南屋科技
NANWU TECHNOLOGY


**匠芯定智 能启未来**
**CRAFTING INTELLIGENCE POWERING THE FUTURE**

# 南屋科技

# Nanwu Technology

# NNC1171180 25Ah 锂离子单体电池

# Lithium-ion NNC1171180 25Ah

# 产品规格书

# Product Specification

## 产品型号

## Product Model：NNC1171180 25Ah

| 制表 Prepared by | 审核 Checked by | 批准 Approved by |
|---|---|---|
| | | |

目录

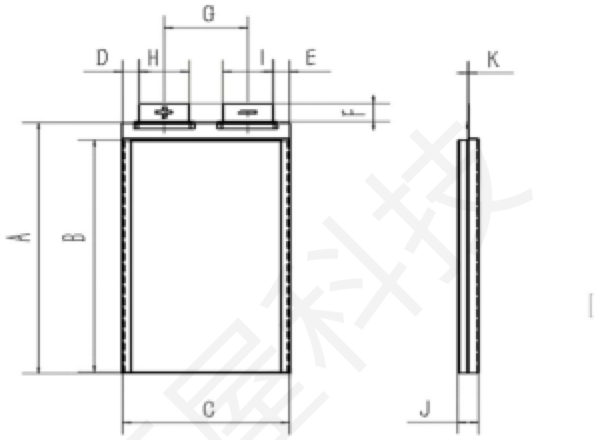
1. 适用范围 Application Scope

本产品规格书描述了 NNC1171180 型号锂离子电池产品性能指标。

This product specification describes the performance of NNC1171180 Lithium-ion Batteries.

2. 产品型号 Product Model

NNC1171180 25Ah




3. 产品尺寸 Product Size

| 项目 (Item) | 描述 (Description) | 尺寸 (Dimension) |
|---|---|---|
| A | 电芯总高 (total cell height) | 180±2 mm |
| B | 主体高度 (body height) | 165.5±1 mm |
| C | 主体宽度 (body width) | 71±1.0 mm |
| D | 正极耳到侧边距离 (distance from cathode tab to side) | 8.0±0.2 mm |
| E | 负极耳到侧边距离 (Distance from anode tab to side) | 8.0±0.2 mm |
| F | 极耳高度 (tab height) | 15±1 mm |
| G | 中心距 (center distance) | 33±0.5 mm |
| H | 正极耳宽度 (cathode tab height) | 22±0.2mm |
| I | 负极耳宽度 (anode tab height) | 22±0.2mm |

| | | |
|---|---|---|
| J | 电芯厚度（50%SOC）(cell thickness) | 10.8±0.2mm |
| K | 极耳厚度 (tab thickness) | 0.2±0.02mm |

## 4. 产品规格 Product Specification

| 序号 NO. | 项目 Items | | 技术指标 Specifications |
|---|---|---|---|
| 1 | 典型容量 Typical Capacity | | 24.5 Ah@1C(25A) |
| 1 | 标称容量 Nominal Capacity | | 25Ah@0.2C(5A） |
| 2 | 标称电压 Nominal Voltage | | 3.65V |
| 3 | 充电截止电压<br>Charge Ending Voltage | | 4.3V |
| 4 | 放电截止电压<br>Discharge Ending Voltage | | 2.7V |
| 5 | 充 电 方 法<br>Charging Method | 标准充电<br>Standard charge | 0.2C(5A)恒流充电至 4.3V, 再 4.3V 恒压充电至截止电流 0.02C(0.5A),充电时间 330min<br>0.2C(5A) constant current charge to 4.3V, then constant voltage<br>4.3V charge until charged current reduced to 0.02C(0.5A), the<br>charging time is 330min |
| 5 | 充 电 方 法<br>Charging Method | 快速充电<br>Fast charge | 1C(25A)恒流充电至 4.3V, 再 4.3V 恒压充电至截止电流 0.02C(0.5A)，充电时间 70min<br>1C(25A) constant current charge to 4.3V, then constant voltage<br>4.3V charge until charged current reduced to 0.02C(0.5A)，the fast<br>charging time is 70min |
| 6 | 放电方法<br>Discharging Method | 标准放电电流<br>Standard Discharge Current | 1C(25A) |
| 6 | 放电方法<br>Discharging Method | 最大持续放电流<br>Max. Continuous Discharge Current | 3C(75A) |
| 6 | 放电方法<br>Discharging Method | 最大脉冲放电流<br>Max. Pulse Discharge Current | 10C(250A) (≤15S) |

