



东莞市智旭电子有限公司  
**JYH HSU (JEC) ELECTRONICS LTD.,**

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 制定日期: 2022/10/25

CL21 (MEF) 金属化聚酯膜电容器 (包封型)

**规格承认书**

ROHS

SVHC

SPECIFICATION FOR APPROVAL

客户名称 (CUSTOMERS): \_

客户料号 (CUSTOMERS M. NO):

型号 (TYPE): **金属化聚酯膜电容器**  
**Metallized Polypropylene Film Capacitor**

品名规格 (SEPCIFICATION):  
 CL21-225K/630VDC P=31.0mm CL21-335K/630VDCP=31.0mm  
 CL21-475K/630VDC P=31.0mm CL21-475K/400VDC P=31.0mm  
 CL21-685K/100VDC P=31.0mm CL21-334J/400VDC P=15.0mm

产品料号 (OUR PN):  
 JMEF225K0630DH3124      JMEF335K0630DH3124  
 JMEF475K0630DH3124      JMEF475K0400DH3124  
 JMEF685K0100DH3124      JMEF334J0400DH1524

适用机种 (FOR MODEL NO.): \_

日期 (DATE):\_ 2024-7-8

<p>客户承认 Customer approval</p>	<p>供应商承认 Supplier admit that</p> 
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编号规则及产品命名方法 PRODUCT CODE COMPARATIVE TABLE:

**J** **MPP** **104** **J** **0450** **D** **H** **T** **15** **24**

1 2 3 4 5 6 7 8 9 10

1) 制造厂商 Brand Mark: JYH HSU (JEC)

2) 产品型号 Type of capacitor

型号 model	MPX	CBB22/21	CBB61	CL21	CL21X	CL21X-B	CL11	MPF	MMKS2	AFB
代码 Code	MPX	MPP	C61	MEF	MEM	MEB	PEI	MPF	DMB	AFB
型号 model	CL20		CBB20		CBB21-B		X2	Y2	PPN	CBB81
代码 Code	MET/MEA		MPT/MPA		MPB	X/P	Y/P	NF	CS1	

3) 产品容量 Capacitance

代码 Code	容量换算 Capacitance		代码 Code	容量换算 Capacitance	
102	1,000pF	0.001uF	475	47,00,000pF	4.7uF
104	100,000pF	0.1uF	106	10,000,000pF	10uF

4) 产品容量误差 Tolerance

代码 Code	G	J	K	M
误差 Tol.	±2.5%	±5%	±10%	±20%

5) 产品额定电压 Rated Voltage

代码 Code	0100	0250	0275	0300	0310	0330	0450	0630	1000	1200	1250	1600	2000
误差 Tol.	100V	250V	2750V	300V	310V	330V	450V	630V	1000V	1200V	1250V	1600V	2000V

6) 电压类别 Voltage category

代码 Code	D	A
型号 model	DC	AC

7) 脚型 type

代码 Code	0	H	K	N	M
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8) 编带代码表示方法: (T)

SYMBLE	SIZE(mm)	SYMBLE	SIZE(mm)	SYMBLE	SIZE(mm)
P	12.7±1.0	S	4.8~5.6	D <sub>0</sub>	4.0±0.1
P <sub>0</sub>	12.7±0.3	△ <sub>H</sub>	±1.0	T	0.9±0.2
P <sub>1</sub>	3.85±0.7	Ψ	18.0±0.5	W <sub>0</sub>	11±0.5
P <sub>2</sub>	6.35±1.3	H <sub>0</sub>	25±1.0		
W <sub>1</sub>	9.0±0.5	H	16.0±0.5		

9) 脚距 Pin pitch (MM)

代码 Code	05	08	10	15	18	20	22	25	28	32
长度 length (mm)	5.0	7.5	10.0	15.0	17.5	20	22.0	25	27.5	31.5

