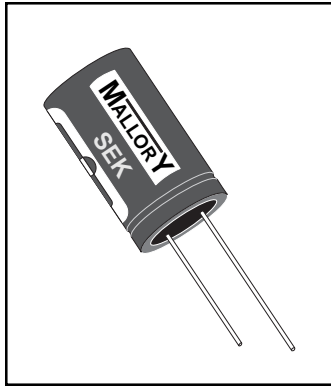


# Type SEK Radial Leaded Capacitors



- 105°C - Long Life
- High CV Product
- High Reliability
- Ideal for High Density Printed Circuit Boards
- Very High Volumetric Efficiency
- Suitable for General Purpose Applications, Coupling, Decoupling, Bypass and Filtering Circuits

## GENERAL SPECIFICATIONS

Operating Temperature:  
-40°C to +105°C

Voltage Range:  
6.3 WVDC to 450 WVDC

Capacitance Range:  
0.47  $\mu\text{F}$  to 15,000  $\mu\text{F}$

Capacitance Tolerance:  
 $\pm 20\%$

DC Leakage Current:  
6.3 - 250VDC  
 $I = .01CV + 3\mu\text{A Max}$   
after 2 minutes application of DC working voltage at 25°C

Over 350VDC  
 $I = .03CV + 10\mu\text{A Max}$   
after 2 minutes application of DC working voltage at 25°C

C = Capacitance in  $\mu\text{F}$

V = Rated Voltage

I = Leakage Current in  $\mu\text{A}$

QA Stability Test:  
Apply WVDC for 1,000 hrs at 105°C

- Capacitance change 20% of initial limits
- DC leakage current meets initial limits
- ESR  $\leq 200\%$  of initial measured value

Shelf Life:

- 500 hours; no voltage applied
- Capacitor change within 20% of initial values
- Dissipation factor not exceed 200% of initial requirements
- Leakage current: not exceed 200% of initial requirement

SEK parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

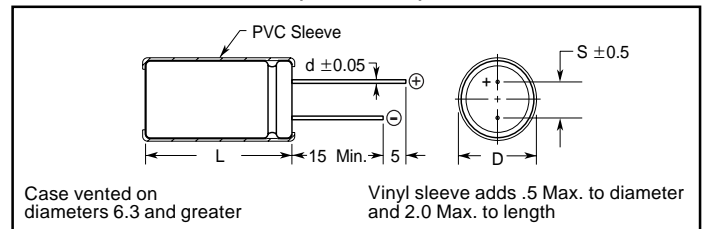
Dissipation Factor @ 120Hz, 25°C											
WV (V)	6.3	10	16	25	35	50	63	80	100	160-250	350-400
DF(%)	26	22	18	16	14	12	10	10	10	15	20

For capacitors whose capacitance value exceeds 1000 $\mu\text{F}$ , the value of DF(%) is increased 2% for every additional 1000 $\mu\text{F}$ .

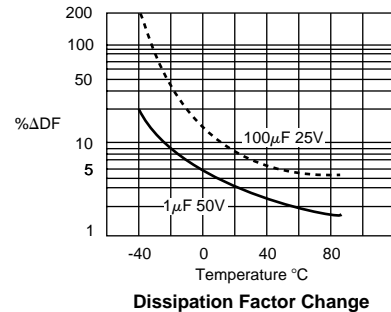
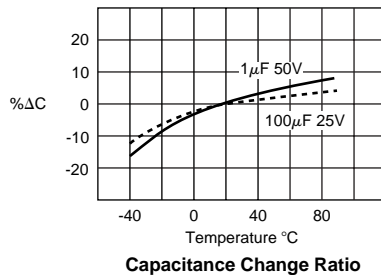
The maximum ripple current at 105°C and 120 Hz for SEK capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers				Ambient Temperature	Ripple Multiplier
	60Hz	120Hz	1kHz	10kHz		
6 to 25	.80	1.0	1.10	1.20	+105°C	1.00
35 to 100	.75	1.0	1.30	1.40	+85°C	1.50
160 to 250	.70	1.0	1.40	1.60	+70°C	1.80
350 to 400	.60	1.0	1.50	1.80		

