锂离子可充电电池产品技术规格书

Li-ion Battery Product Specification

型号/Model： HCB9350116

Doc. NO.: HCB-WI-PS-07-122
Rev.: A/0

修订记录
Revision Record

Revision Date 日期	Brief Content of Revision 修订原因	Version No. 版本号	Prepared by 修订人	Checked by 核实人	Approved By 批准人
2025.04.09	新发布 New Release	A/0	Xue Liu	Qi Sheng	Honglin Ruan

客户会签 Customer' signature:

01 范围 Definition

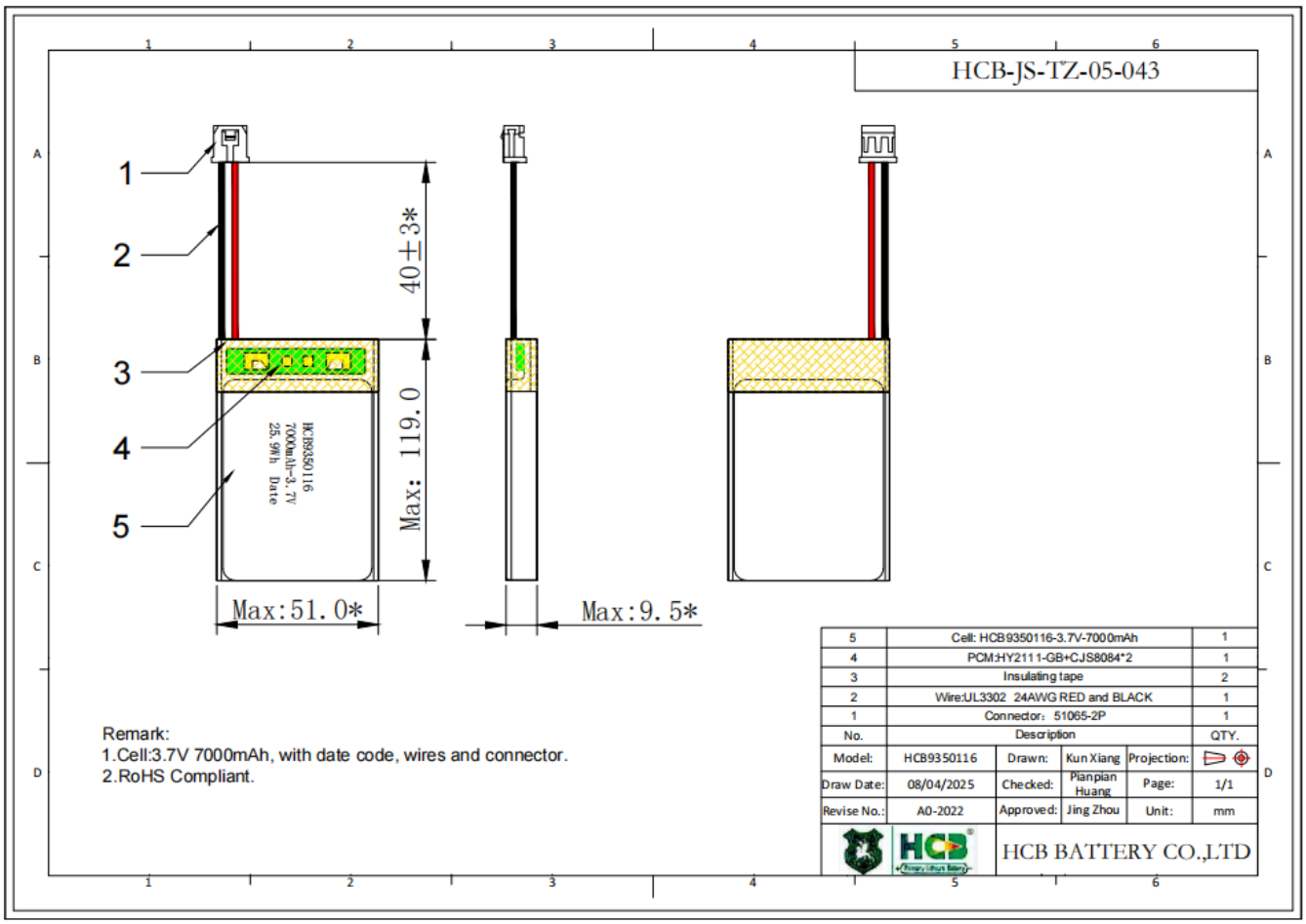
本产品规格书适用于武汉昊诚锂电科技股份有限公司生产的 HCB9350116 7000mAh 锂离子可充电电池，规定产品的性能指标、检测方法以及使用安全注意事项等。

