

# SE-K [ General ]

105°C Single-Ended Lead Aluminum Electrolytic Capacitors Rated Voltage up to 450V

## Miniature Size Aluminum Electrolytic Capacitors

### ELECTRICAL CHARACTERISTICS

Working Voltage : 6.3 ~ 100V / 160 ~ 250V / 350 ~ 450V

Operating Temperature : -40° ~ +105°C / -25° ~ +105°C

Rate Capacitance Range : 0.47 ~ 15000 $\mu$ F / 0.47 ~ 470 $\mu$ F

Capacitance Tolerance : -20 ~ +20%

DC Leakage Current ( $\mu$ A) :  $I=0.01CV + 3 / 0.03CV + 10$

( After 2 Minutes Application of DC Working Voltage at 25°C )

Dissipation Factor : at 120 Hz, 25°C

WV (V) :	6.3	10	16	25	35	50	63	80	100	160~250	350~450
DF (%) :	26	22	18	16	14	12	10	10	10	15	20

For capacitor whose capacitance exceeds 1000  $\mu$ F. The value of DF(%) is increased by 2% for every addition of 1000  $\mu$ F.

Load Life : 1000 Hours at Assured with Full Rated Maximum Ripple Current Applied

(a) Capacitance Change : Within 20% of Initial Value

(b) Dissipation Factor : Not Exceed 200% of Initial Requirement

(c) Leakage Current : Not Exceed the Initial Requirement

Shelf Life : 500 Hours, No Voltage Applied

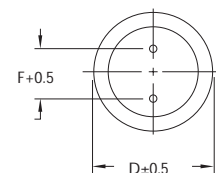
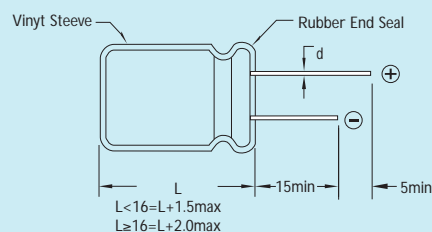
(a) Capacitance Change : Within 20% of Initial Value

(b) Dissipation Factor : Not Exceed 200% of Initial Requirement

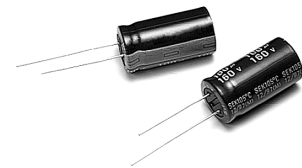
(c) Leakage Current : Not Exceed 200% of Initial

### DIAGRAM OF DIMENSIONS

DE	F	d $\phi$
5.0	2.0	0.5
6.0	2.5	
8.0	3.5	
10.0	5.0	0.6
13.0		
16.0	7.5	0.8
18.0		
22.0	10.0	0.8



Dimensions : mm



### DESCRIPTION

Lower-cost capacitors expressly intended for high density printed circuit board.

Vary high volumetric efficiency.

Ideally suited for general-purpose applications, coupling, decoupling, by pass, and filtering circuit in entertainment electronics.

Feature high CV product with moderate cost.



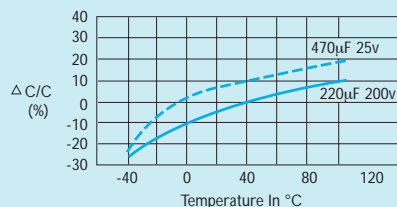
## CASE SIZE OF STANDARD PRODUCTS (D $\phi$ $\geq$ 6mm with Safety Vent at Can Bottom)