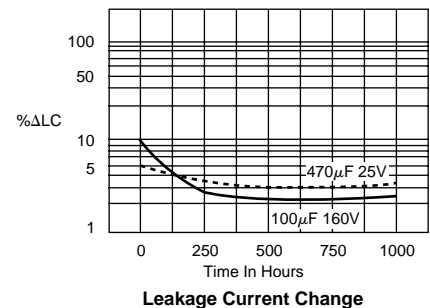
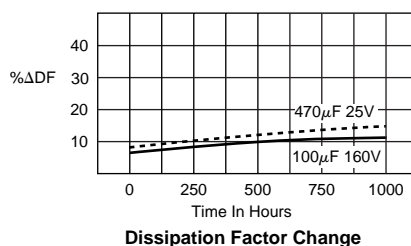
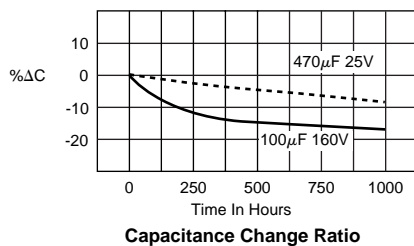
## Outline Dimensions (Millimeters)



## Temperature Characteristics



## Load Life Characteristics



# Type SEK Radial Leaded Capacitors



Aluminum Capacitors

Cap μF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC μA 2 Minutes	Size (Millimeters)				New Catalog Number	Previous Catalog Number
				D Diameter	L Length	S Lead Space	d		
<b>6.3 WVDC; 8 VDC Surge</b>									
100	3.45	100	9.3	5	11	2	0.5	SEK101M6R3ST	TKR101M0JD11
220	1.57	165	16.9	6.3	11	2.5	0.5	SEK221M6R3ST	TKR221M0JE11V
330	1.05	200	23.8	6.3	11.5	2.5	0.5	SEK331M6R3ST	TKR331M0JE11V
470	0.73	280	32.6	8	11.5	3.5	0.6	SEK471M6R3ST	TKR471M0JF11V
1000	0.35	470	66.0	10	13	5	0.6	SEK102M6R3ST	TKR102M0JG13V
2200	0.17	930	141.6	10	21	5	0.6	SEK222M6R3ST	TKR222M0JG21V
3300	0.12	1100	210.9	13	21	5	0.6	SEK332M6R3ST	TKR332M0JJ21V
4700	0.10	1320	299.1	16	26	5	0.6	SEK472M6R3ST	TKR472M0JJ26V
6800	0.07	1490	431.4	16	25	7.5	0.8	SEK682M6R3ST	TKR682M0JK25V
10000	0.06	1830	633.0	16	32	7.5	0.8	SEK103M6R3ST	TKR103M0JK32V
15000	0.05	2280	948.0	18	36	7.5	0.8	SEK153M6R3ST	TKR153M0JL35V
<b>10 WVDC; 13 VDC Surge</b>									
47	6.21	75	7.7	5	11	2	0.5	SEK470M010ST	TKR470M1AD11
100	2.92	110	13.0	5	11	2	0.5	SEK101M010ST	TKR101M1AD11
220	1.33	180	25.0	6.3	11	2.5	0.5	SEK221M010ST	TKR221M1AE11V
330	0.88	255	36.0	8	11.5	3.5	0.6	SEK331M010ST	TKR331M1AF11V
470	0.62	305	50.0	8	11.5	3.5	0.6	SEK471M010ST	TKR471M1AF11V
1000	0.29	570	103.0	10	16	5	0.6	SEK102M010ST	TKR102M1AG16V
