

# Miniature Aluminum Electrolytic Capacitors

## SC [ Low Impedance and Low ESR Suitable for Motherboard Output Termination ]

105°C Single-Ended Lead Aluminum Electrolytic Capacitors For High Frequency Applications



### DESCRIPTION

Applicable for switching regulator of computers, especially for high frequency

#### MULTIPLIER FOR RIPPLE CURRENT

Frequency Coefficient

| FREQUENCY (Hz) | 50   | 120  | 300  | 1K   | 10K  |
|----------------|------|------|------|------|------|
| ~4.7μF         | 0.30 | 0.40 | 0.50 | 0.70 | 0.80 |
| 5.6~33μF       | 0.40 | 0.50 | 0.60 | 0.80 | 0.90 |
| 34~330μF       | 0.60 | 0.70 | 0.80 | 0.90 | 0.95 |
| 331~1000μF     | 0.65 | 0.90 | 0.90 | 0.98 | 1.00 |
| 1200μF Higher  | 0.85 | 0.90 | 0.95 | 0.98 | 1.00 |

### ELECTRICAL CHARACTERISTICS

Operating Temperature Range : -40 ~ +105°C

Rated Voltage Range : 6.3 ~ 100V

Rated Capacitance Range : 4.7 ~ 15000μF

Capacitance Tolerance : -20 ~ +20% at 120Hz, 20°C

DC Leakage Current (μA) : I = 0.01CV or 3μA whichever is greater.  
(After Rated Voltage Applied for 2 Minutes)

Dissipation Factor

|            |     |    |    |    |    |    |    |     |
|------------|-----|----|----|----|----|----|----|-----|
| WV (V) :   | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| D.F. (%) : | 22  | 19 | 16 | 14 | 12 | 10 | 9  | 8   |

When nominal capacitance is over 1000μF, tan δ shall be added 0.02 to listed value with increase of every 1000μF.

|             |                              |  |  |  |  |     |    |    |    |    |    |    |     |
|-------------|------------------------------|--|--|--|--|-----|----|----|----|----|----|----|-----|
| WV (V) :    |                              |  |  |  |  | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| Impedance : | Z(120Hz) Z - 25°C / Z + 20°C |  |  |  |  | 4   | 3  | 3  | 3  | 3  | 2  | 2  | 2   |
|             | Z(120Hz) Z - 40°C / Z + 20°C |  |  |  |  | 8   | 6  | 4  | 4  | 4  | 4  | 4  | 4   |

Endurance : After the rated voltage has been applied at 105°C for 3000 hours, the capacitors shall meet the following requirements.

If Dimension is Down Size, Endurance will be Less 1000 hours than Standard

(a) Capacitance Change : Within ±20% of Initial Value

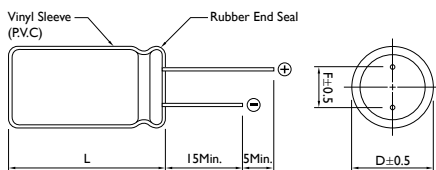
(b) Dissipation Factor: Not Exceeding 200% of Specified Value

(c) Leakage Current: Not Exceeding the Specified Value

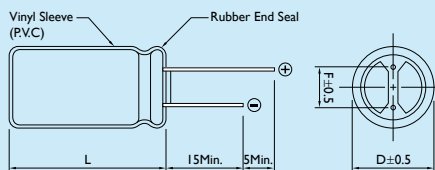
| CASE SIZE | 5×11 ~ 10×12 | 10×15 higher |
|-----------|--------------|--------------|
| LIFE      | 2000         | 3000         |

Shelf Life : After having been placed at 105°C without voltage applied for 1000 hours, the capacitors shall meet the same requirements as Endurance.

### DIAGRAM OF DIMENSIONS



Rubber Stand-off



L ≤ 16 L + 1.5Max.  
L > 16 L + 2Max.

Dø = 8 & 10 L + 2.5Max.

Dø < 20 Dø + 0.5  
Dø ≥ 20 Dø + 1

Dimensions: mm

| Dø   | F    | dø        |
|------|------|-----------|
| 4.0  | 1.5  | 0.45      |
| 5.0  | 2.0  | 0.5       |
| 6.3  | 2.5  |           |
| 8.0  | 3.5  | 0.6       |
| 10.0 | 5.0  |           |
| 12.0 |      |           |
| 13.0 |      |           |
| 16.0 | 7.5  | 0.8       |
| 18.0 |      |           |
| 22.0 | 10.0 | 0.8 (1.0) |

