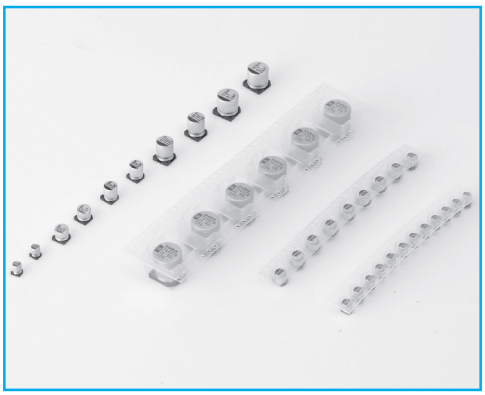
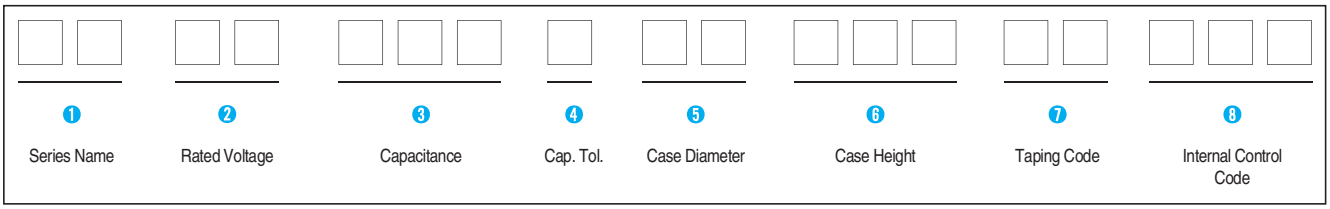
3 SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS



PART NUMBER SYSTEM

● Part Number System



❶ Series Name

See page 4.

❷ Rated Working Voltage

WV	4	6.3	10	16	25	35	50
Code	0G	0J	1A	1C	1E	1V	1H

WV	63	100	160	200	250	400	450
Code	1J	2A	2C	2D	2E	2G	2W

❸ Capacitance

ex) 0.47μF 474
4.7μF 475
47μF 476
470μF 477
4700μF 478

❹ Capacitance Tolerance

Tolerance (%)	±20
Code	M

❺ Case Diameter

ex) Ø3 03
Ø4 04
Ø5 05
Ø6.3 6L
Ø8 08
Ø10 10
Ø12.5 12
Ø16 16
Ø18 18

❻ Case Height

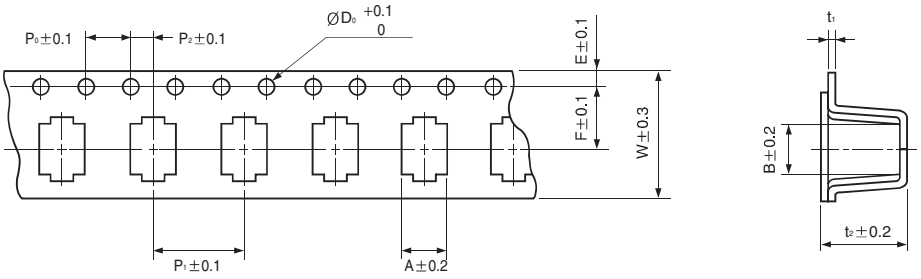
ex) 5.3mm 005
5.8mm 006
6.2mm 06B
7.7mm 07K
10mm 010
13.5mm 13M
16.5mm 16M
21.5mm 21M

❼ VR (Reel Type)

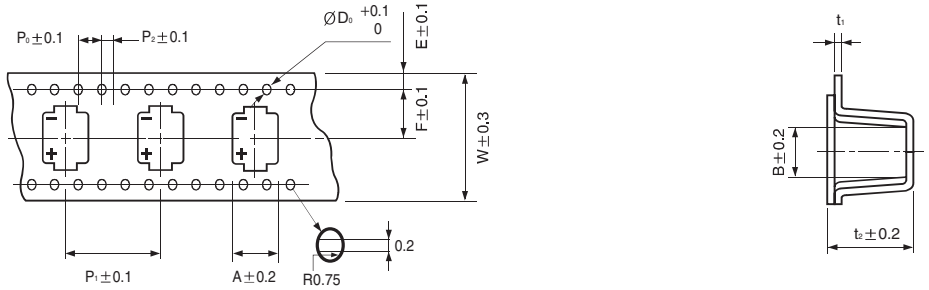
Taping Specifications for Chip Type Capacitors

Carrier Tape

· **Fig.1**

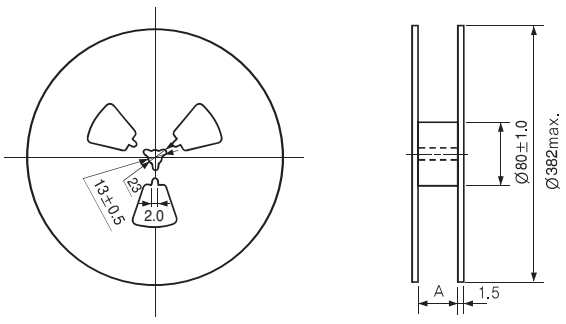


· **Fig.2**



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
16 ×16.5	17.5	17.5	1.5	1.75	20.2	4.0	28.0	2.0	0.5	16.8	44.0	
16 ×21.5	17.5	17.5	1.5	1.75	20.2	4.0	28.0	2.0	0.5	21.8	44.0	
18 ×16.5	19.5	19.5	1.5	1.75	20.2	4.0	32.0	2.0	0.5	16.8	44.0	
18 ×21.5	19.5	19.5	1.5	1.75	20.2	4.0	32.0	2.0	0.5	21.8	44.0	

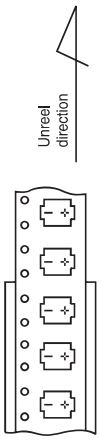
Reel (Taping code : VR)



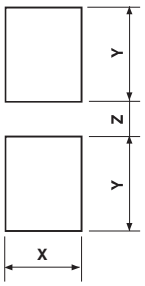
ØD×L	A
4 ×5.3	14
5 ×5.3	14
6.3 ×5.3	18
6.3 ×5.8	18
6.3 ×7.7	18
8 ×6.2	18
8 × 10	26
10 × 10	26
12.5×13.5	34
16, 18	46

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
16 ×16.5	125	750
18 ×16.5		
16 ×21.5	75	375
18 ×21.5		

Polarity



Recommended Land Size



ØD×L	X	Y	Z
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	4.0	7.5	7.0
16 ×16.5	6.0	8.5	9.5
16 ×21.5			
18 ×16.5	6.0	9.5	10.5
18 ×21.5			

