

# EC series

- Low ESR at high frequency range.
- Rated voltage : 2.5~16V
- Endurance : 2,000 hours at 105°C
- Applications : LCD Monitor, LCD-TV, D/A Inverter, SPS, D/D Converter, etc.
- RoHS Compliance.
- Halogen Free compliant



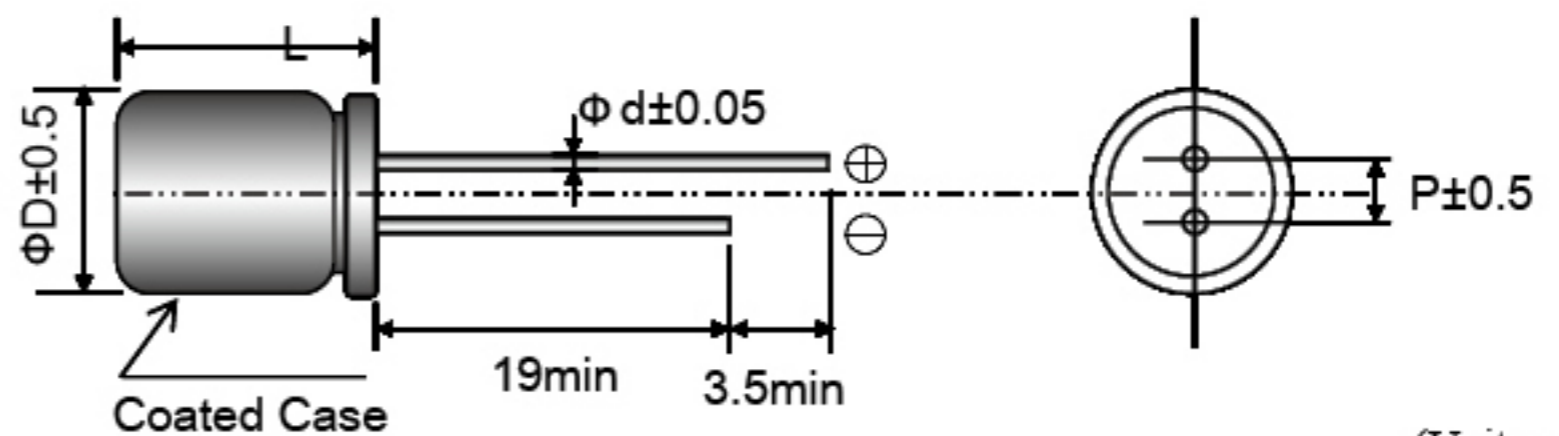
EC

## SPECIFICATIONS

| Items   | Conditions  | Characteristics  |
|---|---|--|
| Category Temperature Range                            | —   | -55 to +105°C  |
| Rated Voltage Range                                   | —   | 2.5 ~ 16V  |
| Capacitance Tolerance                                 | at 20°C, 120 Hz   | ±20% ( M )   |
| Surge Voltage   | at 105°C  | Rated voltage x 1.15v  |
| Leakage Current                                       | at 20°C after 2 minutes   | $I \leq 0.2CV$ or $300(\mu A)$ Whichever is greater measured,after 2minutes application of rated working voltage at +20°C.<br>Please see the attached characteristics list |
| Dissipation Factor ( tan δ )                          | at 20°C, 120 Hz   | Please see the attached characteristics list   |
| Characteristics of Impedance at low, high temperature | at -55°C, 100kHz  | $Z(-55^\circ C) / Z(+20^\circ C) \leq 1.25$  |
|   | at -25°C, 100kHz  | $Z(-25^\circ C) / Z(+20^\circ C) \leq 1.15$  |
| Endurance   | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.   | Appearance NO significant damage.  |
|   |   | Capacitance change $\leq \pm 20\%$ of the initial value.   |
|   |   | DF ( tan δ ) $\leq 150\%$ of the initial specified value.  |
|   |   | ESR $\leq 150\%$ of the initial specified value.   |
|   |   | Leakage current $\leq$ The initial specified value.  |
| Damp Heag (Steady State)                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to store 60°C, 90 to 95% RH for 1,000 hours, without DC applied.                                       | Appearance NO significant damage.  |
|   |   | Capacitance change $\leq \pm 20\%$ of the initial value.   |
|   |   | DF ( tan δ ) $\leq 150\%$ of the initial specified value.  |
|   |   | ESR $\leq 150\%$ of the initial specified value.   |
|   |   | Leakage current $\leq$ The initial specified value.  |
| Surge Voltage   | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltages specified at 105°C for 30 seconds through a protective resistor (R = 1kΩ) and discharge for 5 minutes 30 seconds. | Appearance NO significant damage.  |
|   |   | Capacitance change $\leq \pm 20\%$ of the initial value.   |
|   |   | DF ( tan δ ) $\leq 150\%$ of the initial specified value.  |
|   |   | ESR $\leq 150\%$ of the initial specified value.   |
|   |   | Leakage current $\leq$ The initial specified value.  |

