# INP2714897A-50Ah 锂离子电池

# 产品规格书

## Lithium-ion Rechargeable Cell

## Product Specification

## Model: INP2714897A-50Ah

| 制　定 Designed by | | 审　核 Examined by | | 批　准 Approved by |
|---|---|---|---|---|
| | | | | |
| 标准化<br>**Standardized by** | | 会　签<br>**Counter Signed by** | | |

# 目　录

# 前　言 Preface

本标准为公司统一执行的企业标准。

This standard is specified to the enterprise standard of Gotion.Co.,Ltd.

本标准的编写格式符合 GB/T 1.1-2009《标准化工作导则 第 1 部分：标准的结构和编写》的规定。

The format of this standard complies with the requirements of GB/T 1.1-2009, " standardization work guideline Part 1: Structure and Compilation of Standards".

本标准在参照 GB/T 31484-2015 《电动汽车用动力蓄电池循环寿命要求及试验方法》、GB/T 38031-2020 《电动汽车用动力蓄电池安全要求》、GB/T 31486-2015 《电动汽车用动力蓄电池电性能要求及试验方法》、Q/GX 003-2015 《电动汽车用锂离子动力蓄电池技术规范》的基础上，结合我公司产品实际和试验条件，特制定 Q/GX 0-2020《INP2714897A-50Ah 锂离子电池产品规格书》标准，并对试验方法、判定标准内容进行了修订和补充，以指导 INP2714897A-50Ah 锂离子电池产品的制造和验收。

This standard is referred to GB/T 31484-2015 "cycle life requirements and test methods for power battery for electric vehicles", GB/T 38031-2020 "safety requirements for power battery for electric vehicles", GB/T 31486-2015 "electrical performance requirements and test methods for power battery for electric vehicles ", Q/GX 003-2015 " technical specification for lithium-ion power battery for electric vehicles". Combined with the actual and experimental conditions of our company's products, the standard of Q/GX 0 -2020 "Product Specification for INP 2714897 A - 50Ah Lithium-ion rechargeable cell" was specially -qualified. The test method and criteria were revised carefully and supplemented to guide the manufacturing and approving of INP 2714897 A - 50Ah lithium ion cell.

本标准由三元电池分院研究院平台三元电芯部提出并起草。

This standard is prepared by the Institute of the Battery Research.

本标准由标准法规部归口管理。

This standard is managed by the Department of Standard and Statute.

修订记录 Modification Record

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## 1 范围 The scope

本产品规格书规定了 INP2714897A-50Ah 型锂离子电池的性能要求、试验方法、检验规则、标志、包装、运输和贮存要求。

This document is to specify the performance characteristics, - along with testing and inspection methods marking, packaging, transportation and storage requirements for INP2714897A-50Ah lithium-ion cell.

本产品规格书适用于公司生产的 INP2714897A-50Ah 型锂离子电池。

This specification is applicable only to INP2714897A-50Ah lithium-ion cell produced by Gotion.Co.,Ltd..

## 2 规范性引用文件 Normative References

下列文件中的条款通过本标准的引用而成为本标准的条款。然而，鼓励根据本标准达成协议的各方研究是否可使用这些文件的最新版本。凡是不注日期的引用文件，其最新版本适用于本标准。

The clauses of the following documents are adopted as the references to this standard. - Meanwhile, the parties who have reached an agreement under this standard are encouraged to study whether the latest version of these documents can be used. The latest version of any un-dated references is applicable to this standard.

