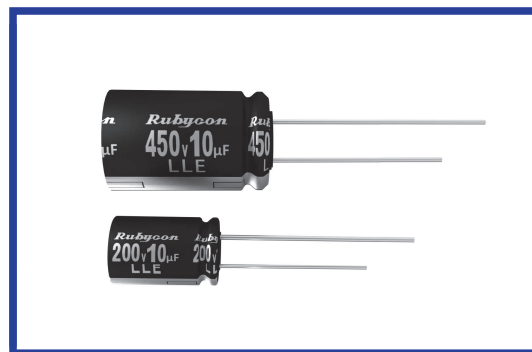


## LLE series

105°C 12000~20000時間品  
Load Life: 105°C 12000~20000 hours

・LED照明用電源回路に最適。  
For LED Lighting.



### ◆規格表／SPECIFICATIONS

| 項目 Item                                                                  | 特性 Characteristics                                                                                                                                                                                                                                                                                                                                                             |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|-------------------------------|-------------------------------------------------|-----|-----|-----|-----|---------------------------------------------------|------------------------------------------------------------|-----------------|------|------|------|------------------------------------------------------|------------------------------------------------------|-----------------|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|-------------------|-------|-----------------|-------|---------------------------|-------|
| カテゴリ温度範囲<br>Category Temperature Range                                   | -40～+105℃                                                                                                                                                                                                                                                                                                                                                                      |      |      |      |      | -25～+105℃                     |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 定格電圧範囲<br>Rated Voltage Range                                            | 160～400Vdc                                                                                                                                                                                                                                                                                                                                                                     |      |      |      |      | 450Vdc                        |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 静電容量許容差<br>Capacitance Tolerance                                         | ±20% (20℃, 120Hz)                                                                                                                                                                                                                                                                                                                                                              |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 漏れ電流<br>Leakage Current (MAX)                                            | <table><tr><th>CV ≤ 1000</th><th colspan="5">CV &gt; 1000</th></tr><tr><td>I=0.1CV+40 μ A以下(1分値)<br/>I=0.1CV+40 μ A (1minute)</td><td colspan="5">I=0.04CV+100 μ A以下(1分値)<br/>I=0.04CV+100 μ A (1minute)</td></tr><tr><td>I=0.03CV+15 μ A以下(5分値)<br/>I=0.03CV+15 μ A (5minutes)</td><td colspan="5">I=0.02CV+25 μ A以下(5分値)<br/>I=0.02CV+25 μ A (5minutes)</td></tr></table>    |      |      |      |      | CV ≤ 1000                     | CV > 1000                                       |     |     |     |     | I=0.1CV+40 μ A以下(1分値)<br>I=0.1CV+40 μ A (1minute) | I=0.04CV+100 μ A以下(1分値)<br>I=0.04CV+100 μ A (1minute)      |                 |      |      |      | I=0.03CV+15 μ A以下(5分値)<br>I=0.03CV+15 μ A (5minutes) | I=0.02CV+25 μ A以下(5分値)<br>I=0.02CV+25 μ A (5minutes) |                 |   |   |   | I=漏れ電流(μ A)<br>Leakage Current<br>C=静電容量(μ F)<br>Capacitance<br>V=定格電圧(Vdc)<br>Rated Voltage                                                                                                                                                  |                     |                      |                   |       |                 |       |                           |       |
| CV ≤ 1000                                                                | CV > 1000                                                                                                                                                                                                                                                                                                                                                                      |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| I=0.1CV+40 μ A以下(1分値)<br>I=0.1CV+40 μ A (1minute)                        | I=0.04CV+100 μ A以下(1分値)<br>I=0.04CV+100 μ A (1minute)                                                                                                                                                                                                                                                                                                                          |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| I=0.03CV+15 μ A以下(5分値)<br>I=0.03CV+15 μ A (5minutes)                     | I=0.02CV+25 μ A以下(5分値)<br>I=0.02CV+25 μ A (5minutes)                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 損失角の正接(tan δ)<br>Dissipation Factor (MAX)                                | <table><tr><th>定格電圧 (Vdc)<br/>Rated Voltage</th><th>160</th><th>200</th><th>250</th><th>400</th><th>450</th><td rowspan="2">(20℃, 120Hz)</td></tr><tr><th>tan δ</th><td>0.24</td><td>0.24</td><td>0.24</td><td>0.24</td><td>0.24</td></tr></table>                                                                                                                             |      |      |      |      |                               | 定格電圧 (Vdc)<br>Rated Voltage                     | 160 | 200 | 250 | 400 | 450                                               | (20℃, 120Hz)                                               | tan δ           | 0.24 | 0.24 | 0.24 | 0.24                                                 | 0.24                                                 |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 定格電圧 (Vdc)<br>Rated Voltage                                              | 160                                                                                                                                                                                                                                                                                                                                                                            | 200  | 250  | 400  | 450  | (20℃, 120Hz)                  |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| tan δ                                                                    | 0.24                                                                                                                                                                                                                                                                                                                                                                           | 0.24 | 0.24 | 0.24 | 0.24 |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 耐久性<br>Endurance                                                         | 105℃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。<br>After applying rated voltage with rated ripple current for specified time at 105℃, the capacitors shall meet the following requirements.                                                                                                                                                                                            |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
