



Aluminum Electrolytic Capacitors

LS

Features

- Snap-in terminal type
- 85°C, 2,000 hours assured
- RoHS Compliance



Sleeve & Marking Color: Black & White

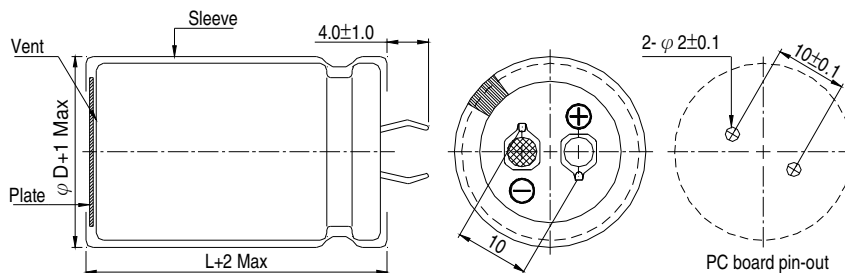
SPECIFICATIONS

Items	Performance														
Category Temperature Range	-40°C ~ +85°C														
Capacitance Tolerance	±20% (at 120Hz, 20°C)														
Leakage Current (at 20°C)	$I = 3\sqrt{CV}$ or 1.5 mA whichever is smaller (after 5 minutes) Where, C = rated capacitance in μF V = rated DC working voltage in V														
Dissipation Factor (Tan δ at 120Hz, 20°C)	Rated Voltage	16	25	35	50	63	100	160	200	250	350	400	420	450	500
	Tan δ (max)	0.50	0.45	0.40	0.35	0.30	0.20	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Low Temperature Characteristics (at 120Hz)	Impedance ratio shall not exceed the values given in the table below.														
	Rated Voltage	16	25	35	50	63	100	160	200	250	350	400	420	450	500
	Impedance Ratio	$Z(-25^\circ\text{C})/Z(+20^\circ\text{C})$		4	3	3	2	2	4	4	4	4	8	8	8
		$Z(-40^\circ\text{C})/Z(+20^\circ\text{C})$		15	10	8	6	5	4	8	10	10	16	18	18
Endurance	Test Time		2,000 Hrs												
	Capacitance Change		Within ±20% of initial value												
	Dissipation Factor		Less than 200% of specified value												
	Leakage Current		Within specified value												
	* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 2,000 hours at 85°C.														
Shelf Life Test	Test Time		1,000 Hrs												
	Capacitance Change		Within ±20% of initial value												
	Dissipation Factor		Less than 150% of specified value												
	Leakage Current		Within specified value												
	* The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements (Refer to JIS C 5101-4 4.1).														
Ripple Current & Frequency Multipliers	Case size	W. V.(V)	Freq.(Hz)		50 / 60	100 / 120	500	1k	10k up						
	Length \leq 55L	Under 100	160 ~ 250		0.81	1.00	1.32	1.45	1.50						
			350 to up		0.77	1.00	1.30	1.41	1.43						
			Length \geq 60L	160 ~ 450	160 ~ 450		0.88	1.00	1.20	1.25	1.40				

• 3,000 Hrs specifications are available upon request

DIAGRAM OF DIMENSIONS

Unit: mm





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DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: $\phi D \times L$ (mm)

