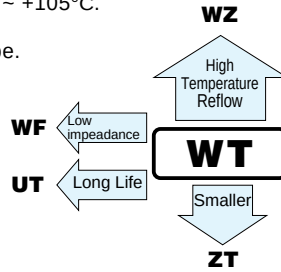


## WT series

Chip Type, Wide Temperature Range



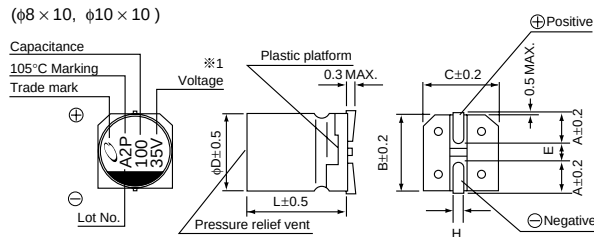
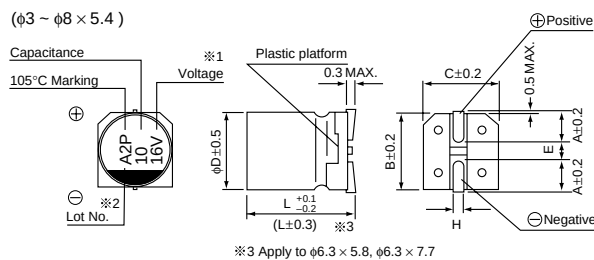
- Chip type operating over wide temperature range of to  $-55 \sim +105^{\circ}\text{C}$ .
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine using carrier tape.
- Adapted to the RoHS directive (2002/95/EC).



### Specifications

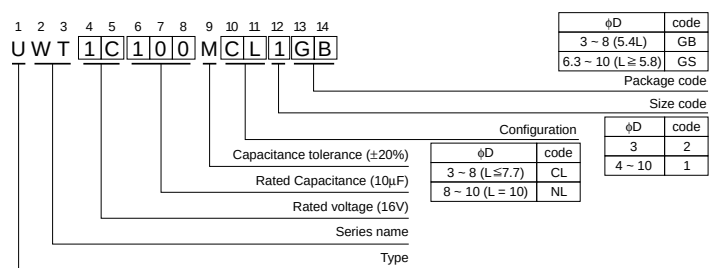
| Item                         | Performance Characteristics                                                                                                                                                                                      |                 |      |      |                    |                                                                                                                                        |      |      |    |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|------|------|----|
| Category Temperature Range   | -55 ~ +105°C                                                                                                                                                                                                     |                 |      |      |                    |                                                                                                                                        |      |      |    |
| Rated Voltage Range          | 4 ~ 50V                                                                                                                                                                                                          |                 |      |      |                    |                                                                                                                                        |      |      |    |
| Rated Capacitance Range      | 0.1 ~ 1500μF                                                                                                                                                                                                     |                 |      |      |                    |                                                                                                                                        |      |      |    |
| Capacitance Tolerance        | ±20% at 120Hz, 20°C                                                                                                                                                                                              |                 |      |      |                    |                                                                                                                                        |      |      |    |
| Leakage Current              | After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA) , whichever is greater.                                                                                         |                 |      |      |                    |                                                                                                                                        |      |      |    |
| tan δ                        | Measurement frequency : 120Hz, Temperature : 20°C                                                                                                                                                                |                 |      |      |                    |                                                                                                                                        |      |      |    |
|                              | Rated voltage (V)                                                                                                                                                                                                | 4               | 6.3  | 10   | 16                 | 25                                                                                                                                     | 35   | 50   |    |
|                              | tan δ (MAX.)                                                                                                                                                                                                     | 0.40            | 0.30 | 0.24 | 0.20               | 0.16                                                                                                                                   | 0.14 | 0.14 |    |
| Stability at Low Temperature | Measurement frequency : 120Hz                                                                                                                                                                                    |                 |      |      |                    |                                                                                                                                        |      |      |    |
|                              | Rated voltage (V)                                                                                                                                                                                                |                 | 4    | 6.3  | 10                 | 16                                                                                                                                     | 25   | 35   | 50 |
|                              | Impedance ratio                                                                                                                                                                                                  | Z-25°C / Z+20°C | 7    | 4    | 3                  | 2                                                                                                                                      | 2    | 2    | 2  |
|                              | ZT / Z20 (MAX.)                                                                                                                                                                                                  | Z-40°C / Z+20°C | 15   | 8    | 8                  | 4                                                                                                                                      | 4    | 3    | 3  |
| Endurance                    | After 1000 hours' application of rated voltage at 105°C, capacitors meet the characteristic requirements listed at right.                                                                                        |                 |      |      | Capacitance change | Within ±25% of initial value for capacitors of φ3mm unit, and 16V or less. Within ±20% of initial value for capacitors of 25V or more. |      |      |    |
|                              |                                                                                                                                                                                                                  |                 |      |      | tan δ              | 200% or less of initial specified value                                                                                                |      |      |    |
|                              |                                                                                                                                                                                                                  |                 |      |      | Leakage current    | Initial specified value or less                                                                                                        |      |      |    |
| Shelf Life                   | After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for endurance characteristics listed above.                                                                        |                 |      |      |                    |                                                                                                                                        |      |      |    |
| Resistance to soldering heat | The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristic requirements listed at right. |                 |      |      | Capacitance change | Within ±10% of initial value                                                                                                           |      |      |    |
|                              |                                                                                                                                                                                                                  |                 |      |      | tan δ              | Initial specified value or less                                                                                                        |      |      |    |
|                              |                                                                                                                                                                                                                  |                 |      |      | Leakage current    | Initial specified value or less                                                                                                        |      |      |    |
| Marking                      | Black print on the case top.                                                                                                                                                                                     |                 |      |      |                    |                                                                                                                                        |      |      |    |

