

Specification For Approval

客户名称:

(Customer Name)

产品名称:

电解电容

(Product Name)

Aluminum Electrolytic Capacitor

客户料号:

(Customer part number)

科尼盛料号:

DHC025M228L214S1AA

(KNSCHA number)

型号规格:

E/C 25V/2200 $\mu$ F 13\*21mm 105°C KNSCHA SHC 2000H  
P:5.0mm  $\pm$ 20% 黑体白字

(Specifications)

日期:

2025.7.14

DATE

|                    |                 |
|--------------------|-----------------|
| 制 造<br>Manufacture |                 |
| 核 准<br>APPROVAL    | 制 作<br>PREPARED |
| 王帅                 | 陆美秀             |

|                            |                |                 |
|----------------------------|----------------|-----------------|
| 客户承认栏<br>CUSTOMER APPROVED |                |                 |
| 核 准<br>APPROVED            | 确 认<br>CHECKED | 经 办<br>DESIGNED |
|                            |                |                 |

**广东科尼盛电子科技有限公司**

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广东科尼盛电子科技有限公司

KNSCHA ELECTRONICS CO.,LIMITED

一、部品规格特征表

| NO | Series | CAP<br>(μF) | WV<br>(V. DC) | Size<br>(mm) | CAP<br>% | Operating<br>Temperature<br>Range (℃) | DF%<br>(120Hz<br>20℃) | LC<br>(2min)<br>(uA) | Max Ripple<br>Curent<br>(mA@105℃<br>/120HZ) | 寿命 (H) | 备注 |
|----|--------|-------------|---------------|--------------|----------|---------------------------------------|-----------------------|----------------------|---------------------------------------------|--------|----|
| 1  | SHC    | 2200        | 25            | 13*21        | ±20      | -40~105                               | 20                    | 550                  | 1300                                        | 2000   |    |
| 2  |        |             |               |              |          |                                       |                       |                      |                                             |        |    |
| 3  |        |             |               |              |          |                                       |                       |                      |                                             |        |    |

注明：无卤产品

1. 适用标准(TEST STANDARD):

- JIS C 5141 - 1991 电子机器用固定非固体电解质电解电容器
- JIS C 5102 电子机器用固定电容器试验方法
- GB 5993-91 电子设备用固定电容器 第四部分：分规范：固体和非固体电解质铝电容器

2. 适用范围（Adapt Range）：

本产品规格书适用于广东科尼盛电子科技有限公司铝电解电容器。  
This product specification is adapted to Aluminum Electrolytic Capacitors produced by KNSCHA ELECTRONICS CO.,LIMITED.

3. 使用温度范围(Operating Temperature Range):

6.3~100WV: -40~+105℃    160~450WV: -25~+105℃

4. 浪涌电压(Surge Voltage):

|               |     |    |    |    |    |    |    |     |     |     |     |     |     |     |
|---------------|-----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| 工作电压 (V)      | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
| Rated voltage |     |    |    |    |    |    |    |     |     |     |     |     |     |     |
| 浪涌电压 (V)      | 8   | 13 | 20 | 32 | 44 | 63 | 79 | 125 | 200 | 250 | 300 | 400 | 450 | 500 |
| Surge voltage |     |    |    |    |    |    |    |     |     |     |     |     |     |     |

5. 损耗(Dissipation Factor): (25℃,120Hz)

|                |     |    |    |    |    |    |    |     |     |     |     |     |     |     |
|----------------|-----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| 工作电压 (V)       | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
| Rated voltage  |     |    |    |    |    |    |    |     |     |     |     |     |     |     |
| 损耗角正切值         | 22  | 20 | 16 | 14 | 12 | 10 | 9  | 8   | 12  | 12  | 12  | 15  | 20  | 20  |
| D.F.(Tan%) Max |     |    |    |    |    |    |    |     |     |     |     |     |     |     |

注：当标准容量每大于1000 μ F时，每增加1000 μ F损失角正切值相应增加2%。

6. 漏电流(DC Leakage Current)

