

CUSTOMER: __

JIA WEI CHENG ELECTRONICS CO.,LTD
SPECIFICATION FOR APPROVAL



Product Name: Aluminium Electrolytic Capacitor



Item : KM 16V220UF 6.3*12

Date : November. 20th, 2018

Environmental Protection Standard of Material: ROHS+REACH

Confirmation from Manufacturer

Confirmation from User

| Drafted by | Verified by | Approved by | | Verified by | Approved by |
|------------|-------------|-------------|--|-------------|-------------|
| 姚海洋 | | | | | |

Manufacturer: JIA WEI CHENG ELECTRONICS CO.,LTD

Address:Huabianling Industrial Zone, Xinxu Town, Huiyang District,
Huizhou, Guangdong

Contact: 0755-89638912

Fax: 0755-89638916

Postcode: 51800

After signing, please kindly return one copy. Thanks.

Content

| | |
|---|------------|
| 1. Sample details and relevant parameters | Page 4 |
| 2. Related notes and product drawings of aluminum electrolytic capacitors | Page 5~6 |
| 3. Aluminum Electrolytic Capacitor Composition List | Page 7 |
| 4. Characteristic Principle | Page 8 |
| 5. Dimensions | Page 9~10 |
| 6. Checking Requirement | Page 11~13 |
| 7. Test Report | Page 14 |

Customer: _____

Item:

E-CAP

Page: 3/14

Version: A/1

| Version | Revision Reason | Revision | Revisor | Effective from |
|---------|-----------------|----------|---------|----------------|
| | | | | |

1.SCOPE

This specification has specified the technical standard of miniature single-ended aluminum electrolytic capacitors.

2.APPLICABLE SPECIFICATION

This specification was made by referring to JIS C5141

3.OPERATING TEMPERATURE RANGE

-40~+105°C(≤100V) -25~+105°C(≥160V)

Operating temperature range is the range of ambient temperature at which the capacitor can be operated continuously at rated voltage.

-40~+105°C(≤100V) -25~+105°C(≥160V)

2.APPLICABLE SPECIFICATION

This specification was made by referring to JIS C5141

3.OPERATING TEMPERATURE RANGE

-40~+105°C(≤100V) -25~+105°C(≥160V)

Operating temperature range is the range of ambient temperature at which the capacitor can be operated continuously at rated voltage.

-40~+105°C(≤100V) -25~+105°C(≥160V)

4.CONTENTS OF QUALITY ASSURANCE

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows.

Ambient temperature : 15 to 35°C

Relative humidity : 45 to 75%

Air pressure : 86kpa to 106kpa

If there may be doubt on the results, measurements shall be made within the following limits.

Ambient temperature : 20±2°C

Relative humidity : 60 to 70%

Air pressure : 86Kpa to 106Kpa

IMPORTANT INFORMATION ON THE APPLICATION OF ALUMINUM ELECTROLYTIC CAPACITORS

(1) DC Capacitors Shall be Polarized

When reverse voltage is applied on DC electrolytic capacitors, the capacitor will become short-circuited and get damaged because of the abnormal current flows. Where the positive voltage may be applied to the cathode terminal, please use no polarized capacitors

(2) Use Capacitor within Rated Voltage

When a capacitor is used at a voltage higher than its rated one, leakage current will increase, and its characteristics drastically deteriorate and get damaged. Peak voltage shall not exceed the rated voltage.

(3) Charge and Discharge Application

When aluminum electrolytic capacitors for general purpose are employed in rapid charge and discharge application, its life expectancy may be shortened by capacitance decrease, heat rise, etc.

(4) Capacitor Storage

Increased leakage current is common in aluminum capacitors which have been stored for a long period of time. The Higher the storage temperature is, the higher the leakage current will be. In case where increased leakage current causes problems in the circuit, please apply voltage (aging) before using.

(5) Ripple current applied to capacitor should not exceed the rated value

Excessive heat will reduce capacitance and result in shortened life of capacitor if ripple currents exceeding the specified rated value are applied. The peak value of the ripple voltage should be less than the rated voltage.

(6) Ambient Temperature.

The ambient temperature affects life of the aluminum electrolytic capacitor. It is generally stated, that life doubles for each 10°C decrease in temperature.

