Aluminum Electrolytic Capacitors

- 105℃ high temperature resistance and ripple current resistance, high reliability
- Suitable for wave filtering return circuit for power of equipment, such as computers

Aluminum Electrolytic Capacitors

RND components

Part Number Codes

K	LZ	450	M	681	P	55	Y

D:PVC
K:PET
V:V-CHIP
P:PA-CAP

SERIES NAME:

See Catalongue Index Table

RATE VOLTAGE:

Rate Voltages is Shown:
In Volts

006=6.3V
010=10V
100=100V

CAPACITANCE TOLERANCE:

J=	±5%
K=	±10%
M=	±20%
A=	0%~+20%
D=	-5%~+20%
V=	-10%~+20%
Q=	-10%~+30%
T=	-10%~+50%
E=	-15%~+20%
I=	-30%~+20%
B=	+ 10%~+30%
N=	+10%~+25%

RATE CAPACITANCE:

0R1=0.1uF
1R0=1uF 100=10uF
101=100uF
102=1000uF
103=10000uF
223=22000uF

LENGTH OF AL. CASE: (L,mm)

Two digits indicate integer,EX: 07=7mm

The following codes indicate containing decimal, EX:A6=7.7mm

A1	5.4	B1	10.2
A2	5.8	B2	10.4
A3	6.2	B3	10.5
A4	6.7	B4	12.2
A5	7.5	B5	12.5
A6	7.7	B6	13.5
A7		B7	16.5
A8		B8	21.5
A9		B9	

TYPE CODE DESCRIPTION:

RADIAL	P Taping(Ammo pack)
	R Taping(Reel Pack)
	C Lead Cut
	D Lead Cut and Crimp
	F Lead Forming Cut
	H Lead Forming Cut and Crimp
	B Forming Only
	S Long Lead
	L Bended lead of 90^0
Lug	G LG Type Terminal
	Y Snap in Terminal
	W Screw Terminal

Diameter (Φ)	Code	Diameter (Φ)	Code
3	B	25	N
4	C	30	O
5	D	35	P
6.3	E	40	Q
8	F	51	R
10	G	64	S
12	H	76	T
12.5	X	90	U
13	I	100	V
16	J		
18	K		
20	L		
22	M		

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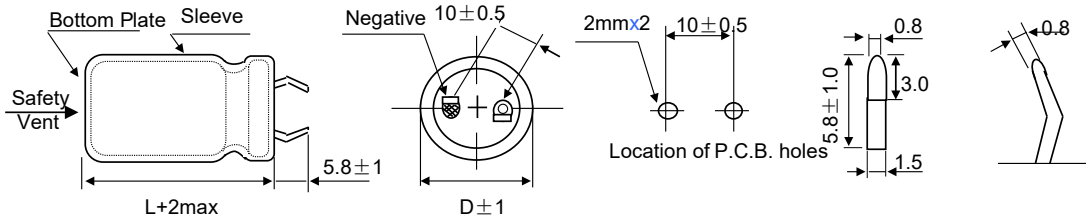
Dimensions (mm)



Standard Ratings

D×L(mm); R.C.: (A rms) at 105℃, 120Hz; IMP: (Ω max)

