承认书编号 NO:SFAK2-1511000011

系列 SER.NO.: KF

承　　認　　書

APPROVAL SHEET

FOR AL. ELECTROLYTIC CAPACITORS

承　　认

APPROVED BY:

料　号（customer）	料　号（CapXon）	规　格		加工形式（mm）
		Description	DΦ*L	
	KF102M035I200A	1000μF/35V	13X20	

签认后，请送回一份。

PLEASE RETURN US ONE COPY YOUR SIGNED SPECIFICATION AFTER YOU APPROVED OF IT.

核　　准 APPROVED BY: 张 2015-11-13 万红

校　　對 CHECKED BY: 覃 2015-11-13 泳杰

經　　辦 DESIGNED BY: 许 2015-11-13 晓君

CapXon

□

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☑

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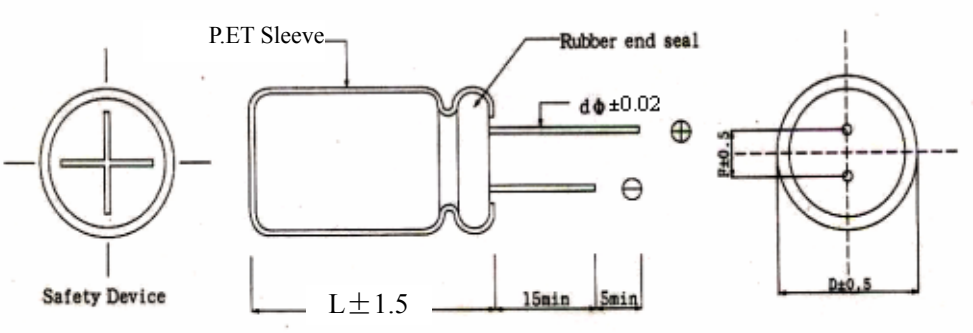
FOR APPROVAL

Aluminum Electrolytic Capacitors
KF Type

1.Electric Characteristics

CAPXON P/N	Cap. (μF)	Cap Tol. (%)	Rate W.V (VDC)	Surge Volt (VDC)	Max.D.F (%)	Ripple Current 100KHz/105℃(mA)	Max.IM 100KHz (Ω)	Max. LC (μA)	Oper. Temp. (℃)	Case Size DΦ* L (mm)	USER P/N
KF102M035I200A	1000	±20	35	40	10	1900	0.044	350	-40~+105	13X20	

2.Diagram of Dimensions (Unit=mm)



D	13
L	20
F	5.0
d Φ	0.6

3.Remarks:

3.1 Leakage Current Test: I≦0.01CV or 3(μA) for 6.3 to 100VDC After 2 minutes whichever is greater measured with rated working voltage applied.

I≦0.03CV(μA) for 160 to 450VDC. After 2 minutes with rated wording voltage applied.

3.2 Operating temperature:6.3~100VDC,0.47～15000μF for -40℃～+105℃

160~450VDC,0.47～470μF for -25℃～+105℃

3.3 Cap and Dissipation factor (D.F) Test: At +20℃,120Hz

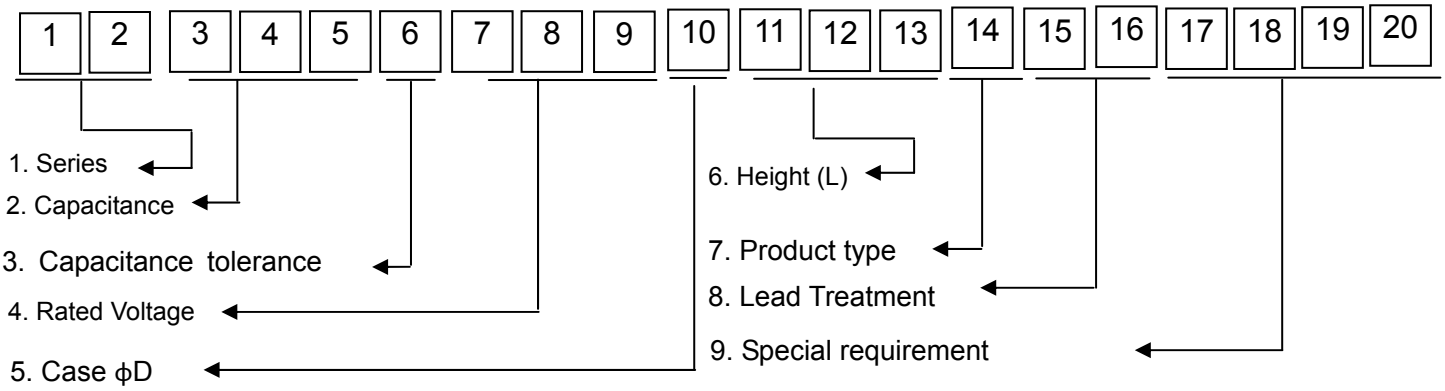
3.4 Load Life Test: At +105℃ for (5-6.3 φ)2000Hrs, (8 φ)3000Hrs,(≥10 φ)5000Hrs,(160V~450V:2000Hrs).