## CASE SIZE &amp; PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

| CAP. (μF) | RATED VOLTAGE WV (SURGE VOLTAGE WV) |        |       |           |        |       |            |        |       |            |        |       |
|-----------|-------------------------------------|--------|-------|-----------|--------|-------|------------|--------|-------|------------|--------|-------|
|           | 6.3 (8)                             |        |       | 10 (13)   |        |       | 16 (20)    |        |       | 25 (32)    |        |       |
|           | SIZE                                | RIPPLE | ESR   | SIZE      | RIPPLE | ESR   | SIZE       | RIPPLE | ESR   | SIZE       | RIPPLE | ESR   |
| 10        |                                     |        |       |           |        |       |            |        |       | *4 × 7     | 40     | 2.000 |
|           |                                     |        |       |           |        |       |            |        |       | 5 × 11     | 50     | 0.550 |
| 47        |                                     |        |       |           |        |       |            |        |       | 5 × 11     | 150    | 0.450 |
| 56        |                                     |        |       |           |        |       | 5 × 11     | 100    | 0.630 | 5 × 11     | 150    | 0.420 |
| 68        |                                     |        |       |           |        |       | 5 × 11     | 150    | 0.420 | 6.3 × 11   | 200    | 0.370 |
| 100       |                                     |        |       | 5 × 11    | 150    | 0.420 | 5 × 11     | 200    | 0.370 | 6.3 × 11   | 250    | 0.220 |
| 120       |                                     |        |       | 5 × 11    | 200    | 0.370 | 6.3 × 11   | 250    | 0.320 | 8 × 11     | 300    | 0.200 |
| 150       | 5 × 11                              | 200    | 0.420 | 6.3 × 11  | 250    | 0.320 | 6.3 × 11   | 300    | 0.220 | 8 × 11     | 550    | 0.140 |
| 220       | 6.3 × 11                            | 250    | 0.320 | 6.3 × 11  | 300    | 0.220 | 8 × 11     | 550    | 0.140 | *8 × 11    | 620    | 0.120 |
|           |                                     |        |       |           |        |       |            |        |       | 8 × 15     | 750    | 0.100 |
| 270       | *6.3 × 11                           | 300    | 0.220 |           |        |       |            |        |       |            |        |       |
| 330       | *6.3 × 11                           | 320    | 0.230 | 8 × 11    | 550    | 0.140 | *8 × 11    | 620    | 0.120 | *8 × 15    | 660    | 0.100 |
|           | 8 × 11                              | 400    | 0.180 |           |        |       | 8 × 15     | 750    | 0.100 | 8 × 20     | 800    | 0.069 |
|           |                                     |        |       |           |        |       | 10 × 12    | 688    | 0.080 | 10 × 15    | 900    | 0.086 |
| 470       | *6.3 × 11                           | 440    | 0.180 | *8 × 11   | 620    | 0.120 | *8 × 15    | 730    | 0.093 | *8 × 20    | 1000   | 0.067 |
|           | 8 × 11                              | 550    | 0.140 | 8 × 15    | 750    | 0.100 | 10 × 12    | 800    | 0.085 | *10 × 12   | 900    | 0.086 |
|           |                                     |        |       |           |        |       |            |        |       | 10 × 15    | 1050   | 0.064 |
| 680       | *8 × 11                             | 580    | 0.120 | *8 × 11   | 640    | 0.110 | 10 × 15    | 1050   | 0.064 | 10 × 19.5  | 1100   | 0.039 |
|           | 8 × 15                              | 700    | 0.100 | 10 × 12   | 800    | 0.085 |            |        |       |            |        |       |
| 820       | 8 × 20                              | 750    | 0.085 | 10 × 15   | 1050   | 0.064 | 10 × 19.5  | 1100   | 0.044 | 10 × 19.5  | 1250   | 0.039 |
| 1000      | *8 × 11                             | 580    | 0.150 | 8 × 20    | 1080   | 0.065 | *10 × 15   | 1140   | 0.043 | *10 × 19.5 | 1160   | 0.047 |
|           | *8 × 15                             | 670    | 0.085 | 10 × 12   | 930    | 0.075 | 10 × 19.5  | 1250   | 0.039 | *10 × 25   | 1310   | 0.042 |
|           | 8 × 20                              | 800    | 0.069 | 10 × 15   | 990    | 0.085 |            |        |       | 13 × 20    | 1450   | 0.038 |
|           | 10 × 12                             | 690    | 0.080 | 10 × 19.5 | 1100   | 0.050 |            |        |       |            |        |       |
| 1200      | 10 × 15                             | 1000   | 0.064 | 10 × 19.5 | 1250   | 0.044 | *10 × 25   | 1310   | 0.042 | 13 × 25    | 1600   | 0.029 |
|           |                                     |        |       |           |        |       | 13 × 20    | 1450   | 0.038 |            |        |       |
| 1500      | *8 × 15                             | 980    | 0.085 | 10 × 19.5 | 1450   | 0.039 | *10 × 19.5 | 1200   | 0.045 | *12 × 30   | 1750   | 0.032 |
|           | *8 × 20                             | 1070   | 0.051 |           |        |       | 13 × 20    | 1600   | 0.034 | 16 × 25    | 2000   | 0.028 |
|           | *10 × 15                            | 1070   | 0.055 |           |        |       |            |        |       |            |        |       |
|           | 10 × 19.5                           | 1250   | 0.044 |           |        |       |            |        |       |            |        |       |

