

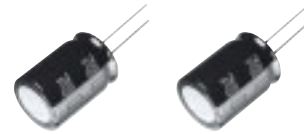
### Radial Lead Type

Series: **ED** Type: **A**

\*Propose EE series for New design

#### ■ Features

- High ripple current (at high frequency)
- Endurance : 105 °C 8000 h to 10000 h
- Including low profile products (20 mm height)
- RoHS directive compliant



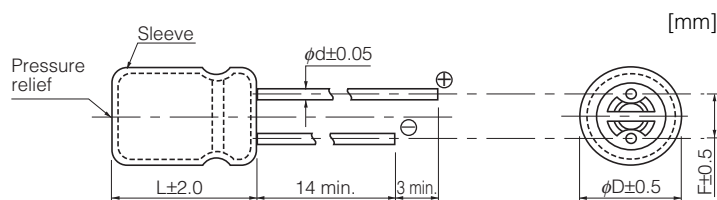
#### ■ Specifications

|                       |                                                                                                                                                                                                                                                                                                                                       |                                    |  |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--|
| Category Temp. Range  | -25 °C to +105 °C                                                                                                                                                                                                                                                                                                                     |                                    |  |
| Rated W.V. Range      | 160 V .DC to 450 V .DC                                                                                                                                                                                                                                                                                                                |                                    |  |
| Nominal Cap. Range    | 10 μF to 330 μF                                                                                                                                                                                                                                                                                                                       |                                    |  |
| Capacitance Tolerance | ±20 % (120 Hz/+20 °C)                                                                                                                                                                                                                                                                                                                 |                                    |  |
| DC Leakage Current    | I ≤ 0.06 CV +10 (μA) After 2 minutes application of rated working voltage at +20 °C                                                                                                                                                                                                                                                   |                                    |  |
| tan δ                 | Please see the attached standard products list                                                                                                                                                                                                                                                                                        |                                    |  |
| Endurance             | After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage),when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below.<br>Duration : ϕ10=8000 hours,<br>ϕ12.5 to ϕ18=10000 hours |                                    |  |
|                       | Capacitance change                                                                                                                                                                                                                                                                                                                    | ±20 % of initial measured value    |  |
|                       | tan δ                                                                                                                                                                                                                                                                                                                                 | ≤ 200 % of initial specified value |  |
|                       | DC leakage current                                                                                                                                                                                                                                                                                                                    | ≤ initial specified value          |  |
| Shelf Life            | After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)                                                                                                                                           |                                    |  |

#### ■ Ripple current Frequency Coefficient

| Frequency (Hz) | 50 ≤ f < 120 | 120 ≤ f < 300 | 300 ≤ f < 1 k | 1 k ≤ f < 10 k | 10 k ≤ f < 30 k | 30 k ≤ f ≤ 100 k |
|----------------|--------------|---------------|---------------|----------------|-----------------|------------------|
| Cap. (μF)      |              |               |               |                |                 |                  |
| Cap. < 100 μF  | 0.30         | 0.40          | 0.55          | 0.70           | 0.90            | 1.00             |
| 100 μF ≤ Cap.  | 0.35         | 0.45          | 0.60          | 0.75           | 0.90            | 1.00             |

#### ■ Dimensions in mm (not to scale)



|                    | (mm) |      |     |     |
|--------------------|------|------|-----|-----|
| Body Dia. $\phi D$ | 10   | 12.5 | 16  | 18  |
| Lead Dia. $\phi d$ | 0.6  | 0.6  | 0.8 | 0.8 |
| Lead space F       | 5.0  | 5.0  | 7.5 | 7.5 |

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.  
Should a safety concern arise regarding this product, please be sure to contact us immediately.

