

Product Specification

Number: L-KLS10-SS-1200uF4V-10×13

Name: Conductive Polymer
Aluminum Solid Capacitors

Customer: D02

Date: 2023-03-31

Customer Signature:



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Jenny	Jack.C		

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范围 Scope

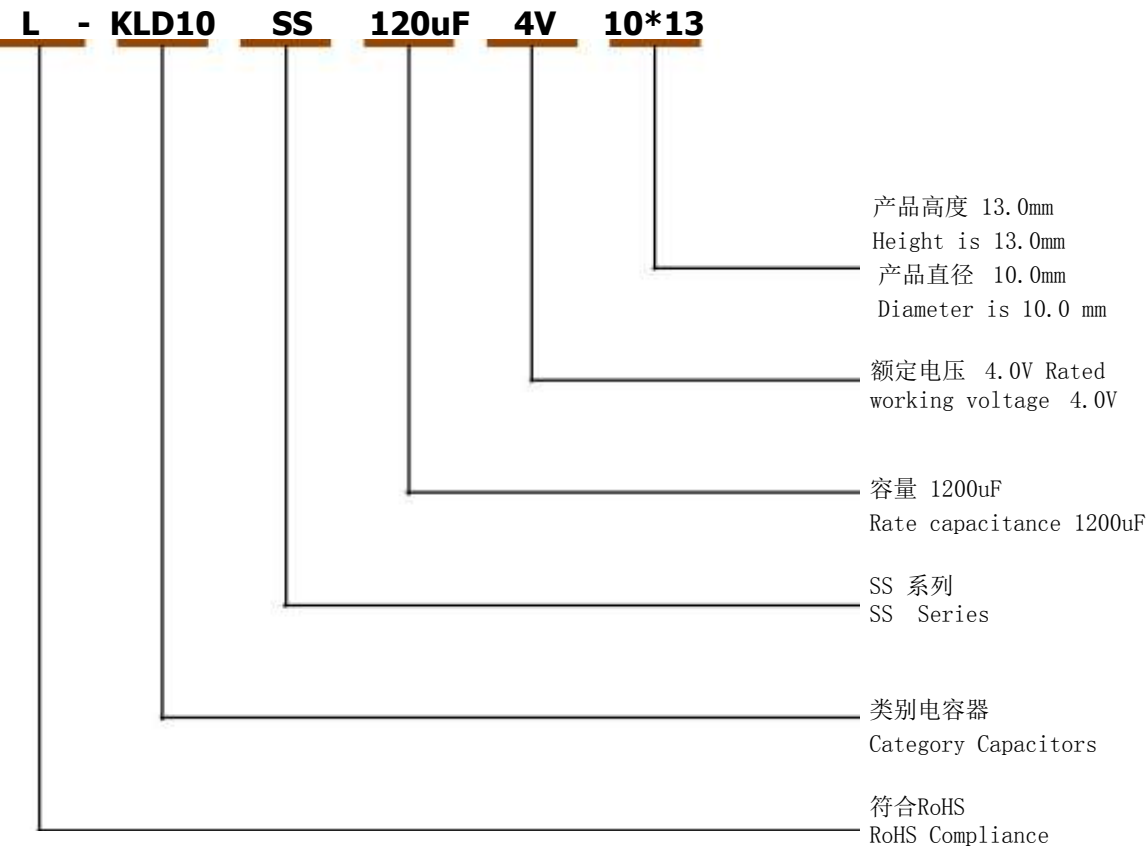
本标准用于定义导电高分子固态电容器当前系列的相关特性和尺寸。

This standard defines the relative characteristics and dimensions of conductive polymer solid capacitors

