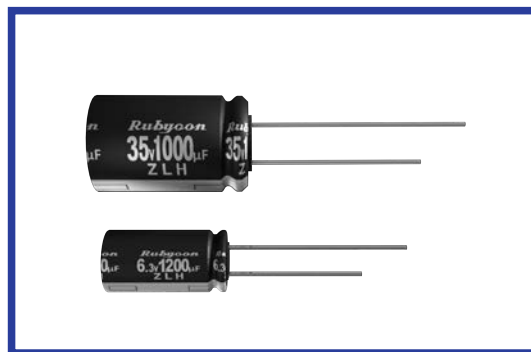


ZLH series

105°C 6000~10000時間品 小形化 長寿命 低インピーダンス品
105°C 6000~10000 hours, Miniaturized, Long Life, Low Impedance



◆規格表/SPECIFICATIONS

| 項目 Item | 特性 Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---------------------|-------------------------------|--|---------------------|----------------------|------------------------------|--|----------|---------------|-------------------------|---|---------------|-------------------|------|------|---------|-------|------|------|------|------|------|--|-------------------|---|---|---|---|---|---|---|---|---|--|
| カテゴリ温度範囲 Category Temperature Range | -40~+105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 定格電圧範囲 Rated Voltage Range | 6.3~100Vdc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 静電容量許容差 Capacitance Tolerance | ±20%(20°C, 120Hz) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 漏れ電流 Leakage Current (MAX) | I=0.01CV又は3µAのいずれか大なる値以下(定格電圧印加2分後) I=0.01CV or 3µA whichever is greater. (After 2 minutes) I=漏れ電流(µA) C=静電容量(µF) V=定格電圧(Vdc) Leakage Current Capacitance Rated Voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 損失角の正接(tan δ) Dissipation Factor (MAX) | <table border="1"> <tr> <td>定格電圧(Vdc) 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><td>80</td><td>100</td> <td>(20°C, 120Hz)</td> </tr> <tr> <td>tan δ</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><td>0.08</td> <td></td> </tr> </table> <p>1000µFを越えるものは1000µF増す毎に上表の値に0.02を加えた値とする。 When capacitance is over 1000µF, tan δ shall be added 0.02 to the listed value with increase of every 1000µF.</p> | | 定格電圧(Vdc) Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | (20°C, 120Hz) | tan δ | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | 0.08 | | | | | | | | | | | | |
| 定格電圧(Vdc) Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | (20°C, 120Hz) | | | | | | | | | | | | | | | | | | | | | | | | | |
| tan δ | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | 0.08 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 耐久性 Endurance | <p>105°C中で右表の時間定格電圧(リップル重畳)印加後、下記項目を満足すること。 After applying rated voltage with rated ripple current for specified time at 105°C, the capacitors shall meet the following requirements.</p> <table border="1"> <tr> <td>静電容量変化率 Capacitance Change</td> <td>初期値の±25%以内(6.3Vdc, 10Vdc: ±30%) Within ±25% of the initial value(6.3Vdc, 10Vdc: ±30%)</td> <td>ケースサイズ Case Size</td> <td>時間(hrs) Time(hrs)</td> </tr> <tr> <td>損失角の正接 Dissipation Factor</td> <td>規格値の200%以下 Not more than 200% of the specified value.</td> <td>φD ≤ 6.3</td> <td>6000</td> </tr> <tr> <td>漏れ電流 Leakage Current</td> <td>規格値以下 Not more than the specified value.</td> <td>φD = 8</td> <td>8000</td> </tr> <tr> <td></td> <td></td> <td>φD ≥ 10</td> <td>10000</td> </tr> </table> | | 静電容量変化率 Capacitance Change | 初期値の±25%以内(6.3Vdc, 10Vdc: ±30%) Within ±25% of the initial value(6.3Vdc, 10Vdc: ±30%) | ケースサイズ Case Size | 時間(hrs) Time(hrs) | 損失角の正接 Dissipation Factor | 規格値の200%以下 Not more than 200% of the specified value. | φD ≤ 6.3 | 6000 | 漏れ電流 Leakage Current | 規格値以下 Not more than the specified value. | φD = 8 | 8000 | | | φD ≥ 10 | 10000 | | | | | | | | | | | | | | | | | |
| 静電容量変化率 Capacitance Change | 初期値の±25%以内(6.3Vdc, 10Vdc: ±30%) Within ±25% of the initial value(6.3Vdc, 10Vdc: ±30%) | ケースサイズ Case Size | 時間(hrs) Time(hrs) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 損失角の正接 Dissipation Factor | 規格値の200%以下 Not more than 200% of the specified value. | φD ≤ 6.3 | 6000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 漏れ電流 Leakage Current | 規格値以下 Not more than the specified value. | φD = 8 | 8000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | φD ≥ 10 | 10000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 低温特性 Low Temperature Stability (インピーダンス比) Impedance Ratio (MAX) | <table border="1"> <tr> <td>定格電圧(Vdc) 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><td>80</td><td>100</td> <td>(120Hz)</td> </tr> <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><td>2</td> <td></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><td>3</td> <td></td> </tr> </table> | | 定格電圧(Vdc) Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | (120Hz) | Z(-25°C)/Z(+20°C) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | Z(-40°C)/Z(+20°C) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 定格電圧(Vdc) Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | (120Hz) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z(-25°C)/Z(+20°C) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z(-40°C)/Z(+20°C) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |

◆呼称方法/PART NUMBER

□□□
ZLH
□□□□□
M
□□□
□□
D x L
 定格電圧 シリーズ名 静電容量 静電容量許容差 副記号 リード加工記号 ケースサイズ
 Rated Voltage Series Capacitance Capacitance Tolerance Option Lead Forming Case Size

◆リップル電流補正係数/

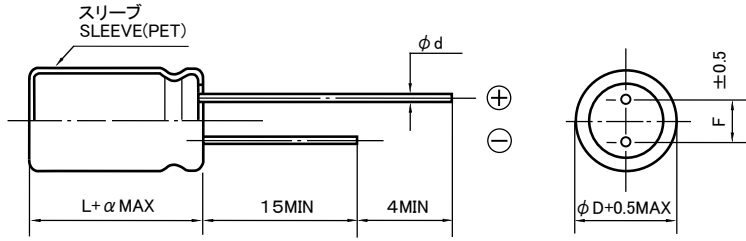
MULTIPLIER FOR RIPPLE CURRENT

| 周波数(Hz) Frequency | 120 | 1k | 10k | 100k ≤ | |
|----------------------|-------------|------|------|--------|------|
| 係数 Coefficient | 8.2~33µF | 0.42 | 0.70 | 0.90 | 1.00 |
| | 47~270µF | 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 |
| | 2200~8200µF | 0.70 | 0.85 | 0.98 | 1.00 |

◆副記号/OPTION

EFC: PETスリーブ PET Sleeve

◆寸法図／DIMENSIONS



(mm)

| | | | | | | | |
|----|-----------------------------------|-----|-----|-----|------|-----|----|
| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
| 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 ≥ 20 : α = 2.0 | | | | | | |

