

## VES Series

### Features

- 4  $\phi$  ~ 6.3  $\phi$ , 105°C, 1,000 hours assured
- Vertical chip type miniaturized for 4.5 / 5.3mm high capacitor
- Designed for surface mounting on high density PC board
- RoHS compliant, AEC-Q200 compliant

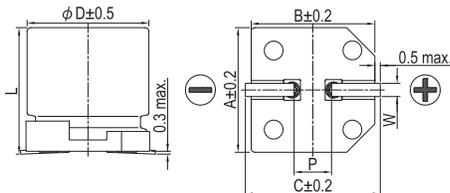


Marking color: Black

### Specifications

Items	Performance																								
Category Temperature Range	-55°C ~ +105°C																								
Capacitance Tolerance	±20% (at 120 Hz, 20°C)																								
Leakage Current (at 20°C)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V																								
Tanδ (at 120 Hz, 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>0.12</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	0.12										
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Low Temperature Characteristics (at 120 Hz)	<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>Z(-25°C)/Z(+20°C)</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>Z(-55°C)/Z(+20°C)</td> <td>8</td> <td>5</td> <td>4</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)	8	5	4	3	3	3
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Ripple Current and Frequency Multipliers	<table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>50</th> <th>120</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>0.7</td> <td>1.0</td> <td>1.3</td> <td>1.4</td> </tr> </tbody> </table>	Frequency (Hz)	50	120	1k	10k up	Multiplier	0.7	1.0	1.3	1.4														
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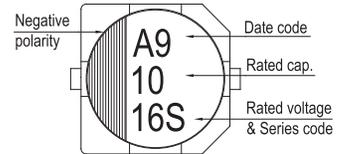
### Diagram of Dimensions



### Marking

Lead Spacing and Diameter Unit: mm

φD	L ± 0.2	A	B	C	W	P ± 0.2
4	4.5 / 5.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	4.5 / 5.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	4.5 / 5.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0



### Dimension and Permissible Ripple Current

Dimension: φD × L(mm)

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

Rated Volt. (V <sub>DC</sub> )	6.3V (0J)	10V (1A)	16V (1C)	25V (1E)	35V (1V)	50V (1H)						
Cap. (μF) Contents	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1 010											4×4.5	5.4
											4×5.3	7
2.2 2R2											4×4.5	9.6
											4×5.3	10
3.3 3R3											4×4.5	11
											4×5.3	12
4.7 4R7							4×4.5	11	4×4.5	13	5×4.5	16
							4×5.3	12	4×5.3	14	5×5.3	17
10 100			4×4.5	14	4×4.5	15	5×4.5	20	5×4.5	22	6.3×4.5	26
			4×5.3	15	4×5.3	16	5×5.3	21	5×5.3	23	6.3×5.3	28
22 220	4×4.5	19	5×4.5	22	5×4.5	26	6.3×4.5	33	6.3×4.5	36		
	4×5.3	21	5×5.3	25	5×5.3	28	6.3×5.3	36	6.3×5.3	50	6.3×5.3	51
33 330	5×4.5	26	5×4.5	28	6.3×4.5	35	6.3×4.5	42				
	5×5.3	30	5×5.3	31	6.3×5.3	40	6.3×5.3	44				
47 470	5×4.5	32	6.3×4.5	40	6.3×4.5	44	6.3×4.5	57				
	5×5.3	36	6.3×5.3	43	6.3×5.3	47	6.3×5.3	60				
100 101	6.3×4.5	52	6.3×4.5	60	6.3×5.3	70						
	6.3×5.3	61	6.3×5.3	65								

### Part Numbering System

VES Series	10μF	±20%	16V	Carrier Tape	4 φ × 5.3L	General Purpose
<b>VES</b>	<b>100</b>	<b>M</b>	<b>1C</b>	<b>TR</b>	<b>-</b>	<b>0405</b>
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case Size
						Application

Note: For more details, please refer to "Part Numbering System - SMD Type" on page 106.

SMD