



## VEH Series

### Features

- $4\phi \sim 10\phi$ , 105°C, 2,000 hours assured
- Vertical chip type miniaturized
- Low impedance capacitors
- Designed for surface mounting on high density PC board
- RoHS Compliance

**NSCN** | WWW.NSCN.COM.CN

总机: 025-52188228 客服: 400-888-5058  
 技术: 025-84712971 邮箱: TECH@NSCN.COM.CN  
 南京南山半导体有限公司

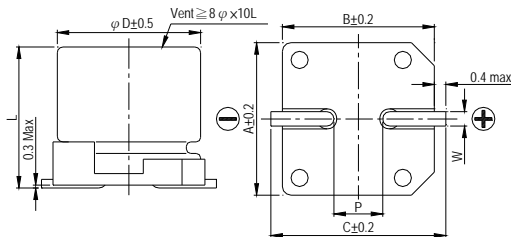


Marking color: Black

### Specifications

| Items                                      | Performance   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
|--|---|----------------|-----------|--------------------|---|--------------------|-----------------------------------|-----------------|------------------------|-----------|---------------------|------|------|------|------|---|---|-------|---------------------|----|---|---|---|---|---|
| Category Temperature Range                 | -55°C ~ +105°C  |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Capacitance Tolerance                      | ± 20% (at 120Hz, 20°C)  |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Leakage Current (at 20°C)                  | $I = 0.01CV$ 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 (Tanδ at 120Hz, 20°C)   | <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <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>0.13</td> </tr> </tbody> </table>   | Rated Voltage  | 6.3       | 10                 | 16  | 25                 | 35                                | 50              | Tanδ (max)             | 0.30      | 0.26                | 0.22 | 0.16 | 0.13 | 0.13 |   |   |       |                     |    |   |   |   |   |   |
| Rated Voltage                              | 6.3   | 10             | 16        | 25                 | 35  | 50                 |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Tanδ (max)                                 | 0.30  | 0.26           | 0.22      | 0.16               | 0.13  | 0.13               |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Low Temperature Characteristics (at 120Hz) | <p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <thead> <tr> <th colspan="2">Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Impedance</td> <td><math>Z(-25°C)/Z(+20°C)</math></td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Ratio</td> <td><math>Z(-55°C)/Z(+20°C)</math></td> <td>10</td> <td>7</td> <td>5</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>  | Rated Voltage  |           | 6.3                | 10  | 16                 | 25                                | 35              | 50                     | Impedance | $Z(-25°C)/Z(+20°C)$ | 4    | 3    | 2    | 2    | 2 | 2 | Ratio | $Z(-55°C)/Z(+20°C)$ | 10 | 7 | 5 | 3 | 3 | 3 |
| Rated Voltage                              |   | 6.3            | 10        | 16                 | 25  | 35                 | 50                                |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Impedance                                  | $Z(-25°C)/Z(+20°C)$   | 4              | 3         | 2                  | 2   | 2                  | 2                                 |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Ratio                                      | $Z(-55°C)/Z(+20°C)$   | 10             | 7         | 5                  | 3   | 3                  | 3                                 |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Endurance                                  | <table border="1"> <thead> <tr> <th>Test Time</th> <th>2,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±25% of initial value for <math>\phi D \leq 6.3</math> mm;<br/>Within ±20% of initial value for <math>\phi D \geq 8</math> mm</td> </tr> <tr> <td>Dissipation Factor</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table> <p>* 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.</p>             | Test Time      | 2,000 Hrs | Capacitance Change | Within ±25% of initial value for $\phi D \leq 6.3$ mm;<br>Within ±20% of initial value for $\phi D \geq 8$ mm | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Test Time                                  | 2,000 Hrs   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Capacitance Change                         | Within ±25% of initial value for $\phi D \leq 6.3$ mm;<br>Within ±20% of initial value for $\phi D \geq 8$ mm   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Dissipation Factor                         | Less than 200% of specified value   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Leakage Current                            | Within specified value  |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Shelf Life Test                            | <table border="1"> <thead> <tr> <th>Test Time</th> <th>1,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±25% of initial value for <math>\phi D \leq 6.3</math> mm;<br/>Within ±20% of initial value for <math>\phi D \geq 8</math> mm</td> </tr> <tr> <td>Dissipation Factor</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.</p> | Test Time      | 1,000 Hrs | Capacitance Change | Within ±25% of initial value for $\phi D \leq 6.3$ mm;<br>Within ±20% of initial value for $\phi D \geq 8$ mm | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Test Time                                  | 1,000 Hrs   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Capacitance Change                         | Within ±25% of initial value for $\phi D \leq 6.3$ mm;<br>Within ±20% of initial value for $\phi D \geq 8$ mm   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Dissipation Factor                         | Less than 200% of specified value   |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Leakage Current                            | Within specified value  |                |           |                    |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Ripple Current & Frequency Multipliers     | <table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>50, 60</th> <th>120</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>0.64</td> <td>0.8</td> <td>0.93</td> <td>1.0</td> </tr> </tbody> </table>  | Frequency (Hz) | 50, 60    | 120                | 1k  | 10k up             | Multiplier                        | 0.64            | 0.8                    | 0.93      | 1.0                 |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Frequency (Hz)                             | 50, 60  | 120            | 1k        | 10k up             |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |
| Multiplier                                 | 0.64  | 0.8            | 0.93      | 1.0                |   |                    |                                   |                 |                        |           |                     |      |      |      |      |   |   |       |                     |    |   |   |   |   |   |

