Rechargeable sodium ion battery

Product specification

Cell model: INR18650-20EB

1. Scope

This product specification describes the rechargeable sodium ion battery of Shenzhen Asia Technology Co., Ltd.
, including product specification information, various performance test conditions, product responsibilities and precautions. If the customer needs any other additional information, it is recommended to contact Shenzhen Asia Technology Co., Ltd.
in advance.

2. Product description and model

2.1 Product description: Battery (rechargeable sodium ion battery)

2.2 model Model: INR18650-20EB

3. definition

3.1 Standard mode charging

The definition of standard mode charging: At 25±2℃, charge the cell to 4.2V at a constant current of 1C, and then switch to constant voltage charging at 4.2V to a cut-off current of 0.03C.

3.2 Standard mode discharge

Definition of standard mode discharge: At 25±2℃, discharge the fully charged cell to 2.5V at a constant current of 0.5C. 4. Product Specifications

Item	Specification
4.1 Nominal capacity	2000mAh (0.5C discharge capacity, 4.2~ 2.5V) Temperature: 25±2℃
4.2 Minimum capacity	1980mAh (0.2C discharge capacity, 4.2~ 2.5V) Temperature: 25±2℃
4.3 Nominal voltage	3.6V
4.5 Maximum charging current	5000mA
4.6 Maximum discharge current	10000mA
4.7 AC internal resistance	≤20mΩ
4.8 Cell weight	≤50.0g
4.9 Cell size	Height≤65.3 mm ; Diameter≤18.40 mm
4.10 Operating temperature	Charge: 0 ~ 45℃; Discharge: -10 ~ 60℃
4.11 Voltage range (shipping state)	50% charged state, open circuit voltage range 3.40 ~ 3.90V
4.12 Storage temperature	1 year: -25 ~ 25° C; 3 months: -25 ~ 45° C; 1 month: -25 ~ 60° C

5. Dimensions

See attached picture 1

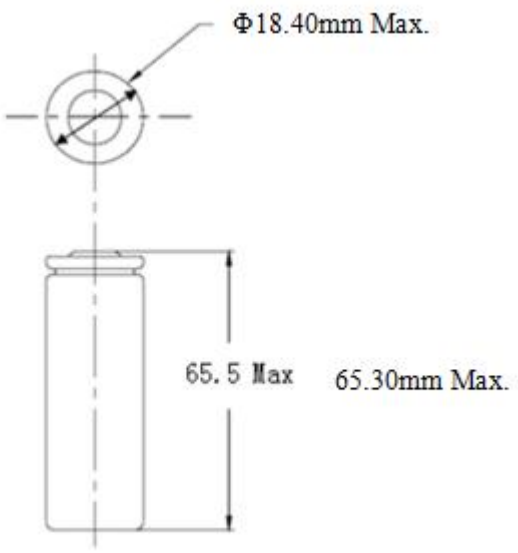


Figure 1. Dimensions of INR18650

6. Appearance

There should be no appearance defects such as deep scratches, cracks, rust, spots or leakage that affect the commercial value of the cell.

7. Performance Specifications

8.

7.1 Standard test conditions

7.1.1 Environmental conditions

Unless otherwise specified, all tests in this specification should be within 25±2℃, relative humidity 65±20% environment.

7.1.2 measuring equipment

(1) Ammeter and voltmeter

The ammeter and voltmeter must be 0.5 or above. (2) Vernier caliper

The minimum scale of the vernier caliper must reach 0.01mm. (3) Internal resistance tester

1kHz AC internal resistance tester must be used.

7.2 Electrical properties

Item	Test Methods	standard
7.2.1 Initial capacity	The battery cell is charged in the standard mode, after being fully charged, discharged to 2.5V in the standard mode to test the initial capacity	Initial capacity≥2000mAh
7.2.2 Cycle life	The battery cell is charged to 4.2V at a constant current and voltage of 0.5C, cuts off at 0.03C, and then discharged to 2.5V at a constant current of 1C, and left for 10 minutes between charging and discharging. One cycle of charging and discharging is defined as one cycle. After 1000 cycles, test the discharge capacity of the cell according to the standard charge-discharge mode.	Discharge capacity (1000th cycle) ≥80% (Based on the initial capacity tested in 7.2.1)
7.2.3 Rate discharge performance	After the battery is fully charged in the standard mode, discharge to the following different currents 2.5V to test the discharge capacity	1C/0.5C≥95%
		2C/0.5C≥92%
		3C/0.5C≥90%
		5C/0.5C≥85%
7.2.4 Discharge capacity at different temperatures	After the battery cell is fully charged in the standard mode, it will be 0.5C constant current discharge to 2.5V to test the discharge capacity	-40℃/25℃≥60%
		-30℃/25℃≥70%
		-20℃/25℃≥80%