This specification is applicable to HCB9350116 Li-ion Battery produced by HCB Battery Co., Ltd, which describes the performance, test method and safety usage of battery.

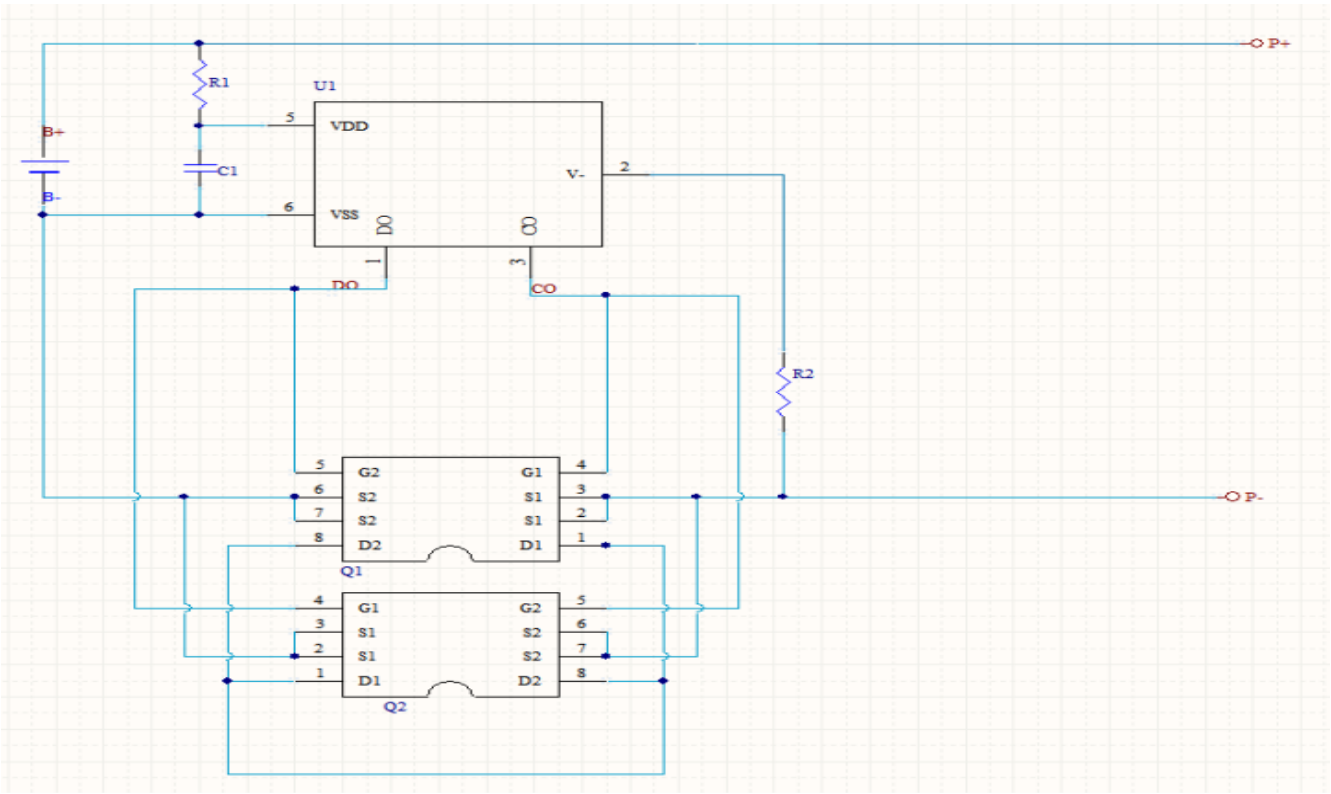
02 基本特性 basic characteristics（Table 1）

NO.	项目Item	参数 Data	条件备注Condition Notes
2.1	标称容量Nominal capacity	7000mAh	25±3℃，1400mA恒流放电至 2.9V At 25±3℃, battery discharged at constant 1400mA current until voltage reaches 2.9V.
2.2	最小容量Minimum capacity	6800mAh	
2.3	标称电压Nominal voltage	3.7V	/
2.4	标准充电方式 Standard charge mode	恒流 Constant current	1400mA恒流充电 Battery charged at constant 1400mA current.
2.5	标准充电截止方式 Standard charging cut-off mode	恒压 Constant voltage	截止电流为140mA Cut-off current is 140mA
2.6	充电电流 Charge current	标准 Standard 1400mA 最大 Max 3500mA	@ 0℃～45℃ @ 0℃～45℃
2.7	最大充电电压Max. charge voltage	4.2V	/
2.8	放电截止电压Discharge cut-off voltage	2.9V	/
2.9	标准放电方式 Standard discharge mode	恒流 Constant current	1400mA恒流放电 Battery discharged at constant 1400mA current.
2.10	连续放电电流 Constant discharge current	标准 Standard 1400mA 最大 Max 3500mA	温度范围 -20℃～80℃ Temperature range at -20℃～80℃
2.11	循环寿命 Cycle lifes	≥500 Cycles	标准充电4.2V与放电2.9V方式下循环，保持率≥80% Cycle under standard charge-discharge 4.2V and discharge 2.9V capacity retention rate ≥80%
2.12	放电工作温度范围 Temperature range of discharge	-20℃～80℃	/
2.13	充电工作温度范围 Temperature range of charge	0℃～45℃	/
2.14	交流内阻 Cell AC Internal resistance	≤150mΩ	Internal resistance at RT @1kHz