Ripple Current: A/rms at 120 Hz, 85°C

V.DC μF	ϕD	16V (1C)								25V (1E)							
		22 ϕ		25 ϕ		30 ϕ		35 ϕ		22 ϕ		25 ϕ		30 ϕ		35 ϕ	
5,600										22x25	2.31						
6,800										22x25	2.38	25x25	2.78				
8,200		22x25	2.56							22x25	2.43	25x25	2.85				
10,000		22x25	2.60	25x25	2.81					22x30	2.97	25x25	2.93	30x25	3.21		
12,000		22x25	2.88	25x25	2.96					22x35	3.33	25x30	3.26	30x25	3.59	35x25	3.58
15,000		22x30	3.45	25x25	3.38	30x25	3.73			22x40	3.53	25x35	3.48	30x30	3.86		
18,000		22x30	3.47	25x25	3.47					22x40	3.68	25x35	3.77	30x25	3.60	35x25	3.96
22,000		22x35	3.69	25x30	3.64					22x50	4.08	25x40	4.00	30x35	4.12		
27,000		22x40	3.98	25x35	3.98					22x50	4.54	25x40	4.42	30x30	4.40	35x25	4.34
33,000		22x50	4.84	25x40	4.44	30x25	4.08	35x25	4.15			25x45	4.68	30x35	4.66	35x30	4.68
														30x45	4.70	35x25	4.60
															5.26	35x35	5.20

V.DC μF	ϕD	35V (1V)								50V (1H)							
		22 ϕ		25 ϕ		30 ϕ		35 ϕ		22 ϕ		25 ϕ		30 ϕ		35 ϕ	
2,200										22x25	1.93						
2,700										22x25	2.05						
3,300										22x30	2.21						
3,900										22x30	2.41	25x25	2.38				
4,700		22x30	2.51							22x35	2.51	25x25	2.46				
5,600		22x35	2.72							22x40	2.72	25x30	2.68				
6,800		22x40	2.83	25x25	2.42					22x40	2.83	25x30	3.03	30x25	3.01		
8,200		22x45	3.01	25x30	2.69					22x45	3.01	25x35	3.37	30x25	3.17	35x25	3.47
10,000		22x50	3.21	25x35	2.69					22x50	3.21	25x40	3.37	30x30	3.43		
12,000				25x40	2.67	30x25	2.99			22x50	3.43	25x45	3.73	30x30	3.56	35x25	3.64
15,000				25x45	2.89	30x30	3.04			22x50	3.73	25x40	3.87	30x35	3.87		
18,000				30x30	3.12	30x30	3.29			22x50	3.94	25x45	4.10	30x35	4.12	35x25	4.07
22,000				30x35	3.33	30x30	3.29					25x45	4.37	30x35	4.42	35x30	4.41
				30x40	3.37	30x30	3.36	35x25	3.32			25x50	4.91	30x40	4.68	35x30	4.59
				30x45	3.59	30x30	3.61							30x40	5.02	35x35	4.92
				30x30	3.79	30x30	3.74	35x25	3.75					30x40	5.10	35x35	5.30
				30x35	4.01	30x35	4.01	35x30	4.02					30x50	5.60	35x40	5.60
				30x35	4.54	30x35	4.54	35x25	4.37							35x40	6.03
				30x40	4.80	30x40	4.80	35x35	5.01							35x45	6.44
				30x45	5.18	30x45	5.18	35x40	5.71								
				30x45	5.79	30x45	5.79	35x45	6.38								



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DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: $\phi D \times L(\text{mm})$

Ripple Current: A/rms at 120 Hz, 85°C

V. DC μF	ϕD	63V (1J)						100V (2A)							
		22 ϕ		25 ϕ		30 ϕ		22 ϕ		25 ϕ		30 ϕ		35 ϕ	
1,200								22x30	2.12	25x25	2.10				
1,500								22x35	2.45	25x30	2.43	30x25	2.46		
1,800		22x25	1.90					22x40	2.77	25x35	2.77	30x25	2.65		
2,200		22x30	2.35	25x25	2.30			22x45	3.12	25x40	3.20	30x30	3.10	35x25	3.14
2,700		22x35	2.50	25x25	2.34					25x45	3.61	30x35	3.60	35x30	3.71
3,300		22x35	2.62	25x30	2.69	30x25	2.78			25x50	4.06	30x40	4.05	35x35	4.07
3,900		22x40	2.90	25x35	3.09	30x30	3.09					30x45	4.60	35x35	4.50
4,700		22x45	3.10												
4,700		22x50	3.49	25x40	3.37	30x30	3.37	35x25	3.36			30x50	5.13	35x40	5.12
5,600				25x45	3.77	30x35	3.75	35x30	3.88					35x45	5.75
6,800				25x50	4.41	30x40	4.41	35x30	4.04					35x50	6.01
8,200						30x45	4.90	35x35	4.80						
10,000						30x50	5.49	35x40	5.47						
12,000								35x45	5.97						
								35x50	6.30						

