



## VLV Series

### Features

- 12.5  $\phi$  ~ 16  $\phi$ , 105°C, 5,000 hours assured
- Suitable for automotive application
- Peak acceleration: 50G / 30G
- RoHS Compliance

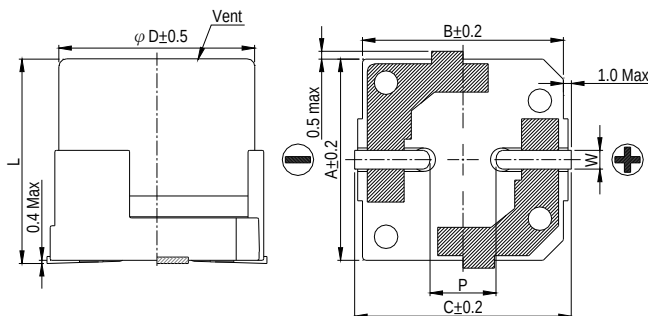


Marking color: Black

### Specifications

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|------------------------------|--------------------|-----------------------------------|-----------------|------------------------|------|-----|------------|--------------------|-----------------|------|------|------|------|------|------|------|---|---|-----------------|---|---|---|---|---|---|---|---|---|
| Items                                         | Performance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Category Temperature Range                    | -55 ~ +105℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Capacitance Tolerance                         | ±20%<br>(at 120Hz, 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                                                                                                                                                                                                                                                                                                                                                                                                     |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Dissipation Factor<br>(Tanδ at 120Hz, 20℃)    | <table><tr><td>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td></tr><tr><td>Tanδ (max)</td><td>0.30</td><td>0.26</td><td>0.22</td><td>0.16</td><td>0.13</td><td>0.10</td><td>0.08</td><td>0.08</td><td>0.07</td></tr></table> <p>When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.</p>                                                                                                                                              | Rated Voltage | 6.3       | 10                 | 16                           | 25                 | 35                                | 50              | 63                     | 80   | 100 | Tanδ (max) | 0.30               | 0.26            | 0.22 | 0.16 | 0.13 | 0.10 | 0.08 | 0.08 | 0.07 |   |   |                 |   |   |   |   |   |   |   |   |   |
| Rated Voltage                                 | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10            | 16        | 25                 | 35                           | 50                 | 63                                | 80              | 100                    |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Tanδ (max)                                    | 0.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.26          | 0.22      | 0.16               | 0.13                         | 0.10               | 0.08                              | 0.08            | 0.07                   |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Low Temperature<br>Characteristics (at 120Hz) | <p>Impedance ratio shall not exceed the values given in the table below.</p> <table><tr><td colspan="2">Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td></tr><tr><td rowspan="2">Impedance<br/>Ratio</td><td>Z(-25℃)/Z(+20℃)</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-55℃)/Z(+20℃)</td><td>8</td><td>5</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr></table> | Rated Voltage |           | 6.3                | 10                           | 16                 | 25                                | 35              | 50                     | 63   | 80  | 100        | Impedance<br>Ratio | Z(-25℃)/Z(+20℃) | 4    | 3    | 2    | 2    | 2    | 2    | 2    | 2 | 2 | Z(-55℃)/Z(+20℃) | 8 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| Rated Voltage                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6.3           | 10        | 16                 | 25                           | 35                 | 50                                | 63              | 80                     | 100  |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Impedance<br>Ratio                            | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4             | 3         | 2                  | 2                            | 2                  | 2                                 | 2               | 2                      | 2    |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
|                                               | Z(-55℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8             | 5         | 4                  | 3                            | 3                  | 3                                 | 3               | 3                      | 3    |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Endurance                                     | <table><tr><td>Test Time</td><td>5,000 Hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±30% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 300% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 5,000 hours at 105℃.</p>                                                                                                  | Test Time     | 5,000 Hrs | Capacitance Change | Within ±30% of initial value | Dissipation Factor | Less than 300% of specified value | Leakage Current | Within specified value |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Test Time                                     | 5,000 Hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Capacitance Change                            | Within ±30% of initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Dissipation Factor                            | Less than 300% of specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Leakage Current                               | Within specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Shelf Life Test                               | <table><tr><td>Test Time</td><td>1,000 Hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±30% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 300% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.</p>                                                                                      | Test Time     | 1,000 Hrs | Capacitance Change | Within ±30% of initial value | Dissipation Factor | Less than 300% of specified value | Leakage Current | Within specified value |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Test Time                                     | 1,000 Hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Capacitance Change                            | Within ±30% of initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Dissipation Factor                            | Less than 300% of specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Leakage Current                               | Within specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Ripple Current &<br>Frequency Multipliers     | <table><tr><td>Frequency(Hz)</td><td>50, 60</td><td>120</td><td>1k</td><td>10k up</td></tr><tr><td>Multiplier</td><td>0.60</td><td>0.70</td><td>0.85</td><td>1.0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                         | Frequency(Hz) | 50, 60    | 120                | 1k                           | 10k up             | Multiplier                        | 0.60            | 0.70                   | 0.85 | 1.0 |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Frequency(Hz)                                 | 50, 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 120           | 1k        | 10k up             |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Multiplier                                    | 0.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.70          | 0.85      | 1.0                |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |
| Vibration                                     | Peak acceleration: 50G<br>Peak to peak amplitude: 1.5mm<br>Frequency: 5 to 2,000 Hz reciprocation for 20 min.<br>Direction and duration of vibration: 3 orthogonal directions mutually each for 4 Hrs.                                                                                                                                                                                                                                                                                                                                     |               |           |                    |                              |                    |                                   |                 |                        |      |     |            |                    |                 |      |      |      |      |      |      |      |   |   |                 |   |   |   |   |   |   |   |   |   |