2.15	储存温度 Storage temperature	10℃～25℃ 0℃～35℃ 0℃～45℃	储存1年以内 Storage within 1 year 储存6个月以内 Storage within 6 months 储存3个月以内 Storage within 3 months
2.16	储存湿度 Storage humidity	45%～85%	/

03 外观及尺寸 Appearance and Dimensions



04 电路图 Circuit Diagram



05 保护板规格 PCM Specification（Table 2）

保护IC：HY2111-GB

Protection IC:

参数值parameter value

常温25℃General temperature 25℃

项目item	最小值 Min.	典型值 Type value	最大值 Max.	单位 Unit
过充保护电压Over charge protection voltage	4.255	4.280	4.305	V
过充保护恢复电压Over charge release voltage	4.030	4.080	4.130	V
过放保护电压Over discharge protection voltage	2.820	2.900	2.980	V
过放保护恢复电压Over discharge release voltage	2.920	3.000	3.080	V
放电过流检测电压Over current detection voltage	0.125	0.15	0.175	V
放电过流保护电流Over current protection current	8.0	13.5	18.0	A
充电过流检测电压Over current detection voltage	-0.14	-0.1	-0.06	V
充电过流保护电流Over current protection current	3.5	9.0	13.0	A
过充保护延迟时间Over charge protection delay time	50	100	150	ms
过放保护延迟时间Over discharge protection delay time	10	25	40	ms
放电过流保护延迟时间Over current protection delay time	5	10	15	ms
充电过流保护延迟时间Over current protection delay time	7	12	17	ms
短路保护延迟时间Short protection delay time		500	700	us
正常状态下静态电流Current consumption (Operation)		3.00	6.00	uA
过放状态下静态电流Current consumption (Power down)			0.1	uA
导通内阻Impedance			65	mΩ
输入电压(B+与B-间)Input voltage(B+ to B-)	-0.3		8	V
0V电池充电功能0V battery charge function		允许Available		

