UN38.3 检测报告

UN38.3 Test Report

Client **委托方**	DONGGUAN SYO ELECTRONIC TECHNOLOGY CO., LTD 东莞市赛亿欧电子科技有限公司
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Samples Description **样品名称**	Li-ion Battery Pack 锂离子电池组
Sample Model **样品型号**	18650-2S
Testing Laboratory **测试机构**	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司 B2A101/B2A201/B2A202, Fuqiao 6th Area, Xintian, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China 广东省深圳市宝安区福海街道新田社区富桥六区 B2A101, B2A201, B2A202 Phone number 电话号码: +86-755-23218380 Email 邮箱: sales@nct-testing.com Website 网址: http://www.ncttesting.cn
Report No. **报告编号**	NCT250131585XB1-1
Issued Date **发行日期**	2025.04.09
Test Conclusion 测试结论: **Shown in the Conclusion of test report. 见检测报告结论页.**	

Tested by 主检人:
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Seal of NCT 报告单位（盖章）

Date of Issue 签发日期: 2025.04.09

Ⅰ、Sample Description 样品描述

Sample Name 样品名称	Li-ion Battery Pack 锂离子电池组		**Sample Model 样品型号**	18650-2S	
Manufacturer 制造商	DONGGUAN SYO ELECTRONIC TECHNOLOGY CO., LTD 东莞市赛亿欧电子科技有限公司				
Address 地址	West of 7th Floor, Building A, XinBoShengChuangke Industrial Park, No.5 XinYuan South Road, Tianxin Community, Tangxia Town, DongGuan City 东莞市塘厦镇田心社区新苑南路 5 号鑫博盛创客产业园 A 栋 7 楼西面				
Factory 工厂	DONGGUAN SYO ELECTRONIC TECHNOLOGY CO., LTD 东莞市赛亿欧电子科技有限公司				
Address 地址	West of 7th Floor, Building A, XinBoShengChuangke Industrial Park, No.5 XinYuan South Road, Tianxin Community, Tangxia Town, DongGuan City 东莞市塘厦镇田心社区新苑南路 5 号鑫博盛创客产业园 A 栋 7 楼西面				
Manufacturer's contact information 制造商联系信息	**Phone number 电话号码**		**E-mail address 电子邮箱地址**		**Website 网址**
	+86-13530325060		yang@syobattery.com		http://www.syobattery.com
Trade Mark 商标	---	**Cell Shape 电芯形状**	Cylindrical 圆柱形	**Battery Size 电池尺寸 (L×W×T)**	(67.0 X 37.2 X 23.0)mm
Nominal Voltage 标称电压	7.4V	**Rated Capacity 额定容量**	2500mAh 18.5Wh	**Limited Charge Voltage 充电限制电压**	8.4V
Standard Charge Current 标准充电电流	500mA	**Maximum Continuous Charge Current 最大持续充电电流**	2500mA	**End Charge Current 结束充电电流**	25mA
Cut-off Voltage 放电截止电压	5.3V	**Standard Discharge Current 标准放电电流**	500mA	**Maximum Continuous Discharge Current 最大持续放电电流**	20A
Cell Number 组成电芯数量	2PCS		**Cell Model 电芯型号**	18650-25P	
Sample Mass 样品重量	100.4g		**Sample Physical description 样品物理形态**	Approximate Blue Cuboid 蓝色近长方体	
Receiving Date 接收日期	2025.03.24		**Completing Date 完成日期**	2025.04.06	

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.2. ☒Thermal test 温度试验
T.3. ☒Vibration 振动
T.4. ☒Shock 冲击
T.5. ☒External short circuit 外部短路
T.6. ☒Impact 撞击/ ☐Crush 挤压
T.7. ☒Overcharge 过充电
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 cell or battery. 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 for purposes of testing on cycled batteries.

