

Specification Approval Sheet(Cell)

产品规格确认书（电芯）

受控 07

Model: IFP40130220-107

型号: IFP40130220-107

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(规格变更记录)

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1 Scope

This document describes the Product Specification of the Lithium-ion rechargeable battery cell supplied by JiangSu Highstar Battery Manufacturing Co.,LTD.

适用范围

本规格说明书描述了江苏海四达电源股份有限公司生产的可充电锂离子电芯的产品性能指标。

2 Model: IFP40130220-107

型号: IFP40130220-107

3 Specification

规格

No.	Items (项目)	Specifications (规格)
1	Charge voltage 充电电压	3.65V
2	Nominal voltage 标称电压	3.2V
3	Initial Capacity 额定容量(discharge at 0.3C to voltage of 2.5V at 23°C±5°C)	107Ah (0.3C)
4	Standard Charging Current 充电电流	1C
5	Standard Charging method 标准充电方法	Under the conditions of 25°C ± 5 °C, 1C Constant current charge to 3.65V, then Constant voltage 3.65V charge till charge current decline to ≤0.05C. 在25°C±5 °C的条件下, 1C恒流充电至3.65V,转为3.65V恒压充电, 直至充电电流小于0.05C.
6	Max. charge current 允许连续最大充电电流	214A/2C
7	Max. Discharge current 允许连续最大放电电流	321A/3C
8	Discharge cut-off voltage 放电截止电压	2.5V
9	Operating temperature Relative humidity % 工作温度、湿度	Charging : 0°C-45°C, 65%±20%RH 充电: 0°C-45°C, 65%±20%RH
		discharging : -20°C-60°C, 65%±20%RH 放电: -20°C-60°C, 65%±20%RH
10	Recommended Storage temperature 推荐存储温度	15°C-35°C
11	Cell Weight 电芯重量	Approx. 2.35kg
12	Impedance 内阻	≤0.6mΩ
13	Cell dimension 电芯尺寸	厚度 thickness : 40.2mm±1.0mm 宽度 Width : 130.2mm±0.2mm 长度 Length : 220.2mm±0.5mm

4 Battery Cell Performance Criteria and Test Conditions

电芯性能标准以及测试条件

4.1 Standard environmental test conditions

标准测试环境

Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition:

Temperature : $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$

Relative Humidity : $65\% \pm 20\%$

除非特别说明，本标准书中所有测试均在以下环境条件下进行：

温度： $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$

湿度： $65\% \pm 20\%$

4.2 Electrical characteristics

电气性能

No.	Items (项目)	Test Method and Condition (测试方法和条	Criteria (标准)
1	Standard Charge condition 标准充 电	Charging the cell with constant current at 1C and then with constant voltage at 3.65V till charge current declines to $\leq 0.05\text{C}$. 1C恒流充电至3.65V，再恒压3.65V充电直 至充电电流 $\leq 0.05\text{C}$ 。	Charge Voltage = 3.65V Charge Current = 107A
2	Initial Impedance 初始内阻	Internal resistance measured at AC 1KHz within 1 hour after standard charge 将电池按标准充电方法充电后，在1h内测 量其AC 1KHz下的交流阻抗。	$\leq 0.6\text{m}\Omega$
3	Cell Voltage 电池电压	Battery state upon shipment 出货状态	$\geq 3.2\text{V}$
4	Initial Capacity 额定容量	(1) Prior to charging, the cell shall be discharged at a constant current of 1C down to the cutoff discharge voltage 2.5V, rest for 10 minutes. (2)The capacity means the discharge capacity of the cell, which is measured with discharge current of 0.3C with 2.5V cut-off voltage after standard charge. (1)充电前，电池以1C的恒流放电至截止电 压2.5V，休息10分钟。 (2)该容量是指标准充电后，0.3C放电至 2.5V的放电电量。	107Ah

5	Rate Charge Performance 倍率充电性能	(1) Prior to charging, the cell shall be discharged at a constant current of 1C down to cut-off voltage 2.5V, rest for 60 minutes. (2) 2C CC to 3.65V, and CV to 0.05C, charging time less than 30 minutes. (3) The capacity means the discharge capacity of the cell, which is measured with discharge current of 1C with 2.5V cut-off voltage. (1) 充电前, 电池应以1C的恒流放电至截止电压2.5V, 搁置60分钟。 (2) 2C恒流充电至3.65V, 再3.65V恒压充电至电流小于0.05C, 充电时间≤30min。 (3) 该容量是1C放电至2.5V的放电容量。	≥80% Initial Capacity ≥80% 初始容量
6	High Rate Discharge Performance 倍率放电性能	(1) Prior to charging, the cell shall be discharged at a constant current of 1C down to cutoff discharge voltage 2.5V, rest for 10 minutes. (2) 1C CC to 3.65V, and CV to 0.05C cut off, rest for 10 minutes. (3) The capacity means the discharge capacity of the cell, which is measured with discharge current of 3C with 2.5V cut-off voltage. (1) 充电前, 电池应以1C的恒流放电至截止电压2.5V, 休息10分钟。 (2) 1C恒流充电至3.65V, 再3.65V恒压充电至电流小于0.05C, 搁置10mins; (3) 以3C放电至2.5V。	≥95% Initial Capacity ≥95% 额定容量
7	Cycle Life 循环寿命	1) 1C discharge to 2.5V, 2) rest 30 mins, 3) Charge: the cell with constant current at 1C and then with constant voltage at 3.65V till charge current declines to ≤0.05C, 4) rest 30 mins 5) Discharge: 1C discharge to 2.5V, 6) repeat 1)~5), repetitions are cycles. 1) 电池以1C放电至2.5V, 2) 搁置30min, 3) 充电: 0.5C恒流充电至3.65V, 再恒压3.65V充电直至充电电流≤0.05C, 4) 搁置30mins, 5) 电池以1C放电至2.5V, 6) 重复以上1)~5)步骤, 重复次数即为循环次数。	After 2000 cycles ≥88% Initiation Capacity 2000周循环后≥初始容量88%

