

SX [For Low Impedance & Low E.S.R]

105°C Single-Ended Lead Aluminum Electrolytic Capacitors For High Frequency Applications

Miniature Size Aluminum Electrolytic Capacitors

ELECTRICAL CHARACTERISTICS

Operating Temperature : -40° ~ +105°C

Working Voltage : 6.3 ~ 100V

Rate Capacitance Range : 1 ~ 15000μF

Capacitance Tolerance : -20 ~ +20%

DC Leakage Current (μA) : I = 0.01 CV or 3(μA) Whichever is greater.

(Measurements shall be Made After a 2 Minute Charge at Rated Working Voltage)

Dissipation Factor : at 120 Hz, 25°C

WV (V) :	6.3	10	16	25	35	50	63	80	100
D.F (%) :	19	16	14	12	10	8	8	7	7

For capacitor whose capacitance exceeds 1000μF. The value of D.F(%) is increased by 2% for every addition of 1000μF.

Temperature Characteristics : at 120 Hz

WV (V) :	6.3	10	16	25	35	50	63	100
Impedance : Z - 40°C / Z + 20°C	10	6	5	4	4	4	4	4

Load Life : At 105°C Assured with Full Rated Maximum Ripple Current Applied

Case Dia	øD ≤ 8	øD = 10	øD ≥ 12
Load Life	2000	3000	5000

(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 : 1000 Hours, No Voltage Applied, at 105°C

(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 Requirement



RoHS
COMPLIANT

DESCRIPTION

Used in switching regulator applications in computers. Especially for high frequency.

Low impedance and E.S.R., high permissible ripple current at high frequency and higher operation temperature (-40°C to +105°C).

High Temperature Load Life at 105°C for 2000 ~ 5000 Hours

Multiplier for Ripple Current
Frequency coefficient

Frequency(Hz)	50	120	300	1K	10K	100K
~4.4μF	0.30	0.40	0.50	0.70	0.80	1.00
5.6~33μF	0.40	0.50	0.60	0.80	0.90	1.00
34~330μF	0.60	0.70	0.80	0.90	0.95	1.00
331~1000μF	0.65	0.90	0.90	0.98	1.00	1.00
1200μF higher	0.85	0.90	0.95	0.98	1.00	1.00

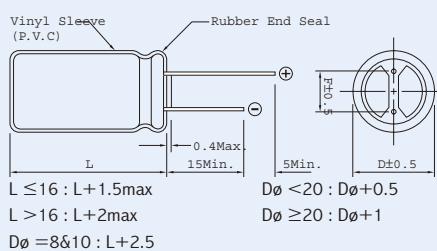
Temperature coefficient

Temperature(°C)	65	85	105
Factor	1.80	1.50	1.00

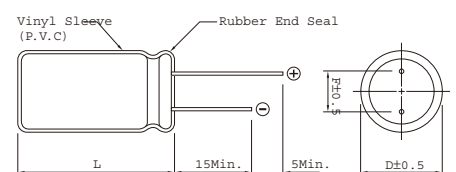
DIAGRAM OF DIMENSIONS

Dø	F	dø
4.0	1.5	0.45
5.0	2.0	0.5
6.0	2.5	
8.0	3.5	
10.0	5.0	0.6
12.0		
13.0		
16.0	7.5	0.8
18.0		
22.0	10.0	0.8

