



# PRODUCT SPECIFICATION

Version :	A0
Date :	2019-11-28
DOC No :	

For Any Detail and Question, Please Tel Engineer: 86-757 2239 0708 FAX: 86-757-22390709

Foshan Jiezen Technology Co., Ltd  
佛山市捷臻科技有限公司

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CUSTOMER NO: \_\_\_\_\_

## Specification Approval Sheet 规格确认书

**MODEL/型号: JZB042630R**

(300mAh 3.7V)

Prepared By/Date 编制/日期	Checked By/Date 审核/日期	Approved By/Date 批准/日期

Customer Approval 客户确认	Customer Model /客户型号:	
	Signature /签 字	Date/日 期
	Company Name/公司名称	
	Company Stamp/公司印章	



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## 1 Scope/适用范围

This specification is applies to describe the related Battery Product in this specification and the Battery/Cell supplied by Foshan Jiezhentech Technology Co.,ltd only.

本说明书只适用于描述本规格书中相关的产品以及佛山市捷臻科技有限公司提供的电池。

## 2 Cell Model/电芯型号: JZB042630R

## 3 Cell Specification/电芯产品规格

No.	Items 项目	Specifications 规格	Remark 备注
1	Nominal Capacity 标称容量	300mAh	0.2C Standard discharge 0.2C 标准放电
2	Minimum Capacity 最小容量	300mAh	
3	Nominal Voltage 标称电压	3.7V	Mean Operation Voltage 即工作电压
4	Delivery voltage 交货电压	3.80~3.95V	Within 10 days from Factory 在出厂 10 天内
5	Charge Limited Voltage 充电限制电压	4.2V	By standard charge method 标准充电方式
	Charge Upper Limited Voltage 充电上限电压	4.2V	By standard charge method 标准充电方式
6	Standard charging method 标准充电方式	0.2C constant current charge to 4.2V, constant voltage charge to 4.2V,continue charging till current decline to $\leq 0.02C$ .	0.2C 恒流充电至 4.2V, 再恒压充至电流 $\leq 0.02C$ , 时间 6.5h(供参考)
7	Charge current 充电电流	0.2C	Standard charge, charge time:6.5h(Ref) 标准充电, 时间 6.5h(供参考)
		0.5C	Rapid Charge, charge time:2.5h(Ref) 快速充电, 时间 2.5h(供参考)
8	Standard discharging method 标准放电方式	0.2C constant current discharge to 3.0V	0.2C 恒流放电至 3.0V
	Discharge Lower Limited Voltage 放电下限电压	2.8V	By standard discharge method 标准放电方式
9	Cell Internal Impedance 单电芯内阻	$\leq 180m\Omega$	Internal resistance measured at AC 1KHz with 50% charge 半电态下用交流法测量内阻



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## Continuous/续上表

No.	Items 项目	Specifications 规格	Remark 备注	
10	Maximum charge current 最大充电持续电流	0.5C	For continuous charging mod 连续充电模式	
11	Maximum discharge current 最大放电持续电流	1.0C	For continuous discharge mod 连续放电模式	
12	Operation Temperature and relative Humidity Range 工作温度和湿度范围 (60±25%R.H.)	Charge 充电	Charging at low temperature such as below 0°C, capacity and cycle life will reduce. 低温充电, 容量及使用寿命会下降。	
		0~10°C		≤0.2C
		10~45°C		≤0.5C
		Discharge 放电		-20~0°C
		0~60°C	≤1.0C	
13	Storage temperature at a long time 长时间储存温度	-20~25°C 60±25%R.H.	Do not storage exceed half year. Must charge at least once when storage half year, and must charge the battery(with protect circuit) when storage for three months. 不可超过半年,达到半年须充电一次带保护板电池 3 个月充电一次	



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## 4 Battery/Cell performance test Criteria/电池性能标准

### 4.1 Appearance inspection by visual/外观目测

There shall be no such defect as flaw, crack, rust, leakage, which may adversely affect commercial value of battery.  
 电池外观应没有裂纹、爆裂、锈渍、污渍、漏液等影响商业价值的缺陷存在。

### 4.2 Environmental test condition/外界环境条件

Unless otherwise specified, all test stated in this product specification are conduct at below test condition.  
 所有测试应按以下环境条件进行，除非特殊指定外。

Temperature : 20°C~25°C

Relative Humidity: 60%±25% R.H.

