



产品规格承认书

Product Specification for Approval

客 户 名: 立创商城

Customer:

产品品名: 铝电解电容器

Description: ALUMINUM ELECTROLYTIC CAPACITORS

规格型号: 见第三页清单

Specifications:

圣融达料号: 见第三页清单

Sincerity P/N:

客户料号: /

Customer P/N:

产品品牌: 圣融达 (商标

Product Brands: Sincerity(Trademark

制作日期: 2024/10/21

Production Date:



客户承认Customer's Approval			圣融达承认Sincerity Approval		
接收Receive	审核Checked	批准Approved	制作Producer	审核Checked	批准Approved
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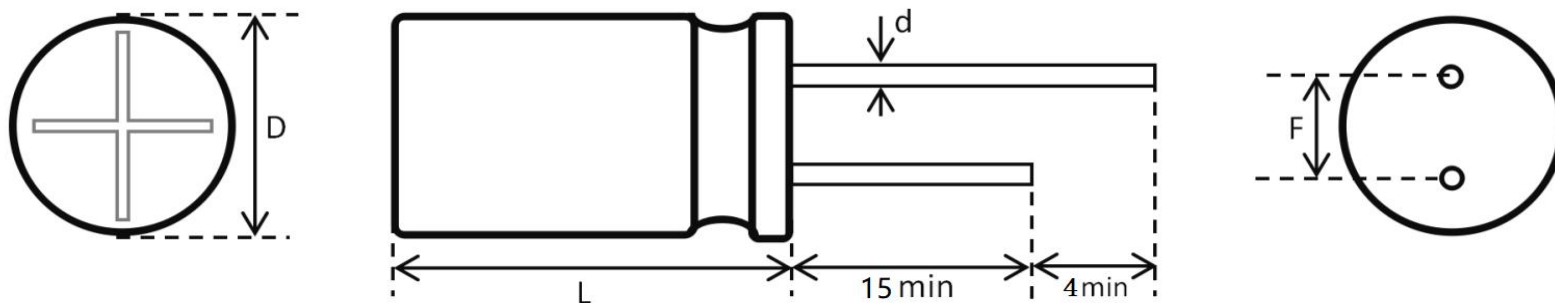
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客户Customer		立创商城													
备注REMARK															
产品型号	额定电压	标称容量	容量误差	损耗角	漏电流	纹波电流	ESR	寿命	温度范围	浪涌电压	产品尺寸 Dimensions (mm)				产品料号
Series	RATE VOLTAGE (V. DC)	Capacitance (uF)	Capacitance Tolerance (%)	DF tan δ (%) MAX	Leakage Current (uA) Max.	Ripple Current (mA) RMS at 105℃ 120Hz	Impedance at 20℃ 100KHz (Ω)	Load Life (Hours)	Temperature Range (℃)	Surge Voltage (V. DC)	D	L	F ±0.5	d ±0.05	
											D: (D<20) ±0.5; (D≥20) ±1.0 L: (L<20) ±1.5; (L≥20) ±2.0				Product number
KF	450	10	±20	20	115	85	/	5000	-40+105	500	10	13	5.0	0.6	KF2W100M1013EAH1COLC
KF	400	4.7	±20	20	62.6	52	/	5000	-40+105	450	8	12	3.5	0.5	KF2G4R7M0812DAH1COLC
KF	400	10	±20	20	105	82	/	5000	-40+105	450	8	16	3.5	0.5	KF2G100M0816DAH1EOLC
KF	250	10	±20	15	75	70	/	5000	-40+105	300	8	12	3.5	0.5	KF2E100M0812DAH1COLC

CAP/DF: at 120Hz, 25±2°C

L.C: 6.3~120V.DC, $I \leq 0.01CV$ or $3\mu A$, whichever is greater; 160~550V.DC, $I \leq 0.02CV + 25\mu A$ ($C = CAP.$, $V = WV$), After 2 minute with rated working voltage applied.

