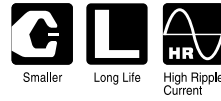
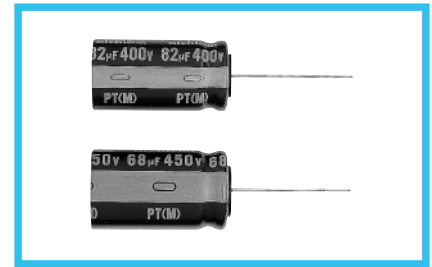
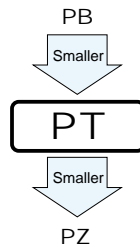


**PT** series Miniature Sized, High Ripple Current, Long Life



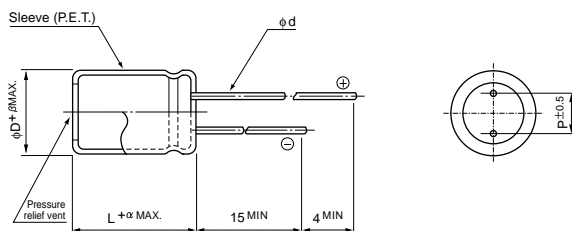
- High ripple current.
- Suited for ballast application.
- Compliant to the RoHS directive (2002/95/EC).



## Specifications

| Item                            | Performance Characteristics   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
|---------------------------------|---|--------------------|--|-------|---|-----------------|---|-----|---------------------------------|-----------------|------|------|------|------|------|
| Category Temperature Range      | -25 to +105°C   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Rated Voltage Range             | 200 to 450V   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Rated Capacitance Range         | 15 to 820µF   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Capacitance Tolerance           | ±20% at 120Hz, 20°C   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Leakage Current                 | After 2 minutes' application of rated voltage, leakage current is not more than 0.06CV+10 (µA)  |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Tangent of loss angle (tan δ)   | Measurement frequency : 120Hz, Temperature : 20°C   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
|                                 | <table border="1"> <tr> <td>Rated voltage (V)</td> <td>200</td> <td>220</td> <td>250</td> <td>400</td> <td>420</td> <td>450</td> </tr> <tr> <td>tan δ (MAX.)</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> </tr> </table>  | Rated voltage (V)  | 200  | 220   | 250   | 400             | 420   | 450 | tan δ (MAX.)                    | 0.12            | 0.12 | 0.12 | 0.15 | 0.20 | 0.20 |
| Rated voltage (V)               | 200   | 220                | 250  | 400   | 420   | 450             |   |     |                                 |                 |      |      |      |      |      |
| tan δ (MAX.)                    | 0.12  | 0.12               | 0.12   | 0.15  | 0.20  | 0.20            |   |     |                                 |                 |      |      |      |      |      |
| Stability at Low Temperature    | Measurement frequency : 120Hz   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
|                                 | <table border="1"> <tr> <td>Rated voltage (V)</td> <td>200</td> <td>220</td> <td>250</td> <td>400</td> <td>420</td> <td>450</td> </tr> <tr> <td>Impedance ratio ZT / Z20 (MAX.)</td> <td>Z-25°C / Z+20°C</td> <td>3</td> <td>3</td> <td>3</td> <td>8</td> <td>8</td> <td>8</td> </tr> </table>  | Rated voltage (V)  | 200  | 220   | 250   | 400             | 420   | 450 | Impedance ratio ZT / Z20 (MAX.) | Z-25°C / Z+20°C | 3    | 3    | 3    | 8    | 8    |
| Rated voltage (V)               | 200   | 220                | 250  | 400   | 420   | 450             |   |     |                                 |                 |      |      |      |      |      |
| Impedance ratio ZT / Z20 (MAX.) | Z-25°C / Z+20°C   | 3                  | 3  | 3     | 8   | 8               | 8   |     |                                 |                 |      |      |      |      |      |
| Endurance                       | <p>The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 5000 hours at 105°C, the peak voltage shall not exceed the rated voltage.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of the initial capacitance value</td> </tr> <tr> <td>tan δ</td> <td>200% or less than the initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Less than or equal to the initial specified value</td> </tr> </table> | Capacitance change | Within ±20% of the initial capacitance value | tan δ | 200% or less than the initial specified value | Leakage current | Less than or equal to the initial specified value |     |                                 |                 |      |      |      |      |      |
| Capacitance change              | Within ±20% of the initial capacitance value  |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| tan δ                           | 200% or less than the initial specified value   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Leakage current                 | Less than or equal to the initial specified value   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Shelf Life                      | After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |
| Marking                         | Printed with white color letter on dark brown sleeve.   |                    |  |       |   |                 |   |     |                                 |                 |      |      |      |      |      |