### 4.3 Cell Electrical characteristics/电气特性

No.	Items 项目	Test Method and Condition 测试方法及条件	Criteria 标准
1	Rated Capacity at 0.2C(Min) 0.2C 最小额定容量	After standard charge, the capacity shall be measured at 0.2C discharge till the voltage discharge to 3.0V. 标准充电后，放电截止 3.0V，测量 0.2C 放电容量	≥ 300mAh 大于等于 300mAh
2	Cycle Life 循环寿命	Charging and discharging battery as below conditions: 0.2C standard charge to 4.2V end-off 0.2C standard discharge to 3.0V cut-off Continuous charge and discharge for 300 cycles,the capacity will be measured after the 300 <sup>th</sup> cycle 充放电按以下条件： 0.2C 标准充电至 4.2V，0.2C 标准放电至 3.0V，连续充放电循环 300 周，在第 300 周结束后测量容量	≥ 80% of initial capacity 大于初始容量的 80%
3	RT temperature Storage RT/28D 常温存储测试	After fully charged the battery in accordance with standard charge condition at 20~25°C, then stored at an ambient temperature 20~25°C for 28 days. Measure the capacity with 0.2C at 20~25°C as retention capacity, then test max discharge capacity with 0.2C discharge for three consecutive cycles as recovery capacity. 将电池在 20~25°C 标准充电后，储存在 20~25°C 的环境中 28 天后，测试电池 0.2C 放电容量作为保持容量，然后再进行 0.2C 标准充放电测试循环 3 次，最高容量作为恢复容量。	Retention capacity 容量保持 ≥ 85% Recovery capacity 恢复容量 ≥ 90%



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## 4.4 Environmental Characteristics/环境适应特性

No.	Items 项目	Test Method and Condition 测试方法及条件	Criteria 标准
1	Free fall test 自由跌落测试	The battery to be fully charged in accordance with standard charge condition, then dropped six times from a height of 1.0m onto a concrete floor, each side falls one time. 电池按照标准充电条件充满电后, 从1m高度跌落到一个水泥地面, 每个面各跌落一次, 共跌落6次。	No fire, No explosion 无起火, 无爆炸
2	Vibration test 振动测试	Standard charged cells are vibrated for 180minutes per each of the three mutually perpendicular axis(X,Y,Z) with double amplitude of 1.6mm and with vibration cycling that consists of 7HZ to 200HZ to 7HZ at sweep rate 1HZ/min. 电池标准充满电后, 进行振动测试, 每一轴 (x,y,z) 振动 180 分钟, 双幅为 1.6mm, 振动周期为 7hz 至 200hz 至 7hz, 以扫描率为 1hz/min。	No leakage, No fire, No explosion 无泄漏, 不起火, 不爆炸
3	Low pressure 低压测试	Each fully charged cell is placed in a vacuum chamber, in an ambient temperature of 20~25°C. Once the chamber has been sealed, its internal pressure is gradually reduced to a pressure equal to or less than 11.6 kPa (this simulates an altitude of 15240 m) held at that value for 6 h. 电池放在一个模拟真空的空间放置6小时, 环境温度为 20~25°C, 真空环境压力≤11.6kpa, 模拟15240m高空低压环境	No leakage, No fire, No explosion 无泄漏, 不起火, 不爆炸
4	Shock test 加速度测试	充满电后, 固定在冲击台上, 进行半正弦脉冲冲击实验, 在最初的 3ms内, 最小平均加速度为75gn, 峰值加速度为 150gn±25gn, 脉冲持续时间为6ms±1ms。电池每个方向进行三次加速度冲击试验。	No leakage, No fire, No explosion 无泄漏, 不起火, 不爆炸
5	Temperature Shock 温度循环测试	Standard charged cells are to be placed in a chamber and repeatedly tested by 10 times with the following heating cycling: Raising the temperature to 75±2°C within 30 minutes and retaining this temperature for 6 hours, then reducing the chamber temperature to -40±2°C within 30 minutes and retaining this temperature for 6 hours 充满电后, 将电池放置在试验箱内按照如下步骤试验: a) 在75°C±2°C的温度下保持6h; b) 在-40°C±2°C的温度下保持6h; c) 重复步骤a)~b), 共循环10次; d) 恢复至20°C±5°C的环境温度。试验过程中每两个温度之间的转换时间不大于30min。	No leakage, No fire, No explosion 无泄漏, 不起火, 不爆炸



