EN: This Datasheet/Document is presented by the manufacturer.

Please visit our website for pricing and availability at www.hestore.hu.

锂离子电芯规格书
PRODUCT SPECIFICATION
RECHARGEABLE LITHIUM ION CELL

型号：INR18650-32HE

Model Name: INR18650-32HE

编制 Prepared By:	丁德峰
审核 Checked By:	吴比赫
批准 Approved By:	郑春龙
生效日期 Effective Date:	2020/03/31

江苏天鹏电源有限公司
Jiangsu Tenpower Lithium Co., Ltd
一厂地址：中国江苏省张家港市新兴产业园区南港路
Add: Nangang Rd,Emerging industries Zone, Zhangjiagang City, Jiangsu, P.R. China
二厂地址：中国江苏省张家港市经济技术开发区新丰东路 6 号
Add: NO.6 Xinfeng East Rd, Economic Development Zone, Zhangjiagang City, Jiangsu, P.R. China
电话 Tel: +86 512 80159961
传真 Fax: +86 512 80159936
网址 Website: www.tenpowercell.com
邮编 P.C.: 215624

该产品规格书为江苏天鹏电源有限公司保密文件，仅供客户内部使用。
TENPOWER confidential proprietary

目录 Contents

1. 范围 Scope 3
2. 型号 Model 3
3. 标称规格 Nominal Specifications 3
4. 外形尺寸（含热缩套）Outline Dimensions(with tube) 5
5. 电芯喷码 Cell Marking 5
6. 外观 Appearance 6
7. 标准测试条件和定义 Test Condition and Definitions 6
8. 电性能 Electrical Characteristics 7
9. 机械特性 Mechanical Characteristics 8
10. 安全特性 Safety 9
11. 保证 Warranty 10
12. 激活 Activation 10
13. 其他 Others 11
14. 包装 Packing 11
15. 运输 Shipping 11
正确使用和处理锂离子电池说明 12
Proper use and handling of lithium-ion batteries 12
1. 充电 Charging 12
2. 放电 Discharging 12
3. 储存 Storage 13
4. 循环 Cycle life 13
5. 电池包设计预防措施 Precautions on Battery Pack Design. 13
6. 电池组组装 Battery Pack Assembly 14
安全守则 Safety Instruction 15
[Danger!] 15
1. 电性能滥用 Electrical misusage 15
2. 环境滥用 Environmental misusage 15
[Warning !] 16
[Caution !] 17

1. 范围 Scope

本规格书描述了江苏天鹏电源有限公司生产的可充电锂离子电芯产品性能指标。

This product specification describes production of rechargeable lithium-ion batteries performance indicators produced.by JIANGSU TENPOWER LITHIUM Co., Ltd.

2. 型号 Model

产品描述：电芯（可充电锂离子电芯）

Description: Cell (lithium-ion rechargeable cell)

产品型号：INR18650-32HE

Model name: INR18650-32HE

3. 标称规格 Nominal Specifications

项目Item	规格Specification
3.1. 标称容量 Nominal capacity	3200mAh（标准充电后，620mA 放电至截止电压 2.5 V） 3200mAh (the cut-off discharge at 2.5V when the discharge current is 620mA after standard charge)
3.2. 最小容量 Minimum capacity	3100mAh （620mA 放电至截止电压 2.5 V） 3100mAh (the cut-off discharge at 2.5 V when the discharge current is 620mA)
3.3. 内阻 （mΩ） Internal Impedance at 1000 Hz	≤35（mΩ）(25±3℃)
3.4. 充电截止电压 Cut-off charging voltage	4.20±0.05V
3.5. 标称电压 Nominal voltage	3.6V
3.6. 标准充电模式 Standard charging mode	恒流恒压（恒压截止电流为 62mA） CC-CV (cut-off current is 62mA)
3.7. 充电电流 Charging current	标准充电：1550mA 倍率充电：3100mA Standard charge: 1550mA Rapid charge: 3100mA
3.8. 最大（持续）放电电流 Max discharge current (continuous)	10A（25 ± 3 °C）
3.9. 重量 Cell weight	47.0g max.

