# UN38.3 TEST REPORT
# UN38.3 检测报告

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|---|---|
| **Report No.:** 报告编号： | CMC251103098 |
| **Name of Goods:** 物品名称： | LiFePO4 BATTERY 磷酸铁锂电池 |
| **Model:** 型号： | 12.8V 100Ah |
| **Type:** 规格： | 12.8V 100Ah 1280Wh |
| **Client:** 委托单位： | KIJO Power(Shenzhen) Co., Ltd 京九电源科技（深圳）有限公司 |
| **Classification of test:** 检测类别： | Commission Test 委托测试 |

**Tested by 主检人：**
（Testing Engineer 测试工程师）
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**Approved by 批准人：**
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（Department Manager 部门经理）
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**Seal of CMC:**
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**CMC Testing International (Shenzhen) Co., Ltd.**
**众检检验认证（深圳）有限公司**

# TEST REPORT
# 检测报告

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| Name of Goods<br>物品名称 | LiFePO4 BATTERY<br>磷酸铁锂电池 | | Model<br>型号 | 12.8V 100Ah | |
| Commissioner<br>委托单位 | KIJO Power(Shenzhen) Co., Ltd<br>京九电源科技（深圳）有限公司 | | | | |
| Commissioner's Address<br>委托单位地址 | Room 2402, Building C2, 1001 Xueyuan Road, Nanshan District, Shenzhen, China<br>深圳市南山区学院大道南山智园 C2 栋 2402 | | | | |
| Manufacturer<br>制造商 | KIJO Power(Xinyu) Co., Ltd<br>江西京九动力能源（新余）有限公司 | | | | |
| Manufacturer's Address<br>制造商地址 | 4/F, BUILDING 6, INDUSTRIAL REAL ESTATE, NO.1988, DONGXING ROAD, XINYU, JIANGXI PROVINCE, CHINA<br>江西省新余市高新开发区东兴路 1988 号工业地产三期 6 栋四楼 | | | | |
| Manufacturer's Contact Telephone<br>制造商联系电话 | +86-755-86535872 | | E-mail 邮箱 | sales34@kijo.com.cn | |
| | | | Web 网址 | www.kijo-battery.com | |
| Trade Mark/ identification<br>商标/识别码 | -- | Shape<br>形状 | Cuboid<br>长方体 | Size 尺寸<br>(L×W×T) | (330.0×172.0×223.0)mm |
| Nominal Voltage<br>标称电压 | 12.8V | Charge Voltage<br>充电电压 | 14.6V | Rated Capacity<br>额定容量 | 100Ah |
| Cell Model<br>电池型号 | -- | Cell Nominal Voltage<br>电池标称电压 | 3.2V | Cell Rated Capacity<br>电池额定容量 | 25Ah |
| Cells Number<br>电池数量 | 16PCS | Sample Receiving Date<br>样品接收日期 | 2025.11.05 | Testing Date<br>测试日期 | 2025.11.05<br>-<br>2025.11.26 |
| Test conclusion<br>检测结论 | The sample has passed the test items of UNITED NATIONS "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8 Subsection 38.3<br>经测试，该样品符合联合国《试验和标准手册》（第 8 修订版）38.3 标准要求。 | | | | |

**Test Standard 检测标准**

UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8 Subsection 38.3

联合国《试验和标准手册》（第 8 修订版）38.3 节

Description and illustration of the sample: The sample's status is good.

样品说明及描述：样品状况良好。

| Test item<br>检测项目 | Sample No.<br>样品编号 | State<br>状态 | Remark<br>备注 |
|---|---|---|---|
| T1,T2,T3,T4,T5 | B001-B002 | At first cycle, in fully charged states<br>第 1 个充电周期，完全充电状态 | -- |
| T1,T2,T3,T4,T5 | B003-B004 | After 25 cycles ending in fully charged states<br>第 25 个充电周期，完全充电状态 | -- |
| T6 | C001-C005 | At first cycle at 50% of the design rated capacity<br>第 1 个充放电周期 50%设计额定容量状态 | -- |
| T6 | C006-C010 | After 25 cycle at 50% of the design rated capacity<br>第 25 个充放电周期 50%设计额定容量状态 | -- |
| T7 | B005-B006 | At first cycle, in fully charged states<br>第 1 个充电周期，完全充电状态 | -- |
| T7 | B007-B008 | After 25 cycles ending in fully charged states<br>第 25 个充电周期，完全充电状态 | -- |
| T8 | C011-C020 | At first cycle in fully discharged states<br>第 1 个充放电周期，完全放电状态 | -- |
| T8 | C021-C030 | After 25 cycles ending in fully discharged states<br>第 25 个充放电周期，完全放电状态 | -- |

CXXX is used as the sample number of cells SN251103098CXXX, "X" is 0~9.