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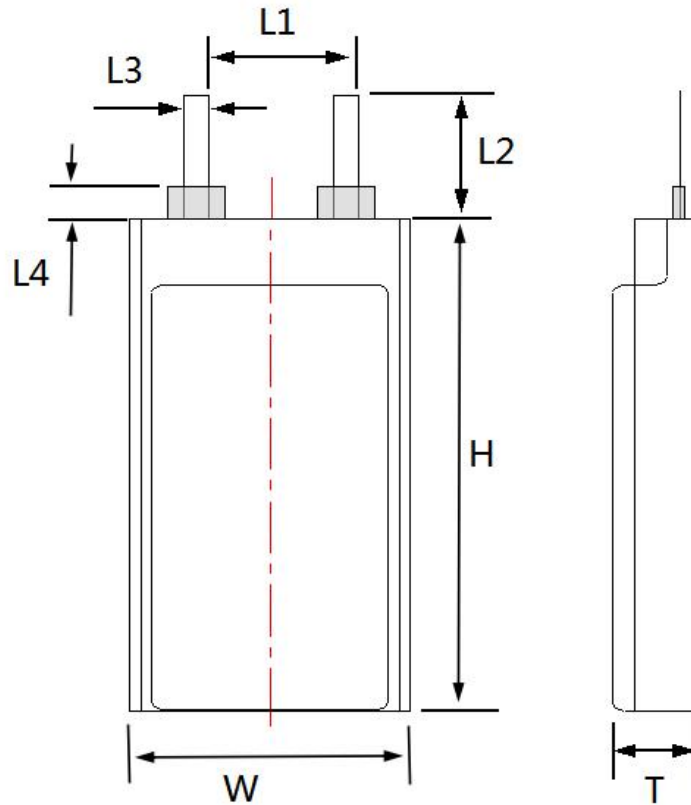
## 4.5 Safty performance/安全性能

No.	Items 项目	Test Method and Condition 测试方法及条件	Criteria 标准
1	Crush test 挤压测试	Fully charged the battery in accordance with standard charge condition, the battery is to be crushed between two flat plates. Continuous to applied force on battery of $13 \pm 0.02\text{KN}$ , stopped until a pressure reading of $13 \pm 0.02\text{KN}$ reached on the hydraulic ram 电池按标准充电条件充满电, 放置在两块平面金属板间, 施加 13KN 的压力, 直到液压油缸施加的压力达到 13KN 时停止。	No fire, No explosion 无起火, 无爆炸
2	RT Short Circuit test 常温短路测试	The fully charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with resistance load of $80 \pm 20\text{m}\Omega$ . Tests are to be conducted at room temperature $20 \sim 25^\circ\text{C}$ . 在室温 $20 \sim 25^\circ\text{C}$ 把充满电的电池的正负极用 $80 \pm 20\text{m}\Omega$ 的负载连接起来, 使电池外部短路	No fire, No explosion The Temperature of the Battery surface not exceeded than $150^\circ\text{C}$ 无起火, 无爆炸 电池表面温度不超过 $150^\circ\text{C}$
3.	$55^\circ\text{C}$ Short Circuit test $55^\circ\text{C}$ 短路测试	The fully charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with resistance load of $80 \pm 20\text{m}\Omega$ . Tests are to be conducted at room temperature $55 \pm 5^\circ\text{C}$ . 在室温充满电, 在 $55 \pm 5^\circ\text{C}$ 把电池的正负极用 $80 \pm 20\text{m}\Omega$ 的负载连接起来, 使电池外部短路	No fire, No explosion The Temperature of the Battery surface not exceeded than $150^\circ\text{C}$ 无起火, 无爆炸 电池表面温度不超过 $150^\circ\text{C}$
4	Forced discharge test 强制放电测试	A discharged cell is subjected to a reverse charge at 1C for 90 min. 将电芯放完电, 再用 1C 反接充电 90 分钟	No fire, No explosion 无起火, 无爆炸
5	Over charge test 过充电测试	After standard charge, continue 3 times the maximum charge current in the specification, and charge at constant voltage up to 4.6V. 电芯标准充满电后, 以规格书中 3 倍最大充电电流进行充电, 恒压至 4.6V	No fire, No explosion 不起火, 不爆炸
6	Heating Test( $130^\circ\text{C}/30\text{min}$ ) 热冲击测试( $130^\circ\text{C}/30\text{min}$ )	Each fully charged cell, stabilized at room temperature, is placed in a circulating air-convection oven. The oven temperature is raised at a rate of $5^\circ\text{C}/\text{min} \pm 2^\circ\text{C}/\text{min}$ to a temperature of $130^\circ\text{C} \pm 2^\circ\text{C}$ . The cell remains at this temperature for 30 min before the test is discontinued. 充满电的电池温度稳定到常温后, 放置入循环空气烘箱里, 从常温以 $5^\circ\text{C}/\text{分} \pm 2^\circ\text{C}/\text{分}$ 的速率升至 $130^\circ\text{C}$ 后, 在 $130^\circ\text{C}$ 放置 30 分钟。	No fire, No explosion 无起火, 无爆炸



