丽智电子 LIZ Electronics

抗硫化厚膜贴片排阻承认书-CS 系列

Approval Specification for Anti-Sulfuration Thick Film Chip Array Resistors - Type CS

1. 范围（scope）：

1.1 适用于本公司所生产的无铅、无卤之抗硫化厚膜贴片排阻 CS 系列
This specification applies to Anti-Sulfuration thick film chip array resistors which meet requirements of Pb free and halogen free.

1.2 本公司的无铅产品指的贴片电阻端电极无铅，而存在于电阻层的玻璃中的符合 RoHS 豁免条款。
There no lead exists in terminal of resistor, and lead which exist in glass of resistor layer meets RoHS exemption.

1.3 符合 AEC-200 标准。
Comply with AEC-Q200 standard.

1.4 耐硫化满足 ASTM-B-809 要求
Comply with ASTM-B-809 standard.

2. 产品料号（part number）：

8P4R (0603) 1/10W 5% 1KΩ
CS034AJA0102G

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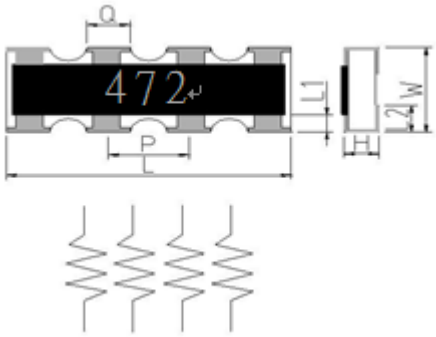
CS	034A	J	A	0102	G
类型(Type) CS: 抗硫化厚膜贴片排阻 (Anti-Sulfuration thick film chip array	尺寸(Size) 024A=8P4R(0402) 034A=8P4R(0603)	公差 Tolerance F=±1% G=±2% J=±5%	额定功率 Rated Power A= 1/10W F= 1/16W	阻值 Resistance value ±1% : 49R9=49.9Ω 1002=10KΩ ±2% , ±5% : 06R8=6.8Ω 0564=560KΩ	包装代码 Packing Code G= reel （卷装） V= bulk （散料） S= Double Standard Quantity (两倍卷盘标准包装量)

3. 尺寸（dimension）：

尺寸 dimension	CA024A / CA034A  单位（unit）: mm						
型别（Type）	L	W	H	L1	Q	P	L2
CS024A	2.00±0.10	1.00±0.10	0.40±0.05	0.18±0.10	0.33±0.10	0.50±0.10	0.26±0.10
CS034A	3.20±0.20	1.50±0.20	0.55±0.05	0.30±0.15	0.50±0.15	0.80±0.15	0.30±0.20

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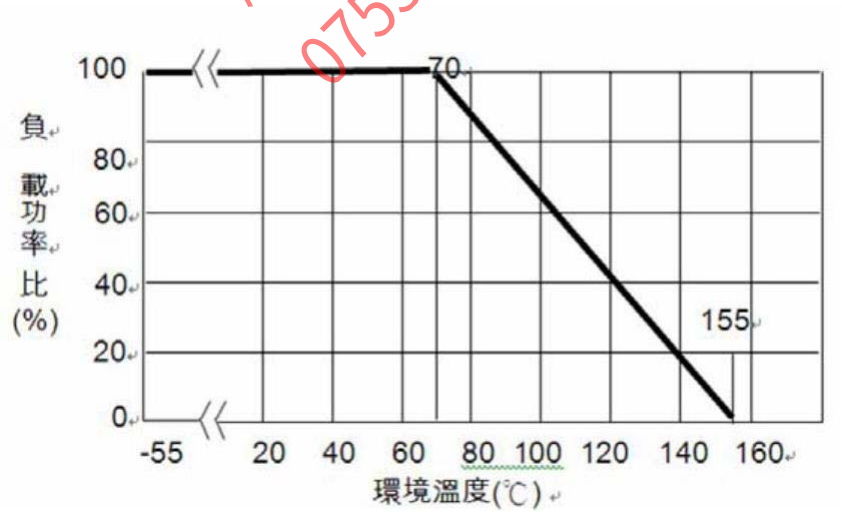
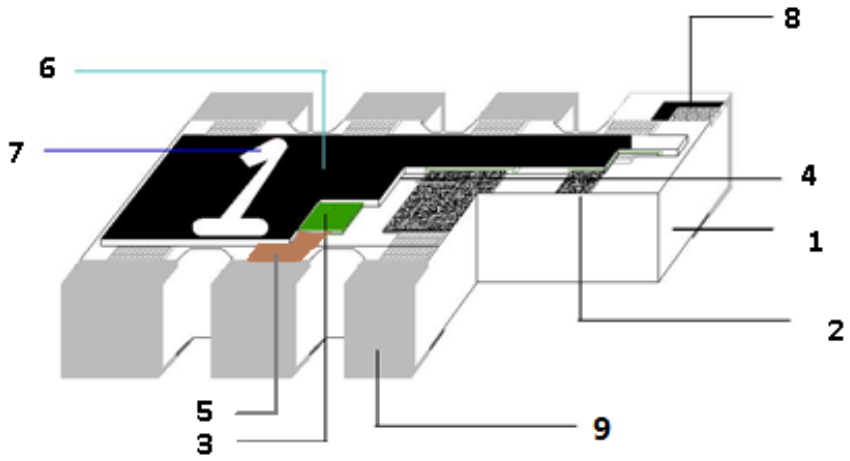
4. 功率衰减曲线（ Derating Curve）：