D x L : mm

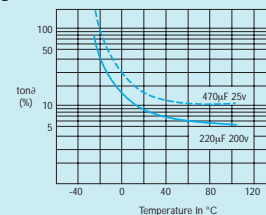
CAP. ( $\mu$ P)	RATED VOLTAGE WV (SV)													
	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
0.47						5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	6 x 11
1.0						5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	6 x 11	8 x 11	8 x 11
2.2						5 x 11	5 x 11	5 x 11	6 x 11	8 x 11 6 x 11	8 x 11 6 x 11	8 x 11	10 x 12 8 x 11	10 x 12
3.3						5 x 11	5 x 11	5 x 11	8 x 11 6 x 11	8 x 11 6 x 11	10 x 12 8 x 11	10 x 12	10 x 12	10 x 15
4.7					5 x 11	5 x 11	5 x 11	5 x 11	8 x 11 6 x 11	10 x 12 8 x 11	10 x 12 8 x 11	10 x 15 10 x 12	10 x 15	10 x 15
6.8					5 x 11	5 x 11	5 x 11	5 x 11	10 x 12 8 x 11	10 x 12	10 x 12	10 x 15	10 x 19	10 x 19
10					5 x 11	5 x 11	5 x 11	6 x 11	10 x 12 8 x 11	10 x 15 10 x 12	10 x 15	10 x 15	13 x 20 10 x 19	13 x 25 13 x 20
15					5 x 11	5 x 11	5 x 11	8 x 11	10 x 15	10 x 15	10 x 15	10 x 19	13 x 25	16 x 25
22	5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11	10 x 15	10 x 15	10 x 19	13 x 20	13 x 25	16 x 32 16 x 25
33	5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11 6 x 11	10 x 12 8 x 11	10 x 19	10 x 19	13 x 20 13 x 25	13 x 25	16 x 25	16 x 36
47	5 x 11	5 x 11	5 x 11	5 x 11	5 x 11 6 x 11	6 x 11 8 x 11	8 x 11	10 x 12 10 x 15	13 x 20	13 x 20 13 x 25	13 x 25	16 x 25	16 x 32	18 x 40
68	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11	8 x 11	10 x 12	10 x 19	13 x 25	13 x 25	16 x 25	16 x 32	18 x 36	22 x 40
100	5 x 11	5 x 11	5 x 11 6 x 11	6 x 11	8 x 11	8 x 11 10 x 12	10 x 12	10 x 19	13 x 25 16 x 25	16 x 25	16 x 32	18 x 36	18 x 36	
150	5 x 11	6 x 11	8 x 11	8 x 11	10 x 12	10 x 12	10 x 15	13 x 25	16 x 32	16 x 36	18 x 40	22 x 40		
220	5 x 11 6 x 11	6 x 11	6 x 11 8 x 11	8 x 11 10 x 12	10 x 12	10 x 15	10 x 15 10 x 19	13 x 25	16 x 32 16 x 36	18 x 36 18 x 40	22 x 40			
330	6 x 11 8 x 11	8 x 11	8 x 11	10 x 12	10 x 12 10 x 15	10 x 19	13 x 20	13 x 25 16 x 25	18 x 36 18 x 40	22 x 40				
470	8 x 11	8 x 11	8 x 11 10 x 12	10 x 12 10 x 15	10 x 15 13 x 20	13 x 20	13 x 25	16 x 25	22 x 40					
680	10 x 12	10 x 12	10 x 15	10 x 19	13 x 20	13 x 25	16 x 25	16 x 36						
1000	10 x 12	10 x 12 10 x 15	10 x 15 10 x 19	10 x 19 13 x 20	13 x 20 13 x 25	13 x 25 16 x 25	16 x 25 16 x 32	18 x 40						
1500	10 x 15	10 x 19	13 x 20	13 x 25	16 x 25	16 x 32	16 x 36							
2200	10 x 19 13 x 20	10 x 19 13 x 20	13 x 20 13 x 25	13 x 25 16 x 25	16 x 25 16 x 32	16 x 36 18 x 36								
3300	10 x 20 13 x 20	13 x 20 13 x 25	13 x 25 16 x 25	16 x 25 16 x 32	16 x 32 18 x 36	18 x 40								
4700	13 x 20 16 x 25	13 x 25 16 x 25	16 x 25 16 x 32	16 x 25 18 x 36	16 x 32 18 x 36	18 x 40								
6800	13 x 25 16 x 25	16 x 25 16 x 32	16 x 36 18 x 36	18 x 36										
10000	16 x 25 16 x 32	16 x 36 18 x 36	18 x 36											
15000	16 x 36 18 x 36	18 x 36												
22000	18 x 40													

## TEMPERATURE CHARACTERISTICS

Capacitance Change Ratio



Dissipation Factor Change

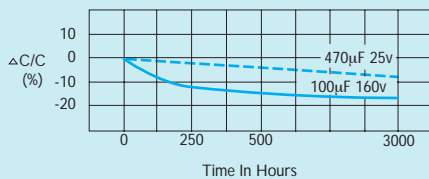


**PERMISSIBLE RIPPLE CURRENT** (mA, rms) at 105°C, 120Hz

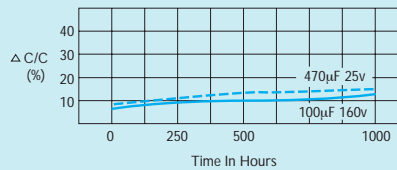
CAP. (μP)	RATED VOLTAGE WV (SV)													
	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
0.47						7	8	10	12	14	14	14	14	14
1.0						12	13	15	17	19	19	20	20	20
2.2						18	20	22	25	28	29	35	35	35
3.3						25	27	29	36	40	42	47	50	54
4.7						30	34	37	43	50	52	55	57	60
6.8						32	37	46	54	60	62	65	72	80
10						50	55	65	70	80	88	95	97	100
15					40	60	65	82	90	110	120	140	150	160
22				60	65	75	90	115	130	140	155	165	175	180
33			70	75	85	105	110	160	180	190	200	220	230	240
47		75	85	90	115	125	155	210	270	290	330	340	350	360
68		80	100	125	130	159	198	241	300	330	350	370	380	400
100	100	110	135	145	190	210	260	385	400	410	430	460	480	
150	120	130	180	200	240	289	330	414	435	450	460	480		
220	165	180	235	250	315	400	460	590	620	650	680			
330	200	255	285	355	440	535	650	720	850	920				
470	280	305	395	470	580	730	800	875	980					
680	320	420	530	650	730	860	1000	1200						
1000	470	570	700	855	995	1110	1200							
1500	600	750	860	1020	1110	1350	1450							
2200	930	1010	1150	1230	1450	1530								
3300	1100	1220	1350	1450	1660	1700								
4700	1320	1410	1560	1690	1750									
6800	1490	1610	1790	1850										
10000	1830	1980	2100											
15000	2280	2400												