※ Note : If any doubt arises, measure the leakage current after following voltage treatment.  
Voltage treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

## MARKING AND DIMENSIONS



(Unit:mm)

| Size | 5x6 - 8   | 6.3x6     | 6.3x8     | 6.3x11    | 8x8       | 8x12      | 8x16      | 8x20      | 10x12     | 10x16 - 20 |
|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| φD   | 5         | 6.3       | 6.3       | 6.3       | 8         | 8         | 8         | 8         | 10        | 10         |
| L    | L+1.0 max | L+1.0 max | L+1.5 max | L+1.0 max | L+1.5 max | L+1.0 max | L+1.0 max | L+1.5 max | L+1.0 max | L+1.5 max  |
| φd   | 0.45      | 0.45      | 0.5       | 0.5       | 0.6       | 0.6       | 0.6       | 0.6       | 0.6       | 0.6        |
| P    | 2         | 2.5       | 2.5       | 2.5       | 3.5       | 3.5       | 3.5       | 3.5       | 5.0       | 5.0        |

EC SERIES STANDARD CHARACTERISTICS LIST

| Rated Voltage (S.V.) | Cap (μF) | Size DxL | Leakage current (μA) max. ※2 | ESR (mΩ) max. 100k to 300kHz / 20°C | Rated Ripple Current (mA rms) 100kHz / 105°C | D.F. (tanδ) max. 120Hz / 20°C |
|----------------------|----------|----------|------------------------------|-------------------------------------|--|-------------------------------|
| 2.5<br>(2.9)         | 560      | 6.3×8    | 300                          | 8                                   | 5,080  | 0.12                          |
|                      | 560      | 8×8      | 300                          | 7                                   | 5,820  | 0.12                          |
|                      | 820      | 6.3×8    | 410                          | 8                                   | 5,080  | 0.12                          |
|                      | 1,200    | 8×8      | 600                          | 7                                   | 5,580  | 0.12                          |
|                      | 1,500    | 8×12     | 750                          | 7                                   | 5,820  | 0.12                          |
|                      | 2,700    | 10×12    | 1,350                        | 7                                   | 6,100  | 0.12                          |
| 4<br>(4.6)           | 560      | 6.3×8    | 448                          | 8                                   | 5,080  | 0.12                          |
|                      | 560      | 8×8      | 448                          | 7                                   | 5,580  | 0.12                          |
|                      | 680      | 8×8      | 544                          | 7                                   | 5,580  | 0.12                          |
|                      | 820      | 8×12     | 656                          | 7                                   | 5,820  | 0.12                          |
|                      | 2200     | 10×12    | 1,760                        | 7                                   | 6,100  | 0.12                          |
| 6.3<br>(7.2)         | 100      | 5×6      | 300                          | 30                                  | 1,500  | 0.12                          |
|                      | 270      | 5×8      | 340                          | 15                                  | 2,400  | 0.12                          |
|                      | 470      | 6.3×8    | 592                          | 10                                  | 4,500  | 0.12                          |
|                      | 560      | 6.3×8    | 706                          | 10                                  | 5,080  | 0.12                          |
|                      | 560      | 8×8      | 706                          | 10                                  | 5,580  | 0.12                          |
|                      | 1,000    | 8×12     | 1,260                        | 7                                   | 5,820  | 0.12                          |
|                      | 1,000    | 10×12    | 1,260                        | 7                                   | 6,200  | 0.12                          |
|                      | 2,200    | 10×12    | 2,772                        | 7                                   | 6,200  | 0.12                          |
| 10<br>(11.5)         | 220      | 6.3×8    | 440                          | 10                                  | 2,820  | 0.12                          |
|                      | 270      | 6.3×8    | 540                          | 10                                  | 3,580  | 0.12                          |
|                      | 560      | 8×8      | 1,120                        | 8                                   | 5,580  | 0.12                          |
|                      | 680      | 8×8      | 1,360                        | 9                                   | 5,580  | 0.12                          |
|                      | 820      | 8×12     | 1,640                        | 9                                   | 5,820  | 0.12                          |
|                      | 1,000    | 10×12    | 2,000                        | 9                                   | 6,100  | 0.12                          |
|                      | 1,500    | 10×12    | 3,000                        | 9                                   | 6,100  | 0.12                          |

