广东嘉尚新能源科技有限公司 GUANGDONG CVASUN NEW ENERGY TECHNOLOGY CO.,LTD	DOC NO.:PS-103450-01
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Polymer Li-ion Cell Specification

聚合物锂离子电芯规格书

Model/型号:103450-2000mAh

Draft 拟定	Checked 审核	Approval 批准

Customer Name/Part Number 客户名称/料号	
Customer Approval 客户确认/盖章	
Date/日期	

Note（注意）:

1.Kindly please sign specification back to us, if the sample has been approved.

如果样品已确认，请回签规格书给我司。

2.Kindly please contact us as soon as possible if the sample has not been approved. Thanks!

如果样品未确认，请尽快与我司联系，谢谢！

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History of specification
规格书修订记录

Date	Contents	Remarks
2023-06-05	New Release	A0

Contents 目录

1.Scope 适用范围---------- 4

2.Product Specification 产品规格---------- 4

3. Product Performance 产品性能---------- 5-8

4. Assembly Drawing 电池图形---------- 8

5. Storage and Transportation 储存和运输---------- 9

Use Attentions 使用注意事项

1.Charging 充电----------10

2.Discharging 放电---------- 11

3. Handling Instructions 电池的注意事项---------- 12

4. Others 其它事项 ---------- 13

1. Scope 适用范围

The specification shall be applied to 103450-2000mAh cell Manufactured by Guangdong CVASUN New Energy Technology CO.,LTD.
Reference Standard GB/T 18287-2013、IEC62133、GB31241
本规格书适用于广东嘉尚新能源科技有限公司生产的 103450-2000mAh 电芯。
参考标准 GB/T 18287-2013、IEC62133、GB31241

2. Product Specification 产品规格

NO	Items	Criteria	Remarks
2.1	Nominal Capacity 标称容量	2000mAh	Discharge at 0.5C after standard charge fully. 标准充电后，按 0.5C 放电。
2.2	Nominal Voltage 标称电压	3.7V	
2.3	Internal Impedance 内阻	≤60mΩ	AC 1KHz after standard chrge
2.4	Charge Voltage/ Charge Limit Voltage 充电电压/ 充电上限电压	4.2V	
2.5	Shipment Voltage 出货电压	3.85-4.05V	
2.6	Standard Charge 标准充电	0.2C CC(4.0V)/CV(4.0V)→ 0.1C cutoff	Operating Temperature 工作温度 0~+10℃
		0.5C CC/CV→0.02C cutoff	Operating Temperature 工作温度 +10~+45℃
		0.2C CC(4.0V)/CV(4.0V)→ 0.1C cutoff	Operating Temperature 工作温度 +45~+55℃
2.7	Standard Discharge 标准放电	0.5C CC→3.0V cutoff	Operating Temperature 工作温度 -10~+60℃
2.8	Fast Charge 快速充电	1.0C CC/CV→0.05C cutoff	Operating Temperature 工作温度 +20~+45℃
2.9	Fast Discharge 快速放电	1.0C CC→3.0V cutoff	Operating Temperature 工作温度 0~+60℃
2.10	Weight 重量（g）	约 32.30g	
2.11	Storage Temperature 贮存温度	within 1 month 1 个月内：-10℃~+45℃	Relative humidity: 相对湿度: ≤75%RH
		within 3 month 3 个月内：-10℃~+35℃	
		within 6 month 6 个月内：-10℃~+30℃	

3. Product Performance 产品性能

3.1 Standard Testing Conditions 标准测试环境

Temperature/温度：25±2℃

Humidity Range /湿度：≤75%RH范围内进行

3.2 Test method and request 检测方法与要求

3.2.1 Electrical Characteristic test 电性能测试

Item 项　目	Measuring Procedure 测试方法	Requirements 要　求
Appearance 外观	By sight 目测	No flaw， crack，rust， leakage. 无凹陷、裂纹、锈蚀、渗漏等缺陷
Open-Circuit Voltage 开路电压	The open-circuit voltage shall be measured within 24 hours after standard charge. 开路电压是在标准充电后24小时内测量	≥4.05V
Impedance 内阻	AC Impedance Resistance 交流阻抗电阻	≤60mΩ
Cycle Life 循环性能	30min rest period after standard charge, 0.5C discharge to a cut-off voltage of 3.0V, 30min rest period, the capacity shall be measured after 300 cycles of standard charge and discharge at 25±2℃. 标准充电后，搁置 30min，0.5C 放电至 3.0V，搁置 30min，重复上述步骤进行循环，直至电池循环 300 次，测试温度 25±2℃	≥80% of the Initial Capacities of the Cell ≥80%的电池初始容量
Storage at Normal Temperature 常温贮存	The capacity on 0.2C discharge shall be measured after standard charge and then storage at 20±5℃ for 28 days. 标准充电后电池在 20±5℃的环境中贮存 28 天，测试 0.2C 放电容量	Remaining Capacity ≥85% 容量保持≥85%

