



## VE Series

### Features

- 3  $\phi$  ~ 18  $\phi$ , 85°C, 2,000 hours assured
- Chip type large capacitance capacitors
- Designed for surface mounting on high density PC board
- RoHS Compliance



Marking color: Black

### Specifications

|                                                                                   |                                                                                                                                                                                                          |            |                                               |      |      |                                            |      |      |                   |      |           |           |           |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------|------|------|--------------------------------------------|------|------|-------------------|------|-----------|-----------|-----------|
| Items                                                                             | Performance                                                                                                                                                                                              |            |                                               |      |      |                                            |      |      |                   |      |           |           |           |
| Category Temperature Range                                                        | -40℃ ~ +85℃                                                                                                                                                                                              |            |                                               |      |      |                                            |      |      |                   |      |           |           |           |
| Capacitance Tolerance                                                             | ±20%<br>(at 120Hz, 20℃)                                                                                                                                                                                  |            |                                               |      |      |                                            |      |      |                   |      |           |           |           |
| Leakage Current (at 20℃)                                                          | Rated Voltage                                                                                                                                                                                            |            | 6.3 ~ 100V                                    |      |      |                                            |      |      | 160 ~ 450V        |      |           |           |           |
|                                                                                   | Time                                                                                                                                                                                                     |            | after 2 minutes                               |      |      |                                            |      |      | after 5 minutes   |      |           |           |           |
|                                                                                   | Case size                                                                                                                                                                                                |            | 3 ~ 10 ϕ                                      |      |      | 12.5 ~ 18 ϕ                                |      |      | 12.5 ~ 18 ϕ       |      |           |           |           |
|                                                                                   | Leakage Current                                                                                                                                                                                          |            | I = 0.01CV or 3μA,<br>whichever is greater    |      |      | I = 0.03CV or 4μA,<br>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                                                                                                                                                                                            | 4          | 6.3                                           | 10   | 16   | 25                                         | 35   | 50   | 63                | 100  | 160 ~ 250 | 400 ~ 450 |           |
|                                                                                   | 3 ~ 10 ϕ                                                                                                                                                                                                 | 0.42       | 0.28                                          | 0.24 | 0.20 | 0.14                                       | 0.12 | 0.10 | 0.10              | 0.10 | -         | -         |           |
|                                                                                   | 12.5 ~ 18 ϕ                                                                                                                                                                                              | -          | 0.38                                          | 0.34 | 0.30 | 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                                                                                                                                                                                            |            | 4.0                                           | 6.3  | 10   | 16                                         | 25   | 35   | 50                | 63   | 100       | 160 ~ 250 | 400 ~ 450 |
|                                                                                   | Impedance Ratio                                                                                                                                                                                          | Z(-25℃)    | ϕ D < 12.5                                    | 7    | 4    | 4                                          | 3    | 2    | 2                 | 2    | 2         | -         | -         |
|                                                                                   |                                                                                                                                                                                                          | /Z(+20℃)   | ϕ D ≥ 12.5                                    | -    | 5    | 5                                          | 4    | 2    | 2                 | 2    | 2         | 3         | 6         |
|                                                                                   |                                                                                                                                                                                                          | Z(-40℃)    | ϕ D < 12.5                                    | 15   | 8    | 5                                          | 4    | 3    | 3                 | 3    | 3         | -         | -         |
| /Z(+20℃)                                                                          |                                                                                                                                                                                                          | ϕ D ≥ 12.5 | -                                             | 14   | 12   | 10                                         | 5    | 4    | 3                 | 3    | 6         | 10        |           |
| Endurance                                                                         | Test Time                                                                                                                                                                                                |            | 2,000 Hrs                                     |      |      |                                            |      |      |                   |      |           |           |           |
|                                                                                   | Capacitance Change                                                                                                                                                                                       |            | Within ±20% of initial value (4V: ±30%)       |      |      |                                            |      |      |                   |      |           |           |           |
|                                                                                   | Tanδ                                                                                                                                                                                                     |            | Less than 200% of specified value (4V: ±300%) |      |      |                                            |      |      |                   |      |           |           |           |
|                                                                                   | 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 85℃.                                                             |            |                                               |      |      |                                            |      |      |                   |      |           |           |           |
| 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 & 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 ≤ 10,000                                                                | 0.85                                                                                                                                                                                                     | 1.00       | 1.15                                          | 1.25 |      |                                            |      |      |                   |      |           |           |           |

