

## 锂离子电池规格书 Specification of Product for Lithium-ion Rechargeable Cell

客户名称

产品名称 圆柱锂离子电池

产品型号 18650INR2000mAh 3C

执行标准 GB31241-2014

编制	核准	日期
虞林海	刘波博	<b>2023-04-23</b>

# 深圳市金盾芯能源科技有限公司

Shenzhen Jindunxin Energy Technology Co., Ltd.

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#### .适用范围 Scope

本产品规格书描述了深圳市金盾芯能源科技有限公司所生产的二次锂离子电池主要性能指标, 用户 请务必按照本规格书中的测试和使用方法进行使用, 如果有不明之处, 请与供方协商解决。

This product specification describesShenzhen Jindunxin Energy Technology Co.,Ltd production of lithium-ion rechargeable battery main performance index, please operate according to the specification of testing and the use of methods were used, if unknown, please contact with us.

#### 2 .产品型号 Model

型号: 18650INR2000mAh 3C

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## 3 引用标准 Reference standard

本标准参考国标 GB/T18287-2013、GB31241-2014、UL1642 以及 CE61960 等技术标准规范编制而成。

The standard reference GB/T18287-2013, GB31241-2014, UL1642 and CE61960 technology standards compiled.

## 4 产品规格 Specification

### 1、电气特性/Electrical Characteristics

项目 Item	规格 Specification	项目 Item	规格 Specification
1.1 标称容量 Nominal Capacity	2000mAh (0.2 C <sub>5</sub> A Discharge)	1.8 快速充电电流 Rapid Charge Current	1000mA (0.5 C <sub>5</sub> A)
1.2 最小容量 Min. Capacity	1980mAh (0.2 C <sub>5</sub> A Discharge)	1.9 快速放电电流 Rapid Discharge Current	2000mA (1.0 C <sub>5</sub> A)
1.3 标称电压 Nominal Voltage	3.7V	1.10 最大放电电流 Max. Discharge Current	6000mA (3.0 C <sub>5</sub> A)
1.4 放电终止电压 Discharge Voltage Cut-off	2.75V	1.11 脉冲放电 Pulse Discharge	20A (30秒) 20A (30S)
1.5 充电限制电压 Charge Voltage Cut-off	4.20V	1.12 内阻 Internal Impedance	≤20mΩ (AC 1KHz)
1.6 标准充电电流 Standard Charge Current	400mA (0.2 C <sub>5</sub> A)	1.13 重量 Weight	大约 43g About 43g
1.7 标准放电电流 Standard Discharge Current	400mA (0.2 C <sub>5</sub> A)	1.14 循环次数 (3C) Cycle Life (3C)	300次 ≥80%标称容量 300times ≥80%Nominal Cap.

### 2、工作条件/Operating Conditions

2.1 充电温度范围 Charging Temperature Range		0°C~+45°C
2.2 放电温度范围 Discharging Temperature Range		-10°C~+60°C
2.3 电池储存环境 Storage Temperature Range	≤1 个月 one month	-10~+ 45°C / 65%±20%RH
	≤3 个月 three months	0~+ 30°C / 65%±20%RH
	≤12 个月 a year	20±5°C / 65%±20%RH
2.4 出厂电压 As of Shipment Voltage		3.85~3.95V

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## 5 电芯的性能标准 Battery Cell Performance Criteria

