承認書編號 NO: SFAK1-2104000758 TO: 格能电子 台照

承 認 書

APPROVAL SHEET

FOR AL. ELECTROLYTIC CAPACITORS

承 認
APPROVED BY：

料號 (Customer)	料號 (CapXon)	規格 Description	Dφ*L	加工形式 (mm)
	SZ100M050B070A	10μF/50V	4X7	A

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核 准 APPROVED BY: 吴 2021-4-21 泉

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CAPXON ELECTRONIC (SHEN ZHEN) CO., LTD

FOR APPROVAL

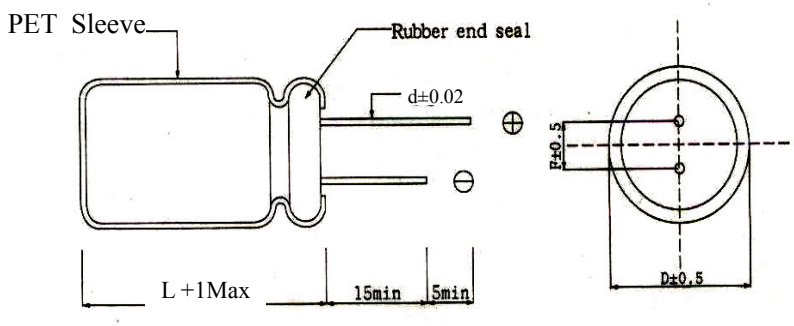
Aluminum Electrolytic Capacitors

SZ *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.LC (μA)	Max.IM. 100KHz /20℃ (Ω)	Oper. Temp. (℃)	Case Size DΦ* L （mm）	Endurance /105℃ (Hrs)
SZ100M050B070A	10	-20~20	50	58	10	80	5	2.2	-55~105	4X7	1000

2.Diagram of Dimensions (Unit=mm)



D	4
L	7
F	1.5
d	0.45

Part Number Explain

Series	Cap	Tol.	Voltage	Case D	Case L	Type	Lead Treatm.	Special
SZ	**100**	**M**	**050**	**B**	**070**	**A**		
	=10μF	=-20~20%	=50V	=4mm	=7mm			

一. 注意事项 Information

1. 最大均方根纹波电流 Maximum RMS ripple current

1.1.最大均方根纹波电流值是指+105°C 100KHz 测试值。

Maximum RMS ripples current at +105°C, 100KHz

1.2. 当电容器的使用温度及频率不是+105°C, 100KHz 时，该纹波电流值须乘附表 3 所示的系数进行换算。

When capacitors are operated at temperatures other than +105°C, and frequency other than100KHz the maximum RMS ripple currents must be multiplied by the factors shown in table 3.

1.3 当频率与上面规定条件不同时，纹波电流不能超过允许纹波电流值乘以上表系数所得值。纹波电流验证方法参照 JIS-C-5101-1(2010) No.: 4.23.

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 ripples current verify methods according to JIS-C-5101-1(2010) No.: 4.23.

☆注意：（1）.纹波电流要对应工作频率 Ripple current corrected with working frequency.

（2）当电路中纹波电流很难测量时，电容器自身的温升应在 5℃以内。

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.工作电压 Working Voltage (WV)

电容器的应用电压要保证不可过压（也就是高于额定电压）。

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.绝缘性 Insulating

铝电解电容器普通品表面套有乙烯基或类似材料的套管，这种套管一般是用来标示的。如果铝壳需要绝缘，建议采用为绝缘设计的特殊类型的电容器。

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.焊锡 Soldering

4.1 在将各种元器件焊接在 PC 板上时，过高的焊接温度或是过长的焊接时间都会引起套管二次收缩 ，导致破洞，并且必须在 PC 板的反面进行焊锡。

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 如果套管与电路板接触，在焊锡时可能熔化或损坏套管，因此建议电容器与电路板保持一定的距离。

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.防爆 Vent

电容器（Φ≥10mm）在铝壳底部设置了一个防爆装置，当误操作时防爆阀会打开以释放内部较高的压力。

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 to relieve the internal higher pressure.

