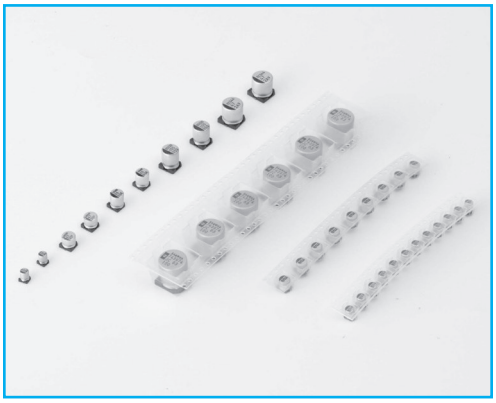
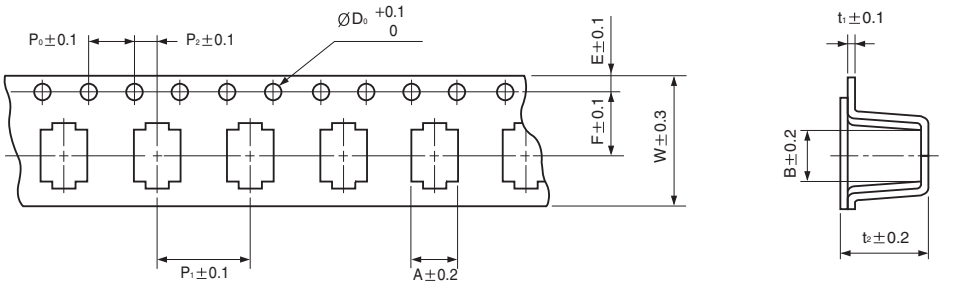
4 SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS



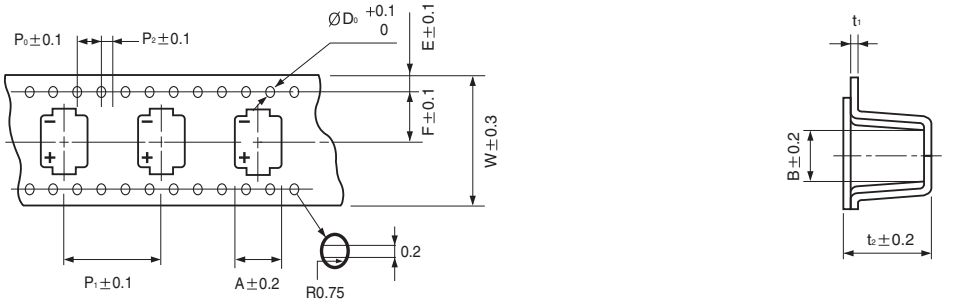
Taping Specifications for Chip Type Capacitors

Carrier Tape

· Fig.1



· Fig.2



ØD×L	A	B	ØD₀	E	F	P₀	P₁	P₂	t₁	t₂	W	Fig.
4 × 5.3	4.7	4.7	1.5	1.75	5.5	4.0	8.0	2.0	0.4	5.7	12.0	1
5 × 5.3	5.7	5.7	1.5	1.75	5.5	4.0	12.0	2.0	0.4	5.7	12.0	
6.3× 5.3	7.0	7.0	1.5	1.75	7.5	4.0	12.0	2.0	0.4	5.7	16.0	
6.3× 5.8	7.0	7.0	1.5	1.75	7.5	4.0	12.0	2.0	0.4	6.3	16.0	
6.3× 7.7	7.0	7.0	1.5	1.75	7.5	4.0	12.0	2.0	0.4	8.2	16.0	
8 × 6.2	8.7	8.7	1.5	1.75	7.5	4.0	12.0	2.0	0.4	6.8	16.0	
8 × 10	8.7	8.7	1.5	1.75	11.5	4.0	16.0	2.0	0.4	11.0	24.0	
10 × 10	10.7	10.7	1.5	1.75	11.5	4.0	16.0	2.0	0.4	11.0	24.0	
12.5×13.5	14.0	14.0	1.5	1.75	14.2	4.0	24.0	2.0	0.5	14.0	32.0	2

Reel

Fig.1(PAPER)

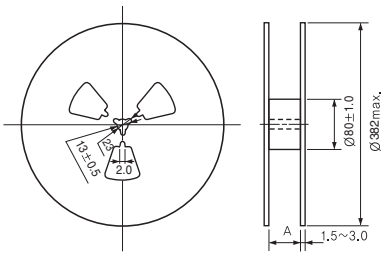
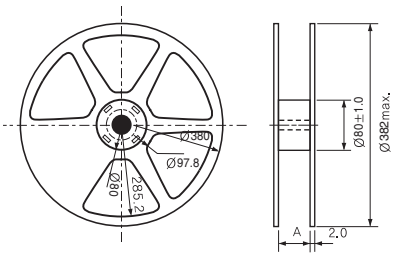
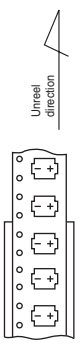


Fig.2(PLASTIC)



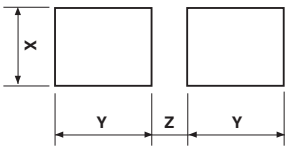
Polarity



ØD×L	A	
	Fig.1	Fig.2
4 × 5.3	14	-
5 × 5.3	14	-
6.3 × 5.3	18	-
6.3 × 5.8	18	-
6.3 × 7.7	18	16
8 × 6.2	18	-
8 × 10	26	24
10 × 10	26	24
12.5×13.5	34	32

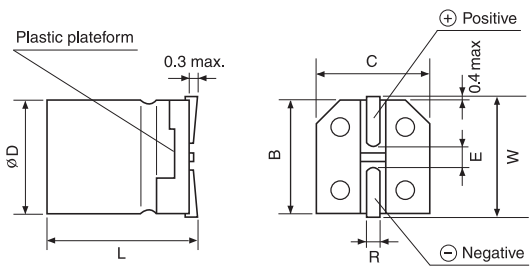
ØD×L	Q'ty/Reel(pcs.)	Q'ty/Box(pcs.)
4 × 5.3	2000	20000
5 × 5.3	1000	10000
6.3 × 5.3	1000	10000
6.3 × 5.8	1000	10000
6.3 × 7.7	900	9000
8 × 6.2	1000	10000
8 × 10	500	3000
10 × 10	500	3000
12.5×13.5	200	1000

Recommended Land Size

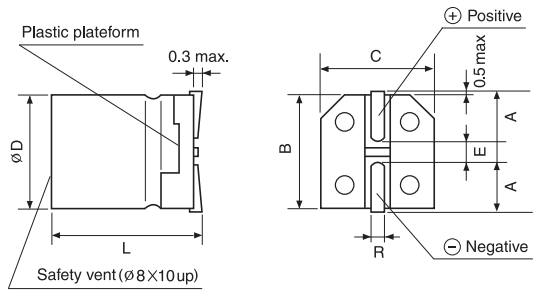


Type	ØD×L	X	Y	Z
VR	4×5.3	1.6	2.6	1.0
	5×5.3	1.6	3.0	1.4
	6.3×5.3	1.6	3.5	2.0
	6.3×5.8	1.6	3.5	2.0
	6.3×7.7	1.6	3.5	2.0
	8×6.2	2.5	4.0	2.0
	8×10	2.5	3.5	3.0
	10×10	2.5	4.0	4.0
	12.5×13.5	2.5	5.7	4.0
VG	6.3×7.7	3.0	4.0	1.6
	8×10	4.3	5.3	2.0
	10×10	4.3	5.6	3.3
	12.5×13.5	7.0	7.3	3.0

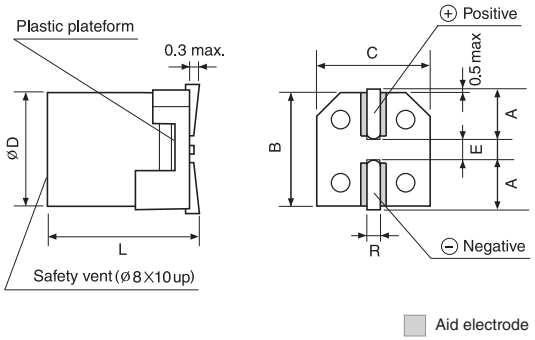
DRAWING Ⅰ



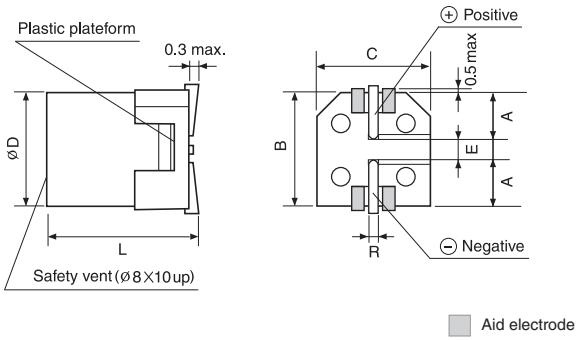
DRAWING Ⅱ



DRAWING Ⅲ



DRAWING Ⅳ



● DIMENSION OF STANDARD TYPE

APPLICABLE DRAWING NO.	Ø×D	B±0.2	C±0.2	E±0.2	A±0.2	R
DRAWING Ⅰ	4×5.3	4.3	4.3	1.0	4.8	0.5 ~ 0.8
	5×5.3	5.3	5.3	1.4	5.8	0.5 ~ 0.8

APPLICABLE DRAWING NO.	Ø×D	B±0.2	C±0.2	E±0.2	A±0.2	R
DRAWING Ⅱ	6.3×5.3	6.6	6.6	2.2	2.4	0.5 ~ 0.8
	6.3×5.8	6.6	6.6	2.2	2.4	0.5 ~ 0.8
	6.3×7.7	6.6	6.6	2.2	2.4	0.5 ~ 0.8
	8×6.2	8.3	8.3	2.3	3.3	0.5 ~ 0.8
	8×10	8.3	8.3	3.1	2.9	0.8 ~ 1.1
	10×10	10.3	10.3	4.5	3.2	0.8 ~ 1.1
	10×12.5	10.3	10.3	4.5	3.2	0.8 ~ 1.1
	12.5×13.5	12.8	12.8	4.5	4.6	1.1 ~ 1.4
	16×16.5	17.1	17.1	6.3	5.4	1.0 ~ 1.4
	18×21.5	17.1	17.1	6.3	5.4	1.0 ~ 1.4