| | | | |
|---|---|---|---|
| 7 | 循环寿命<br>Cycle Life | ≥500 次（25℃±3 ℃，0.5C(12.5A)/1C(25A)）<br>≥500cycles（25℃±3 ℃，0.5C(12.5A)/1C(25A)） | |
| 8 | 工作温度<br>Operating Temperature | 0℃～45℃，max.90%RH | 充电 Charging |
| | | -40℃～55℃，max.90%RH | 放电 Discharging |
| 9 | 工作环境&最大充电电流<br>Max. Charging Current & Operating Environment | 0℃～15℃ | 0.2C(5A)充电到 4.3V<br>0.2C(5A)charge to 4.3V |
| | | 15℃～35℃ | 1C(25A)充电到 4.3V<br>1C(25A)charge to 4.3V |
| | | 35℃～45℃ | 0.5C(12.5A)充电到 4.3V<br>0.5C(12.5A)charge to 4.3V |
| 10 | 贮存温度<br>Storage Temperature | -20℃～45℃ | 小于一个月<br>Less than one month |
| | | -20℃～35℃ | 小于六个月<br>Less than six month |
| 11 | 存储湿度 Store Humidity | ≤85%RH | |
| 12 | 能量密度 Energy Density | 300Wh/Kg(approx) | |
| 13 | 内阻 Internal Resistance | ≤2mΩ | |
| 14 | 重量 Weight | 310±5.0 g | |

## 5. 电池性能 Battery Performance

### 5.1 电化学性能 Electrochemical Characteristics

| 序号 NO. | 项目 Items | 标准 Criteria | 测试方法 Test Methods |
|---|---|---|---|
| 1 | 循环寿命<br>Cycle Life | 0.5C(12.5A)/1C(25A) 容量≥初始循环容量×80%（500 周 ）<br>Capacity ≥ Initial Capacity ×80%<br>（500 cycles） | 1.在 1 标准大气压，环境温度 23±2℃，相对湿度为≤85%RH 的条件下，0.5C(12.5A) 恒流恒压充电到 4.3V，截止电流 0.02C(0.5A)，搁置 30min;<br>2.以 1C(25A) 恒流放电至 2.7V，搁置 30min;<br>3.重复上述步骤，直至循环容量衰减到初始循环容量的 80%；<br>Under the condition of 1 standard atmospheric pressure, ambient temperature 23±2℃ , relative humidity ≤ 85%RH,0.5C(12.5A) constant current constant voltage charged to 4.3V, cut-off current 0.02C(0.5A), 30min-rest; Discharged at 1C(25A) constant current to 2.7V, 30min rest; Repeat the above steps until the cycle capacity decays to 80% of the initial capacity. |
| 2 | 高温放电<br>thermal discharge | 容量≥25℃容量×90%<br>Capacity ≥ Discharge capacity at 25℃×90% | 1.温度 23±2℃的条件下，0.5C(12.5A)恒流恒压充电至 4.3V，电流降为 0.02C(0.5A)时充电结束；<br>2.在 55℃±3℃放置 6h；<br>3.以 1C(25A)放电至终止电压 2.7V，记录其放电容量。<br>Under the condition of ambient temperature 23±2℃, charge to 4.3V at 0.5C(12.5A) standard constant current constant voltage, cut-off current 0.02C(0.5A) ; the battery is placed at 55± 3 °C for 6h,and discharge at 1C(25A) to the cut-off voltage 3.0 V. |
| 3 | -40 ℃ 低温放电性能<br>Low temperature discharge at -40℃ | 容量≥25℃容量×70%<br>Capacity ≥ Discharge capacity at 25℃×70% | 1.温度 23±2℃的条件下，0.5C(12.5A)恒流恒压充电至 4.3V，电流降为 0.02C(0.5A)时充电结束；<br>2.在－40℃±3℃放置 12h；<br>3.以 1C(25A)放电至终止电压 2.2V，记录其放电容量。<br>Under the condition of ambient temperature 23±2℃, charge to 4.3V at 0.5C(12.5A) standard constant current constant voltage, cut-off current 0.02C(0.5A) ;the battery is placed at -40± 3 °C for 12h, and discharged to 70% of the cut-off voltage 2.2V at 1C(25A) constant current. |