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## 5 Cell initial Dimensions/电芯初始尺寸



NO.	Items 项目	Units/mm 单位/毫米	Remark 备注
1	Thickness/厚度 T	4.0	Max./最大
2	Width/宽度 W	26.0	Max./最大
3	Height/长度 H	30.0	Max./最大
4	极耳中心距 L1	8.0±2.0	极耳中心偏心
5	极耳外露长度 L2	9.0±1.0	包含极耳胶外露长度
6	极耳宽度 L3	3.0±0.1	
7	极耳胶外露长度 L4	0.2~2.0	
8	正极极耳说明	铝极耳	



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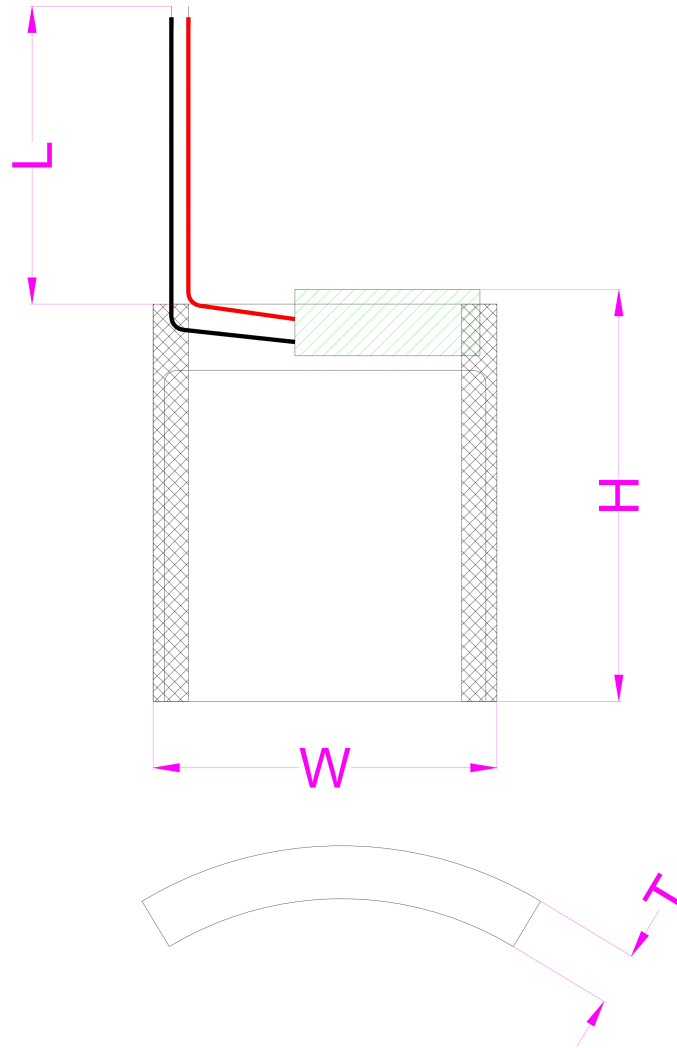
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## 6 Battery specifications/产品规格