● DIMENSION OF VIBRATION RESISTANT TYPE(FOR 30G)

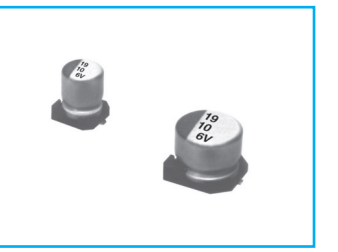
APPLICABLE DRAWING NO.	Ø×D	B±0.2	C±0.2	E±0.2	A±0.2	R
DRAWING Ⅲ	6.3×7.7	6.6	6.6	2.2	2.4	0.5 ~ 0.8
	8×10	8.3	8.3	3.1	2.9	0.8 ~ 1.1
	10×10	10.3	10.3	4.5	3.2	0.8 ~ 1.1
	12.5×13.5	12.8	12.8	4.5	4.6	1.1 ~ 1.4

APPLICABLE DRAWING NO.	Ø×D	B±0.2	C±0.2	E±0.2	A±0.2	R
DRAWING Ⅳ	16×16.5	17.1	17.1	6.3	5.4	1.0 ~ 1.4
	18×21.5	19.1	19.1	6.3	6.4	1.0 ~ 1.4

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

SC Chip type, Standard Series

Solvent Proof
WV≦100V



- Chip type higher capacitance in larger case sizes
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

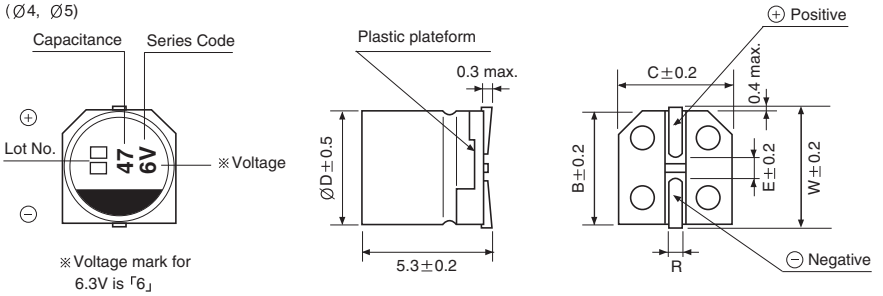
NC ⇦ SC ⇨ RC
Non-polar　Wide temp

Item	Characteristics
Operating temperature range	-40 ~ +85˚C
Leakage current max.	WV≦100　I = 0.01CV or 3μA whichever is greater (after 2 minutes) WV≧160　I = 0.04CV + 100μA(after 1 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 / 160 / 200 / 250 / 400 / 450 tanδ: 0.40 / 0.35 / 0.24 / 0.20 / 0.16 / 0.13 / 0.12 / 0.12 / 0.12 / 0.20 / 0.20 / 0.20 / 0.25 / 0.25
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 4 / 6.3 / 10 / 16 / 25 / 35 ~ 100 / 160 ~ 250 / 400 ~ 450 Z-25˚C/Z+20˚C: 6 / 5 / 4 / 3 / 2 / 2 / 3 / 6 Z-40˚C/Z+20˚C: 12 / 10 / 8 / 6 / 4 / 3 / 6 / 10
Load life (after application of the rated voltage for 2000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value (Small size : ±25%) tanδ: Less than 200% of the specified value
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

● DRAWING　-Series code of SC is "V"

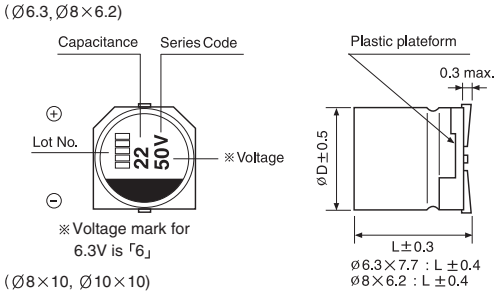
Unit : mm

(Ø4, Ø5)

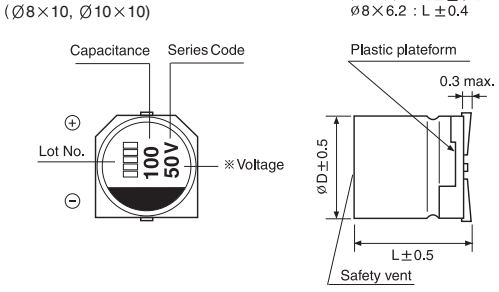


ØD×L	W	A	B	C	E	R
4×5.3	4.8		4.3	4.3	1.0	0.5~0.8
5×5.3	5.8		5.3	5.3	1.4	0.5~0.8
6.3×5.3		2.4	6.6	6.6	2.2	0.5~0.8
6.3×5.8		2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7		2.4	6.6	6.6	2.2	0.5~0.8
8×6.2		3.3	8.3	8.3	2.3	0.5~0.8
8×10		2.9	8.3	8.3	3.1	0.8~1.1
10×10		3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5		4.6	12.8	12.8	4.5	1.1~1.4

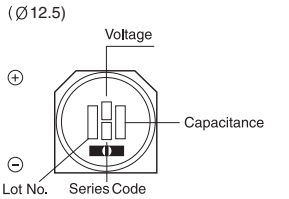
(Ø6.3, Ø8×6.2)

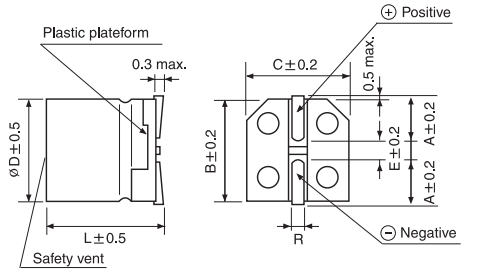


(Ø8×10, Ø10×10)



(Ø12.5)





SC series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	4		6.3		10		16		25		35		50	
1.0													4×5.3	10
2.2											4×5.3	11	4×5.3	15
3.3									4×5.3	15	4×5.3	16	4×5.3	18
4.7							4×5.3	16	4×5.3	18	4×5.3	19	4×5.3	24
													5×5.3	25
10	4×5.3	16	4×5.3	19	4×5.3	21	4×5.3	21	4×5.3	24	4×5.3	27	5×5.3	41
									5×5.3	30	5×5.3	32	6.3×5.3	43
22	4×5.3	24	4×5.3	29	4×5.3	28	4×5.3	30	5×5.3	41	6.3×5.3	55	6.3×5.3	71
					5×5.3	36	5×5.3	41	6.3×5.3	53			6.3×5.8	73
33	4×5.3	29	4×5.3	30	4×5.3	34	5×5.3	43	5×5.3	50	6.3×5.3	65	6.3×7.7	94
			5×5.3	41	5×5.3	44	6.3×5.3	58	6.3×5.3	64	6.3×5.8	67	8×6.2	95
47	4×5.3	35	4×5.3	36	5×5.3	47	5×5.3	52	6.3×5.3	70	6.3×7.7	94	6.3×7.7	105
			5×5.3	48	6.3×5.3	62	6.3×5.3	69	6.3×5.8	72	8×6.2	105	8×10	140
100	5×5.3	54	5×5.3	60	6.3×5.3	80	6.3×5.3	88	8×6.2	145	6.3×7.7	132	8×10	181
	6.3×5.3	68	6.3×5.3	82	6.3×5.8	82	6.3×5.8	91			8×10	175	10×10	195
220	6.3×5.3	93	6.3×5.8	91	6.3×7.7	173	6.3×7.7	162	8×10	232	10×10	265	10×10	320
					8×6.2	175	8×10	215	10×10	250				
330			6.3×7.7	188	8×10	240	8×10	270	10×10	305	10×10	360	12.5×13.5	600
			8×6.2	190										
470			8×10	265	8×10	290	8×10	307	10×10	400	12.5×13.5	600		
							10×10	330						
1000			8×10	370	10×10	454	12.5×13.5	710	12.5×13.5	820				
			10×10	400										
1500			10×10	480	12.5×13.5	850	12.5×13.5	870						
2200			12.5×13.5	890	12.5×13.5	960								

Ripple current (mA rms) at 85°C, 120Hz
Case size ØD x L (mm)

WV / μF	63		100		160		200		250		400		450	
2.2													10×10	85
3.3			6.3×5.8	29							10×10	90	10×10	100
4.7	6.3×5.8	31	6.3×5.8	35			10×10	100	10×10	100	12.5×13.5	115	12.5×13.5	115
			8×6.2	40										
10	6.3×5.8	46	8×10	77	10×10	100	12.5×13.5	150	12.5×13.5	150				
22	8×6.2	96	8×10	100	12.5×13.5	240	12.5×13.5	260						
33	8×10	117	10×10	130	12.5×13.5	260								
47	10×10	140	10×10	155										
68	10×10	160	12.5×13.5	350										
100	12.5×13.5	370	12.5×13.5	420										
220	12.5×13.5	550												

Ripple current (mA rms) at 85°C, 120Hz
Case size ØD x L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

RC

Chip type, Wide Temperature Range Series

Solvent Proof

- Wide operating temperature range of -55 ~ +105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

SC ⇨ RC (Wide temp.)

