



## VZT Series

## Features

- $4\phi \sim 10\phi$ , 105°C, 2,000 hours assured
- Low impedance 30 ~ 50% less than VZS series
- Designed for surface mounting on high density PC board
- RoHS Compliance

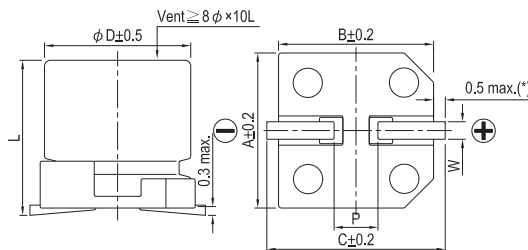


Marking color: Black

## Specifications

| Items                                      | Performance                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------|--------------------|------------------------------|---------|-----------------------------------|-----------------|------------------------|-----------------|-----------------|----------------|------|------|------|------|---|-----------------|---|---|---|---|---|---|
| Category Temperature Range                 | -55℃ ~ +105℃                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Capacitance Tolerance                      | ±20% (at 120Hz, 20℃)                                                                                                                                                                                                                                                                                                                                                                                                                     |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Leakage Current (at 20℃)                   | I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes)<br>Where, C = rated capacitance in μF, V = rated DC working voltage in V                                                                                                                                                                                                                                                                                                     |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Tanδ (at 120Hz, 20℃)                       | <table><tr><td>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td>Tanδ (max)</td><td>0.26</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td></tr></table>                                                                                                                                                                                                              | Rated Voltage               | 6.3       | 10                 | 16                           | 25      | 35                                | 50              | Tanδ (max)             | 0.26            | 0.19            | 0.16           | 0.14 | 0.12 | 0.10 |      |   |                 |   |   |   |   |   |   |
| Rated Voltage                              | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10                          | 16        | 25                 | 35                           | 50      |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Tanδ (max)                                 | 0.26                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.19                        | 0.16      | 0.14               | 0.12                         | 0.10    |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Low Temperature Characteristics (at 120Hz) | <p>Impedance ratio shall not exceed the values given in the table below.</p> <table><tr><td colspan="2">Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td rowspan="2">Impedance Ratio</td><td>Z(-25℃)/Z(+20℃)</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-55℃)/Z(+20℃)</td><td>8</td><td>5</td><td>4</td><td>3</td><td>3</td><td>3</td></tr></table> | Rated Voltage               |           | 6.3                | 10                           | 16      | 25                                | 35              | 50                     | Impedance Ratio | Z(-25℃)/Z(+20℃) | 4              | 3    | 2    | 2    | 2    | 2 | Z(-55℃)/Z(+20℃) | 8 | 5 | 4 | 3 | 3 | 3 |
| Rated Voltage                              |                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.3                         | 10        | 16                 | 25                           | 35      | 50                                |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Impedance Ratio                            | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                          | 4                           | 3         | 2                  | 2                            | 2       | 2                                 |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
|                                            | Z(-55℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                          | 8                           | 5         | 4                  | 3                            | 3       | 3                                 |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Endurance                                  | <table><tr><td>Test Time</td><td>2,000 Hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±30% of initial value</td></tr><tr><td>Tanδ</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.</p>              | Test Time                   | 2,000 Hrs | Capacitance Change | Within ±30% of initial value | Tanδ    | Less than 200% of specified value | Leakage Current | Within specified value |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Test Time                                  | 2,000 Hrs                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Capacitance Change                         | Within ±30% of initial value                                                                                                                                                                                                                                                                                                                                                                                                             |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Tanδ                                       | Less than 200% of specified value                                                                                                                                                                                                                                                                                                                                                                                                        |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Leakage Current                            | Within specified value                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Shelf Life Test                            | Test time: 1,000 hours; other items are the same as those for the Endurance.                                                                                                                                                                                                                                                                                                                                                             |                             |           |                    |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Ripple Current and Frequency Multipliers   | <table><tr><td>Frequency (Hz)<br/>Cap. (μF)</td><td>120</td><td>1k</td><td>10k</td><td>100k up</td></tr><tr><td>Under 470</td><td>0.65</td><td>0.85</td><td>0.95</td><td>1.00</td></tr><tr><td>560 ≤ C &lt; 2200</td><td>0.70</td><td>0.90</td><td>0.95</td><td>1.00</td></tr></table>                                                                                                                                                   | Frequency (Hz)<br>Cap. (μF) | 120       | 1k                 | 10k                          | 100k up | Under 470                         | 0.65            | 0.85                   | 0.95            | 1.00            | 560 ≤ C < 2200 | 0.70 | 0.90 | 0.95 | 1.00 |   |                 |   |   |   |   |   |   |
| Frequency (Hz)<br>Cap. (μF)                | 120                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1k                          | 10k       | 100k up            |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| Under 470                                  | 0.65                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.85                        | 0.95      | 1.00               |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |
| 560 ≤ C < 2200                             | 0.70                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.90                        | 0.95      | 1.00               |                              |         |                                   |                 |                        |                 |                 |                |      |      |      |      |   |                 |   |   |   |   |   |   |

