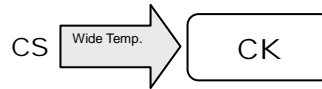


## WIDE TEMPERATURE

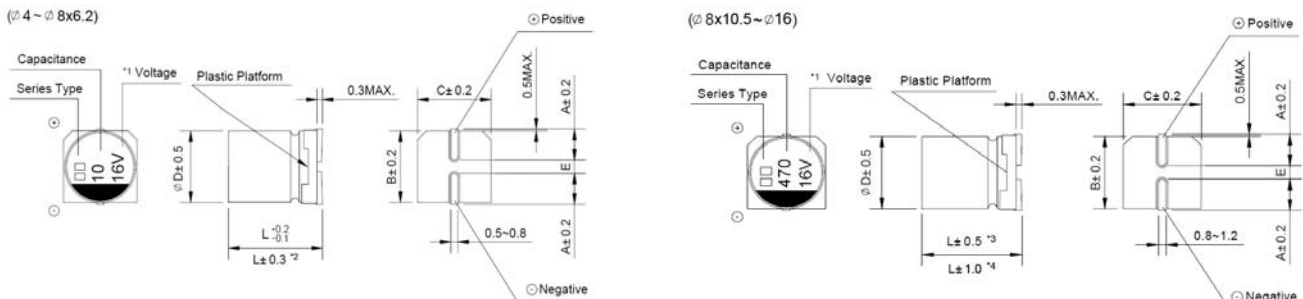
- Operating with wide temperature range -40 ~ +105°C
  - Load life of 1000~2000 hours
  - Comply with the RoHS directive
- RoHS



### □ SPECIFICATIONS 特性表

Items	Characteristics																																																
Operation Temperature Range	-40 ~ +105°C																																																
Voltage Range	4 ~ 100V																																																
Capacitance Range	0.1 ~ 6800μF																																																
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 <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>4</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> </tr> </thead> <tbody> <tr> <td rowspan="2">tan δ (max.)</td> <td>∅4~∅10</td> <td>0.35</td> <td>0.26</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> </tr> <tr> <td>∅12.5~∅16</td> <td>0.42</td> <td>0.38</td> <td>0.34</td> <td>0.30</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.12</td> </tr> </tbody> </table>	Rated Voltage (V)	4	6.3	10	16	25	35	50	63	100	tan δ (max.)	∅4~∅10	0.35	0.26	0.20	0.16	0.14	0.12	0.12	0.12	∅12.5~∅16	0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.12																			
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Load Life	After 2000 hrs. (1000 hrs. for ∅4~∅6.3x5.4) application of the rated voltage at 105°C, they meet the characteristics listed <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value for capacitors of 10V or more (Within ±30% of initial value for capacitors of 4V or less)</td> </tr> <tr> <td>Dissipation Factor</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </table>	Capacitance Change	Within ±20% of initial value for capacitors of 10V or more (Within ±30% of initial value for capacitors of 4V or less)	Dissipation Factor	200% or less of initial specified value	Leakage Current	initial specified value or less																																										
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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. <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>initial specified value or less</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </table>	Capacitance Change	Within ±10% of initial value	Dissipation Factor	initial specified value or less	Leakage Current	initial specified value or less																																										
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Marking	Black print on the case top.																																																

### □ DRAWING (Unit: mm)



\*1. Voltage mark for 6.3V is [6V]  
 \*2. Applicable to ∅6.3x7.7  
 \*3. Applicable to ∅8x10.5~∅10  
 \*4. Applicable to ∅12.5~∅16

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**□ 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 13.5	12.5 x 13.5	12.5 x 16	16 x 16.5
A	1.8	2.1	2.4	2.4	3.3	2.9	3.2	3.2	4.7	4.7	5.5
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
E ± 0.2	1.0	1.3	2.2	2.2	2.2	3.1	4.4	4.4	4.4	4.4	6.7
L	5.4	5.4	5.4	7.7	6.2	10.5	10.5	13.5	13.5	16.0	16.5

