

规格书

SPECIFICATION

丽智电子（南通）有限公司

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平面电极厚膜贴片排阻规格书-CA-F/V

Approval Specification for Flat Type Thick Film Chip Array Resistors - Type **CA-F/V**

1. 范围 (scope)

1.1 适用于本公司所生产的无铅、无卤之平面电极厚膜贴片排阻。

This specification applies to flat type 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.

2. 产品料号 (part number)

012F 1/32W 5% 15Ω

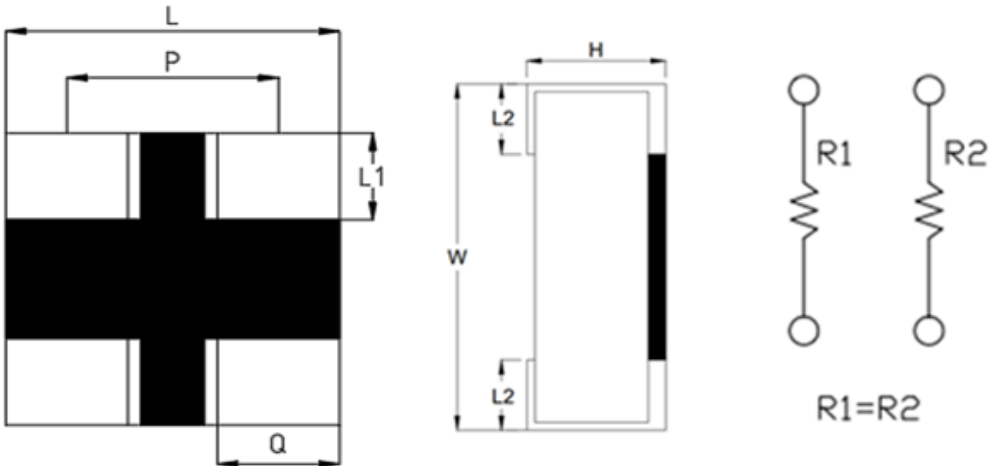
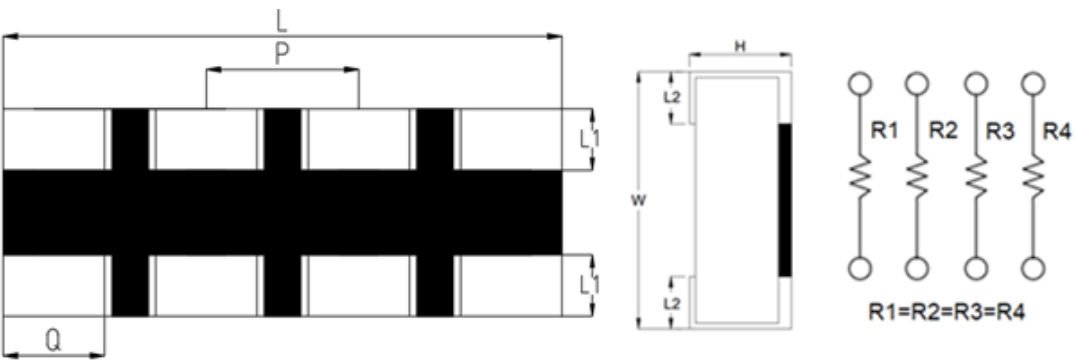
CA012FJL0150G

CA	012F	J	L	0150	G	
↓	↓	↓	↓	↓	↓	↓
类型(Type)	尺寸(Size)	公差	额定功率	阻值	包装代码	区别码
CA:厚膜贴片排阻 (Thick Film Chip Array Resistors)	012F= (0201*2) 014F= (0201*4) 012V= (0201*2) 014V= (0201*4) F=平面电极正包 V=平面电极反包	Tolerance F=±1% J=±5%	Rated Power L=1/32W	Resistance value ±1% : 49R9=49.9Ω 1002=10KΩ ±2%, ±5% : 06R8=6.8Ω 0564=560KΩ	Packing Code G=成品, 7 inch reel 常规包装量 H=成品, 10 inch reel 两倍包装量 Z=成品, 15K包装量 S=成品, 20K包装量 U=成品, 50K包装 V=bulk (散料)	Distinction Code 空码 = 无指定 - “X “= 特别指定, 不同字母代表不同指定

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3. 尺寸 (Dimension)

