

ALUMINUM ELECTROLYTIC CAPACITORS

>LF Long Life Series

- Features : 85°C 3000 hours , Longer life than LH, Snap-in terminal, High ripple current
- Recommended Applications: Smoothing circuit, TV/Monitor, Adapter, SMPS
- Corresponding product to RoHS

>LF

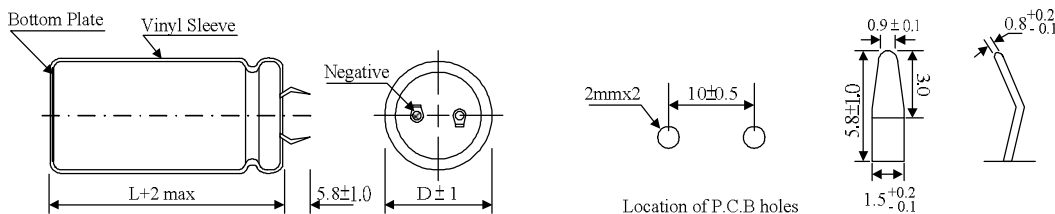
↑ Long Life
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Specifications

Item	Characteristics	
Operating Temperature Range	-40 ~ +85°C	-25 ~ +85°C
Rated Voltage Range	10 ~ 100VDC	160 ~ 450VDC
Capacitance Range	820 ~ 56000 μ F	56 ~ 2200 μ F
Capacitance Tolerance	$\pm 20\%$ at 120Hz, 20°C	
Leakage Current (MAX) (20°C)	$I \leq 0.02CV$ or 3mA whichever is smaller (After rated voltage applied for 5 minutes) I = Leakage Current (μ A) C = Nominal Capacitance (μ F) V = Rated Voltage (V)	
Dissipation Factor (MAX) (tan δ) (120Hz, 20°C)	Dissipation Factor (tan δ) shall not exceed the values showed in the table of standard rating	
Endurance	After applying rated voltage with rated Ripple current for 3000hrs at 85°C, the capacitor shall meet the following requirement.	
	Capacitance Change	Within $\pm 20\%$ of the initial value
	Dissipation Factor	Not more than 200% of the specified value
	Leakage Current	Not more than the specified value
Shelf Life	After placed at 85°C without voltage applied for 1000 hours, the capacitor shall meet the same requirements as Endurance.	

Diagram of Dimensions



Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz)	50	60	120	400	1K	2.4K	5K	10K
Coefficient	0.8	0.85	1.0	1.14	1.23	1.3	1.36	1.4

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■ Dimensions, Max Dissipation Factor, Max Permissible Ripple Current, Max Equivalent Series Resistance

Capacitance (μ F)	Rated (Surge) Voltage											
	10(13)					16(20)						
	ϕ DxL				tan δ	ESR	ϕ DxL				tan δ	ESR
	Ripple Current						Ripple Current					
8200							22x25 2.45				0.55	0.089
10000							22x30 2.60				0.55	0.073
12000	22x25 2.45				0.55	0.061	22x35 3.10	25x25 2.90			0.55	0.061
15000	22x30 2.80				0.55	0.049	22x40 3.46	25x30 3.30	30x25 3.40		0.55	0.049
18000	22x35 3.34	25x25 3.15			0.55	0.041	22x45 3.81	25x35 3.70	30x30 3.85		0.55	0.041
22000	22x40 3.67	25x30 3.50	30x25 3.60		0.55	0.033	22x50 4.32	25x45 4.40	30x30 4.15	35x25 4.23	0.55	0.033
27000	22x45 4.12	25x35 4.00	30x30 4.16		0.55	0.027		25x45 4.65	30x35 4.65	35x30 4.79	0.55	0.027
33000	22x50 4.63	25x40 4.49	30x30 4.45	35x25 4.54	0.55	0.022			30x40 5.25	35x35 5.41	0.55	0.022
39000		25x45 4.90	30x35 4.90	35x30 5.05	0.55	0.019			30x45 5.86	35x35 5.80	0.55	0.019
47000		25x50 5.55	30x40 5.61	35x30 5.50	0.55	0.016				35x40 6.45	0.55	0.016
56000			30x45 6.11	35x35 6.05	0.55	0.013						

