样 品 承 认 书

APPROVED SHEET

客户料号(P/O) ： OT-007-002200-0[illegible]10

品名(MATERIAL)：锂充电电池

规格(SPECIFICATION)：锂充电电池

2200MAH/3.7V/18650-XH2.54-3PIN

承认说明： M16 PRO

广东永邦新能源股份有限公司	EDIFIER 漫步者
承认签核（CUSTOMER APPROVAL）	承认签核（CUSTOMER APPROVAL）
制作(ORIGINATED BY)：	检验（INSPECTED BY）：李永明 2022.03.24
确认（CHECKED BY）：	确认（CHECKED BY）：

产 品 承 认 书
Product Specification

锂 离 子 电 池 (Pack)

Li-ion Battery (Pack)

电芯型号 Cell Model: GP-ICR18650-2200mAh　　成品方式 Pack Mode: 电芯+保护板+引线插头

项目编码 Project Code: YSC005-03　　规格书版本 Specification Rev: A3

批 准 Approved by	审 核 Checked by	拟 定 Prepared by
刘银求/2022-3-22	陈庚福/2022-3-22	邓天尧/2022-3-22

客户编码/名称 Customer Code/Name: YSC005/东莞市漫步者科技有限公司

客户确认 Customer Approval	签 章 Stamp

产 品 修 订 履 历 表

Product Revision History

版本号 Rev No.	修订内容描述 Revision Description	修改人 Modify	审批人 Approval	生效日期 Date
A0	首次发行		李金勇	2019-4-19
A1	更改放电温度范围及温度特性	邓均	李金勇	2019-5-13
A2	更改标贴内容	冯彩铃	刘银求	2021-12-3
A3	出线长度改为 75±5mm		刘银求	2022-3-22

总公司地址：广东省东莞市塘厦镇沙湖麒麟岭路 49 号
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目 录
Content

1. 适用范围 Scope

本规格书描述或规定锂离子电池产品、产品特征、基本性能、相关测试条件和方法、安全使用注意事项等。本标准只适用于广东永邦新能源股份有限公司所生产的锂离子电池。

This specification is made to describe the product, product characteristics and performance, relevant measurement conditions and methods, and safety Instructions of the Lithium ion battery as specified in following details. The specification only applies to Guangdong YungBang New Energy Co.,Ltd.

2. 依据标准 Performance

中华人民共和国国家标准‘GB31241-2014’《便携式电子产品用锂离子电池和电池组安全要求》

Issued by national standard of the People's Republic of China‘GB31241-2014’《Lithium ion cells and batteries used in portable electronic equipment safety requirements》

3. 产品规格 Product Specification

序号 NO.	项目 Description	规格 Specification	备注 Remark
3.1	典型容量 Typical Capacity	2200mAh	用 0.2C 电流从 4.2V 恒流放电至 3.0V。From 4.2V to 3.0V by discharge current 0.2C.
3.2	最小容量 Minimum Capacity	2150mAh	
3.3	重量 Weight	约：47g	
3.4	出货电压 Shipment voltage	3.85~4.0V	
3.5	标称电压 Nominal Voltage	3.7V	
3.6	满充电压 Full Charge Voltage	4.2V（电芯可满充致 4.25V）	定义 FC 电压=4. 2V Defined FC Voltage=4.2V.
3.7	满放电压 Full Discharge Voltage	3.0V	定义 FD 电压=3. 0V Defined FD Voltage=3.0V.
3.8	充电截止电压 Charge Cut-off Voltage	4.2±0.05V	Ref.6.1.1
3.9	放电截止电压 Discharge Cut-off Voltage	3.0±0.05V	Ref.6.1.2
3.10	内阻 Inner Impedance	成品(pack)≤150mΩ	
		电芯(cell)≤60mΩ	
3.11	标准充电方法 Standard Charge Method	0.2C 恒流充电至 FC 电压，再 FC 电压恒压充电至电流降低 0.01C 0.2C CC (constant current) charge to FC Voltage, then CV (constant voltage) charge till charge current decline to 0.01C	恒流/恒压 CC/CV
3.12	最大充电电流 Max. Charge Current	1.0C（2200mA）	0~45℃

