

# Miniature Aluminum Electrolytic Capacitors

## SY [ For Low Impedance and Low ESR Suitable for Motherboard Output Termination ]

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



### DESCRIPTION

Features: Low ESR, high permissible ripple current at high frequency and long life than SC

Recommended Applications: Used switching regulator applications in computers

Especially for high frequency

### MULTIPLIER FOR RIPPLE CURRENT

Frequency Coefficient

FREQUENCY (Hz)	120	1K	10K	100K
22~180μF	0.40	0.75	0.90	1.00
220~560μF	0.50	0.85	0.94	1.00
680~1800μF	0.60	0.87	0.95	1.00
2200~3900μF	0.75	0.90	0.95	1.00
4700μF Higher	0.85	0.95	0.98	1.00

### ELECTRICAL CHARACTERISTICS

Operating Temperature Range : -40 ~ +105°C

Rated Voltage Range : 6.3 ~ 100V

Rated Capacitance Range : 6.8 ~ 15,000μF

Capacitance Tolerance : -20 ~ +20% at 120Hz, 20°C

Leakage Current (Max.) (20°C):  $I = 0.01CV$  or  $3\mu A$  whichever is greater.

(After Rated Voltage Applied for 2 Minutes)

$I$  = Leakage Current ( $\mu A$ ),  $C$  = Nominal Capacitance ( $\mu F$ ),  $V$  = Rated Voltage (V)

Dissipation Factor

WV (V) :	6.3	10	16	25	35	50	63	100	--
D.F. (%) :	22	19	16	14	12	10	9	8	--

When nominal capacitance is over 1,000μF,  $\tan \delta$  shall be added 0.02 to the listed value with increase of every 1000μF.

WV (V) :	Rated Voltage (V)		6.3	10	16	25	35	50	63	100
Impedance :	Z - 25°C / Z + 20°C		4	3	2	2	2	2	2	2
	Z - 40°C / Z + 20°C		8	6	4	3	3	3	3	3

Endurance

D $\phi$ :	5 $\phi$ ~6.3 $\phi$	8 $\phi$ ~10 $\phi$ x12.5	10 $\phi$ x15~12 $\phi$	13 $\phi$ ~18 $\phi$
Life :	3000hrs	4000hrs	5000hrs	6000hrs

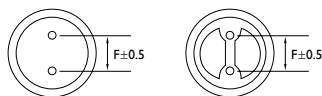
After the rated voltage has been applied at 105°C for 6000 hours. The capacitors shall meet the following requirements.

- (a) Capacitance Change : Within 25% of Initial Value
- (b) Dissipation Factor : Not Exceeding 200% of Specified Value
- (c) Leakage Current : Not Exceeding the Specified Value

Shelf Life : After having been placed at 105°C without voltage applied for 1000 hours, the capacitors shall meet the same requirements as Endurance.

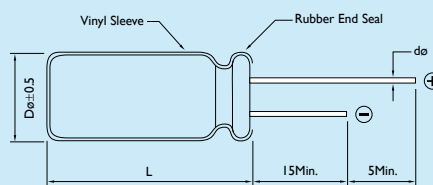
### DIAGRAM OF DIMENSIONS

Dimensions: mm



$D\phi < 20$   $D\phi \pm 0.5$   
 $D\phi \geq 20$   $D\phi \pm 1$

Rubber Stand-off



$L \leq 16$   $L + 1.5Max.$   
 $L > 16$   $L + 2Max.$   
 $D\phi = 8 \& 10$   $L + 2.5Max.$

D $\phi$	F	d $\phi$
5.0	2.0	0.5
6.3	2.5	
8.0	3.5	0.6
10.0	5.0	
12.0		
13.0		
16.0	7.5	0.8
18.0		