※ 1. Capacitance tolerance : ±20% (M)  
 ※ 2. After 2 minutes



EC SERIES STANDARD CHARACTERISTICS LIST

| Rated Voltage (S.V.) | Cap (μF) | Size DxL | Leakage current (μA) max. ※2 | ESR (mΩ) max. 100k to 300kHz / 20°C | Rated Ripple Current (mA rms) 100kHz / 105°C | D.F. (tanδ) max. 120Hz / 20°C |
|----------------------|----------|----------|------------------------------|-------------------------------------|--|-------------------------------|
| 16 (18.4)            | 82       | 6.3×6    | 300                          | 30                                  | 2,200  | 0.12                          |
|                      | 100      | 6.3×6    | 320                          | 30                                  | 2,200  | 0.12                          |
|                      | 220      | 6.3×8    | 704                          | 15                                  | 3,500  | 0.12                          |
|                      | 270      | 6.3×8    | 864                          | 15                                  | 3,500  | 0.12                          |
|                      | 330      | 6.3×11   | 1,056                        | 15                                  | 3,500  | 0.12                          |
|                      | 470      | 8×8      | 1,504                        | 13                                  | 4,500  | 0.12                          |
|                      | 470      | 8×12     | 1,504                        | 13                                  | 5,400  | .12                           |
|                      | 470      | 10×12    | 1,504                        | 13                                  | 6,100  | 0.12                          |
|                      | 560      | 8×12     | 1,792                        | 16                                  | 5,400  | 0.12                          |
|                      | 680      | 10×12    | 2,176                        | 16                                  | 6,100  | 0.12                          |
|                      | 820      | 10×12    | 2,624                        | 10                                  | 6,100  | 0.12                          |
|                      | 1000     | 8×16     | 3,200                        | 10                                  | 6,100  | 0.10                          |
|                      | 1000     | 10×12    | 3,200                        | 10                                  | 6,100  | 0.10                          |
|                      | 1500     | 8x20     | 4,800                        | 8                                   | 6,100  | 0.10                          |
|                      | 1500     | 10x16    | 4,800                        | 8                                   | 6,500  | 0.10                          |
|                      | 1800     | 10x20    | 5,760                        | 8                                   | 6,800  | 0.10                          |
|                      | 2200     | 10×20    | 7,040                        | 8                                   | 6,800  | 0.10                          |

※ 1. Capacitance tolerance : ±20% (M)

※ 2. After 2 minutes

FREQUENCY COEFFICIENT FOR RIPPLE CURRENT

| Frequency   | 120Hz ≤ f < 1kHz | 1kHz ≤ f < 10kHz | 10kHz ≤ f < 100kHz | 100kHz ≤ f < 500kHz |
|-------------|------------------|------------------|--------------------|---------------------|
| Coefficient | 0.05             | 0.3              | 0.7                | 1                   |

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