版本号：A0

圆柱形锂离子电芯产品规格书

SPECIFICATION OF PRODUCT

Cylindrical Lithium Ion Rechargeable Cell

电芯型号：INR18650T-2500mAh

Model：INR18650T-2500 mAh

Document No. 文件编号			**Date** 实施日期	2018-8-25	
Originator 编制		**Checked By** 审核		**Approved By** 批准	

日月牌电池 Since 1931

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1 Scope 适用范围

This specification of product describes technical characteristics, testing procedure, warnings and cautions of the lithium ion rechargeable cell. The specification only applies to INR18650T-2500mAh cell manufactured by Wuhan Sunmoon Battery Co., Ltd.

本产品规格书规定了武汉中原长江科技发展有限公司生产的型号为 INR18650-2500mAh 电芯的技术要求、测试方法及注意事项。

2 Details of Product 产品基本特性

Table 1 表 1

Item 项目	Specification 参数	Remark 备注
Category 产品类型	Cylindrical Lithium Ion Rechargeable Cell 圆柱形锂离子二次电芯	
Model 电池型号	INR18650-2500	
Nominal Voltage 标称电压	3.60 V	
Nominal Capacity 标称容量	2500 mAh ($0.2C_5$)	After standard charging, then $0.2C_5$ discharge to 3.0V, at 25ºC. 标准充电，在 25ºC 下，$0.2C_5$ 放电至 3.0V。
Typical Capacity 典型容量	2530mAh ($0.2C_5$)	After standard charging, then $0.2C_5$ discharge to 3.0V, at 25ºC. 标准充电，在 25ºC 下，$0.2C_5$ 放电至 3.0V。
最小容量 Minimum Capacity	2500mAh ($0.2C_5$)	After standard charging, then $0.2C_5$ discharge to 3.0V, at 25ºC. 标准充电，在 25ºC 下，$0.2C_5$ 放电至 3.0V。
End-of-charge Voltage 充电截止电压	4.2 V±0.05V	
End-of-discharge Current 充电截止电流	$0.02C_5$A(At CV Mode)	
Cut-off Voltage 放电截止电压	3.0 V	
充电时间 Charging Time	8.0(Standard Charge) 8 小时	
Quick Charge Current 快速充电电流	2500mAh($1.0C_5$ Rate)1C 充电	
Quick Discharge Current 快速放电电流	5000mA($2.0C_5$Rate) 2C 放电	
Maximum Instantaneous Pulse Discharge Current 大瞬间脉冲放电电流	7500mA（$3.0C_5$ Rate）3C 放电	
AC Impedance 交流阻抗	≤20mΩ	AC 1kHz 交流频率 1kHz

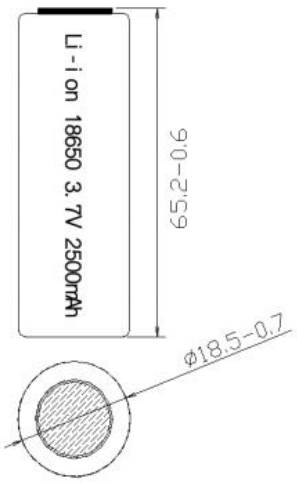
Item 项目	Specification 参数	Remark 备注
Weight 重量	45.5±2g	
Size 尺寸	Diameter(直径): 18.5mm-0.7mm Height（高度）:65.2mm-0.6mm	
Operating Temperature 使用温度	Charge 充电：0ºC~45ºC Discharge 放电：-40ºC~85ºC	
储存温度 Storage Temperature	-5℃~35℃	
储存湿度 Storage Humidity	≤75%RH	
外观 Appearance	Without Scratch, Distortion，Contamination and Leakage(无划痕、变形、污迹、电解液泄露)	
Standard Condition 标准环境	Temperature(温度): 25±2℃; Humidity（湿度）：45~75%RH; Atmospheric Pressure(大气压)：86~106KPA	

Temperature Dependence of Discharge Capacity
放电容量与温度的相互关系 @0.2C Discharge to 2.5V(0.2C 放电到 2.5V)

Charge Temperature	Discharge Temperature				
25℃	-40℃	-30℃	-20℃	25℃	85℃
Relative Capacity	50%	70%	80%	100%	95%

3 Outline Drawing 外形图

Drawing 1 图 1



4 Performance and Testing Procedure 性能及测试方法

4.1 General Performance 常规性能

Table 2 表 2

Item 测试项目	Test Methods and Condition 测试方法和条件	Requirement 检验标准
0.2C Capacity 0.2C 容量	After standard charging, rest battery for 10min, then discharging at 0.2C to voltage 3.0V, recording the discharging time. 标准充饱电后,搁置 10 分钟,然后用 0.2C 电流放电至 3.0V, 所记录放电时间	≥300min
Cycle Life 循环寿命	Constant current 0.5C charge to 4.2V, then constant voltage charge to current declines to 0.01C, rest 10min ， constant current 0.5C discharge to 3.0V ， rest 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells 先用 0.5 C 恒流充电至 4.2V，再恒压 4.2V 充电直至充电电流≤0.01C,搁置 10 分钟,再用 0.5C 电流放电至 3.0V;又搁置 10 分钟,重复以上步骤,直到放电容量是初始容量的 80%	≥300 times(次)
Capability of keeping electricity 荷电保持能力	20±5℃, After standard charging, rest the battery 28days, discharging at 0.2C to voltage 3.0V, recording the discharging time. 在 20±5℃状态下,标准充饱电后,电芯搁置 28 天,然后用 0.2C 放电至 3.0V,所记录放电时间.	≥240min

