

ALUMINUM ELECTROLYTIC CAPACITORS



SM Series

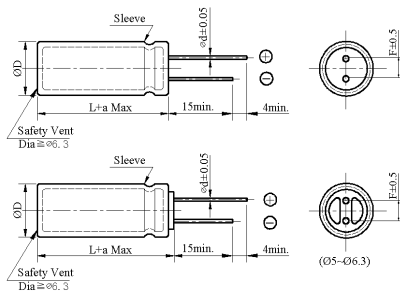
- Standard size downsized
- 2,000 hours assured at 85°C



◆ SPECIFICATIONS

Item	Performance Characteristics	
Category Temperature Range	-40 ~ +85°C	-25 ~ +85°C
Working Voltage Range	6.3 ~ 100Vdc	160 ~ 450Vdc
Capacitance Range	0.1 ~ 22,000μF	0.47 ~ 470 μF
Capacitance Tolerance	±20% (at 25°C and 120Hz)	
Dissipation Factor (tanδ) (at 25°C, 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 100 160 ~ 250 350 ~ 450
	tanδ(Max)	0.26 0.22 0.16 0.14 0.12 0.10 0.09 0.08 0.15 0.20
Leakage Current	The above values should be increased by 0.02 for every additional 1000μF	
	I=0.01CV or 3μA whichever is greater (6.3 ~ 100V) I=0.03CV + 10μA (160 ~ 450V) I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes.	
Low Temperature Characteristics Impedance Ratio(MAX)	Rated voltage (V)	6.3 10 16 25 35 50 63 100 160 ~ 250 350 400 ~ 450
	Z(-40°C)/Z(+20°C)	12 10 8 5 4 3 3 3 — — —
	Z(-25°C)/Z(+20°C)	— — — — — — — — 3 6 6
Endurance	The following requirements shall be satisfied when the capacitor are restored to 25°C after the rated voltage applied for 2,000 hours at 85°C.	
	Capacitance change	≒ ±20% of the initial value
	Dissipation factor(tanδ)	≒ 200% of the specified value
	Leakage current	≒ specified value
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 25°C after the rated voltage applied for 1,000 hours at 85°C without voltage applied.	
	Capacitance change	≒ ±20% of the initial value
	Dissipation factor(tanδ)	≒ 200% of the specified value
	Leakage current	≒ 200% of the specified value
Others	Conforms to JIS-C-5101-4 (1998), characteristic W.	

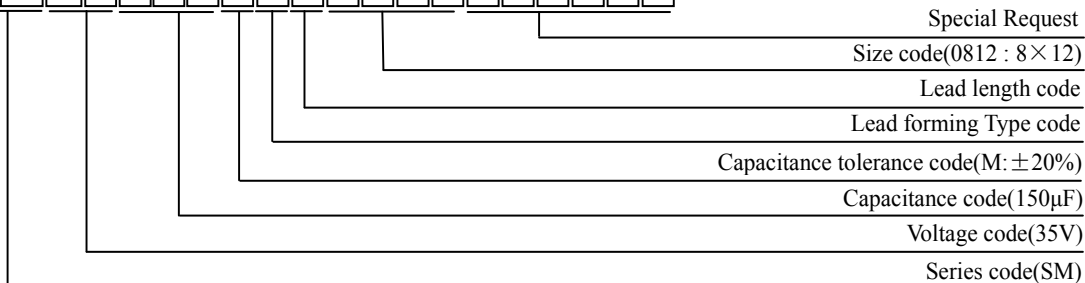
◆ DIMENSIONS (mm)



ΦD	5	6.3	8	10	12.5 L<35	12.5 L≥35	16	18	20	22
ΦD	ΦD +0.5 Max								ΦD +1.0 Max	
Φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0		7.5	7.5	10	10
a	L+1.5 Max				≤ 35 L+1.5Max ≥ 40 L+2.0 Max		L+1.5 Max		L+2.0 Max	

◆ PART NUMBERING SYSTEM (Example : 35V 150μF)

S M 1 V 1 5 1 M N N 0 8 1 2



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◆ Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz

uF \ Vdc	6.3		10		16		25	
	ΦD × L	RC	ΦD × L	RC	ΦD × L	RC	ΦD × L	RC
4.7							5×11	30
10					5×11	40	5×11	55
22	5×11	65	5×11	65	5×11	75	5×11	80
33	5×11	80	5×11	85	5×11	90	5×11	95
47	5×11	95	5×11	100	5×11	110	5×11	120
68	5×11	100	5×11	110	5×11	120	6.3×11	145
100	5×11	130	5×11	150	5×11	160	6.3×11	190
150	5×11	150	5×11	160	6.3×11	210	6.3×11	210
220	5×11	200	5×11	220	6.3×11	270	8×11.5	320
330	6.3×11	270	6.3×11	300	8×11.5	370	8×11.5	400
470	6.3×11	330	6.3×11	360	8×11.5	440	10×12.5	520
680	8×11.5	445	8×11.5	445	10×12.5	500	10×16	605
1000	8×11.5	540	10×12.5	650	10×16	770	10×20	930
2200	10×16	930	10×20	1130	12.5×20	1300	12.5×25	1550
3300	10×20	1230	12.5×20	1450	12.5×25	1700	16×25	1730
4700	12.5×20	1520	12.5×25	1790	16×25	1840	16×31.5	2140
6800	12.5×25	1890	16×25	1940	16×31.5	2280	18×35.5	2630
10000	16×25	2030	16×31.5	2470	18×35.5	2750		
15000	16×35.5	2590	18×35.5	2870				
22000	18×35.5	3220	18×40	3300				