项目 Items	测试方法 Test Conditions	标准 Specification
5.1 充电电 Fully charged	以 0.2C <sub>5</sub> A 恒流充电, 当电池电压达到 4.2V 后, 改为恒压充电, 充电电流逐渐减少, 直到充电电流小于或等于 0.01C <sub>5</sub> A, 设置充电时间为 8 小时 The use of 0.2 C <sub>5</sub> A constant current charging, when the battery voltage reaches 4.2V, instead of constant voltage charging, the charging current is gradually reduced, until the charging current is less than or equal to 0.01 C <sub>5</sub> A, setting the charging time is 8hours.	
5.2 循环寿命 Cycle Life	电池在 300 次完全充放电循环后, 再以 0.2C <sub>5</sub> A 的电流放电至 2.75V 终止电压, 测量其放电容量。 After 300 cycles of charge and discharge, the discharge capacity is measured with 0.2 C <sub>5</sub> A discharge current and 2.75V cut-off voltage.	≥80%标称容量 ≥80%Nominal Capacity
5.3 荷电保持能力 Storage Characteristics	电池充电后, 在 20℃ 的室内环境下, 存放 28 天, 以 0.2C <sub>5</sub> A 电流连续放电至 2.75V 终止电压。 The discharge capacity is measured with 0.2 C <sub>5</sub> A discharge current and 2.75V cut-off voltage after stored at room temperature for 28 days at a full charged state.	容量保持率≥85% Capacity Retention≥85%
5.4 放电性能 Discharge Characteristics	1. 在充电后 1 小时内, 以 0.2C <sub>5</sub> A 电流连续放电至 3.0V 终止电压。 The discharge capacity is measured with 0.2 C <sub>5</sub> A discharge current and 3.0V cut-off voltage after full charged.	≥100%标称容量 ≥100%Nominal Capacity
	2. 在充电后 1 小时内, 以 0.5C <sub>5</sub> A 电流连续放电至 3.0V 终止电压。 The discharge capacity is measured with 0.5 C <sub>5</sub> A discharge current and 3.0V cut-off voltage after full charged.	0.5C/0.2C≥90%
	3. 在充电后 1 小时内, 以 1C <sub>5</sub> A 电流连续放电至 3.0V 终止电压。 The discharge capacity is measured with 1 C <sub>5</sub> A discharge current and 3.0V cut-off voltage after full charged.	1C/0.2C≥85%
	4. 在充电后 1 小时内, 以 3C <sub>5</sub> A 电流连续放电至 3.0V 终止电压。 The discharge capacity is measured with 5 C <sub>5</sub> A discharge current and 3.0V cut-off voltage after full charged.	3C/0.2C≥80%

## 6 环境适应性 Environment Characteristics

项目 Items	测试方法 Test Conditions	标准 Specification
6.1 温度性能 Temperature Performance	在 20℃ 充电后, 测量在不同温度下用 0.2 C <sub>5</sub> A 放电至 2.75V 终止电压的放电容量 (与额定容量作为比较)。 In 20 °C charged, measured at different temperatures for 0.2 C <sub>5</sub> A discharge to 2.75V termination voltage discharge capacity (as compared with rated capacity).	-10℃/25℃≥60%
		0℃/25℃≥75%
		10℃/25℃≥80%
		20℃/25℃≥90%
		60℃/25℃≥95%
6.2 恒定湿热 Constant Temperature and Humidity	将电池放入 40℃ 及相对湿度为 90% 的恒温恒湿箱中 48 小时后, 再以 1C <sub>5</sub> A 放电至 2.75V 终止电压。 Put the battery in 40 °C and relative humidity of 90% for constant temperature and humidity box 48 hours later, the 1 C <sub>5</sub> A discharge to 2.75V termination voltage.	无明显变形、冒烟或爆炸, 放电时间不低于 36 分钟。 No significant deformation, smoking and explosion, the discharge time of not less than 36 minutes.

## 7 安全性能 Safety Characteristics

项目 Items	测试方法 Test Conditions	标准 Specification
7.1 短路 Short circuit Characteristics	充电后, 将接有热电偶的电池置于通风橱中, 短路正负极 (线路总电阻不大于 100 mΩ), 试验过程中, 监视电池温度变化, 当温度下降到比峰值低约 10℃ 时, 结束试验。 A fully charged battery, is to be connected with the thermocouple in a	电池应不起火、不爆炸; 温度 < 150℃。 No fire, No explosion; Max.Temp,of battery

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	fume hood, short circuit of positive and negative ( total line resistance is less than 100 mΩ ), test process, monitoring the cell temperature, when the temperature dropped to about 10°C lower than the peak value, ended test.	surface should not exceed 150°C
7.2 过充电 Over-charge Characteristics	充饱电后的电池, 用 3C <sub>5</sub> A 电流和 4.8V 的恒定电压充电 8 小时。 The battery is charged at a 3 C <sub>5</sub> A constant current with a voltage limit of 4.8V for 8 hours after fully charged	电池应不起火、不爆炸; 温度 < 150°C。 No fire, No explosion; Max.Temp.of battery surface should not exceed 150°C
7.3 过放 Over-Discharge Characteristics	电池充饱电后, 在 20±5°C 条件下, 以 0.2C <sub>5</sub> A 放电至终止电压后, 外接 30Ω 负载放电 24h。 The battery is discharged to termination voltage, then the external 30Ω for 24h after fully charged at 20±5°C	电池应不起火、不爆炸。 No fire, No explosion
7.4 热冲击 Hot oven Characteristics	将电池充饱电后, 放置于热箱中, 温度以 (5°C±2°C)/min 的速率升至 130°C±2°C 并保温 30min。 The fully charged battery is placed the battery in the hot box, then rose to 130°C±2°C in the temperature to 5°C±2°C/min rate, insulation 30min.	电池应不起火、不爆炸。 No fire, No explosion

