

# 承认书

## SPECIFICATION FOR APPROVAL

### 铝电解电容器(Aluminium Electrolytic Capacitors)

客户名称 (CUSTOMER):

系列 (SERIES):

105°C 标准品

规格 (DESCRIPTION):

10  $\mu$  F/25V  $\Phi$ 5X11

形状 (TYPE):

导针型 (Radial)  牛角型 (Snap-in)

制作日期 (DATE):

2018年10月11日

承认书编号 (No.):

20181011023

盖章处	客 户 CUSTOMER		
	Approver 批准	Auditor 审核	Tester 测试者

chongx	供 应 商 VENDOR		
	Approver 批准	Auditor 审核	Designer 制作者
任义良	文丽华	李爱兰	

承认后, 请签回一份!

Please sign and return us a copy after approval.

料号说明 Explanation of parts numbers

<b>CP</b>	<b>050</b>	<b>M</b>	<b>220</b>	<b>05</b>	<b>11</b>	<b>S</b>	<b>A</b>	<b>00</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

一、代号介绍:

(1) CP=成品代号

(2) 050=额定电压50V

<b>004=4V</b>	<b>025=25V</b>	<b>080=80V</b>	<b>250=250V</b>
<b>006=6.3V</b>	<b>035=35V</b>	<b>100=100V</b>	<b>350=350V</b>
<b>010=10V</b>	<b>050=50V</b>	<b>160=160V</b>	<b>400=400V</b>
<b>016=16V</b>	<b>063=63V</b>	<b>200=200V</b>	<b>450=450V</b>

(3) M=容量范围±20%      J= ± 5%      K= ± 10%      M= ± 20%      A= -0%~+ 20%      .....

(4) 220=标称容量22uF      0R1= 0.1uF ; 1R0= 1uF ; 100= 10uF ; 101= 100uF ; 102= 1000uF .....

(5) 05=直径5mm      03=3Φ ; 04=4Φ ; 05=5Φ ; 06=6.3Φ ; 08=8Φ ; 10=10Φ ; 13=13Φ .....

(6) 11=长度 (高度) L为11mm

(7) S=表示长脚      如C=表示切脚; P=表示编带。

(8) A=胶管颜色为黑色 ; B=黑色金字; C=绿色金字; D=咖啡色; E=紫色; F=桔色; G=天蓝色。

(9) 00=商标代号, 这里表示为chongx

## 系列规格明细表

NO.	客户料号	规格	尺寸	chongx料号
1		10uF25V	5X11	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
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16				
17				
18				
19				
20				

■ 105°C产品，标准尺寸。Temperature: 105°C, standard size.

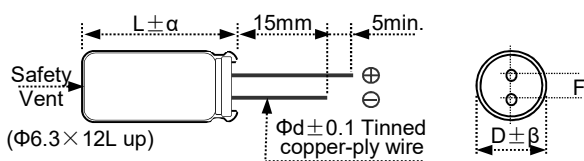
■ 适用于彩显、开关电源、主机板及通讯设备电路。

Used in color display, switching power, computer board and communication sets etc.