uF \ Vdc	35		50		63		100	
	ΦD × L	RC	ΦD × L	RC	ΦD × L	RC	ΦD × L	RC
0.1			5×11	2			5×11	3
0.22			5×11	3			5×11	5
0.33			5×11	5			5×11	7
0.47			5×11	14			5×11	16
1			5×11	20			5×11	23
2.2			5×11	30			5×11	34
3.3			5×11	37			5×11	42
4.7	5×11	35	5×11	40	5×11	45	5×11	50
10	5×11	60	5×11	65	5×11	65	6.3×11	80
22	5×11	90	5×11	95	5×11	95	6.3×11	120
33	5×11	110	6.3×11	120	6.3×11	130	8×11.5	170
47	5×11	130	6.3×11	160	6.3×11	160	10×12.5	220
68	6.3×11	160	6.3×11	170	8×11.5	180	10×12.5	235
100	6.3×11	210	8×11.5	270	10×12.5	290	10×16	340
150	8×11.5	290	10×12.5	345	10×12.5	345	12.5×20	490
220	8×11.5	360	10×12.5	430	10×16	470	12.5×25	710
330	10×12.5	490	10×20	600	12.5×20	660	12.5×25	870
470	10×16	580	12.5×20	760	12.5×20	850	16×25	1010
680	10×20	720	12.5×20	875	12.5×25	1000	16×35.5	1100
1000	12.5×20	1200	12.5×25	1360	16×25	1310	18×35.5	1350
2200	16×25	1880	16×35.5	2060	18×35.5	2220		
3300	16×35.5	2190	18×35.5	2500				
4700	18×35.5	2560						

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◆ Case size & Permissible rated ripple current: (mA rms) at 85°C / 120Hz

uF \ Vdc	160		200		250		350	
	ΦD × L	RC	ΦD × L	RC	ΦD × L	RC	ΦD × L	RC
0.47	5×11	12	5×11	12	5×11	12	5×11	14
1	5×11	17	5×11	17	6.3×11	17	6.3×11	18
2.2	6.3×11	26	6.3×11	26	6.3×11	30	8×11.5	28
3.3	6.3×11	35	6.3×11	35	8×11.5	35	8×11.5	35
4.7	6.3×11	40	8×11.5	45	8×11.5	45	10×12.5	41
10	8×11.5	65	8×11.5	70	10×12.5	70	10×16	70
22	10×16	110	10×20	110	10×20	130	12.5×20	110
33	10×20	150	10×20	160	12.5×20	160	12.5×25	140
47	12.5×20	180	12.5×20	180	12.5×20	210	16×25	220
68	12.5×25	230	12.5×25	230	16×25	250	16×31.5	260
82	12.5×25	250	12.5×25	260	16×25	265	18×31.5	270
100	12.5×25	300	16×25	330	16×31.5	310	18×31.5	305
120	12.5×25	325	16×25	350	16×31.5	345	18×31.5	340
150	16×25	360	16×31.5	400	16×35.5	530	18×35.5	380
180	16×31.5	415	16×35.5	430	18×35.5	540	18×40	410
220	16×31.5	510	16×35.5	520	18×35.5	600		
330	18×35.5	600	18×35.5	635	18×40	650		
470	18×40	700	18×40	705				

uF \ Vdc	400		450	
	ΦD × L	RC	ΦD × L	RC
0.47	6.3×11	14	6.3×11	14
1	6.3×11	18	8×11.5	19
2.2	8×11.5	28	8×11.5	25
3.3	8×11.5	32	10×12.5	32
4.7	10×16	41	10×16	50
10	10×20	70	12.5×20	75
22	12.5×25	120	12.5×25	110
33	16×25	140	16×25	150
47	16×25	160	16×31.5	220
68	16×35.5	280	18×31.5	230
82	18×31.5	290	18×35.5	245
100	18×31.5	300	18×40	280
120	18×35.5	330	18×45	300
150	18×40	360		
180	18×45	400		

◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Vdc	Cap.(uF)	Frequency (Hz)				
		50/60	120	1K	10K	100K
6.3 ~ 100	0.1 ~ 68	0.75	1.00	1.57	2.00	2.00
	100 ~ 680	0.80	1.00	1.34	1.40	1.50
	1000 ~ 22000	0.85	1.00	1.13	1.13	1.13
160 ~ 450	0.47 ~ 220	0.80	1.00	1.40	1.40	1.40
	330 ~ 470	0.90	1.00	1.13	1.13	1.13