

承 认 书

APPROVING SHEET

客 户：
CUSTOMER: 刚达电子

● 品 名：
PART NAME Electrolytic Capacitor
电解电容器

系 列：
SERIES:

规 格：
SPECIFICATION: 220 μ F25V 8 \times 12

日 期：
DATE: 2018-07-10

| 制 造 MANUFACTURE | | 客 户 CUSTOMER | |
|--------------------|-----------------|-----------------|-----------------|
| 拟 制 FORMULATE | 批 准 APPROVAL | 检 验 CHECK | 批 准 APPROVAL |
| 陈木 | | | |

编 制：东莞市华松电子科技有限公司

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一. 铝质电解电容的使用注意事项

为使您获得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 will 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

极性附在电容器的基体上，装置时以免因极性反置可能引起电路短路或电容器破坏，当极性不固定或不定时，请使用双极性电容器，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 may 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 Bo 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，电容器在规定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 rated voltage .Using capacitors at recommended working voltage prolongs capacitors life.

3. 不要使用过量的纹波电流通过电容器

Do not allow excessive ripple current through the capacitor.

通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 current will cause heat of the capacitor, which may decrease the capacitance and the capacitor.

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，升温等原因而缩短，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 maybe shortened by capacitance decrease, hear rise, etc 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发生变化，在温度较高的情况下，容量，漏电流增大， $\tan \delta$ 减少，电容器在较低的温度下使用会确保延长寿命。

The characterizes of capacitors change with the operating temperature. the capacitance and leakage current in crease and $\tan \delta$ decrease at higher temperatures. L ' sage at lower temperature will ensure longer life.

6. 核对工作频率

Check operating frequency

电解电容器的电容量通常是在 100Hz 或 120Hz 下测得的，然而要记住容量随频率的升高而下降， $\tan \delta$ 随频率的升高而增大，并使周围温度升高；高频低阻抗系列阻抗值通常在 10KHZ 或 100KHZ 频率下测得。

The capacitance of electrolytic capacitors is usually measured at 100Hz or 120Hz. However, remember that capacitance and $\tan \delta$ increase as the applied frequency becomes higher where the ambient temperature becomes higher; LOWESR is usually measured at 10KHZ 或 100KHZ.

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.

长时间存放，实际对电容器的容量和 $\tan \delta$ 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 $\tan \delta$. Such periods, however, do increase leakage current and decrease with stand voltage. After removing capacitors from long-duration storage, first apply a gradually increasing DC voltage to rated voltage and then use them.

8. 电容器的外壳与阴极端是不绝缘的。

The capacitor case is not insulated from the cathode terminal

电容器的外壳与阴极端是通过电解液连接的，如果电容器的外壳必须与线路绝缘，则电容器的安装位置处，一定要采取绝缘措施。

The capacitor's case and cathode terminal connect through the electrolyte. If the case is to be completely insulated. That insulation must be at the capacitor's mounting point.

9. 电容器的端子或引线不要施加过大的力。

Do not apply excessive force to the terminals and leads

过大的力施加到端子或引线上，可能引起引线的断裂或端子分裂，转会引起内部连接的破坏。

The excessive strong force applied to the terminals and lead wires may cause leads to break or terminals to separate and in turn, cause the internal contact to fail.

二. 铝电解电容器主要性能参数

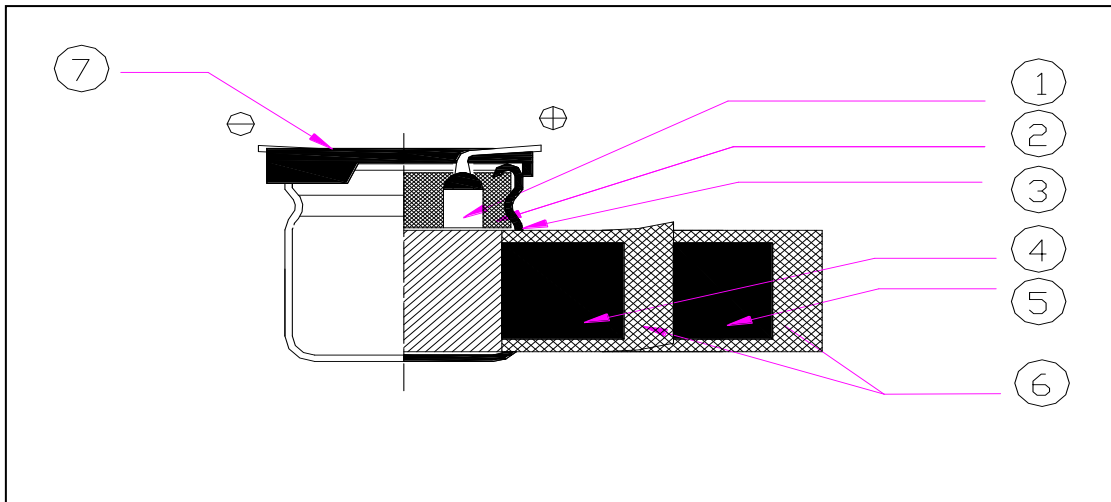
- 105℃,寿命为 3000~5000 小时.
- 适用于电脑主机板、显卡、机箱电源、开关电源输入输出回路
- 适用于高密度表面组装
- Suitable for output of switching mainboard、power supply.
- Available for high density surface mounting

