LONG LIFE WITH EXTRA LOWER IMPEDANCE

- Extra lower impedance with temperature range -55 ~ +105°C
- Load life of 2000~5000 hours
- Impedance 5~25% less than KZ series
- Comply with the RoHS directive RoHS

KZ → Long Life → FZ

☐ SPECIFICATIONS

Items	Characteristics
Operation Temperature Range	-55 ~ +105°C
Voltage Range	6.3 ~ 100V
Capacitance Range	3.3 ~ 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	63~80	100
tan δ (max.)	∅4~∅10	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.07
	∅12.5~∅16	0.26	0.19	0.18	0.16	0.14	0.10	0.08	0.07

Stability at Low Temperature — Measurement frequency : 120Hz

Rated Voltage (V)		6.3 ~ 16	25 ~ 100
Impedance Ratio ZT/Z20 (max.)	Z(-25°C) / Z(20°C)	2	2
	Z(-40°C) / Z(20°C)	3	3
	Z(-55°C) / Z(20°C)	4	3

Load Life — After 5000 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	200% or less of initial specified value
Leakage Current	initial specified value or less

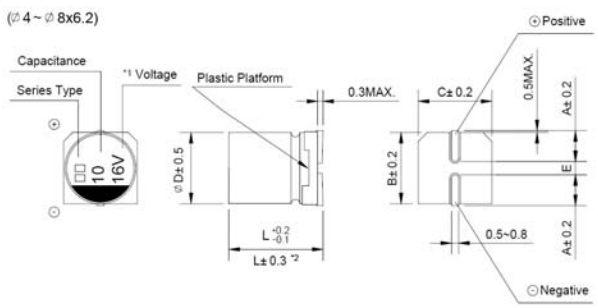
Shelf Life — After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above.

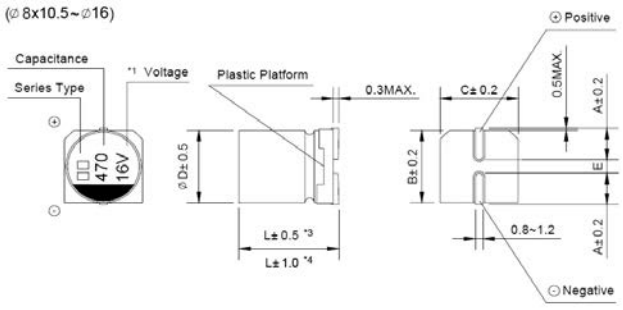
Resistance to Soldering Heat — After reflow soldering and restored at room temperature, they meet the characteristics listed below.

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)





*1. Voltage mark for 6.3V is [6V]
*2. Applicable to ∅6.3×7.7
*3. Applicable to ∅8×10.5~∅10
*4. Applicable to ∅12.5~∅16

NOTE: All designs and specifications are for reference only and are subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.

☐ DIMENSIONS (Unit: mm)

ØD x L	4 x 5.8	5 x 5.8	6.3 x 5.8	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 & IMPEDANCE

WV / Code / µF		6.3			10			16		
		0J			1A			1C		
10	100							4 × 5.8	1.35	90
15	150							4 × 5.8	1.35	90
22	220	4 × 5.8	1.35	90	4 × 5.8	1.35	90	5 × 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)
33	330	5 × 5.8 (4 × 5.8)	0.70 (1.35)	160 (90)	5 × 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)
47	470	5 × 5.8 (4 × 5.8)	0.70 (1.35)	160 (90)	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)
56	560	5 × 5.8	0.70	160	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240
68	680	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)	6.3 × 5.8	0.36	240	6.3 x 7.7 (6.3 × 5.8)	0.26 (0.36)	300 (240)
100	101	6.3 × 5.8 (5 × 5.8)	0.36 (0.70)	240 (160)	6.3 x 7.7 (6.3 × 5.8)	0.26 (0.36)	300 (240)	6.3 x 7.7 (6.3 × 5.8)	0.26 (0.36)	300 (240)
150	151	6.3 × 5.8	0.36	240	6.3 × 7.7	0.26	300	6.3 × 7.7	0.26	300
220	221	6.3 x 7.7 (6.3 × 5.8) (8 × 6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3 × 7.7 (8 × 6.2)	0.26 (0.26)	300 (300)	8 × 10.5 (6.3 × 7.7)	0.16 (0.26)	600 (300)
330	331	6.3 × 7.7 (8 × 6.2)	0.26 (0.26)	300 (300)	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)
470	471	8 × 10.5	0.16	600	10 × 10.5 (8 × 10.5)	0.08 (0.16)	850 (600)	10 × 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)
680	681	10 × 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 × 10.5	0.08	850	10 × 13.5 (10 × 10.5)	0.07 (0.08)	950 (850)
1000	102	10 × 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 × 13.5 (10 × 10.5)	0.07 (0.08)	950 (850)	16×16.5 (12.5×16) (12.5×13.5)	0.05 (0.055) (0.06)	1450 (1200) (1100)
1500	152	10 × 13.5 (10 × 10.5)	0.07 (0.08)	950 (850)	12.5×13.5	0.06	1100	16 × 16.5	0.05	1450
2200	222	12.5 × 13.5	0.06	1100	12.5 × 16	0.055	1200			
3300	332	12.5 × 16	0.055	1200	16 × 16.5	0.05	1450			
4700	472	16 × 16.5	0.05	1450				Case size	Impedance	Ripple current