Reflow soldering method for the chip aluminum electrolytic capacitor

1. Recommended conditions for reflow soldering

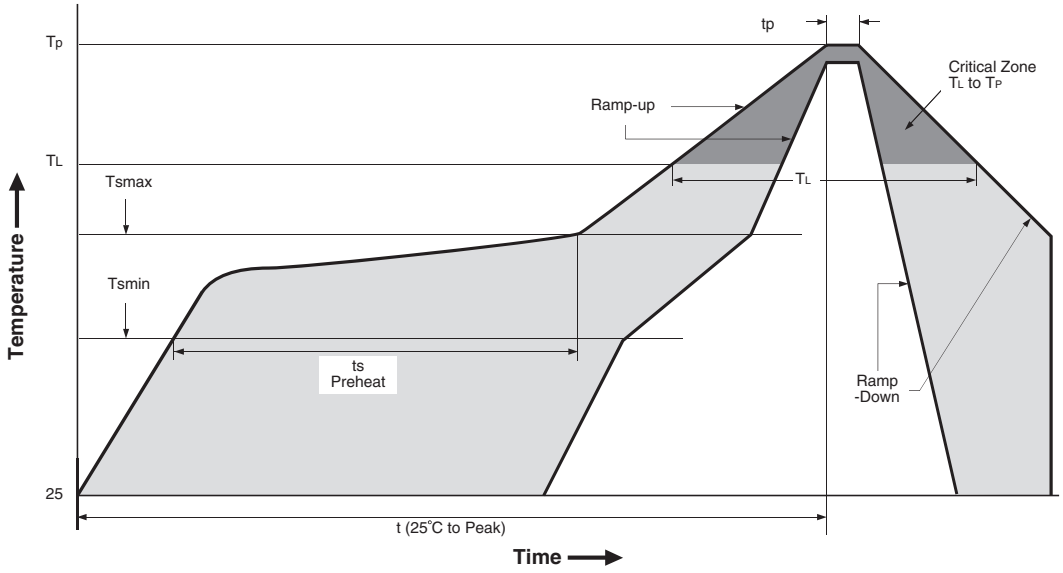
The chip aluminum electrolytic capacitor is subjected to soldering by reflow method.
Temperature and time conditions of reflow soldering shall be set as per each temperature profile shown below as a standard. The following are recommended conditions in the case of reflow soldering method for the chip aluminum electrolytic capacitor.

(1) The capacitor shall not be subjected to either flow or dip soldering method.

(2) Avoid soldering twice by reflow. The number of reflow time for chip aluminum electrolytic capacitor shall be once basically. If this type of capacitor has to be inevitably subjected to the reflow twice, enough cooling time between the first and the second reflow (at least more than 30 minutes) shall be taken to avoid the consecutive reflows by all means.

(3) The touch up work with a soldering iron is allowed after the reflow soldering (Temperature of soldering iron : MAX 400˚C, Time : 5 sec.), provided that carefully attention shall be paid lest a soldering iron should directly touch the capacitor body or its resin bottom base.

2. RECOMMENDED REFLOW SOLDERING CONDITIONS

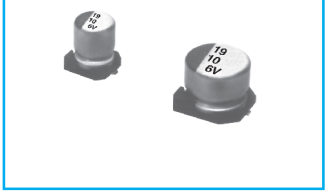


Profile Feature		Soldering condition		
		Ø3 ~ Ø10	Ø12.5	Ø16, Ø18
Average Ramp-up Rate (T_L to T_P)		3˚C / second max.	3˚C / second max.	
Preheat	Temperature Min. (T_S min)	150˚C	150˚C	
	Temperature Max. (T_S max)	200˚C	200˚C	
	Time (T_S min to T_S max)	60 ~ 150 seconds	40~120 seconds	40~100 seconds
T_S max to T_L -Ramp-up Rate		3˚C / second max.	3˚C / second max.	
Time maintained above	Time (T_L)	217˚C	217˚C	
	Time (t_L)	60 ~ 90 seconds	40 ~ 60 seconds	
Peak/classification Temperatrue (T_P)		250˚C	240˚C	230˚C
Time within 5˚C of actual peak temperature(T_P)		10 seconds max.	10 seconds max.	
Ramp-Down rate		3˚C / second max.	3˚C / second max.	
Time 25˚C to peak temperature		8 minute max.	8 minute max.	

Note. All temperatures measured on the body surface Ø16, 18 over 63V products are peak temp. 230˚C

SC Chip type, Standard Series

Solvent Proof
WV≦100V



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

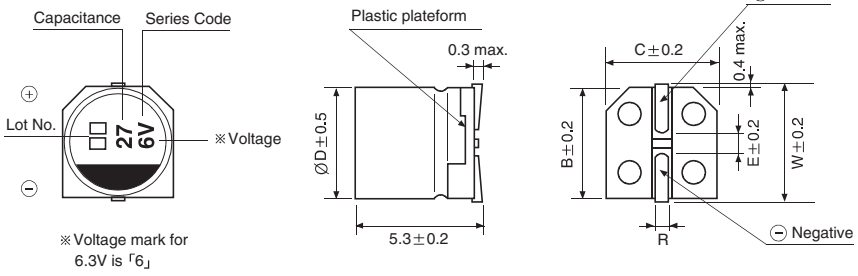
NC ⟵ SC ⟶ RC
Non-polar / Wide temp

Item	Characteristics
Operating temperature range	-40 ~ +85℃
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: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 / 160 / 200 / 250 / 400 / 450 tanδ: 0.35 (0.40) / 0.28 (0.35) / 0.20 (0.24) / 0.16 (0.20) / 0.13 (0.16) / 0.12 (0.15) / 0.09 (0.12) / 0.12 / 0.12 / 0.20 / 0.20 / 0.20 / 0.25 / 0.25 ( ) : Small size between two size in dimension table and over the 6.3×5.8(ØD×L)
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 4 / 6.3 / 10 / 16 / 25 / 35 ~ 100 / 160 ~ 250 / 400 ~ 450 Z-25℃/Z+20℃: 6 / 5 / 4 / 3 / 2 / 2 / 3 / 6 Z-40℃/Z+20℃: 12 / 10 / 8 / 6 / 4 / 3 / 6 / 10
Load life (after application of the rated voltage for 2000 hours at 85℃)	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℃)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.
Resistance to soldering heat	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them at 250℃ for 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