## 8 标准测试条件 Standard Testing Conditions and Requirements

### 8.1 标准测试条件和要求 Standard Testing Conditions and Requirements

本规格书中所有测试均在温度 15~35°C、湿度 45~75% 下进行, 测试项目有特殊要求除外。

All the tests are at a temperature of 15~35°C, humidity is 65±25%, test items except for special requirements.

### 8.2 测量设备及仪表 Measurement Equipment and Instrumentation

#### 8.2.1 尺寸测量 Measurement Tool

用精度为 0.01mm 的卡尺或更高精度的工具测量尺寸, 量程范围 0~100mm。

With a precision of 0.01mm caliper or higher precision instruments for measuring size, range 0~100mm.

#### 8.2.2 电压测量 Measurement Voltage

用精度为 0.01V 的电压表测量电压, 量程范围 0~20V。

With a precision of 0.01V voltage meter measuring voltage, range 0~20V.

#### 8.2.3 电流测量 Measurement Current

用精度为当前电流±0.4%的电流表测量电流, 量程范围 0~10A。

With a precision of ± 0.4% current Ammeter to measure the current, range 0~10A.

#### 8.2.4 内阻测量 Measurement Impedance

用一个 1KHz 的正弦交变电流内阻仪测量内阻。

The impedance is measured with 1KHz sinusoidal alternating current resistance instrument.

## 9 外观 Outside Appearance

不允许有任何影响电芯性能的外观缺陷, 如漏液、生锈、变形、严重炸火等。

There should not be any appearance defect such as leakage, rust, deformation, severe blow fire effect on cell performance.

## 10 包装、储存及运输 Packing/Storage/Shipment

### 10.1 电池装运前的检查 Pre shipment inspection

对于所有电池, 在装运前需检查其电压、内阻与保护电路的功能。

The battery should be checked the voltage, resistance and the function of protective circuit before shipment.

### 10.2 包装与运输电池 Packing and Shipping

10.2.1 当电池需要再运输以便在工厂装配时, 要特别注意包装, 以避免运输时产生应力。深圳市金盾芯能源科技有限公司建议再运输时, 使用同深圳市金盾芯能源有限公司运输时同样的包

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装。即使打开了包装，当再运输时，使用深圳市金盾芯能源有限公司同样的部件和材料进行再包装。

The battery should be transported to the factory assembly, to pay special attention to the packing, in order to avoid transport stress. We suggest to use the same packaging when the battery be transported. Even the package is opened, please pack with the components and materials as same as Shenzhen Jindunxin Energy Technology Co.,Ltd.

10.2.2 电池应在半荷电状态包装成箱进行运输，在运输过程中，防止剧烈振动、冲击、挤压，防止日晒雨淋，应使用汽车、火车、轮船、飞机等交通工具运输。

The battery should be in a half state of charge packaging boxes for transport, in the transport process, prevent severe vibration, shock, extrusion, prevent the sun and rain, should be in automobile, train, ship, airplane and other forms.

## 10.3 电池异常 Abnormal Condition

不要使用由于运输中应力、跌落、短路或其它原因被损害并发出电解液异味的异常电池。

Do not use the battery when it's smell like abnormal cell electrolyte because of transport stress, sag, short circuit or any other.

## 11 安全警告及注意事项 Safety precaution and prohibitions

为了防止电芯出现泄漏、发热、着火、性能降低或寿命下降、爆炸等事故，请按如下操作规定正常使用电池，并遵守防范事项。

In order to prevent battery leakage, heating, fire, reduced performance or life drops, explosion and other accidents, please do the following provisions of the normal use of battery, and compliance with preventive matters.

