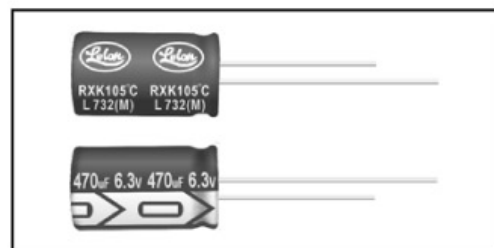


### Features

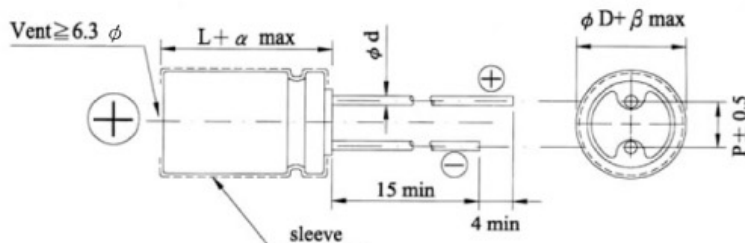
- 105°C, 2,000 ~ 5,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS Compliance



### SPECIFICATIONS

| Items                                       | Performance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|--------------------|-----------------------------------|-----------------|------------------------|-------------|-----------------|-----------------|------|------|------|----------|------|------|------|------|------|------|-------------|------|------|------|------|------|------|----------------|------|------|------|------|------|------|
| Operating Temperature Range                 | -55℃ ~ +105℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Capacitance Tolerance                       | ±20%<br>(at 120Hz, 20℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Leakage Current (at 20℃)                    | I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes)<br>Where, C = rated capacitance in μF    V = rated DC working voltage in V                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Dissipation Factor<br>(Tan δ at 120Hz, 20℃) | <table><tr><td>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr><tr><td>Tan δ (max)</td><td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td></tr></table><br>When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.                                                                                                                                                                                                                                   | Rated Voltage        | 6.3                                                                                                            | 10                 | 16                           | 25                 | 35                                | 50              | 63                     | Tan δ (max) | 0.22            | 0.19            | 0.16 | 0.14 | 0.12 | 0.10     | 0.09 |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Rated Voltage                               | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 10                   | 16                                                                                                             | 25                 | 35                           | 50                 | 63                                |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Tan δ (max)                                 | 0.22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.19                 | 0.16                                                                                                           | 0.14               | 0.12                         | 0.10               | 0.09                              |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Low Temperature Characteristics (at 120Hz)  | Impedance ratio shall not exceed the values given in the table below.<br><table><tr><td colspan="2">Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr><tr><td>Impedance Ratio</td><td>Z(-55℃)/Z(+20℃)</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr></table>                                                                                                                                                                                                                              | Rated Voltage        |                                                                                                                | 6.3                | 10                           | 16                 | 25                                | 35              | 50                     | 63          | Impedance Ratio | Z(-55℃)/Z(+20℃) | 4    | 4    | 3    | 3        | 3    | 3    | 3    |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Rated Voltage                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6.3                  | 10                                                                                                             | 16                 | 25                           | 35                 | 50                                | 63              |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Impedance Ratio                             | Z(-55℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                    | 4                                                                                                              | 3                  | 3                            | 3                  | 3                                 | 3               |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Load Life Test                              | <table><tr><td>Test Time</td><td>2,000 hrs for φD ≤ 6.3 mm<br/>3,000 hrs for φD = 8 mm<br/>4,000 hrs for φD = 10 mm<br/>5,000 hrs for φD ≥ 12.5 mm</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table><br>* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 ~ 5,000 hrs at 105℃. | Test Time            | 2,000 hrs for φD ≤ 6.3 mm<br>3,000 hrs for φD = 8 mm<br>4,000 hrs for φD = 10 mm<br>5,000 hrs for φD ≥ 12.5 mm | Capacitance Change | Within ±20% of initial value | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Test Time                                   | 2,000 hrs for φD ≤ 6.3 mm<br>3,000 hrs for φD = 8 mm<br>4,000 hrs for φD = 10 mm<br>5,000 hrs for φD ≥ 12.5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Capacitance Change                          | Within ±20% of initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Dissipation Factor                          | Less than 200% of specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Leakage Current                             | Within specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Shelf Life Test                             | <table><tr><td>Test Time</td><td>1,000 hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table><br>* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hrs at 105℃ without voltage applied.                                                                                                                               | Test Time            | 1,000 hrs                                                                                                      | Capacitance Change | Within ±20% of initial value | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Test Time                                   | 1,000 hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Capacitance Change                          | Within ±20% of initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Dissipation Factor                          | Less than 200% of specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Leakage Current                             | Within specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                                                                                                                |                    |                              |                    |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Ripple Current & Frequency Multipliers      | <table><tr><th>Cap.(μF) \ Freq.(Hz)</th><th>60(50)</th><th>120</th><th>500</th><th>1K</th><th>10K</th><th>100K</th></tr><tr><td>Under 33</td><td>0.40</td><td>0.55</td><td>0.65</td><td>0.80</td><td>0.90</td><td>1.00</td></tr><tr><td>39 ~ 330</td><td>0.60</td><td>0.70</td><td>0.80</td><td>0.90</td><td>0.95</td><td>1.00</td></tr><tr><td>390 ~ 1,000</td><td>0.65</td><td>0.80</td><td>0.85</td><td>0.98</td><td>1.00</td><td>1.00</td></tr><tr><td>1,200 up above</td><td>0.80</td><td>0.90</td><td>0.95</td><td>0.98</td><td>1.00</td><td>1.00</td></tr></table>     | Cap.(μF) \ Freq.(Hz) | 60(50)                                                                                                         | 120                | 500                          | 1K                 | 10K                               | 100K            | Under 33               | 0.40        | 0.55            | 0.65            | 0.80 | 0.90 | 1.00 | 39 ~ 330 | 0.60 | 0.70 | 0.80 | 0.90 | 0.95 | 1.00 | 390 ~ 1,000 | 0.65 | 0.80 | 0.85 | 0.98 | 1.00 | 1.00 | 1,200 up above | 0.80 | 0.90 | 0.95 | 0.98 | 1.00 | 1.00 |
| Cap.(μF) \ Freq.(Hz)                        | 60(50)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 120                  | 500                                                                                                            | 1K                 | 10K                          | 100K               |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| Under 33                                    | 0.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.55                 | 0.65                                                                                                           | 0.80               | 0.90                         | 1.00               |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| 39 ~ 330                                    | 0.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.70                 | 0.80                                                                                                           | 0.90               | 0.95                         | 1.00               |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| 390 ~ 1,000                                 | 0.65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.80                 | 0.85                                                                                                           | 0.98               | 1.00                         | 1.00               |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |
| 1,200 up above                              | 0.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.90                 | 0.95                                                                                                           | 0.98               | 1.00                         | 1.00               |                                   |                 |                        |             |                 |                 |      |      |      |          |      |      |      |      |      |      |             |      |      |      |      |      |      |                |      |      |      |      |      |      |

