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检测
TESTING
CNAS L11969

UN38.3 检测报告
UN38.3 Test Report

委托方 **Client**	深圳市劲品能电子有限公司 Shenzhen Jinpinneng Electronics Co., Ltd.
委托方地址 **Add. of Client**	深圳市龙岗区龙岗街道南联社区鹏达路 138 号 No.138, Pengda Road, Nanlian Community, Longgang Street, Longgang District, Shenzhen
样品名称 **Sample Name**	锂离子聚合物电池 Li-ion polymer battery
样品型号 **Sample Model**	801723
检测机构 **Testing Laboratory**	诺诚（深圳）安全科技有限公司 NRCC (Shenzhen) Safety Technology Co., Ltd. 深圳市宝安区福永街道腾丰五路 2 号 A 栋 Building A, No. 2, Tengfeng 5th Road, Fuyong, Bao'an District, Shenzhen 电话号码 Phone number: +86-755-23057131 邮箱 Email: service@nrccsafety.com 网址 Website: www.nrccsafety.com
报告编号 **Report No.**	250620040423-13
签发日期 **Issued Date**	2025.06.16

检测结论 Test Conclusion:
见检测报告结论页 Shown in the conclusion of test report.

主检人Tested by:
（测试工程师
Test Engineer）

Ludao cai

审批人Approved by:
（技术负责人
Technical Director）

Duan Pike

报告单位（盖章）
Seal of

深圳诺诚安全科技有限公司
检验检测专用章

Ⅰ、样品描述 Sample Description

样品名称 Sample Name	锂离子聚合物电池 Li-ion polymer battery		样品型号 Sample Model	801723	
制造商 Manufacturer	深圳市劲品能电子有限公司 Shenzhen Jinpinneng Electronics Co., Ltd.				
地址 Address	深圳市龙岗区龙岗街道南联社区鹏达路 138 号 No.138, Pengda Road, Nanlian Community, Longgang Street, Longgang District, Shenzhen				
工厂 Factory	深圳市劲品能电子有限公司 Shenzhen Jinpinneng Electronics Co., Ltd.				
地址 Address	深圳市龙岗区龙岗街道南联社区鹏达路 138 号 No.138, Pengda Road, Nanlian Community, Longgang Street, Longgang District, Shenzhen				
制造商联系信息 Manufacturer's contact information	电话号码 Phone number		电子邮箱地址 Email address	网址 Website	
	+86-755-29408592		1434284972@qq.com	--	
商标 Trade Mark	--	电芯形状 Cell Shape	棱柱形 Prismatic	样品尺寸 Sample Size (L×W×T)	(25.0×17.0×8.0)mm
标称电压 Nominal Voltage	3.7V	额定容量 Rated Capacity	170mAh 0.629Wh	充电限制电压 Limited Charge Voltage	4.2V
标准充电电流 Standard Charge Current	85mA	最大持续充电电流 Maximum Continuous Charge Current	170mA	结束充电电流 End Charge Current	3.4mA
放电截止电压 Cut-off Voltage	3.0V	标准放电电流 Standard Discharge Current	85mA	最大放电电流 Maximum Discharge Current	170mA
组成电芯数量 Cell Number	1PC		电芯型号 Cell Model	801723	
样品重量 Sample Mass	5.5g		样品物理形态 Sample Physical description	银色近长方体 Approximate Silver Cuboid	
测试开始日期 Test Start Date	2025.06.03		测试完成日期 Test Completion Date	2025.06.16	

Ⅱ、标准 Standard

联合国《试验和标准手册》第八修订版第 38.3 节。

UNITED NATIONS "*Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.8 Section 38.3).*

Ⅲ、测试项目 Test Item

T.1. ☒ 高度模拟 Altitude simulation

T.2. ☒ 温度试验 Thermal test

T.3. ☒ 振动 Vibration

T.4. ☒ 冲击 Shock

T.5. ☒ 外部短路 External short circuit

T.6. ☐ 撞击 Impact/ ☒ 挤压 Crush

T.7. ☒ 过充电 Overcharge

T.8. ☒ 强制放电 Forced discharge

Ⅳ、测试方法和要求 Test Method and Requirement

用相同的电芯或电池按照顺序进行试验 T.1 至 T.5。试验 T.6 和 T.8 用没有进行其他试验的电芯。试验 T.7 可以使用原先在试验 T.1 至 T.5 中使用过的未损坏的电池进行。

Tests T.1 to T.5 shall be conducted in sequence on the same cells or batteries. Tests T.6 and T.8 shall be conducted using not otherwise tested cells. Test T.7 may be conducted using undamaged batteries previously used in tests T.1 to T.5.