4.2 Environmental Adaptability Test 环境适应性

Table 4 表 4

Item 测试项目	Test Methods and Condition 测试方法和条件	Requirement 检验标准
Discharge at high temperature 高温放电	After standard charging, rest the cells 4h at 60 ± 2 ℃ , then discharging at 1C to voltage 3.0V, recording the discharging time. 标准充电后，在 60±2℃条件下贮存 4h，然后用 1C 放电至 3.0V,所记录放电时间.	≥54min
Thermal shock	Put the cells in the oven. The	No fire or

Item 测试项目	Test Methods and Condition 测试方法和条件	Requirement 检验标准
热冲击	temperature of the oven is to be raised at 5±2℃ per minute to a temperature of 130±2℃ and remains 30 minutes. 将电池放进烘箱内，以 5±2℃/min 速度升高烘箱内温度至 130±2℃后,恒温 30min.	explosion 不起火,不爆炸

4.3 Safety Performance 安全性能

Table 5 表 5

Item 测试项目	Testing Procedure 测试方法	Requirement 检验标准
Over Discharge 过放	At 20 ± 5 ℃ , According to the requirements of standard charge, the cells will be discharge to cut-off voltage, then The discharged cell is then subjected to a forced discharge at constant current 1C to -4.2V. The total duration for the forced discharge testing is 90 min. 在 20±5℃状态下，按标准放电的要求放电至终止电压后,然后以 1C 电流强制放电至-4.2V,持续强制放电 90 分钟	No fire, no explosion and no leakage 不起火、不爆炸、不漏液
Short Circuiting 短路	At 55 ± 5 ℃ , After standard charging, connect cells anode and cathode by wire which impedance less than 80± 20mΩ, The cell remains on test for 24 h or until the surface temperature declines by 20 % of the maximum temperature rise, whichever is the sooner. 在 55±5℃状态下,标准充电后,将电池的正负极用一根小于 80±20mΩ的导线连接,放置 24 小时或电池显示温度是最高温升的 20%。	No fire, no explosion 不起火、不爆炸

5 Cautions In Use 使用警告

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

为了使电池安全的使用及处理请在使用前认真的阅读操作说明

- Do not expose to, dispose of the battery in fire.
- 不能把电池曝晒或丢在火中
- Do not put the battery in a charger or equipment with wrong terminals connected.
- 电池充电时不能把正负极性装反
- Avoid shorting the battery
- 避免短路电池
- Avoid excessive physical shock or vibration.
- 避免过分的物理震动和冲击电池
- Do not disassemble or deform the battery.
- 不能拆解或使电池变形
- Do not immerse in water.

- 不能将电池浸入水中
- Do not use the battery mixed with other different make, type, or model batteries.
- 不能将其它不同厂家，类型，型号的电池混合使用
- Keep out of the reach of children.
- 禁止小孩接触电池

Charge and Discharge 充放电

Battery must be charged in appropriate charger only.

电池必须在合适的条件下充电

Never use a modified or damaged charger.

决不能用故障的充电器给电池充电

Do not leave battery in charger over 24 hours.

电池持续充电不能超过 24H

Storage 贮存

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

电池贮藏在通风干燥的环境中

Disposal 处理

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

不同国家法规的不同，处理时根据当地的法规。

6 Battery Operation Instruction 电池操作说明

6.1 Charging 充电

Charging current :Cannot surpass the biggest charging current which in this specification book stipulated.

充电电流：不能超过规格书规定的最大的充电电流

Charging voltage : Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.

充电电压：不能超过规格书规定的最高的限制电压

Charge temperature :The battery must carry on the charge in the ambient temperature scope which this specification book stipulated。

充电温度：电池充电温度必须按照规格书的温度范围执行

Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the battery positive electrode and the cathode meet instead, can damage the battery。

先恒流后恒压方式充电，禁止颠倒的方式充电。如果电池正负极颠倒充电会带来危险。

6.2 Charging Current 放电电流

The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the oversized electric current electric discharge can cause the battery capacity play to

reduce and to cause

the battery heat。

电池放电电流不能超过规格书规定的最大放电电流，过大的电流放电会造成电池发热和容量衰减。

6.3 Discharge Temperature 放电温度

The battery discharge must carry on in the ambient temperature scope which this specification book stipulated

电池放电温度必须按照规格书的温度范围执行

6.4 Over-discharges 过放电

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity。

短时间的的过充过放不影响电池的使用，但是长时间的过放电会影响到电池的功能失效，电池永久性不 能适用，电池可能过放还有一个原因是自动能量的消失。预防电池过放的出现方法是电池应保持一定的电量。

6.5 贮存电池。

The battery should store in the product specification book stipulation temperature range. If has surpasses above for six months the long time storage, suggested you should carry on additional charge to the battery。

电池贮存在规格书规定的温度范围内，如果电池贮存超过六个月，建议你开始给电池充电。

7 Period of Warranty 保质期

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

电池的保质期从出货之日算起为 1 年。如果证明电池的缺陷是在制造过程中形成的而不是由于用户滥用及错误使用造成，本公司负责退换电池。

8 Other The Chemical Reaction 其它化学反应

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this

may indicate it is time to change the battery.

由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使是存放很长一段时间而 不使用。如果使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，也会缩短电池的使用寿命，或者产生漏液导致设备损坏。如果电池长周期不能充电，即使充电方法正确，这样需要更换电池了。

9 备注

Any other items which are not covered in this specification shall be agreed by both parties.

本说明书未包括事项应由双方协议确定。