### DIAGRAM OF DIMENSIONS



### LEAD SPACING AND DIAMETER Unit: mm

| φ D | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18 |
|-----|-----|-----|-----|-----|------|-----|----|
| P   | 2.0 | 2.5 | 3.5 | 5.0 |      | 7.5 |    |
| φ d | 0.5 |     | 0.6 |     |      | 0.8 |    |
| α   | 1.0 |     |     |     | 1.5  |     |    |
| β   |     |     |     | 0.5 |      |     |    |

Remark: 16 × 20 is used flat type rubber bung.

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:  $\phi D \times L$ (mm)

Ripple Current: mA/rms at 100K Hz, 105°C

| V.DC<br>Item<br>$\mu F$ | 6.3V (0J)         |                                        |       |                                   |        | 10V (1A)          |                                        |       |                                   |        | 16V (1C)          |                                        |       |                                   |        |
|-------------------------|-------------------|----------------------------------------|-------|-----------------------------------|--------|-------------------|----------------------------------------|-------|-----------------------------------|--------|-------------------|----------------------------------------|-------|-----------------------------------|--------|
|                         | $\phi D \times L$ | Impedance<br>( $\Omega$ , Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105°C) |        | $\phi D \times L$ | Impedance<br>( $\Omega$ , Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105°C) |        | $\phi D \times L$ | Impedance<br>( $\Omega$ , Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105°C) |        |
|                         |                   | 20°C                                   | -10°C | 120Hz                             | 100KHz |                   | 20°C                                   | -10°C | 120Hz                             | 100KHz |                   | 20°C                                   | -10°C | 120Hz                             | 100KHz |
| 56                      |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 5×11              | 0.72                                   | 1.8   | 116                               | 165    |
| 68                      |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 5×11              | 0.72                                   | 1.8   | 126                               | 180    |
| 82                      |                   |                                        |       |                                   |        | 5×11              | 0.72                                   | 1.8   | 116                               | 165    |                   |                                        |       |                                   |        |
| 100                     |                   |                                        |       |                                   |        | 5×11              | 0.72                                   | 1.8   | 126                               | 180    |                   |                                        |       |                                   |        |
| 120                     | 5×11              | 0.72                                   | 1.8   | 116                               | 165    |                   |                                        |       |                                   |        | 6.3×11            | 0.38                                   | 0.95  | 179                               | 255    |
| 180                     |                   |                                        |       |                                   |        | 6.3×11            | 0.38                                   | 0.95  | 179                               | 255    | 6.3×15            | 0.27                                   | 0.68  | 231                               | 330    |
| 220                     | 6.3×11            | 0.38                                   | 0.95  | 179                               | 255    | 6.3×11            | 0.38                                   | 0.95  | 196                               | 280    |                   |                                        |       |                                   |        |
| 270                     | 6.3×11            | 0.38                                   | 0.95  | 196                               | 280    | 6.3×15            | 0.27                                   | 0.68  | 231                               | 330    | 8×11.5            | 0.20                                   | 0.50  | 291                               | 415    |
| 330                     | 6.3×15            | 0.27                                   | 0.68  | 231                               | 330    | 8×11.5            | 0.20                                   | 0.50  | 291                               | 415    | 10×12.5           | 0.12                                   | 0.30  | 438                               | 625    |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 8×11.5            | 0.20                                   | 0.50  | 315                               | 450    |
| 390                     | 8×11.5            | 0.20                                   | 0.50  | 332                               | 415    | 8×11.5            | 0.20                                   | 0.50  | 360                               | 450    | 8×15              | 0.16                                   | 0.40  | 347                               | 495    |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 10×12.5           | 0.12                                   | 0.30  | 540                               | 675    |
| 470                     | 8×11.5            | 0.20                                   | 0.50  | 360                               | 450    | 8×15              | 0.16                                   | 0.40  | 396                               | 495    | 8×15              | 0.16                                   | 0.40  | 472                               | 590    |
|                         | 10×12.5           | 0.12                                   | 0.30  | 500                               | 625    | 10×12.5           | 0.12                                   | 0.30  | 540                               | 675    | 8×20              | 0.11                                   | 0.28  | 512                               | 640    |
| 560                     | 8×15              | 0.16                                   | 0.40  | 396                               | 495    | 8×15              | 0.16                                   | 0.40  | 472                               | 590    | 10×16             | 0.084                                  | 0.21  | 660                               | 825    |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 8×20              | 0.11                                   | 0.28  | 560                               | 700    |
| 680                     | 10×12.5           | 0.12                                   | 0.30  | 540                               | 675    | 10×16             | 0.084                                  | 0.21  | 660                               | 825    | 10×16             | 0.084                                  | 0.21  | 728                               | 910    |
|                         | 10×16             | 0.084                                  | 0.21  | 660                               | 825    | 8×20              | 0.11                                   | 0.28  | 512                               | 640    | 10×20             | 0.062                                  | 0.16  | 832                               | 1,040  |
