

## 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°C ~ +85°C   |   |  |      |      |        |    |    |    |    |    |     |           |           |
| Capacitance Tolerance                      | ±20% (at 120Hz, 20°C)   |   |  |      |      |        |    |    |    |    |    |     |           |           |
| Leakage Current (at 20°C)                  | Rated Voltage   | 6.3 ~ 100V  |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Time  | after 2 minutes                                     |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Case size   | 3 ~ 10 $\phi$                                       |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Leakage Current   | I = 0.01CV or 3 $\mu$ A, whichever is greater       |  |      |      |        |    |    |    |    |    |     |           |           |
| Tan $\delta$ (at 120Hz, 20°C)              | Rated Voltage   | 4 6.3 10 16 25 35 50 63 100 160 ~ 250 400 ~ 450     |  |      |      |        |    |    |    |    |    |     |           |           |
|  | 3 ~ 10 $\phi$   | 0.42 0.28 0.24 0.20 0.14 0.12 0.10 0.10 0.10 - -    |  |      |      |        |    |    |    |    |    |     |           |           |
|  | 12.5 ~ 18 $\phi$  | - 0.38 0.34 0.30 0.26 0.22 0.18 0.14 0.10 0.20 0.25 |  |      |      |        |    |    |    |    |    |     |           |           |
|  | When the capacitance exceeds 1,000 $\mu$ F, 0.02 shall be added every 1,000 $\mu$ F increase.   |   |  |      |      |        |    |    |    |    |    |     |           |           |
| Low Temperature Characteristics (at 120Hz) | Impedance ratio shall not exceed the values given in the table below.   |   |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Impedance Ratio   | Rated Voltage                                       |  | 4.0  | 6.3  | 10     | 16 | 25 | 35 | 50 | 63 | 100 | 160 ~ 250 | 400 ~ 450 |
|  |   | Z(-25°C)  | $\phi$ D < 12.5  | 7    | 4    | 4      | 3  | 2  | 2  | 2  | 2  | 2   | -         | -         |
|  |   | /Z(+20°C)   | $\phi$ D $\geq$ 12.5   | -    | 5    | 5      | 4  | 2  | 2  | 2  | 2  | 2   | 3         | 6         |
| Z(-40°C)                                   |   | $\phi$ D < 12.5                                     | 15   | 8    | 5    | 4      | 3  | 3  | 3  | 3  | 3  | -   | -         |           |
| Endurance                                  | Test Time   | 2,000 Hrs   |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Capacitance Change  | Within ±20% of initial value (4V: ±30%)             |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Tan $\delta$  | Less than 200% of specified value (4V: ±300%)       |  |      |      |        |    |    |    |    |    |     |           |           |
|  | Leakage Current   | Within specified value                              |  |      |      |        |    |    |    |    |    |     |           |           |
| Shelf Life Test                            | * 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. |   |  |      |      |        |    |    |    |    |    |     |           |           |
| Ripple Current & Frequency Multipliers     | 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). |      |      |        |    |    |    |    |    |     |           |           |
|  | Freq. (Hz)  |   | 50   | 120  | 1k   | 10k up |    |    |    |    |    |     |           |           |
| Cap. ( $\mu$ F)                            |   | Under 1,000   | 0.80   | 1.00 | 1.25 | 1.40   |    |    |    |    |    |     |           |           |
|  |   | 1,000 < C $\leq$ 10,000                             | 0.85   | 1.00 | 1.15 | 1.25   |    |    |    |    |    |     |           |           |

### Diagram of Dimensions

Fig. 1

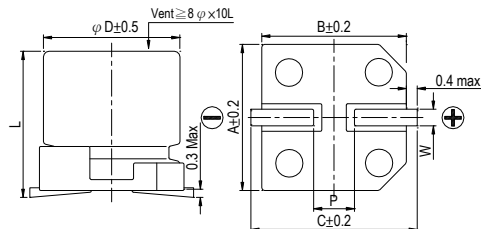


Fig. 2



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

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

## Dimension & Permissible Ripple Current

| $\mu\text{F}$ | V. DC Contents | 4V (0G)            |           | 6.3V (0J)          |                | 10V (1A)                 |                   | 16V (1C)                    |                  | 25V (1E)           |                | 35V (1V)           |                | 50V (1H)           |                | 63 (1J)           |          |       |     |
|---------------|----------------|--------------------|-----------|--------------------|----------------|--------------------------|-------------------|-----------------------------|------------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|-------------------|----------|-------|-----|
|               |                | $\phi D \times L$  | 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            |                    |           |                    |                |                          |                   |                             |                  |                    |                |                    |                | 4×5.3              | 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            | 109            | 8×6.5              | 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             |                             |                  |                    |                |                    |                |                    |                |                   |          |       |     |

| $\mu\text{F}$ | V. DC Contents | 100V (2A)          |            | 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  | $\phi D \times L$ | 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  $\phi$  × 10L    Pb-free and PET coating case

**VE-**    **471**    **M**    **OJ**    **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.

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9