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| 4 | Rate discharge<br>倍率放电 | 5C(125A) 放电容量＞0.5C(12.5A)放电容量×90%，且温升不超过 70℃<br>5C(125A)discharge capacity＞0.5C(12.5A) discharge capacity × 90% | 1.温度 23℃±2℃的条件下，0.5C(12.5A)恒流恒压充电至 4.3V，电流降为 0.02C(0.5A)时充电结束；<br>2.搁置 30min；<br>3. 分别以 0.2C(5A)、0.5C(12.5A)、1C(25A)、2C(50A)、3C(75A)、5C(125A)放电至终止电压 2.7V，并监控表面温度。<br>Under the condition of ambient temperature 23±2℃, charge to 4.3V at 0.5C(12.5A) standard constant current constant voltage, cut-off current 0.02C(0.5A), 30min-rest, and then discharge at 0.2C(5A)、0.5C(12.5A)、1C(25A)、2C(50A)、3C(75A)、5C(125A) to the cut-off voltage of 2.7V, and monitor the surface temperature. |
| 5 | 25℃荷电保持与恢复<br>Charge retention and recovery at 25℃ | 剩余容量≥典型容量*85%<br>恢复容量≥典型容量*90%<br>Capacity retention≥Typical Capacity × 85%<br>Recovery capacity≥ Typical Capacity ×90% | 1.温度 23±2℃的条件下，0.2C(5A)恒流恒压充电到 4.3V，截止电流 0.02C(0.5A) 充满电；<br>2.电池在 25℃的温度箱中存储 28 天<br>3.以 1C(25A)电流放电至 2.7V，测量剩余容量；再 0.2C(5A)充 1C(25A)放测量电池的恢复容量。可循环三次，当有一次达到标准，即达到要求。<br>Under the condition of ambient temperature 23±2℃, charge to 4.3V at 0.2C(5A) standard constant current constant voltage, cut-off current 0.02C(0.5A). The Cell is<br>stored in an oven at 23±2°C for 28 days. Discharge at 1C(25A) current to 2.7V to measure the remaining capacity; Then 0.2C(5A) charge 1C(25A) discharge measure the recovery capacity of the battery. It can be cycled three times, when one reaches the standard, that is, it meets the requirements. |

| | | | |
|---|---|---|---|
| 6 | 60℃荷电保持与恢复<br>Charge retention and recovery at 60℃ | 剩余容量≥典型容量*80%<br>恢复容量≥典型容量*85%<br>Capacity retention≥Typical Capacity × 80%<br>Recovery capacity≥ Typical Capacity×85% | 1. 温度 23℃±2℃的条件下，0.2C(5A)恒流恒压充电到 4.3V，截止电流 0.02C(0.5A) 充满电；<br>2. 电池在 60℃的温度箱中存储 7 天<br>3. 在 23℃±2℃温度条件下，以 1C(25A)电流放电至 2.7V，测量剩余容量；再 0.2C(5A)充 1C(25A)放测量电池的恢复容量。可循环三次，当有一次达到标准，即达到要求。<br>Under the condition of ambient temperature 23±2℃,Charge to 4.3V at 0.2C(5A) standard constant current constant voltage, cut-off current 0.02C(0.5A), The cell is stored in an oven at 60 ±2°C for 7 days, Discharge at 1C(25A) current to 2.7V to measure the remaining capacity; Then 0.2C(5A) charge 1C(25A) discharge measure the recovery capacity of the battery. It can be cycled three times, when one reaches the standard, that is, it meets the requirements. |
| 7 | 贮存性能<br>Storage performance | 放电容量≥典型量×100%<br>贮存 3 个月≥90%<br>贮存 6 个月≥85%<br>贮存 12 个月≥80%<br>Capacity ≥Typical Capacity×100%<br>3 months≥90%<br>6 months≥85%<br>12 months≥80% | 测量电池初始容量，电池标准充电后，记录贮存前的初始状态，分别在室温贮存 3 个月、6 个月、12 个月后，测量电池的最终状态，然后 0.2C(5A)/1C(25A)循环 3 次记录电池放电容量。<br>Measure initial status and initial capacity. Standard charge and store for 3 months, 6 months and 12months respectively. Measure the final capacity, then charge at 0.2C(5A) and discharge at 1C(25A) for 3 cycles, and measure the discharge capacity. |

