



安徽潜川动力锂电科技有限公司

Anhui Qianchuan Power Lithium Battery Technology Co., Ltd.

锂离子电芯规格书

Specification For Lithium-ion Rechargeable Cell

电芯型号： INR18650C10-2000 mAh

Cell Type: INR18650C10-2000 mAh

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1 Preface 前言

This specification describes the type and size, performance, technical characteristics, warning and caution of the lithium ion rechargeable cell. The specification only applies to 18650C10-2000 cell supplied by Anhui Qianchuan Power Lithium Battery Technology Co.,LTD.

本标准描述了圆柱型锂离子电芯的外型尺寸、特性、技术要求及注意事项。本标准适用于安徽潜川动力锂电科技有限公司生产的圆柱型 18650C10-2000 锂离子电芯。

2 Definition 定义

2.1 Rated capacity:

标称容量:

Rated capacity: Cap=2000mAh.Under $25\pm 3^{\circ}\text{C}$, It means the capacity value of being discharged by 2-hours rate to end voltage 3.0 V, which is signed Cap, the unit is mAh.

标称容量 Cap=2000mAh, 指在 $25\pm 3^{\circ}\text{C}$ 环境下, 以 0.5CmA 放电至终止电压 3.0 V 时的容量, 以 Cap 表示, 单位为毫安培时(mAh)。

2.2 Standard charge method:

标准充电方式:

Under $25\pm 3^{\circ}\text{C}$, it can be charged to 4.2V with constant current of 0.5C and then, charged continuously with constant voltage of 4.2V until the charged current is 0.01C.

指在 $25\pm 3^{\circ}\text{C}$ 环境下, 以 0.5C 的电流恒流充电至单体电芯电压 4.2 V 后, 转为恒压 4.2 V 充电, 至充电电流小于 0.01C 时, 停止充电。

2.3 Standard discharge method:

标准放电方式:

Under $25\pm 3^{\circ}\text{C}$, it can be discharged to the voltage of 3.0V with constant current of 0.5C.

指在 $25\pm 3^{\circ}\text{C}$ 环境下, 以 0.5C 的电流恒流放电至单体电芯电压 3.0 V。

3 Cell type and size 电芯型号及尺寸

3.1 Description and model 电芯说明及型号

Description: Cylindrical Li-ion rechargeable cell

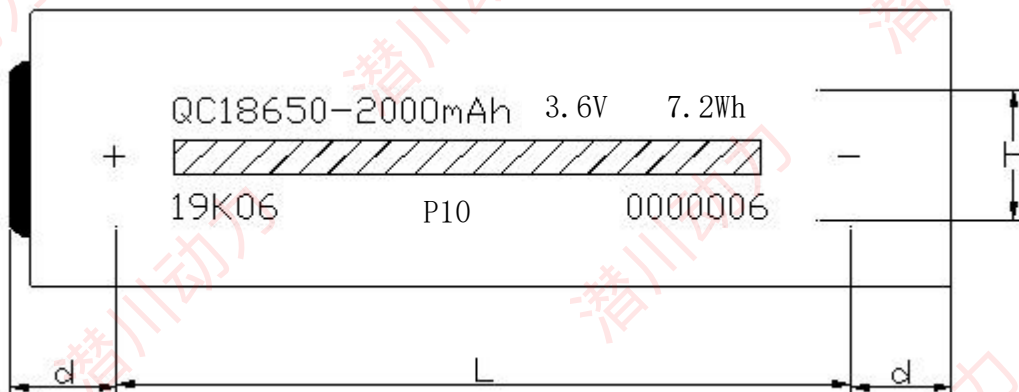
Model: 18650C10-2000mAh

18650C10-2000mAh 型号的圆柱锂离子二次电芯

3.2 Cell bar code and explanation 电芯喷码 (或光身, 或根据客户要求喷码)

Cell bar code as following:

电芯喷码如下:



3.3 Cell size 电芯尺寸

Cell physical dimension listed in Figure 1(unit: mm).

