

## 规格承认书

## Specification For Approval

|                       |                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------|
| 产品名称<br>Product       | 金属化聚丙烯膜抗干扰电容器<br>Metallized polypropylene film Interference Suppression capacitor |
| 部品型号<br>Type &Spec.   | C42 (MKP X2)                                                                      |
| 文件编号<br>File No.      | WSCRS-2025040316                                                                  |
| 客 户<br>Customer       | 深圳市立创电子商务有限公司                                                                     |
| 客户料号<br>Material Code | C46638857                                                                         |
| 日 期<br>Date           | 2025.4.3                                                                          |

| 供方确认 Supplier confirmation                                                          | 客户确认 Customer Approval |
|-------------------------------------------------------------------------------------|------------------------|
|  |                        |

请于承认后签章回执一份  
Please sign for approval and reply



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版本更新记录 Update Record

| 版本号<br>Version | 日期<br>Date | 更改说明<br>Description | 制作<br>Drafted   | 审核<br>Checked       | 批准<br>Approved      |
|----------------|------------|---------------------|-----------------|---------------------|---------------------|
| V1.0           | 2025.4.3   | 新版发行<br>New Release | 张徽<br>Hui.Zhang | 陈志猛<br>Zhimeng.Chen | 张东泽<br>Dongze.Zhang |
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1. 证书信息 Certification

☆ 环保认证 certificates

| 序号<br>No. | 检测项目<br>Test Item | 证书/报告编号<br>Certification/Report No. | 检测型号/对象<br>Type         | 备注<br>Notes                                                                 |
|-----------|-------------------|-------------------------------------|-------------------------|-----------------------------------------------------------------------------|
| ●         | RoHS              | A2240229988102E                     | 薄膜电容器<br>Film Capacitor | 证书到期后，以最新的为准<br>After the certificate expires, the latest one shall prevail |
| ●         | REACH             | A2240229988103E                     | 薄膜电容器<br>Film Capacitor |                                                                             |

☆ 安全认证 Safety Approvals

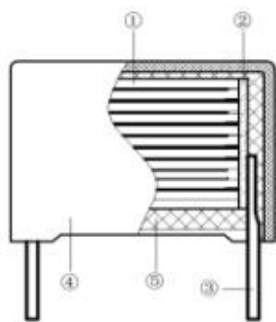
|   |                                                                                    |                    |                                                                                        |
|---|------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------|
| ● |   | CQC<br>(中国)        | IEC60384-14:2013+AMD1:2016<br>证书号(Certificate No.): CQC15001137938                     |
| ● |   | ENEC-VDE<br>(欧盟)   | EN 60384-14:2013/A1:2016<br>证书号(Certificate No.): 40043893                             |
| ● |   | UL/CUL<br>(美国/加拿大) | UL 60384-14<br>证书号(Certificate No.): E483293                                           |
| ● |  | KC<br>(韩国)         | KC60384-1(2015-09), KC60384-14(2015-09)<br>证书号(Certificate No.): SU03109-18001A/18002A |

注：以实际产品图例为准 Note: Based on the actual product legend

2. 结构 Construction

本产品由金属化高温聚丙烯膜卷绕而成，端面喷涂无铅金属并焊接引线，外部用阻燃塑壳和阻燃环氧树脂封装。

This product is winding by metallized high-temperature polypropylene film wound into a capacitor core. Both end faces of the core sprayed with lead-free metal and welded with leads. The exterior is packaged with flame-retardant plastic shell and flame-retardant epoxy resin.



- ① 芯子

② 喷金层

③ 引出线

④ 阻燃塑壳

⑤ 环氧树脂
- Core

Spray Metal Layer

Lead Wire

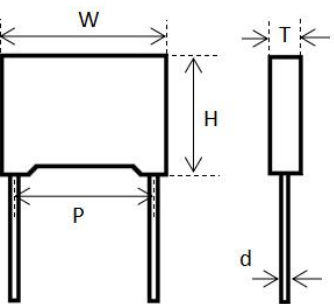
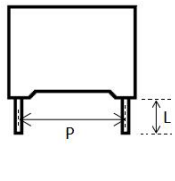
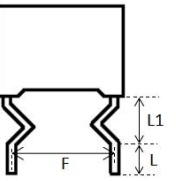
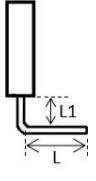
Flame-retardant Plastic Case

Epoxy Resin

☆ 芯子结构图 Structural Diagram

|  | 序号<br>No. | 材料<br>Material                                              |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------|
|                                                                                     | ①         | 金属化高温聚丙烯膜<br>Metallized High-Temperature Polypropylene Film |
|                                                                                     | ②         | 金属化高温聚丙烯膜<br>Metallized high-Temperature Polypropylene Film |

