

# 辽宁博艾格电子科技有限公司

LIAONING BROTHER ELECTRONIC TECHNOLOGY CO., LTD

## BIGCAP<sup>®</sup>产品规格书

BIGCAP<sup>®</sup> PRODUCT SPECIFICATION

产品型号 (Product Model) : BLIC03R8L506FAQ

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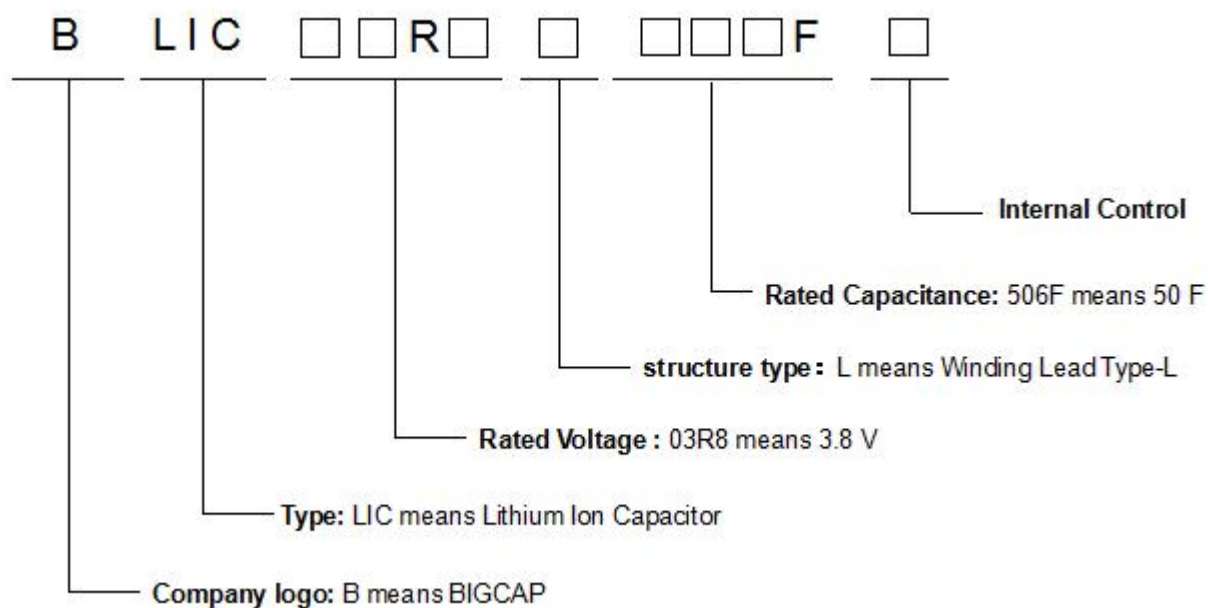
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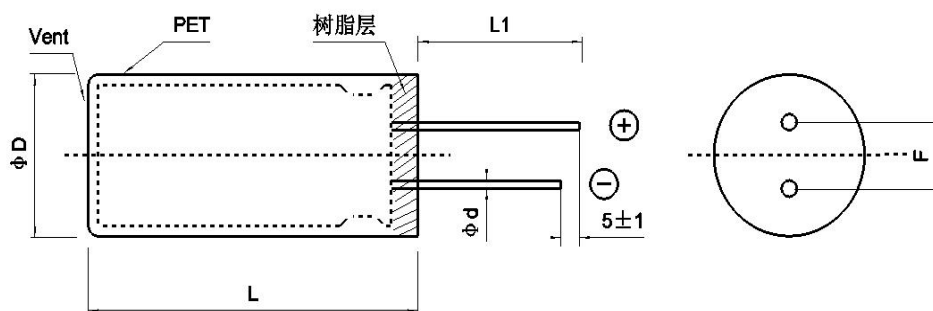
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◆ BIGCAP® 型号命名规则 BIGCAP® Part Number System



◆ BIGCAP® 标准产品外形尺寸图 BIGCAP® Shape Of Standard Product



型号Part Number	ΦD±1.0 (mm)	L±1.5 (mm)	F±0.5 (mm)	Φd±0.05 (mm)	L1±3.0 (mm)
BLIC03R8L506FAQ	8	27	3.5	0.6	25

