# Aluminum Electrolytic Capacitors

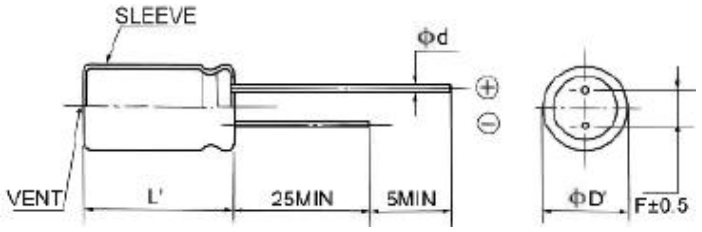
## RQ Series

- Low Impedance, High Ripple Current,Long Life
- Endurance: 105°C8000~10000 hours.
- Have characteristics of withstanding high temperature 105°C and good reliability.
- Suitable for communication equipment and industrial measurement instruments, switching power supplies, etc.
- Rohs compliance.

### ◆ SPECIFICATIONS

| Item | Characteristics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Temperature Range | -40 to +105℃ | | | | | | | | | |
| Rated Voltage Range | 6.3 to 50 WV.DC | | | | | | | | | |
| Surge Voltage | W.V. | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | at 25℃ |
| | S.V. | 8 | 13 | 20 | 32 | 44 | 63 | 73 | 110 | |
| Capacitance Tolerance | - 20%(M) ~ + 20% (at 25℃, 120Hz) | | | | | | | | | |
| Leakage Current | I = 0.01CV, whichever is greater. at 25℃ After 1 minutes<br>I: Max. Leakage Current (μA) C: Rated Capacitance (μF) V: Rated voltage (V) | | | | | | | | | |
| Dissipation Factor (tanδ) | Rated voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | at 25 ℃ , 120Hz |
| | Tanδ(Max) | 22 | 19 | 16 | 14 | 12 | 10 | 9 | 8 | |
| | When rated capacitance is over 1000 uF,tan δshall be added 0.02 to the listed value with increase of every 1000uF （ at 25 ℃ , 120Hz ） | | | | | | | | | |
| Low Temperature Characteristics | Impedance ratio at 120Hz | | | | | | | | | |
| | Rated voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | |
| | Z-25℃/Z+20℃ | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | Z-40℃/Z+20℃ | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 3 | |
| Endurance | The following specification shall be satisfied when the capacitors are restored to 20℃ after subjected DC voltage with the rated ripple current is applied for 10000 hours at 105℃. | | | | | | | | | |
| | Capacitance Change | ≦ ±20% of the initial value | | | | | | | | |
| | Dissipation Factor | ≦ 200% of the initial specified value | | | | | | | | |
| | Leakage Current | ≦ initial specified value | | | | | | | | |
| Shelf Life | The following specification shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1000hours at 105℃ without voltage applied .(Reference JIS C 5102) | | | | | | | | | |
| | Capacitance Change | ≦ ±20% of the initial value | | | | | | | | |
| | Dissipation Factor | ≦ 200% of the initial specified value | | | | | | | | |
| | Leakage Current | ≦ 200% of the initial specified value | | | | | | | | |

### ◆ DRAWING




| φD | 5 | 6.3 | 8 | 10/13 | 16-18 |
|---|---|---|---|---|---|
| φd | 0.5 | | 0.6 | 0.6 | 0.8 |
| F | 2 | 2.5 | 3.5 | 5.3 | 7.5 |
| φD' | D + 0.5 max | | | D + 1.0 max | |
| L' | L + 1.5 max | | | L + 2.0 max | |

## ◆FREQUENCY COEFFICIENT OF RATED RIPPLE CURRENT

| Frequency | uF | 120Hz | 1KHz | 10KHz~ | 100KHz~ |
|---|---|---|---|---|---|
| Coefficient | 6.8~33 | 0.42 | 0.70 | 0.90 | 1.00 |
| | 39~270 | 0.50 | 0.73 | 0.92 | 1.00 |
| | 330~680 | 0.55 | 0.77 | 0.94 | 1.00 |
| | 820~2200 | 0.60 | 0.82 | 0.96 | 1.00 |
| | 2500~10000 | 0.70 | 0.85 | 0.98 | 1.00 |

