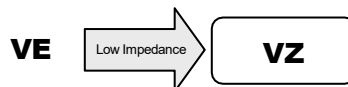


FEATURES

- Extra low impedance with temperature range -55 ~ +105°C
- Impedance 40~60% less than VE series
- Comply with the RoHS directive

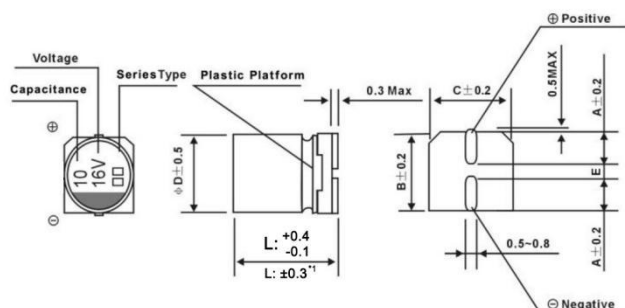


SPECIFICATIONS

Items	Characteristics								
Operation Temperature Range	-55 ~ +105°C								
Voltage Range	6.3 ~ 50V								
Capacitance Range	4.7 ~ 4700μF								
Capacitance Tolerance	±20% at 120Hz, 20°C								
Leakage Current	Leakage current (∅4~∅10) ≦ 0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (∅12.5~∅16) ≦ 0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage)								
Dissipation Factor (tan δ)	Measurement frequency: 120Hz, Temperature: 20°C								
	Rated Voltage (V)		6.3	10	16	25	35	50	
	tan δ (max.)	∅4~∅10	0.22	0.19	0.16	0.14	0.12	0.12	
∅12.5~∅16		0.26	0.22	0.18	0.16	0.14	0.12		
Stability at Low Temperature	Measurement frequency: 120Hz								
	Rated Voltage (V)			6.3	10	16	25	35	50
	Impedance Ratio ZT/Z20 (max.)	∅4~∅10	Z(-25°C) / Z(20°C)	2	2	2	2	2	2
			Z(-55°C) / Z(20°C)	5	4	4	3	3	3
		∅12.5~∅16	Z(-25°C) / Z(20°C)	3	3	2	2	2	2
Z(-55°C) / Z(20°C)			10	8	6	4	3	3	
Load Life	After 3000 hrs. (2000 hrs. for ∅4~∅6.3×5.4&∅8×6.2) application of the rated voltage at 105°C, they meet the characteristics listed below.								
	Capacitance Change		Within ±30% of initial value						
	Dissipation Factor		300% or less of initial specified value						
	Leakage Current		initial specified value or less						
Shelf Life	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above.								
Resistance to Soldering Heat	After reflow soldering and restored at room temperature, they meet the characteristics listed below.								
	Capacitance Change		Within ±10% of initial value						
	Dissipation Factor		initial specified value or less						
	Leakage Current		initial specified value or less						
Marking	Black print on the case top.								

DRAWING (Unit: mm)

(Ø4 ~ Ø8x6.2)

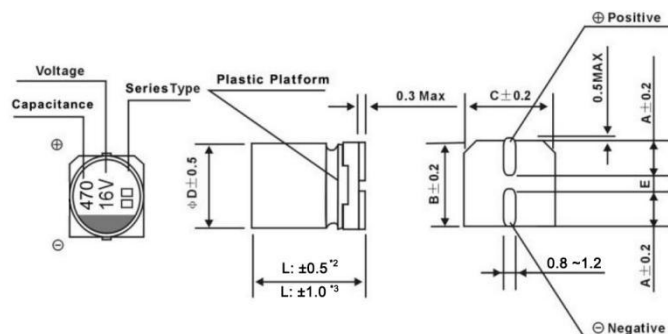


*1. Applicable to Ø6.3x7.7

*2. Applicable to Ø8x10.5~Ø10

*3. Applicable to Ø12.5~Ø16

(Ø8x10.5 ~ Ø16)