- 施加额定电压2分钟后测试 （After 2 minutes application of rated working voltage）  
6.3 ~ 100WV    I≤0.01CV 或3.0(μA) ，（at 25℃）  
160 ~ 450WV    I≤0.03CV(μA) ，（at 25℃）

7. 胶管标识示意图(Marking):



NO. 代表内容 Item

- 1 科尼盛公司商标(Logo)
- 2 电容器规格（额定电压和容量）Capacitance and Rated Vlotage
- 3 负极表示带 Polarity bar
- 4 产品系列(Series)
- 5 容量范围与工作最高温度(Capacitance Tolerance and Operating Temperature Range )

8. 外形图（Dimensions）：



| $\Phi D$ | F   | $\alpha$ | $\Phi d$ |
|----------|-----|----------|----------|
| 5        | 2   | 1.5      | 0.5      |
| 6.3      | 2.5 | 1.5      | 0.5      |
| 8        | 3.5 | 1.5      | 0.5      |
| 10       | 5   | 1.5      | 0.6      |
| 13       | 5   | 1.5      | 0.6      |
| 16       | 7.5 | 2        | 0.8      |
| 18       | 7.5 | 2        | 0.8      |
| 20       | 10  | 2        | 1.0      |

注：长脚

9. 纹波电流系数（Multiplier for ripple current）：

频率系数 Frequency Coefficients

| Frequency<br>CAP(μF)<br>(HZ) | 50   | 120 | 300  | 1K   | 10K  | 100K |
|------------------------------|------|-----|------|------|------|------|
| CAP ≤ 10                     | 0.65 | 1   | 1.35 | 1.75 | 2.3  | 2.5  |
| 10 ≤ CAP ≤ 100               | 0.75 | 1   | 1.25 | 1.5  | 1.75 | 1.8  |
| 100 ≤ CAP ≤ 1000             | 0.8  | 1   | 1.15 | 1.3  | 1.4  | 1.5  |
| 1000 < CAP                   | 0.85 | 1   | 1.03 | 1.05 | 1.08 | 1.08 |

温度系数 temperature coefficients

| Temperature(°C) | ≤50 | 65   | 75   | 85  | 95  | 105 |
|-----------------|-----|------|------|-----|-----|-----|
| Multiplier      | 1.9 | 1.75 | 1.57 | 1.4 | 1.2 | 1.0 |

10. 构造图及材料表 (Frame drawing and Material list):

10.1、构造图(Frame drawing)



10.2、材料表 (Material table)

| NO. | 构成部件<br>Component            | 材质<br>Material                          | 备注<br>Remarks |
|-----|------------------------------|-----------------------------------------|---------------|
| 1   | 引出线<br>Lead line             | 铝+CP线<br>Aluminum + Cpwire              |               |
| 2   | 端子<br>Terminal               | 铝<br>Aluminum wire                      |               |
| 3   | 胶塞<br>Rubber                 | 合成橡胶<br>Synthetic rubber                |               |
| 4   | 正极箔<br>Al Foil(+)            | 铝<br>Aluminum                           |               |
| 5   | 负极箔<br>Al Foil(-)            | 铝<br>Aluminum                           |               |
| 6   | 铝壳<br>Case                   | 铝<br>Aluminum case                      |               |
| 7   | 套管<br>Sleeve                 | PET                                     |               |
| 8   | 电解纸<br>Separator             | 电解电容器纸<br>Electrolytic capacitors paper |               |
| 9   | 工作电解液<br>Working electrolyte | 乙二醇等<br>Ethanediol                      |               |