2200	0.14	1010	223.0	13	21	5	0.6	SEK222M010ST	TKR222M1AJ21V
3300	0.10	1220	333.0	13	25	5	0.6	SEK332M010ST	TKR332M1AJ21V
4700	0.08	1410	473.0	16	25	7.5	0.8	SEK472M010ST	TKR472M1AK25V
6800	0.07	1610	683.0	16	32	7.5	0.8	SEK682M010ST	TKR682M1AK32V
10000	0.05	1980	1003.0	18	36	7.5	0.8	SEK103M010ST	TKR103M1AL35V
15000	0.04	3330	1503.0	18	42	7.5	0.8	SEK153M010ST	TKR153M1AL42V
<b>16 WVDC; 20 VDC Surge</b>									
33	7.24	70	8.3	5	11	2	0.5	SEK330M016ST	TKR330M1CD11
47	5.08	85	10.5	5	11	2	0.5	SEK470M016ST	TKR470M1CD11
100	2.39	135	19.0	6.3	11	2.5	0.5	SEK101M016ST	TKR101M1CE11V
220	1.09	235	38.2	8	11.5	3.5	0.6	SEK221M016ST	TKR221M1CF11V
330	0.72	285	55.8	8	11	3.5	0.6	SEK331M016ST	TKR331M1CF11V
470	0.51	395	78.2	10	13	5	0.6	SEK471M016ST	TKR471M1CG13V
1000	0.24	700	163.0	10	21	5	0.6	SEK102M016ST	TKR102M1CG21V
2200	0.12	1150	355.0	13	21	5	0.6	SEK222M016ST	TKR222M1CJ21V
3300	0.09	1350	531.0	13	26	5	0.6	SEK332M016ST	TKR332M1CJ26V
4700	0.07	1560	755.0	16	32	7.5	0.8	SEK472M016ST	TKR472M1CK32V
6800	0.06	1790	1091.0	18	36	7.5	0.8	SEK682M016ST	TKR682M1CL35V
10000	0.05	2884	1603.0	18	42	7.5	0.8	SEK103M016ST	TKR103M1CL42V
<b>25 WVDC; 32 VDC Surge</b>									
10	21.23	50	5.5	5	11	2	0.5	SEK100M025ST	TKR100M1ED11
22	9.65	60	8.5	5	11	2	0.5	SEK220M025ST	TKR220M1ED11
33	6.43	75	11.3	5	11	2	0.5	SEK330M025ST	TKR330M1ED11
47	4.52	90	14.8	5	11	2	0.5	SEK470M025ST	TKR470M1ED11
100	2.12	145	28.0	6	11	2.5	0.5	SEK101M025ST	TKR101M1EE11V
220	0.97	250	58.0	8	11	3.5	0.6	SEK221M025ST	TKR221M1EF11V
330	0.64	355	85.5	10	13	5	0.6	SEK331M025ST	TKR331M1EG13V