本系列温度使用范围：-55~+105℃

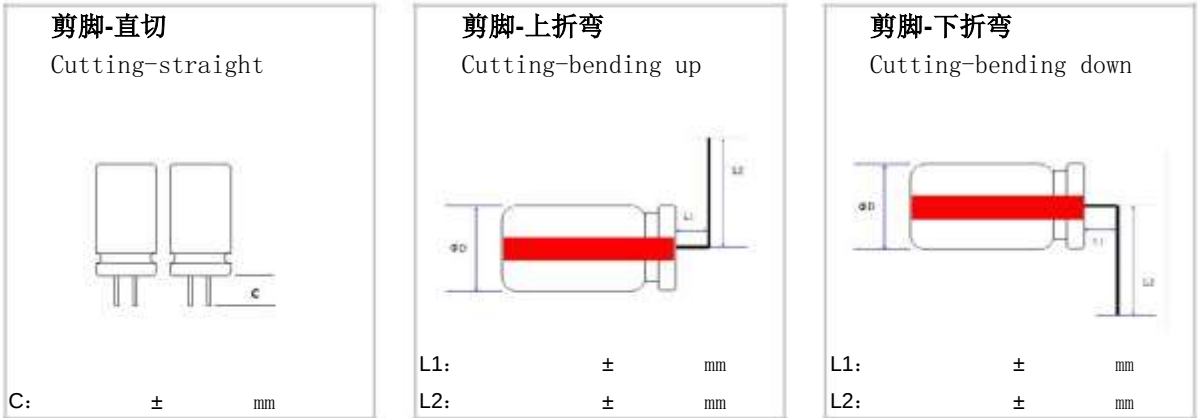
Working temperature scope: -55~+105℃

1>料号 Product Part No.L-KLS10-SS-1200uF4V-10×13

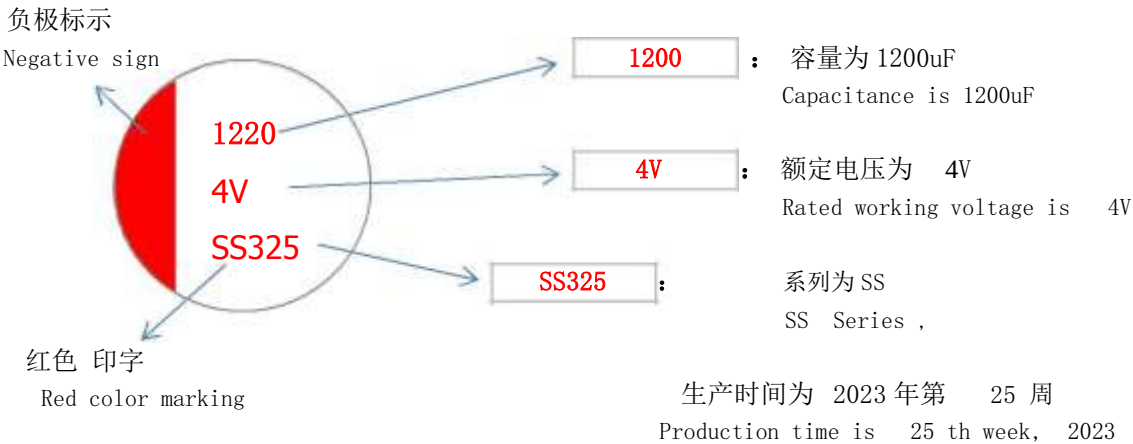


2>加工方式 Lead processing

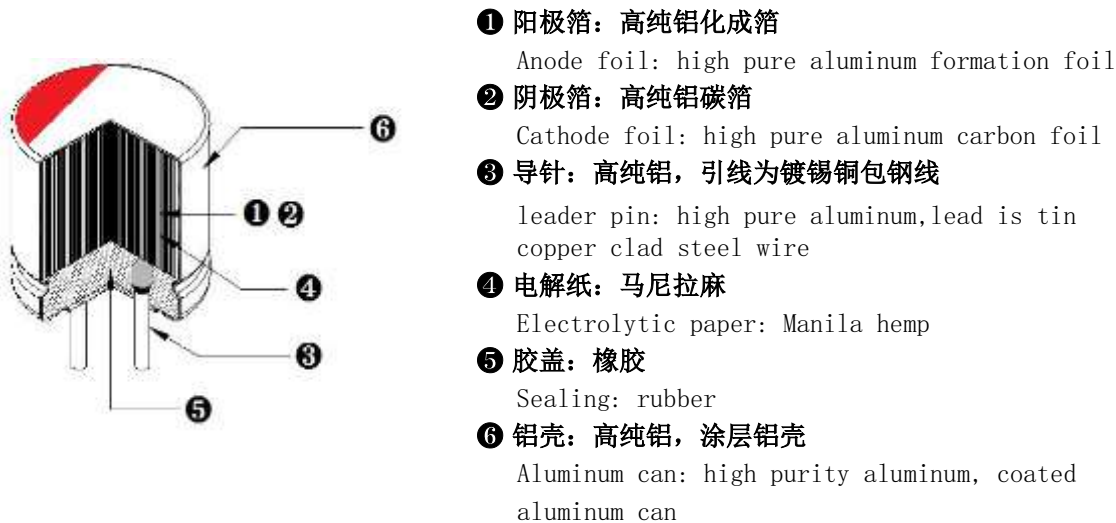




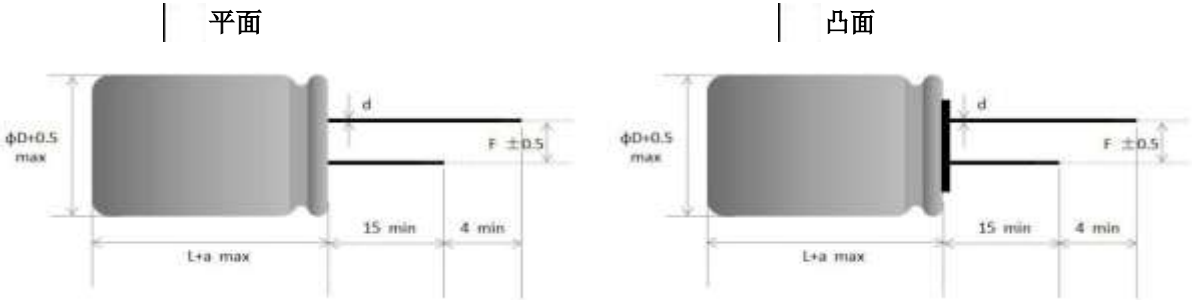
3> 印字 Marking



4> 产品结构图
Product Structure Diagram



5> 尺寸 size



单位(unit):mm

ΦDXL	ΦD+0.5 max.	a	F±0.5	Φd±0.05
10*12	10	1.5	3.5	0.6

6> 特性 Characteristics

1.标准测试条件

Standard test conditions

除非另有规定，所有测试环境应当在以下条件下进行：

Unless otherwise specified,all tests shall be performed at following conditions:

环境温度： 15-35 ℃

Ambient temperature: 15-35 ℃

