

客户**Customer:** 东莞市美瑞电子有限公司

日期**Date:** 2026年6月17日

承 认 书

SPECIFICATION

种 类: 固态铝电解电容器
Description: Conductive Polymer Aluminum Solid Capacitors
艾华料号 AISHI P/N: SPZ1DM471G10O00REX18
系 列 SERIES: PZ
规 格 尺 寸 SPEC.: 20V470uF(Φ10*10)
客户料号 Customer P/N: /
编 号No. : CRS-FX-2606308

批准 Approval			客户确认 Client Confirmation	
制作 Prepared by	审核 Checked by	批准 Approved by	审核 Checked by	批准 Approved by
				

Kindly return one copy with your authorised signature or stamp upon accepting the specification.
Please note that no return within 6 months is considered to be approvable.

制订/修订履历表Change Records

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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的PZ系列固态电解电容

This specification specifies the PZ series of aluminum solid capacitors with conductive polymer electrolyte.

2.使用温度范围Operating Temperature Range (-55~105℃)

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

The operating temperature range indicates the ambient temperature range at which the capacitor can be operated continuously at its 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 measurement and test environmental conditions are as follows:

环境温度Ambient temperature : 15 to 35°C

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 is any doubt about the results, measurements shall be taken within the following conditions:

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)
2.5	105	2.88
6.3	105	7.25
6.8	105	7.82
7	105	8.05
7.5	105	8.63
10	105	11.5
12	105	13.8
16	105	18.4
20	105	23
25	105	28.75
35	105	40.25
50	105	57.5
63	105	72.45
80	105	92
100	105	115

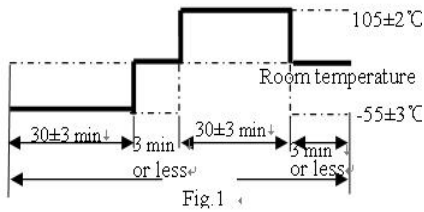
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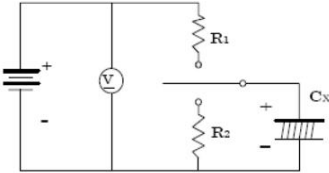
6.2 耐受能力 Endurance Performance