No.	Items/项目	Specifications/规格	Remark 备注
1	Capacity for assembled cell discharging by 0.2C 电芯组装后 0.2C 标准放电的容量	$\geq 300\text{mAh}$	Standard discharging method 标准放电方式
2	Battery Voltage 电池电压	3.8-3.95V	Delivery Voltage, Within 10 days from Factory 交货电压, 在出厂 10 天内
3	Standard charge condition 标准充电条件	Charge with 0.2C constant current and 4.2V constant voltage, charge to 4.2V, continue charging till current decline to $\leq 0.02\text{C}$ 充电电流用 0.2C 恒流, 4.2V 恒压充至电流 $\leq$ 0.02C	Charge voltage: $4.2\text{V} \pm 0.03\text{V}$ Charge current: 0.2C 充电电压: $4.2\text{V} \pm 0.03\text{V}$ 流: 0.2C
4	Standard discharging method 标准放电方式	0.2C constant current discharge to 3.0V,	0.2C 恒流放电至 3.0V
5	Internal Impedance 内阻	Assemblage Impedance 装配后内阻 $\leq 300\text{m}\Omega$	Measure the Red and black wire of the connector after assembling. 装配后测试电池插头红黑线

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## 7 Battery Pack Dimensions/电池组尺寸



NO	Items	Units: mm		Remark
1	Thickness/厚度	T	4.2	Max
2	Width/宽度	W	26.5	Max
3	Height/长度	H	32.5	Max
4	Cable Length/引线长度	L	50±5	

NO	Part name/名称	Quantity/数量	Unit/单位	Remark
1	Cell/电芯	1	Ea	Jie Zhen
2	Solder/焊锡	0.04	g	Lead Free
3	PCM	1	Ea	P-1S1405AA
4	Wire/导线	2	Ea	UL3302/28AWG

以上材料符合 ROHS 标准



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## 附页：保护板参数

### 1. 技术规格 specification

- 1 适用范围 using scope: 本规格书适用于由本公司所设计生产的 P-1S1405AA 锂电保护板。
- 2 电池容量 battery capacity: (客户选择)
- 3 环保要求 environment request: ROHS
- 4 功能描述 function description: 过充保护, 过放保护, 过流保护, 短路保护
- 5 技术参数 electric features:

环境温度: 25 °C

保护 IC	技术参数 parameter value			
过充保护电压 Over-charge Threshold Voltage	4.225	4.250	4.275	V
过充保护恢复电压 Released voltage from Over-charge	4.050	4.100	4.150	V
充电过流检测电压 Charging overcurrent detection voltage	-0.125	-0.150	-0.175	V
充电过流保护电流 Charging discharge-current detect current	-1.5	-3.5	-5.5	A
过放保护电压 Over-discharge Threshold	2.750	2.800	2.850	V
过放保护恢复电压 Released Voltage from Over-discharge	2.950	3.000	3.050	V
放电过流检测电压 Excess discharge-current threshold	0.140	0.150	0.160	V
放电过流保护电流 excess discharge-current detect current	2.0	3.5	5.0	A
过充电检测延迟时间 Output Delay of Over-charge	0.7	1.0	1.3	s
过放电检测延迟时间 Output Delay of Over-discharge	115	145	175	ms
过电流检测延迟时间 Output delay of excess discharge-current	9.0	12	15.0	ms
短路保护延迟时间 Delay Time for Short Protection	200	300	400	μs
正常状态下静态电流 Supply Current	1.0	3.0	6.0	μA
过放状态下静态电流 Standby Current	0.1	0.16	0.5	μA
导通内阻 Impedance Resistance of operation	-	-	70	mΩ
输入电压 (B+与 B-间) Supply Voltage	-0.3	-	10	V
最大持续充电电流 Max charge-current	-	-	-1.5	A
最大持续放电电流 Max discharge-current	-	-	2.0	A
工作温度 Operating Temperature	-20	-	+85	°C
推荐贮存条件 Storage Temperature	-40	-	+125	°C
0V 电池充电功能 for 0V Charging	-	允许	-	

