

SHE1087187-31Ah 性能总结

Semi-Solid-State Li-ion Battery Cell — Performance Summary

电芯型号 / Cell Model: SHE1087187-31Ah

电池类型 / Cell Type: 半固态锂离子电池 / Semi-Solid-State Li-ion Battery Cell

核心优势 / Core Advantages

- 高倍率放电 / High Rate Discharge — 5C持续 / 7C脉冲放电，满足无人机、电动工具等高功率需求
- 高能量密度 / High Energy Density — ≥ 270 Wh/kg / ≥ 600 Wh/L，体积与重量效能优异
- 双循环保障 / Dual Cycle Guarantee — 1500 cycles(1.0C/1.0C, 4.2~3.0V, $25\pm 3^{\circ}\text{C}$, 带夹具0.02MPa) + 一(一)
- 宽温度范围 / Wide Temperature Range — 充电0~55℃ / 放电-20~60℃

关键参数一览 / Key Parameters Overview

No.	Items/项目	Specifications/规格	Remark/备注
5.1	标称电压 Nominal Voltage	3.6V	CC
5.2	充电截止电压 Charge Cut-off Voltage	4.2V	CC/CV
5.3	放电截止电压 Discharge Cut-off Voltage	2.5V	CC
5.4	额定容量* Rated Capacity*	31Ah	0.3C放电容量
5.5	典型容量* Typical Capacity*	—	
5.6	标称能量 Nominal Energy	111.6Wh	
5.7	重量能量密度 Gravimetric Energy Density	≥ 270 Wh/kg	
5.8	体积能量密度 Volumetric Energy Density	≥ 600 Wh/L	
5.9	标准充电电流 Charge Current (Std.)	0.3Cmin	
5.10	最大充电电流 Max Charge Current	1Cmin	
5.11	标准放电电流 Discharge Current (Std.)	0.3Cmin	
5.12	最大放电电流 Max Discharge Current	2Cmin	
5.13	瞬间最大放电电流 Max Momentary Discharge Current	—	规格书未明确脉冲放电参数
5.14	初始内阻 Initial Impedance	$\leq 1.8\text{m}\Omega$	AC 1kHz
5.15	充电工作温度 Charge Operating Temp.	0~55℃	
5.16	放电工作温度 Discharge Operating Temp.	-20~60℃	
5.17	储存温度 Storage Temperature	-20~45℃ (≤ 1 month) -10~35℃ (≤ 6 months)	
5.18	电芯重量 Cell Weight	418 $\pm$ 15g	参考值
5.19	出货电压 Shipping Voltage	3.45~3.55V	

5.20	出货SOC Shipping SOC	—	
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* 本规格书中，带有上标“*”的项目只适用于未经使用的新鲜电芯，且电芯生产时间在30天以内。 | Items with superscript “*” are only applicable to unused fresh cells within 30 days after manufacture.

注: 以上数据基于25±3℃标准测试条件 | Data based on 25±3° C standard test conditions.

1 Scope/适用范围

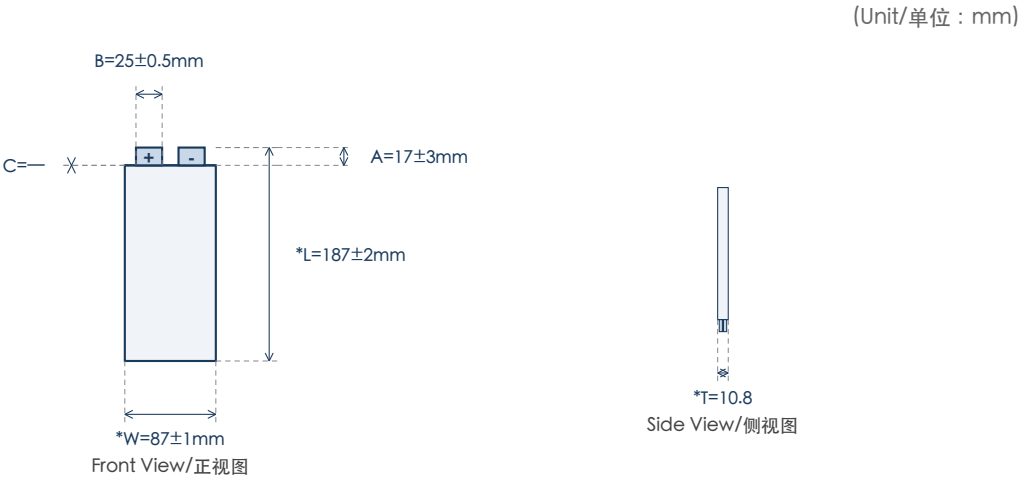
This specification is prepared to define the specifications of the rechargeable semi-solid-state li-ion battery cell manufactured by Shenzhen Jintang New Energy Technology Co., Ltd. and subject to customers' confirmation. For the avoidance of doubt, the specifications herein shall not apply to any host device containing such cell products.

