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## **PART NO 型号：192NTC0010**

### **1 Type Code Designation 本体丝印代码**

**4032**      **N**      **3R0**      **M**      **3R0**  
①            ②            ③            ④            ⑤

- ① 4032: Chip Size 尺寸
- ② N: Negative Temperature Coefficient NTC 负温度系数
- ③ 3R0: 3.0Ω Rated Zero-Power Resistance 额定零功率电阻值
- ④ M: Accuracy Error 20% 精度误差
- ⑤ 3R0: 3.0A Max. Steady State Current 最大稳态电流

### **2 Electrical Characteristics 电气特性**

<b>Technical Data 技术数据</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
Rated Zero-Power Resistance 额定零功率电阻值	R25	3.0	Ω
Material Constant 材料常数	B25/85	2700	K
Max. Steady State Current 最大稳态电流	I <sub>max/25°C</sub>	3.0	A
Thermal Dissipation Constant 耗散系数	mW	≥11	°C
Thermal Time Constant 热时间常数		≤35	S
Operating Temperature Range 工作温度范围		-40 ~ 175	°C

### 3 INSPECTION 检验方法

#### 3-1. Lot Inspection 批量检验

Sampling with IEC410 / DIN ISO 2859-1 (GB/T2828.1-2012) ; Testing with SPEC.NO. :

EKT4032N3ROM3RO

抽样方法按 IEC410/ DIN ISO 2859-1 ( GB/T2828.1-2012 ); 试验方法按 SPEC.NO. :

EKT4032N3ROM3RO

Item 指标项目	IL	AQL	Item 指标项目	IL	AQL
Appearance 外观	II	0.65	Rated Zero-Power Resistance 额定零功率电阻 $R_N$	II	0.65
Soldering-Ability 可焊性	S-2	2.5	Max.Steady State Current 最大稳态电流 (A)	S-2	2.5

### 4. STORAGE CONDITIONS 存储环境条件:

4-1. Temperature 温度:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$

4-2. Humidity 湿度:  $\leq 70\% \text{ RH}$

4-3. Term 期限:  $\leq 6$  months (First-in/ First-out 先进先出)

4-4. Place 地点:

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

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:

- 1) Corrosive gas or deoxidizing gas. 腐蚀性或易氧化气体
- 2) Flammable and explosive gases. 易燃易爆气体
- 3) Oil, water and chemical liquid. 油、水和化学溶液
- 4) Under the sunlight. 太阳光下

4-5. Handling after seal open: After unpacking of the minimum package, reseal it promptly or store it inside a sealed container with a drying agent.

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。

### 5. WARNING 注意、警告 !

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:

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:

- 1) Exceeding  $I_{max}$ . 超过最大工作电流
- 2) Exceeding rated temperature range. 超过许可工作温度范围
- 3) Inferior thermal dissipation (Due to badly inferior thermal dissipation, some part of the components body will become overheated and then be damaged.) 散热不良 (由于散热不良, 本元件可能因部份过热而导致破坏。)