3.5 Shelf Life Test: At +105℃, for 1000hrs.

3.6 Such spec. capacitors are just fit for this electric model , if you have some other application, please contact with us in advance.

Part Number System

When placing and order for Aluminum Electrolytic Capacitors. Please observe following Catalog Part Number format that describes.



(1).Series

The series name.

(2).Capacitance

Capacitance is show in microfarad (μF)

Capacitance (μF)	0.1	0.47	1	4.7	10	100	1000	10000
Code	0R1	R47	010	4R7	100	101	102	103

(3).Capacitance tolerance

Tolerance%	±5	±10	±20	±30	-10to+30	-10to+50	-10to+20	-10to100	0to+20	-30to+0	±15
Code	H	K	M	N	Q	T	V	W	Z	U	S
Tolerance%	0to+30	0to+40	0to+50	-5to+20	-8to+5	+5to+20	0to-20	-15to+20	-25to+20	-50to+0	-5to+30
Code	Y	X	A	J	E	I	B	P	L	O	C

For tolerance other than these and specified capacitance tolerance, please specify the value on the order sheet.

(4).Voltage (W.V)

Voltage (W.V)	6.3	10	16	25	35	50	63	80	100	160	200	220	250	350	400	420	450	500
Code	6R3	010	016	025	035	050	063	080	100	160	200	220	250	350	400	420	450	500

(5).Case (ϕD: mm)

Diameter	3	4	5	6.3	7.3	8	10	12	13	16	18	20	22	25	30	35	40	42	45	51	63.5	76.2	89	14.5	12.5
Code	A	B	C	E	7	F	G	H	I	J	K	L	M	N	O	P	Q	U	V	R	S	T	X	Y	Z

(6). Height (L: mm)

Description	5	5.5	7	7.7	8	11	11.5	12	12.5	14	16	20	21	25	25.5	31.5	35	35.5	41	47	52	83	98	118	141	151
Code	050	055	070	077	080	110	115	120	125	140	160	200	210	250	255	315	350	355	410	470	520	830	980	A18	A41	A51

(7). Product type

Type	Without Lead Treatment	With Lead Treatment
Code	A	E

(8). Lead Treatment (Radial type)

Description	Taping (Ammo Package)	Taping (Reel Package)	Lead Cutting	Lead Forming Cutting	Lead Forming only	Lead Crimping & Forming	Lead Cutting & Kink	Kink	Bending & Cutting	Forming &Kink
Code	TA、TB、TC、TD、TE、TF、ETC.	RA、RB、RC、RD、RE、 Etc.	CA	CF	FA	KF	CK	KA	CR、CL	EF

Remarks: The product of V- chip sticks a dish to process form is “TR”.

(9) Special & appearance requirement (the 17th, 18th, 19th, 20th code)

Code	Special		Code	Special		Code	request characteristic		Code	Special
A	Terminals of Snap-in		H	Height requirement		R	Ripple current		U	Package & label
B	Rubber		I	L.C.		S	countermeasure			
C	Lead wire		K	Vent line		T	Temperature characteristic			
D	D.F.		L	Life		V	Vt, Electrolyte paper			
E	Electrolyte		N	Nude		M	Solder, technics, form, Case with pillar,			
F	Pitch		P	Sleeve, tray, print, PVC sleeve		Y	clip loop			
G	Fill glue		Q	Capacitance, CV, Break		Z	Impedance & ESR			

Remarks:

1. If it's without lead treatment & special requirement, the 15th code is blank.
2. If it's with lead treatment & without require special requirement, the 17th, 18th, 19th, 20th code is blank.
3. If it's without lead treatment, but with special requirement, the 15th, 16th code filled with 0.
4. If it's without lead treatment, but with special requirement, also exceeds 4 kinds, keystone characteristic is 4 codes.
5. If it's with lead treatment, but with 1 special requirement, only remark 17th code, latter three codes is blank.
6. If it's with lead treatment, but with 1 special requirement, and it is different from former data, the 17th is 0, the 18th code is characteristic.