### 6 可靠性测试

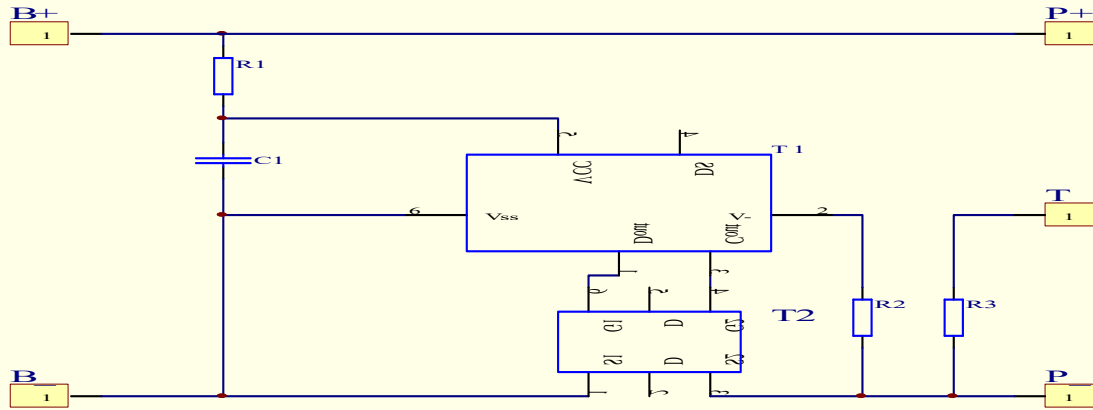
- 恒温恒湿测试 Humidity test : +40±2 °C 90%RH 48Hours 高温测试 High temperature test : +55±2 °C 2Hours
- 低温测试 Low temperature test : -20±2 °C 16Hours

ESD 抗静电测试 ESD test : Normal operation in all parts at ±4KV (contact) ±8KV (AIR) condition

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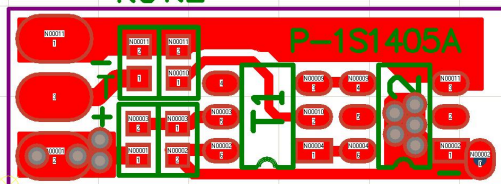
## 2. 电气原理 Circuit diagram

### 2.1 电气原理图 circuit diagram

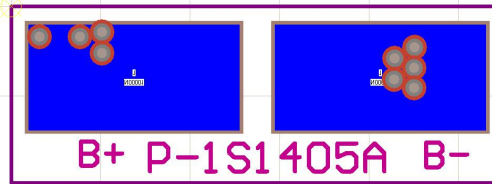


### 2.2 PCB 图 PCB layout

P-1S1405A-s0603  
R3 R2



R1 C1  
PCB:14\*5.0\*0.6



## 3. 物料清单 parts list

序号 No.	物料名称 description	供应商 vendor	代号 symbol	规格/型号 Spec./model	单位 unit	数量 Q'ry
1	PCB 板			P-1S1405A (14*5*0.6)	pcs	1.0000
2	贴片电容		C1	104 16V 0402	pcs	1.0000
3	贴片电阻		R1	100 Ω 0402 5%	pcs	1.0000
4	贴片电阻		R2	2K 0402 5%	pcs	1.0000
5	贴片 IC		T1	HY2116-RB6B	pcs	1.0000
6	MOS 管		T2	MS8205 SOT23-6(代替 HD8205)	pcs	1.0000
7	热敏电阻		R3	CN0402R104B4100FB 100K B=4100 0402 1%	pcs	1.0000

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## 8 Handling of Cells / 电池操作注意事项

Since the cell is packed in soft package, to ensure its better performance, it's very important to carefully handle the cell.  
 由于电芯属于软包包装, 为了确保电芯不受到损害, 保持良好的性能, 需要小心对电芯进行操作。

### 8.1 Notice for package film / 包装薄膜注意事项

#### 1) Soft aluminium foil / 铝箔软包装

Easily damaged by sharp edge parts such as pins and needles, Ni-tabs, so don't strike by those sharp parts.  
 铝箔软包装比较容易被锐利部件刺损, 如针尖、镍带, 所以不要用这此锐利的部件刻划电池。

#### 2) Sealed edge may be damaged by heat above 100°C, bend or fold sealed edge.

封边被加热到 100°C 以上以及弯折封边都容易使封边受损。



### 8.2 Prohibition short circuit / 禁止电池短路

Never make short circuit cell. It generates very high current which causes heating of the cells and may cause electrolyte leakage, gassing or explosion that are very dangerous.

