Great Power Battery (International) Co. Ltd.

Specification

Lithium Ion Rechargeable Battery

Battery Type: ICR18650

1. Scope

The specification describes the requirements for the lithium ion rechargeable battery.

2. Kind of products specified

2.1 Name Lithium Ion Rechargeable Battery

2.2 Type ICR18650

3. Basic characteristics

Items	Specification
3.1 Nominal Capacity	2000mAh
3.2 Nominal Voltage	3.7V
3.3 Internal impedance	≤70mΩ
3.4 Max Charge Current	2.0C(4000mA)
3.5 Max Charge Voltage	4.20±0.02V
3.6 Max Discharge Current	2.0C(4000mA)
3.7 Discharge Cut-off Voltage	2.75V
3.8 Max Dimension	
Diameter	18.0±0.1mm
Height	65.0±0.2mm
3.9 Weight	44±1g
3.10Operating Temperature	
Charge	0～45℃
Discharge	-20～60℃
3.11 Storage Temperature	
Within 1 month	-5～35℃
Within 6 months	0～35℃

4. Standard Conditions for Test

Temperature:25±5℃ Relative Huimdity:65±20%

Standard Charge: 20±5℃，charging the battery at 1C current to 4.2V(C.C)，and then charging with 4.2V constant voltage until the current is less than 20mA.

Standard Discharge: 20±5℃，discharging the battery at 1C constant current to 2.75V.

5. Performance

5.1 Appearance

The surface must be clean, no hurt; no rust; with product label.

5.2 Characteristics

Items	Test procedure	Performances
5.2.1 Nominal Voltage	The average value of the working voltage in discharge.	3.7V
5.2.2 Nominal Capacity	The discharge capacity of the battery, which is measured at 1C current discharge to 3.0V cut-off voltage within 1 hour after completely charged.	Capacity≥2000mAh
5.2.3 Cycle Life	After 300 cycles of 100% DOD charge and discharge at 1C current, the discharge	≥300 cycles

	capacity is above 60% of nominal capacity.	
5.2.4 Storage	After 28 days storage at 25±5℃ after completed charge, the retention capacity is above 90%.	Capacity≥1800 mAh
5.2.5 High temperature performance	The fully charged battery is put in the surroundings of 55±2℃for 2 hours, and then it is discharged to the cut-off voltage at 1C current rate.	Capacity≥1800 mAh
5.2.6 Low temperature performance	The charged battery is put 16-24hours at -20±2℃and then discharge to cut-off voltage at 0.2C current rate.	Capacity≥1400 mAh
5.2.7 Short circuit	The battery is to be short-circuited by connecting the positive and negative terminals of the battery directly with copper wire with a resistance about 0.1Ω.	No fire, no explosion.
5.2.8 Drop Test	The battery is to be dropped from a height of 1m to hard board in X、Y、Z directions for twice respectively..	No fire, no explosion.
5. 2. 9 Anti-vibration	After standard charging, the battery is fixed on the platform and be subjected to vibrate on following frequency 10~55Hz and amplitude vibration for 30 minutes with direction of X, Y. Vibration Frequency: 10~30Hz, vibration amplitude 0.38mm. Vibration Frequency: 30~55Hz, vibration amplitude 0.19mm	By visual check, the battery is not found to deform, leak, smoke and explode, the battery voltage is no less than n×3.6V.
5.2.10 Collision Test	The battery is fixed in the clamping platform regularly according to X, Y, Z directions, then it is collided with the acceleration of 100 m/s^2 peak value pulses, 40-80 times collision per minute , the pulse lasting time is 16ms, and the number of collide times is 1000 +10.	By visual check, the battery is not found to deform, leak, smoke and explode, the battery voltage is no less than n×3.6V.
5.2.11 Impact Test	Impacting of a battery on a hard surface following a hammer of 10 kilogram free fall from 1m height.	No fire, no explosion.
5.2.12 3C/10V Overcharge	The battery that connect with the thermocouple is put in the fume hood, the positive and negative terminals is connected by a permanent constant electrical source, regulate current to 3C and voltage to 10 V. Then charge the battery until voltage is 10 V, current about 0A. Monitor the temperature change of battery when the temperature of battery is about lower 10℃than peak value, the test is over.	No fire, no explosion.
5.2.13 Crush Test	The fully charged battery is to be crushed	No fire, no explosion.

	between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram with a 32MM diameter piston. The crushing is to be continued until a pressure reading of 17.2Mpa is reached on the hydraulic ram, applied force of 13KN.	

6. Caution:

6.1 Forbid to discard the battery near heat sources, such as fire, heater, etc.

6.2 Please use appointed charger.

6.3 Don't reverse the terminals of cathode and anode.

6.4 Safety equipment is equipped inside the battery, for the sake of your safety, please don't break or change the battery's structure.

6.5 Forbid short-circuit the battery terminals.

6.6 Do not beat, throw or trample the battery.

6.7 The battery is forbidden soaked into water, please keep it in the cool and dry environment.

6.8 If the battery leaks, and the electrolyte gets into the eyes, do not rub eyes, instead, rinse the eyes with clean water, and seek medical advice immediately.

7. Warranty period

7.1 Warranty period of this product is 6 months from leaving plant.

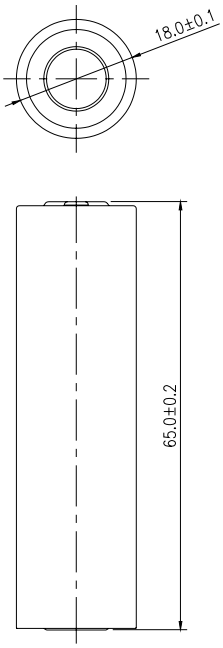
7.2 We will not guarantee against any accidents occurring due to usage against this specification.

8. Transportation:

Violent shaking, bump, rain and flaring sun shall be forbidden during the transportation. Keep the batteries at the half-full charged state.

8. Amend of the specification and the change of sign

Dimension of Battery type : ICR18650



The Diagram below shows the 2000mAh discharge / charge curve
-Black line as charge characteristics
-Brown line as discharge characteristics