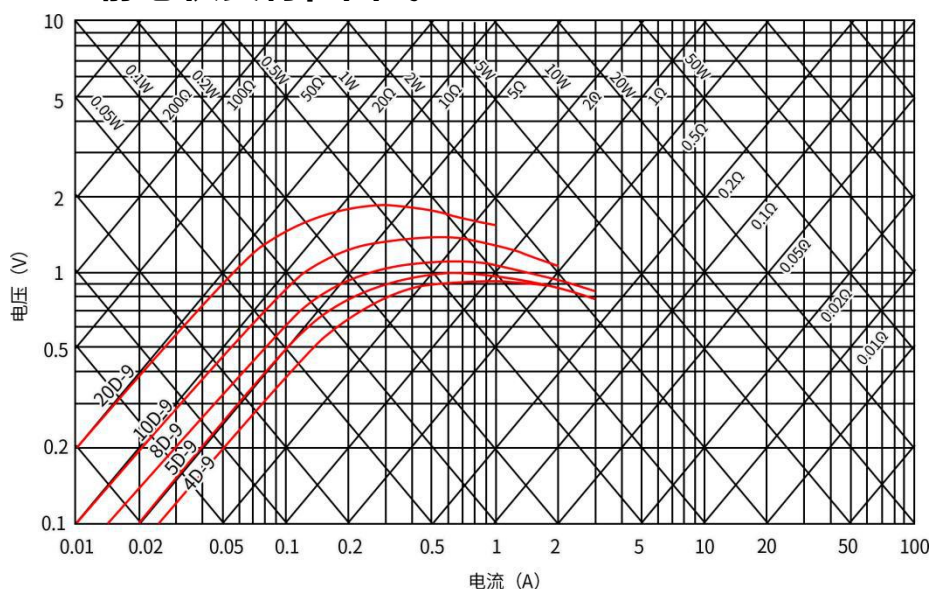
指标项目 Item	技术要求 Specification	测试条件/方法 Test Conditions & Methods
温度循环测试 Temp. Cycling Testing	无可见损伤 No visible mechanical damage. $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N'$)	在 $T_a = -40 \pm 3^\circ\text{C}$ 和 $T_b = 200 \pm 3^\circ\text{C}$ 的环境温度中各存放 30 分钟, 循环 5 次. 每次高低温循环都有在 $25 \pm 2^\circ\text{C}$ 的环境中过渡 5 分钟. 样品进行温度循环测试后, 取出放置室温 ($25 \pm 2^\circ\text{C}$) 4~5 小时后测量零功率电阻 R_N'. $T_a: -40 \pm 3^\circ\text{C} / 30\text{min} \rightarrow 25 \pm 2^\circ\text{C} / 5\text{min} \rightarrow T_b: 200 \pm 3^\circ\text{C} / 30\text{min} \rightarrow 25 \pm 2^\circ\text{C} / 5\text{min}$ Cycles: 5times After recovering 4~5 h under $25 \pm 2^\circ\text{C}$, the rated zero power resistance value R_N' shall be measured.
电循环测试 Electrical Cycling Testing	无可见损伤 No visible mechanical damage. $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N'$)	环境温度: $25^\circ\text{C} \pm 2^\circ\text{C}$ 循环次数: 1,000 次 通/断: 1 分钟 / 5 分钟 测试电流: 4.0A 样品置于室温 ($25 \pm 2^\circ\text{C}$) 4~5 小时后, 测量其零功率电阻 R_N' Ambient temp. Range: $25^\circ\text{C} \pm 2^\circ\text{C}$. Cycles: 1,000times On / Off: 1m / 5m Test Current 4.0A After recovering 4~5h under $25 \pm 2^\circ\text{C}$, the rated zero power resistance value R_N' shall be measured.
持久性测试 LoadLife (Endurance) Testing	无可见损伤 No visible mechanical damage. $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N'$)	环境温度: $25^\circ\text{C} \pm 2^\circ\text{C}$. 样品通过最大工作电流 4.0A, $1,000 \pm 24$ 小时后, 取出置于室温 ($25 \pm 2^\circ\text{C}$) 4~5 小时后, 测量其零功率电阻 R_N'. Ambient temp. Range: $25^\circ\text{C} \pm 2^\circ\text{C}$; 3.0A/ $1,000 \pm 24\text{h}$ After recovering 4~5 h under $25 \pm 2^\circ\text{C}$, the rated zero power resistance value R_N' shall be measured.
耐湿性测试 Humidity Testing	无可见损伤 No visible mechanical damage. $\Delta R_N / R_N \leq 20\%$ ($\Delta R = R_N - R_N'$)	在温度 $40 \pm 2^\circ\text{C}$, 相对湿度 $93 \pm 3\%$ 的环境中放置 1000 ± 24 小时后, 取出置于室温 ($25 \pm 2^\circ\text{C}$) 4~5 小时后, 测量其零功率电阻 R_N' Ambient temp. range : $40^\circ\text{C} \pm 2^\circ\text{C}$ R.H.: $93 \pm 3\%$, Energized time: $1000 \pm 24\text{h}$ After recovering 4~5 h under $25 \pm 2^\circ\text{C}$, the rated zero power resistance value R_N' shall be measured.