6. MECHANICAL CHARACTERISTICS 机械性能		
Item 指标项目	Specification 技术要求	Test Conditions & Methods 测试条件/方法
6-1. Solder-ability 可焊性	① 无外观损伤; No visible damage. ② 元件端电极的焊锡覆盖率不小于 95%。 Wetting shall exceed 95% coverage	① 焊接温度 Solder temperature: 255±5℃. ② 回流焊时间 Reflow soldering: 4±0.3s. ③ 焊锡成分 Solder: 96.5Sn/3.0Ag/0.5Cu. ④ 助焊剂 Flux: (重量比) 25%松香和 75%酒精 25% Resin and 75% ethanol in weight
6-2. Resistance To Soldering Heat 耐焊接热	No visible mechanical damage. 无可见损伤 $\Delta R/RN \leq 20\%$ $(\Delta R =  RN - RN' )$	The test shall be conducted according to IEC68-2-20 (GB2423.28) test Tb. Using the welding method, after the end electrode is coated with solder paste, the temperature is $255 \pm 5^\circ\text{C}$ , and it is maintained for $10 \pm 1$ second After 4-5h recovery at $25 \pm 2^\circ\text{C}$ , retest the rated zero power resistance $R_N$ '根据 IEC68-2-20 (GB2423.28) 试验 Tb 进行试验。 采用焊接法, 将端电极沾锡膏后, 温度为 $255 \pm 5^\circ\text{C}$ 、维持 $10 \pm 1$ 秒, 在 $25 \pm 2^\circ\text{C}$ 条件下恢复 4-5h 后, 复测额定零功率电阻 $R_N'$ 。
6-3. Strength of lead terminal 引出端强度	No break out 无损坏 $\Delta R/RN \leq 20\%$ $(\Delta R =  RN - RN' )$	Fasten the body and apply a force gradually to each lead until 10N and then keep for 10 sec, Hold body and apply a force to each lead until $90^\circ$ 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 $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $R_N'$ shall be measured. (See IEC68-2-21/GB2423.29 Ua / Ub) 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 $90^\circ$ , 拉力 5N, 持续 10 S; 扭转 $180^\circ$ , 拉力 5N, 持续 10 S。 在 $25 \pm 2^\circ\text{C}$ 条件下恢复 4~5 h 后, 复测额定零功率电阻 $R_N'$

