

SB [For Low Leakage Current]

105°C Single-Ended Lead Aluminum Electrolytic Capacitors

Miniature Size Aluminum Electrolytic Capacitors

ELECTRICAL CHARACTERISTICS

Working Voltage : 6.3 ~ 100V

Operating Temperature : -40° ~ +105°C

Rate Capacitance Range : 0.1 ~ 4700μF

Capacitance Tolerance : -20 ~ +20%

DC Leakage Current (μA) : $I = 0.002CV$ (μA) or 0.4μA Whichever is greater.
(After 2 Minutes Application of DC Working Voltage at 25°C)

Equivalent Series Resistance (E.S.R., at 120Hz):

When measured at 25°C and 1 KHz E.S.R value shall not exceed the value given in the table on the next page.

WV (V) :	6.3	10	16	25	35 ~ 100
D.F (%) :	20	16	13	12	10

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

Load Life : 1000 Hours at 105°C Assured with Full Rated Maximum Ripple Current Applied

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

Shelf Life : 500 Hours, No Voltage Applied, at 105°C

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

WV (V) :	6.3	10	16	25	35 ~ 100
Impedance : Z - 40°C / Z + 20°C	4	4	3	3	3



DESCRIPTION

Used in where low leakage current is essential as in coupling of pre-amplifiers.

Very low leakage current remains even after prolonged storage.

For Detail Specifications, Please Refer to Engineering Bulletin No. 2031



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

D x L : mm

CAP. (μF)	RATED VOLTAGE W V (SV)								
	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	80 (100)	100 (125)
0.1						5 x 11	5 x 11	5 x 11	5 x 11
0.15						5 x 11	5 x 11	5 x 11	5 x 11
0.22						5 x 11	5 x 11	5 x 11	5 x 11
0.33						5 x 11	5 x 11	5 x 11	5 x 11
0.47						5 x 11	5 x 11	5 x 11	5 x 11
0.56						5 x 11	5 x 11	5 x 11	5 x 11
1.0						5 x 11	5 x 11	5 x 11	5 x 11
1.5						5 x 11	5 x 11	5 x 11	5 x 11
2.2						5 x 11	5 x 11	5 x 11	6 x 11
3.3						5 x 11	5 x 11	6 x 11	8 x 11
4.7				5 x 11	5 x 11	6 x 11	6 x 11	6 x 11	8 x 11
6.8				5 x 11	5 x 11	6 x 11	6 x 11	8 x 11	10 x 12
10			5 x 11	6 x 11	6 x 11	8 x 11	8 x 11	10 x 12	10 x 15
15			5 x 11	6 x 11	8 x 11	8 x 11	10 x 12	10 x 15	10 x 19
22		5 x 11	6 x 11	8 x 11	8 x 11	10 x 12	10 x 15	10 x 15	10 x 19
33		6 x 11	6 x 11	8 x 11	10 x 12	10 x 15	10 x 15	10 x 19	13 x 20
47		6 x 11	8 x 11	10 x 12	10 x 12	10 x 15	10 x 19	10 x 19	13 x 25
68	6 x 11	6 x 11	8 x 11	10 x 12	10 x 15	10 x 19	10 x 19	13 x 20	13 x 25
100	6 x 11	8 x 11	10 x 12	10 x 15	10 x 19	13 x 20	13 x 25	13 x 25	16 x 25
150	8 x 11	10 x 12	10 x 15	10 x 19	13 x 20	13 x 25	13 x 25	16 x 25	16 x 32
220	10 x 12	10 x 15	10 x 19	13 x 20	13 x 25	16 x 25	16 x 32	16 x 32	18 x 36
330	10 x 15	10 x 19	13 x 20	13 x 25	16 x 25	16 x 32	16 x 36	16 x 36	18 x 40
470	10 x 19	13 x 20	13 x 20	16 x 25	16 x 25	16 x 36	18 x 36	18 x 36	
680	13 x 20	13 x 20	13 x 25	16 x 32	16 x 32	16 x 36	18 x 36		
820	13 x 25	13 x 25	16 x 25	16 x 32	16 x 36	16 x 36	18 x 40		
1000	13 x 25	13 x 25	16 x 25	16 x 36	18 x 36	18 x 40			
1500	13 x 25	16 x 25	16 x 32	16 x 36	18 x 40				
2200	16 x 25	16 x 32	18 x 36	18 x 40					
3300	16 x 36	16 x 36	18 x 40						
4700	18 x 36	18 x 40							