Information

1. Maximum ripple current

1.1 Maximum RMS ripple current at +105°C , 100KHz.

1.2 When capacitors are operated at temperatures other than +105°C, and frequency other than 100KHz, the maximum RMS ripple currents must be multiplied by the factors shown in below table.

Multiplier for Ripple Current vs. Frequency:

CAP (uF) \ Frequency(Hz)	50(60)	120	400	1K	10K	50K-100K
CAP≦10	0.47	0.59	0.76	0.85	0.97	1.0
10<CAP≦100	0.52	0.62	0.80	0.89	0.97	1.0
100<CAP≦1000	0.58	0.72	0.84	0.90	0.98	1.0
1000<CAP	0.63	0.78	0.87	0.91	0.98	1.0

1.3 When frequency is different from specified condition shown as above, do not exceed the value obtained by multiplying the permissible maximum ripple current by the multiplier above. The ripple current verify methods according to JIS-C-5101-1(2010) No.: 4.23

☆ Note: 1) Ripple current corrected with working frequency

2) Check the generated heat of capacitor when ripple current is hard to measure in the circuit. Promoted temperature by self-generating heat should be within 5℃.

2.Working Voltage (WV)

Make sure that no excess voltage (that is, higher than the rated voltage) is applied to capacitor. Please pay attention so that the peak voltage, which is DC voltage, overlapped by ripple current, will not exceed the rated voltage.

3.Insulating

General types of aluminum electrolytic capacitors are covered with a vinyl sleeve or the like. And this Sleeve is used for marking. When the internal element or the container is needed to be insulated, capacitors specially designed for insulation requirement are recommended to be used.

4. Soldering

4.1 When soldering a PC board with various components, too high soldering temperature or too long dipping time may cause secondary shrinking of the sleeve and then the container unnecessarily exposed. The soldering must be done on the reverse of PC board.

4.2 Soldering may melt or break the sleeve when the sleeve is contacted with circuit boards. So the capacitors are recommended to be slightly apart from the circuit boards.

5.Vent

The capacitor (Φ≧10mm) is provided with a safety vent on the bottom of the container. The vent would rupture in the event of the unsafe usage or misusage and relieve the internal higher pressure.

6. High Altitude

The capacitors can withstand those transportation conditions that temperature may range from -40℃ to +105℃, and the altitude may reach 200,000 feet.

7. Cleaning agents:

If the capacitor is cleaned in halogenated agents for organic removing solder flux solvent, the agents may penetrate into the inside of capacitor, and may generate corrosion.

8. Environment-friendly policy

In the entire process of capacitor's production, including manufacture, packaging, storage and transportation, our company always comply with the related Environmental Protection Laws and Regulations of RoHS.

9. Mounting and Installation design according to EIAJ RCR-2367 standards.

1. Performance

Test environment:

Methods	Temperature (℃)	Relative humidity (RH)	Atomospheric (Kpa)
①	15~35	25~75%	86~106
②	25±10	40~60%	86~106
③	20±1	63~67%	86~106

Remark:

①: Normal testing & the test results without doubt.

②: Normal testing & the test results with doubt.

③: Testing it in standard laboratory & the test results still with judgement.

1-1.Leakage current（L.C.）

〔Conditions〕

Rated voltage shall be applied to capacitors in series with a resistor of 1000±10Ω . Then leakage current shall be measured at the end of a specified period after the capacitors reached the rated voltage across the terminals.

〔Criteria〕

DC 6.3~100V : I≦0.01CV or 3(μA)　　DC 160~450V : I≦0.03CV(μA)

After 2 minute whichever is greater measured with rated working voltage applied.

{I: Leakage Current (μA); C: Capacitance (μF); V: Rated voltage (V) }

1-2.Capacitance（Cap.）

〔Conditions〕

Measuring frequency : 120Hz±20%

Measuring voltage : 0.5Vrms max. +1.5 to 2.0VDC

Measuring circuit : Series equivalent circuit

〔Criteria〕

Shall not exceed the values specified in the table of Standard Ratings.

1-3.Dissipation factor(tanδ）

〔Conditions〕

Measuring frequency : 120Hz±20%

Measuring voltage : 0.5Vrms max. +1.5 to 2.0VDC

Measuring circuit : Series equivalent circuit

〔Criteria〕

W.V.(V)	6.3	10	16	25	35	50	63	100
D.F.(%)max.	18	16	14	12	10	9	8	8

W.V.(V)	160	200	250	350	400	420~450
D.F.(%)max.	12	12	12	15	15	17

For capacitance value > 1000μF, add 2% per another 1000μF.

1-4.Terminal strength

(1) Pull strength

〔Conditions〕

The capacitor body shall be held. A force shall be gradually applied to the lead wire in the direction of the axis of the lead wire up to the specified pull force,and retained for 10±1 seconds.