## ■STANDARD RATINGS

| WV / uF | 6.3 | | | 10 | | |
|---|---|---|---|---|---|---|
| | DxL | R.C. | E.S.R | DxL | R.C. | E.S.R |
| 56 | | | | 5 X 11 | 150 | 0.65 |
| 100 | | | | 5 X 11 | 210 | 0.58 |
| 150 | 5 X 11 | 210 | 0.58 | 6.3 X 11 | 280 | 0.42 |
| 220 | 6.3 X 11 | 300 | 0.35 | 6.3 X 11 | 340 | 0.22 |
| 330 | 6.3 X 11 | 340 | 0.22 | 8 X 11 | 550 | 0.18 |
| 470 | 8 X 11 | 550 | 0.18 | 8 X 11 | 640 | 0.13 |
| 1000 | 8 X 16 | 840 | 0.087 | 8 X 20 | 1050 | 0.069 |
| 2200 | 10 X 25 | 1650 | 0.042 | 10 X 30 | 1900 | 0.031 |
| 3300 | 12.5 X 20 | 1900 | 0.035 | 12.5 X 25 | 2230 | 0.027 |
| 4700 | 12.5 X 30 | 2210 | 0.024 | 12.5 X 35 | 2880 | 0.02 |
| 5600 | 12.5 X 35 | 2530 | 0.027 | 12.5 X 40 | 2930 | 0.021 |
| 6800 | 13 X 35 | 2930 | 0.021 | 16 X 32 | 3450 | 0.017 |
| 8200 | 16 X 32 | 3450 | 0.017 | 16 X 36 | 3610 | 0.015 |
| | | | | | | |

| WV / uF | 16 | | | 25 | | |
|---|---|---|---|---|---|---|
| | DxL | R.C. | E.S.R | DxL | R.C. | E.S.R |
| 22 | | | | 5 X 11 | 115 | 0.85 |
| 33 | | | | 5 X 11 | 150 | 0.65 |
| 47 | | | | 5 X 11 | 210 | 0.58 |
| 56 | 5 X 11 | 210 | 0.58 | 5 X 11 | 280 | 0.47 |
| 100 | 6.3 X 11 | 310 | 0.25 | 6.3 X 11 | 340 | 0.22 |
| 220 | 6.3 X 15 | 550 | 0.15 | 8 X 14 | 640 | 0.13 |
| 330 | 8 X 14 | 640 | 0.13 | 8 X 20 | 840 | 0.087 |
| 470 | 8 x 20 | 840 | 0.087 | 10 X 16 | 1210 | 0.06 |
| 1000 | 10 X 20 | 1400 | 0.046 | 10 X 30 | 1910 | 0.031 |
| 2200 | 12.5 X 30 | 2230 | 0.027 | 12.5 X 40 | 2880 | 0.02 |
| 3300 | 12.5 X 40 | 2880 | 0.02 | 16 X 32 | 3450 | 0.017 |
| 4700 | 16 X 35 | 3450 | 0.017 | 16 X 40 | 4080 | 0.013 |
| 5600 | 18 x 35 | 4170 | 0.015 | 18 X 40 | 4280 | 0.012 |
| 6800 | 16 x 40 | 4080 | 0.013 | | | |
| 8200 | 18 x 40 | 4220 | 0.014 | | | |

R.C. : Rated ripple current (mA rms) at 105℃ ,impedance(E.S.R) at 20℃ , 100kHz)

# Aluminum Electrolytic Capacitors

## RQ Series

### ◆FREQUENCY COEFFICIENT OF RATED RIPPLE CURRENT

| Frequency | uF | 120Hz | 1KHz | 10KHz~ | 100KHz~ |
|---|---|---|---|---|---|
| Coefficient | 6.8~33 | 0.42 | 0.70 | 0.90 | 1.00 |
| | 39~270 | 0.50 | 0.73 | 0.92 | 1.00 |
| | 330~680 | 0.55 | 0.77 | 0.94 | 1.00 |
| | 820~2200 | 0.60 | 0.82 | 0.96 | 1.00 |
| | 2500~10000 | 0.70 | 0.85 | 0.98 | 1.00 |

### ■STANDARD RATINGS

| WV / uF | 6.3 | | | 10 | | |
|---|---|---|---|---|---|---|
| | DxL | R.C. | E.S.R | DxL | R.C. | E.S.R |
| 56 | | | | 5 X 11 | 150 | 0.65 |
| 100 | | | | 5 X 11 | 210 | 0.58 |
| 150 | 5 X 11 | 210 | 0.58 | 6.3 X 11 | 280 | 0.42 |
| 220 | 6.3 X 11 | 300 | 0.35 | 6.3 X 11 | 340 | 0.22 |
| 330 | 6.3 X 11 | 340 | 0.22 | 8 X 11 | 550 | 0.18 |
| 470 | 8 X 11 | 550 | 0.18 | 8 X 11 | 640 | 0.13 |
| 1000 | 8 X 16 | 840 | 0.087 | 8 X 20 | 1050 | 0.069 |
| 2200 | 10 X 25 | 1650 | 0.042 | 10 X 30 | 1900 | 0.031 |
| 3300 | 12.5 X 20 | 1900 | 0.035 | 12.5 X 25 | 2230 | 0.027 |
| 4700 | 12.5 X 30 | 2210 | 0.024 | 12.5 X 35 | 2880 | 0.02 |
| 5600 | 12.5 X 35 | 2530 | 0.027 | 12.5 X 40 | 2930 | 0.021 |
| 6800 | 13 X 35 | 2930 | 0.021 | 16 X 32 | 3450 | 0.017 |
| 8200 | 16 X 32 | 3450 | 0.017 | 16 X 36 | 3610 | 0.015 |
| | | | | | | |