工作温度范围（Operating Temperature Range）： -55℃~+155℃;
储存条件（storage condition ）： 5～30℃, 30～75%RH.

5.电阻结构（Construction ）：



No.	结构 construction	主要材料 Major material
1	陶瓷基板 Ceramic substrate	三氧化二铝 Al_2O_3
2	银电极 Conductive layer	银 Ag
3	阻体层 Resistive layer	氧化钌+玻璃 RuO_2 + glass
4	内保护层 Inner protective layer	玻璃 Glass
5	C4 抗硫层 Anti-Sulfuration layer	抗硫膏 Anti-Sulfuration paste
6	外保护层 Outer Protective layer	环氧树脂 Epoxy
7	文字 Marking	环氧树脂 Epoxy
8	镍电极 Ni plating layer	镍 Ni
9	锡电极 Sn plating layer	雾锡 Matte Tin

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6. 阻值范围（resistance range）：

型别 Type	阻值范围 Resistance Range		
	1%	2%	5%
CS024A	1Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ
CS034A	1Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ

7. 电气特性（electrical characteristics）：

型别 Type	CS024A	CS034A
额定功率 Rated power	1/16W	1/10W
最大工作电压 Max Working Voltage	50V	50V
最大过负荷电压 Max Overload Voltage	100V	100V
绝缘耐压 Dielectric Withstanding Voltage	220V	430V
零欧姆电阻阻值 Resistance Value of Jumper	<50mΩ	<50mΩ
零欧姆额定电流 Rated Current of Jumper	1A	1A

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备注（remark）：

※ 额定电压计算公式（The rated voltage is calculated by the following formula）：

$E = \sqrt{RP}$

E：额定电压（Rated Voltage） (V)

P：额定功率（Rated Power ） (W)

R：电阻阻值（Resistance ） (ohm)

※ 如果计算出的电压超过此型别的最大工作电压，则此型别的最大工作电压为此电阻的额定电压。
In case the value calculated by the formula exceed the maximum working voltage as above table 7, the maximum working voltage shall be regarded as rated voltage.

8. 性能(Performance Specifications)

内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
温度系数 Temperature Coefficient	JIS C 5201 4.8	TCR=（R-R_0）/（t-t_0）R_0 ×10^6（ppm） R_0 电阻在室温下的阻值(resistance at room temperature) R 电阻在 125℃或-55℃下的阻值(resistance at 125℃ or -55℃) t_0室温(room temperature) t 测试温度（test temperature 125℃ or -55℃）	±200 PPM/℃
焊锡性 Solderability	J-STD-002	用于引脚型和表面贴装型元件，不需要电气测试. 放大倍数 50 倍。 测试条件: 表面贴装型: a)方法 B, 干热@155℃,4 小时,@235℃,3±0.5 秒 b)方法 B, 蒸煮 8 小时, @235℃,3±0.5 秒 For pin and surface-mount components, no electrical testing required. Magnification 50 times.Test conditions: Surface mount type: a) Method B: dry heat @155℃,4 hours, @235℃,3±0.5 seconds b) Method B: cook for 8 hours at @235℃,3±0.5 seconds	最少 95%面积上锡 (Min 95% coverage)
绝缘电阻 Insulation resistance	JIS C 5201 4.6	电阻本体上加载绝缘耐压 60±5 秒后，测量绝缘阻抗 Applied the dielectric withstanding voltage on the center of body for 60±5seconds. Then measure insulation resistance	>10GΩ
绝缘耐压 Dielectric withstanding voltage	JIS C 5201 4.7	电阻本体上加载绝缘耐压 60±5 秒。 Applied the dielectric withstanding voltage on the center of body for60±5seconds.	无击穿、飞弧及可见机械性损伤 No evidence of flashover, mechanical damage arcing or insulation breakdown