3.13	标准放电方法 Standard Discharge Method	使用 0.2C 恒流放电至 FD 电压截止 Using 0.2C constant current discharge to FD Voltage	
3.14	最大放电电流 Max. Discharge Current	1.5C	-20~60℃
		2C	≤2min
3.15	外观 Cosmetic Appearance	无胀气，无破裂，无漏液 No gas, No rupture, No leakage.	
3.16	储存湿度 Storage Humidity	≤85% RH	
3.17	储存环境 Storage Environment	≤1 month: -20℃~60℃	储存温度 25±2℃，电池为半电状态储存。 Recommended storage temperature is 25±2℃ of half charge state .
		≤3 months: -20℃~45℃	
		≤1 year: -20℃~30℃	

备注 Note:

测试环境均在以下标准测试环境下进行，如果工作条件偏离，电池性能可能发生偏移。

The testing condition is following the standard testing condition as bellow, If the working condition is out of it, the performance may have some deviation.

温度 (Temperature)：25±2℃

相对湿度 (Relative humidity)：≤85%RH

大气压(Atmospheric Pressure)： 86~106 kPa

4. 电性能 Electrical Performance

序号	内容 Item	条件 Testing Method	达到要求 Requirements
4.1	放电容量 Discharging Capacity	在标准测试环境下，标准充满电池后，搁置 10 分钟，然后分别用 0.2C、0.5C、1C 电流放电至 FD 电压，记录放电时间。 At standard testing condition, after standard charging, rest for 10min, then discharge at 0.2C, 0.5C or 1C to voltage FD Voltage, record the discharge time.	0.2C: ≥295min (98%) 0.5C: ≥114min (95%) 1.0C: ≥54min (90%)
4.2	循环寿命 Cycle life	在标准测试环境下，先用 0.2C 将电池恒流充电至 FC 电压，再 FC 电压恒压充电直至充电电流下降至≤0.01C，搁置 10 分钟，再用 0.2C 电流恒流放电至 FD 电压；搁置 10 分钟，重复以上步骤，直到放电容量降低至初始容量的 80%。 At standard testing condition, constant current 0.2C charge to FC Voltage, then constant voltage FC Voltage charge to current declines to 0.01C, rest for 10min, constant current 0.2C discharge to FD voltage, rest for 10min. Repeat above steps till continuously discharge capacity higher than 80% of the initial capacity of the battery.	≥300times

<table>
<tr><td rowspan="3">4.3</td><td rowspan="3">温度特性
Temperature Characteristics</td><td colspan="6">在标准测试环境下，标准充满电池后，分别在 60±2℃、23±2℃，0±2℃或-20±2℃下储存电池 4hrs，然后在相同温度下用 0.2C 将电池放电至 FD 电压，记录放电时间。
At standard testing condition, after standard charging, Stored the recharged battery for 3hrs at 60 ± 2℃, 23±2℃, 0 ± 2℃ or -20℃, and discharged at 0.2C to FD Voltage at the same temp., record the discharge time.</td></tr>
<tr><td>放电温度
Discharge Temperature</td><td>-20℃</td><td>-10℃</td><td>0℃</td><td>23℃</td><td>60℃</td></tr>
<tr><td>放电容量（0.2 C）
Discharge Capacity</td><td>50%</td><td>70%</td><td>80%</td><td>100%</td><td>95%</td></tr>
<tr><td>4.4</td><td>荷电保持能力
Capability of keeping electricity</td><td colspan="3">在标准测试环境下，标准充满电池后，无外接负载线路，电池搁置28天，然后用0.2C 恒流放电至FD电压，记录放电时间。
At standard testing condition, after standard charging, no outer loading circuit, store the battery 28days, discharge at 0.2C to FD voltage, record the discharge time.</td><td colspan="3">≥270min</td></tr>
</table>