| WV / uF | 16 | | | 25 | | |
|---|---|---|---|---|---|---|
| | DxL | R.C. | E.S.R | DxL | R.C. | E.S.R |
| 22 | | | | 5 X 11 | 115 | 0.85 |
| 33 | | | | 5 X 11 | 150 | 0.65 |
| 47 | | | | 5 X 11 | 210 | 0.58 |
| 56 | 5 X 11 | 210 | 0.58 | 5 X 11 | 280 | 0.47 |
| 100 | 6.3 X 11 | 310 | 0.25 | 6.3 X 11 | 340 | 0.22 |
| 220 | 6.3 X 15 | 550 | 0.15 | 8 X 14 | 640 | 0.13 |
| 330 | 8 X 14 | 640 | 0.13 | 8 X 20 | 840 | 0.087 |
| 470 | 8 x 20 | 840 | 0.087 | 10 X 16 | 1210 | 0.06 |
| 1000 | 10 X 20 | 1400 | 0.046 | 10 X 30 | 1910 | 0.031 |
| 2200 | 12.5 X 30 | 2230 | 0.027 | 12.5 X 40 | 2880 | 0.02 |
| 3300 | 12.5 X 40 | 2880 | 0.02 | 16 X 32 | 3450 | 0.017 |
| 4700 | 16 X 35 | 3450 | 0.017 | 16 X 40 | 4080 | 0.013 |
| 5600 | 18 x 35 | 4170 | 0.015 | 18 X 40 | 4280 | 0.012 |
| 6800 | 16 x 40 | 4080 | 0.013 | | | |
| 8200 | 18 x 40 | 4220 | 0.014 | | | |

R.C. : Rated ripple current (mA rms) at 105℃ ,impedance(E.S.R) at 20℃ , 100kHz)

# Aluminum Electrolytic Capacitors

## RQ Series

### ■STANDARD RATINGS

| WV / uF | 35 | | | 50 | | |
|---|---|---|---|---|---|---|
| | DxL | R.C. | E.S.R | DxL | R.C. | E.S.R |
| 33 | 5 X 11 | 210 | 0.58 | 6.3 X 11 | 220 | 0.065 |
| 47 | 6.3 X 11 | 300 | 0.45 | 6.3 X 11 | 285 | 0.35 |
| 56 | 6.3 X 11 | 340 | 0.22 | 6.3 X 11 | 295 | 0.3 |
| 100 | 8 X 11 | 550 | 0.18 | 8 X 14 | 555 | 0.17 |
| 220 | 8 X 20 | 840 | 0.087 | 10 X 16 | 1050 | 0.084 |
| 330 | 10 X 16 | 1210 | 0.06 | 10 X 25 | 1440 | 0.055 |
| 470 | 10 X 20 | 1400 | 0.046 | 10 X 30 | 1690 | 0.043 |
| 680 | 12.5 X 25 | 1900 | 0.035 | 12.5 X 30 | 2310 | 0.03 |
| 1000 | 12.5 X 30 | 2230 | 0.027 | 12.5 X 40 | 2920 | 0.021 |
| 2200 | 16 X 35 | 3140 | 0.019 | 18 X 40 | 3680 | 0.017 |
| 3300 | 16 X 45 | 4080 | 0.013 | | | |
| 3900 | 18 X 40 | 4280 | 0.012 | | | |
| | | | | | | |
| | | | | | | |