单电芯电池 B1#~B5#, B11#~B14#为 1 次循环满电状态；

单电芯电池 B6#~B10#, B15#~B18#为 25 次循环满电状态；

可充电电芯 C1#~C5#为 1 次循环后 50%充电状态；

可充电电芯 C6#~C10#为 25 次循环后 50%充电状态；

可充电电芯 C11#~C20#为 1 次循环完全放电状态；

可充电电芯 C21#~C30#为 25 次循环完全放电状态；

Single cell batteries of B1#~B5#, B11#~B14# are full charged after one cycle;

Single cell batteries of B6#~B10#, B15#~B18# are full charged after twenty-five cycles;

Rechargeable cells of C1#~C5# are 50% charged after one cycle;

Rechargeable cells of C6#~C10# are 50% charged after twenty-five cycles;

Rechargeable cells of C11#~C20# are full discharged after one cycle;

Rechargeable cells of C21#~C30# are full discharged after twenty-five cycles;

质量损失的量化值，可用以下公式计算：

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

质量损失(%)=(M1-M2)/M1×100

Mass loss (%) = (M1-M2)/M1 x 100

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下表所列的数值，应视为"无质量损失"。

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 below, it shall be considered as "no mass loss".

电芯或电池的质量 Mass M of cell or battery	质量损失限值 Mass loss limit
M＜1g	0.5%
1g≤M≤75g	0.2%
M＞75g	0.1%

渗漏是指可以看到的电解液或者其他物质从电芯或者电池中漏出，或电芯或电池中的物质损失（不包括电池外壳、搬运装置、或标签），失去的质量超过上表所列的数值。

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 above.

在测试 T.1 至 T.4 中，电芯和电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态下的测试电芯和电池。

In test T.1 to T.4, cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T.1. 高度模拟 Altitude simulation

测试方法 Test method

试验电芯和电池被放置在压力等于或低于 11.6 kPa 和环境温度(20±5°C)下存放至少 6 小时。

Test cells and batteries are stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C).

要求 Requirement

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态下的测试电芯和电池。

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T.2. 温度试验 Thermal test

测试方法 Test method

试验电芯和电池放置在试验温度等于 72±2°C 的条件下存放至少 6 小时，接着再在试验温度等于-40±2°C 的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行，共完成 10 次循环，接着将所有试验电芯和电池在环境温度(20±5°C)下存放 24 小时。对于大型电芯和电池，暴露于极端试验温度的时间至少应为 12 小时。

Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to -40±2°C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5°C). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

要求 Requirement

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态下的测试电芯和电池。

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T.3. 振动 Vibration

测试方法 Test method

电芯和电池紧固于振动台台面，但不得造成电芯变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在 7 Hz 和 200 Hz 之间，再回到 7 Hz，跨度为 15 分钟。这一振动过程须对三个互相垂直的电芯安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

作对数式频率扫描，对电芯和总质量不超过 12 千克的电池（电芯和小型电池），和对质量超过 12 千克的电池（大型电池）有所不同。

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

对电芯和小型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 8 gn（频率约为 50 Hz）。将峰值加速度保持在 8 gn 直到频率增加到 200 Hz。

For cells and small batteries : from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

对大型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 2 gn（频率约为 25Hz）。将峰值加速度保持在 2 gn 直到频率增加到 200 Hz。

For large batteries : from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.

要求 Requirement

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态下的测试电芯和电池。

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T.4. 冲击 Shock

测试方法 Test method

试验电芯和电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池的所有安装面。

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.

每个电芯须经受峰值加速度 150 gn 和脉冲持续时间 6 ms 的半正弦波冲击。不过，大型电芯须经受峰值加速度 50 gn 和脉冲持续时间 11 ms 的半正弦波冲击。

Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjects to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

每个电池须经受半正弦波冲击，峰值加速度需要根据电池的重量来决定。小型电池的脉冲持续时间为 6 ms，大型电池的脉冲持续时间为 11ms。下面的公式是用来计算合适的最小峰值加速度。

Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the

battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations.

电池	最小峰值加速度	脉冲持续时间
小型电池	150 gn 或计算结果中取最小的值 加速度（gn）= $\sqrt{(\frac{100850}{mass})}$	6ms
大型电池	50 gn 或计算结果中取最小的值 加速度（gn）= $\sqrt{(\frac{30000}{mass})}$	11 ms

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g_n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass*}\right)}$ whichever is smaller	6 ms
Large batteries	50 g_n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass*}\right)}$ whichever is smaller	11 ms

* Mass is expressed in kilograms.

每个电芯或电池须在三个互相垂直的电芯或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。

Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

要求 Requirement

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态下的测试电芯和电池。

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

T.5. 外部短路 External short circuit

测试方法 Test method

试验电芯或电池需要加热一段时间，以使其外壳温度均匀稳定地达到 57±4°C。加热时间的长短是由电芯或电池的尺寸和设计来决定的，这个加热时间需要评估并记录。如果这个加热时间不好评估的话，对于小电芯和小电池需要在此温度下放置至少 6 个小时，对于大电芯和大电池至少放置 12 个小时。然后使电芯或电池在 57±4°C 下经受总外电阻小于 0.1Ω的短路条件。

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4°C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57± 4°C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

短路测试持续到电芯或电池外壳温度回到 57±4°C 后至少持续 1 小时，针对大电池，外壳温度需要下降到测试过程中监控到的最大温度的一半以下。

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, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.

短路测试和冷却阶段至少应该在环境温度下进行。

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

要求 Requirement

电芯和电池外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体、无破裂，无起火。

Cells and batteries meet this requirement if their 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 test.