Cap (uF) \ WV(V)	10			16			25			35			50		
Item	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP
1500													22×25	1.20	0.268
1800													22×30	1.40	0.222
2200										22×25	1.21	0.174	22×25 25×25	1.60	0.182
2700										22×25	1.21	0.174	22×35 25×30	1.73	0.148
3300										22×25	1.36	0.142	22×30 25×30	1.97	0.123
3900							22×25	1.35	0.137	22×30	1.57	0.120	22×45 25×35	2.23	0.104
4700							22×25	1.58	0.114	22×30 25×25	1.77	0.098	22×35 25×40	2.45	0.086
5600							22×30 25×25	1.75	0.096	22×40 25×30	1.99	0.083	25×45 30×35	2.74	0.074
6800				22×25	1.80	0.098	22×30 25×30	2.02	0.079	22×45 22×35	2.29	0.069	22×50 35×30	3.31	0.069
8200				22×30 25×25	2.08	0.082	22×40 25×35	2.18	0.066	22×50 25×40	2.58	0.057	35×35	3.60	0.050
10000	22×25	1.88	0.077	22×30 25×30	2.15	0.062	22×45 25×40	2.48	0.058	25×45 30×40	2.90	0.054	30×40 35×40 25×50	4.02	0.046
12000	22×30 25×25	2.18	0.068	22×40 25×30	2.31	0.056	22×50 25×45	2.86	0.050	25×50 30×40	3.24	0.046	35×50	4.52	0.039
15000	22×35 25×30	2.27	0.055	22×35 25×35	2.69	0.045	22×50 25×40	3.15	0.040	30×45 25×50	3.65	0.037	35×40 30×50	5.56	0.026
18000	22×40 25×30	2.41	0.048	22×50 25×40	3.20	0.042	30×45 35×35	3.55	0.038	35×40	4.13	0.030			
22000	22×45 25×35	2.68	0.045	22×45 30×35	3.40	0.040	25×50 35×40	4.00	0.034	30×45 35×50	4.78	0.025	35×50	6.35	0.020
27000	25×40 30×35	3.17	0.040	30×40 35×35	3.85	0.035	35×45	4.55	0.030						
33000	25×45 30×35	3.39	0.036	25×50 35×40	4.32	0.025	35×50	5.56	0.024						
39000	25×50 30×40	3.72	0.033	35×40	4.85	0.023									
47000	30×45 35×35	4.22	0.030	35×50	5.56	0.020	35×50	6.35	0.020						
56000	35×40	5.00	0.019												
68000	35×50	5.21	0.016												

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Standard Ratings

D×L(mm); R.C.: (A rms) at 105℃, 120Hz; IMP: (Ω max)

Cap (uF)	WV (V)	63			80			100			160			200		
	Item	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP
150														22×25	0.82	1.050
220											22×25	1.04	0.738	22×25	1.07	0.738
330											22×30	1.26	0.605	22×30 25×25	1.20	0.605
390											22×30 25×25	1.29	0.514	22×35 25×30	1.34	0.514
470								22×25	0.95	0.523	22×30 25×30	1.56	0.426	22×35 25×30	1.48	0.426
560								22×25	1.02	0.476	22×40 25×30	1.69	0.357	22×45 25×35	1.65	0.356
680								22×25	1.12	0.393	22×45 25×35	1.72	0.294	25×40 30×30	1.75	0.293
820					22×25	1.04	0.326	22×30 25×25	1.32	0.324	22×50 25×40	1.99	0.246	25×50 30×35	2.04	0.245
1000					22×25	1.21	0.275	22×30 25×30	1.45	0.268	25×45 30×35	2.20	0.202	25×50 35×35	2.30	0.202
1200		25×25	1.21	0.276	22×35 25×25	1.29	0.227	22×40 25×35	1.68	0.223	30×40 35×35	2.45	0.168	30×50 35×40	2.65	0.167
1500		22×30 25×25	1.45	0.223	22×40 25×30	1.57	0.186	22×45 25×40	1.98	0.177	30×50 35×40	3.06	0.138	35×45	2.98	0.134
1800		22×35 25×30	1.59	0.187	22×45 25×35	1.72	0.155	25×45 30×35	2.23	0.148	35×45	3.14	0.112			
2200		22×40 22×25	1.84	0.158	22×40 30×30	2.01	0.133	22×50 30×40	2.53	0.123	35×50	3.50	0.093	35×50	3.56	0.126
2700		22×45 25×35	2.12	0.126	25×45 30×35	2.32	0.099	30×45 35×35	2.82	0.098						
3300		22×40 30×30	2.30	0.102	22×50 35×30	2.62	0.086	25×50 30×40	3.32	0.081						
3900		25×45 30×35	2.42	0.087	30×45 35×35	2.84	0.070	35×45	3.62	0.068						
4700		25×45 30×40	2.91	0.075	25×50	3.29	0.068	30×50	3.80	0.058						
5600		30×45 35×35	3.18	0.060	35×45	3.82	0.048									
6800		25×50 35×40	3.54	0.050	30×50	3.92	0.038	35×50	4.03	0.048						
8200		35×45	3.82	0.042	35×50	4.05	0.033									
10000		35×50	4.50	0.033	35×55	4.20	0.027	35×80	4.80	0.020						
12000					35×95	4.40	0.024									