电芯尺寸示意图如图 1 所示 (单位: mm)。

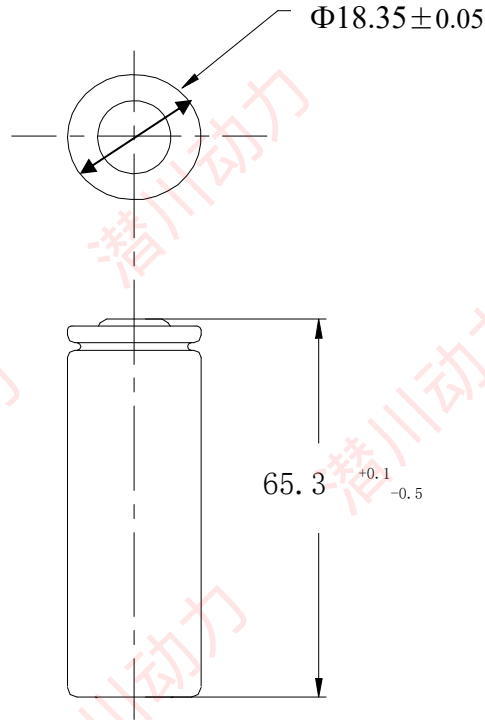


Figure 1/ 图 1

4 Cell specification 电芯特性

ITEM 项目	SPECIFICATION 特性
Normal capacity 标称容量	2000 mAh Rate discharge by 0.5C
Minimum capacity 最小容量	1980 mAh Rate discharge by 0.5C (Discharge the cell from 4.2V to 3.0V by 0.5C current) (电芯以 0.5C 从 4.2V 放电至 3.0V)
Normal voltage 标称电压	3.6V
Charging voltage 充电电压	4.2 ± 0.05 V
Discharge ending voltage 放电终止电压	3.0 ± 0.05 V
Standard charging current 标准充电电流	0.5C(1000 mA)
Standard discharge current 标准放电电流	0.5C(1000mA)
Max continue charge current 最大持续充电电流	1C (2000mA)

Max continue discharge current 最大持续放电电流	10C (20000mA)
Max recommended charge and discharge cell body temperature 充放电过程中电芯表面的最大推荐温度	Charge: 0~ 45°C Discharge: -20~ 60°C 充电时: 0~45°C 放电时: -20~60°C
Maximum short term allowable charge and discharge cell body temperature. Charging and discharging at these conditions will shorten cell cycle life. 充放电过程中电芯表面的短时间最大温度(在这些情况下充放电将会导致电池循环寿命很快衰减)	Charge: 50°C Discharge: 60°C 充电时: 50°C 放电时: 60°C
Humidity range 湿度范围	0~90%RH(non-condensing 不冷凝)
Internal resistance 内阻	≤16mΩ(AC Impedance, 1000 Hz)
Cell dimension 电芯尺寸	Height : 65.4 mm Max 最大高度: 65.4 mm Diameter : 18.4mm Max 最大直径: 18.4 mm
Weight 重量	<46g

5 Technical characteristics 技术要求

5.1 Cell usage conditions 电芯使用环境

Temperature of charge 充电温度: 0~45°C

Temperature of discharge 放电温度: -20~60°C

5.2 Cell testing conditions 电芯试验环境

Unless otherwise specified, all tests stated according to following:

除非有特殊说明, 所有测试的环境条件要求如下:

Temperature 温度: 25±3°C

5.3 Requirement of the testing equipment 测量仪表要求

Voltage meter: The voltage tester internal resistance is $\geq 10\text{ K}\Omega/\text{V}$

电压仪表要求: 测量电压的仪表内阻不小于 10KΩ/V

Temperature meter: The precision is $\leq 0.5^\circ\text{C}$

温度仪表要求: 测量温度的仪表精度不低于 0.5°C

5.4 Electronic performance 电性能

NO. 序号	ITEM 测试项目	Specification 规格
5.4.1	Discharge rate capability 倍率放电性能	Cap(10C)/Cap(1.0C) $\geq 93\%$