用相同的电芯或电池应按顺序进行试验 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，以便测试经过充放电的电池。

Rechargeable lithium batteries of B01~B04, B09~B12, at first cycle in full charged states;
Rechargeable lithium batteries of B05~B08, B13~B16, after 25 cycles ending in full charged states;
Rechargeable component lithium cells of C01~C05, at first cycle at 50% of the design rated capacity;
Rechargeable component lithium cells of C06~C10, after 25 cycles ending at 50% of the design rated capacity;
Rechargeable component lithium cells of C11~C20, at first cycle in full discharged states;
Rechargeable component lithium cells of C21~C30, after 25 cycles ending in full discharged states;
可充电锂电池 B01~B04, B09~B12, 第一个充放电周期完全充电状态；
可充电锂电池 B05~B08, B13~B16, 25 个充放电周期后完全充电状态；
可充电元件锂电芯 C01~C05, 第一个充放电周期 50%设计额定容量状态；
可充电元件锂电芯 C06~C10, 25 个充放电周期后 50%设计额定容量状态；
可充电元件锂电芯 C11~C20, 第一个充放电周期完全放电状态；
可充电元件锂电芯 C21~C30, 25 个充放电周期后完全放电状态；

BAA stands for battery sample number NCT250131585X-BAA, A=0-9.
BAA 代表电池样板编号 NCT250131585X-BAA, A=0-9.
CAA stands for cell sample number NCT250131585X-CAA, A=0-9.
CAA 代表电芯样板编号 NCT250131585X-CAA, A=0-9.

Test environment condition: ambient temperature: 15-25℃, ambient humidity: 40-70%.
试验环境条件：环境温度：15-25℃，环境湿度：40-70%

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.

渗漏系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的试验电芯和电池。

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℃).

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℃)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.

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%。

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℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. 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℃). 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℃的条件下存放至少 6 小时，接着再在试验温度等于-40±2℃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℃)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.

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%。

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.

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%。

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）= $\sqrt{(\frac{100850}{mass})}$	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

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.

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%。

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℃, 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℃ 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℃。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℃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℃, 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℃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℃ 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℃，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℃ 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℃，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。

Shenzhen NCT Testing Technology Co., Ltd. 2008

Ⅴ、Test Data 测试数据

T.1 Altitude simulation 高度模拟

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)			
B01	100.288	8.363	100.286	8.355	0.002	99.904	Pass 合格
B02	100.304	8.362	100.303	8.352	0.001	99.880	Pass 合格
B03	100.180	8.366	100.179	8.358	0.001	99.904	Pass 合格
B04	100.366	8.370	100.364	8.362	0.002	99.904	Pass 合格
B05	100.336	8.363	100.334	8.354	0.002	99.892	Pass 合格
B06	100.270	8.361	100.269	8.351	0.001	99.880	Pass 合格
B07	100.114	8.353	100.112	8.345	0.002	99.904	Pass 合格
B08	100.340	8.355	100.339	8.346	0.001	99.892	Pass 合格

No. B01-B04: At first cycle, in fully charged states
编号 B01-B04: 第 1 个充电周期，完全充电状态

No. B05-B08: After 25 cycles ending in fully charged states
编号 B05-B08: 第 25 个充电周期，完全充电状态

Notes 注释: Ambient temperature 环境温度: 23.1 °C

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%.

测试后，样品无渗漏、无泄气、无解体、无破裂和无起火。电压比不小于 90%。

T.2 Thermal test 温度试验

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)			
B01	100.286	8.355	100.283	8.275	0.003	99.042	Pass 合格
B02	100.303	8.352	100.299	8.271	0.004	99.030	Pass 合格
B03	100.179	8.358	100.176	8.276	0.003	99.019	Pass 合格
B04	100.364	8.362	100.360	8.282	0.004	99.043	Pass 合格
B05	100.334	8.354	100.331	8.273	0.003	99.030	Pass 合格
B06	100.269	8.351	100.265	8.271	0.004	99.042	Pass 合格
B07	100.112	8.345	100.108	8.263	0.004	99.017	Pass 合格
B08	100.339	8.346	100.336	8.266	0.003	99.041	Pass 合格

No. B01-B04: At first cycle, in fully charged states
编号 B01-B04: 第 1 个充电周期，完全充电状态

No. B05-B08: After 25 cycles ending in fully charged states
编号 B05-B08: 第 25 个充电周期，完全充电状态

Notes 注释: Ambient temperature 环境温度: 23.5 °C

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%.