### 11.1 充电 Charging

#### 11.1.1 充电电流 Charging Current

充电电流不得超过本标准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池的充放电性能、机械性能和安全性能的问题，并可能会导致发热或泄漏。

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.

#### 11.1.2 充电电压 Charging Voltage

充电电压不得超过本标准书中规定的额定电压(4.2V/电池)。4.25V为充电电压最高极限，充电器的设计应满足此条件。电池电压高于额定电压值时，将可能引起电池的充放电性能、机械性能和安全性能的问题，可能会导致发热、泄漏或爆炸。

Charging shall be done by voltage less than that specified in the Product Specification (4.2V/cell). Charging beyond 4.25V, which is the absolute maximum voltage, must be strictly prohibited. The charger shall be designed to comply with this condition. 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, leakage or explosion.

#### 11.1.3 充电温度 Charging Temperature

电池必须在 0°C~45°C 的环境温度范围内进行充电。

The cell shall be charged within 0°C~45°C range in the Product Specification.

#### 11.1.4 禁止反向充电

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

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

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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, leakage or explosion.

## 11.2 放电 Discharging

### 11.2.1 放电电流 Discharging Current

放电电流不得超过本标准书规定的最大放电电流，大电流放电会导致电池容量剧减并导致过热。

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 overheat.

### 11.2.2 放电温度 Discharging Temperature

电池必须在-10℃~60℃的环境温度范围内进行放电。

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

### 11.2.3 过放电 Over-Discharging

需要注意的是，在电池长期未使用期间，它可能会用其它自放电特性而处于某种过放电状态。为防止放电的发生，电芯应定期充电，将其电压维持在 3.6V 至 3.9V 之间。过放电会导致电芯性能、电池功能的丧失。充电器应有装置来防止电池放电至低于本标准书规定的截止电压。此外，充电器还应有装置以防止重复充电。

It should be noted that the cell would be at 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 3.6V and 3.9V. Over-discharging may causes loss of cell performance, characteristics, or battery functions. 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.

## 11.3 异常处理 Exception Handling

如果电芯出现被破坏、变形、电解液泄漏或闻到有电解液味道以及其他不正常现象，请不要再使用该电芯；此外，泄漏电解液的电芯应远离火源，避免引起爆炸。

Do not use the cell if you find it in unusual conditions such as distortion, leakage (or odors). The cell should be kept away from fire to avoid an explosion.

## 12 . 贮存 Storage

### 12.1 贮存温度与湿度 Storage temperature and humidity

电池应贮存在环境温度范围为-5℃~+35℃，相对湿度在 25~75%的清洁、干燥、通风的室内，应避免与腐蚀性物质接触，应远离火源及热源。

The cell shall be storied at temperature range of -5 °C~ +35 °C, relative humidity of 25~75%, clearing, drying, ventilated, and kept away from corrosive substances and fire.

### 12.2 长时间储存 Long Time Storage

如果要长时间贮存，电池应在温度范围-5℃~+25℃、低潮湿和无腐蚀性气体环境中贮存。超过三个月时，应对电池进行一次完全充放电循环，再将电池充电约 3.8V/电池的条件下贮存。

If the battery is stored for a long time, the battery should be conducted a cycle of charge and discharge, and the voltage should be about 3.8V and the battery is to be stored at temperature range of - 5 °C~ +25 °C, low moisture and corrosive gases environment.

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## 13 . 保质期 Guarantee Period of Quality

电池保质期为打码出厂后的一年。若电池在此期间内出现异常情况，但必须是由于明显的制造工艺方面的问题，且在电池没有被异常使用的情况下深圳市金盾芯能源科技有限公司才免费更换新 电池。

The guarantee period of quality extend for one year after code. Shenzhen Jindunxin Energy Technology Co.,Ltd.would replace battery which due to the manufacturing problems and it is not abnormal use, if the battery appears during the abnormal situation.

## 14 . 电池外形结构及尺寸 Appearance structure and Size of The Battery

项目 Items	尺寸 Size(mm)	公差 Tolerance(mm)
铆钉宽度 Width	8.5	+0.1
		-0.1
电芯高度 Height	65	+0.3
		-0.3
电芯直径 Diameter	18.3	+0.3
		-0.15