产品外形图



注 Note	检测仪表Aest Instruments
	1、Cap:CHEN HWA 1061 LCZ METER
	2、LC:CHEN HWA CLC-202A

产品料号体系



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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系列	电压	标称容量	容量偏差	直径高度	产品脚距	产品颜色	产品温度	内部识别码					
系列	代码	工作电压	代码	标称容量	代码	容量偏差	代码	产品尺寸	代码	印字温度	代码	产品颜色	代码
SS	SS	2.5	0F	0.10	R10	-5+20%	G	5X11	0511	85℃	S	黑底白字	A
SW	SW	4	0G	0.22	R22	-10+20%	V	6X12	0612	105℃	H	黑底金字	B
EC	EC	6.3	0J	0.33	R33	-10+10%	K	6.3X12	6L12	130℃	G	咖啡白字	C
EI	EI	8	0K	0.47	R47	-15+20%	Z	8X12	0812	产品 脚距	代码	咖啡金字	D
EF	EF	10	1A	1.0	1R0	-20+20%	M	10X12.5	101C			紫底白字	E
EL	EL	12	1B	2.2	2R2	0+20%	R	10X16	1016	1.5	A	紫底金字	F
FJ	FJ	16	1C	3.3	3R3	0+30%	Q	13X20	1320	2.0	B	绿底白字	G
EM	EM	25	1E	4.7	4R7	0+50%	T	16X21	1621	2.5	C	绿底金字	H
EB	EB	35	1V	10	100	0+80%	S	18X21	1821	3.5	D	黄底黑字	J
EG	EG	50	1H	22	220			22X25	2225	5.0	E	咖啡银字	K
NP	NP	63	1J	33	330			25X25	2525	7.5	F	红字	Y
KH	KH	80	1K	47	470			30X30	3030	10	G	黑字	Z
KP	KP	100	2A	100	101			30X35	3035				
KF	KF	120	2B	220	221			35X30	3530				
KT	KT	160	2C	330	331			12.5X50	1C50				
KR	KR	200	2D	470	471			特殊 尺寸	代码				
KI	KI	250	2E	1000	102			0.5	A				
KJ	KJ	300	2L	2200	222			1.5	B				
KC	KC	315	2P	3300	332			2.5	C				
KB	KB	330	2N	4700	472			3.5	D				
LS	LS	350	2V	10000	103			4.5	E				
LJI	LJI	400	2G	22000	223			5.5	F				
LP	LP	420	2M	33000	333			6.5	G				
LF	LF	450	2W	47000	473			7.5	H				
PC	PC	475	2X					8.5	J				
PH	PH	500	2I					9.5	K				
PZ	PZ	550	2Y					0.2	M				
VT	VT	600	2K					0.3	L				
VZ	VZ	630	2J					0.4	N				
								0.7	P				

1. 概述 (Scope)

本承认书适用于 KF 系列径向型铝电解电容器。

This specification covers KF series Radial Type Aluminum Electrolytic Capacitors.

2. 参考标准 (Applicable Specification)

本承认书参考了 JIS - C - 5101 制订。

This approval sheet consulted the institute of JIS - C - 5101, JIC - C - 5141.

3. 测试环境 (Test Environment)

除非另有说明, 用以进行测量和试验的标准大气条件范围如下: 环境温度: $25 \pm 2^\circ\text{C}$, 相对湿度: $65 \pm 5\%$ 。

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows: Ambient temperature: $25 \pm 2^\circ\text{C}$ - Relative humidity: $65 \pm 5\%$.

4. 产品特性 (Product characteristics)

4.1 电学特性 (Electrical characteristics)

4.1.1 额定电压及工作温度: $-40 \sim 105^\circ\text{C}$ ($160 \sim 450\text{V.DC}$); $-25 \sim 105^\circ\text{C}$ (500V.DC)

Rated voltage and Operating Temperature: $-40 \sim 105^\circ\text{C}$ ($160 \sim 450\text{V.DC}$); $-25 \sim 105^\circ\text{C}$ (500V.DC)

4.1.2 电容量 (Capacitance)