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz  
2. ESR: 100KHz / 20°C (Ω Max.)  
3. \* Down Size: 1000 Hours less than standard



## CASE SIZE & PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

| CAP. (μF) | RATED VOLTAGE WV (SURGE VOLTAGE WV) |        |       |            |        |       |          |        |       |          |        |       |
|-----------|-------------------------------------|--------|-------|------------|--------|-------|----------|--------|-------|----------|--------|-------|
|           | 6.3 (8)                             |        |       | 10 (13)    |        |       | 16 (20)  |        |       | 25 (32)  |        |       |
|           | SIZE                                | RIPPLE | ESR   | SIZE       | RIPPLE | ESR   | SIZE     | RIPPLE | ESR   | SIZE     | RIPPLE | ESR   |
| 2200      | *10 × 19.5                          | 1220   | 0.051 | *10 × 19.5 | 1330   | 0.047 | *10 × 30 | 1780   | 0.032 | *13 × 30 | 1810   | 0.029 |
|           | *10 × 25                            | 1310   | 0.048 | *10 × 25   | 1450   | 0.039 | *13 × 20 | 1720   | 0.033 | *16 × 25 | 1660   | 0.032 |
|           | 13 × 20                             | 1450   | 0.043 | 13 × 20    | 1600   | 0.038 | 13 × 25  | 2000   | 0.028 | 16 × 32  | 2200   | 0.024 |
| 3300      | *10 × 25                            | 1400   | 0.043 | *10 × 30   | 1740   | 0.032 | *13 × 40 | 2200   | 0.026 | *16 × 36 | 2540   | 0.019 |
|           | 13 × 25                             | 1700   | 0.035 | 13 × 25    | 2000   | 0.028 | 16 × 25  | 2200   | 0.024 | 18 × 36  | 2550   | 0.019 |
| 3900      | 13 × 25                             | 1750   | 0.032 |            |        |       |          |        |       |          |        |       |
| 4700      | *12 × 30                            | 1570   | 0.033 | *13 × 25   | 1860   | 0.028 | 16 × 36  | 2550   | 0.019 | 18 × 36  | 2800   | 0.019 |
|           | *13 × 25                            | 1520   | 0.032 | 16 × 25    | 2200   | 0.024 |          |        |       |          |        |       |
|           | 16 × 25                             | 1800   | 0.028 |            |        |       |          |        |       |          |        |       |
| 6800      | 16 × 32                             | 2000   | 0.024 | 16 × 36    | 2550   | 0.019 | 18 × 36  | 2800   | 0.019 | 18 × 36  | 2800   | 0.019 |
| 8200      | 16 × 32                             | 2350   | 0.019 | 18 × 36    | 2800   | 0.019 |          |        |       |          |        |       |
| 10000     | 16 × 36                             | 2550   | 0.019 |            |        |       |          |        |       |          |        |       |
| 15000     | 18 × 36                             | 3000   | 0.019 |            |        |       |          |        |       |          |        |       |

