

# LE Series

- Suitable for long life products
- Downsize and long life
- Endurance with ripple current : 10,000 hours at 105°C
- Case size range :  $\phi 5 \times 11L$  to  $\phi 8 \times 11.5L$
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant

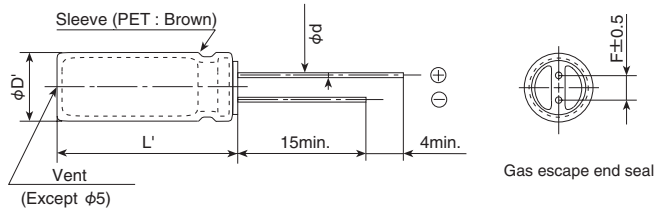


## ◆ SPECIFICATION

| Items   | Characteristics   |                                       |      |      |      |      |      |      |
|---|---|---------------------------------------|------|------|------|------|------|------|
| <b>Category</b>   | -40 to +105°C   |                                       |      |      |      |      |      |      |
| <b>Temperature Range</b>                                      |   |                                       |      |      |      |      |      |      |
| <b>Rated Voltage Range</b>                                    | 10 to 100V <sub>dc</sub>  |                                       |      |      |      |      |      |      |
| <b>Capacitance Tolerance</b>                                  | ±20% (M) (at 20°C, 120Hz)   |                                       |      |      |      |      |      |      |
| <b>Leakage Current</b>  | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)   |                                       |      |      |      |      |      |      |
| <b>Dissipation Factor (tan δ)</b>                             | Rated voltage (V <sub>dc</sub> )  | 10V                                   | 16V  | 25V  | 35V  | 50V  | 63V  | 100V |
|   | tan δ (Max.)  | 0.45                                  | 0.35 | 0.30 | 0.22 | 0.19 | 0.17 | 0.15 |
| <b>Low Temperature Characteristics (Max. Impedance Ratio)</b> | Rated voltage (V <sub>dc</sub> )  | 10V                                   | 16V  | 25V  | 35V  | 50V  | 63V  | 100V |
|   | Z(-25°C)/Z(20°C)  | 8                                     | 6    | 4    | 4    | 3    | 3    | 3    |
| <b>Endurance</b>  | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 10,000 hours at 105°C.  |                                       |      |      |      |      |      |      |
|   | Capacitance change  | ≤ ±25% of the initial value           |      |      |      |      |      |      |
|   | D.F. (tan δ)  | ≤ 300% of the initial specified value |      |      |      |      |      |      |
|   | Leakage current   | ≤ The initial specified value         |      |      |      |      |      |      |
| <b>Shelf Life</b>   | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                       |      |      |      |      |      |      |
|   | Capacitance change  | ≤ ±25% of the initial value           |      |      |      |      |      |      |
|   | D.F. (tan δ)  | ≤ 300% of the initial specified value |      |      |      |      |      |      |
|   | Leakage current   | ≤ The initial specified value         |      |      |      |      |      |      |

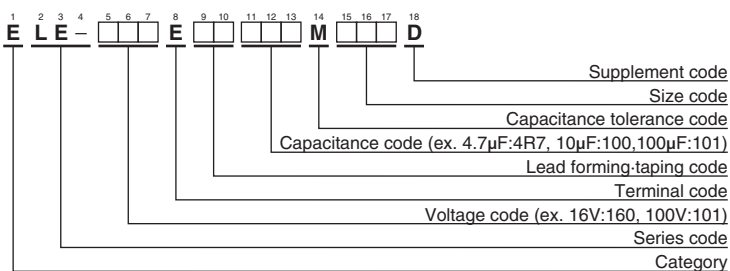
## ◆ DIMENSIONS [mm]

### ● Terminal Code : E



| $\phi D$  | 5                          | 6.3 | 8   |
|-----------|----------------------------|-----|-----|
| $\phi d$  | 0.5                        | 0.5 | 0.6 |
| F         | 2.0                        | 2.5 | 3.5 |
| $\phi D'$ | $\phi D + 0.5 \text{max.}$ |     |     |
| L'        | $L + 1.5 \text{max.}$      |     |     |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