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短时间过负荷 Short-time overload	JIS C 5201 4.13	加载 2.5 倍的额定电压，时间 5 秒后测量试验前后的阻值变化率。 Applied 2.5 times of rated voltage for 5 second. Measure the variation of resistance. $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(1.00%+0.05Ω) Max
抗焊锡热 Resistance to soldering heat	MIL-STD-202 METHOD 210	锡炉温度 260±5℃,时间 10±0.5 秒，样品不进行预热。注意:单一波峰焊-表面贴装元件按程序，浸入器件本体的 1.5mm 的深度. Soldering bath at 260±5℃ for 10±0.5sec. No pre-heat of samples. Note: Single Wave Solder-Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body. $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(1.00%+0.05Ω) Max
端子弯曲 Board Flex	AEC-Q200-005	焊接在 PCB 板上，弯板深度 1mm，保持 20s Reflow solder the samples on PCB，bending plate depth 1mm,Keep 20s $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(1.00%+0.05Ω) Max
负荷寿命 Operational life	MIL-STD-202 METHOD 108	恒定温度 125℃加载额定功率，ON TIME:1.5H，OFF TIME:0.5H，额定电压 1000 $^{+24}/_{-0}$小时 Load rated power, ON TIME:1.5H, OFF TIME:0.5H, rated voltage 1000 +24/-0 hours $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(2.00%+0.05Ω) Max

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内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
耐湿特性 Biased Humidity	MIL-STD-202 METHOD 103	加载 10%额定功率，85℃/85%RH, 持续通电 1000H,试验结束 24±4 小时后进行测试 1000 hours 85℃/85%RH. Note: Specified conditions: 10% of operating power. Measurement at 24±4 hours after test conclusion. $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(2.00%+0.05Ω) Max
温度循环 Temperature cycling	JESD22 METHOD JA -104	-55℃~+ 155℃，循环 1000 次，在每一个极限温度持续时间不超过 30 分钟，且温度转换时间不超过 1 分钟，试验结束 24±4 小时后进行测试. 1000 Cycles (-55℃ to +155℃) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1min. maximum transition time. $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(2.0%+0.05Ω) Max
温湿循环 Moisture resistance	MIL-STD-202 METHOD 106	25 ° C~65 ° C,90~100%RH, 2.5 小时； 65 ° C 90~100%RH, 3小时; 65°C~25°C,80~100%RH,2.5小时,10个循环,试验结束24±4小时后进行测试. 25 ° C~65 ° C,90~100%RH, 2.5H; 65 ° C 90~100%RH, 3H; 65°C~25°C 80~100%RH, 2.5H, 10 cycles, Measurement at 24±4 hours after test conclusion. $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(2.00%+0.05Ω) Max

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内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
高温储存 High Temperature Exposure(Storage)	MIL-STD-202 METHOD 108	155℃下放置 1000h,不加载功率，试验结束24±4小时后进行测试. 1000 hrs. @ T=155℃. Unpowered. Measurement at 24±4 hours after test conclusion $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(1.00%+0.05Ω) Max
ESD 试验 ESD test	AEC-Q200-002	加载规定静电电压2次/间隔1秒， CS024A规格:0.5KV, CS034A规格:1KV, CS024A:0.5KV, CS024A: 1.0KV, 2times/1s $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(3.0%+0.05Ω) Max
抗硫化試驗 Sulfuration test	ASTM-B-809-95	方法一：温度105℃，湿热蒸硫粉试验（加饱和硝酸钾）750hrs 方法二：切削油:硫粉=96.5:3.5，温度105℃，100H; 预处理：前后先经历3次回流焊+100次温冲 Method 1: steam sulfur powder test (with saturated potassium nitrate) at 105℃ with humidity and heat (750hrs) Method 2: cutting oil: sulfur powder =96.5:3.5, temperature 105℃, 100H; Pretreatment: before and after three reflow soldering +100 thermal shock $\Delta R\% = \frac{R_2-R_1}{R_1} *100$------（%） R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test)	±(3.0% +0.05Ω) Max

