PRODUCT SPECIFICATION

1. Scope

This specification defines the technical requirements

for Lithium ion battery supplied by Camelion Battery Co., Ltd..

2. Model

Cell Model INR18650 3500

3. Reference Standard/

GB/T 18287、GB/T31241、UL1642 、IEC61960、IEC62133

4. Cell Specification

No.	Item	General Parameter	Remark
1.	Typical capacity	3500mAh	0.2C charge and discharge for cut-off
2	Minimum Capacity	3300mAh	
3	Nominal Voltage	3.6V	
4	Internal Impedance	≤50mΩ	AC 1KHz
5	Single battery weight	Approximately 47.5g	
6	Limited charge current	4.20V	
7	Cut-off Voltage	2.5 V	
8	Standard charge current	700mA	0.2C
9	Max charge current	3500mA	1C
10	Standard dis-charge current	700mA	0.2C
11	Max Continuous discharging current	10.5A	3C
12	Operating Temperature	10℃~+20℃	Max Charging 0.2C

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		20℃~+45℃	Max Charging 1C
		-20℃~+60℃	Discharging
13	Storage Temperature	-20℃ / +45℃	Less than 1 month
		-20℃ / +35℃	Less than 6 months
14	Cell Dimension	Height ≤67.5mm	Initial Dimension
		Diameter ≤18.6mm	
		Cap Height 帽高 ≥1.0mm	

4. Product Endurance

No.	Items	Test Method and Condition	Criteria
1	standard Charge	Charge to 4.2V at constant current 0.2C, then constant voltage charge to taper current 0.02C	
2	standard Discharge	After standard charge, the cell shall be discharge till the voltage discharge to 2.5V by 0.2C,	The cell shall be discharge at 25±2℃.
3	Cycle Life	Charge: $0.5C_5A$ Discharge: $0.5\ C_5A$ Repeat the procedures 300 cycles	ResidueCapacity≥80%
4	Charged Storage Characteristics	The cell or battery charged with standard charge mode,Open circuit stored in 20±5℃ for 28 days.	Discharge time should not be less than 4h. Then charged with Standard

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		Discharged with standard discharge mode.	Chargemode,

5. Mechanical characteristics and Safety Test

No.	Items	Test Method and Condition	Criteria
1	Vibration Test	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz, the excursion of the vibration is 1.6mm. The cell shall be vibrated for 30 minutes per axis of XYZ axes.	No leakage No fire
2	Drop Test	The cell is to be dropped from a height of 1 meter twice onto concrete ground.	No explosion, No fire, no leakage.
3	Short Circuit 20℃)	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω.Tests are to be conducted at room temperature(20±2℃).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150℃
4	Short Circuit 60℃)	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω.Tests are to be conducted at temperature(60±2℃).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150℃
5	Overcharge testing	1C/4.6V DC power supply charge 1.5hrs after fully charge.	No fire, no explode, no smoke.

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6. Handling Precautions and Guideline For Lithium-Ion Rechargeable Batteries

6.1 Charging

6.1.1 Charging current

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.

6.1.2 Charging voltage

Charging shall be done by voltage less than that specified in the Product Specification . 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 or leakage.

6.1.3 Prohibition of reverse chargin

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 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 or leakage.

6.2 Discharging

6.2.1 Discharging current

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 over-heat

6.2.2 Over-discharging

It should be noted that the cell would be at an 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 3.75V and3.95V.

Over-discharging may causes loss of cell performance, characteristics, or battery functions.

6.3 Prtection Circuit Module

The cell/battery pack shall be with a PCM that can protect cell/battery pack properly. PCM shall have functions of (1) overcharging prevention ,(2) over-discharging prevention,(3) over current prevention to maintain safety and Prevent significant deterioration of cell performance. The over current can occur by external short circuit

7. Cautions In Use

To ensure proper use of the battery please read the manual carefully before using it.

Handling

Do not expose to, dispose of the battery in fire.

Do not put the battery in a charger or equipment with wrong terminals connected.

Avoid shorting the battery

Avoid excessive physical shock or vibration.

Do not disassemble or deform the battery.

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Do not immerse in water.

Do not use the battery mixed with other different make, type, or model batteries.

Keep out of the reach of children.

charge and discharge. Battery must be charged in appropriate charger only.

Never use a modified or damaged charger.

Do not leave battery in charger over 24 hours.

Storage：

Store the battery in a cool, dry and well-ventilated area.

Disposal：

Regulations vary for different countries. Dispose of in accordance with local regulations.

8. Period of Warranty

The period of warranty is one year from the date of shipment. Camelion guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.