相对湿度： 45-75% RH

Relative humidity: 45-75% RH

气压： 86-106 Kpa

Air pressure 86-106 Kpa

测试疑虑时，在以下条件下确认测量结果：

Any testing doubt, confirm the measurement results under the following conditions:

环境温度： 20±2 ℃

Ambient temperature: 20±2 ℃

相对湿度： 60-70% RH

Relative humidity: 60-70% RH

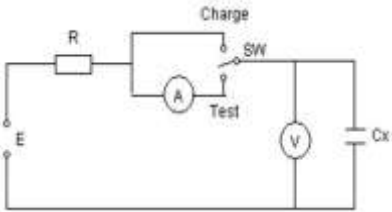
气压： 86-106 Kpa

Air pressure 86-106 Kpa

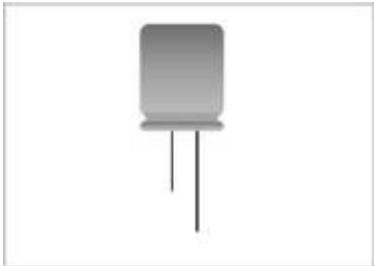
2.特性参数表 Characteristic parameter list

NO.	料号 Part No.	容量 Capacitance	电压 working voltage	损失角 Dissipation Factor	ESR	RC	LC	ΦDXL
1	L-KLS10-SS-1200uF4V-10×13	1200	4	10	7	6100	960	10*12
2								
3								
4								
5								