尺寸 Dimension							
							
	单位 (unit) : mm						
Item Type	L	W	H	L1	L2	P	Q
CA012F/V	0.8±0.10	0.6±0.10	0.23±0.10	0.20±0.10	0.15±0.10	0.50±0.10	0.20±0.10
CA014F/V	1.4±0.10	0.6±0.10	0.23±0.10	0.20±0.10	0.15±0.10	0.40±0.10	0.20±0.10

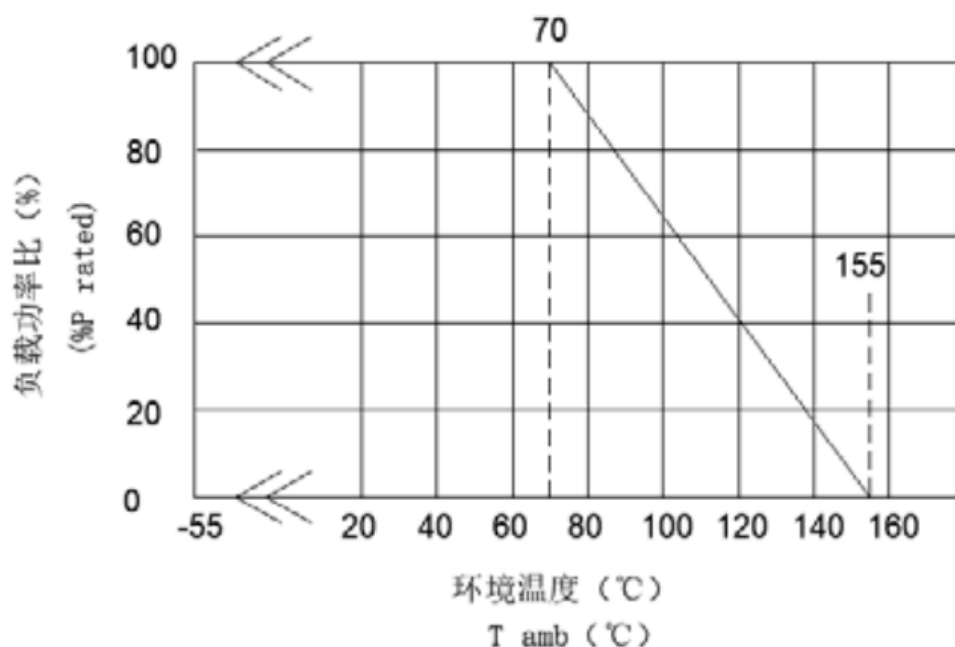
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4. 功率衰减曲线 (Derating Curve)

电阻的额定功率基于环境温度-55℃ 到 70℃, 周围温度若超遇 70℃至 155℃之间, 功率可照下图曲线予以修定之。

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55℃ to 70℃. For temperature in excess of 70℃, the load shall be derated as shown in figure.



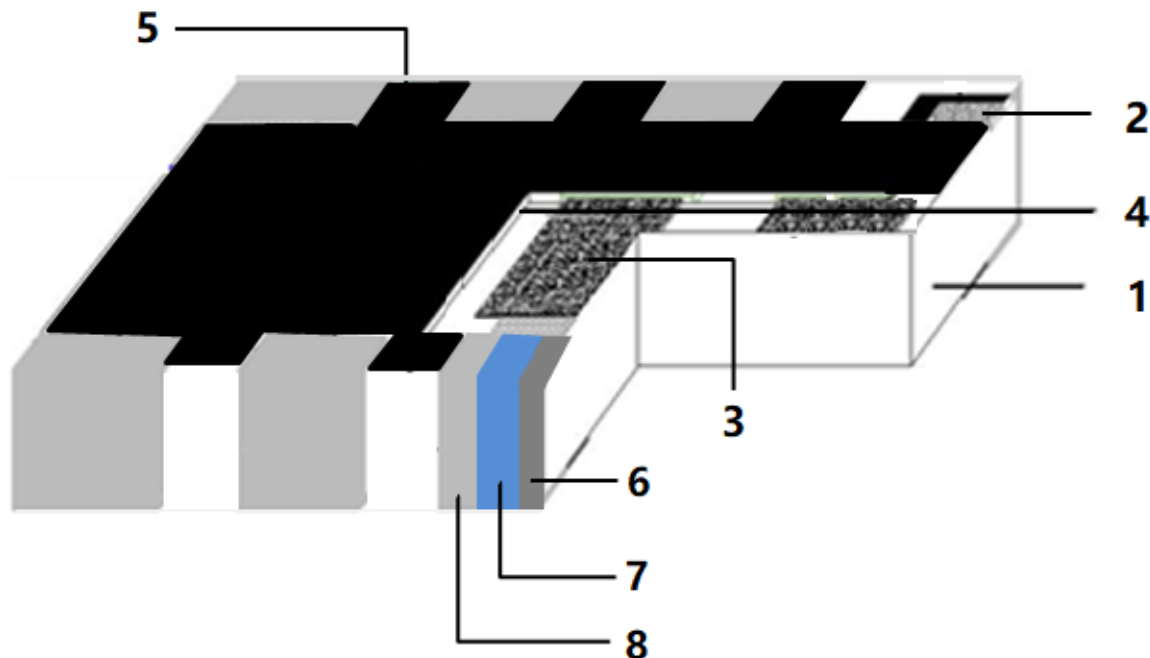
工作温度范围 (Operating Temperature Range) : -55℃~+155℃;