◆標準品一覧表／STANDARD SIZE

| 定格電圧 Rated Voltage (Vdc) | 静電容量 Capacitance (μF) | 外形寸法 Size φD × L (mm) | 定格リップル 電流 Rated Ripple Current | インピーダンス (Ω MAX) Impedance | |
|--------------------------------|-----------------------------|-----------------------------|---|---------------------------------|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| | | | | 6.3 | 220 |
| | 470 | 6.3×11 | 540 | 0.094 | 0.35 |
| | 820 | 8×11.5 | 945 | 0.056 | 0.19 |
| | 1200 | 8×16 | 1250 | 0.045 | 0.15 |
| | 1200 | 10×12.5 | 1330 | 0.039 | 0.14 |
| | 1500 | 8×20 | 1500 | 0.029 | 0.11 |
| | 1800 | 10×16 | 1760 | 0.028 | 0.10 |
| | 2200 | 10×20 | 1960 | 0.020 | 0.060 |
| | 2700 | 10×23 | 2250 | 0.018 | 0.054 |
| | 3900 | 12.5×20 | 2480 | 0.017 | 0.043 |
| | 4700 | 12.5×25 | 2900 | 0.015 | 0.038 |
| | 5600 | 12.5×30 | 3450 | 0.013 | 0.033 |
| | 6800 | 16×20 | 3250 | 0.015 | 0.038 |
| | 6800 | 12.5×35 | 3570 | 0.012 | 0.031 |
| | 8200 | 16×25 | 3630 | 0.013 | 0.035 |
| 10 | 150 | 5×11 | 345 | 0.22 | 0.80 |
| | 330 | 6.3×11 | 540 | 0.094 | 0.35 |
| | 680 | 8×11.5 | 945 | 0.056 | 0.19 |
| | 1000 | 8×16 | 1250 | 0.045 | 0.15 |
| | 1000 | 10×12.5 | 1330 | 0.039 | 0.14 |
| | 1500 | 8×20 | 1500 | 0.029 | 0.11 |
| | 1500 | 10×16 | 1760 | 0.028 | 0.10 |
| | 1800 | 10×20 | 1960 | 0.020 | 0.060 |
| | 2200 | 10×23 | 2250 | 0.018 | 0.054 |
| | 3300 | 12.5×20 | 2480 | 0.017 | 0.043 |
| | 3900 | 12.5×25 | 2900 | 0.015 | 0.038 |
| | 4700 | 12.5×30 | 3450 | 0.013 | 0.033 |
| | 4700 | 16×20 | 3250 | 0.015 | 0.038 |
| | 5600 | 12.5×35 | 3570 | 0.012 | 0.031 |
| | 6800 | 16×25 | 3630 | 0.013 | 0.035 |
| 16 | 100 | 5×11 | 345 | 0.22 | 0.80 |
| | 220 | 6.3×11 | 540 | 0.094 | 0.35 |
| | 470 | 8×11.5 | 945 | 0.056 | 0.19 |
| | 680 | 8×16 | 1250 | 0.045 | 0.15 |
| | 680 | 10×12.5 | 1330 | 0.039 | 0.14 |
| | 1000 | 8×20 | 1500 | 0.029 | 0.11 |
| | 1000 | 10×16 | 1760 | 0.028 | 0.10 |
| | 1500 | 10×20 | 1960 | 0.020 | 0.060 |
| | 1800 | 10×23 | 2250 | 0.018 | 0.054 |
| | 2200 | 12.5×20 | 2480 | 0.017 | 0.043 |
| | 2700 | 12.5×25 | 2900 | 0.015 | 0.038 |
| | 3300 | 12.5×30 | 3450 | 0.013 | 0.033 |
| | 3300 | 16×20 | 3250 | 0.015 | 0.038 |
| | 3900 | 12.5×35 | 3570 | 0.012 | 0.031 |
| | 4700 | 16×25 | 3630 | 0.013 | 0.035 |

Rated Ripple Current (mA r.m.s./105°C, 100kHz)