|                                                                          | <table><tr><th>静電容量変化率<br/>Capacitance Change</th><th colspan="5">初期値の±30%以内<br/>Within ±30% of the initial value.</th></tr><tr><th>損失角の正接<br/>Dissipation Factor</th><th colspan="5">規格値の 300% 以下<br/>Not more than 300% of the specified value.</th></tr><tr><th>漏れ電流<br/>Leakage Current</th><th colspan="5">規格値以下<br/>Not more than the specified value.</th></tr></table> |      |      |      |      | 静電容量変化率<br>Capacitance Change | 初期値の±30%以内<br>Within ±30% of the initial value. |     |     |     |     | 損失角の正接<br>Dissipation Factor                      | 規格値の 300% 以下<br>Not more than 300% of the specified value. |                 |      |      |      | 漏れ電流<br>Leakage Current                              | 規格値以下<br>Not more than the specified value.          |                 |   |   |   | <table><tr><th>ケースサイズ<br/>Case Size</th><th>時間(hrs)<br/>Time(hrs)</th></tr><tr><td>6.3x11, 8x9, 10x9</td><td>12000</td></tr><tr><td>8x11.5, 10x12.5</td><td>15000</td></tr><tr><td>10×16, 10×20<br/>φD ≥ 12.5</td><td>20000</td></tr></table> | ケースサイズ<br>Case Size | 時間(hrs)<br>Time(hrs) | 6.3x11, 8x9, 10x9 | 12000 | 8x11.5, 10x12.5 | 15000 | 10×16, 10×20<br>φD ≥ 12.5 | 20000 |
| 静電容量変化率<br>Capacitance Change                                            | 初期値の±30%以内<br>Within ±30% of the initial value.                                                                                                                                                                                                                                                                                                                                |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 損失角の正接<br>Dissipation Factor                                             | 規格値の 300% 以下<br>Not more than 300% of the specified value.                                                                                                                                                                                                                                                                                                                     |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 漏れ電流<br>Leakage Current                                                  | 規格値以下<br>Not more than the specified value.                                                                                                                                                                                                                                                                                                                                    |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| ケースサイズ<br>Case Size                                                      | 時間(hrs)<br>Time(hrs)                                                                                                                                                                                                                                                                                                                                                           |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 6.3x11, 8x9, 10x9                                                        | 12000                                                                                                                                                                                                                                                                                                                                                                          |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 8x11.5, 10x12.5                                                          | 15000                                                                                                                                                                                                                                                                                                                                                                          |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 10×16, 10×20<br>φD ≥ 12.5                                                | 20000                                                                                                                                                                                                                                                                                                                                                                          |      |      |      |      |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| 低温特性<br>Low Temperature Stability<br>(インピーダンス比)<br>Impedance Ratio (MAX) | <table><tr><th>定格電圧 (Vdc)<br/>Rated Voltage</th><th>160</th><th>200</th><th>250</th><th>400</th><th>450</th><td rowspan="3">(120Hz)</td></tr><tr><th>Z(-25℃)/Z(+20℃)</th><td>3</td><td>3</td><td>3</td><td>6</td><td>6</td></tr><tr><th>Z(-40℃)/Z(+20℃)</th><td>8</td><td>8</td><td>8</td><td>10</td><td>—</td></tr></table>                                                   |      |      |      |      |                               | 定格電圧 (Vdc)<br>Rated Voltage                     | 160 | 200 | 250 | 400 | 450                                               | (120Hz)                                                    | Z(-25℃)/Z(+20℃) | 3    | 3    | 3    | 6                                                    | 6                                                    | Z(-40℃)/Z(+20℃) | 8 | 8 | 8 | 10                                                                                                                                                                                                                                            | —                   |                      |                   |       |                 |       |                           |       |
| 定格電圧 (Vdc)<br>Rated Voltage                                              | 160                                                                                                                                                                                                                                                                                                                                                                            | 200  | 250  | 400  | 450  | (120Hz)                       |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| Z(-25℃)/Z(+20℃)                                                          | 3                                                                                                                                                                                                                                                                                                                                                                              | 3    | 3    | 6    | 6    |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |
| Z(-40℃)/Z(+20℃)                                                          | 8                                                                                                                                                                                                                                                                                                                                                                              | 8    | 8    | 10   | —    |                               |                                                 |     |     |     |     |                                                   |                                                            |                 |      |      |      |                                                      |                                                      |                 |   |   |   |                                                                                                                                                                                                                                               |                     |                      |                   |       |                 |       |                           |       |