Storage at High Temperature 高温贮存	The capacity on 0.2C discharge shall be measured after standard charge and then storage at 60±2℃ for 7 days. 标准充电后电池在 60±2℃的环境中贮存 7 天，测试 0.2C 放电容量	Remaining Capacity ≥60% 容量保持≥60%
High Temperature test 高温性能测试	The capacity on 0.2C discharge shall be measured after standard charge and then storage at 55±2℃ for 2h 电池标准充满电后，放入 55±2℃温度条件下搁置 2h，测 0.2C 放电容量	Remaining Capacity ≥98% 容量保持≥98%
Low Temperature Test 低温性能测试	The capacity on 0.2C discharge shall be measured after standard charge and then storage at -10±2℃ for 4h 电池标准充满电后，放入-10±2℃温度条件下搁置 4h，测 0.2C 放电容量	Remaining Capacity ≥60% 容量保持≥60%

3.2.2 Environmental Characteristic 环境适应性能

Item	Test method and requirement	Criteria of test
Vibration Test 振动测试	After standard charge, the battery is to be tested in three directions which are mutually perpendicular to each axis (X/Y/Z) with amplitude of 0.8mm. The frequency is to be scanned from 7 to 200 Hz, and return to 7 Hz, the process is in not more than 15 minutes. It should be tested for 12 times in each axis, and total vibration time is not less than 3 hours. 标准充电后，电池在以下条件下测试: 振幅: 0.8mm 振动频率: 7HZ~200Hz~ 7HZ(15min 内) 方向: X、Y、Z 三个互相垂直方向每个方向振动重复 12 次，振动 3h.	The battery no leakage, smoking, fire and explosion. 电池无泄漏，无冒烟，无起火，无爆炸。
Low Pressure Test 低气压	A cell is put into a vacuum box after standard charged. Gradually decreasing the internal pressure of vacuum box until it is less than 11.6kPa(Simulation of Elevation Height 电芯标准充电后在，将其搁置在真空箱中。逐步减小真空箱内部压力至不高于 11.6kPa（模拟海拔 15240m）并保持 6h。	No catch fire, no explode, no leak 不起火、不爆炸、不漏液。

Constant Temperature and Constant Humidity Test 恒定湿热测试	After complete standard charge for 1 hour, test voltage, internal resistance and thickness, then put the battery in the box of the temperature of 40℃±2℃ and the relative humidity of 90%-95% for 48 hours. Since that, keep the battery at ambient temperature for 1hour, then test voltage, internal resistance and thickness again. Discharge the battery with 0.2C to the cut-off voltage of 3.0 V. 电池标准充满电后，然后静置 1 个小时；测量完开路电压，内阻及厚度后，将电芯或电池放入温度为 40±2℃，湿度为 90%~95% 的恒温恒湿箱中储存 48 小时，然后将其取出，在常温环境下放置 1 小时；测量开路电压及内阻，然后以 0.2C 电流测试常温下的剩余容量，测试结束后目测电池外观。	Remaining Capacity ≥60%; no leakage, smoking, fire and explosion. 容量保持≥60%； 电池无泄漏，无冒烟，无起火，无爆炸。

3.2.3 Safety Performance 安全性能

Item	Test metod and requirement	Criteria of test
Drop Test 跌落测试	After complete standard charge, drop each side of the battery from 1 meter to the concrete floor, total 6 time. 电池标准充满电后，将电池的每个面从 1 米高度跌落至混凝土地面，共 6 次。	The battery no fire and explosion. 电池无起火，无爆炸。
Heating Test 热冲击	After complete standard charge, the battery is to be heated in a circulating air oven, the temperature of the oven is to be raised at a rate of 5±2℃/min to a temperature of 130±2℃ and remain for 30 minutes. 标准充电后，电池放于热箱中，温度以（5±2℃）/min 的速率升至 130±2℃并保温 30min.	The battery no fire and explosion. 电池无起火，无爆炸。
Overcharge test （NO PCM） 过充测试 （无保护板）	A cell is discharged at 0.5C to 3.0V, and stored for 5min. It is charged at 3C CC to 4.6V, then charged at CV until charge time is ≥7 hours or the cell appearance temperature is 20% lower than peak value. 电芯以 0.5C 放电至 3.0V，搁置 5min 然后以 3C 恒流充电至 4.6V，转为恒压充电，直至充电时间≥7 小时或电芯表面温度下降至比峰值低 20%时结束。	The battery no fire and explosion. 电池无起火，无爆炸。
Short-circuit Test 短路测试	After completely standard charged, the battery is to be short-circuited by connecting the positive and negative terminals with a circuit load having a resistance load of 80±20mΩ. And monitor the temperature. The testing finish when the cell appearance temperature is 20% lower than peak value. Tests are to be conducted at 20±5℃ and at 55±5℃。 电池标准充满电后，用一根电阻80±20mΩ导线短路其正负极，并监视电池温度的变化，当电池温度下降到比峰值温度低20%时，实验结束。此项测试包含20±5℃和55±5℃两个温度下测试。	The battery no fire and explosion. surface≤150℃. 电池无起火，无爆炸；电池表面温度不高于 150℃。