# Type SEK Radial Leaded Capacitors

**MALLORY**

Cap $\mu$ F	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC $\mu$ A 2 Minutes	Size (Millimeters)				New Catalog Number	Previous Catalog Number
				D Diameter	L Length	S Lead Space	d		
<b>25 WVDC; 32 VDC Surge</b>									
470	0.45	470	120.5	10	16	5	0.6	SEK471M025ST	TKR471M1EG16V
1000	0.21	855	253.0	13	21	5	0.6	SEK102M025ST	TKR102M1EJ21V
2200	0.11	1230	553.0	13	26	5	0.6	SEK222M025ST	TKR222M1EJ26V
3300	0.08	1450	828.0	16	32	7.5	0.8	SEK332M025ST	TKR332M1EK32V
4700	0.07	1690	1178.0	18	36	7.5	0.8	SEK472M025ST	TKR472M1EL35V
6800	0.05	2856	1703.0	18	42	7.5	0.8	SEK682M025ST	TKR682M1EL42V
<b>35 WVDC; 44 VDC Surge</b>									
22	8.44	65	10.7	5	11	2	0.5	SEK220M035ST	TKR220M1VD11
33	5.63	85	14.6	5	11	2	0.5	SEK330M035ST	TKR330M1VD11
47	3.95	115	19.5	6.3	11	2.5	0.5	SEK470M035ST	TKR470M1VE11V
100	1.86	190	38.0	8	11.5	3.5	0.6	SEK101M035ST	TKR101M1VF11V
220	0.84	315	80.0	10	13	5	0.6	SEK221M035ST	TKR221M1VG13V
330	0.56	440	118.5	10	16	5	0.6	SEK331M035ST	TKR331M1VG16V
470	0.40	580	167.5	13	20	5	0.6	SEK471M035ST	TKR471M1VG21V
1000	0.19	995	353.0	13	21	5	0.6	SEK102M035ST	TKR102M1VJ21V
2200	0.10	1450	773.0	16	32	7.5	0.8	SEK222M035ST	TKR222M1VK32V
3300	0.07	1660	1158.0	18	36	7.5	0.8	SEK332M035ST	TKR332M1VL35V
4700	0.06	2674	1648.0	18	42	7.5	0.8	SEK472M035ST	TKR472M1VL42V
<b>50 WVDC; 63 VDC Surge</b>									
0.47	338.80	7	3.2	5	11	2	0.5	SEKR47M050ST	TKRR47M1HD11
1	159.24	12	3.5	5	11	2	0.5	SEK010M050ST	TKR010M1HD11
2.2	72.38	18	4.1	5	11	2	0.5	SEK2R2M050ST	TKR2R2M1HD11
3.3	48.25	25	4.7	5	11	2	0.5	SEK3R3M050ST	TKR3R3M1HD11
4.7	33.88	30	5.4	5	11	2	0.5	SEK4R7M050ST	TKR4R7M1HD11
10	15.92	50	8.0	5	11	2	0.5	SEK100M050ST	TKR100M1HD11
22	7.24	75	14.0	5	11	2	0.5	SEK220M050ST	TKR220M1HD11
33	4.83	105	19.5	6.3	11	2.5	0.5	SEK330M050ST	TKR330M1HE11V
47	3.39	125	26.5	6.3	11.5	2.5	0.5	SEK470M050ST	TKR470M1HE11V
100	1.59	210	53.0	8	11	3.5	0.6	SEK101M050ST	TKR101M1HF11V
220	0.72	400	113.0	10	16	5	0.6	SEK221M050ST	TKR221M1HG16V
330	0.48	535	168.0	10	21	5	0.6	SEK331M050ST	TKR331M1HG21V
470	0.34	730	238.0	13	21	5	0.6	SEK471M050ST	TKR471M1HJ21V
1000	0.16	1110	503.0	16	25	7.5	0.8	SEK102M050ST	TKR102M1HK25V
2200	0.08	1530	1103.0	18	36	7.5	0.8	SEK222M050ST	TKR222M1HL35V
3300	0.47	2478	1653.0	18	42	7.5	0.8	SEK332M050ST	TKR332M1HL42V
<b>63 WVDC; 79 VDC Surge</b>									
4.7	28.23	34	6.0	5	11	2	0.5	SEK4R7M063ST	TKR4R7M1JD11
10	13.27	55	9.3	5	11	2	0.5	SEK100M063ST	TKR100M1JD11
22	6.03	90	16.9	6.3	11	2.5	0.5	SEK220M063ST	TKR220M1JE11V
33	4.02	110	23.8	6.3	11	2.5	0.5	SEK330M063ST	TKR330M1JE11V
47	2.82	155	32.6	8	11	3.5	0.6	SEK470M063ST	TKR470M1JF11V
100	1.33	260	66.0	10	13	5	0.6	SEK101M063ST	TKR101M1JG13V
220	0.60	460	141.6	10	21	5	0.6	SEK221M063ST	TKR221M1JG21V
330	0.40	650	210.9	13	21	5	0.6	SEK331M063ST	TKR331M1JJ21V
470	0.28	800	299.1	13	26	5	0.6	SEK471M063ST	TKR471M1JJ26V
1000	0.13	1200	633.0	16	32	7.5	0.8	SEK102M063ST	TKR102M1JK32V

