

客户Customer: 深圳国昂电子

日期Date: 2022年9月15日

承 认 书

SPECIFICATION

种 类: 导电性高分子混合型铝电解电容器
Description: Conductive Polymer Hybrid Aluminum Electrolytic Capacitor
艾华料号 AISHI P/N: HSE1VM470E06E00RAXXV
系 列 SERIES: SE
规 格 尺 寸 ITEM: 35V47uF(Φ6.3*6)
客户料号 Customer P/N: /
编 号No.: CRS-FX-2209178
应用场景: 车灯

批准 Approved by			客户确认Client Confirmed	
制作 Prepared by	审核 Checked by	批准 Approved by	审核 Checked by	批准 Approved by
 张淑媛 技术部	 张超 技术部	 刘强 技术部		

Please return one copy with your authorized signature when you accept these specifications.
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制订/修订履历表Make/revised curriculum vitae

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1.概述Scope

此承认书使用于含有导电高分子电解质和添加剂的SE系列导电性高分子混合型铝电解电容器

These specifications specify SE series of the Conductive Polymer Hybrid Aluminum Electrolytic Capacitor.

AEC-Q200 applicable product. (符合车规认证标准)

2.使用温度范围Operating Temperature Range (-55~125℃)

使用温度范围是指电容在额定电压下可以稳定运行的环境温度范围

Operating temperature range is the range of ambient temperature at which the capacitor can be operated continuously at rated voltage.

3.特性Characteristics

除非另有说明，标准的测量和测试环境条件如下：

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows.

环境温度Ambient temperature : 15 to 35℃

大气压力Air pressure: 86kpa to 106kpa

若对结果有疑问，测试则按如下标准进行

If there may be doubt on the results, measurements shall be made within the following limits.

环境温度Ambient temperature : 20±2℃

大气压力Air pressure: 86kpa to 106kpa

4. 额定电压、浪涌电压和额定温度 Rated voltage, Surge voltage and Rated temperature

额定电压 Rated voltage(V)	额定温度 Rated temperature(°C)	浪涌电压 Surge voltage (V)	电压种类 Category voltage(V)
16	125	18.4	16
25	125	28.75	25
35	125	40.25	35
50	125	57.5	50
63	125	72.45	63

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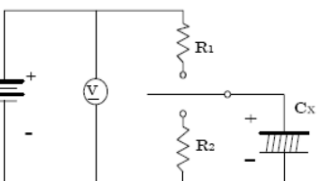
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6.2 耐受能力Endurance Performance

序号 No.	项目 Item	测试方法 Test method	性能 Performance
6.2.1	纹波寿命试验 Ripple Life Test	电容在125±3℃, 额定电压下, 施加额定纹波电流4000小时后, 需在室温下放置2小时才可进行测试。 After 4000 hours continuous application of the rated voltage with the rated ripple current at 125 ±3℃, the measurements shall be measured after 2 hours exposed at room temperature.	容量变化: 在初始值的±30%内 Capacitance change within ±30% of the initial value 损失角: 小于规格值的200% $\tan \delta \leq 200\%$ of the initial specified value. 等效串联电阻≤规格值的200% $ESR \leq 200\%$ of the initial specified value. 漏电流≤规格值 Leakage current $\leq$ initial specified value. 外观: 没有明显的损伤 Appearance: No significant damage
6.2.2	振动试验 Resistance to Vibration	频率: 10到2000Hz(20分钟间隔/10→2000→10Hz) Frequency: 10 to 2000Hz (20 minute interval/10→2000→10Hz) 加速度: 5g Acceleration: 5g 方向: X, Y, Z (3轴) Direction: X, Y, Z (3 axes) 持续时间: 4小时/轴 (共12小时) Duration: 4 hours / axial (Total 12 hours)	容量变化在初始值的±5%内 Capacitance change within ±5% of the initial value 损失角≤规格值 $\tan \delta \leq$ initial specified value. 等效串联电阻≤规格值 $ESR \leq$ initial specified value. 漏电流≤规格值 Leakage current $\leq$ initial specified value. 外观: 没有明显的损伤 Appearance: No significant damage
6.2.3	可焊性 Solder ability	浸渍温度: 235℃ ± 5℃ Temperature of solder bath: 235℃ ± 5℃ 浸渍时间: 2秒±0.5秒 Immersion time: 2 s ± 0.5 s.	至少95%的浸渍表面覆盖有新的焊料 At least 95% of surface area of the dipped portion of the terminal shall be covered with new solder.