(7) Lead Stress

When a strong force is applied to the lead wires or terminals, stress is put on the internal connections. This may result in short circuit, open circuit or increased leakage current. It is not advisable to bend or handle a capacitor after it has been soldered to the PC board.

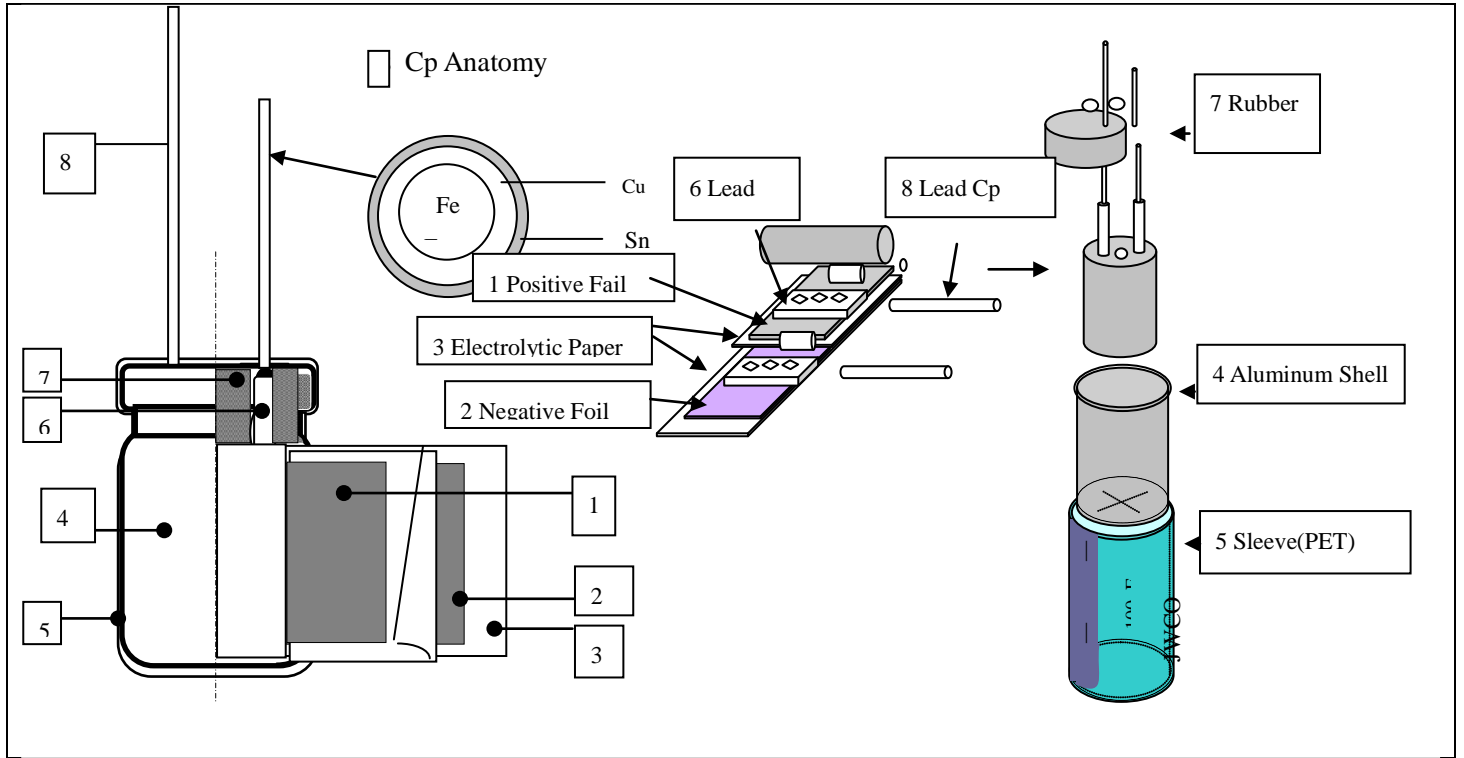
(8) Heat Resistance at the Soldering Process

In the dip soldering process of PC board with aluminum electrolytic capacitors mounted, secondary shrinkage or crack of PVC sleeve may be observed when solder temperature is too high or dipping time is too long.

(9) Hole Pitch and Position of PC board.

A PC board must be designed so its hole pitch coincides with the lead pitch (lead spacing) of the capacitor specified by the catalog or specifications. When a capacitor is forcibly inserted into an unmatched hole pitch, a stress is put on the leads This could result in a short circuit or increased leakage current.