Capacitance (μ F)	Rated (Surge) Voltage											
	25(32)					35(44)						
	ϕ DxL				tan δ	ESR	ϕ DxL				tan δ	ESR
	Ripple Current						Ripple Current					
3900							22x25 2.10				0.40	0.136
4700							22x30 2.30	25x25 2.30			0.40	0.113
5600	22x25 2.20				0.45	0.107	22x35 2.60	25x30 2.62	30x25 2.70	35x25 2.99	0.40	0.095
6800	22x30 2.45	25x25 2.45			0.45	0.088	22x40 2.90	25x35 2.93	30x30 3.07	35x25 3.13	0.40	0.078
8200	22x35 2.75	25x30 2.75			0.45	0.073	22x45 3.30	25x35 3.20	30x30 3.33	35x25 3.42	0.40	0.065
10000	22x40 3.25	25x30 3.10	30x25 3.19		0.45	0.060	22x50 3.74	25x40 3.64	30x30 3.60	35x25 3.67	0.40	0.053
12000	22x45 3.50	25x35 3.40	30x30 3.54	35x25 3.64	0.45	0.050		25x45 4.00	30x35 4.00	35x30 4.12	0.40	0.044
15000		25x40 3.90	30x35 4.10	35x30 4.21	0.45	0.040			30x40 4.60	35x35 4.74	0.40	0.035
18000		25x45 4.30	30x40 4.51	35x30 4.39	0.45	0.033			30x45 5.10	35x40 5.30	0.40	0.029
22000			30x45 4.90	35x35 4.85	0.45	0.027				35x45 5.70	0.40	0.024
27000			30x50 5.45	35x40 5.45	0.45	0.022				35x50 6.45	0.40	0.020
33000				35x45 6.15	0.45	0.018						

☆Size: D ϕ x L (mm). ☆tan δ : 20°C, 120Hz. ☆Ripple Current: 85°C, 120Hz, (A/rms) ☆ESR: 20°C, 120Hz, (Ω).

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■ Dimensions, Max Dissipation Factor, Max Permissible Ripple Current, Max Equivalent Series Resistance

Capacitance (μ F)	Rated (Surge) Voltage											
	50(63)					63(79)						
	ϕ DxL				tan δ	ESR	ϕ DxL				tan δ	ESR
	Ripple Current						Ripple Current					
1800							22x25 1.80				0.30	0.221
2200	22x25 1.80				0.35	0.211	22x30 2.00	25x25 2.00			0.30	0.181
2700	22x30 1.95				0.35	0.172	22x35 2.30	25x30 2.30			0.30	0.147
3300	22x35 2.33	25x25 2.20			0.35	0.141	22x40 2.68	25x30 2.55	30x25 2.63		0.30	0.121
3900	22x40 2.52	25x30 2.40			0.35	0.119	22x45 2.88	25x35 2.80	30x30 2.91		0.30	0.102
4700	22x45 2.78	25x35 2.70	30x30 2.82	35x25 2.89	0.35	0.099	22x50 3.28	25x40 3.18	30x30 3.15	35x25 3.21	0.30	0.085
5600		25x35 3.00	30x30 3.12	35x25 3.21	0.35	0.083		25x45 3.50	30x35 3.50	35x30 3.60	0.30	0.071
6800		25x40 3.35	30x35 3.52	35x30 3.62	0.35	0.068		25x50 3.94	30x40 3.98	35x30 3.90	0.30	0.059
8200		25x50 3.74	30x40 3.77	35x30 3.70	0.35	0.057			30x45 4.39	35x35 4.35	0.30	0.049
10000			30x45 4.24	35x35 4.20	0.35	0.046			30x50 4.90	35x40 4.90	0.30	0.040
12000			30x50 4.65	35x40 4.65	0.35	0.039				35x50 5.45	0.30	0.033
15000				35x45 5.30	0.35	0.031						
18000				35x50 5.90	0.35	0.026						