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序号 No.	项目 Item	测试方法 Test method	性能 Performance
6.2.7	浪涌电压 Surge voltage	额定浪涌电压充电30s后，在室温下放电5min30s。这一过程重复1000次，每一次循环的时间为6min，测试温度为15°C-35°C。测试电路如下图所示： Rated surge voltage shall be applied (switch on) for 30 seconds and then shall be applied (switch off) with discharge for 5min30 seconds at room temperature. This cycle shall be repeated for 1000 cycles. Duration of one cycle is 6 minutes. Test temperature: 15°C-35°C The test circuit is as follows: Test circuit :  ⓧ : DC voltmeter R1: Protective resistor 1kΩ R2: Discharging resistor 1kΩ Cx: Capacitor under test (10pcs) 备注：若浪涌电压测试标准不能满足整机实际ON/OFF要求，请在样品阶段与我司RD确认，并将具体测试要求反馈给我司，包括测试电压、浪涌电流、充放频率、循环次数、测试温度及性能表现等。Remark: If the surge voltage test standard is inconsistent with the actual ON/OFF requirements of the machine, Please confirm with our RD at the sample stage. And feedback the specific test requirements to our company, including test voltage, surge current, charge and discharge frequency, cycle times, test temperature and performance, etc.	电容变化在初始值的±20%内 Capacitance change within ±20% of initial value 损失角≤规格值的200% $\tan \delta \leq 200\%$ of the initial specified value. 等效串联电阻≤规格值的200% ESR ≤ 200% of the initial specified value. 漏电流≤规格值 Leakage current ≤ initial specified value.
6.2.8	高温储存 High temperature storage	电容在125°C±3°C下放置1000小时后，需在室温下放置2小时才可进行测试。 Capacitor is placed under 125 °C±3 °C after 1000 hours, should be placed at room temperature 2 hours can be tested.	容量变化：在初始值的±30%内 Capacitance change within ±30% of the initial value 损失角：小于规格值的200% $\tan \delta \leq 200\%$ of the initial specified value. 等效串联电阻≤规格值的200% ESR ≤ 200% of the initial specified value. 漏电流：小于或等于规格值 Leakage current ≤ initial specified value.
6.2.9	耐溶剂性 Resistance to solvent	温度Temperature: 25°C±5°C 溶液Solution: Chemical-OKEM 浸泡时间: 3~3.5分钟 Soak time: 3~3.5 minutes 循环次数: 3次 Cycle number: 3 cycles	外观：没有明显的损伤 Appearance: No significant damage

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序号 No.	项目 Item	测试方法 Test method	性能 Performance
6.2.10	端子强度 Terminal Strength	SMD先回流焊接 1.将元件焊接在PCB板上(100mm×40mm FR4 PCB板, 板厚为1.6mm±0.2mm) 2.对元件侧面施加一个17.7N的水平推力, 持续时间60+1s The element is reflow soldered first 1.The element is welded to the PCB board (100mm×40mm FR4 PCB with thickness of 1.6mm±0.2mm) 2.A horizontal thrust of 17.7N is applied to the side of the element for a duration of 60+1sec.	电容变化在初始值的±5%内 Capacitance change within ±5% of initial value 损失角≤ 规格值 Tanδ≤ initial specified value. 等效串联电阻≤ 规格值 ESR ≤ initial specified value. 漏电流≤规格值 Leakage current ≤initial specified value. 外观: 没有明显的损伤 Appearance:No significant damage