8	Charge Retention and Recovery at Room Temperature 常温荷电保持与容量恢复能力	The cell shall be charged in accordance with the standard charging method. The cell shall be stored in the temperature of $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for 28 days. Discharge at the constant current of 1C down to 2.5V. This discharge capacity is capacity retention. Charge again in accordance with the standard charging method. Discharge at the constant current of 1C down to 2.5V. This discharge capacity is capacity recovery. 电池按标准方法充满电后, 在 $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 下储存 28 天后, 在 $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 下以 1C 电流放电, 直到放电终止电压 2.5V, 此放电容量为容量保持。电池再充电后在 $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 下以 1C 电流放电, 直到放电终止电压 2.5V, 此放电容量为容量恢复。	Capacity Retention $\geq 93\%$ Initial Capacity 荷电保持 $\geq 93\%$ 初始容量容量 Capacity Recovery $\geq 95\%$ Initial Capacity 荷电恢复 $\geq 95\%$ 初始容量容量
9	Charge Retention and Recovery at High Temperature 高温荷电保持与容量恢复能力	The cell shall be charged in accordance with the standard charging method. The cell shall be stored in the temperature of $55^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 7 days. Discharge at the constant current of 1C down to 2.5V. This discharge capacity is capacity retention. Charge again in accordance with the standard charging method. Discharge at the constant current of 1C down to 2.5V. This discharge capacity is capacity recovery. 电池按标准方法充满电后, 在 $55^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 下储存 7 天后, 在 $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 下以 1C 电流放电, 直到放电终止电压 2.5V, 此放电容量为容量保持。电池再充电后在 $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 下以 1C 电流放电, 直到放电终止电压 2.5V, 此放电容量为容量恢复。	Capacity Retention $\geq 93\%$ Initial Capacity 荷电保持 $\geq 93\%$ 初始容量容量 Capacity Recovery $\geq 95\%$ Initial Capacity 荷电恢复 $\geq 95\%$ 初始容量容量
10	Low Temperature Performance 低温性能	(1) The cell shall be charged in accordance with the standard charge. (2) The cell shall be stored in the temperature of $-20^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 24h. (3) Discharge at the constant current of 1C down to the end-of-discharge voltage 2.0V. 按标准充电方法充电后, 放入 $-20^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 低温箱中恒温 24h, 在此条件下 1C 放电至 2.0V。	discharge capacity $\geq 80\%$ Initial Capacity 放电容量 $\geq 80\%$ 初始容量容量

11	High Temperature Performance 高温性能	(1)The cell shall be charged in accordance with the standard charge. (2) The cell shall be stored in the temperature of $55^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 5h. (3)Discharge at the constant current of 1C down to the end-of-discharge voltage 2.5V. 按标准充电方法充电后, 放入 $55^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 低温箱中恒温5h, 在此条件下1C放电至2.5V。	discharge capacity $\geq 95\%$ Initial Capacity 放电容量 $\geq 95\%$ 初始容量
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4.3 Safety Performance