Item	Characteristics
Operating temperature range	-55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 tanδ: 0.27 / 0.23 / 0.19 / 0.15 / 0.13 / 0.11
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 3 / 3 / 2 / 2 / 2 / 2 Z-55˚C/Z+20˚C: 8 / 5 / 4 / 3 / 3 / 3
Load life (after application of the rated voltage for 1000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±25% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

● DRAWING (See page 60)

-Series code of RC is “F”

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3		10		16		25		35		50	
1.0											4×5.3	7
2.2											4×5.3	11
3.3											4×5.3	13
4.7							4×5.3	13	4×5.3	14	5×5.3	18
10					4×5.3	17	5×5.3	23	5×5.3	24	6.3×5.3	31
22	4×5.3	22	5×5.3	27	5×5.3	30	6.3×5.3	39	6.3×5.3	42	6.3×5.8	45
33	5×5.3	31	5×5.3	33	6.3×5.3	43	6.3×5.3	48	6.3×5.8	52	6.3×7.7	60
47	5×5.3	36	6.3×5.3	46	6.3×5.3	51	6.3×5.8	59	6.3×5.8	63	6.3×7.7	63
100	6.3×5.3	50	6.3×5.8	64	6.3×5.8	64	6.3×7.7	91	8×10	296	10×10	295
220	6.3×7.7	86	6.3×7.7	105	6.3×7.7	105	8×10	340	10×10	435		
330	6.3×7.7	105	8×10	305	8×10	340	10×10	360				
470	8×10	330	10×10	340	10×10	470						
1000	10×10	475										

Ripple current (mA rms) at 105˚C, 120Hz
Case size ØD×L (mm)

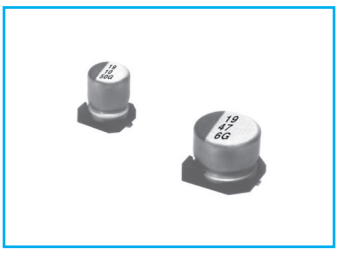
● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

JH Chip type, High Ripple Current Series

Solvent Proof
WV≦100V

JC ⇒ JH
High Ripple



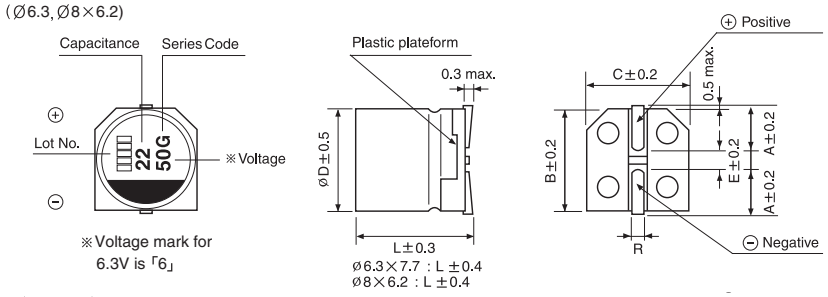
- High Ripple current Compared with JC series
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	WV≦100 : -55 ~ +105℃ WV≧160 : -40 ~ +105℃
Leakage current max.	WV≦100 I = 0.01CV or 3μA whichever is greater (after 2 minutes) WV≧160 I = 0.04CV + 100μA(after 1 minutes)
Capacitance tolerance	±20% at 120Hz, 20℃
Dissipation factor max. (at 120Hz, 20℃)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 / 160 / 200 / 250 / 400 / 450 tanδ: 0.28 / 0.24 / 0.20 / 0.16 / 0.13 / 0.12 / 0.10 / 0.10 / 0.15 / 0.15 / 0.15 / 0.20 / 0.20
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 ~ 50 / 63 ~ 100 / 160 ~ 250 / 400 ~ 450 Z-25℃/Z+20℃: 3 / 3 / 2 / 2 / 3 / 3 / 6 Z-40℃/Z+20℃: - / - / - / - / - / 6 / 10 Z-55℃/Z+20℃: 8 / 5 / 4 / 3 / 4 / - / -
Load life (after application of the rated voltage for 2000 hours at 105℃)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life(at 105℃)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20℃ by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them at 250℃ for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

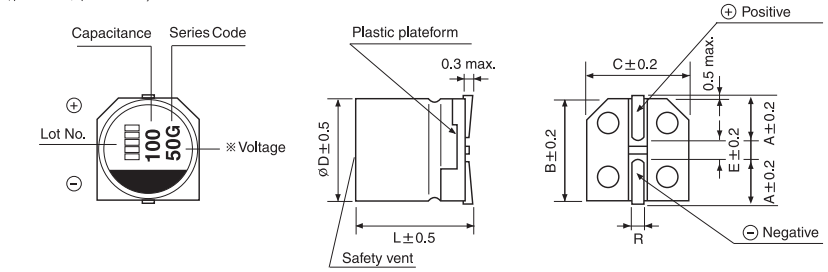
● DRAWING -Series code of JH is "G"

Unit : mm

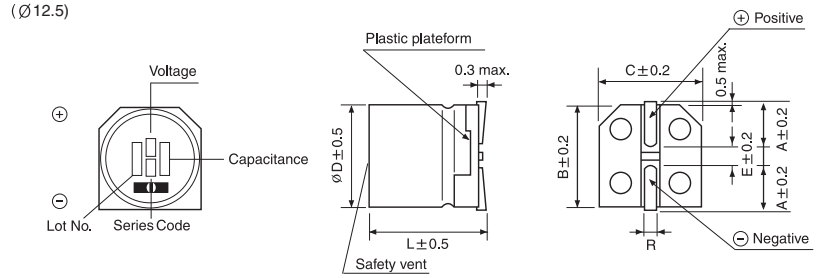
(Ø6.3, Ø8×6.2)



(Ø8×10, Ø10×10)



(Ø12.5)



ØD×L	A	B	C	E	R
6.3×5.8	2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7	2.4	6.6	6.6	2.2	0.5~0.8
8×6.2	3.3	8.3	8.3	2.3	0.5~0.8
8×10	2.9	8.3	8.3	3.1	0.8~1.1
10×10	3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5	4.6	12.8	12.8	4.5	1.1~1.4

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

JH series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3		10		16		25		35	
10										
22							6.3×5.8	57	6.3×5.8	63
33					6.3×5.8	60	6.3×5.8	72	8×6.2	114
47			6.3×5.8	69	6.3×5.8	75	8×6.2	120	8×10	186
100	6.3×5.8	90	6.3×5.8	90	8×10	222	8×10	270	10×10	456
220	8×10	242	8×10	260	10×10	495	10×10	525	10×10	675
330	8×10	432	10×10	477	10×10	660	10×10	558	12.5×13.5	750
470	10×10	510	10×10	527	10×10	735	10×10	675	12.5×13.5	900
680	10×10	612	10×10	588	12.5×13.5	750	12.5×13.5	750		
1000	10×10	743	10×10	825	12.5×13.5	900				
1500	10×10	840	12.5×13.5	975						
2200	12.5×13.5	1095								

Ripple current (mA rms) at 105°C, 120Hz
Case size ØD x L (mm)

μF \ WV	50		63		100	
10	6.3×5.8	45	8×6.2	48		
22	8×6.2	100	8×10	90	8×10	135
33	8×10	200	8×10	165	10×10	180
47	10×10	270	10×10	195	12.5×13.5	375
68	10×10	315	10×10	240	12.5×13.5	450
100	10×10	465	12.5×13.5	405		
220	12.5×13.5	720				

μF \ WV	160		200		250		400		450	
3.3					10×10	45	12.5×13.5	45	12.5×13.5	60
4.7			10×10	65	12.5×13.5	95				
10	10×10	65	12.5×13.5	110						
22	12.5×13.5	125	12.5×13.5	125						
33	12.5×13.5	140								
47										
68										
100										

Ripple current (mA rms) at 105°C, 120Hz
Case size ØD x L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

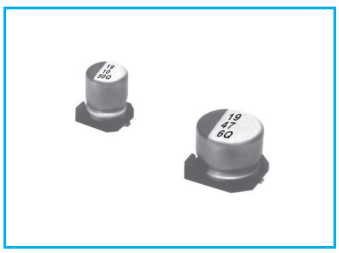
Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

Upgrade

JM Chip type, Long Life Series

Solvent Proof
WV≦100V

JC ⇨ JM
Long life



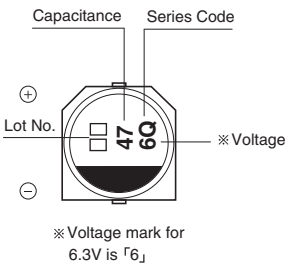
- Long Life Compared with JC series
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

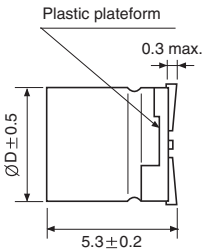
Item	Characteristics
Operating temperature range	-25 ~ +105˚C
Leakage current max.	WV≦100 I = 0.01CV or 3μA whichever is greater (after 2 minutes) WV≧160 I = 0.04CV + 100μA(after 1 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 / 160 / 200 / 250 / 400 / 450 tanδ: 0.32 / 0.28 / 0.21 / 0.21 / 0.18 / 0.18 / 0.12 / 0.12 / 0.15 / 0.15 / 0.15 / 0.20 / 0.20
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 ~ 50 / 63 ~ 100 / 160 ~ 250 / 400 ~ 450 Z-25˚C/Z+20˚C: 8 / 8 / 6 / 4 / 3 / 3 / 6
Load life (after application of the rated voltage for 3000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

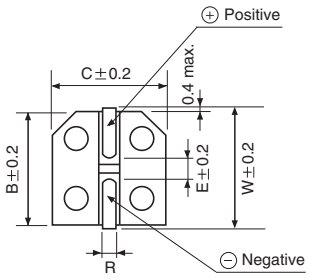
● DRAWING -Series code of JM is “Q”

Unit : mm

(Ø4, Ø5)

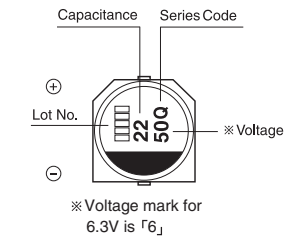


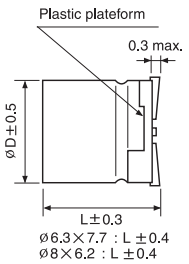


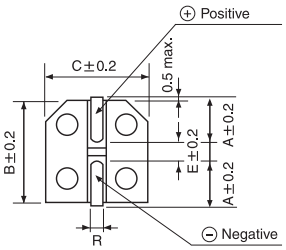


ØD×L	W	A	B	C	E	R
4×5.3	4.8		4.3	4.3	1.0	0.5~0.8
5×5.3	5.8		5.3	5.3	1.4	0.5~0.8
6.3×5.3		2.4	6.6	6.6	2.2	0.5~0.8
6.3×5.8		2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7		2.4	6.6	6.6	2.2	0.5~0.8
8×6.2		3.3	8.3	8.3	2.3	0.5~0.8
8×10		2.9	8.3	8.3	3.1	0.8~1.1
10×10		3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5		4.6	12.8	12.8	4.5	1.1~1.4

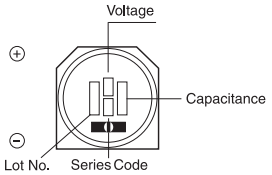
(Ø6.3, Ø8×6.2)



