

承 认 书

SPECIFICATION FOR APPROVAL

Commodity 产品:

- ❖ Production Series 产品系列: X2
- ❖ Operation Temperature 工作温度: -40℃~110℃
- ❖ Storage Temperature 储存温度: 常温≤35℃ 湿度 75%以下
- ❖ Package color 外封颜色: 黄色
- ❖ Certificate : It can be met CQC/VDE
and UL
- ❖ RoHS & REACH-compliant 符合 RoHS 和 REACH 要求

This is a preliminary specification intended for design purposes and subject to change without prior notice.

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X2 系列承认书

N O	客户料号	规 格	料 号
1		P/N: YZPST-X2 334K310VAC P=15mm W*H*T=18*14.5*8.4mm	C62-Q3334K-D48T35
2		以下空白	
3			
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PRODUCT SPECIFICATIONS

产品规格

ISSUED DATE: 2025-08-12

签发日期: 2025-08-12

DESCRIPTIONS : Metallized polypropylene film interference suppression capacitor (class X2)

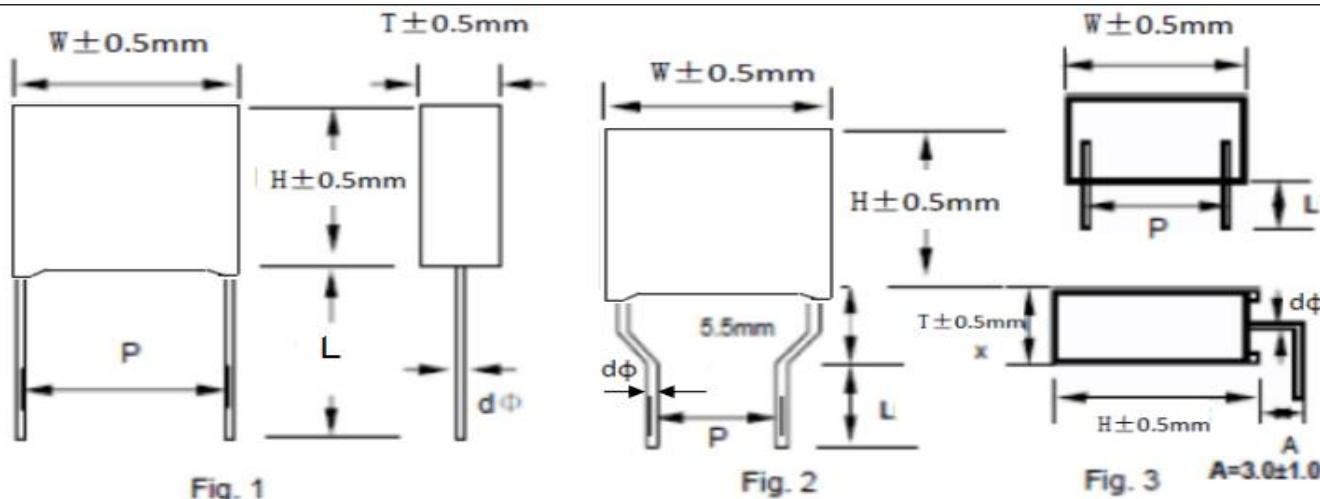
描述: 金属化聚丙烯薄膜抗干扰电容器 (X2类)

TYPE:X2 SERIES

系列: X2系列

Operating temperature : -40°C~110°C

操作温度范围: -40°C~110°C



PRODUCT DIMENSIONS :

产品尺寸(mm)