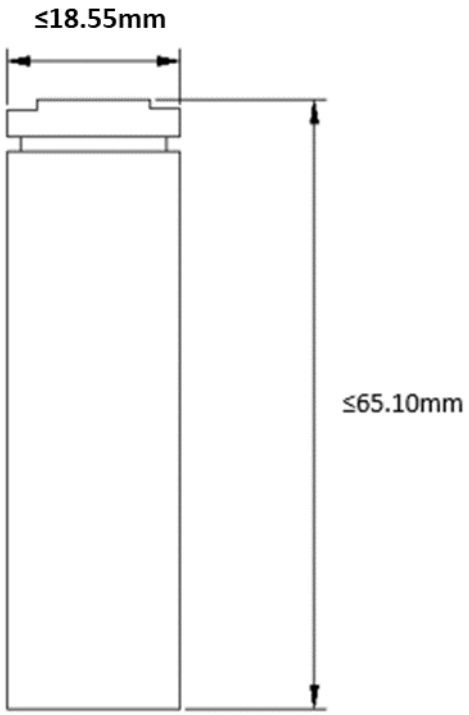
3.10. 尺寸 Cell dimension	高度：≤65.10mm 直径：≤18.55mm Height：≤65.10mm Diameter: ≤18.55mm
3.11. 工作环境温度 Operating temperature (surface temperature)	充电： 0<T≤10℃，620mA 10<T≤20℃，1550mA 20<T≤45℃，3100mA 放电： -20 ~ 60 ℃ Charge： 0<T≤10℃，620mA 10<T≤20℃，1550mA 20<T≤45℃，3100mA Discharge: -20 to 60 ℃
3.12. 储存温度 Storage temperature	1 年： -20 ~ 25 ℃ 3 个月： -20 ~ 45 ℃ 1 个月： -20 ~ 60℃ 1 year: -20 to 25 ℃ 3 month： -20 to 45 ℃ 1 month: -20 to 60 ℃

Note (*) :

如果存储时电芯为出厂状态（约 30%的充电容量），这种情况下，恢复的容量≥标准放电容量的 90%。

If the cell is kept as ex-factory status (30% of charge), the capacity recovery rate is more than 90% of standard discharge capacity.

4. 外形尺寸（含热缩套）Outline Dimensions(with tube)



单位：毫米

Unit : mm

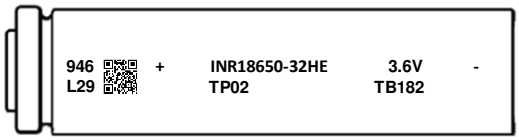
图 1：INR18650-32HE 电芯的外形尺寸

Fig. 1 Outline Dimensions of INR18650-32HE

5. 电芯喷码 Cell Marking

标准喷码参考下图：

See below: Standard Marking



5.1 电池型号(Cell type)

INR18650 3200mAh

5.2 标称电压(Nominal voltage)

3.6V

5.3 公司名称（Manufacturer Name）

TP （江苏天鹏电源有限公司的缩写）

TP （Trade name of Jiangsu Tenpower Lithium Co., Ltd）

5.4 化学体系（Chemical system）

LI-ION

5.5 生产日期及地点（Date and Plant site）

TB182

T： 年 2020 年，2001 年为 A，以此类推；

B： 月 2 月，1 月为 A，以此类推；

18：日 18 日，使用当时日期；

2： 生产地点 二厂，1 为一厂，2 为二厂

T: Year 2020, 2001 as A, Every next year is counted as B, C , …;

B: Month January as A, the consecutive month as B, C , …;

18: Day 01,02,…29,30,31

2: Plant site Plant 2, 2: Plant 1, 2: Plant 2

5.6 追溯二维码（Tracking number）

946
L29

6. 外观 Appearance

电芯外观不存在明显的刮痕、凹坑、裂痕、锈蚀、漏液等影响电芯性能的外观不良。

There is no bad appearance such as scratches, dents, cracks, corrosion, leakage, which affect the performance of the batteries.

7. 标准测试条件和定义 Test Condition and Definitions

7.1. 测试设备 Measuring Equipment

充放电设备 Charge/Discharge Equipment

电压精度：±10 mV; Voltage precision:±10 mV;

电流精度：±0.2 %; Current precision: ± 0.2 %;

游标卡尺 Slide caliper

游标卡尺精度为 0.01 mm

The slide caliper should have a scale of 0.01 mm.