## CASE SIZE & PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

CAP. (μF)	RATED VOLTAGE WV (SURGE VOLTAGE WV)								
	6.3 (8) SIZE			10 (13) SIZE			16 (20) SIZE		
	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR
56							5 x 11	210	0.580
100				5 x 11	210	0.58	6.3 x 11	250	0.230
120							6.3 x 11	340	0.220
150	5 x 11	210	0.58						
220				6.3 x 11	340	0.22	6.3 x 11	469	0.185
							8 x 11	582	0.150
330	6.3 x 11	340	0.22				8 x 11	640	0.130
470	6.3 x 11	510	0.16	8 x 11	640	0.13	*8 x 15	840	0.087
							8 x 20	950	0.078
							*10 x 12	865	0.080
							10 x 15	1210	0.060
680	8 x 11	640	0.13	8 x 15	840	0.087	8 x 20	1050	0.069
							10 x 15	1210	0.060
820	10 x 12	865	0.08	10 x 12	865	0.08			
1000	8 x 15	840	0.087	8 x 20	1050	0.069	8 x 20	1050	0.069
							10 x 15	1210	0.06
							*10 x 15	1210	0.060
							10 x 19.5	1400	0.046
1200	8 x 20	1050	0.069	10 x 19.5	1400	0.046	10 x 25	1650	0.042
							10 x 15	1210	0.06
1500	8 x 20	1050	0.069	10 x 25	1650	0.042	10 x 30	1910	0.031
	*10 x 15	1210	0.06	13 x 15	1450	0.049	13 x 20	1900	0.035
	10 x 19.5	1400	0.046				16 x 15	1940	0.042
1800	13 x 15	1450	0.049						
2200	*10 x 19.5	1400	0.046	10 x 30	1910	0.031	13 x 25	2230	0.027
	10 x 25	1650	0.042	13 x 20	1900	0.042	18 x 15	2210	0.043
				16 x 15	1940	0.042			
2700	10 x 30	1910	0.031	18 x 15	2210	0.043	13 x 30	2650	0.024
	16 x 15	1940	0.042				16 x 20	2530	0.027

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz

2. ESR: 100KHz / 20°C (Ω Max.)

3. \* Down Size: 1000 Hours less than standard

4. For case size 13 x 15, 16 x 15 and 18 x 15, tolerance of height = ±3 mm



## CASE SIZE & PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

CAP. (μF)	RATED VOLTAGE WV (SURGE VOLTAGE WV)								
	6.3 (8)			10 (13)			16 (20)		
	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR
3300	10 x 25	1650	0.042	10 x 30	1910	0.031	13 x 36	2880	0.020
	13 x 20	1900	0.035	13 x 25	2230	0.027			
3900	13 x 25	2230	0.027	13 x 30	2650	0.024	13 x 40	3350	0.017
	18 x 15	2210	0.043	16 x 20	2530	0.027	16 x 25	2930	0.021
		18 x 20	2860				0.026		
4700	13 x 30	2650	0.024	13 x 35	2880	0.02	16 x 32	3450	0.017
							18 x 25	3140	0.019
5600	13 x 35	2880	0.02	13 x 40	3350	0.017	16 x 36	3610	0.015
	16 x 20	2530	0.027	16 x 25	2930	0.021	18 x 32	4170	0.015
				18 x 20	2860	0.026			
6800	13 x 40	3350	0.017	16 x 32	3450	0.017	16 x 40	4080	0.013
	16 x 25	2930	0.021	18 x 25	3140	0.019			
	18 x 20	2860	0.026						
8200	16 x 32	3450	0.017	16 x 36	3610	0.015	18 x 36	4220	0.014
				18 x 32	4170	0.015			
10000	16 x 36	3610	0.015	16 x 40	4080	0.013	18 x 40	4280	0.012
	18 x 25	3410	0.017	18 x 36	4220	0.014			
12000	18 x 32	4170	0.015	18 x 40	4280	0.012			
15000	18 x 36	4220	0.014						

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz

2. ESR: 100KHz / 20°C (Ω Max.)

3. For case size 13 x 15, 16 x 15 and 18 x 15, tolerance of height = ±3 mm

## CASE SIZE & PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

CAP. (μF)	RATED VOLTAGE WV (SURGE VOLTAGE WV)								
	25 (32) SIZE			35 (44) SIZE			50 (63) SIZE		
	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR
2.2							5 × 11	85	2.280
4.7				5 × 11	130	2.400	5 × 11	135	2.000
10				5 × 11	275	0.390	5 × 11	100	1.200
22							5 × 11	180	0.700
33				5 × 11	210	0.580	6.3 × 11	245	0.490
47	5 × 11	210	0.580	6.3 × 11	275	0.390	6.3 × 11	300	0.520
56				6.3 × 11	340	0.220	6.3 × 11	295	0.300
68				6.3 × 11	500	0.170			
82				6.3 × 11	540	0.160			
100	6.3 × 11	340	0.220	6.3 × 11	580	0.150	8 × 11	555	0.170
120							8 × 15	730	0.120
150	8 × 11	640	0.160	8 × 11	640	0.130	10 × 12	760	0.120
180							8 × 20	910	0.091
220	8 × 11	640	0.130	*8 × 15	840	0.087	10 × 15	1050	0.084
				10 × 12	865	0.080			
270				8 × 20	1050	0.069	10 × 19.5	1220	0.060
							13 × 15	1260	0.061
330	8 × 15	840	0.087	*10 × 15	1210	0.060	*10 × 19.5	1400	0.058
	10 × 12	865	0.080	10 × 19.5	1400	0.046	10 × 25	1440	0.055
470	8 × 20	1050	0.069	13 × 15	1450	0.049	13 × 20	1660	0.045
	*10 × 12	1050	0.070				16 × 15	1690	0.055
	10 × 15	1210	0.060						
560				10 × 25	1650	0.042	13 × 25	1950	0.034
							18 × 15	1930	0.054
680	10 × 19.5	1400	0.046	10 × 30	1910	0.031	13 × 30	2310	0.030
	13 × 15	1450	0.049	13 × 20	1900	0.035			
				16 × 15	1940	0.042			
820	10 × 25	1650	0.042	13 × 20	1900	0.035	13 × 36	2510	0.025
							16 × 20	2210	0.034