06 环境与安全测试性能 Environmental & Safety Performance（Table 3）

NO.	项目Item	测试方法和条件Test method and conditions	性能标准Criteria
6.1	高低温循环 Temperature Cycling Test	被检电池在温度为72°C±2°C的环境中至少放置6h,然后在-40°C ±2°C的环境下至少放置6h。不同温度的转换时间不超过30min,进 行10个循环，然后在环境温度下至少放置24h。 The tested battery shall be placed at least 6h in the environment with the temperature of 72°C± 2°C, and then at least 6h in the environment with the temperature of -40°C±2°C. The conversion time of different temperatures shall not exceed 30min, conduct 10 cycles, and then place it at ambient temperature for at least	电池不爆炸、不起火、无泄漏，质量损 失率<0.1% No leakage, no rupture and no fire, mass loss <0.1%
6.2	高空模拟 Low Pressure Test	样品电池在绝对压力为11.6kPa,温度为23±2°C条件下贮存6h。 Sample batteries are to be stored for 6 hours at an absolute pressure of 11.6 kPa (1.68 psi) and a Temperature of 23°C±2°C.	电池不爆炸、不起火、无泄漏 No leakage, no
6.3	振动 Vibration Test	电池牢固地固定在振动台上，采用正弦波进行振动，以对数扫频的 方式在15min内从7Hz扫频到200Hz并返回到7Hz,振幅0.8mm。 按照X、Y、Z三轴的方向均做振动。 使用高低温循环后的电池进行此项试验。 The battery is firmly fixed on the shaking table, vibrates with sine wave, sweeps from 7Hz to 200Hz and returns to 7Hz within 15min in the form of logarithmic frequency sweep, with an amplitude of 0.8mm. Vibrate according to the directions of X, y and Z axes. The test is carried out with a battery after high and low temperature cycling.	电池不爆炸、不起火、无泄漏、不短路 No leakage, no rupture, and no fire, no short-circuit
6.4	冲击 Shock Test	用能支撑被检电池所有固定面的刚性支座将被测电池固定在检测 设备上，每只被检电池在三个相互垂直固定的方位上每个方位各经 受3次冲击，共计18次，冲击采用半正弦波形、峰值加速度150g、 脉冲持续时间6ms、每个半轴冲击次数3次。 The tested battery is fixed on the testing equipment with a rigid support that can support all fixed surfaces of the tested battery. Each tested battery is subjected to three shocks in three mutually perpendicular fixed directions, each direction for a total of 18 times. The shock adopts half sinusoidal waveform, peak acceleration of 150g, pulse duration of 6ms and impact times of each half axis for 3 times.	电池不爆炸、不起火、无泄漏、不短路 No leakage, no rupture, and no fire, no short-circuit

06 环境与安全测试性能 Environmental & Safety Performance（Table 3）

NO.	项目Item	测试方法和条件Test method and conditions	Criteria性能标准
6.5	挤压 Crush Test	在常温下，把电池平躺放在压力机的两平面钢板中间，在电池上施 加的压力，压力一旦达到13 ± 1 kN或电池形变达到50%即可释放 压力。 At room temperature, put the battery flat between the two planes of the press, apply a pressure of 13 ± 1 kN on the battery or has 50% changed of the battery size, and release the pressure once the pressure is reached.	电池不爆炸、不起火 No explosion, no fire
6.6	外部短路 Short circuit test	在被检单体电池的外壳温度稳定在55°C后，在此温度下用阻值小于 0.1Ω的导线将电池正负极短接。持续短路至电池外壳温度回落至 55°C后再短路1h以上，观察被检电池6h。 After the shell temperature of the tested single battery is stabilized at 55 °C, the positive and negative electrodes of the battery shall be short circuited with a wire with a resistance value less than 0.1Ω at this temperature. Short circuit continuously until the battery shell temperature drops to 55 °C, then short circuit for more than 1 h, and observe the tested battery for 6h.	电池不爆炸、不起 火、不过热 No explosion, no fire, no excessive temperature rise
6.7	强制放电 Forced discharge	将已放完电的样品电池与同一型号的3只新电池串联，用阻值为 80±20mΩ的导线将电池正负极短接，直至电池起火、爆炸、漏液， 或直至电池完全放电至0.2V以下，并且壳体温度重新降至环境温度±10℃。A fully discharged cell is to be force-discharged by connecting it in series with 3 fully charged cells of the same kind. The positive and negative terminals of the sample are to be connected with a resistance load of 80±20 mΩ. The sample is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2 V and the battery case temperature has returned to ±	电池不爆炸、不起火 No explosion, no fire

07 环保Environmental Protection

◆ 该产品不含一级环境管理物质。

This product does not contain Class I environmental management substances.