### Diagram of Dimensions

Fig. 1

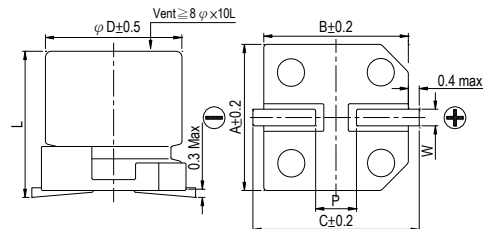
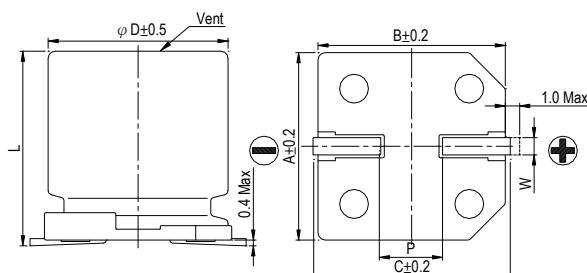


Fig. 2



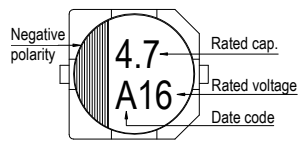
### Lead Spacing and Diameter

Unit: mm

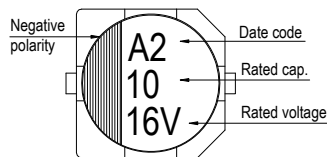
| $\phi$ D | L          | A    | B    | C    | W           | P ± 0.2 | Fig. No. |
|----------|------------|------|------|------|-------------|---------|----------|
| 3        | 5.3 ± 0.2  | 3.3  | 3.3  | 4.1  | 0.45 ~ 0.75 | 0.8     | 1        |
| 4        | 5.3 ± 0.2  | 4.3  | 4.3  | 5.1  | 0.5 ~ 0.8   | 1.0     | 1        |
| 5        | 5.3 ± 0.2  | 5.3  | 5.3  | 5.9  | 0.5 ~ 0.8   | 1.5     | 1        |
| 6.3      | 5.3 ± 0.2  | 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