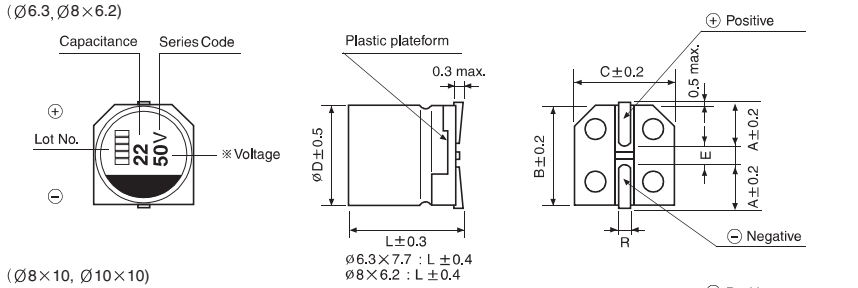
DRAWING

Unit : mm

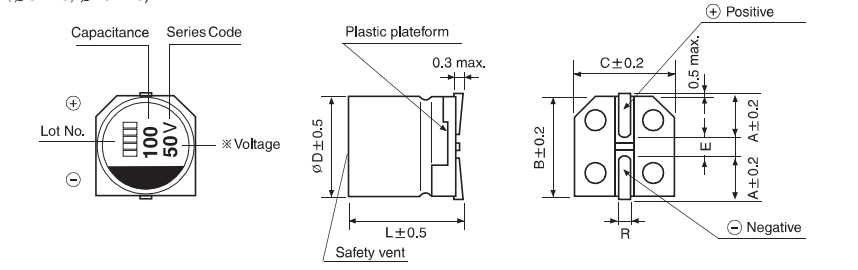
(Ø4, Ø5, Ø6.3×5.3mmL)



(Ø6.3, Ø8×6.2)

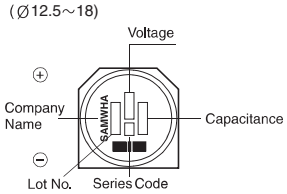


(Ø8×10, Ø10×10)



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
6.3×5.8	7.1		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
16×16.5		5.6	16.8	16.8	6.5	1.1~1.4
16×21.5		5.6	16.8	16.8	6.5	1.1~1.4
18×16.5		6.6	18.8	18.8	6.5	1.1~1.4
18×21.5		6.6	18.8	18.8	6.5	1.1~1.4

(Ø12.5~18)



CHIP TYPES

SC series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / μF	4		6.3		10		16		25		35		50	
0.1													3×5.3	2.4
													4×5.3	3.2
0.22													3×5.3	3.5
													4×5.3	4.7
0.33													3×5.3	4.3
													4×5.3	5.7
0.47													3×5.3	5.2
													4×5.3	6.8
1.0													3×5.3	7.5
													4×5.3	10
2.2											3×5.3	10	4×5.3	15
											4×5.3	11		
3.3									3×5.3	12	4×5.3	16	4×5.3	18
									4×5.3	15				
4.7							3×5.3	13	4×5.3	18	4×5.3	19	4×5.3	24
							4×5.3	16					5×5.3	25
10	3×5.3	13	3×5.3	16	4×5.3	21	4×5.3	21	4×5.3	24	4×5.3	27	5×5.3	41
	4×5.3	16	4×5.3	19					5×5.3	30	5×5.3	32	6.3×5.3	43
22	3×5.3	19	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
	4×5.3	24			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	16×16.5	740
							10×10	330						
1000			8×10	370	10×10	454	12.5×13.5	710	12.5×13.5	820	16×16.5	1000	18×21.5	1150
			10×10	400										
1500			10×10	480	12.5×13.5	850	12.5×13.5	870	16×16.5	1060	16×21.5	1170		
											18×16.5			
2200			12.5×13.5	890	12.5×13.5	960	16×16.5	1150	16×21.5	1350	18×21.5	1550		
									18×16.5					
3300			16×16.5	1200	16×16.5	1300	16×21.5	1450	18×21.5	1700				
							18×16.5							
4700			16×16.5	1400	16×21.5	1500	18×21.5	1750						
					18×16.5	1500								
6800			16×21.5	1650	18×21.5	1850								
			18×16.5	1650										
10000			18×21.5	2000										

SC series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	63		100		160		200		250		400		450	
2.2													10×10	85
3.3			6.5×5.8	29							10×10	90	10×10	100
4.7	6.3×5.8	31	6.3×5.8 8×6.2	35 40			10×10	100	10×10	100	12.5×13.5	115	12.5×13.5	115
10	6.3×5.8	46	8×10	77	10×10	100	12.5×13.5	150	12.5×13.5	150	16×16.5	140	16×16.5	140
22	8×6.2	96	8×10	100	12.5×13.5	240	12.5×13.5	260	16×16.5	300	16×21.5 18×16.5	280	16×21.5 18×16.5	275
33	8×10	117	10×10	130	12.5×13.5	260	16×16.5	350	16×16.5	340	18×21.5	350	18×21.5	345
47	10×10	140	10×10	155	16×16.5	400	16×16.5	415	16×21.5 18×16.5	415				
68	10×10	160	12.5×13.5	350	16×16.5	500	16×21.5 18×16.5	505	18×21.5	490				
100	12.5×13.5	370	12.5×13.5	420	16×21.5 18×16.5	590	18×21.5	590						
220	12.5×13.5	550	16×21.5 18×16.5	665										
330	16×16.5	680	18×21.5	825										
470	18×21.5	850												

Ripple current (mA rms) at 85°C, 120Hz

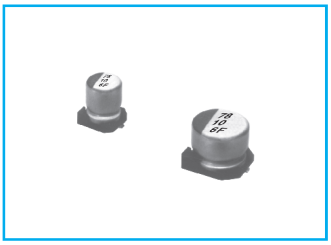
Case size ØD x L (mm)

RC

Chip type, Wide Temperature Range Series

Solvent Proof

SC ⇨ RC
Wide temp.

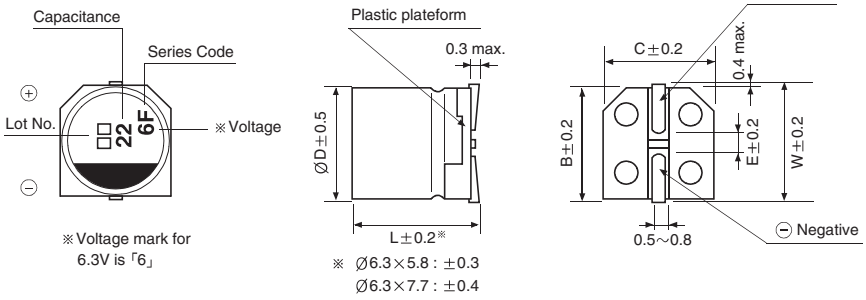


- Wide operating temperature range of -55 ~ +105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

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-40˚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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm



ØD	W	A	B	C	E	R
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	
8		2.9	8.3	8.3	3.1	0.8~1.1
10		3.2	10.3	10.3	4.5	0.8~1.1

