

锂离子可充电电池

Rechargeable Polymer Lithium Ion Battery

产 品 规 格 书

PRODUCT SPECIFICATION

型号 Model: 14500 (1000mAh) 5C

客户名称 Customer Name: _____

编制 Prepared/日期 Date	审核 Checked/日期 Date	批准 Approved/日期 Date
客户承认 Customer Approval	审查 Checked/日期 Date	批准 Approved/日期 Date

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1、适应范围 Scope

本规格书适用于 XING Solutions 生产的锂离子电池。

This specification is applied to Lithium Ion Battery manufactured by Shenzhen XING Solutions Technology Co., LTD.

2、产品类型 Description and Model

2.1 产品名称 Cell description: 锂离子可充电电池 Polymer Lithium Ion Battery

2.2 型号规格 Model specification: 14500 (1000mAh) 5C

3、产品机械性能 Cell mechanical character

3.1 外观尺寸 Outer dimension

项目 Item	H （高度）平头 Height Flat top	H （高度）尖头 Height High top	厚度 Thickness
尺寸 Dimension	H 49.5 ± 0.2mm	H 50.5 ± 0.2mm	Φ 14.2 ± 0.2mm

3.2 外观 Appearance

电池表面无破损、划痕、油污、漏液等缺陷。

Cell surface without damage, scratches, oil, leakage and other defects.

4、产品基本参数 Cell Basic Information

除另有规定外，正常测试在温度 25±5℃ 及湿度≤90%RH 下进行：

Unless otherwise specified, the normal test at temperature of 25 ±5 °C and humidity ≤90% RH:

序号 Number	项目 Item	额定参数 Rating	备注 Note
1	容量 Capacity	典型容量 Typical capacity: 1000mAh	0.2C 标准放电 0.2C Standard Discharge
		最小容量 Minimal capacity: 980mAh	
2	工作电压 Operating Voltage	3.6V	
3	充电限制电压 Charging Limit Voltage	4.20±0.03V	
4	充电截止电流 Charging Cut-off Current	20mA	
5	放电截止电压 Discharge Cut-off Voltage	2.5V	
6	标准充电 Standard Charge	0.2C(200mA)	工作温度/operating Temperature: -20~60℃
7	标准放电 Standard Discharge	0.2C(200mA)	恒流放电至终止电压 Constant current discharge to the cut-off voltage
8	最大持续充电电流 Maximum charge Continue Current	1C(1000mA)	工作温度/operating Temperature: -10~60℃
9	最大放电电流 Maximum Discharge Current	5C(5000mA)	工作温度/operating Temperature: 0~60℃

10	电芯内阻 Resistance	$\leq 40\text{m}\Omega$	4.2V, AC 1KHz 条件下测试 Nominal Internal Impedance measured at 1KHz after standard charge
11	储存温度和湿度范围 Storage Temperature And Humidity	≤ 1 个月 less 1 month: $-20\sim 45^{\circ}\text{C}$ ≤ 3 个月 less 3 month: $-5\sim 40^{\circ}\text{C}$ ≤ 12 个月 less 12 month: $0\sim 30^{\circ}\text{C}$ $65\pm 20\% \text{ RH}$	电池应在 3.70~3.90V 的状态 下储存; The electric core should be stored in the state of 3.70~3.90V;
12	重量 Weight	About 19g	