CXXX 代表电芯样板编号 SN251103098CXXX，X=0~9。

BXXX is used as the sample number of batteries SN251103098BXXX, "X" is 0~9

BXXX 代表电池包样板编号 SN251103098BXXX，X=0~9。

Description of the deviation from the standard, if any:
检测结果不符合标准项的说明： --

Test environment conditions:
检测环境条件： Ambient temperature: 25°C±5°C, Ambient humidity: 45%-75%
环境温度：25°C±5°C；环境湿度：45%-75%

Remarks:
备注： --

| ST/SG/AC.10/11/Rev.8 Subsection 38.3 | | | |
|---|---|---|---|
| **Clause 章节** | **Requirements 标准要求** | **Result 测试结果** | **Verdict 判定** |
| **38.3.4** | **Procedure 检测步骤** | | -- |
| **38.3.4.1** | **Test 1: Altitude simulation 检测 1：高度模拟** | | Pass 合格 |
| | Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hours at ambient temperature (20±5°C).<br>将电池和电池组在温度为 20±5°C，大气压力为不大于 11.6kPa 的环境中贮存不少于 6 小时。 | | |
| | Requirements 标准要求：<br>1) Cells and batteries Mass loss limit reference: Table 38.3.1<br>样品质量损失限值参考：表 38.3.1<br>2) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states.<br>样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电池或电池组。<br>3) No leakage, no venting, no disassembly, no rupture and no fire. 样品（电池）应无渗漏、无排气、无解体、无破裂以及无起火现象的发生。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.1<br>数据见表 T.1 | |
| **38.3.4.2** | **Test 2: Thermal test 检测 2: 温度试验** | | Pass 合格 |
| | Test cells and batteries are to be stored for<br>电池和电池组存储条件如下：<br>1) For small cells and batteries: one temperature cycle: 72±2°C (6h) ~ -40±2°C (6h)<br>对于小型电池和电池组：一次温度循环为 72±2°C (6h) ~ -40±2°C (6h)<br>For large cells and batteries: one temperature cycle: 72±2°C (12h) ~ -40±2°C (12h)<br>对于大型电池和电池组：一次温度循环为 72±2°C (12h) ~ -40±2°C (12h)<br>2) The maximum time interval between test temperature extremes is 30minutes.<br>温度转换最大间隔时间为 30min。<br>3) This procedure is to be repeated 10 times. 重复 10 次循环。<br>4) after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5°C). 循环结束后，电池和电池组在 20±5°C 的条件下搁置 24 小时。 | | |
| | Requirement 标准要求：<br>1) Cells and batteries Mass loss limit reference: Table 38.3.1<br>样品质量损失限值参考：表 38.3.1<br>2) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states.<br>样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电池和电池组。<br>3) No leakage, no venting, no disassembly, no rupture and no fire. 样品（电池）应无渗漏、无排气、无解体、无破裂以及无起火现象的发生。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.2<br>数据见表 T.2 | |

| ST/SG/AC.10/11/Rev.8 Subsection 38.3 | | | |
|---|---|---|---|
| **Clause 章节** | **Requirements 标准要求** | **Result 测试结果** | **Verdict 判定** |
| **38.3.4.3** | **Test 3: Vibration**<br>**检测 3: 振动** | | Pass<br>合格 |
| | 1) Cells and batteries are firmly secured to the platform of the vibration machine.<br>电池和电池组牢固地安装在振动台（的台面）上。<br>2) The vibration: a sinusoidal waveform with a logarithmic sweep between 7Hz and 200Hz and back to 7Hz traversed in 15 minutes.<br>振动以正弦波形式，以 7Hz 增加至 200Hz，然后在减少回到 7Hz 为一个循环，一个循环持续 15 分钟的对数前移传送。<br>3) For cells and small batteries: from 7Hz a peak acceleration of 1gn is maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8gn occurs (approximately 50Hz). A peak acceleration of 8gn is then maintained until the frequency is increased to 200Hz.<br>对于电池和小型电池：从 7Hz 开始，以 1gn 的峰值加速度保持不变，直到达到 18Hz。然后将振幅保持在 0.8mm（总偏移 1.6mm）并且频率增加直到出现 8gn 的峰值加速度（大约 50Hz）。然后保持 8gn 的峰值加速度，直到频率增加到 200Hz。<br>For large batteries: from 7Hz a peak acceleration of 1gn is maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 2gn occurs (approximately 25Hz). A peak acceleration of 2gn is then maintained until the frequency is increased to 200Hz.<br>对于大型电池：从 7Hz 开始，以 1gn 的峰值加速度保持不变，直到达到 18Hz。然后将振幅保持在 0.8mm（总偏移 1.6mm）并且频率增加直到出现 2gn 的峰值加速度（大约 25Hz）。然后保持 2gn 的峰值加速度，直到频率增加到 200Hz。<br>4) This cycle repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell. One of the directions of vibration must be perpendicular to the terminal face.<br>以振动的其中一个方向必须是垂直样品极性，对每个电池从三个互相垂直的方向上循环 12 次，每个方向 3 个小时，共 9 小时。 | | |
| | Requirements 标准要求：<br>1) Cells and batteries Mass loss limit reference: Table 38.3.1<br>样品质量损失限值参考：表 38.3.1<br>2) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states.<br>样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电池和电池组。<br>3) No leakage, no venting, no disassembly, no rupture and no fire.<br>样品（电池）应无渗漏、无排气、无解体、无破裂以及无起火现象的发生。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.3<br>数据见表 T.3 | |