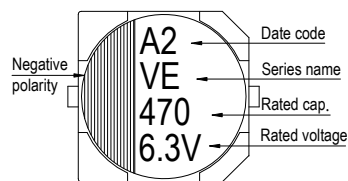
$\phi D = 3 \text{ mm}$



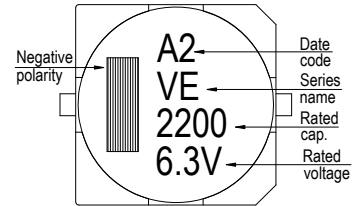
$\phi D = 4 \sim 6.3 \text{ mm}$



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



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



## Dimension & Permissible Ripple Current

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

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

| V. DC  |          | 4V (0G)            |           | 6.3V (0J)          |                | 10V (1A)                 |                   | 16V (1C)                    |                  | 25V (1E)           |                | 35V (1V)           |                | 50V (1H)           |                | 63 (1J)          |          |
|--------|----------|--------------------|-----------|--------------------|----------------|--------------------------|-------------------|-----------------------------|------------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|------------------|----------|
| μF     | Contents | φ D×L              | mA        | φ D×L              | mA             | φ D×L                    | mA                | φ D×L                       | mA               | φ D×L              | mA             | φ D×L              | mA             | φ D×L              | mA             | φ D×L            | mA       |
| 1      | 010      |                    |           |                    |                |                          |                   |                             |                  |                    |                |                    |                | 4×5.3              | 10             | 4×5.3            | 8        |
| 2.2    | 2R2      |                    |           |                    |                |                          |                   |                             |                  |                    |                |                    |                | 4×5.3              | 14             | 4×5.3            | 12       |
| 3.3    | 3R3      |                    |           |                    |                |                          |                   |                             |                  | 3×5.3              | 14             | 3×5.3              | 14             | 4×5.3              | 17             | 5×5.3            | 22       |
| 4.7    | 4R7      |                    |           |                    |                | 3×5.3                    | 14                | 3×5.3                       | 14               | 4×5.3              | 26             | 4×5.3              | 26             | 4×5.3              | 20             | 5×5.3            | 25       |
| 10     | 100      |                    |           | 3×5.3              | 16             | 4×5.3                    | 26                | 4×5.3                       | 26               | 5×5.3              | 44             | 5×5.3              | 44             | 5×5.3              | 35             | 6.3×5.3<br>8×6.5 | 40<br>46 |
| 22     | 220      | 3×5.3              | 16        | 4×5.3              | 26             | 5×5.3                    | 44                | 4×5.3<br>5×5.3              | 30<br>44         | 5×5.3<br>6.3×5.3   | 47<br>59       | 5×5.3<br>6.3×5.3   | 47<br>59       | 6.3×5.3<br>6.3×7.7 | 50<br>65       | 8×10             | 139      |
| 33     | 330      | 4×5.3              | 31        | 4×5.3              | 31             | 4×5.3<br>5×5.3           | 31<br>55          | 5×5.3                       | 55               | 5×5.3<br>6.3×5.3   | 55<br>67       | 6.3×5.3<br>6.3×7.7 | 67<br>85       | 6.3×7.7<br>8×6.5   | 75<br>95       | 8×10             | 139      |
| 47     | 470      | 4×5.3              | 34        | 4×5.3<br>5×5.3     | 34<br>55       | 6.3×5.3                  | 75                | 5×5.3<br>6.3×5.3            | 55<br>75         | 6.3×5.3<br>6.3×7.7 | 75<br>98       | 6.3×7.7<br>8×6.5   | 98<br>105      | 6.3×7.7<br>8×10    | 75<br>190      | 10×10            | 200      |
| 68     | 680      | 5×5.3              | 58        | 5×5.3<br>6.3×5.3   | 58<br>89       | 5×5.3<br>6.3×5.3         | 58<br>89          | 6.3×5.3                     | 89               | 6.3×7.7            | 109            | 6.3×7.7            | 109            | 8×10               | 190            | 10×10            | 226      |
| 100    | 101      | 5×5.3<br>6.3×5.3   | 58<br>89  | 6.3×5.3            | 89             | 6.3×5.3<br>6.3×7.7       | 89<br>109         | 6.3×5.3<br>6.3×7.7<br>8×6.5 | 89<br>109<br>125 | 6.3×7.7<br>8×6.5   | 109<br>145     | 8×10               | 252            | 8×10               | 190            | 10×10            | 226      |
| 150    | 151      |                    |           |                    |                |                          |                   |                             |                  |                    |                | 10×7.7             | 252            |                    |                |                  |          |
| 220    | 221      | 6.3×5.3<br>6.3×7.7 | 89<br>124 | 6.3×5.3<br>6.3×7.7 | 89<br>124      | 6.3×7.7<br>8×6.5<br>8×10 | 124<br>175<br>270 | 6.3×7.7<br>8×10             | 124<br>270       | 8×10<br>10×7.7     | 270<br>270     | 8×10<br>10×10      | 270<br>370     | 10×10              | 320            | 12.5×13.5        | 500      |
| 330    | 331      | 6.3×7.7            | 124       | 6.3×7.7<br>8×6.5   | 124<br>190     | 8×10                     | 290               | 8×10<br>10×7.7              | 290<br>290       | 10×10              | 400            | 10×10              | 400            | 12.5×13.5          | 600            | 12.5×16          | 600      |
| 470    | 471      | 8×10               | 290       | 8×10               | 290            | 10×7.7<br>10×10          | 290<br>400        | 10×10                       | 400              | 10×10              | 400            | 12.5×13.5          | 680            | 12.5×16            | 740            | 16×16.5          | 850      |
| 680    | 681      |                    |           | 10×7.7             | 290            | 10×10                    | 410               | 10×10                       | 410              | 12.5×13.5          | 680            | 12.5×13.5          | 680            | 16×16.5            | 1,000          | 18×16.5          | 1,100    |
| 1,000  | 102      |                    |           | 10×10              | 430            | 10×10                    | 430               | 12.5×13.5                   | 750              | 12.5×13.5          | 750            | 16×16.5            | 1,100          | 18×16.5<br>16×21.5 | 1,350<br>1,400 |                  |          |
| 2,200  | 222      |                    |           | 12.5×13.5          | 890            | 12.5×13.5                | 890               | 16×16.5                     | 1,100            | 16×16.5            | 1,100          | 18×16.5<br>16×21.5 | 1,450<br>1,500 |                    |                |                  |          |
| 3,300  | 332      |                    |           | 12.5×16            | 1,000          | 16×16.5                  | 1,300             | 16×16.5                     | 1,300            | 18×16.5<br>16×21.5 | 1,450<br>1,500 | 18×21.5            | 1,750          |                    |                |                  |          |
| 4,700  | 472      |                    |           | 16×16.5            | 1,400          | 16×16.5                  | 1,400             | 18×16.5<br>16×21.5          | 1,600<br>1,650   | 18×21.5            | 1,750          |                    |                |                    |                |                  |          |
| 6,800  | 682      |                    |           | 18×16.5<br>16×21.5 | 1,700<br>1,750 | 18×16.5<br>16×21.5       | 1,700<br>1,750    | 18×21.5                     | 2,000            |                    |                |                    |                |                    |                |                  |          |
| 10,000 | 103      |                    |           | 18×21.5            | 2,000          | 18×21.5                  | 2,000             |                             |                  |                    |                |                    |                |                    |                |                  |          |