The LIP tabs may be easily short-circuited by putting them on conductive surface.

Such outer short circuit may lead to heat generation and damage of the cell.

An appropriate circuitry with PCM shall be employed to protect accidental short circuit of the battery pack.

避免电池短路。短路会产生很高的电流而使电池发热以及电解液泄漏, 产生有毒气体或爆炸是非常危险的。极片连接在导电物体表面很容易短路, 外部短路会导致发热及损害电池。选用一个适当的保护电路可以在意外短路时保护电池。



### 8.3. Mechanical shock / 机械撞击

LIP cells have less mechanical endurance than metal-can-cased LIB.

Falling, hitting, bending, etc. may cause degradation of LIP characteristics.

聚合物电池比金属外壳电池的机械耐久性更小。

跌落、碰撞、弯曲等等都可能会降低聚合物电池的性能。



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#### 8.4 Handling of tabs/极耳操作注意事项

The battery tabs are not so stubborn especially for aluminum tab.

Don't bend tab, especially Al tab.

Do not bend tabs unnecessarily.

极耳的机械强度并非异常坚固，特别是铝片。没有必要时禁止弯折极片。



### 9 Notice for Designing Battery Pack/电池外壳设计注意事项

#### 9.1 Pack toughness/外壳坚韧度

Battery pack should have sufficient strength and the LIP cell inside should be protected from mechanical shocks.

电池外壳应该有足够的机械强度使聚合物电池免受机械撞击。

#### 9.2 Cell fixing/电池的固定

The LIP cell should be fixed to the battery pack by its larger surface area.

No cell movement in the battery pack should be allowed.

电池最大面积的一面应该固定在外壳上，安装后电池不能有松动。

#### 9.3 Inside design/外壳内部设计

No sharp edge components should be insides the pack containing the LIP cell.

外壳内安装电池的部位不应有锋锐边。

#### 9.4 Tab connection /极片连接

Ultrasonic welding or spot welding is recommended for LIP tab connection method.

Battery pack should be designed that shear force are not applied to the LIP tabs.

If apply manual solder method to connect tab with PCM, below notice is very important to ensure battery performance:

- 1) The solder iron should be temperature controlled and ESD safe;
- 2) Soldering temperature should not exceed 350°C;
- 3) Soldering time should not be longer than 3s;
- 4) Soldering times should not exceed 5 times, Keep battery tab cold down before next time soldering;
- 5) Directly heat cell body is strictly prohibited, Battery may be damaged by heat above approx 100°C

建议使用超声波或点焊焊接方法；外壳设计应使极片不受外力。

如果使用人工焊接保护板，下面的注意事项对于确保电池性能非常重要：

- 1) 焊接烙铁的温度必须可控且可防静电；
- 2) 焊接时烙铁的温度不能超过 350°C；
- 3) 焊锡时间不能超过 3 秒钟；
- 4) 焊锡次数不能超过 5 次，待极片冷却后才能进行下一次焊锡；
- 5) 严禁直接加热电芯，高于 100°C度会损害电芯。

#### 9.5 For mishaps/针对意外事件

Battery pack should be designed not to generate heat even when leakage occurs due to mishaps.

- 1) Isolate PCM (Protection Circuit Module) from leaked electrolyte as perfectly as possible.

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2) Avoid narrow spacing between bare circuit patterns with different voltage(Including around connector).

LIP battery should not have liquid from electrolyte, but in case if leaked electrolyte touch bare circuit patterns, higher potential terminal material may dissolve and precipitate at the lower potential terminal, and may cause short circuit. The design of the PCM must have this covered.

发生意外时外壳设计应考虑即使在电池出现漏液时也不会发热。

1) 尽量把保护电路与渗漏的电解液隔离开。

2) 在不同的电压情况下避免出现小间距的裸露电路(包括插头周围)。

聚合物电池不应该有来自电解液的液体，但是一旦发生电解液渗漏触及裸露电路，高电势端子材料可能会溶解然后沉淀到低电势端子，可能会造成短路。保护板的设计必须含有覆盖保护层。

## 10 Notice for Assembling Battery Pack 电池装配注意事项

Crush (PCB)、Shocks、high temperature or contacts of sharp edge components should not be allowed in battery pack assembling process. 在电池装配过程中不允许出现挤压 PCB 保护板、撞击、高温或接触尖锐部分。

## 11 Others/其它

### 11.1 Cell connection/电池连接

1) Direct soldering of wire leads or devices to the cell is strictly prohibited.