**LOAD LIFE**

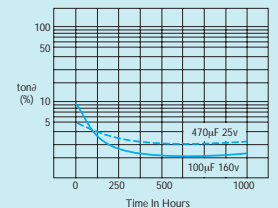
Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change



## COMPENSATION FACTOR OF RIPPLE CURRENT VS. FREQUENCY & TEMPERATURE FOR SMALL RADIAL TYPE

### SH TYPE

FREQUENCY (HZ)	50	120	300	1K	10~100K
6.3~100V Below~68 $\mu$ F	0.75	1	1.35	1.57	2.00
6.3~100V 100~470 $\mu$ F	0.80	1	1.23	1.34	1.50
6.3~100V 471~22000 $\mu$ F	0.85	1	1.10	1.13	1.15
160~450V All Cap ( $\mu$ F)	0.80	1	1.25	1.40	1.60

TEMPERATURE (°C)	40	60	70	85	105
6.3~250V	1.90	1.73	1.62	1.40	1
350~450V	1.29	1.28	1.27	1.2	1

### SE-K TYPE

FREQUENCY (HZ)	50	120	300	1K	10K~100K
6.3~100V Below~68 $\mu$ F	0.75	1	1.35	1.57	2.00
6.3~100V 69~470 $\mu$ F	0.80	1	1.23	1.34	1.50
6.3~100V 471~22000 $\mu$ F	0.85	1	1.10	1.13	1.15
160~450V All Cap ( $\mu$ F)	0.80	1	1.25	1.40	1.60

TEMPERATURE (°C)	40	60	70	85	105
6.3~450V	1.90	1.73	1.62	1.40	1

### SK TYPE

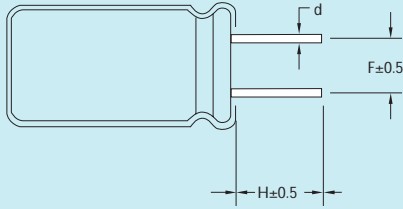
FREQUENCY (HZ)	50	120	300	1K	10K~10K
6.3~100V Below~47 $\mu$ F	0.75	1	1.35	1.57	2.00
6.3~100V 48~470 $\mu$ F	0.80	1	1.23	1.34	1.50
6.3~100V 471~15000 $\mu$ F	0.85	1	1.10	1.13	1.13
160~450V Below~220 $\mu$ F	0.80	1	1.25	1.40	1.40
160~450V 220 $\mu$ F Above	0.90	1	1.10	1.13	1.13

TEMPERATURE (°C)	40	60	70	85
6.3~450V	1.30	1.28	1.27	1

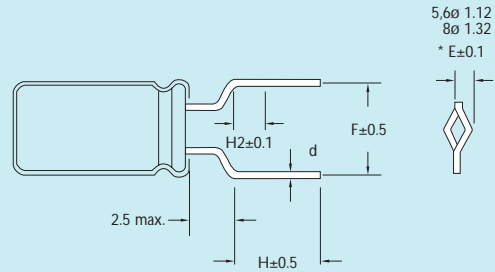
## DIAGRAM OF LEAD CUTTING AND FORMING

Unit : mm

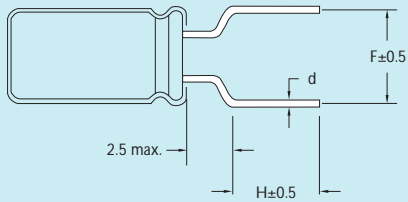
Shape (A)



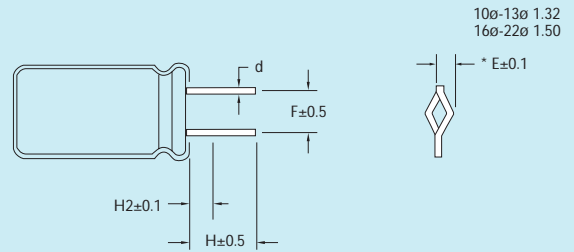
Shape (C)



Shape (B)



Shape (D)



