

## 产品特点 Product Features

# PLASTIC THERMISTOR NTC

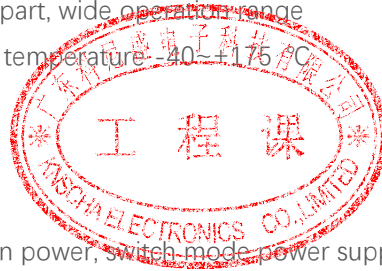
- 1.MF72系列产品为径向引线树脂涂装型
- 2.体积小，功率大，抑制浪涌电流能力强
- 3.反应速度快
- 4.材料常数（B值）大，残余电阻小
- 5.寿命长，可靠性高
- 6.产品规格齐全，工作范围宽
- 7.工作温度-40~ +175℃

- 1.MF72 series in the form of radial resin coated form
- 2.Small dimension, powerful, strong in inrush current limiting
- 3.Fast response
- 4.Large material constant, lower residue resistance
- 5.Long life, high reliability
- 6.Complete part, wide operation range
- 7.Operating temperature -40~ +175 °C

## 应用范围 Application scope

- 1.转换电源、开关电源、UPS电源
- 2.电子节能灯、电子镇流器
- 3.电子线路、电源线路等

1. Conversion power, switch-mode power supply, UPS power
2. Energy saving lights, ballast
3. Electronic circuit, power supply circuit



## 产品型号说明 Product Model Description

KNSCHA	4032	N	2R5	M	5R0
品牌 Logo	尺寸 Size 2220(5750) 3220(8050) 3225(8060) 4032(1008)	Negative Temperature Coefficient NTC负温度系数	Rated Zero-Power Resistance 额定零功率电阻值 2R5=2.5Ω 100=10Ω 101=100Ω	Accuracy Error 精度误差 K: 10% M: 20%	Max. Steady State Current 最大稳态电流 3R0: 3A 5R0: 5A 100: 10A

## 温度特性 Temperature

Parameter	Value	Unit
Operating temperature工作温度	-40 ~ +175	℃
Storage temperature存储温度	-10 ~ +40	℃
thermal time constant	≤18	S
Insulation resistance	≥6	mW/℃

## 主要技术参数 Main technical parameters

尺寸型号Size: 4032(D-11)

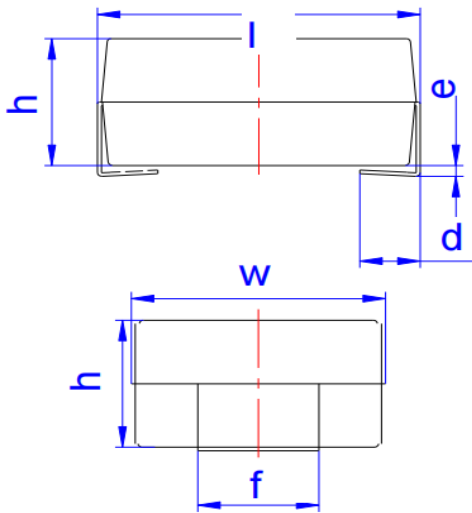
P/N	R <sub>25</sub> (Ω) Resistance	Maximum steady-state current (A)	Residual resistance (Ω)	Resistance B <sub>25/85</sub> (K)	Thermal time constant (s)	Dissipation Coefficient (mW/°C)	Operation Temperature (°C)
	2.5	5	0.156	2700	≤55	≥13	-40 ~ 175
	3	5	0.170	2700			
	4	4	0.200	2700			
	5	4	0.205	2700			
	6	3	0.298	2700			
	7	3	0.282	2800			
	8	3	0.259	2800			
	10	3	0.268	2800			
	12	2	0.347	2800			
	15	2	0.485	3000			
	16	2	0.500	3000			
	18	2	0.545	3000			
	20	2	0.590	3000			
192NTC0014	22	2	0.590	3000			
	25	1.5	0.602	3000			
	30	1.5	0.722	3000			
	33	1.5	0.795	3000			
	47	1.5	1.165	3200			
	50	1.5	1.241	3200			
	60	1	1.489	3200			
	80	1	1.986	3200			
	100	0.8	2.483	3200			
	120	0.8	2.979	3200			
	200	0.6	4.965	3200			
	400	0.3	9.930	3300			

