

**CVJ Series**

**Features**

- 4 φ ~ 18 φ , 105°C, 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°C ~ +105°C   | -40°C ~ +105°C  | -25°C ~ +105°C                          |                    |      |        |      |      |      |           |           |           |           |
| Capacitance Tolerance  | ±20%   |   | (at 120Hz, 20°C)                        |                    |      |        |      |      |      |           |           |           |           |
| Leakage Current (at 20°C)  | Rated voltage  | 6.3 ~ 100V  | 160 ~ 450V                              |                    |      |        |      |      |      |           |           |           |           |
|  | Time   | after 2 minutes   |   |                    |      |        |      |      |      |           |           |           |           |
|  | Case size  | 4 ~ 10 φ  | 12.5 ~ 18 φ                             |                    |      |        |      |      |      |           |           |           |           |
|  | 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°C)  | Rated Voltage  | 6.3   | 10                                      | 16                 | 25   | 35     | 50   | 63   | 100  | 160 ~ 250 | 400 ~ 450 |           |           |
|  | 4 ~ 10 φ   | 0.45  | 0.35                                    | 0.28               | 0.18 | 0.16   | 0.14 | 0.12 | 0.12 | -         | -         |           |           |
|  | 12.5 ~ 18 φ  | 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.  |   |   |                    |      |        |      |      |      |           |           |           |           |
|  | Impedance Ratio  | Rated Voltage   |   | 6.3                | 10   | 16     | 25   | 35   | 50   | 63        | 100       | 160 ~ 250 | 400 ~ 450 |
|  |  | Z(-25°C)  | φ D < 12.5                              | 4                  | 4    | 3      | 2    | 2    | 2    | 2         | 3         | -         | -         |
|  |  | /Z(+20°C)   | φ D ≥ 12.5                              | 5                  | 4    | 3      | 2    | 2    | 2    | 2         | 2         | 3         | 6         |
|  |  | Z(-55/40°C)   | φ D < 12.5                              | 12                 | 8    | 6      | 4    | 3    | 3    | 3         | 4         | -         | -         |
| /Z(+20°C)  | φ D ≥ 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 φ D ≤ 6.3mm;<br>Within ±20% of initial value for φ D ≥ 8mm           |   |                    |      |        |      |      |      |           |           |           |           |
|  | Tanδ   | Less than 300% of specified value for φ D ≤ 6.3mm;<br>Less than 200% of specified value for φ D ≥ 8mm |   |                    |      |        |      |      |      |           |           |           |           |
|  | Leakage Current  | Within specified value  |   |                    |      |        |      |      |      |           |           |           |           |
| * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied for 2,000 hours at 105°C. |  |   |   |                    |      |        |      |      |      |           |           |           |           |
| Shelf Life Test  | Test time: 1,000 hours; other items are the same as those for the Endurance.<br>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 and Frequency Multipliers   | Freq. (Hz)   |   | 50                                      | 120                | 1k   | 10k up |      |      |      |           |           |           |           |
|  | Cap. (μF)  | 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

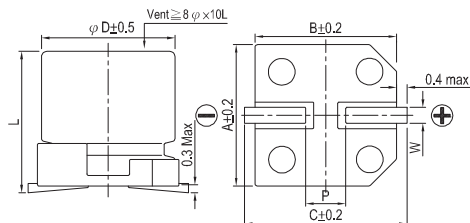
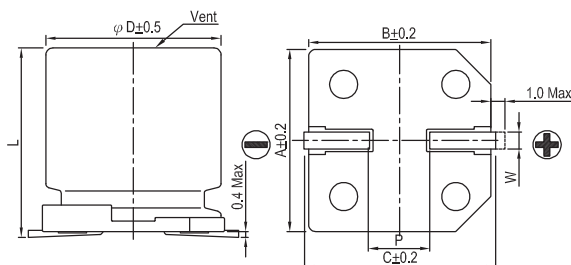


Fig. 2



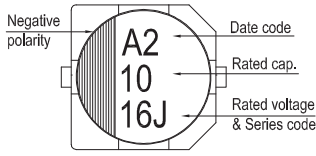
**Lead Spacing and Diameter**

Unit: mm

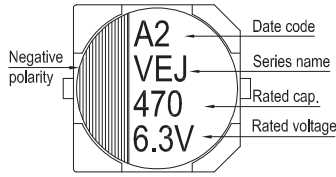
| φ D  | L          | A    | B    | C    | W         | P ± 0.2 | Fig. No. |
|------|------------|------|------|------|-----------|---------|----------|
| 4    | 5.7 ± 0.3  | 4.3  | 4.3  | 5.1  | 0.5 ~ 0.8 | 1.0     | 1        |
| 5    | 5.7 ± 0.3  | 5.3  | 5.3  | 5.9  | 0.5 ~ 0.8 | 1.5     | 1        |
| 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**

