



# **SPECIFICATION OF PRODUCT**

Lithium Ion Rechargeable Cell

Model : INR18650 3000mAh

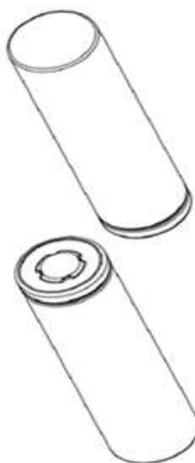
## 1 Scope

This specification is applies to describe the related Battery product in this Specification and the INR 18650 3000mAh

## 2 Specification

Items	Specifications	Remark
Nominal Voltage	3.60 V	
Nominal Capacity	3000mAh	After Standard Charging,discharge to2.5V at 0.2Cn under 25±2℃
AC Impedance	≤40 mΩ	
Working Temperature	charging : 0℃~45℃ Discharging : -30℃~60℃	
Standard Charging	Constant current and constant voltage charging to4.2V at 0.5Cn under 25±2℃, end voltage 0.01C;	
Maximum Charging Current	0~10℃ 0.2Cn 10~20℃ 0.5Cn 20~45℃ 1Cn	25℃±2℃
Standard Discharging Current	0.2Cn	
Maximum Discharging Current	2Cn,for continuous discharge 3Cn,not for continuous discharge	Pls contact the manufacturer for higher current;
Dimension	Diameter : 18.3±0.2 mm, Height : 65±0.25mm	
Weight	45.5±2.0g	
Storage	One Month : -30 to 60℃ Three Month : -30 to 45℃ 12 Months : -30 to 25℃ /Relative Humidity ≤ 75%	Pls contact the manufacturer for higher temperature storage;

## 3 Dimension



## 4 Performance Test Criteria

### 4.1 Appearance and Dimension

Test Item	Test Method	Test Criteria
Appearance	Under daylight conditions, inspect the battery visually with eyes.	The appearance is neat and tidy, the marking is clear, there is no scratches, deformation, rust, leakage, etc.
Dimension	Use a vernier caliper with a measurement error of not more than 0.02mm for testing. In order to prevent battery short circuit, a layer of insulating material should be pasted on the caliper head.	All dimensions meet the requirements.

### 4.2 Electrical characteristics

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Test Item	Test Method	Test Criteria
High and low temperature discharge performance	;Put the standard charged battery separately at -20°C, 25°C, 55°C test temperature conditions for 8 hours, then discharge to 2.5V at a current of 0.2Cn, record the battery discharge capacity under each temperature condition	-20°C/25°C≥70% 25°C/25°C=100% 55°C/25°C≥90%
Cycle life	;The battery is charged and discharged at 0.5C/0.2C. When the 800th cycle of the battery is completed, record the discharge capacity at this time.	Discharge capacity after 800 cycles ≥80% first discharge capacity
High temperature storage performance	Put the standard charged battery discharge with current of 0.2Cn at room temperature, and the discharge capacity is C1. After the battery is fully charged, it is placed in a 55±2°C incubator for 7 days, and then discharged with a current of 0.2Cn at room temperature. The discharge capacity is C2, and the recovery capacity is tested at room temperature with 0.2 Cn current. The discharge capacity is C3.	Capacity Retention Rate C2/C1≥85% Capacity Recovery Rate C3/C1≥90%
Room temperature storage performance	The standard charged battery is discharged at room temperature with a current of 0.2Cn, and the discharge capacity is C1. After the battery is fully charged, it is allowed to stand at room temperature for 28 days, and then discharged with a current of 0.2Cn. The discharge capacity is C2 with a discharge capacity of 0.2 Cn current test its recovery capacity, the discharge capacity is C3.	/Capacity Retention Rate C2/C1≥85% /Capacity Recovery Rate C3/C1≥90%

### 4.3 Environment Adaptability

Test Item	Test Method	Test Criteria
Vibration Test	After the battery is charged according to the standard charging system, fix the battery on the vibrating table and vibrate in the three directions of X, Y, and Z for 60 minutes, with an amplitude of 1mm, and a vibration frequency of 16HZ~17Hz. After the test is completed, the battery cell returns to its original position, and the sample is observed for 6 hours after the test.	
Free Fall	1h. Drop the battery terminal freely from a height of 1m onto the concrete floor, each once on directions of X, Y, and Z; measure the open circuit voltage of the battery. Observe for 1h.	
/impact Test	610mm 自由落下冲击电池。A test sample is to be placed on a flat surface, a 15.8mm diameter bar is to be placed across the sample, a 9.2kg pound weight is to be dropped from a height of 610mm onto the sample。	