序号 No.	项目 Item	测试方法 Test Method	性能 Performance
6.2.1	负荷寿命试验 Load Life Test	电容在105±2℃, 额定电压下, 加载直流电流2000小时后, 需在室温下放置2小时才可进行测试。 After being exposed to a direct current (DC) for 2000 hours at a temperature of 105 ± 2℃ and the rated voltage, the capacitor should be left at room temperature for two hours before measurement.	容量变化: 在初始值的±20%内 Capacitance change: ±20% of the initial value. 损失角: 小于规格值的150% tan δ ≤ 150% of the initial specified value. 等效串联电阻≤规格值的150% ESR ≤ 150% of the initial specified value. 漏电流≤0.2CV值或500μA中的一个较大值 Leakage current ≤ 0.2CV or 500 μA, whichever is greater. 外观: 没有明显的损伤 Appearance: There is no significant damage.
6.2.2	振动试验 Vibration Test	依照JIS C 5102 8.2和 JIS C 5025 This complies with JIS C 5102 8.2 and JIS C 5025. 频率: 10到55Hz(1分钟间隔/10→55→10Hz) Frequency: 10 to 55Hz (1-minute interval/10→55→ 10Hz) 振幅: 0.75mm(整体偏移1.5mm) Amplitude: 0.75mm (overall offset: 1.5mm) 方向: X, Y, Z (3 轴) Direction: X, Y, and Z (3 axes) 持续时间: 2小时/轴 (共6小时) Duration: 2 hours per axis (6 hours total)	容量变化在初始值的±5%内 Capacitance change: ±5% of the initial value. 损失角≤规格值 tan δ ≤ the initial specified value. 等效串联电阻≤规格值 ESR ≤ the initial specified value. 漏电流≤规格值 Leakage current ≤ the initial specified value. 外观: 没有明显的损伤 Appearance: There is no significant damage.
6.2.3	可焊性 Solderability Test	温度: 235℃ ± 5℃ (锡铅焊料) 245℃ ± 5℃ (锡银铜焊料) Temperature: 235℃ ± 5℃ (for Sn-Pb solder) 245℃ ± 5℃ (for Sn-Ag-Cu solder) 持续时间: 5 ± 0.5秒 Duration: 5 ± 0.5 seconds	至少95%的浸渍表面覆盖有新的焊料 At least 95% of the 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
6.2.4	耐焊接热 Soldering Test	(1)焊浴法 Solder bath method 温度: 260 ±5℃ Temperature: 260 ±5℃ 持续时间: 10±1秒 Duration: 10±1 seconds 一直到间距为1.0mm的情况下 Until it is 1.0 mm away from the case. (2)烙铁施焊法 Soldering iron method 温度: 400 ± 10 °C Temperature: 400 ± 10 °C 持续时间: 3+1/-0秒 Duration: 3+1/-0 seconds	容量变化在初始值的±5%内 Capacitance change: ± 5% of initial capacitance. 损失角≤ 规格值的130% Tanδ≤130% of the initial specified value. 等效串联电阻≤ 规格值的130% ESR≤ 130% of the initial specified value. 漏电流≤0.2CV值或500μA中的任一个较大值 Leakage current≤ 0.2CV or 500μA, whichever is greater.
6.2.5	稳态湿热 (恒稳态) Steady State Damp Heat Test	温度: 60±2℃ Temperature: 60±2℃ 相对湿度: 90% ~ 95% Relative humidity: 90% ~ 95% 持续时间: 1000 (-0/+48)小时 Duration: 1000 (-0/+48) hrs 使用电压: 无负荷 Operating voltage: No load	电容变化在初始值的±20%内 Capacitance change: ±20% of the initial value. 损失角≤ 规格值的150% tan δ≤ 150% of the initial specified value. 等效串联电阻≤ 规格值的150% ESR≤ 150% of the initial specified value. 漏电流≤0.2CV值或500μA中的任一个较大值 Leakage current≤ 0.2CV or 500μA, whichever is greater.
6.2.6	快速变温 Rapid Temperature Cycling Test	 使用电压: 无负荷 Operating voltage : no load 循环次数: 10次 Number of cycles: 10 测试图: 图 1 Test Figure: Fig. 1	容量变化: 在初始值的±10%内 Capacitance change: ±10% of the initial capacitance. 损失角: 小于或等于规格值 tanδ≤ the initial specified value. 漏电流≤0.2CV值或500μA中的任一个较大值 Leakage current≤0.2CV or 500μA, whichever is greater.

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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 Test	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℃-35℃。测试电路如下图所示： Charge for 30 seconds at the rated surge voltage, then discharge for 5 minutes and 30 seconds at room temperature. Repeat this process 1,000 times, with each cycle lasting 6 minutes, at a test temperature ranging from 15°C to 35°C. The test circuit is shown in the figure below:	漏电流$\leq 0.2C_V$值或500μA中的任一个较大值 Leakage current$\leq 0.2C_V$ or 500μA, whichever is greater. 容量改变在初始值的$\pm 20\%$内 Capacitance change: $\pm 20\%$ of the initial value. 损失角$\leq$规格值的150% $\tan\delta \leq 150\%$ of the initial specified value. 等效串联电阻$\leq$规格值的150% ESR$\leq 150\%$ of the initial specified value.
		Test circuit :  ⓧ : DC voltmeter R1: Protective resistor 1kΩ R2: Discharging resistor 1kΩ Cx: Testing capacitors (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。 Note: If the surge test standard is inconsistent with the actual on/off requirements of the end product, please confirm with our RD team during the prototype phase. Feedback the specific test requirements to Aishi, including test voltage, surge current, charge and discharge frequency, cycle times, test temperature, and performance, etc.

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The capacitor must be left at room temperature for 2 hours before measurement.

