

GREAT POWER BATTERY	GREAT POWER
SPECIFICATION FOR 553446A	

承 认 书

APPROVAL OF DATA SHEET

BL-5C

客户 CUSTOMER:

客户编号 CUSTOMER REF. NO. AB553446GZ 3.7V 1000mAh

型号 MODEL:553446

描述 DESCRIPTION: *BATTERY PACK*

版本 VERSION: 00

承认书编号 REF. No: *LT-DC-1511038*

DATE:2015-12-30		
Approval	Check	Engineer
Samyan	Tony	Qiqi
CUSTOMER:		
DATE:		
Approval	Check	Engineer

规格书承认 APPROVAL FOR DATA SHEET ONLY

规格书和样品承认 APPROVAL FOR DATA SHEET AND SAMPLE

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Edit Record

Edition	Prepared	Edit Cause	Approved	Effective Date
00	qiqi	New version		

Specification Changed Records List

NO	Edit date	Page	Edit item	Content changed

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1. 范围 Scope

产品规格书包含由我司制造和提供的可充电电池组的必备条件，这个电池组包含锂电芯，安全器件和保护电路单元，所有的测试都在 25℃

This data sheet shows the essential conditions of the rechargeable Lithium-ion battery pack . The battery pack contains lithium-ion cells, safety devices and protection circuit units. All tests are made at 25°C.

2. 基本信息 Basic Information

描述 Description	Rechargeable Lithium Ion Battery Pack
电芯组合 Cell configuration	1P-1S
型号名称 Model name	553446A
标称电压 Normal Voltage	3.7V
标称容量 Normal Capacity	1000mAh
内阻 Internal Resistance	<180 mΩ

3. 性能 Specifications

3-1. 电性能 Electrical specifications

(1) 电压 Voltage	标称 Normal	3.7V
(2) 容量 Capacity	标称 Normal	900mAh (标准充放电 by standard charge and discharge)
(3) 充电 Charge	电压 Voltage	4.20+/- 0.05V
	电流 Current	900mA (快充 Quick Charge)
	方式 Method	450mA (0.2C 慢充 Continuous Charge)
	结束 Finish	CC/CV (恒流/恒压)
(4) 放电 Discharge	电流 Current	< 20mA
		900mA (持续 Continuous)
		450mA (标准 Standard)
	终止 Empty	2.4V

3-2. 外观 Physical specifications

尺寸 Size

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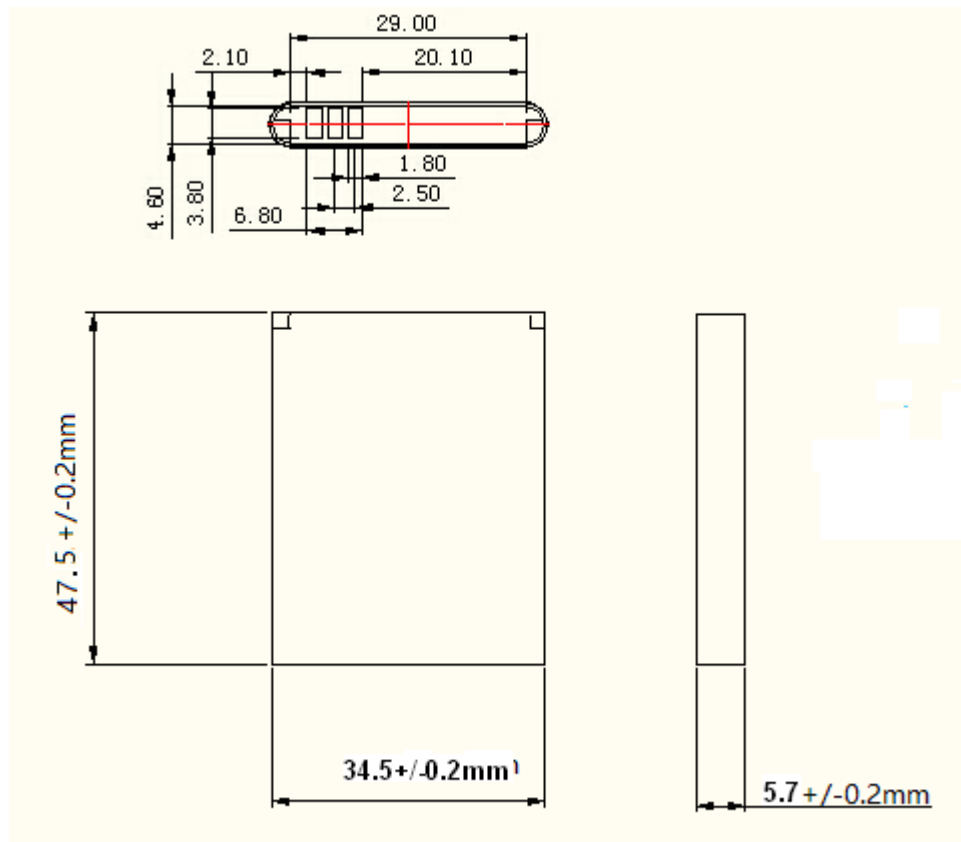
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H: 47.5±0.2 mm