| NO   | 项 目<br>Items                                   | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 规 格<br>Specifications                                                                                                                                                              |
|------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11.1 | 最大允许纹波电流<br>Maximum permissible ripple current | 温度 Temperature: $105\pm 2^{\circ}\text{C}$<br>纹波:120Hz正弦交流实际电流值+交流电压峰值 $\leq$ 标准电压<br>Ripple frequency:<br>The maximum sinusoidal alternating current of a freefrequency specified below at whith the capacitor can be operated continuously,Where DC.Voltage+peak ripple voltage $\leq$ Rated voltage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Refer to table                                                                                                                                                                     |
| 11.2 | 浪涌电压<br>Surge Voltage                          | 在下面规定的温度下，通过指定的浪涌电压，6.0分钟（充电30秒，放电5分30秒）为一循环，往返1000回合，常温常湿下放置1-2小时达到热平衡状态测定满足。<br>The capacitor shall be subjected to 1000 cycles at a temperatu specified below,each consisting of a charge period of $30\pm 5\text{s}$ , followed by a discharge period of approx 5min.30s.And the capacitor shall be stored 1-2hours under standard atmospheric conditions to obtain thermal stability,after which measurement shall be made.<br>应加电压：见4项<br>Test voltage:see 4<br>温度：15~30℃<br>Test Temperature:15~30℃<br>测试回路 Measurement circuit<br> R1:串联保护电阻（1K $\Omega$ ）<br>Protective series resistor(1k $\Omega$ )<br>V:直流电压表 DC Voltage<br>R2:放电电阻 Discharge resister(1K $\Omega$ )<br>S:切换开关 Switch<br>Cx:待测电容器 Test Capacitor | 漏电流：不超过规定值<br>Leakage Current: Not more than the specified value<br>容量变化：初始值的 $\pm 15\%$ 以内<br>Capacitance change:Within $\pm 15\%$ of theinitial valueinitial value<br>损失角：不超过规定值 |
| 11.3 | 静电容量<br>（允许偏差）<br>Capacitance<br>(Tolerance)   | 测试频率：120Hz<br>Measuring frequency:120Hz<br>测试电压：0.5Vrms or less<br>measuring voltage:0.5Vrms or less<br>DC bias voltage:+1.5~2.0 V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 静电容量允许偏差，+20%-20%Capacitance tolerance+20%-20%                                                                                                                                     |
| 11.4 | 损耗角正切值<br>（tg $\delta$ ）<br>Tangant of angle   | 测试条件与静电容量相同<br>Measurement shall be made under the same conditions as those given for the measurement of capacitance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 见5项<br>Refer to table 5.                                                                                                                                                           |

| NO   | 项 目<br>Items           | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 规 格<br>Specifications            |
|------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 11.5 | 漏电流<br>Leakage Current | <p>电容器接<math>1000\pm10\Omega</math>的保护电阻施加电压1分钟后的测试电流。</p> <p>The rated voltage shall be applied across the capacitor and its protective resistor which shall be <math>1000\pm10\Omega</math>.The leakage Current shall then be measured after an electrication period of 1min.The leakage current shall be calculated by the following equation.</p> <p>漏电流： <math>(I) = E/R_s</math></p> <p>Leakage current:</p> <p>E:直流电压表的电压值<br/>Voltage measured with DC voltmeter</p> <p><math>R_s</math>:标准电阻的电阻值<br/>Resistance of the protective resistor</p> <p>测定电路 measurement circuit</p>  <p>电压将下法 (voltage drop method)</p> <p><math>R_s</math>:标准电阻的电阻值 (<math>1000\pm100\Omega</math>)<br/>protective resistor</p> <p>直流电压表或电子电压表<br/>DC voltmeter or electronic voltmeter</p> <p>S1:开关 switch</p> <p>S2:电压表保护用变换开关<br/>protective switch for a voltmeter</p> <p>CX:待测电容器 test capacitor</p> | <p>见6项<br/>Refer to table 6.</p> |