5、电池性能 Cell Performance

序号 Number	项目 Item	标准 Standard	测试方法 Test Method
1	0.2C 容量 0.2C capacity	$\geq 300\text{min}$	电池标准充电后搁置 0.5h, 用 0.2 C 恒流放电至 2.5V, 记录电池放电时间。 The "Standard Charge" means charging the Cell at a constant current of 0.2C until the voltage is 4.2V, then charged at a constant voltage of 4.2V until its current is less 0.02C ,then stored in 0.5h, finally discharged to cut-off voltage at a constant current of 0.2C
2	0.5C 容量 0.5C capacity	$\geq 110\text{min}$	电池标准充电后搁置 0.5h, 用 0.5C 恒流放电至 2.5V, 记录电池放电时间。 The "Standard Charge" means charging the Cell at a constant current of 0.2C until the voltage is 4.2V, then stored in 0.5h, finally discharged to cut-off voltage at a constant current of 0.5C, recording the discharge time
3	1C 容量 1C capacity	$\geq 55\text{min}$	电池标准充电后搁置 0.5h, 用 1C5A 恒流放电至 2.5V, 记录电池放电时间。 The "Standard Charge" means charging the Cell at a constant current of 0.2 C until the voltage is 4.2V, then stored in 0.5h, finally discharged to cut-off voltage at a constant current of 1C, recording the discharge time
4	5C 容量 5C capacity	$\geq 8\text{min}$	电池标准充电后搁置 0.5h, 用 5C5A 恒流放电至 2.5V, 记录电池放电时间。 The "Standard Charge" means charging the Cell at a constant current of 0.2 C until the voltage is 4.2V, then stored in 0.5h, finally discharged to cut-off voltage at a

			constant current of 5C, recording the discharge time														
5	0.5C 循环寿命 0.5C Cycle Life	300 次容量保持率≥80% After 300 times cycle capacity	用0.5 C恒流充电至4.2V, 4.2V 恒压充电至截止电流≤0.02 C, 静置5min 后, 用0.5 C恒流放电至2.5V, 静置5min。重复上述步骤, 记录电池放电容量。 Charging the Cell at a constant current of 0.5 C until the voltage is 4.2V, then charged at a constant voltage of 4.2V until its current is less 0.02 C, then stored for 5min, then discharged to cut-off voltage, after that, stored 5 min, recording the discharge time, prior to next charge-discharge cycle.														
6	荷电 保持能力 Retention	剩余容量≥85% Remaining capacity ≥85%	将充满电后的电池在温度25±3℃环境下存储28 天, 按照标准的测试容量方法测试剩余容量。 When the battery has completed standard charged, it shall be disconnected and put aside for 28 Days at 25℃ ±3℃, Then measured capacity with 0.2C min till FD Voltage.														
7	不同容量温 度特性 Temperature Dependency ofCapacity	电池在 23℃ ± 2℃ 按0.2C 要求充电, 再按 0.2C 电流在以下温度下放电 Cells shall be charged per 0.2C at 23 ℃ ± 2 ℃ and discharged per 0.2C at the following temperatures	<table><tr><td>充电 Charged</td><td>放电 Discharge</td><td>容量 Capacity</td></tr><tr><td rowspan="4">25±3℃</td><td>-20℃</td><td>≥70%Cmin</td></tr><tr><td>0℃</td><td>≥80%Cmin</td></tr><tr><td>25℃</td><td>≥100%Cmin</td></tr><tr><td>60℃</td><td>≥95%Cmin</td></tr></table>			充电 Charged	放电 Discharge	容量 Capacity	25±3℃	-20℃	≥70%Cmin	0℃	≥80%Cmin	25℃	≥100%Cmin	60℃	≥95%Cmin
充电 Charged	放电 Discharge	容量 Capacity															
25±3℃	-20℃	≥70%Cmin															
	0℃	≥80%Cmin															
	25℃	≥100%Cmin															
	60℃	≥95%Cmin															

6、可靠性测试 Reliability Test

序号 Number	项目 Item	标准 Standard	测试方法 Test Method
1	高温性能 High Temperature Performance	$\geq 300\text{min}$	电池标准充电后在 55°C 环境下搁置 2~4h, 用 0.2C 放电至截止电压 2.5V, 记录电池放电时间。且电池外观无变形、冒烟。 After the standard charge, and stored in an ambient temperature of 55°C for 2~4h, then discharged to cut-off voltage at a constant current of 0.2C, recording the discharge time. the battery should no deformation and smoking.

