# VEJ Series

Features

- 4φ ~ 18φ, 105℃, 2,000 hours assured
- Designed for surface mounting on high density PC board
- RoHS Compliance

Marking color: Black

## Specifications

| Items | Performance | | |
|---|---|---|---|
| Category Temperature Range | 6.3 ~ 100V | 160 ~ 400V | 450V |
| | -55℃ ~ +105℃ | -40℃ ~ +105℃ | -25℃ ~ +105℃ |
| Capacitance Tolerance | ±20% (at 120Hz, 20℃) | | |

**Leakage Current (at 20℃)**

| Rated voltage | 6.3 ~ 100V | | 160 ~ 450V |
|---|---|---|---|
| Time | after 2 minutes | | after 5 minutes |
| Case size | 4 ~ 10φ | 12.5 ~ 18φ | 12.5 ~ 18φ |
| Leakage Current | I = 0.01CV or 3μA, whichever is greater | I = 0.03CV or 4μA, whichever is greater | I = 0.04CV + 100μA |

Where, C = rated capacitance in μF V = rated DC working voltage in V

**Tanδ (at 120Hz, 20℃)**

| Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 ~ 250 | 400 ~ 450 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 ~ 10φ | 0.45 | 0.35 | 0.28 | 0.18 | 0.16 | 0.14 | 0.12 | 0.12 | - | - |
| 12.5 ~ 18φ | 0.40 | 0.38 | 0.34 | 0.26 | 0.22 | 0.18 | 0.14 | 0.10 | 0.20 | 0.25 |

When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.

**Low Temperature Characteristics (at 120Hz)**

Impedance ratio shall not exceed the values given in the table below.

| Rated Voltage | | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 ~ 250 | 400 ~ 450 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Impedance Ratio | Z(-25℃) /Z(+20℃) | φD<12.5 | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 3 | - | - |
| | | φD≧12.5 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 6 |
| | Z(-55/-40℃) /Z(+20℃) | φD<12.5 | 12 | 8 | 6 | 4 | 3 | 3 | 3 | 4 | - | - |
| | | φD≧12.5 | 10 | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 6 | 10 |

**Endurance**

| Test Time | 2,000 Hrs |
|---|---|
| Capacitance Change | Within ±25% of initial value for φD ≦ 6.3mm;<br>Within ±20% of initial value for φD ≧ 8mm |
| Tanδ | Less than 300% of specified value for φD ≦ 6.3mm;<br>Less than 200% of specified value for φD ≧ 8mm |
| Leakage Current | Within specified value |

* The above Specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.

**Shelf Life Test**

Test time: 1,000 hours; other items are the same as those for the Endurance.
The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).

**Ripple Current & Frequency Multipliers**

| Cap. (μF) \ Freq. (Hz) | 50 | 120 | 1k | 10k up |
|---|---|---|---|---|
| Under 1,000 | 0.80 | 1.00 | 1.25 | 1.40 |
| 1,000 < C ≦ 8,200 | 0.85 | 1.00 | 1.15 | 1.25 |

## Diagram of Dimensions

Fig. 1

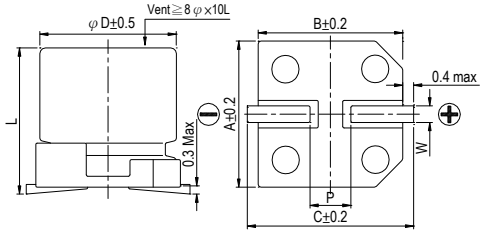
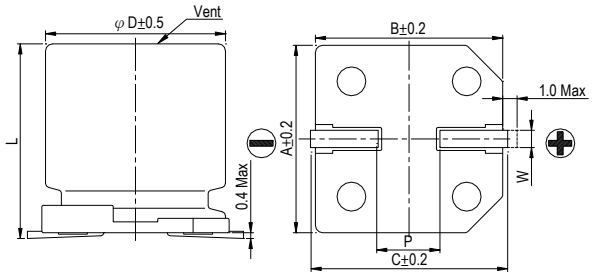