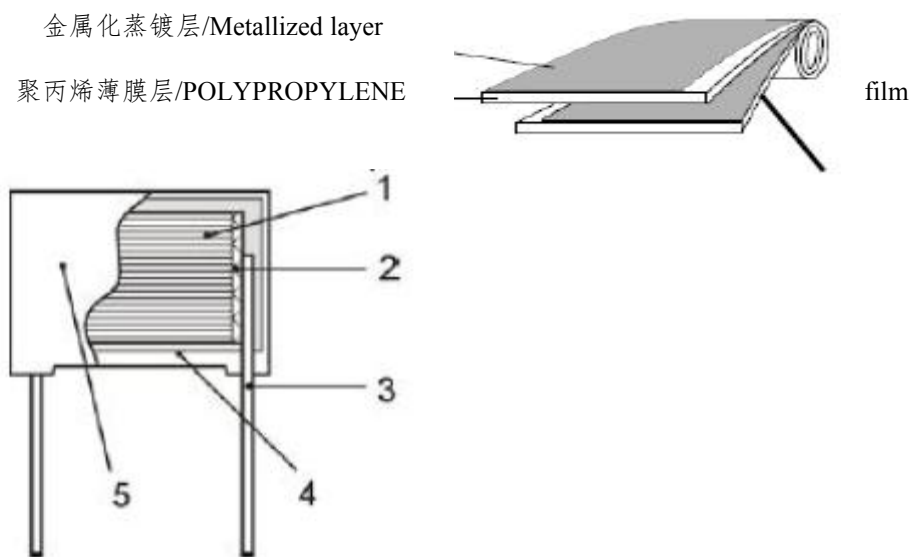
CUSTOMER'S PART NO. 客户料号	CAP 容量 (uF)	ToI. 误差 ± %	R.V. 电压 VAC	T.V. 耐压 VDC	W 长度 ±1.0	H 高度 ±1.0	T 厚度 ±1.0	P 脚距 ±1.0	d 线径 ±0.05	L0 ±2	Fig.	HONGFARAD Cap PART NO. 我司料号
	0.33	10	310	1333	18.0	14.5	8.4	15	0.8	18	1	C62-Q3334K-D48T35

X2 SAFETY CAPACITORS

抑制电源电磁干扰用金属化聚丙烯薄膜安规电容器X2系列

1. 结构及材料(Construction and Component)

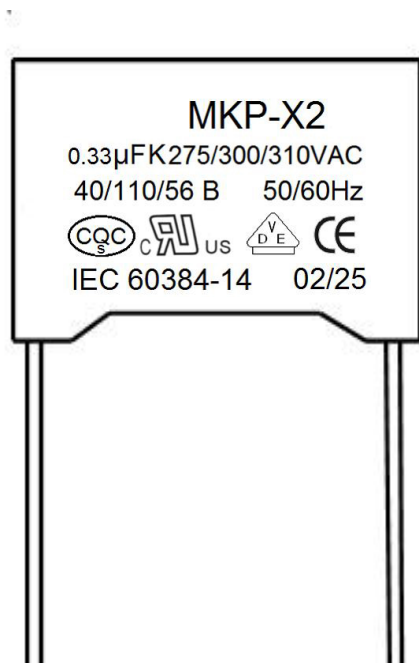
a 产品结构图&印字(Construction&Mark)



b 材料构成清单:(Component List)

项次 Item	构成部位 Component	材料名称/材质 Material	环保要求 RoHS Requirements
1	Element 素子	金属化聚丙烯薄膜 Metallized OPP film	符合RoHS要求 Compliant with RoHS
2	喷金层 Metal spray layer	锌线锡锌合金线 Zn and Zn-Tin alloy wire	符合RoHS要求 Compliant with RoHS
3	引线 Leads	镀锡铜包钢线 Tinned copper-base alloy wire	符合RoHS要求 Compliant with RoHS
4	灌封胶 Potting Compound	UL94V-0 级阻燃环氧树脂 Flame retardant epoxy resin(UL94V0)	符合RoHS要求 Compliant with RoHS
5	塑胶外壳 Enclosure	UL94V-0级阻燃PBT材质 Flame retardant PBT Plastic(UL 94V0)	符合RoHS要求 Compliant with RoHS
6	本体印字 Marking	激光刻印Laser	符合RoHS要求 Compliant with RoHS

Marking:



MKP-X2	BOX -TYPE METALLIZED POLYPROPYLENE AC CAPACITOR
0.33uF	CAPACITANCE
K	CAPACITANCE TOLERANCE
275/300/310VAC	RATED VOLTAGE AC VOLTAGE
40/110/56	Working Lowest Temperature (- 40℃) Working HighestTemperature(+110℃) Working Times (56days)
B	Class of operation
02/25	25 years in week 02