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S	PZ	1D	M	471	G10	O00	R	EX18
								特殊编码 Special code(7.9)
								奈印编码 Marking code(7.8)
								成型方式编码 Terminal code(7.7)
								尺寸编码 Size code(7.6)
								电容量编码 Capacitance Code(7.5)
								电容公差 Capacitance tolerance Code(7.4)
								电压编码 Voltage Code(7.3)
								系列编码 Series Code(7.2)
								类别编码 Category Code(7.1)

编码Code	S
类别编码Category Code	固态电容Solid Capacitor

编码Code	PZ
系列编码Series Code	PZ

编码Code	0E	0J	0C	0A	1A	1C	1D	1E	1S	1V	1H	1J	1B	1K
电压编码Voltage Code(W.V)	2.5	6.3	6.8	7.5	10	16	20	25	30	35	50	63	80	100

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

编码Code	100	220	270	330	470	560	680	820	101	121	151	181	221
电容量Capacitance (uF)	10	22	27	33	47	56	68	82	100	120	150	180	220
编码Code	271	331	391	471	561	681	821	102	122	152	182	222	272
电容量Capacitance (uF)	270	330	390	470	560	680	820	1000	1200	1500	1800	2200	2700

编码Code	D07	D08	D09	D10	D11	B08	B09	B10	B11	B14	B16	E07	E08	E09	E10
直径D (Φ)	5	5	5	5	5	5.5	5.5	5.5	5.5	5.5	5.5	6.3	6.3	6.3	6.3
高度L (mm)	7	8	9	10	11	8	9	10	11	14	16	7	8	9	10
编码Code	E11	E14	E16	F09	F11	F12	F14	F17	F20	G10	G12	G13	G16	G18	G23
直径D (Φ)	6.3	6.3	6.3	8	8	8	8	8	8	10	10	10	10	10	10
高度L (mm)	11	14	16	9	11	12	14	17	20	10	12	13	16	18	23

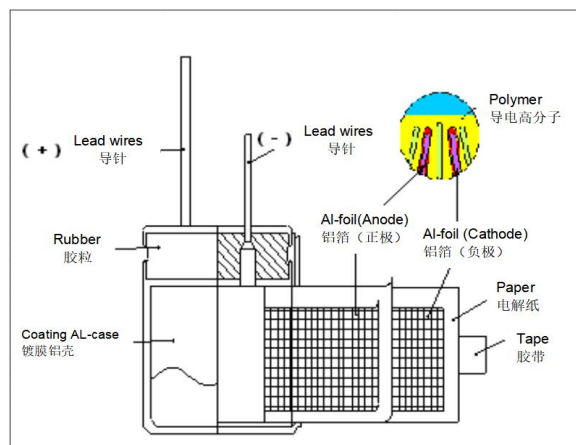
编码Code	O00	C35	P35	C48
其他 Other	平豆散装 Platform rubber& Inbulk	平豆剪脚 Platform rubber & Lead Cut3.5±0.3mm	平豆编带 Platform rubber& Taping	平豆剪脚 Platform rubber& Lead Cut4.8±0.3mm

编码Code	S	R
捺印Marking	天蓝Sky blue	红色Red

“EX18” 代表ESR特殊（ESR最大值为18mΩ）， “EX18” stands for special ESR(ESR max is 18mΩ)

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8. 结构Structure



导针:固体镀锡铜包钢线

Outer lead wire: Tinned copper-clad steel

导针端子：高纯铝

Inner lead: High-purity aluminum

电解纸：马尼拉麻

Electrolytic paper: Manila hemp

铝箔（正极）：高纯铝

Al-foil(Anode): High-purity 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400V以上）

Coated AL-case: Aluminum+coating(withstand voltage > 400V)

胶带: 聚酯

Tape: Polyester

胶粒: (树脂)压缩成型

Rubber: Resin (compression molding)

导针和圆柱端子通过焊接连接在一起

The lead wire and inner cylindrical section are welded together.

导针扁平端子与铝箔通过钉接连在一起

The inner cylindrical terminal section has been flattened and stitched to the aluminium foil.

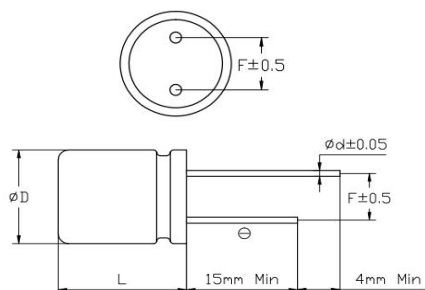
卷绕的素子外部以阴极箔包裹

The outer part of the inner element is wrapped in cathode foil.

导电高分子用作电解质

The electrolyte is the conductive polymer.