[条件]: 测试频率 120Hz $\pm 20\%$

[Conditions]: Measuring frequency: 120Hz $\pm 20\%$

测试电路 串联等效电路

Measuring circuit: Series equivalent circuit

测试电压 1Vrms

Measuring voltage: 1Vrms

[标准]: 容量偏差 $\pm 20\%$

[Criteria]: Capacitance tolerance: $\pm 20\%$

4.1.3 损耗 (Dissipation Factor)

[条件]: 测试条件与 4.1.2 相同

[Conditions]: Test conditions are the same as 4.1.2 for Capacitance

[标准]: 见表 1

[Criteria]: See Table 1

表 1 (Table 1)

WV	160	200	250	350	400	420	450	500
tg δ	0.15	0.15	0.15	0.20	0.20	0.2	0.20	0.24

4.1.4 漏电流 (Leakage Current)

[条件]: 在电容器两端施加额定工作电压, 并串联 $1000\Omega \pm 10\%$ 保护电阻, 漏电流在通电 2 分钟后测量。

[Conditions]: The rated voltage shall be applied across the capacitors and its protective resistor which shall be $1000\Omega \pm 10\%$. The leakage current shall then be measured after an electrification period of 2 min.

[标准] 直流: $160 \sim 500\text{V.DC}$, $I \leq 0.02CV + 25\mu\text{A}$

[Criteria]: DC: $160 \sim 500\text{V.DC}$, $I \leq 0.02CV + 25\mu\text{A}$

I: 漏电流 (μA), C: 容量 (μF), V: 额定电压 (V)

I: Leakage Current (μA), C: Capacitance (μF), V: Rated voltage (V)

4.1.5 高低温特性 (High and Low Temperature Characteristic)

[条件]: 如下表

步骤 (step)	温度 (Temperature)	持续时间 (Duration)
1	$20 \pm 2^\circ\text{C}$	/
2	$-25/-40_{-3}^{+0}^\circ\text{C}$	120min
3	$20 \pm 2^\circ\text{C}$	/
4	$105_{-0}^{+3}^\circ\text{C}$	120min

- [标准] 阶段2: 阻抗值与阶段1相比, 不大于表2要求。
- [Criteria]: Step 2: Comparison of impedance value with step 1, Not more than table 2 requires
- 阶段4: 容量值与阶段1相比, 变化在 $\pm 20\%$ 范围内。
- Step 4: The capacity value is in the range of 20% as compared to stage 1

表2 (Table 2)

WV	160	200	250	350	400	450	500
Z _{-25℃} / Z _{+20℃}	3	3	3	5	5	6	8
Z _{-40℃} / Z _{+20℃}	6	6	6	10	10	12	-

4.1.6 浪涌电压 (Surge Voltage Test)

- [条件]: 施加表3所列浪涌电压, 充电 30 ± 5 秒, 放电 330 ± 5 秒作为一个循环, 共进行1000个循环。
- [Conditions]: Apply the surge voltage listed in Table 3, charge for 30 ± 5 seconds, discharge for 330 ± 5 seconds as a cycle, a total of 1000 cycles.
- 测试温度: $15 \sim 35^\circ\text{C}$
- Test temperature: $15 \sim 35^\circ\text{C}$
- 然后在标准大气条件下放置达到热稳定, 测试各项参数。
- And the capacitors shall be stored under standard atmospheric conditions to obtain thermal stability, after which the measurements shall be made.
- [标准] 容量变化: 在初始值的 $\pm 20\%$ 之内。
- [Criteria]: Capacitance Change: Within $\pm 20\%$ of initial value
- 损耗: 不超过200%表1规定值
- Dissipation Factor: Not more than the 200% specified value in table 1.
- 漏电流: 满足4.1.4项要求
- Leakage Current: To satisfy No. 4.1.4

表3 (Table 3)

WV	160	200	250	350	400	420	450	500
SV	200	250	300	400	450	470	500	550

4.2 机械特性 (Mechanical characteristics)

4.2.1 端子强度 (Mechanical Requirements)

4.2.1.1 抗拉 (Tensile strength of termination)

- [条件]: 常温下, 沿引线下行方向, 在接线端子上施加拉力 (如下表), 维持 5 ± 1 秒。
- [Conditions]: At Room temperature, along the lead line down the direction of the terminal on the application of tension (as shown in the following table), maintain 5 ± 1 seconds.