02 Oct. 2010

### Standard Products

| W.V. | Cap.<br>(±20 %) | Case size |        | Specification                                              |                               |                | Lead Length  |            |              | Part No.       | Min. Packaging Q'ty |        |
|------|-----------------|-----------|--------|------------------------------------------------------------|-------------------------------|----------------|--------------|------------|--------------|----------------|---------------------|--------|
|      |                 | Dia.      | Length | Ripple<br>Current<br>(100 kHz)<br>(+105 °C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endur-<br>ance | Lead<br>Dia. | Lead Space |              |                | Straight<br>Leads   | Taping |
|      |                 |           |        |                                                            |                               |                |              | Straight   | Taping<br>*B |                |                     |        |
| (V)  | (μF)            | (mm)      | (mm)   |                                                            |                               | (hours)        | (mm)         | (mm)       | (mm)         |                | (pcs.)              | (pcs.) |
| 160  | 22              | 10        | 20     | 500                                                        | 0.15                          | 8000           | 0.6          | 5.0        | 5.0          | EEUED2C220( )  | 200                 | 500    |
|      | 33              | 10        | 20     | 580                                                        | 0.15                          | 8000           | 0.6          | 5.0        | 5.0          | EEUED2C330( )  | 200                 | 500    |
|      | 47              | 10        | 20     | 750                                                        | 0.15                          | 8000           | 0.6          | 5.0        | 5.0          | EEUED2C470( )  | 200                 | 500    |
|      | 68              | 12.5      | 20     | 950                                                        | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2C680( )  | 200                 | 500    |
|      | 82              | 12.5      | 25     | 1060                                                       | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2C820( )  | 200                 | 500    |
|      | 100             | 12.5      | 25     | 1170                                                       | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2C101( )  | 200                 | 500    |
|      |                 | 16        | 20     | 1280                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2C101S( ) | 100                 | 250    |
|      | 150             | 16        | 25     | 1400                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2C151( )  | 100                 | 250    |
|      |                 | 18        | 20     | 1400                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2C151S( ) | 100                 | 250    |
|      | 220             | 16        | 31.5   | 1700                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2C221     | 100                 |        |
|      |                 | 18        | 25     | 1500                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2C221S( ) | 100                 | 250    |
|      | 330             | 18        | 31.5   | 2000                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2C331     | 50                  |        |
| 200  | 22              | 10        | 20     | 600                                                        | 0.15                          | 8000           | 0.6          | 5.0        | 5.0          | EEUED2D220( )  | 200                 | 500    |
|      | 33              | 10        | 20     | 650                                                        | 0.15                          | 8000           | 0.6          | 5.0        | 5.0          | EEUED2D330( )  | 200                 | 500    |
|      | 47              | 12.5      | 20     | 790                                                        | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2D470( )  | 200                 | 500    |
|      | 68              | 12.5      | 25     | 950                                                        | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2D680( )  | 200                 | 500    |
|      |                 | 16        | 20     | 1000                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2D680S( ) | 100                 | 250    |
|      | 82              | 16        | 20     | 1100                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2D820S( ) | 100                 | 250    |
|      | 100             | 16        | 25     | 1300                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2D101( )  | 100                 | 250    |
|      |                 | 18        | 20     | 1280                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2D101S( ) | 100                 | 250    |
|      | 150             | 16        | 25     | 1400                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2D151( )  | 100                 | 250    |
|      | 220             | 18        | 31.5   | 2000                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2D221     | 50                  |        |
|      | 330             | 18        | 40     | 2400                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2D331     | 50                  |        |
|      | 250             | 22        | 10     | 20                                                         | 560                           | 0.15           | 8000         | 0.6        | 5.0          | 5.0            | EEUED2E220( )       | 200    |
| 33   |                 | 12.5      | 20     | 710                                                        | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2E330( )  | 200                 | 500    |
| 47   |                 | 12.5      | 25     | 920                                                        | 0.15                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2E470( )  | 200                 | 500    |
|      |                 | 16        | 20     | 990                                                        | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2E470S( ) | 100                 | 250    |
| 68   |                 | 16        | 20     | 1000                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2E680S( ) | 100                 | 250    |
| 82   |                 | 16        | 25     | 1200                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2E820( )  | 100                 | 250    |
|      |                 | 18        | 20     | 1200                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2E820S( ) | 100                 | 250    |
| 100  |                 | 16        | 31.5   | 1500                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2E101     | 100                 |        |
|      |                 | 18        | 25     | 1500                                                       | 0.15                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2E101S( ) | 100                 | 250    |
| 150  |                 | 18        | 31.5   | 1800                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2E151     | 50                  |        |
| 220  |                 | 18        | 40     | 2100                                                       | 0.15                          | 10000          | 0.8          | 7.5        |              | EEUED2E221     | 50                  |        |
| 350  |                 | 10        | 10     | 20                                                         | 350                           | 0.20           | 8000         | 0.6        | 5.0          | 5.0            | EEUED2V100( )       | 200    |
|      | 22              | 12.5      | 20     | 480                                                        | 0.20                          | 10000          | 0.6          | 5.0        | 5.0          | EEUED2V220( )  | 200                 | 500    |
|      | 33              | 16        | 20     | 640                                                        | 0.20                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2V330S( ) | 100                 | 250    |
|      | 47              | 16        | 25     | 800                                                        | 0.20                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2V470( )  | 100                 | 250    |
|      |                 | 18        | 20     | 800                                                        | 0.20                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2V470S( ) | 100                 | 250    |
|      | 68              | 16        | 31.5   | 1100                                                       | 0.20                          | 10000          | 0.8          | 7.5        |              | EEUED2V680     | 100                 |        |
|      |                 | 18        | 25     | 1000                                                       | 0.20                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2V680S( ) | 100                 | 250    |
|      | 82              | 18        | 25     | 1100                                                       | 0.20                          | 10000          | 0.8          | 7.5        | 7.5          | EEUED2V820S( ) | 100                 | 250    |
|      | 100             | 18        | 31.5   | 1200                                                       | 0.20                          | 10000          | 0.8          | 7.5        |              | EEUED2V101     | 50                  |        |

Endurance : 105 °C ϕ10=8000 h, ϕ12.5 to ϕ18=10000 h

When requesting taped product, please put the letter "B" between the "( )". Lead wire pitch B=5 mm, 7.5 mm.