6.高海拔 High Altitude

该电容器可以在-55~105℃ 的温度环境和 200,000 英尺的海拔高度运输。

The capacitors can withstand those transportation conditions that temperature may range from -55~105℃ and the altitude can reach 200,000 feet.

7.清洗剂 Cleaning agents:

如果用含卤元素的有机溶剂清洗电容器，溶剂可能会渗入电容内部导致腐蚀。

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.环保方针 Environment-friendly policy

本公司依蒙特利尔协议书之规定，于生产过程中不使用破坏臭氧层之药品。在电容器生产的整个制程中，包括生产、包装、存储和运输，我司始终遵守环保和 ROHS 的相关法律法规。

None of ozone depleting chemicals (ODC) under the Montreal Protocol is used in manufacturing process of CapXon Electronic industrial CO., Ltd. In the entire process of capacitor's production, including manufacture, packaging, storage and transportation, our company always complies with the related Environmental Protection Laws and Regulations of RoHS.

9. 本公司品质量依 JIS-C-5101-1 标准考核，其信性试验方法依 JIS-5101-4(非 SMD 液态)，-18（液态 SMD）之规范为基准。

CapXon's Products meet or exceed quality standards specified by JIS-C5101-1 Wand with reliability Requirements refer to JIS-C-5101-4(non-SMD liquid capacitor),-18(liquid SMD capacitor).

二．技术性能 Technical Feature

测试环境 Testing Environment：

方案 Precept / 环境条件 Condition	无特别规定及判定无疑问 No special regulation and judgment doubt	无特别规定而判定有疑问 No special regulation but have judgment doubt	在标准室内测试仍有争议 Under the standard room testing but have dispute
温度 Temperature	15～35℃	25±10℃	20±1℃
湿度 Humidity	25～75%RH	40 ～60%RH	63～67%RH
气压 Air pressure	86KPa～106KPa	86KPa～106KPa	86KPa～106KPa

序号 NO.	试验项目 Item	实验条件及判定 Conditions and Criterion
1	工作温度范围 Range of working temperature	-55~105 (℃)
2	电容容量 Capacitance	实验条件 Conditions： 测量温度 Temperature: 20±2℃ 测量频率 Frequency: 120Hz 测量电压 Voltage: 0.5Vrms 判定标准 Criterion: 容量偏差 Tolerance: -20~20%
3	损耗角正切 Dissipation factor (tanδ)	实验条件 Conditions： 测量温度 Temperature: 20±2℃ 测量频率 Frequency: 120Hz 测量电压 Voltage: 0.5Vrms 判定标准 Criterion: See Table 1
4	漏电流 Leakage Current	实验条件 Conditions： 将额定电压加在电容和 1000Ω±10% 的保护电阻上充电 2 分钟后测试。 The rated voltage shall be applied across the capacitors and its protective resistor which shall be 1000Ω±10%.The leakage current shall then be measured after an electrification period of 2 min. 判定标准 Criterion: I≤ 5（μA）

