

ZL SERIES
105°C High ripple current, Low impedance.
◆FEATURES

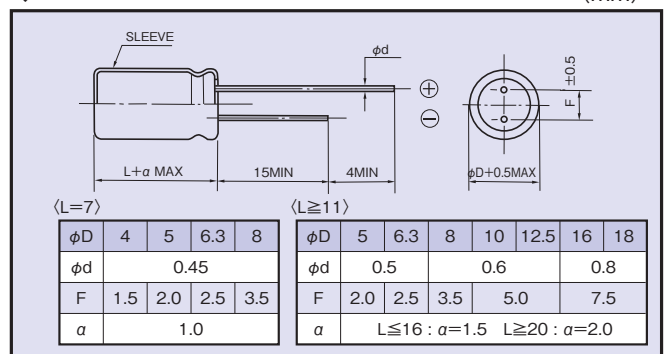
- Enabled high ripple current by a reduction of impedance at high frequency range.
- Load Life : 105°C 1000~5000hours.
- RoHS compliance.


◆SPECIFICATIONS

| Items | Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--------------------|-----------------------------------|--------------------|--|-----------------|------------------------------------|-----------|-----------------|-----|------------------|------|--------|------|-------|------|--------|------|---------|------------------|---|---|---|---|---|---|---|---|
| Category Temperature Range | -40~+105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage Range | 6.3~100V.DC | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% (20°C, 120Hz) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current(MAX) | I=0.01CV or 3µA whichever is greater. (After 2 minutes) I=Leakage Current(µA) C=Rated Capacitance(µF) V=Rated Voltage(V) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (tanδ) Dissipation Factor(MAX) | <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> <th>100</th> </tr> </thead> <tbody> <tr> <td>(20°C, 120Hz)</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> <td>0.08</td> </tr> </tbody> </table> <p>When rated capacitance is over 1000µF, tanδ shall be added 0.02 to the listed value with increase of every 1000µF.</p> | Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | (20°C, 120Hz) | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | | | | | | | | | |
| Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | | | | | | | | | | |
| (20°C, 120Hz) | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | | | | | | | | | | | | | | | | | | | | |
| Endurance | <p>After life test with rated ripple current at conditions stated in the table below, the capacitors shall meet the following requirements.</p> <table border="1"> <thead> <tr> <th>Capacitance Change</th> <th>Within ±25% of the initial value.</th> </tr> </thead> <tbody> <tr> <td>Dissipation Factor</td> <td>Not more than 200% of the specified value.</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than the specified value.</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Case Size</th> <th>Life Time (hrs)</th> </tr> </thead> <tbody> <tr> <td>L=7</td> <td>1000</td> </tr> <tr> <td rowspan="4">L≥11</td> <td>φD≤6.3</td> <td>2000</td> </tr> <tr> <td>φD= 8</td> <td>3000</td> </tr> <tr> <td>φD= 10</td> <td>4000</td> </tr> <tr> <td>φD≥12.5</td> <td>5000</td> </tr> </tbody> </table> | Capacitance Change | Within ±25% of the initial value. | Dissipation Factor | Not more than 200% of the specified value. | Leakage Current | Not more than the specified value. | Case Size | Life Time (hrs) | L=7 | 1000 | L≥11 | φD≤6.3 | 2000 | φD= 8 | 3000 | φD= 10 | 4000 | φD≥12.5 | 5000 | | | | | | | | |
| Capacitance Change | Within ±25% of the initial value. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | Not more than 200% of the specified value. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Not more than the specified value. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Case Size | Life Time (hrs) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L=7 | 1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L≥11 | φD≤6.3 | 2000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | φD= 8 | 3000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | φD= 10 | 4000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | φD≥12.5 | 5000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Stability Impedance Ratio(MAX) | <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> <th>100</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table> <p>(120Hz)</p> | Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | Z(-25°C)/Z(20°C) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | Z(-40°C)/Z(20°C) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | | | | | | | | | | |
| Z(-25°C)/Z(20°C) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | |
| Z(-40°C)/Z(20°C) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | | | | | | | |

◆DIMENSIONS

(mm)


◆MULTIPLIER FOR RIPPLE CURRENT

Frequency coefficient

| Frequency (Hz) | | 120 | 1k | 10k | 100k≤ |
|----------------|-------------|------|------|------|-------|
| Coefficient | 5.6~33µF | 0.42 | 0.70 | 0.90 | 1.00 |
| | 39~270µF | 0.50 | 0.73 | 0.92 | 1.00 |
| | 330~680µF | 0.55 | 0.77 | 0.94 | 1.00 |
| | 820~1800µF | 0.60 | 0.80 | 0.96 | 1.00 |
| | 2200~6800µF | 0.70 | 0.85 | 0.98 | 1.00 |

