东 莞 市 诚 韬 电 子 有 限 公 司

DONG GUAN CHENG TAO ELECTRONIC CO.,LTD

TEL:0769-85328315 FAX:0769-85532615

承 认 书

客　　户：_____

CUSTOMER

品　　名：　叠层高分子固态铝电解电容器　

DESCRIPTION

規　　格：CT 系列 105° 2000H

料　　號：_____

PART NO.

適用機種：_____

FOR MODEL NO.

承制方確認

擬 制	審 核	批 准
蔡 雯 莉	王 文 昊	李 雨 橙

使用方確認

開發/工程 審 核	IQC 審核	批 准

一、产品规格参数 Product specification parameters

序号	Part No.品名规格	WV(VDC) 额定电压	Cap (μF)@120Hz 容量	tanδ Max. 损失角	Leakage Current 漏电流（uA）	ESR Max. 等效串联电阻(mΩ)	CAP 容量规格	Cace size 产品尺寸
1	CT0E471M194R5	2	470	0.06	94	4.5	±20%	7.3*4.3*1.9
2	CT0E471M1906R		470	0.06	94	6	±20%	7.3*4.3*1.9
3	CT0E471M1909R		470	0.06	94	9	±20%	7.3*4.3*1.9
4	CT0E331M1909R		330	0.06	66	9	±20%	7.3*4.3*1.9
5	CT0E331M1906R		330	0.06	66	6	±20%	7.3*4.3*1.9
6	CT0F471M194R5	2.5	470	0.06	117.5	4.5	±20%	7.3*4.3*1.9
7	CT0F471M1906R		470	0.06	117.5	6	±20%	7.3*4.3*1.9
8	CT0F471M1909R		470	0.06	117.5	9	±20%	7.3*4.3*1.9
9	CT0F331M1909R		330	0.06	82.5	9	±20%	7.3*4.3*1.9
10	CT0F331M1906R		330	0.06	82.5	6	±20%	7.3*4.3*1.9
11	CT0J101M1940R	6.3	100	0.06	63	40	±20%	7.3*4.3*1.9
12	CT0J151M1918R		150	0.06	94.5	18	±20%	7.3*4.3*1.9
13	CT0J221M1915R		220	0.06	138.6	15	±20%	7.3*4.3*1.9
14	CT1A101M1940R	10	100	0.06	100	40	±20%	7.3*4.3*1.9

二、物料编码说明 Specifications Of Part Number

系列	电压	容量	精度	尺寸	阻抗上限
CT	0E	471	M	19	4R5
105℃2000 小时	2V	470UF	20%	7.3*4.3*1.9	4.5 毫欧

1. 寿命标准

寿命标准以“小时”为单位，与产品的最高允许使用温度同时讨论方有意义，即表示在最高允许使用温度下，产品正常使用的最低寿命值，

2. 额定静电容量

例：

额定静电容量	0.1	0.47	1	4.7	10	47	100	470	1000	4700	10000
编码	0R1	R47	010	4R7	100	470	101	471	102	472	103