## 主要技术性能 Specifications

项目 Items	特性参数 Characteristics													
使用温度范围 Operating Temperature Range	-40 ~+ 105°C	-25 ~+ 106°C												
额定工作电压 Rated working Voltage Range	6.3V~100V DC	160V~500V DC												
标称容量范围 Nominal Capacitance Range	0.1uF~33,000uF	0.47uF~1,000uF												
容量允许范围 Capacitance Tolerance Range	±20%(M) (at +25°C, 120Hz)													
漏电流 (I) Leakage Current	6.3V~100V DC	160V~500V DC												
	Φ ≤ 18	I ≤ 0.02CV or 3 (uA), which is greater .After 2 minutes application of working Voltage . 施加额定工作电压2分钟后读数，二者取大值。												
		After 1 minute 1分钟后读数	After 5 minutes 5分钟后读数											
	CV ≤ 1000	I = 0.1CV + 40	I = 0.03CV + 15											
CV > 1000	I = 0.04CV + 100	I = 0.02CV + 25												
Φ ≥ 20	I = 0.03CV After 3 minutes 施加额定工作电压3分钟后读数													
Note: I=Max,leakage current (uA), C=Nominal capacitance(uF), V=Rated voltage(V)														
损耗角正切值(tanδ) Dissipation Factor	WV (V)	6.3	10	16	25	35	50	63	100	160	200	250	350~500	
	tanδ (Max.)	0.24	0.20	0.16	0.14	0.12	0.10	0.10	0.10	0.20	0.20	0.20	0.25	
	规格容量每增加1,000uF, 损失角增加0.02。(at 25°C, 120Hz)													
低温阻抗比 Stability at Low Temperature	Rated voltage (V)	6.3	10	16	25	35	50~100	160	200~250	400~500				
	Z(-25°C)/Z(+25°C)	6	4	3	3	2	2	3	7	10				
	Z(-40°C)/Z(+25°C)	12	8	6	4	3	3	2	7	10				
高温负荷特性 Load Life	在105°C环境中对电容器施加额定工作电压连续2,000小时后，在25°C环境下测试，其性能符合下表要求： After applying rated working voltage for 2,000 hours at 105°C and then being stabilized at +25°C, capacitors shall meet following limits.													
	静电容容量变化率 Capacitance change	在初始值±20%以内，Within ±20% of the initial measured value.												
	损失角正切值 D.F.(tanδ)	不大于初始值的+200%，Less than +200% of the initial measured value.												
	漏电流 Leakage current	With in specified value.												
高温无负荷特性 Shelf Life	在105°C环境中（不施加电压）放置500小时后，放置于常温25°C测试，其性能符合上列高温负荷特性中所列的规定值（其中工作电压 ≥ 160V，漏电流 ≤ 5倍规格值）。 After storage for 500 hours at 105°C with no voltage applied and then being stabilized at +25°C, capacitors shall meet the characteristics listed above(When WV ≥ 160V, LC ≤ 500% of the specified value).													
其它 Other	如客户需要，可提供编带或切脚加工品。The products can be ammo packed or cut if customer need.													

## ◆ 尺寸及公差 Size and its tolerance (mm)



ΦD	4	5	6.3	8	10	13	16	18	20以上
F±0.5	1.6	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10
Φd±0.1	0.5	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
α	1	1	1	1	1.5	1.5	1.5	1.5	2.0
β	0.5	0.5	0.5	0.5	0.8	0.8	0.8	0.8	1.0
D ≥ 6.3Φ × 12L 产品防爆; PVC胶管。D ≥ 6.3Φ × 12L with safety vent; PVC sleeve.									

**电解电容器特性检查表**

TEST REPORT FOR ELE. CAPACITORS

客户: \_\_\_\_\_

规格: 10 uF 25 V

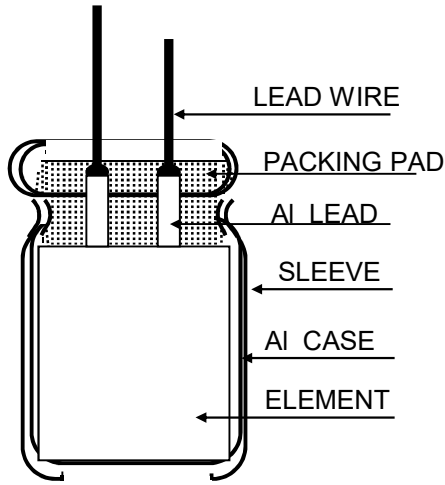
尺寸: D 5  $\Phi \times L$  11 mm

- 1、温度: -40°C~+105°C.
- 2、静电容量容许误差: -20%~+20%.
- 3、漏电流标准值:  $I \leq 0.02CV$  or 3 uA (两者取大值) 施加额定工作电压2分钟.
- 4、测试温度: 25±5°C.

项目 Spec.规格 值 No.	Cap. 静电容量	DF 损失角	LC 漏电流	Solderability 焊锡性	Appearance 外观		
	8-12uF	At 120Hz 12(%)max.	10 (uA)max.	温度: 230±5°C 时间: 3±0.5秒 覆盖面积≥95%	Marking	Sealing	Ooze
1	9.8	4.2	1.8	合格	合格	合格	无
2	10.1	4.5	2.3	合格	合格	合格	无
3	9.9	3.6	1.9	合格	合格	合格	无
4	10.2	3.9	2.2	合格	合格	合格	无
5	9.8	3.8	2.4	合格	合格	合格	无
6	10.2	4.2	2.3	合格	合格	合格	无
7	10.3	4.2	1.8	合格	合格	合格	无
8	9.9	3.6	2.1	合格	合格	合格	无
9	10.2	4.1	2.3	合格	合格	合格	无
10	10.3	4.3	2.1	合格	合格	合格	无
平均值							

