



湖南盛利高新能源科技有限公司

Hunan Shengli High-tech Energy Technology Co., Ltd

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产品规格书—INR18650R 1800mAh 电池
Product Specification For INR18650R 1800mAh Battery

可充电锂离子电芯

产品规格书

Specification Of Product

For Lithium-ion Rechargeable Cell

电芯型号: INR18650R 1800mAh

Cell Model: INR18650R 1800mAh

湖南盛利高新能源科技有限公司

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目录 Contents

1. 范围 Scope	3
2. 产品描述与型号 Description and Model.....	3
3. 定义 Definition.....	3
4. 产品规格 Product Specifications	4
5. 外形尺寸 Outline Dimensions	5
6. 外观 Appearance.....	5
7. 性能规格 Performance Specifications	5
7.1 标准测试条件 Standard Test Conditions	5
7.2 电性能 Electrical Characteristics	6
7.3 环境适应性能 Environmental Characteristics	7
7.4 安全性能 Safety Performance	8
7.5 机械性能 Mechanical Performance	9
8. 包装 Packing	10
9. 运输 Transport.....	11
10. 长期贮存 Long-term Storage.....	11
11. 保质期 Shelf life	11
12. 产品责任 Product Liability.....	12
13. 警告及注意事项 Warning and Cautions	12



产品规格书—INR18650R 1800mAh 电池 Product Specification For INR18650R 1800mAh Battery

1. 范围 Scope

本产品规格书描述的是湖南盛利高新能源科技有限公司的可充电锂离子电芯，包括产品规格信息、各种性能测试条件、产品责任及注意事项。

This product specification defines the requirements of the rechargeable lithium ion battery to be supplied to the customer by Hunan Shengli High-tech Energy Technology Limited Company. Including product specification、testing method、product liability and notice。

如果客户需要任何其它的附加信息，建议事先与湖南盛利高新能源科技有限公司联系。

Should there be any additional information required by the customer, customers are advised to contact Hunan Shengli High-tech Energy Technology Limited Company before selecting a solution.

2. 产品描述与型号 Description and Model

2.1 产品描述: 电芯(可充电锂离子电池)

2.1 Description: Cell (Rechargeable Lithium-ion Battery)

2.2 型号 Model: INR18650R 1800mAh

3. 定义 Definition

3.1 标准模式充电 Standard Charge

标准模式充电的定义: 在 $25 \pm 2^{\circ}\text{C}$ 下，将电芯以900mA电流恒流充电到4.2V，然后转为在4.2V下恒压充电至截至电流20mA。

This "Standard Charge" means charging the cell at constant current of 900mA to 4.2V, then at constant voltage of 4.2V with 20mA cut-off, at temperature $25 \pm 2^{\circ}\text{C}$.

3.2 标准模式放电 Standard Discharge

标准模式放电的定义: 在 $25 \pm 2^{\circ}\text{C}$ 下，将满电态电芯以900mA电流恒流放电到2.75V。

This "Standard Discharge" means discharging the fully charged cell at constant current of 900mA to 2.75V, at temperature $25 \pm 2^{\circ}\text{C}$.



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产品规格书—INR18650R 1800mAh 电池
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4. 产品规格 Product Specifications