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz

2. ESR: 100KHz / 20°C (Ω Max.)

3. \* Down Size: 1000 Hours less than standard

## CASE SIZE & PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

| CAP. (μF) | RATED VOLTAGE WV (SURGE VOLTAGE WV) |        |       |            |        |       |           |        |       |           |        |       |
|-----------|-------------------------------------|--------|-------|------------|--------|-------|-----------|--------|-------|-----------|--------|-------|
|           | 35 (44)                             |        |       | 50 (63)    |        |       | 63 (79)   |        |       | 100 (125) |        |       |
|           | SIZE                                | RIPPLE | ESR   | SIZE       | RIPPLE | ESR   | SIZE      | RIPPLE | ESR   | SIZE      | RIPPLE | ESR   |
| 4.7       | 5 x 11                              | 115    | 1.200 | 5 x 11     | 115    | 2.000 | 5 x 11    | 115    | 2.200 | 5 x 11    | 120    | 2.000 |
| 6.8       | 5 x 11                              | 120    | 1.000 | 5 x 11     | 120    | 1.850 | 5 x 11    | 120    | 2.000 | 5 x 11    | 140    | 1.850 |
| 10        | 5 x 11                              | 140    | 0.900 | 5 x 11     | 140    | 1.700 | 5 x 11    | 140    | 1.850 | 6.3 x 11  | 200    | 1.500 |
| 15        | 5 x 11                              | 170    | 0.690 | 5 x 11     | 180    | 1.200 | 5 x 11    | 200    | 1.700 | 6.3 x 11  | 250    | 1.200 |
| 22        | 5 x 11                              | 190    | 0.420 | 5 x 11     | 200    | 0.700 | 6.3 x 11  | 250    | 1.200 | 8 x 11    | 300    | 0.790 |
| 33        | 5 x 11                              | 200    | 0.420 | 6.3 x 11   | 250    | 0.600 | 6.3 x 11  | 300    | 0.900 | 8 x 15    | 450    | 0.590 |
| 47        | 6.3 x 11                            | 250    | 0.370 | 6.3 x 11   | 300    | 0.520 | 8 x 11    | 450    | 0.700 | 10 x 15   | 550    | 0.350 |
| 68        | 6.3 x 11                            | 300    | 0.220 | 8 x 11     | 450    | 0.350 | 8 x 11    | 550    | 0.520 | 10 x 19.5 | 650    | 0.240 |
| 100       | *6.3 x 11                           | 360    | 0.180 | *8 x 11    | 480    | 0.290 | 8 x 20    | 650    | 0.350 | 13 x 20   | 800    | 0.180 |
|           | 8 x 11                              | 450    | 0.140 | 8 x 15     | 550    | 0.250 |           |        |       |           |        |       |
| 120       | 8 x 11                              | 550    | 0.130 | 8 x 20     | 650    | 0.210 | 10 x 15   | 800    | 0.300 | 13 x 25   | 1050   | 0.150 |
| 150       | 8 x 15                              | 650    | 0.100 | 10 x 12    | 800    | 0.160 | 10 x 15   | 1050   | 0.200 | 13 x 25   | 1300   | 0.110 |
| 220       | *8 x 15                             | 730    | 0.100 | *10 x 15   | 1050   | 0.100 | 10 x 19.5 | 1300   | 0.150 | 16 x 25   | 1400   | 0.071 |
|           | 10 x 12                             | 800    | 0.069 | 10 x 25    | 1050   | 0.068 |           |        |       |           |        |       |
| 330       | *10 x 15                            | 900    | 0.052 | 10 x 19.5  | 1300   | 0.072 | 13 x 20   | 1400   | 0.100 | 16 x 32   | 1550   | 0.049 |
|           | 10 x 19.5                           | 1050   | 0.044 |            |        |       |           |        |       |           |        |       |
| 470       | 10 x 19.5                           | 1300   | 0.039 | *10 x 19.5 | 1390   | 0.075 | 13 x 25   | 1550   | 0.064 | 18 x 36   | 1770   | 0.038 |
|           |                                     |        |       | 13 x 20    | 1400   | 0.060 |           |        |       |           |        |       |
| 680       | 13 x 20                             | 1400   | 0.038 | 13 x 25    | 1550   | 0.050 | 16 x 25   | 1700   | 0.052 |           |        |       |
| 820       | 13 x 20                             | 1550   | 0.034 | 16 x 25    | 1700   | 0.040 | 16 x 32   | 1900   | 0.048 |           |        |       |
| 1000      | 13 x 25                             | 1700   | 0.029 | 16 x 25    | 1900   | 0.039 | 16 x 32   | 2100   | 0.042 |           |        |       |
| 1200      | 16 x 25                             | 1900   | 0.028 | 16 x 32    | 2100   | 0.025 | 16 x 36   | 2550   | 0.036 |           |        |       |
| 1500      | 16 x 25                             | 2100   | 0.024 | 16 x 36    | 2550   | 0.025 | 18 x 36   | 2800   | 0.033 |           |        |       |
| 2200      | *16 x 32                            | 2300   | 0.021 | 18 x 40    | 2800   | 0.025 |           |        |       |           |        |       |
|           | 16 x 36                             | 2550   | 0.019 |            |        |       |           |        |       |           |        |       |
| 3300      | 18 x 36                             | 2880   | 0.019 |            |        |       |           |        |       |           |        |       |

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz  
 2. ESR: 100KHz / 20°C (Ω Max.)  
 3. \* Down Size: 1000 Hours less than standard

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