10) 脚长 length

代码 Code	03	04	05	06	20	24	25
长度 length (mm)	3.0	4.0	5.0	6.0	20.0	24.0	25.0





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### 2. 产品介绍

#### Products Introduction

CL21 电容是由金属化聚酯薄膜，采用无感结构卷绕而成，引线采用镀锡铜包钢线，外部使用阻燃环氧粉体封装而成。具有良好的自愈功能和优良的阻燃性，符合UL94-V0标准。

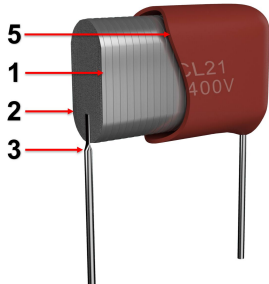
CL21 are wound with metallized polyester film dielectric, Non-inductive construction, tinned copper wire leads, and flame retardant epoxy resin coating.

They have excellent features of self-healing and good flame retardant according to UL 94-V0

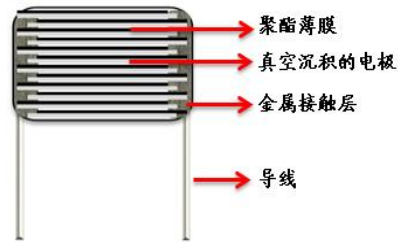
### 3. 产品结构和关键材料

#### Construction and main materials of products

Metallized film construction



The internal structure



NO	关键材料 Main Materials	材料规格 Specification	备注 Remark
1	金属化聚酯薄膜 Metallized polyester film	MEF (1.8~12 μm)	...
2	锌锡层 Zn, Sn line	锌+锌锡合金 Zn or Zn and Sn alloy	...
3	导线 Terminal	镀锡铜包钢线 (Φ0.6 or 0.8mm) CP (tinned copper wire leads)	允许偏差 ±0.05mm
4	内封装材料 Inside Coating Material	高温蜡 High temperature wax	UL94-V0
5	外封装材料 Outside Coating Material	环氧粉末 Epoxy power	UL94-V0

注：以上材料均符合环保要求

Note: All of the Materials are in compliance with the requirements of RoHS AND REACH.

### 4. 典型应用

#### Type application

本产品用于旁路、隔直和耦合，广泛应用于滤波、低脉冲线路，适用于各种高温节能灯具（105℃）

This product is used for bypass, straight and coupling isolation, widely used in filtering and low pulse circuits, energy-saving lamps are suitable for all kinds of high temperature (105 °C)



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### 5. 特点

#### Features

- 5.1 无感结构 Non-induction construction
- 5.2 容量范围宽, 体积小 Wide capacitance range, small size
- 5.3 自愈的性能好 Self-healing property, long life
- 5.4 阻燃性 (符合UL 94V-0) Flame retardant type (compliance with UL 94V-0)

### 6. 电气特性

#### Electrical specifications

如无其他说明, 电气特性请参考 IEC 60384-16:2005

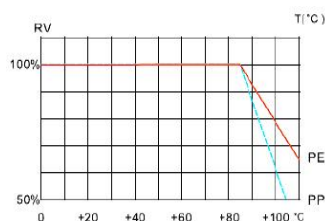
Unless otherwise specified, electric characteristics shall refer to IEC 60384-16:2005

项目 Item	特性要求 Characteristic requirement	测试方法及条件 Test method & Condition
工作温度 Operating Temperature	-55℃~+105℃ 在温度85℃ (AC form 75℃)以上时, 每上升1度, 额定电压下降1.35% +85℃~+105℃ (AC FROM 75℃): derating factor 1.35% per℃ for R.V (DC)	
容量范围 Capacitance Range	0.001 μF~10 μF	1KHz, 1.0Vrms, 25℃
容量偏差 Capacitance Tolerance	±5% (J), ±10% (K)	1KHz, 1.0Vrms, 25℃
额定电压 Rated Voltage	50V、63V、100V、250V、400V、450V、630V	
损耗角正切 Dissipation Factor	1KHz<1%	1KHz, 1.0Vrms, 25℃
绝缘阻值 Insulation Resistance	C≤0.33 μF IR>15000MΩ	UR≤500V 充电电压 100V, 60s, 25℃ UR>500V 充电电压 500V, 60s, 25℃
端子间电压 Withstand voltage Between Terminals	应无永久性击穿或飞弧 No permanent breakdown or flashover	1.6U <sub>R</sub> (d.c) 5s Cut off Current 10mA, ARC=OFF, Voltage raising time 5~10s,