The taping dimensions are explained on p.178 of our Catalog. Please use it as a reference guide.

■ Standard Products

| W.V. | Cap.<br>(±20 %) | Case size |        | Specification                                           |                               |                               | Lead Length |            |              | Part No.       | Min. Packaging Q'ty |        |
|------|-----------------|-----------|--------|---------------------------------------------------------|-------------------------------|-------------------------------|-------------|------------|--------------|----------------|---------------------|--------|
|      |                 | Dia.      | Length | Ripple Current<br>(100 kHz)<br>(+105 °C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endur-<br>ance<br><br>(hours) | Lead Dia.   | Lead Space |              |                | Straight Leads      | Taping |
|      |                 |           |        |                                                         |                               |                               |             | Straight   | Taping<br>*B |                |                     |        |
| (V)  | (μF)            | (mm)      | (mm)   | (mA r.m.s.)                                             |                               |                               | (mm)        | (mm)       | (mm)         |                | (pcs.)              | (pcs.) |
| 400  | 10              | 10        | 20     | 300                                                     | 0.24                          | 8000                          | 0.6         | 5.0        | 5.0          | EEUED2G100( )  | 200                 | 500    |
|      | 15              | 12.5      | 20     | 410                                                     | 0.24                          | 10000                         | 0.6         | 5.0        | 5.0          | EEUED2G150( )  | 200                 | 500    |
|      | 22              | 12.5      | 25     | 500                                                     | 0.24                          | 10000                         | 0.6         | 5.0        | 5.0          | EEUED2G220( )  | 200                 | 500    |
|      |                 | 16        | 20     | 600                                                     | 0.24                          | 10000                         | 0.8         | 7.5        | 7.5          | EEUED2G220S( ) | 100                 | 250    |
|      | 33              | 16        | 20     | 730                                                     | 0.24                          | 10000                         | 0.8         | 7.5        | 7.5          | EEUED2G330S( ) | 100                 | 250    |
|      | 47              | 16        | 25     | 840                                                     | 0.24                          | 10000                         | 0.8         | 7.5        | 7.5          | EEUED2G470( )  | 100                 | 250    |
|      |                 | 18        | 20     | 840                                                     | 0.24                          | 10000                         | 0.8         | 7.5        | 7.5          | EEUED2G470S( ) | 100                 | 250    |
|      | 68              | 18        | 31.5   | 1200                                                    | 0.24                          | 10000                         | 0.8         | 7.5        |              | EEUED2G680     | 50                  |        |
| 450  | 82              | 18        | 40     | 1500                                                    | 0.24                          | 10000                         | 0.8         | 7.5        |              | EEUED2G820     | 50                  |        |
|      | 10              | 12.5      | 20     | 350                                                     | 0.24                          | 10000                         | 0.6         | 5.0        | 5.0          | EEUED2W100( )  | 200                 | 500    |
|      | 15              | 12.5      | 25     | 560                                                     | 0.24                          | 10000                         | 0.6         | 5.0        | 5.0          | EEUED2W150( )  | 200                 | 500    |
|      | 22              | 16        | 20     | 680                                                     | 0.24                          | 10000                         | 0.8         | 7.5        | 7.5          | EEUED2W220S( ) | 100                 | 250    |
|      | 33              | 16        | 31.5   | 850                                                     | 0.24                          | 10000                         | 0.8         | 7.5        |              | EEUED2W330     | 100                 |        |
|      |                 | 18        | 25     | 850                                                     | 0.24                          | 10000                         | 0.8         | 7.5        | 7.5          | EEUED2W330S( ) | 100                 | 250    |
|      | 47              | 18        | 31.5   | 1000                                                    | 0.24                          | 10000                         | 0.8         | 7.5        |              | EEUED2W470     | 50                  |        |
|      | 68              | 18        | 40     | 1300                                                    | 0.24                          | 10000                         | 0.8         | 7.5        |              | EEUED2W680     | 50                  |        |

Endurance : 105 °C ϕ10=8000 h, ϕ12.5 to ϕ18=10000 h

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