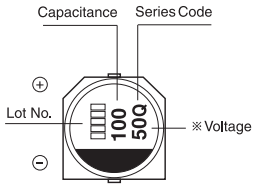


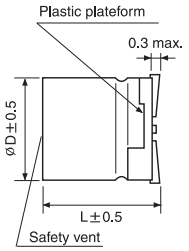


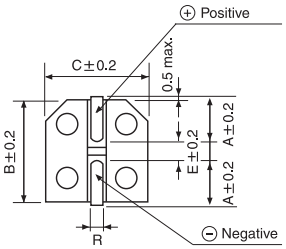
(Ø12.5)

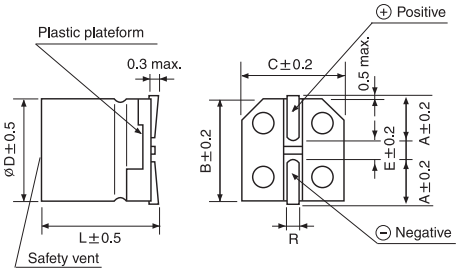


(Ø8×10, Ø10×10)









CHIP TYPES

JM series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3		10		16		25		35	
10	4×5.3	10	4×5.3	15	4×5.3	19	5×5.3	24	6.3×5.3	26
22	4×5.3	25	5×5.3	30	5×5.3	33	6.3×5.3	38	6.3×5.8	42
33	5×5.3	35	5×5.3	38	6.3×5.3	42	6.3×5.8	48	8×6.2	76
47	5×5.3	42	6.3×5.3	52	6.3×5.8	60	8×6.2	79	8×10	124
100	6.3×5.8	60	6.3×5.8	60	8×10	148	8×10	181	10×10	310
220	8×10	161	8×10	173	10×10	330	10×10	351	10×10	480
330	8×10	288	10×10	318	10×10	441	10×10	372	12.5×13.5	500
470	10×10	340	10×10	351	10×10	489	10×10	450	12.5×13.5	600
680	10×10	408	10×10	392	12.5×13.5	500	12.5×13.5	500		
1000	10×10	495	10×10	550	12.5×13.5	600				
1500	10×10	560	12.5×13.5	650						
2200	12.5×13.5	730								

Ripple current (mA rms) at 105°C, 120Hz
Case size ØD x L (mm)

μF \ WV	50		63		100	
10	6.3×5.8	30	8×6.2	32		
22	8×6.2	67	8×10	60	8×10	90
33	8×10	133	8×10	110	10×10	120
47	10×10	180	10×10	130	12.5×13.5	250
68	10×10	200	10×10	160	12.5×13.5	300
100	10×10	310	12.5×13.5	270		
220	12.5×13.5	480				

μF \ WV	160		200		250		400		450	
3.3					10×10	30	12.5×13.5	30	12.5×13.5	40
4.7			10×10	45	12.5×13.5	65				
10	10×10	45	12.5×13.5	75						
22	12.5×13.5	85	12.5×13.5	85						
33	12.5×13.5	95								
47										
68										
100										

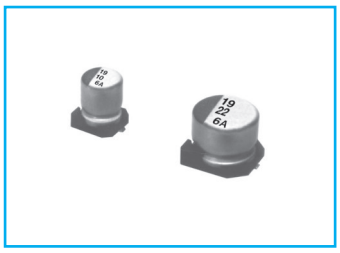
Ripple current (mA rms) at 105°C, 120Hz
Case size ØD x L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

CA Chip type, Long Life Series

Long Life Solvent Proof



- Chip type, long life capacitance in large case sizes
- Chip type with load life of 5000 hours at 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	ØD ≦ 6.3: -40 ~ +105˚C; ØD ≧ 8: -55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50; tanδ: 0.28 / 0.24 / 0.2 / 0.16 / 0.13 / 0.12
Low temperature characteristics (Impedance ratio at 120Hz)	Z-25˚C/Z+20˚C: 2 / 2 / 2 / 3 / 3 / 3; Z-55˚C/Z+20˚C: 14 / 12 / 8 / 6 / 4 / 4; Z-40˚C/Z+20˚C: 14 / 12 / 8 / 6 / 4 / 4
Load life (after application of the rated voltage for 5000 hours at 105˚C)	Leakage current: Less than specified value; Capacitance change: Within ±30% of initial value; tanδ: Less than 300% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value; Capacitance change: Within ±10% of initial value; tanδ: Less than specified value

DRAWING (See page 60)

-Series code of CA is “A”

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3		10		16		25		35		50	
10											6.3×5.8	30
22							6.3×5.8	38	6.3×5.8	42	6.3×7.7	120
33					6.3×5.8	40	6.3×5.8	48	6.3×7.7	57	8×10	140
47			6.3×5.8	46	6.3×5.8	50	6.3×7.7	63	8×10	92	8×10	170
100	6.3×5.8	60	6.3×7.7	81	6.3×7.7	81	8×10	116	10×10	151	10×10	310
220	6.3×7.7	101	8×10	141	10×10	216	10×10	216	10×10	216		
330	8×10	160	10×10	238	10×10	238	10×10	238				
470	10×10	254	10×10	254	10×10	254						
1000	10×10	313										

← Ripple current (mA rms) at 105˚C, 120Hz
↑ Case size ØD×L (mm)

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

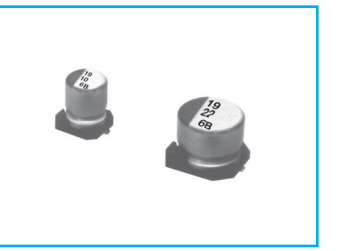
Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

CB

Chip type,Long Life Series

Long Life　Solvent Proof

RC ⇨ CB
Long life



- Chip type with load life 5000 hours at 105°C
- Chip type with 5.5mmL Height
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 tanδ: 0.32 / 0.28 / 0.24 / 0.2 / 0.16 / 0.13 / 0.12
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 4 / 6.3 / 10 / 16 / 25 / 35 ~ 50 Z-25˚C/Z+20˚C: 12 / 10 / 8 / 6 / 4 / 4 Z-40˚C/Z+20˚C: 16 / 14 / 12 / 8 / 6 / 4
Load life (after application of the rated voltage for 5000 hours at 105˚C)	Capacitance change: Within ±30% of initial value tanδ: Less than 300% of the specified value Leakage current: Less than specified value
Shelf life(at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

● DRAWING (See page 60)

-Series code of CB is “B”

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	4		6.3		10		16		25		35		50	
1.0													4×5.3	7
2.2													4×5.3	11
3.3													4×5.3	14
4.7									4×5.3	14	4×5.3	15	5×5.3	19
6.8									4×5.3	17	5×5.3	21	6.3×5.3	26
10							4×5.3	19	5×5.3	24	5×5.3	26	6.3×5.3	33
15					4×5.3	22	5×5.3	28	5×5.3	31	6.3×5.3	37	6.3×5.3	40
22	4×5.3	24	4×5.3	25	5×5.3	30	5×5.3	33	6.3×5.3	42	6.3×5.3	45		
33	5×5.3	33	5×5.3	35	5×5.3	38	6.3×5.3	48						
47	5×5.3	40	5×5.3	42	6.3×5.3	52	6.3×5.3	57						
68	5×5.3	48	6.3×5.3	55	6.3×5.3	63								
100	5×5.3	55	6.3×5.3	67	6.3×5.3	72								

Ripple current (mA rms) at 105˚C, 120Hz
Case size ØD×L(mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

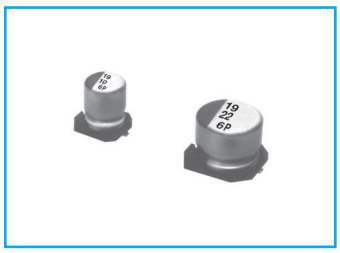
JL

Chip type, Long Life Series

Long Life

Solvent Proof

CA ⇒ JL (Long life)



- Chip type, long life capacitance in large case sizes
- For ECU
- Application to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Leakage current	I = 0.03CV or 4μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% (20˚C, 120Hz)
Dissipation factor max. (at 120Hz, 20˚C)	Rated Voltage(V): 10 / 16 / 25 / 35 / 50 tanδ: 0.32 / 0.24 / 0.21 / 0.18 / 0.18
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 6 / 4 / 3 / 2 / 2 Z-40˚C/Z+20˚C: 12 / 10 / 8 / 6 / 6
Load life (after application of the rated voltage for 10000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of the initial value tanδ: Less than 300% of the specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±30% of the initial value tanδ: Less than 300% of the specified value

DRAWING (See page 60)

-Series code of JL is “P”

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	10		16		25		35		50	
33									8×10	75
47							8×10	90	8×10	90
100			8×10	270	8×10	163	10×10	132	10×10	167
220	8×10	270	8×10	270	10×10	200	10×10	249		
330	8×10	270	10×10	315	10×10	304				
470	10×10	315	10×10	315						

Ripple current (mA rms) at 105˚C, 120Hz
Case size ØD×L(mm)

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

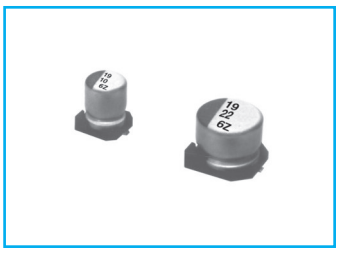
Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

ZC Height 5.5mmL, Low Impedance Series

Low Impedance　Solvent Proof

- Chip type, low impedance temperature range up to 105°C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

RC ⇒ ZC (Low Imp.)