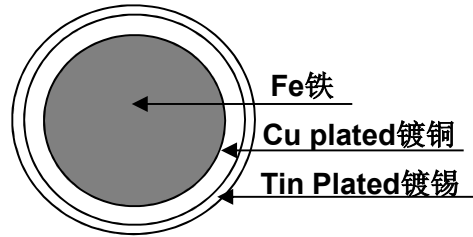
Approver 批准	Auditor 审核	Designer 制作
任义良	文丽华	李爱兰

DECISION 判定	<b>PASS</b>
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(电容器剖面图)

Cross section of wire (Reference sheet)  
CP线横切面(参考图)



(Fe + Cu Plated + Tin Plated)

1	Element 素子	Anode foil 正箔	Aluminium foil (forming) 高纯度铝 (化成处理)		4	Seal 封口部	EPT rubber EPT 胶盖
		Cathode foil 负箔	Aluminum 铝				
		Separator 电解纸	Paper 电解电容器用纸		5	Wire le 导针	Copper clad steel wite (Tin plated) CP线 铁+内层镀铜+镀锡
		Electrolyte 电解液	Solvent 溶媒	Ethylene glycol 乙二醇			
Solute 溶质	Ammonium salt 铵盐						
2	Case 铝壳	Aluminum 铝					
3	Sleeve 胶管	PVC 聚氯乙烯					

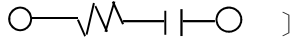
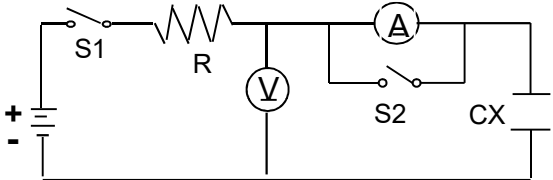
No.	材料 Component	材质 Materials
1	Lead line	Aluminum 99.95% or 99.97%
2	Terminal	Tinnde copper-ply wire
3	Rubber	EPT
4	Sleeve	PVC
5	Case	Aluminum 99.8%
6	Anode Foil	Formed Aluminum 99.99% or 99.98%
7	Cathode Foil	Etched Aluminum 99.7% or 99.4%
8	Paper (Separator)	Manila+pulp,kraft
9	Adhesive tape	Poly-propylene film

1. Scope 适用范围：

This specification applies to aluminium electrolytic capacitor , used in electronic equipment .

本说明对于用电子仪器设备进行检测之铝电解电容器 适用.