储存条件及期限 (storage condition or Data) : 25±5℃, 60±20%RH; 有效期 2 年。

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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	内电极 Inner Conductive layer	银 Ag
3	阻体层 Resistive layer	氧化钌+玻璃 $\text{RuO}_2 + \text{glass}$
4	内保护层 Inner protective layer	玻璃 Glass
5	外保护层 Outer Protective layer	环氧树脂 Epoxy
6	侧面内部电极 Terminal inner electrode	镍铬合金 Ni-Cr
7	镍电极 Ni plating layer	镍 Ni
8	锡电极 Sn plating layer	锡 Sn

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6. 阻值范围 (resistance range)

Type \ Item	阻值范围 Resistance Range	
	1%	5%
CA012F/V	10Ω ~ 1MΩ	10Ω ~ 1MΩ
CA014F/V	10Ω ~ 1MΩ	10Ω ~ 1MΩ

7. 电气特性 (electrical characteristics)

Item \ Type	CA012F/V	CA014F/V
额定功率 Rated power	1/32W	1/32W
最大工作电压 Max Working Voltage	12.5V	12.5V
最大过负荷电压 Max Overload Voltage	25V	25V

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 (Ω)

※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.

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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 of Resistance (T.C.R.)□	JIS-C5201-1 4.8	$TCR = \frac{R_2 - R_1}{(t_2 - t_1) R_1} \times 10^6 \text{ (ppm/}^\circ\text{C)}$ R_1: 室温下阻值 resistance at room temperature R_2: 125°C或-55°C下的阻值 Resistance at 125°C or -55°C t_1: 室温(room temperature) t_2: 125°C or -55°C	$10\Omega \leq R \leq 100\Omega$: +400~-200 $100\Omega < R \leq 1M\Omega$: ±250
短时间过负荷 Short-time overload	JIS-C5201-1 4.13	施加 2.5 倍额定电压或最大过载电压(以最小者为准)5 秒 Apply 2.5 times of rated voltage or maximum overload voltage (whichever is the smallest) for 5 seconds	1%: ±(1.0%+0.05Ω) 5%: ±(2.0%+0.10Ω)
绝缘电阻 Insulation resistance	JIS-C5201-1 4.6 IEC-60115-1 4.6	将电阻置于治具上, 在正负极施加 100 VDC 一分钟后 测量电极与保护层及电极与基板(底材)间之绝缘电阻值 Place the resistors on the fixture and apply 100 VDC to the positive and negative electrodes for one minute. Measure the insulation resistance between the electrode and the protective layer, as well as between the electrode and the substrate	≥ 10GΩ
抗焊锡热 Resistance to Soldering Heat	JIS-C5201-1 4.18 IEC-60115-1 4.18	浸于 260±5°C 锡炉中 10±0.5 秒, 260±5°C for 10±0.5 seconds	1%: ±(0.5%+0.05Ω) 5%: ±(1.0%+0.05Ω)
耐溶剂 Resistance to Solvent	JIS-C5201-1 4.29	将被测电阻器浸入 20~25°C 的异丙醇中 60 秒。室温下放置 48 小时后量测阻值变化。 The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secs. Then the resistor is left in the room for 48 hrs.	1%: ±(0.5%+0.05Ω) 5%: ±(0.5%+0.05Ω)