| NO           | 项 目<br>Items                                              | 条 件                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
|--------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------|--------------|---|-------|-------|---|-----------|---------|---|-------|-------|---|------|---------|---|-------|-------|--------------|------------------------------|---------------------------|--------------------------------------------|------------------------------|--------------|--------------------------------------------|----------------------------------------|------------------------|--------------------------------------------------|
|              |                                                           | Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 11.6         | 高低温特性<br>Characteristic<br>at High and low<br>temperature | <p>电容器根据下表的次序处理</p> <p>The capacitor shall subjected in turn to the procedures specified below.</p> <table border="1"> <tr> <th>阶 段<br/>Step</th><th>温 度<br/>Temperature</th><th>时 间<br/>Times</th></tr> <tr> <td>1</td><td>20±2℃</td><td>热平衡状态</td></tr> <tr> <td>2</td><td>-40(-25)℃</td><td>*2hours</td></tr> <tr> <td>3</td><td>20±2℃</td><td>热平衡状态</td></tr> <tr> <td>4</td><td>105℃</td><td>*2hours</td></tr> <tr> <td>5</td><td>20±2℃</td><td>热平衡状态</td></tr> </table> <p>* 电容器放置在每一温度下，待阻抗或电容量稳定后方可测试。</p> <p>* The capacitor should be stored at rech temperature until measured temperature impedance or capacitance are stabilized.</p> <table border="1"> <tr> <td rowspan="2">阶段2<br/>Step2</td><td>阻抗比（对阶段1）<br/>Impedance ratio</td><td>见9.10项<br/>refer to No9.10</td></tr> <tr> <td>静电容量变化率<br/>（对阶段1）<br/>change in capacitance</td><td>静电-20～+20%<br/>within-20～+20%</td></tr> <tr> <td rowspan="2">阶段4<br/>Step4</td><td>静电容量变化率<br/>（对阶段1）<br/>change in capacitance</td><td>静电-20～+20%<br/>within-20～+20% of step 1</td></tr> <tr> <td>漏电流<br/>Leakage Current</td><td>规定值5倍以下<br/>Less than 500% of the specified value</td></tr> </table> <p>阶段1：测定容量，损耗和阻抗值。</p> <p>Step1:Capacitance,Dissipation Factor and impedance shall be measured.</p> <p>阶段2：放置2小时后，达到热平衡状态再测。</p> <p>Step2:After the capacitor being stored for 2 hours,capacitance, Dissipation Factor and impedance shall be Measured.The measurement shall be made at thermal stability.</p> <p>阶段4：放置2小时后，达到热平衡状态测测。</p> <p>Setp4:After the capacitor being stored for 2 hours,Capacitance, Dissipation Factor and impedance shall be Measured.The measurement shall be made at thermal stability.</p> | 阶 段<br>Step | 温 度<br>Temperature | 时 间<br>Times | 1 | 20±2℃ | 热平衡状态 | 2 | -40(-25)℃ | *2hours | 3 | 20±2℃ | 热平衡状态 | 4 | 105℃ | *2hours | 5 | 20±2℃ | 热平衡状态 | 阶段2<br>Step2 | 阻抗比（对阶段1）<br>Impedance ratio | 见9.10项<br>refer to No9.10 | 静电容量变化率<br>（对阶段1）<br>change in capacitance | 静电-20～+20%<br>within-20～+20% | 阶段4<br>Step4 | 静电容量变化率<br>（对阶段1）<br>change in capacitance | 静电-20～+20%<br>within-20～+20% of step 1 | 漏电流<br>Leakage Current | 规定值5倍以下<br>Less than 500% of the specified value |
| 阶 段<br>Step  | 温 度<br>Temperature                                        | 时 间<br>Times                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 1            | 20±2℃                                                     | 热平衡状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 2            | -40(-25)℃                                                 | *2hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 3            | 20±2℃                                                     | 热平衡状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 4            | 105℃                                                      | *2hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 5            | 20±2℃                                                     | 热平衡状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 阶段2<br>Step2 | 阻抗比（对阶段1）<br>Impedance ratio                              | 见9.10项<br>refer to No9.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
|              | 静电容量变化率<br>（对阶段1）<br>change in capacitance                | 静电-20～+20%<br>within-20～+20%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
| 阶段4<br>Step4 | 静电容量变化率<br>（对阶段1）<br>change in capacitance                | 静电-20～+20%<br>within-20～+20% of step 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |
|              | 漏电流<br>Leakage Current                                    | 规定值5倍以下<br>Less than 500% of the specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                    |              |   |       |       |   |           |         |   |       |       |   |      |         |   |       |       |              |                              |                           |                                            |                              |              |                                            |                                        |                        |                                                  |

