VE Series

Features

- 3φ ~ 18φ, 85℃, 2,000 hours assured
- Chip type large capacitance capacitors
- Designed for surface mounting on high density PC board
- RoHS compliance
- AEC-Q200 Parts Avaliable: Replace “S” Suffix with “KS” or “LS” Suffix



Marking color: Black

Specifications

Items	Performance
Category Temperature Range	-40℃ ~ +85℃
Capacitance Tolerance	±20% (at 120 Hz, 20℃)

Leakage Current (at 20℃)

Rated Voltage	6.3 ~ 100V		160 ~ 450V
Time	after 2 minutes		after 5 minutes
Case size	3 ~ 10φ	12.5 ~ 18φ	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℃)

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.

Rated Voltage			4.0	6.3	10	16	25	35	50	63	100	160 ~ 450	400 ~ 450
Impedance Ratio	Z(-25℃) /Z(+20℃)	φD<12.5	7	4	4	3	2	2	2	2	2	-	-
		φD≧12.5	-	5	5	4	2	2	2	2	2	3	6
	Z(-40℃) /Z(+20℃)	φD<12.5	15	8	5	4	3	3	3	3	3	-	-
		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℃after the rated voltage applied for 2,000 hours at 85℃.

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

Cap. (μF) \ Freq. (Hz)	50	120	1k	10k up
≦ 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

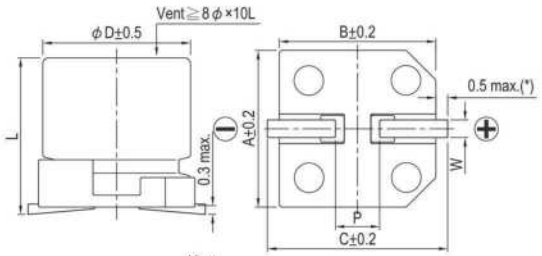
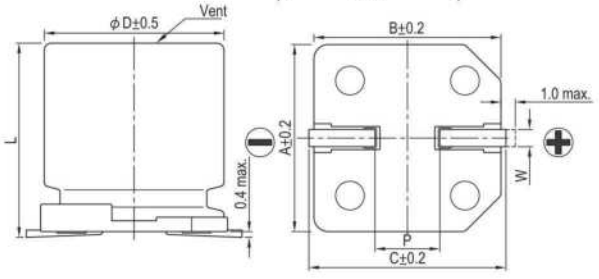


Fig. 2



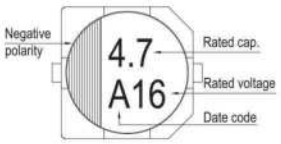
Lead Spacing and Diameter Unit: mm

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

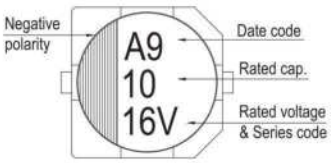
(*): For 3 ~ 6.3φ is 0.4 max.

Marking

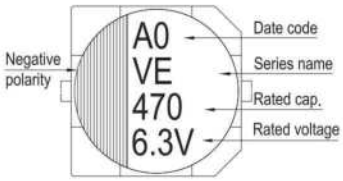
ϕD = 3 mm



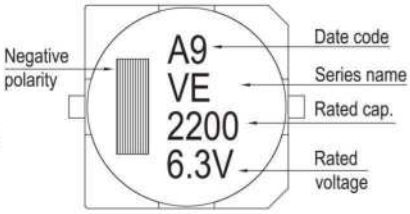
ϕD = 4 ~ 6.3 mm



ϕD = 8 ~ 10 mm



ϕD ≧ 12.5 mm



Dimension and Permissible Ripple Current

Dimension: ϕD × L(mm)

Ripple Current: mA/rms at 120 Hz, 85℃

Rated Volt. (VDC)		4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63 (1J)	
Cap. (μF)	Contents	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×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 8×6.5	40 46
22	220	3×5.3	16	4×5.3	26	5×5.3	44	4×5.3 5×5.3	30 44	5×5.3 6.3×5.3	47 59	5×5.3 6.3×5.3	47 59	6.3×5.3 6.3×7.7	50 65	8×10	139
33	330	4×5.3	31	4×5.3	31	4×5.3 5×5.3	31 55	5×5.3	55	5×5.3 6.3×5.3	55 67	6.3×5.3 6.3×7.7	67 85	6.3×7.7 8×6.5	75 95	8×10	139
47	470	4×5.3	34	4×5.3 5×5.3	34 55	6.3×5.3	75	5×5.3 6.3×5.3	55 75	6.3×5.3 6.3×7.7	75 98	6.3×7.7 8×6.5	98 105	6.3×7.7 8×10	75 190	10×10	200
68	680	5×5.3	58	5×5.3 6.3×5.3	58 89	5×5.3 6.3×5.3	58 89	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 6.3×5.3	58 89	6.3×5.3	89	6.3×5.3 6.3×7.7	89 109	6.3×5.3 6.3×7.7 8×6.5	89 109 125	6.3×7.7 8×6.5	109 125	8×10	252	8×10	190	10×10	226
150	151											10×7.7	252				
220	221	6.3×5.3 6.3×7.7	89 124	6.3×5.3 6.3×7.7	89 124	6.3×7.7 8×6.5 8×10	124 175 270	6.3×7.7 8×10	124 270	8×10 10×7.7	270 270	8×10 10×10	270 370	10×10	320	12.5×13.5	500
330	331	6.3×7.7	124	6.3×7.7 8×6.5	124 190	8×10	290	8×10 10×7.7	290 290	10×10	400	10×10	400	12.5×13.5	600	12.5×16	600
470	471	8×10	290	8×10	290	10×7.7 10×10	290 400	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	1,100
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 16×21.5	1,350 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 16×21.5	1,450 1,500				
3,300	332			12.5×16	1,000	16×16.5	1,300	16×16.5	1,300	18×16.5 16×21.5	1,450 1,500	18×21.5	1,750				
4,700	472			16×16.5	1,400	16×16.5	1,400	18×16.5 16×21.5	1,600 1,650	18×21.5	1,750						
6,800	682			18×16.5 16×21.5	1,700 1,750	18×16.5 16×21.5	1,700 1,750	18×21.5	2,000								
10,000	103			18×21.5	2,000	18×21.5	2,000										

Rated Volt. (VDC)		100V (2A)		160V (2C)		200V (2D)		250V (2E)		400V (2G)		450V (2W)	
Cap. (μF)	Contents	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×L	mA	ϕD×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 16×21.5	440 450	18×21.5	350		
100	101	12.5×13.5	440	18×16.5 16×21.5	650 690	18×16.5 16×21.5	550 590	18×21.5	490				
220	221	16×16.5	600										
330	331	18×16.5 16×21.5	780 850										

Part Numbering System

VE Series	470μF	±20%	6.3V	Carrier Tape		8ϕ×10L	
VE-	**471**	**M**	**0J**	**TR**	**-**	**0810**	**S**
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size	Regional Code

Note: For more details, please refer to "Part Numbering System (SMD Type)" on page 15.