项目 Item	规格 Specification
4.1 标称容量	1800mAh (0.5C 放电容量, 4.20~2.75V)
4.1 Nominal Capacity	1800mAh (0.5C discharge, 4.20~2.75V)
4.2 最小容量	1800mAh (0.5C 放电容量, 4.20~2.75V)
4.2 Minimum Capacity	1800mAh (0.5C discharge, 4.20~2.75V)
4.3 标称电压	3.7 V
4.3 Nominal Voltage	
4.4 交流内阻	$\leq 55\text{m}\Omega$
4.4 Internal AC Impedance	
4.5 最大充电电流	900mA (Ambient temperature 25°C)
4.5 Max. Charge Current	
4.6 最大持续放电电流	900mA (Ambient temperature 25°C)
4.6 Max. Continuous Discharge Current	
4.7 最大瞬间放电电流	5400mA (Ambient temperature 25°C)
4.7 Max. Pulse Discharge Current	
4.8 电芯重量	50.0g max
4.8 Cell Weight	
4.9 操作温度	充电 Charge : 0 ~ 45°C;
4.9 Operating Temperature	放电 Discharge : -10 ~ 60°C
4.10 电压范围(出货状态)	50%充电态, 开路电压范围3.60~3.90V
4.10 Voltage range	50% state of charge (50%SOC);
(State of shipment)	Open Circuit Voltage (OCV) is from 3.60V to 3.90V.
4.11 储存温度	1 年: -20 ~25°C (1*) 1 year : -20 to 25°C (1*)
4.11 Storage Temperature	3 个月: -20 ~45°C (1*) 3 months : -20 to 45°C (1*)
(for shipping state)	1 个月: -20 ~60°C (1*) 1 month : -20 to 60°C (1*)

注(1*): 如果电芯维持在出厂状态(半充电)下, 容量恢复率应大于 50%。

Note (1*): If the cell is kept as ex-factory status (50% of charge), the capacity recovery rate is more than 50%.



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5. 外形尺寸 Outline Dimensions

见附图1 See the attachment (Fig. 1)

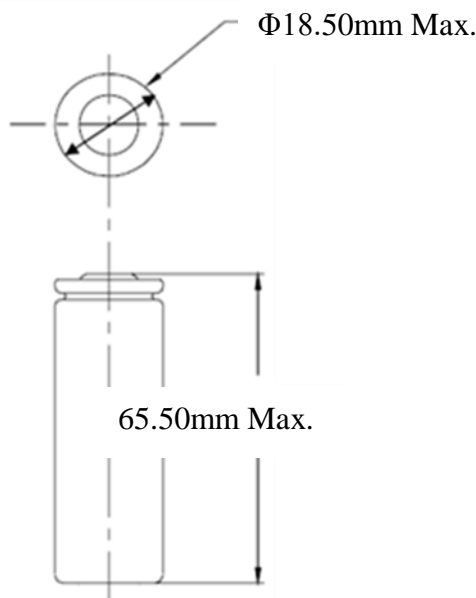


图1. ICR18650C 1800mAh的外形尺寸图

Fig.1. Outline Dimensions of INR18650C 1800mAh

6. 外观 Appearance

应没有如深度划痕、裂缝、生锈、斑点或漏液等影响电芯商业价值的外观瑕疵。

There shall be no such defects as deep scratch, crack, rust, discoloration or leakage, which may adversely affect the commercial value of the cell.

7. 性能规格 Performance Specifications

7.1 标准测试条件 Standard Test Conditions

7.1.1 环境条件 Environmental Conditions

除非另有说明, 本规格书中的所有测试应在 $25\pm 2^{\circ}\text{C}$, 相对湿度 $65\pm 20\%$ 的环境下进行。

Unless otherwise specified, all tests stated in this specification are conducted at temperature $25\pm 2^{\circ}\text{C}$ and humidity $65\pm 20\%$.



产品规格书—INR18650R 1800mAh 电池 Product Specification For INR18650R 1800mAh Battery

7.1.2 测量设备 Measuring Equipment

(1) 电流表和电压表 Ammeter and Voltmeter

电流表和电压表必须达到0.5级或以上。

The ammeter and voltmeter should have an accuracy of the grade 0.5 or higher.

(2) 游标卡尺 Slide caliper

游标卡尺的最小刻度必须达到0.01mm。

The slide caliper should have 0.01 mm scale.

(3) 内阻测试仪 Impedance meter

须使用1kHz的交流内阻测试仪。

The impedance meter with AC 1kHz should be used.