电压/内阻测试仪 Voltage/Impedance meter

内阻精度：±0.5 mOhm; Impedance precision: ± 0.5 mOhm;

电压精度：±2 mV; Voltage precision: ± 2mV;

在 1kHz 交流条件下进行内阻测试。

The impedance meter should be operated at AC 1kHz.

7.2. 除特殊要求外，所有测试均在标准温度 25 ± 3 °C 和标准湿度 65 ± 20 % RH 的条件下进行。测试使用电芯为交货一周内的电芯。

Unless otherwise specified, all tests should be performed at 25 ±3 °C and humidity of 65 ± 20 % RH. The cells used for the test mentioned should be delivered within one week.

7.3. 定义 Definitions:

C 倍率（“C”）：满电电芯 1 小时放电至终止电压所用的电流大小（mA）。

C Rate (“C”): The rate (milliamperes) at which a fully charged cell is discharged to its ending voltage in one (1) hour.

8. 电性能 Electrical Characteristics

8.1. 标准充电 Standard charge

标准充电定义为 25±3℃下，1550mA 恒流充电至截止电压 4.2 V，恒压截止电流至 62mA。
This "Standard charge" means charging the cell with constant current 1550mA and then with constant voltage 4.2V and 62mA cut-off at 25±3℃.

8.2. 标准放电 Standard discharge

标准放电是指 25±3 ℃时标准充满电后，620mA 恒流放电至截止电压 2.5V。
The "Standard discharge" means discharging current of 620mA with 2.5V cut-off at 25±3 ℃ after the standard charge.

8.3. 标准倍率放电 Standard Rate discharge

标准倍率放电容量是指电池的初始放电容量，按如下形式，在 25±3℃下，按照标准充满电后，1C 恒流放电至截止电压 2.5V 所得到的容量。
The standard discharge capacity is the initial discharge capacity which is measured with discharge current of 1C with 2.5V cut-off at 25±3℃ after the standard charge.
标准倍率放电容量≥ 2976mAh (96% of 3100mAh)
Standard discharge capacity≥ 2976mAh (96% of 3100mAh)

8.4. 温度与放电容量的关系 Temperature dependence of discharge capacity

不同温度下容量的对比，不同温度下容量的对比，按如下形式测试，标准充满电后按 1C 恒流放电至截止电压 2.5V 所得到的容量，数据如下：
Capacity comparison at each temperature, measured with discharge constant current 1C and 2.5V cut-off after the standard charge is as follows.

温度 Temperature	-10℃	0℃	25℃	60℃
容量比率 Relative Capacity	55%	65%	96%	96%

备注： 如果充放电温度不一致，充电后在测试的温度环境中搁置 3 小时；表中的百分比值，按 25℃(=3100mAh)的容量作为参照比。
Note: If charge temperature and discharge temperature is not the same, the interval for temperature change is three (3) hours. Percentage as an index of the capacity at 25℃(=3100mAh) is 100%.

8.5. 倍率放电性能 Discharge rate capabilities

放电容量按如下测试，标准充电后，按照不同的电流恒流放电至截止电压 2.5V 所得到的容量。
Discharge capacity is measured with the various currents which shown in under table and 2.5V cut-off after the standard charge.

放电条件 Discharge Condition					
电流 Current	0.62A	1.55A	3.1A	5A	10A
容量比率 Relative Capacity	100%	97%	96%	93%	90%

备注：表中的百分比值，按 25℃(=3100mAh)的容量作为参照比。

Note: Percentage as an index of the capacity at 25℃(=3100mAh) is 100%.

8.6. 循环测试 Cycle life

在 25±3 °C 环境下，1550mA CC-CV 模式充电至 4.2V，截止 63 mA，静置 15 分钟，3100mA 恒流放电至截止电压 2.5V，休息 30 分钟，为一个循环。循环 500 次后，容量≥25℃首次放电容量的 80%。

Each cycle is an interval between the 1550mA CC-CV charge to 4.2V at 25±3 °C, cut off 63 mA, rest 15 minutes, and then discharge (discharge current 3100mA) to 2.5V , and rest 30 minutes again. After 500 cycles, the capacity is higher than 80% of the first discharge capacity.