| 定格電圧 Rated Voltage (Vdc) | 静電容量 Capacitance (μF) | 外形寸法 Size φD × L (mm) | 定格リップル 電流 Rated Ripple Current | インピーダンス (Ω MAX) Impedance | |
|--------------------------------|-----------------------------|-----------------------------|---|---------------------------------|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| | | | | 25 | 68 |
| | 150 | 6.3×11 | 540 | 0.094 | 0.35 |
| | 330 | 8×11.5 | 945 | 0.056 | 0.19 |
| | 390 | 8×16 | 1250 | 0.045 | 0.15 |
| | 470 | 10×12.5 | 1330 | 0.039 | 0.14 |
| | 560 | 8×20 | 1500 | 0.029 | 0.11 |
| | 680 | 10×16 | 1760 | 0.028 | 0.10 |
| | 820 | 10×20 | 1960 | 0.020 | 0.060 |
| | 1000 | 10×23 | 2250 | 0.018 | 0.054 |
| | 1500 | 12.5×20 | 2480 | 0.017 | 0.043 |
| | 1800 | 12.5×25 | 2900 | 0.015 | 0.038 |
| | 2200 | 12.5×30 | 3450 | 0.013 | 0.033 |
| | 2200 | 16×20 | 3250 | 0.015 | 0.038 |
| | 2700 | 12.5×35 | 3570 | 0.012 | 0.031 |
| | 3300 | 16×25 | 3630 | 0.013 | 0.035 |
| 35 | 47 | 5×11 | 345 | 0.220 | 0.80 |
| | 100 | 6.3×11 | 540 | 0.094 | 0.35 |
| | 220 | 8×11.5 | 945 | 0.056 | 0.19 |
| | 270 | 8×16 | 1250 | 0.045 | 0.15 |
| | 330 | 10×12.5 | 1330 | 0.039 | 0.14 |
| | 390 | 8×20 | 1500 | 0.029 | 0.11 |
| | 470 | 10×16 | 1760 | 0.028 | 0.10 |
| | 560 | 10×20 | 1960 | 0.020 | 0.060 |
| | 680 | 10×23 | 2250 | 0.018 | 0.054 |
| | 1000 | 12.5×20 | 2480 | 0.017 | 0.043 |
| | 1200 | 12.5×25 | 2900 | 0.015 | 0.038 |
| | 1500 | 12.5×30 | 3450 | 0.013 | 0.033 |
| | 1500 | 16×20 | 3250 | 0.015 | 0.038 |
| | 1800 | 12.5×35 | 3570 | 0.012 | 0.031 |
| | 2200 | 16×25 | 3630 | 0.013 | 0.035 |
| 50 | 27 | 5×11 | 238 | 0.34 | 1.18 |
| | 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 | 0.09 |
| | 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 |

◆標準品一覧表／STANDARD SIZE

Rated Ripple Current (mA r.m.s./105°C, 100kHz)

| 定格電圧 Rated Voltage (Vdc) | 静電容量 Capacitance (μ F) | 外形寸法 Size ϕ D×L (mm) | 定格リップル 電流 RatedRipple Current | インピーダンス (Ω MAX) Impedance | |
|--------------------------------|-----------------------------------|---------------------------------|--|---|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| | | | | 63 | 18 |
| 47 | 6.3×11 | 278 | 0.35 | | 1.4 |
| 82 | 8×11.5 | 525 | 0.22 | | 0.88 |
| 100 | 8×16 | 688 | 0.16 | | 0.64 |
| 120 | 10×12.5 | 725 | 0.15 | | 0.6 |
| 150 | 8×20 | 861 | 0.12 | | 0.48 |
| 180 | 10×16 | 998 | 0.11 | | 0.44 |
| 270 | 10×20 | 1200 | 0.078 | | 0.31 |
| 270 | 12.5×16 | 1200 | 0.082 | | 0.27 |
| 330 | 10×23 | 1410 | 0.069 | | 0.28 |
| 390 | 12.5×20 | 1570 | 0.060 | | 0.19 |
| 470 | 12.5×25 | 1990 | 0.043 | | 0.14 |
| 560 | 12.5×30 | 2410 | 0.035 | | 0.13 |
| 560 | 16×20 | 2100 | 0.043 | | 0.14 |
| 680 | 12.5×35 | 2620 | 0.033 | | 0.11 |
| 820 | 12.5×40 | 2940 | 0.027 | | 0.09 |
| 820 | 16×25 | 2730 | 0.032 | | 0.096 |
| 820 | 18×20 | 2500 | 0.038 | | 0.100 |
| 1200 | 16×31.5 | 2990 | 0.024 | | 0.068 |
| 1200 | 18×25 | 2800 | 0.031 | | 0.084 |
| 1500 | 16×35.5 | 3040 | 0.021 | | 0.057 |
| 1500 | 18×31.5 | 3300 | 0.025 | | 0.068 |
| 1800 | 16×40 | 3570 | 0.019 | | 0.057 |
| 1800 | 18×35.5 | 3570 | 0.020 | | 0.054 |
| 2200 | 18×40 | 3670 | 0.018 | 0.049 | |
| 80 | 12 | 5×11 | 163 | 1.4 | 5.6 |
| | 33 | 6.3×11 | 267 | 0.57 | 2.3 |
| | 56 | 8×11.5 | 462 | 0.36 | 1.4 |
| | 68 | 8×16 | 585 | 0.25 | 1.0 |
| | 82 | 10×12.5 | 624 | 0.23 | 0.96 |
| | 100 | 8×20 | 735 | 0.19 | 0.76 |
| | 120 | 10×16 | 780 | 0.17 | 0.72 |
| | 180 | 10×20 | 1040 | 0.12 | 0.52 |
| | 180 | 12.5×16 | 975 | 0.13 | 0.43 |
| | 220 | 10×23 | 1170 | 0.11 | 0.47 |
| | 270 | 12.5×20 | 1430 | 0.085 | 0.31 |
| | 330 | 12.5×25 | 1620 | 0.060 | 0.23 |
| | 390 | 12.5×30 | 1950 | 0.051 | 0.21 |
| | 390 | 16×20 | 1750 | 0.058 | 0.21 |
| | 470 | 12.5×35 | 2140 | 0.043 | 0.17 |
| | 560 | 12.5×40 | 2340 | 0.036 | 0.15 |
| | 560 | 16×25 | 2210 | 0.044 | 0.16 |
| | 560 | 18×20 | 1950 | 0.054 | 0.18 |
| | 680 | 16×31.5 | 2400 | 0.033 | 0.12 |
| | 820 | 16×35.5 | 2600 | 0.029 | 0.10 |
| | 820 | 18×25 | 2270 | 0.038 | 0.13 |
| | 1000 | 16×40 | 2860 | 0.027 | 0.09 |
| | 1000 | 18×31.5 | 2470 | 0.031 | 0.11 |
| | 1200 | 18×35.5 | 2860 | 0.027 | 0.084 |
| 1500 | 18×40 | 3510 | 0.026 | 0.076 | |