**LE Series**
**◆ STANDARD RATINGS**

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-----------------------|----------|--------------------|-------|---|--------------------|
| 10                    | 100      | 5 × 11             | 0.45  | 130   | ELE-100E□□101ME11D |
|                       | 220      | 6.3 × 11           | 0.45  | 210   | ELE-100E□□221MF11D |
|                       | 330      | 8 × 11.5           | 0.45  | 330   | ELE-100E□□331MHB5D |
| 16                    | 47       | 5 × 11             | 0.35  | 130   | ELE-160E□□470ME11D |
|                       | 100      | 6.3 × 11           | 0.35  | 210   | ELE-160E□□101MF11D |
|                       | 220      | 8 × 11.5           | 0.35  | 330   | ELE-160E□□221MHB5D |
| 25                    | 33       | 5 × 11             | 0.30  | 130   | ELE-250E□□330ME11D |
|                       | 47       | 5 × 11             | 0.30  | 130   | ELE-250E□□470ME11D |
|                       | 100      | 6.3 × 11           | 0.30  | 210   | ELE-250E□□101MF11D |
| 35                    | 33       | 5 × 11             | 0.22  | 130   | ELE-350E□□330ME11D |
|                       | 47       | 6.3 × 11           | 0.22  | 210   | ELE-350E□□470MF11D |
|                       | 100      | 8 × 11.5           | 0.22  | 330   | ELE-350E□□101MHB5D |
| 50                    | 1.0      | 5 × 11             | 0.19  | 25  | ELE-500E□□1R0ME11D |
|                       | 2.2      | 5 × 11             | 0.19  | 35  | ELE-500E□□2R2ME11D |
|                       | 3.3      | 5 × 11             | 0.19  | 70  | ELE-500E□□3R3ME11D |
|                       | 4.7      | 5 × 11             | 0.19  | 80  | ELE-500E□□4R7ME11D |
|                       | 10       | 5 × 11             | 0.19  | 90  | ELE-500E□□100ME11D |
|                       | 22       | 5 × 11             | 0.19  | 110   | ELE-500E□□220ME11D |
|                       | 33       | 6.3 × 11           | 0.19  | 190   | ELE-500E□□330MF11D |
|                       | 47       | 6.3 × 11           | 0.19  | 190   | ELE-500E□□470MF11D |
| 100                   | 8 × 11.5 | 0.19               | 270   | ELE-500E□□101MHB5D                                      |                    |
| 63                    | 10       | 5 × 11             | 0.17  | 80  | ELE-630E□□100ME11D |
|                       | 22       | 6.3 × 11           | 0.17  | 170   | ELE-630E□□220MF11D |
|                       | 33       | 6.3 × 11           | 0.17  | 170   | ELE-630E□□330MF11D |
|                       | 47       | 8 × 11.5           | 0.17  | 240   | ELE-630E□□470MHB5D |
| 100                   | 1.0      | 5 × 11             | 0.15  | 40  | ELE-101E□□1R0ME11D |
|                       | 2.2      | 5 × 11             | 0.15  | 50  | ELE-101E□□2R2ME11D |
|                       | 3.3      | 5 × 11             | 0.15  | 60  | ELE-101E□□3R3ME11D |
|                       | 4.7      | 5 × 11             | 0.15  | 70  | ELE-101E□□4R7ME11D |
|                       | 10       | 6.3 × 11           | 0.15  | 150   | ELE-101E□□100MF11D |
|                       | 22       | 8 × 11.5           | 0.15  | 230   | ELE-101E□□220MHB5D |

□□ : Enter the appropriate lead forming or taping code.

**◆ RATED RIPPLE CURRENT MULTIPLIERS**

## ⊙ Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) |      |      |      |
|-----------------|---------------|------|------|------|
|                 | 120           | 1k   | 10k  | 100k |
| 1.0 to 10       | 0.42          | 0.60 | 0.80 | 1.00 |
| 22 to 33        | 0.55          | 0.75 | 0.90 | 1.00 |
| 47 to 330       | 0.70          | 0.85 | 0.95 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.