※ Ø8, 10 drawing see page 49

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

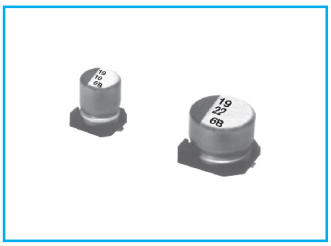
μF \ WV	6.3		10		16		25		35		50	
0.1											4×5.3	2.3
0.22											4×5.3	3.4
0.33											4×5.3	4.1
0.47											4×5.3	4.9
1.0											4×5.3	7.2
2.2											4×5.3	10.7
3.3											4×5.3	13.1
4.7							4×5.3	13	4×5.3	14	5×5.3	18.1
10					4×5.3	17	5×5.3	23	5×5.3	24	6.3×5.3	30.8
22	4×5.3	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)

CB Chip type,Long Life Series

Long Life Solvent Proof

RC ⇒ CB
Long life

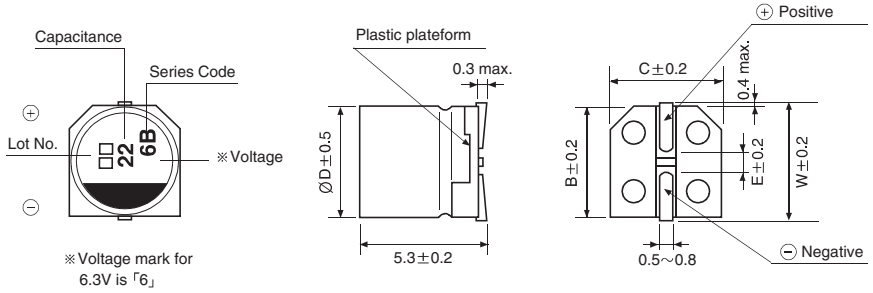


- Chip type with load life 5000 hours at 105°C
- Chip type with 5.5mmL Height
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-55 ~ +105˚C
Leakage current max.	I = 0.01CV or 3㎂ 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: 0.24 / 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.11
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 4 / 6.3 / 10 / 16 / 25 ~ 50 Z-25˚C/Z+20˚C: 2 / 2 / 2 / 2 / 3 Z-55˚C/Z+20˚C: 4 / 4 / 4 / 3 / 3
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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm



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

㎌ \ WV	4		6.3		10		16		25		35		50	
0.1													4×5.3	2.4
0.22													4×5.3	3.5
0.33													4×5.3	4.3
0.47													4×5.3	5.1
1.0													4×5.3	7.4
2.2													4×5.3	11.0
3.3													4×5.3	13.5
4.7									4×5.3	14	4×5.3	15	5×5.3	18.6
6.8									4×5.3	17	5×5.3	21	6.3×5.3	26.1
10							4×5.3	19	5×5.3	24	5×5.3	26	6.3×5.3	32.6
15					4×5.3	22	5×5.3	28	5×5.3	31	6.3×5.3	37	6.3×5.3	40.0
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								

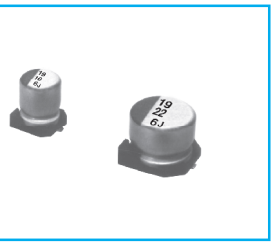
Ripple current (mA rms) at 105˚C, 120Hz
Case size ØD×L(mm)

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

JC Chip type, Higher Capacitance Range Series

Solvent Proof
WV≦100V

RC ⇒ JC
Long life



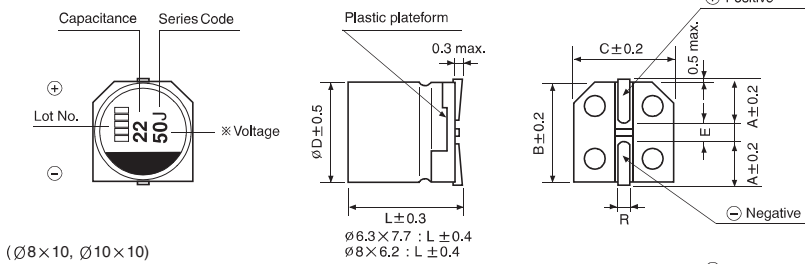
- Chip type higher capacitance in large case sizes
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	WV≦100 : -55 ~ +105˚C WV≧160 : -40 ~ +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: 4 / 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 / 160 / 200 / 250 / 400 / 450 tanδ: 0.37 / 0.22 (0.28) / 0.19 (0.24) / 0.16 (0.20) / 0.14 (0.16) / 0.12 (0.13) / 0.10 (0.12) / 0.10 / 0.10 / 0.15 / 0.15 / 0.15 / 0.20 / 0.20 ( ) : Small size between two size in dimension table and over the 6.3×5.8(ØD×L)
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 4 / 6.3 / 10 / 16 / 25 ~ 50 / 63 ~ 100 / 160 ~ 250 / 400 ~ 450 Z-25˚C/Z+20˚C: 6 / 3 / 3 / 2 / 2 / 3 / 3 / 6 Z-40˚C/Z+20˚C: 12 / 8 / 5 / 4 / 3 / 4 / 6 / 10
Load life (after application of the rated voltage for 2000 hours at 105˚C)	Leakage current: Less than specified value Capacitance change: Within ±20% of initial value (Small size : ±25%) 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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

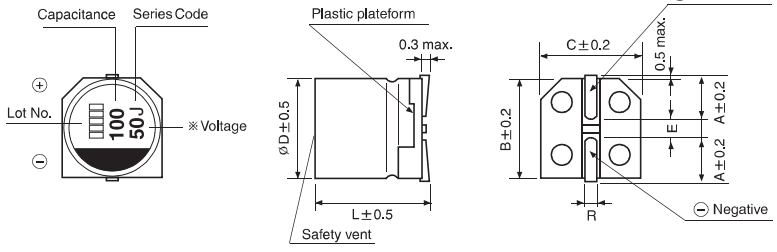
DRAWING

Unit : mm

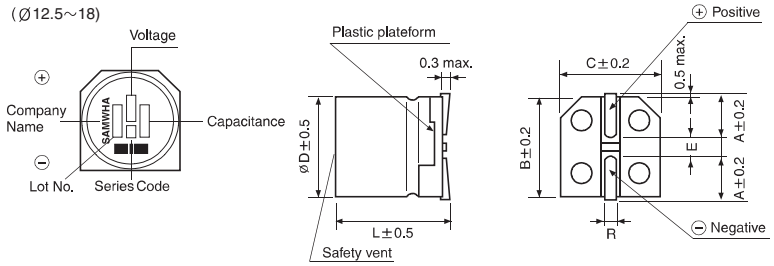
(Ø6.3, Ø8×6.2)



(Ø8×10, Ø10×10)



(Ø12.5~18)



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
16×16.5	5.6	16.8	16.8	6.5	1.1~1.4
16×21.5	5.6	16.8	16.8	6.5	1.1~1.4
18×16.5	6.6	18.8	18.8	6.5	1.1~1.4
18×21.5	6.6	18.8	18.8	6.5	1.1~1.4