GB/T 2900.41 电工术语原电池和蓄电池

GB/T 2900.41 electrotechnical terms for primary battery and storage battery

GB/T 19596 电动汽车术语

GB/T 19596 electric vehicle terminology

GB/T 31484-2015 电动汽车用动力蓄电池循环寿命要求及试验方法

GB/T 31484-2015 cycle life requirements and test methods for traction battery -for electric vehicles

GB/T 38031-2020 电动汽车用动力蓄电池安全要求

GB/T 38031-2020 safety requirements for traction battery for electric vehicles

GB/T 31486-2015 电动汽车用动力蓄电池电性能要求及试验方法

GB/T 31486-2015 electrical performance requirements and test methods for traction battery for electric vehicles

Q/GX 003-2015 电动汽车用锂离子动力蓄电池技术规范

Q/GX 003-2015 technical specification for lithium ion traction battery for electric vehicles

## 3 术语和定义 Terms and Definitions

### 3.1 倍率电流 Rate Current

缩写符号 C，1C 表示电池以 1 小时率充放电的电流，3C 表示电池以 1/3 小时率充放电的电流。

Denoted by “C”, 1 C indicates current that the cell charges/discharges to full/empty in 1 hour, and 3 C represents the current at which the cell charges/discharges to full/empty in 1/3 hour.

### 3.2 直流内阻 DC Internal Resistance

电池在室温（25℃±2℃）、50%SOC 条件下，以最大脉冲电流放电 10s，计算放电前后的电压和电流变化，然后将电压变化的差值除以电流变化的差值，即为直流内阻。

The cell is discharged at the maximum pulse current for 10 s at room temperature conditions (25±2)℃ and 50 % SOC, the voltage and current change before and after discharge are calculated. The value of the voltage change divided by the current change is defined as the DC internal resistance.

### 3.3 最大持续充电电流 Maximum Continuous Charge Current

电池在指定温度下，保证电池正常工作所允许进行持续充电的最大电流

The maximum current that the cell is allowed to charge continuously at the specified temperature to ensure proper operation of the cell.

### 3.4 最大持续放电电流 Maximum Continuous Discharge Current

电池在指定温度下，保证电池正常工作所允许进行持续放电的最大电流

The maximum discharging current allowed by the cell to operate continuously at the specified temperature.

3.5 恒流充电容量比例 Constant Current Charging Ratio of Charge Capacity

电池在室温、0%SOC 条件下，以某一倍率下恒流充电至 4.35V 截止的充电容量与标准充电方法下的充电容量的比值。

At room temperature and 0 % SOC, the ratio of the charge capacity at the constant current charge to the cut-off voltage 4.35V and the charge capacity under the standard charging method.

3.6 冷启动功率 Cold Cranking Power

在-20℃、50%SOC 条件下，电池的 2s 脉冲最大放电功率。

The maximum discharge power of 2 s pulse at -20 ℃ and 50 % SOC.

3.7 产品型号含义 Product model Implication

IN P 27 148 97 A – 50Ah

- 50Ah：代表蓄电池电池额定容量 Indicates rated capacity of the cell
- A：代表蓄电池壳体材质为铝 Indicates the material of the cellshell is aluminum
- 97：代表蓄电池高度尺寸 Indicates the height of the cell
- 148：代表蓄电池宽度尺寸 Indicates the width of the cell
- 27：代表蓄电池厚度尺寸 Indicates the thickness of the cell
- P：代表蓄电池形状为方形 Indicates the shape of the cell，and P defines the prismatic
- IN：代表蓄电池正极材料为镍钴锰酸锂 Indicates cathode material of the cell is the Lithium nickel cobalt manganite

## 4 基本性能 Basic Performances

表 1 基本性能

Table 1 Basic Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 4.1 外观 Appearance | 无破裂、划痕、变形、污渍、电解液泄漏<br>No cracks, Scratches, Deformation, Stains, | |
| 4.2 尺寸 Dimensions | (26.7~27.5)　mm*(148.2±0.5)　mm*(97.4±0.5)　mm | 包含绝缘胶和顶盖贴片（详见附录 A.1） |
| 4.3 重量 Weight | 835g±25g | |
| 4.4 标称电压 Nominal Voltage | 3.68V/3.73V | 1C/0.33C |

| | | |
|---|---|---|
| 4.5 交流内阻 AC Resistance | ≤1.0mΩ | 25℃，50%SOC |
| 4.6 直流内阻 DC Resistance | ≤2.0mΩ | 25 ℃， 5C， 10s，50%SOC |
| 4.7 额定容量 Rated Capacity | 50Ah | 1C,25℃ |
| 4.8 工作电压 Operation voltage | 2.8V～4.35V | |