2.技术规范/Technical specification

项次 NO.	检测项目 Test item	性能 Performance	检测方法(参照IEC60384-14) Test method (refer to IEC60384-14)
1	耐压测试 Withstand Voltage		参照4.2.1节 Ref 4.2.1 clause
	端子与端子间(T-T)	应无永久性击穿及飞弧 No permanent breakdown or flashover	1333VDC/60sec
	端子与外壳间 Terminal-Case		2000VAC,50/60HZ, 60sec
2	绝缘电阻 Insulation Resistance	$C_R \leq 0.33\mu F$; $IR > 15000M\Omega$	参照4.2.5节 Ref4.2.5 clause 充电电压100VDC charge voltage100v
		$C_R > 0.33\mu F$; $IR > 5000S$	充电时间60秒 charge time 60sec
3	容量 Capacitance	$J \pm 5\%$; $K \pm 10\%$; $M \pm 20\%$	参照4.2.2节 :Ref 4.2.2 clause 测试条件:1V, 1KHZ
4	Dissipation factor 损耗角正切	$\leq 0.001 (0.1\%)$ at 1 KHz.	参照4.2.3节 :Ref 4.2.3 clause 测试条件:1V,1KHZ 20°C
5	可焊性 Solderability	被测引线90%以上上锡率 At least 90% immersed lead wire should be covered new solder.	参照4.5节: Ref 4.5 clause Ta:锡槽法(方法1) Ta:Tin bath method (1) 温度:260 $\pm$ 5°C; 时间:2 $\pm$ 0.5秒 Solder temperature :260 $\pm$ 5°C Immersion time: 2 $\pm$ 0.5 sec
6	端子强度测试 Terminal strength	端子无可见的破损 There shall be no visible damage	参照4.3节 :Ref 4.3 clause 拉力Ua: 0.5<d $\leq$ 0.8 ,10N $\pm$ 10% 0.8<d $\leq$ 1.25, 20N $\pm$ 10% 弯力Ub: 0.5<d $\leq$ 0.8 , 5N $\pm$ 10% 0.8<d $\leq$ 1.25, 10N $\pm$ 10% 引线在每个方向进行两次弯曲 Lead to rigid, Ub test method is not applicable Tense: 0.5<d $\leq$ 0.8 ,5N 0.8<d $\leq$ 1.25, 10N $\pm$ 10% Bend(Ub): 0.5<d $\leq$ 0.8 , 5N $\pm$ 10% 0.8<d $\leq$ 1.25, 10N $\pm$ 10% Bent 2 times each direction

项次 NO.	检测项目 Test item	性能 Performance	检测方法(参照IEC60384-14) Test method (refer to IEC60384-14)
7	耐焊接熱 Resistance to Solder heat	There should be no visible damage, $\Delta C/C < \pm 5\%$ 外觀無可見的損傷,標誌清晰,容量變化率 $\Delta C/C < \pm 5\%$	參照4.4節: Ref 4.4 clause Tb:錫槽法(方法1A) Tb: method (1 A) 溫度: $260 \pm 5^\circ\text{C}$; 時間: 5-10秒 Solder temperature: $260 \pm 5^\circ\text{C}$ Immersion time: 5-10 sec
8	Solvent resistance of the marking 标志耐溶剂性	标志应保持清晰 The marking should be legible	參照4.20节: Ref 4.20 clause 使用溶剂: 工业异丙醇 Solvent: Industrial isopropanol 用脱脂棉摩擦 Use absorbent cotton wool
9	初始測量 Initial measurement	容量,損耗角正切 Capacitance, Tan δ	
	溫度快速變化 Rapid change of temperature	外觀無可見的損傷 There should be no visible damage.	參照4.6節: Ref 4.6 clause $\theta A = -40^\circ\text{C}, \theta B = +105^\circ\text{C}$ 循環周期: 5次, 5 cycles 周期時間: 30分鐘 Duration = 30min
	振動 Vibration	外觀無可見的損傷 There should be no visible damage.	參照4.7節: Ref 4.7 clause 位移0.75mm或加速度 0.98m/s^2 Amplitude 0.75mm or acceleration 0.98m/s^2 (兩者取較小者) (whichever is the smaller values) 振動頻率: 10~500HZ, 三个方向,每2小時/方向,共6小時 2h each direction, total 6h
	碰撞 Bump	外觀無可見的損傷,標誌清晰,容量變化率 $\Delta C/C < \pm 5\%$ There should be no visible damage, $\Delta C/C < \pm 5\%$	參照4.8節: Ref 4.8 clause 4000次,加速度 390m/s^2 4000 times, acceleration 390m/s^2 脈衝持續時間: 6ms. Pulse duration 6ms.
	最終測量 Final measurement	外觀無可見的損傷,標誌清晰,容量變化率 $\Delta C/C < \pm 5\%$ There should be no visible damage, $\Delta C/C < \pm 5\%$	