DIAGRAM OF DIMENSIONS

Dimensions : mm

$L \leq 12 \quad L + 1.5\text{Max.}$
 $13 \leq L \leq 15 \quad \begin{matrix} +1.0 \\ -0.5 \end{matrix}$
 $L \geq 16 \quad L + 2.0\text{Max.}$

$L \leq 12 \quad L + 1.5\text{Max.}$
 $13 \leq L \leq 15 \quad \begin{matrix} +1.0 \\ -0.5 \end{matrix}$
 $L \geq 16 \quad L + 2.0\text{Max.}$

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

E.S.R. AT 1 KHZ, 25°C Ohm

μF	W V								
	6.3	10	16	25	35	50	63	80	100
0.1						215	204	193	182
0.15						126	120	113	107
0.22						80.0	76.0	72.0	68.0
0.33						65.2	61.9	58.6	55.4
0.47						45.7	43.4	41.1	38.8
0.56						33.0	31.3	29.7	28.0
0.68						31.2	29.6	28.0	26.5
1.0						25.3	24.0	22.7	21.5
1.5						21.7	20.6	19.5	18.4
2.2						17.5	16.6	15.7	14.8
3.3						13.2	12.5	11.8	11.2
4.7				13.0	18.8	9.20	8.74	8.28	7.82
6.8				11.0	13.0	9.00	8.55	8.10	7.65
10			11.3	8.84	8.84	8.84	8.39	7.95	7.51
15			7.07	5.89	5.89	5.89	5.59	5.30	5.00
22		5.22	4.82	4.01	4.01	4.01	3.80	3.60	3.40
33		3.48	3.21	2.67	2.67	2.67	2.53	2.40	2.26
47		2.44	2.25	1.88	1.88	1.88	1.78	1.69	1.59
68	2.00	1.68	1.56	1.30	1.30	1.30	1.23	1.17	1.10
100	1.15	1.14	1.06	0.88	0.88	0.88	0.83	0.79	0.74
150	0.77	0.76	0.70	0.58	0.58	0.58	0.55	0.52	0.49
220	0.52	0.52	0.48	0.40	0.40	0.40	0.38	0.36	0.34
330	0.34	0.34	0.32	0.26	0.26	0.26	0.24	0.23	0.22
470	0.24	0.24	0.22	0.18	0.18	0.18	0.17	0.16	
680	0.16	0.16	0.15	0.12	0.12	0.12	0.11		
820	0.14	0.14	0.12	0.10	0.10	0.10	0.10		
1000	0.11	0.11	0.10	0.08	0.08	0.08			
1500	0.07	0.07	0.06	0.05	0.05				
2200	0.06	0.06	0.06	0.04					
3300	0.04	0.04	0.04						
4700	0.03	0.03							

E.S.R. AT 120HZ, 25°C Ohm

μF	W V								
	6.3	10	16	25	35	50	63	80	100
0.1						510	484	459	433
0.15						355	337	319	301
0.22						223	209	198	187
0.33						185	175	166	157
0.47						96.0	91.2	86.4	81.6
0.56						50.0	47.5	45.0	42.5
0.68						47.0	45.1	42.7	40.3
1.0						43.4	41.2	39.0	36.8
1.5						35.2	33.4	31.6	29.9
2.2						32.5	30.8	29.2	27.6
3.3						24.3	23.0	21.9	20.6
4.7				20.0	28.2	20.7	19.6	18.6	17.5
6.8				19.5	19.5	19.5	18.5	17.5	16.5
10			17.0	13.2	13.2	13.2	12.5	11.9	11.2
15			10.6	8.84	8.8	8.84	8.39	7.95	7.51
22		7.83	7.23	6.02	6.02	6.02	5.71	5.41	5.11
33		5.22	4.82	4.01	4.01	4.01	3.30	3.60	3.40
47		3.66	3.38	2.82	2.82	2.82	2.67	2.53	2.39
68	3.00	2.53	2.34	1.95	1.95	1.95	1.85	1.75	1.65
100	1.72	1.72	1.59	1.32	1.32	1.32	1.25	1.18	1.12
150	1.15	1.14	1.06	0.88	0.88	0.88	0.83	0.79	0.74
220	0.78	0.78	0.72	0.60	0.60	0.60	0.57	0.54	0.51
330	0.52	0.52	0.48	0.40	0.40	0.40	0.38	0.36	0.34
470	0.36	0.36	0.33	0.28	0.28	0.28	0.26	0.25	
680	0.25	0.25	0.23	0.19	0.19	0.19	0.18		
820	0.21	0.21	0.18	0.15	0.15	0.15	0.15		
1000	0.17	0.17	0.14	0.13	0.13	0.13			
1500	0.11	0.11	0.10	0.08	0.08				
2200	0.09	0.09	0.08	0.06					
3300	0.06	0.06	0.06						
4700	0.05	0.05							