DIMENSIONS (Unit: mm)

∅D x L	4 x 5.4	5 x 5.4	6.3 x 5.4	6.3 x 7.7	8 x 6.2	8 x 10.5	10 x 10.5	10 x 12.5	12.5 x 13.5	12.5 x 16	16 x 16.5
A	2.0	2.2	2.6	2.6	3.3	3.0	3.2	3.2	4.7	4.7	5.8
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	12.8	12.8	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	12.8	12.8	17.0
E ± 0.2	1.0	1.5	2.1	2.1	2.2	3.1	4.6	4.6	4.6	4.6	6.4
L	5.4	5.4	5.4	7.7	6.2	10.5	10.5	12.5	13.5	16.0	16.5

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE

μF	WV Code	6.3			10			16		
		0J			1A			1C		
10	100							4 x 5.4	1.8	80
15	150							4 x 5.4	1.8	80
22	220	4 x 5.4	1.8	80	4 x 5.4	1.8	80	5 x 5.4 (4 x 5.4)	0.76 (1.8)	150 (80)
33	330	5 x 5.4 (4 x 5.4)	0.76 (1.8)	150 (80)	5 x 5.4 (4 x 5.4)	0.76 (1.8)	150 (80)	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)
47	470	5 x 5.4 (4 x 5.4)	0.76 (1.8)	150 (80)	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)
56	560	5 x 5.4	0.76	150	6.3 x 5.4	0.44	230	6.3 x 5.4	0.44	230
68	680	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)	6.3 x 5.4	0.44	230	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.34 (0.44) (0.34)	280 (230) (280)
100	101	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.34 (0.44) (0.34)	280 (230) (280)
150	151	6.3 x 5.4	0.44	230	6.3 x 7.7	0.34	280	6.3 x 7.7	0.34	280
220	221	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 x 7.7 (8 x 6.2)	0.34 (0.34)	280 (280)	8 x 10.5 (6.3 x 7.7)	0.17 (0.34)	450 (280)
330	331	6.3 x 7.7 (8 x 6.2)	0.34 (0.34)	280 (280)	8 x 10.5	0.17	450	10 x 10.5 (8 x 10.5)	0.09 (0.17)	670 (450)
470	471	8 x 10.5	0.17	450	8 x 10.5	0.17	450	10 x 10.5 (8 x 10.5)	0.09 (0.17)	670 (450)
680	681	10 x 10.5 (8 x 10.5)	0.09 (0.17)	670 (450)	10 x 10.5	0.09	670	10 x 12.5 (10 x 10.5)	0.075 (0.09)	800 (670)
1000	102	10 x 10.5 (8 x 10.5)	0.09 (0.17)	670 (450)	10 x 10.5	0.09	670	16 x 16.5 (12.5 x 16) (12.5 x 13.5)	0.055 (0.06) (0.065)	1350 (1050) (900)
1500	152	10 x 12.5 (10 x 10.5)	0.075 (0.09)	800 (670)	12.5 x 13.5	0.065	900	16 x 16.5	0.055	1350
2200	222	12.5x13.5	0.065	900	12.5x16	0.060	1050	16x16.5	0.055	1350
3300	332	12.5x16	0.060	1050	16x16.5	0.055	1350			
4700	472	16x16.5	0.055	1350						