注: 额定电压定义: 在工作温度范围内, 电容持续运行的可承受电压。

但是, 工作温度在85℃~105℃之间时 (AC form 75℃), 每上升1℃, 额定工作电压应下降1.35%。

Note: Rated voltage is defined the voltage which shall be capable of applying to capacitors continuously in the operating temperature range. However, rated voltage shall be derated 1.35% per℃ when capacitors operation temperature is between 85℃ to 105℃ (AC from 75℃).





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### 7. 印字

#### Marking

1. 静电容量 Capacitance : ( 334J, 0.33  $\mu$ F)
2. 允许误差 Capacitance Tolerance : (J)  $\pm$ 5%的误差值
3. 额定电压 Rated Voltage : 400VDC
4. 金属化聚酯膜电容器 Metallized Polyester Film

例:





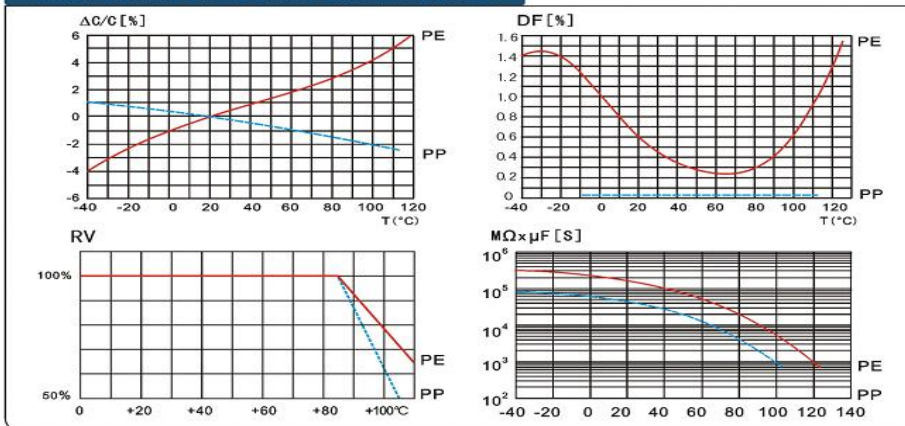
8. 温度特性

TEMPERATURE CHARACTERISTICS

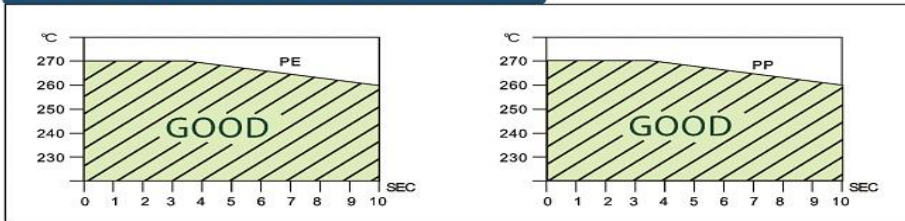
**CHARACTERISTICS**

**TYPICAL GRAPHS**

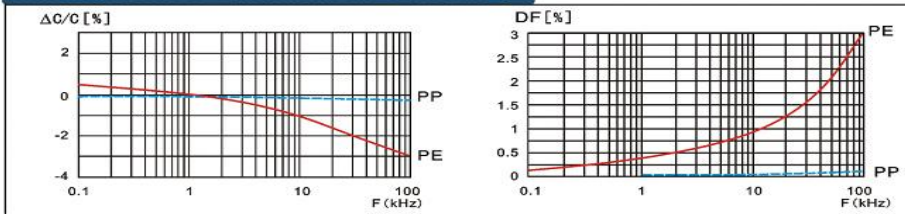
TEMPERATURE CHARACTERISTICS



SOLDERING TEMPERATURE VS. TIME



FREQUENCY CHARACTERISTICS