Product Diagram



ALUMINIUM ELECTROLYTIC CAPACITOR

COMPOSITION LIST

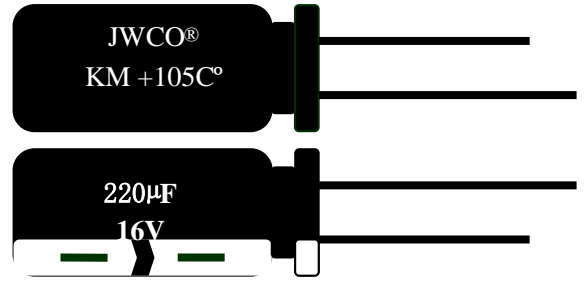
| MATERIALS | | COMPOSITION OF MATERIALS | |
|--------------------------------------|--|--------------------------------|--------------|
| SLEEVE TUBE | | POLYETHYLENE TEREPHTHALATE PVC | 90% |
| | | STABILILER | 0.2% |
| | | (LUBRICANT) | 0.15% |
| | | (PIGMENT) | 1.0% |
| RUBBER | | (TOUGHENER) | 8.65% |
| | | EPDM | 40% |
| | | CLAY | 45% |
| | | CARBON | 9.0% |
| LEAD WIRE | | OTHER | 6.0% |
| | | AL | 99.91% |
| | | Si | 0.03% |
| | | Fe | 0.05% |
| TIN PLATED COPPER COVERED SLEEL WIRE | | Cu | 0.01% |
| | | Fe | 71.35% |
| | | Cu | 20% |
| | | Sn | 8.65% |
| AL-CASE | | AL | 99.3% |
| | | Cu | 0.20% |
| | | Mn | 0.20% |
| | | Zn | 0.20% |
| | | OTHER | 0.1% |
| ALUMINUM FOIL | | AL | 99.98% |
| | | Al_2O_3 | 0.02% |
| PAPER | | CELLULOSE | 100% |
| ELECTROLYTE | | ETHYL GLYCL | 50% |
| | | AMMONIUM ADIPATE | Confidential |
| | | ADIPIC ACID | Confidential |
| | | AMMOUIUN BENZOATE | Confidential |
| | | CITRIC ACID | Confidential |
| | | PARA-NITORO BENZOIE ACID | Confidential |
| | | AMMDIHYDROGEN PHOSPHLATE | Confidential |
| | | PURE WATER , AMMONIUM ACETATE | Confidential |

JWCO® KM Series

KM Series 105°C

Features

- ◆ Used in communication equipment, switching power supply, etc.
- ◆ Load life 2000 hours at 105°C
- ◆ Safety vent construction design



