中国认可
国际互认
检测
TESTING
CNAS L11969

UN38.3 检测报告
UN38.3 Test Report

Client 委托方	SYSMAX Innovations Co.,Ltd. 广州希脉创新科技有限公司
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Sample Name 样品名称	Rechargeable Li-ion battery 可充电锂离子电池
Sample Model 样品型号	652540
Testing Laboratory 检测机构	NRCC (Shenzhen) Safety Technology Co., Ltd. 诺诚（深圳）安全科技有限公司 (Testing and Inspection Body affiliated to the National Registration Center for Chemicals, MEM) （应急管理部化学品登记中心旗下检测检验机构） Building A, No. 2, Tengfeng 5th Road, Fuyong, Bao'an District, Shenzhen 深圳市宝安区福永街道腾丰五路 2 号 A 栋 Phone number 电话号码: +86-755-27322216 Email 邮箱: service@nrccsafety.com Website 网址: www.nrccsafety.com
Report No. 报告编号	241040170434-13
Issued Date 签发日期	2024.11.04

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

Tested by主检人: Lvdao cai 吕道财
(Engineer 工程师)

Approved by审批人: Duan Pike 段丕钊
(Manager 经理)

诺诚（深圳）安全科技有限公司 检测检验章

Ⅰ、Sample Description 样品描述

Sample Name 样品名称	Rechargeable Li-ion battery 可充电锂离子电池		**Sample Model** 样品型号	652540	
Manufacturer 制造商	Dong Guan Golden CEL Battery Co., Ltd. 东莞市金赛尔电池科技有限公司				
Address 地址	No.11, jiaoyitang yinhu industrial zone, tangxia town, dongguan city, guangdong province. 广东省东莞市塘厦镇蛟乙塘银湖工业区 11 号				
Factory 工厂	Dong Guan Golden CEL Battery Co., Ltd. 东莞市金赛尔电池科技有限公司				
Address 地址	No.11, jiaoyitang yinhu industrial zone, tangxia town, dongguan city, guangdong province. 广东省东莞市塘厦镇蛟乙塘银湖工业区 11 号				
Manufacturer's contact information 制造商联系信息	**Phone number** 电话号码		**Email address** 电子邮箱地址	**Website** 网址	
	+86-020-83862000		info@nitecore.com	--	
Trade Mark 商标	--	**Cell Shape** 电芯形状	Prismatic 棱柱形	**Battery Size** 电池尺寸 **(L×W×T)**	(41.1×24.9×5.7)mm
Nominal Voltage 标称电压	3.85V	**Rated Capacity** 额定容量	700mAh 2.695Wh	**Limited Charge Voltage** 充电限制电压	4.4V
Standard Charge Current 标准充电电流	140mA	**Maximum Continuous Charge Current** 最大持续充电电流	700mA	**End Charge Current** 结束充电电流	7mA
Cut-off Voltage 放电截止电压	2.75V	**Standard Discharge Current** 标准放电电流	140mA	**Maximum Discharge Current** 最大放电电流	700mA
Cell Number 组成电芯数量	1PC		**Cell Model** 电芯型号	652540	
Sample Mass 样品重量	12.1g		**Sample Physical description** 样品物理形态	Approximate Silver Cuboid 银色近长方体	
Test Start Date 测试开始日期	2024.10.21		**Test Completion Date** 测试完成日期	2024.11.04	

Ⅱ、Standard 标准

UNITED NATIONS “*Manual of Tests and Criteria” (ST/SG/AC.10/11/Rev.8 Section 38.3).*
联合国《试验和标准手册》第八修订版第 38.3 节。

Ⅲ、Test Item 测试项目

T.1.	☒ Altitude simulation 高度模拟	T.5.	☒ External short circuit 外部短路
T.2.	☒ Thermal test 温度试验	T.6.	☐ Impact 撞击/ ☒ Crush 挤压
T.3.	☒ Vibration 振动	T.7.	☒ Overcharge 过充电
T.4.	☒ Shock 冲击	T.8.	☒ Forced discharge 强制放电

Ⅳ、Test Method and Requirement 测试方法和要求

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.