V. DC μF	ϕD	160V (2C)						200V (2D)									
		20 ϕ ~ 22 ϕ		25 ϕ		30 ϕ		35 ϕ ~ 40 ϕ		22 ϕ		25 ϕ		30 ϕ		35 ϕ ~ 40 ϕ	
150		22x25	0.95							22x25	0.95						
180		22x25	1.04							22x25	1.04						
220		22x25	1.15							22x25	1.15						
270		20x25	1.12							22x25	1.30						
270		22x25	1.27														
330		20x30	1.28							22x30	1.44	25x25	1.43				
330		22x25	1.40							22x30	1.65	25x25	1.63				
390		22x30	1.62							22x35	1.76	25x30	1.74				
470		22x30	1.77	25x25	1.77					22x35	1.88	25x30	1.86	30x25	1.85		
470		22x40	1.97							22x40	1.97						
560		22x30	1.92	25x25	1.92					22x40	2.08	25x30	2.05	30x25	2.05		
560		22x35	2.05	25x30	2.05	30x25	2.02			22x45	2.18	25x35	2.16	30x30	2.15		
680		22x35	2.12	25x30	2.22	30x25	2.22			22x45	2.36	25x35	2.36	30x30	2.36	35x25	2.10
680		22x40	2.24	25x35	2.31					22x50	2.47	25x40	2.43	30x35	2.43		
820		22x40	2.32	25x30	2.32	30x25	2.31	35x25	2.50	22x50	2.68	25x40	2.66	30x30	2.62	35x30	2.72
820		22x45	2.55	25x35	2.52	30x30	2.51					25x45	2.79	30x35	2.77	35x25	2.39
1,000		22x50	2.88	25x40	2.86	30x30	2.82	35x25	2.79			25x45	2.96	30x35	3.00	35x30	2.96
1,000				25x45	2.98	30x35	2.94					25x50	3.12	30x40	3.10	35x35	3.09
1,200				25x45	3.27	30x35	3.25	35x30	3.24			25x50	3.44	30x40	3.44	35x35	3.40
1,200				25x50	3.43	30x40	3.42	35x35	3.40					30x45	3.53	35x40	3.50
1,500						30x40	3.77	35x35	3.75					30x50	3.93	35x40	3.87
1,500						30x45	3.92	35x40	3.90							35x45	3.95
1,800						30x45	4.10	35x35	4.08							35x45	4.37
1,800						30x50	4.32	35x40	4.30							35x50	4.45
2,200								35x45	4.72							35x50	5.00
2,200								35x50	4.88							40x40	4.92
2,700																35x70	5.40
2,700																40x50	5.00
3,300								35x70	5.00							35x80	5.90
3,300								40x60	5.00							40x60	5.90
3,900								35x80	5.40							35x80	6.30
3,900								40x70	5.60							40x80	6.40
4,700								40x80	6.60							35x90	7.10
4,700																40x80	7.38
5,600																35x100	8.90
5,600																40x90	8.00
6,800																40x100	8.65



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DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: $\phi D \times L$ (mm)