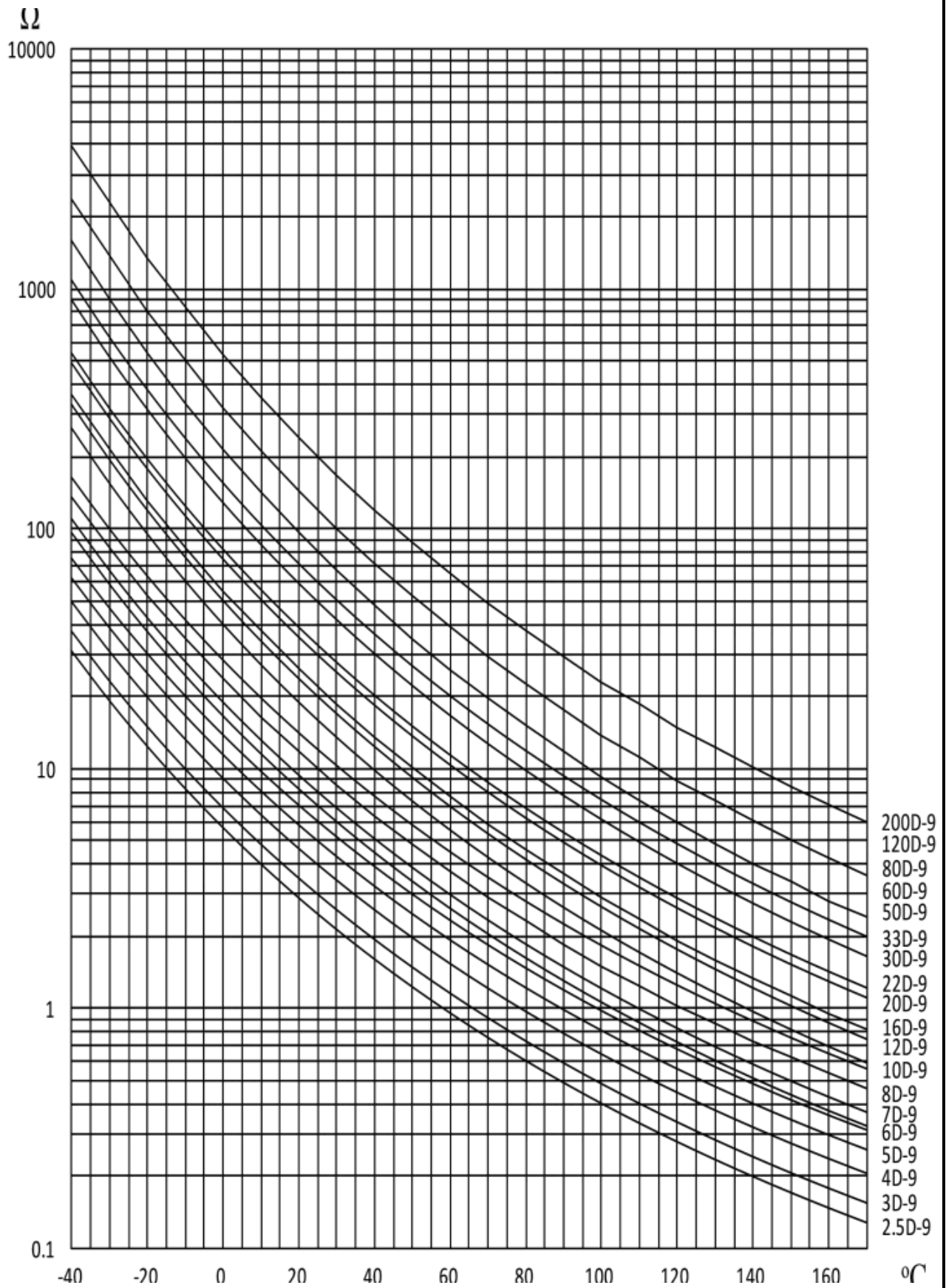
## 7.ELECTRICAL CHARACTERISTICS 电气性能测试

### 7-1.Test Conditions & Method 测试条件/方法

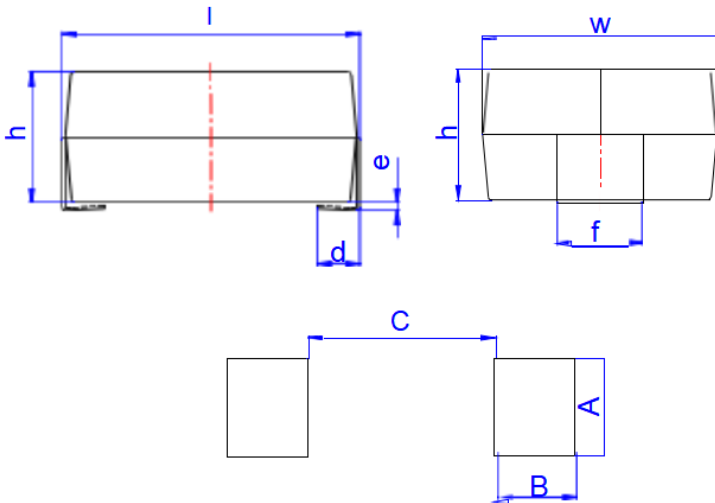
Items 指标项目	Spec. 技术要求	Test Conditions & Methods 测试条件/方法
7-1-1.Rated Zero- Power Resistance 额定零功率电阻 $R_N (\Omega)$	$3.0 \pm 20\%$	A mbient temp . Range: $25^\circ\text{C} \pm 2^\circ\text{C}(T_A)$ . Testing voltage: 1.5V <sub>DC</sub> After placing for 1~2 hours under $T_A$ , the resistance value shall be measured. 环境温度 $T_A$ : $25^\circ\text{C} \pm 2^\circ\text{C}$ 测试电压: 1.5V <sub>DC</sub> 在常温 $T_A$ 条件下, 放置 1~2 小时 后测得阻值 $R_N$ 。
7-1-2.Thermal Dissipation Constant 热耗散系数 ( mW/ $^\circ\text{C}$ )	$\geq 11$	The thermal dissipation constant( $\delta$ ) could be calculated by the ratio of a change in power dissipation( $\Delta P$ ) of the thermistor to a change in temperature( $\Delta T$ ) of the thermistor at a specified ambient temperature. 在特定的环境温度下, 热耗散系数( $\delta$ )为热敏电阻电功率消耗( $\Delta P$ )与本体温度变化量 ( $\Delta T$ )的比值。
7-1-3.Thermal Time Constant 热时间常数 T (s)	$\leq 35$	The time(T ) 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. 热时间常数(T)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。
7-1-4.Material Constant 材料常数 B (K)	$2700 \pm 10\%$ $B = T_1 T_2 / (T_2 - T_1) \times \ln(R_1 / R_2)$	$R_1, R_2$ is zero-power resistance at $T_1, T_2$ $R_1, R_2$ 分别为 $T_1, T_2$ 温度下的零功率电阻 $T_1 = 298.15\text{K}(25^\circ\text{C})$ $T_2 = 358.15\text{K}(85^\circ\text{C})$
7-1-5.Max.Steady State Current 最大稳态电流(A)	3.0A No visible mechanical damage. 无可见损伤 $\Delta R_N / R_N \leq 20\%$ $( \Delta R =   R_N - R_N'   )$	Environmental temperature 环境温度: $25^\circ\text{C} \pm 2^\circ\text{C}$ Testing Current 测试电流: 3.0A