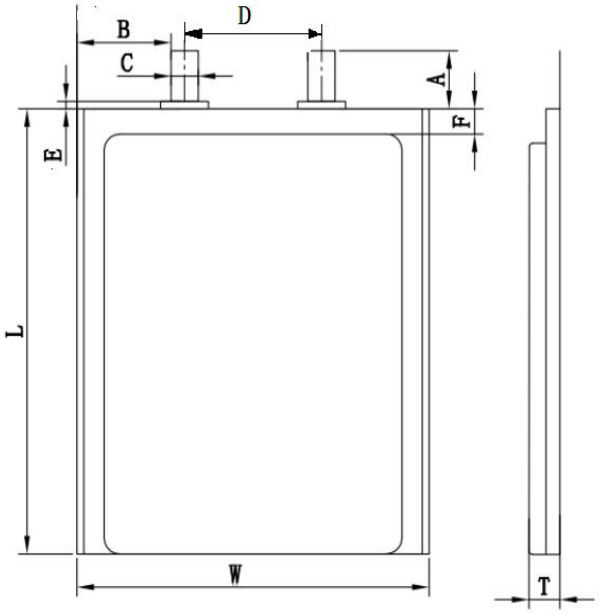
Forced-Discharge Test 强制放电	A cell is discharged to 3.0V at 0.2C. Then, it is reversely charged at 1C for 90min. 电芯以0.2C进行放电至3.0V，然后以1C的电流进行反向充电90min。	The battery no fire and explosion. 电池无起火，无爆炸。
Impact Test 重物冲击 (Reference Item 参考项目)	A cell is placed on a flat surface. A 15.8mm diameter bar is placed across the center of cell. The longitudinal axis of the bar shall be parallel to the surface. A 9.1±0.1kg weight dropped from a height of 610±25mm onto the bar. During the test, the longitudinal axis of cell shall be parallel to surface, and vertical to longitudinal axis of bar. 电芯放置于一平面上，并将一Φ15.8mm 的钢柱置于电芯中央，钢柱的纵轴平行于平面，让重量 9.1±0.1kg 的重物从 610±25mm 高度自由落到电池中心上方的钢柱上。电池在接受冲击试验时，其纵轴要平行于平面，垂直于钢柱的纵轴	The battery no fire and explosion. 电池无起火，无爆炸。
Shock Test 加速度冲击	A cell is fixed on the shock flat to be subjected shock. In the initial 3ms, the minimum average acceleration is 75gn, and peak acceleration is 150±25gn. It lasts for 6±1ms. Each cell shall be subjected to a total of three shocks of equal magnitude. 将电芯固定冲击台上，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 150±25gn，脉冲持续时间为 6±1ms。电池每个方向进行三次加速度冲击实验。 在三个相互垂直的方向上一次进行冲击实验。	The battery no fire and explosion. 电池无起火，无爆炸。
Temperature Impact Test 温度循环测试	After completely standard charged, put the battery into the box of temperature of 75℃±5℃and keep it for 6 hour. And then transfer it to the box of temperature of -40±2℃ and keep it for 6 hour, repeating the sequence for a further 10 cycles. 电池标准充满电后，将电池放入 75±5℃的温控箱中保持 6h，将温控箱温度降至-40±2℃保持 6h，重复上述操作步骤循环 10 次；测试结束后将电池取出。	The battery no leakage, smoking, fire and explosion. 电池无泄漏，无冒烟，无起火，无爆炸。

备注：GB31241 所有安全测试项目均可通过

Remark: All safety Performance of GB31241 can pass

4.**Battery graphics** 电池图形

Items	Description	Dimension and Spec
T	电芯厚度	10.0mm Max
W	电芯宽度	34.0mm Max
L	电芯长度	50.0mm Max
D	Tab 中心距	13.0±2.0mm
C	Tab 宽度	3.0±0.1mm
F	顶封宽度	3.0±0.5mm
E	极耳胶外露	0.5-2.0mm
A	极耳长度 (含极耳胶)	9.0±1.5mm



按公司要求或客户要求喷码

5. Storage and Transportation 储存和运输

5.1 Storage 储存

The polymer Li-ion battery should be stored in a cool, dry and well-ventilated area, and should be far from the fire and the high temperature.