■主要技术性能 Specifications

| 项目 template | 特性 Characteristic |
|-------------------------------------|----------------------|
| 使用温度 Operating temperature Range | - 40℃ ~ +105℃ |
| 额定电压范围 | 6.3 ~ 450V DC |

| | | | | | | | | | |
|--|--|--------|------|----|-----|-----|------|------|------|
| eRated Voltage Range | | | | | | | | | |
| 标称电容量范围 Nominal Capacitance Range | 1.0∞10000μf | | | | | | | | |
| 标称电容量允许偏差 Capacitance Tolerance | ±20% (120Hz, 20℃) | | | | | | | | |
| 漏电流 (20℃) Leakage Current (20℃) | $I \leq 0.01CR \text{ VR} (\mu\text{A})$ 或 $3\mu \text{ A}$ 取较大者. $I \leq 0.01CR \text{ VR} (\mu\text{A})$ or $3\mu \text{ A}$ Whichever is greater (after 2 minutes) | | | | | | | | |
| 损耗角正切值 (120Hz 20℃) Dissipation Factor (120Hz 20℃) | <table border="1"> <tr> <td>UR (V)</td> <td>25</td> <td>50</td> <td>400</td> </tr> <tr> <td>tgδ</td> <td>0.14</td> <td>0.10</td> <td>0.10</td> </tr> </table> | UR (V) | 25 | 50 | 400 | tgδ | 0.14 | 0.10 | 0.10 |
| UR (V) | 25 | 50 | 400 | | | | | | |
| tgδ | 0.14 | 0.10 | 0.10 | | | | | | |

三. 构造图及材料表 Frame drawing and materials



| 序号 No. | 部件名称 Parts | 材料名称 Material |
|-----------|---------------|---|
| 1 | 引出线 | 铝线 LG3+镀锡铜钢线 AL- wire LG3+Tin- plating of copper cover steel |
| 2 | 橡胶塞 | 丁基橡胶 IIR rubber |
| 3 | 铝壳 | 99.9%纯度铝 AL-99.5% |

| | | |
|---|---------------------|--|
| 4 | 阳极箔 AL – foil(+) | 99.99%或 99.98%形成铝箔 Formed AL 99.98% or 99.98% |
| 5 | 阴极箔 AL – foil(-) | 99.7%铝箔 Etched AL 99.7% |
| 6 | 电解纸 Separstor paper | 电解电容器纸 Electrolytic Capacitor paper |
| 7 | 电解液 | |

四.试验方法及要求 Tests

| | | | | | | | | | | | | |
|----------------|---------------------------------------|---|---|-------|----|----|-----|--|-----|------|------|------|
| 1 | 额定电压 (rated voltage) | 6.3~500V | | | | | | | | | | |
| 2 | 工作温度范围 Operating temperature range | 工作温度范围是指电容器在额定电压下能持续工作的所允许外部环境的温度范围 额定温度范围: -55~+105°C operating temperature range is the range of ambient temperature at which the capacitor can be operated continuously at rated voltage SPEC: -55~+105°C | | | | | | | | | | |
| 3 | 电容容量 capacitance | 测量等效电路图 measuring circuit equivalent series circuit | | | | | | | | | | |
| | | 测量温度:20±2°C | measuring temperature:20±2°C | | | | | | | | | |
| | | 测量频率:120HZ | measuring frequency:120HZ | | | | | | | | | |
| | | 测量电压:0.5Vrms | measuring voltage:0.5Vrms | | | | | | | | | |
| | | 标称电容容量允许偏差 :±20% MAX | Nominal Capacitance Tolerance:±20% MAX | | | | | | | | | |
| 4 | 损耗角正切 tangent of the loss angle | 损耗角正切的测量应要和测量电容容量一样的条件下进行:20±2°C, 120Hz, 0.5Vrms,最大合格值见下表: Measurement should be made under the same conditions as those given for the measurement of capacitance:20°C, 120Hz, 0.5Vrms. SPEC: <table border="1" style="margin-left: 20px;"> <tr> <td>损耗角正切 (tgδ)</td> <td>UR(V)</td> <td>25</td> <td>50</td> <td>400</td> </tr> <tr> <td></td> <td>tgδ</td> <td>0.14</td> <td>0.10</td> <td>0.10</td> </tr> </table> | 损耗角正切 (tgδ) | UR(V) | 25 | 50 | 400 | | tgδ | 0.14 | 0.10 | 0.10 |
| 损耗角正切 (tgδ) | UR(V) | 25 | 50 | 400 | | | | | | | | |
| | tgδ | 0.14 | 0.10 | 0.10 | | | | | | | | |
| 5 | 漏电流 leakage current | 将额定电压加在电容和 2000±100Ω 的保护电阻上。在充电 2 分钟后,按下列等式计算漏电流 the rated voltage shall be applied across the capacitor and its protective resistor which shall be 2000±100Ω.The leakage current shall be then | | | | | | | | | | |