测试后，样品无渗漏、无泄气、无解体、无破裂和无起火。电压比不小于 90%。

T.3 Vibration 振动

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)			
B01	100.283	8.275	100.282	8.267	0.001	99.903	Pass 合格
B02	100.299	8.271	100.297	8.262	0.002	99.891	Pass 合格
B03	100.176	8.276	100.175	8.268	0.001	99.903	Pass 合格
B04	100.360	8.282	100.358	8.274	0.002	99.903	Pass 合格
B05	100.331	8.273	100.330	8.263	0.001	99.879	Pass 合格
B06	100.265	8.271	100.264	8.262	0.001	99.891	Pass 合格
B07	100.108	8.263	100.106	8.255	0.002	99.903	Pass 合格
B08	100.336	8.266	100.334	8.256	0.002	99.879	Pass 合格

No. B01-B04: At first cycle, in fully charged states
编号 B01-B04: 第 1 个充电周期，完全充电状态

No. B05-B08: After 25 cycles ending in fully charged states
编号 B05-B08: 第 25 个充电周期，完全充电状态

Notes 注释: Ambient temperature 环境温度: 23.1 °C

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%.

测试后，样品无渗漏、无泄气、无解体、无破裂和无起火。电压比不小于 90%。

T.4 Shock 冲击

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)			
B01	100.282	8.267	100.281	8.259	0.001	99.903	Pass 合格
B02	100.297	8.262	100.295	8.253	0.002	99.891	Pass 合格
B03	100.175	8.268	100.173	8.258	0.002	99.879	Pass 合格
B04	100.358	8.274	100.357	8.266	0.001	99.903	Pass 合格
B05	100.330	8.263	100.329	8.254	0.001	99.891	Pass 合格
B06	100.264	8.262	100.262	8.254	0.002	99.903	Pass 合格
B07	100.106	8.255	100.105	8.247	0.001	99.903	Pass 合格
B08	100.334	8.256	100.332	8.246	0.002	99.879	Pass 合格

No. B01-B04: At first cycle, in fully charged states
编号 B01-B04: 第 1 个充电周期，完全充电状态

No. B05-B08: After 25 cycles ending in fully charged states
编号 B05-B08: 第 25 个充电周期，完全充电状态

Notes 注释: 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. And change ratio is not less than 90%.

测试后，样品无渗漏、无泄气、无解体、无破裂和无起火。电压比不小于 90%。

T.5 External short circuit 外部短路

No. 编号	Max. External Temperature 样品表面最高温度(°C)	Status 结果
B01	57.8	Pass 合格
B02	57.6	Pass 合格
B03	58.1	Pass 合格
B04	57.8	Pass 合格
B05	57.9	Pass 合格
B06	58.0	Pass 合格
B07	57.7	Pass 合格
B08	57.5	Pass 合格

No. B01-B04: At first cycle, in fully charged states
编号 B01-B04: 第 1 个充电周期，完全充电状态

No. B05-B08: After 25 cycles ending in fully charged states
编号 B05-B08: 第 25 个充电周期，完全充电状态

Notes 注释: Ambient temperature 环境温度: 23.3 °C

The samples external temperature does not exceed 170℃ and there is no disassembly, no rupture and no fire during the test and within six hours after test.

