



承认书

SPECIFICATION FOR APPROVAL

制造商 corporation



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桂林至敏电子科技有限公司

GUILIN SEMISAM ELECTRONIC TECHNOLOGY CO., LTD

Add:Floor 1-3 building 5 B18 standard workshop Suqiao Industrial ParkGuilin economic

and Technological Development ZoneGuilin City Guangxi Zhuang Autonomous Region

客户名称:

CUSTOMER :

产品名称:

PART NAME : 功率型 NTC 热敏电阻 Power NTC thermistors

认证型号:

CERTIFIED MODEL :

产品编码:

Product code:

产品料号:

PART No. : HNPXXXD9N4032MXXXR

客户料号:

CUSTOMER P/N :

其他说明:

REMARK :

编制日期: Compile Date:	2023-10-16	修订日期: Revision date:		版本: Edition:	1.0
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供应商确认 Supplier confirmation			
编制 Editor	骆忠全	日期 Date	2023-10-16
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加盖 印章 Affix a seal			

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编制 Editor		日期 Date	
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	产品名称 Product Name	功率型 NTC 热敏电阻 Power NTC thermistors	版本 Edition	1.0
	规格型号 Specification model	HNPxxxD9N4032MxxxR	修订日期 Revision date	2023-10-16

特点 Product Features

Characteristics

- | | |
|--|-------------------------|
| . 4032 (D-9) series in the form of radial resin coated form | .4032(D9)系列产品为径向引线树脂涂装型 |
| . Small dimension, powerful, strong in inrush current limiting | .体积小, 功率大, 抑制浪涌电流能力强 |
| . Fast response | .反应速度快 |
| . Large material constant, lower residue resistance | .材料常数 (B 值) 大, 残余电阻小 |
| . Long life, high reliability | .寿命长, 可靠性高 |
| . Complete part, wide operation range | .产品规格齐全, 工作范围宽 |
| . Operating temperature -40~+175°C | .工作温度 -40~ +175°C |

用途 Application scope

Recommended Applications

- | | |
|---|------------------|
| . Conversion power, switch mode power supply, UPS power | .转换电源、开关电源、UPS电源 |
| . Energy saving lights, ballast | .电子节能灯、电子镇流器 |
| . Electronic circuit, power supply circuit | .电子线路、电源线路等 |

产品物料编码规则 Part Number Code

H	N	P	2R5		D	9	N	4032	M		3A0		R	
1	2		3	4	3	4	5	6		7				
产品类型	25°C 阻值		芯片形状	本体尺寸	封装类型	塑封尺寸	阻值公差	最大电流		包装				
热敏电阻	2R5	2.5Ω	D:圆片型	9	Φ9mm	塑封	4032 (1008)	K	±10%	0A5	0.5A	R	编带	
	5	5Ω						L	±15%	2A5	2.5A			
	101	100Ω						M	±20%	3A0	3A			

温度特性 Temperature


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



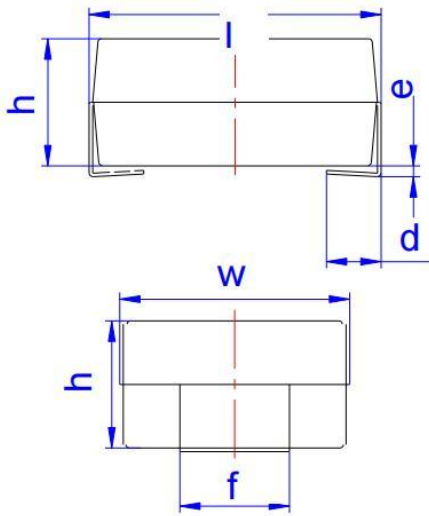
	产品名称 Product Name	功率型 NTC 热敏电阻 Power NTC thermistors	版本 Edition	1.0
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电性参数 Electrical parameters