μF	WV Code	25			35			50		
		1E			1V			1H		
4.7	4R7				4 x 5.4	1.8	80	5 x 5.4 (4 x 5.4)	1.52 (3.0)	85 (60)
10	100	4 x 5.4	1.8	80	5 x 5.4 (4 x 5.4)	0.76 (1.8)	150 (80)	6.3 x 5.4 (5 x 5.4)	0.88 (1.52)	165 (85)
15	150	5 x 5.4	0.76	150	5 x 5.4	0.76	150	6.3 x 5.4	0.88	165
22	220	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.68 (0.88) (0.68)	185 (165) (185)
33	330	6.3 x 5.4 (5 x 5.4)	0.44 (0.76)	230 (150)	6.3 x 5.4 (8 x 6.2)	0.44 (0.34)	230 (280)	6.3 x 7.7 (8 x 6.2)	0.68 (0.68)	185 (185)
47	470	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	0.34 (0.44) (0.34)	280 (230) (280)	6.3 x 7.7 (8 x 6.2)	0.68 (0.68)	185 (185)
56	560	6.3 x 7.7 (6.3 x 5.4)	0.34 (0.44)	280 (230)	6.3 x 7.7	0.34	280	8 x 10.5 (6.3 x 7.7)	0.34 (0.68)	350 (185)
68	680	6.3 x 7.7	0.34	280	6.3 x 7.7	0.34	280	8 x 10.5	0.34	350
100	101	6.3 x 7.7 (8 x 6.2)	0.34 (0.34)	280 (280)	6.3 x 7.7 8 x 6.2 8 x 10.5	0.34 0.34 0.17	280 280 450	10 x 10.5 (8 x 10.5)	0.18 (0.34)	670 (350)
150	151	8 x 10.5 (6.3 x 7.7)	0.17 (0.34)	450 (280)	10 x 10.5	0.09	670	10 x 10.5	0.18	670
								Case size ∅DxL(mm)	Impedance (Ω) at 20°C 100KHz	Ripple current (mA rms) at 105°C 100KHz



DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE

μF	Code	25			35			50		
		1E			1V			1H		
220	221	8 × 10.5	0.17	450	10 × 10.5	0.09	670	10 × 12.5 (10 × 10.5)	0.16 (0.18)	750 (670)
330	331	10 × 10.5 (8 × 10.5)	0.09 (0.17)	670 (450)	10 × 10.5	0.09	670	12.5×13.5	0.14	800
470	471	10 × 12.5 (10 × 10.5)	0.075 (0.09)	800 (670)	12.5×13.5 (10×12.5)	0.065 (0.075)	900 (800)	16×16.5 (12.5×16)	0.10 (0.12)	1150 (900)
680	681	12.5×13.5	0.065	900	12.5×16 (12.5×13.5)	0.060 (0.065)	1050 (900)			
1000	102	16×16.5 (12.5×16)	0.055 (0.060)	1350 (1050)	16×16.5	0.055	1350	Case size ØD×L(mm)	Impedance (Ω) at 20°C 100KHz	Ripple current (mA rms) at 105°C 100KHz
1500	152	16×16.5	0.055	1350						

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

Frequency		50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient	Ø4 ~ Ø10	4.7 ~ 68 μF	0.35	0.50	0.64	0.83
		100 ~ 1500 μF	0.40	0.55	0.70	0.85
	Ø12.5 ~ Ø16	~ 680 μF	0.45	0.65	0.80	0.90
		1000 ~ 4700 μF	0.65	0.85	0.95	1.00

PN Structure

WVZ	0J	220	M	040054	T	R
Series	Rated Voltage	Capacitance	Capacitance Tolerance	Dimension	Packing	Pb
	1.	2.	3.	4.	5.	6.

1. Rated Voltage

Code	0J	1A	1C	1D	1E	1V	1G	1H	1J	1K	2A
Voltage	6.3V	10V	16V	20V	25V	35V	40V	50V	63	80V	100V

2. Capacitance

Code	0R1	R22	R33	R47	010	2R2	3R3	4R7	100	220	330	470	101
Capacitance (μF)	0.1	0.22	0.33	0.47	1	2.2	3.3	4.7	10	22	33	47	100

3. Capacitance Tolerance

Code	K	L	M
Tolerance	±10%	±15%	±20%

4. Dimension

Code	040054	050054	063054	080105	100105
Dimension (mm)	4x5.4	5x5.4	6.3x5.4	8x10.5	10x10.5

5. Packing

Code	T
Packing	Tape & Reel

6. Pb

Code	L	R
Pb	Lead	RoHS