5. 安全性能 Safety Performance

序号	内容 Item	条件 Testing Method	达到要求 Requirements
5.1	过充测试 Overcharge Test	在标准测试环境下，用0.5C 电流恒流放电至FD 电压，然后电芯用3C 电流恒流充电至4.6V，再用4.6V 恒压充电至电流下降到≤0.005C，或者充电时间不小于8hrs。 At standard testing condition，constant current 0.5C discharge to FD Voltage, charge the battery without PCB with constant current 3C to voltage 4.6V, then with constant voltage 4.6V till current decline to 0.005C, or the total charge time is over 8hrs.	不起火，不爆炸 No fire, No explosion
5.2	短路测试 Short - Circuit Test	在标准测试环境下，标准充满电池后，用内阻为80 ±20mΩ 的导线连接电芯正负极，测试过程中监测电芯温度，直到电芯表面温度低于峰值温度10℃，停止实验。 At standard testing condition, after standard charging, then connecting the positive and negative terminals of the cell with a circuit load having a resistance load of 80 ±20mΩ. The temperature of the cell case is to be recorded during the test. Stop the test until the cell surface temperature lower 10℃ than the maximum temperature.	不起火，不爆炸 No fire, No explosion

5.3	热冲击测试 Heating Test	在标准测试环境下，标准充满电池后，将电池放进烘箱内，以5±2℃/min 速度升高烘箱内温度至130±2℃后，恒温10min。 At standard testing condition, after standard charging, Put the cells in the oven, the temperature of the oven is to be raised at 5±2℃ per minute to a temperature of 130 ± 2 ℃ and remain for 10 minutes.	不起火，不爆炸 No fire, No explosion
5.4	跌落测试 Drop Test	在标准测试环境下，标准充满电池后，电池从1m(3.28英尺) 的高度自由跌落到水泥地面上；每个池将沿着三个互相垂直轴的正负方向跌落1次，总共跌6次，然后25±5℃静置观察1hrs。 At standard testing condition, after standard charging, Then batteries were dropped from a height of 1m (3.28ft) to a concrete surface, Each battery is to be dropped once in the positive and negative directions of three mutually perpendicular mounting positions for a total of 6 times, then rest for 1 hrs at 25±5℃.	不起火，不爆炸 No fire, No explosion
5.5	振动测试 Vibration test	在标准测试环境下，标准充饱电后，将电池稳固地、有保护地固定在振动平台上，不要扭曲电池，以便振动能很好的传送。每个电池经受简单的调谐振动， 振幅为0.8mm(0.03 英寸)[最大双振幅1.6mm(0.06 英寸)]。振动的频率在10 - 55Hz 范围内以1Hz/min 的速率变化，在90 - 100min 内恢复回来，电池沿3个互相垂直的方向振动。对于只有两个对称轴向的电池，样品应沿垂直于每个轴的方向测试。 At standard testing condition, after standard charging, Batteries are firmly secured to the platform of the vibration machine without distorting the batteries in such a manner as to faithfully transmit the vibration. The battery is to be subjected to simple harmonic motion with the amplitude for 0.8 mm(0.03 inch) [1.6 mm (0.06 inch) total maximum excursion]. The frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, and return in not less than 90 no more than 100 minutes. The battery is to be tested in three mutually perpendicular directions. For a battery that has only two axes of symmetry, the sample is to be tested perpendicular to each axis.	不起火，不爆炸 No fire, No explosion