5.2 安全性能 Safety performance

| 序号 NO. | 项目 Items | 标准 Criteria | 测试方法 Test Methods |
|---|---|---|---|
| 1 | 过充电<br>Overcharge | 不起火、不爆炸<br>No fire No explosion | 电芯放电至终止电压后，用0.5C(12.5A)电流和4.65V的极限电压充电，电压达到最大值后，继续以该电压值恒压充电，当充电时间大于 7h或者温度降至比峰值低 20%时终止测试。<br>After discharge to limit voltage, charged at constant current of 0.5C(12.5A) and constant voltage of 4.65V, While voltage reaches to themax ,continue to charge at constant voltage at this value,if charging continued over 7 hours or temperature is 20% less than the top , close the test . |
| 2 | 短路<br>Shorts | 不起火、不爆炸<br>No fire No explosion | 电池以 0.5C(12.5A) 标准恒流恒压充电至 4.3V，截止电流 0.02C(0.5A)，将其正负极用线缆（线路总电阻 5mΩ以内）短接 10min，观察 1 h.<br>The battery is charged to 4.3V at 0.5C(12.5A) constant current, charged to cutoff current of 0.02C(0.5A) at constant voltage, put the battery into a ventilation cabinet and connect the positive and negative terminals directly by a 5 mΩ wire for 10min at 25±5°C, then observe for at least 1h. |
| 3 | 加热<br>Thermal stability | 不起火、不爆炸<br>No fire, No explosion | 电池以 0.5C(12.5A) 标准恒流恒压充电至 4.3V，截止电流 0.02C(0.5A)，放入温箱中以 5 ℃/min 的速率升至 130 ℃ 并保持 30 min 后停止加热，观察 1 h。<br>The battery is charged to 4.3V at 0.5C(12.5A) constant current,charged to cutoff current of 0.02C(0.5A) at constant voltage. Put the battery into an oven and heating from room temperature to 130±2°C at the rate of 5±2°C/min, then observe for at least 1h. |
| 4 | 挤压<br>Crushing | 不起火、不爆炸<br>No fire No explosion | 电池以 0.5C(12.5A) 标准恒流恒压充电至 4.3V，截止电流 0.02C(0.5A)。在电池的正反面上各放 1 个平面，两平板间施加 13±0.78KN 的挤压力，用 0.1mm/s 的速度挤压电池，一旦压力到达最大值或者电压下降 30%停止挤压，<br>保持 10 分钟，观察 1 h.<br>The battery is charged to 4.3V at 0.5C(12.5A) constant current, charged to cutoff current of 0.02C(0.5A) at constant voltage .<br>Put a plane on the front and back of the battery, apply a extrusion pressure of 13±0.78KN between the two plates, and squeeze the battery at a speed of 0.1mm/s. Once the pressure reaches the top value or the voltage drops by 30%, stop the extrusion, keep it for 10 minutes, observe for 1 h. |
| 5 | 低气压<br>Low pressure | 不起火、不爆炸<br>No fire No explosion | 电池以 0.2C(5A) 标准恒流恒压充电至 4.3V，截止电流 0.02C(0.5A)，然后将电池放入低气压箱中，调节试验箱中气压为 11.6kPa，温度为室温，静置 6h. |