### Chip Type



- ※1. Voltage mark for 6.3V is 「6V」. In case of marking for  $\phi 3$  units, 「V」 for rated voltage is omitted.  
 ※2. In case of marking for  $\phi 3$  units, Lot No is expressed by a digit (month code).

### Type numbering system (Example : 16V 10 $\mu\text{F}$ )



|        | (mm)      |           |           |           |           |           |           |           |           |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| φD × L | 3 × 5.4   | 4 × 5.4   | 5 × 5.4   | 6.3 × 5.4 | 6.3 × 5.8 | 6.3 × 7.7 | 8 × 5.4   | 8 × 10    | 10 × 10   |
| A      | 1.5       | 1.8       | 2.1       | 2.4       | 2.4       | 2.4       | 3.3       | 2.9       | 3.2       |
| B      | 3.3       | 4.3       | 5.3       | 6.6       | 6.6       | 6.6       | 8.3       | 8.3       | 10.3      |
| C      | 3.3       | 4.3       | 5.3       | 6.6       | 6.6       | 6.6       | 8.3       | 8.3       | 10.3      |
| E      | 0.8       | 1.0       | 1.3       | 2.2       | 2.2       | 2.2       | 2.3       | 3.1       | 4.5       |
| L      | 5.4       | 5.4       | 5.4       | 5.4       | 5.8       | 7.7       | 5.4       | 10        | 10        |
| H      | 0.5 ~ 0.8 | 0.5 ~ 0.8 | 0.5 ~ 0.8 | 0.5 ~ 0.8 | 0.5 ~ 0.8 | 0.5 ~ 0.8 | 0.5 ~ 0.8 | 0.8 ~ 1.1 | 0.8 ~ 1.1 |

## ■ Dimensions

φD × L (mm)