# Type SEK Radial Leaded Capacitors



Cap μF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC μA 2 Minutes	Size (Millimeters)				New Catalog Number	Previous Catalog Number
				D Diameter	L Length	S Lead Space	d		
<b>100 WVDC; 125 VDC Surge</b>									
0.47	282.33	10	3.5	5	11	2	0.5	SEKR47M100ST	TKRR47M2AD11
1	132.70	15	4.0	5	11	2	0.5	SEK010M100ST	TKR010M2AD11
2.2	60.32	22	5.2	5	11	2	0.5	SEK2R2M100ST	TKR2R2M2AD11
3.3	40.21	29	6.3	5	11	2	0.5	SEK3R3M100ST	TKR3R3M2AD11
4.7	28.23	37	7.7	5	11	2	0.5	SEK4R7M100ST	TKR4R7M2AD11
10	13.27	65	13.0	6.3	11	2.5	0.5	SEK100M100ST	TKR100M2AE11V
22	6.03	115	25.0	8	11	3.5	0.6	SEK220M100ST	TKR220M2AF11V
33	4.02	160	36.0	10	13	5	0.6	SEK330M100ST	TKR330M2AG13V
47	2.82	210	50.0	10	16	5	0.6	SEK470M100ST	TKR470M2AG16V
100	1.33	385	103.0	13	20	5	0.6	SEK101M100ST	TKR101M2AJ21V
220	0.60	590	223.0	16	25	7.5	0.8	SEK221M100ST	TKR221M2AK25V
330	0.40	720	333.0	16	25	7.5	0.8	SEK331M100ST	TKR331M2AK25V
470	0.28	875	473.0	16	32	7.5	0.8	SEK471M100ST	TKR471M2AK32V
<b>160 WVDC; 200 VDC Surge</b>									
0.47	423.50	12	12.3	6.3	11	2.5	0.5	SEKR47M160ST	TKRR47M2CE11V
1	199.04	17	14.8	6.3	11	2.5	0.5	SEK010M160ST	TKR010M2CE11V
2.2	90.47	25	20.6	6.3	11	2.5	0.5	SEK2R2M160ST	TKR2R2M2CE11V
3.3	60.32	36	25.8	6.3	11	2.5	0.5	SEK3R3M160ST	TKR3R3M2CE11V
4.7	42.35	43	32.6	6.3	11	2.5	0.5	SEK4R7M160ST	TKR4R7M2CE11V
10	19.90	70	58.0	8	11	3.5	0.6	SEK100M160ST	TKR100M2CF11V
22	9.05	130	115.6	10	16	5	0.6	SEK220M160ST	TKR220M2CG16V
33	6.03	180	168.4	10	21	5	0.6	SEK330M160ST	TKR330M2CG21V
47	4.23	270	235.6	13	21	5	0.6	SEK470M160ST	TKR470M2CJ21V
100	1.99	330	490.0	13	26	5	0.6	SEK101M160ST	TKR101M2CJ26V
220	0.90	500	1066.0	16	35	7.5	0.8	SEK221M160ST	TKR221M2CK35V
330	0.60	850	1594.0	18	42	7.5	0.8	SEK331M160ST	TKR331M2CL42V
<b>200 WVDC; 250 VDC Surge</b>									
0.47	423.50	12	12.8	6.3	11	2.5	0.5	SEKR47M200ST	TKRR47M2DE11V
1	199.04	17	16.0	6.3	11	2.5	0.5	SEK010M200ST	TKR010M2DE11V
2.2	90.47	25	23.2	6.3	11.5	2.5	0.5	SEK2R2M200ST	TKR2R2M2DE11V
3.3	60.32	36	29.8	6.3	11.5	2.5	0.5	SEK3R3M200ST	TKR3R3M2DE11V
4.7	42.35	50	38.2	8	11	3.5	0.6	SEK4R7M200ST	TKR4R7M2DF11V
10	19.90	80	70.0	10	13	5	0.6	SEK100M200ST	TKR100M2DG13V
22	9.05	140	142.0	10	21	5	0.6	SEK220M200ST	TKR220M2DG21V
33	6.03	190	208.0	13	21	5	0.6	SEK330M200ST	TKR330M2DJ21V
47	4.23	220	292.0	13	21	5	0.6	SEK470M200ST	TKR470M2DJ21V
100	1.99	335	610.0	16	25	7.5	0.8	SEK101M200ST	TKR101M2DK25V
220	0.90	515	1330.0	18	42	7.5	0.8	SEK221M200ST	TKR221M2DL42V
<b>250 WVDC; 300 VDC Surge</b>									
0.47	423.50	12	13.5	6.3	11	2.5	0.5	SEKR47M250ST	TKRR47M2EE11V
1	199.04	17	17.5	6.3	11	2.5	0.5	SEK010M250ST	TKR010M2EE11V
2.2	90.47	29	26.5	6.3	11.5	2.5	0.5	SEK2R2M250ST	TKR2R2M2EE11V
3.3	60.32	42	34.8	8	11	3.5	0.6	SEK3R3M250ST	TKR3R3M2EF11V
4.7	42.35	50	45.3	8	11	3.5	0.6	SEK4R7M250ST	TKR4R7M2EF11V
10	19.90	88	85.0	10	16	5	0.6	SEK100M250ST	TKR100M2EG16V