## 3. 外形尺寸 Dimensions

|  | Forming Lead Shapes                                                                         |                                                                                              |                                                                                               |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|                                                                                   | T                                                                                           | K                                                                                            | L                                                                                             |
|                                                                                   | <br>Fig. 1 | <br>Fig. 2 | <br>Fig. 3 |

(单位 Dimension: mm)

| 客户料号<br>Customer P/N | 规格型号 & 料号<br>Specifications & Walson P/N    | W*H*T<br>±1.0 | P<br>±0.5 | F<br>±0.5 | d<br>±0.1 | L1<br>Max | L<br>±0.5 | Fig | MPQ<br>(Pcs) |
|----------------------|---------------------------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----|--------------|
| C46638842            | MKP-X2-310VAC-103K-P7.5<br>C42Q310388P30001 | 10*9*4        | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638843            | MKP-X2-310VAC-103K-P10<br>C42Q310382P40001  | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638844            | MKP-X2-310VAC-223K-P7.5<br>C42Q322360P30001 | 10*9*4        | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638845            | MKP-X2-310VAC-223K-P10<br>C42Q322380P40001  | 13*9*4        | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638846            | MKP-X2-310VAC-333K-P7.5<br>C42Q333348P30001 | 10*9*4        | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638847            | MKP-X2-310VAC-333K-P10<br>C42Q333368P40001  | 13*9*4        | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638848            | MKP-X2-310VAC-473K-P7.5<br>C42Q347360P30001 | 10*11*5       | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638849            | MKP-X2-310VAC-473K-P10<br>C42Q347368P40001  | 13*11*5       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638850            | MKP-X2-310VAC-683K-P7.5<br>C42Q368348P30001 | 10*11*5       | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638851            | MKP-X2-310VAC-683K-P10<br>C42Q368358P40001  | 13*11*5       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638852            | MKP-X2-275VAC-823K-P7.5<br>C42P282338P30001 | 10*11*5       | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638853            | MKP-X2-310VAC-823K-P10<br>C42Q382358P40001  | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638854            | MKP-X2-310VAC-823K-P15<br>C42Q382380P60001  | 18*12*6       | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638855            | MKP-X2-275VAC-104K-P7.5<br>C42P210438P30001 | 10*11*5       | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |
| C46638856            | MKP-X2-310VAC-104K-P7.5<br>C42Q310448P30001 | 10*12*6       | 7.5       | -         | 0.6       | -         | -         | 1   | 500          |

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|----------------------|----------------------------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----|--------------|
| C46638857            | MKP-X2-275VAC-104K-P10<br>C42P210438P40001   | 13*9*4        | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638858            | MKP-X2-310VAC-104K-P10<br>C42Q310460P40002   | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638859            | MKP-X2-310VAC-104K-P15<br>C42Q310480P60001   | 18*12*6       | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638860            | MKP-X2-310VAC-124K-P10<br>C42Q312448P40001   | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638861            | MKP-X2-310VAC-154K-P10<br>C42Q315448P40002   | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638862            | MKP-X2-310VAC-154K-P15<br>C42Q315470P60001   | 18*12*6       | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638863            | MKP-X2-310VAC-184K-P10<br>C42Q318443P40001   | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638864            | MKP-X2-310VAC-184K-P15<br>C42Q318470P60001   | 18*13.5*7.5   | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638865            | MKP-X2-275VAC-224K-P10<br>C42P222438P40002   | 12*12*6       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638866            | MKP-X2-310VAC-224K-P10<br>C42Q322448P40001   | 13*13*7       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638867            | MKP-X2-310VAC-224K-P15<br>C42Q322448P60001   | 18*12*6       | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638868            | MKP-X2-310VAC-334K-P10<br>C42Q333446P40001   | 13*15*8       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638869            | MKP-X2-310VAC-334K-P15<br>C42Q333448P60001   | 18*13.5*7.5   | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638870            | MKP-X2-310VAC-334K-P22.5<br>C42Q333476P90001 | 26.5*17*8.5   | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638871            | MKP-X2-275VAC-474K-P10<br>C42P247438P40001   | 13*15*8       | 10        | -         | 0.6       | -         | -         | 1   | 500          |
| C46638872            | MKP-X2-310VAC-474K-P15<br>C42Q347446P60001   | 18*13.5*7.5   | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638873            | MKP-X2-310VAC-474K-P15<br>C42Q347446P60002   | 18*17.5*6     | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638874            | MKP-X2-310VAC-474K-P22.5<br>C42Q347470P90001 | 26.5*17*8.5   | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638875            | MKP-X2-310VAC-474K-P22.5<br>C42Q347476P90001 | 26.5*19*10    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638876            | MKP-X2-310VAC-564K-P15<br>C42Q356446P60001   | 18*14.5*8.5   | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638877            | MKP-X2-310VAC-564K-P22.5<br>C42Q356470P90001 | 26.5*19*10    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |

| 客户料号<br>Customer P/N | 规格型号 & 料号<br>Specifications & Walson P/N     | W*H*T<br>±1.0 | P<br>±0.5 | F<br>±0.5 | d<br>±0.1 | L1<br>Max | L<br>±0.5 | Fig | MPQ<br>(Pcs) |
|----------------------|----------------------------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----|--------------|
| C46638878            | MKP-X2-310VAC-684K-P15<br>C42Q368446P60001   | 18*15.5*9.5   | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638879            | MKP-X2-310VAC-684K-P22.5<br>C42Q368460P90001 | 26.5*17*8.5   | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638880            | MKP-X2-310VAC-824K-P15<br>C42Q382446P60001   | 18*19*11      | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638881            | MKP-X2-310VAC-824K-P22.5<br>C42Q382460P90001 | 26.5*19*10    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638882            | MKP-X2-310VAC-105K-P15<br>C42Q310543P60001   | 17*16*10      | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638883            | MKP-X2-310VAC-105K-P22.5<br>C42Q310558P90001 | 26.5*20*11    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638884            | MKP-X2-310VAC-125K-P15<br>C42Q312543P60001   | 18*19*11      | 15        | -         | 0.8       | -         | -         | 1   | 500          |
| C46638885            | MKP-X2-310VAC-125K-P22.5<br>C42Q312548P90001 | 26.5*19*10    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638886            | MKP-X2-310VAC-155K-P22.5<br>C42Q315550P90001 | 26.5*20*11    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638887            | MKP-X2-310VAC-205K-P22.5<br>C42Q320543P90001 | 26.5*20*11    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638888            | MKP-X2-310VAC-225K-P22.5<br>C42Q322548P90001 | 26.5*23*13    | 22.5      | -         | 0.8       | -         | -         | 1   | 250          |
| C46638889            | MKP-X2-310VAC-225K-P27.5<br>C42Q322548PB0001 | 31.5*21.6*13  | 27.5      | -         | 0.8       | -         | -         | 1   | 200          |
| C46638890            | MKP-X2-310VAC-255K-P27.5<br>C42Q325548PB0001 | 31.5*21.6*13  | 27.5      | -         | 0.8       | -         | -         | 1   | 200          |
| C46638891            | MKP-X2-310VAC-335K-P27.5<br>C42Q333548PB0001 | 31*25*14      | 27.5      | -         | 0.8       | -         | -         | 1   | 200          |
|                      |                                              |               |           |           |           |           |           |     |              |
|                      |                                              |               |           |           |           |           |           |     |              |
|                      |                                              |               |           |           |           |           |           |     |              |
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|                      |                                              |               |           |           |           |           |           |     |              |
|                      |                                              |               |           |           |           |           |           |     |              |

4. 产品编码说明 Part Number System

☆ 16 位产品代码说明 16 digit product code description

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| C | 4 | 2 |   |   |   |   |   |   |    |    |    |    |    |    |    |

|           |                                                                              |                |                                                                                                           |
|-----------|------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------|
| 第 1~3 位   | 型号代码<br>C42=MKP-X2                                                           | Digit 1 to 3   | Series Code<br>C42=MKP-X2                                                                                 |
| 第 4~5 位   | 交流额定电压                                                                       | Digit 4 to 5   | AC. Rated Voltage                                                                                         |
| 第 6~8 位   | P2=275VAC Q1=300VAC Q3=310VAC<br>标称容量<br>举例:103=10×10 <sup>3</sup> pF=0.01μF | Digit 6 to 8   | P2=275VAC Q1=300VAC Q3=310VAC<br>Rated Capacitance value<br>for example: 103=10×10 <sup>3</sup> pF=0.01μF |
| 第 9~10 位  | 内部代码                                                                         | Digit 9 to 10  | Internal Use                                                                                              |
| 第 11 位    | 成型方式                                                                         | Digit 11       | Forming                                                                                                   |
| 第 12 位    | 引线脚距<br>3=7.5mm 4=10mm 6=15mm<br>8=20mm 9=22.5mm A=25mm                      | Digit 12       | Lead pin pitch<br>3=7.5mm 4=10mm 6=15mm<br>8=20mm 9=22.5mm A=25mm                                         |
| 第 13~14 位 | 引线长度或编带<br>30=3.0mm 35=3.5mm BD=编带                                           | Digit 13 to 14 | Lead Length or Ammo-Pack<br>30=3mm 35=3.5mm BD=Ammo-Pack                                                  |
| 第 15~16 位 | 内部代码                                                                         | Digit 15 to 16 | Internal Use                                                                                              |