8.7. 储存特性 Storage characteristics

标准充电后，在环境温度 25±3 ℃的条件下存储 28 天，25 ℃下以 620mA 恒流放电至截止电压 2.5V 所得的容量为剩余容量，剩余容量≥25 ℃下标准放电容量的 90%

Storage for 28 days at 25±3 ℃ from the standard charge, measured with discharge constant current 620mA with 2.5V cut-off at 25 ℃. Capacity retention (after the storage) ≥ 90% of the standard discharge capacity at 25 ℃.

8.8. 电池出厂状态 Status of the cell as of ex-factory

电池充电至约 30%荷电态，开路电压 3.49~3.64V 出货。

The cell should be shipped in 30% charged state. In this case, OCV is from3.49~3.64V.

9. 机械特性 Mechanical Characteristics

测试项目 Items	判断标准 Criteria	测试方法与条件 Test Method and Condition
振动测试 Vibration test	电解液无泄漏 There shall be no electrolyte leakage	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。 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.
机械冲击性能 Mechanical shock	电芯不漏液、不起火、不爆炸 No leakage 、No fire 、No explosion	机械冲击应在三个相互垂直的 X,Y,Z 每个轴上施加。每次冲击要施加在电芯表面的法线方向上。每次冲击加速在初始 3ms，最小平均加速度为 75G（G 为当地加速度）。峰值加速度应该在 125G～175G 之间。 In direction X, Y, and Z intersecting one another at right-angles, apply impacts having a minimum mean acceleration of 75G in the first 3mSec and a peak acceleration that falls between 125G and 175G.

10. 安全特性 Safety

测试项目 Items	判断标准 Criteria	测试方法与条件 Test Method and Condition
过充测试 Abnormal Charging Test	不着火不爆炸 No fire and no explosion	将电芯放电至终止电压后，以 3C 电流进行充电至电压达到 10V。测试过程中监测电芯温度变化，当电芯温度下降至室温时，结束测试。 Cell fully discharged, then overcharged with3C to 10V. Monitoring cell temperature during testing. Stop the test when cell temperature decays to room temperature.
过放电测试 Over-discharge Test	不着火不爆炸 No fire and no explosion	电芯按标准充电方式充完电后，以 1C 电流放电 90min After standard charge, then discharged with 1C for 90min.
短路测试 Short-Circuit Test	不着火不爆炸 No fire and no explosion	标准充电后，在 20℃±5 环境中用不超过 100mΩ金属丝将单颗电池短路至电池恢复到常温。 After standard charge, short-circuit the cell at 20℃±5℃ until the cell temperature returns to ambient temperature.(cross section of the wire or connector should be less than 100mΩ).
挤压测试 Crush Test	不着火不爆炸 No fire and no explosion	标准充电后，电芯放置于两个水平平板之间，要求电芯长度方向与平板平行。对两平板持续加压，直到液压达到 2500psig（17.2MPa），两平板间压力到达 3000pounds（13kN）的挤压力，结束测试。 After standard charge, cell is to be crushed between two flat surfaces and with cell longitudinal axis parallel to the flat surfaces of the crushing apparatus. The crushing is to be continued until a pressure reading of 2500 psig(17.2 MPa) is reached on the hydraulic ram, applied force of 3000 pounds (13 kN). Once the maximum pressure has been obtained it is to be released.
热冲击 Heating Test	不着火不爆炸 No fire and no explosion	标准充电后，电芯放置到恒温加热箱中，用热电偶连接电芯监测电芯温度。恒温箱升温加热电芯，要求恒温箱升温速度为每分钟 5±2℃。监测恒温箱温度变化，当恒温箱温度达到 130±2℃后恒温保持 10 分钟，结束测试。

该产品规格书为江苏天鹏电源有限公司保密文件，仅供客户内部使用。
TENPOWER confidential proprietary

		After standard charge, cell is to be placed in the hot oven. Store the testing cells connecting with thermocouple in constant temperature box, heating the cells and box(speed of ascending temperature is 5ºC±2ºC per min) together at room temperature simultaneity, monitor the temperature change of the box, keep for 10 minutes after the box temperature reaches 130ºC±2ºC,then stop the test.
自由跌落测试 Free falling (drop)	不着火不爆炸 No fire and no explosion	标准充电后，从 1.0m 高度自由跌落到水泥地面上 3 次，单体电池在跌落时，应保证每个随机方向均受到冲击。 Each fully charged cell is dropped three times from a height of 1, 0 m onto a concrete floor. The cells are dropped so as to obtain impacts in random orientations.

