# Aluminum Electrolytic Capacitors

RND components

- 105℃ high temperature resistance and ripple current resistance, high reliability
- Suitable for wave filtering return circuit for power of equipment, such as computers

**Specifications**

| Items | Characteristics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Capacitance Tolerance | ±20%(120Hz, 20℃) | | | | | | | | | |
| Operating Temperature Range | -40~+105℃ | | | | -25~+105℃ | | | | | |
| Rated Voltage Range | 10~250V | | | | 350~450V | | | | | |
| Leakage Current | I≦3√CV or 3000 (uA), which is greater. (After 5 minutes application of working voltage) | | | | | | | | | |
| Dissipation Factor (tan δ) | Measurement Frequency:120Hz. Temperature:20℃ | | | | | | | | | |
| | Rated Voltage(V) | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 160~250 | 350~450 |
| | tan δ (MAX) | 0.45 | 0.40 | 0.35 | 0.30 | 0.25 | 0.25 | 0.20 | 0.20 | 0.15 | 0.20 |
| Low Temperature Stability Impedance Ratio(MAX) | Measurement Frequency:120Hz. | | | | | | | | | |
| | Rated Voltage(V) | 10 | 16 | 25 | 35 | 50 | 63~100 | | 160~250 | 350~450 |
| | Z(-25℃)/Z(20℃) | 6 | 6 | 4 | 4 | 4 | 4 | | 4 | 8 |
| | Z(-40℃)/Z(20℃) | 16 | 15 | 10 | 10 | 8 | 6 | | 15 | - |
| Load Life | 2000hours, with application of working voltage at 105℃ | | | | | | | | | |
| | Capacitance Change | Within ± 20% of Initial Value | | | | | | | | |
| | tan δ | 200% or less of Initial Specified Value | | | | | | | | |
| | Leakage Current | Initial Specified Value or less | | | | | | | | |
| Shelf Life | 1000hours, no voltage applied, at 105℃。After Test：$U_R$ to be applied for 30 minutes, 24 to 48 hours before measurement. | | | | | | | | | |
| | Capacitance Change | Within ± 15% of Initial Value | | | | | | | | |
| | tan δ | 200% or less of Initial Specified Value | | | | | | | | |
| | Leakage Current | Initial Specified Value or less | | | | | | | | |
| Standards | JIS C 5141 and JIS C 5102 | | | | | | | | | |

**Permissible Ripple Current Temperature Coefficient**

| TEMP(℃) | 45 | 60 | 85 | 105 |
|---|---|---|---|---|
| Coefficient | 2.50 | 2.20 | 1.65 | 1.00 |

**Frequency Coefficient**

| | Frequency (Hz) | | | | |
|---|---|---|---|---|---|
| WV(V) | 50 | 120 | 1K | 10K | 100K |
| 10~100 | 0.88 | 1.00 | 1.15 | 1.15 | 1.20 |
| 160~250 | 0.85 | 1.00 | 1.15 | 1.20 | 1.20 |
| 350~450 | 0.88 | 1.00 | 1.10 | 1.15 | 1.20 |

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## Part Number Codes

| K | LZ | 450 | M | 681 | P | 55 | Y |
|---|---|---|---|---|---|---|---|

D:PVC
K:PET
V:V-CHIP
P:PA-CAP

**RATE VOLTAGE:**

Rate Voltages is Shown:
In Volts

006=6.3V
010=10V
100=100V

**CAPACITANCE TOLERANCE:**

| | |
|---|---|
| J= | ±5% |
| K= | ±10% |
| M= | ±20% |
| A= | 0%~+20% |
| D= | -5%~+20% |
| V= | -10%~+20% |
| Q= | -10%~+30% |
| T= | -10%~+50% |
| E= | -15%~+20% |
| I= | -30%~+20% |
| B= | + 10%~+30% |
| N= | +10%~+25% |

**SERIES NAME:**

See Catalongue Index Table

**RATE CAPACITANCE:**

0R1=0.1uF
1R0=1uF 100=10uF
101=100uF
102=1000uF
103=10000uF
223=22000uF

**LENGTH OF AL. CASE: (L,mm)**

Two digits indicate integer,EX: 07=7mm

The following codes indicate containing decimal, EX:A6=7.7mm

| | | | |
|---|---|---|---|
| A1 | 5.4 | B1 | 10.2 |
| A2 | 5.8 | B2 | 10.4 |
| A3 | 6.2 | B3 | 10.5 |
| A4 | 6.7 | B4 | 12.2 |
| A5 | 7.5 | B5 | 12.5 |
| A6 | 7.7 | B6 | 13.5 |
| A7 | | B7 | 16.5 |
| A8 | | B8 | 21.5 |
| A9 | | B9 | |