W: 34.5±0.2mm

T: 5.7±0.2mm

3-3 使用环境 Using conditions

- | | | |
|--------------------|--------------|---|
| (1) 温度 Temperature | 充电 Charge | 0 ~ 50°C |
| | 放电 Discharge | -10 ~ 60°C |
| | 贮存 Storage | -20 ~ 25°C (< 1 year)
-20 ~ 40°C (< 3 months)
-20 ~ 50°C 1 month) |
| (2) 湿度 Humidity | 工作 Operation | 20 ~ 85%RH (not condensed) |
| | 贮存 Storage | 40 ~ 85%RH (not condensed) |

3-4. 安全性能 Safety specifications

- (1) 过充保护: 单只电芯的电压偶尔或者持续超过 4.20±0.05V (同时仍然能放电), 要切断电路停止充电。

Over Charge Prohibition: Shut down the circuitry and stop charge if one of cell's voltage exceeds more than 4.20±0.05V momentarily or continuously.(Meanwhile, it is able to discharge)

延迟时间: 1.5s(Typ.),1.7s(Max.)

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Delay Time: 1.5s(Typ.),1.7s(Max.)

- (2) 过充释放: 在电芯电压已被检测到充电禁止模式下,如果单只电芯的电压低于 $4.15V \pm 0.5V$,禁止模式将被复位.

Over Charge Release: In case of the cell voltage which has detected charge prohibition mode. If all of cells are less than: $4.15V \pm 0.05V$ prohibition mode would be reset.

- (3) 过放保护: 如单只电芯的电压偶尔或者持续低于 $2.40V \pm 0.1V$ (同时仍然能充电), 要切断电路停止放电。

Over Discharge Prohibition: Shut down circuitry and stop discharge if one of cell's voltage becomes less than $2.40V \pm 0.1V$ momentary or continuously.(Meanwhile, it is able to discharge)

延迟时间: 180ms(Typ.), 210ms(Max.)

Delay Time: 180ms(Typ.), 210ms(Max.)

- (4) 过放释放: 电压达到 $2.5V \pm 0.1V$ 时需要恢复电压。如电池组没有电压需要恢复时, 请连接电源供应。

Over Discharge Release: Recover when the voltage of cells reach above: $2.5V \pm 0.1V$. If battery pack is no voltage, please connect the power supply, and the voltage will recover.

- (5) 短路保护: 当保护 IC 检测到 MOS 管上压降大于规定电压 ($1.2V(\text{Min.}), 1.25V(\text{Typ.}), 1.3V(\text{Max.})$), 要切断电路停止放电

Short circuit protection: When protection IC detects the voltage drop on MOS exceeds the specified voltage ($1.2V(\text{Min.}), 1.25V(\text{Typ.}), 1.3V(\text{Max.})$), it shall shut the circuit and stop discharge.