11. 保证 Warranty

11.1. 自出货之日起，电芯的保质期为一年。在此期限内，如果非 TENPOWER 制程原因，而是由于客户的误用造成的电芯质量问题，TENPOWER 公司不承诺免费更换。

The warranty period of a Cell is one (1) year after the delivery to the Customer. However, even though the problem occurs within this period, TENPOWER won't replace a new cell for free as long as the problem is not due to the failure of TENPOWER manufacturing process or the problem is due to Customer's abuse or misuse.

10.2 TENPOWER 公司对违反安全守则操作所产生的问题不承担任何责任。

TENPOWER will not be responsible for trouble occurred by handling outside of the precautions in safety instructions.

10.3 由包装，电路、电芯组以及充电器搭配使用所产生的问题 TENPOWER 概不负责。

TENPOWER will not be responsible for packing, trouble occurred by matching electric circuit, cell pack and charger.

10.4 收货后在电芯组装过程中产生的不良电芯 TENPOWER 不予以质量保证。

TENPOWER will be exempt from warrantee any defect cells during assembling after acceptance by the Customer.

12. 激活 Activation

电池每隔 3 个月激活电池一次，标准的激活方式为：使用标准充电方式 8.1 充电后静置 10 分钟，再使用标准放电方式 8.2 放电后静置 30 分钟，使用 750mA 电流恒流充电 0.5 小时。
如电池已被装配或已使用，须用配套的充电器和机器做激活。

Please activate the battery once every three months according to the following method:
Cell shall be charged per 8.1, rest 10mins, then be discharged per 8.2, rest 30mins. Charge the cell at constant current of 750mA for 0.5hours.
If the battery has been assembled or used, use the suitable matched charger and machines

to activate.

13. 其他 Others

13.1 长期储存 Storage for a long time

如果电芯要储存三个月及以上的时间，电芯必须在干燥、低温下储存。

If the cell is kept for a long time (3 months or more), it is strongly recommended that the cell is preserved at dry and low temperature.

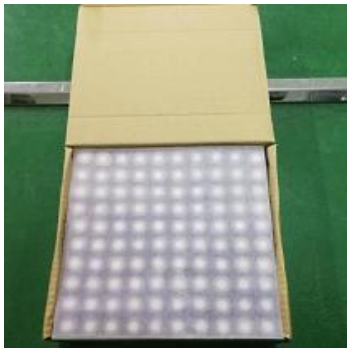
13.2 任何未包含在此产品规格书之内的问题，由双方协商解决。

Any matter not included in that specification should be discussed and confirmed by both parties.

14. 包装 Packing

电芯使用 TENPOWER 标准的外箱， 每箱装 4 盒，每盒装 100 只电芯。

The cells are packed with TENPOWER standard carton, which hold four inner boxes. There are 100 cells per inner box.



15. 运输 Shipping

出货电芯约 30%荷电状态，由于电芯存在自耗电，运送到客户端的电芯无法完全保证 30%荷电量。运输过程应防止剧烈振动、冲击、日晒雨淋。

The capacity of delivery cell is approximately at 30% of charging. Due to the self-discharge, it is not specified more than 30% capacity remain at customer, During transportation, keep the cell from acutely vibration, impacting, solarization, drenching.

正确使用和处理锂离子电池说明

Proper use and handling of lithium-ion batteries

使用之前请阅读
江苏天鹏电源提供
See before using lithium-ion cell
Supplied by
Jiangsu Tenpower Lithium Co ., Ltd.

1.充电 Charging

1.1. 正常电芯充电电压设定为 4.2V，考虑到充电器的控制偏差，必须保证电芯充电电压低于 4.25V，即使在异常情况下，充电电压不可超过 4.25V 以避免过充电。充电电压高于 4.25V 会导致电芯循环寿命缩短，并会导致电池失效，严重的会出现安全问题。

Charging voltage must be set 4.2V/cell. Concerning charge voltage tolerance of charger, charging voltage must be set below 4.25V/cell. Even if the charge could be out of order, charge voltage of charger should not be above 4.25V/cell to avoid over-charging. Cell life will be shorten by charging voltage above 4.25V, leading to cell failure, serious can appear safety problems.