**TYPE CODE DESCRIPTION:**

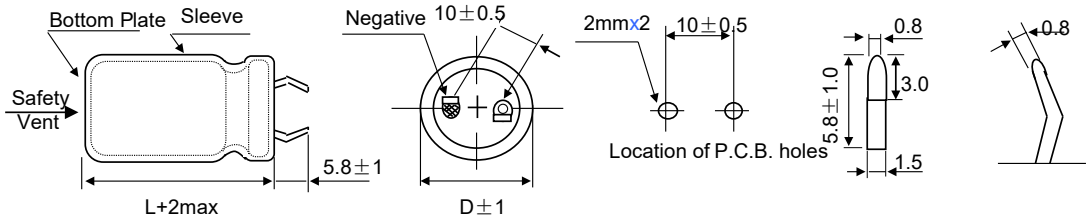
| | |
|---|---|
| RADIAL P | Taping(Ammo pack) |
| R | Taping(Reel Pack) |
| C | Lead Cut |
| D | Lead Cut and Crimp |
| F | Lead Forming Cut |
| H | Lead Forming Cut and Crimp |
| B | Forming Only |
| S | Long Lead |
| L | Bended lead of $90^0$ |
| Lug | G LG Type Terminal |
| | Y Snap in Terminal |
| | W Screw Terminal |

| Diameter (Φ) | Code | Diameter (Φ) | Code |
|---|---|---|---|
| 3 | B | 25 | N |
| 4 | C | 30 | O |
| 5 | D | 35 | P |
| 6.3 | E | 40 | Q |
| 8 | F | 51 | R |
| 10 | G | 64 | S |
| 12 | H | 76 | T |
| 12.5 | X | 90 | U |
| 13 | I | 100 | V |
| 16 | J | | |
| 18 | K | | |
| 20 | L | | |
| 22 | M | | |

# Aluminum Electrolytic Capacitors

RND components

### Dimensions (mm)




### Standard Ratings

D×L(mm); R.C.: (A rms) at 105℃, 120Hz; IMP: (Ω max)