## 5 电性能 Electrical Performances

### 5.1 充电性能 Charging Properties

表 2 充电性能

Table 2 Charging Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 5.1.1 最大持续充电电流 Maximum Continuous Charge Current | 1C | 25~45℃ |
| 5.1.2 最大脉冲充电电流 Maximum Allowable pulse Charge Current | 3C | 25~45℃, 10s |
| 5.1.3 最大允许充电电压 Maximum Allowable Charge Voltage | 4.35V | |
| 5.1.4 最大允许充电温度范围 Maximum Allowable Charge Temperature Range | -20℃～55℃ | |
| 5.1.5 最佳充电温度范围 Optimum Charging Temperature Range | 10℃～35℃ | |

表 2 充电性能（续）

Table 2 Charging Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 5.1.6 恒流充电容量比例 Constant Current Charging Ratio of Charge Capacity | ≥80% | 25℃，2C |

### 5.2 放电性能 Discharging Properties

表 3 放电性能

Table 3 Discharging Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 5.2.1 最大持续放电电流<br>Maximum Continuous Discharge Current | 2C | 25~45℃ |
| 5.2.2 最大脉冲放电电流<br>Maximum Pulse Discharge Current | 5C | 25~45℃, 10s |
| 5.2.3 最低允许放电电压<br>Minimum Allowable Discharge Voltage | 2.8V | 0℃～55℃ |
| | 2.4V | -30℃～0℃ |
| 5.2.4 最大允许放电温度范围<br>Maximum Allowable Discharge Temperature Range | -30℃～55℃ | |
| 5.2.5 最佳放电温度范围<br>Optimum Discharge Temperature Range | 10℃～35℃ | |
| 5.2.6 室温放电容量<br>Room Temperature Discharge Capacity | ≥50Ah | 25℃，1C，2.8-4.35V |
| 5.2.7 高温放电容量<br>High Temperature Discharge Capacity | ≥50Ah | 45℃，1C，2.8-4.35V |
| 5.2.8 低温放电容量<br>Low Temperature Discharge Capacity / Energy Retention | ≥80% | -20℃， 1C， Cut-off Voltage 2.4V |
| 5.2.9 倍率放电容量<br>C-rate discharge Capacity Retention Rate | ≥90% | 25℃，3C |

## 5.3 功率性能 Power Properties

表 4 功率性能

Table 4 Power Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 5.3.1 质量功率密度<br>Mass Power Density | ≥1600 W/kg | 50%SOC，25℃ |
| 5.3.2 体积功率密度<br>Volumetric Power Density | ≥3400W/L | 50%SOC，25℃ |
| 5.3.3 最大放电功率<br>Maximum Discharge Power | 1400W | 50%SOC ，25℃，参见 7.10<br>Reference to 7.10 |
| 5.3.4 最大反馈功率<br>Maximum –Response Power | 900W | 50%SOC， 25℃，参见 7.10<br>Reference to 7.10 |
| 5.3.5 冷启动功率 | ≥100W | -20℃，50%SOC |

| | | |
|---|---|---|
| Cold Cranking Power | | |

5.4 电池寿命 Cell Life

表 5 电池寿命

Table 5 Cell Life

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 5.4.1 标准循环寿命<br>Standard Cycle Life | ≥2000 次 | 25℃，1C 阶梯充电/1C，3-97%SOC |
| 5.4.2 高温循环寿命<br>High Temperature Cycle Life | ≥1000 次 | 45℃，1C 阶梯充电/1C，3-97%SOC |