项次 NO.	检测项目 Test item		性能 Performance	检测方法(参照IEC60384-14) Test method (refer to IEC60384-14)
10	气候 顺序	Initial measurement 初始测量		参照4.11节: Ref 4.11 clause
		干热Dry heat		+105℃,16h
		寒冷Cold		-40℃,2h
		循环湿热 Damp heat, cyclic		试验Db,其余循环 Test Db, remaining cycles
	最终测量及要求 Final measurement		应无可见损坏,标志清晰 There should be no visible damage, legible marking. 容量变化率 $\Delta C/C < \pm 5\%$ Capacitance change $\Delta C/C < \pm 5\%$ 损耗角正切增加: Increase of Tan δ $CR \leq 1\mu f: \leq 0.008(10\text{khz})$ $CR > 1\mu f: \leq 0.005(1\text{khz})$ 耐压: 应无永久性的击穿或飞弧 Dielectric strength; there shall be no permanent breakdown or flashover. 绝缘电阻(IR): $> 50\%$ 的额定值 $IR > 50\% \cdot \text{Rate value}$	
11	稳态湿热 Damp heat steady state		应无可见损坏,标志清晰 容量变化率 $\Delta C/C < \pm 5\%$ There should be no visible damage, legible marking. Capacitance change $\Delta C/C < \pm 5\%$ 损耗角正切增加: Increase of Tan δ $CR \leq 1\mu f: \leq 0.008(10\text{khz})$ $CR > 1\mu f: \leq 0.005(1\text{khz})$ 耐压: 应无永久性的击穿或飞弧 Dielectric strength; there shall be no permanent breakdown or flashover. 绝缘电阻(IR): $> 50\%$ 的额定值 $IR > 50\% \cdot \text{Rate value}$	参照4.12节: Ref 4.12 clause Temperature: $40 \pm 2\%$ 温度: $40 \pm 2\%$ 湿度: $93(+2/-3)\%RH$ Humidity: $93(+2/-3)\%RH$ 持续时间: 21天 Duration: 21 days

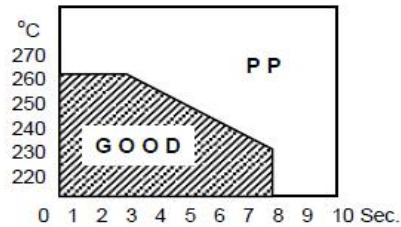
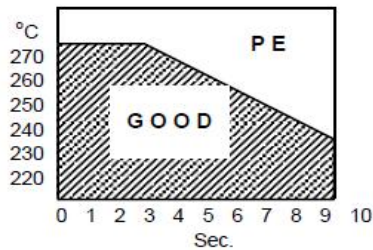
项次 NO.	检测项目 Test item	性能 Performance	检测方法(参照IEC60384-14) Test method (refer to IEC60384-14)
12	充放电 Charge and Discharge	容量变化率$\Delta C/C \leq \pm 10\%$ Capacitance change $\Delta C/C \leq \pm 10\%$ 损耗角正切增加: Increase of Tan δ $CR \leq 1\mu f: \leq 0.008(10\text{kHz})$ $CR > 1\mu f: \leq 0.005(1\text{kHz})$ 耐压: 应无永久性的击穿或飞弧 Dielectric strength; there shall be no permanent breakdown or flashover. 绝缘电阻(IR): $> 50\%$的额定值 $IR > 50\% \cdot \text{Rate value}$	参照4.15节: Ref 4.15 clause 试验次数: 10000次 充电时间: 0.5秒 放电时间: 0.5秒 充电电压: 550VDC 充电电阻: $220/CR(\Omega)$ 或将充电电流限制在1A以下(取其大者) 放电电阻: $R = \frac{550}{C_R \cdot dv/dt} - \frac{550}{C_R} (\Omega)$ Dv/dt: 最大100v/us Times: 10,000 Duration of charge: 0.5sec Duration of discharge: 0.5sec Charge resistor: $220/CR(\Omega)$ or The limited current should be no more than 1A, (whichever the resistance value is the greater) DV/DT(V/us): 100v/us max
13	阻燃性试验 Passive flammability	任一试验电容器在离开火源后持续燃烧的时间不能超过30秒, 其燃烧下落物不能将下面的纱棉引燃 The flaming time of each sampling capacitor shall not go beyond 30sec after it is taken apart from the flame. Drop of each capacitor caused by the flame shall not fire the tissue below	参照4.17节 Ref 4.17 clause 采用针炎测试法, 阻燃等级C级 Needle flame test The category of flammability: C 暴露次数: 1次 Expose time: 1 time 产品体积 暴露时间 Capacitor volume Exposing time $250 < V(\text{mm}^3) \leq 500$ s=20秒 $500 < V(\text{mm}^3) \leq 1750$ s=30秒 $V(\text{mm}^3) > 1750$ s=60秒