3.特性参数说明 Description

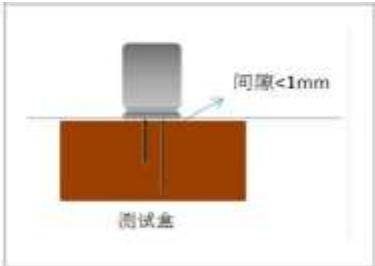
NO.	特性 Characteristics	单位 unit	说明 Description					
1	容量 capacitance	uF	产品标称容量，测试频率：120HZ，在规定容量公差内 Product nominal capacity, test frequency: 120HZ, within the specified capacity tolerance					
2	电压 working voltage	V	产品额定电压 Rated working voltage					
3	损失角 Dissipation Factor	%	也称损耗，测试频率：120HZ Also calls dissipation, test frequency: 120HZ					
4	ESR	mΩ	等效串联电阻，测试频率 100KHZ Equivalentent series resistance, test frequency 100KHZ					
5	RC	mA, rms	最大许可纹波电流为 100KHZ 下最大 A.C 电流 The maximum allowable ripple current is 100KHZ, the largest A.C current					
			DC 电压和峰值 AC 电压总和不可超出额定电压，不可反向充电 The DC voltage plus the peak AC voltage must not exceed the rated voltage, and non-reverse charging					
			频率 HZ Frequency	120≤f<1k	1K≤f<10K	10K≤f<100K	100K≤f<500K	
			系数 coefficient	0.05	0.3	0.7	1	
6	LC	uA	泄漏电流，产品施加额定电压，充电 2 分钟后测试漏电流值 Leakage current, after charging for 2 minutes, test the leakage current value of product					
								
7	ΦDXL	mm	产品外径、高度 Diameter、Height					

4.特性测试注意事项 Precautions before testing characteristics



测试前保持引脚垂直平行
不能扭动、拉扯电容引脚

Keep pins vertical and parallel
before testing,and can not wiggle, pull the pins



测试容量/损失角/ESR 值时，
测试点需在引线根部

When testing capacitance/dissipation factor/ESR value, test points need to be at the root of the lead



测试 LC 时，需保持引脚平行
不能让电容引脚呈八字形分开

When testing LC, keep pins parallel, and can not separate two pins as “八”shape

7> 高温负荷寿命试验 High temperature load life test

电容器在额定最高温度下印加额定电压，持续储存至规定寿命时间后，符合以下要求：

Charged rated voltage and continously stored at upper category tempevture for specified life time,characteristics of capacitor shoule meet following requirements

项目 item	要求 requirements
寿命时间 life time	2000 ±48 小时 hours
容量变化 change of capacitance	在容量初始值±20%内 Within ±20% of the initial value
损失角 dissipation factor	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
ESR	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
LC	不超过规定值 Not to exceed the value specified

8> 浪涌电压试验 Surge voltage test

在任何情况下，浪涌直流电压是电容器所应承受的最大电压，这包括瞬变和峰值纹波最高的线路电压。

The surge DC rating is the maximum voltage to which the capacitor should be subjected under any conditions. This includes transients and peak ripple at the highest line voltage.

额定电压 (V) rated working voltage	额定温度 (℃) upper temperature	浪涌电压 (V) surge voltage
2.5	105	2.9
6.3	105	7.2
10	105	11.5
16	105	18.4
25	105	28.8
35	105	40.3
50	105	57.5
63	105	72.5
100	105	115.0

浪涌电压=1.15*额定电压

在常温条件下，电容串联 **1000Ω** 电阻后，应用浪涌直流电压进行测试。

充电 **30±5** 秒，放电 **5±0.5** 分钟，充电放电过程重复 **1000** 次，符合以下要求：

Connected in series with 1000 ohm resistors, capacitor shall withstand the surge test voltage applied with 30±5 seconds on, 330±5 seconds off, for 1000 successive test cycles at normal temperature

项目 item	要求 requirements
容量变化 change of capacitance	在容量初始值±20%内 Within ±20% of the initial value
损失角 dissipation factor	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
ESR	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
LC	不超过规定值 Not to exceed the value specified

9> 稳态湿热试验 Damp heat (steady state) test

于环境温度 **60±2℃**，湿度 **90-95% RH** 条件下，储存 **1000±48** 小时，符合以下要求：

The following requirements shall be satisfied after the capacitors are stored at 60±2℃, 90 to 95%RH for 1000±48 hours

项目 item	要求 requirements
容量变化 change of capacitance	在容量初始值±20%内 Within ±20% of the initial value
损失角 dissipation factor	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
ESR	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
LC	不超过规定值 Not to exceed the value specified