安全性能测试

4.3.1 Battery Cell Safety Performance

电芯安全性能测试

No.	Items (项目)	Test Method and Condition (测试方法和条件)	Criteria (标准)
1	Short Circuit Test 强制放电测试	Discharge at the constant current of 1C down to 2.5V, rest for 0.5hours, Positive and negative pole reverse pole, 1C CC 90 minutes. 在 $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 条件下, 以1C恒流放电至2.5V, 搁置0.5h, 正负极反接, 用1C电流充电90min	No Fire, No Explosion. 不起火; 不爆炸
2	Overcharge 过充试验	After standard charge, rest for 10mins; then charge at constant current of 3C to 5V. 按标准充电后, 搁置10mins; 3C恒流充电至电压5V。	No Fire, No Explosion 不爆炸、不起火
3	Short Test 短路试验	After standard charge, the external short circuit for 10 min, the external circuit resistance $80\text{m}\Omega\pm 20\text{m}\Omega$. 电池充电后, 经外部短路10min, 外部线路电阻 $80\text{m}\Omega + 20\text{m}\Omega$ 。	No Fire, No Explosion 不爆炸、不起火
4	Heating Test 加热试验	After standard charge, the cell shall be stored in a oven with the heat rate of $5^{\circ}\text{C}/\text{min}\pm 2^{\circ}\text{C}/\text{min}$ up to $130^{\circ}\text{C}\pm 2^{\circ}\text{C}$, maintain 10mins. 电池充电后放入烘箱, 烘箱按照 $5^{\circ}\text{C}/\text{min}\pm 2^{\circ}\text{C}/\text{min}$ 的速率由室温升至 $130^{\circ}\text{C}\pm 2^{\circ}\text{C}$, 保持此温度10min后停止加热。	No Fire, No Explosion 不爆炸、不起火
5	Impact test 重物冲击试验	A test sample cell is to be placed on a flat surface and fixed in a jig. A 10kg weight is to be dropped from a height of 1.0m onto the sample. Cell allows deformation. 电池放置于冲击台上并固定在夹具中, 将10kg重锤自1.0m高度自由落下, 电池允许发生变形。	The samples shall not fire, and explosion. 样品应不起火, 不爆炸

6	Needling test 针刺试验	After standard charge, high temperature needle with $\phi 3\text{mm} \sim \phi 8\text{mm}$ penetrates the cell from the perpendicular to the direction of the cell plate (needle stuck in the cell). 电池充电后, 用$\phi 3\text{mm} \sim \phi 8\text{mm}$的耐高温钢针, 从垂直于蓄电池极板的方向贯穿(钢针停留在蓄电池中)。	No Fire, No Explosion 不爆炸、不起火																								
7	Crush test 挤压试验	After standard charge, according to the following test conditions: 1) crush direction: perpendicularly to the cell plates, 2) crush degree: the applied force is $13\text{ kN} \pm 1\text{ kN}$ by hydrocylinder. 电池充电后, 按下列条件进行试验: 1) 挤压方向: 垂直于蓄电池极板方向, 2) 挤压程度: 施加的压力为$13\text{ kN} \pm 1\text{ kN}$, 当达到最大压力后泄压试验。	No Fire, No Explosion 不爆炸、不起火																								
8	Fall Test 跌落试验	After standard charge, the cell falls freely from 1.5m to the wooden floor, twice each. 电池充电后, 电池从1.5m高度处自由跌落到木地板上, 每个面2次。	No Fire, No Explosion 不爆炸、不起火																								
9	Temperature Cycling Test 温度冲击试验	After standard charge, the cell is put into the oven, cycling according to following chart, cycle 10 times, observe 1h. 电池标准方法充电, 电池放入温度箱中, 按照下图表进行调节, 循环次数10次, 观察1h. <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>温度$^{\circ}\text{C}$</th><th>时间增量h</th><th>累计时间h</th><th>温度变化要求</th></tr> </thead> <tbody> <tr> <td>20</td><td>0</td><td>0</td><td>0</td></tr> <tr> <td>70</td><td>4</td><td>4</td><td>30min内达到</td></tr> <tr> <td>20</td><td>2</td><td>6</td><td>30min内达到</td></tr> <tr> <td>40</td><td>4</td><td>10</td><td>30min内达到</td></tr> <tr> <td>20</td><td>2</td><td>12</td><td>30min内达到</td></tr> </tbody> </table>	温度 $^{\circ}\text{C}$	时间增量h	累计时间h	温度变化要求	20	0	0	0	70	4	4	30min内达到	20	2	6	30min内达到	40	4	10	30min内达到	20	2	12	30min内达到	No Leakage, No Explosion or Catch Fire 不爆炸、不起火、不漏液
温度 $^{\circ}\text{C}$	时间增量h	累计时间h	温度变化要求																								
20	0	0	0																								
70	4	4	30min内达到																								
20	2	6	30min内达到																								
40	4	10	30min内达到																								
20	2	12	30min内达到																								

4.4 Visual inspection

外观检测

There shall be no such defect as scratch, flaw, crack, and leakage, which may adversely affect commercial value of the cell.

不允许有任何影响电芯性能的外观缺陷, 诸如裂纹、裂缝、泄漏等。

5. Storage and Others

贮存及其它事项

5.1. Storage

The best storage temperature: 15°C-35°C.