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内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
Leaching 溶蚀	JIS-C5201-1 4.18 IEC-60068-2-58 8.2.1	浸于 $260 \pm 5^{\circ}\text{C}$ 锡炉中 30+1/-0 秒, 取出置于显微镜下观察焊锡面积。 Dip the resistance in a tin furnace at $260 \pm 5^{\circ}\text{C}$ for 30+1/-0 seconds, then take it out and observe the solder area under a microscope;	吃锡面积 > 95% > 95% coverage
端子弯曲 Bending Strength	JIS-C5201-1 4.33 IEC-60115-1 4.33	电阻焊接在测试板上进行弯折, 弯折保持时间 5 秒, 弯曲 3 mm; 量测试前后阻值变化率 Specimen shall be mounted on test board, then bend the board and maintained for 5s. the distance of bending is 3 mm. Measure the variation of resistance.	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.05\Omega)$
冷热冲击 Rapid Change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	将电阻置入冷热冲击机中, 温度为 -55°C 到 $+155^{\circ}\text{C}$, 共计循环 5 次后取出, 静置 1hr 再量测阻值变化率。 Put the resistor in a cold and hot shock machine at a temperature of -55°C to $+155^{\circ}\text{C}$, cycle for a total of 5 times, then remove it and let it stand for 1 hour before measuring the resistance change rate.	1%: $\pm(0.5\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.10\Omega)$
耐湿负荷 Loading Life in Moisture	JIS-C5201-1 4.24 IEC-60115-1 4.24	电阻放入恒温恒湿箱, 温度 $40 \pm 2^{\circ}\text{C}$, 湿度 90~95%RH; 通额定电压 1.5 小时, 断电 0.5 小时; 重复通断电 1000 $^{+48}/_{-0}$ 小时. 量测试前后阻值变化率。 Put the specimen in a chamber at $40 \pm 2^{\circ}\text{C}$ temperature and 90~95% relative humidity, then applied rated voltage for 1.5H and rested for 0.5H repeatedly till total test time is 1000 $^{+48}/_{-0}$. Measure the variation of resistance.	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(2.0\%+0.05\Omega)$

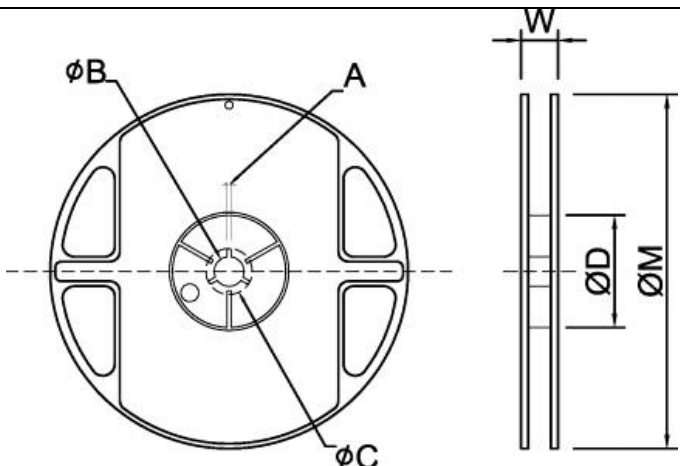
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内容 Item	测试方法 Test Method	测试条件 Test Conditions	规格 Specification
负荷寿命 Load life	JIS-C5201-1 4.25 IEC-60115-1 4.25.1	电阻放入恒温箱中, 温度 $70\pm 2^{\circ}\text{C}$, 通额定电压 1.5 小时, 断电 0.5 小时; 重复通断电 1000 ^{+24/-0} 小时. 量测试前后阻值变化率. Put the specimen in a chamber at $70\pm 2^{\circ}\text{C}$ temperature, ON TIME:1.5H, OFF TIME:0.5H, and applied rated voltage for 1000 ^{+24/-0} H. Measure the variation of resistance.	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.10\Omega)$

9. 包装规格 (Tapping Specification)