| NO               | 项 目<br>Items            | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 规格              |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
|------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-------|-----------|------------|---------|--------------|-------|----------------|--------|------------------|-----------|-----------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Specifications  |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| 11.7             | 压力释放<br>Pressure relief | <p>一、交流试验 A.C.test</p> <p>施加电压值：Applied voltage</p> <p>交流电压不超过0.7倍的额定直流电压或250VAC以下</p> <p>A.C.voltage not exceeding 0.7times the rated</p> <p>Direct voltage or 250V AC whichever is</p> <p>the lower.</p> <p>频率：Frequency:50Hz或60Hz</p> <p>串联电阻参照下表 Series resistor refer to</p> <p>the table below.</p> <table><tr><td>Capacitance</td><td>Series resistor</td></tr><tr><td>C≤1μF</td><td>1000±100Ω</td></tr><tr><td>1μF&lt;C≤10μF</td><td>100±10Ω</td></tr><tr><td>10μF&lt;C≤100μF</td><td>10±1Ω</td></tr><tr><td>100μF&lt;C≤1000μF</td><td>1±0.1Ω</td></tr><tr><td>1000μF&lt;C≤10000μF</td><td>0.1±0.01Ω</td></tr><tr><td>10000μF&lt;C</td><td>/</td></tr></table> <p>*电阻相当于试验频率阻抗的1/2</p> <p>Resistance is equivalent to a half of</p> <p>Impedance by test frequency.</p> <p>二、直流试验 D.C.test</p> <p>施加同额定电压相等的反向电压。</p> <p>Reversed polarity D.C.rated voltage shall</p> <p>be applied to the capacitor.</p> <p>注：1、该规定适用于铝壳直径6mm以上的电容器。</p> <p>2、试验开始30Min后。防爆装置不动作时，</p> <p>停止试验。</p> <p>Note:</p> <p>1.This requirement applies to capacitors</p> <p>with a diameter of 6mm or more.</p> <p>2.When the pressure relief device dose</p> <p>not open even 30minutes after commencement</p> <p>of this test,the test may be ended.</p> | Capacitance     | Series resistor | C≤1μF | 1000±100Ω | 1μF<C≤10μF | 100±10Ω | 10μF<C≤100μF | 10±1Ω | 100μF<C≤1000μF | 1±0.1Ω | 1000μF<C≤10000μF | 0.1±0.01Ω | 10000μF<C | / | <p>防爆装置打开时，无 燃烧、无爆</p> <p>炸或铝壳 和封口材料的分离。</p> <p>The pressure relief device shall</p> <p>open in such a way as to avoid any</p> <p>danger of fire or explosion of</p> <p>Capacitor elements.</p> |
|                  |                         | Capacitance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Series resistor |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| C≤1μF            | 1000±100Ω               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| 1μF<C≤10μF       | 100±10Ω                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| 10μF<C≤100μF     | 10±1Ω                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| 100μF<C≤1000μF   | 1±0.1Ω                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| 1000μF<C≤10000μF | 0.1±0.01Ω               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
| 10000μF<C        | /                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |
|                  |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                 |       |           |            |         |              |       |                |        |                  |           |           |   |                                                                                                                                                                                                 |