Fig. 2

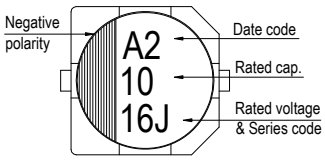



Lead Spacing and Diameter Unit: mm

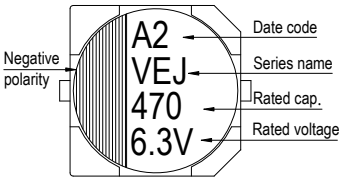
| φD | L | A | B | C | W | P ± 0.2 | Fig. No. |
|---|---|---|---|---|---|---|---|
| 4 | 5.7 ± 0.3 | 4.3 | 4.3 | 5.1 | 0.5 ~ 0.8 | 1.0 | 1 |
| 5 | 5.7 ± 0.3 | 5.3 | 5.3 | 5.9 | 0.5 ~ 0.8 | 1.5 | 1 |
| 6.3 | 5.7 ± 0.3 | 6.6 | 6.6 | 7.2 | 0.5 ~ 0.8 | 2.0 | 1 |
| 6.3 | 7.7 ± 0.3 | 6.6 | 6.6 | 7.2 | 0.5 ~ 0.8 | 2.0 | 1 |
| 8 | 6.5 ± 0. 3 | 8.4 | 8.4 | 9.0 | 0.5 ~ 0.8 | 2.3 | 1 |
| 8 | 10 ± 0.5 | 8.4 | 8.4 | 9.0 | 0.7 ~ 1.1 | 3.1 | 1 |
| 10 | 7.7 ± 0.3 | 10.4 | 10.4 | 11.0 | 0.7 ~ 1.3 | 4.7 | 1 |
| 10 | 10 ± 0.5 | 10.4 | 10.4 | 11.0 | 0.7 ~ 1.3 | 4.7 | 1 |
| 12.5 | 13.5 ± 0.5 | 13.0 | 13.0 | 13.7 | 1.1 ~ 1.4 | 4.4 | 2 |
| 12.5 | 16 ± 0.5 | 13.0 | 13.0 | 13.7 | 1.1 ~ 1.4 | 4.4 | 2 |
| 16 | 16.5 ± 0.5 | 17.0 | 17.0 | 18.0 | 1.1 ~ 1.4 | 6.4 | 2 |
| 16 | 21.5 ± 0.5 | 17.0 | 17.0 | 18.0 | 1.1 ~ 1.4 | 6.4 | 2 |
| 18 | 16.5 ± 0.5 | 19.0 | 19.0 | 20.0 | 1.1 ~ 1.4 | 6.4 | 2 |
| 18 | 21.5 ± 0.5 | 19.0 | 19.0 | 20.0 | 1.1 ~ 1.4 | 6.4 | 2 |