☆ 型号规格描述说明 (例) Description of specifications and models (example)

|        |   |        |   |      |   |          |
|--------|---|--------|---|------|---|----------|
| MKP-X2 | - | 275VAC | - | 104K | - | CT10*3.5 |
| ①      |   | ②      |   | ③    |   | ④        |

|       |                                                                                                                                                                                                   |         |                                                                                                                                                                                                                                                                                                                                                                       |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 第 1 组 | 型号                                                                                                                                                                                                | Group 1 | Series                                                                                                                                                                                                                                                                                                                                                                |
| 第 2 组 | 交流额定电压                                                                                                                                                                                            | Group 2 | AC Rated Voltage                                                                                                                                                                                                                                                                                                                                                      |
| 第 3 组 | 标称容量与容量偏差                                                                                                                                                                                         | Group 3 | Rated Capacitance value & tolerance                                                                                                                                                                                                                                                                                                                                   |
| 第 4 组 | 成型方式与脚距<br>长脚包装: P+脚距<br>例: P10 表示长脚, 脚距为 10mm, 无成型剪脚。<br><br>成型剪脚: 成型方式+脚距*引线长度<br>例: CT10*3.5 表示成型方式为 CT,成型后脚距为 10mm, 引线长度为 3.5mm。<br><br>编带电容为: 成型方式+脚距*编带<br>例: CT10*T 表示脚距为 10mm, 包装方式为直脚编带。 | Group 4 | Forming method and Lead pin pitch<br>Standard: P+ pitch<br>e.g. P10 indicates general lead, pitch=10 mm, no lead shape shearing.<br><br>Forming: Forming shape+pitch*insertion depth<br>e.g. CT 10*3.5 indicates CT forming, pitch=10 mm, and the lead length=3.5 mm.<br><br>Taping: Forming pitch*Taping<br>e.g. CT10*T indicates the pitch=10 mm with ammo-packing. |

## 5. 特点及主要用途 Application and Feature

## ☆ 主要用途

- 用于电源跨线路等抗干扰场合

## ☆ Application

- Used in across-the-line, interference suppression circuit

## ☆ 特点

- 金属化聚丙烯膜介质
- 能承受过压冲击
- 优异的阻燃性能

## ☆ Characteristics

- Metallized polypropylene film
- Withstanding over-voltage stressing
- Excellent flame resistant ability

## ☆ 技术要求 Specifications

|                                                              |                                                                                                                            |                              |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 引用标准<br>Reference Standard                                   | GB/T 6346.14 ( IEC 60384-14)                                                                                               |                              |
| 气候类别/阻燃等级<br>Climatic Category/Passive Flammability Category | 40/110/56/B                                                                                                                |                              |
| 工作温度范围<br>Operating Temperature Range                        | -40 °C ~ +110 °C                                                                                                           |                              |
| 额定电压<br>Rated Voltage ( $U_R$ )                              | 250/275/280/300/310 VAC                                                                                                    |                              |
| 电容量偏差<br>Capacitance Tolerance                               | K (±10 %)                                                                                                                  | 20 °C, 1 kHz, 1 V            |
| 耐电压<br>Voltage Proof                                         | 引线之间<br>Between Terminals:                                                                                                 | $4.3 U_R$ (Vdc) (20 °C, 5 s) |
|                                                              | 极壳之间<br>Between Terminals To Case:                                                                                         | $2 U_R + 1500$ VAC, 1 min    |
| 损耗角正切值<br>Dissipation Factor                                 | ≤0.001                                                                                                                     | 20 °C, 1 kHz, 1 V            |
| 绝缘电阻<br>Insulation Resistance                                | $\geq 15000 \text{ M}\Omega$ $C_R \leq 0.33 \text{ }\mu\text{F}$<br>$\geq 5000 \text{ s}$ $C_R > 0.33 \text{ }\mu\text{F}$ | 20 °C, 100 V, 1 min          |