| 820                     | 8×15              | 0.16                                   | 0.40  | 472                               | 590    | 8×20              | 0.11                                   | 0.28  | 560                               | 700    | 10×20             | 0.062                                  | 0.16  | 904                               | 1,130  |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 10×25             | 0.052                                  | 0.13  | 1,008                             | 1,260  |
| 1,000                   | 10×16             | 0.084                                  | 0.21  | 728                               | 910    | 10×16             | 0.084                                  | 0.21  | 728                               | 910    |                   |                                        |       |                                   |        |
|                         | 8×20              | 0.11                                   | 0.28  | 560                               | 700    | 10×20             | 0.062                                  | 0.16  | 832                               | 1,040  | 10×25             | 0.052                                  | 0.13  | 1,112                             | 1,390  |
| 1,200                   | 10×20             | 0.062                                  | 0.16  | 936                               | 1,040  | 10×20             | 0.062                                  | 0.16  | 1,017                             | 1,130  | 10×30             | 0.044                                  | 0.11  | 1,296                             | 1,440  |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 12.5×20           | 0.046                                  | 0.12  | 1,206                             | 1,340  |
| 1,500                   | 10×20             | 0.062                                  | 0.16  | 1,017                             | 1,130  | 10×25             | 0.052                                  | 0.13  | 1,251                             | 1,390  | 10×30             | 0.044                                  | 0.11  | 1,413                             | 1,570  |
|                         | 10×25             | 0.052                                  | 0.13  | 1,134                             | 1,260  | 10×30             | 0.044                                  | 0.11  | 1,296                             | 1,440  | 12.5×20           | 0.046                                  | 0.12  | 1,305                             | 1,450  |
| 1,800                   | 10×25             | 0.052                                  | 0.13  | 1,251                             | 1,390  | 10×30             | 0.044                                  | 0.11  | 1,413                             | 1,570  | 12.5×25           | 0.034                                  | 0.085 | 1,521                             | 1,690  |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 12.5×25           | 0.034                                  | 0.085 | 1,629                             | 1,810  |
| 2,200                   | 10×30             | 0.044                                  | 0.11  | 1,296                             | 1,440  | 12.5×20           | 0.046                                  | 0.12  | 1,305                             | 1,450  | 12.5×30           | 0.030                                  | 0.075 | 1,755                             | 1,950  |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        | 16×20             | 0.035                                  | 0.087 | 1,485                             | 1,650  |
| 2,700                   | 12.5×20           | 0.046                                  | 0.12  | 1,305                             | 1,450  | 12.5×25           | 0.034                                  | 0.085 | 1,521                             | 1,690  | 12.5×30           | 0.030                                  | 0.075 | 1,917                             | 2,130  |
|                         | 12.5×25           | 0.034                                  | 0.085 | 1,521                             | 1,690  | 12.5×30           | 0.030                                  | 0.075 | 1,755                             | 1,950  | 12.5×35           | 0.027                                  | 0.068 | 1,980                             | 2,200  |
| 3,300                   | 12.5×25           | 0.034                                  | 0.085 | 1,629                             | 1,810  | 12.5×30           | 0.030                                  | 0.075 | 1,917                             | 2,130  | 16×25             | 0.028                                  | 0.070 | 1,863                             | 2,070  |
|                         |                   |                                        |       |                                   |        | 12.5×35           | 0.027                                  | 0.068 | 1,980                             | 2,200  | 12.5×35           | 0.027                                  | 0.068 | 2,151                             | 2,390  |
| 3,900                   | 12.5×30           | 0.030                                  | 0.075 | 1,755                             | 1,950  | 12.5×40           | 0.024                                  | 0.060 | 2,151                             | 2,390  | 16×31.5           | 0.025                                  | 0.063 | 2,115                             | 2,350  |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |
| 4,700                   | 16×20             | 0.035                                  | 0.087 | 1,485                             | 1,650  | 16×25             | 0.028                                  | 0.070 | 1,863                             | 2,070  |                   |                                        |       |                                   |        |
|                         | 16×25             | 0.028                                  | 0.070 | 1,863                             | 2,070  | 16×30             | 0.024                                  | 0.060 | 2,358                             | 2,620  | 16×31.5           | 0.025                                  | 0.055 | 2,295                             | 2,550  |
| 5,600                   | 12.5×30           | 0.030                                  | 0.075 | 1,917                             | 2,130  | 16×35             | 0.022                                  | 0.055 | 2,295                             | 2,550  | 16×35.5           | 0.022                                  | 0.055 | 2,295                             | 2,550  |
|                         | 12.5×35           | 0.027                                  | 0.068 | 1,980                             | 2,200  | 16×40             | 0.018                                  | 0.045 | 2,610                             | 2,900  |                   |                                        |       |                                   |        |
| 6,800                   | 16×20             | 0.035                                  | 0.087 | 1,440                             | 1,600  |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |
|                         | 16×25             | 0.028                                  | 0.070 | 1,863                             | 2,070  |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |
| 8,200                   | 12.5×40           | 0.024                                  | 0.060 | 2,358                             | 2,620  |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |
|                         | 16×31.5           | 0.025                                  | 0.063 | 2,115                             | 2,350  |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |
| 10,000                  | 16×35.5           | 0.022                                  | 0.055 | 2,295                             | 2,550  |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |
|                         |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |                   |                                        |       |                                   |        |