5.4.2	Cycle life 循环寿命	0.5C充/1.0C放: Cap(500th)/Cap(Av5) ≥80%; 0.5C 充/10C 放: Cap(300th)/Cap(Av5) ≥80%;
5.4.3	High-Low temperature discharge performance 高低温放电性能	Cap(-10℃)/Cap(25℃) ≥70% Cap(0℃)/Cap(25℃) ≥85% Cap(60℃)/Cap(25℃) ≥95%
5.4.4	Storage performance 存储性能	28 days:Cap(After)/Cap(before) ≥95%

5.5 Environmental characteristics 环境适应性能

NO. 序号	ITEM 测试项目	CRITERION 性能标准	TESTING METHOD 测试条件与方法
5.5.1	Vibration 振动性能	There shall be no electrolyte leakage 电解液无泄漏	After standard fully charge, cell shall be attached to a vibration table directly and subjected to vibration that consists of 10 Hz to 55 Hz to 10 Hz at the speed of 1Hz/min in 90~100mins.The total excursion of the vibration is 0.8mm(0.060 inches). The cell shall be vibrated in each direction along axis of the cylinder and the vertical directions of axis of the cylinder. 将满电电芯放在振动实验台上,在 90~100mins 由 10 Hz 到 55 Hz 再到 10Hz 以 1Hz/min 的速率变化,振幅为 0.8mm(0.060 英寸)进行振动实验。电芯在电芯的轴向和与电芯轴向垂直的两个方向上振动。

5.6 Safety characteristics 安全性能

NO. 序号	ITEM 测试项目	CRITERION 性能标准	TESTING METHOD 测试条件与方法
5.6.1	Overcharge test 过充测试	No leakage、No flame、 No fire、No explode 电芯不漏液、不冒烟、 不起火、不爆炸	The cell is discharged following the standard discharge method. Apply a 4.6V power supply and a 3C charge current for 1.5hrs. 电芯按照标准放电方式放完后,采用 3C 电流 4.6V 电压恒流恒压充电 1.5 小时。
5.6.2	130℃hot oven test 130℃热箱测试	When the temperature of the cell is 150℃. Cell must not fire or explode in 60 minutes 电芯表面温度达到 130℃后的 60 分钟 内,电芯不起火、不 爆炸	The cell is charged following the standard charge method. After charging the cell is put in the oven. And then the oven temperature will be ramped at 5℃ per minute to 130℃ and held at 130℃. When the temperature of the cell reach 130℃, the cell is maintained in the 130℃ oven for a maximum of 60 minutes or until a fire or explosion is obtained, whichever comes first. Record the time that the cell temperature reaches 130℃ and the time when a fire or explosion occurs. 电芯按照标准充电方式充满电后,将电芯放进热箱里,然后将热箱按 5℃/min 升温到 130℃,当电芯的温度也达到 130℃时,电芯在热箱 130℃环境下保持 60 分钟或者电芯起火爆炸为止。记录电芯温度升至 130℃起直到电芯起火或爆炸的时间。

5.6.3	Over discharge 过放电	No fire、No explode 电芯不起火、不爆炸	After standard charge, continue to discharge at constant current of 0.2C until the voltage was 0V. 将完全放电态的电池，以 0.2C 的电流放电至电压为 0V
5.6.4	Short circuit test 短路测试	No fire、No explode 电芯不起火、不爆炸	Cell shall first be charged according to standard charge method, and then cell is to be short-circuited by connecting the positive and negative terminals of the cell with copper wire having a maximum resistance load of 50 mΩ. This test is done at room temperature and at 60°C (different cells). Monitor the cell temperature while testing. The cell is continuously discharged until the cell case temperature has returned to be 10°C less than peak temperature. 电芯按照标准充电方式充满电后，在室温和 60°C 进行短路实验，将接有热电偶的电芯置于通风橱中，用铜线短路其正负极(线路总电阻不大于 50 毫欧)，实验过程中监视电芯温度变化，当电芯温度下降到比峰值低约 10°C 时，结束实验。
Note 备注	All above safety tests will be conducted at 25°C±3°C except where specified differently. Use proper ventilation with protective equipment. 除特殊说明，以上所有安全测试均应在 25°C±3°C 通风橱中，且附带有保护装置的情况下进行。		