2	低温性能 Low Temperature Performance	$\geq 180\text{min}$	电池标准充电后在-10°C环境下搁置 16~24h,用 0.2C 放电至截止电压 2.5V, 记录电池放电时间。电池外观无变形、冒烟。 After the standard charge, and stored in an ambient temperature of -10°C for 16~24h, then discharged to cut-off voltage at a constant current of 0.2C, recording the discharge time. the battery should no deformation and smoking.
3	恒定湿热 Constant Temperature And Humidity	1、不变形、不胀气、不冒烟或爆炸 2、放电时间不少于 270min。 1. no distortion, no rust, no fire, no explosion; 2. the discharging time is not less than 270min.	电池标准充电后在 $55 \pm 2^{\circ}\text{C}$, 相对湿度 $93 \pm 2\%$ 环境中放置 48h, 用 0.2C 放电至截止电压 2.5V, 记录电池放电时间。 After the standard charge, and stored in an ambient temperature of $55 \pm 2^{\circ}\text{C}$ ($90 \sim 95\% \text{RH}$) for 48h, then placed in room temperature for 2h. After that, check its appearance prior to being discharged to cut-off voltage at a constant current of 0.2C, recording the discharge time
4	机械振动 Vibration Test	不漏液、冒烟或爆炸, no leakage, no smoke, no explosion	电池标准充电后固定在振动台上, 以X, Y, Z 三个方向从 10Hz~55Hz 循环振动各30min, 扫描速率为 1oct/min; 振动频率: 10Hz~30Hz; 移位振幅/单振幅: 0.38mm; 振动频率: 30Hz~55Hz; 移位振幅/单振幅: 0.19mm。 After the standard charge, then installed onto the vibration desk with clamps. Equipment parameters of frequency and amplitude are as follows (the frequency is to be varied at the rate of 1oct/min between 10 and 55 hertz, and repeat vibration for 30min. The cell is to be tested in three mutually perpendicular directions): frequency:10Hz~30Hz amplitude: 0.38mm frequency:30Hz~55Hz amplitude: 0.19mm
5	机械碰撞 Shock Test	不漏液、冒烟或爆炸, no leakage, no smoke, no explosion	电池平均按X, Y, Z 三个互相垂直轴向固定在台面上。脉冲峰值加速度: 100m/s^2; 每分钟碰撞次数: 40~80; 脉冲持续时间16ms; 碰撞次数1000 ± 10。 The shocks are to be applied in each of three mutually perpendicular directions. The acceleration and impulse time are as follows: acceleration of impulse peak value: 100m/s^2, shock frequency: 40~80times/min, impulse lasting time:16ms, shock times: 1000 ± 10

6	跌落测试 Drop test	无爆炸、无起火、无漏液 No explosion, No Fire, No leakage	将电池按到标准充满电，然后从1 米跌落混凝土板上（圆形跌落4 次，方形6 个面），试验后按照标准充放电继续进行一次放电充电循环。 Fully charge the battery according to the standard, and then drop the battery from 1.0 meters on the concrete plate (circular drop 4 times, square 6 sides), after the test according to the standard charge and discharge to continue a discharge charging cycle.
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7、安全性能 Safety Performance

1	过充电 Over charge	不爆炸、不着火 No explosion, no fire	电池应在1.5C 恒流充电直到电压为4.6V，当电流接近0 或电池温度下降到比峰值低10℃时终止试验。 Charged the cell up to 4.6V at CC of 1.5C until the voltage is 4.6V, stop the test ,when the surface temperature of the cell decays to about 10 °C from the maximum or the currents decays to the 0mA.
2	过放电 Over discharge	不爆炸、不着火 No explosion, no fire	将电池放电至 2.5V,再用 30 Ω 的电阻将正负极连接 24 小时。Discharge the battery to the 2.5V, and then 24 with a 30 ohm resistor.
3	热冲击 Heating Test	不爆炸、不着火 No explosion, no fire	将电池放入烘箱中，烘箱自室温起以 $5 \pm 1^{\circ}\text{C}/\text{min}$ 的速率升至 $130 \pm 2^{\circ}\text{C}$ ，保持 30min。 A cell is to be heated in a circulating air oven. The temperature of the oven is to be raised at a rate of $5^{\circ}\text{C} \pm 1^{\circ}\text{C}$ per minute to a temperature of $130^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and remain for 30min at that temperature before the test is discontinued.
4	外部短路 Short-circuit test	不爆炸、不着火 No explosion, no fire	用电阻值小于 $80\text{m}\Omega$ 的导线将电池的正负极连接，当温度下降到比峰值低约 10°C 结束。 A Cell is to be short-circuited by connecting the positive and negative terminals of the cell with copper wire having a maximum resistance load of $80\text{m}\Omega$, Monitor its temperature while testing, the cell is to be discharged until the cell case temperature has returned to be 10°C less then peak temperature.