聚合物锂离子电池组应储存在阴凉、干燥、通风良好的地方。并应远离火和高温。

· The best capacity in storage is 30%-50% (voltage between 3.7-3.9V).

保持储容量最好是在30%-50% （在3.7- 3.9V 之间的电压）。

· The battery should be stored within the proper temperature and humidity range specified by specification.

电池应储存在产品规格书规定的温度和湿度范围内。

· If stored for more than six months or longer, the battery will be suggested to charge.

如果电池存放时间超过六个月以上或更长，建议对电池进行充电

5.2 Transportation 运输

· Forbidden to mix battery with other goods. 禁止将电池与其他货物混装。

· Forbidden to immerse battery into liquid such as water or soak it with liquid. 禁止将电池浸入水中或弄湿。

· Forbidden to deposit battery over 10 layers or upside-down. 禁止电池堆放超过10层或倒立。

· The highest temperature during battery transportation should be lower than 65℃. 电池运输过程中最高温度应低于65℃ 。

5.3 Warranty period 质保期

·The warranty period of the product is 6 months, excluded capacity. 产品质保期为6个月，不包含容量。

Use Attentions

使用注意事项

1 Charging 充电

1.1 Charging Current 充电电流

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 electrical, mechanical and safety performance and could lead to heat generation or leakage.

充电电流不得超过本规格书中规定的最大充电电流。使用高于推荐值电流充电将可能引起电芯的充放电性能、机械性能和安全性能的问题，并可能会导致发热或泄漏。

1.2 Charging Voltage 充电电压

Charging shall be done by voltage less than that specified in the Product Specification (4.2V/cell). Charging beyond 4.2V, which is the absolute maximum voltage, must be strictly prohibited. The charger shall be designed to comply with this condition.

充电电压不得超过本规格书刊号中规定的额定电压（4.2V/电芯）。4.2V 为充电电压最高极限，充电器的设计应满足此条件。

It is very dangerous that charging with higher voltage than maximum voltage may cause damage to the cell electrical, mechanical safety performance and could lead to heat generation or leakage.

电池电压高于额定电压值时，将可能引起电芯的充放电性能、机械性能和安全性能的问题，可能会导致发热或泄漏。

1.3 Charging Temperature 充电温度

The cell shall be charged within 0℃~+10℃(0.2C) or +45℃~+55℃(0.2C) or +10℃~+45 ℃ range in the Product Specification.

电池必须在 0℃~+10℃(0.2C)或+45℃~+55℃(0.2C) or 或+10℃~+45 ℃的环境温度范围内进行充电。

1.4 Prohibition of Reverse Charging 禁止反向充电

Reverse charging is prohibited. The cell shall be connected correctly. The polarity has to be confirmed before wiring. In case of the cell is connected improperly, the cell cannot be charged. Simultaneously, the reverse charging may cause damaging to the cell which may lead to degradation of cell performance and damage the cell safety, and could cause heat generation or leakage.

正确连接电池的正负极，严禁反向充电。若电池正负极接反，将无法对电芯进行充电。同时，反向充电会降低电芯的充放电性能、安全性，并会导致发热、泄漏。

2 Discharging 放电

2.1 Discharging Current 放电电流

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.

放电电流不得超过本规格书规定的最大放电电流，大电流放电会导致电芯容量剧减并导致过热。

2.2 Discharging Temperature 放电温度

The cell shall be discharged within -10℃~60℃ range specified in the Product Specification.

电池必须在 -10℃~60℃ 的环境温度范围内进行放电。

2.3 Over-discharging 过放电

It should be noted that the cell would be at an 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.

需要注意的是，在电池长期未使用期间，它可能会用其自放电特性而处于某种过放电状态。为防止过放电的发生，电池应定期充电，将其电压维持在3.7V至3.9V之间。

Over-discharging may causes loss of cell performance, characteristics, or battery functions.