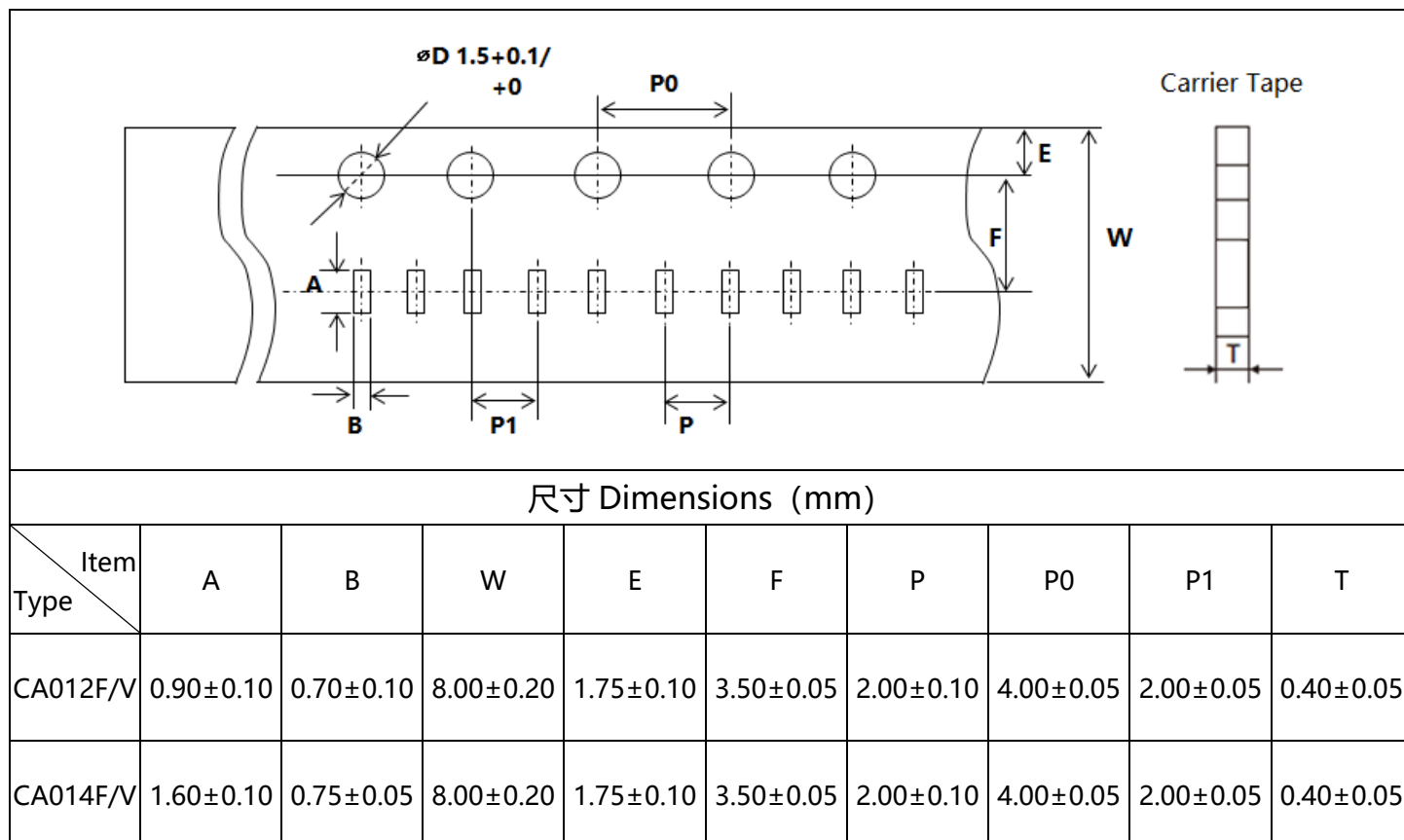
9.1 卷盘尺寸 (reel dimension)

								
TYPE	SIZE		A	φB	φC	φD	W	φM
CA012F/V CA014F/V	7"	10K/Reel	2.0 ± 0.5	13.5 ± 1.0	21 ± 1.0	60 ± 1.0	11.5 ± 2.0	178 ± 2.0