## 6. 可靠性测试 Reliability Test

| 序号<br>No. | 测试项目<br>Test Item                 | 测试方法<br>Test method                                                                                                                                                                                                                                                                                          | 要求<br>Requirement                                                                                                        |
|-----------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 1         | 外部检查<br>Outline check             | 目视检查, 卡尺测量<br>Visual inspection and caliper measurement                                                                                                                                                                                                                                                      | 外形规整, 无可见损伤; 标志端正、清晰、无误<br>The appearance is regular without visible damage; The mark is regular, clear and correct.     |
|           | 初始测量<br>Initial measurement       | 电容量 C: 20 °C, 1 kHz, 1 V<br>损耗角正切 Tan δ: 20 °C, 1 kHz, 1 V                                                                                                                                                                                                                                                   |                                                                                                                          |
|           | 引出端强度<br>Terminal Strength        | 拉力: 5 N<br>方向: 180 °<br>时间: 10±1 s<br><br>Pull: 5 N<br>Direction: 180 °<br>Time: 10±1 s                                                                                                                                                                                                                      | 无可见损伤<br><br>No visible damage                                                                                           |
|           |                                   | 弯曲<br>The pull of bend<br>拉力: 2.5N<br>方向: 90 °<br>次数: 2 次<br><br>The pull of bend: 2.5 N<br>Direction: 90 °<br>Times: 2                                                                                                                                                                                      | 无可见损伤<br><br>No visible damage                                                                                           |
|           | 耐焊接热<br>Soldering Heat Resistance | 焊槽温度: +260 °C±5 °C<br>浸入时间: 10 s±1 s<br>浸入深度离安装面 2+0/-0.5 mm, 采用厚度为 1.5 mm±0.5 mm 的绝热屏蔽板<br><br>Solder temperature: 260 °C±5 °C<br>Immersion time: 10 s±1 s<br>Immersion depth is 2+0/-0.5 mm away from the installation surface, and insulation shielding plate with a thickness of 1.5 mm ± 0.5 mm is used | 无可见损伤<br><br>No visible damage                                                                                           |
|           | 最后测量<br>Final measurement         |                                                                                                                                                                                                                                                                                                              | 无可见损伤<br>容量变化: $ \Delta C/C  \leq 5\%$<br><br>No visible damage<br>$ \Delta C/C  \leq 5\%$                               |
| 2         | 初始测量<br>Initial measurement       | 电容量 C: 20 °C, 1 kHz, 1 V                                                                                                                                                                                                                                                                                     |                                                                                                                          |
|           | 可焊性<br>Solderability              | 焊槽温度: 235 °C±5 °C<br>浸入时间: 2.0 s±0.5 s<br><br>Solder temperature: 235 °C±5 °C<br>Immersion time: 2.0 s±0.5 s                                                                                                                                                                                                 | 引线表面浸锡良好, 焊层面积达 95 % 以上<br><br>The surface of the lead wire is well tinned, and the welding layer area reaches over 95 % |

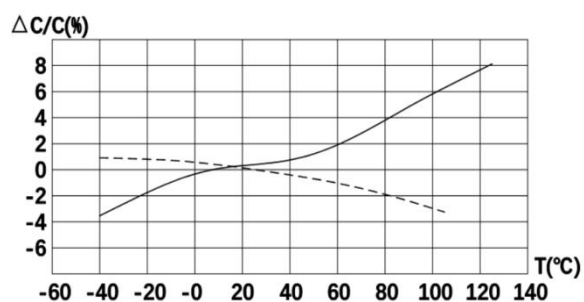
| 序号<br>No. | 测试项目<br>Test Item                     | 测试方法<br>Test method                                                                                                                                                                                                                                                       | 要求<br>Requirement                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2         | 温度快速变化<br>Rapid Change of Temperature | $\theta A = -40\text{ }^{\circ}\text{C}$<br>$\theta B = +110\text{ }^{\circ}\text{C}$<br>循环次数: 5 次,<br>持续时间 $t = 30\text{ min}$<br><br>$\theta A = -40\text{ }^{\circ}\text{C}$<br>$\theta B = +110\text{ }^{\circ}\text{C}$<br>5 cycles<br>Duration: $t = 30\text{ min}$ | 无可见损伤<br><br>No visible damage                                                                                                                                                                                                                                                                                                                                                                                  |
|           | 振动<br>Vibration                       | 频率范围: 10--500 Hz<br>振幅: 0.75 mm<br>试验安装方向: X, Y, Z.<br>试验每个方向持续时间: 2 h<br><br>Frequency range: 10Hz to 500 Hz<br>Amplitude: 0.75 mm<br>Test installation direction: X,Y,Z,<br>Test duration in each direction: 2 h                                                        | 无可见损伤<br><br>No visible damage                                                                                                                                                                                                                                                                                                                                                                                  |
|           | 碰撞<br>Bump                            | 碰撞次数: 4000 次<br>加速度: 390 m/s <sup>2</sup><br>脉冲持续时间: 6 ms<br><br>Times of collisions: 4000 times<br>Acceleration: 390 m/s <sup>2</sup><br>Pulse duration: 6 ms                                                                                                            | 无可见损伤<br><br>No visible damage                                                                                                                                                                                                                                                                                                                                                                                  |
|           | 最后测量<br>Final measurement             |                                                                                                                                                                                                                                                                           | 无可见损伤<br>容量变化: $ \Delta C/C  \leq 5\%$<br><br>No visible damage<br>$ \Delta C/C  \leq 5\%$                                                                                                                                                                                                                                                                                                                      |
| 3         | 气候顺序<br>Climate Sequence              | 干热<br>Dry Heat                                                                                                                                                                                                                                                            | +110 °C, 16 h                                                                                                                                                                                                                                                                                                                                                                                                   |
|           |                                       | 循环湿热<br>Damp Heat<br>Cyclic                                                                                                                                                                                                                                               | 湿热试验 Db,严酷度 b 第一次循环<br><br>Test Db, Severity: b, the first cycle                                                                                                                                                                                                                                                                                                                                                |
|           |                                       | 寒冷<br>Cold                                                                                                                                                                                                                                                                | -40 °C, 2 h                                                                                                                                                                                                                                                                                                                                                                                                     |
|           |                                       | 循环湿热<br>Damp Heat<br>Cyclic                                                                                                                                                                                                                                               | 试验 Db,严酷度 b 其余循环<br><br>Test Db, Severity b, the other cycles,                                                                                                                                                                                                                                                                                                                                                  |
|           |                                       | 最后测量<br>Final<br>Measurement                                                                                                                                                                                                                                              | 外观无可见损伤, 标志清晰<br>电容量变化: $ \Delta C/C  \leq 5\%$ ,<br>损耗角正切的增加: $\Delta \tan \delta \leq 0.008(1\text{ kHz})$<br>耐电压: 无击穿或飞弧<br>绝缘电阻: $\geq$ 额定值的 50 %<br><br>There shall be no evidence of deterioration and the marking shall be legible.<br>$ \Delta C/C  \leq \pm 5\%$<br>Increase of $\tan \delta \leq 0.008(1\text{ kHz})$<br>Voltage Proof: No breakdown or arcing<br>I.R. $\geq 50\%$ of the rated value |