5	挤压测试 Crush test	不爆炸、不着火 No explosion, no fire	电池按标准充电条件充满电，放置在两块平面金属板间，持续施加 13kN（17.2Mpa）的压力，直到液压油缸施加的压力达到 13kN（17.2Mpa）时停止。 After standard charging, crush the cell between two flat plates with continuous force of 13kN (17.2Mpa) Stop until a pressure reading of 17.2Mpa is reached on the hydraulic ram.
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8、保质期 Period of Warranty

保质期为出厂后12个月内。

The period of warranty is 12 months from the date of shipment.

9、产品责任书 Product Liability

您必须严格遵守XING Solutions规格书和文件后面的注释使用电池。

You must strictly comply Shenzhen XING Solutions Technology Co., LTD specifications and annotation of documents when use the battery, since misuse can cause the battery to overheat, fire or explosion, any accident caused by the operation of not following the specifications, Shenzhen XING Solutions Technology Co., LTD does not be responsible for any responsibility.

10、使用注意事项 Handling Instructions

10、技术和安全要求/Technical and safety requirements

10.1 充电charging

10.1.1 充电电流Charging Current

充电电流应小于产品说明书中所规定的最大充电电流；过高电流充电将有损于电池性能，严重影响电池的安全性，并可能使电池发热、泄漏。

Charging current should be less than maximum charge current specified in the Product Specification. Charging with higher current than recommended value may cause damage to cell performance and safety characteristics and could lead to heat generation or leakage.

10.1.2 充电电压Charging voltage

单体电池充电电压应小于产品说明书中所规定的充电电压4.2V；充电器应在 $\leq 4.25V$ 档使用；高压充电同样会对电池造成所述影响。

Charging shall be done by voltage less than that specified in the Product Specification (4.2V/cell). Charging beyond 4.25V.It is very dangerous that charging with higher voltage than specified value may cause damage to cell performance and safety characteristics and could lead to heat generation or leakage.

10.1.3 充电温度Charging temperature.

电池充电应在产品说明书所规定的温度范围内充电。

The cell shall be charged within the specified temperature range in the Product Specification.

10.1.4 禁止反充电Do not reverse the positive(+) and negative(-) terminals.

请确认电极连接正确后再充电；如果反接电池，会使电池性能严重损坏，降低电池安全性，并使电池发热、泄漏。

Please make sure the positive(+) and negative(-) conforms with the charger. Reversing charge may cause damage to cell performance and safety characteristics and could lead to heat generation or leakage.

10.2 放电Discharging

10.2.1 放电电流Discharging current

电池放电电流应小于产品说明书中所规定的最大放电电流；高电流放电会使放电容量显著降低，且可能产生发热等现象。

The cell shall be discharged at less than the maximum discharge current specified in the Product Specification.

High discharging current may reduce the discharging capacity significantly or cause over-heat.

10.2.2 放电温度Discharging temperature.

电池应在产品说明书所规定的温度范围内放电使用。

The cell shall be discharged within the temperature range specified in the Product Specification.

10.2.3 过放电Over-discharging

长时间搁置的电池，需每隔六个月充一次电，将其电压维持在3.7~3.9V，以减少电池过放电的可能性。

It should be noted that the cell would be over-discharged state by its self-discharge characteristics in case the cell is not used for long time. In order to prevent over-discharging, the cell shall be charged periodically to maintain between 3.7V and 3.9V.