5.5 存储性能 Storage Properties

表 6 存储性能

Table 6 Storage Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 5.5.1 最佳存储温度范围<br>Optimum Storage Temperature Range | -20℃～35℃ | |
| 5.5.2 自放电率<br>Self-discharge Rate | ≤4% | 25℃，28 天 25℃，28 days |
| 5.5.3 室温荷电保持率<br>Room Temperature Charge Retention Rate | ≥96% | 25℃，28 天，参考 7.8<br>Reference to 7.8 |
| 5.5.4 室温容量恢复率<br>Room Temperature Capacity Recovery Rate | ≥97% | |
| 5.5.5 高温荷电保持率<br>High Temperature Charge Retention Rate | ≥92% | 60℃，7 天，参考 7.8<br>Reference to 7.8 |
| 5.5.6 高温容量恢复率<br>High Temperature Capacity Recovery Rate | ≥95% | |
| 5.5.7 储存容量恢复率<br>Storage Capacity Recovery Rate | >95% | 45℃，50%SOC，28 天<br>45℃，50%SOC，28days |

**6 安全性能** Safety Performances

表 7 安全性能

Table 7 Safety Properties

| 项目 Item | 规格 Specification | 备注 Remarks |
|---|---|---|
| 6.1 过放电 Over Discharging | 不爆炸，不起火，不漏液<br>No explosion，no fire，no leakage | GB 38031-2020 |
| 6.2 过充电 Over Charging | 不爆炸，不起火<br>No explosion， no fire | GB 38031-2020 |
| 6.3 短路 Short Circuiting | 不爆炸，不起火<br>No explosion， no fire | GB 38031-2020 |
| 6.4 加热 Heating | 不爆炸，不起火<br>No explosion， no fire | GB 38031-2020 |
| 6.5 挤压 Pressing | 不爆炸，不起火<br>No explosion， no fire | GB 38031-2020 |
| 6.6 温度循环<br>Temperature Cycling | 不爆炸，不起火，不漏液<br>No explosion，no fire，no leakage | GB 38031-2020 |

## 7 测试方法 Testing Methods

### 7.1 测试环境 Test Conditions

除另有备注说明外，电池测试环境条件为：温度 25℃±2℃，相对湿度为 25%～85%，大气压力 86kPa～106kPa；电池充电采用 7.2 方式；电池放电采用 7.3 方式；本标准中所提到的室温，是指 25℃±2℃。

Unless otherwise stated in this standard, the cell shall be tested at the room temperature of (25±2) ℃ , relative humidity of 25 %~85 %, and atmospheric pressure of 86 kPa～106 kPa; Cells charging method refers to 7.2 and discharging method refers to 7.3.

### 7.2 标准充电 Standard charge

室温下（25℃±2℃），单体蓄电池以 1C 电流放电至电压为 2.8V，静置 10min，然后在以 1C 电流充电至电压为 4.35V 时转恒压充电，至充电电流降至 0.01C 时停止充电，充电后静置 1h。

At room temperature (25±2) ℃, the single cell is discharged at 1 C current until the voltage is reduced to 2.8 V, keep cell for 10 min, charge at 1 C current to 4.35V, following constant voltage of 4.35 V to charge until current drops to 0.01 C, and again keep it for 1 h.

### 7.3 标准放电 Standard Discharging

先按照 7.2 充满电，室温下，单体蓄电池以 1C 电流放电至电压为 2.8V 截止。

The cell should be fully charged according to the method specified in 7.2, and discharge at 1 C current until voltage reaches to 2.8 V.

7.4 直流内阻 Direct Current (DC) Internal Resistance

按 7.2 方法充电，在室温下以 1C 电流放电 30min 后，以 5C 电流放电 10s，计算放电前后的电压和电流变化，然后将电压变化的差值除以电流变化的差值。

The cell should be fully charged according to 7.2 method. At room temperature with 1 C current discharge the cell for 30 min, and with 5 C current for 10 s. Through this way the DC internal resistance could be determined by the ΔV/ΔI. where the ΔV and ΔI are the change in voltages and current respectively before and after the discharging.

