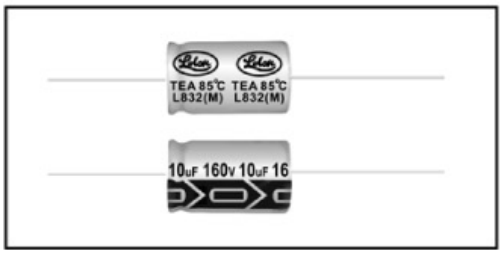
Features

- 85℃, 2,000 hours assured
- For general purpose application
- RoHS Compliance




SPECIFICATIONS

| Items | Performance |
|---|---|
| Operating Temperature Range | -40℃ ~ +85℃ |
| Capacitance Tolerance | ±20% (at 120Hz, 20℃) |

**Leakage Current (at 20℃)**

| Rated voltage | ≦ 100V | > 100V | |
|---|---|---|---|
| Time | after 2 minutes | after 5 minutes | |
| Leakage Current | I = 0.02CV or 3 (μA) whichever is greater | CV ≦ 1000 I = 0.03CV+15(μA) | CV > 1000 I = 0.02CV+25(μA) |

Where, C= rated capacitance in μF. V = rated DC working voltage in V.

**Dissipation Factor (Tan δ at 120 Hz, 20℃)**

| Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tan δ (max) | 0.23 | 0.20 | 0.17 | 0.15 | 0.12 | 0.10 | 0.09 | 0.08 | 0.12 | 0.14 | 0.17 | 0.20 | 0.24 | 0.24 |

When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.

**Low Temperature Characteristics (at 120Hz)**

Impedance ratio shall not exceed the values given in the table below.

| Rated Voltage | | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impedance Ratio | Z(-25℃)/Z(+20℃) | φD<16 | 6 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 6 | 8 | 12 | 14 | 16 |
| | | φD≧16 | 8 | 6 | 4 | 4 | 3 | 3 | 3 | 3 | | | | | | |
| | Z(-40℃)/Z(+20℃) | φD<16 | 10 | 8 | 6 | 6 | 4 | 3 | 3 | 3 | 4 | 8 | 10 | - | - | - |
| | | φD≧16 | 18 | 16 | 12 | 10 | 8 | 8 | 6 | 6 | | | | | | |

**Load Life Test**

| Test Time | 2,000 hrs |
|---|---|
| Capacitance Change | Within ±20% of initial value |
| Dissipation Factor | Less than 200% of specified value |
| Leakage Current | Within specified value |

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hrs at 85℃

**Shelf Life Test**

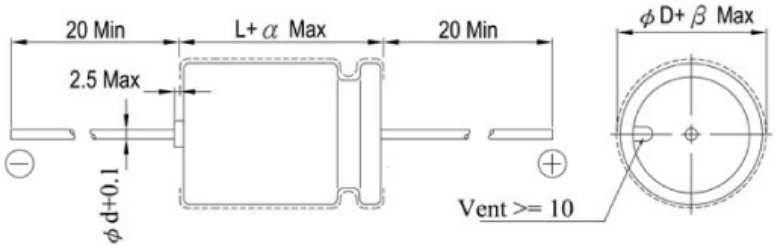
| Test Time | 1,000 hrs |
|---|---|
| Capacitance Change | Within ±20% of initial value |
| Dissipation Factor | Less than 200% of specified value |
| Leakage Current | Within specified value |

* The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hrs at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

**Ripple Current & Frequency Multipliers**

| Freq.(Hz) / Cap.(μF) | 60 (50) | 120 | 500 | 1K | 10K up |
|---|---|---|---|---|---|
| Under 100 | 0.70 | 1.00 | 1.30 | 1.40 | 1.50 |
| 100 < C ≦ 1,000 | 0.75 | 1.00 | 1.20 | 1.30 | 1.35 |
| 1,000 up above | 0.80 | 1.00 | 1.10 | 1.12 | 1.15 |

## DIAGRAM OF DIMENSIONS




LEAD SPACING AND DIAMETER Unit: mm

| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 | 22 | 25 |
|---|---|---|---|---|---|---|---|---|---|
| φd | 0.6 | | | | | 0.8 | | | |
| α | 1.5 | | | 2.0 | | | | | |
| β | 0.5 | | | | | | | | |