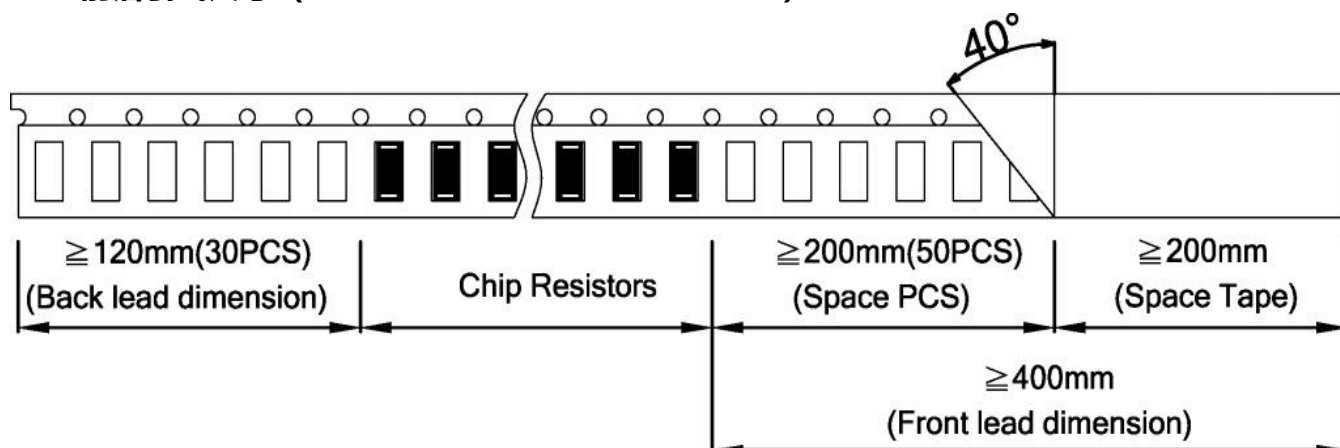
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9.2 包装尺寸 (packing dimension)



9.3 前后引线尺寸 (Front & Back Lead Dimension)



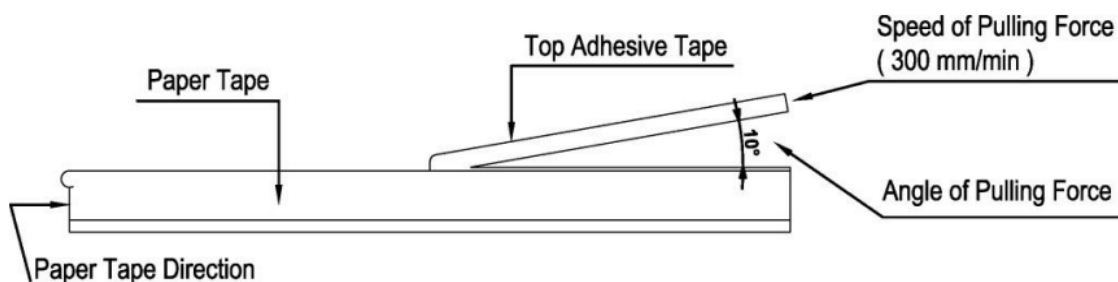
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10. 上胶带剥离力测试 (Peel force of top cover tape)

上胶带剥离强度: 0.1N~0.7N(10g~70g);

Top Adhesive Peel Off Strength: 0.1N~0.7N(10g~70g);