WV / Code / µF		25			35			50		
		1E			1V			1H		
4.7	4R7				4 × 5.8	1.35	90	5 × 5.8 (4 x 5.8)	1.52 (2.9)	85 (60)
10	100	4 × 5.8	1.35	90	5 × 5.8 (4 x 5.8)	0.70 (1.35)	160 (90)	6.3 × 5.8 (5 × 5.8)	0.88 (1.52)	165 (85)
15	150	5 × 5.8	0.70	160	5 × 5.8	0.70	160	6.3 × 5.8	0.88	165
22	220	6.3 × 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 × 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 × 7.7 (6.3 x 5.8) (8 x 6.2)	0.68 (0.88) (0.68)	195 (165) (195)
33	330	6.3 × 5.8 (5 x 5.8)	0.36 (0.70)	240 (160)	6.3 × 5.8 (8 x 6.2)	0.36 (0.26)	240 (300)	6.3 × 7.7 (8 x 6.2)	0.68 (0.68)	195 (195)
47	470	6.3 × 7.7 (6.3 x 5.8) (8 x 6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3 × 7.7 (6.3 x 5.8) (8 x 6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3 × 7.7 (8 x 6.2)	0.68 (0.68)	195 (195)
56	560	6.3 × 7.7 (6.3 x 5.8)	0.26 (0.36)	300 (240)	6.3 × 7.7	0.26	300	8 × 10.5	0.34	350
68	680	6.3 × 7.7	0.26	300	6.3 x 7.7	0.26	300	8 × 10.5	0.34	350
100	101	6.3 × 7.7 (8 x 6.2)	0.26 (0.26)	300 (300)	8 × 10.5	0.16	600	10 × 10.5 (8 × 10.5)	0.18 (0.34)	670 (350)
150	151	8 x 10.5 (6.3 × 7.7)	0.16 (0.26)	600 (300)	10 × 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 × 10.5	0.18	670
220	221	8 × 10.5	0.16	600	10 × 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 × 13.5 (10 × 10.5)	0.14 (0.18)	780 (670)
330	331	10 × 10.5 (8 x 10.5)	0.08 (0.16)	850 (600)	10 × 10.5	0.08	850	12.5×13.5	0.12	900
470	471	10 × 13.5 (10 × 10.5)	0.07 (0.08)	950 (850)	12.5 × 13.5 (10 × 13.5)	0.06 (0.07)	1100 (950)	16 × 16.5 (12.5 × 16)	0.08 (0.10)	1250 (1050)
680	681	12.5 × 13.5	0.06	1100	12.5 × 16	0.055	1200			
1000	102	16 × 16.5 (12.5 × 16)	0.05 (0.055)	1450 (1200)	16 × 16.5	0.05	1450			
1500	152	16 × 16.5	0.05	1450				Case size	Impedance	Ripple current

•Case size ∅D×L(mm), impedance (Ω) at 20°C 100KHz, ripple current (mA rms) at 105°C 100KHz

NOTE: All designs and specifications are for reference only and are subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.

☐ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE

WV / Code / μF		63			80			100		
		1J			1K			2A		
3.3	3R3				5 × 5.8	5.0	25			
4.7	4R7	5 × 5.8	3.0	50	6.3 × 5.8	3.0	40			
10	100	6.3 × 7.7 (6.3 x 5.8)	1.2 (1.5)	120 (80)	6.3 × 7.7 (8 x 6.2)	2.4 (2.4)	60 (60)	8 × 10.5	1.3	130
22	220	8 x 10.5 (6.3 × 7.7) (8 x 6.2)	0.65 (1.2) (1.2)	250 (120) (120)	8 × 10.5	1.3	130	10 × 10.5 (8 × 10.5)	0.7 (1.3)	200 (130)
33	330	8 × 10.5	0.65	250	8 × 10.5	1.3	130	10 × 10.5	0.7	200
47	470	8 × 10.5	0.65	250	10 × 10.5	0.7	200	12.5 × 13.5 (10 x 13.5)	0.32 (0.60)	500 (250)
68	680	12.5 × 13.5 (8 x 10.5)	0.16 (0.65)	800 (250)	12.5 x 13.5	0.32	500	12.5 × 13.5	0.32	500
100	101	12.5 × 13.5 (10 x 10.5)	0.16 (0.35)	800 (400)	12.5 x 13.5	0.32	500	16 × 16.5 (12.5 × 16)	0.17 (0.26)	795 (550)
150	151	12.5 × 13.5 (10 x 13.5)	0.16 (0.25)	800 (650)	12.5 x 13.5	0.32	500			
220	221	12.5 × 13.5 (10 x 13.5)	0.16 (0.25)	800 (650)	12.5 x 16	0.26	550			
330	331	16 × 16.5	0.082	1400	16 × 16.5	0.17	795	Case size	Impedance	Ripple current

•Case size ∅D×L(mm), impedance (Ω) at 20°C 100KHz, ripple current (mA rms) at 105°C 100KHz

☐ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

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

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

NOTE: All designs and specifications are for reference only and are subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.