7.5 低温放电容量 Low Temperature Discharge Capacity

按 7.2 方法充电；在 5.2.8 规定温度下储存 8h；在对应温度下以 1C 电流放电，放电至 2.4V。按此方法测试不同温度下的放电能力。

Charge the cell according to 7.2 method, keep the cell at temperature as mentioned in 5.2.8 for 8h, discharge with current of 1 C to the cut-off voltage of 2.4V, to obtain the discharge capacity at different temperatures.

7.6 高温放电容量：High Temperature Discharge Capacity

按 7.2 方法充电；在 45℃±2℃下储存 5h；在 45℃±2℃下以 1C 电流放电，放电至 2.8V，得到高温放电容量。

Charge the cell according to 7.2 method, keep the battery at (45±2) ℃ for 5 hours, discharge with current of 1 C to the cut-off voltage of 2.8 V at temperature of (45±2) ℃ to obtain the discharge capacity.

7.7 室温倍率充放电容量 Room Temperature C-rate Charge/Discharge Capacity

室温下，以 7.3 方法放电，分别以规定倍率进行恒流充电至 4.35V，得到不同倍率下的充电容量；室温下，以 7.2 方法充电，分别以规定倍率进行放电至 2.8V，得到不同倍率下的放电容量。

Discharge the cell according to 7.3 method, with different current rate charging to 4.35V, to obtain the charge capacity for different rate. Charge the cell according to 7.2, with different current rate discharging to 2.8 V, to obtain the discharge capacity for different rate.

7.8 荷电保持率、自放电率与容量恢复率 Charge Retention Rate, Self-discharge Rate and Capacity Recovery Rate

按 7.2 方法充电，在 25℃±2℃下储存 28 天或在 60℃±2℃下储存 7 天后，以 1C 电流放电至 2.8V，得到放电容量，其与初始容量的比值即为荷电保持率；放电容量与初始容量的差值为自放电容量，自放电容量与初始容量的比值即为自放电率；

再按 7.2 方法充电和 7.3 方法放电，得到恢复容量，其与初始容量的比值即为容量恢复率。

Charge the cell according to 7.2, keep the cell at (25±2) ℃ for 28 days or at (60±2) ℃ for 7 days, with 1 C current discharge to the voltage of 2.8 V, to obtain the discharge capacity, the ratio of the discharge capacity to the initial capacity is called the charge retention rate. The difference between room temperature capacity recovery rate and room temperature charge retention rate is called the battery self-discharge rate.

According to 7.2 and 7.3 recharge and discharge respectively to obtain the recovery capacity, the ratio of the recovery capacity to the initial capacity is called the capacity recovery rate.

7.9 存储容量恢复率 Storage Capacity Recovery Rate

按 7.2 方法充电，在室温下以 1C 电流放电 30min 后，在 45℃±2℃下储存 28 天，按 7.2 方法充电，在室温下以 1C 电流放电至 2.8V，得到放电容量，其与初始容量的比值即为存储容量恢复率。

At room temperature，charge the cell according to 7.2，with 1 C current discharge for 30 min and store at the temperature of (45±2) ℃ for 28 days，recharge the cell according to 7.2，with 1 C current discharge to a voltage of 2.8 V，to obtain the discharge capacity，the ratio of the discharge capacity to the initial capacity is called the storage capacity recovery rate.