| NO    | 项 目<br>Items         | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 规 格<br>Specifications                                                                                                                                                                                                          |
|-------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11.8  | 高温负荷<br>Load life    | <p>在105±2℃的恒温箱内，电容器施加最大允许纹波电流，施加直流电压和交流电压的峰值的和要等于额定电压，时间 2000 +24 小时，试验结束后，在标准状态下放置16小时候进行测试。</p> <p>The capacitor shall be placed in a circulating air oven at an ambient temperature of 105±2℃. It must not be subjected to direct radiation from heating elements. DC voltage and the rated ripple current shown in table shall be applied for a period of 2000 +24 hours, The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitor. It shall be subjected to standard atmospheric for 16 hours, after which measurement shall be made.</p> | <p>漏电流：不超过规定值<br/>Leakage current: ≤ Initial specified value</p> <p>容量变化率：初测值的 ±20%以内<br/>Capacitance change: within ±20% of Initial value</p> <p>损耗角正切：不超过规定值的2倍<br/>Dissipation factor: ≤200% of initial specified value</p> |
| 11.9  | 高温储存<br>Shelf life   | <p>温度 Temp: 105±2℃<br/>时间 Time: 1000+36小时<br/>电压处理：在常温下电容器串联保护电阻（1KΩ），加额定施加额定电压30分鐘後在放電，常温放置24-48小时后测量</p> <p>Condition: The DC rated voltage shall be applied across the capacitor and its protective resistor (1kΩ) for 1 minutes, The capacitor shall then be stored under standard Atmospheric Conditions for 24-48 hours.</p> <p>漏电流：施加额定电压一分钟，常温下测试，I ≤ 2倍的规定值。<br/>Leakage current: rated voltage for one minute I ≤ applied the provisions of twice the value of</p>                                                                                                                | <p>漏电流：施加额定电压一分钟 I ≤ 2倍的规定值。</p> <p>容量变化率：初测值的 ±20%以内<br/>Capacitance change: within ±20% of Initial value</p> <p>损耗角正切：不超过规定值的2倍<br/>Dissipation factor: ≤200% of initial specified value</p>                                 |
| 11.10 | 可焊性<br>Solderability | <p>浸渍时间<br/>Solder presstime: 2±0.5s<br/>焊接温度<br/>Solder temperature: 235±5℃</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>浸渍面积90%以上附着<br/>At least 90% of Circumferential surface of the dipped portion of termination shall be covered with new solder</p>                                                                                           |

| NO    | 项 目<br>Items                            | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                     | 规 格<br>Specifications                                                                                                                                                                                                                                                                         |
|-------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11.11 | 耐焊接热<br>Resistance to<br>soldering heat | 温度: 350±10℃<br>Test Temperature:350±10℃<br>时间: 3.5±0.5s<br>Test time:3.5±0.5s                                                                                                                                                                                                                                                                         | 漏电流: 不超过规定值<br>Leakage current: Not more<br>than the specified value<br>电容量变化: 初测值的±10%以内<br>Capacitance Change :<br>within±10% of the<br>initial value<br>损耗角正切: 不超过规定值<br>Dissipation Factor: Not More<br>than the specified value<br>外观: 无明显异常<br>Appearance: No remarkable<br>abnormality |
| 11.12 | 耐湿性<br>Resistance of<br>dump heat       | 温度: 40±2℃<br>Test Temperature:40±2℃<br>湿度: 90-95%Rh<br>Relative Hwmidity:90-95%Rh<br>时间: 240±8hrs<br>Test time:240±8hrs<br>试验后常温放置24-48小时<br>To expose in the atmospheric<br>condition for 24to 48 hours<br>after completion of test                                                                                                                  | 漏电流: 不超过规定值<br>Leakage current: Not more<br>than the specified value<br>电容量变化: 初测值的±10%以内<br>Capacitance Change :<br>within±10% of the<br>initial value<br>损耗角正切: 不超过规定值<br>Dissipation Factor: Not More<br>than the specified value<br>外观: 无明显异常<br>Appearance: No remarkable<br>abnormality |
| 11.13 | 耐振性<br>Resistance to<br>vibration       | 频率: 10-55-10Hz/分<br>Frequency: From 10 to 55 Hz and<br>return to 10 Hz,shall be transferred<br>in 1 Min Total Amplitude:1.5mm<br><br>条件: X.Y.Z 方向各2小时<br>Direction and duration of vibration :<br>3 orthogonal directions mutually<br>each for 2 hours Total 6 hours.<br><br>静电容量变化: 初始值的±5%以内<br>Capacitance change: Within ±5% of the initial value | 静电容量测试时无接触不良, 断线及短路, 端子无机械损伤。<br>Capacitance:During the<br>test,measured value to<br>be stabilized(when<br>measured several times<br>within 30 min before<br>completion of test)<br>Appearance:No<br>remarkable abnormality<br><br>外观: 无明显异常<br>Appearance: No remarkable<br>abnormality      |