<table>
<tr>
<td>5</td>
<td>引线强度
Terminal strength</td>
<td>
实验条件 Conditions：
引线抗拉强度 Tensile strength of termination:
沿电容器端子引线方向施加下表重力 N, 10±1S 。
A static load of N shall be applied to the terminal in the down-lead direction for 10±1S.
<table>
<tr><th>端 子 线 径
Diameter mm</th><th>重力 Gravity
(±10%)</th><th>重锤重量 Weight
(±10%)</th></tr>
<tr><td>0.35＜d≤0.5</td><td>5N</td><td>0.51Kg</td></tr>
<tr><td>0.5＜d≤0.8</td><td>10N</td><td>1.02Kg</td></tr>
<tr><td>0.8＜d≤1.25</td><td>20N</td><td>2.04Kg</td></tr>
<tr><td>SNAP-IN 型 端子</td><td>40N</td><td>4.08Kg</td></tr>
</table>
引线抗弯折强度 Bending strength of termination:
在电容器引线施加固定下表重力 N,然后将电容本体弯折 90 度后回到原位，再向相反方向弯折 90 度后回到原位。如此操作约 2~3 秒为一个循环,操作至规定次数。注意弯曲时不可扭转端子。
A static load of N applied to the lead wire, then bent the body through 90°, return to the original position. Next step bent it in opposite direction through 90° with the same speed, again return to the original position. Carry out this operation in about 2~3 sec for one cycle. Do it for specified cycles .But bending the termination is forbidden.
<table>
<tr><th>端 子 线 径
Diameter mm</th><th>重力 Gravity
(±10%)</th><th>重锤重量 Weight
(±10%)</th></tr>
<tr><td>0.35＜d≤0.5</td><td>2.5N</td><td>2.5N</td></tr>
<tr><td>0.5＜d≤0.8</td><td>5N</td><td>5N</td></tr>
<tr><td>0.8＜d≤1.25</td><td>10N</td><td>10N</td></tr>
<tr><td>LUG 端子</td><td>20N</td><td>20N</td></tr>
</table>
SNAP-IN 型端子不做抗弯实验，LUG 端子做折弯试验,折弯度角 45℃。
判定标准 Criterion:
端子不得有松动、断裂及接触不良之情形。
The terminal should not be loose, breakage and bad connected.
</td>
</tr>
<tr>
<td>6</td>
<td>温度特性
Temperature characteristic</td>
<td>
实验条件 Conditions：
<table>
<tr><th>步骤
Step</th><th>温度 Temperature</th><th>测量项目 Item</th></tr>
<tr><td>1</td><td>20±2℃</td><td>阻抗 Impedance</td></tr>
<tr><td>2</td><td>下限类别温度
Lower Category temperature ±3°C</td><td>阻抗 Impedance</td></tr>
<tr><td>3</td><td>上限类别温度
Upper Category temperature ±2°C</td><td>漏电 LC</td></tr>
</table>
要求达到热平衡后测量，并且阻抗在同一频率下测试
Testing when thermal equilibrium and Impedance must be on the same frequency.
判定标准 Criterion:
1.阻抗比不能超出表 2 所示值：Impedance ratio shall not exceed the values shown in Table 2.
2.LC≤800%初始规格值
2. Leakage current Shall not more than800% of initial specified value.
</td>
</tr>
<tr>
<td>7</td>
<td>高温负荷
High temperature load</td>
<td>
实验条件 Conditions：
实验温度 Temperature ：105℃
施加电压 Applied voltage：Rated DC working voltage
实验时间 Test time ：1000 H
测试条件 Test condition ：在标准大气压下保存 16 小时后进行测试
Test after keep on standard atmospheric conditions for 16 hours.
判定标准 Criterion:
1.容量的变化：△C/C ≤±20%初始值
Capacitance Change Rate：△C/C ≤±20% of initial value
2.损耗角正切：DF ≤200%规格值
Dissipation Factor: DF ≤200% of specified value
3.漏电流：LC ≤规格值
Leakage Current: LC ≤specified value.
4.外观：无明显损伤
Appearance: No visible damage.
</td>
</tr>
</table>