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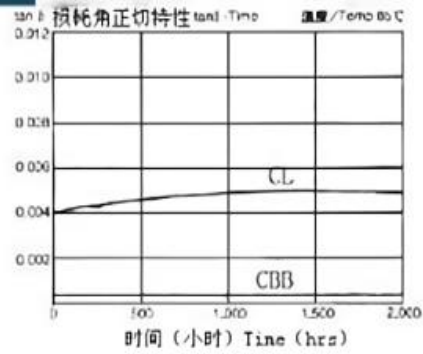
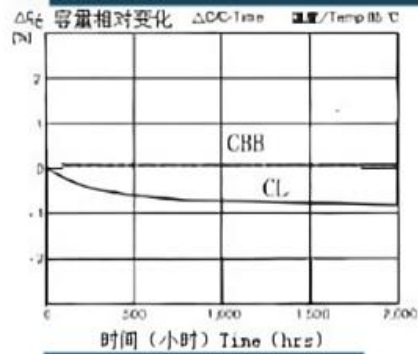
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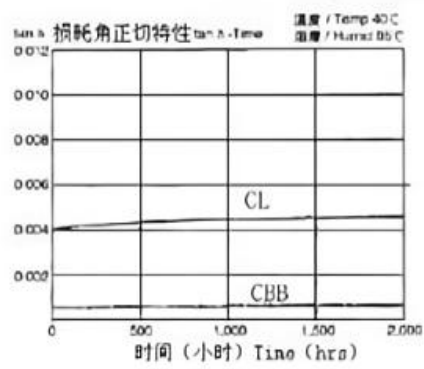
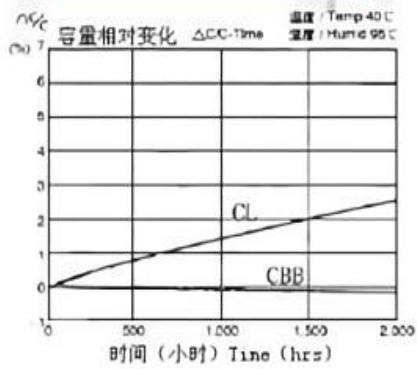
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### HIGH TEMPERATURE ENDURANCE



### DAMP HEAT ENDURANCE



## 9. 使用指导

### Guide in usage

#### 9.1 焊锡

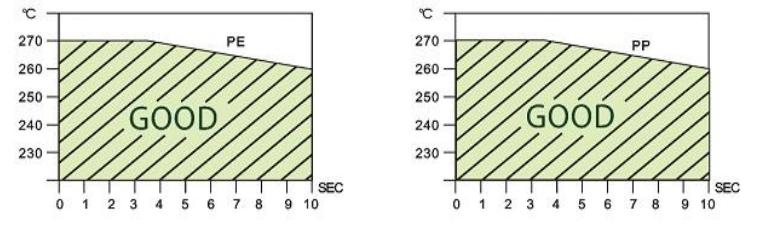
##### Soldering

当焊接电容器时，焊锡热会通过引线端子和封装层传递到电容素子，因此必须注意高温和长时间焊接引起的电容电气特性衰减或损坏。请确认焊锡在以下温度范围内。

When soldering a capacitor, heat in soldering is conducted to the element of the capacitor from wire lead and an enclosure, and hence it should be noted that soldering under high temperature and long period may cause deterioration of characteristic or breakdown of capacitors.

Be sure to solder within the following temperature condition range.