1.2. 必须使用恒压恒流方式对电芯进行充电，不可使用持续充电方式。

Cell must be charged with CC (constant current) - CV (constant voltage) method. Do not use the continuous charging method.

1.3. 当电芯电压低于 3.0V 时，必须使用低于 0.2C 电流对电芯进行预充电，直到电芯电压高于 3.0V 再进行标准方式充电。如果电芯电压在限定时间内无法充至 3.0V，充电器需停止充电。

In case of cell voltage is below 3.0V, Cell should be charged with pre-charge that current is below0.2C. Then cell voltage reach over 3.0V, standard charge starts. And if cell voltage never reaches to 3.0V in specified period (timer), charger will stop charging.

1.4. 充电器必须能够通过计时，电流检测，开路电压检测监控电芯充电状态，如检测到电芯充满电，充电器需停止充电。

By timer, current detection and open circuit voltage detection, charger detects full charge. When charger detect cell is full charged, charger stop charging.

2.放电 Discharging

2.1. 电芯放电电流需小于规格书要求。

The discharge current of a cell must be below specified in the product specification.

2.2. 电芯放电终止电压需高于规格书要求。

The discharge end voltage of a cell must be over specified in the product specification.

2.3. 正常使用时电芯不可过放电至电压低于 2.0V。

The cell should not be over-discharged below 2.0V by using.

2.4. 电芯放电温度范围需按照规格书要求。

The cell should be discharged within a range of temperatures specified in the product

specification.

3.储存 Storage

3.1. 电芯应在干燥无腐蚀性气体的环境下储存。

The cell should be stored in a dry area and no corrosive gas.

3.2. 不要让电芯承受任何压力。

No press on the cell.

3.3. 储存温度要求 Storage temperature

储存期 1 个月 : -20°C ~ +60°C

When stored within 1 month : -20°C ~ +60°C

储存期 3 个月 : -20°C ~ +45°C

When stored within 3 months: -20°C ~ +45°C

储存期 12 个月: -20°C ~ +25°C

When stored within 12 months : -20℃ ~ +25°C

3.4. 电芯组装后，若电池包超过 1 年未能使用，须将电池充电到约 30% 荷电态，以避免电池电压降的过低。

After the cell assembled in pack, the pack should be recharged to 30% SOC if the pack has never been used for one (1) year, this will avoid the cell voltage drop too low.

4.循环 Cycle life

4.1. 在超出限定温度范围进行充电或放电，会引发电芯产热或严重的损伤，也会造成循环寿命缩短及性能衰降。

Charge or discharge out of recommended range might cause the generating heat or serious damage of cell. And also, it might cause the deterioration of cell's characteristics and cycle life.

4.2. 循环性能 Cycle life performance

按照规格书中的方法和要求进行电芯充放电，循环数次和容量水平均可达到产品规格书中所对应的水平。

The cell can be charged/ discharged repeatedly up to times with a certain level of capacity specified in the production specification.

4.3. 电池寿命取决于充电、放电、使用温度、及储存条件。

Cycle life may be determined by conditions of charging, discharging, operating temperature and storage.

5.电池包设计预防措施 Precautions on Battery Pack Design.

5.1. 终端外形与构造设计能够有效阻止静电及水进入电池包内部。

Do not make the shape and mechanism which static electricity and water easy go through the battery pack inside.

5.2. 正常使用时过充保护能够确保电芯充电电压低于 4.2V，若电芯电压高于 4.2V 则停止充电。

Overcharge protection should work below 4.2V/cell by using. Then charge current shall be shut down.

5.3. 正常使用时过放保护能够在电芯电压达到 3.0V 时停止放电且漏电流需小于 1μA。
Within a voltage range of 3.0V/cell by using, over-discharge protection should work. Then discharge current shall be shut down and consumption current is below 1μA.

5.4. 电池包电路设计低漏电流（例如保护电路，电量监控等）以避免电芯储存过程被放电。
To avoid discharging during storage, design the low consumption current electronic circuit (e.g. Protection circuit, fuel gauge, etc) inside battery pack.