延时时间: 600us(Max.)

Delay time: 600us(Max.)

4. 性能及测试 Performance and Tests

4-1. 样品测试及环境条件 Test sampling and environmental conditions

- (1) 样品测试条件 Test sample condition

The battery used for the test shall be manufactured and delivered no later than one month before.

- (2) 环境条件 Environmental condition

测试条件为 $23 \pm 2^\circ\text{C}$ and $65 \pm 20\% \text{RH}$

The test shall be performed at $23 \pm 2^\circ\text{C}$ and $65 \pm 20\% \text{RH}$.

- (3) 测试仪器要求 Test equipment condition

测试用的伏特表和电表的精度要高过 0.5 级, 高电阻类型。

The grade of Voltmeter and Ammeter used in the test shall be higher than class 0.5, a high impedance type.

4-2. 标准测试条件 Standard test conditions

- (1) 标准充电 Standard Charge

标准充电即在 $23 \pm 2^\circ\text{C}$ 下, 用 0.5C 电流和 4.2V 的电压持续给电池组充电 2.5 个小时直到充电电流小于 0.01C.

"Standard Charge" means charging the pack with a Charge Current 0.5C with constant Voltage of 4.2V at $23 \pm 2^\circ\text{C}$ for 2.5 hours until the current $< 0.01c$.

- (2) 标准放电 Standard Discharge

标准放电即在 $23 \pm 2^\circ\text{C}$ 下, 用 0.5C 电流持续放电, 一直到电池的电压降到 2.75V。

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"Standard discharge" means charging the pack with a Discharge Current 0.5C with constant Voltage down to 2.75V at 23±2°C.

4-3. 常规性能 General performance

(1) 初始容量 Initial capacity

标准充放电三个循环然后测量最后放电的容量

Perform the Standard Charge and Discharge cycling for 3 times, and measure the last Discharge Capacity.

初始容量应高于最低容量

* The initial capacity shall be higher than minimum capacity

(2) 循环寿命 Cycle life

按照以下要求，标准充放电 300 个循环然后测量放电容量。

After 300 cycles of Standard Charge and Discharge under conditions mentioned below, the pack is measured for Discharge Capacity.

充电和放电之间要暂停 10 分钟

* Each charge and discharge process includes 10 minutes rest time.

300 次循环后测出的容量应高于最低容量的 80%

* Last Discharge Capacity after 300th cycle shall be higher than 80% of minimum capacity.

(3) 不同温度下的容量 Discharge Capacity with temperature

如把标准容量定为 100%，则在不同的温度下容量有所差别。

This means the relative value of Discharge Capacity at various temperatures compared with the Standard Discharge Capacity as 100%.

在标准充电条件下充电

* Pack is charged under Standard Charge conditions.

在不同的温度下标准放电

* Pack is discharged under Standard Discharge conditions at various temperatures.

Relative capacity 相关容量	70%	80%	100%	95%
At 温度	-10°C	0°C	23°C	60°C

(4) 贮存 Storage

按标准条件充满电的电池组在 23±2°C 的温度下贮存 30 天按标准放电条件测量其容量

A fully charged pack under Standard Charge condition is stored at 23±2°C for 30 days and the capacity is measured for the standard discharge condition.

剩余的容量应高于最低容量的 90%。

* Remaining capacity shall be higher than 90% of the minimum capacity.

4-4. 机械性能 Mechanical performance

(1) 自由跌落 Drop test

测试方法 Test method :将电池样品由高度(最低点高度)为 1000mm 的位置自由跌落到置于水泥地面上的 18mm~20mm 厚的硬木板上,在 X、Y、Z 正负方向(六个方向)每个方向自由跌落 1 次

Test method :Dropping the battery pack freely on the hard board 18mm~20mm thickness at 1000mm height on 6 bearings of X、Y、Z freely each time.