Rubber Stand-off



Dimensions : mm



CAP. (μF)	RATED VOLTAGE								
	SIZE	6.3 Ripple	ESR	SIZE	10 Ripple	ESR	SIZE	16 Ripple	ESR
4.7									
6.8									
10				5 × 11	20	5.900			
							5 × 11	42	1.180
22				5 × 11	44	5.400	5 × 11	53	3.300
33	5 × 11	131	0.217	5 × 11	66	3.300	5 × 11	79	2.100
47	5 × 11	139	0.203	5 × 11	94	2.200	5 × 11	210	0.580
56							5 × 11	210	0.580
68	5 × 11	150	0.182	5 × 11	136	1.300	5 × 11	210	0.580
							6.3 × 11	163	0.920
82				5 × 11	210	0.58	5 × 11	210	0.580
100	5 × 11	210	0.58	5 × 11	210	0.58	6.3 × 11	340	0.220
				6.3 × 11	200	0.10	8 × 11	241	0.890
120	5 × 11	210	0.58	5 × 11	210	0.58	6.3 × 11	340	0.220
				6.3 × 11	240	0.91	8 × 11	290	0.580
150	5 × 11	210	0.58	6.3 × 11	265	0.700	6.3 × 11	340	0.470
	6.3 × 11	210	0.58				8 × 11	380	0.470
180	6.3 × 11	340	0.22	6.3 × 11	340	0.22	8 × 11	640	0.130
220	8 × 11	285	0.61	6.3 × 11	340	0.22	8 × 11	410	0.330
	6.3 × 11	340	0.22	8 × 11	370	0.480			
270	6.3 × 11	340	0.22	8 × 11	640	0.13	8 × 11	640	0.130
330	8 × 11	410	0.40	8 × 11	470	0.330	10 × 12	600	0.230
	6.3 × 11	340	0.22				8 × 11	600	0.230
390	8 × 11	640	0.13				10 × 12	640	0.130
470	10 × 12	550	0.28	8 × 11	480	0.300	8 × 20	710	0.180
	6.3 × 11	540	0.22	10 × 12	590	0.240	8 × 15	750	0.180
	8 × 11	640	0.13				10 × 15	750	0.180
							10 × 12	750	0.180
560	8 × 11	640	0.13	8 × 15	790	0.18	8 × 15	840	0.06
							10 × 15	1050	0.14
680	10 × 15	735	0.220	8 × 20	790	0.180	10 × 19	1050	0.140
	8 × 11	640	0.13	10 × 12	750	0.18	8 × 20	1050	0.140
	8 × 15	840	0.087	10 × 15	790	0.18	10 × 15	1050	0.140
820	8 × 11	640	0.13	10 × 15	990	0.14	10 × 12	865	0.140
	10 × 15	795	0.190	10 × 19.5	990	0.140	10 × 15	1050	0.140
	8 × 15	840	0.089						
	10 × 12	865	0.08						
1000	10 × 19.5	950	0.170	8 × 20	1060	0.12	10 × 19	990	0.042
	10 × 12	865	0.08	10 × 15	1060	0.12	10 × 30	1400	0.091
				10 × 19.5	1060	0.12	10 × 25	990	0.042
1200	10 × 19.5	1000	0.136	10 × 25	1290	0.120	10 × 25	1450	0.086
	8 × 20	1050	0.069				12 × 25	1450	0.086
	10 × 15	1210	0.06						
1500	10 × 12	865	0.08	10 × 30	1450	0.093	12 × 25	1650	0.072
	10 × 19.5	1000	0.046	10 × 25	1450	0.093	10 × 30	1650	0.072
	8 × 20	1050	0.069				13 × 25	1790	0.055
	10 × 25	1200	0.120						
1800	10 × 25	1650	0.042	13 × 20	1900	0.046	13 × 25	1924	0.056
2200	10 × 30</								

* 3. ESR (Ω Max20°C / 100KHz)



CASE SIZE OF STANDARD PRODUCTS $D \geq \varnothing 6\text{mm}$ with Safety Vent at Can Bottom