贮存

最佳贮存温度: 15°C-35°C

5.2. Others

Any matters that this specification does not specify should be confirmed by the customer and

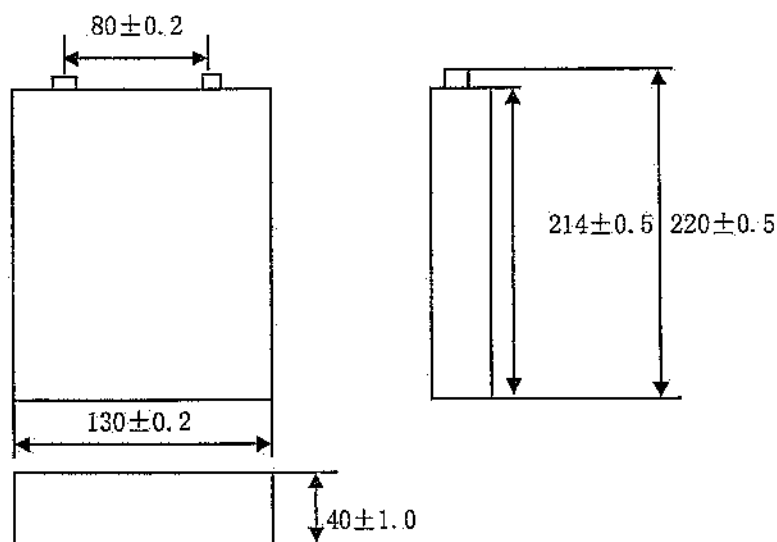
其他事项

任何本说明书中未提及的事项, 须经双方协商确定

6. Battery Cell Drawing (all unit in mm, not in scale)

电芯尺寸图

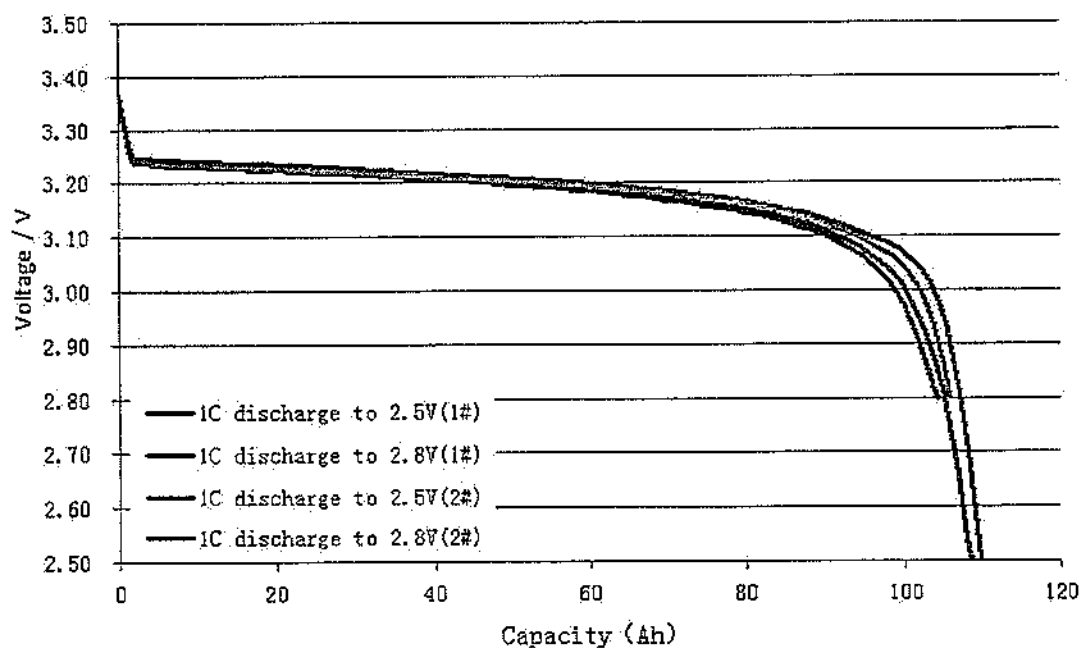
单位: mm



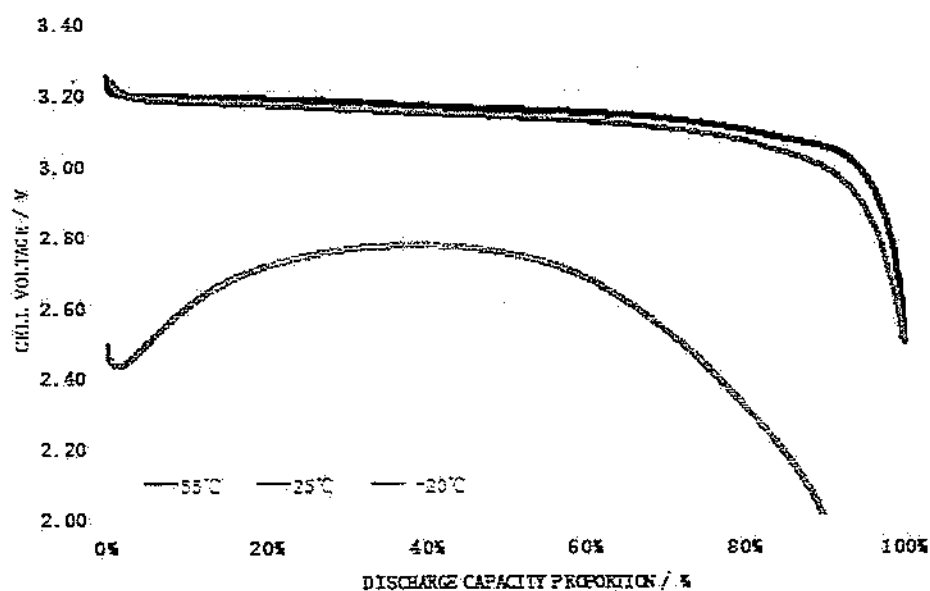
7. Appendix (For Reference Only)