| ST/SG/AC.10/11/Rev.8 Subsection 38.3 | | | |
|---|---|---|---|
| **Clause 章节** | **Requirements 标准要求** | **Result 测试结果** | **Verdict 判定** |
| **38.3.4.4** | **Test 4: Shock**<br>**检测 4: 冲击** | | Pass<br>合格 |
| | 1) Test cells and batteries shall be secured to the testing machine.<br>以稳固的托架固定住每个电池和电池组样品的全部配件表面。<br>2) Each cell shall be subjected to a half-sine shock of peak acceleration of 150$g_n$ and pulse duration of 6 milliseconds. Large cells may be subjected to a half-sine shock of peak acceleration of 50$g_n$ and pulse duration of 11 milliseconds.<br>对每个电池以峰值为 150$g_n$ 的半正弦的加速度撞击，脉冲持续 6ms，大型电池须经受最大加速度 50$g_n$ 和脉冲持续时间 11ms 的半正弦波冲击。<br>Small batteries shall be subjected to a half-sine shock of peak acceleration of 150$g_n$ (or Acceleration($g_n$)=$\sqrt{(\frac{100850}{mass})}$, which is smaller) acceleration of 50$g_n$ (or Acceleration($g_n$)=$\sqrt{(\frac{30000}{mass})}$, which is smaller) and pulse dud pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak accelration of 11 milliseconds.<br>对每个电池以峰值为 150$g_n$（或与$\sqrt{(\frac{100850}{mass})}$中较小值）的半正弦的加速度撞击，脉冲持续 6ms，大型电池须经受最大加速度 50$g_n$（或与$\sqrt{(\frac{30000}{mass})}$中较小值）和脉冲持续时间 11ms 的半正弦波冲击。<br>3) Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.<br>每个电池或电池组须在三个互相垂直的电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受 18 次冲击。 | | |
| | Requirements 标准要求：<br>1) Cells and batteries Mass loss limit: ≤0.2%.<br>样品质量损失≤0.2%<br>2) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states.<br>样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电池或电池组。<br>3) No leakage, no venting, no disassembly, no rupture and no fire.<br>样品（电池）应无渗漏、无排气、无解体、无破裂以及无起火现象的发生。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.4<br>数据见表 T.4 | |

| ST/SG/AC.10/11/Rev.8 Subsection 38.3 | | | |
|---|---|---|---|
| **Clause 章节** | **Requirements 标准要求** | **Result 测试结果** | **Verdict 判定** |
| **38.3.4.5** | **Test 5: External Short Circuit**<br>**检测 5: 外部短路** | | Pass<br>合格 |
| | 1) The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature 57±4°C.<br>加热电池或电池组样品直到温度稳定在 57±4°C<br>2) The cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 57±4°C, This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4°C.<br>将样品正负极用小于 0.1Ω 的总电阻回路进行短路，样品的外表温度恢复到 57±4°C 之后保持短路状态 1 小时以上。<br>3) The cell or battery must be observed for a further six hours for the test to be concluded.<br>对电池或电池组必须进一步观察 6 个小时才能下结论。 | | |
| | Requirements 标准要求：<br>1) Cells external temperature not exceed 170°C.<br>电池的最高表面温度应不超过 170°C。<br>2) No disassembly, no rupture and no fire during the test and within six hours after the test.<br>测试中与测试后 6 小时内无解体、无破裂、无起火。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.5<br>数据见表 T.5 | |
| **38.3.4.6** | **Test 6: Impact / Crush**<br>**检测 6: 撞击/挤压** | | N/A<br>不适用 |
| | Impact (applicable to cylindrical cells not less than 18mm in diameter)<br>撞击（适用于直径不小于 18 毫米的圆柱形电池） | | |
| | 1) This test sample cell or component cell is to be placed on a flat smooth surface.<br>将试验样品用的电池或元件电池放在一个平坦光滑的平面上<br>2) A 15.8 mm diameter bar is to be placed across the center of the sample, A 9.1kg mass is to be dropped from a height of 61±2.5cm onto the sample.<br>将一直径为 15.8mm 的不锈钢圆棒横过电池中部放置后，将一质量为 9.1kg 的物体从 61±2.5cm 的高度落向样品。<br>3) The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm ± 0.1mm diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact.<br>接受撞击的试样，纵轴应与平坦的表面平行并与横放在试样中心的直径 15.8±0.1 毫米弯曲表面的纵轴垂直。每一个试样只经受一次撞击。 | | |
| | Requirements 标准要求：<br>1) Cells external temperature not exceed 170°C.<br>电池的最高表面温度应不超过 170°C。<br>2) No disassembly, no rupture and no fire during the test and within six hours after the test.<br>测试中与测试后 6 小时内无解体、无破裂、无起火。 | -- | |

| ST/SG/AC.10/11/Rev.8 Subsection 38.3 | | | |
|---|---|---|---|
| **Clause 章节** | **Requirements 标准要求** | **Result 测试结果** | **Verdict 判定** |
| | Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18mm in diameter).<br>挤压（适用于棱柱形、袋装、硬币/纽扣电池和直径小于 18 毫米的圆柱形电池）。 | | Pass<br>合格 |
| | 1) A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.<br>将电池或元件电池放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 厘米/秒。挤压持续进行，直到出现以下三种情况之一：<br>(a) The applied force reaches 13kN ± 0.78kN.<br>施加的力达到 13 千牛顿±0.78 千牛顿。<br>(b) The voltage of the cell drops by at least 100mV.<br>电池的电压下降至少 100 毫伏。<br>(c) The cell is deformed by 50% or more of its original thickness.<br>电池变形达原始厚度的 50%或以上。<br>2). A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.<br>棱柱形或袋装电池应从最宽的一面施压。纽扣/硬币形电池应从其平坦表面施压。圆柱形电池应从与纵轴垂直的方向施压。 | | |
| | Requirements 标准要求：<br>1) Cells external temperature not exceed 170°C.<br>电池的最高表面温度应不超过 170°C。<br>2) No disassembly, no rupture and no fire during the test and within six hours after the test.<br>测试中与测试后 6 小时内无解体、无破裂、无起火。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.6<br>数据见表 T.6 | |