项次 NO.	检测项目 Test item	性能 Performance	检测方法(参照IEC60384-14) Test method (refer to IEC60384-14)
14	自燃性 Active flammability	缠绕在电容器上的纱布应不被火焰燃烧 The cheesecloth around the capacitor shall not burn with a flame	试样用未处理过的纯棉布缠绕至少一层,但不能多于两层. 每一样品应能承受贮存电容器放电20次; 第两次放电间隔5秒, $U_i=2.5KV+7\%/-0\%$ The specimens shall be individually wrapped at least 1 layer, but not more than 2 layers, complete of cheesecloth, the cheesecloth should be untreated pure cotton. Each sample shall be subjected to 20 discharged, the interval between successive discharges shall be 5s $U_i=2.5KV+7\%/-0\%$

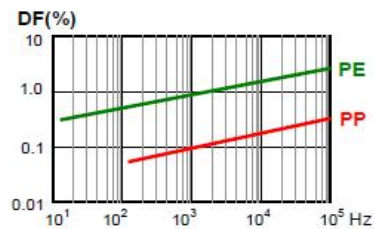
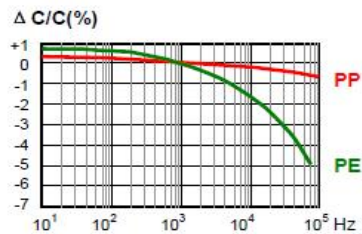
抑制电源电磁干扰用金属化聚丙烯薄膜安规电容器 X2 系列

CHARACTERISTICS REFERENCE

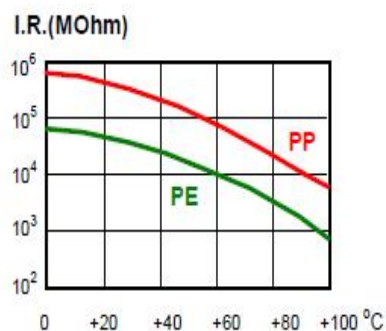
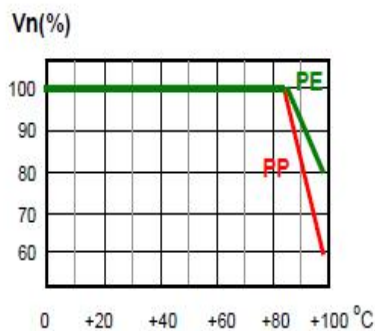
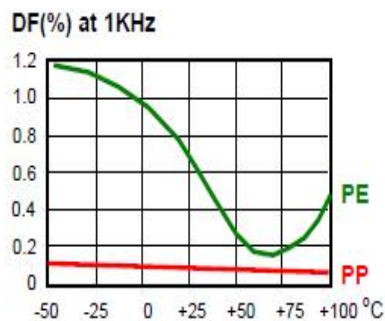
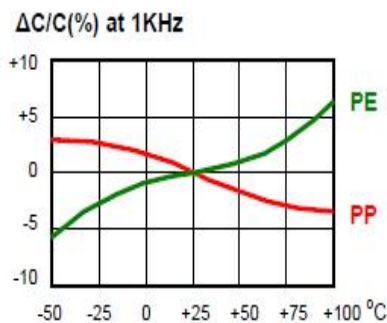
Solderring Temperature VS Time 焊接温度 VS 时间



Frequency Characteristics 频率特性



Temperature Characteristics 温度特性



3.焊接要求/Welding requirements

为达到更好的可焊性，我们建议遵照下列的标准。

In order to obtain a good solderability, we suggest to observe the following rules.