CAP. (μF)	RATED VOLTAGE								
	SIZE	25 Ripple	ESR	SIZE	35 Ripple	ESR	SIZE	50 Ripple	ESR
1							5 x 11	180	2.4
2.2							5 x 11	180	1.3
3.3							5 x 11	180	1.3
15							5 x 11	180	1.3
18							5 x 11	180	0.7
4.7							5 x 11	180	1.3
6.8				4 x 7	20	0.770	5 x 11	180	1.3
10				5 x 11	42	0.310	5 x 11	180	1.3
12							5 x 11	180	1.3
22	5 x 11	66	3.300	5 x 11	101	0.580	6.3 x 11	129	0.900
							5 x 11	180	0.7
27				5 x 11	210	0.580	5 x 11	180	0.7
33	5 x 11	99	1.300	6.3 x 11	151	0.870	8 x 11	194	0.720
							6.3 x 11	295	0.3
39	5 x 11	210	0.580	5 x 11	210	0.580	6.3 x 11	295	0.3
47	5 x 11	210	0.580	8 x 11	216	0.870	8 x 11	276	0.660
				6.3 x 11	340	0.220	6.3 x 11	222	0.82
56	5 x 11	210	0.580	6.3 x 11	340	0.220	8 x 11	555	0.17
68	8 x 11	204	0.570	8 x 11	340	0.220	10 x 12	400	0.310
				6.3 x 11	340	0.220	8 x 11	555	0.17
82	5 x 11	340	0.220	8 x 11	640	0.130	8 x 11	555	0.17
100	6.3 x 11	340	0.220	8 x 11	370	0.390	8 x 15	730	0.12
							8 x 11	400	0.29
	8 x 11	300	0.420	10 x 12	460	0.320	10 x 15	440	0.29
							10 x 12	440	0.29
120	8 x 11	400	0.380	8 x 11	550	0.260	8 x 15	670	0.17
				10 x 12	550	0.260	10 x 15	670	0.170
							10 x 12	670	0.17
150	8 x 11	460	0.330	8 x 11	600	0.230	10 x 19.5	860	0.150
	10 x 12	460	0.330	10 x 12	600	0.230	10 x 15	860	0.15
180	8 x 11	640	0.130	10 x 12	800	0.180	8 x 20	910	0.091
							10 x 15	910	0.091
220	10 x 15	630	0.230	10 x 12	690	0.210	10 x 15	780	0.150
				8 x 15	800	0.180	10 x 19.5	1030	0.110
				10 x 15	800	0.180	10 x 25	1030	0.110
270	10 x 12	865	0.08	10 x 15	800	0.180	10 x 25	1440	0.550
330	10 x 12	800	0.190	10 x 19.5	1060	0.130	10 x 30	1070	0.110
	8 x 15	800	0.190	8 x 20	1060	0.130	12 x 20	1220	0.092
	10 x 15	800	0.190	10 x 15	1060	0.130	13 x 20	1300	0.086
	8 x 20	525	0.069				13 x 25	1300	0.086
390	10 x 15	1210	0.060	10 x 19.5	1420	0.089	13 x 20	1660	0.055
470	10 x 15	1050	0.140	10 x 30	990	0.089	12 x 25	1500	0.068
	8 x 20	1050	0.140	10 x 19.5	1420	0.089	10 x 30	1690	0.043
	10 x 19.5	1050	0.140	13 x 25	1060	0.086	13 x 25	1690	0.043
560	10 x 19.5	1400	0.046	12 x 20	1500	0.080	13 x 25	1930	0.054
				10 x 25	1650	0.042			
				10 x 30	1450	0.035			
680	10 x 15.5	1400	0.090	12 x 25	1650	0.070	13 x 30	1850	0.048
	10 x 30	1400	0.090	10 x 30	1450	0.035	12 x 35	1850	0.048
				13 x 20	1650	0.070	16 x 20	1850	0.048
820	12 x 25	1450	0.085	12 x 30	1750	0.066	12 x 40	2020	0.042
	10 x 25	1650	0.042	12 x 25	1750	0.076	16 x 25	1553	0.025
	13 x 20	1900	0.035	13 x 25	1750	0.076	18 x 20	2020	0.042
				18 x 15	1750	0.076			
1000	10 x 30	1650	0.071	12 x 30	2000	0.061	16 x 25	1800	0.060
	12 x 20	1420	0.091	13 x 25	2000	0.061	16 x 32	2120	0.050
	13 x 20	1650	0.071	16 x 20	2000	0.061			
	12 x 25	1650	0.071						
1200	12 x 30	1700	0.078	12 x 35	2200	0.049	16 x 36	2260	0.043
	13 x 25	1700	0.078	13 x 30	2200	0.049	18 x 25	2260	0.043
	18 x 15	1700	0.078						
1500	12 x 30	1950	0.062	12 x 40	2350	0.046	16 x 40	2420	0.035
	13 x 25	1950	0.062	16 x 25	2948	0.028	16 x 36	2420	0.035
	16 x 20	1950	0.062						
1800	13 x 30	2210	0.035	18 x 20	2882	0.034	16 x 40	3635	0.021
				16 x 25	2882	0.034			
2200	12 x 40	2360	0.044	16 x 36	2700	0.044	18 x 32	3635	0.021
	12 x 35	2360	0.044	16 x 32	2700	0.044	18 x 36	3680	0.017
	16 x 25	2495	0.034	18 x 25	2700	0.044			
	18 x 20	2495	0.034						
2700	16 x 25	2552	0.028	16 x 36	3608	0.020	18 x 40	3800	0.014
				18 x 32	3608	0.020			
3300	16 x 36	2700	0.045	18 x 36	3050	0.035			
	16 x 32	2700	0.045	18 x 40	3050	0.035			
	18 x 25	2700	0.045						
3900	16 x 36	3124	0.024	18 x 40	4367	0.015			
	18 x 32	3124	0.024						
4700	18 x 36	3000	0.036						
	18 x 40	3000	0.036						
4900	18 x 40	3781	0.015						
5600	18 x 40	3781	0.015						
6800									
8200									
10000									
15000									

Note : * L, D x L : mm

* 2. Ripple Current : (mA r.m.s 105°C / 100KHz)