本规格书用于明确深圳市金汤新能源科技有限公司所生产的可充电半固态锂离子电池的电芯产品规格，并需客户之承认。为避免产生疑义，本规格书不适用于含有该电芯的主机设备。

2 Model Number/型号

SHE1087187-31Ah

3 Cell Drawing/电芯绘图



* T/W/L: Cell body dimensions (measured per specification method)
A: Tab protrusion length B: Tab width C: Top sealing width

3.1 Dimension Parameters/尺寸参数表

No.	Items/项目	Specifications/规格	Remark/备注
1	*T Cell Thickness/电芯厚度	10.8±0.3mm	mm
2	Cell Thickness (After cycle) 电芯厚度(经过循环后)	—	mm
3	*W Cell Width/电芯宽度	87±1mm	mm
4	*L Cell Length/电芯长度	187±2mm	mm
5	A Tab Length/极耳外漏长度	17±3mm	mm
6	B Tab Width/极耳宽度	25±0.5mm	mm
7	C Top Sealing Width/顶封宽度	—	mm
8	Bar Code Face/喷码面	Front(deep pit)/正面(深坑面)	

9	Shipment with Protective Tape 贴保护膜出货	Yes/是	
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4 Standard Environmental Test Conditions/标准测试环境条件

1) Unless otherwise specified, all tests stated in this cell specification are conducted with below temperature and humidity conditions.

除非特别说明，本电芯规格书中测试均按以下温度、湿度和环境大气压条件进行：

No.	Items/项目	Specifications/规格	Remark/备注
1	Temperature/温度	25±3℃	
2	Humidity/湿度	60±20%RH	

2) In this specification, items with superscript "*" mean these items are only applicable to unused fresh cells within 30 days after manufacture.

本规格书中，带有上标"*"的项目只适用于未经使用的新鲜电芯，且电芯生产时间在30天以内。

5 Cell Specifications/电芯规格

No.	Items/项目	Specifications/规格	Remark/备注
5.1	Charge Cut-off Voltage 充电截止电压	4.2V	CC/CV
5.2	Nominal Voltage 标称电压	3.6V	CC
5.3	Discharge Cut-off Voltage 放电截止电压	2.5V	CC
5.4	*Rated Capacity *额定容量	31Ah	0.3C放电容量
5.5	*Typical Capacity *典型容量	—	
5.6	Charge Current (Std.) 标准充电电流	0.3Cmin	
5.7	Discharge Current (Std.) 标准放电电流	0.3Cmin	
5.8	Max Charge Current 最大充电电流	1Cmin	
5.9	Max Discharge Current 最大放电电流	2Cmin	
5.10	Max. Momentary Discharge Current 瞬间最大放电电流	—	规格书未明确脉冲放电参数
5.11	Operating Temperature 工作温度	Charge: 0~55℃ Discharge: -20~60℃	
5.12	Storage Temperature 储存温度	≤ 1 month: -20~45℃ ≤ 6 months: -10~35℃	
5.13	Cell Weight/电芯重量	418±15g	参考值
5.14	Shipping Voltage/出货电压	3.45~3.55V	
5.15	Initial Impedance/初始内阻	≤ 1.8mΩ	AC 1kHz

6 Cell Performances and Criteria/电芯性能及标准

Standard Charge: A cell is charged at 0.3C(9.3A) CC to 4.2V, CV to 0.05C(1.55A) constant current to 4.2V at 25±3℃. Then it is charged at 4.2V constant voltage. Charging shall be terminated when the charging current has tapered to 0.05Cmin. The longest charging time shall not be longer than 5h.