## Diagram of Dimensions



## Lead Spacing and Diameter

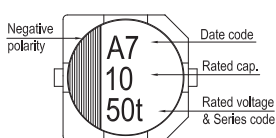
Unit: mm

| φD  | L         | A    | B    | C   | W         | P ± 0.2 |
|-----|-----------|------|------|-----|-----------|---------|
| 4   | 5.8 ± 0.3 | 4.3  | 4.3  | 5.1 | 0.5 ~ 0.8 | 1.0     |
| 5   | 5.8 ± 0.3 | 5.3  | 5.3  | 5.9 | 0.5 ~ 0.8 | 1.5     |
| 6.3 | 5.8 ± 0.3 | 6.6  | 6.6  | 7.2 | 0.5 ~ 0.8 | 2.0     |
| 6.3 | 7.7 ± 0.3 | 6.6  | 6.6  | 7.2 | 0.5 ~ 0.8 | 2.0     |
| 8   | 10 ± 0.5  | 8.3  | 8.3  | 9.0 | 0.7 ~ 1.1 | 3.1     |
| 10  | 10 ± 0.5  | 10.3 | 10.3 | 11  | 0.7 ~ 1.3 | 4.7     |

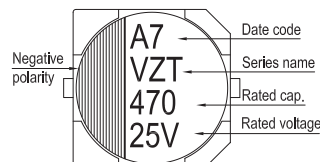
(\*): For 4 ~ 6.3φ is 0.4 max.