引线直径 Diameter of wire (mm)	0.45	0.5	0.6	0.8	1.0
拉力 Force (N)	5 (0.51kg)	5 (0.51kg)	10 (1.02kg)	10 (1.02kg)	20 (2.04kg)

4.2.1.2 抗弯 (Bending strength of termination)

- [条件]: 常温下, 在电容器引线施加固定重力 (如下表), 然后弯曲身体通过90度, 回到原来的位置。下一步以相同的速度, 将其朝相反方向弯曲到90度, 再次回到原来的位置。上述过程在5秒内完成。
- [Conditions]: At Room temperature, apply fixed gravity to the capacitor leads (as shown in the table below), then bend the body through 90 degrees to return to its original position. Next, at the same speed, bend it in the opposite direction to 90 degrees and return to its original position again. The above process is completed in 5 seconds.

引线直径 Diameter of wire (mm)	0.45	0.5	0.6	0.8	1.0
拉力 Force (N)	5 (0.51kg)	5 (0.51kg)	10 (1.02kg)	10 (1.02kg)	20 (2.04kg)

- [标准] 测量电容器应无接触不良、开路或短路现象, 外观无可见机械损伤。
- [Criteria]: When the capacitor is measured, there shall be no intermittent contacts, or open or short-circuiting. There shall be no such mechanical damage.

4.2.2 Vibration (振动)

- [条件]: 在 3 个互相垂直的方向分别施加 2 小时振动, 共 6 小时。
- [Conditions]: Direction and duration of vibration: 3 orthogonal directions mutually each for 2h, total 6h.
频率: 10~55Hz。
Vibration Frequency Range :10-55Hz.
振幅: 1.5mm。
Peak to peak amplitude: 1.5mm.
振速: 1分钟内振速10~55~10Hz、
Sweep rate :10to55to10Hz in about 1 min.
- [标准] 测量电容器应无接触不良、开路或短路现象, 外观无可见机械损伤。
- [Criteria]: When the capacitor is measured, there shall be no intermittent contacts, or open or short-circuiting. There shall be no such mechanical damage.

4.2.3 Solder ability Test (可焊性)

- [条件]: 焊锡温度: 245±5℃
- [Conditions]: Temperature or solder: 245±5 ° C
浸入时间: 2±0.5 s
Dipping time: 2±0.5 s
- [标准] 浸入焊锡的引线表面积 90%以上应附着新锡。
- [Criteria]: At least 90% of circumferential surface of the dipping portion of termination shall be covered with new solder.

4.3 耐久性试验 (Durability test)

4.3.1 高温负荷 (Load Life Test)

- [条件]: 试验温度: 105±2℃, 施加额定电压和额定纹波电流。
- [Conditions]: Test temperature: 105±2° C, Application of the rated voltage and rated ripple current.
试验时间: 5000H
Test time: 5000H
- [标准] 容量变化: 在初始值的±20%之内。
- [Criteria]: Capacitance Change: Within ±20% of initial value.
损耗: 不超过初始值的200%
Dissipation Factor: Not more than 200% of the specified value
漏电流: 满足4.1.4项要求
Leakage Current: To satisfy No. 4.1.4
外观: 无异常
Appearance: No remarkable abnormality

4.3.2 高温贮存 (Shelf Life Test)

- [条件]: 在 105±2℃环境下无负荷贮存 1000₋₀⁺⁴⁸小时, 至少恢复16小时后。
- [Conditions]: The capacitors are then stored with no voltage applied at a temperature of 105 ±2℃ for 1000₋₀⁺⁴⁸h and then resumed 16 hours.
- [标准] 容量变化: 在初始值的 ±20% 之内。
- [Criteria]: Capacitance Change: Within ±20% of initial value.
损耗: 不超过初始值的200%
Dissipation Factor: Not more than 200% of the specified value
漏电流: 不超过初始值的200%
Leakage Current: Not more than 200% of the specified value
外观: 无异常
Appearance: No remarkable abnormality