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。

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;
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；

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

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

质量损失的量化值，可用以下公式计算：

质量损失(%)=(M1-M2)/M1×100

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 below, 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下表所列的数值，应视为“无质量损失”。

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

1g≤M≤75g	0.2%
M＞75g	0.1%

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.

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。

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.

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。

T.1. Altitude simulation 高度模拟

Test method 测试方法

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).

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。

Requirement 要求

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.

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。

T.2. Thermal test 温度试验

Test method 测试方法

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.

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。

Requirement 要求

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.

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。

T.3. Vibration 振动

Test method 测试方法

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.

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。

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).

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。

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 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.

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。

Requirement 要求

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.

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。

T.4. Shock 冲击

Test method 测试方法

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.

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。

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 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.

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。

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.

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）= $\sqrt{\left(\frac{100850}{mass}\right)}$	6ms
大型电池	50 gn 或计算结果中取最小的值 加速度（gn）= $\sqrt{\left(\frac{30000}{mass}\right)}$	11 ms

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.

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。

Requirement 要求

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.

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。

T.5. External short circuit 外部短路

Test method 测试方法

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.

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。

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。

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

短路测试和冷却阶段至少应该在环境温度下进行。

Requirement 要求

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.

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。

T.6. Impact / Crush 撞击/挤压

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

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）

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.

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 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.

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。

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

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）

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.

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) 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.

(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。

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.

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。

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.

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。

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.

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。

Requirement 要求

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.

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。

T.7. Overcharge 过充电

Test method 测试方法

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

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：

(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.

(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。

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

试验应在环境温度下进行。进行试验的时间应为 24 小时。

Requirement 要求

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

充电电池应在试验过程中和试验后 7 天内无解体，无起火。

T.8. Forced discharge 强制放电

Test method 测试方法

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.

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。

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).

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)