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(2) 振动测试 Vibration test

测试方法 Test method: 目的在于测试电池组的抗震能力

This is to test the endurance of the pack against vibration.

频率和振幅 Frequency and Amplitude: 10Hz → 55Hz → 10Hz / 0.8mm

速率 Sweep speed: 1 ±0.055Hz/min

标准 Criteria: 无漏液、冒烟、起火 No damage such as leakage, flame, or fire is allowed.

5. 注意事项 Caution and prohibition

在使用电池组之前，请详细阅读《可充锂离子电池组的使用说明》

Before using and handling the pack, see attached "Handling instructions for Rechargeable Lithium IonBattery Pack".

出于安全考虑，在运输途中，可充电电池组的容量较低，使用前请对电池组进行充电。

For safety reasons Rechargeable Batteries are shipped in a low capacity state.

Charge battery pack before using.

新电池组在使用一段时间后，如果没有完全充放电，容量会受到损失。但经过几次完全的充放电之后，电池组就可以恢复到初始的性能。

New pack is the initialied. But if used over a period of time without fully charging and discharging, a loss in capacity accuracy may occur. Recover such packs to original performance through repeating several cycles of full charging and discharging.

6. 长期贮存 Storage for a long term

如需长时间保存电池组（3个月或更长），请把电池组贮存在干燥、低温的地方。

If the pack is kept in storage for a long term (3 months or more), it is strongly recommended that the pack be preserved in a dry and low temperature atmosphere.

7. 质量保证 Warranty

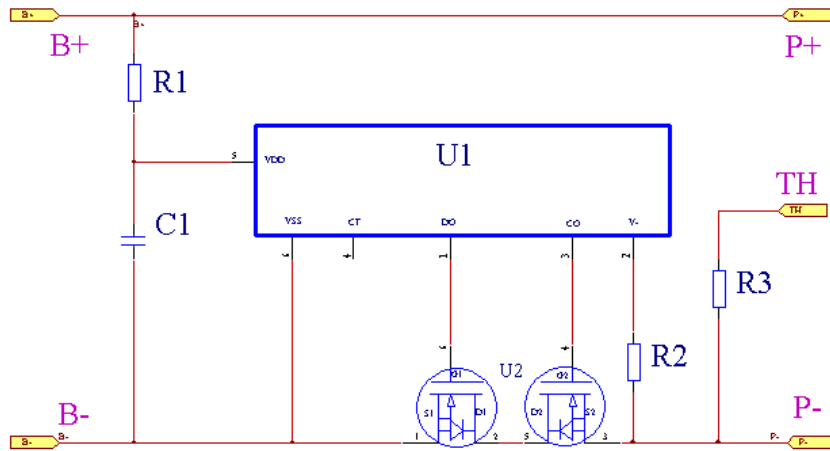
从出厂之日算起 6 个月内，如电池组出现质量问题，我司负责更换。但如因设备故障或者使用方法不对导致电池出现问题的除外。

Manufacturer will be responsible for replacing the pack against defects or poor workmanship for 6 months from the date of shipping. Any other problem caused by malfunction of the equipment or misuse of the battery is not covered under this Warranty.

8. 附录 Appendix

8-1 保护板线路图与元件清单 PCM Diagram and Part list

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Part list:

NO.	Description/vendor	Symbol	Model/Spec.	Supplier	unit	Q'ty
1	MOSFET	U1	8205A/ SOT-23-6	DEVELOPER	PCS	1
2	RES	R1	100 ±5% 1/16W 0603	YAGEO	PCS	1
3	RES	R2	1K ±5% 1/16W 0603	YAGEO	PCS	1
4	IC	U1	DW01	IMICRO WX	PCS	1
5	CAP	C1	0.1uF +80% -20% 50V 0603	ROYALOHM	PCS	1
6	RES	R3	4.7K ±5% 1/16W 0603	YAGEO	PCS	1

8-2 可充锂离子电池组的使用说明 Handling instructions guide for Rechargeable Li-ion Battery Pack

1. 概述 General

在使用电池组时，请根据规格书的要求进行操作。以下为详细说明。

Battery packs have to be handled carefully according to the specifications. Here are some more to be followed.