3.1 最大焊接温度 Max soldering temperature

3.1.1 手动焊接 Manual soldering

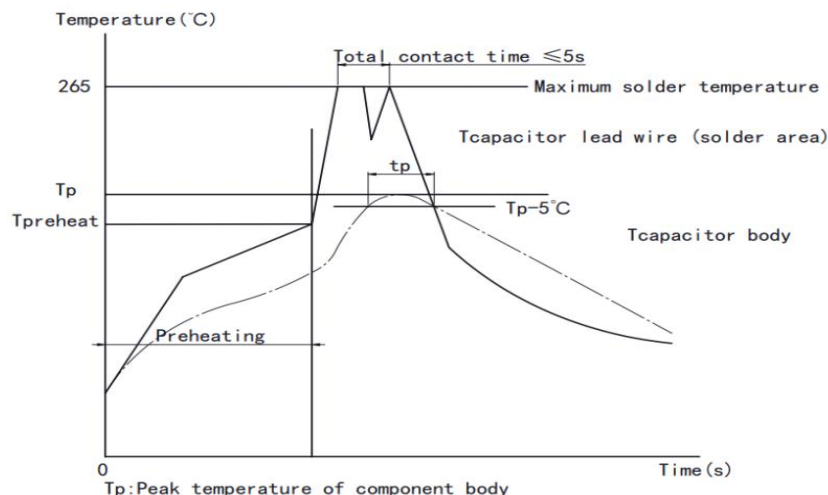
最高温度:350℃，时间:3s

Max. temperature:350℃, time:3s

3.1.2 波峰焊 Wave soldering

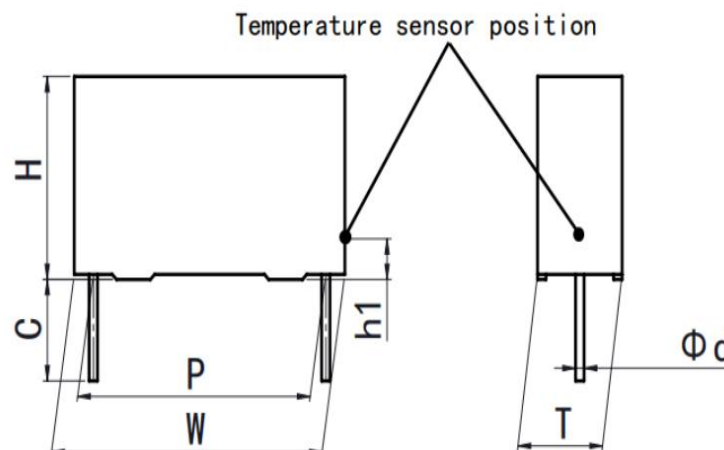
波峰焊工艺过程中有较多因素对薄膜电容器受热有影响，如：预热温度、预热时间、锡炉温度、过锡炉时间、其他热源影响等。

There are many factors affecting the heating of film capacitor during the wave soldering process, such as: preheating temperature, preheating time, soldering temperature, soldering time, other heat sources influence and so on. The typical soldering profile is as below:



因为过热有可能会损害电容器，我们建议关注电容器最高温度以及耐热时间，用热电偶检测电容本体最高温度 T_p (测量位置参考下图)

Because overheating could damage the capacitor, we recommend paying attention to the maximum capacitor temperature and heating time, use temperature sensor to detect the maximum capacitor body temperature



测温点位置 Temperature sensor position(Tcapacitor body)	电容器引线侧的外壳表面，电容距离 PCB 板高度：h1=2mm~3mm 的位置 The capacitor body surface of lead side, capacitor height position from PCB: h1=2mm~3mm		
焊接过程电容本体最高耐热温度 Maximum capacitor body temperature $T_p(^{\circ}\text{C})$	OPP film $P \leq 15\text{mm}$	OPP film $P > 15\text{mm}$	PET film
	115	120	125
焊接过程电容引脚最高耐热温度 Maximum capacitor lead wire temperature($^{\circ}\text{C}$)	265	265	265
焊接过程电容本体最长耐热时间 Maximum capacitor body heating time $t_p = T_p - 5^{\circ}\text{C}$	30s		

3.2 如果需要焊接两次，第二焊接必须等到电容器恢复到常温。

If re-working or dipping twice is necessary, it should be done after the capacitor returns to the normal temperature.

3.3 插件产品仅适合做波峰焊接。

Plug parts only suitable for wave soldering.