6.电池组组装 Battery Pack Assembly

6.1. 禁止使用受损电芯。不要使用由于运输损伤，跌落，短路，二次点焊或其它原因造成破损或漏液电芯。
Prohibition of usage of damaged cell. Do not use abnormal cell which has been damaged by shipping stress, drop, short, twice spot or something else, and which gives off electrolyte odor.

6.2. 电池组装前检查电池外包装。
The cell should be inspected visually before battery assembly.

6.3. 使用前需检测电芯电压及内阻。
Inspect voltage and internal impedance before using.

6.4. 不可使用锡焊以避免对电芯造成损伤，电池包组装使用点焊方式在电芯上连接导线及线路板。
Do not solder onto a cell in order to avoid damage on the cell. Weld spot welding lead plate onto cell, and solder lead wire or lead plate.

6.5. 电池组装须注意防静电，避免电子元件损伤。
The battery assembly must pay attention to anti-static, Avoid electronic components damaged by electrostatic.

6.6. 电池组装时须注意防止短路。
Battery assembly should pay attention to prevent the short circuit.

安全守则 Safety Instruction

锂离子电池如果使用不当会引起电池损坏甚至危害人身安全，使用前请仔细阅读并注意预防措施。
若顾客想了解本规格书以外的技术要求或使用条件，请与江苏天鹏电源有限公司联系相关事宜。
Lithium-ion battery if use undeserved can cause cell damage and even harm the personal safety, read it carefully before using and pay attention to the prevention measures.
Should there be any additional information required by the Customer, please contact Jiangsu Tenpower Lithium Co., Ltd.

[Danger!]

1.电性能滥用 Electrical misusage

1.1. 只按照规格书的说明充电或使用。
Use or charge the battery only in the stipulated application.
1.2. 使用 Lithium-ion 专用充电器。
Use the correct charger for Lithium-ion batteries.
1.3. 当把电池放入充电器中时，注意保证极性正确。
When connecting a battery pack to a charger, ensure correct polarity.
1.4. 不能对电池进行反充电。
Do not reverse charge batteries.
1.5. 当电池不使用时，不要将二次电池插在充电器上。
Do not maintain secondary batteries on charge when not in use.

2.环境滥用 Environmental misusage

2.1 不能将电池放入水中或海水中。
Never put a battery into water or seawater.
2.2 不能将电池投入火中。
Don't throw the battery into the fire.
2.3 不能使用或将电芯放在太阳光直射的地方（或阳光直接照射的车内）。这种情况会使得电芯产热，冒烟或起火，也可能使得电芯性能衰减及循环寿命缩短。
Do not use or leave the cell under the blazing sun (or in heated car by sunshine). The cell may generate heat, smoke or flame. And also, it might cause the deterioration of cell's characteristics or cycle life.
2.4 不能私自拆除、打开或分解电池，电池只能由专业人员拆解。多串电池组外壳须合理设计，使得专业人员只能使用工具拆解。
Do not dismantle, open or shred cells. Batteries should be dismantled only by trained personnel. Multicell battery cases should be designed so that they can be opened only with the aid of a tool.
2.5 不能直接对电池进行焊接。

Do not solder directly to batteries.

2.6 不能让电池处于不利环境中，比如极端的温度，深度循环，或者经常过充/过放电。

Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive overcharge/over discharge.

2.7 不能将电池短路，也不能将电池杂乱的放在盒子或抽屉里，电池的相互接触或由于导电材料的存在易形成短路，这将永久的损坏电池。

Do not short-circuit batteries. Do not store batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by conductive materials, permanent damage to batteries may result.

2.8 不能燃烧或毁坏电池，可能导致有毒气体释放或爆炸。

Do not incinerate or mutilate batteries, may burst or release toxic material.

2.9 不能让电池承受机械冲击。

Do not subject batteries to mechanical shock.

[Warning !]

1.1. 在使用新电池前，或者长期存放后第一次使用电池，在使用前请将电池充满电。

When using a new battery or a battery to be used for the first time after long term storage, please fully charge the battery before using.

