

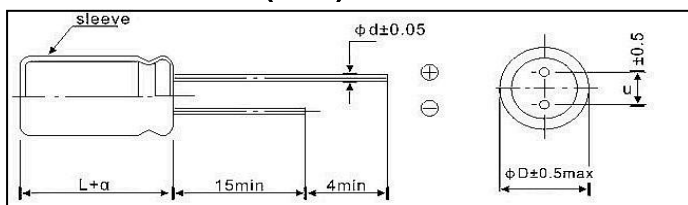
LL series Low Leakage Current Type

- Excellent shelf performance.
- Leakage current is very low after subject to high temperature, no load condition.
- Units of $\Phi 6.3$ or more are furnished with safety case vents.
- Solvent proof.

■ SPECIFICATIONS

| Item | Performance Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------------------|-------------------------|--------------------|------------------------------|--------------------|---------------------------------|----|----|-------|-----------------|------------------------|------|------|------|------|------|--|--|----------------|------------------------|---|---|---|---|--|--|--|
| Operating Temperature Range | -40°C~105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage Range | 6.3~63V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Range | 0.1~2200uF | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20%,(M) 【-10~10% (K) is available at requesta】 at 120Hz,20°C | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current (MAX) | After 2 minutes application of rated voltage.leakage current is not more than 0.002CV or 0.5(uA),whichever is greater | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (tan δ) | For capacitance of more than 1000uF, added 0.02 for every increase of 1000 uF, (at 120Hz,20 °C) <table border="1"> <thead> <tr> <th>Rated voltage(V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Tan δ</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table> | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | Tan δ | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12 | 0.10 | | | | | | | | | | | |
| Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | | | | | | | | | | | | | | | | | | | | | |
| Tan δ | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12 | 0.10 | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Stability Impedance Ratio | Measurement frequency:120Hz <table border="1"> <thead> <tr> <th colspan="2">Rated voltage(V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Impedance ratio</td> <td>Z(-25°C) / Z (+20°C)</td> <td>3</td> <td>2</td> <td>2</td> <td colspan="4">1.5</td> </tr> <tr> <td>ZT/Z20 (MAX)</td> <td>Z(-40°C) / Z (+20°C)</td> <td>5</td> <td>4</td> <td>3</td> <td colspan="4">2</td> </tr> </tbody> </table> | Rated voltage(V) | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | Impedance ratio | Z(-25°C) / Z (+20°C) | 3 | 2 | 2 | 1.5 | | | | ZT/Z20 (MAX) | Z(-40°C) / Z (+20°C) | 5 | 4 | 3 | 2 | | | |
| Rated voltage(V) | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | | | | | | | | | | | | | | | | | | | | |
| Impedance ratio | Z(-25°C) / Z (+20°C) | 3 | 2 | 2 | 1.5 | | | | | | | | | | | | | | | | | | | | | | | |
| ZT/Z20 (MAX) | Z(-40°C) / Z (+20°C) | 5 | 4 | 3 | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Load Life | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rate voltage applied for 2000 hours at 105°C. <table border="1"> <tbody> <tr> <td>Leakage Current</td> <td>Specified value or less</td> </tr> <tr> <td>Capacitance Change</td> <td>Within ±25% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>150% or less of specified value</td> </tr> </tbody> </table> | Leakage Current | Specified value or less | Capacitance Change | Within ±25% of initial value | Dissipation Factor | 150% or less of specified value | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Specified value or less | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±25% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | 150% or less of specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life | After leaving capacitors under no load at 105°C for 1000hours and applying voltage according to JIS C-5102 4-3,they meet the specified value for load life characteristics listed above. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | According to JIS C 5141 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

■ DIMENSIONS(mm)



| | | | | | | |
|----|--------------|-----|--------------|-----|-----|----|
| ΦD | 5 | 6.3 | 8 | 10 | 13 | 16 |
| Φd | 0.5 | | 0.6 | | 0.8 | |
| F | 2.0 | 2.5 | 3.5 | 5.0 | 7.5 | |
| α | L≤16 : α=1.5 | | L≥16 : α=2.0 | | | |