备注 REMARKS

如果有任何疑问，在电压处理后测量漏电流。

电压：直流额定电压适用于电容器在125℃下120分钟。

需在室温下放置2小时才可进行测试

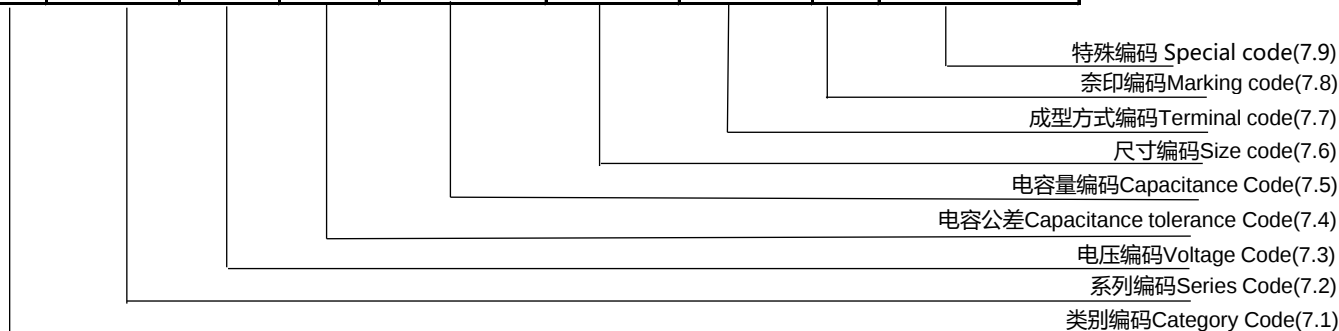
If any doubt arises, measure the leakage current after following voltage treatment.

Voltage treatment : DC rated voltage are applied to the capacitors for 120 minutes at 125°C.

The measurements should be measured after 2 hours exposed at room temperature.

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H	SE	1V	M	470	E06	E00	R	AXXV
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编码Code	H
类别编码Category Code	混合型电容Hybrid Capacitor

编码Code	SE
系列编码Series Code	SE

编码Code	0E	0J	1C	1E	1V	1H	1K
电压编码VoltageCode(W.V)	2.5	6.3	16	25	35	50	100

“M”代表 -20 % ~ +20 % “M”stands for -20 % ~ +20 %

编码Code	470	101	331	471	561	681	821	122
电容量Capacitance (uF)	47	100	330	470	560	680	820	1200

编码Code	D10	B09	E06	E7C	E11	F9R	FBR	GAR	K18
直径D (Φ)	5	5.5	6.3	6.3	6.3	8	8	10	13
高度H (mm)	10	9	6	7.7	11	9.5	11.5	10.5	18

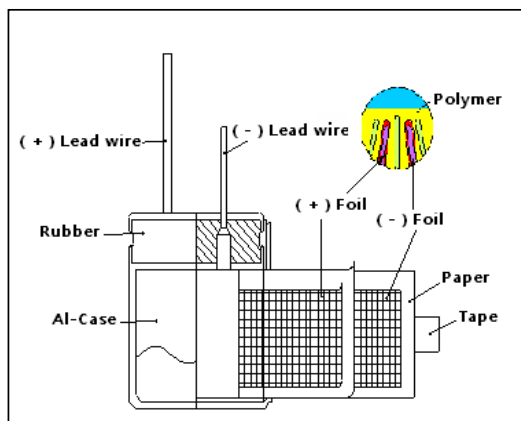
编码Code	D00	E00
其他 Other	贴片、散装SMD&Bulk	贴片、编带SMD&Taping

编码Code	S	R
捺印Marking	天蓝Sky blue	红色Red

“AXXV” 代表常规四轮车用电子, “AXXV” stands for normal four-wheelers products.

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8. 结构Construction



导针:固体镀锡铜包钢线

Lead wires : Solid tinned copper weld steel wire

导针端子: 高纯铝 Al-boss : High pure aluminum

电解纸：马尼拉麻Paper : Manila hemp

铝箔 (正极): 高纯铝Al-foil (Anode): High pure aluminum

铝箔(负极): 碳箔、高纯铝

Al-foil (Cathode) : Carbon foil, High purity aluminum

镀膜铝壳: 铝+镀膜 (耐压600V以上) Coating AL-case: Aluminum+coating(Can withstand voltage above 600V)

膠帶：聚酯 Tape : Polyester

胶粒: (树脂)压缩成型 IIR-Rubber:Resin (Compression molding)

导针和圆柱端子通过焊接连接在一起

The lead wire and the Al-boss are welded together.