NO	R25 (Ω) Resistance	Maximum steady-state current (A)	Residual resistance (Ω)	Resistance B25/85 (K)	Thermal time constant (s)	Dissipation Coefficient (mW/oC)	Operation Temperature (oC)
HNP1R5D9N4032M4R0R	1.5	4	0.1	2600	≤35	≥11	-40 ~ 175
HNP2R5D9N4032M4R0R	2.5	4	0.195	2700			
HNP3D9N4032M3R0R	3	4	0.145	2700			
HNP4D9N4032M3R0R	4	3	0.254	2700			
HNP5D9N4032M3R0R	5	3	0.264	2700			
HNP6D9N4032M2R0R	6	2	0.358	2700			
HNP7D9N4032M2R0R	7	2	0.326	2800			
HNP8D9N4032M2R0R	8	2	0.373	2800			
HNP10D9N4032M2R0R	10	2	0.398	2800			
HNP12D9N4032M1R0R	12	1	0.989	2800			
HNP15D9N4032M1R0R	15	1	1.028	3000			
HNP16D9N4032M1R0R	16	1	1.041	3000			
HNP18D9N4032M1R0R	18	1	1.107	3000			
HNP20D9N4032M1R0R	20	1	1.173	3000			
HNP22D9N4032M1R0R	22	1	1.235	3000			
HNP25D9N4032M1R0R	25	1	1.267	3000			
HNP30D9N4032M1R0R	30	1	1.320	3000			
HNP33D9N4032M1R0R	33	1	1.431	3000			
HNP50D9N4032M1R0R	50	1	1.480	3100			
HNP60D9N4032M0R8R	60	0.8	1.641	3100			
HNP80D9N4032M0R8R	80	0.8	2.187	3200			
HNP101D9N4032M0R8R	100	0.8	2.734	3200			
HNP121D9N4032M0R8R	120	0.8	3.281	3200			
HNP201D9N4032M0R5R	200	0.5	5.469	3200			
HNP401D9N4032M0R2R	400	0.2	10.94	3300			

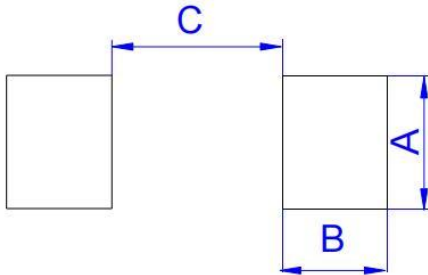
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尺寸图 Dimensional drawing



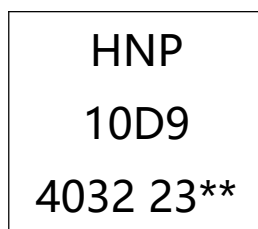
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
l	10.1		10.7	0.398		0.421
w	7.7		8.3	0.303		0.327
h	3.6		4.5	0.165		0.189
d	1.2		1.8	0.047		0.071
e	0		0.3	0		0.012
f	2.7		3.3	0.106		0.130

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	

产品印字示例 Product print example




"23**" 代表生产批次 The "23 **" stands for the production lot

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可靠性测试 Reliability Test

序号 No.	项目 Items	测试方法及备注 Test Methods and Remarks
1	25°C零功率电阻值 Nominal Zero-Power Resistance at 25°C(R25)	环境温度 Ambient temperature: 25±2 °C 测试功率 Measuring electric power: ≥6mW
2	B 值常数 Nominal B Constant	分别在环境温度 25±0.05°C, 50±0.05°C或 85±0.05°C下测量电阻值。 Measure the resistance at the ambient temperature of 25±0.05°C , 50±0.05°C or 85±0.05°C. $B(25-50^{\circ}\text{C}) = \frac{\ln R_{25}}{1/T_{25}} - \frac{\ln R_{50}}{1/T_{50}} \qquad B(25-85^{\circ}\text{C}) = \frac{\ln R_{25}}{1/T_{25}} - \frac{\ln R_{85}}{1/T_{85}}$ 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 T0 与最终温度 T1 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 T0 (°C) to T1 (°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°C 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°C 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°C 下因自身发热使表面温度升高 100°C 所需要的功率。 The necessary electric power makes thermistor's temperature rise 100 °C by self-heating at ambient temperature 25°C .
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°C 的电流。 The current that keep body temperature of chip NTC on the PC board in still air rising 1°C by self-heating.

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焊接建议 Soldering Recommendation

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.