2. Electrical characteristics 电气特性：

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格															
2.1	Rated voltage 额定电压		Voltage range、capacitance range,see specification of this series. 电压、容量范围请看该系列之规格说明.															
2.2	Capacitance 静电容量	1. Measuring frequency : 120 ± 12Hz 测定频率 2. Measuring voltage : ≤0.5Vrms + 0.5 ~ 2.0VDC 测定电压																
2.3	Dissipation factor 散逸因素 (损失角正切值)	3. Measurement circuit : [  ] 测定电路																
2.4	Leakage current 泄漏电流	DC leakage current shall be measured after 1~5 minutes application of the DC rated working voltage through the 1000 Ω resistor at 25°C. 在25 °C 通过1000Ω的电阻施加直流工作电压1~5分钟后测定直流泄漏电流.  R : 1000 ± 100Ω      S1 : Switch 开关 A : DC current meter      S2 : Switch for protect of 直流电流计                  直流电流计的保护开关 V : DC voltage meter      直流电压计 CX : Testing capacitor 测试电容	Dissipation factor、leakage current, see specification of this series. 损失角、泄漏电流请看 该系列之规格说明.															
2.5	Temperature characteristics 温度特性	<table border="1"> <thead> <tr> <th>STEP 步骤</th> <th>TEMPERATURE 温度</th> <th>STORAGE TIME 放置时间</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20 ± 2 °C</td> <td>30 minutes</td> </tr> <tr> <td>2</td> <td>-40 (or -55) ± 3 °C</td> <td>2 hours</td> </tr> <tr> <td>3</td> <td>20 ± 2 °C</td> <td>15 minutes</td> </tr> <tr> <td>4</td> <td>85 (or 105) ± 2 °C</td> <td>2 hours</td> </tr> </tbody> </table> <p>Step 1. Measure the capacitance and impedance. 测定静电容量及阻抗 (Z<sub>r0</sub>) . (   Z   , 20°C , 120Hz ± 10% )</p> <p>Step 2. Measure the impedance at thermal balance after 2 hours. 达到热平衡2小时后测定阻抗 (Z<sub>r</sub>) . (   Z   , -40°C , 120Hz ± 10% )</p> <p>Step 4. Measure the capacitance and leakage current at thermal balance after 2 hours. 达到热平衡2小时后测定静电容量及漏电流 .</p>	STEP 步骤	TEMPERATURE 温度	STORAGE TIME 放置时间	1	20 ± 2 °C	30 minutes	2	-40 (or -55) ± 3 °C	2 hours	3	20 ± 2 °C	15 minutes	4	85 (or 105) ± 2 °C	2 hours	<p>Step 2. Impedance ratio (Z<sub>r</sub> / Z<sub>r0</sub>) less than specified value. 阻抗比：低于规定值 .</p> <p>Step 4 ① Capacitance change : within ± 20% of the initial measured value. 静电容量变化：最初测定值的 ± 20%以内.</p> <p>②Leakage current : Less than 10 times of initial specified value . 泄漏电漏：初期规格值的10倍以下 .</p>
STEP 步骤	TEMPERATURE 温度	STORAGE TIME 放置时间																
1	20 ± 2 °C	30 minutes																
2	-40 (or -55) ± 3 °C	2 hours																
3	20 ± 2 °C	15 minutes																
4	85 (or 105) ± 2 °C	2 hours																

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
2.6	Surge test 突波试验	Rated surge voltage shall be applied (swich on) for 30 ± 5 seconds and then shall be applied (swich off) with discharge for 5 ± 0.5 min at room temperature . This cycle shall be repeated for 1000 cycles .Duration of one cycle is 6 ± 0.5 minutes .  在常温下施加 ( 合上开关 ) 额定涌浪电压 30 ± 5 秒, 然后停止施加 ( 断开开关 ) 涌浪电压并且放电 5 ± 0.5 分钟. 这个循环要重复1000次. 以 6 ± 0.5 分钟为一个循环周期 .	①Capacitance change : within ± 20% of the initial specified value. 容量变化率ΔC/C : 最初规定值的 ± 20%以内.  ② Dissipation factor : less than 200% of the initial specified value. 损失角 : 低于最初规定值的 200%.  ③Leakage current : within initial specified value. 泄漏电流 : 在最初规定值以内.
2.7	Maximum applicable ripple current 最大纹波电流测试	The maximum A.C.current having frequency of 120 or 100K Hz which can be applied to the capacitor at (Rated temp. max.±2℃) continuously.Peak voltage not to exceed rated D.C.voltage.  在120或100K HZ频率条件下施加最大的纹波电流,温度为 ( 额定最高允许使用温度±2℃ ) .施加的AC及DC偏压不能超过DC电压.	

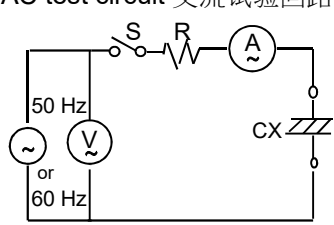
3. Mechanical characteristics 机械特性 :