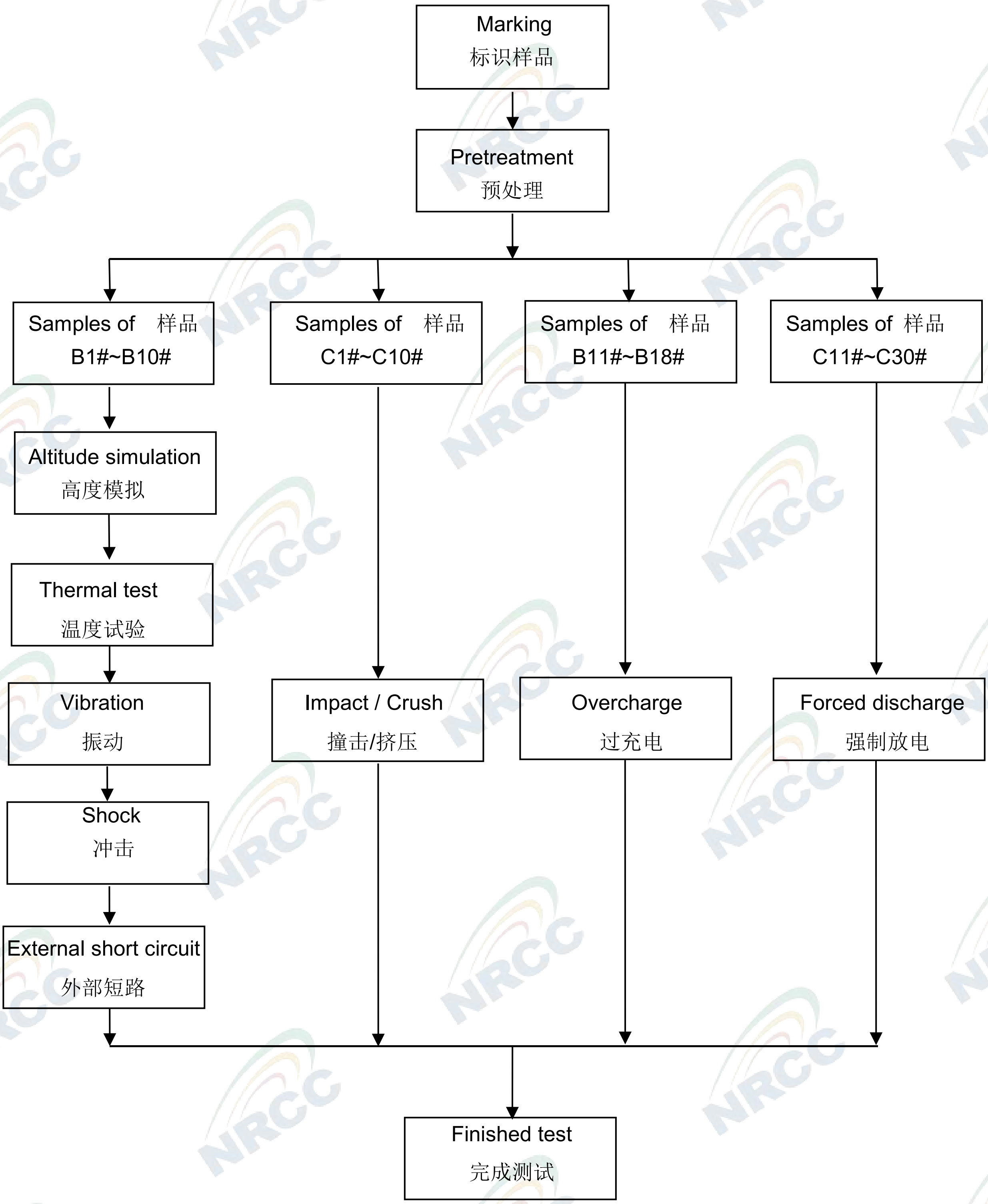
等于电芯的额定容量除以试验初始放电电流（单位 A）。

Requirement 要求

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.

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。

V、Test Procedure 测试流程



Ⅵ、Test Data 测试数据

T.1. Altitude simulation 高度模拟

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	11.802	4.386	11.801	4.386	0.008	100.000	Pass 合格
	B2#	11.914	4.384	11.914	4.383	0.000	99.977	Pass 合格
	B3#	11.842	4.382	11.842	4.382	0.000	100.000	Pass 合格
	B4#	12.061	4.381	12.060	4.380	0.008	99.977	Pass 合格
	B5#	12.093	4.383	12.093	4.383	0.000	100.000	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B6#	11.945	4.385	11.945	4.384	0.000	99.977	Pass 合格
	B7#	12.038	4.384	12.037	4.384	0.008	100.000	Pass 合格
	B8#	12.066	4.384	12.066	4.383	0.000	99.977	Pass 合格
	B9#	11.877	4.385	11.877	4.385	0.000	100.000	Pass 合格
	B10#	11.963	4.386	11.962	4.385	0.008	99.977	Pass 合格

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

T.2. Thermal test 温度试验

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	11.801	4.386	11.797	4.345	0.034	99.065	Pass 合格
	B2#	11.914	4.383	11.911	4.341	0.025	99.042	Pass 合格
	B3#	11.842	4.382	11.839	4.346	0.025	99.178	Pass 合格
	B4#	12.060	4.380	12.056	4.342	0.033	99.132	Pass 合格
	B5#	12.093	4.383	12.090	4.345	0.025	99.133	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B6#	11.945	4.384	11.942	4.347	0.025	99.156	Pass 合格
	B7#	12.037	4.384	12.034	4.343	0.025	99.065	Pass 合格
	B8#	12.066	4.383	12.062	4.346	0.033	99.156	Pass 合格
	B9#	11.877	4.385	11.873	4.342	0.034	99.019	Pass 合格
	B10#	11.962	4.385	11.958	4.344	0.033	99.065	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^{5}Pa, Ambient temperature 环境温度: 23.0°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.3. Vibration 振动

