# VES Series

Features

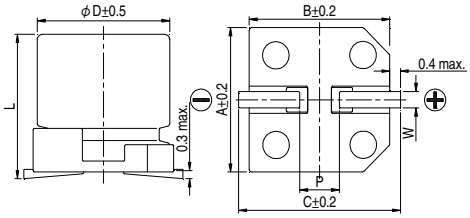
- 4φ ~ 6.3φ, 105℃, 1,000 hours assured
- Vertical chip type miniaturized for 5.5mm high capacitor
- Designed for surface mounting on high density PC board
- RoHS compliance


Marking color: Black

Specifications

| Items | Performance |
|---|---|
| Category Temperature Range | -55℃ ~ +105℃ |
| Capacitance Tolerance | ±20% (at 120 Hz, 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 120 Hz, 20℃) | Rated Voltage: 6.3 / 10 / 16 / 25 / 35 / 50<br>Tanδ (max): 0.30 / 0.26 / 0.22 / 0.16 / 0.13 / 0.12 |
| Low Temperature Characteristics (at 120 Hz) | Impedance ratio shall not exceed the values given in the table below.<br>Impedance Ratio Z(-25℃)/Z(+20℃): 4 / 3 / 2 / 2 / 2 / 2<br>Impedance Ratio Z(-55℃)/Z(+20℃): 8 / 5 / 4 / 3 / 3 / 3 |
| Endurance | Test Time: 1,000 Hrs<br>Capacitance Change: Within ±20% of initial value<br>Tanδ: Less than 200% of specified value<br>Leakage Current: Within specified value<br>* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃. |
| Shelf Life Test | Test time: 1,000 hours; other items are the same as those for the Endurance. |
| Ripple Current and Frequency Multipliers | Frequency (Hz): 50 / 120 / 1k / 10k up<br>Multiplier: 0.7 / 1.0 / 1.3 / 1.4 |

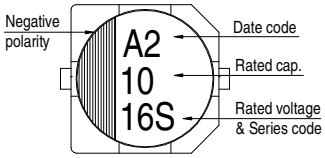
Diagram of Dimensions




Lead Spacing and Diameter Unit: mm

| 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 and Permissible Ripple Current

Dimension: φD × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

| Rated Volt. (VDC) | | 6.3V (0J) | | 10V (1A) | | 16V (1C) | | 25V (1E) | | 35V (1V) | | 50V (1H) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cap. (μF) | Contents | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA | φD×L | mA |
| 1 | 010 | | | | | | | | | | | 4×5.3 | 7 |
| 2.2 | 2R2 | | | | | | | | | | | 4×5.3 | 10 |
| 3.3 | 3R3 | | | | | | | | | | | 4×5.3 | 12 |
| 4.7 | 4R7 | | | | | | | 4×5.3 | 12 | 4×5.3 | 14 | 5×5.3 | 17 |
| 10 | 100 | | | 4×5.3 | 15 | 4×5.3 | 16 | 5×5.3 | 21 | 5×5.3 | 23 | 6.3×5.3 | 26 |
| 22 | 220 | 4×5.3 | 21 | 5×5.3 | 25 | 5×5.3 | 28 | 6.3×5.3 | 36 | 6.3×5.3 | 50 | 6.3×5.3 | 51 |
| 33 | 330 | 5×5.3 | 30 | 5×5.3 | 31 | 6.3×5.3 | 40 | 6.3×5.3 | 44 | | | | |
| 47 | 470 | 5×5.3 | 36 | 6.3×5.3 | 43 | 6.3×5.3 | 47 | 6.3×5.3 | 60 | | | | |
| 100 | 101 | 6.3×5.3 | 61 | 6.3×5.3 | 65 | 6.3×5.3 | 70 | | | | | | |

Part Numbering System

| VES Series | 10μF | ±20% | 16V | Carrier Tape | | 4φ×5.3L | Pb-free and PET coating case |
|---|---|---|---|---|---|---|---|
| **VES** | **100** | **M** | **1C** | **TR** | **-** | **0405** | |
| 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.