9. 产品特性曲线 Graph of Characteristics:

温度特性曲线 Resistance-Temperature Characteristic



静态伏安特性曲线 Static Characteristics



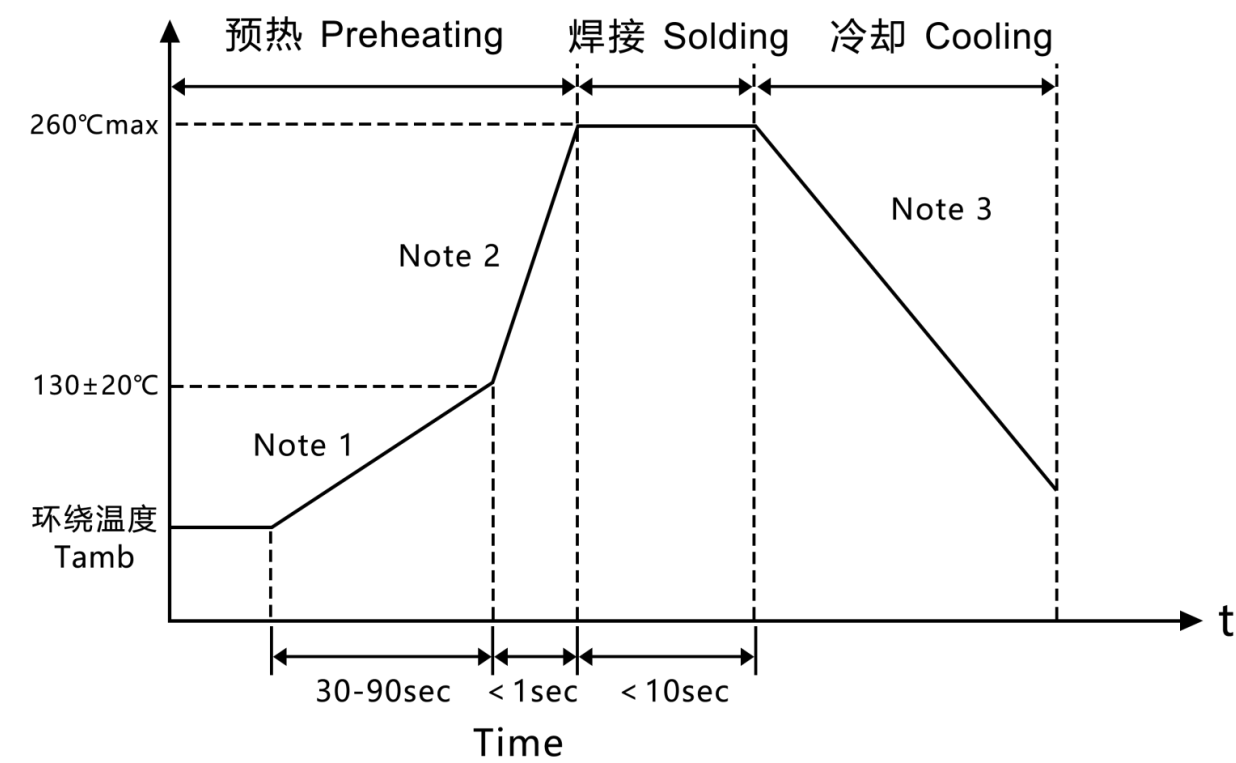
XXD-9电压-电流曲线

10. 标志 Marking:

	NTC	负温度系数热敏电阻器 NTC thermistor
	X	零功率电阻值 Rated Zero-Power Resistance
	D	圆片型 Disk-Type
	-Y	最大芯片直径 Max diameter of disk (mm)

11. 焊接说明 Soldering Recommendation

(1) 波峰焊接条件 (Wave soldering profile)