## Radial Lead Type



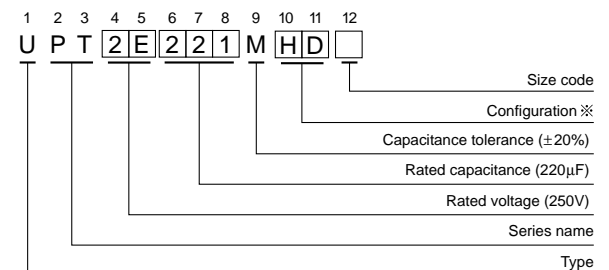
|    | (mm) |      |     |     |      |      |      |
|----|------|------|-----|-----|------|------|------|
| φD | 10   | 12.5 | 16  | 18  | 20   | 22   | 25   |
| P  | 5.0  | 5.0  | 7.5 | 7.5 | 10.0 | 10.0 | 12.5 |
| φd | 0.6  | 0.6  | 0.8 | 0.8 | 1.0  | 1.0  | 1.0  |
| β  | 0.5  | 0.5  | 0.5 | 0.5 | 0.5  | 1.0  | 1.0  |

\* In case L > 25 for the φ12.5 dia. unit, lead dia. φ d = 0.8mm.

|   |                |
|---|----------------|
| α | (φD < 20): 1.5 |
|   | (φD ≥ 20): 2.0 |

• Please refer to page 20 about the end seal configuration.

## Type numbering system (Example : 250V 220µF)



\* Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|--|
| 10         | PD                                     |
| 12.5 to 18 | HD                                     |
| 20 to 25   | RD                                     |

Please refer to page 20, 21, 22 about the formed or taped product spec.  
 Please refer to page 4 for the minimum order quantity.

- Dimension table in next page.