Specifications

| Item | Performance Characteristics | | | | | | | | | | | | | | |
|---|--|-----|----|----|----|----|----|--|-----|-----|-----|-----|-----|-----|-----|
| Operating Temperature Range | -40to+105°C | | | | | | | -25to+105°C | | | | | | | |
| Rated Voltage Range | 6.3to100VDC | | | | | | | 160to450VDC | | | | | | | |
| Capacitance Range | 0.1to4700 µ F | | | | | | | 0.47to220 µ F | | | | | | | |
| Capacitance Tolerance | ±20% (100Hz or 120Hz, +20°C) | | | | | | | | | | | | | | |
| Leakage Current (+20°C, max) | I ≤ 0.01CV or 3 (µ A) After 1minutes, whichever is greater measured with rated working voltage applied | | | | | | | I ≤ 0.03CV+10 (µ A) After 1minutes, whichever is greater measured with rated working voltage applied | | | | | | | |
| Dissipation Factor (tg δ) | Working Voltage (VDC) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
| | D.F(%) | 22 | 20 | 16 | 15 | 14 | 10 | 9 | 8 | 12 | 20 | 20 | 20 | 25 | 25 |
| For capacitance > 1000 µ F, Add 2% per another 1000 µ F (100Hz or 120Hz, +20°C) | | | | | | | | | | | | | | | |
| Low Temperature Characteristics (120Hz) | Impedance ratio ,max | | | | | | | | | | | | | | |
| | Working Voltage(VDC) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
| | Z-25°C / Z+20 °C | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 5 | 6 | 15 |
| Z-40°C / Z+20 °C | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | |
| Fpr capacitance > 1000 µ F , and 0.5% per another 1000 µ F for Z-25°C/Z+20°C, add 1% per another 1000 µ F for Z-40°C/Z+20°C | | | | | | | | | | | | | | | |
| Load Life | Test conditions | | | | | | | | | | | | | | |
| | Duration time: 2000hours | | | | | | | | | | | | | | |
| | Ambient temperature: +105°C | | | | | | | | | | | | | | |
| | Applied voltage: Rated Working Voltage(DVC) | | | | | | | | | | | | | | |
| | After test requirements: Resumde 16 hours at normal temperature | | | | | | | | | | | | | | |
| | Capacitance change: ≤20% of the initial measured value | | | | | | | | | | | | | | |
| | Dissipation Factor: ≤200% of the initial specified value | | | | | | | | | | | | | | |
| Leakage Current: ≤The initial specified value | | | | | | | | | | | | | | | |
| Shelt Life | Test conditions | | | | | | | | | | | | | | |
| | Duration time: 1000hours | | | | | | | | | | | | | | |
| | Ambient temperature: +105°C | | | | | | | | | | | | | | |
| | Applied voltage: None | | | | | | | | | | | | | | |
| | After test requirements: Resumed 16 hours at normal temperature | | | | | | | | | | | | | | |
| | Capacitance change: ≤20% of the initial measured value | | | | | | | | | | | | | | |
| | Dissipation Factor: ≤200% of the initial specified value | | | | | | | | | | | | | | |
| Leakage Current: ≤200% of the initial specified value | | | | | | | | | | | | | | | |

JWCO® KM Series

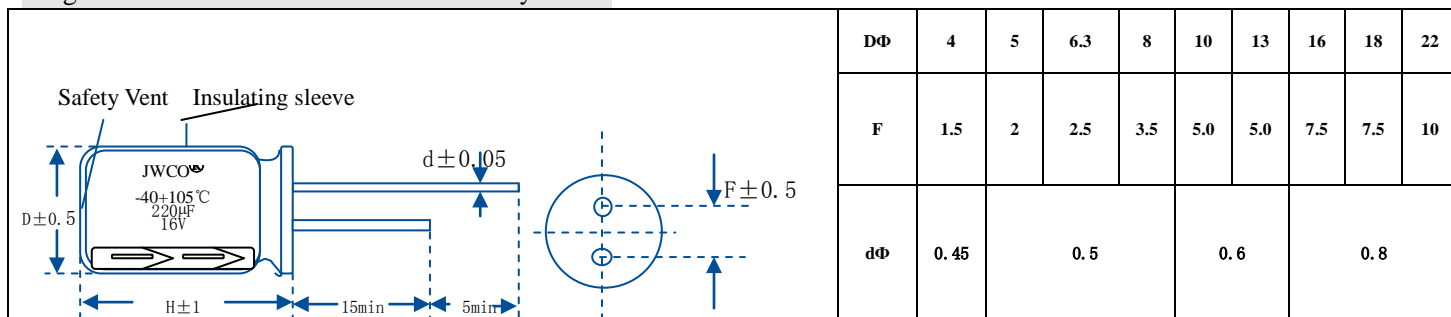
Multiplier for ripple current vs.frequency

| Capacitance (μ F) / Hz | | 60(50) | 120 | 400 | 1K | 10K | 50K~100K |
|------------------------------|-----------|--------|-----|------|------|------|----------|
| Data | ≤ 10 | 0.8 | 1 | 1.30 | 1.30 | 1.65 | 1.70 |
| | 10~100 | 0.8 | 1 | 1.23 | 1.23 | 1.48 | 1.53 |
| | 100~1000 | 0.8 | 1 | 1.16 | 1.16 | 1.35 | 1.38 |
| | >1000 | 0.8 | 1 | 1.11 | 1.11 | 1.25 | 1.28 |

Multiplier for ripple current vs.temperature

| $^{\circ}$ C | 45 | 60 | 70 | 85 | 105 |
|--------------|------|------|------|------|------|
| Data | 2.10 | 1.90 | 1.40 | 1.25 | 1.00 |

Diagram of Dimension ($\geq D\Phi 8$ with safety vent)