10.3 必要的保护线路PMC specifications

为确保安全，电池应配备保护模组来保护电池正常运行，充电器和保护线路必须符合以下项目要求。

For safety reasons, polymer lithium cells shall be used with PMC specified, and the charger and the PMC must be accorded with as followings.

10.3.1 从安全设计考虑，请连接温度保护开关。

With the consideration of safety design, please connected up the temperature protecting-switch;

10.3.2 标准充电方式为CC / CV （恒流/ 恒压）。

Use a constant current, constant voltage (CC/CV)

11.1 电池的连接/ Electrical connection

11.1.1 严禁在电池上直接焊接导线或连接其他用电器。

Is strictly prohibited in the electric core directly welded wire or other electrical appliances.

11.1.2 将导线焊上护头，再将导线护头点焊在电池上；直接焊接，产生热量会损坏电池组件

Will lead wire welding on the head, and then wire guard head spot welding on the electric core; direct welding, heat will damage the electric core component

11.2 超声波焊接Ultrasonic welding

11.2.1 不要将护头直接用超声波焊接在电池上，否则将可能对电池造成严重损坏。

Do not directly use ultrasonic welding on the electric core, otherwise it may cause serious damage to the battery.

11.2.2 超声波焊接使用于塑料间焊接，但尽量不要用于电池上的焊接，否则将可能对电池造成严重

损坏。

Ultrasonic welding used in plastic welding, but try not to be used for welding on the core, otherwise it will cause serious damage to the electric core.

11.3 电池内部短路的保护Protection of internal short circuit of electric core

电池块在组装时应尽量保证无内部短路；导线外裹塑料管在电池块组装时易被破坏，可能导致短路，因此在导线和电池间垫加足够的绝缘层可以对短路问题起双层保护作用。

The electric core block should be assembled with no internal short circuit; the wire wrapped in plastic tube is easy to be destroyed when the electric core block is assembled, and the insulation layer can be protected by the short circuit.

12、包装、储存及运输/Packaging, storage and transportation

12.1 电池的包装应干燥防潮、防尘、防震；

The cells should be stored at a dry moisture, dustproof, shockproof , core packaging.

12.2 电池应储存在清洁、干燥通风的环境中，应避免与腐蚀性物质接触，应远离火源及热源。

The cell shall be stored at a clear ,dry and ventilated room, should avoid contact with corrosive substances, should away form fire and heat.

12.3 电池在运输过程中应防止剧烈振动、冲击或挤压，防止日晒雨淋。

The Cell should avoid strenuous vibration, impact and pressure in the transport, and need avoiding the strong direct sunlight and under the raining

危险！Danger!

- 充电时请使用指定的充电器并按照说明书的要求进行充电。
- Please use the specified charger charging and charging in accordance with the requirements of the specification.
- 仅在指定的设备上使用电池。
- Use the battery only in the specified device.
- 不要把电池加热或投进火中。
- Do not heat the battery or thrown into the fire.
- 不要在火源附近或温度超过60°C的轿车中使用或遗留电池，也不要这些环境中进行充放电。
- Do not use or leave the battery near fire or cars that temperature exceeds 60 °C, and do not charge and discharge in these environments.
- 不要把电池投入水中，也不要弄湿。
- Do not put the battery into the water, and do not wet the battery.
- 不要把电池与项链、发夹、硬币或螺钉等金属品一起放在兜中或包中，也不要把电池同上述物品一起储存。
- Do not put the battery with necklaces, hairpins, coins, screws and other metal items together in pocket or bag, do not storage the battery together with these items.
- 不要使用金属导体短路电池的正负极。
- Do not short-circuit the battery positive and negative with metal conductor.
- 在装入设备时注意电池的正负极不要反装。
- Do not reversed positive and negative of battery when you load the device.
- 不要使用锐利的物品刺穿电池。

- Do not pierce battery with sharp objects.
- 不要对电池进行拆解。
- Do not weld the battery directly.
- 不要使用带有严重伤痕或变形的电池。
- Do not use a battery with serious scar or deformation.
- 在使用之前请详细阅读操作说明书，不适当的操作可能引起电池变热、着火、爆炸、毁坏或电池容量的衰减。
- Please read the operating instructions before using, improper operation may cause the battery to become hot, fire, explosion, damage or battery capacity decay.