08 储存条件 Storage Warning

◆ 电池应在远离静电的场所使用和储存。

Battery should store and used away from static electricity.

◆ 电池长期储存（超过3个月）应保存在 10℃～25℃、湿度 45%～85%的环境中。

If battery is stored for a long time (more than 3 months), it should be stored in an environment with a temperature of 10 ℃ to 25 ℃ and a humidity of 45% to 85%.

◆ 长期储存（超过3个月）应每三个月对电池进行一次充电。

If battery is stored for a long time (more than 3 months), it should be charged every three months.

◆ 电池储存时要远离热源，也不能置于阳光直射的地方，保证清洁、凉爽、干燥、通风，并不受气候影响。

Battery should be stored away from source of heat and avoid direct sunlight.

◆ 电池的堆放高度取决于包装强度，一般规定，纸质包装箱堆放高度不得超过1.5 米，木箱不超过3 米。

The pile of battery should not exceed 1.5 meters of paper packaging, and should not exceed 3 meters of wooden boxes.

◆ 电池以原包装存放和陈列电池，去掉包装后电池不能乱堆放，易引起电池短路和损坏。

09 电池操作注意事项 Handing of Cells

◆ 包装薄膜注意事项 Consideration of strength of film package

1) 铝塑膜软包装比较容易被锐利部件刺损，如针尖、镍带，所以不要用锐利的部件刻划电池。

Easily damaged by sharp edge parts such as pins and needles, Ni-tabs, so don't strike by those sharp parts.

2) 封边被加热到100℃以上和对齐进行弯折都容易使封边受损。

Sealed edge may be damaged by heat above 100℃, bend or fold sealed edge.

◆ 机械撞击 Mechanical shock

软包电池比金属外壳电池的机械耐久性小，跌落、碰撞、弯曲等可能会降低软包电池的性能。

Soft aluminium foil cells have less mechanical endurance than metal-can-cased cells, falling, hitting, bending, etc. may cause degradation of soft aluminium foil cells characteristics.

◆ 极耳操作注意事项 Handing of tabs

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耳。

The battery tabs are not so stubborn especially for aluminum tab. Don't bend tab. Do not bend tabs unnecessarily.

◆ 外壳坚韧度 Pack toughness

电池外壳应有足够的机械强度使电池免受机械撞击。

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

◆ 电池的固定 Cell fixing

电池最大面积的一面应固定在外壳上，安装后电池不能有松动，外壳内安装电池的部位不应有锋锐边。

The cell should be fixed to the battery pack by its large surface area. No cell movement in the battery pack should be allowed. No sharp edge components should be insides the pack containing the cell.

◆ 极片连接 Tab connection

如果使用人工焊接保护板，下面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) 焊接时烙铁温度不能超过350℃；

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℃会损害电芯。

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℃;

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℃.

10 运输条件 Transportation Warning

◆ 电池在运输过程中，应避免日晒、火烤、雨淋、水浸及与腐蚀性物质放在一起。

Avoid direct sunlight, heat, rain, water, and corrosive substance during transportation.

◆ 运输和装卸中的冲击、震动应限制在最小程度。

Reduce shock and crush during transportation and load & unload process.

◆ 对于纸质的包装箱堆放高度不得超过 1.5 米。

Pile up carton height no more than 1.5 meters.

◆ 电池长途运输时，如是船运，应放在远离发动机的地方；夏季不应该长期滞留在不通风的环境内。

For long term transportation such as sea shipment, store battery away from engine.

◆ 电池需取得相关认证证书方可在特定区域运输或销售，这些认证至少需要包括 UN38.3、电池指令。

Batteries can be transported or sold in specific areas only after obtaining relevant certification.

11 注意 Note

◆ 不要对电池强制放电，可能会导致性能衰减或内阻升高。

Do not force the battery to discharge, which may cause performance degradation or internal resistance increase.

◆ 对电池进行串并联应与我司联系。

Contact our company for series-parallel connection of batteries.