Sleeve Marks Information(Applied to all series)

| JWCO® | VENT | -40+105 $^{\circ}$ C | 220 μ F | 16V | 6.3*12 | -- |
|-------|----------------------|-----------------------|------------------|-----------------|--------|----|
| Brand | Anti-explosion valve | Operating Temperature | Mark Capacitance | Working Voltage | size | -- |

Case Size

D x L(mm)

| wv μ F | 6.3 (8) | 10 (13) | 16 (20) | 25 (32) | 35 (44) | 50 (63) | 63 (79) | 100 (125) | 160 (200) | 200 (250) | 250 (300) | 350 (400) | 400 (450) | 450 (500) |
|---------------|------------|------------|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 0.1 | | | | | | 4x8 | 5x11 | 5x11 | | | | | | |
| 0.22 | | | | | | 4x8 | 5x11 | 5x11 | | | | | | |
| 0.33 | | | | | | 4x8 | 5x11 | 5x11 | | | | | | |
| 0.47 | | | | | | 4x8 | 5x11 | 5x11 | 5x11 | 5x11 | 5x11 | 6.3x11 | 6.3x11 | 8x12 |
| 1 | | | | | | 4x8 | 5x11 | 5x11 | 6.3x12 | 6.3x12 | 6.3x12 | 8x12 | 6.3x12 | 8x12 |
| 2.2 | | | | | | 5x11 | 5x11 | 5x11 | 6x12 | 6x12 | 6.3x12 | 8x12 | 6.3x12 | 8x12 |
| 3.3 | | | | | | 5x11 | 5x11 | 5x11 | 6.3x12 | 6.3x12 | 8x12 | 8x12 | 8x12 | 8x16 |
| 4.7 | | | | | | 5x11 | 5x11 | 5x11 | 6.3x12 | 8x12 | 8x12 | 8x12 | 8x12 | 10x13 |
| 6.8 | | | | | | 5x11 | 5x11 | 5x11 | 6.3x12 | 8x12 | 8x12 | 8x12 | 10x13 | 10x15 |
| 10 | | | 4x8 | 4x8 | 5x11 | 5x11 | 6.3x12 | 6.3x12 | 8x12 | 10x13 | 10x17 | 10x15 | 10x17 | 10x20 |
| 15 | | | 4x8 | 5x11 | 5x11 | 5x11 | 6.3x12 | 6.3x12 | 8x12 | 10x13 | 10x17 | 10x15 | 10x17 | 10x20 |
| 22 | | | 4x8 | 5x11 | 5x11 | 5x11 | 6.3x12 | 8x12 | 10x17 | 10x17 | 10x20 | 13x21 | 13x21 | 16x25 |
| 33 | | | 4x8 | 5x11 | 5x11 | 6.3x12 | 8x12 | 10x13 | 10x20 | 13x20 | 13x25 | 16x21 | 16x21 | 16x30 |
| 47 | | | 4x8 | 5x11 | 5*11 | 6 x12 | 8x12 | 10x16 | 13x25 | 13x25 | 13x25 | 13x25 | 16x25 | 16x30 |
| 68 | 5x11 | 5x11 | 5x11 | 6.3x12 | 6.3x12 | 6.3x12 | 8x12 | 10x16 | 13x25 | 13x25 | 13x25 | 13x25 | 18x25 | 18x25 |
| 82 | 5x11 | 5x11 | 5x11 | 6.3x12 | 8x12 | 8x12 | 10x16 | 13x20 | 16x25 | 16x32 | 16x32 | 18x25 | 18x25 | |
| 100 | 5x11 | 5x11 | 5x11 | 6.3x12 | 6.3*12 | 8x12 | 10x16 | 13x20 | 16x25 | 16x32 | 16x32 | 18x30 | 18x32 | |
| 120 | 5x11 | 6.3x12 | 6.3x12 | 6.3x12 | 8x12 | 10x13 | 10x16 | 13x20 | 16x25 | 16x32 | 16x32 | 18x35 | 18x35 | |
| 150 | 6.3x12 | 6.3x12 | 6.3x12 | 8x12 | 8x12 | 10x14 | 10x20 | 13x25 | 13x36 | 16x36 | 18x36 | 22x26 | 22x36 | |
| 220 | 6.3x12 | 6.3x12 | 6.3x12 | 8x12 | 8x12 | 10x16 | 10x20 | 16x25 | 16x36 | 18x41 | 18x41 | | | |
| 330 | 8x12 | 8x12 | 8x12 | 8x12 | 10x13 | 10x20 | 13x20 | 16x32 | | | | | | |
| 470 | 8x12 | 6x12 | 6x12.8 | 8*12 | 10x17 | 10x20 | 13x25 | 16x36 | | | | | | |
| 680 | 8x12 | 8x12 | 8x14 | 10x16 | 10x25 | 13x25 | 16x25 | 18x41 | | | | | | |
| 1000 | 8x12 | 8x12 | 10x13 | 10x17 | 10x20 | 13x25 | 16x32 | 18x41 | | | | | | |
| 2200 | 10x20 | 10x17 | 13x20 | 13x25 | 16x32 | 18x36 | 18x41 | | | | | | | |
| 3300 | 10x25 | 13x20 | 13x25 | 16x26 | 18x36 | 18x36 | | | | | | | | |
| 4700 | 13x25 | 16x25 | 16x26 | 16x26 | 18x40 | | | | | | | | | |