JC series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	4		6.3		10		16		25		35		50	
10													6.3×5.8	30
22									6.3×5.8	38	6.3×5.8	42	8×6.2	67
33							6.3×5.8	40	6.3×5.8	48	8×6.2	76	8×10	133
47					6.3×5.8	46	6.3×5.8	50	8×6.2	79	8×10	124	10×10	180
100	6.3×5.8	60	6.3×5.8	60	6.3×5.8	60	8×10	148	8×10	181	10×10	304	10×10	310
220			8×10	161	8×10	173	10×10	330	10×10	351	10×10	450	12.5×13.5	480
330			8×10	288	10×10	318	10×10	441	10×10	372	12.5×13.5	500	16×16.5	500
470			10×10	340	10×10	351	10×10	489	10×10	450	12.5×13.5 16×16.5	600	16×21.5 18×16.5	550
680			10×10	408	10×10	392	12.5×13.5	500	12.5×13.5	500	16×16.5	620	18×16.5	690
1000			10×10	495	10×10	550	12.5×13.5 16×16.5	600 630	16×21.5 18×16.5	630	16×21.5 18×16.5	680 750	18×21.5	820
1500			10×10	560	12.5×13.5	650	16×16.5	770	16×21.5 18×16.5	780	18×21.5	905		
2200			12.5×13.5 16×16.5	730 750	16×16.5	810	16×21.5 18×16.5	930	18×21.5	930				
3300			16×21.5 18×16.5	930	16×21.5 18×16.5	1100	18×21.5	1150						
4700			18×21.5	1100	18×21.5	1200								

μF \ WV	63		100		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	16×16.5	60	16×16.5	60
10	8×6.2	32			10×10	45	12.5×13.5	75	16×16.5	100	16×16.5	85	16×16.5	85
22	8×10	60	8×10	90	12.5×13.5	85	12.5×13.5	85	16×16.5	180	18×21.5	130	18×21.5	130
33	8×10	110	10×10	120	12.5×13.5	95	16×16.5	220	16×21.5 18×16.5	230				
47	10×10	130	12.5×13.5	250	16×16.5	260	16×21.5 18×16.5	270	18×21.5	280				
68	10×10	160	12.5×13.5	300	16×21.5 18×16.5	320	18×21.5	330						
100	12.5×13.5	270	16×16.5	380	18×21.5	380								
220	16×16.5	385	16×21.5 18×16.5	440										
330	16×21.5 18×16.5	490												
470	18×21.5	590												

← Ripple current (mA rms) at 105°C, 120Hz

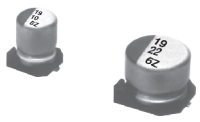
↑ Case size ØD x L (mm)

CHIP TYPES

ZC Height 5.5mmL, Low Impedance Series

Low Impedance　Solvent Proof

RC ⇨ ZC (Low Imp.)

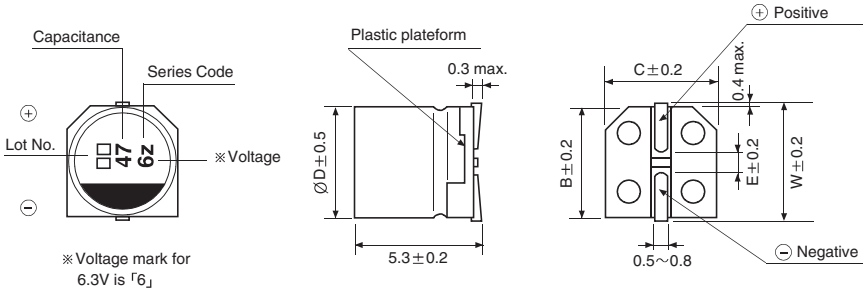


- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm



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

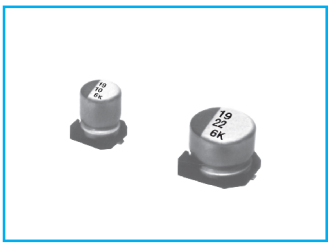
μF \ WV	6.3			10			16			25			35		
1.0													4×5.3	5.0	50
1.5													4×5.3	5.0	50
2.2													4×5.3	5.0	50
3.3													4×5.3	5.0	50
4.7										4×5.3	5.0	50	4×5.3	5.0	50
6.8										4×5.3	5.0	50	5×5.3	2.6	80
10							4×5.3	5.0	50	5×5.3	2.6	80	5×5.3	2.6	80
15							5×5.3	2.6	80	6.3×5.3	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	← Ripple current (mA rms) at 105˚C, 100kHz					
68	6.3×5.3	1.3	115	6.3×5.3	1.3	115	↑ Impedance (Ω) at 20˚C, 100kHz								
100	6.3×5.3	1.3	115				↑ Case size ØD×L(mm)								

CK

Chip type, Low Impedance, High CV Series

Low Impedance　Solvent Proof

ZC ⇒ CK
Low Imp.



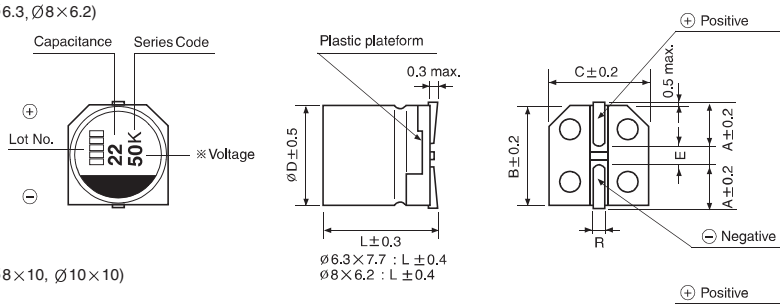
- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

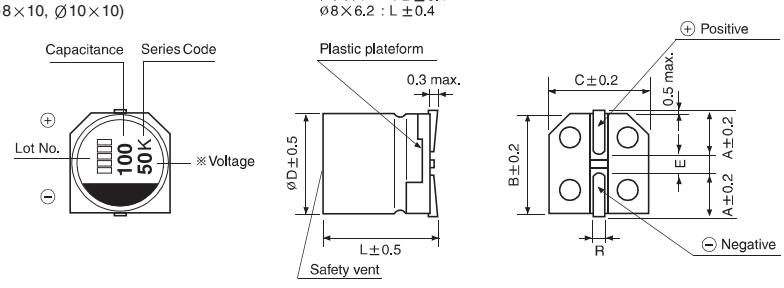
DRAWING

Unit : mm

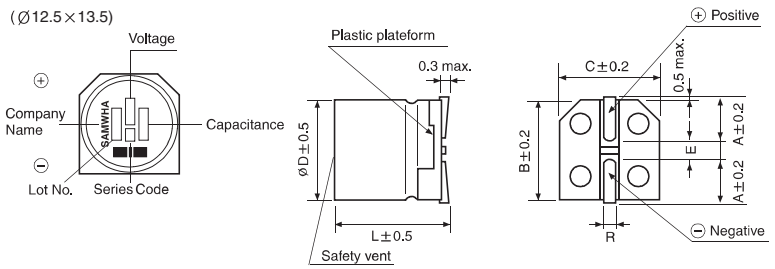
(Ø6.3, Ø8×6.2)