6 Warning and cautions in handling the lithium-ion cell

电芯使用时警告事项及注意事项

To prevent the possibility of the cell from leaking, heating, explosion, please observe the following precautions:

为防止电芯可能发生泄露，发热，爆炸，请注意以下预防措施：

- » Don't immerse the cell in water.
- » 严禁将电芯浸入水中，保存不用时，应放置在阴凉干燥的环境中。
- » Don't use and leave the cell near a heat source such as fire or heater.
- » 禁止将电芯在热高温源旁，如火，加热器等旁边使用和留置。
- » When charging, use a cell charger specifically for that purpose.
- » 充电时请选用锂离子电芯专用充电器。
- » Don't reverse the positive and negative terminals.
- » 严禁颠倒正负极后使用电芯。
- » Don't connect the cell to an electrical outlet directly.
- » 严禁将电芯直接插入电源插座。
- » Don't discard the cell in fire or heater.
- » 禁止将电芯丢入火或加热器中。
- » Don't connect the positive and negative terminal directly with metal objects.
- » 禁止用金属直接连接电芯正负极，造成短路。
- » Don't transport and store the cell together with metal objects such as necklaces, hairpins.

- » 禁止将电芯与金属，如发卡、项链等一起运输或存储。
- » Don't strike, throw or trample the cell.
- » 禁止敲击，抛掷或踩踏电芯等。
- » Don't directly tin soldering the cell.
- » 禁止直接锡焊电芯。
- » Don't pierce the cell with a nail or other sharp object.
- » 禁止用钉子或其它利器刺穿电芯。

Caution 小心

- » Don't use or leave the cell at very high temperature conditions (for example, strong direct sunlight or a vehicle in extremely hot conditions).
- » 禁止在高温下（直热的阳光下或很热的汽车中）使用或放置电芯，否则可能会引起电芯过热，起火或功能失效，寿命减短。
- » If the cell leaks and the electrolyte get into your eyes, don't wipe eyes, instead, thoroughly rinse the eyes with clean running water for at least 15 minutes, and immediately seek medical attention. Otherwise, eyes injury can result.
- » 如果电芯发生泄露，电解液进入眼睛，请不要搓揉，应用清水冲洗眼睛，必要时请立即前往医院接受治疗，否则会伤害眼睛。
- » If the cell gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during usage, recharging or storage, immediately remove it from the device or cell charger and stop using it.
- » 如果电芯发出异味，发热，变色，变形或使用、存储、充电过程中出现任何异常现象，立即将电芯从装置或充电器中移开并停用。
- » In case the cell terminals get dirty, clean the terminals with a dry cloth before use.
- » 如果电芯弄脏，使用前应用干布抹净。
- » Long - term storage not in use, The battery voltage should be kept between 3.6~3.9V
- » 长期存储不使用时，应保持电池电压在 3.6~3.8V 之间。

7 The restriction of the use of hazardous substances 有害物质控制要求

This model of lithium-ion cell is in accordance with our company's request of "environmental substances control standard".

本型号锂离子电芯符合本公司“环境物质控制标准”要求！

8 Contact information 联系方式

Headquarter : Southwest corner of the intersection of Xinqiao Road and Jintang Road in Lujiang County Economic Development Zone, Hefei City, Anhui Province, China

厂址：庐江县经济开发区新桥路与金汤路交叉口西南角

Tel: 0551- 87771768

电话：0551- 87771768



安徽潜川动力锂电科技有限公司

Anhui Qianchuan Power Lithium Battery Technology Co., Ltd.

9 Version change record 修改记录

Serial Number 序号	Change item 修改项目	Change Content 修改内容	修改人 PIC	修改日期 Date
A/00	无	初次发行	无	无