### ◆呼称方法／PART NUMBER

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

### ◆副記号／OPTION

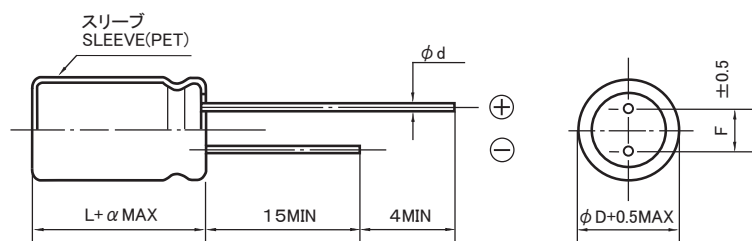
EFC : PETスリーブ PET Sleeve

### ◆リップル電流補正係数／MULTIPLIER FOR RIPPLE CURRENT

| 160~400Vdc        |           |     |     |        |     |
|-------------------|-----------|-----|-----|--------|-----|
| Frequency (Hz)    | 120       | 1k  | 10k | 100k ≤ |     |
| 係数<br>Coefficient | 1~5.6 µF  | 1.0 | 1.6 | 1.8    | 2.0 |
|                   | 6.8~18 µF | 1.0 | 1.5 | 1.7    | 1.9 |
|                   | 22~33 µF  | 1.0 | 1.4 | 1.6    | 1.8 |

| 450Vdc            |           |     |     |        |     |
|-------------------|-----------|-----|-----|--------|-----|
| Frequency (Hz)    | 120       | 1k  | 10k | 100k ≤ |     |
| 係数<br>Coefficient | 4.7~15 µF | 0.3 | 0.6 | 0.9    | 1.0 |
|                   | 22~68 µF  | 0.4 | 0.7 | 0.9    | 1.0 |

◆寸法図／DIMENSIONS



|          |      |     |     |      |     |    |
|----------|------|-----|-----|------|-----|----|
|          | (mm) |     |     |      |     |    |
| $\phi D$ | 6.3  | 8   | 10  | 12.5 | 16  | 18 |
| $\phi d$ | 0.5  | 0.6 |     |      | 0.8 |    |
| F        | 2.5  | 3.5 | 5.0 |      | 7.5 |    |
| $\alpha$ | 2.0  |     |     |      |     |    |