8. Reliability Test 可靠性试验 (周期性检测项目)		
Items 指标项目	Spec. 技术要求	Test Conditions & Methods 测试条件/方法
*8-1. Temp. Cycling Testing 温度循环测试	No visible mechanical damage 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ( $\Delta R =   R_N - R_N'  $ )	Ta: $-40 \pm 3^\circ\text{C} / 30\text{min} \rightarrow 25 \pm 2^\circ\text{C} / 5\text{min}$ Tb: $150 \pm 3^\circ\text{C} / 30\text{min} \rightarrow 25 \pm 2^\circ\text{C} / 5\text{min}$ Cycles: 5 times After recovering 4~5 h under $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $R_N'$ shall be measured. 在 $T_a = -40 \pm 3^\circ\text{C}$ 和 $T_b = 150 \pm 3^\circ\text{C}$ 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 $R_N'$ 。
*8-2. Electrical Cycling Testing 电循环测试	No visible mechanical damage. 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ( $\Delta R =   R_N - R_N'  $ )	A mbient temp. Range: $25^\circ\text{C} \pm 2^\circ\text{C}$ . Cycles: 2,000 times On / Off: 5 s / 55 s Test Current: 4.0 A After recovering 4~5 h under $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $R_N'$ shall be measured. 环境温度: $25^\circ\text{C} \pm 2^\circ\text{C}$ . 循环次数: 2,000 次 通/断: 5 s / 55 s 测试电流: 4.0 A 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 $R_N'$ 。
*8-3. Load Life ( Endurance ) Testing 持久性测试	No visible mechanical damage. 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ( $\Delta R =   R_N - R_N'  $ )	A mbient temp. Range: $25^\circ\text{C} \pm 2^\circ\text{C}$ ; 4.0 A / 1,000 $\pm$ 24 h. After recovering 4~5 h under $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $R_N'$ shall be measured. 环境温度: $25^\circ\text{C} \pm 2^\circ\text{C}$ . 样品通过最大工作电流 4.0 A, 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 $R_N'$ 。
*8-3. Humidity Testing 耐湿性测试	No visible mechanical damage 无可见损伤 $\Delta R_N / R_N \leq 20\%$ ( $\Delta R =   R_N - R_N'  $ )	A mbient temp . range : $40^\circ\text{C} \pm 2^\circ\text{C}$ R.H.: $93 \pm 3\%$ , Energized time: 1000 $\pm$ 24 h After recovering 4~5 h under $25 \pm 2^\circ\text{C}$ , the rated zero power resistance value $R_N'$ shall be measured. 在温度 $40 \pm 2^\circ\text{C}$ , 相对湿度 $93 \pm 3\%$ 的环境中放置 1000 $\pm$ 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 $R_N'$ 。