| Cap (uF) \ WV(V) | 10 | | | 16 | | | 25 | | | 35 | | | 50 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP |
| 1500 | | | | | | | | | | | | | 22×25 | 1.20 | 0.268 |
| 1800 | | | | | | | | | | | | | 22×30 | 1.40 | 0.222 |
| 2200 | | | | | | | | | | 22×25 | 1.21 | 0.174 | 22×25<br>25×25 | 1.60 | 0.182 |
| 2700 | | | | | | | | | | 22×25 | 1.21 | 0.174 | 22×35<br>25×30 | 1.73 | 0.148 |
| 3300 | | | | | | | | | | 22×25 | 1.36 | 0.142 | 22×30<br>25×30 | 1.97 | 0.123 |
| 3900 | | | | | | | 22×25 | 1.35 | 0.137 | 22×30 | 1.57 | 0.120 | 22×45<br>25×35 | 2.23 | 0.104 |
| 4700 | | | | | | | 22×25 | 1.58 | 0.114 | 22×30<br>25×25 | 1.77 | 0.098 | 22×35<br>25×40 | 2.45 | 0.086 |
| 5600 | | | | | | | 22×30<br>25×25 | 1.75 | 0.096 | 22×40<br>25×30 | 1.99 | 0.083 | 25×45<br>30×35 | 2.74 | 0.074 |
| 6800 | | | | 22×25 | 1.80 | 0.098 | 22×30<br>25×30 | 2.02 | 0.079 | 22×45<br>22×35 | 2.29 | 0.069 | 22×50<br>35×30 | 3.31 | 0.069 |
| 8200 | | | | 22×30<br>25×25 | 2.08 | 0.082 | 22×40<br>25×35 | 2.18 | 0.066 | 22×50<br>25×40 | 2.58 | 0.057 | 35×35 | 3.60 | 0.050 |
| 10000 | 22×25 | 1.88 | 0.077 | 22×30<br>25×30 | 2.15 | 0.062 | 22×45<br>25×40 | 2.48 | 0.058 | 25×45<br>30×40 | 2.90 | 0.054 | 30×40<br>35×40<br>25×50 | 4.02 | 0.046 |
| 12000 | 22×30<br>25×25 | 2.18 | 0.068 | 22×40<br>25×30 | 2.31 | 0.056 | 22×50<br>25×45 | 2.86 | 0.050 | 25×50<br>30×40 | 3.24 | 0.046 | 35×50 | 4.52 | 0.039 |
| 15000 | 22×35<br>25×30 | 2.27 | 0.055 | 22×35<br>25×35 | 2.69 | 0.045 | 22×50<br>25×40 | 3.15 | 0.040 | 30×45<br>25×50 | 3.65 | 0.037 | 35×40<br>30×50 | 5.56 | 0.026 |
| 18000 | 22×40<br>25×30 | 2.41 | 0.048 | 22×50<br>25×40 | 3.20 | 0.042 | 30×45<br>35×35 | 3.55 | 0.038 | 35×40 | 4.13 | 0.030 | | | |
| 22000 | 22×45<br>25×35 | 2.68 | 0.045 | 22×45<br>30×35 | 3.40 | 0.040 | 25×50<br>35×40 | 4.00 | 0.034 | 30×45<br>35×50 | 4.78 | 0.025 | 35×50 | 6.35 | 0.020 |
| 27000 | 25×40<br>30×35 | 3.17 | 0.040 | 30×40<br>35×35 | 3.85 | 0.035 | 35×45 | 4.55 | 0.030 | | | | | | |
| 33000 | 25×45<br>30×35 | 3.39 | 0.036 | 25×50<br>35×40 | 4.32 | 0.025 | 35×50 | 5.56 | 0.024 | | | | | | |
| 39000 | 25×50<br>30×40 | 3.72 | 0.033 | 35×40 | 4.85 | 0.023 | | | | | | | | | |
| 47000 | 30×45<br>35×35 | 4.22 | 0.030 | 35×50 | 5.56 | 0.020 | 35×50 | 6.35 | 0.020 | | | | | | |
| 56000 | 35×40 | 5.00 | 0.019 | | | | | | | | | | | | |
| 68000 | 35×50 | 5.21 | 0.016 | | | | | | | | | | | | |

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RND components

**Standard Ratings**

D×L(mm); R.C.: (A rms) at 105℃, 120Hz; IMP: (Ω max)