Ripple Current: A/rms at 120 Hz, 85°C

V.DC μF	ϕD	250V (2E)						350V (2V)							
		22 ϕ		25 ϕ		30 ϕ		20 ϕ ~ 22 ϕ		25 ϕ		30 ϕ		35 ϕ	
82								22x25	0.81						
100								22x25	0.90						
120								20x30 22x25 22x30	0.95 0.99 1.05	25x25	1.04				
150	22x25	0.91						20x35 22x30 22x35	1.05 1.14 1.24	25x25 25x30	1.16 1.24	30x25	1.24		
180	22x25	1.01						20x40 22x35 22x40	1.23 1.28 1.38	25x30 25x35	1.30 1.37	30x25	1.37		
220	22x25 22x30	1.18 1.27	25x25	1.24				20x45 22x40 22x45	1.36 1.40 1.49	25x35 25x40	1.46 1.51	30x25 30x30	1.47 1.52		
270	22x30 22x35	1.43 1.52	25x25	1.49				22x45 22x50	1.62 1.69	25x35 25x40	1.65 1.73	30x30 30x35	1.71 1.76	35x25	1.72
330	22x30 22x35	1.58 1.67	25x25 25x30	1.53 1.62	30x25	1.59		22x50	1.94	25x40 25x45	1.88 1.96	30x35 30x40	1.93 1.98	35x25 35x30	1.77 1.96
390	22x35 22x40	1.79 1.89	25x30 25x35	1.79 1.87	30x25 30x30	1.77 1.85				25x45	2.04	30x35 30x40	2.12 2.18	35x30 35x35	2.19 2.24
470	22x40 22x45	2.05 2.14	25x35	2.05	30x25 30x30	1.80 2.03						30x40 30x45	2.41 2.48	35x35 35x40	2.43 2.50
560	22x50	2.43	25x40 25x45	2.32 2.41	30x30 30x35	2.24 2.32	35x25 35x30	2.21 2.30				30x45	2.60	35x35 35x40	2.62 2.69
680			25x45 25x50	2.62 2.70	30x35 30x40	2.58 2.65	35x30 35x35	2.54 2.62						35x40 35x45	2.80 3.08
820					30x40 30x45	2.92 3.00	35x35 35x40	2.90 2.98							
1,000					30x45 30x50	3.11 3.47	35x35 35x40 35x45	3.06 3.39 3.45							
1,200							35x40 35x45 35x50	3.39 3.74 3.81							
1,500							40x40	4.04							
1,800							35x70 40x50	4.60 4.50							
2,200							35x80 40x60	4.90 4.90							
2,700							35x90 40x80	5.40 6.30							
3,300							35x90 40x80	6.10 7.00							
3,900							35x100 40x90	7.47 8.00							
4,700							40x100	8.88							

V.DC μF	ϕD	400V (2G)						450V (2W)								
		20 ϕ ~ 22 ϕ		25 ϕ		30 ϕ		20 ϕ ~ 22 ϕ		25 ϕ		30 ϕ		35 ϕ		
56								20x25 22x25	0.57 0.68							
68	20x25 22x25	0.66 0.72						20x25 22x25 22x30	0.62 0.72 0.80							
82	20x25 22x25	0.72 0.80						20x30 22x30	0.74 0.87	25x25	0.85					
100	22x25 22x30	0.81 0.94	25x25	0.97				20x35 22x30 22x35	0.87 0.87 1.00	25x25	0.98					
120	22x30 22x35	1.04 1.12	25x25 25x30	1.08 1.16				20x40 22x35 22x40	0.96 1.05 1.15	25x30 25x35	1.09 1.12	30x25	1.10			
150	20x35 22x35 22x40	1.00 1.18 1.25	25x30	1.21	30x25	1.24		20x45 22x35 22x40	1.13 1.20 1.25	25x30 25x35 25x40	1.16 1.27 1.35	30x25 30x30	1.16 1.32			
180	20x40 22x40 22x45	1.17 1.34 1.40	25x30 25x35	1.23 1.37	30x25 30x30	1.45 1.52	35x25	1.54	20x50 22x45 22x50	1.29 1.36 1.51	25x35 25x40 25x45	1.31 1.45 1.50	30x30 30x35	1.43 1.49	35x25 35x30	1.35 1.49
220	20x50 22x50 22x50	1.43 1.56 1.56	25x35 25x40	1.56 1.62	30x30 30x35	1.58 1.64	35x25	1.60			25x40 25x45 25x50	1.47 1.65 1.73	30x30 30x35 30x40	1.45 1.63 1.72	35x25 35x30	1.43 1.61
270	22x50	1.74	25x40 25x45	1.70 1.76	30x30 30x35 30x40	1.56 1.73 1.79	35x25 35x30	1.53 1.75			25x45 25x50	1.59 1.72	30x35 30x40 30x45	1.65 1.83 1.95	35x30 35x35	1.71 1.86



