

VE Series

Features

- 3φ ~ 18φ, 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 120 Hz, 20°C)																																					
Leakage Current (at 20°C)	<table border="1"> <tr> <td>Rated Voltage</td> <td>6.3 ~ 100V</td> <td>160 ~ 450V</td> </tr> <tr> <td>Time</td> <td colspan="2">after 2 minutes</td> </tr> <tr> <td>Case size</td> <td>3 ~ 10φ</td> <td>12.5 ~ 18φ</td> </tr> <tr> <td>Leakage Current</td> <td>I = 0.01CV or 3μA, whichever is greater</td> <td>I = 0.03CV or 4μA, whichever is greater</td> </tr> </table>	Rated Voltage	6.3 ~ 100V	160 ~ 450V	Time	after 2 minutes		Case size	3 ~ 10φ	12.5 ~ 18φ	Leakage Current	I = 0.01CV or 3μA, whichever is greater	I = 0.03CV or 4μA, whichever is greater																									
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Leakage Current	I = 0.01CV or 3μA, whichever is greater	I = 0.03CV or 4μA, whichever is greater																																				
Where, C = rated capacitance in μF, V = rated DC working voltage in V																																						
Tanδ (at 120 Hz, 20°C)	<table border="1"> <tr> <td>Rated Voltage</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> <td>160 ~ 250</td> <td>400 ~ 450</td> </tr> <tr> <td>3 ~ 10φ</td> <td>0.42</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.10</td> <td>-</td> <td>-</td> </tr> <tr> <td>12.5 ~ 18φ</td> <td>-</td> <td>0.38</td> <td>0.34</td> <td>0.30</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.14</td> <td>0.10</td> <td>0.20</td> <td>0.25</td> </tr> </table>	Rated Voltage	4	6.3	10	16	25	35	50	63	100	160 ~ 250	400 ~ 450	3 ~ 10φ	0.42	0.28	0.24	0.20	0.14	0.12	0.10	0.10	0.10	-	-	12.5 ~ 18φ	-	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.20	0.25	
	Rated Voltage	4	6.3	10	16	25	35	50	63	100	160 ~ 250	400 ~ 450																										
3 ~ 10φ	0.42	0.28	0.24	0.20	0.14	0.12	0.10	0.10	0.10	-	-																											
12.5 ~ 18φ	-	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.20	0.25																											
When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.																																						
Low Temperature Characteristics (at 120 Hz)	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)	φD < 12.5	7	4	4	3	2	2	2	2	2	-	-																								
		/Z(+20°C)	φD ≥ 12.5	-	5	5	4	2	2	2	2	2	3	6																								
Z(-40°C)		φD < 12.5	15	8	5	4	3	3	3	3	3	-	-																									
/Z(+20°C)	φD ≥ 12.5	-	14	12	10	5	4	3	3	3	6	10																										
Endurance	Test Time	2,000 Hrs																																				
	Capacitance Change	Within ±20% of initial value (4V: ±30%)																																				
	Tanδ	Less than 200% of specified value (4V: <300%)																																				
	Leakage Current	Within specified value																																				
* 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.																																						
Shelf Life Test	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).																																					
Ripple Current and Frequency Multipliers	Freq. (Hz)		50	120	1k	10k up																																
	Cap. (μF)	≤ 1,000	0.80	1.00	1.25	1.40																																
		1,000 < C ≤ 10,000	0.85	1.00	1.15	1.25																																

Diagram of Dimensions

Fig. 1

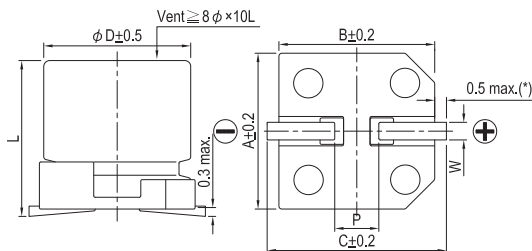
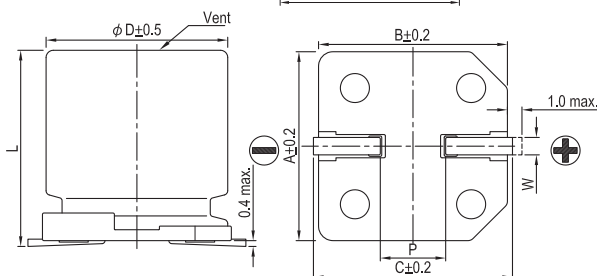