### Diagram of Dimensions



### Lead Spacing and Diameter

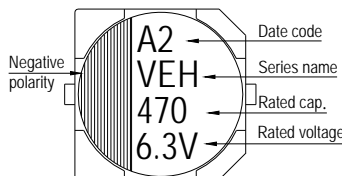
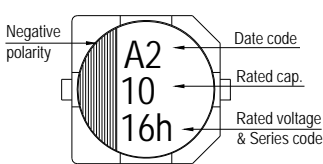
Unit: mm

| φ D | L          | A    | B    | C    | W         | P ± 0.2 |
|-----|------------|------|------|------|-----------|---------|
| 4   | 5.7 ± 0.3  | 4.3  | 4.3  | 5.1  | 0.5 ~ 0.8 | 1.0     |
| 5   | 5.7 ± 0.3  | 5.3  | 5.3  | 5.9  | 0.5 ~ 0.8 | 1.5     |
| 6.3 | 5.7 ± 0.3  | 6.6  | 6.6  | 7.2  | 0.5 ~ 0.8 | 2.0     |
| 8   | 10 ± 0.5   | 8.4  | 8.4  | 9.0  | 0.7 ~ 1.1 | 3.1     |
| 10  | 10 ± 0.5   | 10.4 | 10.4 | 11.0 | 0.7 ~ 1.3 | 4.7     |
| 10  | 10.3 ± 0.5 | 10.4 | 10.4 | 11.0 | 0.7 ~ 1.3 | 4.7     |

### Marking

φ D ≤ 6.3mm

φ D = 8 ~ 10 mm





Dimension:  $\phi D \times L$ (mm)  
 Ripple Current: mA/rms at 100k Hz, 105°C  
 Impedance:  $\Omega$ / at 100k Hz, 20°C

Dimension & Permissible Ripple Current

| $\mu F$ | V. DC<br>Contents | 6.3V (0J)         |      |     | 10V (1A)          |      |     | 16V (1C)          |      |       | 25V (1E)          |      |       | 35V (1V)          |      |       | 50V (1H)          |      |     |
|---------|-------------------|-------------------|------|-----|-------------------|------|-----|-------------------|------|-------|-------------------|------|-------|-------------------|------|-------|-------------------|------|-----|
|         |                   | $\phi D \times L$ | 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  |
| 3.3     | 3R3               |                   |      |     |                   |      |     |                   |      |       |                   |      |       |                   |      |       | 4×5.7             | 5.0  | 30  |
| 4.7     | 4R7               |                   |      |     |                   |      |     |                   |      | 4×5.7 | 3.2               | 65   | 4×5.7 | 3.2               | 65   | 4×5.7 | 5.0               | 30   |     |
| 10      | 100               |                   |      |     |                   |      |     | 4×5.7             | 3.2  | 65    | 5×5.7             | 1.5  | 110   | 5×5.7             | 1.5  | 110   | 5×5.7             | 3.0  | 50  |
| 22      | 220               |                   |      |     | 4×5.7             | 3.2  | 65  | 5×5.7             | 1.5  | 110   | 6.3×5.7           | 0.85 | 170   | 6.3×5.7           | 0.85 | 170   | 6.3×5.7           | 2.0  | 70  |
| 33      | 330               | 4×5.7             | 3.2  | 65  | 5×5.7             | 1.5  | 110 | 6.3×5.7           | 0.85 | 170   | 6.3×5.7           | 0.85 | 170   | 6.3×5.7           | 0.85 | 170   | 8×10              | 0.6  | 300 |
| 47      | 470               | 5×5.7             | 1.5  | 110 | 6.3×5.7           | 0.85 | 170 | 6.3×5.7           | 0.85 | 170   | 6.3×5.7           | 0.85 | 170   | 8×10              | 0.45 | 450   | 8×10              | 0.6  | 300 |
| 100     | 101               | 6.3×5.7           | 0.85 | 170 | 6.3×5.7           | 0.85 | 170 | 8×10              | 0.45 | 450   | 8×10              | 0.45 | 450   | 8×10              | 0.45 | 450   | 8×10              | 0.6  | 300 |
| 150     | 151               | 6.3×5.7           | 0.85 | 170 | 6.3×5.7           | 0.85 | 170 | 8×10              | 0.45 | 450   | 8×10              | 0.45 | 450   | 8×10              | 0.45 | 450   | 10×10             | 0.3  | 500 |
| 220     | 221               | 6.3×5.7           | 0.85 | 170 | 8×10              | 0.45 | 450 | 8×10              | 0.45 | 450   | 8×10              | 0.45 | 450   | 10×10             | 0.25 | 670   |                   |      |     |
| 330     | 331               | 8×10              | 0.45 | 450 | 8×10              | 0.45 | 450 | 8×10              | 0.45 | 450   | 10×10.3           | 0.25 | 670   |                   |      |       |                   |      |     |
| 470     | 471               | 8×10              | 0.45 | 450 | 8×10              | 0.45 | 450 | 10×10             | 0.25 | 670   |                   |      |       |                   |      |       |                   |      |     |
| 820     | 821               | 10×10             | 0.25 | 670 | 10×10             | 0.25 | 670 |                   |      |       |                   |      |       |                   |      |       |                   |      |     |
| 1,000   | 102               | 10×10             | 0.25 | 670 |                   |      |     |                   |      |       |                   |      |       |                   |      |       |                   |      |     |

**NSCN** | WWW.NSCN.COM.CN  
 总机: 025-52188228 客服: 400-888-5058  
 技术: 025-84712971 邮箱: TECH@NSCN.COM.CN  
 南京南山半导体有限公司