Aluminum Electrolytic Capacitors

RND components

Standard Ratings

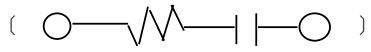
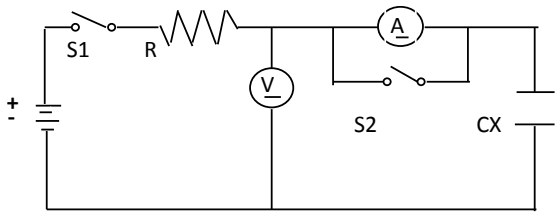
D×L(mm); R.C.: (A rms) at 105℃, 120Hz; IMP: (Ω max)

Cap (uF)	WV(V)	250			350			400			450		
	Item	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP	D×L	R.C.	IMP
47								22×25	0.46	5.120	22×25	0.43	5.160
68								22×25	0.52	4.880	22×25 25×30	0.55	4.880
100					22×30 22×25	0.69	2.654	22×30 25×25	0.72	3.318	22×35 25×35	0.75	3.318
120					22×35 25×30	0.76	2.215	22×40 25×30	0.75	2.766	22×45 25×40	0.83	2.766
150	22×25	0.76	1.328	22×35 25×30	0.79	1.770	22×40 30×25	0.89	2.214	22×45 25×40	0.95	2.214
180	22×30	0.98	1.106	22×45 25×35	0.88	1.475	22×50 25×40	0.98	1.842	25×45 30×40	1.15	1.842
220	22×30 25×25	1.09	0.905	22×45 25×40	0.98	1.208	22×45 25×40	1.12	1.506	25×50 35×40	1.24	1.506
270	22×35 25×30	1.19	0.738	25×45 30×35	1.10	0.984	25×50 30×40	1.29	1.230	30×50 35×45	1.46	1.230
330	22×40 22×35	1.35	0.605	30×40 35×35	1.22	0.806	30×40 35×35	1.45	1.015	30×45	1.45	1.115
390	22×45 25×35	1.52	0.512	30×45 35×40	1.42	0.681	30×50 35×40	1.59	0.847	35×55	1.78	0.852
470	22×45 25×40	1.63	0.425	35×45	1.62	0.567	35×40 30×50	1.75	0.710	35×45	2.12	0.760
560	25×45 30×35	1.84	0.357	35×50	1.89	0.473	35×50	2.12	0.588			
680	25×50 30×40	2.05	0.294	35×50	2.10	0.420	40×50	2.20	0.485	35*55	2.30	
820	30×45 35×35	2.29	0.246	35×65	2.35	0.352	35×65	2.50	0.412			
1000	30×50	2.49	0.201									
1500	35×50	2.95	0.15									

Aluminum Electrolytic Capacitors

1. Scope:
   This specification applies to aluminium electrolytic capacitor , used in electronic equipment.

2. Electrical charateristics:

<table>
<tr><th>NO.</th><th>ITEM</th><th>TEST METHOD</th><th>SPECIFICATION</th></tr>
<tr><td>2. 1</td><td>Rated voltage</td><td></td><td rowspan="2">Voltage range、capacitance range, see specification of this series.</td></tr>
<tr><td>2. 2</td><td>Capacitance</td><td>1. Measuring frequency : 120 ± 12Hz
2. Measuring voltage : ≦0.5Vrms + 0.5 ~ 2.0VDC</td></tr>
<tr><td>2. 3</td><td>Dissipation factor</td><td>3. Measurement circuit :  </td><td rowspan="2">Dissipation factor、leakage current, see specification of this series.</td></tr>
<tr><td>2. 4</td><td>Leakage current</td><td>DC leakage current shall be measured after 1~2 minutes application of the DC rated working voltage through the 1000 Ω resistor at 20℃.
 