## Marking

φD ≤ 6.3mm



φD = 8 ~ 10 mm



Dimension:  $\phi D \times L(\text{mm})$ 

Ripple Current: mA/rms at 100k Hz, 105°C

Impedance:  $\Omega/$  at 100k Hz, 20°C

## Dimension and Permissible Ripple Current

| V. DC         |          | 6.3V (0J)         |      |       | 10V (1A)          |      |       | 16V (1C)          |      |       | 25V (1E)          |      |       | 35V (1V)          |      |       | 50V (1H)          |      |     |
|---------------|----------|-------------------|------|-------|-------------------|------|-------|-------------------|------|-------|-------------------|------|-------|-------------------|------|-------|-------------------|------|-----|
| $\mu\text{F}$ | Contents | $\phi D \times L$ | Imp. | mA    | $\phi D \times L$ | Imp. | mA    | $\phi D \times L$ | Imp. | mA    | $\phi D \times L$ | Imp. | mA    | $\phi D \times L$ | Imp. | mA    | $\phi D \times L$ | Imp. | mA  |
| 10            | 100      |                   |      |       |                   |      |       |                   |      |       |                   |      |       |                   |      |       | 4×5.8             | 2.30 | 85  |
| 22            | 220      |                   |      |       |                   |      |       |                   |      |       | 4×5.8             | 0.85 | 160   | 4×5.8             | 0.85 | 160   | 5×5.8             | 0.88 | 165 |
| 33            | 330      |                   |      |       |                   |      |       |                   |      |       | 4×5.8             | 0.85 | 160   | 5×5.8             | 0.36 | 240   |                   |      |     |
| 47            | 470      |                   |      |       |                   |      |       | 4×5.8             | 0.85 | 160   | 5×5.8             | 0.36 | 240   | 5×5.8             | 0.36 | 240   | 6.3×5.8           | 0.68 | 195 |
| 68            | 680      |                   |      |       | 4×5.8             | 0.85 | 160   | 5×5.8             | 0.36 | 240   | 5×5.8             | 0.36 | 240   | 6.3×5.8           | 0.26 | 300   |                   |      |     |
| 100           | 101      | 4×5.8             | 0.85 | 160   |                   |      |       | 5×5.8             | 0.36 | 240   | 6.3×5.8           | 0.26 | 300   | 6.3×5.8           | 0.26 | 300   | 6.3×7.7           | 0.34 | 350 |
| 150           | 151      |                   |      |       | 5×5.8             | 0.36 | 240   | 6.3×5.8           | 0.26 | 300   | 6.3×7.7           | 0.16 | 600   | 6.3×7.7           | 0.16 | 600   |                   |      |     |
| 220           | 221      | 5×5.8             | 0.36 | 240   | 6.3×5.8           | 0.26 | 300   | 6.3×5.8           | 0.26 | 300   | 6.3×7.7           | 0.16 | 600   |                   |      |       | 8×10              | 0.18 | 670 |
| 330           | 331      | 6.3×5.8           | 0.26 | 300   | 6.3×7.7           | 0.16 | 600   | 6.3×7.7           | 0.16 | 600   |                   |      |       | 8×10              | 0.08 | 850   | 10×10             | 0.12 | 900 |
| 470           | 471      | 6.3×7.7           | 0.16 | 600   | 6.3×7.7           | 0.16 | 600   |                   |      |       | 8×10              | 0.08 | 850   |                   |      |       |                   |      |     |
| 560           | 561      |                   |      |       |                   |      |       |                   |      |       |                   |      |       | 10×10             | 0.06 | 1,190 |                   |      |     |
| 680           | 681      | 6.3×7.7           | 0.16 | 600   |                   |      |       | 8×10              | 0.08 | 850   |                   |      |       |                   |      |       |                   |      |     |
| 820           | 821      |                   |      |       |                   |      |       |                   |      |       | 10×10             | 0.06 | 1,190 |                   |      |       |                   |      |     |
| 1,000         | 102      |                   |      |       | 8×10              | 0.08 | 850   | 10×10             | 0.06 | 1,190 |                   |      |       |                   |      |       |                   |      |     |
| 1,500         | 152      | 8×10              | 0.08 | 850   | 10×10             | 0.06 | 1,190 |                   |      |       |                   |      |       |                   |      |       |                   |      |     |
| 2,200         | 222      | 10×10             | 0.06 | 1,190 |                   |      |       |                   |      |       |                   |      |       |                   |      |       |                   |      |     |

## Part Numbering System

|             |                    |                       |               |              |               |                            |                              |
|-------------|--------------------|-----------------------|---------------|--------------|---------------|----------------------------|------------------------------|
| VZT Series  | 1500 $\mu\text{F}$ | $\pm 20\%$            | 6.3V          | Carrier Tape |               | 8 $\phi \times 10\text{L}$ | Pb-free and PET coating case |
| <b>VZT</b>  | <b>152</b>         | <b>M</b>              | <b>0J</b>     | <b>TR</b>    | <b>-</b>      | <b>0810</b>                |                              |
| Series Name | Capacitance        | Capacitance Tolerance | Rated Voltage | Package Type | Terminal Type | Case size                  | Lead Wire and Coating Type   |

Note: For more details, please refer to "Part Numbering System (SMD Type)" on page 15.