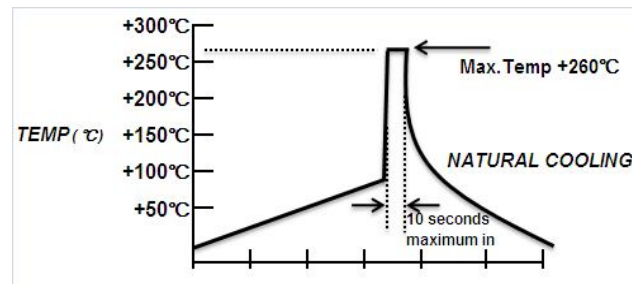
#### SOLDERING TEMPERATURE VS. TIME



#### 9.2 波峰焊

##### FLOW / WAVE SOLDERING

PRODUCTS: FILM CAPACITORS (Application of Through-Hole)



#### 9.3 烙铁焊接

##### soldering iron

当使用烙铁焊接时，烙铁尖端温度不得超过 350°C，焊接时间不超过 5 秒

When using soldering iron, iron tip temperature less than 350°C, Soldering time(sec.) within 5 seconds.



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### 10. 环保要求

#### Enviroment requirement

- 10.1 符合RoHS要求 Compliance with the requirement of RoHS.
- 10.2 符合REACH要求 Compliance with the requirement of REACH.
- 10.3 符合无卤 (如要求) Without Halogen(as required).
- 10.4 附件2为第三方测试的RoHS和REACH报告  
Please see the attachment 2 for the test reports of the Rohs and Reach by a third party .

### 11. 参考标准

#### Reference standards

- GB-T2693-2001 (IDT IEC 60384-1-2016) 电子设备用固定电容器 第1部分 总规范
- GB/T 7332-2011 电子设备用固定电容器 第2部分: 分规范 金属化聚乙烯对苯二甲酸酯膜介质直流固定电容器
- IEC-60384-2-2011 电子设备用固定电容器 第2部分: 分规范 金属化聚乙烯对苯二甲酸酯膜介质直流固定电容器
- GB-T 2828.1-2012 计数抽样检验程序 第1部分 按接收质量限(AQL)检索逐批检验抽样计划
- GB-T2693-2001 (IDT IEC 60384-1-2016) Fixed capacitors for use in electronic equipment –Part 1: Generic specification
- GB-T7332-2011 Fixed capacitors for use in electronic equipment—Part 2:Sectional specification– Fixed metallized polyethylene-terephthalate film dielectric d.c.capacitors
- IEC-60384-2-2011 Fixed capacitors for use in electronic equipment–Part 2: Sectional specification– Fixed metallized polyethylene terephthalate film dielectric c. capacitors
- GB-T 2828.1-2012 Sampling procedures for inspection by attributes—Part 1: Sampling schemes indexed by acceptance quality limit (AQL)for lot-by-lot inspection (ISO 2859-1:1999, IDT)

### 12. 包装

#### Packing

##### 12.1 散装



塑料袋最小包装, 数量200、300、500、1000PCS  
 Plastic bag is the minimum packing,the quantity are 200、300、500、1000PCS.  
 袋内放置产品合格环保标识标签, 包括料号, 规格, 数量, LOT批号, 生产日期等  
 The label of the RoHS include the product name、specification、quantity、lot No、manufacture date etc.