Item	Characteristics
Operating temperature range	-55 ~ +105°C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20°C
Dissipation factor max. (at 120Hz, 20°C)	WV: 6.3 / 10 / 16 / 25 / 35 tanδ: 0.22 / 0.19 / 0.16 / 0.14 / 0.12
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 Z-25°C/Z+20°C: 2 / 2 / 2 / 2 / 3 Z-55°C/Z+20°C: 4 / 4 / 3 / 3 / 3
Load life (after application of the rated voltage for 1000 hours at 105°C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them at 250°C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING (See page 60)

-Series code of ZC is "Z"

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35		
1.0													4×5.3	5.0	50
1.5													4×5.3	5.0	50
2.2													4×5.3	5.0	50
3.3													4×5.3	5.0	50
4.7										4×5.3	5.0	50	4×5.3	5.0	50
6.8										4×5.3	5.0	50	5×5.3	2.6	80
10							4×5.3	5.0	50	5×5.3	2.6	80	5×5.3	2.6	80
15							5×5.3	2.6	80	6.3×5.3	1.3	75	6.3×5.3	1.3	115
22	4×5.3	5.0	50	5×5.3	2.6	80	5×5.3	2.6	80	6.3×5.3	1.3	115	6.3×5.3	1.3	115
33	5×5.3	2.6	80	5×5.3	2.6	80	6.3×5.3	1.3	115	6.3×5.3	1.3	115			
47	5×5.3	2.6	80	6.3×5.3	1.3	115	6.3×5.3	1.3	115						
68	6.3×5.3	1.3	115	6.3×5.3	1.3	115									
100	6.3×5.3	1.3	115												

Ripple current (mA rms) at 105°C, 100kHz
Impedance (Ω) at 20°C, 100kHz
Case size ØD×L(mm)

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.5	0.64	0.83	1.00

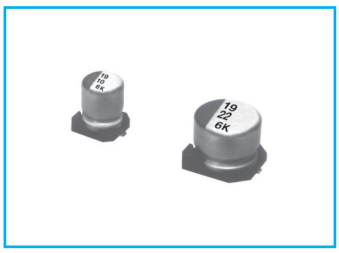
CK

Chip type, Low Impedance, High CV Series

Low Impedance　Solvent Proof

- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

ZC ⇒ CK
Low Imp.

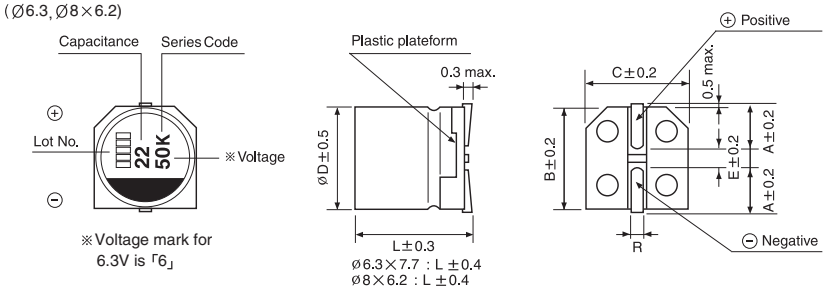


Item	Characteristics
Operating temperature range	-55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 80 / 100 tanδ: 0.24 / 0.19 / 0.16 / 0.14 / 0.12 / 0.12 / 0.10 / 0.10 / 0.10
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63~100 Z-25˚C/Z+20˚C: 2 / 2 / 2 / 2 / 2 / 2 / 3 Z-55˚C/Z+20˚C: 3 / 3 / 3 / 3 / 3 / 3 / 4
Load life (after application of the rated voltage for 2000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±25% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

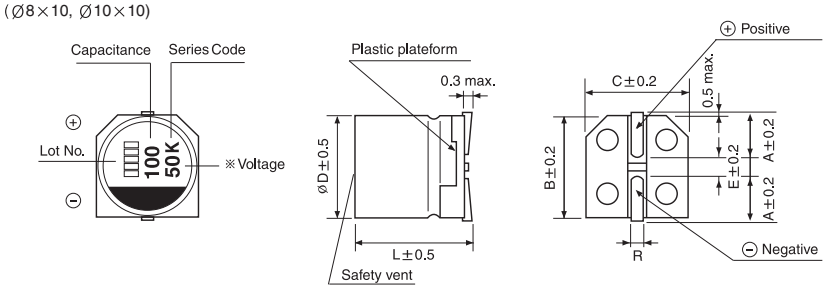
DRAWING　-Series code of CK is “K”

Unit : mm

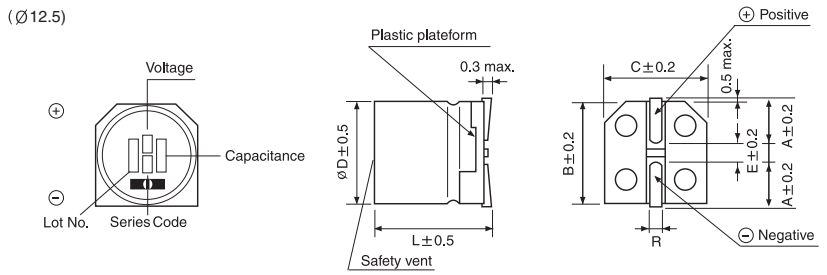
(Ø6.3, Ø8×6.2)



(Ø8×10, Ø10×10)



(Ø12.5)



ØD×L	A	B	C	E	R
6.3×5.8	2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7	2.4	6.6	6.6	2.2	0.5~0.8
8×6.2	3.3	8.3	8.3	2.3	0.5~0.8
8×10	2.9	8.3	8.3	3.1	0.8~1.1
10×10	3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5	4.6	12.8	12.8	4.5	1.1~1.4

CK series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35			50		
10																6.3×5.8	1.0	165
15																6.3×5.8	1.0	165
22																6.3×5.8	1.0	165
33							6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	280
																8×6.2	0.63	300
47				6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	280
																8×6.2	0.63	300
68	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8×10	0.34	450
													8×6.2	0.38	300			
100	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8×10	0.17	450	10×10	0.18	670
										8×6.2	0.26	300					
150	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8×10	0.17	450	8×10	0.17	450			
							8×6.2	0.26	300									
220	6.3×5.8	0.44	230	6.3×7.7	0.34	280	6.3×7.7	0.34	280	8×10	0.17	450	10×10	0.09	670			
				8×6.2	0.26	300	8×6.2	0.26	300									
330	6.3×7.7	0.34	280	8×10	0.17	450	8×10	0.17	450	10×10	0.15	670						
	8×6.2	0.26	300															
470	8×10	0.17	450	8×10	0.17	450	10×10	0.09	670									
680	8×10	0.17	450	10×10	0.09	670												
1000	10×10	0.09	670															
1500	10×10	0.09	670															

μF \ WV	63			80			100		
10	6.3×5.8	2.8	80	6.3×7.7	2.4	60			
22	6.3×7.7	2.1	120	8×10	1.3	130	8×10	2.0	130
33	8×10	1.0	250	8×10	1.3	130	10×10	1.5	200
47	8×10	1.0	250	10×10	1.2	200	12.5×13.5	1.0	500
68	10×10	0.8	400	12.5×13.5	0.8	500	12.5×13.5	1.0	500
100	10×10	0.8	400	12.5×13.5	0.8	500			
150	12.5×13.5	0.6	800	12.5×13.5	0.8	500			
220	12.5×13.5	0.6	800						

Ripple current (mA rms) at 105°C, 100kHz
Impedance (Ω) at 20°C, 100kHz
Case size ØD X L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.5	0.64	0.83	1.00

Upgrade

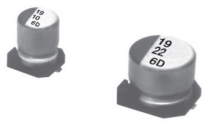
CD

Chip type, Extremely Low Impedance Series

Low Impedance　Solvent Proof

- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

CK ⇒ CD
Low Imp.



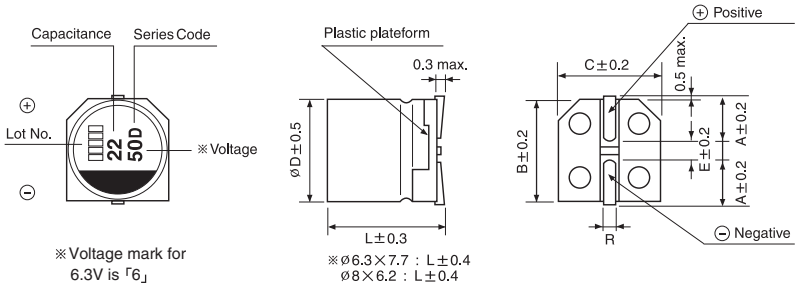
Item	Characteristics
Operating temperature range	-55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 80 / 100 tanδ: 0.24 / 0.19 / 0.16 / 0.14 / 0.12 / 0.12 / 0.10 / 0.10 / 0.10
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 ~ 100 Z-25˚C/Z+20˚C: 2 / 2 / 2 / 2 / 2 / 2 / 3 Z-55˚C/Z+20˚C: 3 / 3 / 3 / 3 / 3 / 3 / 4
Load life (after application of the rated voltage for 2000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±25% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

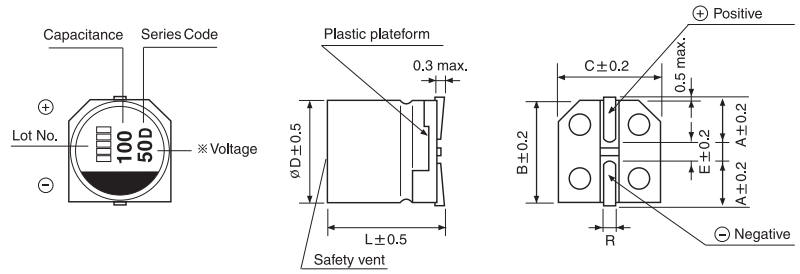
Unit : mm

-Series code of CD is “D”

(Ø6.3×5.8, 7.7, Ø8×6.2)



(Ø8×10, Ø10×10)



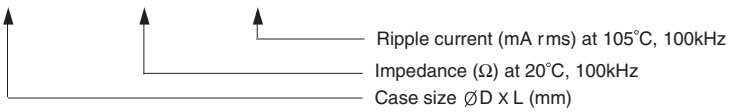
ØD	A	B	C	E	R
6.3×5.8	2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7	2.4	6.6	6.6	2.2	0.5~0.8
8×6.2	3.3	8.3	8.3	2.3	0.5~0.8
8×10	2.9	8.3	8.3	3.1	0.8~1.1
10×10	3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5	4.6	12.8	12.8	4.5	1.1~1.4