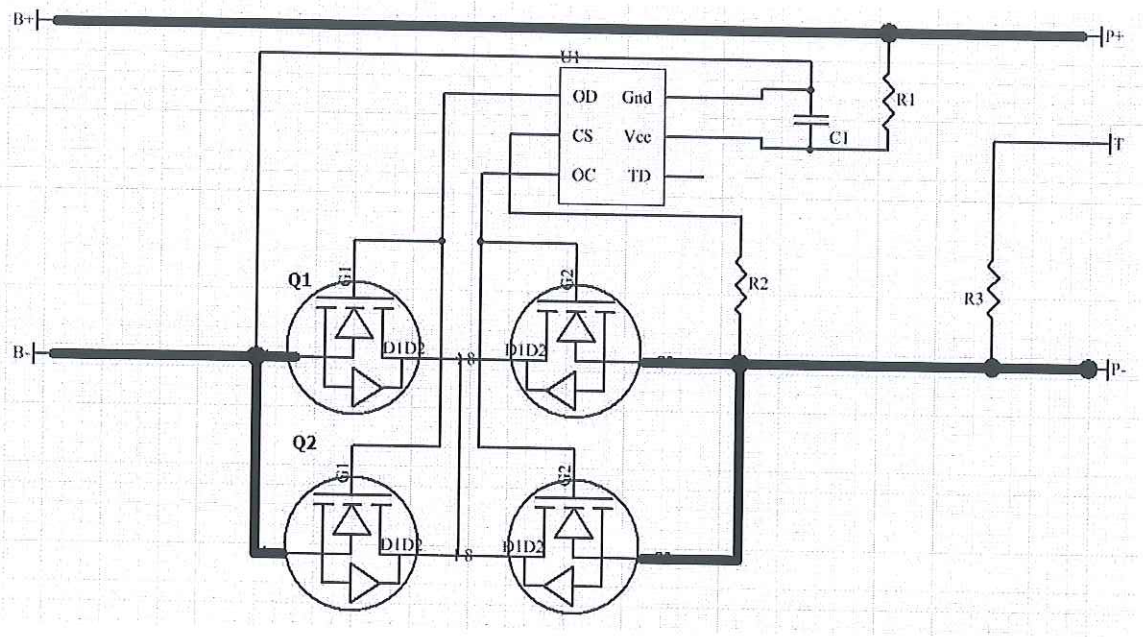
5.6	挤压测试 Crush Test	在标准测试环境下，标准充饱电后，。将电芯放置在两个平行板中间进行挤压。压力通过液压油缸或其它的机械装置实现，平行板表面与电芯的宽面接触，逐渐加压至13 ±1kN (3000 ±224 lbs)，然后释压，25±2℃下静置观察1h。 At standard testing condition, after standard charging, Then the cell is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar force mechanism. The flat surfaces are to be brought in contact with the cells 'wide sides and the crushing is to be continued until an applied force of 13±1kN (3000 ±224 lbs) is reached. Once the maximum force has been obtained it is to be released, then rest for 1 hrs at 25±2℃.	不起火，不爆炸 No fire, No explosion

6. 保护板规格与特性 PCM Specification and Characteristics

6.1 保护板参数 PCM Electrical Characteristics

序号 NO.	项目 Item	Limit Values			单位 Unit
		Min	Typical	Max	
1	过充保护电压 Overcharge Protection voltage	4.260	4.280	4.30	V
2	过放保护电压 Over-discharge detection voltage	2.950	3.000	3.050	V
3	充电过流保护电流 Charge over-current detection current	/	/	/	A
4	放电过流保护电流 Discharge over-current detection current	6	/	12	A
5	过充保护延迟时间 Overcharge detection delay time	0.7	/	1.3	S
6	过放保护延迟时间 Over-discharge detection delay time	179.2	256.0	332.8	mS
7	短路保护延迟时间 Short detection delay time	196	280	364	uS
8	自耗电流 Current consumption	/	1.5	7.0	uA
9	0V 充电 0VBattery charge function	允许 Available			

