



## VZT Series

### Features

- 5  $\phi$  ~ 10  $\phi$ , 105°C, 2,000 ~ 5000 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°C ~ +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                                                                                      |                    |                              |        |                                   |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| Capacitance Tolerance                      | ±20% (at 120Hz, 20°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                                                      |                    |                              |        |                                   |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| Leakage Current (at 20°C)                  | 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°C)                      | <table border="1"> <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 border="1"> <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°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C)/Z(+20°C)</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°C)/Z(+20°C) | 4         | 3    | 2    | 2    | 2    | 2              | Z(-55°C)/Z(+20°C) | 8    | 5    | 4    | 3 | 3 | 3 |
| Rated Voltage                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6.3           | 10                                                                                   | 16                 | 25                           | 35     | 50                                |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| Impedance Ratio                            | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4             | 3                                                                                    | 2                  | 2                            | 2      | 2                                 |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
|                                            | Z(-55°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8             | 5                                                                                    | 4                  | 3                            | 3      | 3                                 |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| Endurance                                  | <table border="1"> <tr> <td>Test Time</td> <td>2,000 Hrs for <math>\phi D \leq 6.3\text{mm}</math> ;<br/>5,000 Hrs for <math>\phi D \geq 8\text{mm}</math></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°C after the rated voltage applied for 2,000 ~ 5,000 hours at 105°C.</p> | Test Time     | 2,000 Hrs for $\phi D \leq 6.3\text{mm}$ ;<br>5,000 Hrs for $\phi D \geq 8\text{mm}$ | Capacitance Change | Within ±30% of initial value | Tanδ   | Less than 200% of specified value | Leakage Current | Within specified value |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| Test Time                                  | 2,000 Hrs for $\phi D \leq 6.3\text{mm}$ ;<br>5,000 Hrs for $\phi D \geq 8\text{mm}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |                                                                                      |                    |                              |        |                                   |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| 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 & Frequency Multipliers     | <table border="1"> <tr> <td>Freq.(Hz)</td> <td>120</td> <td>1K</td> <td>10k</td> <td>10k up</td> </tr> <tr> <td>Cap. (μF)</td> <td></td> <td></td> <td></td> <td></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 &lt; C &lt; 2200</td> <td>0.70</td> <td>0.90</td> <td>0.95</td> <td>1.00</td> </tr> </table>                                                                                                                                                                                        | Freq.(Hz)     | 120                                                                                  | 1K                 | 10k                          | 10k up | Cap. (μF)                         |                 |                        |                 |                   | Under 470 | 0.65 | 0.85 | 0.95 | 1.00 | 560 < C < 2200 | 0.70              | 0.90 | 0.95 | 1.00 |   |   |   |
| Freq.(Hz)                                  | 120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1K            | 10k                                                                                  | 10k up             |                              |        |                                   |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| Cap. (μF)                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |                                                                                      |                    |                              |        |                                   |                 |                        |                 |                   |           |      |      |      |      |                |                   |      |      |      |   |   |   |
| 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

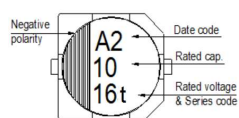
Unit: mm

| φD  | L         | A    | B    | C   | W         | P ± 0.2 |
|-----|-----------|------|------|-----|-----------|---------|
| 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  | 8.4  | 8.4  | 9.0 | 0.7 ~ 1.1 | 3.1     |
| 10  | 10 ± 0.5  | 10.4 | 10.4 | 11  | 0.7 ~ 1.3 | 4.7     |

### Marking

φ D ≤ 6.3mm

φ D = 8 ~ 10 mm





Dimension:  $\phi D \times L$ (mm)  
 Ripple Current: mA/rms at 100k Hz, 105°C  
 Impedance:  $\Omega$ / at 100k Hz, 20°C

**Dimension & Permissible Ripple Current**

| $\mu F$ | V. DC Contents | 6.3V (0J)         |      |       | 10V (1A)          |      |       | 16V (1C)          |      |       | 25V (1E)          |       |       | 35V (1V)          |       |       | 50V (1H)          |       |      |     |
|---------|----------------|-------------------|------|-------|-------------------|------|-------|-------------------|------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|------|-----|
|         |                | $\phi D \times L$ | 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      |                |                   |      |       |                   |      |       |                   |      |       |                   |       |       |                   |       | 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**

|             |              |                       |               |              |               |                     |                              |
|-------------|--------------|-----------------------|---------------|--------------|---------------|---------------------|------------------------------|
| VZS series  | 1500 $\mu F$ | $\pm 20\%$            | 6.3V          | Carrier Tape |               | 8 $\phi \times 10L$ | Pb-free and PET coating case |
| <b>VZT</b>  | <b>152</b>   | <b>M</b>              | <b>0J</b>     | <b>TR</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 13.