| ST/SG/AC.10/11/Rev.8 Subsection 38.3 | | | |
|---|---|---|---|
| **Clause 章节** | **Requirements 标准要求** | **Result 测试结果** | **Verdict 判定** |
| **38.3.4.7** | **Test 7: Overcharge**<br>**检测 7: 过度充电** | | Pass<br>合格 |
| | 1) The charge current shall be twice the manufacturer's recommended maximum continuous charge current. 以制造商建议的最大持续充电电流的两倍对样品充电。<br>2) The minimum voltage of the test shall be as follows: 试验的最小电压如下：<br>a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.<br>制造商建议的充电电压不大于 18V 时，试验的最小电压应是电池组最大充电电压的两倍或 22V 两者中的较小者。<br>b) when the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.<br>制造商建议的充电电压大于 18V 时，试验的最小电压应为最大充电电压的 1.2 倍。<br>3) Tests are to be conducted at ambient temperature 20±5°C, The duration of the test shall be 24 hours. 试验应在环境温度（20±5°C）下进行。进行试验的时间应为 24 小时。 | | |
| | Requirements 标准要求:<br>No disassembly and no fire during the test and within seven days after the test.<br>试验过程中和试验后 7 天内无解体，无起火。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.7<br>数据见表 T.7 | |
| **38.3.4.8** | **Test 8: Forced discharge**<br>**检测 8: 强制放电** | | Pass<br>合格 |
| | Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.<br>每个电池应在环境温度（20±5°C）下与 12V 直流电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。 | | |
| | The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).<br>将适当大小和额定值的电阻负荷与试验电池串联，计算得出给定的放电电流。对每个电池进行强制放电，放电时间(小时)应等于其额定容量除以初始试验电流(安培)。 | | |
| | Requirements 标准要求:<br>No disassembly and no fire during the test and within seven days after the test.<br>试验过程中和试验后 7 天内无解体，无起火。 | Test Samples: No leakage, no venting, no disassembly, no rupture and no fire.<br>样品：无渗漏、无排气、无解体、无破裂以及无起火现象。<br>The data is shown in Test Table T.8<br>数据见表 T.8 | |

**ST/SG/AC.10/11/Rev.8 Subsection 38.3**

**General terms and definitions 一般术语与定义**

**Table 38.3.1: Mass loss limit**

**表 38.3.1: 质量损失限值**

| Mass M of cell or battery<br>电池或电池组质量 M | Mass loss limit<br>质量损失限值 |
|---|---|
| M < 1 g | 0.5% |
| 1 g ≤ M ≤ 75 g | 0.2% |
| M > 75 g | 0.1% |

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss (\%)} = (M_1 - M_2)/M_1 \times 100$$

质量损失的量化值，可用以下公式计算：

$$\text{质量损失(\%)} = (M_1 - M_2)/M_1 \times 100$$

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table 38.3.1, it shall be considered as "no mass loss".

式中：M1 是试验前的质量，M2 是试验后的质量。如果质量损失不超过表 38.3.1 所列的数值，应视为“无质量损失”。

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table 38.3.1.

渗漏是指可以看到的电解液或者其他物质从电池或电池组中漏出，或电池或电池组中的物质损失（不包括电池外壳、搬运装置、或标签），质量损失超过表 38.3.1 所列的数值。

Venting means the release of excessive internal pressure from a cell or battery in a manner intended by design to preclude rupture or disassembly.

排气是指按设计方式释放电池或电池组内部过高的压力，防止其破裂或解体。

Disassembly means a vent or rupture where solid matter from any part of a cell or battery penetrates a wire mesh screen (annealed aluminium wire with a diameter of 0.25 mm and grid density of 6 to 7 wires per cm) placed 25 cm away from the cell or battery.

解体是指排气或破裂使电池或电池组任何部分的固体物质穿过放在离电池或电池 25 cm 处的丝网筛（直径 0.25 mm 的软铝丝，网格密度每厘米 6 至 7 条铝丝）。

Rupture means the mechanical failure of a cell container or battery case induced by an internal or external cause, resulting in exposure or spillage but not ejection of solid materials.

破裂是指内部或外部原因引起的电池容器或电池组外壳机械损坏，造成内装物暴露或溢出，但无固体喷射。

Fire means that flames are emitted from the test cell or battery.