| | | | |
|---|---|---|---|
| | | | The battery is charged to 4.3V at 0.2C(5A) constant current, charged to cutoff current of 0.02C(0.5A) at constant voltage .then test batteries shall be stored at a pressure of 11.6kPa or less for at least six hours at ambient temperature. |
| 6 | 强制放电<br>Forced Discharge | 不起火、不爆炸、不漏液<br>No fire 、<br>No explosion<br>No leakage | 电池以 0.5C(12.5A) 标准恒流恒压充电至 4.3V，截止电流 0.02C(0.5A)，然后以 1C(25A) 恒流放电 90 min 或者电压为 0V，观察 1h。<br>The battery is charged to 4.3V at 0.5C(12.5A) constant current, charged to cutoff current of 0.02C(0.5A) at constant voltage, and discharged at 1C(25A) for 90 min or the voltage of 0V, then observe for 1h |
| 7 | 跌落<br>Droping | 不起火、不爆炸、不漏液<br>No fire 、<br>No explosion<br>No leakage | 电池以 0.5C(12.5A) 标准恒流恒压充电至 4.3V，截止电流 0.02C(0.5A)，从 1 m 高处由落体跌落于水泥地上，每个面跌落一次.<br>The battery is charged to 4.3V at 0.5C(12.5A) constant current, charged to cutoff current of 0.02C(0.5A) at constant voltage. Free fall from a height of 1m to the cement ground, one drop on each surface . |

## 6. 外观检查 Visual Inspection

不允许有任何影响电池性能的外观缺陷，如裂纹、裂缝、泄漏等。

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

## 7. 标准测试环境 Standard Test Conditions

除非特别说明，本规格书中所有测试均在以下环境条件下进行：

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

温度 Temperature: 25±3℃

湿度 Humidity: ≤75%RH

大气压 Atmosphere: 86KPa~106KPa

## 8. 包装 Packaging

8.1 电池的包装应符合防潮防震的要求，详细包装如下：

The cell shall be packed in accordance with the requirements of moisture-proof and shock proof. The detailed packaging is as follows:

——单个电池使用无色塑料托盘存放，每盘 3 只；

——Cell is stored in a colorless plastic tray, and there are 4 cells in every tray;

——外包装为纸箱，每箱 10 盘，共 30 只。

——The outer packing is carton, where 30 pieces cells in 10 trays per carton is.

8.2 包装箱内应装入随同产品提供的文件：

The packing case shall contain the documents provided with the products:

——装箱单（指一批多箱包装时） Packing list (refers to a batch of multiple boxes);

——产品合格证 Product certificate;

——产品检验报告 Product inspection report

## 9. 标识 Identification

9.1 单体电池产品上应有下列标识:

Cell product shall have the following marks:

极性符号+、- Polar symbol: +/-

产品条码(信息包含产品型号、批号、生产日期信息)

Product barcode (information including product model, batch number and date of production)

9.2 包装箱外壁应有下列标志:

Each packing case shall be marked with:

产品名称(锂离子电池)、产品型号、产品批号、产品等级、数量、物料编码

Product name (solid lithium ion cell), product model, product batch number, product grade, quantity, material code

标明防潮、不准倒置、轻放等标志

Moisture-proof, no upside-down and other signs

## 10.存储及其他事项 Storage and Others

10.1 长期储存 Long Time Storage: 长期储存的电池(超过 3 个月)须置于干燥、凉爽处，每 6 个月对电池进行一次充放电，储存电压为 3.45-3.55V。

If the cell is to be stored for a long time (over 3 months), the cell should be stored in dry and cool place. The cell should be charged and discharged every six month. The cell's storage voltage should be 3.45-3.55V.

10.2 其他事项 Others: 任何本规格书中未提及的事项，须经双方协商确定。

Any matters which have not been covered in this specification should be conferred between the customer and Nanwu Technology (Guangzhou) Co., Ltd..