标准充电：在环境温度25±3℃条件下，对电芯以0.3C(9.3A) CC to 4.2V, CV to 0.05C(1.55A)恒流充电至4.2V，然后以4.2V恒压充电至充电电流小于等于0.05Cmin，最长充电时间不大于5h，停止充电。

6.1 Electrical Performances/电性能

No.	Items/项目	Specifications/规格	Remark/备注
6.1.1	*Discharge Performance *放电性能	电芯标准充电后，搁置0.5h~1h，在25±3℃的环境温度下分别以0.5Cmin、3Cmin、5Cmin恒流放电至截止电压2.6V。A cell is stored for 0.5h~1h after standard charge. It is discharged at a constant current of 0.5Cmin/3Cmin/5Cmin to ending voltage of 2.6V at 25±3° C.	≥100%*Cmin@0.5Cmin ≥95%*Cmin@3Cmin ≥90%*Cmin@5Cmin
6.1.2	*RT Cycle Life 1 *室温循环寿命1	在25±3℃环境温度下，按照如下步骤进行循环实验：充电：1.0Cmin恒流恒压充电至4.2V，截止电流0.05Cmin；放电：3Cmin放电至2.6V；充放电之间搁置30min；每100th循环进行一次标准充放电；共进行300次循环。A cell is cycled at 25±3° C as follows: Charge: 1.0Cmin CC to 4.2V, CV to 0.05Cmin; Discharge: 3Cmin CC to 2.6V; suspended between 30min; standard charge and discharge for every 100th cycle; 300 cycles.	Discharge Capacity (300th cycle) ≥80%*Cmin 第300周放电容量 ≥80%*Cmin
6.1.3	*RT Cycle Life 2 *室温循环寿命2	在室温下，按照如下步骤进行循环实验：充电：0.5Cmin恒流恒压充电至4.2V，截止电流0.05Cmin；放电：0.5Cmin放电至2.6V；充放电之间搁置30min；每100th循环进行一次标准充放电；共进行600次循环。A cell is cycled at room temperature as follows: Charge: 0.5Cmin CC to 4.2V, CV to 0.05Cmin; Discharge: 0.5Cmin CC to 2.6V; suspended between 30min; standard charge and discharge for every 100th cycle; 600 cycles.	Discharge Capacity (600th cycle) ≥80%*Cmin 第600周放电容量 ≥80%*Cmin
6.1.4	Different Temperature Discharge 不同温度放电特性	电芯在经过标准充电后，储存在特定温度的环境中2h，然后以0.5Cmin恒流放电至截止电压2.6V。After standard charge, a cell is stored in an environment of specific temperature for 2 hours, then 0.5Cmin CC to 2.6V.	(55℃) ≥98%*Cmin (-20℃) ≥70%*Cmin
6.1.5	Charge (Capacity) Retention 荷电保持能力	电芯在经过标准充电后，于25±3℃的环境温度下搁置28天后，25±3℃的环境温度下，进行0.5Cmin标准放电到2.6V测试残余容量，再进行一次标准充放电测试恢复容量。A cell is stored at 25±3° C for 28 days after standard charge. After storage, measure the residual capacity with 0.5Cmin till 2.6V. Measure the recovery capacity with 0.5Cmin till 2.6V after standard charge again.	Residual Capacity ≥90%*Cmin 残余容量 ≥90%*Cmin Recovery Capacity ≥95%*Cmin 恢复容量 ≥95%*Cmin

6.2 Mechanical Performances/机械性能

No.	Items/项目	Specifications/规格	Remark/备注
6.2.1	Low Pressure Test 低气压	电芯标准充电后在25±3℃的环境温度下，将其搁置在真空箱中。逐步减小真空箱内部压力至不高于11.6kPa(模拟海拔15240m)并保持6h。A cell is put into a vacuum box at 25±3℃ after standard charged. Gradually decreasing the internal pressure until less than 11.6kPa(Simulation of Elevation Height 15240m), keeping for 6 hours.	No fire, no explosion 不起火、不爆炸
6.2.2	Vibration Test 振动测试	电芯满充后，固定于振幅为0.8mm(总振程1.6mm)的简谐振动台，沿样品互相垂直的3个方向对电芯做振动测试，振动频率从10到55Hz之间线性往复变化。A fully charged cell is subjected to simple harmonic motion with amplitude of 0.8mm. The frequency varies between 10 and 55 hertz in three mutually perpendicular directions.	No fire, no explosion 不起火、不爆炸