CD series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35			50		
10																6.3×5.8	0.92	170
15																6.3×5.8	0.79	170
22																6.3×5.8	0.79	170
33							6.3×5.8	0.39	384	6.3×5.8	0.39	384	6.3×5.8	0.43	384	6.3×7.7	0.61	280
																8×6.2	0.58	300
47				6.3×5.8	0.36	384	6.3×5.8	0.39	384	6.3×5.8	0.39	384	6.3×5.8	0.43	384	6.3×7.7	0.61	280
																8×6.2	0.58	300
68	6.3×5.8	0.40	384	6.3×5.8	0.36	384	6.3×5.8	0.36	384	6.3×5.8	0.36	384	6.3×7.7	0.29	600	8×10	0.29	350
100	6.3×5.8	0.40	384	6.3×5.8	0.36	384	6.3×5.8	0.36	384	6.3×7.7	0.29	600	8×10	0.15	960	10×10	0.18	700
										8×6.2	0.24	500					
150	6.3×5.8	0.40	384	6.3×5.8	0.36	384	6.3×7.7	0.29	600	8×10	0.15	960	8×10	0.15	960			
220	6.3×5.8	0.40	384	6.3×7.7	0.32	600	6.3×7.7	0.29	600	8×10	0.15	960	10×10	0.09	1360			
				8×6.2	0.24	500	8×6.2	0.24	500									
330	6.3×7.7	0.29	600	8×10	0.15	960	8×10	0.15	960	10×10	0.09	1360						
	8×6.2	0.24	500															
470	8×10	0.15	960	8×10	0.15	960	10×10	0.07	1360									
680	8×10	0.15	960	10×10	0.07	1360												
1000	10×10	0.07	1360															
1500	10×10	0.07	1360															

μF \ WV	63			80			100		
10	6.3×5.8	2.30	80	6.3×7.7	2.16	60			
22	6.3×7.7	1.90	120	8×10	1.17	130	8×10	1.80	130
33	8×10	0.80	250	8×10	1.17	130	10×10	1.35	200
47	8×10	0.80	250	10×10	1.08	200	12.5×13.5	0.90	500
68	10×10	0.70	400	12.5×13.5	0.70	500	12.5×13.5	0.90	500
100	10×10	0.70	400	12.5×13.5	0.70	500			
150	12.5×13.5	0.54	800	12.5×13.5	0.70	500			
220	12.5×13.5	0.54	800						



● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.5	0.64	0.83	1.00

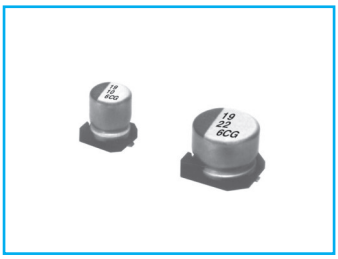
CG

Chip type, Miniaturization Series

Solvent Proof

- Chip type, miniaturized temperature range up to 105˚C
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

CD ⇨ CG
miniaturized



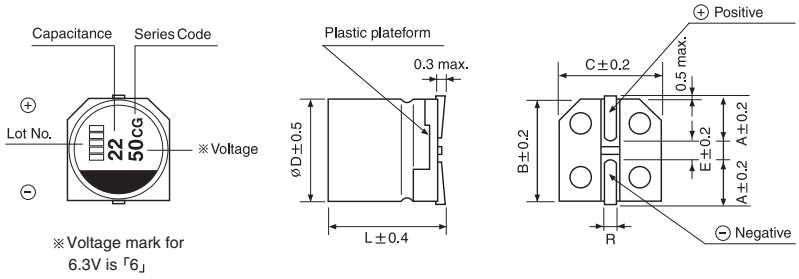
Item	Characteristics
Operating temperature range	-55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 tanδ: 0.26 / 0.19 / 0.16 / 0.14 / 0.12 / 0.12
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 2 / 2 / 2 / 2 / 2 / 2 Z-55˚C/Z+20˚C: 4 / 4 / 4 / 3 / 3 / 3
Load life (after application of the rated voltage for 2000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 200% of specified value
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm

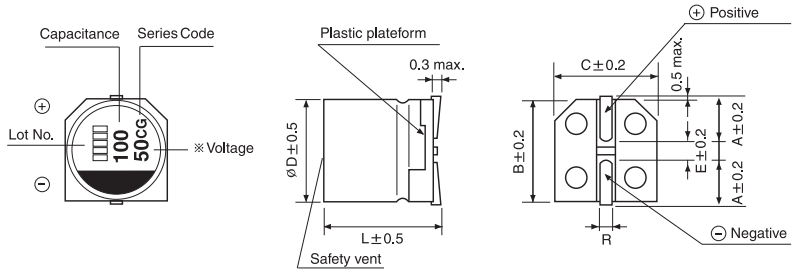
-Series code of CG is “CG”

(Ø6.3×7.7)



ØD	A	B	C	E	R
6.3×7.7	2.4	6.6	6.6	2.2	0.5~0.8
8×10	2.9	8.3	8.3	3.1	0.8~1.1
10×10	3.2	10.3	10.3	4.5	0.8~1.1

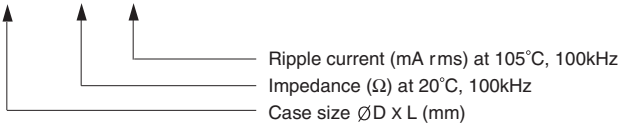
(Ø8×10, Ø10×10)



CG series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35			50		
100																6.3×7.7	0.34	350
150										6.3×7.7	0.16	600	6.3×7.7	0.16	600			
220										6.3×7.7	0.16	600				8×10	0.18	670
330				6.3×7.7	0.16	600	6.3×7.7	0.16	600				8×10	0.08	850	10×10	0.12	900
470	6.3×7.7	0.16	600	6.3×7.7	0.16	600				8×10	0.08	850						
560													10×10	0.06	1190			
680	6.3×7.7	0.16	600				8×10	0.08	850									
820										10×10	0.06	1190						
1000				8×10	0.08	850	10×10	0.06	1190									
1500	8×10	0.08	850	10×10	0.06	1190												
2200	10×10	0.06	1190															



● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.5	0.64	0.83	1.00

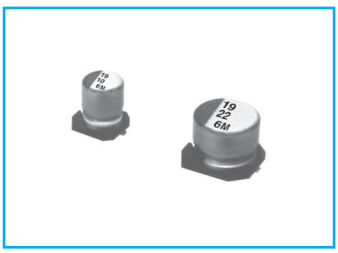
CM

Chip type, Extremely Low Impedance Long Life Series

Low Impedance　Solvent Proof

- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

CD ⇒ CM
Long life



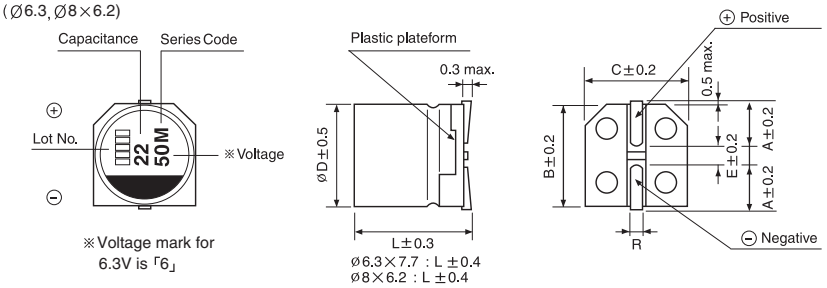
Item	Characteristics
Operating temperature range	-55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 / 63 ~ 100 tanδ: 0.26 / 0.19 / 0.16 / 0.14 / 0.13 / 0.12 / 0.10
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 ~ 100 Z-25˚C/Z+20˚C: 2 / 2 / 2 / 2 / 2 / 2 Z-55˚C/Z+20˚C: 4 / 4 / 4 / 3 / 3 / 3
Load life (after application of the rated voltage for 5000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 250% of specified value ØD ≦ 6.3, Ø8×6.2mmL: 3000 hours ØD ≧ 8: 5000 hours
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

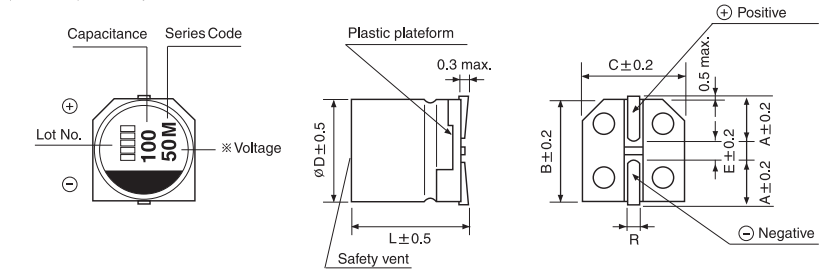
Unit : mm

-Series code of CM is “M”

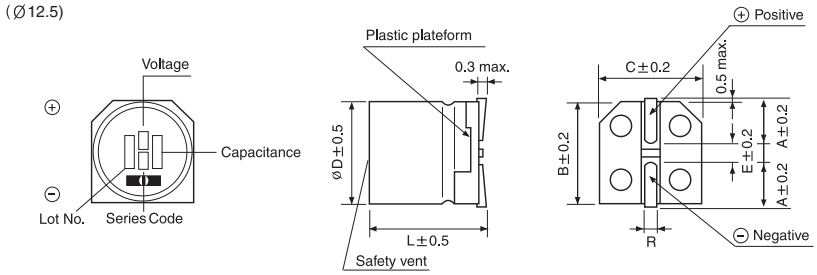
(Ø6.3, Ø8×6.2)



(Ø8×10, Ø10×10)



(Ø12.5)



ØD×L	A	B	C	E	R
6.3×5.8	2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7	2.4	6.6	6.6	2.2	0.5~0.8
8×6.2	3.3	8.3	8.3	2.3	0.5~0.8
8×10	2.9	8.3	8.3	3.1	0.8~1.1
10×10	3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5	4.6	12.8	12.8	4.5	1.1~1.4

CM series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35			50		
10																6.3×5.8	1.00	170
15																6.3×5.8	0.86	170
22																6.3×5.8	0.86	170
33							6.3×5.8	0.43	240	6.3×5.8	0.43	240	6.3×5.8	0.50	240	6.3×7.7	0.66	280
																8×6.2	0.63	300
47				6.3×5.8	0.43	240	6.3×5.8	0.43	240	6.3×5.8	0.43	240	6.3×5.8	0.50	240	6.3×7.7	0.66	280
																8×6.2	0.63	300
68	6.3×5.8	0.43	240	6.3×5.8	0.39	240	6.3×5.8	0.39	240	6.3×5.8	0.39	240	6.3×7.7	0.32	290	8×10	0.32	350
100	6.3×5.8	0.43	240	6.3×5.8	0.39	240	6.3×5.8	0.39	240	6.3×7.7	0.32	290	8×10	0.16	600	10×10	0.2	700
										8×6.2	0.26	300						
150	6.3×5.8	0.43	240	6.3×5.8	0.39	240	6.3×7.7	0.32	290	8×10	0.16	600	8×10	0.16	600			
220	6.3×5.8	0.43	240	6.3×7.7	0.36	290	6.3×7.7	0.32	290	8×10	0.16	600	10×10	0.08	850			
				8×6.2	0.26	300	8×6.2	0.26	300									
330	6.3×7.7	0.32	290	8×10	0.16	600	8×10	0.16	600	10×10	0.1	850						
	8×6.2	0.26	300															
470	8×10	0.16	600	8×10	0.16	600	10×10	0.08	850									
680	8×10	0.16	600	10×10	0.08	850												
1000	10×10	0.08	850															