* 3. ESR (Ω Max 20°C / 100KHz)



CASE SIZE OF STANDARD PRODUCTS D $\geq$ $\varnothing$ 6mm with Safety Vent at Can Bottom

CAP. (μ F)	RATED VOLTAGE								
	63			80			100		
	SIZE	Ripple	ESR	SIZE	Ripple	ESR	SIZE	Ripple	ESR
4.7	5 x 11	36	4.600	5 x 11	43	4.200	5 x 11	65	4.100
6.8	5 x 11	52	4.300	5 x 11	62	1.900	5 x 11	55	1.840
							8 x 11	94	1.300
10	5 x 11	77	2.000	6.3 x 11	92	1.400	8 x 11	138	1.100
12	5 x 11	55	1.840				6.3 x 11	115	0.960
15	6.3 x 11	116	1.400	8 x 11	138	1.100	8 x 11	207	0.800
18	6.3 x 11	85	1.500						
22	8 x 11	170	1.200	8 x 11	203	0.640	10 x 12	305	0.530
	6.3 x 11	115	0.960						
27							8 x 11	232	0.504
33	8 x 11	250	0.750	10 x 12	305	0.540	10 x 15	500	0.350
39	8 x 11	232	0.504				8 x 15	288	0.344
47	10 x 12	365	0.560	10 x 15	410	0.360	10 x 19.5	288	0.344
	8 x 11	232	0.504				10 x 12	288	0.344
56	8 x 11	232	0.504				8 x 20	362	0.264
68	10 x 15	500	0.360	10 x 19.5	600	0.260	10 x 25	357	0.248
	8 x 11	232	0.504				10 x 15	357	0.248
82	10 x 12	288	0.344				10 x 19.5	466	0.168
100	10 x 15	288	0.344	10 x 25	795	0.190	10 x 30	531	0.160
	8 x 15	300	0.344				13 x 20	531	0.160
	10 x 12	288	0.344				10 x 25	531	0.160
120	10 x 15	357	0.248	10 x 30	900	0.170	12 x 30	663	0.130
	10 x 19.5	820	0.270						
	10 x 30	663	0.120						
	13 x 20	690	0.128						
150	8 x 20	362	0.264	10 x 30	955	0.150	12 x 30	1200	0.128
	10 x 25	950	0.200						
180	10 x 19.5	466	0.168				13 x 25	784	0.096
220	12 x 25	531	0.160	12 x 30	1200	0.130	16 x 32	905	0.086
	10 x 19.5	466	0.210				12 x 30	905	0.080
	10 x 25	531	0.160				16 x 20	905	0.080
	13 x 20	531	0.160						
270							12 x 35	1050	0.066
							16 x 25	1050	0.066
330	10 x 30	663	0.130	12 x 35	1450	0.088	12 x 40	1180	0.057
	12 x 30	663	0.130				16 x 32	1180	0.062
	13 x 20	663	0.130				18 x 20	1180	0.064
	13 x 25	663	0.130				16 x 36	1180	0.062
390	13 x 25	784	0.096				16 x 32	1570	0.043
							18 x 25	1490	0.046
470	12 x 35	905	0.091	16 x 32	1790	0.063	16 x 36	1790	0.036
	12 x 30	905	0.080				16 x 40	2160	0.048
	13 x 25	392	0.096				18 x 32	1630	0.038
	16 x 20	905	0.073				18 x 36	1630	0.047
560	16 x 25	1250	0.058				18 x 40	2020	0.032
680	16 x 32	1240	0.065	16 x 40	1990	0.060	18 x 36	1790	0.032
	12 x 35	1050	0.066						
	16 x 25	1250	0.058						
	18 x 20	1240	0.064						
820	16 x 36	1490	0.056	18 x 36	2200	0.060	18 x 40	2330	0.029
	12 x 40	1180	0.057						
	16 x 32	1180	0.057						
	18 x 25	1490	0.046						
1000	18 x 36	1570	0.049	18 x 40	2370	0.044			
	16 x 32	1570	0.043						
	16 x 36	1570	0.036						
1200	18 x 40	2520	0.046						
	16 x 40	1630	0.032						
	18 x 32	1630	0.038						
1500	18 x 36	1790	0.032						
1800	18 x 40	2330	0.029						
2200									
3300									
3900									
4700									
6800									
8200									
10000									
15000									

Note : * 1. D x L : mm

* 2. Ripple Current : (mA r.m.s 105°C / 100KHz)

* 3. ESR (Ω Max25°C / 100KHz)