6.3 Safety Performances/安全性能

No.	Items/项目	Specifications/规格	Remark/备注
6.3.1	*External Short Test *外短路测试	满充电芯通过阻抗为 $80\pm 20m\Omega$ 的负载电路直接连接正负极极耳。测试在 $55\pm 5^{\circ}C$ 温度下进行。Each fully charged sample cell is short-circuited by connecting the positive and negative terminals with a circuit load having resistance of $80\pm 20m\Omega$. Tests are conducted at $55\pm 5^{\circ}C$.	No fire, no explosion 不起火、不爆炸
6.3.2	*Over Charge Test *过充测试	电芯常规充电至充电截止电压并静置5分钟，然后以3Cmin充电至4.6V并保持充电，当充电时间达到7小时，或电芯表面温度低于最高温度的20%时，停止测试。A sample cell is standardly charged to charge cut-off voltage and rested for 5 min. Then it is charged at 3Cmin to 4.6V, and kept at 4.6V until charge time ≥ 7 hours or cell surface temperature is 20% lower than peak value.	No fire, no explosion 不起火、不爆炸
6.3.3	Forced-Discharge Test 强制放电	在 $25\pm 3^{\circ}C$ 的环境温度下，电芯以0.5Cmin进行放电至2.6V，然后以1Cmin的电流进行反向充电90min。Under $25\pm 3^{\circ}C$, a cell is discharged to 2.6V at 0.5Cmin. Then, it is reversely charged at 1Cmin for 90min.	No fire, no explosion 不起火、不爆炸
6.3.4	Temperature Cycling Test 温度循环测试	电芯按规格书规定充电，将充满的电芯放置在温控箱体中进行如下： $75\pm 2^{\circ}C$ 保持6h→ $-40\pm 2^{\circ}C$ 保持6h→重复10次。After charging specified, stored the cell in a temperature of $75\pm 2^{\circ}C$ for 6h, then $-40\pm 2^{\circ}C$ for 6h, repeat 10 cycles.	No leakage, no fire no explosion 不漏液、不起火、不爆炸
6.3.5	Drop Test 跌落测试	电芯从1m高度自由跌落至硬质地面。A cell is dropped from 1m height onto a hard surface.	No fire, no explosion 不起火、不爆炸
6.3.6	Nail Penetration Test 针刺测试	5mm钢针以一定速度穿透电芯。A 5mm steel nail penetrates the cell at a certain speed.	No fire, no explosion 不起火、不爆炸

6.4 Visual Inspection/外观

There shall be no defects such as deformation, scratch, corrosion and leakage, which may jeopardize the performance of cell.
电芯外表应无变形、刮擦、腐蚀和漏液等会危及电芯性能的不良现象。

6.5 Guarantee Period of Quality/质量保质期

Guarantee period of quality of cell is 12 months after sold.
电芯保质期为出厂后12个月内。

7 Technical and Safety Requirements/技术和安全要求

Statement 1) Customers are required to apply the cells under the conditions described in this cell specification. Otherwise, customers are requested to consult Shenzhen Jintang New Energy Technology Co., Ltd. to evaluate the risk to use the cells in other application conditions.
声明1): 用户需在本电芯规格书规定的使用环境下使用电芯。如需在规定之外的环境下使用，用户需向深圳市金汤新能源科技有限公司咨询评估风险。

Statement 2) Shenzhen Jintang New Energy Technology Co., Ltd. will assume no liability for any accidents arising from the use of the cells under conditions other than those specified in this cell specification.
声明2): 在本规格书规定环境之外使用电芯发生的意外，深圳市金汤新能源科技有限公司不承担责任。

7.1 Charge/充电

7.1.1 Charge Current/充电电流

Charge current for a single cell should be less than the maximum charge current specified in this cell specification. 单电芯的充电电流应该小于本规格书所标明的最大充电电流。

7.1.2 Charge Voltage/充电电压

Charge voltage for a single cell shall be less than that specified in this cell specification. Higher charge voltage must be strictly prohibited.

单电芯的充电电压必须低于本规格书所标明的充电截止电压。超过规定充电电压必须被严格禁止。

7.1.3 Charge Temperature/充电温度

Cells shall be charged according to the temperature condition specified in this cell specification.

电芯的充电温度必须严格遵守本规格书规定之温度。

7.1.4 Prohibition of Reverse Charge/禁止反向充电

Reverse charge is prohibited. Reverse charge will damage the cells' chemical system, and may lead to gassing, over-heat, fast capacity degradation, and even catching fire.

禁止反向充电。反向充电会破坏电芯的化学体系，并可能导致产气、过热、快速容量衰减甚至着火。

7.2 Discharge/放电

7.2.1 Discharge Current/放电电流

Discharge current shall be not over the maximum discharge current specified in this cell specification.

放电电流不能超过本规格书规定的最大放电电流。

7.2.2 Discharge Temperature/放电温度

Cells shall be discharged according to the temperature condition specified in this cell specification.