1.2. 禁止反向充电 Prohibition of reverse charge

正确连接电池的正负极，严禁反向充电。若电池正负极接反，应保证无法对电芯进行充电。反向充电会降低电芯的充放电性能、安全性，并会导致发热、泄漏。

Reverse charge is prohibited. Cells shall be connected correctly. The polarity has to be confirmed before wiring. If a cell is connected improperly, the cell cannot be charged. Simultaneously, the reverse charging may cause damage to the cell which may lead to degradation of cell performance and damage the cell safety, and could cause heat generation or leakage.

1.3. 不能将我公司电池与其他品牌的电池或者不同种类的电池，比如碱性锌电池混用。

Do not mix our batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.

1.4. 不能将新旧电池混用，可能会导致过放电。

Do not mix new batteries in use with semi-used batteries, over-discharge may occur.

1.5. 如果出现噪音，温度异常，或者漏液，请停止使用。

If find any noise, excessive temperature or leakage from a battery, please stop its use.

1.6. 如果电池发烫，请勿触摸，直至冷却。

When the battery is hot, please do not touch it and handle it, until it has cooled down.

1.7. 不能把电池（电池组）的外套去除。

Do not remove the outer sleeve from a battery pack nor cut into its housing.

1.8. 电池使用时发现功率下降，请关闭用电器开关以防止电池过放。

When find battery power down during use, please switch off the device to avoid over discharge.

1.9. 电池使用后，如果电池发热，再次充电前，请在通风环境中冷却。

After using, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

1.10. 不能尝试分离，挤压，撞击电池，电池会发热或起火.电池中的碱液对皮肤和眼睛有害，而且会损伤衣服。

Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.

1.11. 不能将电池放入水中或海水中。

Never put a battery into water or seawater.

1.12. .要使电池远离儿童。如发现吞食，立即联系医生。

Keep the battery away from babies and children. If swallowed, see a doctor immediately.

1.13. 电池泄漏时，液体不能接触皮肤和眼睛。一旦接触，立即用大量的水冲洗患处，并及时就医。

In the event of a cell leaking, do not allow the liquid to come into contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.

[Caution !]

1.1. 当电池不使用时，请把它从装置上取下。

When not using a battery, disconnect it from the device.

1.2. 取下电池组时，用手抓住插头而不是拉线。

Unplug a battery by holding the connector itself and not by pulling at its cord.

1.3. 废弃电池应交予有相关资质的处理单位处置。

Used batters should be treated by authorized units.

1.4. 长时间存储后，为了保证电池的最高效能，电池需要做数次充放电激活。

After extended periods of storage, it may be necessary to charge and discharge the batteries several times to obtain maximum performance.

1.5. 二次电池在室温下使用可以发挥出最好性能。

Secondary batteries give their best performance when they are operated at normal room temperature.

1.6. 电池保持清洁、干燥。

Keep batteries clean and dry.

1.7. 如果电池表面有污渍，用干燥整洁的布擦拭。

Wipe the battery terminals with a clean dry cloth if they become dirty.

1.8. 二次电池处理时，请将电池和其他电化学体系的产品分开。

When disposing of secondary batteries, keep batteries of different electrochemical systems separate from each other.

该产品规格书为江苏天鹏电源有限公司保密文件，仅供客户内部使用。
TENPOWER confidential proprietary

联系方式

Contact information

如有任何有关电芯或应用方面的技术疑问和咨询，请按以下地址联系：

If you have any questions regarding the cell and application, please contact the following address:

江苏天鹏电源有限公司

Jiangsu Tenpower Lithium Co., Ltd

一厂地址：中国江苏省张家港市新兴产业园区南港路

Add: Nangang Rd,Emerging industries Zone, Zhangjiagang City, Jiangsu, P.R. China

二厂地址：中国江苏省张家港市经济技术开发区新丰东路 6 号

Add: NO.6 Xinfeng East Rd, Economic Development Zone, Zhangjiagang City, Jiangsu, P.R. China

电话 Tel: +86 512 80159961

传真 Fax: +86 512 80159936

网址 Website: www.tenpowercell.com

邮编 P.C.: 215624

文件修订记录表(HISTORY RECORD)

修訂日期 (Date)	版次 (Rev.)	修订说明 (Revision Statement)	
		旧版内容 (Old)	新版内容 (New)
20/3/31	1.0		Initial Version