◆標準品一覧表／STANDARD SIZE

| 定格電圧<br>Rated Voltage<br>(Vdc) | 静電容量<br>Capacitance<br>(μF) | 外形寸法<br>Size<br>φD×L (mm) | 定格リプル電流<br>Rated Ripple |        |
|--------------------------------|-----------------------------|---------------------------|-------------------------|--------|
|                                |                             |                           | 120Hz                   | 100kHz |
| 160                            | 5.6                         | 6.3×11                    | 52                      | 104    |
|                                | 10                          | 8×9                       | 70                      | 133    |
|                                | 15                          | 8×11.5                    | 92                      | 174    |
|                                |                             | 10×9                      | 95                      | 180    |
|                                | 22                          | 10×12.5                   | 121                     | 217    |
|                                | 33                          | 10×16                     | 158                     | 284    |
| 200                            | 2.2                         | 6.3×11                    | 36                      | 72     |
|                                | 3.3                         | 6.3×11                    | 42                      | 84     |
|                                | 4.7                         | 6.3×11                    | 49                      | 98     |
|                                | 5.6                         | 8×9                       | 56                      | 112    |
|                                | 6.8                         | 8×9                       | 62                      | 117    |
|                                | 8.2                         | 8×9                       | 66                      | 125    |
|                                | 10                          | 8×11.5                    | 80                      | 152    |
|                                | 12                          | 10×9                      | 88                      | 167    |
|                                | 18                          | 10×12.5                   | 113                     | 214    |
|                                | 27                          | 10×16                     | 149                     | 268    |
| 250                            | 1.8                         | 6.3×11                    | 33                      | 66     |
|                                | 2.2                         | 6.3×11                    | 36                      | 72     |
|                                | 3.3                         | 6.3×11                    | 42                      | 84     |
|                                | 4.7                         | 8×9                       | 53                      | 106    |
|                                | 5.6                         | 8×11.5                    | 62                      | 124    |
|                                | 6.8                         | 8×11.5                    | 68                      | 129    |
|                                | 8.2                         | 10×9                      | 76                      | 144    |
|                                | 10                          | 10×12.5                   | 90                      | 171    |
|                                | 12                          | 10×12.5                   | 97                      | 184    |
|                                | 18                          | 10×16                     | 127                     | 241    |

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

| 定格電圧<br>Rated Voltage<br>(Vdc) | 静電容量<br>Capacitance<br>(μF) | 外形寸法<br>Size<br>φD×L (mm) | 定格リプル電流<br>Rated Ripple |        |
|--------------------------------|-----------------------------|---------------------------|-------------------------|--------|
|                                |                             |                           | 120Hz                   | 100kHz |
| 400                            | 1                           | 6.3×11                    | 24                      | 48     |
|                                | 1.2                         | 8×9                       | 28                      | 56     |
|                                | 1.5                         | 8×9                       | 30                      | 60     |
|                                | 1.8                         | 8×9                       | 33                      | 66     |
|                                | 2.2                         | 8×9                       | 36                      | 72     |
|                                |                             | 8×11.5                    | 40                      | 80     |
|                                | 2.7                         | 8×11.5                    | 43                      | 86     |
|                                | 3.3                         | 8×11.5                    | 47                      | 94     |
|                                |                             | 10×9                      | 48                      | 96     |
|                                | 3.9                         | 10×12.5                   | 57                      | 114    |
| 450                            | 4.7                         | 10×12.5                   | 61                      | 122    |
|                                | 6.8                         | 10×16                     | 85                      | 161    |
|                                | 4.7                         | 10×16                     | 54                      | 180    |
|                                |                             | 10×20                     | 66                      | 220    |
|                                | 6.8                         | 10×20                     | 84                      | 280    |
|                                | 8.2                         | 10×20                     | 84                      | 280    |
|                                | 10                          | 12.5×20                   | 135                     | 450    |
|                                | 15                          | 12.5×25                   | 180                     | 600    |
|                                | 22                          | 12.5×25                   | 240                     | 600    |
|                                |                             | 16×20                     | 292                     | 730    |
| 450                            | 33                          | 16×25                     | 392                     | 980    |
|                                |                             | 18×20                     | 312                     | 780    |
|                                | 47                          | 18×25                     | 480                     | 1200   |
|                                | 68                          | 18×31.5                   | 520                     | 1300   |