◆PART NUMBER

| | | | | | | |
|---------------|--------|-------------------|-----------------------|--------|--------------|-----------|
| □□□ | ZL | □□□□□ | □ | □□□ | □□ | D×L |
| Rated Voltage | Series | Rated Capacitance | Capacitance Tolerance | Option | Lead Forming | Case Size |

◆STANDARD SIZE

| Rated Voltage (V·DC) | Rated capacitance (μF) | Size φD×L(mm) | Rated ripple current (mA r.m.s./105°C, 100kHz) | (Ω MAX) Impedance | |
|----------------------|------------------------|---------------|--|-------------------|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| 6.3 (0J) | 39 | 4×7 | 130 | 0.85 | 2.6 |
| | 68 | 5×7 | 210 | 0.43 | 1.3 |
| | 150 | 6.3×7 | 300 | 0.23 | 0.69 |
| | 150 | 5×11 | 250 | 0.30 | 1.0 |
| | 220 | 8×7 | 380 | 0.15 | 0.45 |
| | 330 | 6.3×11 | 405 | 0.13 | 0.41 |
| | 560 | 8×11.5 | 760 | 0.072 | 0.22 |
| | 820 | 8×16 | 995 | 0.056 | 0.17 |
| | 1000 | 10×12.5 | 1030 | 0.053 | 0.16 |
| | 1200 | 8×20 | 1250 | 0.041 | 0.13 |
| | 1200 | 10×16 | 1430 | 0.038 | 0.12 |
| | 1500 | 10×20 | 1820 | 0.023 | 0.069 |
| | 2200 | 10×23 | 2150 | 0.022 | 0.066 |
| | 3300 | 12.5×20 | 2360 | 0.021 | 0.053 |
| | 3900 | 12.5×25 | 2770 | 0.018 | 0.045 |
| | 4700 | 12.5×30 | 3290 | 0.016 | 0.041 |
| 5600 | 12.5×35 | 3400 | 0.015 | 0.039 | |
| 5600 | 16×20 | 3140 | 0.018 | 0.045 | |
| 6800 | 16×25 | 3460 | 0.016 | 0.043 | |
| 10 (1A) | 27 | 4×7 | 130 | 0.89 | 2.7 |
| | 56 | 5×7 | 210 | 0.44 | 1.4 |
| | 100 | 5×11 | 250 | 0.30 | 1.0 |
| | 120 | 6.3×7 | 300 | 0.23 | 0.69 |
| | 180 | 8×7 | 380 | 0.15 | 0.45 |
| | 220 | 6.3×11 | 405 | 0.13 | 0.41 |
| | 470 | 8×11.5 | 760 | 0.072 | 0.22 |
| | 680 | 8×16 | 995 | 0.056 | 0.17 |
| | 680 | 10×12.5 | 1030 | 0.053 | 0.16 |
| | 1000 | 8×20 | 1250 | 0.041 | 0.13 |
| | 1000 | 10×16 | 1430 | 0.038 | 0.12 |
| | 1200 | 10×20 | 1820 | 0.023 | 0.069 |
| | 1500 | 10×23 | 2150 | 0.022 | 0.066 |
| | 2200 | 12.5×20 | 2360 | 0.021 | 0.053 |
| | 3300 | 12.5×25 | 2770 | 0.018 | 0.045 |
| | 3900 | 12.5×30 | 3290 | 0.016 | 0.041 |
| 3900 | 16×20 | 3140 | 0.018 | 0.045 | |
| 4700 | 12.5×35 | 3400 | 0.015 | 0.039 | |
| 5600 | 16×25 | 3460 | 0.016 | 0.043 | |
| 16 (1C) | 18 | 4×7 | 130 | 0.92 | 2.8 |
| | 33 | 5×7 | 210 | 0.45 | 1.4 |
| | 56 | 5×11 | 250 | 0.30 | 1.0 |
| | 68 | 6.3×7 | 300 | 0.24 | 0.72 |
| | 120 | 8×7 | 380 | 0.15 | 0.45 |
| | 120 | 6.3×11 | 405 | 0.13 | 0.41 |
| | 330 | 8×11.5 | 760 | 0.072 | 0.22 |
| | 470 | 8×16 | 995 | 0.056 | 0.17 |
| | 470 | 10×12.5 | 1030 | 0.053 | 0.16 |
| | 680 | 8×20 | 1250 | 0.041 | 0.13 |
| | 680 | 10×16 | 1430 | 0.038 | 0.12 |
| | 1000 | 10×20 | 1820 | 0.023 | 0.069 |
| | 1200 | 10×23 | 2150 | 0.022 | 0.066 |
| | 1500 | 12.5×20 | 2360 | 0.021 | 0.053 |
| | 2200 | 12.5×25 | 2770 | 0.018 | 0.045 |
| | 2700 | 12.5×30 | 3290 | 0.016 | 0.041 |
| 2700 | 16×20 | 3140 | 0.018 | 0.045 | |
| 3300 | 12.5×35 | 3400 | 0.015 | 0.039 | |
| 3900 | 16×25 | 3460 | 0.016 | 0.043 | |
| 25 (1E) | 15 | 4×7 | 130 | 0.94 | 2.9 |
| | 27 | 5×7 | 210 | 0.46 | 1.4 |
| | 47 | 5×11 | 250 | 0.30 | 1.0 |
| | 56 | 6.3×7 | 300 | 0.24 | 0.72 |
| | 100 | 8×7 | 380 | 0.15 | 0.45 |
| | 100 | 6.3×11 | 405 | 0.13 | 0.41 |
| | 220 | 8×11.5 | 760 | 0.072 | 0.22 |
| | 330 | 8×16 | 995 | 0.056 | 0.17 |
| | 330 | 10×12.5 | 1030 | 0.053 | 0.16 |
| | 470 | 8×20 | 1250 | 0.041 | 0.13 |
| | 470 | 10×16 | 1430 | 0.038 | 0.12 |
| | 680 | 10×20 | 1820 | 0.023 | 0.069 |
| | 820 | 10×23 | 2150 | 0.022 | 0.066 |
| | 1000 | 12.5×20 | 2360 | 0.021 | 0.053 |
| | 1500 | 12.5×25 | 2770 | 0.018 | 0.045 |
| | 1800 | 12.5×30 | 3290 | 0.016 | 0.041 |
| 1800 | 16×20 | 3140 | 0.018 | 0.045 | |
| 2200 | 12.5×35 | 3400 | 0.015 | 0.039 | |
| 2700 | 16×25 | 3460 | 0.016 | 0.043 | |