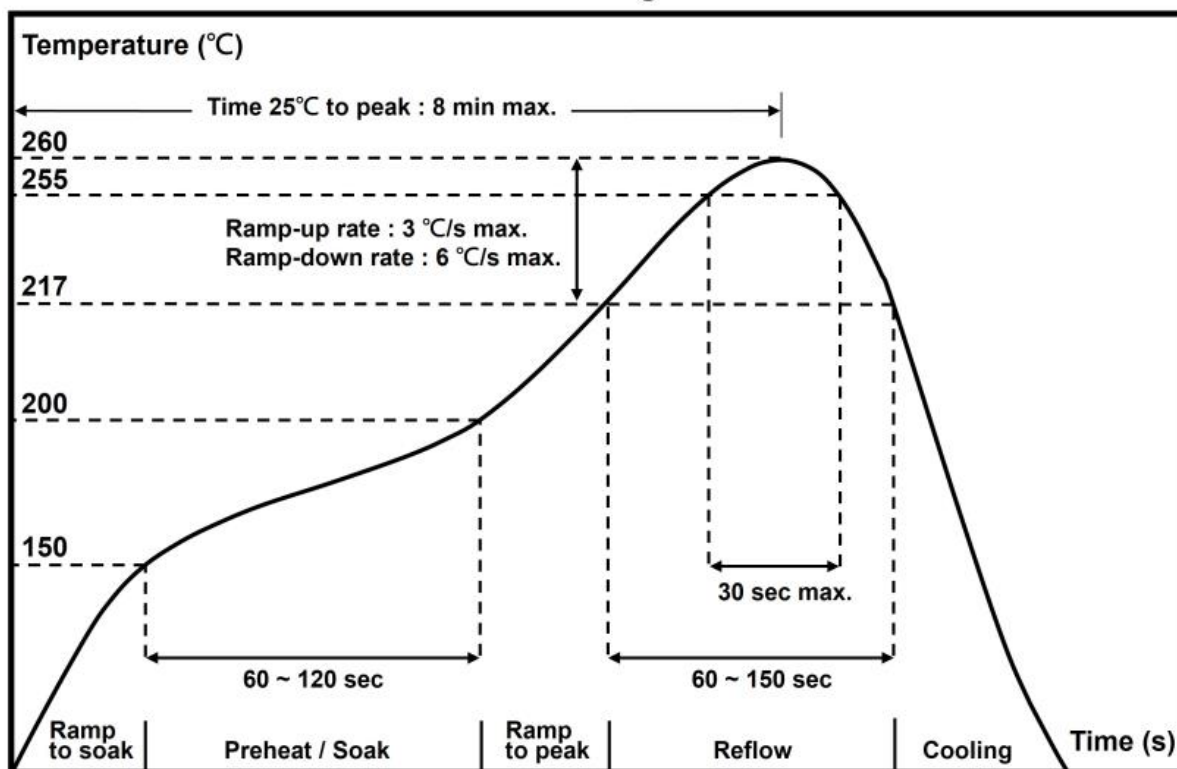


11. 焊接方法 (soldering Method)

11.1 建议回流焊曲线

Lead-free IR Reflow Soldering Profile

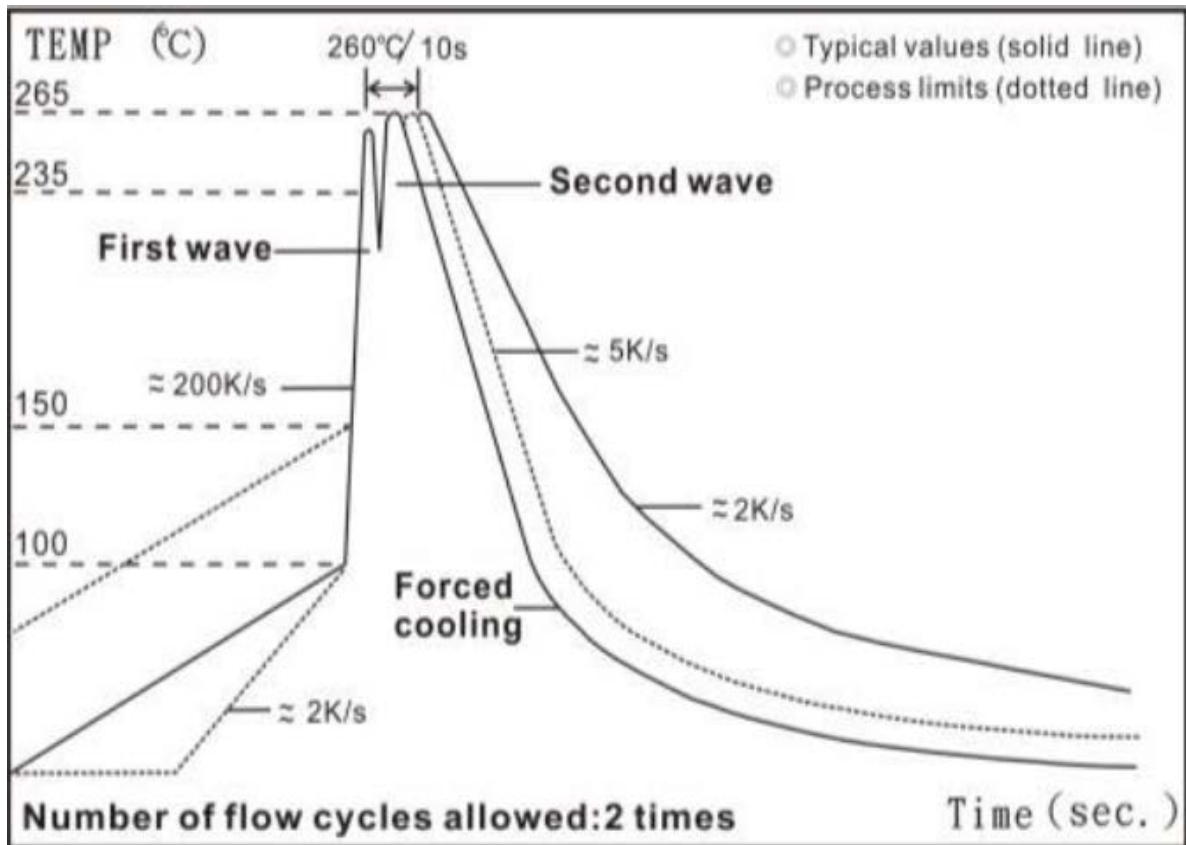
Reflow Soldering Profile



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11.2 建议波峰焊曲线



11.3 烙铁焊锡方法

350°C 3~5 秒之内。

Manual soldering in 350°C within 3~5 sec.