| Cap (uF) | WV (V) | 63 | | | 80 | | | 100 | | | 160 | | | 200 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP |
| 150 | | | | | | | | | | | | | | 22×25 | 0.82 | 1.050 |
| 220 | | | | | | | | | | | 22×25 | 1.04 | 0.738 | 22×25 | 1.07 | 0.738 |
| 330 | | | | | | | | | | | 22×30 | 1.26 | 0.605 | 22×30<br>25×25 | 1.20 | 0.605 |
| 390 | | | | | | | | | | | 22×30<br>25×25 | 1.29 | 0.514 | 22×35<br>25×30 | 1.34 | 0.514 |
| 470 | | | | | | | | 22×25 | 0.95 | 0.523 | 22×30<br>25×30 | 1.56 | 0.426 | 22×35<br>25×30 | 1.48 | 0.426 |
| 560 | | | | | | | | 22×25 | 1.02 | 0.476 | 22×40<br>25×30 | 1.69 | 0.357 | 22×45<br>25×35 | 1.65 | 0.356 |
| 680 | | | | | | | | 22×25 | 1.12 | 0.393 | 22×45<br>25×35 | 1.72 | 0.294 | 25×40<br>30×30 | 1.75 | 0.293 |
| 820 | | | | | 22×25 | 1.04 | 0.326 | 22×30<br>25×25 | 1.32 | 0.324 | 22×50<br>25×40 | 1.99 | 0.246 | 25×50<br>30×35 | 2.04 | 0.245 |
| 1000 | | | | | 22×25 | 1.21 | 0.275 | 22×30<br>25×30 | 1.45 | 0.268 | 25×45<br>30×35 | 2.20 | 0.202 | 25×50<br>35×35 | 2.30 | 0.202 |
| 1200 | | 25×25 | 1.21 | 0.276 | 22×35<br>25×25 | 1.29 | 0.227 | 22×40<br>25×35 | 1.68 | 0.223 | 30×40<br>35×35 | 2.45 | 0.168 | 30×50<br>35×40 | 2.65 | 0.167 |
| 1500 | | 22×30<br>25×25 | 1.45 | 0.223 | 22×40<br>25×30 | 1.57 | 0.186 | 22×45<br>25×40 | 1.98 | 0.177 | 30×50<br>35×40 | 3.06 | 0.138 | 35×45 | 2.98 | 0.134 |
| 1800 | | 22×35<br>25×30 | 1.59 | 0.187 | 22×45<br>25×35 | 1.72 | 0.155 | 25×45<br>30×35 | 2.23 | 0.148 | 35×45 | 3.14 | 0.112 | | | |
| 2200 | | 22×40<br>22×25 | 1.84 | 0.158 | 22×40<br>30×30 | 2.01 | 0.133 | 22×50<br>30×40 | 2.53 | 0.123 | 35×50 | 3.50 | 0.093 | 35×50 | 3.56 | 0.126 |
| 2700 | | 22×45<br>25×35 | 2.12 | 0.126 | 25×45<br>30×35 | 2.32 | 0.099 | 30×45<br>35×35 | 2.82 | 0.098 | | | | | | |
| 3300 | | 22×40<br>30×30 | 2.30 | 0.102 | 22×50<br>35×30 | 2.62 | 0.086 | 25×50<br>30×40 | 3.32 | 0.081 | | | | | | |
| 3900 | | 25×45<br>30×35 | 2.42 | 0.087 | 30×45<br>35×35 | 2.84 | 0.070 | 35×45 | 3.62 | 0.068 | | | | | | |
| 4700 | | 25×45<br>30×40 | 2.91 | 0.075 | 25×50 | 3.29 | 0.068 | 30×50 | 3.80 | 0.058 | | | | | | |
| 5600 | | 30×45<br>35×35 | 3.18 | 0.060 | 35×45 | 3.82 | 0.048 | | | | | | | | | |
| 6800 | | 25×50<br>35×40 | 3.54 | 0.050 | 30×50 | 3.92 | 0.038 | 35×50 | 4.03 | 0.048 | | | | | | |
| 8200 | | 35×45 | 3.82 | 0.042 | 35×50 | 4.05 | 0.033 | | | | | | | | | |
| 10000 | | 35×50 | 4.50 | 0.033 | 35×55 | 4.20 | 0.027 | 35×80 | 4.80 | 0.020 | | | | | | |
| 12000 | | | | | 35×95 | 4.40 | 0.024 | | | | | | | | | |

# Aluminum Electrolytic Capacitors

RND components

**Standard Ratings**

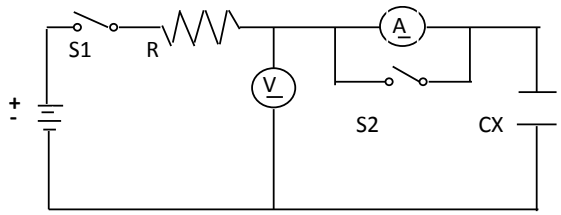
D×L(mm); R.C.: (A rms) at 105℃, 120Hz; IMP: (Ω max)