3. 额定电压

额定电压单位为 V（伏特），以 2 个字母表示

例：

额定电压（WV）	2	2.5	4	6.3	10	16	25
编码	0E	0F	0G	0J	1A	1C	1E

4. 尺寸

尺寸用 4 个数字表示

例：

尺寸（mm）	7.3*4.3*1.9	7.3*4.3*2.8
编码	19	28

5. 容量范围

容量范围用 1 个字母表示

例：

容量范围	±20%	-35%-+10%	-10%-+20%	0-+20%
编码	M	L	V	A

6. 阻抗上限

阻抗上限用 3 个字母或数字表示，当阻抗上限不足 10 毫欧且出现小数点时，只取整数部分（不四舍五入）。

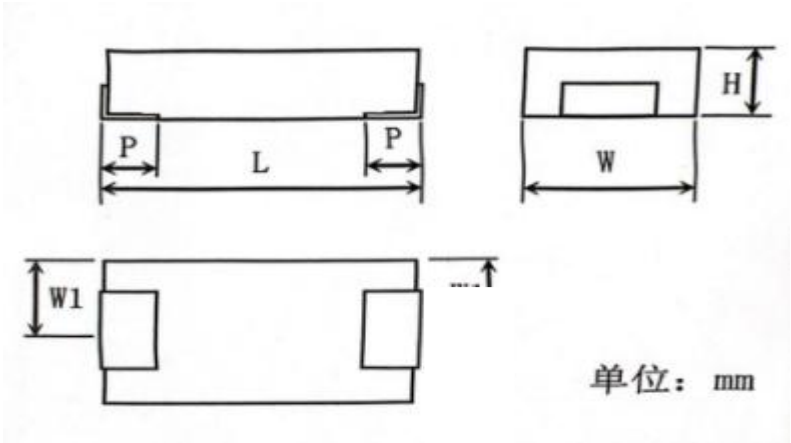
例：

阻抗上限（毫欧）	4.5	9	10	25	60
编码	4R5	09R	10R	25R	60R

三、适用范围 Scope

本产品规格书适用于 CT 型叠层高分子固态铝电解电容器产品。

五、外形图及尺寸表 Case Size Tabl



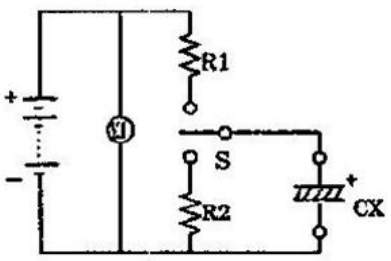
L±0.2	W±0.2	H±0.1	W1±0.1	P±0.2
7.3	4.3	1.9	2.4	1.3

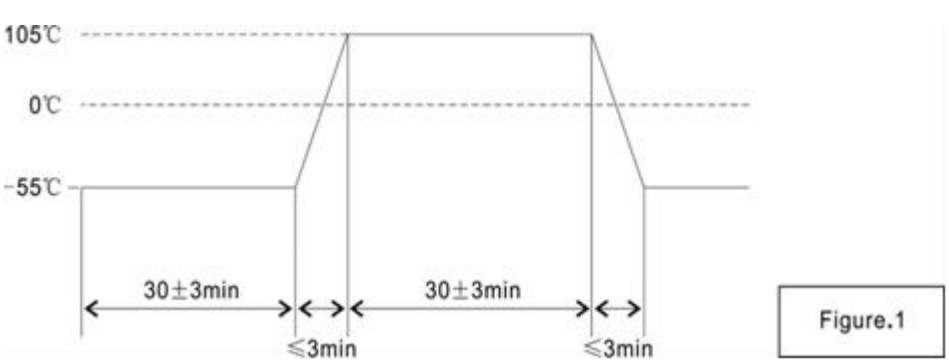
备注：此外形图为示意图，细节部分或未标示数据请以确认工程图纸为准。

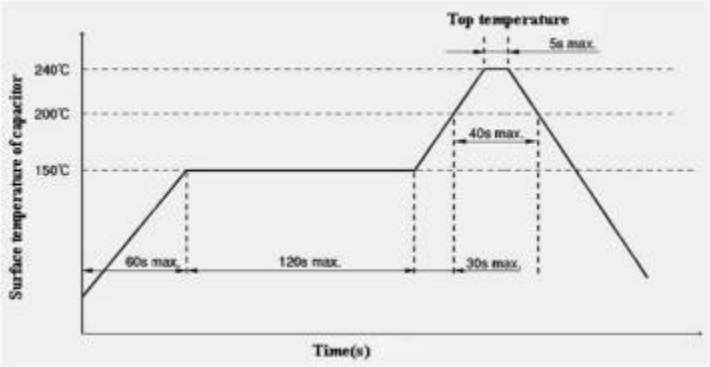
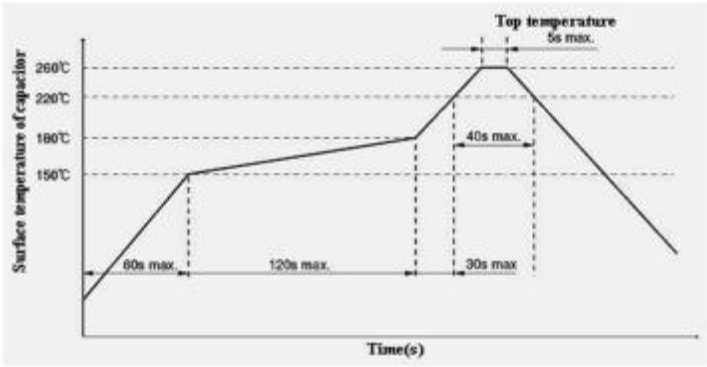
四、技术性能 Specifications