T.6. 撞击/挤压 Impact / Crush

测试步骤 – 撞击（适用于直径大于等于 18.0 毫米以上的圆柱形电芯）

Test procedure – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)

试样电芯或电芯组件放在平坦光滑表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米±0.1 毫米，长度至少 6 厘米，或电芯最长端的尺度，取二者之长者。将一块 9.1 千克±0.1 千克的重锤从 61±2.5 厘米高度跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。垂直轨道或管道用于引导落锤沿与水平支撑表面呈 90 度落下。

The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

受撞击的试样，纵轴应与平坦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。每一试样只经受一次撞击。

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

测试步骤– 挤压（适用于棱柱形，袋状，硬币/纽扣电芯和圆柱形电芯直径小于 18.0 毫米）

Test procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

将电芯或电芯组件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 cm/s。挤压持续进行，直到出现以下三种情况之一：

A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

(a)施加的力达到 13 kN ± 0.78 kN；

(b)电芯的电压下降至少 100mV；

(c)电芯形变达到原始厚度的 50%或更多。

(a) The applied force reaches 13 kN ± 0.78 kN;

(b) The voltage of the cell drops by at least 100 mV;

(c) The cell is deformed by 50% or more of its original thickness.

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达到原始厚度的 50%，即可解除压力。

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

棱柱形或袋装电芯须从最宽的面施压。纽扣/硬币形电芯应从其平坦表面施压。圆柱形电芯应从与纵轴垂

直的方向施压。

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.

每个试样电芯或电芯组件只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的试样电芯或电芯组件进行。

Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

要求 Requirement

电芯和电芯组件外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体，无起火。

Cell and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after test.

T.7. 过充电 Overcharge

测试方法 Test method

充电电流为制造商推荐的最大持续充电电流的两倍。试验的最小电压如下：

The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

(a) 制造商推荐的充电电压不大于 18 伏时，试验的最小电压应是电池最大充电电压的两倍或 22 伏两者中的较小者。

(b) 制造商推荐的充电电压大于 18 伏时，试验的最小电压应是电池最大充电电压的 1.2 倍。

(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.

(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.

试验应在环境温度下进行。进行试验的时间应为 24 小时。

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

要求 Requirement

充电电池应在试验过程中和试验后 7 天内无解体，无起火。

Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

T.8. 强制放电 Forced discharge

测试方法 Test method

每个电芯在环境温度下与 12V 直流电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。

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.

试样电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每个电芯的放电时间（单位为 h）等于电芯的额定容量除以试验初始放电电流（单位 A）。

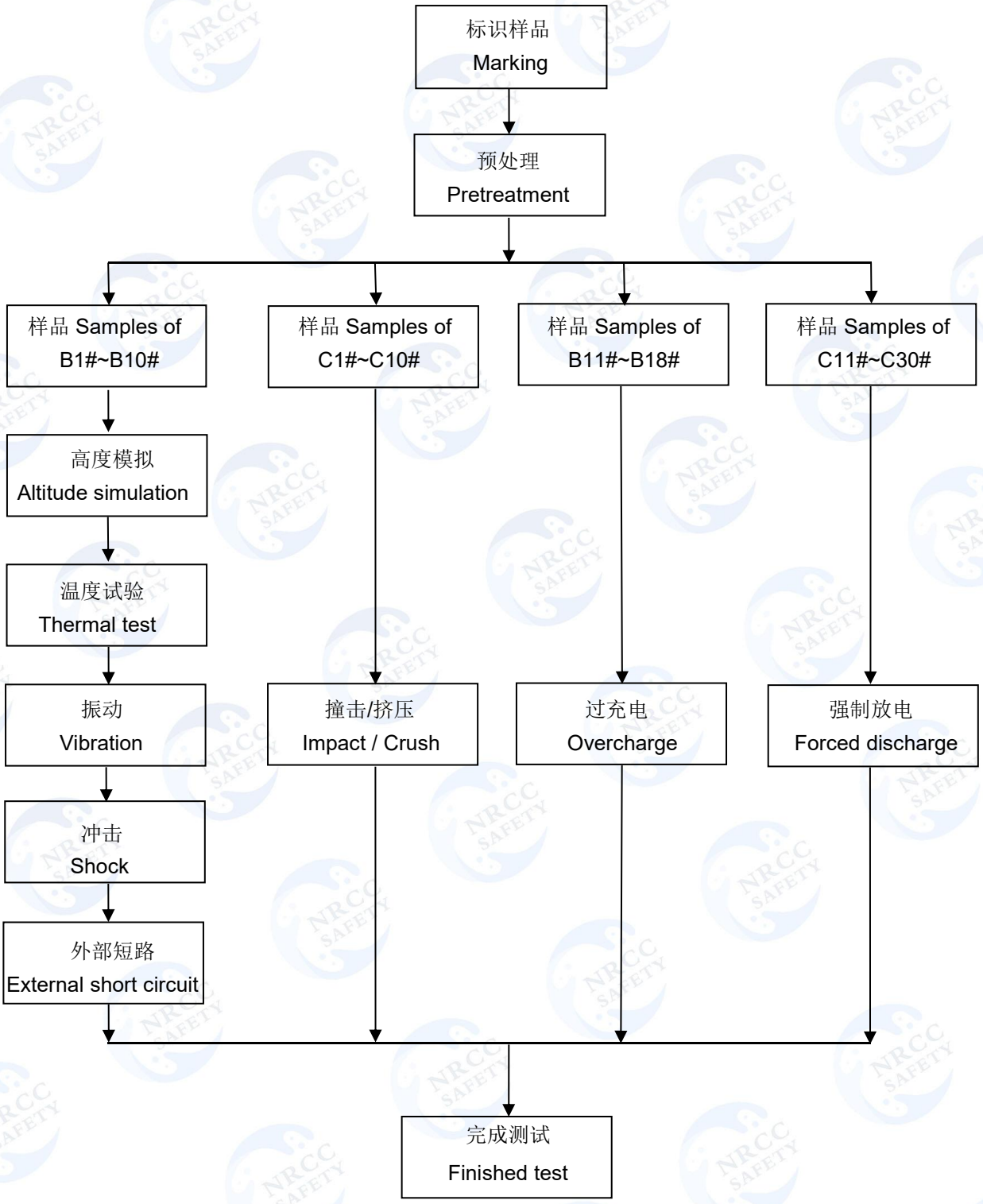
The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