6.2 保护板原理图 PCM Schematic Diagram



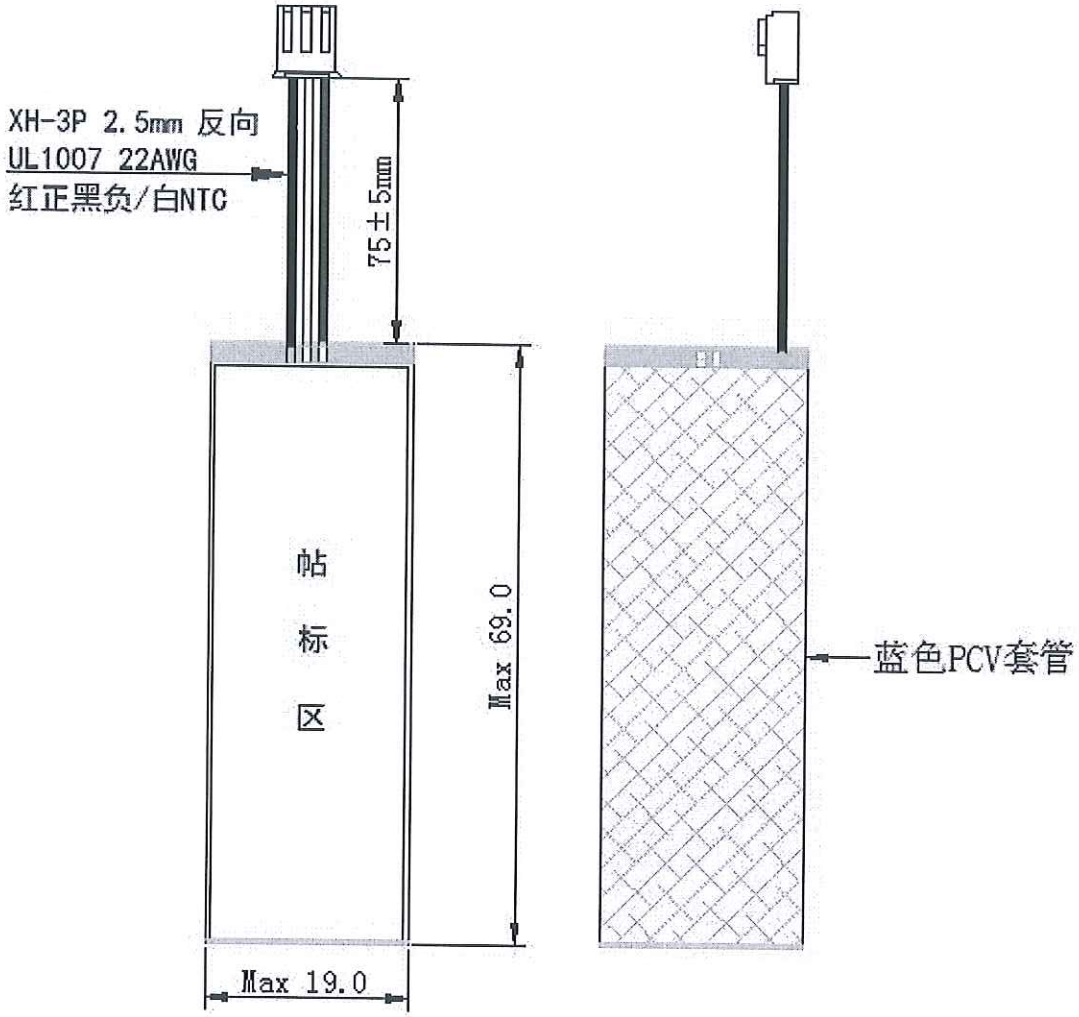
6.3 保护板元器件清单 Bill of PCM

序号 NO.	元件编号 Symbol	元件名称 Material Name	元件规格 Material Specification	封装 Package	数量 Qty	厂商 Manufacturer
1	U1	I C	S-8261DAI-M6T1U	SOT-23-6	1	精工
2	Q1,Q2	MOSFET	DP8205A	TSS0P-8	2	德普微
3	R1	电 阻	330Ω/±5%	0603	1	国巨
4	R2	电 阻	470Ω/±5%	0402	1	国巨
5	C1	电 容	0.1μF/+80%-20%/Y5V /16V	0402	1	国巨
6	R3	NTC	10K ±1% B=3435	0402	1	卓英社
7	PCB	印制电路板	Φ17.5*0.8mm，喷锡，绿油		1	/
8	B+、B-	镀镍钢片	3*3*0.3mm/镀镍		2	/

7. 电池主要物料 Battery Materials

序号 NO.	物料名称 Material Name	规格型号 Specifications	单位 Unit	数量 Qty	备注 Remark
1	电芯 Cell	18650-2200mAh	PCS	1	(Jiangsu Tenpower)
2	保护板 PCM	DR-MT-BFNφ17.5-1S-C-V1	PCS	1	
3	导线 Wire	XH Pitch:2.54mm UL1007 22AWG,	PCS	1	
4	标贴 Label	银底黑字 50*30mm	PCS	1	

8. 电池尺寸结构 Battery Dimension (Unit: mm)