| 序号<br>No. | 测试项目<br>Test Item              | 测试方法<br>Test method                                                                                                                                      | 要求<br>Requirement                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4         | 初始测量<br>Initial measurement    | 电容量 C: 20 °C, 1 kHz, 1 V<br>损耗角正切 Tanδ: 20 °C, 1 kHz, 1 V                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                       |
|           | 稳态湿热<br>Damp Heat Steady State | 温度: +40 °C±2 °C<br>相对湿度: 93 %±2 %RH<br>试验周期: 21 天<br><br>Temperature: +40 °C±2 °C<br>Humidity: 93 %±2 %RH<br>Duration: 21 Days                           | 无可见损伤<br><br>No visible damage                                                                                                                                                                                                                                                                                                                                                                        |
|           | 最后测量<br>Final measurement      |                                                                                                                                                          | 外观无可见损伤, 标志清晰<br>电容量变化: $ \Delta C/C  \leq 5\%$ ,<br>损耗角正切的增加: $\Delta \tan \delta \leq 0.008$ (1 kHz)<br>耐电压: 无击穿或飞弧<br>绝缘电阻: $\geq$ 额定值的 50 %<br><br>There shall be no evidence of deterioration and the marking shall be legible.<br>$ \Delta C/C  \leq \pm 5\%$<br>Increase of $\tan \delta \leq 0.005$ (1 kHz)<br>Voltage Proof: No breakdown or arcing<br>I.R. $\geq 50\%$ of the rated value   |
| 5         | 初始测量<br>Initial measurement    | 电容量 C: 20 °C, 1 kHz, 1 V<br>损耗角正切 Tan δ: 20 °C, 1 kHz, 1 V                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                       |
|           | 耐久性<br>Endurance               | 温度: +85 °C±2 °C<br>试验周期: 1000 小时<br>施加电压: 1.25 U <sub>R</sub><br><br>Temperature: +85 °C±2 °C<br>Duration: 1000 (h)<br>Test voltage: 1.25 U <sub>R</sub> | 无可见损伤, 标志清晰<br><br>No visible damage                                                                                                                                                                                                                                                                                                                                                                  |
|           | 最后测量<br>Final measurement      |                                                                                                                                                          | 外观无可见损伤, 标志清晰<br>电容量变化: $ \Delta C/C  \leq 10\%$ ,<br>损耗角正切的增加: $\Delta \tan \delta \leq 0.008$ (1 kHz)<br>耐电压: 无击穿或飞弧<br>绝缘电阻: $\geq$ 额定值的 50 %<br><br>There shall be no evidence of deterioration and the marking shall be legible.<br>$ \Delta C/C  \leq \pm 10\%$<br>Increase of $\tan \delta \leq 0.008$ (1 kHz)<br>Voltage Proof: No breakdown or arcing<br>I.R. $\geq 50\%$ of the rated value |