Capacitance (μ F)	Rated (Surge) Voltage											
	80(100)					100(125)						
	ϕ DxL				tan δ	ESR	ϕ DxL				tan δ	ESR
	Ripple Current						Ripple Current					
820							22x25 1.70				0.25	0.404
1000							22x30 1.95	25x25 1.95			0.25	0.332
1200	22x25 1.70				0.25	0.276	22x35 2.15	25x30 2.15			0.25	0.276
1500	22x30 1.95	25x25 1.95			0.25	0.221	22x40 2.57	25x30 2.45	30x25 2.52		0.25	0.221
1800	22x35 2.15	25x30 2.15			0.25	0.184	22x45 2.83	25x35 2.75	30x30 2.86		0.25	0.184
2200	22x40 2.57	25x30 2.45	30x25 2.52		0.25	0.151	22x50 3.17	25x40 3.08	30x30 3.05	35x25 3.11	0.25	0.151
2700	22x45 2.83	25x35 2.75	30x30 2.86		0.25	0.123		25x45 3.45	30x35 3.45	35x30 3.55	0.25	0.123
3300	22x50 3.22	25x40 3.13	30x30 3.10	35x25 3.16	0.25	0.100		25x50 3.94	30x40 3.98	35x30 3.90	0.25	0.100
3900		25x45 3.40	30x35 3.40	35x30 3.50	0.25	0.085			30x45 4.34	35x35 4.30	0.25	0.085
4700		25x50 3.84	30x40 3.88	35x35 4.04	0.25	0.071				35x40 4.75	0.25	0.071
5600			30x45 4.24	35x40 4.43	0.25	0.059				35x50 5.30	0.25	0.059
6800			30x50 4.70	35x45 4.93	0.25	0.049						
8200				35x50 5.25	0.25	0.040						

☆Size: D ϕ x L(mm). ☆tan δ : 20°C, 120Hz. ☆Ripple Current: 85°C, 120Hz, (A/rms) ☆ESR: 20°C, 120Hz, (Ω).

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■ Dimensions, Max Dissipation Factor, Max Permissible Ripple Current, Max Equivalent Series Resistance

Capacitance (μ F)	Rated (Surge) Voltage											
	160(200)						180(225)					
	ϕ DxL			tan δ	ESR	ϕ DxL			tan δ	ESR		
	Ripple Current					Ripple Current						
270							22x25				0.15	0.737
							1.10					
330	22x25				0.15	0.603	22x30				0.15	0.603
	1.15						1.25					
390	22x30				0.15	0.510	22x30	25x25			0.15	0.510
	1.30						1.40	1.40				
470	22x35	25x30			0.15	0.423	22x35	25x30			0.15	0.423
	1.59	1.62					1.60	1.60				
560	22x35	25x30			0.15	0.355	22x40	25x30	30x25		0.15	0.355
	1.70	1.70					1.89	1.80	1.85			
680	22x40	25x35	30x25		0.15	0.293	22x45	25x35	30x30		0.15	0.292
	1.97	1.99	1.95				2.11	2.05	2.13			
820	22x50	25x40	30x30		0.15	0.243	22x50	25x40	30x30	35x30	0.15	0.243
	2.32	2.28	2.24				2.34	2.27	2.25	2.45		
1000		25x45	30x35	35x30	0.15	0.199		25x50	30x35	35x30	0.15	0.199
		2.58	2.57	2.65				2.67	2.55	2.63		
1200		25x50	30x40	35x35	0.15	0.166			30x40	35x35	0.15	0.166
		2.78	2.80	2.92					2.85	2.93		
1500			30x45	35x40	0.15	0.133			30x50	35x40	0.15	0.130
			3.03	3.17					3.10	3.10		
1800			30x50	35x45	0.15	0.111				35x45	0.15	0.111
			3.50	3.67						3.60		
2200				35x50	0.15	0.090						
				4.08								

Capacitance (μ F)	Rated (Surge) Voltage											
	200(250)						250(300)					
	ϕ DxL			tan δ	ESR	ϕ DxL			tan δ	ESR		
	Ripple Current					Ripple Current						
180							22x25				0.15	1.110
							1.00					
220	22x25	25x25			0.15	0.905	22x30	25x25			0.15	0.905
	1.00	1.08					1.15	1.15				
270	22x30	25x25			0.15	0.737	22x30	25x25			0.15	0.737
	1.15	1.15					1.30	1.30				
330	22x30	25x25			0.15	0.603	22x35	25x30			0.15	0.603
	1.29	1.30					1.45	1.45				
390	22x35	25x30	30x25		0.15	0.510	22x40	25x35	30x25		0.15	0.510
	1.45	1.45	1.51				1.62	1.63	1.60			
470	22x40	25x35	30x25		0.15	0.423	22x45	25x40	30x30	35x25	0.15	0.423
	1.67	1.68	1.65				1.80	1.84	1.80	1.85		
560	22x45	25x35	30x30		0.15	0.355		25x40	30x35	35x30	0.15	0.355
	1.94	1.87	1.96					2.00	2.10	2.20		
680	22x50	25x45	30x35	35x30	0.15	0.293		25x50	30x40	35x30	0.15	0.293
	2.14	2.21	2.20	2.27				2.32	2.35	2.30		
820		25x50	30x35	35x30	0.15	0.243			30x45	35x35	0.15	0.243
		2.32	2.22	2.30					2.57	2.55		
1000			30x45	35x35	0.15	0.199			30x50	35x40	0.15	0.199
			2.63	2.60					2.90	2.90		
1200			30x50	35x40	0.15	0.166				35x45	0.15	0.166
			2.90	2.90						3.25		
1500				35x45	0.15	0.133						
				3.11								

☆Size: D ϕ x L (mm). ☆tan δ : 20°C, 120Hz. ☆Ripple Current: 85°C, 120Hz, (A/rms) ☆ESR: 20°C, 120Hz, (Ω).