导针扁平端子与铝箔通过按压连接在一起

The Al-tab and the Al-foil are stitched to join together.

卷绕的素子外部以阴极箔包裹

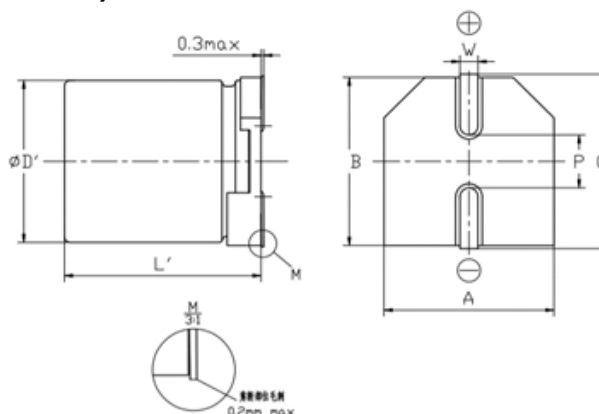
The outer most Al-foil spiral of the element is cathode.

导电高分子用作电解质

Conductive polymer is used as the electrolyte.

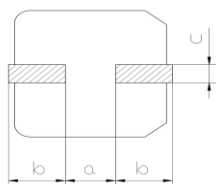
9.尺寸图Outer dimensions (单位Unit:mm)

尺寸Outer dimensions (单位Unit:mm



尺寸编码 Size Code	ΦD' (mm)	ΦD'(mm) Tolerance	L' (mm)	L'(mm) Tolerance	A±0.2 (mm)	B±0.2 (mm)	C±0.2 (mm)	P±0.2 (mm)	W (mm)
E06	6.3	-0.1~+0.5	6	-0.3~+0.3	6.6	6.6	7.2	1.9	0.65±0.15

焊盘尺寸 Soldering pad dimensions (单位Unit:mm)



尺寸 Size	a	b	c
Φ6.3	2.1	3.5	1.6
Φ8	2.8	4.2	1.9
Φ10	4.3	4.4	1.9

10. 特性表格Characteristics Table

序号 N o.	艾华料号 AISHI P/N	额定 工作电压 Rated Work Voltage (V.DC)	电容量 Nominal Capacitanc e 120Hz,20 °C(μF)	电容量 公差 Capacitanc e Tolerance (%)	温度 Oper Temp (°C)	尺寸 Nominal Case Size D*L (mm)	等效 串联电阻 E.S.R 100KHz 20°C (mΩmax)	最大漏电流 Leakage current 20°C(μA max) 2Minutes/W.V	损失 D.F (tan δ) 120Hz, 20°C (%max)	纹波电流 Ripple Current 100KHz,125°C (mA.rms)	寿命 Load Life (Hours)
1	HSE1VM470E06E00RAXXV	35	47	-20 ~ +20	125	6.3*6	60	16.45	10	900	4000

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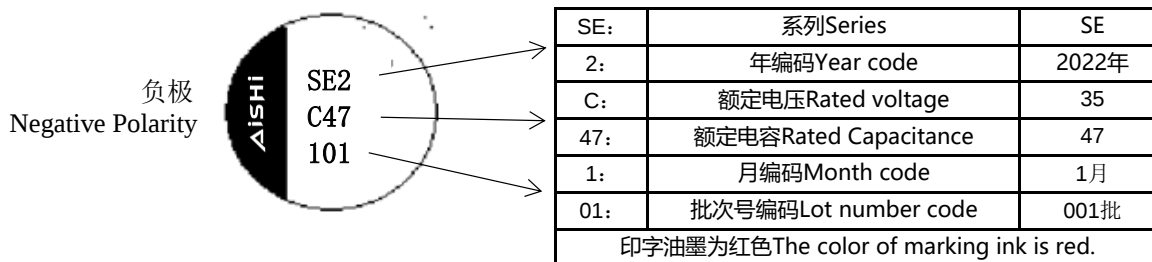
纹波电流频率系数Frequency coefficient for ripple current