◆STANDARD SIZE

| Rated Voltage (V·DC) | Rated capacitance (μF) | Size φD×L(mm) | Rated ripple current (mA r.m.s./105°C, 100kHz) | (Ω MAX) Impedance | |
|-------------------------|------------------------|------------------|---|----------------------|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| 35 (1V) | 10 | 4×7 | 130 | 0.96 | 2.9 |
| | 18 | 5×7 | 210 | 0.47 | 1.5 |
| | 33 | 5×11 | 250 | 0.30 | 1.0 |
| | 39 | 6.3×7 | 300 | 0.25 | 0.75 |
| | 56 | 8×7 | 380 | 0.16 | 0.48 |
| | 56 | 6.3×11 | 405 | 0.13 | 0.41 |
| | 150 | 8×11.5 | 760 | 0.072 | 0.22 |
| | 220 | 8×16 | 995 | 0.056 | 0.17 |
| | 220 | 10×12.5 | 1030 | 0.053 | 0.16 |
| | 270 | 8×20 | 1250 | 0.041 | 0.13 |
| | 330 | 10×16 | 1430 | 0.038 | 0.12 |
| | 470 | 10×20 | 1820 | 0.023 | 0.069 |
| | 560 | 10×23 | 2150 | 0.022 | 0.066 |
| | 680 | 12.5×20 | 2360 | 0.021 | 0.053 |
| | 1000 | 12.5×25 | 2770 | 0.018 | 0.045 |
| | 1200 | 12.5×30 | 3290 | 0.016 | 0.041 |
| 1200 | 16×20 | 3140 | 0.018 | 0.045 | |
| 1500 | 12.5×35 | 3400 | 0.015 | 0.039 | |
| 1800 | 16×25 | 3460 | 0.016 | 0.043 | |
| 50 (1H) | 5.6 | 4×7 | 130 | 1.0 | 3.0 |
| | 10 | 5×7 | 210 | 0.50 | 1.5 |
| | 22 | 6.3×7 | 300 | 0.26 | 0.78 |
| | 22 | 5×11 | 238 | 0.34 | 1.18 |
| | 33 | 8×7 | 380 | 0.17 | 0.51 |
| | 56 | 6.3×11 | 385 | 0.14 | 0.50 |
| | 100 | 8×11.5 | 724 | 0.074 | 0.22 |
| | 120 | 8×16 | 950 | 0.061 | 0.18 |
| | 150 | 10×12.5 | 979 | 0.061 | 0.18 |
| | 180 | 8×20 | 1190 | 0.046 | 0.14 |
| | 220 | 10×16 | 1370 | 0.042 | 0.12 |
| | 270 | 10×20 | 1580 | 0.030 | 0.090 |
| | 330 | 10×23 | 1870 | 0.028 | 0.085 |
| | 470 | 12.5×20 | 2050 | 0.027 | 0.068 |
| | 560 | 12.5×25 | 2410 | 0.023 | 0.059 |
| | 680 | 12.5×30 | 2860 | 0.021 | 0.052 |
| 820 | 12.5×35 | 2960 | 0.019 | 0.051 | |
| 820 | 16×20 | 2730 | 0.023 | 0.059 | |
| 1000 | 16×25 | 3010 | 0.021 | 0.056 | |