7.10 最大放电功率和最大反馈功率 Maximum Discharge Power and Maximum Regain Power

按 7.3、7.5 和 7.6 方法得出不同温度的放电容量，并以此作为不同温度下的 SOC 计算标准；按 7.2 方法充电后于待测环境温度下搁置相应时间后（＞0℃，5h；≤0℃，8h），以 1C 电流放电调整 SOC 为 90%，静置 1h 后，以当前温度脉冲允许脉冲电流放电 10s，搁置 40s，再以当前温度允许脉冲电流充电 10s；依次以 1C 电流将 SOC 调整为 80%，70%，…10%，测试不同 SOC 下脉冲充放电能力，记录过程数据，按照 HPPC 测试方法中直流内阻和脉冲功率的计算公式，计算出不同温度和 SOC 下的最大放电功率和最大反馈功率。

According to the 7.3, 7.5 and 7.6 methods, obtain the discharge capacity which are used as the SOC calculation standard for different temperatures. Charge the cell according to 7.2, keep the cell at the corresponding temperature and time（＞0℃:5h；≤0℃:8h）. Adjust the SOC to 90 % by the 1 C current discharge, keep for 1 h, with the max C pulse discharge for 10 s and keep for 40 s, with the max C pulse charge for 10 s, adjust next SOC (80%, 70%....10%) by the 1 C current discharge, repeat the above procedures to test discharge performance for different SOC. According to the HPPC test methods, calculate the DC internal resistance, maximum discharge power and maximum regain power for different temperature and SOC.

7.11 冷启动测试 Cold Cranking Test

按 7.2 方法充电，在室温下以 1C 电流放电至 50%SOC，将电池放置到-20℃环境下搁置 20h，然后在-20℃环境下以 100W 功率放电 2s，然后静置 10s，重复 3 次。

At room temperature，Charge the cell according to 7.2, with 1 C current discharge for SOC at 50 %, keep the cell at temperature of -20 ℃ for 20 h, with 100W power discharge for 2 s, and keep for 10 s, repeat the procedure for three times.

7.12 标准循环寿命和高温循环寿命 Standard Cycle Life and High Temperature Cycle Life

阶梯充电：单体蓄电池以 1C 电流放电至电压为 2.8V，静置 30min，然后在以 0.5C 电流充电至 3.60V，转 2C 电流充电至 3.89V，转 1.6C 恒流充电至 4.00V，转 1.4C 恒流充电至 4.10V，转 1.0C 恒流充电至 4.19V，转 0.6C 恒流充电至 4.21V，转 0.33C 恒流充电至 4.23V，转 0.2C 恒流充电至 4.30V，充电后静置 30min。

Step charge：the single cell is discharged at 1 C current until the voltage is reduced to 2.8 V, keep cell for 30 min, charge at 0.5 C current to3.60V, charge at 2 C current to3.89V, charge at 1.6 C current to 4.00V, charge at 1.4 C current to 4.10V, charge at 1C current to 4.19V, charge at 0.6 C current to 4.21V, charge at 0.33 C current to 4.23V, charge at 0.2 C current to 4.30V ， and again keep it for 30min.

电池在 25℃或 45℃环境下，以阶梯充电方式充电至 4.30V, 静置 30min，然后以 1C 电流放电至 3.26V，静置 30min，重复 2000 次或 1000 次，若放电容量低于室温初始容量的 80%，则终止试验；若放电容量高于室温初始容量的 80%，则继续循环 500 次；

At 25 ℃ or 45 ℃ , charge the cell with step charge to 4.30V, keep for 30 min, discharge current of 1 C till 3.26 V, keep for 30 min, repeating 2000 cycles at 25 ℃ or repeating 1000 cycles at 45 ℃ , the discharge capacity should not be less than 80 % of the rated capacity.