◆ 当发现电池漏液或散发出难闻的气味时立即远离。如果电解液渗透到皮肤或衣服上，立刻用清水清洗。如果电解液渗出并进入你的眼睛里，不要揉擦你的眼睛，立刻用干净的水清洗并去医院检查。

Keep away from the battery immediately when it is found that the battery leaks or emits an unpleasant smell. If the electrolyte penetrates into the skin or clothes, wash immediately with clean water. If the electrolyte seeps out and enters your eyes, do not rub your eyes, immediately wash them with clean water and go to the hospital for examination.

12 安全须知 Safety Warning

◆ 在使用之前请详细阅读本规格书。该产品所使用材料均为无污染的材料，采用独特的技术生产而成；安全方面也有保障性设计，但在产品的装卸和使用过程中应遵守以下几点防患措施：

Please read this specification carefully before use. The materials used in this product are pollution-free materials, using unique technology to produce; There are also safeguards for safety. In the process of loading, unloading, and using products, the following preventive measures should also be observed:

◆ 严禁将本产品正负极直接短路。

It is strictly forbidden to directly short circuit the positive and negative poles of this product.

◆ 严禁正负极反接。

It is strictly forbidden to connect the positive and negative poles.

◆ 严禁过放电、挤压、刺穿、分解和焚烧电池，并不得加温超过 100℃；不能焚烧或放入水中。

Do not crush, puncture, decompose and burn the battery, and shall not be heated more than 100℃, do not put the battery into water.

◆ 充电超过过充电压，可能会导致爆炸或安全阀开启泄压。

Charging beyond the overcharge voltage may result in an explosion or relief from the opening of the safety valve.

◆ 不要在允许温度范围（-20℃~60℃）之外的环境中使用本产品。

Do not use this product outside the allowable temperature range (- 20 ℃~60 ℃).

◆ 不要将不同生产商生产的产品及电池组装在一起。

Do not assemble products and batteries from different manufacturers.

◆ 不要使用带有严重伤痕或变形的产品。

Do not use products with serious scars or deformation.

◆ 本产品使用至寿命结束时应深埋于地下或交专业危废厂家做无害化处理。

The product shall be handed over to professional hazardous waste manufacturers for harmless treatment at the end of its service life.

13 重要提示 Important

◆ 电池保证符合规格书中所涵盖的内容，客户（设备制造商或者经销商）任何要求必须在此时期内提出。在此保证期内，如果电池被证明是有缺陷的，HCB 将会及时提供无缺陷合格的电池。

The battery is guaranteed to comply with the contents covered in the data sheet, and any request from the customer (equipment manufacturer or distributor) must be made within this period. During this warranty period, if the battery proves to be defective, HCB will promptly provide a defect-free qualified battery.

◆ 在实际应用中，客户有责任确认和保证电池与装置的匹配性和可靠性。

In practical applications, it is the customer's responsibility to confirm and ensure the matching and reliability of the battery and the device.

◆ 在以下情况下，HCB 将不承担任何责任：客户未能适当处理、操作、安装、测试、维护、检测电池，或者未能遵循本规格书提供的指示、注意事项、注释，以及HCB 其他的说明和建议。

HCB will not be liable if the customer fails to properly handle, operate, install, test, maintain, test the battery, or fails to follow the instructions, precautions, notes, and other instructions and recommendations provided in this specification.

◆ 此规格书从发行 6 个月内未被退还，则认为已被客户所接受，即可生效。

If this specification is not returned within 6 months from the issuance, it is deemed to have been accepted by the customer and will become effective.

14 产品责任书 Product Liability

◆ 在使用电池之前，必须严格遵照本规格书进行操作，高于环境温度的使用可能会导致使用寿命的减少。

Before using the battery, it must be operated in strict accordance with this data sheet and use above ambient temperature may result in a reduction in service life.

◆ 误用将会引起电池出现发热、爆炸，而造成人体伤害或者财产损失。

Incorrect use will cause heat and explosion of the battery, resulting in personal injury or property damage.

◆ 对于没有按照产品规格书进行操作而造成的任何意外事故，武汉昊诚锂电科技股份有限公司将不承担任何责任。

HCB Battery Co, Ltd will not be liable for any accidents caused by failure to operate in accordance with the product specifications.

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