Diameter of terminal (mm)	Pull force(N±10%)
0.35＜d≦0.5	5(0.51Kg)
0.5＜d≦0.8	10(1.02Kg)
0.8＜d≦1.25	20(2.04Kg)
SNAP-IN type terminal	40(4.08Kg)

〔Criteria〕

The lead wire shall neither loosen nor break away.

(2) Lead bending strength

〔Conditions〕

The capacitor shall be held so that the normal axis of the lead wire can be in a vertical position.
A weight equivalent to the specified load shall be hung on the end of the lead wire.
The capacitor body shall be inclined through 90°and returned to its normal position within
2 to 3 seconds. The consecutive bend shall then be in the opposite direction in the same manner.

Diameter of terminal (mm)	Pull force(N±10%)	Bends
0.35＜d≤0.5	2.5N(0.26 Kg)	2
0.5＜d≤0.8	5 N(0.51 Kg)	2
0.8＜d≤1.25	10N(1.02 Kg)	2
LUG type terminal	20N(2.04Kg)	2

SNAP-IN type terminals do not bending experiments, LUG terminal do bending test, bending angle of 45 degree centigrade.

〔Criteria〕

The lead wire shall neither loosen nor break away.

1-5.Soldering Heat Resistance Test

〔Conditions〕

Type of solder	: Sn-3Ag-0.5Cu
Flux	: Ethanol solution(25 wt.% rosin)
Solder temperature/immersion time	: 260(0~+3)℃ for 10±1 seconds
Solder iron temperature/time	: 400±10℃ for 5 to 6 seconds,3 times
Depth of immersion	: Up to 1.5-2.0mm from the root of the lead wire covered with a thermal shield plate
Speed of immersion	: 25±2.5mm/sec.

〔Criteria〕

Appearance	: No significant damage, legible marking, and no electrolyte leakage.
Capacitance change	: Within ±5% of initial value.
Tan δ	: Not more than the specified value
Leakage current	: Not more than the specified value

1-6. Solderability Test

〔Conditions〕

Type of solder	: Sn-3Ag-0.5Cu
Flux	: Ethanol solution (25 wt.% rosin)
Solder temperature	: 245±5℃
Depth of immersion	: Up to 1.5-2.0mm from the root of the lead wire covered with a thermal shield plate
Dipping time	: 2±0.5 seconds

〔Criteria〕

At least 95% of circumferential surface of the dipped portion of terminal shall be covered with new solder.

1-7.Temperature cycles

〔Conditions〕

Referring to JIS-C- 5101-1 (2010) No:1-10, the capacitor shall be subjected in turn to the procedures specified below:

Step	Temperature	Time (min.)	Cycles
1	Rated low working temperature (±3℃)	30±3	1 to 4 = 1 cycle, total 10 cycles.
2	25±5℃	3	
3	Rated high working temperature (105±2℃)	30±3	
4	25±5℃	3	

Remark: If the highest working temp. over than 125℃, the using temp. tolerance is ±5℃.

〔Criteria〕

Capacitance change	: Within ±5% of initial value.
Tan δ	: Not more than the specified value
Leakage current	: Not more than the specified value
Appearance	: No leakage and damaged.

1-8.Vibration

〔Conditions〕

Vibration frequency range	: 2 to 3000Hz
Amplitude or Acceleration	: 0.75 mm (Half amplitude)or 98m/s^2 (Whichever is less severe)
The vibration amplitude of P-P value	: 0mm~25mm
Test frequency	: 10-55-10Hz (Approximately 1 minute)
Direction and duration of vibration	: 3 orthogonal directions mutually each for 2h.(Total 6hrs)

〔Criteria〕

Capacitance change	: Within ±5% of initial value.
Tan δ	: Not more than the specified value
Leakage current	: Not more than the specified value
Appearance	: No leakage and damaged.

1-9.Damp Heat Steady State Test

〔Conditions〕

Test temperature	: +40±2℃
Relative humidity	: 90 to 95%RH
Test time	: 250 hours (Endurance time≤2000H)
	: 500 hours (Endurance time＞2000H)

After completion of test, the capacitors shall expose in the atmospheric condition for 16 hours, and then measurements shall be taken.

〔Criteria〕

Capacitance change	: Within ±20% of initial value. (Endurance time≤2000H)
	: Within ±10% of initial value. (Endurance time＞2000H)
Tan δ	: Not more than 120% of the specified value
Leakage current	: Not more than the specified value
Appearance	: No leakage and damaged.

1-10.Endurance

〔Conditions〕

Capacitors shall be placed in an oven with application of the rated D.C voltage.