JWCO® KM Series

Maximum Ripple Current

(mA 120 Hz at 105°C)

| WV UF | 6.3 (8) | 10 (13) | 16 (20) | 25 (32) | 35 (44) | 50 (63) | 63 (79) | 100 (125) | 160 (200) | 200 (250) | 250 (300) | 350 (400) | 400 (450) | 450 (500) |
|----------|------------|------------|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 0.1 | | | | | | 1.3 | 1.3 | 1.9 | | | | | | |
| 0.22 | | | | | | 2.9 | 2.9 | 3.4 | | | | | | |
| 0.33 | | | | | | 4 | 4.5 | 5 | | | | | | |
| 0.47 | | | | | | 7 | 7 | 10 | 11 | 12 | 12 | 14 | 15 | 17 |
| 1 | | | | | | 10 | 12 | 15 | 16 | 16 | 17 | 20 | 20 | 22 |
| 2.2 | | | | | | 18 | 20 | 25 | 25 | 25 | 28 | 35 | 35 | 36 |
| 3.3 | | | | | | 25 | 26 | 35 | 35 | 40 | 45 | 45 | 48 | 48 |
| 4.7 | | | | | | 30 | 35 | 45 | 45 | 50 | 52 | 55 | 57 | 60 |
| 6.8 | | | | | | 34 | 35 | 50 | 50 | 52 | 55 | 60 | 62 | 72 |
| 10 | | | 35 | 38 | 45 | 50 | 50 | 56 | 59 | 59 | 64 | 79 | 79 | 87 |
| 15 | | | 42 | 45 | 50 | 52 | 60 | 64 | 79 | 84 | 89 | 92 | 95 | 98 |
| 22 | | | 54 | 54 | 60 | 68 | 82 | 96 | 96 | 96 | 110 | 130 | 145 | 165 |
| 33 | | | 56 | 67 | 75 | 90 | 100 | 120 | 125 | 140 | 140 | 175 | 185 | 210 |
| 47 | | | 57 | 70 | 76 | 125 | 135 | 160 | 165 | 165 | 180 | 230 | 240 | 260 |
| 68 | 70 | 80 | 105 | 112 | 120 | 135 | 150 | 180 | 195 | 195 | 210 | 240 | 260 | 290 |
| 82 | 75 | 85 | 110 | 115 | 135 | 145 | 178 | 210 | 225 | 248 | 265 | 285 | 310 | 320 |
| 100 | 95 | 105 | 110 | 130 | 140 | 180 | 225 | 245 | 270 | 285 | 310 | 335 | 350 | 380 |
| 120 | 115 | 125 | 130 | 162 | 205 | 216 | 270 | 294 | 325 | 342 | 375 | 405 | 420 | |
| 150 | 135 | 140 | 170 | 205 | 255 | 270 | 340 | 365 | 405 | 430 | 465 | 500 | 525 | |
| 220 | 160 | 175 | 180 | 230 | 235 | 345 | 400 | 450 | 480 | 625 | 680 | | | |
| 330 | 195 | 245 | 260 | 310 | 350 | 460 | 540 | 700 | 890 | 940 | | | | |
| 470 | 250 | 262 | 278 | 360 | 460 | 610 | 700 | 880 | 960 | | | | | |
| 680 | 390 | 420 | 535 | 635 | 752 | 880 | 1010 | | | | | | | |
| 1000 | 460 | 460 | 500 | 630 | 685 | 1080 | 1210 | | | | | | | |
| 2200 | 810 | 860 | 1000 | 1170 | 1340 | 1530 | | | | | | | | |
| 3300 | 960 | 1100 | 1300 | 1460 | 1650 | 1750 | | | | | | | | |
| 4700 | 1330 | 1400 | 1600 | 1780 | 1900 | | | | | | | | | |