Ripple current (mA rms) at 105°C, 100kHz

Impedance (Ω) at 20°C, 100kHz

Case size ØD x L (mm)

μF \ WV	63			80			100		
10	6.3×7.7	2.1	80	6.3×7.7	2.4	60	8×10	2	100
22	6.3×7.7	2.1	120	8×10	1.3	130	8×10	2	140
33	8×10	1.0	250	8×10	1.3	130	10×10	1.5	330
47	8×10	1.0	250	10×10	1.0	200	12.5×13.5	1.0	500
68	10×10	0.8	400	12.5×13.5	0.8	500	12.5×13.5	1.0	500
100	10×10	0.8	400	12.5×13.5	0.8	500			
150	12.5×13.5	0.6	800	12.5×13.5	0.8	500			
220	12.5×13.5	0.6	800						

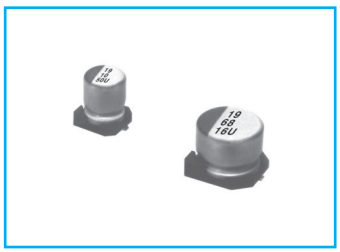
● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.5	0.64	0.83	1.00

UC Chip type, High Reliability Series

Solvent Proof
WV≦100V

RC ⇨ UC
High Temp.



- Chip type, high temperature range, for 125˚C use
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-40 ~ +125˚C
Leakage current max.	WV≦100 I = 0.03CV or 4μA whichever is greater (after 2 minutes) WV≧160 I = 0.04CV + 100μA(after 1 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 10 / 16 / 25 / 35~63 / 80~100 / 160~200 / 250~400 tanδ: 0.32 / 0.24 / 0.21 / 0.18 / 0.12 / 0.2 / 0.24
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 10 / 16 / 25 / 35~63 / 80~100 / 160~200 / 250~400 Z-25˚C/Z+20˚C: 8 / 6 / 4 / 4 / 3 / 3 / 6 Z-40˚C/Z+20˚C: 12 / 8 / 6 / 4 / 4 / 6 / 10
Load life (after application of the rated voltage for 2000 hours at 125˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 125˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

● DRAWING (See page 60)

-Series code of UC is “U”

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	10		16		25		35		50		63	
10									8×6.2	65	8×6.2	40
22									8×6.2	65	8×10	67
33							8×6.2	65	8×10	125	8×10	67
47					8×6.2	65	8×10	125	10×10	200	10×10	115
68			8×6.2	65	8×6.2	65	10×10	200	12.5×13.5	525	12.5×13.5	335
100	8×6.2	65	8×10	125	8×10	125	10×10	200	12.5×13.5	525	12.5×13.5	335
220	8×10	125	10×10	200	10×10	200	12.5×13.5	525				
330	10×10	200	10×10	200	12.5×13.5	525						
470	10×10	200	12.5×13.5	525								
1000	12.5×13.5	525										

Ripple current (mA rms) at 125˚C, 120Hz
Case size ØD×L(mm)

μF \ WV	80		100		160		200		250		400	
3.3											12.5×13.5	30
4.7									12.5×13.5	45	12.5×13.5	30
10	8×10	45	8×10	45	10×10	45	10×10	45	12.5×13.5	85		
22	8×10	45	10×10	80	12.5×13.5	85	12.5×13.5	85				
33	10×10	80	10×10	80								
47	10×10	80	12.5×13.5	300								
68	12.5×13.5	300	12.5×13.5	300								

Ripple current (mA rms) at 125˚C, 120Hz
Case size ØD×L(mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

UR Chip type, High Reliability Series

Low ESR | Long Life | Solvent Proof WV≦100V

- Chip type, high temperature range, for 125˚C use
- Lower ESR than UC series
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Application to automotive system
- Complied to the RoHS directive

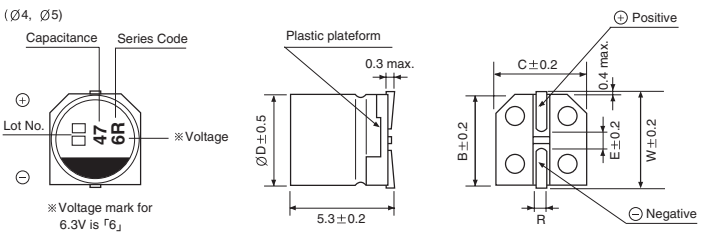
Item	Characteristics
Operating temperature range	-40 ~ +125˚C
Leakage current max.	WV ≤ 100: I = 0.01CV or 3μA whichever is greater (after 2 minutes) WV ≥ 160: I = 0.04CV + 100μA (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 10 / 16 / 25 / 35 / 50 ~ 80 / 100 / 160 ~ 250 / 400 tanδ: 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 / 0.20 / 0.24
Temperature characteristics (Impedance ratio at 120Hz)	WV: 10 / 16 / 25 / 35 ~ 100 / 160 ~ 250 / 400 Z-25˚C/Z+20˚C: 3 / 2 / 2 / 2 / 3 / 6 Z-40˚C/Z+20˚C: 4 / 3 / 3 / 3 / 6 / 10
Load life (after application of the rated voltage for 5000 hours at 125˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of specified value ØD: ~ 80V / 100V / 160V ~ ØD = 4, 5, 6.3: 1000 hours / - / - 8×6.2: 3000 hours / - / - ØD = 8, 10: 5000 hours / 2000 hours / 2000 hours ØD = 12.5: 5000 hours / 5000 hours / 2000 hours
Shelf life (at 125˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384-4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING - Series code of UR is "R"

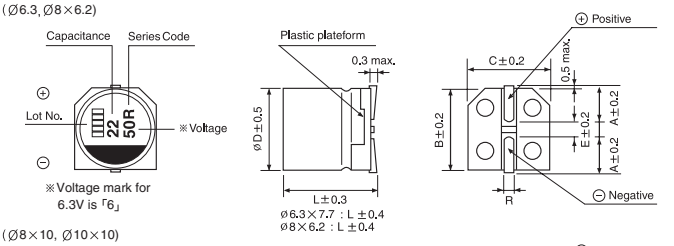
Unit : mm

ØD×L	W	A	B	C	E	R
4×5.3	4.8		4.3	4.3	1.0	0.5 ~ 0.8
5×5.3	5.8		5.3	5.3	1.4	0.5 ~ 0.8
6.3×5.3		2.4	6.6	6.6	2.2	0.5 ~ 0.8
6.3×5.8		2.4	6.6	6.6	2.2	0.5 ~ 0.8
6.3×7.7		2.4	6.6	6.6	2.2	0.5 ~ 0.8
8×6.2		3.3	8.3	8.3	2.3	0.5 ~ 0.8
8×10		2.9	8.3	8.3	3.1	0.8 ~ 1.1
10×10		3.2	10.3	10.3	4.5	0.8 ~ 1.1
12.5×13.5		4.6	12.8	12.8	4.5	1.1 ~ 1.4

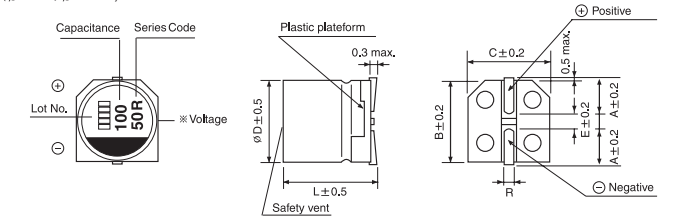
(Ø4, Ø5)



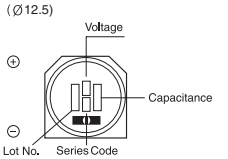
(Ø6.3, Ø8×6.2)

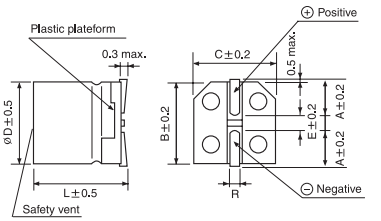


(Ø8×10, Ø10×10)



(Ø12.5)





UR series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	10			16			25			35		
10				4×5.3	7.00	12	5×5.3	3.30	23	6.3×5.8	1.60	69
22	5×5.3	3.30	23	5×5.3	3.30	23	6.3×5.3	2.00	40	6.3×5.8	1.60	69
33	5×5.3	3.30	23	6.3×5.3	2.00	40	6.3×5.8	1.60	69	8×6.2	0.90	110
47	6.3×5.3	2.00	40	6.3×5.8	1.60	69	8×6.2	0.90	110	8×10	0.30	264
100	8×6.2	0.90	110	8×6.2	0.90	110	8×10	0.30	264	8×10	0.30	264
220	8×10	0.30	264	8×10	0.30	355	8×10	0.30	355	10×10	0.20	400
330	8×10	0.30	355	10×10	0.20	400	10×10	0.20	400	12.5×13.5	0.14	750
							12.5×13.5	0.14	750			
470	10×10	0.20	400	12.5×13.5	0.14	750						

μF \ WV	50			63			80			100		
10	6.3×5.8	2.80	51	8×6.2	2.00	60	8×10	1.20	70	8×10	1.60	70
22	8×6.2	1.60	83	8×10	1.00	70	10×10	0.80	115	10×10	1.60	95
33	8×10	0.70	192	10×10	0.55	115	10×10	0.55	115	10×10	0.80	115
47	10×10	0.50	330	10×10	0.55	115	12.5×13.5	0.40	450	12.5×13.5	0.40	450
100	10×10	0.50	330	12.5×13.5	0.33	450	12.5×13.5	0.33	450	12.5×13.5	0.33	450
220	12.5×13.5	0.23	550									
330												
470												

Ripple current (mA rms) at 125˚C, 100kHz
ESR (Ω) at 20˚C, 100kHz
Case size ØD×L (mm)

μF \ WV	160		200		250		400	
1							10×10	18
2.2							10×10	26
3.3							10×10	37
4.7					12.5×13.5	70	12.5×13.5	70
10	12.5×13.5	100	12.5×13.5	100	12.5×13.5	100		
22	12.5×13.5	120	12.5×13.5	120				

Ripple current (mA rms) at 125˚C, 100Hz
Case size ØD×L (mm)

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency		120Hz	1kHz	10kHz	100kHz
wv	cap.				
≤ 100	~ 10	0.66	0.86	0.93	1.00
	22 ~	0.93	0.97	1.00	1.00
160 ≤	-	1.00	1.50	1.75	1.80

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Upgrade

UN Chip type, High Reliability Series

Low ESR Solvent Proof

- Chip type, high temperature range, for 125˚C use
- Lower ESR than UR series
- Application to automotive system
- Complied to the RoHS directive

UR ⇨ UN
Low ESR.