| Rated Voltage (V·DC) | Rated capacitance (μF) | Size φD×L(mm) | Rated ripple current (mA r.m.s./105°C, 100kHz) | (Ω MAX) Impedance | |
|-------------------------|------------------------|------------------|---|----------------------|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| 63 (1J) | 15 | 5×11 | 165 | 0.88 | 3.5 |
| | 33 | 6.3×11 | 265 | 0.35 | 1.4 |
| | 56 | 8×11.5 | 500 | 0.22 | 0.88 |
| | 82 | 8×16 | 665 | 0.16 | 0.64 |
| | 82 | 10×12.5 | 685 | 0.15 | 0.60 |
| | 120 | 8×20 | 820 | 0.12 | 0.48 |
| | 120 | 10×16 | 945 | 0.11 | 0.44 |
| | 180 | 10×20 | 1100 | 0.080 | 0.32 |
| | 180 | 12.5×16 | 1135 | 0.082 | 0.27 |
| | 220 | 10×23 | 1300 | 0.073 | 0.29 |
| | 270 | 12.5×20 | 1495 | 0.060 | 0.20 |
| | 330 | 12.5×25 | 1850 | 0.043 | 0.14 |
| | 470 | 12.5×30 | 2250 | 0.039 | 0.13 |
| | 470 | 16×20 | 1990 | 0.045 | 0.14 |
| | 560 | 12.5×35 | 2450 | 0.033 | 0.11 |
| | 560 | 16×25 | 2550 | 0.032 | 0.096 |
| | 680 | 12.5×40 | 2780 | 0.029 | 0.096 |
| | 680 | 18×20 | 2450 | 0.038 | 0.10 |
| | 820 | 16×31.5 | 2810 | 0.026 | 0.078 |
| | 820 | 18×25 | 2780 | 0.031 | 0.084 |
| 1000 | 16×35.5 | 2835 | 0.021 | 0.063 | |
| 1000 | 18×31.5 | 3270 | 0.025 | 0.068 | |
| 1200 | 16×40 | 3340 | 0.019 | 0.057 | |
| 1200 | 18×35.5 | 3310 | 0.020 | 0.054 | |
| 1500 | 18×40 | 3420 | 0.018 | 0.049 | |
| 100 (2A) | 6.8 | 5×11 | 125 | 1.40 | 5.6 |
| | 15 | 6.3×11 | 205 | 0.57 | 2.3 |
| | 27 | 8×11.5 | 355 | 0.36 | 1.4 |
| | 39 | 8×16 | 450 | 0.25 | 1.0 |
| | 47 | 10×12.5 | 450 | 0.24 | 0.96 |
| | 56 | 8×20 | 565 | 0.19 | 0.76 |
| | 68 | 10×16 | 580 | 0.18 | 0.72 |
| | 82 | 10×20 | 750 | 0.13 | 0.52 |
| | 82 | 12.5×16 | 735 | 0.13 | 0.43 |
| | 100 | 10×23 | 880 | 0.12 | 0.48 |
| | 120 | 12.5×20 | 1045 | 0.094 | 0.31 |
| | 180 | 12.5×25 | 1195 | 0.071 | 0.23 |
| | 220 | 12.5×30 | 1410 | 0.063 | 0.21 |
| | 220 | 16×20 | 1295 | 0.071 | 0.21 |
| | 270 | 12.5×35 | 1560 | 0.052 | 0.17 |
| | 270 | 16×25 | 1600 | 0.053 | 0.16 |
| | 270 | 18×20 | 1470 | 0.069 | 0.19 |
| | 330 | 12.5×40 | 1700 | 0.046 | 0.15 |
| | 390 | 16×31.5 | 1750 | 0.041 | 0.12 |
| | 390 | 18×25 | 1620 | 0.049 | 0.13 |
| 470 | 16×35.5 | 1890 | 0.033 | 0.10 | |
| 470 | 18×31.5 | 1775 | 0.039 | 0.11 | |
| 560 | 16×40 | 2080 | 0.030 | 0.090 | |
| 560 | 18×35.5 | 2060 | 0.031 | 0.084 | |
| 680 | 18×40 | 2570 | 0.028 | 0.076 | |