频率Frequency	$120\text{Hz} \leq f < 1\text{ kHz}$	$1\text{ kHz} \leq f < 10\text{ kHz}$	$10\text{ kHz} \leq f < 100\text{ kHz}$	$100\text{ kHz} \leq f < 300\text{ kHz}$
系数Coefficient	0.05	0.3	0.7	1

11.捺印Marking

除非另有说明，捺印应该清晰地印在电容上

Unless otherwise specified. Capacitor shall be clearly marked on it body.



系列代码 Series code

系列	SD	SE	SF	SG	
代码	SD	SE	SF	SG	

年份代码 Year Code

年份	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
代码	K	M	N	1	2	3	4	5	6	7	8	9	A
年份	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	...
代码	B	C	D	E	F	G	H	K	M	N	1	2	...

电压代码 W.V code

电压	16	25	35	50	63	80	100
代码	A	B	C	D	E	F	G

容量代码 Cap. Value code

容量	6.8	47	100	220	270	470	560	1000	1500	
代码	6R8	47	100	220	270	470	560	10C	15C	

月份代码 Month code

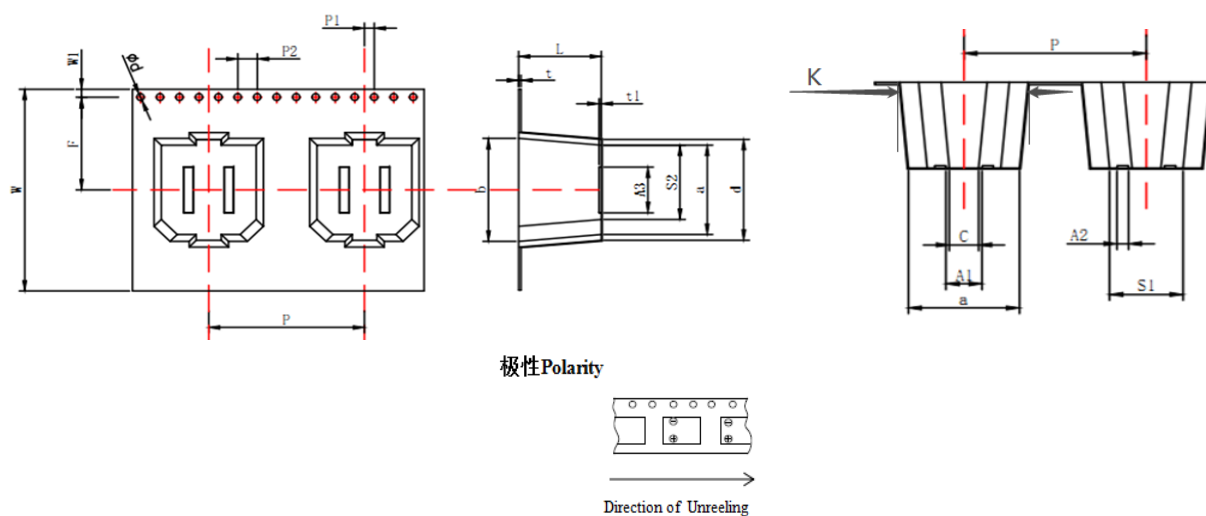
月份	1	2	3	4	5	6	7	8	9	10	11	12
代码	1	2	3	4	5	6	7	8	9	A	B	C

批次号代码Lot number code

批次号	001	002	003		010		099	100	101		126	
代码	01	02	03		10		99	AA	AB		BA	

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12. 匣盒帶Box cassette (單位Unit:mm)