起火是指试验电池或电池组有火焰冒出。

# Test Data 检测数据

**Table T.1 Altitude simulation (表 T.1) 高度模拟**

| Sample No. 样品编号 | Before Mass 测试前 样品质量 (kg) | Before Voltage 测试前 开路电压 (V) | After Mass 测试后 样品质量 (kg) | After Voltage 测试后 开路电压 (V) | Mass Loss 质量损失 (%) | Residual OCV 剩余电压 (%) | Test Result 测试结果 |
|---|---|---|---|---|---|---|---|
| B001 | 12.775 | 13.85 | 12.775 | 13.56 | 0.000 | 97.91 | Pass/合格 |
| B002 | 12.786 | 13.83 | 12.786 | 13.54 | 0.000 | 97.90 | Pass/合格 |
| B003 | 12.801 | 13.88 | 12.800 | 13.57 | 0.008 | 97.77 | Pass/合格 |
| B004 | 12.793 | 13.82 | 12.793 | 13.55 | 0.000 | 98.05 | Pass/合格 |

**Notes 注释:**

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %. 检测后，样品无渗漏、无排气、无解体、无破裂和无起火。电压比不小于 90 %。

**Table T.2 Thermal test (表 T.2) 温度试验**

| Sample No. 样品编号 | Before Mass 测试前 样品质量 (kg) | Before Voltage 测试前 开路电压 (V) | After Mass 测试后 样品质量 (kg) | After Voltage 测试后 开路电压 (V) | Mass Loss 质量损失 (%) | Residual OCV 剩余电压 (%) | Test Result 测试结果 |
|---|---|---|---|---|---|---|---|
| B001 | 12.775 | 13.56 | 12.772 | 13.51 | 0.023 | 99.63 | Pass/合格 |
| B002 | 12.786 | 13.54 | 12.784 | 13.47 | 0.016 | 99.48 | Pass/合格 |
| B003 | 12.800 | 13.57 | 12.797 | 13.53 | 0.023 | 99.71 | Pass/合格 |
| B004 | 12.793 | 13.55 | 12.789 | 13.49 | 0.031 | 99.56 | Pass/合格 |

**Notes 注释:**

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %. 检测后，样品无渗漏、无排气、无解体、无破裂和无起火。电压比不小于 90 %。

**Table T.3 Vibration (表 T.3) 振动**

| Sample No. 样品编号 | Before Mass 测试前 样品质量 (kg) | Before Voltage 测试前 开路电压 (V) | After Mass 测试后 样品质量 (kg) | After Voltage 测试后 开路电压 (V) | Mass Loss 质量损失 (%) | Residual OCV 剩余电压 (%) | Test Result 测试结果 |
|---|---|---|---|---|---|---|---|
| B001 | 12.772 | 13.51 | 12.772 | 13.49 | 0.000 | 99.85 | Pass/合格 |
| B002 | 12.784 | 13.47 | 12.783 | 13.47 | 0.008 | 100.00 | Pass/合格 |
| B003 | 12.797 | 13.53 | 12.797 | 13.50 | 0.000 | 99.78 | Pass/合格 |
| B004 | 12.789 | 13.49 | 12.788 | 13.47 | 0.008 | 99.85 | Pass/合格 |

**Notes 注释:**
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %. 检测后，样品无渗漏、无排气、无解体、无破裂和无起火。电压比不小于 90 %。

**Table T.4 Shock (表 T.4) 冲击**

| Sample No. 样品编号 | Before Mass 测试前 样品质量 (kg) | Before Voltage 测试前 开路电压 (V) | After Mass 测试后 样品质量 (kg) | After Voltage 测试后 开路电压 (V) | Mass Loss 质量损失 (%) | Residual OCV 剩余电压 (%) | Test Result 测试结果 |
|---|---|---|---|---|---|---|---|
| B001 | 12.772 | 13.49 | 12.772 | 13.49 | 0.000 | 100.00 | Pass/合格 |
| B002 | 12.783 | 13.47 | 12.782 | 13.45 | 0.008 | 99.85 | Pass/合格 |
| B003 | 12.797 | 13.50 | 12.797 | 13.50 | 0.000 | 100.00 | Pass/合格 |
| B004 | 12.788 | 13.47 | 12.788 | 13.46 | 0.000 | 99.93 | Pass/合格 |

**Notes 注释:**
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90 %. 检测后，样品无渗漏、无排气、无解体、无破裂和无起火。电压比不小于 90 %。

**Table T.5 External short circuit (表 T.5) 外部短路**

| Sample No.<br>样品编号 | Max. External Temperature<br>样品表面最高温度(°C) | Test Result<br>测试结果 |
|---|---|---|
| B001 | 57.4 | Pass/合格 |
| B002 | 57.6 | Pass/合格 |
| B003 | 57.6 | Pass/合格 |
| B004 | 57.5 | Pass/合格 |

**Notes 注释:**

Test sample external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.
检测样品表面温度不超过 170 °C，检测中与检测后 6 小时内无解体、无破裂、无起火。

**Table T.6 Crush (表 T.6) 挤压**

| Sample No.<br>样品编号 | Max. External Temperature<br>样品表面最高温度(°C) | Test Result<br>测试结果 |
|---|---|---|
| C001 | 23.5 | Pass/合格 |
| C002 | 23.4 | Pass/合格 |
| C003 | 23.6 | Pass/合格 |
| C004 | 23.9 | Pass/合格 |
| C005 | 23.8 | Pass/合格 |
| C006 | 23.7 | Pass/合格 |
| C007 | 23.8 | Pass/合格 |
| C008 | 23.8 | Pass/合格 |
| C009 | 23.5 | Pass/合格 |
| C010 | 23.3 | Pass/合格 |

**Notes 注释:**

Test sample external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.
检测样品表面温度不超过 170°C，检测中与检测后 6 小时内无解体、无破裂、无起火。

**Table T.7 Overcharge (表 T.7) 过度充电**

| Sample No.<br>样品编号 | Test Result<br>测试结果 |
|---|---|
| B005 | Pass/合格 |
| B006 | Pass/合格 |
| B007 | Pass/合格 |
| B008 | Pass/合格 |