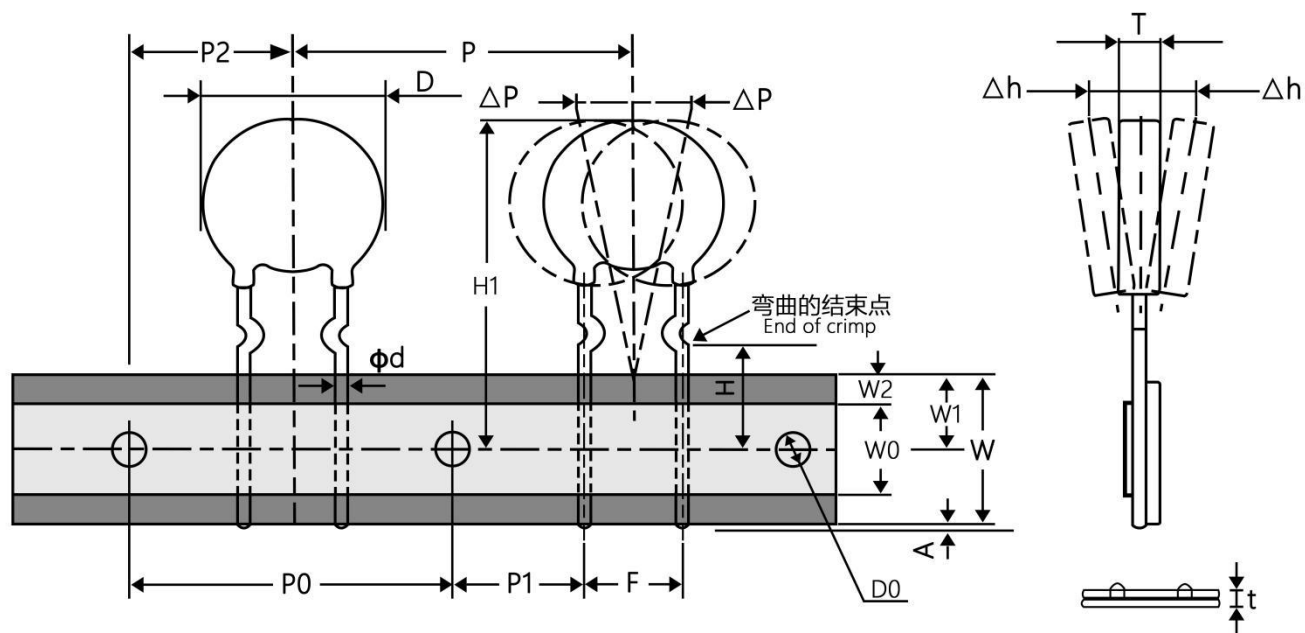


Note1: (1~3) °C/sec Note2: 大约200°C/sec Note3: 5°C/sec Max

(2) 烙铁焊接条件 Recommended Reworking Conditions with Soldering Iron

项目	条件
烙铁焊接温度	360°C (max)
焊接时间	3 sec (max)
与压敏电阻的距离	2mm (min)

12. 编带尺寸 Tape size:



名称 Description	符号 Symbol	尺寸 Dimension(mm)
编带式样 Taped style		内弯
输送孔间距 Feed hole pitch	P_0	12.7 ± 1.0
编带间距 Taping pitch	P	12.7 ± 1.0
引线间距 Lead spacing	F	5.0 ± 1.0
对输送孔的偏移 Feed hole off alignment	P_1	3.85 ± 0.7
引线弯曲位置高度 Lead crimp height	H	16.5 ± 1.0
顶部高度 Bottom height	$H1$	36.0 max
载带宽度 Carrier tape width	W	18.0 ± 1.0
粘带宽度 Adhesive tape width	W_0	8.0 / 10.0
对输送孔的高度偏移 Feed hole height off alignment	W_1	9.0 ± 0.5
粘带边距 Adhesive tape thickness	W_2	3.0 max
编带总厚度 Overall tape thickness	t	0.7 ± 0.2
本体直径 Body diameter	D	见单独规范 See the specification
输送孔直径 Feed hole diameter	D_0	4.0 ± 0.3
引线直径 Wire lead diameter	d	0.55 / 0.6 / 0.7 / 0.75
引线尾端伸出 Lead end protrusion	A	F Style figure2 1.0max
本体厚度 Body thickness	T	见单独规范 See the specification
本体偏斜 Body warp	ΔP	0 ± 0.2
本体倾斜 Body inclination	Δh	2.0 max