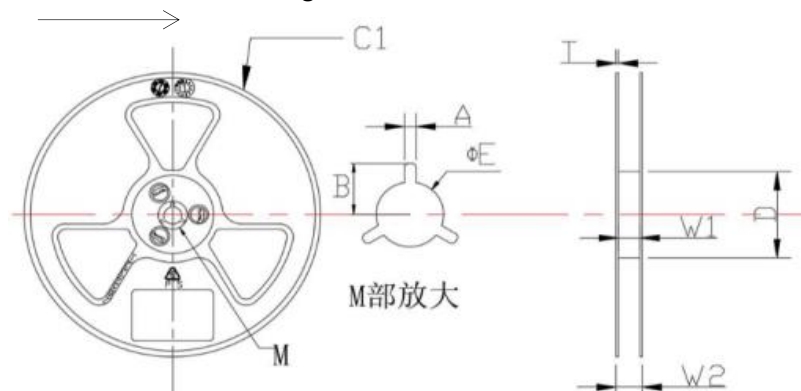
尺寸编码 Size Code	Φd	L	P	P1	P2	t	t1	W	W1	F	A1	A2	A3	S1	S2	a	b	c	d
E06	1.5	6.5	12.0	2.0	4.0	0.5	0.35	16.0	1.75	7.5	2.5	0.8	3.5	4.3	5.2	6.8	7.8	1.6	8.0

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13. 包装Packing

Bulk: Standard

Direction of Unreeling



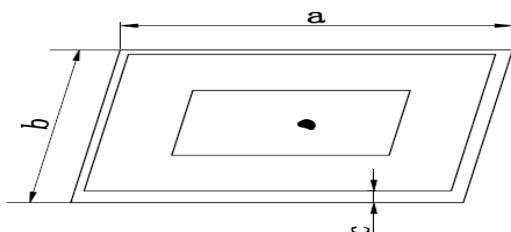
胶盘加真空包装

plastic carrier reel and vacuum packing

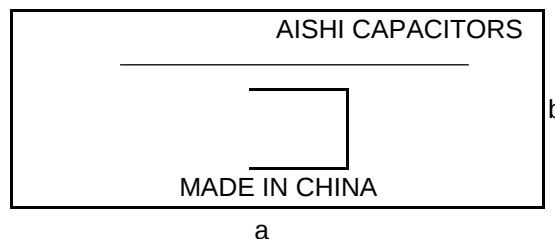
Aishi	
P/N:	
CUSTOMER P/N	
SIZE:	
Q'TY	
DATE	

胶盘尺寸 plastic carrier reel dimensions (单位Unit:mm)

尺寸	C1±2	A±0.2	B±0.2	W1±2	E±0.4	W2±1	T±0.2	D±0.5
6.3拍	380	2.6	10.8	16	13.8	21.7	2	100
8拍、10拍	380	2.6	10.8	24	13.8	29.7	2	100



Zipper bag



13.1 编带包装Tape Packing

编带Taping: 标准Standard

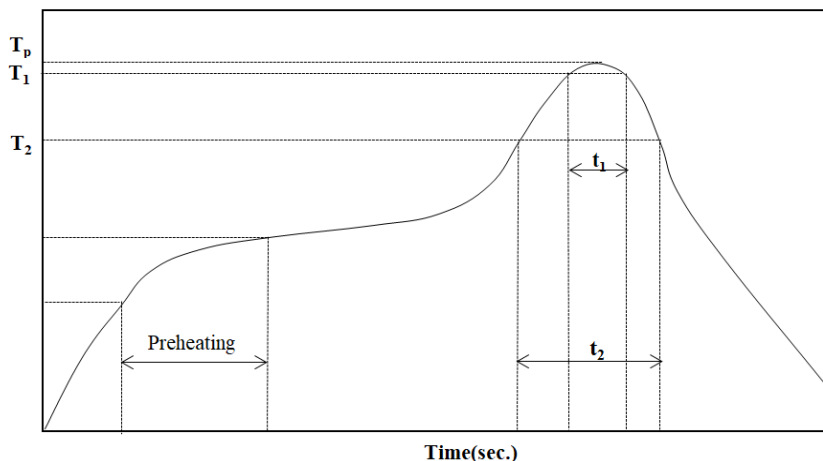
分类Classification	标准Standard			
产品尺寸 Product size D*L(mm)	承载卷轴 Carrier reel/ (pcs)	外包箱 Outer carton/ (plastic carrier reel) 390*225*390 (mm)	承载卷轴尺寸Carrier reel size/ (mm)	
			W1±2	W2±1
6.3*4.5	1200	10	16	21.7
6.3*6	1000	10	16	21.7
6.3*7.7	800	10	16	21.7