## 电气测试 Electrical Test

序号 No.	项目 Items	测试方法及备注 Test Methods and Remarks
1	25℃ 零功率电阻值 Nominal Zero-Power Resistance at 25℃(R25)	环境温度 Ambient temperature: 25±0.05℃ 测试功率 Measuring electric power: ≤ 0.1mW
2	B 值常数 Nominal B Constant	分别在环境温度 25±0.05℃, 50±0.05℃ 或 85±0.05℃ 下测量电阻值。 Measure the resistance at the ambient temperature of 25±0.05℃, 50±0.05℃ or 85±0.05℃. $B(25-50^{\circ}\text{C}) = \frac{\ln R_{25}}{1/T_{25}} - \frac{\ln R_{50}}{1/T_{50}}$ $B(25-85^{\circ}\text{C}) = \frac{\ln R_{25}}{1/T_{25}} - \frac{\ln R_{85}}{1/T_{85}}$ T: 绝对温度 (K) Absolute temperature (K)
3	热时间常数 Thermal Time Constant	在零功率条件下, 当热敏电阻的环境温度发生急剧变化时, 热敏电阻元件产生最初温度 T <sub>0</sub> 与最终温度 T <sub>1</sub> 两者温度差的 63.2% 的温度变化所需要的时间, 通常以秒(S)表示。 The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T <sub>0</sub> (°C) to T <sub>1</sub> (°C) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state, normally expressed in second (S).
4	耗散系数 Dissipation Factor	在一定环境温度下, NTC热敏电阻通过自身发热使其温度升高 1℃ 时所需要的功率, 通常以 mW/°C 表示。可由下面公式计算: The required power which makes the NTC thermistor body temperature raise 1℃ through self-heated, normally expressed in milliwatts per degree Celsius (mW/°C). It can be calculated by the following formula: $\delta = \frac{W}{T - T_0}$

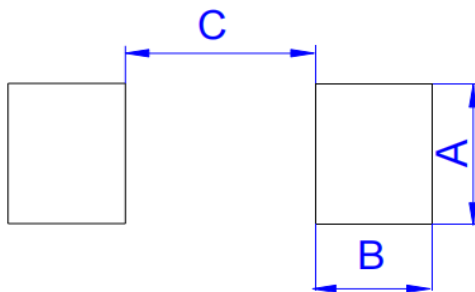
5	额定功率 Rated Power	在环境温度 25℃下因自身发热使表面温度升高 100℃所需要的功率。 The necessary electric power makes thermistor's temperature rise 100℃ by self-heating at ambient temperature 25℃ .
6	允许工作电流 Permissible operating current	在静止空气中通过自身发热使其升温为 1℃的电流。 The current that keep body temperature of chip NTC on the PC board in still air rising 1℃ by self-heating.

## 尺寸图 Dimensional drawings



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
l	10.1		10.7	0.398		0.421
w	7.7		8.3	0.303		0.327
h	3.6		4.5	0.165		0.189
d	1.2		1.8	0.047		0.071
e	0		0.3	0		0.012
f	2.7		3.3	0.106		0.130

## 推荐焊盘布局 Recommended solder pad layout



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.5			0.138	
B		2.8			0.110	
C		6.5			0.265	

## 焊接指南 Dimensional drawings

建议使用温和的非活性焊剂进行焊接，并适当清洁PCB。

The usage of mild, non-activated fluxes for soldering is recommended, as well as proper cleaning of the PCB.

根据JEDEC J-STD-020C，这些部件适用于回流焊

The components are suitable for reflow soldering per JEDEC J-STD-020C.

### 建议焊接条件 Recommended Soldering Technologies

#### 回流焊 Re-flowing Profile

温升：1~2°C/sec.

1~2°C/sec. Ramp

预热：150~190°C/90±30 sec.

Pre-heating: 150~190°C/90±30 sec.

大于 240°C时间：20~40sec

Time above 240°C: 20~40 sec.

峰值温度：最高 260°C/10 sec.

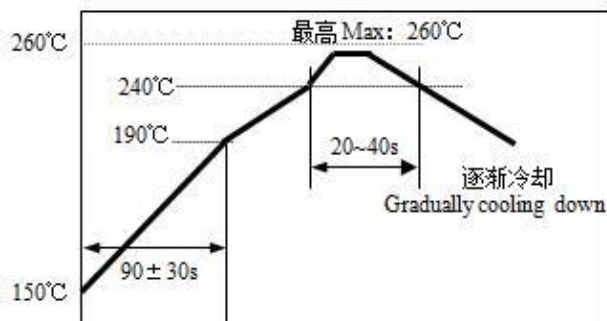
Peak temperature: 260°C Max./10 sec.

焊锡：Sn/3.0Ag/0.5Cu

Solder paste: Sn/3.0Ag/0.5Cu

回流焊：最多 2 次

Max.2 times for re-flowing



#### 手工焊 Iron Soldering Profile

烙铁功率：最大 30W

Iron soldering power: Max.30W

预热：150°C/60 sec.

Pre-heating: 150°C/60 sec.

烙铁头温度：最高 350°C

Soldering Tip temperature: 350°C Max.

焊接时间：最多 3sec.

Soldering time: 3 sec Max.