## ■ Dimensions

| Cap | V<br>Code | 200         |      | 220         |      | 250         |      | 400         |      | 420         |      | 450                       |      |
|-----|-----------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|---------------------------|------|
|     |           | 2D          |      | 2P          |      | 2E          |      | 2G          |      | W6          |      | 2W                        |      |
| 15  | 150       |             |      |             |      |             |      |             |      |             |      | 10 × 31.5                 | 0.15 |
| 18  | 180       |             |      |             |      |             |      |             |      | 10 × 31.5   | 0.17 | 12.5 × 25                 | 0.18 |
| 22  | 220       |             |      |             |      |             |      | 10 × 31.5   | 0.21 | 12.5 × 25   | 0.20 | 12.5 × 31.5               | 0.22 |
| 27  | 270       |             |      |             |      |             |      | 12.5 × 25   | 0.24 | 12.5 × 31.5 | 0.24 | 12.5 × 31.5               | 0.25 |
| 33  | 330       |             |      |             |      |             |      | 12.5 × 31.5 | 0.29 | 12.5 × 31.5 | 0.27 | 12.5 × 35.5               | 0.28 |
| 39  | 390       |             |      |             |      |             |      | 12.5 × 31.5 | 0.32 | 12.5 × 35.5 | 0.31 | 12.5 × 40                 | 0.32 |
| 47  | 470       |             |      |             |      | 10 × 31.5   | 0.27 | 12.5 × 35.5 | 0.37 | 12.5 × 40   | 0.36 | 16 × 31.5                 | 0.38 |
| 56  | 560       |             |      | 10 × 31.5   | 0.29 | 12.5 × 25   | 0.31 | 12.5 × 40   | 0.42 | 16 × 31.5   | 0.43 | 16 × 35.5                 | 0.44 |
| 68  | 680       | 10 × 31.5   | 0.35 | 12.5 × 25   | 0.34 | 12.5 × 31.5 | 0.36 | 16 × 31.5   | 0.46 | 16 × 35.5   | 0.51 | 16 × 40                   | 0.49 |
|     |           |             |      |             |      |             |      |             |      | ▲ 18 × 31.5 | 0.51 | ▲ 18 × 31.5               | 0.48 |
| 82  | 820       | 12.5 × 25   | 0.41 | 12.5 × 31.5 | 0.39 | 12.5 × 31.5 | 0.40 | 16 × 31.5   | 0.50 | 16 × 40     | 0.57 | 18 × 35.5                 | 0.55 |
|     |           |             |      |             |      |             |      |             |      | ▲ 18 × 31.5 | 0.57 |                           |      |
| 100 | 101       | 12.5 × 31.5 | 0.48 | 12.5 × 31.5 | 0.43 | 12.5 × 35.5 | 0.46 | 16 × 35.5   | 0.58 | 18 × 35.5   | 0.61 | 18 × 40                   | 0.65 |
|     |           |             |      |             |      |             |      | ▲ 18 × 31.5 | 0.58 |             |      |                           |      |
| 120 | 121       | 12.5 × 31.5 | 0.53 | 12.5 × 35.5 | 0.49 | 12.5 × 40   | 0.53 | 16 × 40     | 0.66 | 18 × 40     | 0.66 | 22 × 40                   | 0.77 |
|     |           |             |      |             |      |             |      | ▲ 18 × 35.5 | 0.67 |             |      |                           |      |
| 150 | 151       | 12.5 × 35.5 | 0.62 | 12.5 × 40   | 0.58 | 16 × 31.5   | 0.62 | 18 × 40     | 0.77 | 22 × 40     | 0.80 | 22 × 50                   | 0.92 |
|     |           |             |      |             |      |             |      |             |      |             |      | ▲ 25 × 40                 | 0.92 |
| 180 | 181       | 12.5 × 40   | 0.70 | 16 × 31.5   | 0.67 | 16 × 35.5   | 0.72 | 22 × 40     | 0.85 | 22 × 50     | 0.95 | 25 × 50                   | 1.10 |
|     |           |             |      |             |      | ▲ 18 × 31.5 | 0.72 |             |      | ▲ 25 × 40   | 0.95 |                           |      |
| 220 | 221       | 16 × 31.5   | 0.76 | 16 × 35.5   | 0.77 | 16 × 40     | 0.83 |             |      |             |      |                           |      |
|     |           | ▲ 18 × 31.5 | 0.81 | ▲ 18 × 31.5 | 0.77 | ▲ 18 × 35.5 | 0.83 |             |      |             |      |                           |      |
| 270 | 271       | 16 × 35.5   | 0.88 | 16 × 40     | 0.88 | 18 × 40     | 0.95 | 22 × 50     | 1.30 | 25 × 50     | 1.20 |                           |      |
|     |           | ▲ 18 × 31.5 | 0.87 | ▲ 18 × 35.5 | 0.88 | ▲ 25 × 40   | 1.30 |             |      |             |      |                           |      |
| 330 | 331       | 18 × 35.5   | 1.01 | 18 × 40     | 1.01 | 22 × 40     | 1.05 | 25 × 50     | 1.40 |             |      |                           |      |
| 390 | 391       | 18 × 40     | 1.13 | 22 × 40     | 1.15 |             |      |             |      |             |      |                           |      |
| 470 | 471       | 22 × 40     | 1.20 |             |      | 22 × 50     | 1.45 |             |      |             |      |                           |      |
|     |           |             |      | ▲ 25 × 40   | 1.45 |             |      |             |      |             |      |                           |      |
| 560 | 561       |             |      | 22 × 50     | 1.50 | 25 × 50     | 1.55 |             |      |             |      |                           |      |
|     |           | ▲ 25 × 40   | 1.50 |             |      |             |      |             |      |             |      |                           |      |
| 680 | 681       | 22 × 50     | 1.50 | 25 × 50     | 1.60 |             |      |             |      |             |      |                           |      |
|     |           | ▲ 25 × 40   | 1.50 |             |      |             |      |             |      |             |      |                           |      |
| 820 | 821       | 25 × 50     | 1.60 |             |      |             |      |             |      |             |      | Case size<br>φ D × L (mm) | ※    |

※: Rated ripple current (Arms) at 105°C 120Hz

▲: In this case, [ ] will be put at 12th digit of type numbering system.

### • Frequency coefficient of rated ripple current

| Frequency   | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
|-------------|------|-------|-------|------|---------------|
| Coefficient | 0.80 | 1.00  | 1.25  | 1.40 | 1.60          |