| NO          | 项 目<br>Items                                                                                        | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 规 格<br>Specifications                                |  |             |          |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|-------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--|-------------|----------|----------------|-------------|---------|----------------|-----------|----------|------|-----|-----------|---|---------|-----------|----|-------------|----|------------|--|--|----|-----|-----|-------------|---------|-------------|-----------|----------|------|-----|-----------|-----|--------|-----------|---|--------|-------------|----|-------|
| 11.14       | 耐溶剂性<br>Resisting<br>Solvent                                                                        | 溶剂：异丙醇<br>Solvent:Isopropylalcohol<br>温度：20-25℃<br>Temperature:20-25℃<br>时间：30±5s<br>Time:30±5s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 外观：无明显异常<br>Appearance: No remarkable<br>abnormality |  |             |          |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
| 11.15       | 端子强度<br>Terminal<br>Strength<br>拉伸度<br>Tensile<br>test<br>intensity<br>弯曲强度<br>winding<br>intensity | <table><tr><td>线径</td><td>拉伸力</td><td>维持时间</td></tr><tr><td>Diameter of</td><td>Tensile</td><td rowspan="3">continued time</td></tr><tr><td>terminnal</td><td>Strength</td></tr><tr><td>(mm)</td><td>(N)</td></tr><tr><td>0.3&lt;d≤0.5</td><td>5</td><td rowspan="3">10±1sec</td></tr><tr><td>0.5&lt;d≤0.8</td><td>10</td></tr><tr><td>0.5&lt;d≤1. 25</td><td>20</td></tr><tr><td colspan="3">2回合 2bends</td></tr><tr><td>线径</td><td>弯曲力</td><td>锥质量</td></tr><tr><td>Diameter of</td><td>Tensile</td><td rowspan="3">Awl quality</td></tr><tr><td>terminnal</td><td>Strength</td></tr><tr><td>(mm)</td><td>(N)</td></tr><tr><td>0.3&lt;d≤0.5</td><td>2.5</td><td>0.75kg</td></tr><tr><td>0.5&lt;d≤0.8</td><td>5</td><td>0.51kg</td></tr><tr><td>0.5&lt;d≤1. 25</td><td>10</td><td>1.0kg</td></tr></table> |                                                      |  | 线径          | 拉伸力      | 维持时间           | Diameter of | Tensile | continued time | terminnal | Strength | (mm) | (N) | 0.3<d≤0.5 | 5 | 10±1sec | 0.5<d≤0.8 | 10 | 0.5<d≤1. 25 | 20 | 2回合 2bends |  |  | 线径 | 弯曲力 | 锥质量 | Diameter of | Tensile | Awl quality | terminnal | Strength | (mm) | (N) | 0.3<d≤0.5 | 2.5 | 0.75kg | 0.5<d≤0.8 | 5 | 0.51kg | 0.5<d≤1. 25 | 10 | 1.0kg |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 线径          | 拉伸力      | 维持时间           |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | Diameter of | Tensile  | continued time |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | terminnal   | Strength |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | (mm)        | (N)      |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 0.3<d≤0.5   | 5        | 10±1sec        |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 0.5<d≤0.8   | 10       |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 0.5<d≤1. 25 | 20       |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 2回合 2bends  |          |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 线径          | 弯曲力      | 锥质量            |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | Diameter of | Tensile  | Awl quality    |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | terminnal   | Strength |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | (mm)        | (N)      |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 0.3<d≤0.5   | 2.5      | 0.75kg         |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
|             |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      |  | 0.5<d≤0.8   | 5        | 0.51kg         |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |
| 0.5<d≤1. 25 | 10                                                                                                  | 1.0kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                      |  |             |          |                |             |         |                |           |          |      |     |           |   |         |           |    |             |    |            |  |  |    |     |     |             |         |             |           |          |      |     |           |     |        |           |   |        |             |    |       |