测试样品外壳温度不超过 170℃, 测试中和测试后 6 小时内无解体、无破裂，无起火。

T.6 Impact 撞击

No. 编号	Max. External Temperature 样品表面最高温度(°C)	Status 结果
C01	116.2	Pass 合格
C02	116.4	Pass 合格
C03	115.6	Pass 合格
C04	116.5	Pass 合格
C05	119.4	Pass 合格
C06	120.1	Pass 合格
C07	113.9	Pass 合格
C08	113.4	Pass 合格
C09	117.4	Pass 合格
C10	120.0	Pass 合格

No. C01-C05: At first cycle at 50% of the design rated capacity
编号 C01-C05: 第 1 个充放电周期 50%设计额定容量状态

No. C06-C10: After 25 cycle at 50% of the design rated capacity
编号 C06-C10: 第 25 个充放电周期 50%设计额定容量状态

Notes 注释: Ambient temperature 环境温度: 23.3 °C

The samples external temperature does not exceed 170℃ and there is no disassembly, no rupture and no fire during the test and within six hours after test.

测试样品外壳温度不超过 170℃, 测试中和测试后 6 小时内无解体、无破裂，无起火。

T.7 Overcharge 过度充电

No. 编号	Status 结果
B09	Pass 合格
B10	Pass 合格
B11	Pass 合格
B12	Pass 合格
B13	Pass 合格
B14	Pass 合格
B15	Pass 合格
B16	Pass 合格

No. B09-B12: At first cycle, in fully charged states
编号 B09-B12: 第 1 个充电周期，完全充电状态

No. B13-B16: After 25 cycles ending in fully charged states
编号 B13-B16: 第 25 个充电周期，完全充电状态

Notes 注释: Ambient temperature 环境温度: 23.0 °C

There is no disassembly and no fire during the test and within seven days after the test.
样品在测试中和测试后 7 天内无解体，无起火。

T.8 Forced discharge 强制放电

No. 编号	Status 结果
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
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

No. C11-C20: At first cycle in fully discharged states
编号 C11-C20: 第 1 个充放电周期，完全放电状态

No. C21-C30: After 25 cycles ending in fully discharged states
编号 C21-C30: 第 25 个充放电周期，完全放电状态

Notes 注释: Ambient temperature 环境温度: 23.2 °C

There is no disassembly and no fire during the test and within seven days after the test.
样品在测试中和测试后 7 天内无解体，无起火。

Ⅵ、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	B01~B08	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	C01~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	B09~B16	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。