| Cap (uF) | WV(V) | 250 | | | 350 | | | 400 | | | 450 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP | D×L | R.C. | IMP |
| 47 | | | | | | | | 22×25 | 0.46 | 5.120 | 22×25 | 0.43 | 5.160 |
| 68 | | | | | | | | 22×25 | 0.52 | 4.880 | 22×25<br>25×30 | 0.55 | 4.880 |
| 100 | | | | | 22×30<br>22×25 | 0.69 | 2.654 | 22×30<br>25×25 | 0.72 | 3.318 | 22×35<br>25×35 | 0.75 | 3.318 |
| 120 | | | | | 22×35<br>25×30 | 0.76 | 2.215 | 22×40<br>25×30 | 0.75 | 2.766 | 22×45<br>25×40 | 0.83 | 2.766 |
| 150 | 22×25 | 0.76 | 1.328 | 22×35<br>25×30 | 0.79 | 1.770 | 22×40<br>30×25 | 0.89 | 2.214 | 22×45<br>25×40 | 0.95 | 2.214 | |
| 180 | 22×30 | 0.98 | 1.106 | 22×45<br>25×35 | 0.88 | 1.475 | 22×50<br>25×40 | 0.98 | 1.842 | 25×45<br>30×40 | 1.15 | 1.842 | |
| 220 | 22×30<br>25×25 | 1.09 | 0.905 | 22×45<br>25×40 | 0.98 | 1.208 | 22×45<br>25×40 | 1.12 | 1.506 | 25×50<br>35×40 | 1.24 | 1.506 | |
| 270 | 22×35<br>25×30 | 1.19 | 0.738 | 25×45<br>30×35 | 1.10 | 0.984 | 25×50<br>30×40 | 1.29 | 1.230 | 30×50<br>35×45 | 1.46 | 1.230 | |
| 330 | 22×40<br>22×35 | 1.35 | 0.605 | 30×40<br>35×35 | 1.22 | 0.806 | 30×40<br>35×35 | 1.45 | 1.015 | 30×45 | 1.45 | 1.115 | |
| 390 | 22×45<br>25×35 | 1.52 | 0.512 | 30×45<br>35×40 | 1.42 | 0.681 | 30×50<br>35×40 | 1.59 | 0.847 | 35×55 | 1.78 | 0.852 | |
| 470 | 22×45<br>25×40 | 1.63 | 0.425 | 35×45 | 1.62 | 0.567 | 35×40<br>30×50 | 1.75 | 0.710 | 35×45 | 2.12 | 0.760 | |
| 560 | 25×45<br>30×35 | 1.84 | 0.357 | 35×50 | 1.89 | 0.473 | 35×50 | 2.12 | 0.588 | | | | |
| 680 | 25×50<br>30×40 | 2.05 | 0.294 | 35×50 | 2.10 | 0.420 | 40×50 | 2.20 | 0.485 | 35*55 | 2.30 | | |
| 820 | 30×45<br>35×35 | 2.29 | 0.246 | 35×65 | 2.35 | 0.352 | 35×65 | 2.50 | 0.412 | | | | |
| 1000 | 30×50 | 2.49 | 0.201 | | | | | | | | | | |
| 1500 | 35×50 | 2.95 | 0.15 | | | | | | | | | | |

# Aluminum Electrolytic Capacitors

1. Scope:
This specification applies to aluminium electrolytic capacitor , used in electronic equipment.

2. Electrical charateristics:

<table>
<tr><th>NO.</th><th>ITEM</th><th>TEST METHOD</th><th>SPECIFICATION</th></tr>
<tr><td>2. 1</td><td>Rated voltage</td><td></td><td rowspan="2">Voltage range、capacitance range, see specification of this series.</td></tr>
<tr><td>2. 2</td><td>Capacitance</td><td>1. Measuring frequency : 120 ± 12Hz<br>2. Measuring voltage : ≦0.5Vrms + 0.5 ~ 2.0VDC</td></tr>
<tr><td>2. 3</td><td>Dissipation factor</td><td>3. Measurement circuit : 〔  〕</td><td rowspan="2">Dissipation factor、leakage current, see specification of this series.</td></tr>
<tr><td>2. 4</td><td>Leakage current</td><td>DC leakage current shall be measured after 1~2 minutes application of the DC rated working voltage through the 1000 Ω resistor at 20℃.<br>  <br><br>R : 1000 ± 100Ω A : DC current meter<br>V : DC voltage meter<br>S1 : Swich<br>S2 : Swich for protect of current meter<br>CX : Testing capacitor</td></tr>
<tr><td>2. 5</td><td>Temperature characteristics</td><td>
<table>
<tr><th>STEP</th><th>TEMPERATURE</th><th>STORAGE TIME</th></tr>
<tr><td>1</td><td>20 ± 2 ℃</td><td>30 minutes</td></tr>
<tr><td>2</td><td>-40 ± 3 ℃</td><td>2 hours</td></tr>
<tr><td>3</td><td>20 ± 2 ℃</td><td>15 minutes</td></tr>
<tr><td>4</td><td>105 ± 2℃</td><td>2 hours</td></tr>
</table>
Step 1. Measure the capacitance and impedance.<br>( |Z| , 20℃ , 120Hz ± 10% )<br>Step 2. Measure the impedance at thermal balance after 2 hours<br>( |Z| , -40℃, 120Hz ± 10% )<br>Step 4. Measure the capacitance and leakage current at thermal balance after 2 hours.
</td><td>Step 2.<br>Impedance ratio ($Zr / Z_{r0}$) less than specified value.<br><br>Step 4<br>Capacitance change :<br>within ± 20% of the initial measured value.<br><br>Leakage current :<br>Less than 10 times of initial specified value.</td></tr>
</table>