Dimension:  $\phi D \times L(mm)$

Ripple Current: mA/rms at 100K Hz, 105°C

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

| V DC<br><br>μF | Item | 25V (1E) |                               |       |                                  | 35V (1V) |         |                               |       | 50V (1H)                         |        |         |                               |       |                                  |        |
|----------------|------|----------|-------------------------------|-------|----------------------------------|----------|---------|-------------------------------|-------|----------------------------------|--------|---------|-------------------------------|-------|----------------------------------|--------|
|                |      | φ D×L    | Impedance<br>(Ω, Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105℃) |          | φ D×L   | Impedance<br>(Ω, Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105℃) |        | φ D×L   | Impedance<br>(Ω, Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105℃) |        |
|                |      |          | 20℃                           | -10℃  | 120Hz                            | 100KHz   |         | 20℃                           | -10℃  | 120Hz                            | 100KHz |         | 20℃                           | -10℃  | 120Hz                            | 100KHz |
| 18             |      |          |                               |       |                                  |          |         |                               |       |                                  | 5×11   | 1.1     | 3.3                           | 72    | 130                              |        |
| 22             |      |          |                               |       |                                  |          |         |                               |       |                                  | 5×11   | 1.1     | 3.3                           | 83    | 150                              |        |
| 27             |      |          |                               |       |                                  | 5×11     | 0.72    | 1.8                           | 91    | 165                              |        |         |                               |       |                                  |        |
| 33             |      |          |                               |       |                                  | 5×11     | 0.72    | 1.8                           | 99    | 180                              |        |         |                               |       |                                  |        |
| 39             |      | 5×11     | 0.72                          | 1.8   | 116                              | 165      |         |                               |       |                                  | 6.3×11 | 0.56    | 1.6                           | 154   | 220                              |        |
| 47             |      | 5×11     | 0.72                          | 1.8   | 126                              | 180      |         |                               |       |                                  | 6.3×11 | 0.56    | 1.6                           | 161   | 230                              |        |
| 56             |      |          |                               |       |                                  |          |         |                               |       |                                  | 6.3×15 | 0.41    | 1.2                           | 217   | 310                              |        |
| 68             |      |          |                               |       |                                  |          |         |                               |       |                                  | 6.3×11 | 0.38    | 0.95                          | 179   | 255                              |        |
| 82             |      | 6.3×11   | 0.38                          | 0.95  | 179                              | 255      | 6.3×15  | 0.27                          | 0.68  | 231                              | 330    | 8×11.5  | 0.29                          | 0.84  | 238                              | 340    |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 8×11.5  | 0.29                          | 0.84  | 249                              | 355    |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 8×15    | 0.25                          | 0.75  | 329                              | 470    |
| 100            |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 10×12.5 | 0.16                          | 0.40  | 336                              | 480    |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 10×12.5 | 0.16                          | 0.40  | 371                              | 530    |
|                |      | 6.3×11   | 0.38                          | 0.95  | 196                              | 280      |         |                               |       |                                  |        | 10×12.5 | 0.16                          | 0.40  | 371                              | 530    |
| 120            |      | 6.3×15   | 0.27                          | 0.68  | 231                              | 330      | 8×11.5  | 0.20                          | 0.50  | 291                              | 415    | 8×15    | 0.25                          | 0.75  | 392                              | 560    |
|                |      |          |                               |       |                                  |          | 10×12.5 | 0.12                          | 0.30  | 438                              | 625    | 8×20    | 0.18                          | 0.52  | 427                              | 610    |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 10×16   | 0.12                          | 0.30  | 529                              | 755    |
| 150            |      | 8×11.5   | 0.20                          | 0.50  | 291                              | 415      | 8×11.5  | 0.20                          | 0.50  | 315                              | 450    | 10×16   | 0.12                          | 0.30  | 588                              | 840    |
|                |      |          |                               |       |                                  |          | 10×12.5 | 0.12                          | 0.30  | 473                              | 675    |         |                               |       |                                  |        |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 180            |      | 8×11.5   | 0.20                          | 0.50  | 315                              | 450      | 8×15    | 0.16                          | 0.40  | 347                              | 495    | 8×20    | 0.18                          | 0.52  | 525                              | 750    |
|                |      | 10×12.5  | 0.12                          | 0.30  | 438                              | 625      |         |                               |       |                                  |        | 10×20   | 0.088                         | 0.22  | 662                              | 945    |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 220            |      | 8×15     | 0.16                          | 0.40  | 347                              | 495      | 8×15    | 0.16                          | 0.40  | 413                              | 590    | 10×20   | 0.088                         | 0.22  | 728                              | 1,040  |