4.3.3 耐焊接热 (Solder - Heat - Resistance)

[条件]:	焊锡温度:	260±5 ° C
[Conditions]:	Solder Temperature:	260±5 ° C
	浸入时间:	10±1 s.
	Dipping time:	10±1 s.
	电路板:	1.6mm
	Printed wiring board:	1.6mm
[标准]	容量变化:	在初始值的 ±10% 之内。
[Criteria]:	Capacitance Change:	Within ±10% of initial value.
	损耗:	不超过初始值
	Dissipation Factor:	Not more than the specified value
	漏电流:	满足4.1.4项要求
	Leakage Current:	To satisfy No. 4.1.4
	外观:	无异常
	Appearance:	No remarkable abnormality

4.3.4 防爆 (Safety Vent)

[条件]:	以下试验只适用于铝壳直径≥Φ8 产品, 试验条件如下表。
[Conditions]:	The following tests only apply to those products with vent products at diameter≥Φ8 with vent, The test conditions are shown in the following table.

电容直径 (Capacitor diameter)	施加电流 (Applied Current)	施加电压 (Applied Voltage)	排气时间 (Vent Time)
Φ≤22.4mm	1A	反向额定电压 Reverse Rated Voltage	≤30min
Φ≥22.5mm	10A	反向额定电压 Reverse Rated Voltage	≤30min

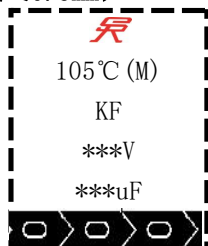
[标准]	在测试期间或之后, 电容器不得有爆炸、闪光、火焰、火花或火焰, 亦不得有任何金属从外壳排出。
[Criteria]:	There shall be no explosion, flash, flame, spark or fire from the capacitor during or after the test, nor shall there be expulsion of any metal from the casing.

4.3.5 稳态湿热 (Resistance to damp heat)

[条件]:	试验温度:	40±2° C
[Conditions]:	Test temperature:	40±2° C
	相对湿度:	90~95%
	Relative humidity:	90~95%
	试验时间:	500±8h
	Test time:	500±8h
	试验后, 电容器在标准大气条件下 1~2 小时, 然后测试参数。	
	After completion of test, the capacitors shall be subject to standard atmospheric conditions for 1 to 2 hours, after which the measurements shall be made.	
[标准]	容量变化:	在初始值的 ±10%
[Criteria]:	Capacitance Change:	Within ±10% of initial value.
	损耗:	不超过初始值
	Dissipation Factor:	Not more than the specified value
	漏电流:	满足4.1.4项要求
	Leakage Current:	To satisfy No. 4.1.4
	外观:	无异常
	Appearance:	No remarkable abnormality

5. 套管丝印 (insulating bush Marking)

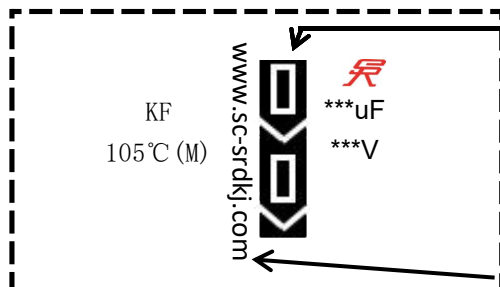
5.1 平行版 (直径≤6.3mm)



商标 (Trademark)
额定温度 (Operating temperature)
型号 (Series)
工作电压 (Working voltage)
标称容量 (Norminal capacitance)
负极标志 (Polarity of the terminals)

5.2 垂直版 (直径≥8mm)

型号 (Series)
额定温度和容量偏差



负极标志 (Polarity of the terminals)
商标 (Trademark)
工作电压和标称容量
(Working voltage
and Norminal capacitance)
公司网站 (Company website)

6. 最大纹波电流 (Maximum ripple current)

当电容器在不超过+105℃下工作, 以及频率不是120Hz时, 最大有效值纹波电流必须乘以下表所示的因数。

When capacitors are operated at temperatures other than +105° C, and frequency not 120Hz, the maximum RMS ripple currents must be multiplied by the factors shown in below table.