| Cap. (μF) | V<br>Code | 4         |          | 6.3       |          | 10        |     | 16          |         | 25          |         | 35        |         | 50          |              |
|-----------|-----------|-----------|----------|-----------|----------|-----------|-----|-------------|---------|-------------|---------|-----------|---------|-------------|--------------|
|           |           | 0G        |          | 0J        |          | 1A        |     | 1C          |         | 1E          |         | 1V        |         | 1H          |              |
| 0.1       | 0R1       |           |          |           |          |           |     |             |         |             |         |           |         | 4 × 5.4 (3) | 1.0          |
| 0.22      | R22       |           |          |           |          |           |     |             |         |             |         |           |         | 4 × 5.4 (3) | 2.6          |
| 0.33      | R33       |           |          |           |          |           |     |             |         |             |         |           |         | 4 × 5.4 (3) | 3.2          |
| 0.47      | R47       |           |          |           |          |           |     |             |         |             |         |           |         | 4 × 5.4 (3) | 3.8          |
| 1         | 010       |           |          |           |          |           |     |             |         |             |         |           |         | 4 × 5.4 (3) | 6.3 (5.9)    |
| 2.2       | 2R2       |           |          |           |          |           |     |             |         |             |         | 3 × 5.4   | 7.5     | 4 × 5.4 (3) | 11 (9)       |
| 3.3       | 3R3       |           |          |           |          |           |     |             |         |             |         | 3 × 5.4   | 9       | 4 × 5.4     | 14           |
| 4.7       | 4R7       |           |          |           |          |           |     |             |         | 4 × 5.4 (3) | 13 (10) | 4 × 5.4   | 15      | 5 × 5.4     | 19           |
| 10        | 100       |           |          |           |          |           |     | 4 × 5.4 (3) | 18 (14) | 5 × 5.4     | 23      | 5 × 5.4   | 25      | 6.3 × 5.4   | 30           |
| 22        | 220       | 4 × 5.4   | 22       | 4 × 5.4   | 22       | 5 × 5.4   | 27  | 5 × 5.4     | 30      | 6.3 × 5.4   | 38      | 6.3 × 5.4 | 42      | ● 8 × 5.4   | 51 (45)      |
| 33        | 330       | 5 × 5.4   | 30       | 5 × 5.4   | 30       | 5 × 5.4   | 35  | 6.3 × 5.4   | 40      | 6.3 × 5.4   | 48      | ● 8 × 5.4 | 59 (52) | 6.3 × 7.7   | 60           |
| 47        | 470       | 5 × 5.4   | 36       | 5 × 5.4   | 36       | 6.3 × 5.4 | 46  | 6.3 × 5.4   | 50      | ● 8 × 5.4   | 66 (59) | 6.3 × 5.8 | 63      | 6.3 × 7.7   | 63           |
| 100       | 101       | 6.3 × 5.4 | 60       | 6.3 × 5.4 | 60       | 6.3 × 5.4 | 60  | 6.3 × 5.4   | 60      | 6.3 × 7.7   | 91      | 6.3 × 7.7 | 84      | 8 × 10      | 140          |
| 150       | 151       | 6.3 × 5.8 | 86       | 6.3 × 5.8 | 86       | 6.3 × 5.8 | 86  | 6.3 × 7.7   | 95      | 8 × 10      | 140     | 8 × 10    | 155     | 10 × 10     | 180          |
| 220       | 221       | ● 8 × 5.4 | 102 (91) | ● 8 × 5.4 | 102 (91) | 6.3 × 7.7 | 105 | 6.3 × 7.7   | 105     | 8 × 10      | 155     | 8 × 10    | 190     | 10 × 10     | 220          |
| 330       | 331       | 6.3 × 7.7 | 105      | 6.3 × 7.7 | 105      | 8 × 10    | 195 | 8 × 10      | 195     | 8 × 10      | 190     | 10 × 10   | 300     |             |              |
| 470       | 471       | 8 × 10    | 210      | 8 × 10    | 210      | 8 × 10    | 210 | 8 × 10      | 230     | 10 × 10     | 300     |           |         |             |              |
| 680       | 681       | 8 × 10    | 210      | 8 × 10    | 210      | 10 × 10   | 310 | 10 × 10     | 310     |             |         |           |         |             |              |
| 1000      | 102       | 8 × 10    | 230      | 8 × 10    | 230      | 10 × 10   | 310 |             |         |             |         |           |         | Case size   | Rated ripple |
| 1500      | 152       | 10 × 10   | 310      | 10 × 10   | 310      |           |     |             |         |             |         |           |         |             |              |

Rated Ripple (mA rms) at 105°C 120Hz

( ) is also available with φ3mm upon request. In such a case, [2] will be put at 12th digit of type numbering system.

Size φ6.3 × 5.8 is available for capacitors marked. " ● " In such a case, [6] will be put at 12th digit of type numbering system.

## ● Frequency coefficient of rated ripple current

| Frequency   | 50 Hz | 120 Hz | 300 Hz | 1 kHz | 10 kHz~ |
|-------------|-------|--------|--------|-------|---------|
| Coefficient | 0.70  | 1.00   | 1.17   | 1.36  | 1.50    |

- Taping specifications are given in page 24.
- Recommended land size, soldering by reflow are given in page 25
- Please select UX(p.66), UJ(p.68) series if high C/V products are required.
- Please refer to page 3 for the minimum order quantity.