焊锡：Sn/3.0Ag/0.5Cu

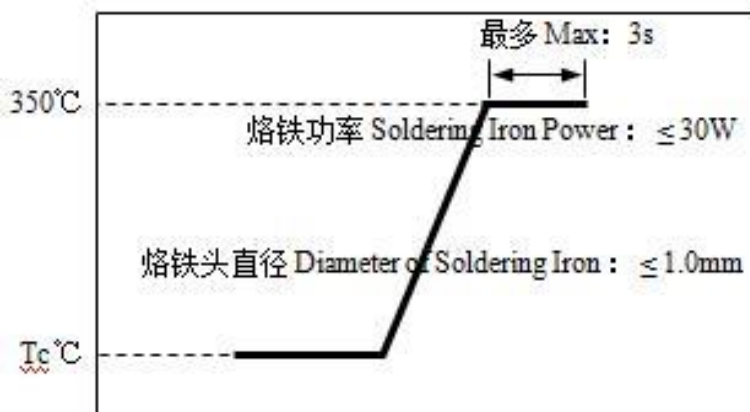
Solder paste: Sn/3.0Ag/0.5Cu

手工焊：最多 1 次

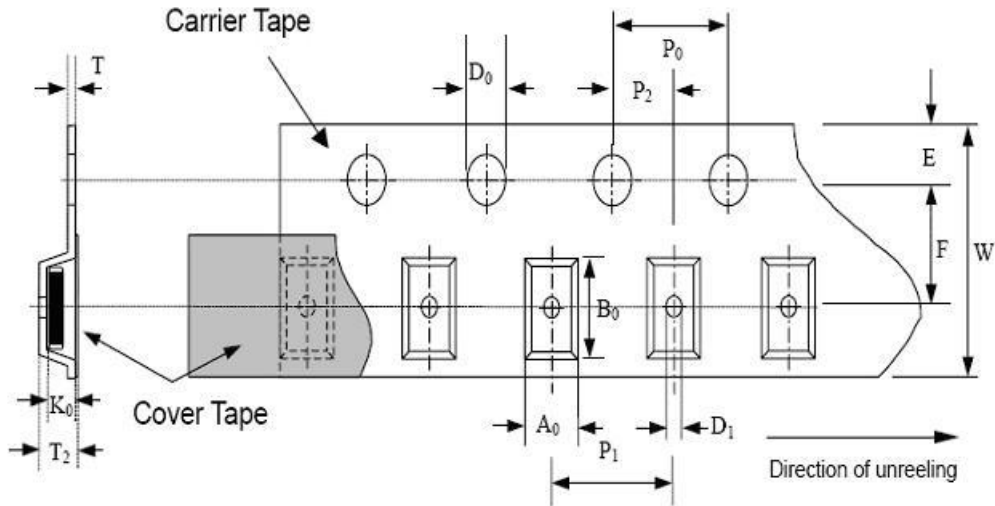
Max.1 time for iron soldering

[注：不要使烙铁头接触到端头]

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]

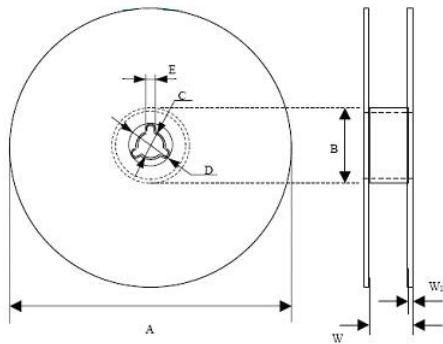


## 编带包装: Taping and packaging Specification



Type	A <sub>0</sub> ±0.20	B <sub>0</sub> ±0.20	K <sub>0</sub> ±0.10	T max	T <sub>2</sub> max	D <sub>0</sub> +0.05	D <sub>1</sub> ±0.05	P <sub>1</sub> ±0.10	P <sub>2</sub> ±0.05	P <sub>0</sub> ±0.1	W ±0.30	E ±0.10	F ±0.05
3220	7.0	8.7	3.85	0.3	5.50	1.55	1.55	12.00	2.00	4.00	16.00	1.75	7.50
4032	8.4	10.8	3.85	0.3	5.50	1.55	1.55	12.00	2.00	4.00	24.00	1.75	11.50

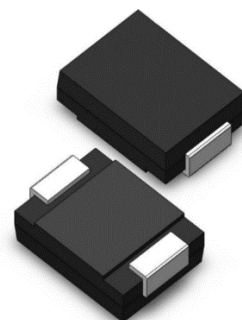
## 卷轴尺寸 Reel dimension



Type	A	B	C	D	E	W-W1	W <sub>1</sub>
3220-4032	329.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	17.2±0.7	2.3±0.15

## 盘装数量 Quantity of taping packing(pcs): 1000

<p>RoHS</p>	<p>LOT :</p> <p>P/N :</p> <p>QTY: KPCS</p> <p>N.W: KGS</p> <p>G.W: KGS</p>
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