## 8 检验规则 Inspection Regulations

8.1 检验项目按表 10 的规定 Inspection items are specified in table 10

表 10 检验项目

Table 10 Inspection items

| 检验类型 Inspection Type | 检验项目 Inspection Items | 检验数量 Inspection Quantity |
|---|---|---|
| 免检项目 Exempted inspection Items | 4.4　标称电压 Nominal Voltage　　4.7　额定容量 Rated Capacity<br>4.8　工作电压 Operating Voltage<br>5.1.3　最大允许充电电压 Maximum Allowable Charge Voltage<br>5.1.4　最大允许充电温度范围　Maximum Charge Temperature Range<br>5.1.5　最佳充电温度范围 Optimum Charge Temperature Range<br>5.2.3　最低允许放电电压 Minimum Allowable Discharge Voltage<br>5.2.4　最大允许放电温度范围 Maximum Allowable Discharge Temperature Range<br>5.2.5　最佳放电温度范围 Optimum Discharge Temperature Range<br>5.4.1 标准循环寿命 Standard Cycle Life<br>5.4.2 高温循环寿命 High Temperature Cycle life<br>5.4.3 日历寿命 Calendar life<br>5.5.1 最佳存储温度范围 Optimum Storage Temperature Range | / |
| 出厂检验 Delivery inspection | 4.1　外观　Appearance　　4.5　交流内阻 AC Internal Resistance<br>5.2.6　室温放电容量 Room Temperature Discharge Capacity<br>5.5.2　自放电率 Self-discharge Rate | 100% |
| | 4.2 尺寸 Dimension　　4.3 重量 Weight | 160 只/批 160 pcs/batch |
| 型式检验 Type inspection | 免检项目、出厂检验项目以外的其余指标:Other indicators except exempted inspection item and delivery inspection items.<br>4.6　直流内阻 DC- Internal Resistance<br>5.1.1　最大持续充电电流　Maximum Continuous Charge Current<br>5.1.2　最大脉冲充电电流　Maximum Allowable pulse Charge Current<br>5.1.6 恒流充电容量比例 Constant Current Charging Ratio of Charge Capacity<br>5.2.1 最大持续放电电流　Maximum Continuous Discharge Current<br>5.2.2 最大脉冲放电电流　Maximum Pulse Discharge Current<br>5.2.7 高温放电容量　High Temperature Discharge Capacity<br>5.2.8 低温放电容量　Low Temperature Discharge Capacity<br>5.2.9 倍率放电容量　C-Rate Discharge Capacity<br>5.3.1 质量功率密度　Gravimetric Power Density<br>5.3.2 体积功率密度　Volumetric Power Density | 2 只/项 2 pcs/item |

| | | |
|---|---|---|
| | 5.3.3 最大放电功率 Maximum Discharge Power<br>5.3.4 最大反馈功率 Maximum Retention Power<br>5.3.5 冷启动功率 Cold Cranking Power<br>5.5.3 室温荷电保持率 Room Temperature Charge Retention<br>5.5.4 室温容量恢复率 Room Temperature Capacity Recovery Ratio<br>5.5.5 高温荷电保持率 High Temperature Capacity Retention<br>5.5.6 高温容量恢复率 High Temperature Capacity Recovery Ratio<br>5.5.7 储存容量恢复率 Capacity Recovery Ratio after Storage<br>6.1 过放电 Over Discharging<br>6.2 过充电 Over Charging<br>6.3 短路 Short circuiting<br>6.4 加热 Heating<br>6.5 挤压 Pressing<br>6.6 温度循环 Temperature Cycling | |

8.2 型式检验 Type Inspection

8.2.1 产品在下列情况之一时应进行型式检验 Products should be type inspected in one of the following situations

a）新产品投产和老产品转产；Production of first batch and transfer product from old

b）转厂；Production in the different Plants

c）停产超过一年后复产； Reopening of the production line over a year

d）结构、工艺或材料有重大改变。Major changes in the cell structure, cell materials and production process

8.2.2 判定规则 Criterion Rule

在型式检验中，若有一项不合格时，应判定为不合格。

During inspection process, if one of items don not meet the requirements, it should be considered as an unqualified.