7.2 电性能 Electrical Characteristics

项目 Item	测试方法	标准
7.2.1 初始容量 7.2.1 Initial Capacity	电芯经标准模式充电，充满电后，经标准模式放电，初始容量应满足下面的要求 Cells shall be charged per Standard Charge and discharged per Standard Discharge . Initial capacity shall meet the following requirement.	初始容量 \geq 1800mAh Initial Capacity \geq 1800mAh
7.2.2 循环寿命 7.2.2 Cycle Life	电芯以900mA恒流恒压充电至4.20V, 截止20mA, 然后以900mA恒流放电至2.75V, 充电与放电之间需要搁置10min, 以一次充电和一次放电定义为1个循环。151次循环后, 按照标准充放电模式测试电芯的放电容量。 Cells shall be charged at constant current of 900mA to 4.2V with end current of 20mA, and discharged at constant current of 900mA to 2.75V. Cells are to rest 10 minutes after charge and discharge. A cycle is defined as one charge and one discharge. Discharge capacity shall be measured per Standard Charge and Standard Discharge after 151 cycles.	放电容量 (151th cycle) \geq 80% Discharge capacity (151th cycle) \geq 80%



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产品规格书—INR18650R 1800mAh 电池

Product Specification For INR18650R 1800mAh Battery

7.2.3 倍率放电性能 7.2.3 Discharge Rate Capabilities	电芯以标准模式充满电后, 按以下不同电流放电至2.75V来测试放电容量 Discharge capacity is measured with various currents as below to 2.75V after the standard charge. Relative capacity at each current shall meet the following table.	1C/0.5C \geq 90%
		2C/0.5C \geq 85%
		3C/0.5C \geq 80%
7.2.4不同温度下的放电能力 7.2.4Temperature Dependence of Discharge Capacity	电芯以标准模式充满电后, 在下列不同温度下以0.5C恒流放电至2.75V来测试放电容量, Cells shall be fully charged per and discharged with constant current 0.5C to 2.75V at the following temperatures.	-20°C/25°C \geq 50%
		-10°C/25°C \geq 60%
		0°C/25°C \geq 70%
		60°C/25°C \geq 90%
7.2.5 储存性能 7.2.5Storage Characteristics	电芯以标准模式充满电后, 在控制温度为25 \pm 2°C的环境下储存30天, 储存后, 电芯按标准模式放电获得剩余容量。 Cells shall be fully charged per Standard Charge and stored in a temperature-controlled environment at 25 \pm 2°C for 30 days. After storage, cells shall be discharged per Standard Discharge to obtain the remaining capacity.	剩余容量 \geq 80 % (以测试的初始容量为基准) Remaining capacity \geq 80% (initial capacity measured)

7.3 环境适应性能 Environmental Characteristics.

项目 Item	测试方法	标准
7.3.1高温高湿测试 7.3.1High Temperature and High Humidity Test	电芯以标准模式充满电, 在温度为60 \pm 2°C, 相对湿度为95%的环境下储存168小时。储存后按标准模式放电并按标准模式充电和标准模式放电循环3次获得恢复容量(第三次循环的放电容量)。 Cells are fully charged per Standard Charge and stored at 60 \pm 2°C (95%RH) for 168 hours. After test, cells are discharged per Standard Charge and Standard Discharge cycled per & Standard Discharge for 3 cycles to obtain recovered capacity (3rd discharge capacity).	不漏液, 不破裂, 不生锈, 容量恢复率 \geq 80% No leakage, No rupture, No rust, Capacity recovery rate \geq 80%



产品规格书—INR18650R 1800mAh 电池

Product Specification For INR18650R 1800mAh Battery

7.4 安全性能 Safety Performance.