**Notes 注释:**

There is no disassembly and no fire during the test and within seven days after the test.
样品在检测中和检测后 7 天内无解体、无起火。

**Table T.8 Forced discharge (表 T.8) 强制放电**

| Sample No.<br>样品编号 | Test Result<br>测试结果 | Sample No.<br>样品编号 | Test Result<br>测试结果 |
|---|---|---|---|
| C011 | Pass/合格 | C021 | Pass/合格 |
| C012 | Pass/合格 | C022 | Pass/合格 |
| C013 | Pass/合格 | C023 | Pass/合格 |
| C014 | Pass/合格 | C024 | Pass/合格 |
| C015 | Pass/合格 | C025 | Pass/合格 |
| C016 | Pass/合格 | C026 | Pass/合格 |
| C017 | Pass/合格 | C027 | Pass/合格 |
| C018 | Pass/合格 | C028 | Pass/合格 |
| C019 | Pass/合格 | C029 | Pass/合格 |
| C020 | Pass/合格 | C030 | Pass/合格 |

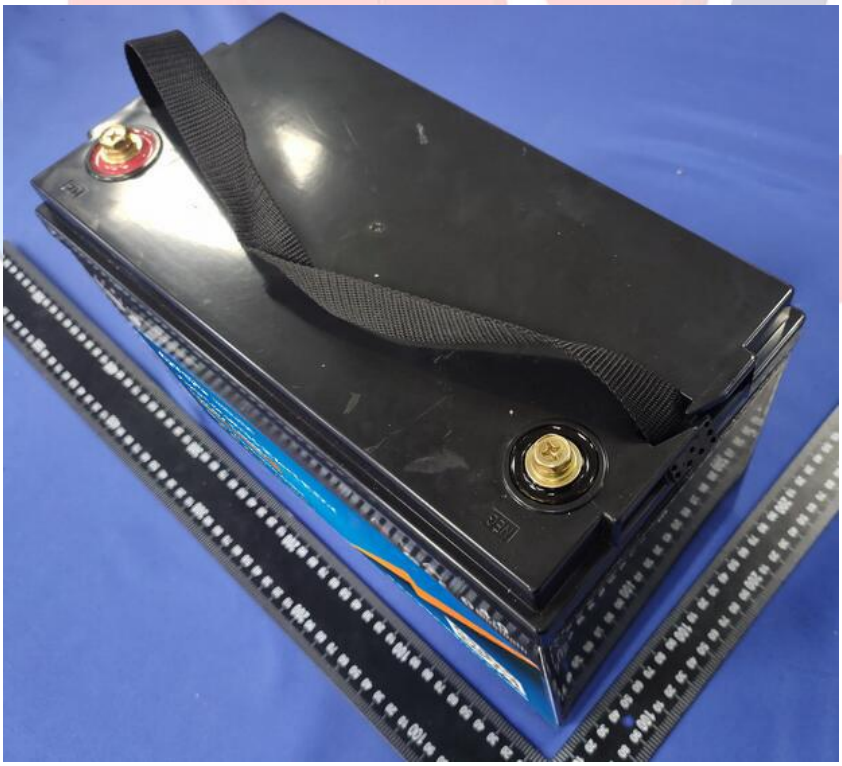
**Notes 注释:**

There is no disassembly and no fire during the test and within seven days after the test.
样品在检测中和检测后 7 天内无解体、无起火。