R : 1000 ± 100Ω A : DC current meter
V : DC voltage meter
S1 : Swich
S2 : Swich for protect of current meter
CX : Testing capacitor</td></tr>
<tr><td>2. 5</td><td>Temperature characteristics</td><td>
<table>
<tr><th>STEP</th><th>TEMPERATURE</th><th>STORAGE TIME</th></tr>
<tr><td>1</td><td>20 ± 2 ℃</td><td>30 minutes</td></tr>
<tr><td>2</td><td>-40 ± 3 ℃</td><td>2 hours</td></tr>
<tr><td>3</td><td>20 ± 2 ℃</td><td>15 minutes</td></tr>
<tr><td>4</td><td>105 ± 2℃</td><td>2 hours</td></tr>
</table>
Step 1. Measure the capacitance and impedance.
(|Z| , 20℃ , 120Hz ± 10%)
Step 2. Measure the impedance at thermal balance after 2 hours
(|Z| , -40℃, 120Hz ± 10%)
Step 4. Measure the capacitance and leakage current at thermal balance after 2 hours.</td><td>Step 2.
Impedance ratio (Zr / Z_{r0}) less than specified value.

Step 4
Capacitance change :
within ± 20% of the initial measured value.

Leakage current :
Less than 10 times of initial specified value.</td></tr>
</table>

NO.	ITEM	TEST METHOD	SPECIFICATION
2. 6	Surge test	Rated surge voltage shall be applied (swich on) for 30 ± 5 seconds and then shall be applied (swich off) with discharge for 5 ± 0.5 min at room temperature . This cycle shall be repeated for 1000 cycles. Duration of one cycle is 6 ± 0.5 minutes .	Capacitance change : within ± 20% of the initial specified value. Dissipation factor : lessthan 200% of the initial specified value.
2. 7	Applicable ripple current	The maximum A.C.current having frequency of 100K Hz which can be applied to the capacitor at 105±2℃ continuously.Peak voltage not to exceed rated D.C.voltage.	Leakage current : within initial specified value.

3. Mechanical characteristics

NO.	ITEM	TEST METHOD	SPECIFICATION
3. 1	Lead strength	(A) Tensile strength: wire lead terminal: d (mm) ≦0.45 | 0.5 ~ 0.8 | 0.8＜d≦1.25 load (Kg) 0. 51 | 1.0 | 2.0 snap-in terminal: d (mm) snap-in terminal load (Kg) 2.0 The capacitor shall withstand the constant tensile force specified between the body and each lead for 10 seconds without damage either mechanical or electrical. (B) Bending strength: wire lead terminal: d (mm) ≦0.45 | 0.5 ~ 0.8 | 0.8＜d≦1.25 load (Kg) 0. 25 | 0.51 | 1.0 snap-in terminal: cross section area of terminal (㎜²) | force (Kg) 0.5＜S≦1 | 1.0 S＞1 | 2. 5 With the capacitor in a vertical position apply the load specified axially to each lead . The capacitor shall be rotated slowly from the vertical to the horizontal position, back to the vertical position. The 90° in the opposite direction and back the original position . Performance of capacitor shall not have changed and leads shall be undaged .	When the capacitance is measured, there shall be no intermittent contacts, or open- or short- circuiting. There shall be no such mechanical damage as terminal damage etc.

NO.	ITEM	TEST METHOD	SPECIFICATION
3. 2	Vibration resistance	The frequancy of the vibration shall vary uniformly within the range 10 to 55 Hz with the amplitude of 1.5 mm , completing the cycle in the internal of one minute . The capacitor shall be securely mounted by its leads with hold the body of capacitor . The capacitor shall be vibrated in three mutually perpendicular directions for a period of 2 hours in each direction .	Capacitance : no unsteady . Appearance : no abnormal . Capacitance change : within ± 5% of initial measured value .
3. 3	Solderability	The leads are dipped in the solder bath of Sn at 260 ± 5 ℃ for 2 ± 0.5 seconds . The dipping depth should be set at 1.5 ~ 2.0 mm .	The solder alloy shall cover the 95% or more of the dipped lead's area .