#### 4.4 Safety performance

#### 5

Test Item	Test Method	Test Criteria
Over-discharge	standard charged and discharged with 50Ω resistor load for 24h	No fire, no explosion,
Over-charge	After standard charged, The cell should be charged for 2.5 hours using 10V, 3200mAh power supply	No fire, no explosion.
Short-circuit	After the battery is charged according to the standard charging system, the battery is placed in an environment of 25±2℃, and then the single battery is externally short-circuited for 1h. The external circuit resistance should be less than 50 mΩ; observe for 1 hour.	
(130℃ 30min) Thermal shock	After the battery is charged according to the standard charging system, the battery core is suspended in a temperature shock box (far-infrared blast oven or vacuum oven) with an insulated wire, and the temperature of the shock box rises to 130℃±2 at a rate of 5±2℃/min ℃, keep for 30min. Observe for 1h.	
Extrusion	The force for the crushing is to be applied by hydraulic ram with a 32mm diameter piston, the crushing is to be continued until the pressure reading of 17.2MPa is reached on the Hydraulic ram, applied the force of 13KN	

### 5 Test Condition

#### 5.1

**Initial test:** Unless otherwise specified, routine performance testing must be completed within 45 days of receiving the battery.

#### 5.2

**Temperature and humidity:** if there is no special regulation, the test should be carried out at 20℃±5℃ and relative humidity 45%-75%.

#### 5.3 Test Equipment

##### 5.3.1

**Dimension measuring instrument:** a vernier caliper with a measurement error of no more than

±0.02mm or a measuring tool with equivalent accuracy.

### 5.3.2

**Voltmeter:** DC voltmeter with accuracy not less than 0.25%, and its internal resistance should not be less than 10MΩ.

### 5.3.3

**Precision resistance:** the relative error is less than 0.5%.

### 5.3.4

**Resistance box:** the relative error is less than 0.5%.

### 5.3.5

**Electric heating constant temperature drying oven:** the absolute error is less than ±2°C.

## 6 Nameplate and Logo

The nameplate and logo of the battery should be kept clear, without falling off, and without obvious color difference.

### 6.1

**Nameplate:** The nameplate (trademark) of the battery includes the battery model, rated voltage, production date code, warning signs, etc.

### 6.2

**Code writing:** The battery production date code is represented by eight digits. The first four digits indicate the year, and the middle two digits indicate the month. The last two digits indicate the date. For example: the code "20200520" means that the battery was produced on May 20, 2020.

### 6.3

**Mark of the extremes:** mark on the side of the battery, and use "+" and "-" to indicate the positive and negative ends of the battery.

## 7 Transportation

—During transportation, the battery should be protected from sunlight, fire, rain, water and corrosive substances.

—Shock and vibration during transportation and loading and unloading should be limited to a minimum.

—The stacking height of paper packaging boxes shall not exceed 1.5 meters.

—When the battery is transported over long distances, if it is transported by ship, it should be placed away from the engine; in summer, it should not be left in an unventilated environment for a long time.

## **8 Safety Precautions**

Because this product has some hazards during transportation, storage and use, leakage or even explosion may occur when the operation is not correct. Before you use this product, please read this product specification carefully and keep it properly for reference. .

—Batteries are strictly prohibited from over-discharging, squeezing and burning.

-It is strictly forbidden to short-circuit or charge the battery.

—It is strictly forbidden for users to disassemble the battery by themselves.

—It is strictly forbidden to use or heat outside the allowable temperature range.

—It is strictly forbidden to weld directly on the surface of the battery.

—It is strictly forbidden to use batteries with severe scars or deformation.

—It is strictly forbidden to use batteries with dry batteries or other primary batteries, and do not use batteries with different packages, different models or different brands.

—It is strictly forbidden to mix new and old batteries.

—When installing the device, make sure that the battery's positive and negative poles are not reversed.

—When the battery is used to the end voltage, it should be removed from the instrument in time.

—When not in use for a long time, remove the battery from the device and store it in a low temperature and low humidity environment.

—To connect batteries in series and parallel, please contact our company.

—Used batteries should be disposed of in accordance with local environmental protection regulations.

-During use or storage, if the battery is found to have heat, odor, discoloration, deformation or other abnormalities, please stop using it.

## **9 Storage**

—The battery should be used and stored in a place away from static electricity.

—The battery should be stored in an environment where the temperature does not exceed 30°C and the relative humidity is 45% to 75%.

—When storing the battery, keep it away from heat sources, nor place it in direct sunlight. Ensure that it is clean, cool, dry, ventilated, and not affected by climate.

—The stacking height of batteries depends on the packaging strength. Generally, the stacking height of paper packaging boxes should not exceed 1.5 meters, and the stacking height of wooden boxes should not exceed 3 meters.

—Batteries are stored and displayed in their original packaging. After the packaging is removed, the batteries cannot be stacked, which may cause short circuit and damage to the battery.

## **10 Usage Advice**

—When the battery is used with the positive pole facing upwards, the energy utilization is the highest. It is recommended that the battery be placed upright when designing the battery compartment.

—The battery is suitable for use in a relatively cool environment. When used for a long time in a high temperature and high humidity environment, the service life will be reduced.

## **11 Claim**

If you have any questions about this product specification, please contact Akyga battery.