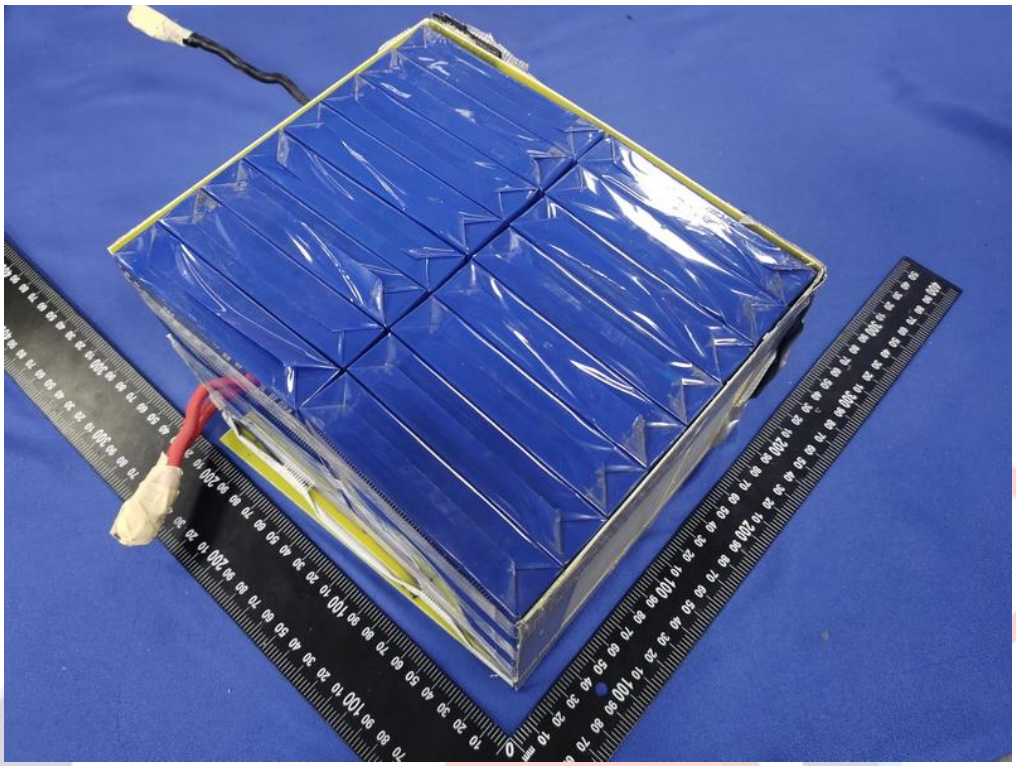
# Photos of Samples
# 样品照片



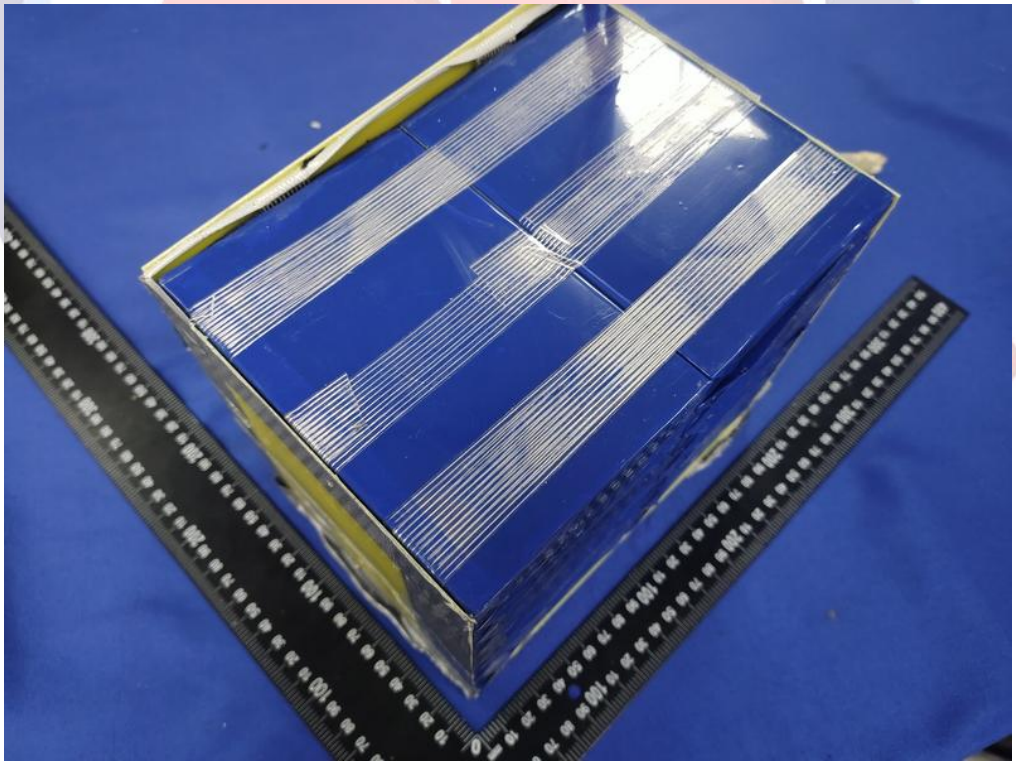

Picture 1. Front view of battery
图片 1. 电池组前视图



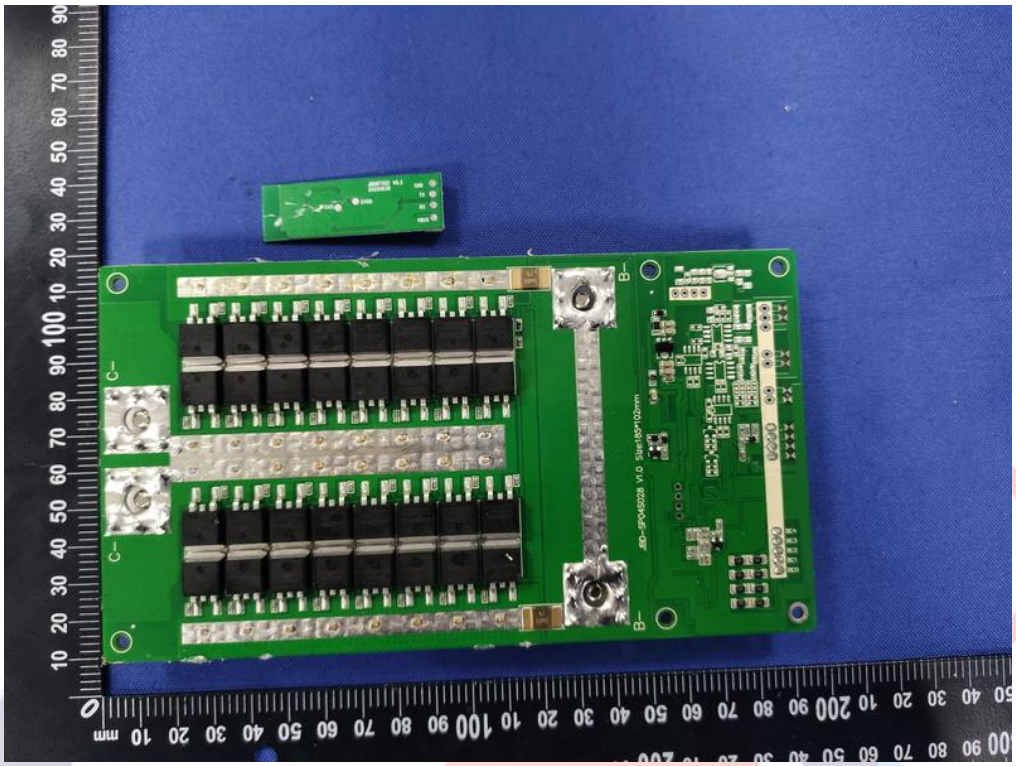
Picture 2. Back view of battery
图片 2. 电池组后视图