|                |      | 10×12.5  | 0.12                          | 0.30  | 473                              | 675      | 8×20    | 0.11                          | 0.28  | 448                              | 640    | 10×25   | 0.068                         | 0.17  | 805                              | 1,150  |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 270            |      |          |                               |       |                                  |          | 10×16   | 0.084                         | 0.21  | 578                              | 825    |         |                               |       |                                  |        |
|                |      |          |                               |       |                                  |          | 8×20    | 0.11                          | 0.28  | 490                              | 700    | 10×25   | 0.068                         | 0.17  | 896                              | 1,280  |
|                |      |          |                               |       |                                  |          | 10×16   | 0.084                         | 0.21  | 637                              | 910    |         |                               |       |                                  |        |
| 330            |      |          |                               |       |                                  |          | 10×20   | 0.062                         | 0.16  | 728                              | 1,040  | 10×30   | 0.059                         | 0.15  | 882                              | 1,260  |
|                |      | 8×15     | 0.16                          | 0.40  | 413                              | 590      |         |                               |       |                                  |        | 12.5×20 | 0.059                         | 0.15  | 833                              | 1,190  |
|                |      | 8×20     | 0.11                          | 0.28  | 448                              | 640      |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 390            |      | 10×16    | 0.084                         | 0.21  | 578                              | 825      |         |                               |       |                                  |        |         |                               |       |                                  |        |
|                |      | 8×20     | 0.11                          | 0.28  | 560                              | 700      | 10×20   | 0.062                         | 0.16  | 904                              | 1,130  | 12.5×20 | 0.059                         | 0.15  | 952                              | 1,190  |
|                |      | 10×16    | 0.084                         | 0.21  | 728                              | 910      | 10×25   | 0.052                         | 0.13  | 1,008                            | 1,260  |         |                               |       |                                  |        |
| 470            |      | 10×20    | 0.062                         | 0.16  | 832                              | 1,040    | 10×25   | 0.052                         | 0.13  | 1,112                            | 1,390  | 10×30   | 0.059                         | 0.15  | 1,176                            | 1,470  |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 12.5×25 | 0.045                         | 0.11  | 1,192                            | 1,490  |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 12.5×25 | 0.045                         | 0.11  | 1,304                            | 1,630  |
| 560            |      | 10×20    | 0.062                         | 0.16  | 904                              | 1,130    | 10×30   | 0.044                         | 0.11  | 1,152                            | 1,440  | 12.5×25 | 0.045                         | 0.11  | 1,304                            | 1,630  |
|                |      | 10×25    | 0.052                         | 0.13  | 1,008                            | 1,260    | 12.5×20 | 0.046                         | 0.12  | 1,072                            | 1,340  | 12.5×30 | 0.039                         | 0.098 | 1,376                            | 1,720  |
|                |      | 10×25    | 0.052                         | 0.13  | 1,112                            | 1,390    | 10×30   | 0.044                         | 0.11  | 1,256                            | 1,570  | 12.5×30 | 0.039                         | 0.098 | 1,520                            | 1,900  |
| 680            |      |          |                               |       |                                  |          | 12.5×20 | 0.046                         | 0.12  | 1,160                            | 1,450  | 12.5×35 | 0.033                         | 0.083 | 1,512                            | 1,890  |
|                |      |          |                               |       |                                  |          | 12.5×25 | 0.034                         | 0.085 | 1,352                            | 1,690  | 16×20   | 0.048                         | 0.120 | 1,248                            | 1,560  |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 820            |      | 10×30    | 0.044                         | 0.11  | 1,152                            | 1,440    | 12.5×25 | 0.034                         | 0.085 | 1,448                            | 1,810  | 12.5×35 | 0.033                         | 0.083 | 1,656                            | 2,070  |
|                |      | 12.5×20  | 0.046                         | 0.12  | 1,072                            | 1,340    |         |                               |       |                                  |        | 12.5×40 | 0.029                         | 0.073 | 1,624                            | 2,030  |
|                |      |          |                               |       |                                  |          |         |                               |       |                                  |        | 16×25   | 0.033                         | 0.083 | 1,504                            | 1,880  |
| 1,000          |      | 10×30    | 0.044                         | 0.11  | 1,256                            | 1,570    | 12.5×30 | 0.030                         | 0.075 | 1,560                            | 1,950  | 12.5×40 | 0.029                         | 0.073 | 1,800                            | 2,250  |
|                |      | 12.5×20  | 0.046                         | 0.12  | 1,160                            | 1,450    | 16×20   | 0.035                         | 0.087 | 1,376                            | 1,720  | 16×25   | 0.033                         | 0.083 | 1,664                            | 2,080  |