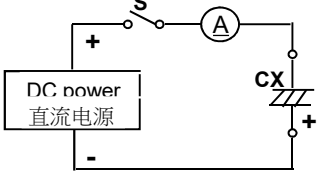
No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格																										
3.1	Lead strength 端子强度	<p>(A) Tensile strength 拉伸强度 :</p> <p>wire lead terminal 导针型 :</p> <table border="1"> <tr> <td>d (mm)</td> <td>≤0.45</td> <td>0.5 ~ 0.8</td> <td>0.8 &lt; d ≤ 1.25</td> </tr> <tr> <td>load (Kg)</td> <td>0.51</td> <td>1.0</td> <td>2.0</td> </tr> </table> <p>snap-in terminal 尖脚型 :</p> <table border="1"> <tr> <td>d (mm)</td> <td>snap-in terminal 尖脚端子</td> </tr> <tr> <td>load (Kg)</td> <td>2.0</td> </tr> </table> <p>The capacitor shall withstand the constant tensile force specified between the body and each lead for 10 seconds without damage either mechanical or electrical. 电容器各端子要承受规定的荷重 10 秒. 不能有电气或机械特性上的损伤.</p> <p>(B) Bendina strength 弯曲强度 :</p> <p>wire lead terminal 导针型 :</p> <table border="1"> <tr> <td>d (mm)</td> <td>≤0.45</td> <td>0.5 ~ 0.8</td> <td>0.8 &lt; d ≤ 1.25</td> </tr> <tr> <td>load (Kg)</td> <td>0.25</td> <td>0.51</td> <td>1.0</td> </tr> </table> <p>snap-in terminal 尖脚型 :</p> <table border="1"> <tr> <td>Cross section area of terminal 端子截面积 (mm<sup>2</sup>)</td> <td>force 拉伸力 (Kg)</td> </tr> <tr> <td>0.5 &lt; S ≤ 1</td> <td>1.0</td> </tr> <tr> <td>S &gt; 1</td> <td>2.5</td> </tr> </table> <p>With the capacitor in a vertical position apply the load specified ax-ially to each lead . The capacitor shall be rotated slowly from the vertical to the horizontal position , back to the vertical position.The 90° in the opposite direction and back the original position . Perfor- mance of capacitor shall not have changed and leads shall be unda-aged . 给在竖直位置的电容器的每一端子以轴方向施加规定荷重, 慢慢将电容器由竖直位置转至水平位置. 然后向相反方向弯曲 90°, 再回到原来位置. 电容器性能不能有变化及端子不能有损伤.</p>	d (mm)	≤0.45	0.5 ~ 0.8	0.8 < d ≤ 1.25	load (Kg)	0.51	1.0	2.0	d (mm)	snap-in terminal 尖脚端子	load (Kg)	2.0	d (mm)	≤0.45	0.5 ~ 0.8	0.8 < d ≤ 1.25	load (Kg)	0.25	0.51	1.0	Cross section area of terminal 端子截面积 (mm <sup>2</sup> )	force 拉伸力 (Kg)	0.5 < S ≤ 1	1.0	S > 1	2.5	<p>When the capacitance is measured, there shall be no intermittent contacts,or open- or short- circui- ting.</p> <p>测定静电容量时, 不能有接触不良, 开路或短路.</p> <p>There shall be no such mechanical damage as terminal damage etc.</p> <p>不能有如端子受损之类的机械特性上的损伤.</p>
d (mm)	≤0.45	0.5 ~ 0.8	0.8 < d ≤ 1.25																										
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S > 1	2.5																												

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
3.2	Vibration resistance 耐振性	<p>The frequency of the vibration shall vary uniformly within the range 10 to 55 Hz with the amplitude of 1.5 mm , completing the cycle in the internal of one.</p> <p>The capacitor shall be securely mounted by its leads with hold the body of capacitor . The capacitor shall be vibrated in three mutually perpendicular directions for a period of 2 hours in each direction .</p> <p>振动频率 10 ~ 55 Hz , 振幅为 1.5 mm , 在 1 分钟内完成该循环 . 电容器将由端子牢固地固定 . 电容器会被向三个互相垂直的方向每个方向振动 2 小时 .</p>	<p>① Capacitance : no unsteady . 静电容量 : 稳定 .</p> <p>② Appearance : no abnormal . 外观 : 无异常 .</p> <p>③ Capacitance change : within <math>\pm 5\%</math> of initial measured value . 容量变化率<math>\Delta C/C</math> : 最初测得值的<math>\pm 5\%</math> 之内 .</p>
3.3	Solderability 焊锡性	<p>The leads are dipped in the solder bath of Sn at <math>260 \pm 5^\circ\text{C}</math> for <math>3 \pm 0.5</math> seconds . The dipping depth should be set at 1.5 ~ 2.0 mm .</p> <p>端子浸没在 <math>260 \pm 5^\circ\text{C}</math> 的锡焊液中 <math>3 \pm 0.5</math> 秒 . 浸没深度设定为 1.5 ~ 2.0 mm .</p>	<p>The solder alloy shall cover the 95% or more of the dipped lead's area .</p> <p>锡液要覆盖导针浸入表面积 95% 以上 .</p>