<table>
<tr><td>1.</td><td>工作温度范围
Working temperature range</td><td colspan="2">-55~+105℃</td></tr>
<tr><td>2.</td><td>额定工作电压
rated operational voltage</td><td colspan="2">2~35V</td></tr>
<tr><td>3.</td><td>容量范围
Capacity range</td><td colspan="2">15~470μF 120Hz/20℃</td></tr>
<tr><td>4</td><td>容量允许偏差
Capacity range, allowable deviation of capacity</td><td colspan="2">±20%(120Hz/20℃)</td></tr>
<tr><td>5</td><td>损耗角正切值
Loss angle tangent value</td><td colspan="2">标准品一览表的值以下 120Hz／20℃</td></tr>
<tr><td>6</td><td>漏电流
Leakage current</td><td colspan="2">I≤0.15CV 额定电压下充电 2 分钟，20℃</td></tr>
<tr><td>7</td><td>等效串联阻抗（ESR）
Equivalent series impedance (ESR)</td><td colspan="2">标准品一览表的值以下 100KHz／20℃</td></tr>
<tr><td>8</td><td>浪涌电压（V）
Surge voltage (V)</td><td colspan="2">额定电压的 1.1 倍</td></tr>
<tr><td rowspan="4">9</td><td rowspan="4">耐久性
durability</td><td colspan="2">在 105℃温度下，施加额定工作电压 2000 小时，并在 20℃下放置 16 小时后，产品应满足：</td></tr>
<tr><td>静电容量变化率</td><td>初始值的±20％</td></tr>
<tr><td>损失角正切值</td><td>≤初始规格值的 200％</td></tr>
<tr><td>漏电流</td><td>≤初始规格值</td></tr>
<tr><td>10</td><td>高温高湿
High temperature and humidity</td><td colspan="2">在 60℃温度、90％～95％R．H 湿度条件下放置 1000 小时，不施加电压，并在 20℃下放置 16 小时后，产品应满足：
<table>
<tr><td>静电容量变化率</td><td>初始值的＋50％-20％</td></tr>
<tr><td>损失角正切值</td><td>≤初始规格值的 200％</td></tr>
<tr><td>漏电流</td><td>≤初始规格值</td></tr>
</table></td></tr>
</table>