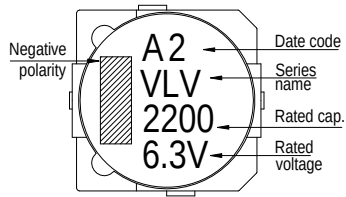
### Diagram of Dimensions



| Lead Spacing and Diameter |            |      |      |      |           |         | Unit: mm |
|---------------------------|------------|------|------|------|-----------|---------|----------|
| φD                        | L          | A    | B    | C    | W         | P ± 0.2 |          |
| 12.5                      | 13.5 ± 0.5 | 13.0 | 13.5 | 14.5 | 1.1 ~ 1.4 | 4.4     |          |
| 12.5                      | 16 ± 0.5   | 13.0 | 13.5 | 14.5 | 1.1 ~ 1.4 | 4.4     |          |
| 16                        | 16.5 ± 0.5 | 16.5 | 17.0 | 18.2 | 1.1 ~ 1.4 | 6.4     |          |

## Marking

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



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

Ripple Current: mA/rms at 100k Hz, 105°C

Impedance:  $\Omega/$  at 100k Hz, 20°C

## Dimension & Permissible Ripple Current

| V. DC         |          | 6.3V (0J)         |       |       | 10V (1A)          |       |       | 16V (1C)          |       |       | 25V (1E)          |       |       | 35V (1V)          |       |       | 50V (1H)          |       |       |
|---------------|----------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|
| $\mu\text{F}$ | Contents | $\phi D \times L$ | Imp.  | mA    | $\phi D \times L$ | Imp.  | mA    | $\phi D \times L$ | Imp.  | mA    | $\phi D \times L$ | Imp.  | mA    | $\phi D \times L$ | Imp.  | mA    | $\phi D \times L$ | Imp.  | mA    |
| 330           | 331      |                   |       |       |                   |       |       |                   |       |       |                   |       |       | 12.5×13.5         | 0.066 | 850   | 12.5×13.5         | 0.11  | 700   |
| 470           | 471      |                   |       |       |                   |       |       |                   |       |       |                   |       |       | 12.5×16           | 0.058 | 950   | 16×16.5           | 0.070 | 1,100 |
| 680           | 681      |                   |       |       |                   |       |       |                   |       |       | 12.5×13.5         | 0.066 | 850   | 12.5×16           | 0.058 | 950   | 16×16.5           | 0.070 | 1,100 |
| 1,000         | 102      |                   |       |       |                   |       |       | 12.5×13.5         | 0.066 | 850   | 12.5×16           | 0.058 | 950   | 16×16.5           | 0.052 | 1,300 |                   |       |       |
| 1,500         | 152      |                   |       |       | 12.5×13.5         | 0.066 | 850   | 12.5×16           | 0.058 | 950   | 16×16.5           | 0.052 | 1,300 |                   |       |       |                   |       |       |
| 2,200         | 222      | 12.5×13.5         | 0.066 | 850   | 12.5×16           | 0.058 | 950   | 16×16.5           | 0.052 | 1,300 | 16×16.5           | 0.052 | 1,300 |                   |       |       |                   |       |       |
| 3,300         | 332      | 12.5×16           | 0.058 | 950   | 16×16.5           | 0.052 | 1,300 | 16×16.5           | 0.052 | 1,300 |                   |       |       |                   |       |       |                   |       |       |
| 4,700         | 472      | 16×16.5           | 0.052 | 1,300 | 16×16.5           | 0.052 | 1,300 |                   |       |       |                   |       |       |                   |       |       |                   |       |       |

| V. DC         |          | 63V (1J)          |       |     | 80V (1K)          |      |     | 100V (2A)         |      |     |
|---------------|----------|-------------------|-------|-----|-------------------|------|-----|-------------------|------|-----|
| $\mu\text{F}$ | Contents | $\phi D \times L$ | Imp.  | mA  | $\phi D \times L$ | Imp. | mA  | $\phi D \times L$ | Imp. | mA  |
| 100           | 101      |                   |       |     |                   |      |     | 12.5×13.5         | 0.32 | 450 |
| 150           | 151      | 12.5×13.5         | 0.140 | 700 | 12.5×13.5         | 0.32 | 450 | 12.5×16           | 0.26 | 550 |
| 220           | 221      | 12.5×13.5         | 0.140 | 700 | 12.5×16           | 0.26 | 550 | 16×16.5           | 0.17 | 650 |
| 330           | 331      | 16×16.5           | 0.080 | 900 | 16×16.5           | 0.17 | 650 |                   |      |     |
| 470           | 471      | 16×16.5           | 0.080 | 900 |                   |      |     |                   |      |     |

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

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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

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