## 9 标志、包装、运输、贮存 Marking、Packaging、Transportation and Storage

9.1 标志 Marking

每个产品上应有清晰的条码。

Every product should have a clear bar code

9.2 包装 Packaging

产品都应有外包装，保证产品在运输、装卸、堆放过程中不受机械损伤。

All products should have external packaging to ensure that the product is not mechanically damaged during transportation, handling (loading or unloading) and stacking.

9.3 运输 Transportation

在运输过程中应严禁暴力装卸，防止剧烈振动、冲击或挤压，防止日晒雨淋。

During the transportation, the violent loading and unloading is strictly prohibited, avoid the strong vibrations, shocks or extrusions, and keep away from sunshine and rain.

9.4 贮存 Storage

不打开包装的产品应贮存在环境温度为-10℃～30℃，相对湿度≤75％的清洁、干燥、通风的库房内，库房内不应含有腐蚀性气体；产品应远离火源和热源；应定期进行充电周期不超过 2 个月。

Sealed Product should be stored in a clean, dry, and ventilated warehouses with an ambient temperature - of -10 ℃~30 ℃, relative humidity ≤ 75 % R.H. that do not contain corrosive gases; Keep away from fire and heat source. The charging cycle of the product should no more than 2 months at regular intervals.

## 附录 **A** Appendix A

### A.1　电池尺寸图 A.1 Cell Dimensional Drawing

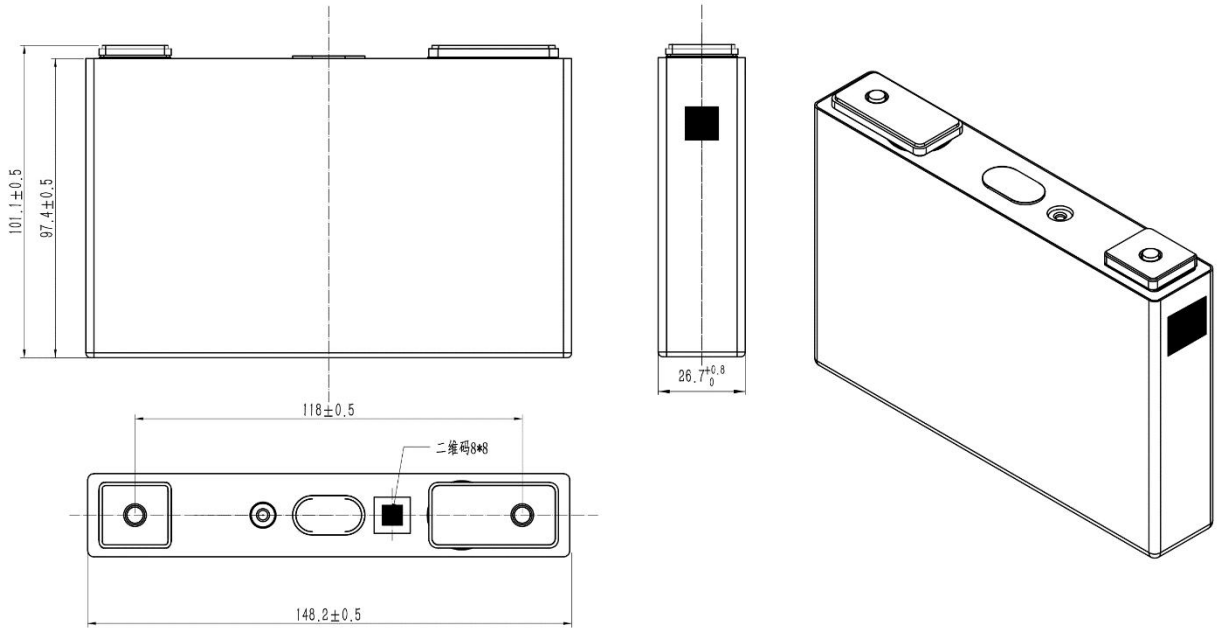


图 A.1　电池尺寸图

Figure A.1 Cell Dimensional Drawing