## 11.保质期及产品责任 Warranty Period and Product Liability

### 11.1 保质期 Warranty

保质期是从客户验收开始起 12 个月。

Warranty period of this product is 12 months from the production date

### 11.2 产品责任 Product Liability

对因没有按本规格书规定操作而导致的意外不负责任，当本规格书有些变动时，本公司会通知购买方。

Nanwu Technology (Guangzhou) Co., Ltd. is not responsible for the troubles caused by mishandling of the cell which is clearly against the instructions in this specification. Nanwu Technology (Guangzhou) Co., Ltd. will notify our customers if there are any changes of the product specification.

## 12.文件有效期 Validity Period of Documents

本文件自发布之日至下次修正日止。

The validaiton for this document is from the issue date to the date of the next revision.

## 13.保密 Confidentiality

本产品规格书在没有得到南屋科技(广州)有限公司的许可时，不能向第三方泄露，禁止复印或转载。

This product specification shall not be disclosed to any third party without the permission of Nanwu Technology (Guangzhou) Co., Ltd.; nor shall it be copied or reproduced.

## 14.警告及注意事项 Warnings and Cautions

14.1 不要将电池投入火中或加热;

Do not put the cell into the fire or a heater;

14.2 不要将电池分解拆散:

Do not dismantle the cell;

14.3 严禁将电池浸入海水或水中，保存不用时，应放置于阴凉干燥的环境中；

Do not immerse the cell in water or seawater, keep the cell in a cool dry environment if it stands by;

14.4 禁止将电池放在热源旁，如火、加热器等；

Do not use or leave the cell near sources of heat such as a fire or heater;

14.5 充电时请选用锂离子电池专用充电器；

Use the charger specifically for lithium-ion cell when recharging;

14.6 严禁颠倒正负极使用电池:

Do not reverse the position and negative terminals;

14.7 严禁将电池直接插入电源插座

Do not connect the cell directly to an electrical outlet;

14.8 禁止用金属直接连接电池正负极短路；

Do not short-circuit the cell by directly connecting the positive and negative terminals with metal objects;

14.9 禁止将电池与金属(如发夹、项链等)一起运输或贮存；

Do not transport or store the cell together with metal objects such as hairpins, necklaces, etc;

14.10 禁止敲击或抛掷、踩踏电池等；

Do not strike, trample or throw the cell, etc;

14.11 禁止直接焊接电池和用钉子或其它利器刺穿电池；

Do not directly solder the cell and pierce the cell with a nail or other sharp objects;

14.12 禁止在高温下(炙热的阳光下或很热的汽车中)使用或放置电池，否则可能会引起电池过热、起火或功能失效、寿命减短；

Do not use or leave the cell at high temperature (for example, under the hot sunlight or in a hot vehicle). Otherwise, it can overheat, catch fire, or suffer from performance and life degradation;

14.13 禁止在强静电和强磁场的地方使用，否则易破坏电池安全保护装置，带来不安全的隐患；

Do not use the cell in a location with strong electrostatic field or magnetic field. Otherwise, the safety protective device may be damaged, causing safety hazard;

14.14 如果电池发生泄露，电解液进入眼睛，请不要揉擦，应用清水冲洗眼睛，并立即送医治疗；

If the cell leaks and the electrolyte gets into the eyes, do not rub the eyes, instead, rinse the eyes with clean water, and immediately seek medical attention so as not to cause more injury to your eyes;

14.15 如果电池发出异味、发热、变色、变形或使用、贮存、充电过程中出现任何异常，立即将电池从装置或充电器中移离并停用；

If the cell gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or cell charger and stop using it;

14.16 废弃之电池应用绝缘纸包住电极以防起火、爆炸；

Be aware that abandoned batteries may cause fire or explosion, tape the cell terminals to insulate them;

14.17 如果电池极柱弄脏，使用前应用干布抹净，否则可能会导致接触不良功能失效。

If the cell terminals are stained, clean the terminals with a dry cloth before use. Otherwise performance degredation may be caused due to the poor connection.

14.18 废弃电池应交予专业回收处理公司进行无害化处理；

Waste batteries should be handed over to professional recycling companies for harmless treatment.

14.19 电池在使用过程中应遵循所在地的法律法规。

During battery usage, the local laws and regulations should be followed.