要求 Requirement

原电芯或充电电芯应在试验过程中和试验后 7 天内无解体，无起火。

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

Ⅴ、测试流程 Test Procedure



Ⅵ、测试数据 Test Data

T.1. 高度模拟 Altitude simulation

样品状态 The state of cells	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	试验后电压/试验前电压 (%)Voltage after test /Voltage pre-test	结果 Status
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
1 次循环后满电状态 Full charged after one cycle	B1#	5.438	4.181	5.438	4.181	0.000	100.000	合格 Pass
	B2#	5.471	4.183	5.470	4.182	0.018	99.976	合格 Pass
	B3#	5.495	4.182	5.495	4.181	0.000	99.976	合格 Pass
	B4#	5.480	4.184	5.480	4.184	0.000	100.000	合格 Pass
	B5#	5.466	4.182	5.466	4.182	0.000	100.000	合格 Pass
25 次循环后满电状态 Full charged after twenty-five cycles	B6#	5.452	4.183	5.451	4.183	0.018	100.000	合格 Pass
	B7#	5.474	4.180	5.473	4.180	0.018	100.000	合格 Pass
	B8#	5.440	4.180	5.440	4.180	0.000	100.000	合格 Pass
	B9#	5.448	4.184	5.448	4.183	0.000	99.976	合格 Pass
	B10#	5.463	4.182	5.463	4.182	0.000	100.000	合格 Pass

注释 Notes： 大气压强 Atmospheric pressure:1.013×10^{5}Pa，环境温度 Ambient temperature: 23.4°C
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

T.2. 温度试验 Thermal test

样品状态 The state of cells	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	试验后电压/试验前电压 (%)Voltage after test /Voltage pre-test	结果 Status
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
1 次循环后满电状态 Full charged after one cycle	B1#	5.438	4.181	5.434	4.139	0.074	98.995	合格 Pass
	B2#	5.470	4.182	5.466	4.143	0.073	99.067	合格 Pass
	B3#	5.495	4.181	5.492	4.140	0.055	99.019	合格 Pass
	B4#	5.480	4.184	5.477	4.144	0.055	99.044	合格 Pass
	B5#	5.466	4.182	5.464	4.142	0.037	99.044	合格 Pass
25 次循环后满电状态 Full charged after twenty-five cycles	B6#	5.451	4.183	5.448	4.142	0.055	99.020	合格 Pass
	B7#	5.473	4.180	5.470	4.138	0.055	98.995	合格 Pass
	B8#	5.440	4.180	5.438	4.139	0.037	99.019	合格 Pass
	B9#	5.448	4.183	5.446	4.145	0.037	99.092	合格 Pass
	B10#	5.463	4.182	5.459	4.141	0.073	99.020	合格 Pass

注释 Notes： 大气压强 Atmospheric pressure:1.013×10^{5}Pa，环境温度 Ambient temperature: 23.6°C
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

T.3. 振动 Vibration

样品状态 The state of cells	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	试验后电压/试验前电压 (%)Voltage after test /Voltage pre-test	结果 Status
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
1 次循环后满电状态 Full charged after one cycle	B1#	5.434	4.139	5.434	4.139	0.000	100.000	合格 Pass
	B2#	5.466	4.143	5.465	4.142	0.018	99.976	合格 Pass
	B3#	5.492	4.140	5.492	4.140	0.000	100.000	合格 Pass
	B4#	5.477	4.144	5.477	4.143	0.000	99.976	合格 Pass
	B5#	5.464	4.142	5.464	4.142	0.000	100.000	合格 Pass
25 次循环后满电状态 Full charged after twenty-five cycles	B6#	5.448	4.142	5.448	4.141	0.000	99.976	合格 Pass
	B7#	5.470	4.138	5.470	4.138	0.000	100.000	合格 Pass
	B8#	5.438	4.139	5.437	4.139	0.018	100.000	合格 Pass
	B9#	5.446	4.145	5.446	4.145	0.000	100.000	合格 Pass
	B10#	5.459	4.141	5.459	4.141	0.000	100.000	合格 Pass