4. Reliability 信赖度 .

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
4.1	Soldering heat resistance 焊锡耐热性	<p>The leads immerse in the solder bath of Sn at <math>260 \pm 5^\circ\text{C}</math> for <math>10 \pm 1</math> seconds until a distance of 1.5 ~ 2mm from the case .</p> <p>导针在 <math>260 \pm 5^\circ\text{C}</math> 的锡焊液中浸没至离本体 1.5 ~ 2 mm 的地方 <math>10 \pm 1</math> 秒钟 .</p>	<p>① No damage or leakage of electrolyte . 无损伤或电解液漏出 .</p> <p>② Capacitance change : within <math>\pm 10\%</math> of the initial measured value . 容量变化率<math>\Delta C/C</math> : 最初测定值的 <math>\pm 10\%</math> 以内 .</p> <p>③ Tan <math>\delta</math> : less than specified value . 损失角 : 低于规定值 .</p> <p>④ Leakage current : less than specified value . 泄漏电流 : 低于规定值 .</p>
4.2	Damp heat ( steady state ) 耐湿性 ( 稳定状态 )	<p>Subject the capacitors to <math>40 \pm 2^\circ\text{C}</math> and 90% to 95% relative humidity for <math>240 \pm 8</math> hours .</p> <p>电容器在 <math>40 \pm 2^\circ\text{C}</math> 及相对湿度 90% 到 95% 的条件下经历 <math>240 \pm 8</math> 小时 .</p>	<p>① Capacitance change : within <math>\pm 10\%</math> of the initial measured value . 容量变化率<math>\Delta C/C</math> : 最初测定值的 <math>\pm 10\%</math> 以内 .</p> <p>② Tan <math>\delta</math> : less than specified value . 损失角 : 低于规定值 .</p> <p>③ Leakage current : less than specified value . 泄漏电流 : 低于规定值 .</p>