项目 Item	测试方法	标准
7.4.1 外部短路测试 (25±2°C) 7.4.1 External Short-Circuiting Test (25±2°C)	电芯以标准模式充满电, 将电芯的正极和负极以一根电阻为80±20 mΩ的导线相连接, 并维持1小时 Cells are fully charged per Standard Charge, and the positive and negative terminal is connected by a 80±20mΩ-wire for 1hour	不起火, 不爆炸 No fire, No explosion.
7.4.2 热冲击测试 7.4.2 Heating Test	电芯以标准模式充满电, 置入鼓风烘箱中并以5°C/min的速率升温至130°C, 在130°C下维持30min。 Cells are fully charged per Standard Charge and heated in a circulating air oven at a rate of 5°C per minute to 130°C. and remain then oven at 130°C for 30 minutes.	不起火, 不爆炸 No fire, No explosion.
7.4.3 过充电测试 7.4.3 Overcharge Test	电芯以标准模式放电, 然后以1C恒定电流充电直到电压达到5V并维持2.5小时, 测试中应没有任何保护措施。 Cells are discharged per Standard Charge, then charged at constant current of 1C till the voltage reaches 5V for 2.5hrs. Not should have any protect during testing.	不起火, 不爆炸 No fire, No explosion.



产品规格书—INR18650R 1800mAh 电池

Product Specification For INR18650R 1800mAh Battery

7.5 机械性能 Mechanical Performance.

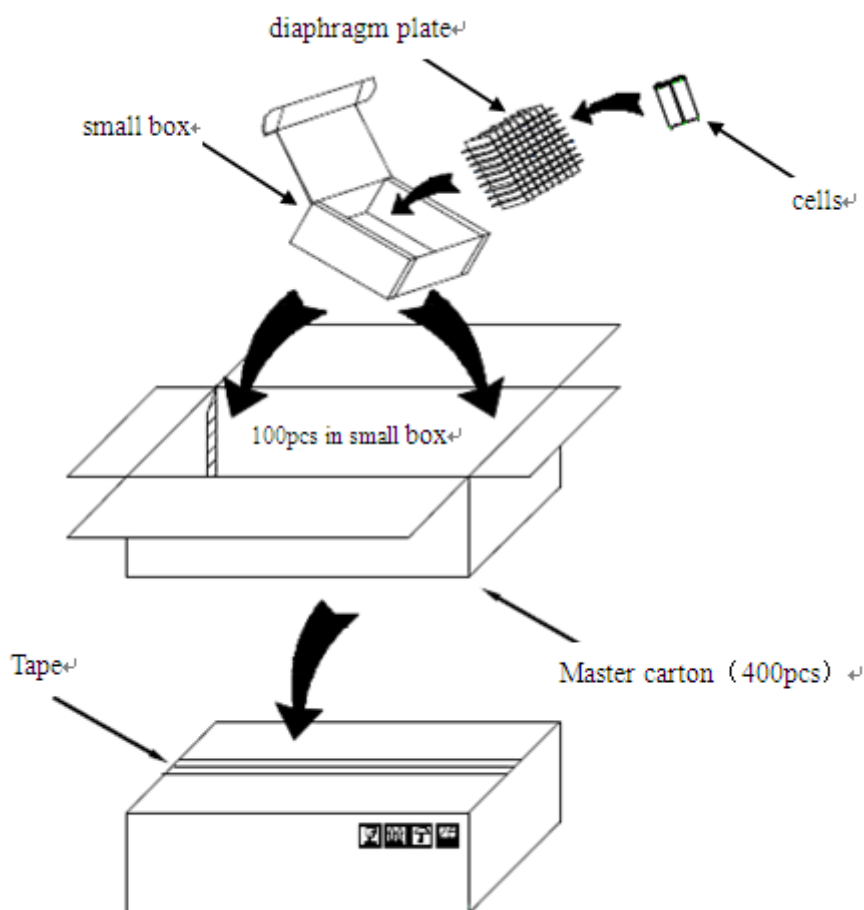
7.5.1 跌落测试 7.5.1 Drop Test	<p>按标准模式充满电的电芯,从1.0m高处跌落至平滑的水泥地板上,电芯上下两个面各跌落一次、侧面跌落一次计为一个循环,一共测试6个循环。(总跌落次数为18次)</p> <p>Cells are fully charged per Standard Charge are dropped from a height of 1.0m onto concrete-floor for six cycles, 2 drops from each cell terminal and 1 drop from the side of cell can (Total number of drops =18).</p>	<p>不起火,不爆炸</p> <p>No fire, No explosion.</p>
7.5.2 振动测试 7.5.2 Vibration Test	<p>电池按标准充电模式充满电后,将电池安装在振动台面上,按(振动频率:10Hz~30Hz,位移单振幅:0.38mm; 振动频率:30Hz~55Hz,位移单振幅:0.19mm)振动频率和对应的振幅以X,Y,Z三个方向从10Hz~55Hz循环扫频振动30min,扫频速率为1 oct/min</p> <p>Cells are fully charged per Standard Charge are vibrated for install battery on the vibration table,adjust the equipment according to the following vibration and amplitude frequency.From X,Y,Z three directions in 10Hz~55Hz sweep vibration to sweep for 30mins with the sweep vibration to sweep frequency speed rate at 1oct/min :</p> <p>(Vibration frequency:10Hz~30Hz(single amplitude)</p> <p>Displacement amplitude(single):0.38mm</p> <p>Amplitude frequency:30Hz~55Hz(single amplitude)</p> <p>Displacement amplitude(single):0.19mm)</p>	<p>电芯外观无明显损伤,漏液,冒烟或爆炸</p> <p>Exterior appearance no Apparent stain,leakage,smoke and Explosion</p> <p>电压衰减$\leq 0.5\%$</p> <p>Diminishing rate of voltage$\leq 0.5\%$</p> <p>内阻增大率$\leq 20\%$</p> <p>Increasing rate of internal resistance$\leq 20\%$</p>
7.5.4 挤压测试 7.5.4 Crush test	<p>电池按标准模式充电后,在温度为$25\pm 2^{\circ}\text{C}$环境下,搁置24小时。从径向挤压压力达到13KN。</p> <p>Cells are charged per Standard Charge and stored at $25\pm 2^{\circ}\text{C}$ for 24 hours.The crushing was continued until a force of 13KN</p>	<p>不起火,不爆炸</p> <p>No fire, No explosion.</p>