PERMISSIBLE RIPPLE CURRENT AT 120HZ,105°C mA,rms

IMPEDANCE AT 10KHZ,25°C Ohm

μF	W V									μF	W V								
	6.3	10	16	25	35	50	63	80	100		6.3	10	16	25	35	50	63	80	100
0.1						1	1	1	1	0.1						323	306	290	274
0.15						4	4	4	4	0.15						270	256	243	229
0.22						4	4	4	4	0.22						235	223	211	199
0.33						6	6	6	6	0.33						175	166	157	148
0.47						7	7	7	7	0.47						90.0	85.5	81.0	76.5
0.56						7	7	7	7	0.56						40.0	38.0	36.0	34.0
0.68						9	9	9	9	0.68						38.5	36.5	34.6	32.7
1.0						18	18	18	18	1.0						32.7	31.0	29.4	27.7
1.5						24	24	24	24	1.5						28.5	27.0	25.6	24.2
2.2						30	30	30	30	2.2						22.4	21.2	20.1	19.3
3.3						36	36	36	36	3.3						17.4	16.5	15.6	14.7
4.7				27	40	45	45	45	60	4.7				8.00	14.4	12.5	11.8	11.2	10.6
6.8				42	45	55	55	60	67	6.8				7.6	10.0	10.0	9.50	9.00	8.50
10			40	63	67	82	82	90	94	10			5.00	6.80	6.80	6.80	6.46	6.12	5.78
15			56	67	75	97	103	112	117	15			4.43	4.53	4.53	4.56	4.30	4.07	3.85
22		68	70	84	97	127	148	165	187	22		4.01	3.70	3.08	3.08	3.08	2.92	2.77	2.61
33		78	95	102	139	156	210	217	225	33		2.67	2.46	2.05	2.05	2.05	1.94	1.84	1.74
47		106	122	141	166	217	240	276	285	47		1.87	1.73	1.44	1.44	1.44	1.36	1.29	1.22
68	80	142	168	190	238	300	328	361	375	68	1.50	1.29	1.20	1.00	1.00	1.00	0.95	0.90	0.85
100	126	179	264	277	310	390	420	447	456	100	0.88	0.87	0.81	0.67	0.67	0.67	0.63	0.68	0.56
150	196	280	416	455	491	569	648	663	707	150	0.59	0.58	0.53	0.44	0.44	0.44	0.41	0.39	0.37
220	272	355	553	590	630	910	930	970	1010	220	0.40	0.40	0.36	0.30	0.30	0.30	0.28	0.27	0.25
330	388	480	732	754	771	986	1088	1198	1377	330	0.26	0.26	0.24	0.20	0.20	0.20	0.19	0.18	0.17
470	507	640	1040	1110	1150	1249	1385	1509		470	0.18	0.18	0.16	0.13	0.15	0.13	0.12	0.11	
680	700	848	1280	1385	1462	1870	1870			680	0.12	0.12	0.11	0.09	0.09	0.09	0.08		
820	850	980	1450	1540	1630	1950	1950			820	0.11	0.11	0.09	0.08	0.08	0.08	0.08		
1000	896	1081	1700	1710	1723	2070				1000	0.08	0.08	0.06	0.06	0.06	0.06			
1500	1204	1376	1750	1779	2006					1500	0.05	0.05	0.06	0.03	0.03				
2200	1513	1680	1900	2174						2200	0.04	0.04	0.05	0.03					
3300	1902	2155	2250							3300	0.04	0.03	0.04						
4700	2272	2560								4700	0.02	0.02							