7.3 Environmental adaptability

Item	Test Methods
7.3.1 High temperature and high humidity test	The battery cell is fully charged in standard mode and stored for 168 hours in an environment with a temperature of 60±2°C and a relative humidity of 95%. After storage, discharge according to standard mode and charge according to standard mode and discharge in standard mode 3 times The recovery capacity (discharge capacity of the third cycle) is

	obtained.

7.4Safety performance

Item	Test Methods	standard
7.4.1 External short circuit test (25±2°C)	The battery cell is fully charged in the standard mode, and the positive and negative electrodes of the battery are connected with a wire with a resistance of 100mΩ and maintained for 1 hour	No fire, no explosion, the surface temperature of the battery does not exceed 150° C.
7.4.2 Thermal shock test	The battery cell is fully charged in standard mode, placed in a blast oven and heated at 5℃ The temperature was increased to 130° C at a rate of /min, and maintained at 130° C for 30 minutes.	No fire, no explosion
7.4.3 Overcharge test	The cell is discharged in a standard mode, and then charged with a constant current of 1C until the voltage reaches 5V. During the test, the temperature of the cell is monitored. When the temperature of the cell drops to room temperature, the test ends.	No fire, no explosion

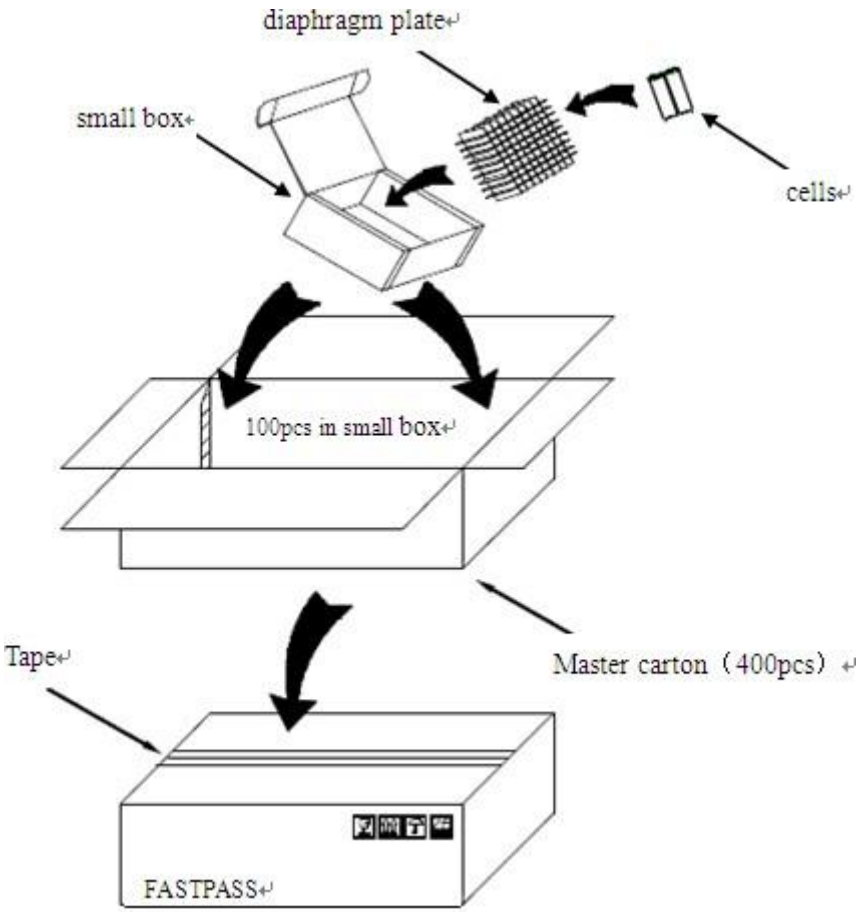
7.5 Mechanical behavior Mechanical Performance.