(Ø8×10, Ø10×10)



(Ø12.5×13.5)



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	0.88	165
15																6.3×5.8	0.88	165
22																6.3×5.8	0.88	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	0.26	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	0.09	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															

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

Impedance (Ω) at 20°C, 100kHz

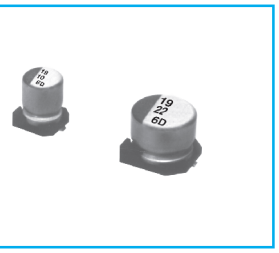
Case size ØD x L (mm)

μF \ WV	63			80			100		
10	6.3×5.8	2.3	80	6.3×7.7	2.4	60			
22	6.3×7.7	2.1	120	8×10	1.3	130	8×10	1.3	130
33	8×10	0.7	250	8×10	1.3	130	10×10	0.7	200
47	8×10	0.7	250	10×10	0.7	200	12.5×13.5	0.45	500
68	10×10	0.45	400	12.5×13.5	0.35	500	12.5×13.5	0.45	500
100	10×10	0.45	400	12.5×13.5	0.35	500			
150	12.5×13.5	0.32	800	12.5×13.5	0.35	500			
220	12.5×13.5	0.32	800						

CD Chip type, Extremely Low Impedance Series

Low Impedance Solvent Proof

CK ⇒ CD
Low Imp.



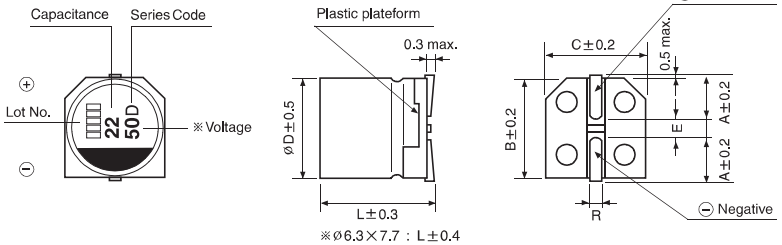
- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

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: 0.24 / 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: 3 / 3 / 3 / 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 ±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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

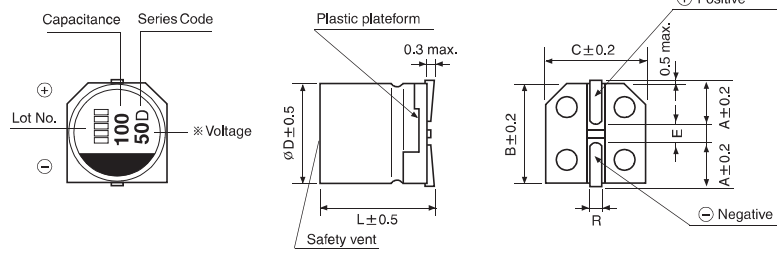
DRAWING

Unit : mm

(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

CD series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35			50		
10																6.3×5.8	0.86	170
15																6.3×5.8	0.86	170
22																6.3×5.8	0.86	170
33							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	0.66	280
																8×6.2	0.63	300
47				6.3×5.8	0.39	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	0.66	280
																8×6.2	0.63	300
68	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.32	350
100	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.16	600	10×10	0.16	700
										8×6.2	0.26	300						
150	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.16	600	8×10	0.16	600			
220	6.3×5.8	0.36	240	6.3×7.7	0.32	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	0.10	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															
1500	10×10	0.08	850															

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

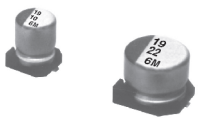
Impedance (Ω) at 20°C, 100kHz

Case size ØD x L (mm)

CM Chip type, Extremely Low Impedance Long Life Series

Low Impedance Solvent Proof

CD ⇒ CM
Long life



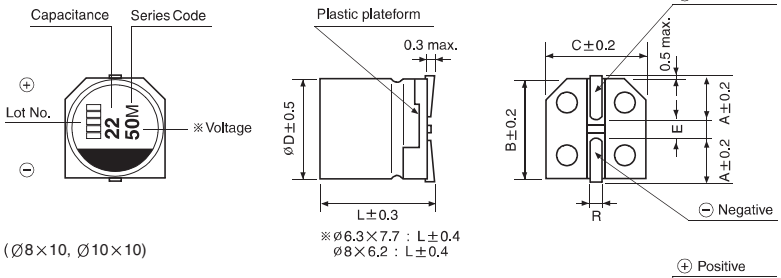
- Chip type, low impedance temperature range up to 105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

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 / 0.13 / 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 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 Ø6.3 and 8×6.2 product are for 3000 hours
Shelf life (at 105˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

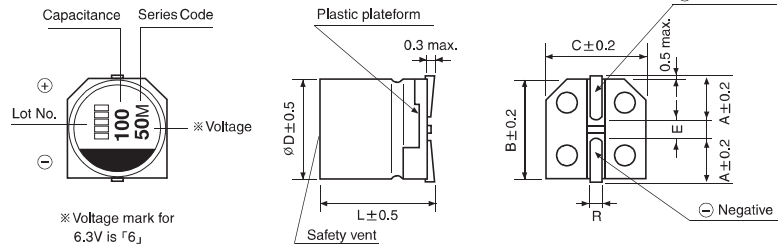
DRAWING

Unit : mm

(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

CM series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	6.3			10			16			25			35			50		
10																6.3×5.8	0.86	170
15																6.3×5.8	0.86	170
22																6.3×5.8	0.86	170
33							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	0.66	280
																8×6.2	0.63	300
47				6.3×5.8	0.39	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	0.66	280
																8×6.2	0.63	300
68	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.32	350
100	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.16	600	10×10	0.16	700
										8×6.2	0.26	300						
150	6.3×5.8	0.36	240	6.3×5.8	0.36	240	6.3×7.7	0.32	290	8×10	0.16	600	8×10	0.16	600			
220	6.3×5.8	0.36	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	0.08	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

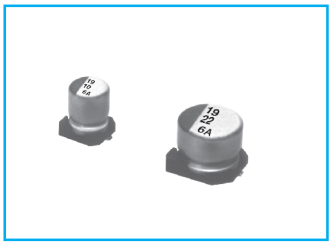
Impedance (Ω) at 20°C, 100kHz

Case size ØD x L (mm)

CA Chip type, Long Life, High CV Series

Long Life Solvent Proof

JC ⇨ CA
Long life

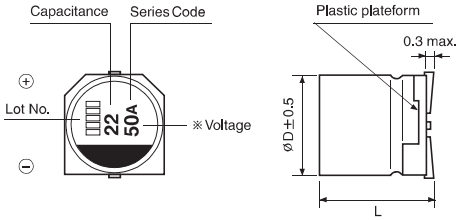


- Chip type, long life capacitance in large case sizes
- Chip type with load life of 5000 hours at +105˚C
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-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)	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: 10 / 7 / 5 / 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 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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm



* Please refer to drawing for CK Series in page 57 for detail drawing.