Ⅶ、Photo of The Sample 样品图片

SYO 18650-2S 7.4V 2500mAh
18.5Wh 20250222

Model 型号: 18650-2S

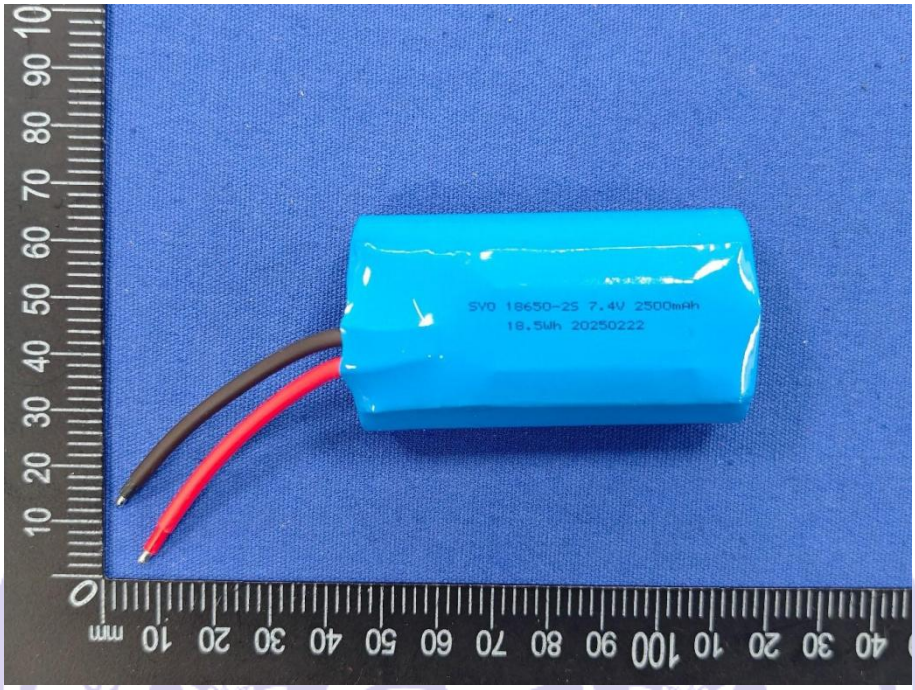


Photo 1 Front 正面

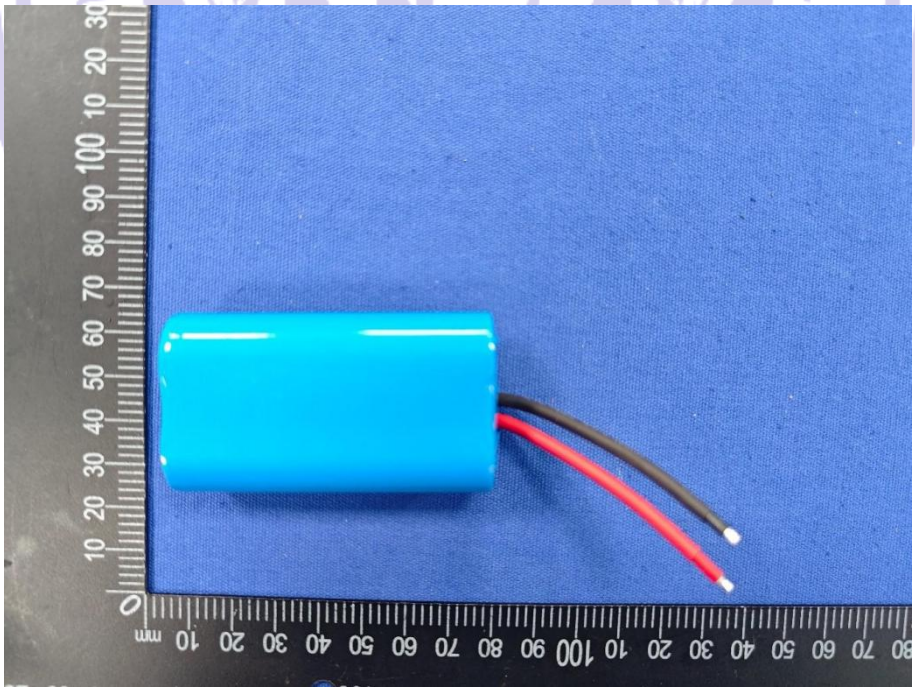


Photo 2 Rear 反面

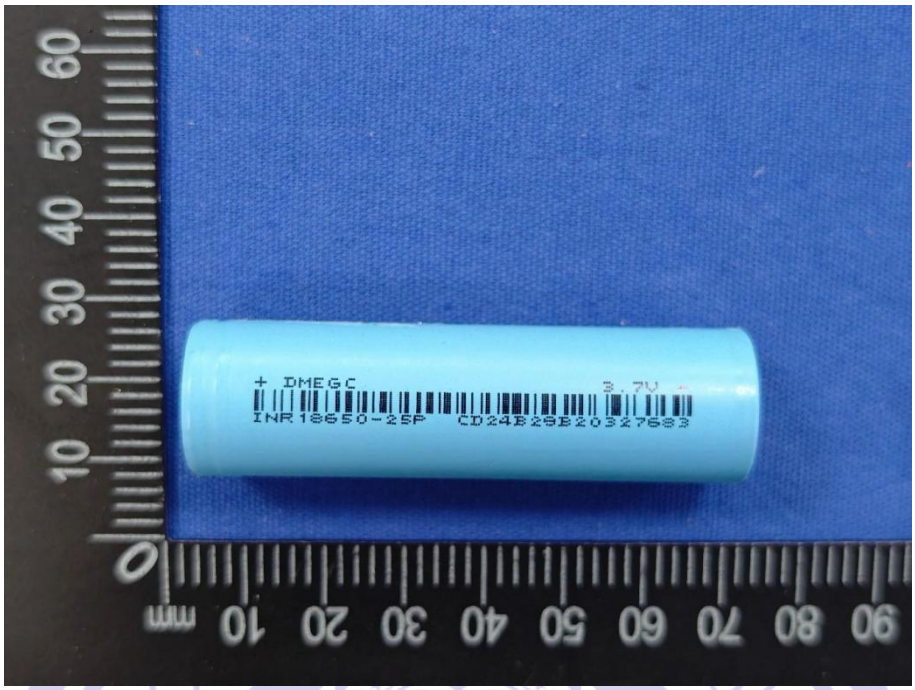


Photo 3 Internal Cell 内部电芯

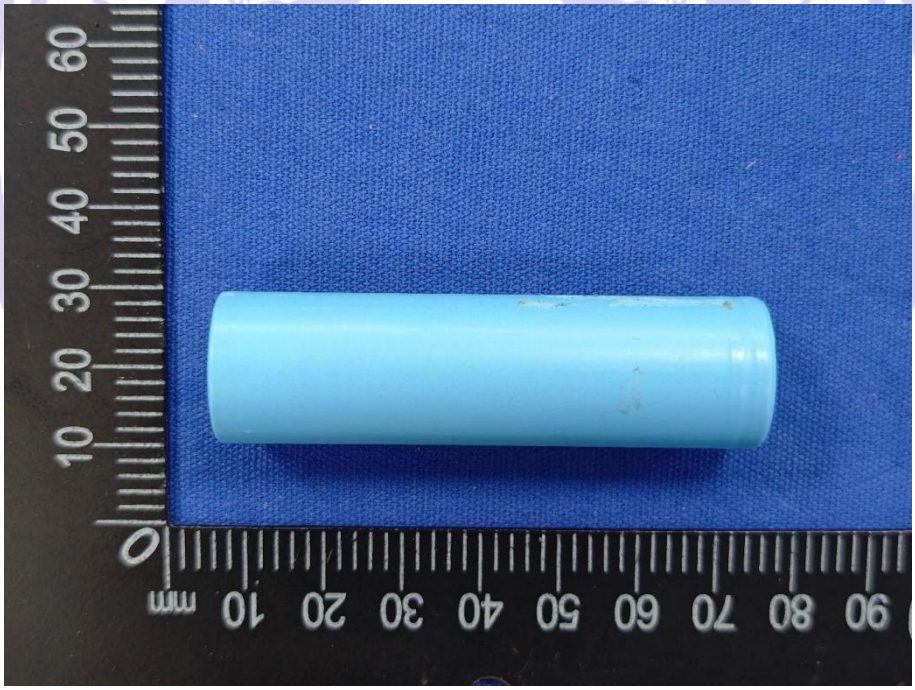


Photo 4 Internal Cell 内部电芯

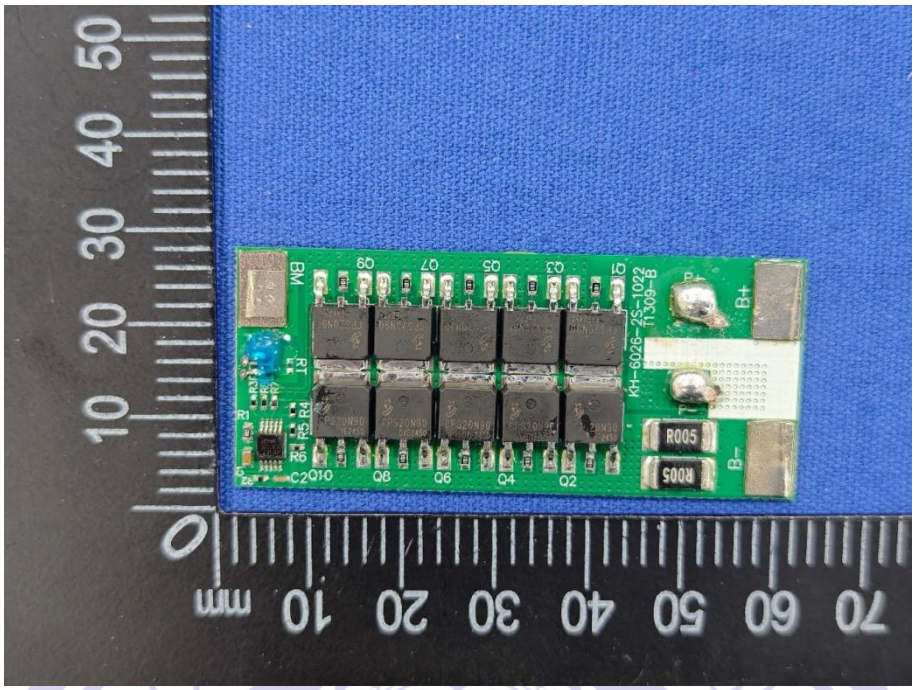


Photo 5 Protection board 保护板