N袋小包装装一内箱  
 One inner box have N PCS bags  
 内箱尺寸为 (长×宽×高) =23×30×30cm  
 Inner box size (L×W×H) =23×30×30cm

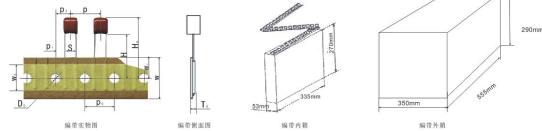
有环保标识  
 Marking for RoHS AND SVHC

两内箱装一外箱  
 One outer box have two inner boxes  
 外箱尺寸为 (长×宽×高) =48×32.2×33cm  
 Outer box size (L×W×H) =48×32.2×33cm

有环保标识  
 Marking for RoHS AND SVHC



##### 12.2 编带



编带实物图

编带侧视图

编带内卷

编带外卷



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### 13. 存储条件

#### Storage conditions

- 13.1 请注意，长时间产品暴露在空气中会导致引线氧化，焊接性能衰减。  
It should be noted that the solderability of the terminals may be deteriorated when stored barely in an atmosphere for a long periods
- 13.2 不能放置在高温高湿环境中，请遵循以下存储条件（原包装下保存）  
It shouldn't be located in particularly high temperature and high humidity, it must submit to the following conditions(keeping in the original package)

温度 Temperature: 35℃ MAX

相对湿度 Relative humidity: 60% MAX

- 13.3 存储时间：最长12个月（以包装袋上标注的生产日期为准）  
Storage period: 12 months max  
(from the manufacturing date marked on the label in package bag)

### 14. 可靠性实验

#### Reliability test

- 14.1 测试条件：除非另有规定，所有试验和测量均应在GB2421—81第4.3条（IEC68≡1第5.3条）中规定的试验用标准大气条件下进行，条件如下：  
Test condition: Unless otherwise specified, all tests and measurements shall be made under standard atmospheric conditions for testing as given in GB2421-81 NO.4.3(IEC68-1 NO.5.3), AS follows

温 度 Temperature: 15℃—35℃

相对湿度 Relative humidity: 25%—75%

气 压 Air pressure: 86—106Kpa (860—1060mbra)

- 14.2 如对测试结果有任何疑问，则按一下限制测试：  
If there may be any doubt on the results, measurements shall be made within the following limits.  
环境温度 Ambient temperature: 25±2℃  
环境湿度 Relative humidity: 50~70%

- 14.3 电性参数参考  
Electric characteristics shall refer to  
IEC 60384-1:2016 ;  
IEC 60384-2:2005;  
IEC 60068-2-1;  
IEC 60068-2-2;  
IEC 60068-2-6;  
IEC 60068-2-20;  
IEC 60068-2-21;  
IEC 60068-2-27;  
IEC 60060-1;



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### 14.4 电性参数 Electric characteristics

项目 Item	特性要求 Characteristic requirement	测试方法及条件 Test method&Condition
容量范围 Capacitance Range	0.001 $\mu$ F~10.0 $\mu$ F	IEC60384-2 4.2.2 IEC60384-1 4.7
容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)	1KHz, 1.0Vrms, 25 $^{\circ}$ C
额定电压 Rated Voltage	50V、63V、100V、250V、400V、450、630V	
损耗角正切 Dissipation Factor	1KHz<0.80%	1KHz, 1.0Vrms, 25 $^{\circ}$ C
绝缘阻值 Insulation Resistance	C $\leq$ 0.33 $\mu$ F	UR $\leq$ 500V 充电电压 100V, 60s, 25 $^{\circ}$ C UR>500V 充电电压 500V, 60s, 25 $^{\circ}$ C
	C>0.33 $\mu$ F	
端子间电压 Withstand voltage Between Terminals	应无永久性击穿或飞弧 No permanent breakdown or flashover	1.6U <sub>R</sub> (d.c) 5s Cut off Current 10mA, ARC=OFF, Voltage raising time 5~10s,