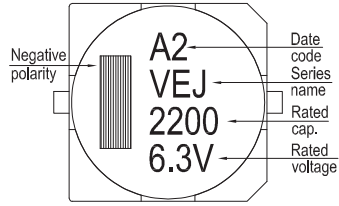
$\phi D \leq 6.3 \text{ mm}$



$\phi D = 8 \sim 10 \text{ mm}$



$\phi D \geq 12.5 \text{ mm}$



**Dimension and Permissible Ripple Current**

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

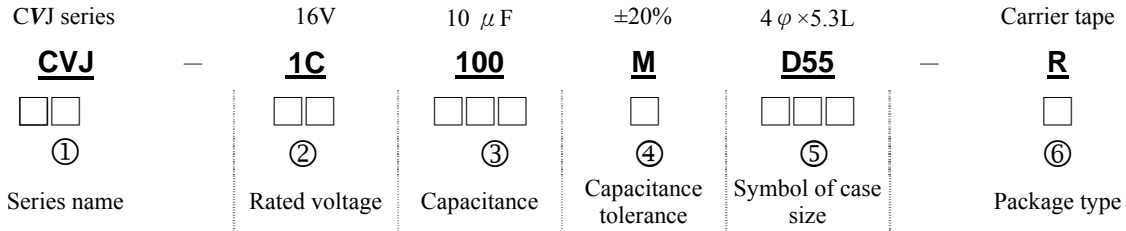
Ripple Current: mA/rms at 120 Hz, 105°C

| $\mu\text{F}$ | V. DC Contents | 6.3V (0J)          |                | 10V (1A)           |                | 16V (1C)           |                | 25V (1E)           |                | 35V (1V)          |          | 50V (1H)          |          | 63V (1J)          |          | 100V (2A)          |            |
|---------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|-------------------|----------|-------------------|----------|-------------------|----------|--------------------|------------|
|               |                | $\phi D \times L$  | 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       | $\phi D \times L$ | mA       | $\phi D \times L$  | 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 | 8×6.5              | 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          |                    |                |                    |                |                   |          |                   |          |                   |          |                    |            |

| $\mu\text{F}$ | V. DC Contents | 160V (2C)         |     | 200V (2D)         |     | 250V (2E)         |     | 400V (2G)         |     | 450V (2W)         |     |
|---------------|----------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|               |                | $\phi D \times L$ | mA  | $\phi D \times L$ | mA  | $\phi D \times L$ | mA  | $\phi D \times L$ | mA  | $\phi D \times L$ | mA  |
| 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            | 12.5×16.5         | 205 | 16×16.5           | 220 | 16×16.5           | 220 | 18×21.5           | 130 |                   |     |
| 100           | 101            | 16×16.5           | 250 | 18×16.5           | 280 | 18×21.5           | 290 |                   |     |                   |     |

## Part Numbering System for the SMD Type

When you place an order for Calchip electrolytic capacitors, please refer to our part number as shown below.



① Series:

Series is represented by a two or three digit code. If there are 2 digits only for series code, keep blank on the third digit.

→ →

② Rated Voltage:

Voltage on volts (V) is represented by two digit code showing the real working voltage.

OG=4V, OJ=6.3V, 1A=10V, 1C=16V, 1E=25V, 1V=35V, 1H=50V, 1J = 63V, 1K = 80V and 2A = 100V

③ Capacitance:

Rated capacitance in  $\mu$ F is represented by a three digit number. The first two digits are the significant figures of the nominal capacitance and the third digit indicates the number of zeros following these figures. The decimal point is represent by the capital letter R. Please refer to the following example:

|             |     |      |     |     |     |     |     |     |      |
|-------------|-----|------|-----|-----|-----|-----|-----|-----|------|
| $\mu$ F     | 0.1 | 0.47 |     | 4.7 |     | 47  | 100 | 470 | 1000 |
| Part number | 0R1 | R47  | 010 | 4R7 | 100 | 470 | 101 | 471 | 102  |

④ Tolerance:

Symbol of W, T, Q, V, M, K and J show special capacitance tolerance which are listed as follows:

|                  |                 |
|------------------|-----------------|
| W = -10% ~ +100% | M = -20% ~ +20% |
| T = -10% ~ +50%  | K = -10% ~ +10% |
| Q = -10% ~ +30%  | J = -5% ~ +5%   |
| V = -10% ~ +20%  |                 |

⑤ Case Size: Symbol of case size are listed as follows:

| $\phi$ D×L (mm) | Symbol | $\phi$ D×L (mm) | Symbol | $\phi$ D×L (mm) | Symbol | $\phi$ D×L (mm) | Symbol |
|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|
| 3×5.3           | B55    | 6.3×5.3         | F55    | 8×6.5           | G68    | 10×10.0         | H10    |
| 4×5.3           | D55    | 6.3×5.7         | F60    | 8×7.0           | G72    | 10×13.0         | H13    |
| 4×5.7           | D60    | 6.3×6.0         | F62    | 8×10.0          | G10    | 12.5×13.5       | K14    |
| 5×5.3           | E55    | 6.3×7.0         | F72    | 8×12.0          | G12    | 12.5×16.0       | K16    |
| 5×5.7           | E60    | 6.3×7.7         | F80    | 10×8.0          | H82    | 16×16.5         | L17    |

⑥ Package type:

|   |  |
|---|--|
| R | Taping polarity symbol with reel package in 380 mm |
| M | Taping polarity symbol with reel package in 450 mm |
| T | Tray   |