纹波电流频率修正系数 (Ripple current frequency coefficient)

频率 (Hz) 容量 (uF)	50/60	100/120	1K	≥10K
Cap<10	0.65	1.00	1.75	1.95
10≤Cap<100	0.75	1.00	1.50	1.75
Cap≥100	0.80	1.00	1.30	1.40

纹波电流温度修正系数 (Multiplier for Ripple Current vs. Temperature)

Temperature℃	45	60	85	95	105
温度系数Temperature coefficient 实际纹波值/额定最大纹波值 Actualrmsripple/Ratedrmsmax.ripple	2.1	1.9	1.65	1.25	1

7. 包装 (Packing)

7.1 包装标签 (Packing label)

ELECTROLYTIC CAPACITOR			
CAP. /W. V.	MFD	WV	
TYPE:	TOL: ±20%		
CASE SIZE:		Q	
QTY: PCS		C	
LOTNO:	环保产品	RoHS	
DATE:			

7.2 袋装包装规范 (Bagging Packaging Specification)

ΦD×L (mm)	最小包装 (个/袋)	中箱包装 (个/盒) Small Box Capacity (PCS)	大箱包装 (个/箱) Carton Box Capacity (PCS)
			包装箱尺寸
			475*345*310
10*13	500	3000	12000
8*12	500	5000	20000
8*16	250	2500	10000

7.3 编带包装规范 (Braiding Packaging Specification)

产品直径 Capacitor diameter	小箱容量 (只) Small Box Capacity (PCS)	大箱容量 (只) Carton Box Capacity (PCS)
		包装箱尺寸 (mm)
		485*345*280
φ 5	2000	20000
φ 6.3	1500	15000
φ 8/8.2	1000	10000
φ 10	600	6000
φ 12.5/13	300	3000
φ 16	250	2500
φ 18	200	2000

7.4 盒装包装规范 (Bagging Packaging Specification)

ΦD×L (mm)	中箱包装 (个/盒) Small Box Capacity (PCS)	大箱包装 (个/箱) Carton Box Capacity (PCS)
		包装箱尺寸
		425*328*310

8. 铝电解电容器存放环境与控制

Storage Conditions and Control for Aluminum Electrolytic Capacitor

8.1 环境温度: 5℃ ~ 35℃, 环境相对湿度:75%以下。

Store the capacitor at a temperature of 5℃ to 35℃ and at a relative humidity of less than 75%.

8.2 存放环境不应有阳光直射, 不宜高温。

Store the capacitor in low temperature places free from direct sun shine.

8.3 存放环境不能有盐分、油含量高的雾气。

Store the capacitor in places free from oil vapor, salt water vapor.

8.4 存放在远离氯气、氨气、硫化氢、亚硫酸、硝酸等有害气体含量高的地方。

Store the capacitor in places far from toxic gases (chlorine, ammonium, hydrogen sulfide, sulphurous acid, nitric acid, etc).

8.5 储存环境不能有臭氧、紫外线或辐射。

Store the capacitor in place free from Ozone, ultraviolet ray or radiation.

8.6 产品储存期限: ≤12个月。

Storage life: ≤12months

8.7 产品储存期限>12个月时, 需充电后再使用。

If storage life > 12months, the products need to be charged again before using;

8.8 存放时间超过3年的电解电容器应报废处理。

If Storage time more than 3 years, the products need to be discarded.

8.9 库存品有效期以套管上印刷的时间开始计算。

Expiry Date: calculating from the date marked on the sleeve.

8.10 请尽量以包装状态保管。

Please keep capacitors in the original package.