Item	Characteristics
Operating temperature range	-40 ~ +125˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 35 / tanδ: 0.16
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 35 / Z-25˚C/Z+20˚C: 2 / Z-40˚C/Z+20˚C: 3
Load life (after application of the rated voltage for 2000 hours at 125˚C)	Leakage current: Less than specified value / Capacitance change: Within ±30% of initial value / tanδ: Less than 300% of specified value
Shelf life (at 125˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value / Capacitance change: Within ±10% of initial value / tanδ: Less than specified value

● DRAWING (See page 60)

Unit : mm

-Series code of UN is “UN”

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	35		
	ØD×L(mm)	ESR (Ω)max. 20˚C 100kHz	Ripple current (mA rms) 125˚C 100kHz
47	6.3 × 7.7	0.30	200
100	6.3 × 7.7	0.24	240
220	8 × 10	0.20	270
330	10 × 10	0.15	500

● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

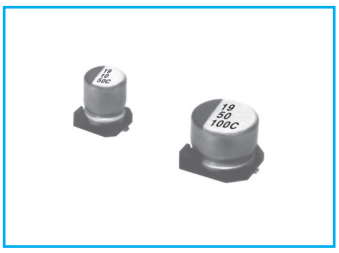
Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.5	0.64	0.83	1.00

KC Chip type, High Temperature Series

Solvent Proof

- Chip type, high temperature range, for +135˚C use
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

UC ⇒ KC
High Temp.



Item	Characteristics
Operating temperature range	-40 ~ +135˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% (20˚C, 120Hz)
Dissipation factor max. (at 120Hz, 20˚C)	WV: 10 / 16 / 25 / 35 / 50 tanδ: 0.30 / 0.23 / 0.18 / 0.16 / 0.16
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 8 / 6 / 4 / 4 / 4 Z-40˚C/Z+20˚C: 12 / 8 / 6 / 4 / 4
Load life (after application of the rated voltage for 2000 hours at 135˚C)	Leakage Current: Less than specified value Capacitance Change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 135˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage Current: Less than specified value Capacitance Change: Within ±10% of initial value tanδ: Less than specified value

DRAWING (See page 60)

-Series code of KC is “C”

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	10			16			25			35			50		
47										8×10	0.20	270	8×10	0.25	270
68										8×10	0.20	270			
100				8×10	0.20	270	8×10	0.20	270	8×10	0.20	270	10×10	0.20	500
220	8×10	0.20	270	8×10	0.20	270	10×10	0.15	500	10×10	0.15	500			
330	10×10	0.20	270	10×10	0.15	500	10×10	0.15	500						
470	10×10	0.15	500	10×10	0.15	500	← Ripple current (mA rms) at 135˚C, 100kHz								

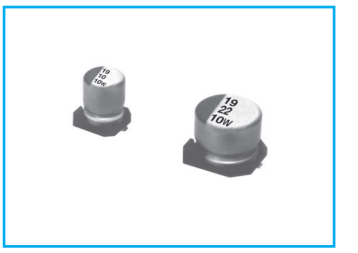
ESR (Ω) at 20˚C, 100kHz
Case size ØD×L(mm)

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.35	0.50	0.64	0.83	1.00

CW Chip type, High Reliability Series

Solvent Proof



- Chip type, high temperature range, for 150˚C use
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

KC CW
High Temp.

Item	Characteristics
Operating temperature range	-40 ~ +150˚C
Leakage current	I = 0.03CV or 4μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 10 / 16 / 25 / 35 / 50 tanδ: 0.30 / 0.20 / 0.16 / 0.14 / 0.14
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 8 / 6 / 4 / 4 / 4 Z-40˚C/Z+20˚C: 12 / 10 / 8 / 6 / 6
Load life (after application of the rated voltage for 2000 hours at 150˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of the specified value ØD: ØD ≦ 10 / ØD ≧ 12.5 Life time: 1000 hours / 2000 hours
Shelf life (at 150˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING (See page 60)

-Series code of CW is “W”

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	10		16		25		35		50	
33									10×10	75
47							10×10	90	10×10	90
68							10×10	105	12.5×13.5	132
100					10×10	160	10×10	132	12.5×13.5	167
220			10×10	163	10×10	200	12.5×13.5	249		
330	10×10	183	10×10	200	12.5×13.5	304				
470	10×10	218	12.5×13.5	304						
1000	12.5×13.5	405								

Ripple current (mA rms) at 150˚C, 120Hz
Case size ØD×L(mm)

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz≦
Coefficient	0.70	1.00	1.17	1.36	1.50

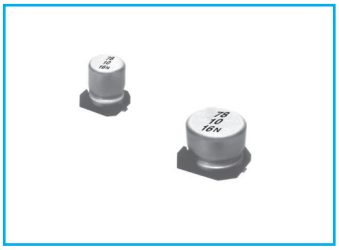
NC

Chip type, Non-polarized
Series

Non-polarized Solvent Proof

- Chip type with 5.5mmL height
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

SC (Non-polar) → NC → CN (Wide temp.)

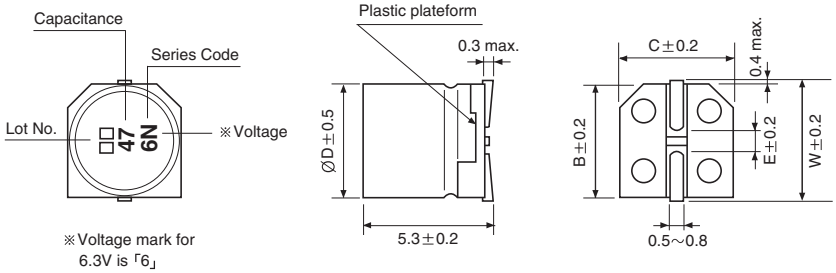


Item	Characteristics
Operating temperature range	-40 ~ +85˚C
Leakage current max.	I = 0.05CV or 10μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 tanδ: 0.24 / 0.20 / 0.17 / 0.17 / 0.15 / 0.15
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 4 / 3 / 2 / 2 / 2 / 2 Z-40˚C/Z+20˚C: 8 / 6 / 4 / 4 / 3 / 3
Load life (after application of the rated voltage for 2000 hours at 85˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value Test method: Polarity reverse each 250 hours
Shelf life (at 85˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm

-Series code of NC is “N”



ØD	W	B	C	E
4	4.8	4.3	4.3	1.0
5	5.8	5.3	5.3	1.4
6.3	7.1	6.6	6.6	2.2

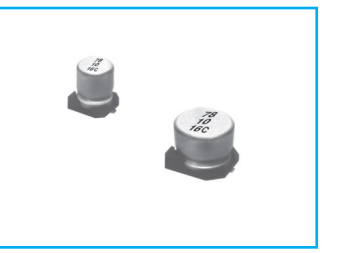
DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3		10		16		25		35		50	
1.0											4×5.3	8.4
2.2									4×5.3	8.4	5×5.3	13
3.3							5×5.3	12	5×5.3	16	5×5.3	17
4.7					4×5.3	12	5×5.3	16	5×5.3	18	6.3×5.3	20
10			4×5.3	17	5×5.3	23	6.3×5.3	27	6.3×5.3	29		
22	5×5.3	28	6.3×5.3	33	6.3×5.3	37						
33	6.3×5.3	37	6.3×5.3	41	6.3×5.3	49						
47	6.3×5.3	45										

Ripple current (mA rms) at 85˚C, 120Hz
Case size ØD x L (mm)

CN 105˚C Non-polarized Series

Non-polarized Solvent Proof



- Chip type, Non-polarized, Wide temperature 105˚C
- Chip type with 5.5mmL height
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

NC ⇒ CN
Wide temp.

Item	Characteristics
Operating temperature range	WV≦25 : -55 ~ +105˚C WV≧35 : -40 ~ +105˚C
Leakage current max.	I = 0.05CV or 10μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 tanδ: 0.32 / 0.26 / 0.24 / 0.20 / 0.18 / 0.18
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 6.3 / 10 / 16 / 25 / 35 / 50 Z-25˚C/Z+20˚C: 4 / 3 / 2 / 2 / 2 / 2 Z-40˚C/Z+20˚C: - / - / - / - / 4 / 4 Z-55˚C/Z+20˚C: 8 / 5 / 4 / 3 / - / -
Load life (after application of the rated voltage for 1000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value tanδ: Less than 200% of specified value Test method: Polarity reverse each 250 hours
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20˚C by the KS C IEC 60384 - 4
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20˚C after exposing them at 250˚C for 10 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

● DRAWING (See page 85)

-Series code of CN is “C”

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3		10		16		25		35		50	
1.0											4×5.3	8.4
2.2									4×5.3	8.4	5×5.3	13
3.3							5×5.3	12	5×5.3	16	5×5.3	17
4.7					4×5.3	12	5×5.3	16	5×5.3	18	6.3×5.3	20
10			4×5.3	17	5×5.3	23	6.3×5.3	27	6.3×5.3	29		
22	5×5.3	28	6.3×5.3	33	6.3×5.3	37						
33	6.3×5.3	37	6.3×5.3	41	6.3×5.3	49						
47	6.3×5.3	45										

Ripple current (mA rms) at 105˚C, 120Hz
Case size ØD×L (mm)