Examination requirements Inspection level and acceptable quality level according to GB2828-87 “batch inspection count sampling procedure and sampling table”.

| No. | Inspection item | Test condition | IL | AQL | Characteristic requirement |
|-----|-----------------------------|---|----------------------------|------|--|
| 1 | Appearance inspection | In accordance with the shape shown, check appearance by visual method, dimension by vernier caliper and micrometer. | General inspection level 1 | 0.1 | The appearance isn't abnormal with clear and no visible signs of damage, comply with the provisions of the sixth. Dimensions are in accordance with Table 1 and Table 3. |
| 2 | Leakage current | $V_R \leq 100V$ approx. 100Ω $V_R \geq 160V$ approx. 1000Ω Protective resistance $V_R \leq 100V$ about 100Ω $V_R \geq 160V$ about 1000Ω Read the numbers after rated working voltage charging for 2 minutes. | | 0.04 | $V_R \leq 100V$ $I \leq 0.01C_R$ V_R or $3\mu A$ larger one applied $V_R \geq 160V$ $I \leq 0.03C_R$ $V_R + 10\mu A$ |
| 3 | Capacitance | Frequency is 100HZ or 120HZ. Temperature $25 \pm 2^\circ C$ | | | $\leq \pm 20\%$ |
| 4 | Dissipation Factor | | | | |
| 5 | Outer insulation resistance | Add 100V voltage for one minute between insulation bush and lead wire. | | | 1.0 |
| 6 | Solderability | Solderability tester by solder bath method 1 Welding temperature: $235 \pm 5^\circ C$ Immersion time: $2.0 \pm 0.5S$ | S-3 | 2.5 | Good solder at the end |
| 7 | Terminal tensile strength | Tension: 10N, 10S, no visible damage. Bend: Half of tension, bend twice with 45° , no visible damage. | 9 | 1 | No abnormal appearance, clear signs, no visible damage |
| 8 | Soldering heat resistance | $260 \pm 5^\circ C$, 10S, Immersion depth: 2mm | | | $\Delta C/C = 5\%$ No visible damage |
| 9 | Solvent resistance | Softened water as solvent Temperature: $20-25^\circ C$ Immersion time: $30 \pm 0.5S$ | | | No abnormal appearance, clear signs. |

| No. | Inspection item | Test condition | IL | AQL | Characteristic requirement |
|-----|---|--|----|-----|--|
| 10 | Rapid change of temperature | $\Theta A: -40^{\circ}\text{C}$ $\Theta A: -25^{\circ}\text{C}$; $\Theta B: 85^{\circ}\text{C}$ T1: 30min T2: $\leq 5\text{min}$ Five cycles | 18 | 1 | No visible damage of appearance, no leakage. Capacitance change rate $\leq \pm 10\%$ initial measurements |
| 11 | Vibration | F=10-55HZ, A=1.5mm or 98m/s ² , Solid body; three directions; 6 hours in total. | | | $\Delta C/C=5\%$ No visible damage of appearance, no leakage, clear signs. |
| 12 | Charge & discharge | Apply the rated voltage, charging time: 30s(charge for 25s, discharge for 5s), 500 times(+20-0times) | | | No visible damage of appearance, no leakage. Capacitance change rate: $\leq \pm 10\%$ initial measurements; Leakage current: $\leq 150\%$ initial measurements. Dissipation factor $\leq 150\%$ initial measurements. |
| 13 | Climatic sequence(temperature characteristic) | First stage: $+20^{\circ}\text{C} \pm 2^{\circ}\text{C}$; Second stage: Minimum allowable temperature; Third stage: $+20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (15 minutes); Fourth stage: Minimum allowable temperature $+0^{\circ}\text{C}$, -3°C (2h); Fifth stage: $+20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (2h) | 9 | 1 | No visible damage of appearance, no leakage. |
| 14 | Hot and humid in steady state | $+40 \pm 2^{\circ}\text{C}$, Humidity 90-95% 21 days | | | No visible damage of appearance, no leakage, clear signs. |
| 15 | High temperature load(Apply ripple current) | $+105^{\circ}\text{C}$ under voltage with Ripple Current 2000hours, recovering 16hours; | 21 | 1 | No abnormal appearance, clear signs, no visible damage, no leakage. Capacitance change rate: $\leq \pm 20\%$ initial measurements; Leakage current: \leq initial measurements; Dissipation factor: $\leq 200\%$ initial measurements. |