※备注 (remark) :

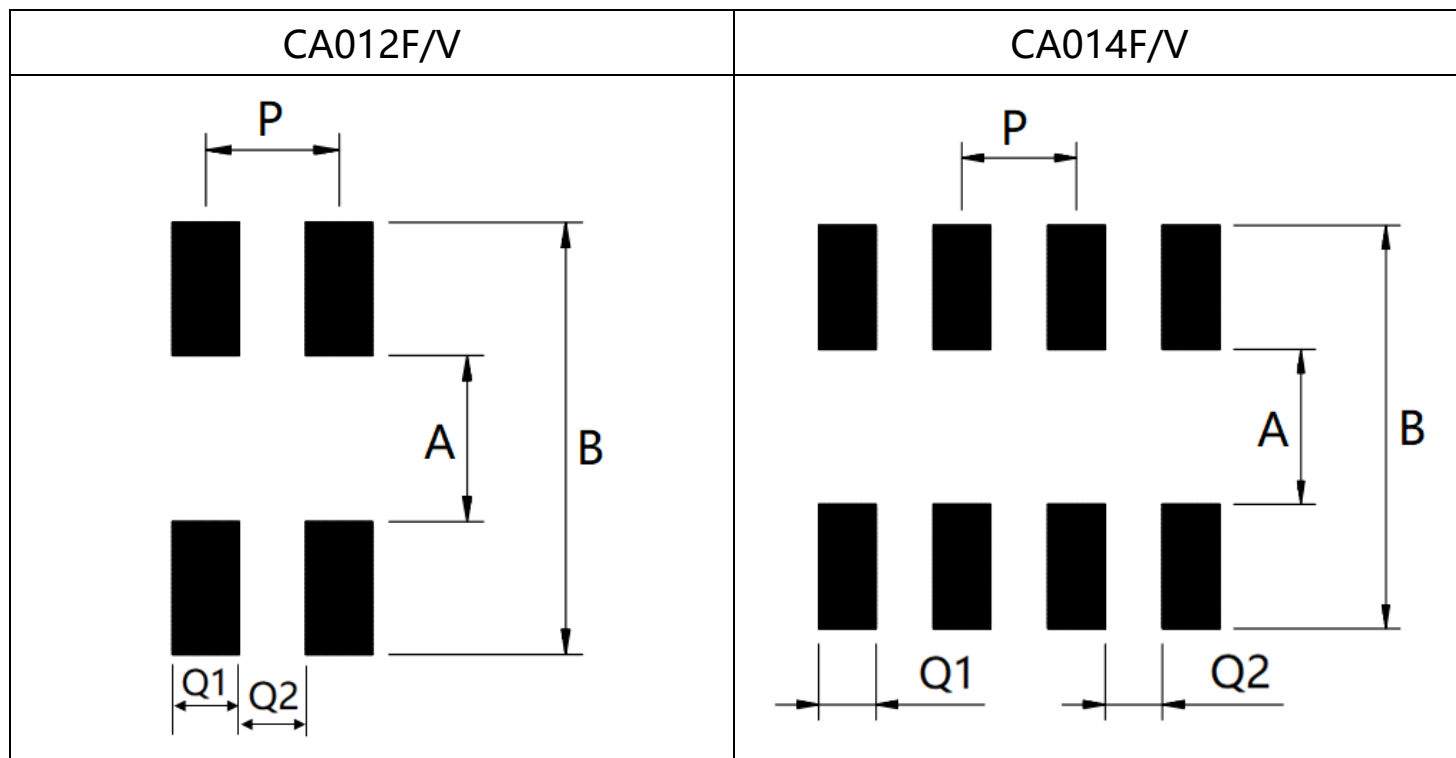
如果焊锡温度超过建议的温度，产品可能无法满足性能要求

If the soldering temperature exceeds the recommended temperature, the product may not meet the performance requirements

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12. 焊盘尺寸 SOLDERING PAD (For Reflow Soldering)



Type \ Item	尺寸 Dimensions (mm)				
	A	B	P	Q1	Q2
CA012F/V	0.28	0.90	0.50	0.30	0.20
CA014F/V	0.28	0.90	0.40	0.30	0.20