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■ Dimensions, Max Dissipation Factor, Max Permissible Ripple Current, Max Equivalent Series Resistance

Capacitance (μ F)	Rated (Surge) Voltage											
	315(365)					350(400)						
	ϕ DxL				tan δ	ESR	ϕ DxL				tan δ	ESR
	Ripple Current						Ripple Current					
82							22x25 0.70				0.15	2.426
100	22x25 0.75				0.15	1.989	22x30 0.80				0.15	1.989
120	22x30 0.80				0.15	1.658	22x30 0.85	25x25 0.85			0.15	1.658
150	22x30 1.00	25x25 1.00			0.15	1.326	22x35 1.11	25x25 1.05			0.15	1.326
180	22x35 1.10	25x30 1.10			0.15	1.105	22x40 1.16	25x35 1.17	30x25 1.15		0.15	1.105
220	22x40 1.31	25x30 1.25	30x25 1.29		0.15	0.905	22x45 1.34	25x35 1.30	30x30 1.35	35x25 1.39	0.15	0.905
270	22x45 1.44	25x35 1.40	30x30 1.46	35x25 1.50	0.15	0.737		25x45 1.51	30x35 1.49	35x25 1.45	0.15	0.737
330	22x50 1.63	25x40 1.60	30x35 1.68	35x30 1.74	0.15	0.603		25x50 1.67	30x40 1.68	35x30 1.65	0.15	0.603
390		25x45 1.75	30x35 1.75	35x30 1.80	0.15	0.510			30x45 1.87	35x35 1.85	0.15	0.510
470			30x40 2.00	35x35 2.06	0.15	0.423			30x50 2.10	35x40 2.10	0.15	0.423
560			30x45 2.20	35x40 2.29	0.15	0.355				35x45 2.30	0.15	0.355
680				35x45 2.50	0.15	0.293				35x50 2.60	0.15	0.293
820				35x50 2.80	0.15	0.243						

Capacitance (μ F)	Rated (Surge) Voltage											
	400(450)					450(500)						
	ϕ DxL				tan δ	ESR	ϕ DxL				tan δ	ESR
	Ripple Current						Ripple Current					
56							22x25 0.65				0.25	5.921
68	22x25 0.65				0.15	2.926	22x30 0.75				0.25	4.876
82	22x25 0.75				0.15	2.426	22x30 0.85	25x25 0.85			0.25	4.044
100	22x30 0.85	25x25 0.85			0.15	1.989	22x35 0.90	25x30 0.90			0.25	3.316
120	22x35 0.99	25x25 0.93	30x25 1.04		0.15	1.658	22x40 1.11	25x35 1.12	30x25 1.10		0.25	2.763
150	22x40 1.15	25x30 1.10	30x25 1.13		0.15	1.326	22x50 1.25	25x40 1.21	30x30 1.20		0.25	2.210
180	22x45 1.24	25x35 1.20	30x30 1.25		0.15	1.105		25x45 1.40	30x35 1.39	35x25 1.35	0.25	1.842
220	22x50 1.40	25x40 1.36	30x30 1.35	35x25 1.38	0.15	0.905		25x50 1.51	30x40 1.53	35x30 1.50	0.25	1.507
270		25x45 1.50	30x35 1.50	35x30 1.54	0.15	0.737			30x45 1.72	35x35 1.70	0.25	1.228
330		25x50 1.70	30x40 1.70	35x35 1.77	0.15	0.603			30x50 1.90	35x40 1.90	0.25	1.005
390			30x45 1.92	35x35 1.90	0.15	0.510				35x45 2.10	0.25	0.850
470				35x40 2.10	0.15	0.423				35x50 2.30	0.25	0.705
560				35x50 2.30	0.15	0.355						

☆Size: D ϕ x L (mm). ☆tan δ : 20°C, 120Hz. ☆Ripple Current: 85°C, 120Hz, (A/rms) ☆ESR: 20°C, 120Hz, (