Aluminum Electrolytic Capacitors

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DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: $\phi D \times L$ (mm)

Ripple Current: A/rms at 120 Hz, 85°C

V. DC μF	ϕD	400V (2G)						450V (2W)									
		20 ϕ ~ 22 ϕ		25 ϕ		30 ϕ		35 ~ 40 ϕ		20 ϕ ~ 22 ϕ		25 ϕ		30 ϕ		35 ~ 40 ϕ	
330				25x45 25x50	1.76 1.90	30x35 30x40 30x45	1.76 1.97 2.02	35x30 35x35	1.95 2.02			25x50	1.76	30x40 30x45 30x50	1.93 2.10 2.19	35x30 35x35 35x40	1.88 2.06 2.13
390				25x50	1.95	30x40 30x45	2.15 2.22	35x30 35x35 35x40	1.97 2.17 2.24					30x45 30x50	2.03 2.24	35x35 35x40 35x45	2.00 2.11 2.34
470						30x45 30x50	2.23 2.40	35x35 35x40 35x45	2.20 2.42 2.48					30x50	2.33	35x45 35x50	2.43 2.63
560						30x50	2.44	35x40 35x45 35x50	2.49 2.71 2.78							35x45	2.60
680								35x45 35x50 35x60 40x50	2.88 2.95 3.70 3.70							35x50 35x70 40x50	2.91 4.00 3.70
820								35x60 40x50	4.10 4.00							35x80 40x60	4.60 4.30
1,000								35x70 40x60	4.80 4.80							35x100 40x70	5.60 5.10
1,200								35x100 40x70	6.10 5.50							40x80	5.80
1,500								35x100 40x80	6.80 6.50							40x100	7.20
1,800								40x100	7.80								

V. DC μF	ϕD	420V (2P)				500V (2H)							
		35 ϕ		40 ϕ		22 ϕ		25 ϕ		30 ϕ		35 ϕ	
56						22x25	0.70						
68						22x30	0.82						
82						22x35	0.96	25x30	0.97				
100						22x40	1.14	25x35	1.15	30x30	1.16		
120						22x45	1.30	25x35	1.25	30x30	1.26	35x25	1.20
150						22x50	1.52	25x40	1.48	30x35	1.50	35x30	1.34
180								25x50	1.65	30x40	1.60	35x30	1.55
220										30x45	1.90	35x30	1.85
270												35x40	1.95
330												35x45	2.00
680		35x60	3.70	40x50	3.70								
820		35x70	4.40	40x60	4.30								
1,000		35x80	5.10	40x60	4.80								
1,200				40x70	5.50								
1,500				40x100	7.20								
1,800				40x100	7.80								

Ripple current: A/rms
Case size: $\phi D \times L$ (mm)

Part numbering system

LS series	100 μF	$\pm 20\%$	400V	4.0 ± 0.5 mm	22 ϕ x30L	Pb-free Terminal + PVC Sleeve
LS-	101	M	2G	--	A	2230
Series name	Capacitance	Capacitance tolerance	Rated voltage	Terminal type	Terminal length	Case size
Example:	Example:	Example:	Example:	Example:	Example:	Example:
Cap. Symbol	WV Symbol	M = $\pm 20\%$ K = $\pm 10\%$	400 2G 450 2W	Type Symbol 2 pins -- 5 pins L5	6.3 ± 1.0 mm	$\phi D \times L$ Code 22x30 2230 25x25 2525 30x40 3040

Note: For more details, please refer to "Product Code Guide- Snap-in Type" on page 15.