series Low Leakage Current Type

STANDARD SIZE PERMISSIBLE RIPPLE CURRENT

Size $\Phi D \times L$ (mm) Ripple Current(mA 105°C, 120Hz)r.m.s

| W.V Cap(μF) | 6.3 | | 10 | | 16 | | 25 | | 35 | | 50 | | 63 | |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | SIZE | Ripple | SIZE | Ripple | SIZE | Ripple | SIZE | Ripple | SIZE | Ripple | SIZE | Ripple | SIZE | Ripple |
| 0.1 | | | | | | | | | | | 5×11 | 1.1 | 5×11 | 1.4 |
| 0.15 | | | | | | | | | | | 5×11 | 1.6 | 5×11 | 1.8 |
| 0.22 | | | | | | | | | | | 5×11 | 2.3 | 5×11 | 2.6 |
| 0.33 | | | | | | | | | | | 5×11 | 3.5 | 5×11 | 3.8 |
| 0.47 | | | | | | | | | | | 5×11 | 5.0 | 5×11 | 5.5 |
| 0.68 | | | | | | | | | | | 5×11 | 7.3 | 5×11 | 7.8 |
| 1 | | | | | | | | | | | 5×11 | 10.7 | 5×11 | 11 |
| 1.5 | | | | | | | | | | | 5×11 | 16 | 5×11 | 18 |
| 2.2 | | | | | | | | | | | 5×11 | 23 | 5×11 | 25 |
| 3.3 | | | | | | | | | | | 5×11 | 29 | 5×11 | 31 |
| 4.7 | | | | | | | 5×11 | 32 | 5×11 | 33 | 5×11 | 36 | 5×11 | 39 |
| 6.8 | | | | | | | 5×11 | 38 | 5×11 | 40 | 5×11 | 45 | 5×11 | 42 |
| 10 | | | | | 5×11 | 35 | 5×11 | 43 | 5×11 | 48 | 5×11 | 52 | 6.3×12 | 58 |
| 15 | | | | | 5×11 | 50 | 5×11 | 54 | 5×11 | 56 | 5×11 | 68 | 6.3×12 | 76 |
| 22 | 5×11 | 36 | 5×11 | 52 | 5×11 | 65 | 5×11 | 65 | 5×11 | 71 | 5×11 | 77 | 6.3×12 | 94 |
| 33 | 5×11 | 42 | 5×11 | 65 | 5×11 | 68 | 5×11 | 75 | 5×11 | 83 | 6.3×12 | 99 | 8×12 | 110 |
| 47 | 5×11 | 41 | 5×11 | 73 | 5×11 | 102 | 5×11 | 116 | 6.3×12 | 125 | 6.3×12 | 138 | 8×12 | 150 |
| 68 | 5×11 | 70 | 5×11 | 84 | 6.3×12 | 115 | 5×11 | 122 | 6.3×12 | 154 | 6.3×12 | 165 | 10×13 | 198 |
| 100 | 5×11 | 74 | 5×11 | 104 | 6.3×12 | 135 | 6.3×12 | 149 | 8×12 | 187 | 812 | 217 | 10×16 | 260 |
| 150 | 6.3×12 | 94 | 6.3×12 | 125 | 6.3×12 | 140 | 8×12 | 184 | 10×13 | 262 | 10×16 | 325 | 10×20 | 330 |
| 220 | 6.3×12 | 131 | 8×12 | 192 | 8×12 | 220 | 8×12 | 246 | 10×13 | 330 | 10×16 | 380 | 13×20 | 440 |
| 330 | 6.3×12 | 161 | 8×12 | 256 | 8×12 | 258 | 10×13 | 252 | 10×16 | 440 | 13×20 | 506 | 13×25 | 594 |
| 470 | 8×12 | 242 | 8×12 | 318 | 10×13 | 405 | 10×16 | 480 | 10×20 | 590 | 13×20 | 710 | | |
| 1000 | 10×13 | 398 | 10×16 | 600 | 10×20 | 708 | 13×20 | 845 | | | | | | |
| 2200 | 13×20 | 660 | 13×20 | 855 | 13×25 | 880 | | | | | | | | |

※以上最大体积为标准尺寸，其他为体积缩小品，寿命相应缩短

MULTIPLIER FOR RIPPLE CURRENT

Frequency coefficient

| W.V | Frequency(Hz) | | | | | |
|--------|---------------|--------|------|------|------|------|
| | Cap(μF) | 60(50) | 120 | 500 | 1k | 10k~ |
| 6.3~63 | 0.1~47 | 0.80 | 1.00 | 1.35 | 1.57 | 2.00 |
| | 100~470 | 0.80 | 1.00 | 1.23 | 1.34 | 1.50 |
| | 1000~2200 | 0.80 | 1.00 | 1.10 | 1.13 | 1.15 |

Temperature coefficient

| Temperature | 45°C | 60°C | 70°C | 85°C | 105°C |
|-------------|------|------|------|------|-------|
| Coefficient | 1.50 | 1.30 | 1.45 | 1.30 | 1.00 |