7.5.1 Drop test	According to the standard mode, a fully charged battery cell is dropped from a height of 1.0m to a smooth concrete floor. The battery cell drops once on the upper and lower sides, and once on the side, it is counted as a cycle. A total of 3 cycles are tested. (Total fall (The number of drops is 9)	No fire, no explosion
7.5.2 Vibration test	After the battery is fully charged according to the standard charging mode, install the battery on the vibrating table and press (vibration frequency: 10Hz～30Hz, displacement single amplitude: 0.38mm; Vibration frequency: 30Hz ~ 55Hz, single amplitude of displacement: 0.19mm) Vibration frequency and corresponding amplitude in X, Y, Z three directions from10Hz ~ 55Hz cyclic frequency sweep vibration for 30min, the frequency sweep rate is 1 oct/min	There is no obvious damage to the appearance of the electric core, liquid leakage, smoke or explosion Voltage attenuation≤0.5% Internal resistance increase rate ≤20%
7.5.3 Squeeze test	After the battery is charged in the standard mode, put it aside for 24 hours at a temperature of 25±2°C. Squeeze pressure from the radial direction to 13KN.	No fire, no explosion

8. Packaging

The battery must be half-filled when it is packaged, and the product name, model, nominal voltage, quantity, and production date should be marked on the outside of the packaging box

And the internal resistance and capacity of the corresponding level.



9. transportation

Batteries should be packed in boxes for transportation. During transportation, they should be protected from severe vibration, impact or squeeze, and protected from sun and rain. They can be transported by vehicles, trains, ships, airplanes and other transportation.

10. Long-term storage

Please use the battery within a short time after being fully charged, because the capacity will deteriorate due to self-discharge and other reasons under this condition for a long time.

reduce. If the battery cell needs to be stored for more than 3 months, please charge the battery cell to half charge and store it under dry and low temperature conditions. we

The transportation voltage is 3.40V-3.70V. High-voltage

storage will cause deterioration of battery cell

performance.

11. Shelf life

As long as the battery is used and handled correctly in accordance with this manual, Shenzhen Asia Technology Co., Ltd. guarantees that the battery will start from the date of delivery.
There are no defects within the year.

12. Product Liability

The scope of responsibility of Shenzhen Asia Technology Co., Ltd. only covers the battery cell itself, and the customer should bear the responsibility of the battery product including the battery cell and the protection circuit board.

Please be sure to use the battery produced by Shenzhen Asia Technology Co., Ltd. in accordance with the specifications provided and the note at the end of this article. Incorrect use of the battery may cause accidents or fire. Shenzhen Asia Technology Co., Ltd. does not guarantee its safety performance for customers who use the battery beyond the specifications.

13. Warnings and precautions

To prevent possible leakage of batteries, fever, Explosion, please pay attention to the following precautions: Do not immerse the battery in water. When not in use, it should be placed in a cool and dry environment. It is forbidden to use and leave the battery cell near a hot and high temperature source, such as a fire, heater, etc.

It is strictly forbidden to use batteries after reversing the positive and negative poles.

It is strictly forbidden to plug the battery core directly into the power socket.

Do not throw the battery into the fire or heater.

It is forbidden to use metal to directly connect the positive and negative electrodes of the battery to cause a short circuit.

It is forbidden to transport or store batteries together with metal, such as issuing cards, necklaces, etc. It is forbidden to knock, throw or step on the battery cell.

It is forbidden to weld batteries directly.

It is forbidden to pierce the battery core with nails or other sharp objects.

If the battery cell leaks and the electrolyte enters the eyes, please do not rub them. Rinse your eyes with clean water for at least 15 minutes. If necessary, please go to the hospital for treatment immediately, otherwise it will hurt your eyes.

If the battery cell emits a peculiar smell, heat, changes color, deforms, or any abnormal phenomenon occurs during use, storage, or charging, immediately remove the battery cell from the device or charger and stop using it.