9. R/T curve 阻温曲线 (EKT4032N3R0M3R0) 3D-9



## 10. Dimensional drawings 尺寸图 4032



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
l	10.20		11.00	0.402		0.433
w	7.90		8.50	0.311		0.335
h	3.75		4.50	0.173		0.197
d	1.20		1.80	0.047		0.071
e	0		0.30	0		0.012
f	2.70		3.30	0.106		0.130
A		3.50			0.138	
B		2.80			0.110	
C		6.50			0.256	

Recommended solder pad layout

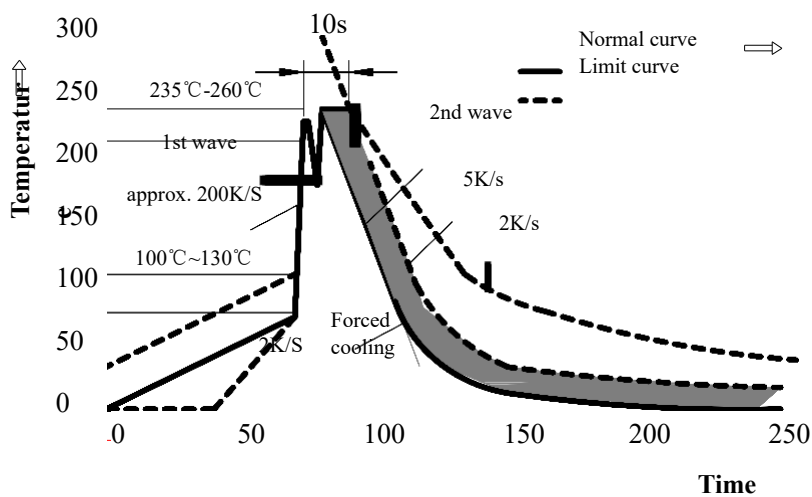
## 11. Soldering guidelines 焊接指南

The usage of mild, non-activated fluxes for soldering is recommended, as well as proper cleaning of the PCB. 建议使用温和的非活性焊剂进行焊接，并适当清洁PCB