产品尺寸 Product size D*L(mm)	承载卷轴 Carrier reel/ (pcs)	外包箱 Outer carton/ (plastic carrier reel) 390*225*390 (mm)	承载卷轴尺寸Carrier reel size/ (mm)	
			W1±2	W2±1
8*9.5	600	6	24	29.7
8*11.5	500	6	24	29.7
10*10.5	500	6	24	29.7

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The reflux times shall not exceed twice. After the first reflux, the second reflux can be carried out only after the temperature of the capacitor has been completely cooled to room temperature (5 ~ 30 °C). With the change of welding conditions, the leakage current may increase or even exceed the specification value after welding. After being used by loading voltage, the leakage current will gradually decrease.



Preheating	T _p	T ₁	T ₂	t ₁	t ₂	Reflow cycle
150℃~180℃ ≤90s	250℃	245℃	217℃	≤30s	≤90s	1
150℃~180℃ ≤90s	245℃	240℃	217℃	≤20s	≤70s	2

Even under the recommended reflow soldering conditions, the outer box of the capacitor may change color or cargo expansion, but it will not affect the reliability of the product. Please understand.

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产品内包装开封后，有效期一个月 The product is valid for one month after the inner package is opened.

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14.9 清洗Cleaning

关于HCFC，可用高浓酒精，石油，匝烯，水和表面活性剂以及别的溶剂（单独或混合使用）浸泡，用超声波，煮沸，蒸发等方法按制作者的建议清洗。更多详情请联系。

Concerning about HCFC, higher alcohol system, petroleum system, terpene system, water system with surface active agent and other solvents the washing way (separateness or combinations) by soak, ultrasonic wave, boil, vapor etc. is confirmed under the maker's recommendation. Please contact us if you require further details.

14.10为AishiCAP设计电路的说明Notes on circuit designs for AishiCAP

14.10.1 执行Performance

在承认书中指定的额定性能范围内使用AishiCAP。

Use AishiCAP within the rating and performance ranges defined in this specifications.

14.10.2 使用温度和纹波电流 Operating temperature and ripple current

如果AishiCAP的使用温度超过了上限温度（125℃）或是有过载纹波电流通过，则有较大可能使寿命缩短，或漏电流增大，造成AishiCAP失效。

If AishiCAP is used at a temperature higher than the upper category temperature(125°C), or excess ripple current flows through AishiCAP, there are high possibilities of life cycle reduction or leakage current increasing to cause AishiCAP defective.

14.10.3漏电流Leakage current

漏电流会因焊接条件而有些微的上升，加载直流电压可使电容自我修复，漏电流逐渐减小。

The leakage current of AishiCAP may increase slightly by soldering conditions. The application of DC voltage enables the capacitors to be repaired by itself and this leads the leakage current to be smaller gradually.

14.10.4使用电压Applied voltage

为了保证AishiCAP的可靠性，加载到AishiCAP上的电压最好小于其额定电压。直流加交流电压的峰值应小于额定电压。

For the reliability of AishiCAP, it is recommended that the voltage applied to AishiCAP should be less than the rated voltage.

Peak value of the the dc and ac voltage should not exceed its rated voltage.

14.10.5失效模式Failure mode

AishiCAP含有导电聚合物，其寿命的终止大部分是由于偶然失效模式，主要是开路。如果开路，AishiCAP将会因持续电流流过而过热，然后铝壳会因内部压力的增加而脱离电容。

AishiCAP contains a conductive polymer. The life ends mostly due to random failure mode, mainly open circuit. In case of open circuit, AishiCAP can be overheated by continuous current flow, then case of AishiCAP would be removed by internal pressure increasing.

14.10.6变更提前通知Advance consultation for changing

如果承认书改变，我们会提前通知

It is conducted under an advance consultation with you if this specification is changed.

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