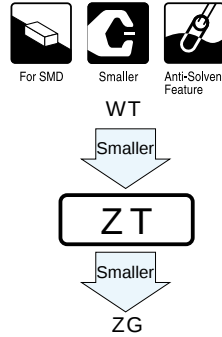


# ZT series

4.5mmL Chip Type, Wide Temperature Range

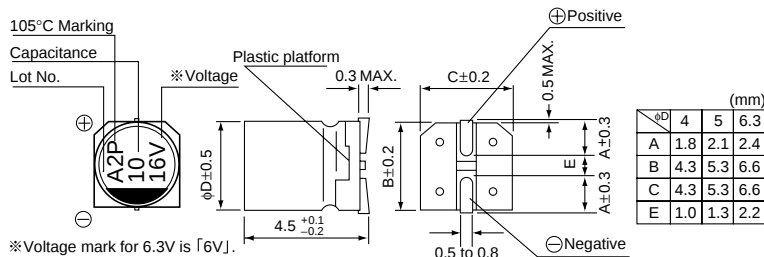


- Chip type with 4.5mm height, operating over wide temperature range of  $-40$  to  $+105^{\circ}\text{C}$ .
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

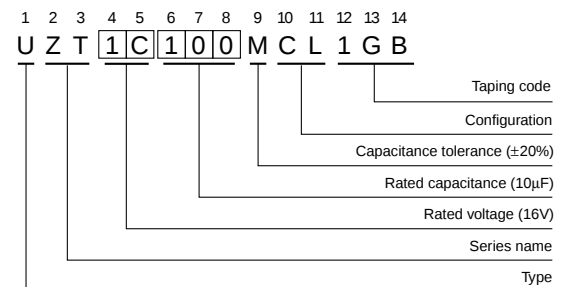
## Specifications

| Item                                    | Performance Characteristics                                                                                                                                                                                                                                              |                                                                                                                                      |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Category Temperature Range              | $-40$ to $+105^{\circ}\text{C}$                                                                                                                                                                                                                                          |                                                                                                                                      |
| Rated Voltage Range                     | 6.3 to 50V                                                                                                                                                                                                                                                               |                                                                                                                                      |
| Rated Capacitance Range                 | 0.1 to $100\mu\text{F}$                                                                                                                                                                                                                                                  |                                                                                                                                      |
| Capacitance Tolerance                   | $\pm 20\%$ at 120Hz, $20^{\circ}\text{C}$                                                                                                                                                                                                                                |                                                                                                                                      |
| Leakage Current                         | After 2 minutes' application of rated voltage, leakage current is not more than $0.01\text{CV}$ or $3(\mu\text{A})$ , whichever is greater.                                                                                                                              |                                                                                                                                      |
| Tangent of loss angle ( $\tan \delta$ ) | Measurement frequency : 120Hz at $20^{\circ}\text{C}$                                                                                                                                                                                                                    |                                                                                                                                      |
|                                         | Rated voltage (V)                                                                                                                                                                                                                                                        | 6.3 10 16 25 35 50                                                                                                                   |
|                                         | $\tan \delta$ (MAX.)                                                                                                                                                                                                                                                     | 0.38 0.32 0.20 0.16 0.14 0.14                                                                                                        |
| Stability at Low Temperature            | Measurement frequency : 120Hz                                                                                                                                                                                                                                            |                                                                                                                                      |
|                                         | Rated voltage (V)                                                                                                                                                                                                                                                        | 6.3 10 16 25 35 50                                                                                                                   |
|                                         | Impedance ratio                                                                                                                                                                                                                                                          | Z- $25^{\circ}\text{C}$ / Z- $20^{\circ}\text{C}$ 6 5 3 3 3 3                                                                        |
|                                         | ZT / Z20 (MAX.)                                                                                                                                                                                                                                                          | Z- $40^{\circ}\text{C}$ / Z- $20^{\circ}\text{C}$ 10 10 6 6 4 4                                                                      |
| Endurance                               | The specifications listed at right shall be met when the capacitors are restored to $20^{\circ}\text{C}$ after the rated voltage is applied for 1000 hours at $105^{\circ}\text{C}$ .                                                                                    |                                                                                                                                      |
|                                         | Capacitance change                                                                                                                                                                                                                                                       | Within $\pm 25\%$ of the initial capacitance value (16V or less)<br>Within $\pm 20\%$ of the initial capacitance value (25V or more) |
|                                         | $\tan \delta$                                                                                                                                                                                                                                                            | 300% or less than initial specified value                                                                                            |
|                                         | Leakage current                                                                                                                                                                                                                                                          | Less than or equal to the initial specified value                                                                                    |
| Shelf Life                              | After storing the capacitors under no load at $105^{\circ}\text{C}$ for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at $20^{\circ}\text{C}$ , they shall meet the specified values for the endurance characteristics listed above. |                                                                                                                                      |
| Resistance to soldering heat            | The capacitors are kept on a hot plate for 30 seconds, which is maintained at $250^{\circ}\text{C}$ . The capacitors shall meet the characteristic requirements listed at right when they are removed from the plate and restored to $20^{\circ}\text{C}$ .              |                                                                                                                                      |
|                                         | Capacitance change                                                                                                                                                                                                                                                       | Within $\pm 10\%$ of the initial capacitance value                                                                                   |
|                                         | $\tan \delta$                                                                                                                                                                                                                                                            | Less than or equal to the initial specified value                                                                                    |
|                                         | Leakage current                                                                                                                                                                                                                                                          | Less than or equal to the initial specified value                                                                                    |
| Marking                                 | Black print on the case top.                                                                                                                                                                                                                                             |                                                                                                                                      |

## Chip Type



## Type numbering system (Example : 16V 10μF)



## Dimensions

| V                      |      | 6.3    | 10     | 16     | 25     | 35     | 50                                 |
|------------------------|------|--------|--------|--------|--------|--------|------------------------------------|
| Cap. ( $\mu\text{F}$ ) | Code | 0J     | 1A     | 1C     | 1E     | 1V     | 1H                                 |
| 0.1                    | 0R1  |        |        |        |        |        | 4 0.9                              |
| 0.22                   | R22  |        |        |        |        |        | 4 2.2                              |
| 0.33                   | R33  |        |        |        |        |        | 4 2.8                              |
| 0.47                   | R47  |        |        |        |        |        | 4 3.3                              |
| 1                      | 010  |        |        |        |        |        | 4 5.4                              |
| 2.2                    | 2R2  |        |        |        |        |        | 4 9.6                              |
| 3.3                    | 3R3  |        |        |        |        |        | 4 12                               |
| 4.7                    | 4R7  |        |        |        | 4 11   | 4 13   | 5 16                               |
| 10                     | 100  |        |        | 4 16   | 5 20   | 5 22   | 6.3 26                             |
| 22                     | 220  | 4 19   | 5 24   | 5 26   | 6.3 33 | 6.3 36 |                                    |
| 33                     | 330  | 5 26   | 5 30   | 6.3 35 | 6.3 42 |        |                                    |
| 47                     | 470  | 5 32   | 6.3 40 | 6.3 44 |        |        |                                    |
| 100                    | 101  | 6.3 52 |        |        |        |        | Case size<br>φ D (mm) Rated ripple |

Rated ripple current (mA rms) at  $105^{\circ}\text{C}$  120Hz

## Frequency coefficient of rated ripple current

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

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UX(p.158), UJ(p.164) series if high C/V products are required.
- Please refer to page 3 for the minimum order quantity.