



Miniature Aluminum Electrolytic Capacitors

Series
CSL

FEATURES

1. Extremely low and stable leakage current characteristics
2. Close capacitance tolerance $\pm 20\%$ ($\pm 10\%$)

SPECIFICATIONS

Item	Performance Characteristics								
Operating Temperature Range	-40 to +105°C								
Rated Working voltage Range	6.3 to 100V								
Nominal Capacitance Range	0.1- 10000(uF)								
Capacitance Tolerance	$\pm 20\%$ (120Hz, +20°C)								
Leakage Current	$I \leq 0.002CV$ or $0.3(\mu A)$ Whichever is greater measured after 2 minutes application of rated working voltage at $\pm 20^\circ C$								
Dissipation Factor $\tan \delta$ (120Hz+20°C)	Working voltage(V)	6.3	10	16	25	35	50	63	100
	$\tan \delta$ (max.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08
For capacitance value >1000uF add 0.02per another 1000uF									
Low Temperature Characteristics	Impedance ratio max. at 120Hz								
	Working voltage(V)	6.3	10	16	25	35	50	63	100
	Z-25°C/Z+20°C	3(4)	2(3)	2	1.5	1.5	1.5	1.5	1.5
Z-40°C/Z+20°C 5(8) 4(6) 3(4) 2(4) 2(3) 2(3) 2(3) 2(3)									
Figure in () is applicable for products $\geq 10 \times 16$									
Multiplier for Ripple Current vs. Frequency	CAP(uF)\Hz		60(50)	120	400	1K	10K	50K-100K	
	Multiplier	CAP ≤ 10	0.8	1	1.30	1.45	1.65	1.70	
		10<CAP ≤ 100	0.8	1	1.23	1.36	1.48	1.53	
100<CAP ≤ 1000 0.8 1 1.16 1.25 1.35 1.38									
Multiplier for Ripple Current vs. Temperature	Temperature°C	45	60	70	85	95	105		
	Multiplier	1.5	1.3	1.45	1.3	1.15	1.00		
High temperature Loading	Test conditions Duration : 2000 hours Ambient temperature : +105°C Applied voltage : Rated DC working voltage Post test requirements at +20°C Leakage current : \leq Initial specified value Capacitance change : $\leq \pm 20\%$ of initial measured value $\tan \delta$: $\leq 150\%$ of initial specified value								
Shelf life	Test conditions Duration : 1000 hours Ambient temperature : +105°C Applied voltage : (None) Post test requirements at +20°C Leakage current : \leq Initial specified value Capacitance change : $\leq \pm 20\%$ of initial measured value $\tan \delta$: $\leq 150\%$ of initial specified value Pre-treatment for measurements Measurement shall be conducted after application of DC working voltage for 30 minutes								
Others	JIS C-5141 JIS C-5102								

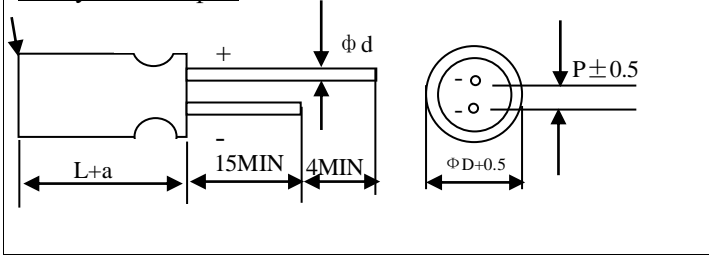


Miniature Aluminum Electrolytic Capacitors

Unit:mm

CASE SIZE TABLE

Safety vent for $\phi \geq 8$



D ϕ	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
d ϕ (± 0.05)	0.5			0.6		0.8	

aMAX	(L<20)1.5
	(L \geq 20)2.0

DIMENSIONS

$\phi D \times L$ (mm)

WV(SV)		6.3V(8)		10V(13)		16V(20)		25V(32)	
Cap.(uF)	Code	0J		1A		1C		1E	
4.7	475							5×11	45
6.8	685							5×11	55
10	106					5×11	55	5×11	70
15	156					5×11	70	5×11	85
22	226					5×11	85	5×11	100
33	336					5×11	100	6.3×11	140
47	476			5×11	110	6.3×11	140	6.3×11	170
68	686			6.3×11	150	6.3×11	160	8×12	230
100	107			6.3×11	180	8×12	230	8×12	280
150	157			8×12	250	8×12	280	10×12.5	370
220	227			8×12	310	10×12.5	370	10×15	400
330	337			10×12.5	400	10×15	420	10×20	490
470	477	10×12.5	390	10×15	530	10×20	550	13×21	660
680	687	10×16	480	10×20	600	13×21	730	13×25	810
1000	108	10×20	650	13×21	810	13×25	910	16×26	1010
1500	158	13×25	910	13×25	1020	16×26	1150	16×30	1270
2200	228	13×25	1060	16×26	1200	16×26	1300	16×35	1440
3300	338	16×26	1270	16×30	1420	16×35	1550	18×40	1720
4700	478	16×30	1500	16×35	1650	18×36	1820		
6800	688	18×36	1760	18×36	1890				
10000	109	18×40	1900					Case size	Allowable ripple

Allowable Ripple (mA rms)at 105°C 120Hz



Miniature Aluminum Electrolytic Capacitors

DIMENSIONS

ΦD×L(mm)

WV(SV)		35V(44)		50V(63)		63V(79)		100V(125)	
Cap.(μF)	Code	1V		1H		1J		2A	
0.1	104			5×11	1.1			5×11	2.1
0.15	154			5×11	1.6			5×11	3.2
0.22	224			5×11	2.3			5×11	4.7
0.33	334			5×11	3.5			5×11	10.1
0.47	474			5×11	5.0			5×11	14.5
0.68	684			5×11	7.3			5×11	19
1	105			5×11	10.7			5×11	13
1.5	155			5×11	16			5×11	28
2.2	225			5×11	23			5×11	45
3.3	335			5×11	40			5×11	50
4.7	475			5×11	45			6.3×11	65
6.8	685			5×11	55	5×11	56	8×12	90
10	105			5×11	70	6.3×11	75	8×12	110
15	156	5×11	85	6.3×11	95	6.3×11	100	10×12.5	136
22	226	6.3×11	110	6.3×11	110	8×12	115	10×15	180
33	336	6.3×11	140	8×12	165	8×12	170	10×20	220
47	476	8×12	190	8×12	190	10×12.5	200	10×20	290
68	686	8×12	230	10×12.5	250	10×15	270	13×21	370
100	107	10×12.5	300	10×15	320	10×20	330	13×25	470
150	157	10×15	400	10×20	420	13×21	450	16×26	580
220	227	10×20	440	13×21	490	13×21	550	16×30	730
330	337	13×21	550	13×21	600	13×25	710	18×36	910
470	477	13×25	680	16×26	760	16×26	850		
680	687	16×26	840	16×26	910	16×30	1050		
1000	108	16×26	1100	16×30	1140	18×36	1330		
1500	158	16×35	1390	18×40	1480				
2200	228	18×36	1580					Case size	Allowable ripple

Allowable Ripple (mA rms)at 105℃120Hz