8	高温储存 High Temperature Exposure(Storage）	实验条件 Conditions： 实验温度 Temperature: 105℃ 施加电压 Applied voltage：None 实验时间 Test time：1000H 测试条件 Test condition: 在标准大气压下保存 16 小时后进行测试 Test after keep on standard atmospheric conditions for 16 hours. Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes. 判定标准 Criterion: 1.容量的变化：△C/C ≤±20%初始值 Capacitance Change Rate：△C/C ≤±20% of initial value 2.损耗角正切：DF ≤200%规格值 Dissipation Factor: DF ≤200% of specified value. 3.漏电流：LC ≤规格值 Leakage Current: LC ≤specified value. 4.外观：无明显损伤 Appearance: No visible damage
9	浪涌试验 Surge Test	实验条件 Conditions： 实验温度 Temperature: 15~35℃ 施加电压 Applied voltage：58V 周期 Period：充电 30 秒，放电 330 秒为一个周期。 Charge for 30 seconds，discharge for 330 seconds as a cycle 循环次数 Cycles：1000 测试条件 Test Condition：在标准大气压下保存 16 小时后进行测试。 Test after keep on standard atmospheric conditions for 16 hours. 判定标准 Criterion: 1.容量的变化：△C/C ≤±15%初始值 Capacitance Change Rate：△C/C ≤±15% of initial value 2.损耗角正切：DF ≤规格值 Dissipation Factor: DF ≤ Original Spec value 3.漏电流：LC ≤规格值 Leakage Current: LC ≤original Spec value 4. 外观：无明显损伤 Appearance: No visible damage
10	振动 Vibration	实验条件 Conditions： 频率范围 Frequency Scope : 10~55HZ 振幅 Amplitude : 0.75mm 加速度 Acceleration : 98 m/s^2（10g） 振动时间 Vibration Time : X、Y、Z 各方向循环各 2 小时、共计 6 小时 X , Y , Z directions each for 2 Hrs, total 6 Hrs. 测试条件 Test Condition : 从振动仪上取下电容后在 30 分钟内测试 Testing within 30 minutes after take it down from vibration machine 判定标准 Criterion: 1.容量的变化：△C/C ≤±5%初始值 Capacitance Change Rate：△C/C ≤±5% of initial value 2.损耗角正切：DF ≤规格值 Dissipation Factor: DF ≤ Original Spec value 3.漏电流：LC ≤规格值 Leakage Current: LC ≤original Spec value 4. 外观：无明显损伤 Appearance: No visible damage

<table>
<tr>
<td>11</td>
<td>可焊性
Solderability</td>
<td>实验条件 Conditions：
焊锡种类 Kind of solder: Sn：96.5%，Ag：3%，Cu：0.5%或是同等品。
Sn：96.5%，Ag：3%，Cu：0.5% or equal article
锡炉温度 Solder stove temperature: 245±5℃
浸锡时间 Immerse time: 2.0±0.5S
浸入或移出速度 Speed of immerse or leave: 25±2.5mm/s
浸入深度 Immerse depth: 浸入深度保持在电容本体与焊锡之间距离在 1.5~2.0mm。
1.5~2.0mm between the capacitor body and the solder.
试验次数 times: 1.
测试条件 Test Condition: 从锡炉中取出后 2 小时测试。
Testing after 2 hours for taking it out from the solder stove.
判定标准 Criterion:
新锡附着度应大于 95%。
Above 95% area of surroundings surface shall be covered by the new soldering.</td>
</tr>
<tr>
<td>12</td>
<td>耐焊接热
Resistance to soldering heat</td>
<td>实验条件 Conditions：
焊锡种类 Kind of solder: Sn：96.5%，Ag：3%，Cu：0.5%或是同等品。
Sn：96.5%，Ag：3%，Cu：0.5% or equal article
锡炉温度 Solder stove temperature: 260（0~3）℃
浸锡时间 Immerse time: 10±1S
浸入或移出速度 Speed of immerse or leave: 25±2.5mm/s
浸入深度 Immerse depth: 浸入深度保持在电容本体与焊锡之间距离在 1.5~2.0mm。
1.5~2.0mm between the capacitor body and the solder.
试验次数 times: 1.
测试条件 Test Condition: 从锡炉中取出后 2 小时测试。
Testing after 2 hours for taking it out from the solder stove.
判定标准 Criterion:
1.容量的变化：△C/C ≤±5%初始值
Capacitance Change Rate：△C/C ≤±5% of initial value
2.损耗角正切：DF ≤规格值
Dissipation Factor: DF ≤ Original Spec value
3.漏电流：LC ≤规格值
Leakage Current: LC ≤original Spec value</td>
</tr>
<tr>
<td>13</td>
<td>温度循环
Temperature Cycling</td>
<td>实验条件 Conditions:
<table>
<tr><th>阶段 Step</th><th>温度 Temp.</th><th>时间 Time (Min)</th></tr>
<tr><td>1</td><td>下限类别温度±3℃</td><td>30±3</td></tr>
<tr><td>2</td><td>25±5℃</td><td>3</td></tr>
<tr><td>3</td><td>上限类别温度±2℃</td><td>30±3</td></tr>
<tr><td>4</td><td>25±5℃</td><td>3</td></tr>
<tr><td colspan="3">参照 JIC-5101-1 (2010) No:4.16，从 1 到 4 为一个循环，共需要 10 个循环。
Referring to JIC-5101-1 (2010) No:4.16 (1) to (4) = 1 cycle, total 10 cycles.</td></tr>
</table>
判定标准 Criterion:
1.容量的变化：△C/C ≤±5%初始值
Capacitance Change Rate：△C/C ≤±5% of initial value
2.损耗角正切：DF ≤规格值
Dissipation Factor: DF ≤ Original Spec value
3.漏电流：LC ≤规格值
Leakage Current: LC ≤original Spec value
4. 外观：无明显损伤
Appearance: No visible damage</td>
</tr>
</table>