|                |      | 12.5×25  | 0.034                         | 0.085 | 1,352                            | 1,690    |         |                               |       |                                  |        | 16×31.5 | 0.029                         | 0.073 | 1,720                            | 2,150  |
| 1,200          |      | 12.5×25  | 0.034                         | 0.085 | 1,629                            | 1,810    | 12.5×30 | 0.030                         | 0.075 | 1,917                            | 2,130  | 16×31.5 | 0.029                         | 0.073 | 2,088                            | 2,320  |
|                |      |          |                               |       |                                  |          | 12.5×35 | 0.027                         | 0.068 | 1,980                            | 2,200  | 16×35.5 | 0.025                         | 0.063 | 2,115                            | 2,350  |
|                |      |          |                               |       |                                  |          | 16×25   | 0.028                         | 0.070 | 1,863                            | 2,070  |         |                               |       |                                  |        |
| 1,500          |      | 12.5×30  | 0.030                         | 0.075 | 1,755                            | 1,950    | 12.5×35 | 0.027                         | 0.068 | 2,151                            | 2,390  | 16×35.5 | 0.025                         | 0.063 | 2,286                            | 2,540  |
|                |      | 16×20    | 0.035                         | 0.087 | 1,539                            | 1,710    | 12.5×40 | 0.024                         | 0.060 | 2,196                            | 2,440  | 16×40   | 0.021                         | 0.063 | 2,336                            | 2,595  |
|                |      |          |                               |       |                                  |          | 16×25   | 0.028                         | 0.070 | 2,025                            | 2,250  |         |                               |       |                                  |        |
| 1,800          |      | 12.5×30  | 0.030                         | 0.075 | 1,917                            | 2,130    | 12.5×40 | 0.024                         | 0.060 | 2,358                            | 2,620  | 16×40   | 0.021                         | 0.063 | 2,466                            | 2,740  |
|                |      | 12.5×35  | 0.027                         | 0.068 | 1,980                            | 2,200    | 16×31.5 | 0.025                         | 0.063 | 2,115                            | 2,350  | 18×35.5 | 0.023                         | 0.058 | 2,160                            | 2,400  |
|                |      | 16×25    | 0.028                         | 0.070 | 1,863                            | 2,070    |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 2,200          |      | 12.5×35  | 0.027                         | 0.068 | 2,151                            | 2,390    | 16×31.5 | 0.025                         | 0.063 | 2,295                            | 2,550  | 18×35.5 | 0.023                         | 0.058 | 2,349                            | 2,610  |
|                |      | 12.5×40  | 0.024                         | 0.060 | 2,196                            | 2,440    | 16×35.5 | 0.022                         | 0.055 | 2,295                            | 2,550  | 18×40   | 0.020                         | 0.050 | 2,385                            | 2,650  |
|                |      | 16×25    | 0.028                         | 0.070 | 2,025                            | 2,250    |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 2,700          |      | 16×31.5  | 0.025                         | 0.063 | 2,115                            | 2,350    | 16×35.5 | 0.022                         | 0.055 | 2,448                            | 2,720  |         |                               |       |                                  |        |
|                |      |          |                               |       |                                  |          | 16×40   | 0.018                         | 0.045 | 2,610                            | 2,900  |         |                               |       |                                  |        |
|                |      |          |                               |       |                                  |          | 18×35.5 | 0.021                         | 0.053 | 2,394                            | 2,660  |         |                               |       |                                  |        |
| 3,300          |      | 16×31.5  | 0.025                         | 0.063 | 2,295                            | 2,550    | 18×35.5 | 0.021                         | 0.053 | 2,601                            | 2,890  |         |                               |       |                                  |        |
|                |      | 16×35.5  | 0.022                         | 0.055 | 2,295                            | 2,550    | 18×40   | 0.017                         | 0.043 | 2,709                            | 3,010  |         |                               |       |                                  |        |
|                |      | 16×35.5  | 0.022                         | 0.055 | 2,448                            | 2,720    | 18×40   | 0.017                         | 0.043 | 2,934                            | 3,260  |         |                               |       |                                  |        |
| 3,900          |      | 16×40    | 0.018                         | 0.045 | 2,610                            | 2,900    |         |                               |       |                                  |        |         |                               |       |                                  |        |
|                |      | 18×35.5  | 0.021                         | 0.053 | 2,394                            | 2,660    |         |                               |       |                                  |        |         |                               |       |                                  |        |
|                |      | 18×35.5  | 0.021                         | 0.053 | 2,601                            | 2,890    |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 4,700          |      | 18×40    | 0.017                         | 0.043 | 2,709                            | 3,010    |         |                               |       |                                  |        |         |                               |       |                                  |        |
|                |      | 18×40    | 0.017                         | 0.043 | 2,934                            | 3,260    |         |                               |       |                                  |        |         |                               |       |                                  |        |
| 5,600          |      | 18×40    | 0.017                         | 0.043 | 2,934                            | 3,260    |         |                               |       |                                  |        |         |                               |       |                                  |        |