# ◆ BIGCAP® 标准产品规格 BIGCAP® Standard Product Specification

项目 Project	BLIC03R8L506FAQ	备注 Remark
工作温度范围 Category Temperature Range	-15~+70℃	85℃ (at 3.5V)
存储温度 Storage Temperature Range	-25~+85℃	
额定电压 Rated Voltage	3.8V	
最低工作电压 Min. Operating Voltage	2.5V	
浪涌电压 Surge Voltage	4.2V	
额定容量 Rated Capacitance	50F	At 25℃
容量偏差 Capacitance Tolerance	±20%	
交流内阻 ESR <sub>AC</sub>	300mΩ	1KHz, 25℃
直流内阻 ESR <sub>DC</sub>	600mΩ	At 25℃
额定充放电电流 Rated Charge/discharge Current	0.2A	
最大充放电电流 (≤3s) Max. Charge/discharge Current (≤3sec)	1.5A	

# ◆ BIGCAP® 环境特性 BIGCAP® Environmental Characteristics

项目 Project	规格 条件 Specification Condition	
温度特性 Temperature Characteristics	-15℃	容量变化: 初始值的 50%以内, ESR <sub>AC</sub> : 不超过 10 倍规定值   ΔC/C   ≤50%, ESR <sub>AC</sub> ≤ 10 times of specified ESR <sub>AC</sub>
	+70℃	容量变化: 初始值的 10%以内, ESR <sub>AC</sub> : 不超过规定值   ΔC/C   ≤10%, ESR <sub>AC</sub> ≤ specified ESR <sub>AC</sub>
高温寿命 (额定电压下, +70℃ 负荷) High Temperature Life (at +70℃, Rated voltage)	1000h	容量变化: 初始值的 30%以内, ESR <sub>AC</sub> : 不超过 4 倍规定值   ΔC/C   ≤30%, ESR <sub>AC</sub> ≤ 4 times of specified ESR <sub>AC</sub>
高温存储 (+85℃) High Temperature storage (at +85℃)	1000h	容量变化: 初始值的 30%以内, ESR <sub>AC</sub> : 不超过 4 倍规定值   ΔC/C   ≤30%, ESR <sub>AC</sub> ≤ 4 times of specified ESR <sub>AC</sub>

## ◆ BIGCAP®测试方法 BIGCAP® Test Methods

Note:

额定电压  $U_R=3.8V$

最低工作电压  $U_{min}=2.5V$

额定容量  $C_R$ ——Rated capacitance

充放电电流 Charge/discharge current:  $I=5 \cdot C_R \cdot (U_R - U_{min}) / 3600$

### 1. 静电容量 Static capacitance

在室温下 ( $25 \pm 2^\circ C$ )，按以下步骤测试电容器的静电容量：

At room temperature ( $25 \pm 2^\circ C$ ), testing the static capacitance of capacitor just following the steps below:

(a) 将电容器以恒流  $I$  充电至额定电压  $U_R$ ;

The capacitor is charged to the rated voltage  $U_R$  with constant current  $I$ ;

(b) 将电容器在额定电压  $U_R$  下持续充电 30 分钟;

The capacitor is continued to charge for 30 minutes at the rated voltage  $U_R$ ;

(c) 用恒定电流  $I$  将电容器放电到最小工作电压  $U_{min}$ ，记录开始放电的电压  $U_S$ ;

The capacitor is discharged to the minimum operating voltage  $U_{min}$  with a constant current  $I$ , record the start discharge voltage  $U_S$ ;

(d) 重复以上步骤从 (a) 到 (c) 三次，当电压从  $U_S$  降到  $U_{min}$ ，记录放电时间  $t$ 。

Repeat the steps for three times from (a) to (c) and record the discharge time  $t$ , when the voltage drops from  $U_S$  to  $U_{min}$ ;

(e) 按公式 (1) 计算第 3 次循环的静电容量，作为电容器的静电容量。

Calculate the static capacitance of capacitor within the third cycle according to the formula (1);

$$C=It/ (U_S-U_{min}) \text{ ----- (1)}$$

### 2. 直流内阻 DC internal resistance ( $ESR_{DC}$ )

在室温下 ( $25 \pm 2^\circ C$ )，按以下步骤测试电容器的直流内阻：

At room temperature ( $25 \pm 2^\circ C$ ), testing the DC internal resistance of capacitor just following the steps below:

(a) 将电容器以恒流  $I$  充电至额定电压  $U_R$ ;

The capacitor is charged to the rated voltage  $U_R$  with constant current  $I$ ;

(b) 将电容器在额定电压  $U_R$  下持续充电 30 分钟，记录该时刻的时间为  $t_0$ ;

The capacitor is continued to charge for 30 minutes at the rated voltage  $U_R$ , record the terminal time  $t_0$ ;

(c) 用恒定电流  $I$  将电容器放电到最小工作电压  $U_{min}$ ，记录在  $t_0+30\text{ ms}$  的  $U_i$ ;

The capacitor is discharged to the minimum operating voltage  $U_{min}$  with a constant current  $I$ , record the voltage  $U_i$  at  $t_0+30\text{ ms}$ ;

(d) 重复以上步骤从 (a) 到 (c) 三次;

Repeat the steps for three times from (a) to (c) ;

(e) 按公式 (2) 计算第 3 次循环的直流内阻, 作为电容器的直流内阻。

Calculate the DC internal resistance of capacitor ( $R_{DC}$ ) within the third cycle according to the formula (2) ;

$$R_{DC} = (U_R - U_i) / I \text{ ----- (2)}$$

### 3. 交流内阻 AC internal resistance ( $ESR_{AC}$ )

在室温 ( $25 \pm 2^\circ\text{C}$ ) 下, 电容器在测试前以恒流方式放电至  $U_{min}$ 。

At room temperature ( $25 \pm 2^\circ\text{C}$ ) , the capacitor is discharged  $U_{min}$  with constant current  $I$  before testing.

图 1 为交流内阻测试电路图。在电容器上施加固定频率 1 kHz 的交流电, 等效电流为 5mA。电容的交流内阻 ( $R_{AC}$ ) 可用公式 (3) 计算。

Fig1 shows the circuit diagram of AC internal resistance test. Specifically, the alternating current with fixed frequency 1kHz is applied to the capacitor and the equivalent current is 5 mA. The AC internal resistance of capacitor ( $R_{AC}$ ) can be calculated by formula (3) .

$$R_{AC} = V_{AC} / I_{AC} \text{ ----- (3)}$$

在公式中:

In this formula:

$R_{AC}$ --- 交流内阻 AC internal resistance, unit ( $\Omega$ ) ;

$V_{AC}$ --- 等效交流电压 Equivalent AC voltage, unit (V) ;

$I_{AC}$ --- 等效交流电流 Equivalent AC current, unit (A) .

图示:

Directions:

C--- 被测电容器 Measured capacitor;

V--- 交流电压表 AC voltmeter;

A--- 交流电流表 AC ammeter.

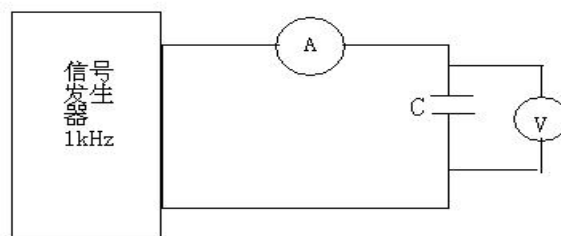


图 1 交流内阻测试线路图

Fig 1 the circuit diagram of AC internal resistance test

## ◆ **BIGCAP®注意事项和使用指导 BIGCAP® Handling Precautions and Guidelines**

为安全起见，当需要使用锂离子电容器时，请直接联系博艾格咨询技术规格、安装注意事项和使用要求。

For safety application, please contact BIGCAP directly for any technical specifications, handling precautions and guidelines critical to application.

### **1、注意事项 Precautions**

1) 禁止挤压、钉刺或拆解锂离子电容器。

No crushing, nail penetrating or disassembling LIC.

2) 禁止将锂离子电容器投入火中。

Prohibition of dumping LIC into fire.

3) 禁止将锂离子电容器直接接触水、油、酸或碱。

No direct contacting with water, oil, acid or alkaline.