9. 喷码或标签 Coding/Label

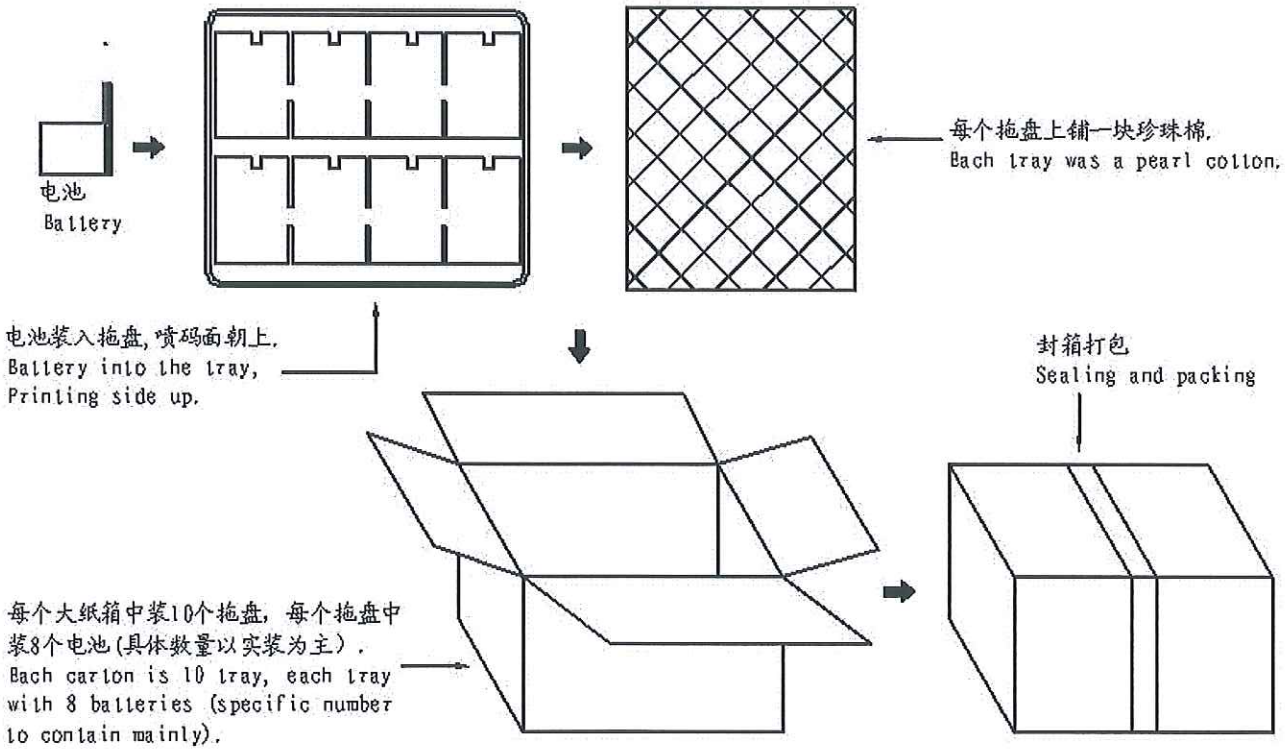
SIZE:50*30mm

要求：50# 肖银龙,银底黑字/覆亚膜

10. 包装说明 Packing Instruction

包装的图形、尺寸、颜色应符合 GP/T 191-2000 的要求

The photo, size and color of the mark are all comply with the requirement of GP/T 191-2000.



11. 安全警示 Safety warning

危 险

Danger

为了防止电池泄漏、发热、爆炸，请遵守以下防范事项：

In order to prevent battery leakage, explosion, fever, please observe the following precautions:

1.请不要将电池浸入水或海水中，注意防潮。
Please don't put the battery into water or seawater, pay attention to moisture.

2.请不要将电池接近热源，如火或发热器。
Please do not use the battery near the heat source, fire or heater.

3.在充电时，请用特定的充电器。
When charging, please use the charger.

4.请不要颠倒电池的正（+）负（-）极。
Please don't reverse battery positive (+) and negative (-) polar.

5.请不要将电池连接在电源的出口、车辆自动点灯处。
Please do not use the battery connected to the power outlet, automatic vehicle lighting.

6.请不要将电池弃置于火里或热的物体上。
Please do not use the battery disposal at the fire or heat objects.

7.请不要将电池的正（+）负（-）极用导体短路、不要把电池和金属导体，如项链、发夹等一起运输或存储。
Please do not use the battery positive (+) and negative (-) polar conductor short-circuit, don't put the battery and metal conductor, such as necklaces, hair clips, together with the transport or storage.