# Type SEK Radial Leaded Capacitors

**MALORY**

Cap $\mu$ F	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC $\mu$ A 2 Minutes	Size (Millimeters)				New Catalog Number	Previous Catalog Number
				D Diameter	L Length	S Lead Space	d		
<b>250 WVDC; 300 VDC Surge</b>									
22	9.05	155	175.0	13	21	5	0.6	SEK220M250ST	TKR220M2EJ21V
33	6.03	190	257.5	13	21	5	0.6	SEK330M250ST	TKR330M2EJ21V
47	4.23	230	362.5	13	26	5	0.6	SEK470M250ST	TKR470M2EJ26V
100	1.99	340	760.0	16	32	7.5	0.8	SEK101M250ST	TKR101M2EK32V
<b>350 WVDC; 400 VDC Surge</b>									
0.47	564.67	14	14.9	8	11	3.5	0.6	SEKR47M350ST	TKRR47M2VF11V
1	265.39	20	20.5	8	11	3.5	0.6	SEK010M350ST	TKR010M2VF11V
2.2	120.63	35	33.1	10	11.5	3.5	0.6	SEK2R2M350ST	TKR2R2M2VF11V
3.3	80.42	47	44.7	10	13	5	0.6	SEK3R3M350ST	TKR3R3M2VG13V
4.7	56.47	55	59.4	10	13	5	0.6	SEK4R7M350ST	TKR4R7M2VG13V
10	26.54	95	115.0	10	21	5	0.6	SEK100M350ST	TKR100M2VG21V
22	12.06	165	241.0	13	26	5	0.6	SEK220M350ST	TKR220M2VJ26V
33	8.04	195	356.5	13	25	7.5	0.8	SEK330M350ST	TKR330M2VK25V
47	5.65	240	503.5	16	35	7.5	0.8	SEK470M350ST	TKR470M2VK35V
100	2.65	360	1060.0	18	42	7.5	0.8	SEK101M350ST	TKR101M2VL42V
<b>400 WVDC; 450 VDC Surge</b>									
0.47	564.67	14	15.6	8	11	3.5	0.6	SEKR47M400ST	TKRR47M2GF11V
1	265.39	20	22.0	8	11	3.5	0.6	SEK010M400ST	TKR010M2GF11V
2.2	120.63	35	36.4	10	13	5	0.6	SEK2R2M400ST	TKR2R2M2GG13V
3.3	80.42	50	49.6	10	13	5	0.6	SEK3R3M400ST	TKR3R3M2GG13V
4.7	56.47	58	66.4	10	16	5	0.6	SEK4R7M400ST	TKR4R7M2GG16V
10	26.54	100	130.0	13	21	5	0.6	SEK100M400ST	TKR100M2GJ21V
22	12.06	170	274.0	13	26	5	0.6	SEK220M400ST	TKR220M2GJ26V
33	8.04	205	406.0	16	32	7.5	0.8	SEK330M400ST	TKR330M2GK32V
47	5.65	255	574.0	18	36	7.5	0.8	SEK470M400ST	TKR470M2GL35V
<b>450 WVDC; 500 VDC Surge</b>									
0.47	564.67	14	15.6	8	11	3.5	0.6	SEKR47M450ST	
1	265.39	20	22.0	8	11	3.5	0.6	SEK010M450ST	
2.2	120.63	35	36.4	10	13	5	0.6	SEK2R2M450ST	
3.3	80.42	50	49.6	10	13	5	0.6	SEK3R3M450ST	
4.7	56.47	58	66.4	10	16	5	0.6	SEK4R7M450ST	
10	26.54	100	130.0	13	21	5	0.6	SEK100M450ST	
22	12.06	170	274.0	13	26	5	0.6	SEK220M450ST	
33	8.04	205	406.0	16	32	7.5	0.8	SEK330M450ST	
47	5.65	255	574.0	18	36	7.5	0.8	SEK470M450ST	

Aluminum Capacitors