10> 温度特性试验 characteristics at High and low Temperature

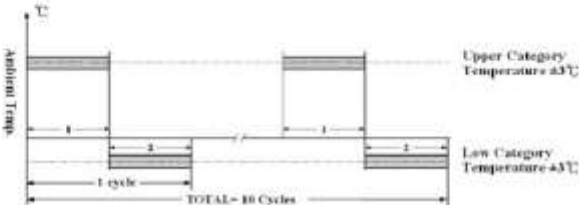
于以下环境步骤按规定时间储存，符合以下要求：

The following requirements shall be satisfied after the capacitors are stored at following conditions and specified time

			要求 requirement
阶段	温度 (C°)	测试项目(120HZ)	容量变化在初始值±20%内 Within ±20% of the initial value
1	20±2	CAP/DF/ESR	
2	最低使用温度±3	ESR	损失角不超过规定值 Dissipation factor: not to exceed the value specified
3	20±2	CAP/DF	
4	最高使用温度±3		ESR 不超过规定值 ESR: not to exceed the value specified
5	20±2		

11> 快速变温试验 Rapid change of temperature

阶段	温度 (C°)	时间 (min)	循环回数	要求 requirement
1	最低使用温度±3	30±3	5	容量变化在初始值±20% 内 Within ±20% of the initial value
2	常温	<3		
3	最高使用温度±3	30±3		
4	常温	<3		



The diagram illustrates a temperature profile for testing. The vertical axis is labeled 'Temp.' and the horizontal axis represents time. The profile shows a cycle between two temperature levels: 'Upper Category Temperature +3℃' and 'Low Category Temperature +3℃'. The cycle consists of a dwell time 't' at the upper temperature, followed by a dwell time 't' at the lower temperature. The total duration is labeled 'TOTAL = 10 Cycles'.

| | | | | 损失角不超过规定值 Dissipation factor: not to exceed the value specified |
| | | | | LC 不超过规定值 LC: not to exceed the value specified |

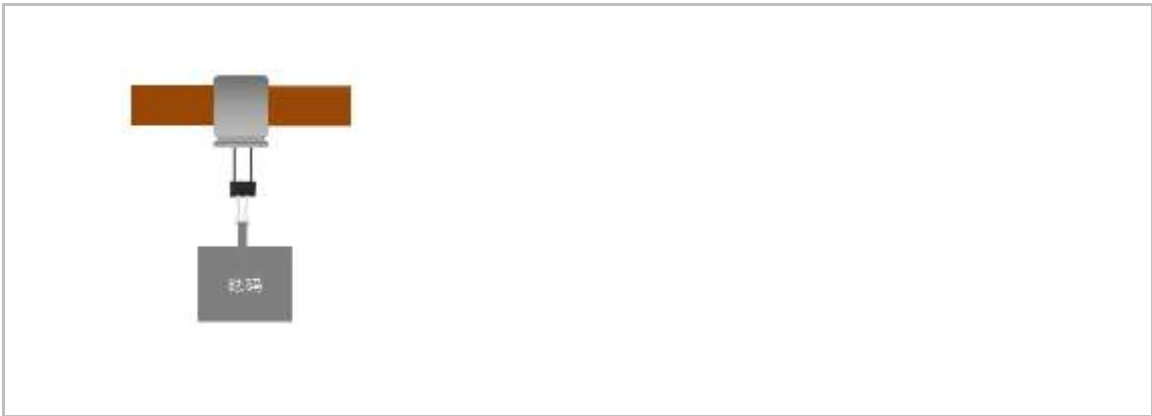
12> 端子强度试验 Lead strength test

1.引张强度 Tensile Strength

电容器引脚向下，固定电容器本体，在引脚上静态负重至规定时间，符合以下要求：

Fixing capacitor body and pins down,static load on the pins to the specified time,meets the following requirements