附件 (仅供参考)

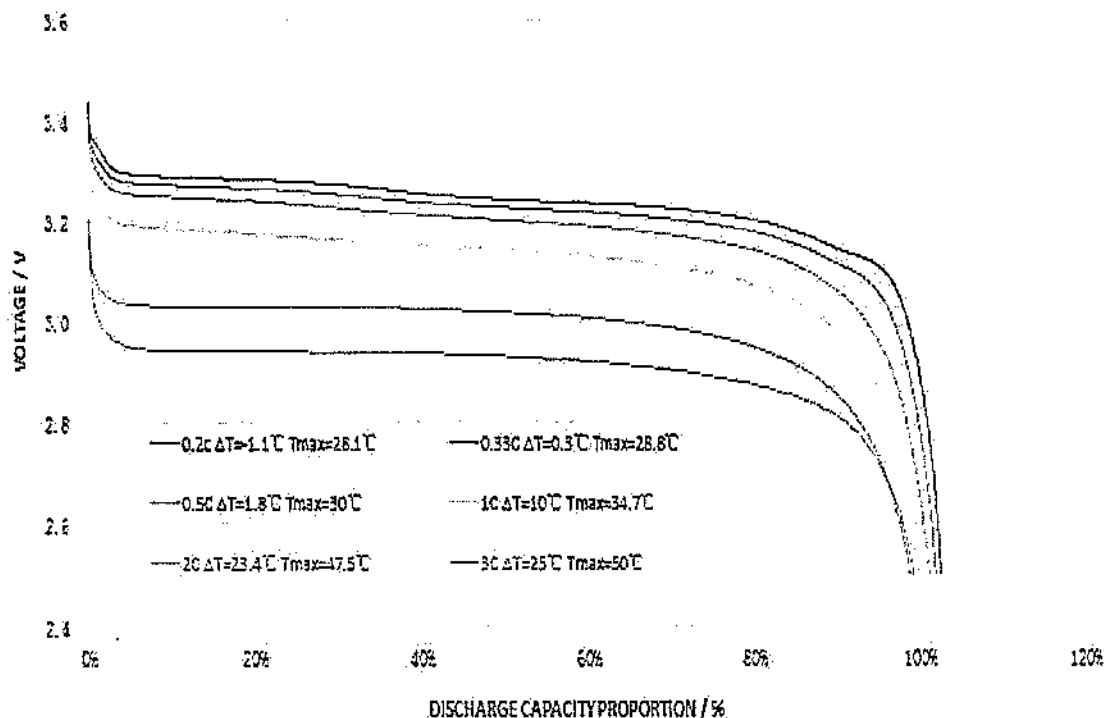
DISCHARGE CAPACITY @ 1C RATE



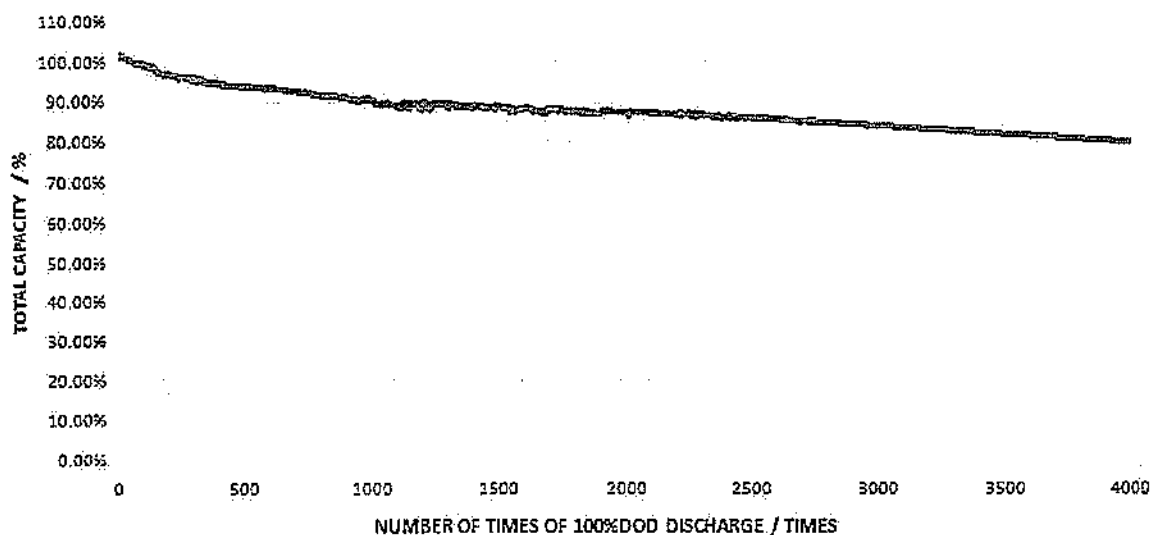
DISCHARGE PERFORMANCE@DIFFERENT TEMPERATURE



DISCHARGE PERFORMANCE @ DIFFERENT DISCHARGE RATE



CYCLE LIFE PERFORMANCE @ 1C, 100%DOD, 25 $^{\circ}\text{C}$





PRODUCT SPECIFICATION

DOC NO.: IEP40130220-107

SHEET : 13 OF 19

ECN NO.: Q/KAGG666-2018

8 Limited Warranty and Liabilities

有限保证和责任

8.1 Limited Warranty 有限保证

The cells shall comply with this specification within 12 months from the manufacture date as stipulated on cell marking ("Warranty Period"). In the Warranty Period, HIGHSTAR will replace cells which fail to conform to this specification at no cost to Customer.

自电芯标识显示的制造日期之日起12个月内（“保证期限”），电芯应符合本规格书的规定。在此保证期限内，海四达免费为客户更换不符合本规格书规定的电芯。

8.2 Warranty and Waiver 保证责任免除

Under the following conditions, HIGHSTAR will not take any responsibility incurred in any losses resulting from the use of cells:

在以下条件下，海四达对客户因使用电芯而引起的任何损失不承担赔偿责任：

a. The cells are misused, abused or are used in any manner deviated or in breach of conditions as set out in this specification.

误用、滥用电芯或违反本规格书的规定使用电芯；

b. The cells are rendered to be nonconforming to this specification for reasons caused by parties other than HIGHSTAR or by circumstances beyond the control of HIGHSTAR.

非海四达原因导致的或海四达不能控制的原因导致的电芯不符合本规格书的规定。

9.3 Limited Warranty 有限保证

Customer is recommended to follow this specification to use. Or Customer can use an alternative operation method mutually agreed by Customer and HIGHSTAR. Using a operation method neither according to the specification nor agreed by HIGHSTAR in written will cause voiding of Limited Warranty.

推荐客户完全按照此产品规格书上所描述的要求进行操作，或采用经过客户与海四达双方确认的其他条件。如果客户采用的操作方法既没有按照此规格书的要求，也没有经海四达同意，将导致产品质量保证不适用于此保质期限

Warning Statement

WARNING

