



VEC Series

Features

- $4\phi \sim 6.3\phi$, 85°C, 2,000 hours assured
- Vertical chip type miniaturized for 5.5mm, high capacitors
- Low Leakage Current Lead free reflow soldering is available
- Designed for surface mounting on high density PC board
- RoHS Compliance

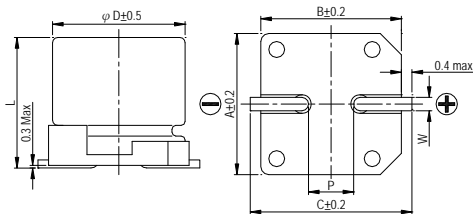


Marking color: Black

Specifications

| Items | Performance | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|----------------|-----------|--------------------|------------------------------|--------------------|-----------------------------------|-----------------|------------------------|-----------------|-------------------|------|------|------|------|---|---|-------------------|---|---|---|---|---|---|
| Category Temperature Range | -40°C ~ +85°C | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% (at 120Hz, 20°C) | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current (at 20°C) | $I = 0.002CV$ or $0.5 (\mu A)$ whichever is greater (after 2 minutes) Where, C = rated capacitance in μF V = rated DC working voltage in V | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (Tan δ at 120Hz, 20°C) | <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max)</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table> | Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | Tan δ (max) | 0.28 | 0.24 | 0.20 | 0.14 | 0.12 | 0.10 | | | | | | | | | |
| Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | | | | | | | | | | | | | | | | | | |
| Tan δ (max) | 0.28 | 0.24 | 0.20 | 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"> <thead> <tr> <th colspan="2">Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance Ratio</td> <td>Z(-25°C)/Z(+20°C)</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table> | Rated Voltage | | 6.3 | 10 | 16 | 25 | 35 | 50 | Impedance Ratio | Z(-25°C)/Z(+20°C) | 3 | 3 | 2 | 2 | 2 | 2 | Z(-40°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) | 3 | 3 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | |
| | Z(-40°C)/Z(+20°C) | 8 | 5 | 4 | 3 | 3 | 3 | | | | | | | | | | | | | | | | | |
| Endurance | <table border="1"> <thead> <tr> <th>Test Time</th> <th>2,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied for 2,000 hours at 85°C.</p> | Test Time | 2,000 Hrs | Capacitance Change | Within ±20% of initial value | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value | | | | | | | | | | | | | | | |
| Test Time | 2,000 Hrs | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | Less than 200% of specified value | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life Test | <table border="1"> <thead> <tr> <th>Test Time</th> <th>1,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied.</p> | Test Time | 1,000 Hrs | Capacitance Change | Within ±20% of initial value | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value | | | | | | | | | | | | | | | |
| Test Time | 1,000 Hrs | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | Less than 200% of specified value | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Current & Frequency Multipliers | <table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>50</th> <th>120</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>0.7</td> <td>1.0</td> <td>1.3</td> <td>1.4</td> </tr> </tbody> </table> | Frequency (Hz) | 50 | 120 | 1k | 10k up | Multiplier | 0.7 | 1.0 | 1.3 | 1.4 | | | | | | | | | | | | | |
| Frequency (Hz) | 50 | 120 | 1k | 10k up | | | | | | | | | | | | | | | | | | | | |
| Multiplier | 0.7 | 1.0 | 1.3 | 1.4 | | | | | | | | | | | | | | | | | | | | |

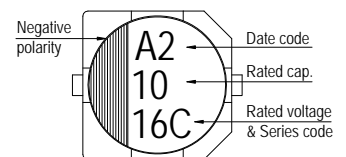
Diagram of Dimensions



Lead Spacing and Diameter

| ϕD | L | A | B | C | W | P ± 0.2 |
|----------|-----------|-----|-----|-----|-----------|---------|
| 4 | 5.3 ± 0.2 | 4.3 | 4.3 | 5.1 | 0.5 ~ 0.8 | 1.0 |
| 5 | 5.3 ± 0.2 | 5.3 | 5.3 | 5.9 | 0.5 ~ 0.8 | 1.5 |
| 6.3 | 5.3 ± 0.2 | 6.6 | 6.6 | 7.2 | 0.5 ~ 0.8 | 2.0 |

Marking



Dimension & Permissible Ripple Current

Dimension: $\phi D \times L$ (mm)

Ripple Current: mA/rms at 120 Hz, 85°C

| μF | Contents | 6.3V (0J) | | 10V (1A) | | 16V (1C) | | 25V (1E) | | 35V (1V) | | 50V (1H) | |
|---------|----------|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|
| | | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA |
| 1 | 010 | | | | | | | | | | | 4×5.3 | 10 |
| 2.2 | 2R2 | | | | | | | | | | | 4×5.3 | 15 |
| 3.3 | 3R3 | | | | | | | | | | | 4×5.3 | 19 |
| 4.7 | 4R7 | | | | | | | 4×5.3 | 19 | 4×5.3 | 20 | 5×5.3 | 26 |
| 10 | 100 | | | 4×5.3 | 23 | 4×5.3 | 26 | 5×5.3 | 32 | 5×5.3 | 34 | 6.3×5.3 | 44 |
| 22 | 220 | 4×5.3 | 31 | 5×5.3 | 39 | 5×5.3 | 44 | 6.3×5.3 | 55 | 6.3×5.3 | 59 | | |
| 33 | 330 | 5×5.3 | 44 | 5×5.3 | 48 | 6.3×5.3 | 63 | 6.3×5.3 | 67 | | | | |
| 47 | 470 | 5×5.3 | 52 | 6.3×5.3 | 67 | 6.3×5.3 | 75 | | | | | | |
| 100 | 101 | 6.3×5.3 | 89 | 6.3×5.3 | 98 | | | | | | | | |

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