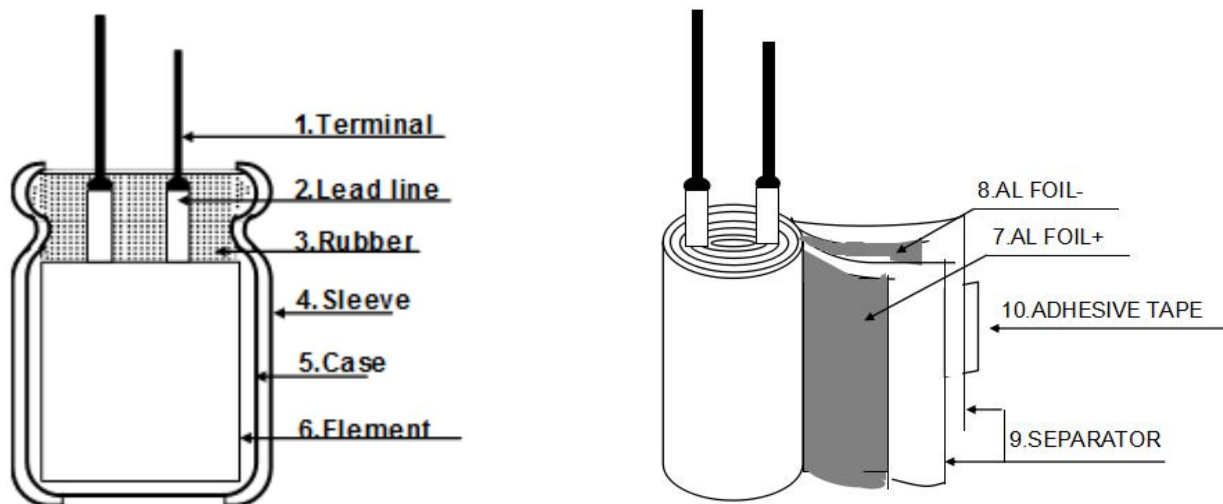
8.11 使用清洁剂之注意事项。(Detergent needing attention)

铝质电解电容器会受含有碳化氢卤素溶剂之侵蚀, 下列为各种安全与不安全之清洁剂, 为避免不必要的损失, 您所使用有关印刷基板之清洁剂名请事先告知本公司。

Hydrogen carbide liquid and halogen liquid can cause Aluminium Electrolytic Capacitor to corrode. Some of Safe and Unsafe detergent are as follows.

Safe 安全	Unsafe 不安全
Methanol/甲醇	1.1.2- trichloroethane/1.1.2- 三氯乙烷
Ethanol/乙醇	Tetrachloroethylene/四氯化碳
Propanol/丙醇	Chloroform(colorless volatilizable liquid)/哥罗仿(无色挥发性液体)
Butanol/丁醇	Dichloromethane/二氯甲烷
Detergent/去垢剂	Trichlorelethylene/三氯甲烯
	Dimethybenxene/二甲苯

9. 铝电解电容器结构图 (The structure chart of solid electrolytic capacitors)



零件名称 PART NAME	材料 MATERIALS
1. CP线 Terminal	镀铜镀锡铁线 Tinned copper-ply wire
2. 引出线 Lead line	纯度为99.95%或99.97%的金属铝片 Aluminum, 99.95% or 99.97%
3. 封口橡胶 Rubber	EPT、IIR、EPT+IIR 橡胶 EPT、IIR、EPT+IIR rubber
4. 胶管 Sleeve	P.E.T (Polyethylene Terephthalate Resin)
5. 铝壳 Case	纯度为99.8%的金属铝 Aluminum, 99.8%
6. 电解液 Electrolyte	乙二醇、铵盐等 Ethylene glycol, ammonium salt, etc.
7. 正极箔 AL FOIL+	纯度99.99%或99.98%的化成铝箔 Formed aluminum, 99.99% or 99.98%
8. 负极箔 AL FOIL-	纯度99.7%或99.4%的腐蚀铝箔 Etched aluminum, 99.7% or 99.4%
9. 电解纸 SEPARATOR	纤维纸 fiber paper
10. 胶带 ADHESIVE TAPE	聚丙烯薄膜 POLY PROPYLENE FILM