Ambient temperature	:105±2℃
Specified test time	: (5-6.3ϕ)2000Hrs, (8ϕ)3000Hrs, (≥10ϕ)5000Hrs,(160V~450V:2000Hrs)

〔Criteria〕

Capacitance change	: Within ±20% of initial value.
Tan δ	: Not more than 200% of the specified value
Leakage current	: Not more than the specified value
Appearance	: No leakage and damaged.

1-11.Surge voltage test

〔Conditions〕

Test temperature	: +15 to +35℃
Series protective resistor	: 1000±10Ω
Charge and discharge time	: Charge period is 30s, followed by a discharge period of 5.5 min.
Test cycle	: 1000 cycles.
Rated voltage≦315V	:Surge voltage shall be 1.15 times the rated voltage
Rated voltage > 315V	:Surge voltage shall be 1.1 times the rated voltage

〔Criteria〕

Capacitance change	: Within ±15% of initial value.
Tan δ	: Not more than the specified value
Leakage current	: Not more than the specified value
Appearance	: No leakage and damaged.

1-12.Pressure relief vent

〔Conditions〕

Apply a reverse voltage with the DC current of 1 amp.(DC reverse voltage test)
When the pressure relief vent operated, the capacitor shall not flame although emission of gas or a part of the inside element is allowable.
If the vent does not operate with the voltage applied for 30 minutes, the test is considered to be passed.

〔Criteria〕

No sparking ; No shorting.
No breaking out of electrolyte paper;
Vent opening , no flowing down of electrolyte.

1-13.High Temperature Storage

〔Conditions〕

The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1000 hours at 105±2℃ without an applied voltage. Before the measurements, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.

〔Criteria〕

Capacitance change	: Within ±20% of initial value.
Tan δ	: Not more than 200% of the specified value
Leakage current	: Not more than the specified value
Appearance	: No leakage and damaged.

1-14.High and Low Temperature characteristics

〔Conditions〕

Step	Temperature [℃]	Time
1	+20±2	/
2	-40(-25)±3	2h
3	+20±2	15±2 min.
4	+105±2	2h
5	+20±2	15±2 min.

〔Criteria〕

Step 2: Impedance ratio shall not exceed the values shown in Table attached.

[120Hz]

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

Rated Voltage(V)	160	200	250	350	400	450
Z-25℃/Z+20℃	2	2	3	5	5	6
Z-40℃/Z+20℃	3	6	6	6	6	-

For capacitance value > 1000μF: 1). add 0.5 per another 1000μF for -25℃/+20℃

2). add 1.0 per another 1000 μF for -40℃/+20℃

Step 4. Capacitance change	: Within ±30% of initial value.
Tan δ	: Not more than the specified value.
Leakage current	: Shall not more than 800% of initial specified value.

2. Reference standard

KF series is applicable to general-purpose grade capacitors of JIS-C-5101-1(2010)

The othes test conditions shall comply with JIS-C-5101-4(2010).

3. Marking

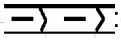
The following items shall be marked on each capacitor. All marking shall be legible and permanent.

（Example)

(1) CapXon: Manufacturer: trademark

(2) 16V: Rated voltage

(3) 100μF: Nominal capacitance

(4) :(-)Polarity (Cathode indicate)

(5) 105℃: Maximum operating temperature.

(6) KF: Series

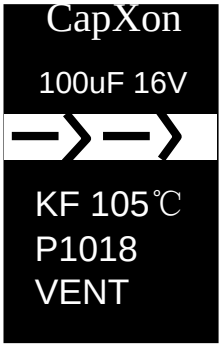
(7) P1018: Production date code

（P: PET Sleeve; 10: year 2010; 18: the 18 week）

(8) VENT: Safety vent (≧6.3X11mm, 8X7mm have mark of vent)

Front side:

Back side:



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Capxon:

FH470M050E110A GH100uF 35V 6.3*11 HV4R7M050B055ETR KF221M016E110A SK470M025C070A
DV221M050G105ETR GH101M050F115ETA KF221M035F115A KM10uF 50V 5*11 KM470M050E110A
KM681M100J355A HV471M010E077ETR KF221M100I250A KM102M025G160A SK220M050E070A
DV470M025E055ETR DV471M025G105ETR KM330M400I200A SY221M010E070A KM470M063E110A
KF101M050F115A KF221M010E110A KF331M016F115A KF4R7M400F115ECA KM220uF 50V 10*12.5
GH10uF 50V 5*11 HV101M050F105ETR HV220M035C055ETR HP101M450M360ECL SK101M016E070A