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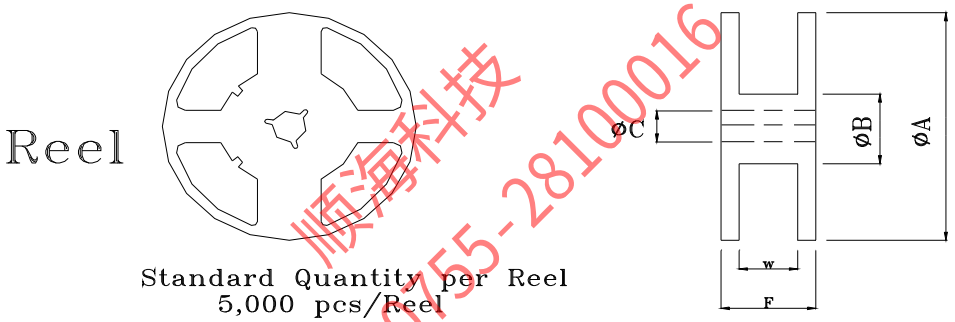
9. 包装规格（Tapping Specification）

9.1 卷盘尺寸（reel dimension）

尺寸 Dimensions		A	B	C	F	W
CS024A CS034A	mm	178±2.0	60.0±1.0	13.5±0.5	11.4±0.1	9.00±0.3
	Inch	7.008±0.079	2.362±0.039	0.531±0.020	0.449±0.039	0.354±0.012

※ 备注（Remark）: (1)CS024A 每卷 10,000 pcs
CS024A Quantity per Reel 10,000 pcs/Reel
(2)CS034A 每卷 5,000 pcs
CS034A Quantity per Reel 5,000 pcs/Reel



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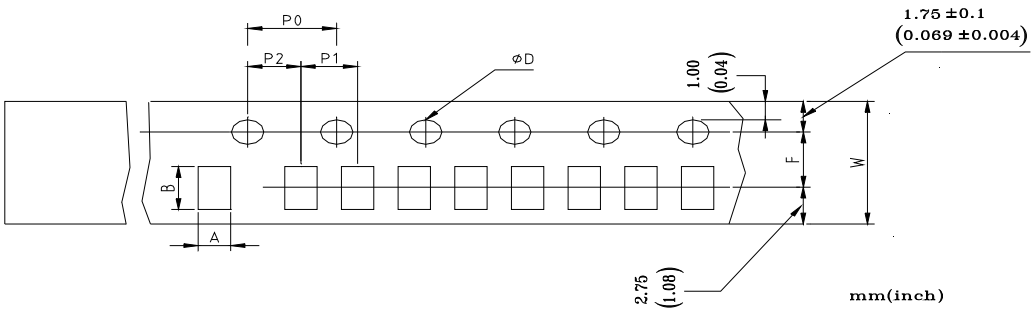
9.2 包装尺寸（packing dimension）



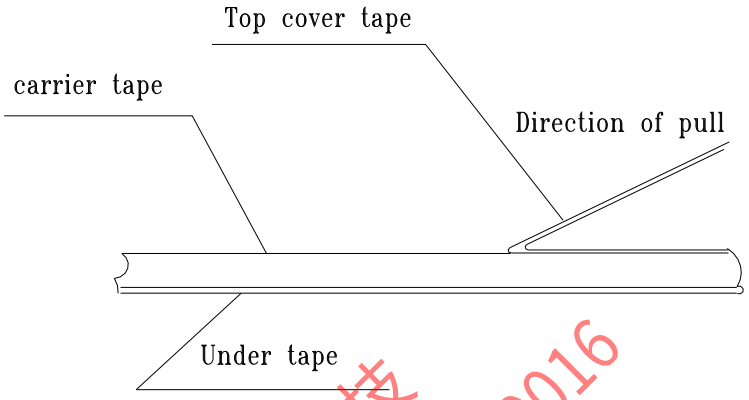
Unit: mm

Dimensions	A	B	D	F	P0	P1	P2	W
CS024A	1.20±0.10	2.20±0.10	$1.50^{+0.1}_{0.0}$	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	8.00±0.20
CS034A	1.90±0.15	3.40±0.20	$1.50^{+0.1}_{0.0}$	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	8.00±0.20

10.上胶带剥离力测试（Peel force of top cover tape）

上胶带以 200mm/分钟的速度，沿 165～180 度角的方向进行剥离，如下图所示。纸带的剥离力范围为 10g～70g; 载带的剥离力范围为 15～80g.