BATTERIES ARE POTENTIALLY DANGEROUS AND PROPER PRECAUTIONS MUST BE OBSERVED IN HANDLING AND MAINTENANCE.

RUNNING TESTS ON THE BATTERIES IMPROPERLY MAY RESULT IN SEVERE PERSONAL BODY INJURY OR PROPERTY DAMAGES.

WORK ON BATTERIES MUST BE PERFORMED ONLY WITH PROPER TOOLS AND PROTECTIVE EQUIPMENT MUST BE USED.

BATTERY MAINTENANCE MUST BE CARRIED OUT BY PERSONNEL KNOWLEDGEABLE OF BATTERIES AND TRAINED IN THE SAFETY PRECAUTIONS INVOLVED.

FAILURE TO OBSERVE THE ABOVE MAY CAUSE VARIOUS HAZARDS.

9 Appendix**Handling Precautions and Guideline For Lithium-Ion****Rechargeable Batteries****锂离子充电电芯操作指示及注意事项****Statement (1):**

Customers are requested to contact HIGHSTAR in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

声明一:

客户若需要将电芯用于超出文件规定以外的设备，或在文件规定以外的使用条件下使用电芯，应事先联系海四达，因为需要进行特定的实验测试以核实电芯在该使用条件下的性能及安全性。

Statement (2):

HIGHSTAR will take no responsibility for any accident when the cell is used under other conditions than those described in this Document.

声明二:

对于在超出文件规定以外的条件下使用电芯而造成的任何意外事故，海四达概不负责。

Statement (3):

HIGHSTAR will inform, in a written form, customers of improvement(s) regarding proper usage and handling of cells, if it is deemed necessary.

声明三:

如有必要，海四达会以书面形式告知客户有关正确操作使用电芯的改进措施。

Statement (4):

During designation of host device or battery pack, it's better for customers to get HIGHSTAR involve to review the battery installation and safety protection scheme. This is very helpful to safety of battery application.

声明四:

客户在产品的设计过程中，最好邀请海四达共同完成电池安装及电池安全保护装置部分的设计，这对电池的安全使用会很有帮助。

9.1 Charging**充电****9.1.1 Charging current**

Charge current should be less than the maximum value specified in the Product Specification. Charging with higher current than recommended value may cause damage to cells' electrical, mechanical, and safety performance and could lead to heat generation or leakage. If you have special needs, please contact with the company.