Dimension:  $\phi D \times L(mm)$

Ripple Current: mA/rms at 100K Hz, 105°C

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

| V. DC<br>Item<br>$\mu F$ | $\phi D \times L$ | 63V(1J)                                |       |                                   |        |
|--------------------------|-------------------|----------------------------------------|-------|-----------------------------------|--------|
|                          |                   | Impedance<br>( $\Omega$ , Max/100K Hz) |       | Ripple Current<br>(mA/rms, 105°C) |        |
|                          |                   | 20°C                                   | -10°C | 120Hz                             | 100KHz |
| 12                       | 5×11              | 1.90                                   | 4.78  | 55                                | 100    |
| 27                       | 6.3×11            | 1.10                                   | 2.78  | 88                                | 160    |
| 33                       | 6.3×11            | 1.10                                   | 2.75  | 96                                | 175    |
| 39                       | 6.3×15            | 0.62                                   | 1.55  | 161                               | 230    |
| 47                       | 8×11.5            | 0.49                                   | 1.23  | 193                               | 275    |
| 56                       | 8×11.5            | 0.49                                   | 1.23  | 203                               | 290    |
|                          | 10×12.5           | 0.27                                   | 0.675 | 294                               | 420    |
| 68                       | 8×15              | 0.34                                   | 0.850 | 252                               | 360    |
|                          | 10×12.5           | 0.27                                   | 0.675 | 354                               | 505    |
|                          | 10×16             | 0.21                                   | 0.525 | 366                               | 523    |
| 82                       | 8×20              | 0.21                                   | 0.525 | 350                               | 500    |
| 100                      | 8×15              | 0.34                                   | 0.850 | 308                               | 440    |
| 120                      | 10×16             | 0.210                                  | 0.525 | 455                               | 650    |
|                          | 10×20             | 0.160                                  | 0.400 | 490                               | 700    |
| 150                      | 8×20              | 0.210                                  | 0.525 | 476                               | 680    |
|                          | 10×25             | 0.130                                  | 0.325 | 546                               | 780    |
| 180                      | 10×20             | 0.160                                  | 0.400 | 553                               | 790    |
|                          | 10×30             | 0.100                                  | 0.250 | 672                               | 960    |
| 220                      | 10×25             | 0.130                                  | 0.325 | 648                               | 925    |
|                          | 12.5×20           | 0.110                                  | 0.275 | 609                               | 870    |
| 270                      | 10×30             | 0.100                                  | 0.250 | 812                               | 1,160  |
|                          | 12.5×25           | 0.074                                  | 0.185 | 805                               | 1,150  |
| 330                      | 12.5×20           | 0.110                                  | 0.275 | 746                               | 1,065  |
| 390                      | 12.5×25           | 0.074                                  | 0.185 | 1,088                             | 1,360  |
|                          | 12.5×30           | 0.068                                  | 0.170 | 1,024                             | 1,280  |
|                          | 12.5×30           | 0.068                                  | 0.170 | 1,120                             | 1,400  |
| 470                      | 12.5×35           | 0.063                                  | 0.158 | 1,112                             | 1,390  |
|                          | 16×20             | 0.059                                  | 0.148 | 1,080                             | 1,350  |
|                          | 16×25             | 0.055                                  | 0.138 | 1,184                             | 1,480  |
| 560                      | 12.5×40           | 0.051                                  | 0.128 | 1,224                             | 1,530  |
|                          | 16×25             | 0.055                                  | 0.138 | 1,296                             | 1,620  |
| 680                      | 12.5×35           | 0.063                                  | 0.158 | 1,336                             | 1,670  |
|                          | 16×31.5           | 0.046                                  | 0.115 | 1,376                             | 1,720  |
| 820                      | 12.5×40           | 0.051                                  | 0.128 | 1,480                             | 1,850  |
|                          | 16×31.5           | 0.046                                  | 0.115 | 1,512                             | 1,890  |
|                          | 16×35.5           | 0.040                                  | 0.100 | 1,528                             | 1,910  |
| 1,000                    | 16×35.5           | 0.040                                  | 0.100 | 1,688                             | 2,110  |
|                          | 18×35.5           | 0.040                                  | 0.100 | 1,576                             | 1,970  |
| 1,500                    | 18×35.5           | 0.040                                  | 0.100 | 2,169                             | 2,410  |