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	← Ripple current (mA rms) at 105˚C, 120Hz			
470	10×10	254	10×10	254	10×10	254	↑ Case size ØD×L (mm)					
1000	10×10	313										

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

CF Chip type, High Temperature, Long Life, Series

Long Life Solvent Proof

- Chip type, high temperature range, for + 130˚C use
- For ECU
- Application to automatic insertion machine using carrier
- Complied to the RoHS directive

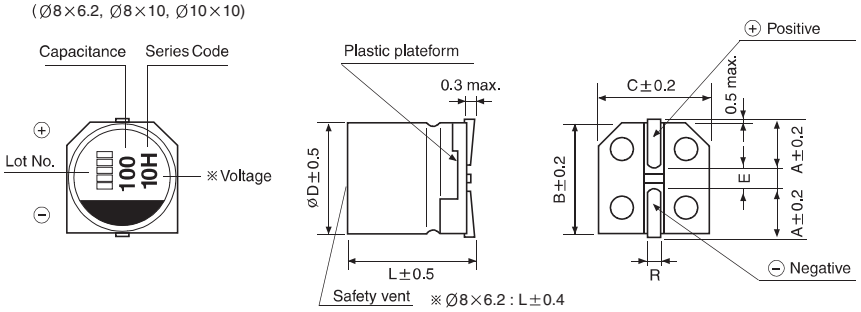
JC ⇨ CF
Wide temp
Long life

Item	Characteristics
Operating temperature range	-40 ~ +130˚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-40˚C/Z+20˚C: 12 / 11 / 8 / 6 / 6
Load life (after application of the rated voltage for 5000 hours at 130˚C)	Leakage current: Less than specified value Capacitance change: Within ±30% of initial value tanδ: Less than 300% of the specified value Ø8×6.2 : 2000 hours, Ø8×10 : 3000 hours, Ø10~: 5000 hours
Shelf life (at 130˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

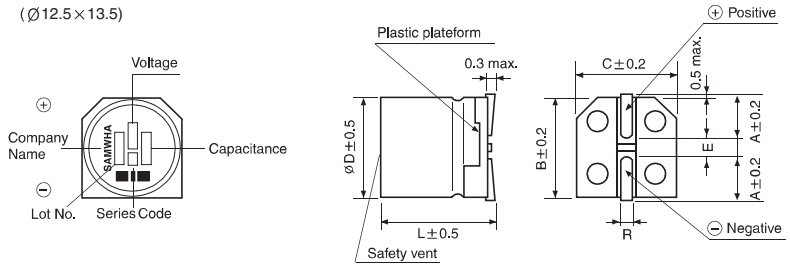
DRAWING

Unit : mm

(Ø8×6.2, Ø8×10, Ø10×10)



(Ø12.5×13.5)



ØD	A	B	C	E	R
8×6.2	3.3	8.3	8.3	2.3	0.5~0.8
8×10	2.9	8.3	8.3	8.3	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

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	10		16		25		35		50	
22									8×6.2	28
33							8×6.2	41	8×10	75
47							10×10	90	10×10	90
68			8×6.2	50	8×6.2	45	10×10	105	12.5×13.5	132
100	8×6.2	48	8×10	66	10×10	163	10×10	132	12.5×13.5	167
220	8×10	90	10×10	163	10×10	200	12.5×13.5	249		
330	10×10	125	10×10	200	12.5×13.5	304				
470	10×10	150	12.5×13.5	304						
1000	12.5×13.5	405								

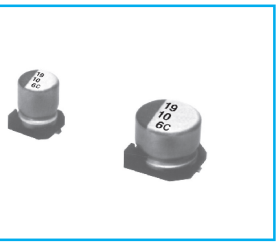
Ripple current (mA rms) at 130˚C, 120Hz
Case size ØD×L(mm)

CT Chip type, High Temperature, Low Imp., Series

Solvent Proof

- Chip type, Low Impedance temperature range up to 130˚C use
- For ECU
- Application to automatic insertion machine using carrier tape
- Complied to the RoHS directive

CF ⇨ CT (Low Imp.)

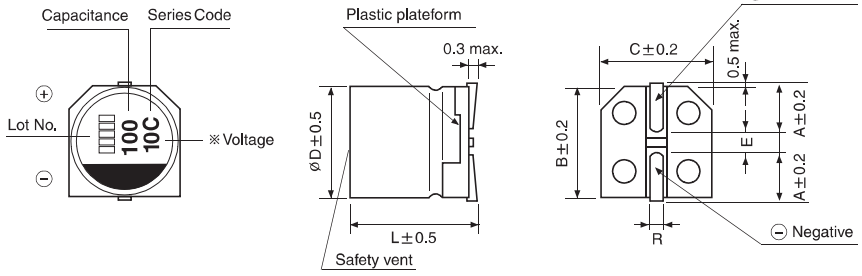


Item	Characteristics
Operating temperature range	-40 ~ +130˚C
Leakage current max.	I = 0.03CV or 4μA whichever is greater (after 2 minutes)
Capacitance tolerance	±20% (20˚C, 120Hz)
Dissipation factor max. (at 120Hz, 20˚C)	Rated Voltage(V): 10 / 16 / 25 / 35 / 50 tanδ: 0.32 / 0.24 / 0.21 / 0.18 / 0.18
Low temperature characteristics (Impedance ratio at 120Hz)	WV: 10 / 16 / 25 / 35 / 50 Z-40˚C/Z+20˚C: 12 / 10 / 8 / 6 / 6
Load life (after application of the rated voltage for 2000 hours at 130˚C)	Leakage Current: Less than specified value Capacitance Change: Within ±30% of initial value tanδ: Less than 300% of specified value
Shelf life (at 130˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.
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 30 seconds. Leakage Current: Less than specified value Capacitance Change: Within ±10% of initial value tanδ: Less than specified value