14	稳态湿热 High temp and humidity	实验条件 Conditions： 温度 Temperature: 40±2℃ 湿度 Humidity: 90~95%RH 维持时间 Maintained Time: 250H 测试条件 Test Condition: 在标准大气压下保存 16 小时后进行测试 Test after keep on standard atmospheric conditions for 16 hours. 判定标准 Criterion: 1.容量的变化：△C/C ≤±20%初始值 Capacitance Change Rate： △C/C ≤±20% of initial value 2.损耗角正切：DF ≤1.2 倍规格值 Dissipation Factor: DF ≤ 1.2 times of the original Spec. value 3.漏电流：LC ≤规格值 Leakage Current: LC ≤original Spec value 4. 外观：无明显损伤 Appearance: No visible damage

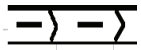
三. 标示说明 MARKING：

例：

(1) **CapXon**： 制造商标 Brand

(2) **50V**： 电压 Rated Voltage

(3) **10μF** ： 容量 Nominal Capacitance

(4)  ： (-)负极指示 Polarity(Cathode Indicate)

(5) **105℃**： 最高工作温度(Maximum Operating Temp.)

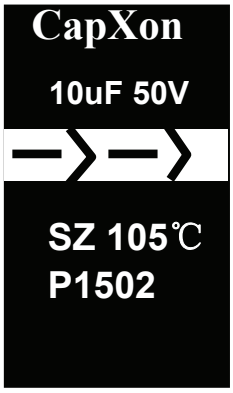
(6) **SZ**： 系列 Series

(7) **P1502**： 生产周期 Date Code

（P:PET,15：2015 年 Year; 02：第 2 周 Week）

正面 Front:

背面 Back:



四．CHARACTERISTICS TABLE

1. 损失角 DF Dissipation Factor (表 1 TABLE 1)

Rated Voltage(VDC)	6.3	10	16	25	35
D.F. (%)max.	18	16	14	12	12

2. 阻抗比值表 （表 2. TABLE 2）

Impedance ratio max

Rated Voltage(VDC)	6.3	10	16	25	35
Z-25℃ / Z+20℃	2	2	2	2	2
Z-55℃ / Z+20℃	3	3	3	3	3

3. 频率系数表（表 3 TABLE 3）

Multiplier for Ripple Current vs. Frequency：

CAP(μF)/Frequency(Hz)	50(60）	120	400	1K	10K	50K-100K
1≦CAP≦10	0.47	0.59	0.76	0.85	0.97	1
10＜CAP≦220	0.52	0.65	0.80	0.89	0.97	1
100＜CAP	0.58	0.72	0.84	0.90	0.98	1

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