充电电流:

充电电流不得超过本标准书中规定的最大充电电流。使用高于推荐值电流充电将可能引起电芯的充放电性能、机械性能和安全性能的问题，并可能会导致发热或泄漏。如有特殊需要，请与公司联系沟通。

9.1.2 Charge Voltage

Batteries shall be charged shall be done by voltage less than that specified in the Product Specification (3.65V/cell). Charging beyond 3.65V, which is the absolute maximum voltage, must be strictly prohibited. The charger and protection circuit of battery pack shall be designed to comply with this condition. It is very dangerous that charging with higher voltage than the maximum value and may cause damage to the cell electrical, mechanical safety performance and could lead to heat generation or leakage.

充电电压:

充电电压不得超过本标准书中规定的额定电压（3.65V/电芯）。3.65V为充电电压最高极限，充电器和电池保护电路的设计应满足此条件。电芯电压高于额定电压值时，将可能引起电芯的充放电性能、机械性能和安全性能的问题，可能会导致发热或泄漏。

9.1.3 Charge Temperature:

Batteries shall be charged at 0°C-45°C environment temperature specified in the Product Specification. In case of environment temperature is lower than 10°C, batteries shall be charged with a little current (no larger than 0.2C). If the environment temperature is lower than 0°C, charge shall be prohibited.

充电温度:

电芯必须在0°C-45°C的环境温度范围内才能进行正常充电。环境温度低于10°C时，建议以小电流（不大于0.2C）充电；当环境温度低于0°C时，应禁止充电。

9.1.4 Prohibition of Reverse Charge:

Reverse charging is prohibited. Cells 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. 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.

禁止反向充电:

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。

9.2 Discharge**放电****9.2.1 Discharge Current:**

The cell shall be discharged at less than the maximum discharge current specified in the Product Specification. High discharging current may reduce the discharge capacity significantly or cause over-heat.

放电电流:

放电电流不得超过本标准书规定的最大放电电流，大电流放电会导致电芯容量剧减并导致过热。

9.2.2 Discharge Temperature:

Cells shall be discharged at -20°C-60°C environment temperature specified in the Product Specification

放电温度:

电芯必须在 -20°C-60°C 的环境温度范围内进行放电。

9.2.3 Over-discharge:

It should be noted that cells would be at an over-discharged status due to self-discharge characteristics in case they were not used for a long time. In order to prevent over-discharging, cells shall be charged periodically to maintain the voltage between 3.2V and 3.4V. Over-discharging may cause the loss of cell performance, characteristics, or battery functions.

过放电:

需注意的是，在电芯长期未使用期间，它可能会因其自放电特性而处于某种过放电状态。为防止过放电的发生，电芯应定期充电，将其电压维持在3.2V至3.4V之间。过放电会导致电芯性能、电池功能的丧失。

9.3 Notice for Designing Battery Pack 电池结构设计注意事项**9.3.1 Pack Design 外壳设计**

Battery pack should have sufficient strength to make sure the cell(s) inside is protected from mechanical shock.

电池外壳应有足够的机械强度以保证其内部电芯免受机械损伤，材质为阻燃性材料。

9.3.2 Cell Fixing

电芯的安装

9.3.2.1 No cell movement in the battery pack should be allowed.

电芯不得在壳内活动。

9.3.2.2 Prevention of short circuit in a battery pack or host device.

防止电芯在电池包装或主机内产生短路。

Enough insulation layers between wiring and the cells shall be used to maintain extra safety protection.

The battery pack or host device shall be structured with no any potential short circuit, which may cause generation of smoke or firing.

引线与电芯之间要有足够的绝缘层以保证绝对安全。电池壳内不得有任何短路发生隐患，以防止冒烟或着火。

9.4 Storage

贮存

The cell shall be stored at the environmental condition of -20°C - 45°C and $65\%\pm 20\%$ RH.

The voltage for a long time storage shall be 3.2V-3.4V range.

If the cell has to be storied for a long time (Over 3 months), the environmental condition should be:

Temperature: $23^{\circ}\text{C}\pm 3^{\circ}\text{C}$

Humidity: $65\%\pm 20\%$ RH

电芯储存温度必须在 -20°C ~ 45°C 的范围内。

长期存储电池（超过3个月）须置于温度为 $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 、湿度为 $65\%\pm 20\%$ RH 的环境中。长期贮存电压为 3.2V~3.4V。保质期内每隔3个月对电池电压低于 3.2V 的电池用 10A~33A 电流进行补充电，至电压达到 3.5V。

9.5 User's Guideline for Safety Handling:

用户安全操作信息:

9.5.1 The following information, or equivalent statements, shall be made available to the user through one or more of the following means, as appropriate: printed on the label for the battery, printed on the label for host device, printed in the owner's manual, or posted in a help file or Internet website:

下列信息或类似的申明必须通过一种或多种适当的途径让用户知晓，可选择的途径包括：电池标签、主机标签、用户手册、储存于帮助文档或互联网：

9.5.1.1 Do not disassemble or open, crush, bend or deform, puncture, or shred;

请勿拆解或打开、挤压、弯折、变形、刺穿、敲碎；

9.5.1.2 Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.