电芯放电温度必须遵守本规格书所规定的电芯放电温度条件。

7.2.3 Over Discharge/过放

Cells could be in an over-discharge status due to self-discharge in long time storage. So cells shall be charged periodically to keep the voltage above 2.6V to prevent over-discharge. 由于电芯的自放电，长期储存的电芯可能会处于过放电状态。因此长期储存的电芯应定期充电，保证电压处于2.6V以上，防止电芯过放电。

7.3 Protection Functions for Batteries and Host Devices/电池和主机的保护功能

Below protection functions are required for battery packs and host devices to keep the cells under safe usage conditions: over charge protection, over discharge protection, over current protection, over heat protection, and short circuit protection. 电池pack或主机应具备以下保护功能，以保证电芯处于安全的使用环境：过充保护、过放保护、过流保护、过热保护以及短路保护。

7.4 Notice for Battery Pack Design/电池pack设计建议

7.4.1 Tab Welding/极耳焊接

1) Ultrasonic welding, laser welding or spot welding is recommended to connect cell tabs. 1) 推荐使用超声波焊接、激光焊接或点焊来连接电芯极耳。

推荐使用超声波焊接、激光焊接或点焊来连接电芯极耳。

2) Cells are not allowed to be movable in the battery pack. 2) 电芯在pack中不允许有移动现象。

3) Insulation layers between wiring and the cell are required to prevent short circuit. 3) 电芯和线路间要有绝缘层防止短路。

电芯和线路间要有绝缘层防止短路。

8 Handling Precautions and User's Guidelines/操作注意和用户指引

8.1 Storage of Cells/电芯储存

Cells shall be stored at the temperature condition and the humidity condition specified in this cell specification always. The voltage for long time storage shall be between 3.2V and 3.6V.

电芯应在本规格书规定的温度和湿度条件下储存。长期储存的电芯电压应保持在3.2V和3.6V之间。

8.2 Handling of Cells/电芯操作

1) Do not scratch or touch cells with any sharp stuff. Wear gloves before taking cells.

请勿用尖锐物体接触或刮擦电芯。拿取电芯前需戴手套。

- 2) Do not bend or fold the top sealing section. It will damage the top sealing and cause leakage.
请勿弯折电芯顶封处，易造成顶封破损漏液。
- 3) Don't unfold the side sealing edge. Or the aluminum layer of the packing foil will be damaged.
请勿展开侧封边，否则铝塑包装膜中铝层会受损并引起漏液。
- 4) Don't fold or bend cell tabs. Tabs are fragile and may be broken after folding or bending.
请勿弯折电芯极耳，极耳较脆弱，弯折极耳易造成损伤。
- 5) Do not drop or bend cell. 请勿弯折或跌落电芯。

8.3 User's Guidelines/用户指引

- 1) Do not disassemble or open, crush, bend or deform, puncture, or shred cells.
请勿拆解或打开、挤压、弯折或扭曲电芯。
- 2) Do not modify or remanufacture, attempt to insert foreign objects into the battery cell.
不要改变或改造电芯，不要尝试把异物插入电芯。
- 3) Do not immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
不要置电芯于水或其它液体中，或暴露在危险环境中。
- 4) Only use the battery for the system for which it was designed. 只在为其所设计的体系中使用该电芯。
- 5) Only use the battery with a charging system that has been qualified with the system per standard.
只使用经过认证合格的充电系统充电。
- 6) Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
请勿短路电池或允许导电金属物接触电池的正负极端子。
- 7) Promptly dispose of used batteries in accordance with applicable local regulations.
合理处置废旧电池或遵照本地规范处置。
- 8) Battery usage by children should be supervised. 儿童应在大人监管下使用电池。
- 9) In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes.
电池发生泄漏时，请勿让电池液体接触到皮肤或眼睛。

8.4 Others/其它事项

- 8.4.1 Never incinerate nor dispose the cell in fire. It may cause cell explosion.
请勿焚烧电池或置电池于火中，可能会导致爆炸。
- 8.4.2 Never try to replace the battery. The battery replacement can only be done by the technicians with professional training. 请勿尝试置换电池。电池置换只能由经过专业培训的人员进行。
- 8.4.3 The cells might be damaged during shipping. If any abnormal phenomenon is found, such as deformation of the cell package, smelling of electrolyte, electrolyte leakage and others, the cells shall never be used any more. 禁止使用破损电芯。电芯在运输过程中可能会受到损伤，如发现任何异常现象，电芯应立即报废不得使用。

免责声明: 本规格书中所列参数基于标准测试条件下的典型值，实际产品可能存在合理范围内的偏差。深圳市金汤新能源科技有限公司保留对规格书中参数进行修订的权利，恕不另行通知。

Disclaimer: Parameters in this specification are typical values based on standard test conditions. Actual products may vary within reasonable tolerances. Shenzhen Jintang New Energy Technology Co., Ltd. reserves the right to revise specifications without prior notice.