

### Features

- 4φ ~ 18φ, 105°C, 2,000 hours assured
- Designed for surface mounting on high density PC board
- RoHS compliance
- AEC-Q200 qualified



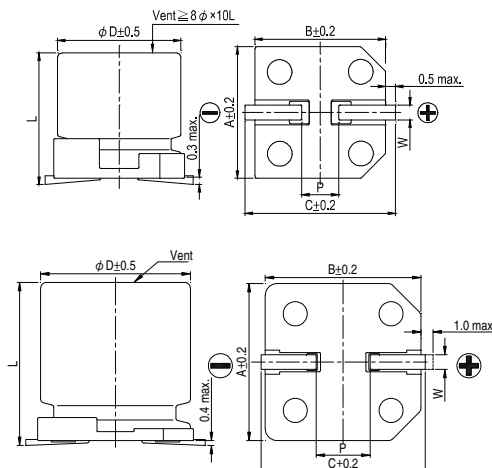
Marking color: Black

### Specifications

Items	Performance																																										
	6.3 ~ 100V	160 ~ 400V	450V																																								
Category Temperature Range	-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																																									
	Case size	4 ~ 10φ	12.5 ~ 18φ																																								
	Leakage Current	I = 0.01CV or 3μA, whichever is greater	I = 0.03CV or 4μA, whichever is greater	I = 0.04CV + 100μA																																							
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>100</th> <th>160 ~ 250</th> <th>400 ~ 450</th> </tr> </thead> <tbody> <tr> <td>4 ~ 10φ</td> <td>0.45</td> <td>0.35</td> <td>0.28</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>-</td> <td>-</td> </tr> <tr> <td>12.5 ~ 18φ</td> <td>0.40</td> <td>0.38</td> <td>0.34</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> </tbody> </table>										Rated Voltage	6.3	10	16	25	35	50	63	100	160 ~ 250	400 ~ 450	4 ~ 10φ	0.45	0.35	0.28	0.18	0.16	0.14	0.12	0.12	-	-	12.5 ~ 18φ	0.40	0.38	0.34	0.26	0.22	0.18	0.14	0.10	0.20	0.25
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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.																																										
	Rated Voltage		6.3	10	16	25	35	50	63	100	160	200	250	400	450																												
	Impedance Ratio	Z(-25°C) /Z(+20°C)	φD < 12.5	4	4	3	2	2	2	2	3	-	-	-	-																												
		φD ≥ 12.5	5	4	3	2	2	2	2	2	3	3	3	6	6																												
Z(-55/-40°C) /Z(+20°C)	φD < 12.5	12	8	6	4	3	3	3	4	-	-	-	-	-																													
φD ≥ 12.5	10	8	6	4	3	3	3	3	6	6	6	10	-																														
Note: The ratio value with "*" is only available for 400V.																																											
Endurance	Test Time	2,000 Hrs																																									
	Capacitance Change	Within ±25% of initial value for φD ≤ 6.3 mm; Within ±20% of initial value for φD ≥ 8 mm																																									
	Tanδ	Less than 300% of specified value for φD ≤ 6.3 mm; Less than 200% of specified value for φD ≥ 8 mm																																									
	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 105°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	<table border="1"> <thead> <tr> <th>Cap. (μF)</th> <th colspan="4">Freq. (Hz)</th> </tr> <tr> <th></th> <th>50</th> <th>120</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <td>≤ 1,000</td> <td>0.80</td> <td>1.00</td> <td>1.25</td> <td>1.40</td> </tr> <tr> <td>1,000 &lt; C ≤ 8,200</td> <td>0.85</td> <td>1.00</td> <td>1.15</td> <td>1.25</td> </tr> </tbody> </table>				Cap. (μF)	Freq. (Hz)					50	120	1k	10k up	≤ 1,000	0.80	1.00	1.25	1.40	1,000 < C ≤ 8,200	0.85	1.00	1.15	1.25																			
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### Diagram of Dimensions

Fig. 1



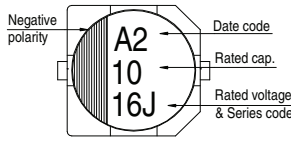
### Lead Spacing and Diameter

Unit: mm

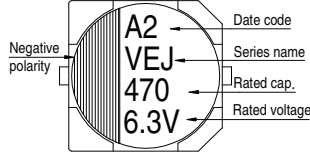
φD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.3	10.3	11.0	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