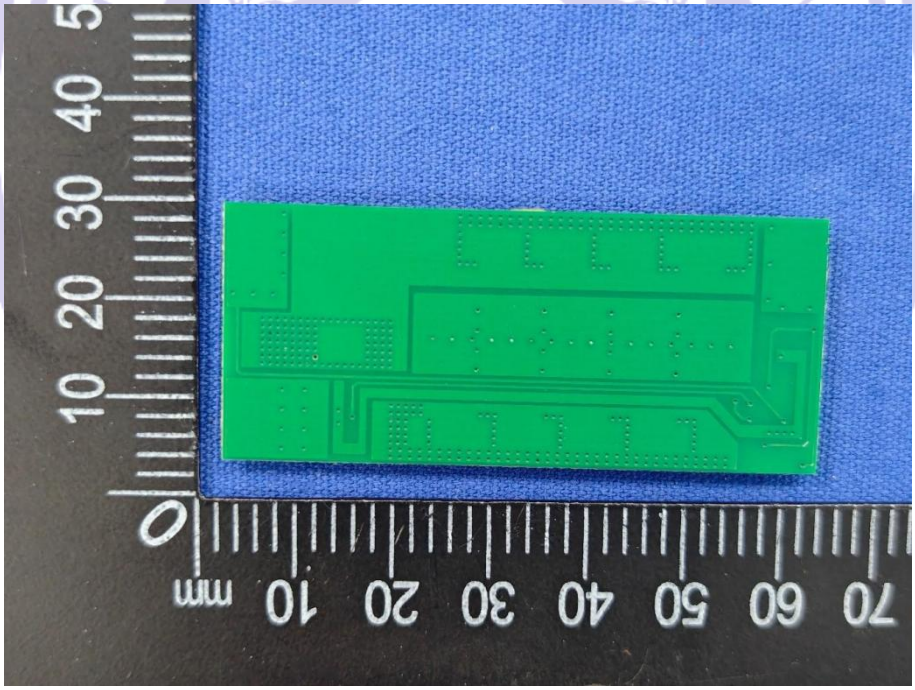


Photo 5 Protection board 保护板

注意事项

Important Notice

1. The test report is invalid without the official stamp of NCT.
   本报告书无 NCT 盖章无效.
2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of NCT.
   未经 NCT 书面同意，不得部分地复制本报告书。
3. The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
   本报告书无批准人、审核人、及主检人签名无效。
4. The report is invalid when anything of following happens – illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.
   私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。
5. Objections to the test report must be submitted to NCT within 15 days.
   对报告书若有异议，应于收到报告之日起 15 天内向本公司提出。
6. The test report is valid for the tested samples only.
   本报告仅对测试样品有效。
7. The Chinese contents in this report are only for reference.
   本报告中的中文内容仅供参考。

********End of Report 报告结束********