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	11.797	4.345	11.797	4.344	0.000	99.977	Pass 合格
	B2#	11.911	4.341	11.910	4.341	0.008	100.000	Pass 合格
	B3#	11.839	4.346	11.839	4.345	0.000	99.977	Pass 合格
	B4#	12.056	4.342	12.055	4.342	0.008	100.000	Pass 合格
	B5#	12.090	4.345	12.090	4.344	0.000	99.977	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B6#	11.942	4.347	11.941	4.347	0.008	100.000	Pass 合格
	B7#	12.034	4.343	12.034	4.342	0.000	99.977	Pass 合格
	B8#	12.062	4.346	12.061	4.346	0.008	100.000	Pass 合格
	B9#	11.873	4.342	11.873	4.341	0.000	99.977	Pass 合格
	B10#	11.958	4.344	11.957	4.344	0.008	100.000	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.2°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后，电池未渗漏、未泄气、未解体、未破裂和未起火。

T.4. Shock 冲击

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	11.797	4.344	11.797	4.344	0.000	100.000	Pass 合格
	B2#	11.910	4.341	11.910	4.340	0.000	99.977	Pass 合格
	B3#	11.839	4.345	11.838	4.345	0.008	100.000	Pass 合格
	B4#	12.055	4.342	12.055	4.341	0.000	99.977	Pass 合格
	B5#	12.090	4.344	12.089	4.344	0.008	100.000	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B6#	11.941	4.347	11.941	4.346	0.000	99.977	Pass 合格
	B7#	12.034	4.342	12.033	4.342	0.008	100.000	Pass 合格
	B8#	12.061	4.346	12.061	4.345	0.000	99.977	Pass 合格
	B9#	11.873	4.341	11.872	4.341	0.008	100.000	Pass 合格
	B10#	11.957	4.344	11.957	4.343	0.000	99.977	Pass 合格

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

T.5. External short circuit 外部短路

The state of cells 样品状态	No. 编号	External Peak temperature(℃) 电池表面最高温度(℃)	Status 结果
Full charged after one cycle 1 次循环后满电状态	B1#	58.1	Pass 合格
	B2#	58.3	Pass 合格
	B3#	58.5	Pass 合格
	B4#	57.7	Pass 合格
	B5#	58.4	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B6#	57.8	Pass 合格
	B7#	58.2	Pass 合格
	B8#	58.4	Pass 合格
	B9#	57.5	Pass 合格
	B10#	58.1	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.5°C There is no disassembly, no rupture and no fire during the test and within six hours after test. 电池在测试中和测试后 6 小时内未解体、未破裂，未起火。			

T.6. Crush 挤压

The state of cells 样品状态	No. 编号	External Peak temperature(℃) 电池表面最高温度(℃)	Status 结果
50% charged after one cycle 1 次循环后 50%充电状态	C1#	24.2	Pass 合格
	C2#	24.4	Pass 合格
	C3#	24.6	Pass 合格
	C4#	23.7	Pass 合格
	C5#	23.9	Pass 合格
50% charged after twenty-five cycles 25 次循环后 50%充电状态	C6#	24.1	Pass 合格
	C7#	24.3	Pass 合格
	C8#	24.5	Pass 合格
	C9#	24.6	Pass 合格
	C10#	23.8	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.3°C There is no disassembly and no fire during the test and within six hours after test. 电芯在测试中和测试后 6 小时内未解体、未起火。			

T.7. Overcharge 过充电

The state of cells 样品状态	No. 编号	Status 结果
Full charged after one cycle 1 次循环后满电状态	B11#	Pass 合格
	B12#	Pass 合格
	B13#	Pass 合格
	B14#	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B15#	Pass 合格
	B16#	Pass 合格
	B17#	Pass 合格
	B18#	Pass 合格
Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.1°C There is no disassembly and no fire during the test and within seven days after the test. 电池在测试中和测试后 7 天内未解体，未起火。		