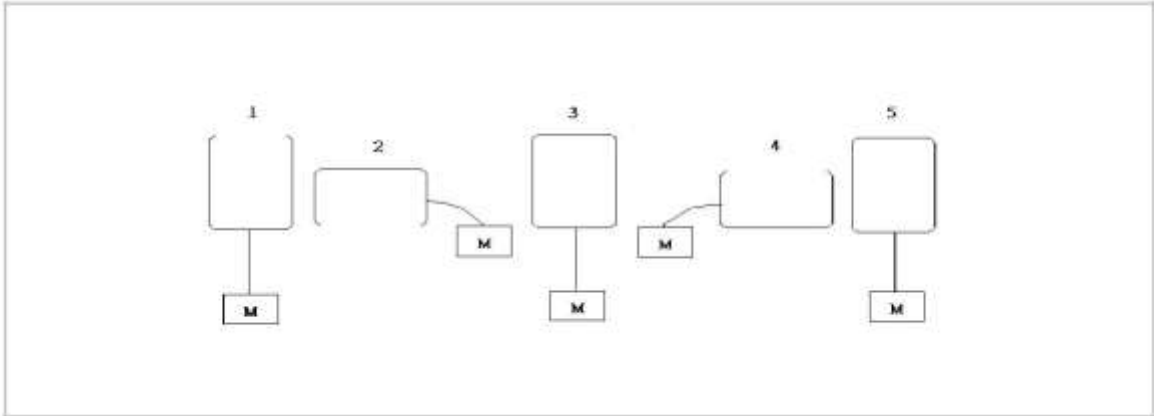
电容器引线直径 mm diameter of pin	负重 (N) weight	负重时间 (秒) load time	要求 requirement
d≤0.5	5	10±1	端子无断裂、松动 pins have no broken and loose
0.5<d≤0.8	10	10±1	端子无断裂、松动 pins have no broken and loose
0.8<d≤1.2	25	10±1	端子无断裂、松动 pins have no broken and loose



2.折弯强度 Bending strength

电容器引脚向下，固定电容器本体，在引脚上负重，按图示折弯，试验两回。

Fixing capacitor body and pins down,load on the pins and bending for 2 times according to following diagram, then meets requirements as below:



电容器引线直径 mm diameter of pin	负重 (N) weight	回数 cycle	要求 requirement
d≤0.5	2.5	2	端子无断裂、松动 pins have no broken and loose
0.5<d≤0.8	5	2	端子无断裂、松动 pins have no broken and loose
0.8<d≤1.2	10	2	端子无断裂、松动 pins have no broken and loose

- 13> 振动试验 Vibration test
- 振动频率： 10-55HZ （间隔 1 分钟 / 10HZ-->55HZ-->10HZ）
- Vibration frequency: 10-55HZ （Spaced one minute apart/ 10HZ-->55HZ-->10HZ）
- 振幅： 0.75mm （总偏移 1.5mm）
- Amplitude: 0.75mm （total migration 1.5mm）
- 方向： X、Y、Z （3 向）
- Direction: X、Y、Z axis(three directions)
- 持续时间： 2 小时/向
- Duration: 2 hours/direction
- 安装图示如下：
- Installation diagram as below:



30 分钟内，容量值相比初始值不应有明显变化

Within 30 minutes, capacitance has no significant change comparison with initial value

项目 item	要求 requirement
容量变化 change of capacitance	在容量初始值±5%内 Within ±5% of the initial value
外观 appearance	端子无断裂、松动 pins have no broken and loose

14> 可焊性试验 Solderability test

焊料: 约 25%松香/乙醇溶液, 焊料 Sn-Ag-Cu

Solder: about 25% rosin/ethanol solution, solder Sn - Ag - Cu

温度: 243±5℃

Temperature: 243±5℃

时间: 2±0.5 秒

Time: 2±0.5 seconds

试验后端子浸渍位置至少 95%面积包盖了新锡。

After testing, more than 95% of the terminal surface shall be covered with new solder

15> 焊锡耐热试验 Solder Heat Resistance Test

1.焊锡槽法 Tin groove method:

温度: 260±5℃ 时间: 10±1 秒

Temperature: 260±5℃ Time: 10±1 seconds

2.烙铁焊接方法 Soldering iron welding method:

温度: 400±10℃ 时间: 3+1/-0 秒

Temperature: 400±10℃ Time: 3+1/-0 seconds

以上两种方法, 在电容器热量趋于稳定后, 符合以下要求:

For above two methods, after the capacitor heat is stabilized, the following requirements should be met