注释 Notes： 大气压强 Atmospheric pressure:1.013×10^5Pa，环境温度 Ambient temperature: 23.5°C
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

T.4. 冲击 Shock

样品状态 The state of cells	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	试验后电压/试验前电压 (%)Voltage after test /Voltage pre-test	结果 Status
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
1 次循环后满电状态 Full charged after one cycle	B1#	5.434	4.139	5.434	4.138	0.000	99.976	合格 Pass
	B2#	5.465	4.142	5.465	4.142	0.000	100.000	合格 Pass
	B3#	5.492	4.140	5.491	4.140	0.018	100.000	合格 Pass
	B4#	5.477	4.143	5.477	4.143	0.000	100.000	合格 Pass
	B5#	5.464	4.142	5.464	4.141	0.000	99.976	合格 Pass
25 次循环后满电状态 Full charged after twenty-five cycles	B6#	5.448	4.141	5.448	4.141	0.000	100.000	合格 Pass
	B7#	5.470	4.138	5.470	4.138	0.000	100.000	合格 Pass
	B8#	5.437	4.139	5.437	4.139	0.000	100.000	合格 Pass
	B9#	5.446	4.145	5.445	4.144	0.018	99.976	合格 Pass
	B10#	5.459	4.141	5.459	4.140	0.000	99.976	合格 Pass

注释 Notes： 大气压强 Atmospheric pressure:1.013×10^5Pa，环境温度 Ambient temperature: 23.6°C
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

T.5. 外部短路 External short circuit

样品状态 The state of cells	编号 No.	电池表面最高温度(℃) External Peak temperature(℃)	结果 Status
1 次循环后满电状态 Full charged after one cycle	B1#	58.3	合格 Pass
	B2#	57.7	合格 Pass
	B3#	57.8	合格 Pass
	B4#	58.0	合格 Pass
	B5#	58.3	合格 Pass
25 次循环后满电状态 Full charged after twenty-five cycles	B6#	58.1	合格 Pass
	B7#	57.6	合格 Pass
	B8#	57.9	合格 Pass
	B9#	57.7	合格 Pass
	B10#	58.2	合格 Pass
注释 Notes： 大气压强 Atmospheric pressure:1.013×10^{5}Pa, 环境温度 Ambient temperature: 23.4°C 电池在测试中和测试后 6 小时内未解体、未破裂、未起火。 There is no disassembly, no rupture and no fire during the test and within six hours after test.			

T.6. 挤压 Crush

样品状态 The state of cells	编号 No.	电池表面最高温度(℃) External Peak temperature(℃)	结果 Status
1 次循环后 50%充电状态 50% charged after one cycle	C1#	24.2	合格 Pass
	C2#	24.0	合格 Pass
	C3#	23.8	合格 Pass
	C4#	23.9	合格 Pass
	C5#	24.1	合格 Pass
25 次循环后 50%充电状态 50% charged after twenty-five cycles	C6#	24.1	合格 Pass
	C7#	23.7	合格 Pass
	C8#	23.9	合格 Pass
	C9#	24.0	合格 Pass
	C10#	23.8	合格 Pass
注释 Notes： 大气压强 Atmospheric pressure:1.013×10^{5}Pa, 环境温度 Ambient temperature: 23.3°C 电芯在测试中和测试后 6 小时内未解体、未起火。 There is no disassembly and no fire during the test and within six hours after test.			

T.7. 过充电 Overcharge

样品状态 The state of cells	编号 No.	结果 Status
1 次循环后满电状态 Full charged after one cycle	B11#	合格 Pass
	B12#	合格 Pass
	B13#	合格 Pass
	B14#	合格 Pass
25 次循环后满电状态 Full charged after twenty-five cycles	B15#	合格 Pass
	B16#	合格 Pass
	B17#	合格 Pass
	B18#	合格 Pass
注释 Notes： 大气压强 Atmospheric pressure:1.013×10^5Pa，环境温度 Ambient temperature: 23.4°C 电池在测试中和测试后 7 天内未解体，未起火。 There is no disassembly and no fire during the test and within seven days after the test.		

T.8. 强制放电 Forced discharge

样品状态 The state of cells	编号 No.	结果 Status
1 次循环完全放电状态 Full discharged after one cycle	C11#	合格 Pass
	C12#	合格 Pass
	C13#	合格 Pass
	C14#	合格 Pass
	C15#	合格 Pass
	C16#	合格 Pass
	C17#	合格 Pass
	C18#	合格 Pass
	C19#	合格 Pass
	C20#	合格 Pass
25 次循环完全放电状态 Full discharged after twenty-five cycles	C21#	合格 Pass
	C22#	合格 Pass
	C23#	合格 Pass
	C24#	合格 Pass
	C25#	合格 Pass
	C26#	合格 Pass
	C27#	合格 Pass
	C28#	合格 Pass

	C29#	合格 Pass
	C30#	合格 Pass

注释 Notes： 大气压强 Atmospheric pressure:1.013×10^5Pa，环境温度 Ambient temperature: 23.6°C
电芯在测试中和测试后 7 天内未解体，未起火。
There is no disassembly and no fire during the test and within seven days after the test.

