



Miniature Sized, Low Impedance,  
High Reliability For Switching Power Supplies  
series



Smaller



Low Impedance

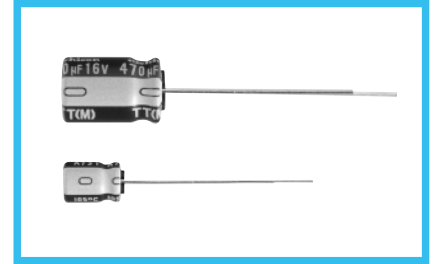
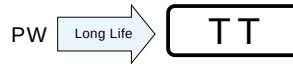


Long Life



Anti-Solvent  
Feature

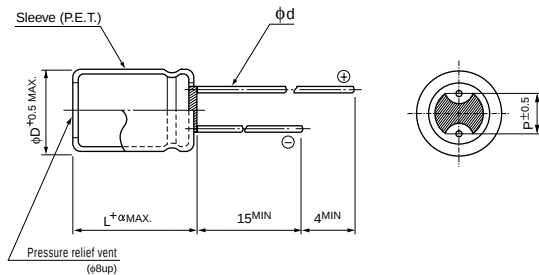
- Smaller case size and Long Life product.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item                          | Performance Characteristics                                                                                                                                                                                                             |                 |      |      |                    |                                                   |      |    |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|--------------------|---------------------------------------------------|------|----|
| Category Temperature Range    | −40 to +105°C                                                                                                                                                                                                                           |                 |      |      |                    |                                                   |      |    |
| Rated Voltage Range           | 6.3 to 50V                                                                                                                                                                                                                              |                 |      |      |                    |                                                   |      |    |
| Rated Capacitance Range       | 1 to 470μF                                                                                                                                                                                                                              |                 |      |      |                    |                                                   |      |    |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                     |                 |      |      |                    |                                                   |      |    |
| Leakage Current               | After 2 minutes' application of rated voltage, leakage current is less than 0.03CV or 3 (μA), whichever is greater.                                                                                                                     |                 |      |      |                    |                                                   |      |    |
| Tangent of loss angle (tan δ) | Measurement frequency : 120Hz at 20°C                                                                                                                                                                                                   |                 |      |      |                    |                                                   |      |    |
|                               | Rated voltage (V)                                                                                                                                                                                                                       | 6.3             | 10   | 16   | 25                 | 35                                                | 50   |    |
|                               | tan δ (MAX.)                                                                                                                                                                                                                            | 0.30            | 0.28 | 0.24 | 0.18               | 0.16                                              | 0.14 |    |
| Stability at Low Temperature  | Measurement frequency : 120Hz                                                                                                                                                                                                           |                 |      |      |                    |                                                   |      |    |
|                               | Rated voltage (V)                                                                                                                                                                                                                       |                 | 6.3  | 10   | 16                 | 25                                                | 35   | 50 |
|                               | Impedance ratio                                                                                                                                                                                                                         | Z−25°C / Z+20°C | 5    | 4    | 3                  | 3                                                 | 3    | 3  |
|                               | ZT / Z20 (MAX.)                                                                                                                                                                                                                         | Z−40°C / Z+20°C | 10   | 10   | 8                  | 6                                                 | 4    | 4  |
| Endurance                     | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 5000 hours at 105°C.                                                                                    |                 |      |      | Capacitance change | Within ±30% of the initial capacitance value      |      |    |
|                               |                                                                                                                                                                                                                                         |                 |      |      | tan δ              | 300% 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 blown sleeve.                                                                                                                                                                                   |                 |      |      |                    |                                                   |      |    |

## Radial Lead Type

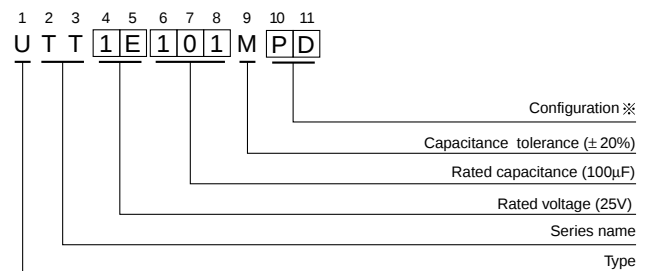


|   |             |
|---|-------------|
| α | (L = 7) 1.0 |
|   | (L ≥ 9) 1.5 |

|    | (mm) |      |               |     |
|----|------|------|---------------|-----|
| φD | 4    | 5    | 6.3           | 8   |
| P  | 1.5  | 2.0  | 2.5           | 3.5 |
| φd | 0.45 | 0.45 | 0.5<br>(0.45) | 0.6 |

( ) : Applied to 7mmL products

## Type numbering system (Example : 25V 100μF)



※ Configuration

| φ D      | Pb-free leadwire<br>Pb-free PET sleeve |
|----------|----------------------------------------|
| 4 to 6.3 | DD                                     |
| 8        | PD                                     |

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

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.

