

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

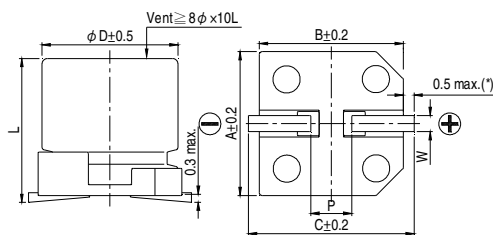


Marking color: Black

Specifications

Items	Performance																																		
Category Temperature Range	-55℃ ~ +105℃																																		
Capacitance Tolerance	± 20% (at 120Hz, 20℃)																																		
Leakage Current (at 20℃)	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 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></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>0.13</td></tr></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)	Impedance ratio shall not exceed the values given in the table below. <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></tr><tr><td rowspan="2">Impedance 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></tr><tr><td>Z(-55℃)/Z(+20℃)</td><td>10</td><td>7</td><td>5</td><td>3</td><td>3</td><td>3</td></tr></table>							Rated Voltage		6.3	10	16	25	35	50	Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	Z(-55℃)/Z(+20℃)	10	7	5	3	3	3					
Rated Voltage		6.3	10	16	25	35	50																												
Impedance Ratio	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2																												
	Z(-55℃)/Z(+20℃)	10	7	5	3	3	3																												
Endurance	<table><tr><td>Test Time</td><td colspan="6">2,000 Hrs</td></tr><tr><td>Capacitance Change</td><td colspan="6">Within ±25% of initial value for ϕ D ≤ 6.3 mm; Within ±20% of initial value for ϕ D ≥ 8 mm</td></tr><tr><td>Tanδ</td><td colspan="6">Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td colspan="6">Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hours at 105℃.							Test Time	2,000 Hrs						Capacitance Change	Within ±25% of initial value for ϕ D ≤ 6.3 mm; Within ±20% of initial value for ϕ D ≥ 8 mm						Tanδ	Less than 200% of specified value						Leakage Current	Within specified value					
Test Time	2,000 Hrs																																		
Capacitance Change	Within ±25% of initial value for ϕ D ≤ 6.3 mm; Within ±20% of initial value for ϕ D ≥ 8 mm																																		
Tanδ	Less than 200% of specified value																																		
Leakage Current	Within specified value																																		
Shelf Life Test	<table><tr><td>Test Time</td><td colspan="6">1,000 Hrs</td></tr><tr><td>Capacitance Change</td><td colspan="6">Within ±25% of initial value for ϕ D ≤ 6.3 mm; Within ±20% of initial value for ϕ D ≥ 8 mm</td></tr><tr><td>Tanδ</td><td colspan="6">Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td colspan="6">Within specified value</td></tr></table> * 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.							Test Time	1,000 Hrs						Capacitance Change	Within ±25% of initial value for ϕ D ≤ 6.3 mm; Within ±20% of initial value for ϕ D ≥ 8 mm						Tanδ	Less than 200% of specified value						Leakage Current	Within specified value					
Test Time	1,000 Hrs																																		
Capacitance Change	Within ±25% of initial value for ϕ D ≤ 6.3 mm; Within ±20% of initial value for ϕ D ≥ 8 mm																																		
Tanδ	Less than 200% of specified value																																		
Leakage Current	Within specified value																																		
Ripple Current and 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>0.64</td><td>0.8</td><td>0.93</td><td>1.0</td></tr></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

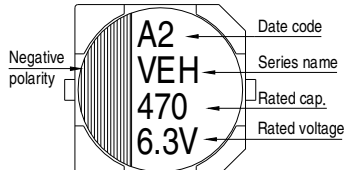
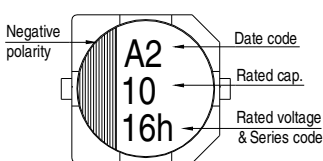
φD	L	A	B	C	W	P ± 0.2
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

(*): For 4 ~ 6.3φ is 0.4 max.

Marking

$\phi D \leq 6.3$ mm

$\phi D = 8 \sim 10$ 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 and Permissible Ripple Current

V. DC		6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)		
μF	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
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	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															

Part Numbering System

VEH Series	470 μF	±20%	6.3V	Carrier Tape	8 ϕ × 10L	Pb-free and PET coating case
VEH	471	M	0J	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 15.