| 定格電圧 Rated Voltage (Vdc) | 静電容量 Capacitance (μ F) | 外形寸法 Size ϕ D×L (mm) | 定格リップル 電流 RatedRipple Current | インピーダンス (Ω MAX) Impedance | |
|--------------------------------|-----------------------------------|---------------------------------|--|---|---------------|
| | | | | 20°C, 100kHz | -10°C, 100kHz |
| | | | | 100 | 8.2 |
| 18 | 6.3×11 | 267 | 0.57 | | 2.3 |
| 33 | 8×11.5 | 462 | 0.36 | | 1.4 |
| 47 | 8×16 | 585 | 0.25 | | 1.0 |
| 56 | 10×12.5 | 624 | 0.23 | | 0.96 |
| 68 | 8×20 | 735 | 0.19 | | 0.76 |
| 82 | 10×16 | 780 | 0.17 | | 0.72 |
| 100 | 10×20 | 1040 | 0.12 | | 0.52 |
| 100 | 12.5×16 | 975 | 0.13 | | 0.43 |
| 120 | 10×23 | 1170 | 0.11 | | 0.47 |
| 150 | 12.5×20 | 1430 | 0.085 | | 0.31 |
| 220 | 12.5×25 | 1620 | 0.060 | | 0.23 |
| 270 | 12.5×30 | 1950 | 0.051 | | 0.21 |
| 270 | 16×20 | 1750 | 0.058 | | 0.21 |
| 330 | 12.5×35 | 2140 | 0.043 | | 0.17 |
| 390 | 12.5×40 | 2340 | 0.036 | | 0.15 |
| 390 | 16×25 | 2210 | 0.044 | | 0.16 |
| 390 | 18×20 | 1950 | 0.054 | | 0.18 |
| 470 | 16×31.5 | 2400 | 0.033 | | 0.12 |
| 470 | 18×25 | 2270 | 0.038 | | 0.13 |
| 560 | 16×35.5 | 2600 | 0.029 | | 0.10 |
| 560 | 18×31.5 | 2470 | 0.031 | | 0.11 |
| 680 | 16×40 | 2860 | 0.027 | | 0.09 |
| 680 | 18×35.5 | 2860 | 0.027 | | 0.084 |
| 820 | 18×40 | 3510 | 0.026 | 0.076 | |

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