## ■ Standard Ratings

| V (Code) |           | 6.3 (0J)                     |                                        |                                           | 10 (1A)                      |                                        |                                           | 16 (1C)                      |                                        |                                           |
|----------|-----------|------------------------------|----------------------------------------|-------------------------------------------|------------------------------|----------------------------------------|-------------------------------------------|------------------------------|----------------------------------------|-------------------------------------------|
| Cap.(μF) | Item Code | Case size<br>φ D × L<br>(mm) | Impedance<br>(Ω) MAX.<br>20°C / 100kHz | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance<br>(Ω) MAX.<br>20°C / 100kHz | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance<br>(Ω) MAX.<br>20°C / 100kHz | Rated ripple<br>(mArms)<br>105°C / 100kHz |
| 10       | 100       |                              |                                        |                                           |                              |                                        |                                           | 4 × 7                        | 7.4                                    | 46                                        |
| 22       | 220       | 4 × 7                        | 7.4                                    | 46                                        |                              |                                        |                                           | 5 × 7                        | 4.0                                    | 74                                        |
| 33       | 330       |                              |                                        |                                           | 5 × 7                        | 4.0                                    | 74                                        |                              |                                        |                                           |
| 47       | 470       | 5 × 7                        | 4.0                                    | 74                                        |                              |                                        |                                           | 6.3 × 7                      | 2.1                                    | 120                                       |
| 100      | 101       | 6.3 × 7                      | 2.1                                    | 120                                       |                              |                                        |                                           | 6.3 × 9                      | 1.1                                    | 163                                       |
| 150      | 151       |                              |                                        |                                           | 6.3 × 9                      | 1.1                                    | 163                                       | 8 × 9                        | 0.68                                   | 230                                       |
| 220      | 221       | 6.3 × 9                      | 1.1                                    | 163                                       | 8 × 9                        | 0.68                                   | 230                                       | 8 × 9                        | 0.68                                   | 230                                       |
| 330      | 331       | 8 × 9                        | 0.68                                   | 230                                       |                              |                                        |                                           | 8 × 9                        | 0.68                                   | 230                                       |
| 470      | 471       | 8 × 9                        | 0.68                                   | 230                                       |                              |                                        |                                           | 8 × 11.5                     | 0.40                                   | 298                                       |

| V (Code) |           | 25 (1E)                      |                                        |                                           | 35 (1V)                      |                                        |                                           | 50 (1H)                      |                                        |                                           |
|----------|-----------|------------------------------|----------------------------------------|-------------------------------------------|------------------------------|----------------------------------------|-------------------------------------------|------------------------------|----------------------------------------|-------------------------------------------|
| Cap.(μF) | Item Code | Case size<br>φ D × L<br>(mm) | Impedance<br>(Ω) MAX.<br>20°C / 100kHz | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance<br>(Ω) MAX.<br>20°C / 100kHz | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance<br>(Ω) MAX.<br>20°C / 100kHz | Rated ripple<br>(mArms)<br>105°C / 100kHz |
| 1        | 010       |                              |                                        |                                           |                              |                                        |                                           | 4 × 7                        | 30                                     | 23                                        |
| 2.2      | 2R2       |                              |                                        |                                           |                              |                                        |                                           | 4 × 7                        | 23                                     | 26                                        |
| 3.3      | 3R3       |                              |                                        |                                           |                              |                                        |                                           | 4 × 7                        | 20                                     | 29                                        |
| 4.7      | 4R7       |                              |                                        |                                           | 4 × 7                        | 7.4                                    | 37                                        | 5 × 7                        | 14                                     | 37                                        |
| 10       | 100       |                              |                                        |                                           | 5 × 7                        | 4.0                                    | 74                                        | 6.3 × 7                      | 4.4                                    | 84                                        |
| 22       | 220       | 5 × 7                        | 4.0                                    | 74                                        | 6.3 × 7                      | 2.1                                    | 120                                       | 6.3 × 9                      | 2.4                                    | 112                                       |
| 33       | 330       | 6.3 × 7                      | 2.1                                    | 120                                       | 6.3 × 9                      | 1.1                                    | 163                                       |                              |                                        |                                           |
| 47       | 470       | 6.3 × 9                      | 1.1                                    | 163                                       | 6.3 × 9                      | 1.1                                    | 163                                       | 8 × 9                        | 1.4                                    | 162                                       |
| 100      | 101       | 8 × 9                        | 0.68                                   | 230                                       |                              |                                        |                                           |                              |                                        |                                           |
| 150      | 151       |                              |                                        |                                           |                              |                                        |                                           |                              |                                        |                                           |
| 220      | 221       | 8 × 11.5                     | 0.40                                   | 298                                       |                              |                                        |                                           |                              |                                        |                                           |
| 330      | 331       | 8 × 11.5                     | 0.40                                   | 298                                       |                              |                                        |                                           |                              |                                        |                                           |

## ● Frequency coefficient of rated ripple current

| Cap.(μF)   | Frequency | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz | 100kHz or more |
|------------|-----------|------|-------|-------|------|-------|----------------|
| 1 to 4.7   |           | 0.25 | 0.30  | 0.50  | 0.70 | 0.90  | 1.00           |
| 10 to 47   |           | 0.30 | 0.40  | 0.60  | 0.75 | 0.90  | 1.00           |
| 100 to 470 |           | 0.60 | 0.60  | 0.70  | 0.80 | 0.90  | 1.00           |