### 14.5 寿命实验 Life Test

NO	项目 Item	特性要求 Characteristic requirement	测试方法及条件 Test method&Condition			
1	端子强度 Terminal Strength	拉伸强度 Pull Strength  无可见机械损伤 There shall be no visible mechanical damage	线径mm	荷重	时间	
			wire diameter	Load	Time	
			$\leq 0.5$	5N	10S	
			$0.5 < d \leq 0.8$	10N	10S	
			$0.8 < d \leq 1.25$	20N	10S	
				IEC60384-2 C4.3 IEC60384-1 C4.13 IEC60068-2-21 Test Ua1		
	端子强度 Terminal Strength	弯曲强度 Bending Strength  无可见机械损伤 There shall be no visible mechanical damage	线径mm	荷重	次数	
			wire diameter	Load	Time s	
			$\leq 0.5$	5N	90 $^{\circ}$ C*4	
			$0.5 < d \leq 0.8$	5N	90 $^{\circ}$ C*4	
$0.8 < d \leq 1.25$			5N	90 $^{\circ}$ C*4		
			IEC60384-2 C4.3 IEC60384-1 C4.13 IEC60068-2-21 Test Ua1			



# 东莞市智旭电子有限公司

## CL21 (MEF) 金属化聚酯膜电容器 (包封型)

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### 14.5 寿命实验 Life Test

No.	项目 Item	特性要求 Characteristic requirement	测试方法及条件 Test method&Condition
2	可焊性 Solderability	端子引线周围至少95%的面积均匀附锡，且本体无破裂等损坏现象 锡料成分Sn 97.5%+ Ag 2%+Cu 0.5% At least 95% of the Circumference of the Lead wire.Around load surface dipped into with new solder, the body be no visible damage.	焊锡温度：235±5℃ Solder temp 浸渍时间：2.0±0.5s  Immersion time IEC60384-2 C4.5 IEC60384-1 C4.15 IEC60068-2-20 Test Ta
3	耐焊接热 Resistance to Soldering heat	外观 Appearance 无可见损伤，标志清晰 No visible damage. The marking shall be legible.	焊锡温度：260±5℃ Solder temp
	容量变化 Capacitance Variation	$\Delta C/C \leq 5\%$	浸渍时间：10±1s Immersion time
	损耗 Dissipation Factor	at 1KHz	恢复时间1-2小时 Then recovery at ordinary condition 1~2hours
	耐电压 Withstand Voltage	1.6 U <sub>R</sub> (d.c) 5s耐电压后无击穿或飞弧 No permanent breakdown or flashover	
	绝缘电阻 Insulation Resistance	$\Delta R/R \leq 50\%$	IEC60384-2 C4.4 IEC60384-1 C4.14 IEC60068-2-20 Test Ta
4	耐久性 Endurance	外观 Appearance 无可见损伤，标志清晰 No visible damage. The marking shall be legible.	温度Temp：105±3℃ 持续时间： Duration 1000+48H
	容量变化 Capacitance	$\Delta C/C \leq 10\%$	施加电压voltage： 1.25 U <sub>R</sub> (d. c.) 50Hz
	损耗 Dissipation Factor	$\Delta \tan \delta < 0.0080$ C <sub>0</sub> ≤ 1.0 μF $\Delta \tan \delta < 0.0050$ C <sub>0</sub> > 1.0 μF at 1KHz	恢复时间至少16小时 Then recovery at ordinary condition at least 16 hours
	耐电压 Withstand Voltage	1.6 U <sub>R</sub> (d.c) 5s耐电压后无击穿或飞弧 No permanent breakdown or flashover	
	绝缘电阻 Insulation Resistance	$\Delta R/R \leq 50\%$	IEC60384-2 C4.12 IEC60384-1 C4.23 IEC60068-2-2
5	稳态湿热 Damp heat, steady state	外观 Appearance 无可见损伤，标志清晰 No visible damage. The marking shall be legible.	温度Temp：40±2℃ 湿度：90-95%RH Humidity 持续时间：56 day Duration
	容量变化 Capacitance Variation	$\Delta C/C \leq 5\%$	电容不施加电压 恢复时间1-2小时 Then recovery at ordinary condition 1-2 hours
	损耗 Dissipation Factor	$\Delta \tan \delta < 0.0080$ C <sub>0</sub> ≤ 1.0 μF $\Delta \tan \delta < 0.0050$ C <sub>0</sub> > 1.0 μF at 1KHz	
	耐电压 Withstand Voltage	1.6 U <sub>R</sub> (d.c) 5s耐电压后无击穿或飞弧 No permanent breakdown or flashover	
	绝缘电阻 Insulation Resistance	$\Delta R/R \leq 50\%$	IEC60384-2 C4.11 IEC60384-1 C4.22 IEC60068-2-78 Test Cab