### Marking

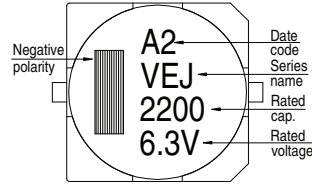
$\phi D \leq 6.3 \text{ mm}$



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



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



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

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

### Dimension and Permissible Ripple Current

Rated Volt. (Voc)	Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)		
			$\phi D \times L$	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	4×5.7	8			
2.2	2R2												4×5.7	12	4×5.7	12			
3.3	3R3												4×5.7	14	5×5.7	17			
4.7	4R7								4×5.7	17	4×5.7	17	5×5.7	20	6.3×5.7	22			
10	100						4×5.7	20	4×5.7	20	5×5.7	27	6.3×5.7	32	6.3×5.7 8×6.5	32 51			
22	220	4×5.7	22	4×5.7	22	5×5.7	30	5×5.7	30	6.3×5.7	44	6.3×5.7 8×6.5	38 67	6.3×7.7	58	8×10	100		
33	330	5×5.7	34	5×5.7	34	5×5.7	34	6.3×5.7	46	6.3×5.7 8×6.5	46 76	6.3×7.7	65	8×10	140	10×10	150		
47	470	5×5.7	38	5×5.7	38	6.3×5.7	48	6.3×5.7 8×6.5	48 79	6.3×7.7	80	6.3×7.7	70	8×10	170	12.5×13.5	250		
100	101	6.3×5.7 8×6.5	69	6.3×5.7 8×6.5	69 90	6.3×5.7	69	6.3×7.7	100	8×10	240	8×10	210	10×10	310	12.5×13.5	380		
220	221	6.3×7.7 8×6.5	120	6.3×7.7	120	6.3×7.7	120	8×10 10×7.7	270 270	8×10	270	10×10	330	12.5×13.5	470	16×16.5	450		
330	331	8×10	290	8×10	290	8×10 10×7.7	290 290	8×10	290	10×10	370	12.5×13.5	490	16×16.5	650	18×16.5 16×21.5	590 750		
470	471	8×10	320	8×10 10×7.7	320 320	10×10	380	10×10	380	12.5×13.5	520	12.5×16	550	16×16.5	700	18×21.5	980		
1,000	102	10×10	410	10×10	410	12.5×13.5	500	12.5×16	550	16×16.5	800	18×16.5	990						
2,200	222	12.5×13.5	680	12.5×13.5	680	16×16.5	900	16×16.5	900	18×16.5	1,050								
3,300	332	12.5×16	850	16×16.5	950	16×16.5	950	18×16.5 16×21.5	1,150 1,200										
4,700	472	16×16.5	1,000	16×16.5	1,000	18×16.5 16×21.5	1,225 1,275	18×21.5	1,300										
6,800	682	18×16.5 16×21.5	1,290 1,350	18×16.5 16×21.5	1,290 1,350														
8,200	822	18×21.5	1,450	18×21.5	1,450														

Rated Volt. (Voc)	Cap. (μF)	Contents	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
4.7	4R7						12.5×13.5	65	12.5×13.5	45	12.5×13.5	45
10	100			12.5×13.5	80	12.5×13.5	70	12.5×13.5	50	12.5×16	75	
22	220			12.5×16	110	12.5×13.5	105	16×16.5	85	16×16.5	85	
33	330	12.5×13.5	95	12.5×16	120	16×16.5	180	18×16.5	100	18×16.5	100	
47	470	12.5×16	205	16×16.5	220	16×16.5	220	18×21.5	130			
100	101	16×16.5	250	18×16.5	280	18×21.5	290					

### Part Numbering System

VEJ Series    470μF    ±20%    6.3V    Carrier Tape    8φ × 10L

**VEJ**    **471**    **M**    **0J**    **TR**    -    **0810**    **XX**

Series Name    Capacitance    Capacitance Tolerance    Rated Voltage    Package Type    Terminal Type    Case Size

**XX**  
**S** = Standard  
**KS** = AEC-Q200 Qualified, Safety Critical Application  
**LS** = AEC-Q200 Qualified, Non-Safety Critical Application