五.试验方法及要求 Tests

<table>
<tr><td>1.</td><td>浪涌测试
Surge test</td><td>
在规定温度下，循环测试 1000 次，每次充电 30±5 秒，再放电大约 5 分 30 秒。在标准温度条件下存放使其稳定，然后测试。
The capacitor shall be subjected to 1000 cycles at a temperature specified below, each consisting of a charge period of 30±5sec, followed by a discharge period of approx. 5min30sec. And the capacitor shall be stored under standard conditions thermal to obtain stability, after which measurements shall be made.
measurement circuit (测试电路图）
<table>
<tr><td rowspan="3"> 
</td><td>VZ: 浪涌电压
Surge voltage</td><td>V1: 直流电压 DC voltmeter</td></tr>
<tr><td>R1: 保护电阻（1KΩ） Protective series</td><td>R2: 放电电阻器 Discharge resistor</td></tr>
<tr><td>CX: 测试电容 Test capacitor</td><td>S: 开关
Switch</td></tr>
</table>
SPEC:
电容量变化 Change in capacitance: ±10%初始值以内 Within±10% of the initial value
损耗角正切 Tangent of the loss angle: 小于等于初始规定值 The initial specified value or less
ESR（equivalent series resistance）：小于等于初始规定值 The initial specified value or less
漏电流 leakage current：小于等于初始规定值 The initial specified value or less
电压设定：
<table>
<tr><td>RATED VOLTAGE (V_{DC})</td><td>2</td><td>2.5</td><td>4</td><td>6.3</td><td>10</td><td>16</td><td>25</td></tr>
<tr><td>SURGE VOLTAGE (V_{DC})</td><td>2.2</td><td>2.7</td><td>4.4</td><td>6.93</td><td>11</td><td>17.6</td><td>27</td></tr>
</table>
</td></tr>
<tr><td>2.</td><td>可焊性
solderability</td><td>
1.测试方法：回流法；Testing method: reflux method;
2.目视检查 Visual inspection
需要焊 接 的区域应涂上新焊料，不超过少量分散缺陷的涂层，例如针孔或未润湿或去-润湿区域。这些缺陷不应集中在一个区域
The area that needs to be welded should be coated with new solder, not exceeding a small amount of dispersed defect coating, such as pinholes or areas that have not been wetted or have been removed from wetting. These defects should not be concentrated in one area
</td></tr>
<tr><td>3</td><td>耐焊接热
Resistance to soldering heat</td><td>
1.测试方法：回流法，回流温度曲线见第八项第.10 个试验，恢复期：24 小 时±2 小时；
Test method: Reflux method. The reflux temperature curve can be found in Experiment 10 of Item 7. Recovery period: 24 hours ± 2 hours
2. 目视检查：无可见损坏、清晰的标记；电容变化（ΔC/C）≤初始测量值的±10%；损失角≤初始极限；阻抗≤初始极限；漏电≤初始极限
Visual inspection: No visible damage, clear markings; Capacitance variation （ Δ C/C) ≤ ± 10% of the initial measurement value; Loss angle ≤ initial limit; Impedance ≤ initial limit; Leakage ≤ initial limit
</td></tr>
<tr><td>4</td><td>溶剂
标志耐溶性</td><td>
1.使用的溶剂：IPA Solvent used: IPA
2.溶剂温度：23℃±5℃ Solvent temperature: 23 ℃± 5 ℃
3.浸泡时间：5分 钟 ±0.5分钟方法2（无摩擦）Soaking time: 5 minutes ± 0.5 minutes Method 2 (no friction)
4.恢复时间：48 小时 Recovery time: 48 hours
5.目视检查： 无可见损坏；清晰的标记 Visual inspection: No visible damage; Clear markings
</td></tr>
<tr><td>5</td><td>高温高湿
Damp heat,
Steady state</td><td>
电容器要在温度 60±2℃，相对湿度 90％到 95％条件下存放 240±8 个小时。然后在标准条件下放 1 到 2 小时后进行测量。
The capacitor shall be stored at a temperature of 60±2℃ and relative humidity of 90 to 95% for 240±8hours .And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2hours, after which measurements shall be made
SPEC:
电容量变化 Change in capacitance: ±20%初始值以内 Within±20% of the initial value
损耗角正切 Tangent of the loss angle: ±150%初始规定值以内 within ±150%of the initial value
ESR（Equivalent series resistance）：±150%初始规定值以内 within ±150%of the initial value
漏电流 Leakage current：小于等于初始规定值 The initial specified value or less
</td></tr>
</table>