## Marking

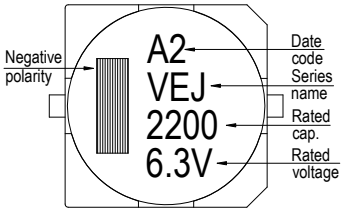
$\phi$D ≦ 6.3 mm




$\phi$D = 8 ~ 10 mm




$\phi$D ≧ 12.5 mm




## Dimension & Permissible Ripple Current

Dimension: $\phi$D × L(mm)
Ripple Current: mA/rms at 120 Hz, 105℃

| V. DC | | 6.3V (0J) | | 10V (1A) | | 16V (1C) | | 25V (1E) | | 35V (1V) | | 50V (1H) | | 63V (1J) | | 100V (2A) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| μF | Contents | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA |
| 1 | 010 | | | | | | | | | | | 4×5.7 | 8 | 4×5.7 | 8 | | |
| 2.2 | 2R2 | | | | | | | | | | | 4×5.7 | 12 | 4×5.7 | 12 | | |
| 3.3 | 3R3 | | | | | | | | | | | 4×5.7 | 14 | 5×5.7 | 17 | | |
| 4.7 | 4R7 | | | | | | | 4×5.7 | 17 | 4×5.7 | 17 | 5×5.7 | 20 | 6.3×5.7 | 22 | | |
| 10 | 100 | | | | | 4×5.7 | 20 | 4×5.7 | 20 | 5×5.7 | 27 | 6.3×5.7 | 32 | 6.3×5.7<br>8×6.5 | 32<br>51 | | |
| 22 | 220 | 4×5.7 | 22 | 4×5.7 | 22 | 5×5.7 | 30 | 5×5.7 | 30 | 6.3×5.7 | 44 | 6.3×5.7<br>8×6.5 | 38<br>67 | 6.3×7.7 | 58 | 8×10 | 100 |
| 33 | 330 | 5×5.7 | 34 | 5×5.7 | 34 | 5×5.7 | 34 | 6.3×5.7 | 46 | 6.3×5.7<br>8×6.5 | 46<br>76 | 6.3×7.7 | 65 | 8×10 | 140 | 10×10 | 150 |
| 47 | 470 | 5×5.7 | 38 | 5×5.7 | 38 | 6.3×5.7 | 48 | 6.3×5.7<br>8×6.5 | 48<br>79 | 6.3×7.7 | 80 | 6.3×7.7 | 70 | 8×10 | 170 | 12.5×13.5 | 250 |
| 100 | 101 | 6.3×5.7 | 69 | 6.3×5.7<br>8×6.5 | 69<br>90 | 6.3×5.7 | 69 | 6.3×7.7 | 100 | 8×10 | 240 | 8×10 | 210 | 10×10 | 310 | 12.5×13.5 | 380 |
| 220 | 221 | 6.3×7.7<br>8×6.5 | 120<br>120 | 6.3×7.7 | 120 | 6.3×7.7 | 120 | 8×10<br>10×7.7 | 270<br>270 | 8×10 | 270 | 10×10 | 330 | 12.5×13.5 | 470 | 16×16.5 | 450 |
| 330 | 331 | 8×10 | 290 | 8×10 | 290 | 8×10<br>10×7.7 | 290<br>290 | 8×10 | 290 | 10×10 | 370 | 12.5×13.5 | 490 | 16×16.5 | 650 | 18×16.5<br>16×21.5 | 590<br>750 |
| 470 | 471 | 8×10 | 320 | 8×10<br>10×7.7 | 320<br>320 | 10×10 | 380 | 10×10 | 380 | 12.5×13.5 | 520 | 12.5×16 | 550 | 16×16.5 | 700 | 18×21.5 | 980 |
| 1,000 | 102 | 10×10 | 410 | 10×10 | 410 | 12.5×13.5 | 550 | 12.5×16 | 550 | 16×16.5 | 800 | 18×16.5 | 990 | | | | |
| 2,200 | 222 | 12.5×13.5 | 680 | 12.5×13.5 | 680 | 16×16.5 | 900 | 16×16.5 | 900 | 18×16.5 | 1,050 | | | | | | |
| 3,300 | 332 | 12.5×16 | 850 | 16×16.5 | 950 | 16×16.5 | 950 | 18×16.5<br>16×21.5 | 1,150<br>1,200 | | | | | | | | |
| 4,700 | 472 | 16×16.5 | 1,000 | 16×16.5 | 1,000 | 18×16.5<br>16×21.5 | 1,225<br>1,275 | 18×21.5 | 1,300 | | | | | | | | |
| 6,800 | 682 | 18×16.5<br>16×21.5 | 1,290<br>1,350 | 18×16.5<br>16×21.5 | 1,290<br>1,350 | | | | | | | | | | | | |
| 8,200 | 822 | 18×21.5 | 1,450 | 18×21.5 | 1,450 | | | | | | | | | | | | |

| V. DC | | 160V (2C) | | 200V (2D) | | 250V (2E) | | 400V (2G) | | 450V (2W) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| μF | Contents | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA | $\phi$D×L | mA |
| 4.7 | 4R7 | | | | | 12.5×13.5 | 65 | 12.5×13.5 | 45 | 12.5×13.5 | 45 |
| 10 | 100 | | | 12.5×13.5 | 80 | 12.5×13.5 | 70 | 12.5×13.5 | 50 | 12.5×16 | 75 |
| 22 | 220 | | | 12.5×16 | 110 | 12.5×13.5 | 105 | 16×16.5 | 85 | 16×16.5 | 85 |
| 33 | 330 | 12.5×13.5 | 95 | 12.5×16 | 120 | 16×16.5 | 180 | 18×16.5 | 100 | 18×16.5 | 100 |
| 47 | 470 | 16×16.5 | 240 | 16×16.5 | 220 | 16×16.5 | 220 | 18×21.5 | 130 | | |
| 100 | 101 | 16×16.5 | 250 | 18×16.5 | 280 | 18×16.5 | 260 | | | | |

## Part Numbering System

| VEJ series | 470μF | ±20% | 6.3V | Carrier Tape | | 8$\phi$×10L | Pb-free and PET coating case |
|---|---|---|---|---|---|---|---|
| **VEJ** | **471** | **M** | **0J** | **TR** | **-** | **0810** | |
| 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 12.



All product specifications in the catalog are subject to change without notice. (CAT. 2015E1)

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