| WV / uF | 63 | | | 100 | | |
|---|---|---|---|---|---|---|
| | DxL | R.C. | E.S.R | DxL | R.C. | E.S.R |
| 33 | 6.3 X 11 | 126 | 1 | 8 X 11 | 260 | 0.5 |
| 56 | 8 X 14 | 260 | 0.5 | 10 X 16 | 408 | 0.26 |
| 100 | 10 X 16 | 400 | 0.28 | 10 X 25 | 595 | 0.16 |
| 220 | 10 X 25 | 595 | 0.16 | 12.5 X 35 | 1010 | 0.08 |
| 330 | 12.5 X 30 | 875 | 0.096 | 13 X 40 | 1280 | 0.06 |
| 470 | 12.5 X 35 | 1010 | 0.07 | 16 X 40 | 1900 | 0.04 |
| 560 | 12.5 X 40 | 1140 | 0.062 | 18 X 35 | 2130 | 0.036 |
| 680 | 13 X 40 | 1280 | 0.06 | 18 X 40 | 1890 | 0.036 |
| 820 | 16 X 35 | 1650 | 0.049 | | | |
| 1000 | 18 X 35 | 1720 | 0.04 | | | |
| 1500 | 18 X 40 | 2470 | 0.032 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

R.C. : Rated ripple current (mA rms) at 105℃ ,impedance(E.S.R) at 20℃ , 100kHz)

# Aluminum Electrolytic Capacitors

## RG Series

- 105℃, 8,000~10,000hours assured
- Suitable for switching power supplies.UPS,Ballast
- Smaller case size current
- Rohs compliance.

■SPECIFICATIONS

| Item | Characteristics | |
|---|---|---|
| Operating Temperature Range | -40℃ ~ +105℃ | -25℃--＋105℃ |
| Voltage Range | 160 ~400 V.DC | 450V.DC |
| Nominal Cap. Range | 6.8 ~ 330 μF | 6.8 ~ 100 μF |
| Leakage Current | I = 0.02CV + 15(μA) whichever is greater.(after 5 minutes)<br>where,I: Max Leakage Current(μA), C: Nominal Capacitance(μF), V: Rated Voltage(V) (at 20℃) | |

Dissipation Factor (tanδ) ( at 20℃ 120HZ)

| WV | 160 | 200 | 250 | 350 | 400 | 450 |
|---|---|---|---|---|---|---|
| tanδ | 0.20 | 0.20 | 0.20 | 0.24 | 0.24 | 0.24 |

Add 0.02 per 1,000μF for more than 1,000μF items .

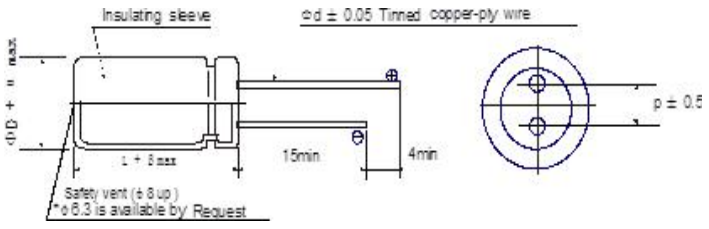
Low Temperature Characteristics

Stability at 120Hz

| W.V. | 160 | 200 | 250 | 350 | 400 | 450 |
|---|---|---|---|---|---|---|
| Z(-25℃)/Z(+20℃) | 3 | 3 | 3 | 5 | 5 | 6 |
| Z(-40℃)/Z(+20℃) | 6 | 6 | 6 | 6 | 6 | _ |

| | |
|---|---|
| High Temp. Load Test | After ΦD＝Φ10: 8000hrs, ΦD ≧Φ13: 10000hrs, application of DC rated working.<br>application of DC rated working voltage at +105℃, the capacitor shall meet the following limits .<br>Capacitance Change … ≤±25% of the initial measured value<br>Tan δ … ≦200% of the initial specified value<br>DC Leakage Current …≤ the initial specified value |
| High Temp. Non-Load Test | After storage for 1000 hours at 105℃ with no voltage applied, voltage treatment of JIS-C-5102 article 4-4 is to be given and then measurement shall be made, at which time requirements specified in the table "High Temperature Loading" can be met. |

**DRAWING**




| ΦD | 5 | 6.3 | 8 | 10 | 13 | 16 | 18 |
|---|---|---|---|---|---|---|---|
| P | 2 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| Φd | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.8 | 0.8 |
| β | 1.0 | | | 1.5 | | | |
| α | 0.5 | | | | | | |

▼ MULTIPLIER FOR RIPPLE CURRENT

Frequency coefficient

| Freq.(Hz) / Cap.(μF) | 120 | 1K | 10K | 100K up |
|---|---|---|---|---|
| 6.8~82 | 1.00 | 1.75 | 2.25 | 2.50 |
| 100up | 1.00 | 1.67 | 2.05 | 2.25 |