| V. DC |          | 100V (2A)          |            | 160V (2C)          |            | 200V (2D)          |            | 250V (2E)          |            | 400V (2G) |     | 450V (2W) |     |
|-------|----------|--------------------|------------|--------------------|------------|--------------------|------------|--------------------|------------|-----------|-----|-----------|-----|
| μF    | Contents | φ D×L              | mA         | φ D×L              | mA         | φ D×L              | mA         | φ D×L              | mA         | φ D×L     | mA  | φ D×L     | mA  |
| 4.7   | 4R7      |                    |            |                    |            |                    |            |                    |            | 12.5×13.5 | 120 | 12.5×13.5 | 120 |
| 10    | 100      | 8×10               | 90         |                    |            |                    |            | 12.5×13.5          | 150        | 12.5×13.5 | 120 | 12.5×16   | 130 |
| 22    | 220      | 8×10               | 90         |                    |            | 12.5×13.5          | 240        | 12.5×13.5          | 150        | 16×16.5   | 140 | 16×16.5   | 140 |
| 33    | 330      | 10×10              | 120        | 12.5×13.5          | 290        | 12.5×16            | 310        | 12.5×16            | 240        | 16×16.5   | 140 | 18×16.5   | 180 |
| 47    | 470      | 10×10              | 120        | 12.5×16            | 370        | 16×16.5            | 420        | 16×16.5            | 340        | 18×16.5   | 280 | 18×21.5   | 250 |
| 68    | 680      | 12.5×13.5          | 380        | 16×16.5            | 500        | 16×16.5            | 420        | 18×16.5<br>16×21.5 | 440<br>450 | 18×21.5   | 350 |           |     |
| 100   | 101      | 12.5×13.5          | 440        | 18×16.5<br>16×21.5 | 650<br>690 | 18×16.5<br>16×21.5 | 550<br>590 | 18×21.5            | 490        |           |     |           |     |
| 220   | 221      | 16×16.5            | 600        |                    |            |                    |            |                    |            |           |     |           |     |
| 330   | 331      | 18×16.5<br>16×21.5 | 780<br>850 |                    |            |                    |            |                    |            |           |     |           |     |

## Part Numbering System

|             |                   |                       |               |              |                            |                              |
|-------------|-------------------|-----------------------|---------------|--------------|----------------------------|------------------------------|
| VE series   | 470 $\mu\text{F}$ | $\pm 20\%$            | 6.3V          | Carrier Tape | 8 $\phi \times 10\text{L}$ | Pb-free and PET coating case |
| <b>VE-</b>  | <b>471</b>        | <b>M</b>              | <b>0J</b>     | <b>TR</b>    | <b>-</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 12.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.