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 85°C

| V. DC / μF | Contents | 6.3V (0J) | | 10V (1A) | | 16V (1C) | | 25V (1E) | | 35V (1V) | | 50V (1H) | | 63V (1J) | | 100V (2A) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA |
| 0.10 | 0R1 | | | | | | | | | | | 5×12 | 1.5 | 5×12 | 3 | 5×12 | 3 |
| 0.22 | R22 | | | | | | | | | | | 5×12 | 3.5 | 5×12 | 4.5 | 5×12 | 5 |
| 0.33 | R33 | | | | | | | | | | | 5×12 | 5 | 5×12 | 7.5 | 5×12 | 8 |
| 0.47 | R47 | | | | | | | | | | | 5×12 | 6 | 5×12 | 9 | 5×12 | 9 |
| 1.0 | 010 | | | | | | | | | | | 5×12 | 10 | 5×12 | 15 | 5×12 | 15 |
| 2.2 | 2R2 | | | | | | | | | | | 5×12 | 20 | 5×12 | 30 | 5×12 | 30 |
| 3.3 | 3R3 | | | | | | | | | | | 5×12 | 30 | 5×12 | 36 | 5×12 | 40 |
| 4.7 | 4R7 | | | | | | | | | | | 5×12 | 42 | 5×12 | 44 | 6.3×13 | 41 |
| 10 | 100 | | | | | | | 5×12 | 40 | 5×12 | 55 | 5×12 | 50 | 6.3×13 | 55 | 6.3×13 | 72 |
| 22 | 220 | | | | | 5×12 | 71 | 5×12 | 76 | 6.3×13 | 70 | 6.3×13 | 85 | 6.3×13 | 109 | 8×16 | 133 |
| 33 | 330 | | | | | 5×12 | 85 | 5×12 | 80 | 6.3×13 | 115 | 6.3×13 | 126 | 8×13 | 154 | 10×17 | 190 |
| 47 | 470 | 5×12 | 87 | 5×12 | 94 | 6.3×13 | 88 | 6.3×13 | 100 | 6.3×13 | 138 | 8×13 | 174 | 8×16 | 214 | 10×21 | 237 |
| 100 | 101 | 6.3×13 | 121 | 6.3×13 | 145 | 6.3×13 | 160 | 8×13 | 215 | 8×16 | 232 | 10×17 | 296 | 10×17 | 326 | 13×22 | 377 |
| 220 | 221 | 6.3×13 | 215 | 8×13 | 231 | 8×13 | 298 | 8×16 | 319 | 10×17 | 401 | 10×21 | 459 | 13×22 | 527 | 16×28 | 625 |
| 330 | 331 | 8×16 | 305 | 8×16 | 327 | 8×16 | 365 | 10×17 | 454 | 10×21 | 514 | 13×22 | 613 | 13×22 | 675 | 16×33 | 793 |
| 470 | 471 | 8×16 | 364 | 8×16 | 390 | 8×16 | 460 | 10×21 | 524 | 13×22 | 613 | 13×22 | 731 | 13×27 | 780 | 16×36 | 942 |
| 1,000 | 102 | 10×17 | 662 | 10×17 | 671 | 10×21 | 775 | 13×22 | 873 | 13×27 | 955 | 16×33 | 1,111 | 16×36 | 1,249 | 18×42 | 1,359 |
| 2,200 | 222 | 13×22 | 929 | 13×22 | 1,051 | 13×24 | 1,125 | 16×28 | 1,344 | 16×33 | 1,421 | 18×36 | 1,699 | 22×43 | 1,744 | 25×52 | 2,430 |
| 3,300 | 332 | 13×27 | 1,150 | 13×27 | 1,288 | 16×28 | 1,454 | 16×33 | 1,611 | 18×36 | 1,640 | 22×43 | 2,027 | 25×52 | 2,309 | | |
| 4,700 | 472 | 13×27 | 1,354 | 16×28 | 1,552 | 16×33 | 1,650 | 18×36 | 1,881 | 22×43 | 2,280 | 25×43 | 2,347 | 25×52 | 2,710 | | |
| 6,800 | 682 | 16×28 | 1,762 | 16×33 | 1,930 | 18×36 | 2,040 | 18×42 | 2,170 | 22×43 | 2,470 | 25×52 | 2,650 | | | | |
| 10,000 | 103 | 16×36 | 2,062 | 18×36 | 2,122 | 18×42 | 2,503 | 22×43 | 2,893 | 25×52 | 3,180 | | | | | | |

| V. DC / μF | Contents | 160V (2C) | | 200V (2D) | | 250V (2E) | | 350V (2V) | | 400V (2G) | | 450V (2W) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA |
| 1.0 | 010 | 6.3 × 13 | 7 | 6.3 × 13 | 9 | 6.3 × 13 | 12 | 8 × 16 | 13 | 8 × 16 | 14 | 8 × 16 | 15 |
| 2.2 | 2R2 | 6.3 × 13 | 15 | 8 × 13 | 16 | 8 × 16 | 17 | 8 × 20 | 19 | 10 × 17 | 21 | 10 × 21 | 23 |
| 3.3 | 3R3 | 8 × 13 | 21 | 8 × 16 | 26 | 8 × 21 | 31 | 8 × 21 | 33 | 10 × 17 | 34 | 10 × 21 | 36 |
| 4.7 | 4R7 | 8 × 16 | 31 | 10 × 17 | 33 | 10 × 17 | 38 | 10 × 21 | 44 | 10 × 26 | 45 | 10 × 26 | 46 |
| 10 | 100 | 10 × 17 | 60 | 10 × 21 | 66 | 10 × 21 | 72 | 13 × 22 | 72 | 13 × 22 | 80 | 13 × 27 | 82 |
| 22 | 220 | 10 × 21 | 121 | 13 × 22 | 121 | 13 × 27 | 126 | 13 × 27 | 132 | 16 × 33 | 137 | 16 × 36 | 143 |
| 33 | 330 | 13 × 22 | 154 | 13 × 27 | 167 | 16 × 28 | 178 | 16 × 33 | 186 | 16 × 36 | 192 | 16 × 42 | 201 |
| 47 | 470 | 13 × 27 | 198 | 16 × 33 | 214 | 16 × 33 | 241 | 16 × 42 | 253 | 18 × 42 | 339 | 18 × 42 | 339 |
| 100 | 101 | 16 × 33 | 345 | 16 × 36 | 368 | 16 × 42 | 391 | 22 × 43 | 402 | 25 × 43 | 424 | 25 × 52 | 448 |
| 220 | 221 | 18 × 42 | 586 | 22 × 43 | 609 | 22 × 43 | 632 | | | | | | |
| 330 | 331 | 22 × 43 | 632 | | | | | | | | | | |