| | | |
|---|--|---|
| | | <p>measured after an electrifications period of (A)min. The leakage current shall be calculated by the following equation</p> <p>在加上额定电压一定时间后，应满足下列要求：$I \leq 0.01-0.02CV$ or $3\mu A$ Which is greater(取较大者)（20°C，2 分钟）</p> <p>SPEC: The following specifications shall be satisfied when the rated voltage is applied for the required time.</p> |
| 6 | <p>允许最大纹波电流 Maximum permissible ripple current</p> | <p>在规定的某一频率下的最大交流电流，在该电流下电容器连续工作。即使在测过第 16 项下的耐久性后，此要求仍要满足。在此，DC 电压加上最大纹波电压小于等于额定电压。各规格允许最大纹波电流见《标称电容量、额定电压、额定纹波电流与外形尺寸对应表》</p> <p>The maximum sinusoidal alternating current of a frequency specified below, at which the capacitor can be operated continuously. This requirement shall be satisfied even after he measurement of clause 16(electrical endurance)</p> <p>Where(DC voltage +peak ripple voltage)\leqrated voltage</p> |

测试数据:

| | | | | | | | | | | |
|--|--|-----------------|---|---|--------------------|-----|-----|-----|-----|--------|
| 参数 项目 | 电压: 25V | 容量: 220 μ F | 容量误差: $\pm 20\%$ | 温度范围: $-40^{\circ}\text{C}\sim+105^{\circ}\text{C}$ | | | | | | |
| 外型尺寸 (mm) | 直径 D: <u>8\pm0.2</u> 高度 L: <u>12\pm1</u> 脚距 E: 3.5 (绿金) | | | | | | | | | |
| 参数标准 | 电容量 (C): <u>176~264</u> (μ F) 损失 (tg δ): <u>10%</u> (Max) 漏电 (I): <u>55μA</u> (充电 2 分钟取最大读数)z | | | | | | | | | |
| 贮存试验 | (105 $^{\circ}$ C 5000 小时试验后) | | 容量变化率: $\pm 20\%$ 初始值以内 ($\leq 25\text{V}$: $\pm 25\%$ 初始值以内) 损失值 ≤ 2 倍 漏电流 ≤ 2 倍 | | | | | | | |
| 寿命试验 | (105 $^{\circ}$ C 5000 小时试验后) | | 容量变化率: $\pm 20\%$ 初始值以内 ($\leq 25\text{V}$: $\pm 25\%$ 初始值以内) 损失值 ≤ 2 倍 漏电流 ≤ 2 倍 | | | | | | | |
| 初始测试(25 \pm 3 $^{\circ}$ C) | | | | | | | | | | |
| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 容量(C) | 217 | 215 | 220 | 215 | 211 | 214 | 215 | 217 | 215 | 211 |
| 损失角(tg δ %) | 7.6 | 7.5 | 7.9 | 8.1 | 7.2 | 7.5 | 7.9 | 7.5 | 7.3 | 8.0 |
| 漏电流 I(30 秒) | 7 | 8 | 9 | 10 | 7 | 9 | 7 | 8 | 7 | 8 |
| 制样: 陈木 | | | | | 审核: 陈翠娥 | | | | | 发样: 黄奇 |
| 结论: 1. <input type="checkbox"/> 承认 2. <input type="checkbox"/> 有条件承认 3. <input type="checkbox"/> 退料 | | | | | 客户承认章 客户签名: | | | | | |