2. 电池组的贮存 Storage of pack

a. 电池组应贮存在以下的环境中：

The packs are requested to be stored under the following conditions:

b. 屋内太阳直射不到的凉爽的地方。

Indoor storage in cool conditions without direct sun light on the packs or cartons.

c. 干燥、湿度低的地方，温度保持在-20°C ~ +30°C

Store batteries in a dry location with low humidity, and a temperature range of -20°C to +30°C

长期贮存说明

Instructions for 'long term storage':

d. 长时间贮存会加速电池的自放电，导致电池的钝化。为了把钝化效应降到最低，电池组贮存的温度应

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保持在+10°C ~ +30°C。

Long-term storage can accelerate battery self-discharge and lead to the deactivation of the batteries. To minimize the deactivation effect, store battery packs in a temperature range of +10°C to +30°C.

- e. 长时间贮存后第一次充电时，由于电池组还没有被击活，容量会变低。经过几次完全的充放电之后，电池就会恢复到初始的容量。

When charging for the first time after long-term storage, deactivation of the packs may have led to decreased capacity. Recover such packs to original performance through repeating several cycles of fully charging and discharging.

- f. 由于电池组会自放电，如贮存时间超过 6 个月，应保持至少每 6 个月要对电池充一次电，以防止漏液及性能的衰退。

When storing packs for more than 6 month, charge at least once every 6 months to prevent leakage and deterioration in performance due to self-discharging.

3. 充电 Charging the pack

- a. 充电时需使用特定的充电器，电压和电流要匹配。

Use suitable Charger with the specified Voltage and Current.

- b. 正负极装反请勿充电。充电时，如果正负极装反，将会导致电池内部鼓气及漏液。

Never attempt Reverse Charging. Charging with polarity reversed can cause a reversal in battery polarity, causing gas pressure inside of the battery to rise, which can lead to leakage of the batteries in the pack.

- c. 请勿过度充电。重复过充会导致电池组过热及性能的衰退。

Avoid overcharging. Repeated overcharging can lead to deterioration in pack performance and the battery pack may get over heated.

- d. 温度超过 40°C 时，充电功率会降低。

Charging efficiency drops at temperatures above 40°C.

4. Protection from unexpected damaged to pack

- a. 请勿用导线、项链等金属物体连接电池组的正负极 (+) and/or (-) terminals must not be connected in metal wire, necklace, chasing.

- b. 请勿把电池从高处往下抛，以免电池受到损害无法正常工作。

Donot drop packs from height in order to prevent them from possible malfunction or damage.

- c. 请勿弯折，以免电池组受到损害

Do not twist or bend packs in order to prevent possible damage.

5. For Safety

- a. 请勿拆开电池组 Do not disassemble packs.

- b. 如发现电池组有异常情况，比如异味，变形，变色的，请勿再使用电池组 Do not use the pack if an abnormality is detected such as foul odor, deformation, discoloration, and so on.

- c. 电池组拆开请勿再使用电芯和其他配件。Do not re-use Li-ion Polymer cells or other parts after removing from the packs.

- d. 如有漏液，请勿触摸漏液。Donot touch the liquid if there is an electrolyte leakage.

- e. 浸过水的电池组功能会出现异常，因此请勿使用浸过水的电池组，Once watered, packs may have potential malfunctions. Do not use those packs.

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- f. 请勿把电池组置于高温环境中(60°C 以上)Do not keep packs in hot temperature (60°C or more) conditions.
- g. 请勿把电池组放到火中 Do not put packs into fire.
- h. 请勿刺穿电池组。 Do not crush/nail packs.
- i. 请勿直接在电池组上焊接。 Do not apply solder directly to packs.