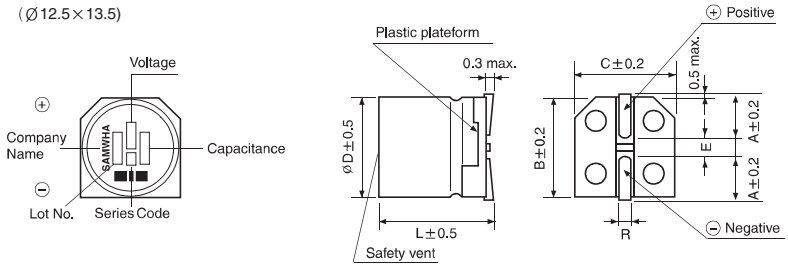
DRAWING

Unit : mm

(Ø8×10, Ø10×10)



(Ø12.5×13.5)



ØD	A	B	C	E	R
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

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	10			16			25			35			50		
33													8×10	0.6	270
47										8×10	0.6	270	10×10	0.5	315
68				8×10	0.6	270	8×10	0.6	270	10×10	0.5	270	10×10	0.5	315
100	8×10	0.6	270	8×10	0.6	270	8×10	0.6	270	10×10	0.5	315	12.5×13.5	0.4	345
220	8×10	0.6	270	8×10	0.6	270	10×10	0.5	315	12.5×13.5	0.4	345			
330	10×10	0.5	315	10×10	0.5	315	12.5×13.5	0.4	345						
470	10×10	0.5	315	12.5×13.5	0.4	345									

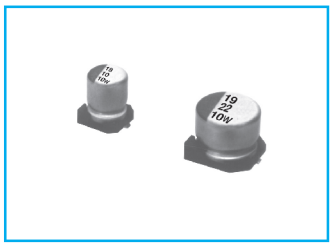
Ripple current (mA rms) at 130˚C, 100kHz
Impedance (Ω) at 20˚C, 100kHz
Case size ØD×L(mm)

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

CW Chip type, High Reliability Series

Solvent Proof

CF ⇨ CW
High Temp



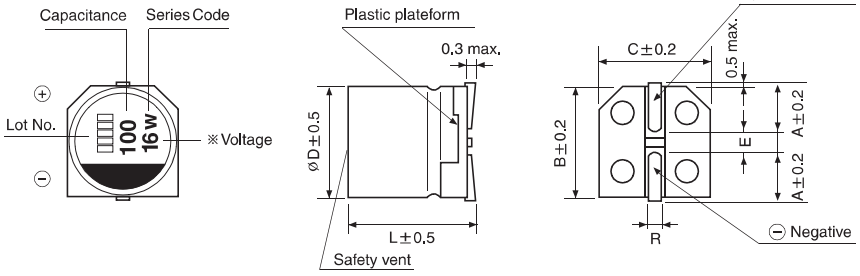
- Chip type, high temperature range, for + 150˚C use
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

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-40˚C/Z+20˚C: 12 / 10 / 8 / 6 / 6
Load life (after application of the rated voltage for 1000 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
Shelf life (at 150˚C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

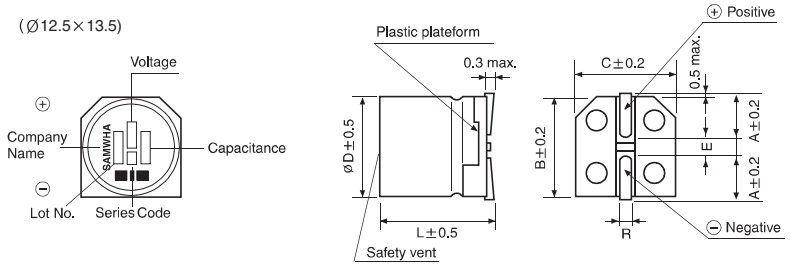
DRAWING

Unit : mm

(ØD10×10)



(ØD12.5×13.5)



ØD	A	B	C	E	R
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

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

μF \ WV	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)

NC Chip type, Non-polarized Series

Non-polarized

Solvent Proof

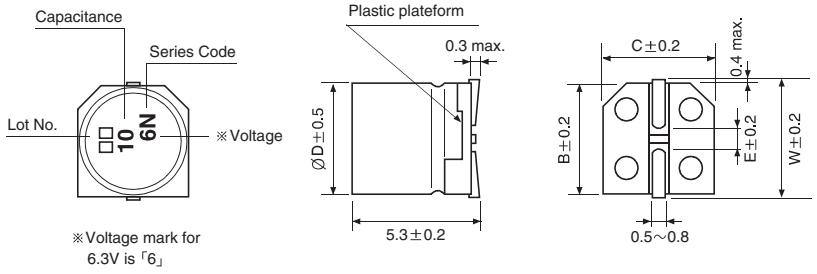
SC (Non-polar) ⇨ NC ⇨ CN (Wide temp.)

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

Item	Characteristics
Operating temperature range	-40 ~ +85˚C
Leakage current max.	I = 0.05CV or 10㎂ 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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm



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

㎌ \ WV	6.3		10		16		25		35		50	
0.1											4×5.3	1.0
0.22											4×5.3	2.0
0.33											4×5.3	2.8
0.47											4×5.3	4.0
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										

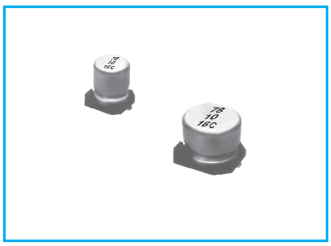
Ripple current (mA rms) at 85˚C, 120Hz
Case size ØD x L (mm)

SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

CN Height 5.5mmL, 105˚C Non-polarized Series

Non-polarized Solvent Proof

NC ⇒ CN
Wide temp.

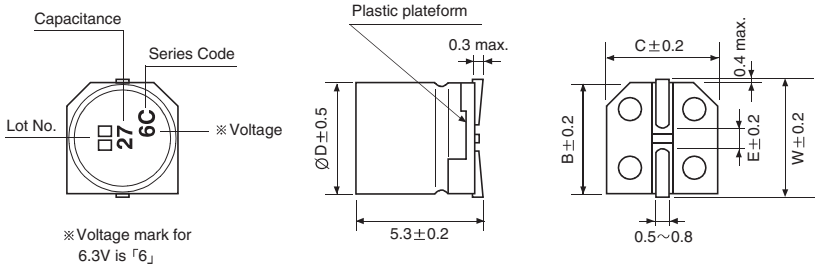


- Chip type, Non-polarized, Wide temperature 105˚C
- Chip type with 5.5mmL height
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive

Item	Characteristics
Operating temperature range	-55 ~ +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: 8 / 6 / 4 / 4 / 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 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.
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 30 seconds. Leakage current: Less than specified value Capacitance change: Within ±10% of initial value tanδ: Less than specified value

DRAWING

Unit : mm



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	
0.1											4×5.3	1.3
0.22											4×5.3	2.3
0.33											4×5.3	2.8
0.47											4×5.3	4.0
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)