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz

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CAP. (μF)	RATED VOLTAGE WV (SURGE VOLTAGE WV)								
	25 (32) SIZE			35 (44) SIZE			50 (63) SIZE		
	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR	SIZE	RIPPLE	ESR
1000	10 x 19.5	1400	0.046	13 x 25	2230	0.027	13 x 40	2920	0.021
	10 x 30	1910	0.031	18 x 15	2210	0.043	16 x 25	2555	0.025
	13 x 20	1900	0.035				18 x 20	2490	0.036
	16 x 15	1940	0.042						
1200	18 x 15	2210	0.043	13 x 30	2650	0.024	16 x 32	3010	0.022
				16 x 20	2530	0.027	18 x 25	2740	0.026
1500	*13 x 20	1900	0.035	13 x 35	2880	0.020	16 x 36	3510	0.019
	13 x 25	2230	0.027						
1800	13 x 30	2650	0.024	13 x 40	3350	0.017	16 x 40	3710	0.016
	16 x 20	2530	0.027	16 x 25	2930	0.021	18 x 32	3635	0.021
				18 x 20	2860	0.026			
2200	13 x 35	2880	0.020	16 x 32	3450	0.017	18 x 36	3680	0.017
	18 x 20	2860	0.026	18 x 25	3140	0.019			
2700	13 x 40	3350	0.017	16 x 36	3610	0.015	18 x 40	3800	0.014
	16 x 25	2930	0.021	18 x 32	4170	0.015			
3300	16 x 32	3450	0.017	16 x 40	4080	0.013			
	18 x 25	3140	0.019	18 x 36	4220	0.014			
3900	18 x 32	4170	0.015	18 x 40	4280	0.012			
4700	18 x 36	4220	0.014						
5600	18 x 40	4280	0.012						

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz

2. ESR: 100KHz / 20°C (Ω Max.)

3. \* Down Size: 1000 Hours less than standard

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## CASE SIZE & PERMISSIBLE RIPPLE CURRENT OF STANDARD PRODUCTS

D x L: mm

CAP. (μF)	RATED VOLTAGE WV (SURGE VOLTAGE WV)					
	63 (79) SIZE			100 (125) SIZE		
		RIPPLE	ESR		RIPPLE	ESR
6.8				5 × 11	55	2.30
15	5 × 11	55	2.30	6.3 × 11	115	1.20
27				8 × 11	232	0.63
33	6.3 × 11	115	1.20			
39				8 × 15	300	0.45
47				10 × 12	288	0.43
56	8 × 11	232	0.63	8 × 20	362	0.33
68				10 × 15	357	0.31
82	8 × 15	300	0.45	10 × 19.5	466	0.21
	10 × 12	288	0.43	13 × 15	466	0.23
100				10 × 25	531	0.20
120	8 × 20	362	0.33	10 × 30	663	0.15
	10 × 15	357	0.31	13 × 20	690	0.16
150				16 × 16	795	0.14
180	10 × 19.5	466	0.21	13 × 25	784	0.12
	13 × 15	466	0.23	18 × 15	920	0.12
220	10 × 25	531	0.20	13 × 30	905	0.10
				16 × 20	1040	0.091
270	10 × 30	663	0.15	13 × 35	1050	0.083
	13 × 20	690	0.16	16 × 25	1250	0.073
	16 × 16	795	0.14			
330	13 × 25	784	0.12	13 × 40	1180	0.071
				18 × 20	1240	0.08
390	18 × 16	920	0.12	16 × 32	1570	0.054
				18 × 25	1490	0.057
470	13 × 30	905	0.10	16 × 36	1790	0.045
	16 × 20	1040	0.091	18 × 32	1630	0.047
560	13 × 35	1050	0.083	16 × 40	2020	0.04
	16 × 25	1250	0.073			
680	13 × 40	1180	0.071	18 × 36	1790	0.04
	18 × 20	1240	0.080			
820	16 × 32	1570	0.054	18 × 40	2330	0.036
	18 × 25	1490	0.057			
1000	16 × 36	1790	0.045			
	18 × 32	1630	0.047			
1200	16 × 40	2020	0.04			

Note: 1. Ripple Current: (mA/rms) 105°C, 100KHz

2. ESR: 100KHz / 20°C (Ω Max.)

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