<table>
<tr><th>NO.</th><th>ITEM</th><th>TEST METHOD</th><th>SPECIFICATION</th></tr>
<tr><td>2. 6</td><td>Surge test</td><td>Rated surge voltage shall be applied (swich on) for 30 ± 5 seconds and then shall be applied (swich off) with discharge for 5 ± 0.5 min at room temperature . This cycle shall be repeated for 1000 cycles. Duration of one cycle is 6 ± 0.5 minutes .</td><td rowspan="2">Capacitance change : within ± 20% of the initial specified value.<br><br>Dissipation factor : lessthan 200% of the initial specified value.<br><br>Leakage current :<br>within initial specified value.</td></tr>
<tr><td>2. 7</td><td>Applicable ripple current</td><td>The maximum A.C.current having frequency of 100K Hz which can be applied to the capacitor at 105±2℃ continuously.Peak voltage not to exceed rated D.C.voltage.</td></tr>
</table>

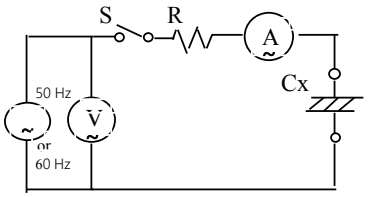
**3. Mechanical characteristics**

<table>
<tr><th>NO.</th><th>ITEM</th><th>TEST METHOD</th><th>SPECIFICATION</th></tr>
<tr><td>3. 1</td><td>Lead strength</td><td>(A) Tensile strength:<br>wire lead terminal:
<table>
<tr><td>d (mm)</td><td>≦0.45</td><td>0.5 ~ 0.8</td><td>0.8＜d≦1.25</td></tr>
<tr><td>load (Kg)</td><td>0. 51</td><td>1.0</td><td>2.0</td></tr>
</table>
snap-in terminal:
<table>
<tr><td>d (mm)</td><td>snap-in terminal</td></tr>
<tr><td>load (Kg)</td><td>2.0</td></tr>
</table>
The capacitor shall withstand the constant tensile force specified between the body and each lead for 10 seconds without damage either mechanical or electrical.<br><br>(B) Bending strength:<br>wire lead terminal:
<table>
<tr><td>d (mm)</td><td>≦0.45</td><td>0.5 ~ 0.8</td><td>0.8＜d≦1.25</td></tr>
<tr><td>load (Kg)</td><td>0. 25</td><td>0.51</td><td>1.0</td></tr>
</table>
snap-in terminal:
<table>
<tr><td>cross section area of terminal (㎜²)</td><td>force (Kg)</td></tr>
<tr><td>0.5＜S≦1</td><td>1.0</td></tr>
<tr><td>S＞1</td><td>2. 5</td></tr>
</table>
With the capacitor in a vertical position apply the load specified axially to each lead . The capacitor shall be rotated slowly from the vertical to the horizontal position, back to the vertical position. The 90° in the opposite direction and back the original position . Performance of capacitor shall not have changed and leads shall be undaged .</td><td>When the capacitance is measured, there shall be no intermittent contacts, or open- or short- circuiting.<br><br>There shall be no such mechanical damage as terminal damage etc.</td></tr>
</table>

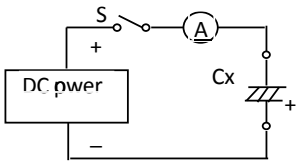
| NO. | ITEM | TEST METHOD | SPECIFICATION |
|---|---|---|---|
| 3. 2 | Vibration resistance | The frequancy of the vibration shall vary uniformly within the range 10 to 55 Hz with the amplitude of 1.5 mm , completing the cycle in the internal of one minute .<br>The capacitor shall be securely mounted by its leads with hold the body of capacitor .<br>The capacitor shall be vibrated in three mutually perpendicular directions for a period of 2 hours in each direction . | Capacitance : no unsteady .<br><br>Appearance : no abnormal .<br><br>Capacitance change :<br>within ± 5% of initial measured value . |
| 3. 3 | Solderability | The leads are dipped in the solder bath of Sn at 260 ± 5 ℃ for 2 ± 0.5 seconds . The dipping depth should be set at 1.5 ~ 2.0 mm . | The solder alloy shall cover the 95% or more of the dipped lead's area . |