T.8. Forced discharge 强制放电

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

	C27#	Pass 合格
	C28#	Pass 合格
	C29#	Pass 合格
	C30#	Pass 合格

Notes 注释: Atmospheric pressure 大气压强:1.013×10^5Pa, Ambient temperature 环境温度: 23.5°C
There is no disassembly and no fire during the test and within seven days after the test.
电芯在测试中和测试后 7 天内未解体，未起火。

Ⅶ、Conclusion 结论

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

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。

Ⅷ、Photo of The Sample 样品图片

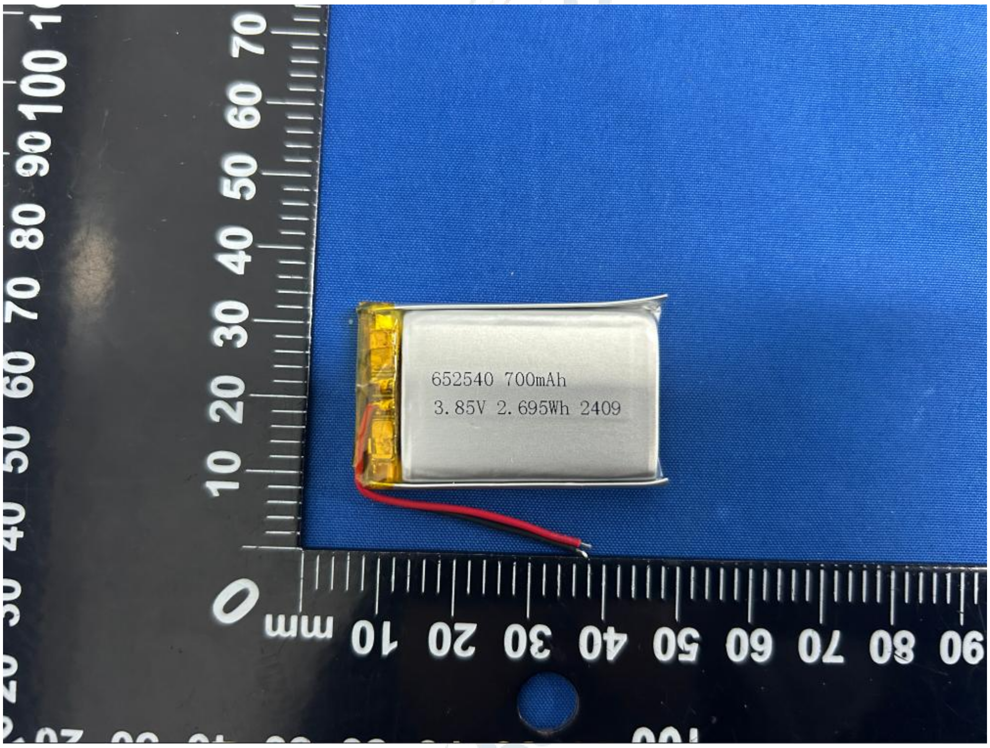


Photo 1 Front 正面

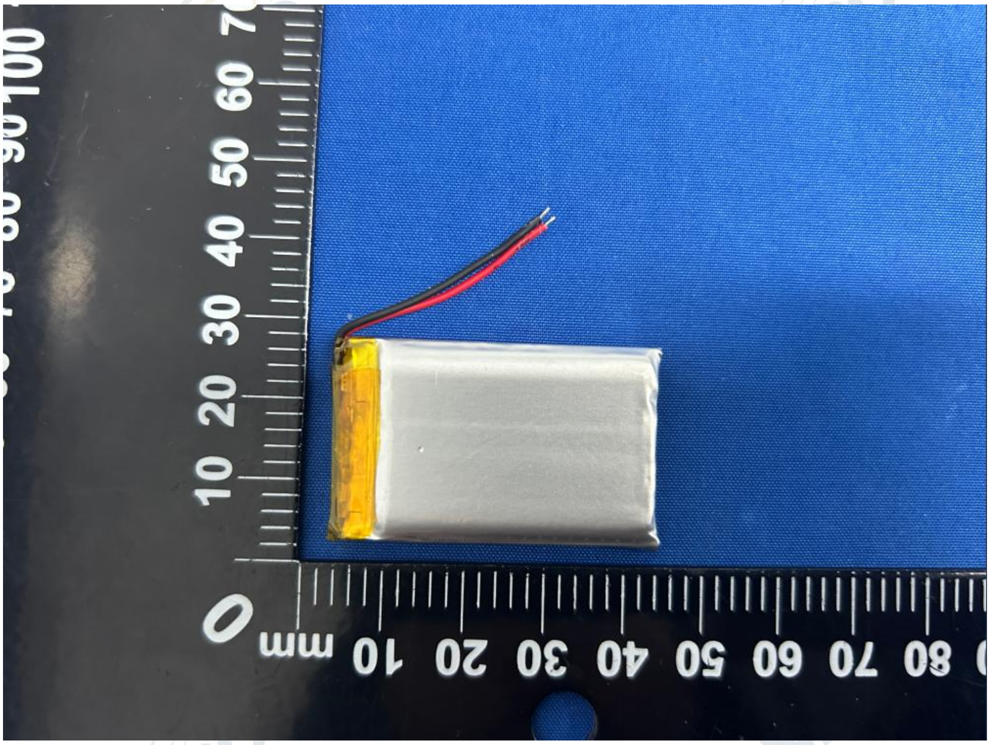


Photo 2 Rear 反面

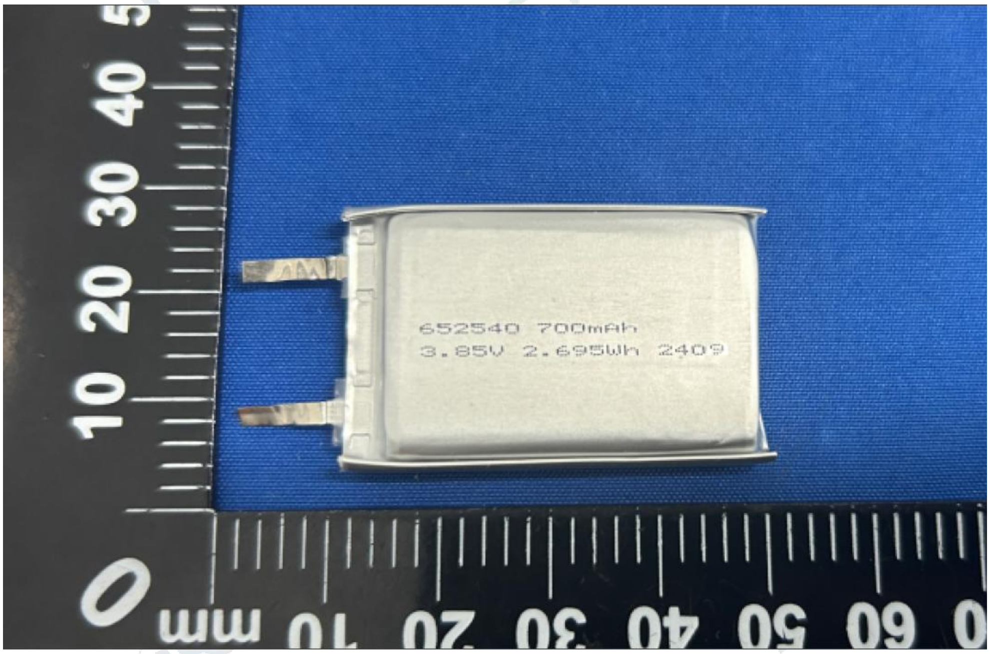


Photo 3 Internal Cell 内部电芯

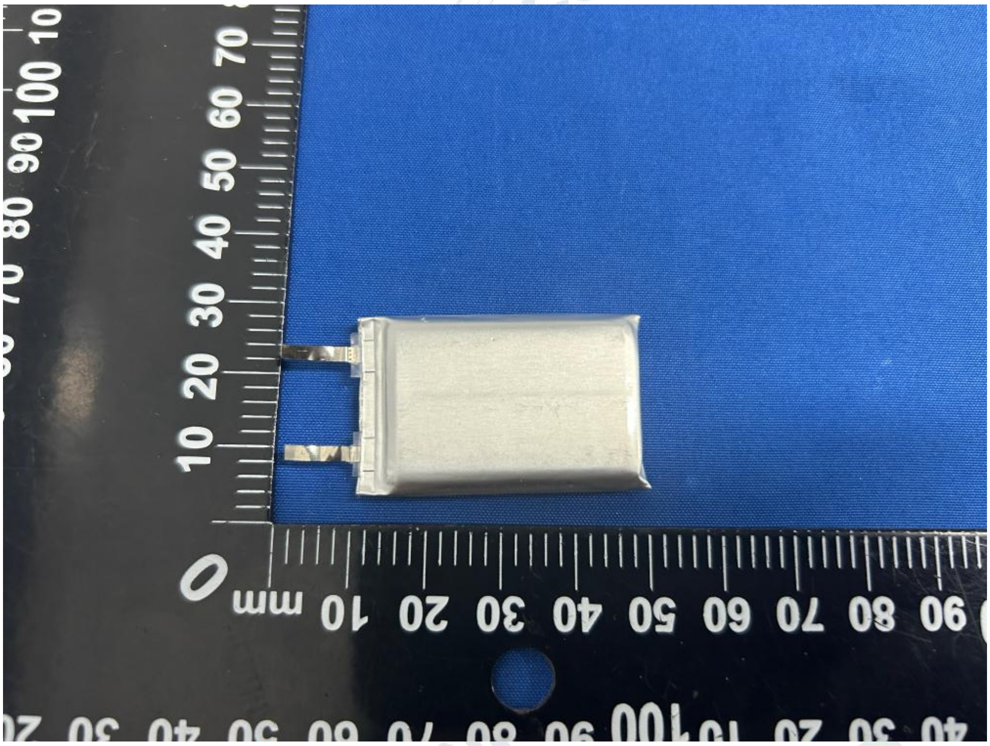


Photo 4 Internal Cell 内部电芯

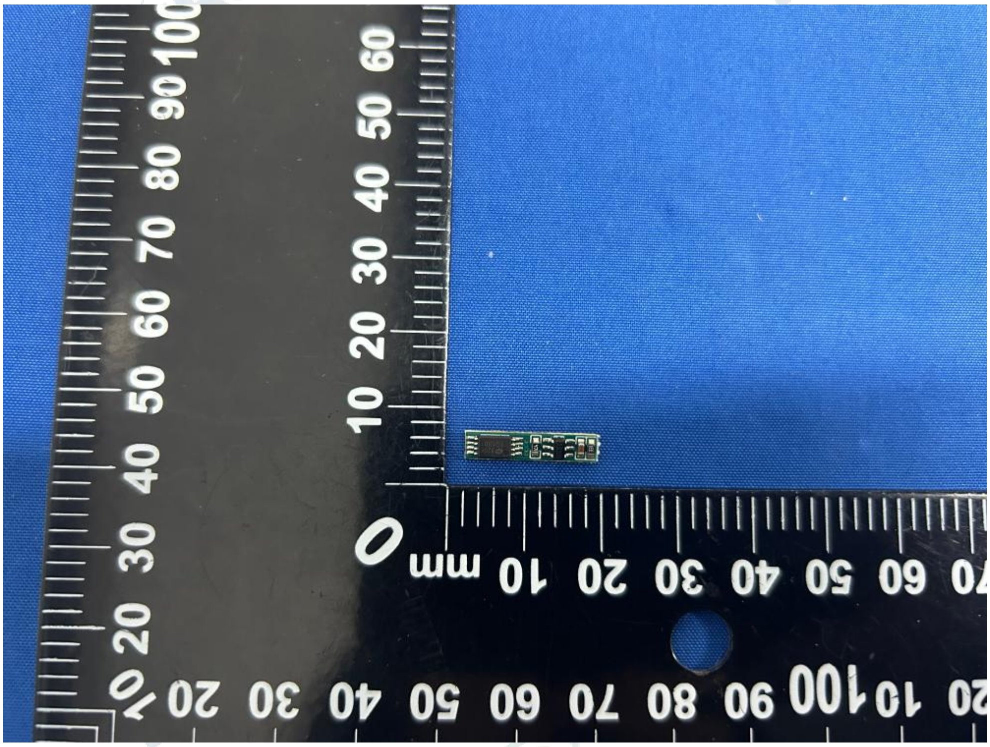


Photo 5 Protection board 保护板

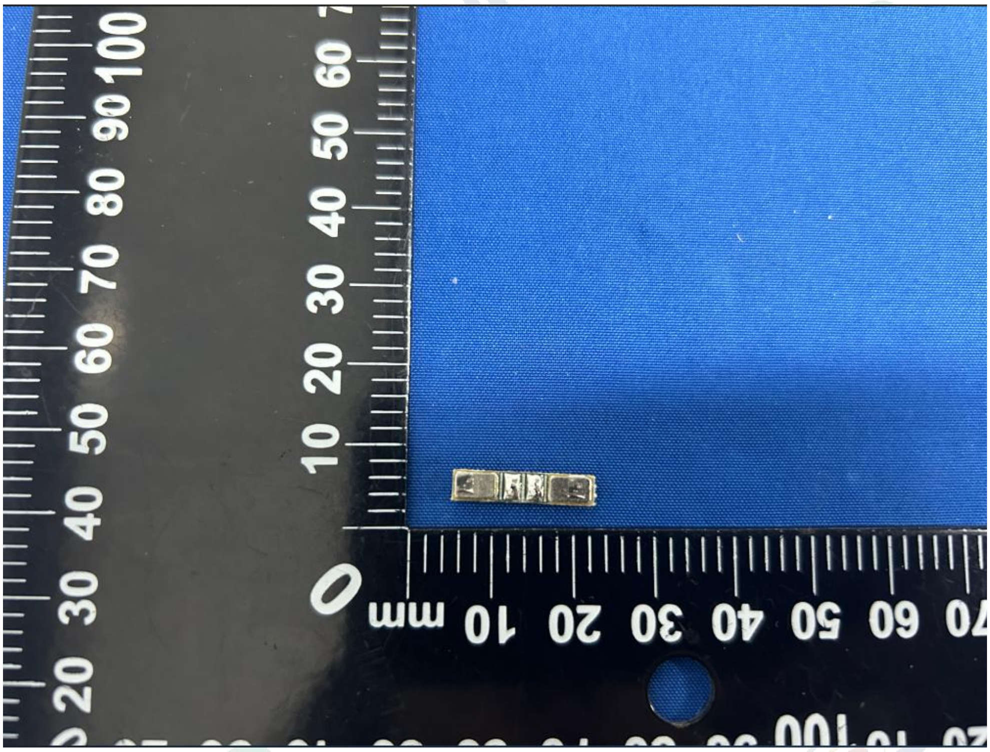


Photo 6 Protection board 保护板

注意事项

Important Notice

1. 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").

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

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

   本报告经伪造、篡改、删除、部分复制均无效。

3. 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.

   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。

4. 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.

   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。

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

   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。

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

   本报告中英文内容出现不一致时，以中文内容为准。

7. Visiting www.nrccsafety.com, or contact us by telephone, email could check report authenticity.

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********End of Report 报告结束********