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

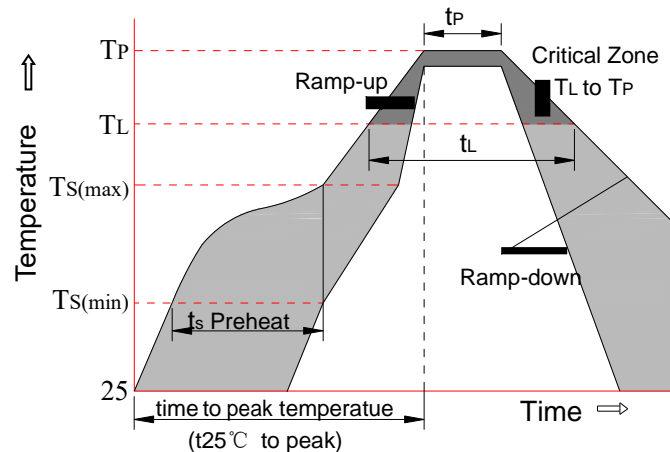
根据 JEDEC J-STD-020C，组件适用于回流焊

### 11.1 Wave soldering 波峰焊



Temperature characteristics at component terminal with dual-wave soldering

## 11.2 Reflow soldering 回流焊

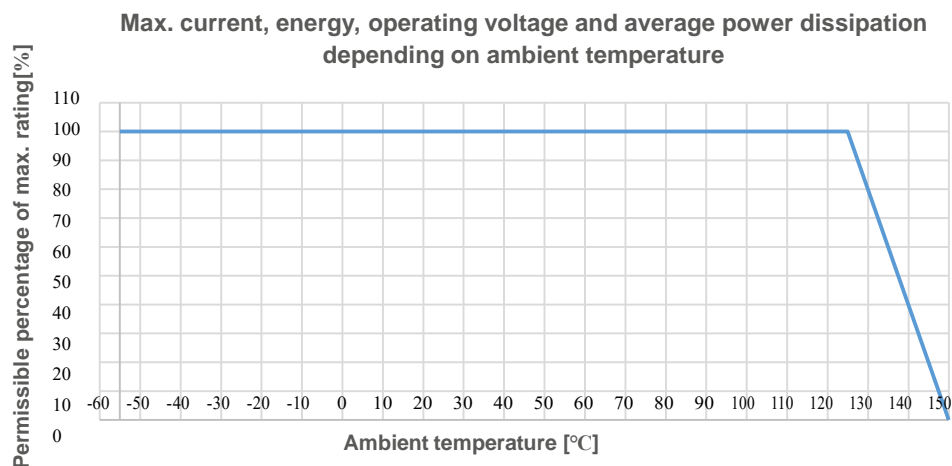


Profile feature 产品特性		Sn-Pb assembly 有铅焊接	Pb-Free assembly 无铅焊
Average ramp-up rate (T <sub>Smax</sub> to T <sub>p</sub> )		3°C/sec. Max	3°C/sec. Max
Preheat	-Temperature min. (T <sub>s</sub> (min))	+100°C	+150°C
	-Temperature max.(T <sub>s</sub> (max))	+150°C	+200°C
	-Time (t <sub>Smin</sub> to t <sub>Smax</sub> )	60-120 secs.	60-180 secs.
T <sub>s</sub> (max) to T <sub>L</sub> - Ramp-up Rate		3°C/sec. Max	3°C/sec. Max
Time maintained above	-Temperature min. (T <sub>L</sub> )	+183°C	+217°C
	-Time (t <sub>L</sub> )	60-150 secs.	60-150 secs.
Peak classification temperature (T <sub>p</sub> )		+220°C to +240°C	+240°C to +260°C
Time within 5°C of actual peak temperature (t <sub>p</sub> )		10 secs. to 30 secs.	20 secs. to 40 secs.
Ramp-down rate		6°C/sec. max.	6°C/sec. max.
Time 25°C to peak temperature		6 min. max.	8 min. max.

Notes: All temperature refer to topside of the package, measured on the package body surface

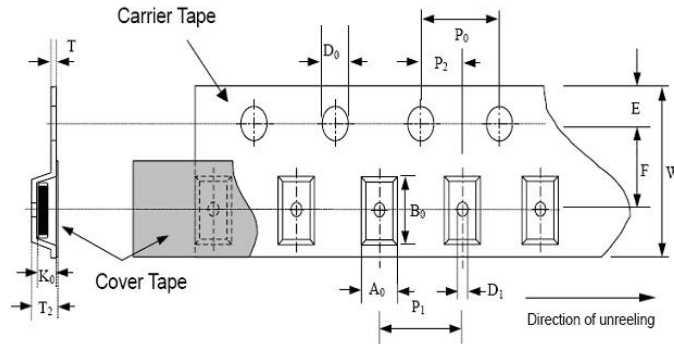
Maximum number of reflow cycles:所有温度均指包装顶部，在包装体表面测量最大回流循环次数

## 12 Temperature derating curve 温度下降曲线



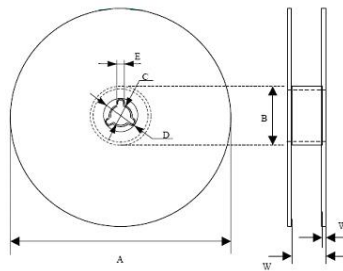


### 13.1 Packaging Specification 包装规格



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
2220	6.0	8.15	4.00	0.3	4.50	1.55	1.55	8.00	2.00	4.00	16.00	1.75	7.50
3220	7.0	8.7	4.50	0.3	5.20	1.55	1.55	12.00	2.00	4.00	16.00	1.75	7.50
4032	8.4	10.8	4.50	0.3	5.50	1.55	1.55	12.00	2.00	4.00	16.00	1.75	7.50

### 13.2 reel dimension 卷轴尺寸



type	A	B	C	D	E	W-W1	W <sub>1</sub>
2220-4032	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

1) Quantity of taping packing(pcs) 胶带包装每盘数量: 1000 只

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