| No. | Inspection item | Test condition | IL | AQL | Characteristic requirement |
|-----|--------------------------|---|----|-----|--|
| 16 | Surge voltage | 1000 times, indoor temperature; Charge: 30s Discharge: 5min 30s; Applied voltage(DC) | 6 | 1 | No visible damage of appearance, no leakage, clear signs. Leakage current: \leq initial measurements. |
| 17 | Pressure release | DC-method | | | Equipment should be open, no explosion, no burning. |
| 18 | Low temperature storage | -40℃, 16h; 16hours later; | | | No visible damage of appearance, clear signs, no leakage. Capacitance change rate: \leq 10% initial measurements; Leakage current: \leq initial measurements. Dissipation factor: \leq initial measurements. |
| 19 | High temperature storage | +105℃, 1000h; 16hours later; | 12 | 1 | No visible damage of appearance, no leakage, clear signs. Capacitance change rate: \leq ±20% initial measurements; Leakage current: \leq 200% initial measurements. Dissipation factor: \leq 200% initial measurements. |
| 20 | Hose melting point | Melt: Silicone oil Temperature: 220℃ (Lowest temperature) | 6 | 1 | Hose can not have broken phenomenon in the specified time. |

JIA WEI CHENG ELECTRONICS CO.,LTD

Aluminum Electrolytic Capacitors Sample Test Report

Test Date: 2018-11-21

| | | | | | |
|-------------|--------|---------------|-----------------|--------------|------------------------|
| Customer | | Series | KM | Sleeve Color | Black |
| Sample Qty | 10 pcs | Specification | 220 μ F/16V | Part Number | KM221M1CBKJ061 2VBK |
| Test Qty | 10 pcs | Size | 6.3X12 | PO No. | |
| ROHS Report | | | REACH Report | | |

| Items | Test Standard | AQL | | Failed Qty | Failure Reason | Conclusion |
|------------------------------|---|-----|----|------------|----------------|------------|
| | | Ac | Re | | | |
| Out-looking Check | Normal outlooking, Clear marks, No noticeable damage, Size compliant to diagram | 0 | 1 | 0 | / | OK |
| Capacitance (C) | 176~264 μ F | 0 | 1 | 0 | / | OK |
| Dissipation Factor((DF) | $\leq 16\%$ | 0 | 1 | 0 | / | OK |
| Leakage Current(charge 120s) | $\leq 35.2\mu$ A | 0 | 1 | 0 | / | OK |
| Weldability | Lead well coated | 0 | 1 | 0 | / | OK |
| Leas tensile | Normal outlooking, Clear marks, No noticeable damage, Stable Features | 0 | 1 | 0 | / | OK |
| Welding Heat Resistance | No noticeable damage, Capacitance Fluctuation $\leq 5\%$ | 0 | 1 | 0 | / | OK |
| Stress Release | Safety Vent Open, no explosion nor burning | 0 | 1 | 0 | / | OK |

Electrolytic Features Test

| Data No. | Capacitance (μ F) (120HZ) | Dissipation (tan δ) % (120HZ) | Leakage Current (μ A) (charge for 120s) |
|-------------|--------------------------------------|---|--|
| 1 | 203.2 | 5.61 | 1.35 |
| 2 | 200.2 | 4.62 | 1.52 |
| 3 | 199.3 | 5.35 | 1.62 |
| 4 | 203.2 | 5.62 | 1.34 |
| 5 | 204.5 | 5.64 | 1.25 |
| 6 | 206.2 | 5.62 | 1.62 |
| 7 | 205.3 | 5.86 | 1.34 |
| 8 | 204.3 | 5.25 | 1.25 |
| 9 | 202.2 | 4.99 | 1.62 |
| 10 | 209.3 | 5.62 | 1.35 |

Inspected by: 李红梅

Approved by: 柴斌