过放电会导致电芯性能、电池功能的丧失。

The charger shall be equipped with a device to prevent further discharging exceeding a cut-off voyage specified in the Product Specification. Also the charger shall be equipped with a device to control the recharging procedures as follows: The cell battery pack shall start with a low current (0.01C) for 15 - 30 minutes, i.e. pre-charging, before rapid charging starts. The rapid charging shall be started after the （individual）cell voltage has been reached above 3V within 15 - 30 minutes that can be determined with the use of an appropriate timer for pre-charging. In case the (individual) cell voltage does not rise to 3V within the pre-charging time, then the charger shall have functions to stop further charging and display the cell/pack is at abnormal state.

充电器应有装置来防止电池放电至低于本规格书规定的截止电压。此外，充电器还应有装置以防止重复充电，步骤如下：电池在快速充电之前，应先以一小电流（0.01C）预充电 15~30 分钟，以使电池的电压达到 3.0V 以上，再进行快速充电。可用一记时器来实现该预充电步骤。如果在预充电规定时间内，电池的电压仍未升到 3.0V 以上，充电器应能够停止下一步快速充电，并显示该电芯/电池正处于非正常状态。

3. Handling Instructions 电池的注意事项

Read and observe the following warnings and precautions to ensure correct and safe use of Li-ion batteries. We will not be responsible for any problems arising from the violation of the following precautions.

认真阅读下面的注意事项，确保正确使用聚合物锂离子电池。嘉尚新能源科技有限公司对违反下述注意事项而产生的任何问题不予负责。

Danger!

危　　险！

— Do not immerse the battery in water or allow it to get wet.
— 勿将电池投入水中或将其弄湿！
— Do not use or store the battery near sources of heat such as a fire or heater.
— 禁止在火源或极热条件下给电池充电！勿在热源（如火或加热器）附近使用或贮存电池！如果电池泄漏或发出异味，应立即将其从接近明火处移开；
— Do not use any chargers other than those recommended by special charger.
— 请使用专用充电器！
— Do not reverse the positive(+) and negative(-) terminals.
— 勿将正负极接反！
— Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
— 勿将电池直接连接到墙上插座或车载点烟式插座上！
— Do not put the battery into a fire or apply direct heat to it.
— 勿将电池投入火中或给电池加热！
— Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
— 禁止用导线或其它金属物体将电池正负极短路，禁止将电池与项链、发夹或其它金属物体一起运输或贮存！
— Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
— 禁止用钉子或其它尖锐物体刺穿电池壳体，禁止锤击或脚踏电池！
— Do not strike, throw or subject the battery to sever physical shock.
— 禁止撞击、投掷或者使电池受到机械震动
— Do not directly solder the battery terminals.
— 禁止直接焊接电池端子！
— Do not attempt to disassemble or modify the battery in any way.
— 禁止以任何方式分解电池！
— Do not place the battery in a microwave oven or pressurized container.
— 禁止将电池置入微波炉或压力容器中！
— Do not use the battery in combination with primary batteries (such as dry-cell batteries) or batteries of different capacity, type or brand.
— 禁止与一次电池（如干电池）或不同容量、型号、品种电池组合使用！
— Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.
— 如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用；如果电池正在使用或充电，应立即从用电器中或充电器上取出并停止使用！

Caution!

注　　意!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.

不要使用处于极热环境中的电池，如阳光直射或热天的车内。否则，电池会过热，可能着火（点燃），这样就会影响电池的性能、缩短电池的使用寿命。

If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.

如果电池漏液后电解液进入眼睛，不要擦，应用水冲洗，立即寻求医疗救助。如不及时处理，眼睛将会受到伤害。

Use the battery only under the following environmental conditions. Failure to do so can result in reduced performance or a shorten service life. Recharging the battery outside of these temperatures can cause the battery to overheat, explode or catch fire.

只能在下述条件下使用电池，否则将会降低电池的性能或缩短电池的使用寿命。

Operating environment:

工作环境

When charging the battery: 0℃～+10℃(0.2C) or +45℃~+55℃(0.2C)

充电： 0℃～+10℃(0.2C)或+45℃~+55℃(0.2C)

When charging the battery: +10℃～+45℃(0.5C)

充电：+10℃～+45℃(0.5C)

When discharging the battery: -10℃～60℃

放电: -10℃～60℃

When stored up to 30 days: -10℃～45℃

储存 30 天：-10℃～45℃

When stored up to 90 days: -10℃～+35℃

储存 90 天：-10℃～+35℃

When stored up to 180 days: -10℃～+30℃

储存 180 天：-10℃～+30℃

5. Others 其它事项

Our company has the right to amend the specification.

本公司有权对本产品规格书进行修订。

Any matters that this specification does not cover should be conferred between the customer and CVASUN.

任何本说明书中未提及的事项，须经双方协商确定。