Ⅶ、结论 Conclusion

编号 No.	测试项目 Test item	样品数量 Sample number	测试参考 Test reference	结论 Conclusion
1	高度模拟 Altitude simulation	B1#~B10#	联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.1 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.1	合格 Pass
2	温度试验 Thermal test		联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.2 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.2	合格 Pass
3	振动 Vibration		联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.3 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.3	合格 Pass
4	冲击 Shock		联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.4 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.4	合格 Pass
5	外部短路 External short circuit		联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.5 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.5	合格 Pass
6	撞击/挤压 Impact/Crush	C1#~C10#	联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.6 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.6	合格 Pass
7	过度充电 Overcharge	B11#~B18#	联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.7 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.7	合格 Pass
8	强制放电 Forced discharge	C11#~C30#	联合国《试验和标准手册》，第Ⅲ部分，第 38.3.4.8 节 United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3.4.8	合格 Pass

经检测，提交的检测样品均符合联合国《试验和标准手册》第Ⅲ部分第 38.3 节的要求，检测结论为合格。

The submitted samples were complied with the stated requirements of United Nations *Manual of Tests and Criteria*, part Ⅲ, subsection 38.3, the test result is qualified.

Ⅷ、样品图片 Photo of The Sample

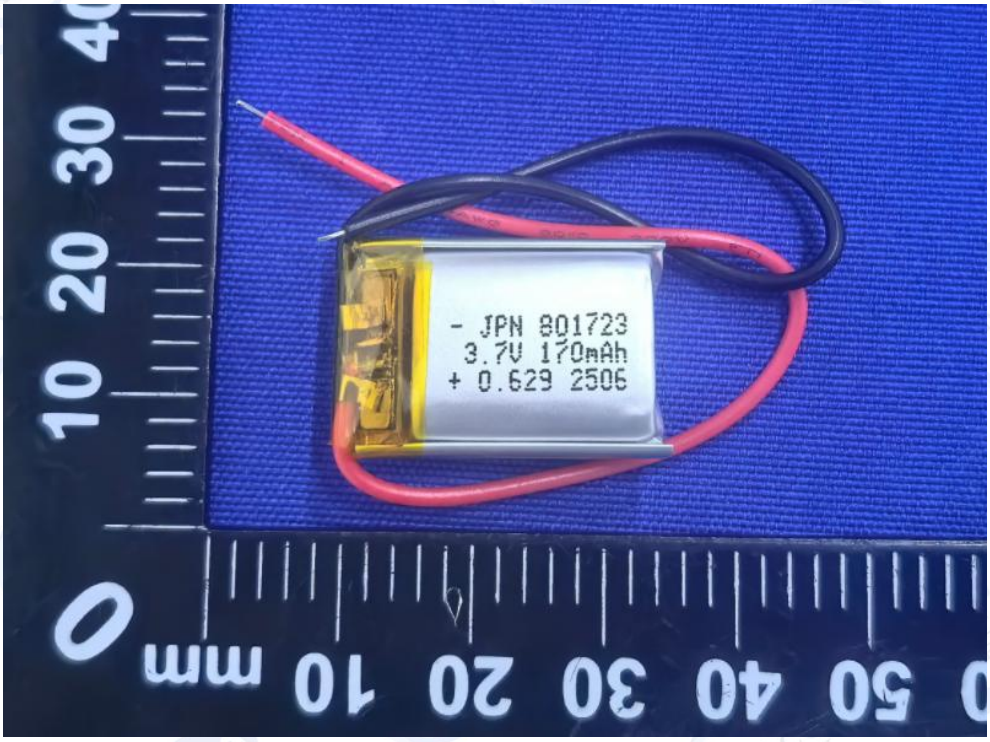


Photo 1 正面 Front

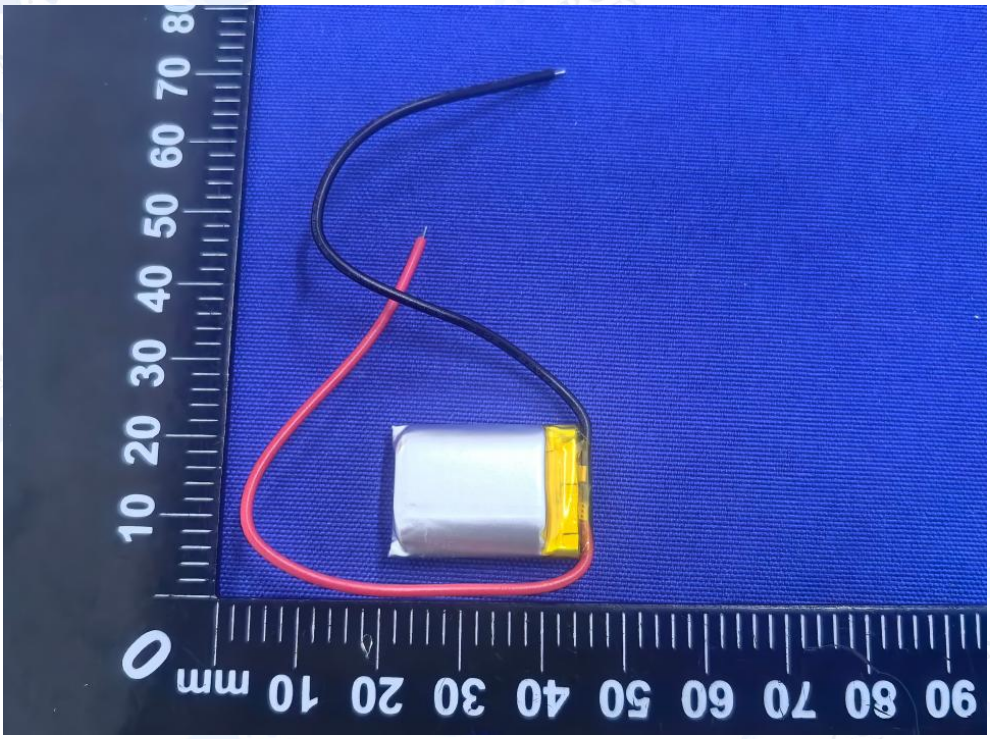


Photo 2 反面 Rear

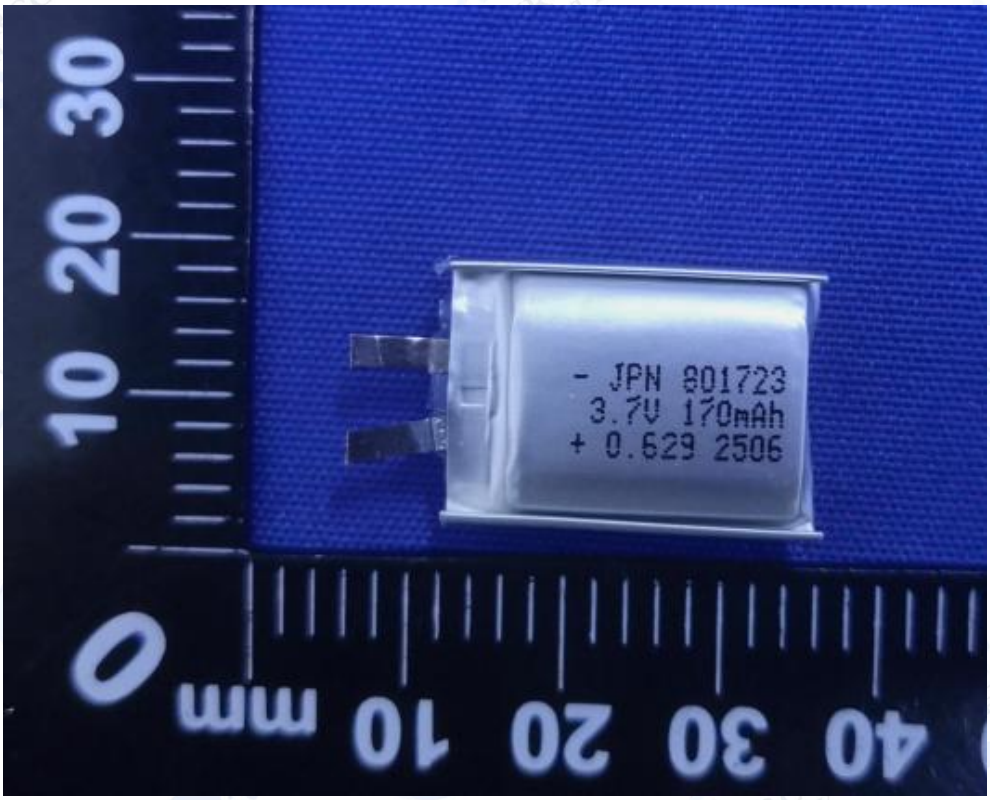


Photo 3 内部电芯 Internal Cell



Photo 4 内部电芯 Internal Cell

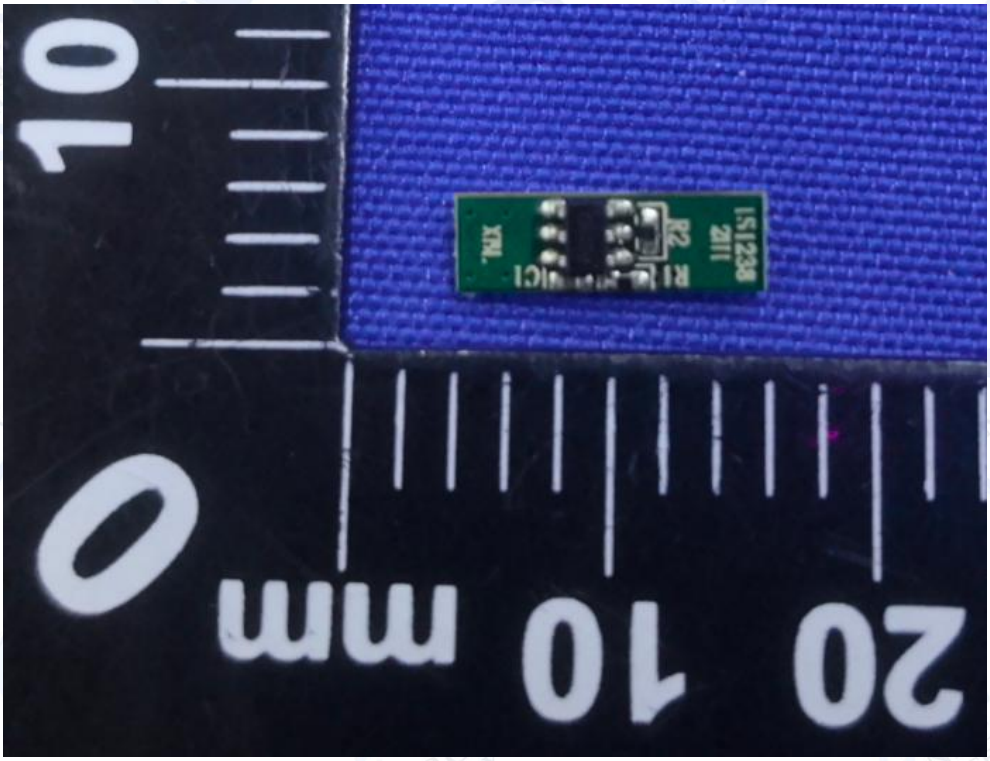


Photo 5 保护板 Protection board

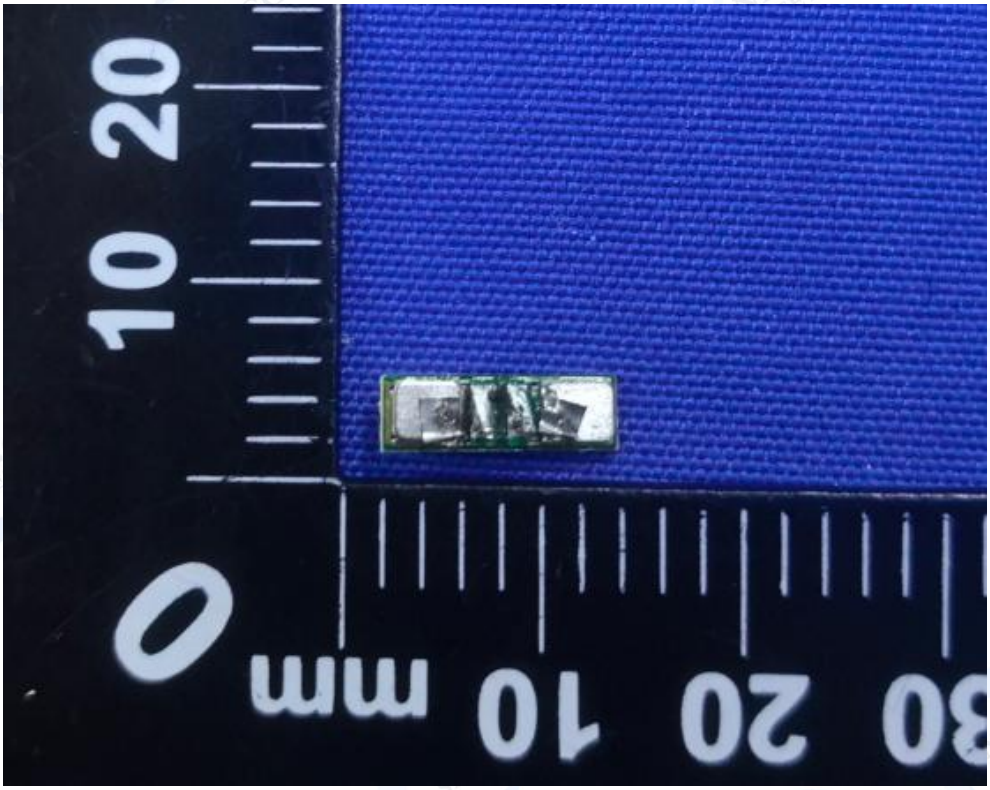


Photo 6 保护板 Protection board

注意事项

Important Notice

1. 本报告无审批人签字和诺诚（深圳）安全科技有限公司（以下简称“实验室”）签章无效。

This report is invalid until signed by the approver and sealed by the NRCC (Shenzhen) Safety Technology Co., Ltd. (Hereinafter referred to as "the Laboratory").

2. 本报告经伪造、篡改、删除、部分复制均无效。

This report is invalid with any unauthorized altered, forgery, falsification or partial replication.

3. 本报告的检测结论仅在委托方提交的委托资料和样品真实的情况下有效，检测结论与样品名称及其他同类物质的检测结论无关。

This report is only valid to the test conclusion under the precondition that client submitted real entrusted materials and samples, and the test conclusion result is not relevant with other materials sharing same name or congeners.

4. 如电池的生产工艺、原材料、组分等因素有较大改变，可能使其危险性发生改变时，应重新进行检测；当检测报告所依据的法规、标准发生变化时，其检测结论可能发生变化，应重新进行检测。

When significant changing of manufacturing process, materials, components, or other factors of the battery may change its hazard classification, this battery should be identified again; If relative regulations or standards update, the conclusions may change, and the batteries should be identified again.

5. 对报告书若有异议，应于收到报告之日起 15 天内向实验室提出。

Objections to the test report must be submitted to the Laboratory within 15 days.

6. 本报告中英文内容出现不一致时，以中文内容为准。

Should there be any inconsistencies between Chinese and English content in this report, the Chinese version shall prevail.

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