请勿修改或改装，不要试图将外物插入电池，不要浸入或暴露在水或其它液体中，远离火源、爆炸物和其他危险；

9.5.1.3 Only use the battery for the system for which it was specified.

只能使用本系统规定的电池；

9.5.1.4 Only use the battery with a charging system that has been qualified with the system per standard.

Use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazard.

只能使用通过标准认证具有充电管理系统的电池，使用未经认证的电池或充电器可能存在起火、爆炸、或其它危险；

9.5.1.5 Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals

请勿使电池短路，也不要让金属或其它导体接触电池接电端子；

9.5.1.6 Replace the battery only with another battery that has been qualified with the system per standard. Use of an unqualified battery may present a risk of fire, explosion, leakage, or other hazard.

更换电池时只能使用通过标准认证的电池，使用未经认证的电池可能存在起火、爆炸、或其它危险；

9.5.1.7 Don't keep a battery at rest for a long time (over 6 months). Safety accident may happen when recharging a battery which has a rest for a long time.

避免电池长时间放置不用，长期放置不用的电池重新充电时可能会发生安全问题。

9.5.1.8 Promptly dispose of used batteries in accordance with local regulations.

按当地法规迅速处理报废电池；

9.5.1.9 Battery usage by children should be supervised.

儿童使用电池应受到监督；

9.5.1.10 Avoid dropping the phone or battery. If the phone or battery is dropped, especially on a hard surface, and the user suspects damage, take it to a service center for inspection.

不要跌落主机或电池，如果主机或电池不慎跌落（尤其在硬表面上），用户怀疑电池损坏，则应找服务中心检查；

9.5.1.11 Improper battery use may result in a fire, explosion, or other hazard.

不正确使用电池可能发生燃烧、爆炸或其它危险。

9.5.1.12 In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.

如果电池发生漏液，不要让电池接触皮肤和眼睛，如果接触不幸发生，则用大量的水冲洗接触部位或寻求医生帮助；

9.5.1.13 Seek medical advice immediately if a battery has been swallowed.

如果电池被吞食了，立即就医；

9.5.1.14 Communicate the appropriate steps to be taken if a hazard occurs.

告知用户如果危险发生，应采取什么步骤。

9.5.2 The following indications, notifications, and dialog/messages, at the system level, or an equivalent statement, may be displayed along with recommended actions as appropriate:

下列指示、通告、语句/信息或类似的申明应通过适当途径让用户知悉：

9.5.2.1 Abnormal battery temperature alert.

不正常的电池温度警示；

9.5.2.2 Abnormal host device and/or battery dc input voltage alert.

不正常的主机或电池的直流输入电压警示；

9.5.2.3 Abnormal current draw alert.

不正常的电流警示；

9.5.2.4 Battery communication fail/time-out alert.

电池通讯失败或超时警示；

9.5.2.5 Incompatible battery alert.

不相容电池警示:

9.5.2.6 Alert for other malfunctions that may lead to hazards.

可能导致危险的其它故障警示。

9.6 Others:

其它事项:

9.6.1 Prohibition of Disassembly

严禁拆卸电芯

9.6.1.1 Never disassemble cells. The disassembling may generate internal short circuit in the cell, which may cause firing or other problems.

在任何情况下不得拆卸电芯。拆卸电芯可能会导致内部短路, 进而引起着火及其它问题。

9.6.1.2 Electrolyte is harmful. In case the electrolyte come into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

电解液有害。万一有电解液泄漏而接触到皮肤、眼睛或身体其它部位, 应立即用清水冲洗电解液并就医。

9.6.2 Never incinerate nor dispose the cells in fire. These may cause firing of the cells, which is very dangerous and is prohibited.

在任何情况下, 不得燃烧电芯或将电芯投入火中, 否则会引起电芯燃烧, 这是非常危险的, 应绝对禁止。

9.6.3 The cells shall never be soaked with liquids such as water, seawater, drinks such as soft drinks, juices, coffee or others.

不得将电芯浸泡液体, 如淡水、海水、饮料(果汁、咖啡等)。

9.6.4 The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

更换电芯应由电芯供应商或设备供应商完成, 用户不得自行更换。

9.6.5 Prohibition of use of damaged cells

禁止使用已损坏的电芯

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as deformation of the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more. The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing.

电芯在运输过程中可能因撞击等原因而损坏, 若发现电芯有任何异常特征, 如外壳破损, 闻到电解液气味, 电解液泄漏等, 该电芯不得使用。有电解液泄漏或闻到异常味道的电池应远离火源以避免着火。

Customer Inquiry
产品规格需求**Model:** IFP40130220-107

The customer is requested to write down your information and contact HIGHSTAR in advance, if and when the customer needs applications or operating conditions other than those described in this document. HIGHSTAR could design and build such products according to your special request.

我司也可以根据客户的特殊要求而设计、制造符合要求的产品，如果贵公司有本规格书描述之外的性能要求，请您写在下面并回签给我司：

	Special Request	Criteria
	要求	规格
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Company Name: _____

Signature: _____

Date: _____