6.	高温储存 shelf life	在+105℃温度下不外加电压贮存，电容器存放 1000 小时。然后在标准条件下放 1 到 2 小时后进行测量，并且在测漏电流前，必须满足下列条件。 The capacitor shall be stored at +105℃ temperature specified below for 1000 hours. During which time no voltage shall be applied. And then the capacitor shall be subjected to standard atmosphere conditions for 1 to 2 hours, after which measurements shall be made, Prior to the measurement of leakage current, following conditioning may be made. SPEC: 电容量变化 Change in capacitance: ±20%初始值以内 Within±20% of the initial value 损耗角正切 Tangent of the loss angle: ±150%初始规定值以内 within ±150%of the initial value ESR（Equivalent series resistance）：±150%初始规定值以内 within ±150%of the initial value 漏电流 Leakage current：小于等于初始规定值 The initial specified value or less
7	耐久性 load life	在+105℃下，电容器施加带额定纹波电流的额定电压 2000 小时。在标准条件下放 1 到 2 小时后进行测量。 The rated voltage with specified ripple current shall be applied continuously to the capacitor at maximum operating temperature +105℃ for 2000 hours. And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2hours, after which measurement shall be made. SPEC: 电容量变化 Change in capacitance: ±20%初始值以内 Within±20% of the initial value 损耗角正切 Tangent of the loss angle: ±150%初始规定值以内 within ±150%of the initial value ESR（Equivalent series resistance）：±150%初始规定值以内 within ±150%of the initial value 漏电流 Leakage current：小于等于初始规定值 The initial specified value or less
8.	温度循环试验 Rapid temperature change	电容器要图一的温度循环要求下保持 5 个循环。然后在标准条件下放 1 到 2 小时后进行测量。 The characteristics of a capacitor kept under the temperature cycle indicated in Figure1 for 5 cycles . And then the capacitor shall be subjected to standard atmospheric conditions for 1to 2hours, after which measurement shall be made.  Figure.1 SPEC: 电容量变化 Change in capacitance: ±10%初始值以内 Within±10% of the initial value 损耗角正切 Tangent of the loss angle: 小于等于初始规定值 The initial specified value or less ESR（Equivalent series resistance）：小于等于初始规定值 The initial specified value or less 漏电流 Leakage current：小于等于初始规定值 The initial specified value or less
9	低温试验 Low temperature test	电容器要在温度-55℃条件下存放 72±2 个小时。然后在标准条件下放 1 到 2 小时后进行测量。 The capacitor shall be stored at a temperature of -55℃ for 72±2hours。And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2hours, after which measurements shall be made SPEC: 电容量变化 Change in capacitance: ±10%初始值以内 Within±10% of the initial value 损耗角正切 Tangent of the loss angle: 小于等于初始规定值 The initial specified value or less ESR（Equivalent series resistance）：小于等于初始规定值 The initial specified value or less 漏电流 Leakage current：小于等于初始规定值 The initial specified value or less

10	回流焊试验 Reflow soldering test	焊料（Solder）:H60A、H60S or(或)H63A 焊接温度（Solder temperature）:265±5℃ 10S 采用回流焊法！使用电烙铁时，电烙铁头不应接触外壳。确保焊接温度不超过 350℃，时间不超过 3 秒 Solder temperature: 265 ± 2 ℃ for 30S using reflow soldering method! When using an electric soldering iron, the tip of the soldering iron should not come into contact with the outer shell. Ensure that the welding temperature does not exceed 350 ℃ and the time does not exceed 3 seconds 焊接曲线：  无铅焊接的推荐曲线： 

六、叠层型产品包装说明 Package Specifications For Multilayer Type

1．包装数量说明：

产品尺寸（mm］ Case Size	只／盘（（Ø330mm）） pcs/Reel [Ø330mm]	只／外箱 pcs/Outer box
7.3*4.3*1.9	3500	17500
7.3*4.3*2.8	2000	10000

七、 产品使用注意事项 Guidelines For Using Aluminum Electrolytic Capacitor

为使您获得叠层高分子固态铝电解电容器的最佳性能和延长电解电容器的使用寿命，在使用电解电容器前，请务必阅读本注意事项。

Upon using Aluminum Electrolytic Capacitors，please proper handing and observing to following important points insure optimum capacitor performance and long life.

1. 直流电解电容器是有极性的 DC electrolytic capacitors are polarized.
   确定极性，极性标志在电容器的基体上。以免因极性反可能引起电路短路或电容器损坏，当极性不固定或不确定的，使用双极性电容器。注意直流电解电容器不能使用于交流。
   Make sure of the polarity. The polarity is marked on the body of the capacitor .Application of the reversed voltage cause a short circuit or damage to the capacitor. Use bipolar capacitors when the polarity is not determined or unknown. Note that DC electrolytic capacitors can not be used for AC application.