8. 包装 Packing

电池在包装时需处于半充满状态，包装箱外应标明产品名称、型号、标称电压、数量、生产日期及相应等级的内阻、容量。

Battery in the package should be in half charged state, the packing box should be marked with product name, model, rated voltage, number, production date and the corresponding level of internal resistance, capacity.





产品规格书—INR18650R 1800mAh 电池 Product Specification For INR18650R 1800mAh Battery

9. 运输 Transport

电池应包装成箱进行运输，在运输过程中应防止剧烈振动、冲击或挤压、防止日晒雨淋、可使用汽车、火车、轮船、飞机等交通工具运输。

Battery should be packed in case to deliver. During delivery, it should be protected from violent vibration, shock, extrusion and sun-scorched and rain-drenched. Automobile, train, ship or plane are available as media of transportation.

10. 长期贮存 Long-term storage

在充满电后请在短时间内将电池使用，因为长时间在此条件下会由于自放电等原因而导致容量衰减。如果电芯需要存储超过3个月以上时，请将电芯充至半电并在干燥和低温条件下存储。我们的运输电压为3.60V-4.00V. 高电压存储会导致电芯性能变差。

After fully charged, please put the battery in work in a short time, because if the battery under fully charged in a long time, battery capacity will fade out of self-discharge. If battery need to be stored for longer than 3 months, please charge the battery to half full and store under dry and low temperature condition. Our delivery voltage is 3.60V-4.00V. high voltage storage will cause worse battery performance. Under packed, battery need to be half charged. Product name, model, nominal voltage, quantity, weight, production date, resistance and capacity should be clearly marked outside of each case.