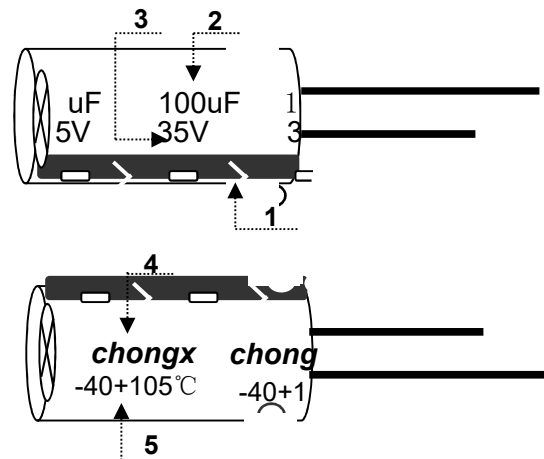
No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格														
4.3	Load life 高温负荷	<p>After X hours continuous application of DC rated working voltage at (Rated temp. max. <math>\pm 2</math>) <math>^{\circ}\text{C}</math>, the measurements shall meet the following limits .</p> <p>Measurements shall be performed after 16 hours exposed at room temperature .</p> <p>在额定最高使用温度<math>\pm 2^{\circ}\text{C}</math> 环境当中连续施加直流定格电压 X小时后 ,按以下条件测试 .</p> <p>( X: see specification of this series. 见该系列规格说明 . )</p>	<p>Standard of judgement is according to requirement of this series .</p> <p>判定标准依该系列要求 .</p>														
4.4	Shelf life 高温无负荷	<p>After storage for Y hours at (Rated temp. max. <math>\pm 2</math>) <math>^{\circ}\text{C}</math> without voltage application , the measurements shall meet the following limits .</p> <p>Measurements shall be performed after exposed for 16 to 24 hrs at room temperature after application of DC rated voltage to the capacitor for Z minutes .</p> <p>在 额定最高使用温度 <math>\pm 2^{\circ}\text{C}</math> 环境当中不施加直流定格电压放置 Y 小时后 ,按以下条件测试 .</p> <p>测试在室温露置16 到24小时 ,施加直流定格电压 Z 分锺后 进行 .</p> <p>( Y . Z : see specification of this series. 见该系列规格说明 . )</p>															
4.5	Storage at low temperature 低温贮存	<p>The capacitor shall be stored at temperature of <math>-40 \pm 3^{\circ}\text{C}</math> for 16 hours , during which time no voltage shall be applied . And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours or more.</p> <p>电容器在 <math>-40 \pm 3^{\circ}\text{C}</math> 环境当中贮存16 小时 ,其间不施加电压 . 之后 ,在标准大气压中露置 16 小时以上 ,然后进行测试 .</p>	<p>① Capacitance change : within <math>\pm 10\%</math> of the initial value . 容量变化率<math>\Delta C/C</math> : 最初值的 <math>\pm 10\%</math>以内 .</p> <p>② Tan <math>\delta</math> : less than specified value . 损失角 : 低于规定值 .</p> <p>③ Leakage current : less than specified value . 泄漏电流 : 低于规定值 .</p> <p>④ Appearance: no abnormal 外 观 : 无异常 .</p>														
4.6	Pressure relief 防爆 试验	<p>AC test 交流试验 : Applied voltage : AC voltage not exceeding 0.7 times of the rated direct voltage or 250 V AC whichever is the lower . 施 加 电 压 : 不超过定格电压 0.7 倍 的交流电压或低于交流电压 250 V 的任意电压 .</p> <p>Frequency 频率 : 50 Hz or 60 Hz .</p> <p>Series resistor : refer to the table below . 串 联 阻 抗 : 参照下表 .</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Capacitance ( C ) 容 量</th> <th>Series resistor 串 联 阻 抗</th> </tr> </thead> <tbody> <tr> <td><math>C \leq 1\mu\text{F}</math></td> <td>1000 <math>\Omega</math></td> </tr> <tr> <td><math>1\mu\text{F} &lt; C \leq 10\mu\text{F}</math></td> <td>100 <math>\Omega</math></td> </tr> <tr> <td><math>10\mu\text{F} &lt; C \leq 100\mu\text{F}</math></td> <td>10 <math>\Omega</math></td> </tr> <tr> <td><math>100\mu\text{F} &lt; C \leq 1000\mu\text{F}</math></td> <td>1 <math>\Omega</math></td> </tr> <tr> <td><math>1000\mu\text{F} &lt; C \leq 10000\mu\text{F}</math></td> <td>0.1 <math>\Omega</math></td> </tr> <tr> <td><math>10000\mu\text{F} &lt; C</math></td> <td>*</td> </tr> </tbody> </table> <p>* Resistance is equivalent to a half impedance by test frequency 相当于试验频率的一半阻抗值 .</p>	Capacitance ( C ) 容 量	Series resistor 串 联 阻 抗	$C \leq 1\mu\text{F}$	1000 $\Omega$	$1\mu\text{F} < C \leq 10\mu\text{F}$	100 $\Omega$	$10\mu\text{F} < C \leq 100\mu\text{F}$	10 $\Omega$	$100\mu\text{F} < C \leq 1000\mu\text{F}$	1 $\Omega$	$1000\mu\text{F} < C \leq 10000\mu\text{F}$	0.1 $\Omega$	$10000\mu\text{F} < C$	*	<p>AC test circuit 交流试验回路</p>  <p> <math>\sim</math> : AC power 交流电源          S : Switch 开关  <math>\text{A}</math> : AC voltage meter 交流电压计  <math>\text{V}</math> : AC current meter 交流电流计          R : protection resistor 保护电阻          Cx : testing capacitor 供试电容器     </p>
Capacitance ( C ) 容 量	Series resistor 串 联 阻 抗																
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$10000\mu\text{F} < C$	*																