2. 使用电压不要大于额定电压 Do not apply voltage greater than rated voltage

使用电压大于额定电压，漏电流会增大，可能损坏电容器。建议工作电压为额定电压的百分之七十～八十，电容器在建议的工作电压下使用可延长电容器的寿命。

If a voltage exceeding the rated voltage is applied, the leakage current will increase, which damage the capacitor. Recommended working voltage is 70 to 80 percent of tatted voltage. Using capacitors at recommended working voltage prolongs capacitor life.

3. 不要使过量的纹波电流通过电容器 Do not allow excessive ripple current through the capacitor.

流过电容器的纹波电流超过许可值，将会引起电容器发热，电容量减少，损害电容器。通过电容器的纹波电流不要大于允许值。

The flow of ripple current over permissible ripple current will cause heat of the capacitor, which may decrease the capacitance and damage the capacitor. Ripple current on the capacitor must be at or below allowable level.

4. 快速的充放电电路中，使用专门设计的电容器 Use specially designed capacitors for the circuits where charge and discharge are frequency repeated.

在经受快速的周期性充放电电路中，电容器可能受损害，它的寿命因容量下降、温升等原因而缩短，在这种电路中，一定要使用专门设计的电容器。

In the circuit subjected to rapid charge cycles, capacitors may be damaged, its life may be shortened by capacitance decrease, heat rise, ect. Be sure and use special capacitors in these applications.

5. 工作温度范围 Operating temperature range.

电容器的特性随工作温度而变化，在温度较高的情况下，容量、漏电流增大，损耗减少；在低温情况下，容量和漏电流下降，损耗增大。电容器在较低的温度下使用会确保延长寿命。

The characteristics of capacitors change with the operating temperature. The capacitance and leakage current increase and tgδ decrease at higher temperatures. The capacitance and leakage current decrease and tgδ at increase lower temperature. Usage at lower temperature will ensure longer life.

6. 核对工作频率 Check operating frequency.

电解电容器的容量通常是在 100Hz 或 120Hz 下测得的。然而要记住容量随频率的升高而下降，tgδ随频率的升高而增大，并使周围温度升高。

The capacitance of electrolytic capacitors is usually measured at 100Hz or 120Hz. However, remember that capacitance decrease and tgδ increase as the applied frequency becomes higher whereas the ambient temperature becomes higher.

7. 长时间存放的电容器，在使用前加额定直流电压处理

Apply rated DC voltage treatment to the capacitors which have been stored for a long time .

长时间的存放，实际对电容器的容量和 tgδ没有多大的影响，然而往往会使漏电流增大，耐压降低。长时间存放后的电容器处理，首先逐渐施加直流电压至额定电压，然后再使用。

Long periods of storage have virtually no effect on a capacitor's capacitance and tgδ. Such periods tend however, to increase leakage current and decrease withstand voltage. After removing capacitors from long-duration storage, first apply a gradually increasing DC voltage to rated voltage and then use them.

8. 电容器的储 存 Storage of capacitors

电容器应储存在防潮且无阳光直射的环境中。优选温度为 5℃～30℃，相对湿度低于 60%RH。

水分敏感性等级：3 级。

为了保持良好的安装能力，请将电容器保持在交付时的状态。产品应在打开包装后的储存期内全部使用。请将剩余的产品放回包装袋中，并用胶带密封未密封的部分。

产品的储存期限：制造后 24 个月（打开包装前），打开包装后 7 天。超过储存极限后，需要进行干燥处理，条件为：50℃±2℃，100h 至 200h。

Capacitors should be stored in a moisture-proof and sun free environment. The preferred temperature is between 5 ℃ and 30 ℃, and the relative humidity is below 60% RH.

Moisture sensitivity level: Level 3.

To maintain good installation capability, please keep the capacitors in their delivered condition. The product should be fully used during the storage period after opening the packaging. Please put the remaining products back into the packaging bag and seal the unsealed parts with tape.

The storage period of the product is 24 months after manufacturing (before opening the packaging) and 7 days after opening the packaging. After exceeding the storage limit, drying treatment is required under the following conditions: 50 ℃± 2 ℃, 100h to 200h.