8.请不要敲打或丢抛电池。
Please don't knock or throw battery.

9.请不要用针或其它锋利物刺穿电池
Do not penetrate the battery with a nail or other sharp object.

10.请不要直接焊接电池。
Please do not direct welding battery.

11.电池内有安全装置，为了保证其固有的安全功能，请不要将电池分解开或改变任何的部份。
A safety device in the battery, in order to guarantee the safety of its inherent function of the battery, please don't break down or alter any part.

12.请不要在接近火源或在酷热的环境中充电。
Please don't close to the fire or charging in hot environments.

13.废弃之电池应用绝缘纸包住电极，以防起火、爆炸。
Waste battery application of insulation paper wrap electrode, in case of fire, explosion.

14.如电池泄露，电解液进入眼睛，请不要揉擦，用清水冲洗眼睛，立即送医治疗，否则会伤害眼睛。
If the battery electrolyte leakage, into the eyes, do not rub the eyes, rinse with water, immediately to the hospital, otherwise it will damage the eyes.

15.请不要将电池放于高温处(如阳光直射或热天下汽车里)，否则会导致电池过热着火，性能降低和寿命缩短。
Please do not put the battery in high temperature (such as direct sunlight or heat the car), otherwise cause the battery overheating can fire, reduced performance and life.

注意事项
Caution

1.为确保安全，电池应安装安全装置，在静电强于制造时所要求的静电时请勿使用，否则，安全装置会失效，导致电池过热、破裂、爆炸及着火。
To ensure safety, the battery must be provided with safety devices, use, do not in the static

electricity is stronger than manufacturing required otherwise, safety device failure, leading to overheating of the battery, rupture, explosion and fire.

2.如果儿童使用电池，应指定他们按使用说明书进行使用，且保证电池在任何时候都必须是正常使用。

If you use the battery for children, should designate them according to the instructions for use, and ensure the battery at any time must be normal use.

3.若电池泄露，电解质粘于皮肤或衣服上，请用水冲洗掉或用流水洗衣服，否则将会腐蚀皮肤。

If the battery electrolyte leakage, stick to the skin or clothes, please wash with water or use water to wash clothes, otherwise it will corrode the skin Die.

4.为了不装错或损耗电池，请认真阅读使用说明书，并按照指导进行安装与拆卸(从装置上)。

In order not to install the wrong or loss of the battery, please carefully read the instruction manual, and installation and disassembly (in accordance with the guidance from the device).

5.若电池不长期使用，请把电池拿出并放于干燥的地方，否则电器将会被腐蚀电池降低性能和减少寿命。

If the battery is not used for a long time, please take the batteries out and placed in a dry place, or the appliance will be corroded battery performance and reduce life expectancy.

6.若被污染了电池终端，请在使用之前用干布擦干净，否则将导致与装置接触不良，功率不足或充电失败。

If the contaminated the battery terminals before use, please clean with a dry cloth, otherwise it will result in poor contact with the device, power shortage or charger failure.

7.如果规格书、原材料、生产过程或生产控制系统发生改变，改变的信息将会随质量和可靠性数据以书面形式通知消费者。

If the specification, raw materials, production processor production control system to change, to change the information will be increased with the quality and reliability of the data written notice to the consumer.

8.保质期 Period of Warranty

电池的保质期从出货之日算起为一年。如果证明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。

The shelf life of the battery is one year from the date of shipment. If it is proved that the defect of the battery was formed in the manufacturing process and not caused by the user's abuse and wrong use, the company shall be responsible for the return and replacement of the battery.

9.产品责任 Product liability

您必须严格遵守广东永邦新能源股份有限公司规格书和文件后面的注释使用电池，由于误用会引起电池过热，发生火灾或爆炸。对于没有按照规格书进行操作所造成的任何以外事故，广东永邦新能源有股份限公司不负担任何责任。

You must obey the following Guangdong YungBang New Energy Co.,Ltd. specification and file comments using the battery, due to misuse and will cause the battery overheating, fire or explosion. For not caused by the operation of any accident in accordance with the specification, Guangdong YungBang New Energy Co.,Ltd. is not responsible.