2) Lead tabs with pre-soldered wiring shall be spot welded to the cells.

Direct soldering may cause damage of components, such as separator and insulator, by heat generation.

1) 严禁直接焊接引线或设备到电池上。

2) 极片在焊接引线之前应该先点焊到电池上，直接与电池热焊接，产生的热量会使电池的隔离体及绝缘体受损。

### 11.2 Prevention of short circuit within a battery pack/电池内部的短路预防

Enough insulation layers between wiring and the cells shall be used to maintain extra safety protection. The battery pack shall be structured with no short circuit within the battery pack, which may cause generation of smoke or firing.

在电池和引线之间应该有足够的绝缘层用于安全保护。电池的包装构成应没有导致起烟起火的短路情况。

### 11.3 Prohibition of disassembly/禁止拆卸

1) Never disassemble the cells

The disassembling may generate internal short circuit in the cell, which may cause gassing, firing, explosion, or other problems.

2) Electrolyte is harmful

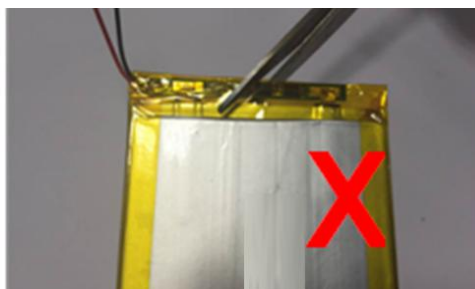
LIP battery should not have liquid from electrolyte flowing, but in case the electrolyte come into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

1) 不要拆卸电池。

拆卸电池会发生电池内部短路，会引起起火、爆炸、有害气体或者其它问题。

2) 电解液是有害的

万一电解液沾到皮肤、进入眼睛，应立即用清水冲洗以及求助医生。







# PRODUCT SPECIFICATION

Version :	A0
Date :	2019-11-28
DOC No :	

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## 11.4 Prohibition of dumping of cells into fire/不要把电池倾倒入火中

Never incinerate nor dispose the cells in fire. These may cause explosion of the cells, which is very dangerous and is prohibited.  
不要焚毁电池，否则会致电池爆炸，这个很危险，必须禁止。

## 11.5 Prohibition of cells immersion into liquid such as water/禁止浸泡电池

The cells shall never be soaked with liquids such as water, seawater, drinks such as soft drinks, juices, coffee or others.  
请不要把电池浸泡在液体当中，像清水、海水，及非酒精饮料、果汁、咖啡或者其它的饮料。

## 11.6 Battery cells replacement/更换电池

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.  
更换电池应由电池生产商或设备供应商完成，用户不要自行更换。

## 11.7 Prohibition of use of damaged cells/禁止使用损坏的电池

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in a plastic envelop of the cell, deformation of the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more.

The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

电池可能在出货途中碰撞而受损。如果发现电池有异常，例如包装损坏、电池包裹变形，有电解液的味道、发现漏液等等，不要再使用这些电池。

电池如果有电解液的味道或者出现漏液，电池放置应该远离火源避免起火及爆炸。

## 12 Period of Warranty/保质期

The period of warranty is a year from the date of shipment. Great Power guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

保质期从出货之日算起为 1 年。如果电池的缺陷是在制造过程中形成的而不是由于用户滥用及错误使用造成，本公司负责退换电池。

## 13 Storage of the Batteries/电池的存放

The batteries should be stored at room temperature, charged to about 30% to 50% of capacity.  
We recommend that batteries be charged about once per half a year to prevent over discharge.

电池应当在室温下存放，应充到 30%至 50%的电量。如长时间储存，建议每半年充一次电以防止电池过放电。

## 14 Other The Chemical Reaction/其它化学反应

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使是存放很长一段时间而不使用。若使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，会使缩短电池的使用寿命，或者会产生漏液导致设备损坏。如果电池长周期不能充电，即使充电方法正确，这样需要更换电池了。

## 15 Note/注释

Any other items which are not covered in this specification shall be agreed by both parties.

本说明书未包括事项应由双方协议确定。