**4. Reliability**

| NO. | ITEM | TEST METHOD | SPECIFICATION |
|---|---|---|---|
| 4. 1 | Soldering heat resistance | The leads immerse in the solder bath of Sn at 260 ± 5 ℃ for 10 ± 1 seconds until a distance of 1.5 ~ 2mm from the case . | No damage or leakage of electrolyte .<br><br>Capacitance change :<br>within ± 10% of the initial measured value .<br><br>Tan δ :<br>less than specified value .<br><br>Leakage current :<br>less than specified value . |
| 4. 2 | Damp heat ( steady state ) | Subject the capacitors to 40 ± 2 ℃ and 90% to 95% relative humidity for 240 ± 8 hours . | Capacitance change :<br>within ± 10% of the initial measured value .<br><br>Tan δ :<br>less than specified value .<br><br>Leakage current :<br>less than specified value . |

<table>
<tr><th>NO.</th><th>ITEM</th><th>TEST METHOD</th><th>SPECIFICATION</th></tr>
<tr><td>4. 3</td><td>Load life</td><td>After X hours continuous application of DC rated working voltage at 105 ± 2 ℃ , the measurements shall meet the following limits .<br>Measurements shall be performed after 2 hours exposed at room temperature .</td><td rowspan="2">Standard of judgement is according to requirement of this series .</td></tr>
<tr><td>4. 4</td><td>Shelf life</td><td>After storage for Y hours at 105 ± 2 ℃ without voltage application , the measurements shall meet the following limits .<br>Measurements shall be performed after exposed for 1 to 2 hrs at room temperature after application of DC rated voltage to the capacitor for Z minutes .</td></tr>
<tr><td>4. 5</td><td>Storage at low temperature</td><td>The capacitor shall be stored at temperature of -40 ± 3 ℃ for 240 ± 8 hours , during which time no voltage shall be applied . And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours or more , after which measurements shall be made .</td><td>Capacitance change :<br>within ± 10% of the initial value .<br><br>Tan δ :<br>less than specified value .<br><br>Leakage current :<br>less than specified value .<br><br>Appearance : no abnormal .<br>外 觀 : 無異常 .</td></tr>
<tr><td>4. 6</td><td>Pressure relief</td><td>AC test:<br>Applied voltage : AC voltage not exceeding 0.7 times of the rated direct voltage or 250 V AC whichever is the lower .<br><br>Frequency : 50 Hz or 60 Hz .<br><br>Series resitor : refer to the table below .<br><br>
<table>
<tr><th>Capacitance ( C )</th><th>Series resistor</th></tr>
<tr><td>C ≦ 1 μF</td><td>1000 Ω</td></tr>
<tr><td>1 μF ＜ C ≦ 10 μF</td><td>100 Ω</td></tr>
<tr><td>10 μF ＜ C ≦ 100 μF</td><td>10 Ω</td></tr>
<tr><td>100 μF ＜ C ≦ 1000 μF</td><td>1 Ω</td></tr>
<tr><td>1000 μF ＜ C ≦ 10000 μF</td><td>0. 1 Ω</td></tr>
<tr><td>10000 μF ＜ C</td><td>*</td></tr>
</table>
* Resistance is equivalent to a half impedance by test frequency .</td><td>AC test circuit<br> 

<br>~ : AC power<br>S : Swich<br>V : AC voltage<br>A : AC current meter<br><br>R : protection resistor<br>Cx : testing capacitor</td></tr>
</table>

| NO. | ITEM | TEST METHOD | SPECIFICATION |
|---|---|---|---|
| 4. 6 | Pressure relief | DC test:<br>Send the following electricitios while applying the inverse voltage .<br><br>where case size:<br><br>D ≦ 22.4 mm : 1 A d.c. max<br>D ＞ 22.4 mm : 10 A d.c. max<br><br>Note : 1. This requirement applies to capacitors with a diameter of 6 mm or more .<br><br>the test may be ended . | DC test circuit<br>  <br>S : Swich<br>(–) : DC current meter<br>Cx : testing capacitor<br><br>of fire or explosion of capacitor elements ( terminal and metal foil etc ) or cover . |

**5 Marking:**

Marking on capacitors include :

| |
|---|
| ▌ trade-mark |
| ▌ Working voltage |
| ▌ Norminal capacitance |
| ▌ Tolerance |
| ▌ Polarity |
| ▌ Operating temperature range |
| ▌ Date code |