No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格																	
4.6	Pressure relief 防爆试验	<p>DC test 直流测试： Send the following electricities while applying the inverse voltage .</p> <p>施加反向电压时通入下记电流 .</p> <p>where case size 外壳尺寸 ( D 直径 )：</p> <p style="margin-left: 40px;"><math>D \leq 22.4 \text{ mm} : 1 \text{ A d.c. max}</math></p> <p style="margin-left: 40px;"><math>D &gt; 22.4 \text{ mm} : 10 \text{ A d.c. max}</math></p> <p>Note :</p> <p>1. This requirement applies to capacitors with adiameter of 8 mm or more .</p> <p>2. When the pressure relief divice does not open even 30 minutes after commencement of test , the test may be ended .</p> <p>注：1. 此要求对于直径 8 mm 或以上之电容器适用.</p> <p>2. 试验开始，经 30 分钟后防爆装置仍不动作，试验终止 .</p>	<p>DC test circuit 直流试验回路</p>  <p>S : Switch 开关          (A) : DC current meter 直流电流计          CX : testing capacitor 供试电容器</p> <p>The pressure relief divice shall open in such a way as to avoid any dange of fire or explosion of capacitor elements ( terminal and metal foil etc ) or cover .          防爆装置必须动作，以防止发生火灾、爆炸或金属片飞溅 .</p>																	
4.7	Temperature changed quickly 温度快速变化	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Step</th> <th>Temp. 温度 °C</th> <th>Time</th> <th>Recycling times循环次数</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Operating Low Temp</td> <td>30 ± 3</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">5 times (次)</td> </tr> <tr> <td>2</td> <td>Room Temp</td> <td>Below 3</td> </tr> <tr> <td>3</td> <td>Operating High Temp.</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room Temp</td> <td>Below 3</td> </tr> </tbody> </table> <p>Return to room temp 常温恢复时间：16H</p>	Step	Temp. 温度 °C	Time	Recycling times循环次数	1	Operating Low Temp	30 ± 3	5 times (次)	2	Room Temp	Below 3	3	Operating High Temp.	30 ± 3	4	Room Temp	Below 3	<p>1. No visual damage and No leakage of electrolytic capa 无可见损伤和电解液漏出；</p> <p>2.The characteristics changed range the limit of specifications. 特性值变化满足目录书给定的要求.</p>
Step	Temp. 温度 °C	Time	Recycling times循环次数																	
1	Operating Low Temp	30 ± 3	5 times (次)																	
2	Room Temp	Below 3																		
3	Operating High Temp.	30 ± 3																		
4	Room Temp	Below 3																		
4.8	Other 其它	Reference to JISC 5141 参考 JIS C 5141标准.																		

5. Marking 标识：

Marking on capacitors include 电容器上的标识包括：

- 1) Negative Polarity  
负极标示
- 2) Norminal capacitance  
标准静电容量
- 3) Working voltage  
额定工作电压
- 4) chongx trade-mark  
chongx 商标
- 5) maximum operating temperature  
电容器允许的最高温度



◆Detergent needing attention:

使用清洗剂之注意事项

Hydrogen carbide liquid and halogen liquid can cause Aluminium Electrolytic Capafitor to corrode. Some of safe and unsafe detergent are as follow.

铝质电解电容器会受含有碳化氢、卤素溶剂之侵蚀，下列为各种安全与不安全之清洗剂，为避免不必要的损失，您所使用有关印刷基板的清洗剂名请事先告知本公司。

Safe 安全	Unsafe 不安全
Dimethybenxene 二甲苯	1.1.2- Trichloroethane 1.1.2- 三氯乙烷
Methanol 甲醇	Tetrachloroethylene 四氯化碳
Ethanol 乙醇	Chloroform(colorless volatilizable liquid) 哥罗仿(无色挥发性液体)
Propanol 丙醇	Dichloromethane 二氯甲烷
Butanol 丁醇	Trichloreethylene 三氯甲烯
Detergent 去垢剂	

◆Storage Conditions and Control for Aluminum Electrolytic Capacitor.

铝电解电容器存放环境与控制

1. 环境温度 : 5°C ~ 35°C, 环境相对湿度 : 75%以下 .  
Store the capacitor at a temperature of 5°C to 35°C and at a relative humidity of less than 75% .
2. 存放环境不应有阳光直射,不宜高温 .  
Store the capacitor in low temperature places free from direct sun shine .
3. 存放环境不能有盐分、油含量高的雾气 .  
Store the capacitor in places free from oil vapor、salt water vapor.
4. 存放在远离氯气、氨气、硫化氢、亚硫酸、硝酸等有害气体含量高的地方 .  
Store the capacitor in places far from toxic gases ( chlorine、 ammonium、 hydrogen sulfide、 sulphurous acid、 nitric acid , etc ) .
5. 储存环境不能有臭氧、紫外线或辐射 .  
Store the capacitor in place free from Ozone、 ultraviolet ray or radiation .