# Aluminum Electrolytic Capacitors

## RG Series

### ■STANDARD RATINGS

| WV(Vdc) / Parameter / Cap (μF) | 160V ΦDxL (mm) | 160V Ripple current 20℃ 120KHZ | 160V Ripple current –10℃ 100KHZ | WV(Vdc) / Parameter / Cap (μF) | 200V ΦDxL (mm) | 200V Ripple current 20℃ 120KHZ | 200V Ripple current –10℃ 100KHZ |
|---|---|---|---|---|---|---|---|
| 6.8 | | | | 6.8 | | | |
| 10 | 10X16 | 125 | 313 | 10 | 10X16 | 125 | 313 |
| 22 | 10X20 | 200 | 500 | 22 | 10X20 | 200 | 500 |
| 33 | 10X20 | 250 | 625 | 33 | 10X20 | 260 | 650 |
| 47 | 10X20 | 300 | 750 | 47 | 13X20 | 390 | 975 |
| 68 | 13X20 | 470 | 1175 | 68 | 13X20 | 470 | 1175 |
| 82 | 13X20 | 510 | 1275 | 82 | 16X20 | 550 | 1375 |
| 100 | 13X25<br>16X20 | 620<br>630 | 1395<br>1418 | 100 | 16X20 | 630 | 1418 |
| 120 | 16X20 | 720 | 1560 | 120 | 16X25 | 800 | 1750 |
| 150 | 16X20 | 770 | 1733 | 150 | 16X25 | 840 | 1890 |
| 220 | 16X25 | 1020 | 2295 | 220 | 18X25 | 1050 | 2363 |
| 330 | 18X31.5 | 1390 | 3128 | 330 | 18X35.5 | 1430 | 3218 |

| WV(Vdc) / Parameter / Cap (μF) | 250V ΦDxL (mm) | 250V Ripple current 20℃ 120KHZ | 250V Ripple current –10℃ 100KHZ | WV(Vdc) / Parameter / Cap (μF) | 350V ΦDxL (mm) | 350V Ripple current 20℃ 120KHZ | 350V Ripple current –10℃ 100KHZ |
|---|---|---|---|---|---|---|---|
| 6.8 | | | | 6.8 | 10X16 | 110 | 275 |
| 10 | 10X20 | 140 | 350 | 10 | 10X20 | 140 | 350 |
| 22 | 10X20 | 200 | 500 | 22 | 13X20 | 260 | 650 |
| 33 | 13X20 | 320 | 800 | 33 | 16X20 | 360 | 900 |
| 47 | 13X20 | 390 | 975 | 47 | 16X20 | 430 | 1075 |
| 68 | 16X20 | 520 | 1300 | 68 | 16X25<br>18X20 | 560<br>550 | 1400<br>1375 |
| 82 | 16X20 | 550 | 1375 | 82 | 18X25 | 610 | 1525 |
| 100 | 16X25 | 680 | 1530 | 100 | 18X25 | 700 | 1575 |
| 120 | | | | 120 | 18X31.5 | 830 | 1868 |
| 150 | 18X25 | 860 | 1935 | 150 | 18X35.5 | 960 | 2160 |
| 220 | 18X31.5 | 1130 | 2543 | 220 | | | |
| 330 | | | | 330 | | | |

| WV(Vdc) / Parameter / Cap (μF) | 400V ΦDxL (mm) | 400V Ripple current 20℃ 120KHZ | 400V Ripple current –10℃ 100KHZ | WV(Vdc) / Parameter / Cap (μF) | 450V ΦDxL (mm) | 450V Ripple current 20℃ 120KHZ | 450V Ripple current –10℃ 100KHZ |
|---|---|---|---|---|---|---|---|
| 4.7 | 8X16 | 110 | 275 | 4.7 | 8X16 | 110 | 275 |
| 6.8 | 10X16 | 110 | 275 | 6.8 | 10X20 | 110 | 275 |
| 10 | 10X20 | 140 | 350 | 10 | 13X20 | 180 | 450 |
| 22 | 13X20 | 260 | 650 | 22 | 16X20 | 290 | 725 |
| 33 | 16X20 | 360 | 900 | 33 | 16X25<br>18X20 | 390<br>380 | 975<br>950 |
| 47 | 16X25<br>18X20 | 470<br>450 | 1175<br>1125 | 47 | 18X25 | 480 | 1200 |
| 68 | 18X25 | 585 | 1463 | 68 | 18X31.5 | 630 | 1575 |
| 82 | 18X25 | 610 | 1525 | 82 | 18X35.5 | 715 | 1788 |
| 100 | 18X31.5 | 765 | 1721 | 100 | 18X40 | 800 | 1800 |
| 120 | 18X35.5 | 865 | 1946 | | | | |
| 150 | 18X40 | 985 | 2216 | | | | |