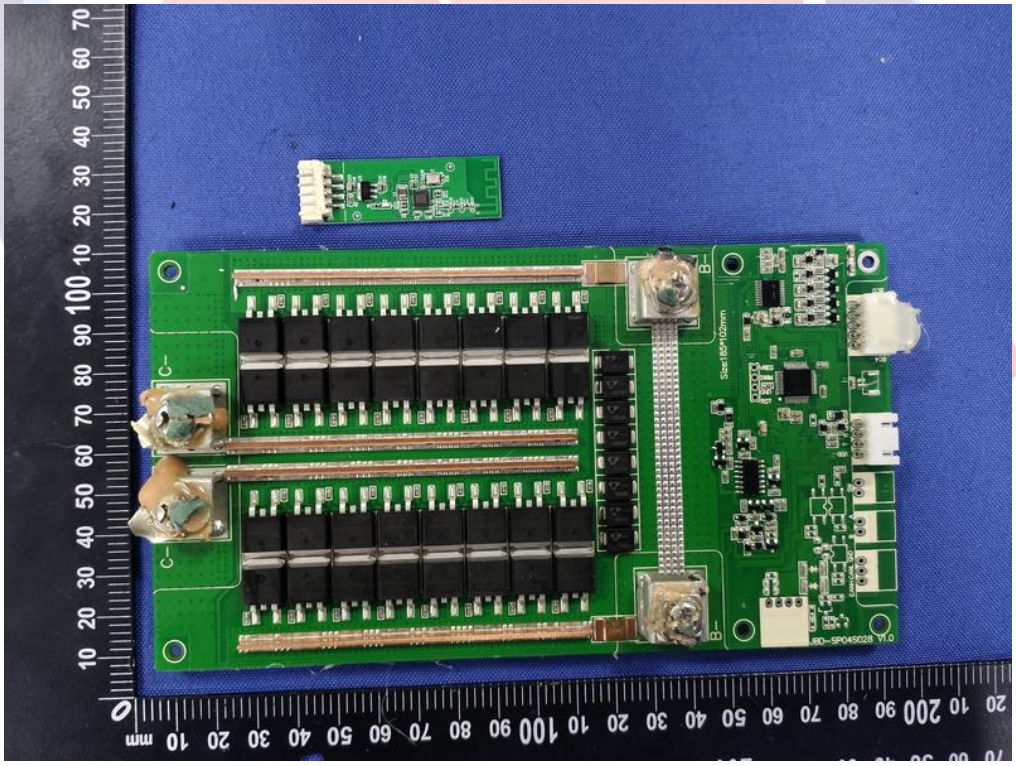
Picture 3. Front view of cell
图片 3. 电池前视图



Picture 4. Back view of cell
图片 4. 电池后视图



Picture 5. Front view of Protection board
图片 5. 保护板前视图



Picture 6. Back view of Protection board
图片 6. 保护板后视图




Picture 7. Label view
图片 7. 标签视图

# Important
# 注意事项

1. The test report is invalid if it is not affixed the official seal of the laboratory to it.
   检测报告无本实验室公章（或检验检测专用章）无效。
2. Copies of the test report without the official seal of the laboratory are invalid.
   复制检测报告未重新加盖本实验室公章(或检验检测专用章)无效。
3. It is forbidden to copy the test report partially without the written approval of the laboratory.
   未经本实验室书面批准不得部分复制检测报告。
4. The test report is invalid without the signatures of Approver, Reviewer and Testing engineer.
   检测报告无检测、审核、批准人签名无效。
5. The test report is invalid if it is blotted out.
   检测报告涂改无效。
6. Objections to the test report must be submitted to CMC Testing International (Shenzhen) Co., Ltd. within 15 days.
   对检测报告若有异议，应于收到报告之日起十五天内向众检检验认证（深圳）有限公司提出。
7. This report is only responsible for the test results of the tested samples, and the test results and related judgment conclusions only reflect the evaluation of the tested samples. For the report and the content can not be used for commercial advertising, the use of direct or indirect losses and all legal consequences, the company does not assume any economic and legal responsibility.
   本报告仅对所测样品的检测结果负责，检测结果及其相关判定结论仅反映对所测样品的评价。对于报告及所载内容不能进行商业广告宣传使用，使用所产生的直接或间接损失及一切法律后果，本单位不承担任何经济和法律责任。
8. As for the Verdict, “--” means “no need for judgment”, “P” means “pass”, “F” means “fail” and “N/A” means “not applicable”.
   判定栏中“--”表示“不需要判定”，“P”表示“通过”，“F”表示“不通过”，“N/A”表示“不适用”。

*** End of Report ***
*** 报告结束 ***