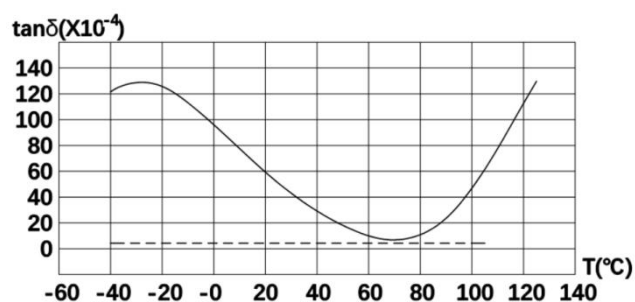
| 序号<br>No. | 测试项目<br>Test Item                 | 测试方法<br>Test method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 要求<br>Requirement                                                                                                                                                                                                                                     |
|-----------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6         | 初始测量<br>Initial measurement       | 电容量 C: 20 °C, 1 kHz, 1 V<br>损耗角正切 Tan $\delta$ : 20 °C, 1 kHz, 1 V                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                       |
|           | 充电和放电<br>Charging and Discharging | 充电次数: 10000 次<br>充电电压: $\sqrt{2} U_R$<br>充电时间: 0.5 s<br>放电时间: 0.5 s<br>充电电阻: $220/C_R \Omega$<br>放电电阻: $R=10/C_R$ 或 $20 \Omega$ 取较大者 $C_R$ :<br>额定电容量 ( $\mu F$ )<br><br>Times: 10000<br>Charging voltage: $\sqrt{2} U_R$<br>Duration of charging: 0.5 s<br>Duration of discharging: 0.5 s<br>Charging resistance: $220/C_R (\Omega)$ or<br>current intensity $\leq 1A$ (whichever is the less<br>current intensity)<br>Discharging resistance: $R=U_R/(C_R \times dv/dt)$<br>$C_R$ : rated capacitance ( $\mu F$ ) |                                                                                                                                                                                                                                                       |
|           | 最后测量<br>Final measurement         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 容量变化: $ \Delta C/C  \leq 10\%$<br>损耗变化: $\Delta \tan \delta \leq 0.008$ (1 kHz)<br>绝缘电阻: $\geq$ 初始测量值的 50 %<br><br>$ \Delta C/C  \leq 10\%$<br>$\Delta \tan \delta \leq 0.008$ (1 kHz)<br>I.R. $\geq 50\%$ of the rated value                         |
| 7         | 阻燃试验<br>Flame Retardancy          | 施加三次火焰, 每次施加 15 秒, 施加火焰<br>时间间隔 15 秒<br><br>Apply flame three times, each time for 15<br>seconds, with a flame application interval<br>of 15 seconds                                                                                                                                                                                                                                                                                                                                                                | 第一次和第二次施加火焰后燃烧时间 $\leq 15$<br>秒, 第三次施加火焰后燃烧时间 $\leq 60$ 秒<br><br>The combustion time after the first and<br>second application of flame is $\leq 15$<br>seconds, and the combustion time after the<br>third application of flame is $\leq 60$ seconds |

## 7. 产品特性曲线图 Graphs of Product Characteristics

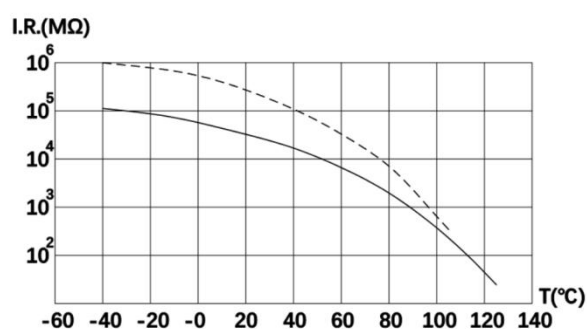
## ☆ 温度特性曲线 Temperature Characteristic Curve



Capacitance vs. Temperature at 1kHz



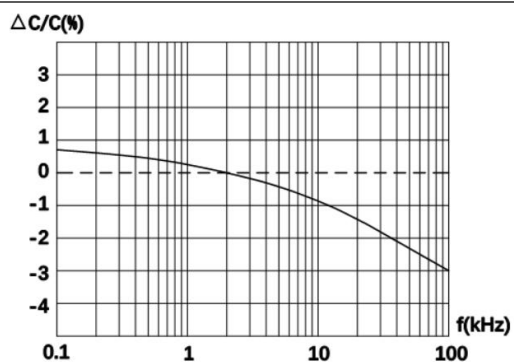
Dissipation Factor vs. Temperature at 1kHz



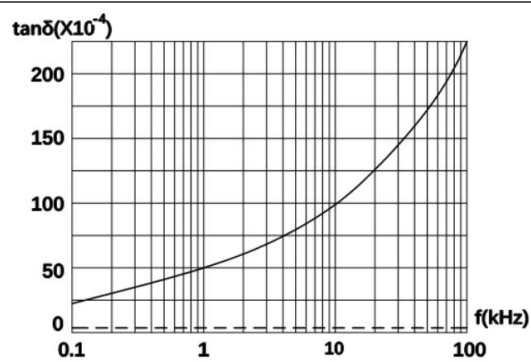
I.R. vs. Temperature

----- 聚丙烯薄膜 Polypropylene Film  
 ————— 聚酯薄膜 Polyester Film

## ☆ 频率特性曲线 Frequency Characteristic Curve



Capacitance vs. Frequency (Room Temperature)