4. Reliability

NO.	ITEM	TEST METHOD	SPECIFICATION
4. 1	Soldering heat resistance	The leads immerse in the solder bath of Sn at 260 ± 5 ℃ for 10 ± 1 seconds until a distance of 1.5 ~ 2mm from the case .	No damage or leakage of electrolyte . Capacitance change : within ± 10% of the initial measured value . Tan δ : less than specified value . Leakage current : less than specified value .
4. 2	Damp heat (steady state)	Subject the capacitors to 40 ± 2 ℃ and 90% to 95% relative humidity for 240 ± 8 hours .	Capacitance change : within ± 10% of the initial measured value . Tan δ : less than specified value . Leakage current : less than specified value .

<table>
<tr><th>NO.</th><th>ITEM</th><th>TEST METHOD</th><th>SPECIFICATION</th></tr>
<tr><td>4. 3</td><td>Load life</td><td>After X hours continuous application of DC rated working voltage at 105 ± 2 ℃ , the measurements shall meet the following limits .
Measurements shall be performed after 2 hours exposed at room temperature .</td><td rowspan="2">Standard of judgement is according to requirement of this series .</td></tr>
<tr><td>4. 4</td><td>Shelf life</td><td>After storage for Y hours at 105 ± 2 ℃ without voltage application , the measurements shall meet the following limits .
Measurements shall be performed after exposed for 1 to 2 hrs at room temperature after application of DC rated voltage to the capacitor for Z minutes .</td></tr>
<tr><td>4. 5</td><td>Storage at low temperature</td><td>The capacitor shall be stored at temperature of -40 ± 3 ℃ for 240 ± 8 hours , during which time no voltage shall be applied . And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours or more , after which measurements shall be made .</td><td>Capacitance change :
within ± 10% of the initial value .

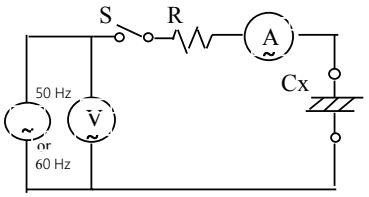
Tan δ :
less than specified value .

Leakage current :
less than specified value .

Appearance : no abnormal .
外 觀 : 無異常 .</td></tr>
<tr><td>4. 6</td><td>Pressure relief</td><td>AC test:
Applied voltage : AC voltage not exceeding 0.7 times of the rated direct voltage or 250 V AC whichever is the lower .

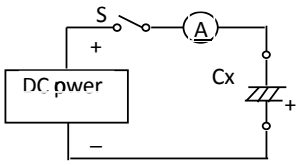
Frequency : 50 Hz or 60 Hz .

Series resitor : refer to the table below .

<table>
<tr><th>Capacitance (C)</th><th>Series resistor</th></tr>
<tr><td>C ≦ 1 μF</td><td>1000 Ω</td></tr>
<tr><td>1 μF ＜ C ≦ 10 μF</td><td>100 Ω</td></tr>
<tr><td>10 μF ＜ C ≦ 100 μF</td><td>10 Ω</td></tr>
<tr><td>100 μF ＜ C ≦ 1000 μF</td><td>1 Ω</td></tr>
<tr><td>1000 μF ＜ C ≦ 10000 μF</td><td>0. 1 Ω</td></tr>
<tr><td>10000 μF ＜ C</td><td>*</td></tr>
</table>
* Resistance is equivalent to a half impedance by test frequency .</td><td>AC test circuit
 

~ : AC power
S : Swich
V : AC voltage
A : AC current meter

R : protection resistor
Cx : testing capacitor</td></tr>
</table>

NO.	ITEM	TEST METHOD	SPECIFICATION
4. 6	Pressure relief	DC test: Send the following electricitios while applying the inverse voltage . where case size: D ≦ 22.4 mm : 1 A d.c. max D ＞ 22.4 mm : 10 A d.c. max Note : 1. This requirement applies to capacitors with a diameter of 6 mm or more . the test may be ended .	DC test circuit  S : Swich (–) : DC current meter Cx : testing capacitor of fire or explosion of capacitor elements (terminal and metal foil etc) or cover .

5 Marking:

Marking on capacitors include :

▌ trade-mark
▌ Working voltage
▌ Norminal capacitance
▌ Tolerance
▌ Polarity
▌ Operating temperature range
▌ Date code