Fig. 2

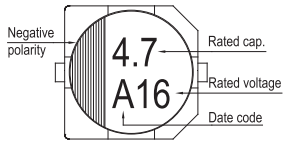
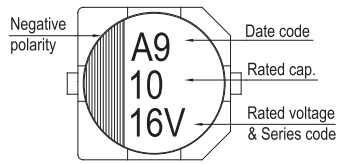
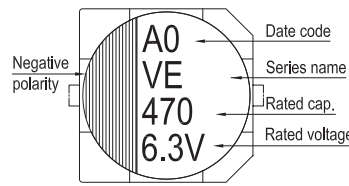
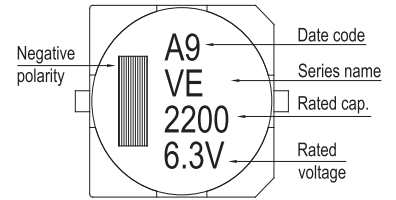


Lead Spacing and Diameter

Unit: mm

φD	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	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.3	10.3	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

(*) For 3 ~ 6.3φ is 0.4 max.

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 and Permissible Ripple Current

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

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

Rated Volt. (Voc)	Cap. (µF)	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	40	8×6.5	46
22	220	3×5.3	16	4×5.3	26	5×5.3	44	4×5.3	30	5×5.3	47	5×5.3	47	6.3×5.3	50	6.3×5.3	65	8×10	139
33	330	4×5.3	31	4×5.3	31	4×5.3	31	5×5.3	55	5×5.3	59	5×5.3	59	6.3×5.3	67	6.3×7.7	85	8×6.5	95
47	470	4×5.3	34	4×5.3	34	5×5.3	55	6.3×5.3	75	5×5.3	55	6.3×5.3	75	6.3×7.7	98	6.3×7.7	85	8×6.5	95
68	680	5×5.3	58	5×5.3	58	6.3×5.3	89	5×5.3	58	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	58	6.3×5.3	89	6.3×5.3	89	6.3×7.7	109	6.3×5.3	89	6.3×7.7	109	8×10	252	8×10	190	10×10	226
150	151													10×7.7	252				
220	221	6.3×5.3	89	6.3×7.7	124	6.3×5.3	89	6.3×7.7	124	8×6.5	124	8×10	270	8×10	270	10×10	320	12.5×13.5	500
330	331	6.3×7.7	124	6.3×7.7	124	8×6.5	190	8×10	290	8×10	290	10×7.7	290	10×10	400	12.5×13.5	600	12.5×16	600
470	471	8×10	290	8×10	290	10×7.7	290	10×10	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	1,350	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	1,450	16×21.5	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	1,450	16×21.5	1,500				
3,300	332			12.5×16	1,000	16×16.5	1,300	16×16.5	1,300	18×16.5	1,450	16×21.5	1,500	18×21.5	1,750				
4,700	472			16×16.5	1,400	16×16.5	1,400	18×16.5	1,600	16×21.5	1,650	18×21.5	1,750						
6,800	682			18×16.5	1,700	16×21.5	1,750	18×16.5	1,700	18×21.5	2,000								
10,000	103			18×21.5	2,000	18×21.5	2,000												

Rated Volt. (Voc)	Cap. (µF)	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	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	440	16×21.5	450	18×21.5	350		
100	101	12.5×13.5	440	18×16.5	650	16×21.5	690	18×16.5	550	18×21.5	490				
220	221	16×16.5	600												
330	331	18×16.5	780	16×21.5	850										

Part Numbering System

VE Series 470µF ±20% 6.3V Carrier Tape 8φ×10L Pb-free and PET coating case
VE- **471** **M** **0J** **TR** - **0810**
 Series Name 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.