11. 保质期 Shelf life

只要按照本说明书、正确使用和处理电芯，湖南盛利高新能源科技有限公司保证电芯自出厂日期起1年以内不出现任何缺陷。

As long as the cell is treated in accordance with this Product Specification and/or Proper Use and Handling, Hunan Shengli High-tech Energy Technology Limited Company warrants that the cell should be free from any defect for a period of 1 year from date of shipment.



产品规格书—INR18650R 1800mAh 电池 Product Specification For INR18650R 1800mAh Battery

12. 产品责任 Product Liability

湖南盛利高新能源科技有限公司的责任范围只涵盖电芯本身，而客户应承担包括电芯和保护线路板在内的电池产品责任。

The coverage of Hunan Shengli High-tech Energy Technology Limited Company is for the cell itself, while the customer assumes the liability of the battery including the cell and its protection circuit.

请您务必按照所提供的规格说明书和本文最后所附的注意条款来使用湖南盛利高新能源科技有限公司生产的电池。

You are kindly requested to use the cell which is delivered from Hunan Shengli High-tech Energy Technology Limited Company in strict accordance with the specification and remarks include at the end of the document.

不正确使用电池，可能会发生意外或起火。对于客户在超出规格说明书以外的情况下使用电池，湖南盛利高新能源科技有限公司不保证其安全性能。

Due to improper usage of the cell, an accident or a fire may occur. Hunan Shengli High-tech Energy Technology Limited Company will not guarantee against any accidents occurring due to use beyond the content of this specification.

13. 警告及注意事项 Warning and cautions

为防止电芯可能发生泄露，发热，爆炸，请注意以下预防措施：

To prevent the possibility of the cell from leaking, heating, explosion, please observe the following precautions:

严禁将电芯浸入水中。保存不用时，应放置在阴凉干燥的环境中。

Don't immerse the cell in water. When not in use, should be placed in a cool and dry environment.

禁止将电芯在热高温源旁，如火，加热器等旁边使用和留置。

Don't use and leave the cell near a heat source, such as fire or heater.

严禁颠倒正负极后使用电芯。

Don't reverse the positive and negative terminals.



产品规格书—INR18650R 1800mAh 电池

Product Specification For INR18650R 1800mAh Battery

严禁将电芯直接插入电源插座。

Don't connect the cell to an electrical outlet directly.

禁止将电芯丢入火或加热器中。

Don't discard the cell in fire or heater.

禁止用金属直接连接电芯正负极，造成短路。

Don't connect the positive and negative terminal directly with metal objects.

禁止将电芯与金属，如发卡、项链等一起运输或存储。

Don't transport and store the cell together with metal objects such as necklaces, hairpins.

禁止敲击，抛掷或踩踏电芯等。

Don't strike, throw or trample the cell.

禁止用钉子或其它利器刺穿电芯。

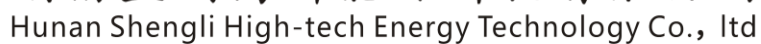
Don't pierce the cell with a nail or other sharp object.

如果电芯发生泄露，电解液进入眼睛，请不要搓揉，应用清水冲洗眼睛至少15分钟，必要时请立即前往医院接受治疗，否则会伤害眼睛。

If the cell leaks and the electrolyte get into your eyes, don't wipe eyes, instead, thoroughly rinse the eyes with clean running water for at least 15 minutes, and immediately seek medical attention . Otherwise, eye injury can result.

如果电芯发出异味，发热，变色，变形或使用、存储、充电过程中出现任何异常现象，立即将电芯从装置或充电器中移开并停用。

If the cell gives off an odor, generates heat, becomes discolored or deformed, or in any way appears abnormal during usage, recharging or storage, immediately remove it from the device or cell charger and stop using it.



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14