

## VE Series

### Features

- 3  $\phi$  ~ 18  $\phi$ , 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 120Hz, 20°C)													
Leakage Current (at 20°C)	Rated Voltage	6.3 ~ 100V												
	Time	after 2 minutes												
	Case size	3 ~ 10 $\phi$ 12.5 ~ 18 $\phi$ 12.5 ~ 18 $\phi$												
	Leakage Current	I = 0.01CV or 3 $\mu$ A, whichever is greater      I = 0.03CV or 4 $\mu$ A, whichever is greater      I = 0.04CV + 100 $\mu$ A												
Where, C = rated capacitance in $\mu$ F      V = rated DC working voltage in V														
Dissipation Factor (Tan $\delta$ at 120Hz, 20°C)	Rated Voltage	4   6.3   10   16   25   35   50   63   100   160 ~ 250   400 ~ 450												
	3 ~ 10 $\phi$ 12.5 ~ 18 $\phi$	0.42   0.28   0.24   0.20   0.14   0.12   0.10   0.10   0.10   0.10   0.20   0.25												
When the capacitance exceeds 1,000 $\mu$ F, 0.02 shall be added every 1,000 $\mu$ F increase.														
Low Temperature Characteristics (at 120Hz)	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)	$\phi$ D < 12.5	7	4	4	3	2	2	2	2	2	-	-
		/Z(+20°C)	$\phi$ D $\geq$ 12.5	-	5	5	4	2	2	2	2	2	3	6
Z(-40°C)		$\phi$ D < 12.5	15	8	5	4	3	3	3	3	3	-	-	
/Z(+20°C)	$\phi$ D $\geq$ 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%)												
	Dissipation Factor	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 & Frequency Multipliers	Freq. (Hz)		50	120	1k	10k up								
	Cap. ( $\mu$ F)	Under 1,000	0.80	1.00	1.25	1.40								
	1,000 < C $\leq$ 6,800	0.85	1.00	1.15	1.25									

### Diagram of Dimensions

Fig. 1

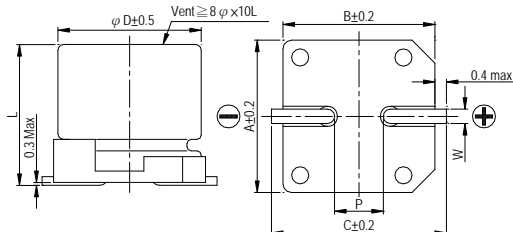
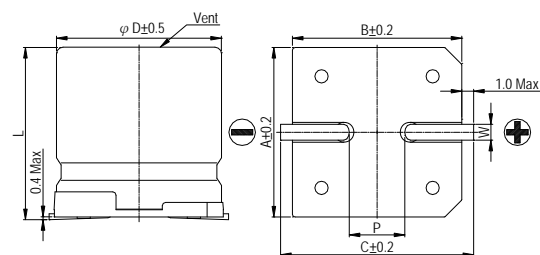


Fig. 2



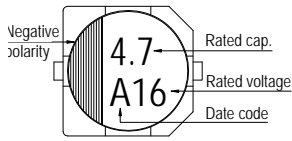
### Lead Spacing and Diameter

Unit: mm

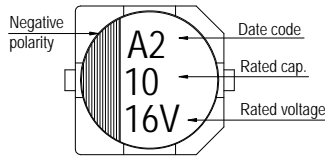
$\phi$ D	L	A	B	C	W	P ± 0.2	Fig. No.
3	5.3 ± 0.2	3.3	3.3	4.1	0.45 ~ 0.75	0.8	1
4	5.3 ± 0.2	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.3 ± 0.2	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.3 ± 0.2	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	10 ± 0.5	8.4	8.4	9.0	0.7 ~ 1.1	3.1	1
8	10.3 ± 0.5	8.4	8.4	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.4	10.4	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.4	10.4	11.0	0.7 ~ 1.3	4.7	1
10	10.3 ± 0.5	10.4	10.4	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

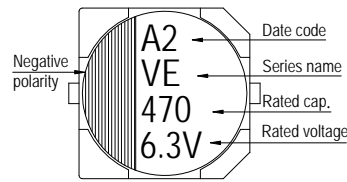
$\phi D = 3 \text{ mm}$



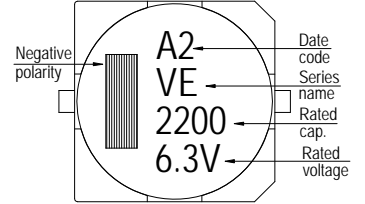
$\phi D = 4 \sim 6.3 \text{ mm}$



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



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



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

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

## Dimension & Permissible Ripple Current

$\mu\text{F}$	V. DC 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																
2.2	2R2													4×5.3	10	4×5.3	8
3.3	3R3													4×5.3	14	4×5.3	12
4.7	4R7													4×5.3	17	5×5.3	22
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
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	8×10	139
33	330	4×5.3	31	4×5.3	31	4×5.3	31	5×5.3	55	5×5.3	55	6.3×5.3	67	6.3×7.7	75	8×10	139
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	10×10	200
68	680	5×5.3	58	5×5.3	58	6.3×5.3	89	6.3×5.3	89	6.3×5.3	89	6.3×7.7	109	6.3×7.7	109	8×10	190
100	101	5×5.3	58	6.3×5.3	89	6.3×5.3	89	6.3×5.3	89	6.3×5.3	89	6.3×7.7	109	8×10	252	10×10	226
150	151													10×7.7	252		
220	221	6.3×5.3	89	6.3×5.3	89	6.3×7.7	124	6.3×7.7	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	8×10	270	8×10	270	10×7.7	270	10×10	370	10×10	370		
470	471	6.3×7.7	124	6.3×7.7	124	8×10	290	8×10	290	10×7.7	290	10×10	400	12.5×13.5	600	12.5×16	600
680	681			10×7.7	290	10×10	410	10×10	410	10×10	400	12.5×13.5	750	12.5×16	740	16×16.5	850
1,000	102			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	1,100
2,200	222			10×10	430	10×10	430	12.5×13.5	750	12.5×13.5	750	16×16.5	1,100	18×16.5	1,350		
3,300	332			16×16.5	1,400	16×16.5	1,400	16×16.5	1,300	16×16.5	1,300	18×16.5	1,450	18×21.5	1,750		
4,700	472			16×16.5	1,400	16×16.5	1,400	18×16.5	1,600	18×21.5	1,750						
6,800	682			18×16.5	1,700	18×16.5	1,700	18×16.5	1,700	18×21.5	2,000						
10,000	103			16×21.5	1,750	16×21.5	1,750	18×21.5	2,000								

$\mu\text{F}$	V. DC 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	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	18×21.5	350		
100	101	12.5×13.5	440	18×16.5	650	18×16.5	550	18×16.5	450	18×21.5	350		
220	221	16×16.5	600	16×21.5	690	16×21.5	590	18×21.5	490				
330	331	18×16.5	780	16×21.5	850								

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