Dissipation Factor vs. Frequency (Room Temperature)

----- 聚丙烯薄膜 Polypropylene Film  
 ————— 聚酯薄膜 Polyester Film

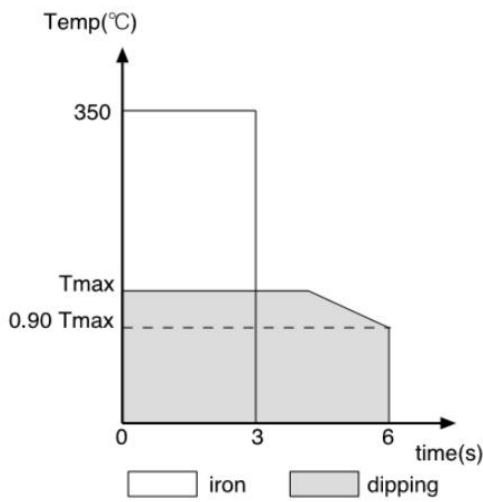
8. 焊接 Weld

焊接电容器时，热量会对电容器的引线和包封层产生影响，并且高温，以及长时间焊接都会对电容器的性能造成影响，甚至导致失效。

When welding, heat can have an impact on the leads and packaging layer of the capacitor, and high temperature and prolonged welding can affect the performance of the capacitor, even leading to failure.

焊接条件按下面的焊接图表：

The welding conditions are shown in the following welding chart



|             | Tmax | Time | Note      |
|-------------|------|------|-----------|
| Pre-heating | 110℃ | 1min |           |
|             | 100℃ | 1min | OPP ≤ 7.5 |
| Soldering   | 270℃ | 4s   |           |
|             | 260℃ | 4s   | OPP ≤ 7.5 |

## 9. 产品出厂检验 OQC

| 检查项目 (每批) Tested Items                                                                            | 检查报告 Test Level (IEC410) |         |
|---------------------------------------------------------------------------------------------------|--------------------------|---------|
|                                                                                                   | IL                       | AQL     |
| 1 外观检查 Appearance Check<br>2 外形尺寸 Dimension                                                       | S-4                      | 1 %     |
| 1 电容量 Capacitance<br>2 损耗角正切 Dimension<br>3 耐电压 Voltage Withstand<br>4 绝缘电阻 Insulation Resistance | II                       | 0.065 % |
| 1 可焊性 Weld-ability                                                                                | S-3                      | 2.5 %   |

## 10. 储存条件 Storage Conditions

环境温度: -10 °C ~ +40 °C

相对湿度: 不大于 85 %

气 压: 40-106 kPa

Environmental Temperature: -10 °C ~ +40 °C

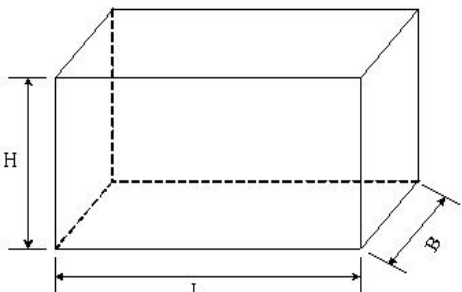
Relative Humidity: ≤85 %

Atmospheric Pressure: 40-106 kPa

应在无酸性碱性或其它腐蚀气体的库房内贮存, 且不允许阳光直射, 包装成箱的产品的贮存期为二年。产品拆封后应在不超过三个月内使用, 避免因暴露而致引脚氧化锈蚀。

Should be stored in a warehouse without acidic, alkaline or other corrosive gases, and direct sunlight is not allowed. The storage period of packaged products is two years. After the product is unpacked, it should be used for no more than three months to avoid pin oxidation and corrosion caused by exposure.

## 11. 包装 Packaging

|  | 类型 types of                | L <sub>(cm)</sub> | B <sub>(cm)</sub> | H <sub>(cm)</sub> |
|-------------------------------------------------------------------------------------|----------------------------|-------------------|-------------------|-------------------|
|                                                                                     | 标准外箱<br>Standard outer box | 44                | 26                | 20                |
|                                                                                     |                            | 50                | 29                | 25                |
|                                                                                     |                            | 52                | 35                | 27.5              |
|                                                                                     | 标准内箱<br>Standard inner box | 24.5              | 21                | 17.5              |
|                                                                                     |                            | 27                | 23.5              | 23                |
|                                                                                     |                            | 34.5              | 25.5              | 4.8               |

注: 部分情况下包装箱尺寸与上表尺寸略有差异

Note: Packaging may differ from the dimensions in the table above in some cases.