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### 14.5 寿命实验 Life Test

NO	项目 Item	特性要求 Characteristic requirement	测试方法及条件 Test method&Condition
6	干热 Dry heat	外观 Appearance	温度Temp: 105±2℃  持续时间: 16H Duration 恢复时间不低于4小时 Then recovery at ordinary condition at least 4 hours IEC60384-2 C4.10.2 IEC60384-1 C4.21.3 IEC60068-2-2, test Bb
		容量变化 Capacitance Variation	
		损耗 Dissipation Factor	
		耐电压 Withstand Voltage	
		绝缘电阻 Insulation Resistance	
7	寒冷 Cold	外观 Appearance	温度Temp: -40±2℃  持续时间: 2H Duration 恢复时间不低于4小时 Then recovery at ordinary condition at least 4 hours IEC60384-2 C4.10.4 IEC60384-1 C4.21.5 IEC60068-2-1, test Ab
		容量变化 Capacitance Variation	
		损耗 Dissipation Factor	
		耐电压 Withstand Voltage	
		绝缘电阻 Insulation Resistance	
8	浪涌 Surge	外观 Appearance	When $C_R \leq 1.0 \mu F$ UP = 1.6U <sub>R</sub> When $C_R > 1.0 \mu F$ UP = U <sub>R</sub> time: 10s Cycle times: 24次 前三次脉冲没有发生自愈性击穿, 则可停止, 为合格  IEC60384-1 C4.26  IEC60060-1
		容量变化 Capacitance Variation	
		损耗 Dissipation Factor	
		耐电压 Withstand Voltage	
		绝缘电阻 Insulation Resistance	



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### 14.5 寿命实验 Life Test

NO	项目 Item	特性要求 Characteristic requirement	测试方法及条件 Test method&Condition
9	外观 Appearance	无可见损伤, 标志清晰 No visible damage. The marking shall be legible.	Test voltage: $U_R$ (d. c.) time: 1Cycle/s Cycle times: 10000 $dv/dt: 100 \text{ V}/\mu\text{s}$ . resistor: $(220 * 10^{-6} / C_R) \Omega$ IEC60384-2 C4.13 IEC60384-1 C4.27
	容量变化 Capacitance Variation	$\Delta C/C \leq 5\%$	
	损耗 Dissipation Factor	$\Delta \text{tg} \delta < 0.0080 \quad C_R \leq 1.0 \mu\text{F}$ $\Delta \text{tg} \delta < 0.0050 \quad C_R > 1.0 \mu\text{F}$ at 1KHz	
	耐电压 Withstand Voltage	$1.6 U_R$ (d.c) 5s耐电压后无击穿或飞弧 No permanent breakdown or flashover	
	绝缘电阻 Insulation Resistance	$\Delta R/R \leq 50\%$	
10	振动 Vibration	外观 Appearance	上下左右前后三个方向 各2H, 频率10-55Hz 振幅0.75mm或98m/S <sup>2</sup> 3 directions at 2 hours each 10-55Hz at 0.75mm or 98m/s <sup>2</sup> IEC60384-2 C4.7 IEC60384-1 C4.17 IEC 60068-2-6, test Fc,
11	碰撞或冲击 Bump	外观 Appearance	次数 number of bumps: 1000 or 4000 加速度 Acceleration: $400 \text{ m/s}^2$ Pulse duration: 6 ms IEC60384-2 C4.8 IEC60384-1 C4.18 IEC60068-2-27, test Eb,