

## VEU Series

### Features

- $4\phi \sim 18\phi$ , 105°C, 3,000 ~ 5,000 hours assured
- Long life assured
- Designed for surface mounting on high density PC board
- RoHS compliant
- AEC-Q200 compliant



Marking color: Black

### Specifications

Items	Performance																																																												
Category Temperature Range	6.3 ~ 100V					160 ~ 400V					450V																																																		
	-55°C ~ +105°C					-40°C ~ +105°C					-25°C ~ +105°C																																																		
Capacitance Tolerance	±20%													(at 120 Hz, 20°C)																																															
Leakage Current (at 20°C)	Rated Voltage					6.3 ~ 100V					160 ~ 450V																																																		
	Time					after 2 minutes					after 5 minutes																																																		
	Leakage Current					I = 0.01CV or 3 (μA), whichever is greater					I = 0.04CV + 100 (μA)																																																		
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> <th>63</th> <th>80</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max)</td> <td>0.30</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.13</td> <td>0.12</td> <td>0.09</td> <td>0.08</td> <td>0.07</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> </tr> </tbody> </table>														Rated Voltage	6.3	10	16	25	35	50	63	80	100	160	200	250	400	450	Tanδ (max)	0.30	0.24	0.20	0.16	0.13	0.12	0.09	0.08	0.07	0.15	0.15	0.15	0.20	0.20																	
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Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.																																																												
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Impedance Ratio	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	2	3	3	3	6	6																																														
	Z(-55/-40°C)/Z(+20°C)	10	7	5	3	3	3	3	3	3	6	6	6	10	-																																														
Endurance	Test Time		3,000 Hrs for $\phi D \leq 10$ mm; 5,000 Hrs for $\phi D \geq 12.5$ mm																																																										
	Capacitance Change		Within ±30% of initial value																																																										
	Tanδ		Less than 300% of specified value																																																										
	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 3,000 ~ 5,000 hours at 105°C.																																																												
Shelf Life Test	Test Time		1,000 Hrs																																																										
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Ripple Current and Frequency Multipliers	<table border="1"> <thead> <tr> <th colspan="2">Frequency (Hz)</th> <th>50</th> <th>120</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Cap.(μF)</td> <td>≤ 1,000</td> <td>0.70</td> <td>1.00</td> <td>1.30</td> <td>1.40</td> </tr> <tr> <td>1,000 &lt; C ≤ 1,500</td> <td>0.85</td> <td>1.00</td> <td>1.13</td> <td>1.15</td> </tr> </tbody> </table>														Frequency (Hz)		50	120	1k	10k up	Cap.(μF)	≤ 1,000	0.70	1.00	1.30	1.40	1,000 < C ≤ 1,500	0.85	1.00	1.13	1.15																														
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### Diagram of Dimensions

Fig. 1

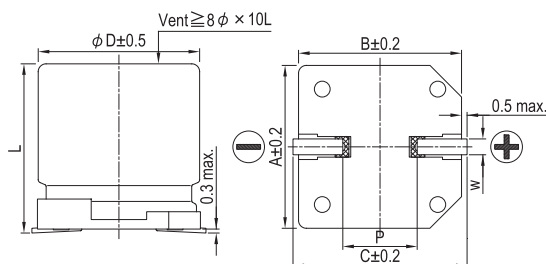
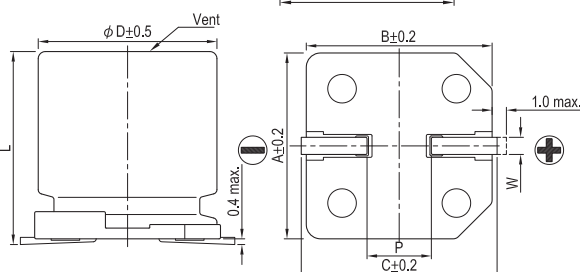


Fig. 2



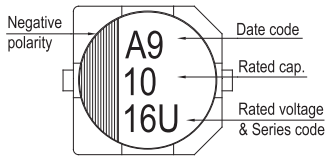
### Lead Spacing and Diameter

Unit: mm

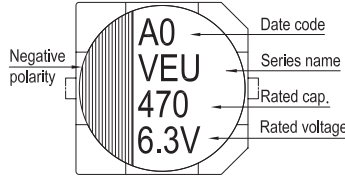
φD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	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

### Marking

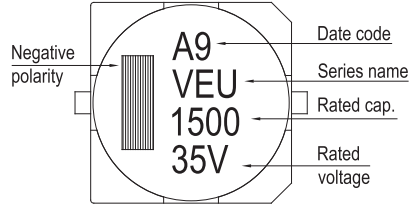
$\phi D \leq 6.3 \text{ mm}$



$\phi D = 8 \sim 10 \text{ mm}$



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



### Dimension and Permissible Ripple Current

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

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

Rated Volt. (V <sub>DC</sub> )	Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		80V (1K)			
			$\phi D \times L$	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												4×5.7	8						
2.2	2R2												4×5.7	12						
3.3	3R3												4×5.7	17						
4.7	4R7										4×5.7	16	5×5.7	22						
10	100					4×5.7	18	5×5.7	27	5×5.7	27	6.3×5.7	32							
22	220	4×5.7	22	4×5.7	22	5×5.7	30	6.3×5.7	44	6.3×5.7	44	6.3×7.7	58							
33	330	5×5.7	35	5×5.7	35	6.3×5.7	48	6.3×5.7	50	6.3×7.7	57	8×10	130							
47	470	5×5.7	38	6.3×5.7	50	6.3×5.7	50	6.3×7.7	63	8×10	92	8×10	141							
100	101	6.3×5.7	69	6.3×7.7	81	6.3×7.7	81	8×10	116	10×10	151	10×10	160				12.5×13.5	220		
150	151																12.5×13.5	240	12.5×16	290
220	221	6.3×7.7	120	8×10	141	8×10	141	10×10	290	10×10	320	12.5×13.5	280	12.5×16	320	16×16.5	320	16×16.5	410	
330	331	8×10	141	10×10	290	10×10	290	10×10	320	12.5×13.5	320	12.5×16	360	16×16.5	450	16×16.5	450	16×16.5	510	
470	471	10×10	320	10×10	320	10×10	320			12.5×16	410	16×16.5	510	16×16.5	540	18×16.5	540	18×16.5	650	
1,000	102	10×10	410							16×16.5	690	18×16.5	780							
1,500	152									18×16.5	900									

Rated Volt. (V <sub>DC</sub> )	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
3.3	3R3											12.5×13.5	40	
4.7	4R7							12.5×13.5	65	12.5×16	50	12.5×16	50	
10	100					12.5×13.5	80	12.5×16	105	16×16.5	85	16×16.5	85	
22	220					12.5×16	105	16×16.5	180	18×21.5	130	18×21.5	130	
33	330			12.5×13.5	95	16×16.5	220	18×16.5	230					
47	470			16×16.5	260	18×16.5	270	18×21.5	280					
68	680	12.5×13.5	180	18×16.5	320	18×21.5	330							
100	101	12.5×16	240	16×21.5	380									
150	151	16×16.5	340											
220	221	16×16.5	410											
330	331	18×16.5	540											

### Part Numbering System

VEU Series	470μF	±20%	6.3V	Carrier Tape	10 $\phi$ × 10L	General Purpose
<b>VEU</b>	<b>471</b>	<b>M</b>	<b>0J</b>	<b>TR</b>	<b>-</b>	<b>1010</b>
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case Size

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

SMD