## SPECIFICATIONS INFORMATION

Unit : mm

SHAPE NO.	CUTTING & FORMING METHODS	Dø	5ø	6ø	8ø	10ø	12,13ø	16ø	18ø	22ø
A	Lead Cut Only	F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
		H	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
		d	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
B	Lead Cut and Form	F	5.0	5.0	5.0	-	-	-	-	-
		H	5.0	5.0	5.0	-	-	-	-	-
		d	0.5	0.5	0.5	-	-	-	-	-
C	Lead Cut, Crimp and Form	F	5.0	5.0	5.0	-	-	-	-	-
		H1	5.0	5.0	5.0	-	-	-	-	-
		H2	2.5	2.5	2.5	-	-	-	-	-
		d	0.5	0.5	0.5	-	-	-	-	-
D	Lead Cut and Crimp	F	-	-	-	5.0	5.0	7.5	7.5	10.0
		H1	-	-	-	5.0	5.0	5.0	5.0	5.0
		H2	-	-	-	2.5	2.5	2.5	2.5	2.5
		d	-	-	-	0.6	0.6	0.8	0.8	0.8



## DIAGRAM OF TAPING DIMENSIONS

Unit : mm

Fig. 1 Formed Taping

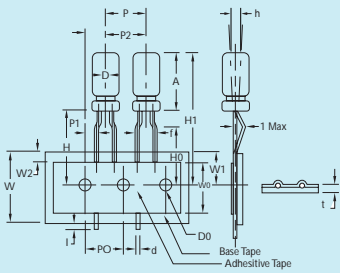


Fig. 2 Straight Taping (Under 13ø)

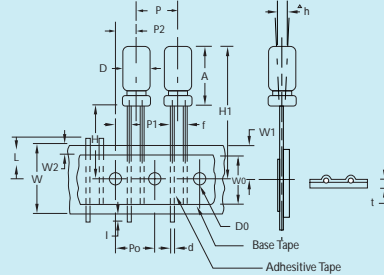
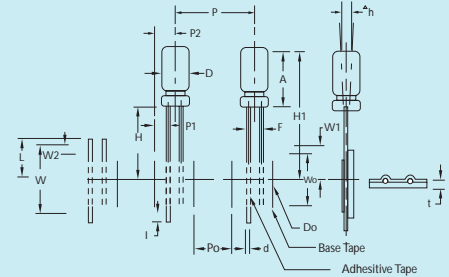


Fig. 3 Straight Taping (16ø, 18ø)



## SPECIFICATIONS INFORMATION

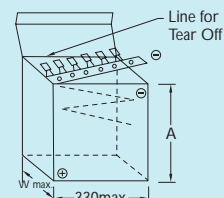
Unit : mm

CODE	D	A	D	P	P0	P1	P2	F	W	W0	W1	W2	H	H0	D0	1	T	ΔH	FIG.
Tolerance	±0.5	±1.0	±0.05	±1.0	±0.2	±0.7	±1.3	+0.8	±0.5	Min.	±0.5	Max.	±0.75	±0.5	±0.2	±Max.	±0.2	Max.	
								-0.2											
Item	4-6	7.0	0.45	12.7	12.7	3.85	6.35	5.0	180	125	9.0	3.0	18.5	16.0	4.0	1.0	0.7	2.0	1
	5-8	12.5	0.5	12.7	12.7	3.85	6.35	5.0	180	125	9.0	3.0	18.5	16.0	4.0	1.0	0.7	2.0	
	5, 6	12.5	0.5	12.7	12.7	5.1	6.35	2.5	180	125	9.0	3.0	18.5	-	4.0	1.0	0.7	2.0	2
	8	12.5	0.5	12.7	12.7	4.6	6.35	3.5	180	125	9.0	3.0	18.5	-	4.0	1.0	0.7	2.0	
	10	21.0	0.6	12.7	12.7	3.85	6.35	5.0	180	125	9.0	3.0	18.5	-	4.0	1.0	0.7	2.0	
	12, 13	26.0	0.6	15.0	15.0	5.0	7.5	5.0	180	125	9.0	3.0	18.5	-	4.0	1.0	0.7	2.0	
	16, 18	26.0	0.8	30.0	15.0	3.75	7.5	7.5	180	125	9.0	3.0	18.0	-	4.0	1.0	0.7	2.0	3

## PACKAGE INFORMATION

DIAMETER (MM)	AMMUNITION STYLE			REEL STYLE	
	A	W	Q'ty (PCS)	W	Q'ty (PCS)
4	265	50	2500	44	1500
5	265	50	2000	44	1300
6	265	50	2000	44	1100
8	265	50	1000	44	750
10 (12L)	265	50	700	44	600
10 (16L)	285	60	700	50	600
10 (20L)	285	60	500	-	-
12, 13	285	60	500	-	-
16	285	60	250	-	-

Ammunition Style Package



Reel Style Package