4) 禁止使用损坏的锂离子电容器，如果发现有任何异常情况，如包装破损、电解液气味、电解液泄漏等，请勿使用该电容器。有电解液味道或泄漏的电容器应放置在远离火的地方，以避免起火或爆炸。

Do not use damaged LIC. If any abnormal features of the capacitors are found, such as damages in the package, electrolyte leakage, drumming gas or others, prohibition of using the LIC. The LIC with an electrolyte smell or leakage should be placed away from fire to avoid fire or explosion.

5) 禁止短路使用或者超压使用以免引起产气，泄漏，爆炸或其他问题

Prohibition of short-circuit or using for outside the working voltage which may cause to gas, leakage, explosion or other problems.

6) 禁止反向充电，以免引起产气，泄漏，爆炸或其他问题

Prohibition of reversing the positive (+) and negative (-) terminals. Which may cause to gas, leakage, explosion or other problems.

### **2、使用指导 Handling Guidelines**

1) 不可以用于以下场合：交流电路和滤波电路。

It's not suitable for such conditions: AC circuit and wave filtering.

2) 锂离子电容器具有固定的极性。在使用前，应确认极性，请勿反极安装。

LIC are normally polarized. Confirm the polarize before use the LIC. Do not use the LIC in reverse.

3) 锂离子电容器使用时不应该让工作电压超过额定电压。

Working voltage should not exceed to the Rate voltage . working voltage of LIC when using.

4) 锂离子电容器的使用温度不宜超过额定温度上限或下限。

Working temperature of LIC should not exceed the upper and lower limits of the rated temperature.

5) IR 压降：当锂离子电容器充放电功率大时，必须考虑电压降和伴随而来的热量变化。

IR drop: We should consider the voltage drop and heat with the IR drop , when using the LIC with a big power charge/discharge.

6) 串联：为了达到更高的电压将锂离子电容器串联使用时，必须保证单体的工作电压在允许的范围内。

When LIC in series connection for higher voltage, it should be assured that working voltage of any singer capacitor must not exceed to the limit of the max. and min. working voltage.

7) 焊接：请用手工焊接电路板。不要使用红外线加热和空气加热的回流焊或波峰焊。热冲击会降低锂离子电容器的电性能。会使产品膨胀、漏液或开裂。焊接温度不应超过 260℃，焊接时间不得超过 5s。

Soldering: Please use manual soldering for PCB. Don't use reflow soldering or wave-soldering of infrared heating and air heating. Heat shock will decrease electric performance of LIC, even cause to swell, leakage or Crack. Soldering temperature should not exceed 260℃ and soldering time not exceed 5s.

8) 使用环境：锂离子电容器不可处于相对湿度为85%RH以上或含有有毒气体的场所，该种环境下引线及壳体易受潮及腐蚀，导致锂离子电容器断路。

Operating environment: No storage in a condition with a relative humidity exceeding 85%RH or with toxic gases. It is easy to cause the damage and corrosion of the terminals and case, resulting in disconnection.

9) 存放：超级电容器不能置于高温、高湿的环境中，应在温度 15-35℃、相对湿度在 40-70%RH 的环境下储存，避免温度骤升骤降，这样会导致产品损坏；

Storage: LIC should not be stored in high humidity or high temperature. The suitable temperature is 15-35℃, humidity 40-70%RH.

10) 规格书若有更改我司不另行通知，我司保留可能出现的各种更改权利，最终解释权归辽宁博艾格电子科技有限公司所有。

If there is any change in the specification without prior notice, our company reserves the right to make any possible change, and the final interpretation right belongs to liaoning brother electronic technology co., LTD.

11) 本产品发货前已具有一定电压值，使用过程切勿使正负极端子短路，常见产品短路示意图如下表所示。

The cell embraced constant voltage before shipment, therefore, the short circuit should be extremely forbidden.  
Familiar short circuit is shown in the following table.

<b>Short Circuit during Testing</b> <b>测量中发生短路</b>	<b>Short Circuit during connecting</b> <b>产品处理中发生短路</b>
	
<b>Radial connecting during the storage or moving processes</b> <b>产品放置在一起导致引线接触</b>	<b>Short circuit</b> <b>发生短路</b>