警告！Warning!

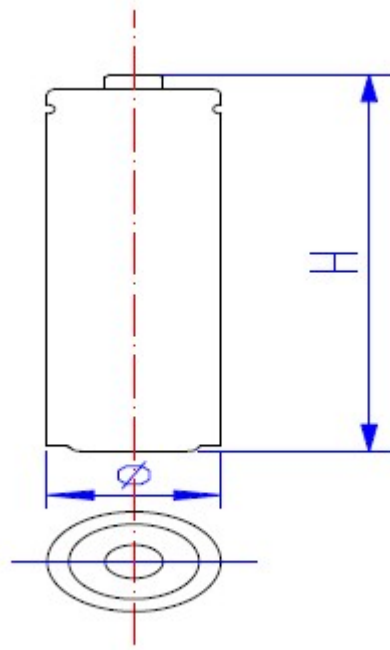
- 不要把电池放加热器皿、洗衣机或高压容器中。
- Do not put the battery in hot utensils, washer or high-pressure container.
- 不要把电池同干电池或其它原电池一起使用，也不要同不同包装、不同型号或不同品牌的电池一起使用。
- Do not use the battery with the dry battery or other primary battery, and do not use the battery with the battery of different packaging, different models or different brands.
- 如果在规定的充电时间内充电没有结束，停止充电。
- If the charge within the specified charging time is not over, should stop charging
- 在使用、充电或储存期间如发现电池变热、散发气味、变色、变形或其它反常之处停止使用。
- Stop using when using, charging or storing the batteries become hot, emitting odor, discoloration, deformation, or other unusual performance.
- 当发现电池漏液或散发出难闻的气味时立即远离。
- Go away immediately when the battery is leakage or emit unpleasant odors.
- 如果电解液渗漏到你的皮肤或衣服上，立刻用清水清洗。
- If the electrolyte leaks onto your skin or clothing, wash with water immediately.
- 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看医生。
- If electrolyte leakage and into your eyes, do not rub your eyes, wash with clean water and see your doctor immediately.

注意！Attention!

- 把电池放到小孩够不到的地方以免吞服。
- Put the batteries out of the reach of children to prevent swallowing.
- 小孩使用电池时，监护人应详细解释操作方法。
- When children using the battery, the guardian should explain the operation method in detail.
- 在使用电池之前，应详细阅读操作指南并对使用中的注意事项有足够深刻的理解。
- Before using the battery, we should carefully read the instructions and have sufficient understanding of matters.
- 在对电池充电之前仔细阅读操作指导指南。
- Read the instructions guide carefully before charging the battery.
- 在将电池装入设备或从设备中取出之前详细阅读设备操作手册。
- Read the operation manual in detail before inserting a battery in the device or removed from the device.
- 电池具有使用寿命，如果使用电池的设备的工作时间比平常少的多，要对电池进行更新。

- Battery has service life, if operating time of device with battery you are using is much less than usual, the battery should be updated.
- 电池寿命终止后要立刻从设备中取出。
- Remove battery immediately from the equipment after the termination of battery life.
- 当长期不用时，需将电池从设备中取出并放在低温低湿的环境中保存。
- When not used for long, remove the battery from the device and put a low temperature and low humidity environment for preservation
- 电池应在远离静电的场所进行充电、使用和储存。
- The battery should be charged, used and stored far from the electrostatic place.
- 如果电池的接线端变脏，在使用之前用干布擦净。
- If the battery terminals become dirty, wipe with a dry cloth before using.
- 电池在使用时的温度不能超出上面的要求。
- When using the battery, temperature cannot exceed the above requirements.

附件一：电池尺寸图 Appendix 1: Battery Dimensions Figure



Φ (厚度) Thickness	14.2 ± 0.2mm	H (高度) 平头 Height Flat top	H 49.5 ± 0.2mm	H (高度) 尖头 Height High top	H 50.5 ± 0.2mm
备注: Remarks:				单位 UNIT	mm