The top cover tape is pulled at a speed of 200 mm/min with the angle between the tape during peel and the direction of unreeling maintained at 165 to 180 degree as following picture. The peel force of paper carrier tape shall be 0.1N to 0.7N(10 to 70 g), the peel force of plastic carrier tape shall be 0.15N to 0.80N (15 to 80 g)



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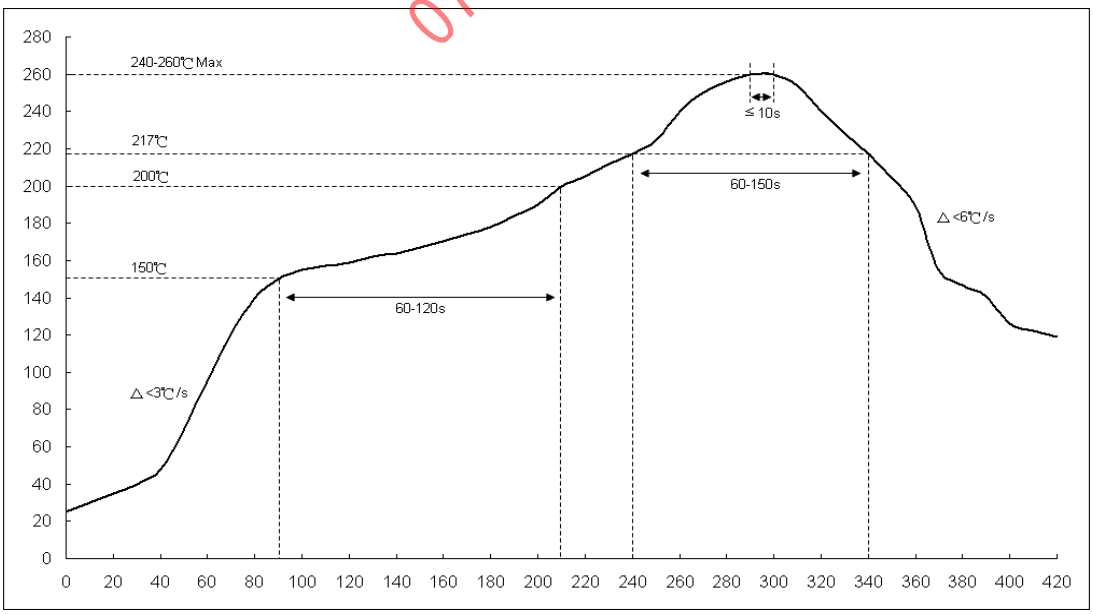
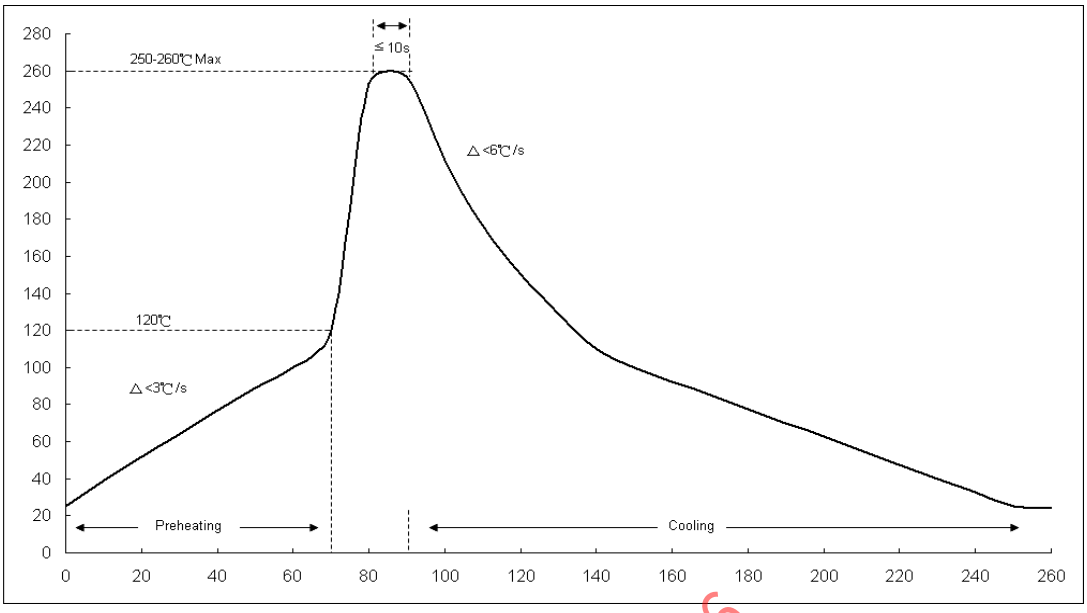
11. 焊接 （soldering）

11.1 建议回流焊曲线（Recommend reflow soldering profile）



11.2 建议波峰焊曲线（Recommend wave soldering profile）



11.3 手工焊温度（hand soldering temperature）

烙鐵温度 350±10℃ 3 秒之內，避免烙铁接触电阻本体

The iron temperature is 350±10℃, hand soldering time less than 3S. Avoid solder iron tip direct touch the components body

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