9.尺寸图Outer Dimensions (单位Unit: mm)



尺寸编码 Size Code	ΦD (mm)	ΦD(mm) Tolerance	L (mm)	L (mm) Tolerance	F (mm)	Φd (mm)
G10	10.0	-0.1~+0.5	10	-1~+0.5	5	0.6

10. 特性表格Characteristic 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 (%)	上限温度 Upper Limit Temp (°C)	尺寸 Nominal Case Size D*L (mm)	等效 串联电阻 E.S.R 100kHz 20°C (mΩ max.)	最大漏电流 Leakage Current 20°C(μA max.) 2 Min./ W.V	损失 DF 120Hz, 20°C (% max.)	纹波电流 Ripple Current 100kHz,105 °C (mA.rms)	寿命 Load Life (Hours)
1	SPZ1DM471G10000REX18	20	470	-20~+20	105	10*10	18	1880	12	2800	2000

11.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

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(a) 已安装过的或加过电压的Aishi电容器请勿再使用。经历了周期性电性能测试的Aishi电容器不可再用。

Do not reuse Aishi capacitors that have been installed or subjected to voltage. Do not reuse Aishi capacitors that have undergone periodic electrical performance testing.

(b) Aishi电容器在储存两年后，漏电流可能会增大。使用前，请在额定电压及接1k Ω 电阻的条件下充电2小时。

Aishi capacitors may exhibit increased leakage current after two years of storage. Prior to use, a 1k Ω resistor should be connected in parallel at the rated voltage, and the capacitor should be charged for 2 hours.

(c) 回流焊接Reflow soldering

插件型产品不适用于回流焊接作业 Radial-type products are not suitable for use in reflow soldering operations.

(d) Handling after soldering 焊接后处理

在这之后，不要倾斜，弯曲或扭曲Aishi电容器。After soldering, do not tilt, bend, or twist the Aishi capacitor.

不可通过抓捏Aishi电容器来移动印刷电路板. Do not move the PCB by holding the Aishi capacitor.

堆叠印刷电路板时确保Aishi电容器没有碰触到其它电路板或部件。

When stacking PCBs, please ensure that the Aishi capacitors do not come into contact with other PCBs or components.

不可将Aishi电容器与其它物品堆放。 Avoid storing Aishi capacitors alongside other items.

14.6 使用Aishi电容器于生命保障系统The Use of Aishi Capacitors in Life-Support Systems

若使用于与人类生命有关的设备上（如空间设备、航空设备、原子设备等），请与湖南艾华集团股份有限公司详细咨询，不要使用没有湖南艾华集团股份有限公司承认文件的Aishi电容器。

In the event of the utilisation of equipment that pertains to human life (for instance, space equipment, aeronautical equipment and atomic equipment, amongst others), it is imperative to consult with Human Aihua Group Co., Ltd.

14.7 贮存Storage

1) 请将Aishi电容器储存在5-35°C、相对湿度在75%以下且无阳光直射的环境中。如条件允许，建议将其存放在包裹中。若温度在35-85°C之间，请确保储存时间不超过三个月。

Please store Aishi capacitors in an environment with a temperature between 5 and 35°C, relative humidity below 75%, and no direct sunlight. If possible, we recommend storing them in their original packaging. If the temperature is between 35 and 85°C, please ensure that the storage period does not exceed 3 months.

2) Aishi电容器请在使用前打开包装袋，并尽快用完。

Aishi capacitors should be removed from their packaging prior to use and used at the earliest opportunity.

3) 不要在有水、盐水、油及凝结状况的地方贮存Aishi电容器。

Aishi capacitors must not be stored in conditions that involve direct exposure to water, brine, oil or in a state of condensation.

4) 禁止在含有毒气体的区域放置Aishi电容器（如：硫化氢、亚硫酸、亚硝酸、氯气、氨水等）。

Aishi capacitors must not be stored in areas where there are poisonous gases, including hydrogen sulfide, sulfurous acid, nitrous acid, chlorine and ammonia.

5) 禁止在有紫外线或放射性辐射的区域放置Aishi电容器。

Aishi capacitors must not be placed in areas exposed to ultraviolet or radioactive radiation.

6) 存储时间Storage period

开封前: 制造后24个月内 Before opening: Within 24 months from the manufacturing date.

开封后: 打开后1月内 After opening: Within 1 month from the opening date.

存放时间超过3年的电解电容器应报废处理 In instances where storage duration exceeds three years, the products must be discarded.

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