**□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT**

μF	WV Code	4		6.3		10		16		25	
		0G		0J		1A		1C		1E	
4.7	4R7									4 x 5.4	13
10	100							4 x 5.4	18	5 x 5.4 (4 x 5.4)	20 (14)
22	220			4 x 5.4	22	5 x 5.4 (4 x 5.4)	25 (20)	5 x 5.4 (4 x 5.4)	27 (20)	6.3 x 5.4 (5 x 5.4)	36 (25)
33	330	5 x 5.4 (4 x 5.4)	30 (18)	5 x 5.4 (4 x 5.4)	27 (22)	5 x 5.4 (4 x 5.4)	30 (22)	6.3 x 5.4 (5 x 5.4)	40 (28)	6.3 x 5.4 (5 x 5.4)	44 (29)
47	470	5 x 5.4 (4 x 5.4)	36 (24)	5 x 5.4 (4 x 5.4)	33 (25)	6.3 x 5.4 (5 x 5.4)	41 (30)	6.3 x 5.4 (5 x 5.4)	48 (31)	6.3 x 5.4 (8 x 6.2)	48 (91)
100	101	6.3 x 5.4 (5 x 5.4)	60 (43)	6.3 x 5.4 (5 x 5.4)	50 (39)	6.3 x 5.4 (8 x 6.2)	53 (110)	6.3 x 5.4 (8 x 6.2)	60 (120)	6.3 x 7.7	91
150	151	6.3 x 5.4	52	6.3 x 5.4	55	6.3 x 5.4	62	6.3 x 7.7	95	8 x 10.5 (6.3 x 7.7)	140 (100)
220	221	6.3 x 5.4	57	6.3 x 7.7 (6.3 x 5.4)	105 (67)	6.3 x 7.7 (8 x 6.2)	105 (105)	8 x 10.5 (6.3 x 7.7) (8 x 6.2)	150 (105) (85)	8 x 10.5	175
330	331	6.3 x 7.7	100	6.3 x 7.7	105	8x10.5	196	8 x 10.5	195	10 x 10.5 (8 x 10.5)	240 (220)
470	471	6.3 x 7.7	105	8 x 10.5 (6.3 x 7.7)	210 (120)	10 x 10.5 (8 x 10.5)	260 (210)	10 x 10.5 (8 x 10.5)	295 (230)	10 x 10.5	280
680	681	8 x 10.5	210	8 x 10.5	210	10 x 10.5	270	10 x 10.5	315	10 x 13.5	400
1000	102	8 x 10.5	230	10 x 10.5 (8 x 10.5)	300 (230)	10 x 10.5	315	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	500 (390) (340)	12.5 x 13.5	580
1500	152	10 x 10.5	315	10 x 13.5 (10 x 10.5)	450 (315)	10 x 13.5	460	12.5 x 13.5	550	12.5 x 16	850
2200	222	10 x 13.5 (10 x 10.5)	440 (340)	12.5 x 13.5 (10 x 13.5)	620 (500)	12.5 x 13.5	680	16 x 16.5 (12.5 x 16)	950 (750)	16 x 16.5	1050
3300	332	10 x 13.5	490	12.5 x 16 (12.5 x 13.5)	700 (660)	16 x 16.5	1000	16 x 16.5	1000		
4700	472	12.5 x 13.5	600	16 x 16.5	1000					Case size	Ripple current
6800	682	16 x 16.5 (12.5 x 16)	950 (650)								

μF	WV Code	35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4 x 5.4	0.7	4 x 5.4	0.7		
0.22	R22			4 x 5.4	1.6	4 x 5.4	1.6		
0.33	R33			4 x 5.4	2.5	4 x 5.4	2.5		
0.47	R47			4 x 5.4	3.5	4 x 5.4	3.5		
1	010			4 x 5.4	7	4 x 5.4	7	4 x 5.4	7
2.2	2R2			4 x 5.4	11	4 x 5.4	11	6.3 x 5.4	14
3.3	3R3	4 x 5.4	13	4 x 5.4	13	5 x 5.4	13	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	32 (20) (30)
4.7	4R7	4 x 5.4	14	5 x 5.4 (4 x 5.4)	16 (13)	5 x 5.4	16	6.3 x 7.7 (6.3 x 5.4)	35 (21)
10	100	5 x 5.4 (4 x 5.4)	21 (14)	6.3 x 5.4	24	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	39 (24) (25)	8 x 10.5 (6.3 x 7.7)	77 (35)
22	220	6.3 x 5.4	38	6.3 x 7.7 (6.3 x 5.4) (8 x 6.2)	51 (42) (70)	8 x 10.5 (6.3 x 7.7)	98 (49)	10 x 10.5 (8 x 10.5)	126 (84)
33	330	6.3 x 5.4 (8 x 6.2)	42 (84)	6.3 x 7.7	60	8 x 10.5	112	10 x 10.5	133
47	470	6.3 x 7.7 (6.3 x 5.4)	70 (50)	8 x 10.5 (6.3 x 7.7)	120 (63)	10 x 10.5 (8 x 10.5)	160 (119)	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	250 (160) (140)
68	680					Case size	Ripple current	12.5 x 13.5 (10 x 13.5)	300 (180)

•Case size ∅DxL(mm), ripple current (mA rms) at 105°C 120Hz

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### □ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF Code		35		50		63		100	
		1V		1H		1J		2A	
100	101	8 × 10.5 (6.3 × 7.7)	120 (84)	10 × 10.5 (8 × 10.5)	170 (140)	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	270 (210) (196)	16 × 16.5 (12.5 × 13.5)	450 (380)
150	151	8 × 10.5	155	10 × 10.5	170	10 × 13.5	225		
220	221	10 × 10.5 (8 × 10.5)	220 (190)	10 × 13.5 (10 × 10.5)	280 (220)	16 × 16.5 (12.5 × 13.5) (10 × 13.5)	560 (470) (235)	16 × 16.5	550
330	331	10 × 10.5	245	16 × 16.5 (12.5 × 13.5) (10 × 13.5)	600 (420) (295)	16 × 16.5 (12.5 × 16)	700 (510)		
470	471	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	520 (375) (280)	16 × 16.5 (12.5 × 16)	700 (520)	16 × 16.5	750		
680	681	12.5 × 13.5 (10 × 13.5)	530 (395)	16 × 16.5	750			Case size	Ripple current
1000	102	16 × 16.5 (12.5 × 16)	750 (600)						

•Case size  $\varnothing D \times L$ (mm), ripple current (mA rms) at 105°C 120Hz

### □ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

Frequency		50Hz	120Hz	300Hz	1KHz	10KHz~	
Coefficient	Ø4 ~ Ø10	0.1 ~ 68μF	0.70	1.00	1.17	1.36	1.50
		100 ~ 3300μF	0.85	1.00	1.08	1.20	1.30
	Ø12.5 ~ Ø16	~ 68μF	0.75	1.00	1.35	1.57	2.00
		100 ~ 680μF	0.80	1.00	1.23	1.34	1.50
		1000 ~ 6800μF	0.85	1.00	1.10	1.13	1.15

- Taping specifications are given in page 11.
- Please refer to page 12 for the minimum package quantity.

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