项目 item	要求 requirement
容量变化 change of capacitance	在容量初始值±5%内 Within ±5% of the initial value
损失角 dissipation factor	不超过规定值 Not to exceed the value specified
ESR	不超过规定值 Not to exceed the value specified
LC	不超过规定值 Not to exceed the value specified

16> 回流焊试验 Flow soldering test

项目 item	温度 temperature	时间 time	次数 times
预热 preheating	120℃	≤120 秒	1 次 1 times
焊锡条件 soldering conditions	260℃	≤10 秒	不超过 2 次 2 times or less

1.如为两次回流焊, 时间应不超过 10 秒。

When soldering 2 times immersion time should be 10 sec.or less

2.SMD 产品不适用该标准。

Do not apply flow soldering to SMD type

3.试验后 ESR 值不超过规定值的 1.3 倍。

After test, ESR not to exceed 130% of the value specified

17> 包装数量 Packing quantity

1.标准品包装 Bulk packing

尺寸 size	每袋数量 pcs quantity of per bag	每内箱数量 pcs quantity of inner box	每外箱数量 pcs quantity of outer box
Φ5x7-11	1000	10000	20000
Φ5.5x7-11	1000	10000	20000
Φ6.3x5	1000	10000	20000
Φ6.3x7-12	1000	10000	20000
Φ8x7-8	1000	10000	20000
Φ8x11.5	750	7500	15000
Φ8x12-15	500	5000	10000
Φ10x12.5	500	5000	10000
Φ10x15	400	4000	8000

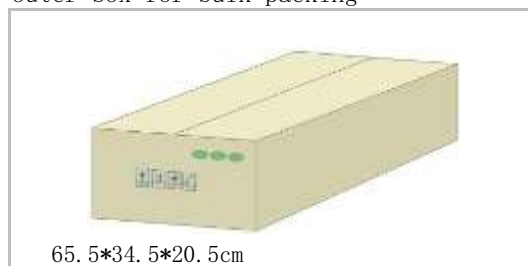
标准品内箱:

inner box for bulk packing



标准品外箱:

outer box for bulk packing



2.剪脚品包装 packing of cutting products

尺寸 size	每袋数量 pcs quantity of per bag	每内箱数量 pcs quantity of inner box	每外箱数量 pcs quantity of outer box
Φ5x7-11	1000	28000	56000
Φ5.5x7-8	1000	28000	56000
Φ5.5x9-10	1000	28000	56000
Φ5.5x11	1000	24000	48000
Φ6.3x5/7	1000	24000	48000
Φ6.3x8/9	1000	20000	40000
Φ6.3x11/12	1000	16000	32000
Φ8x7/8	1000	12000	24000
Φ8x11.5	1000	10000	20000
Φ8x12-15	500	8000	16000
Φ10x12.5	500	5000	10000
Φ10x15/17	400	4000	8000

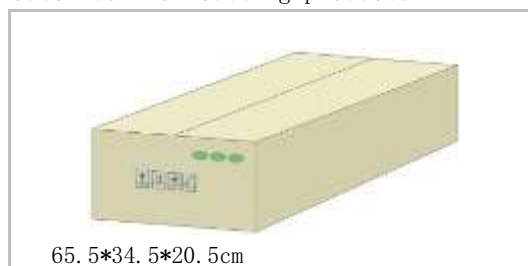
剪脚品内箱:

inner box for cutting products



剪脚品外箱:

outer box for cutting products



3.编带品包装 taping packing

尺寸 size	每内盒数量 pcs quantity of inner box	每外箱数量 pcs quantity of outer box
Φ5.5x7-11	2000	20000
Φ6.3x5	1500	15000
Φ6.3x7-12	1500	15000
Φ8x8-15	1000	10000
Φ10x12.5-15	600	6000

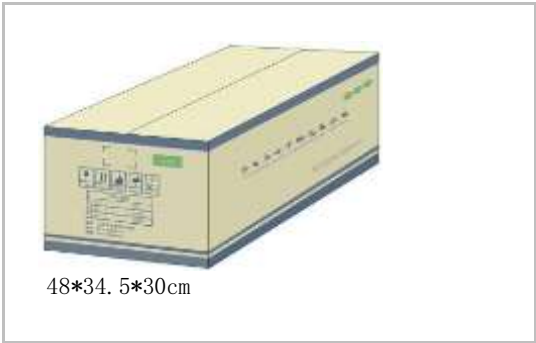
编带品内箱:

inner box for taping packing



编带品外箱:

outer box for taping packing



4.标签内容 Label content

客户无要求的情况下，内标、外标尺寸都一样，格式与内容如下:

In the case of customer without special requirements, the inner and outer labels are the same. The format and content are as follows

客户有需求时，标签上可以备注客户物料编码、PO 订单号

As customer requirements, the label may note the customer's P/N, PO order number

18> 使用前注意事项 Precautions before using



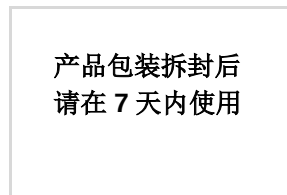
电容储存环境正常

Storage environment is normal



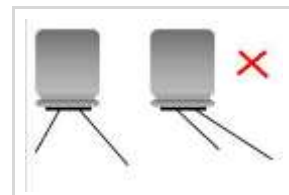
电容周期在有效期内 (18个月)

Date-code is within the validity period(18 months)



电容拆袋后有密封保存

Please use the product after package is opened in 7 days



电容引线无扭曲弯折

Pins no distortion and bending

19> 安装前注意事项 Precautions before installation



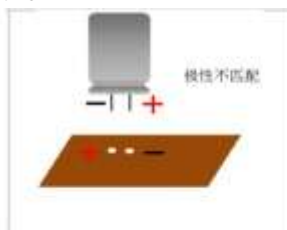
电容引线直径与 PC 板孔径匹配

Diameter of capacitor pin is matched with PC board aperture



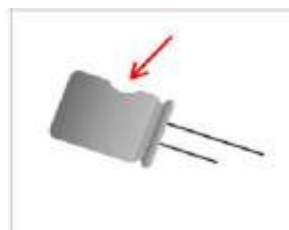
电容引线脚距与 PC 板孔距匹配

Pitch of capacitor pins is matched to the PC plate hole spacing



电容插件时极性正确

Polarities of capacitor and PC board are corresponding



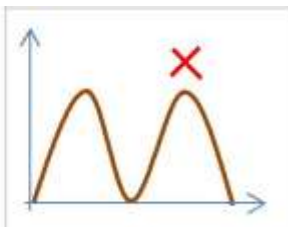
本体变形电容不使用

Capacitors which body deformed can not be used



电容插件倾斜不强行用力下压

When capacitors plugged slantly, they can not be forced down



电容只经过一次高温回焊

Capacitor can only pass through one time reflow soldering



电容上锡后本体不受力

Body of capacitor can not be forced after soldering



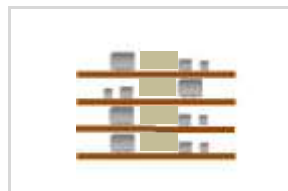
电容施加电压不超额定电压

Charging voltage can not exceed rated working voltage of capacitor



电容手工焊锡时, 烙铁不能长时间接触引线

When manual soldering, the soldering iron can not contact pins of capacitor for long time



电容插件后的线路板不叠加堆放

The PC boards which have capacitors should not be stacked



不要让电容正负极接触导电性溶液

Do not allow pins of capacitor to be in contact with the electrical conductivity solution



掉落地面电容不使用

Capacitors dropping down can not be used

其它相关注意事项，详见本公司最新产品目录书。

For more information, please refer to our latest catalogue

20> 环保 Environmental protection

本公司每年一次，将电容主要材料及电容成品送第三方权威检测机构检测。

Once a year, we will send the main materials and the capacitor products to the third party authorities for testing

检测时，根据当年欧盟最新要求检测 **ROHS、SVHC** 管理物质。

Test ROHS and SVHC management substances according to the latest requirements of the European Union

检测报告，本公司会在检测完成后上传到公司网站。

The test report will be uploaded to the company website after the test is completed

为倡导环保，节能减排，本公司一律提供 **pdf** 电子档承认书给客户。

To advocate environmental protection, energy conservation and emissions reduction, our company will provide the PDF specification by email admitted to customer

有特殊要求，请再联络本公司业务人员，谢谢！

For special requirements, please contact our business personnel. Thanks!