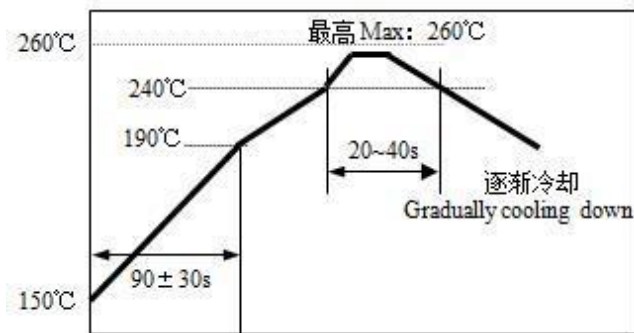
根据 JEDEC J-STD-020C，这些部件适用于回流焊

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

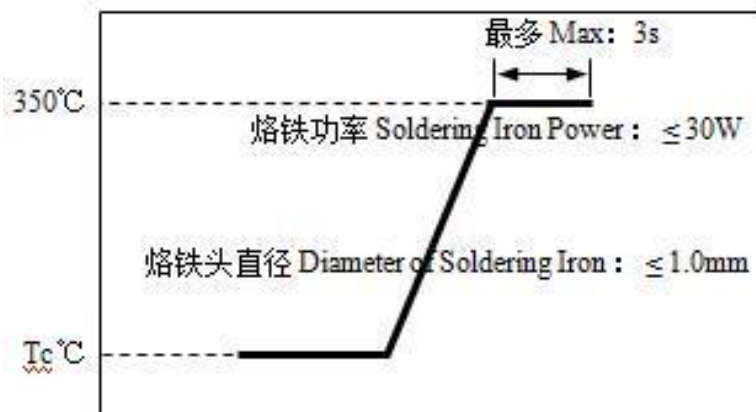



■ 手工焊 Iron Soldering Profile

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]

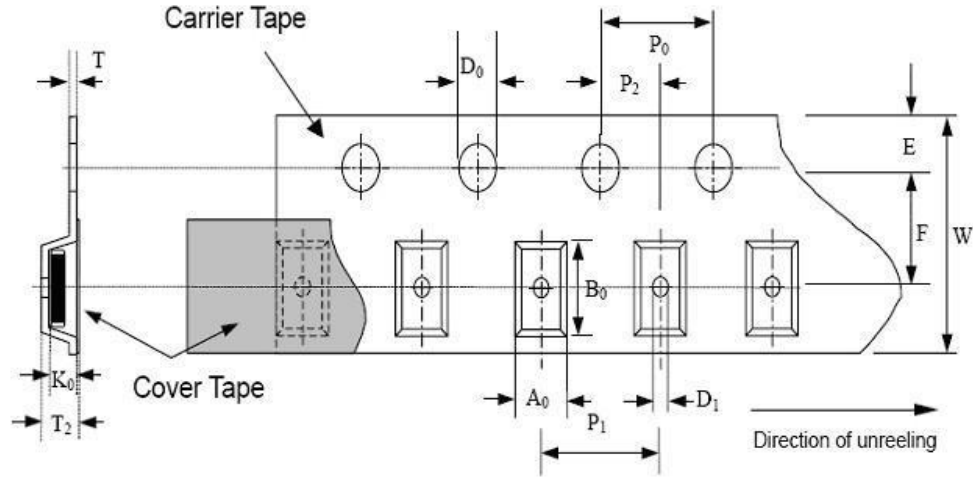
[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]



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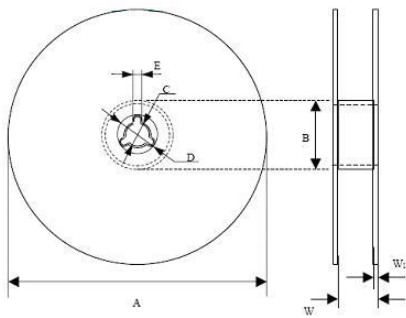
包装 Packing

■ 编带包装: Taping and packaging Specification



Type	A0	B0	K0	T	T2	D0	D1	P1	P2	P0	W	E	F
	±0.20	±0.20	±0.10	Max	Max	+0.05	±0.05	±0.10	±0.05	±0.1	±0.30	±0.10	±0.05
4032	8.4	10.8	3.85	0.3	5.50	1.55	1.55	12.00	2.00	4.00	24.0	1.75	11.5

■ 卷轴尺寸 Reel dimension



Type	A	B	C	D	E	W-W1	W1
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