

UN38.3 Test Report

UN38.3 测试报告

Report No.:

报告编号:

BTI26061300901

Model:

型号:

JH 553147

Name of Goods:

物品名称:

Polymer Lithium-ion Battery

聚合物锂离子电池

Applicant:

申请商:

Seed Technology Co.,Ltd

深圳矽递科技股份有限公司

Classification of test:

检测类别:

Commission Test

委托测试

Shenzhen BTI Testing & Technology Co., Ltd.

深圳市信宝检测技术有限公司



UN38.3 Test Report
UN38.3测试报告

Tested by 测试	Hina Gan /Testing Engineer 甘荣康/测试工程师				
Checked by 审核	Jammy Chao/Project Engineer 晁晓金/项目工程师				
Approved by 批准	Key Yang/Technical Manager 杨泽/技术总监				
Date of issue 签发日期	2026.06.26				
Commissioner 委托单位	Seeed Technology Co.,Ltd 深圳矽递科技股份有限公司				
Commissioner's address 委托单位地址	9F, Building G3, TCL International E city, Shuguang Community, Xili street, Nanshan, Shenzhen, Guangdong Province, P.R.C 深圳市南山区西丽街道曙光社区TCL国际E城G3栋9楼9F				
Manufacturer 制造商	ShenZhen Jinghao Energy Technology CO.,Ltd 深圳市晶昊能源科技有限公司				
Manufacturer's address 制造商地址	602, Building 4, No. 3, Huachang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen 深圳市龙华区大浪街道浪口社区华昌路3号4栋602				
Factory 工厂	ShenZhen Jinghao Energy Technology CO.,Ltd 深圳市晶昊能源科技有限公司				
Factory Address 工厂地址	602, Building 4, No. 3, Huachang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen 深圳市龙华区大浪街道浪口社区华昌路3号4栋602				
Manufacturer's Contact Telephone 制造商联系电话	28101858	E-mail 邮箱	bill@jhbattery.com		
		Web 网址	/		
Name of Goods 物品名称	Polymer Lithium-ion Battery 聚合物锂离子电池	Model 型号	Cell Model 电池型号	JH 553147	
			Battery Model 电池组型号	JH 553147	
Classification 类别	Single Cell Li-ion Battery 单电芯锂离子电池	Shape 形状	Cuboid 长方体	Cell Size (mm) 电池尺寸 (mm)	L×W×T: 47.0×31.0×5.5
				Battery Size (mm) 电池组尺寸 (mm)	L×W×T: 49.5×31.5×5.8
Battery Nominal Voltage 电池组标称电压	3.85V	Battery Charge Voltage 电池组充电电压	4.4V	Battery Rated Capacity 电池组额定容量	1100mAh
Cell Nominal Voltage 电池标称电压	3.85V	Cell Charge Voltage 电池充电电压	4.4V	Cell Rated Capacity 电池额定容量	1100mAh
Rated Energy 额定能量	4.24Wh	Trade Mark/ identification 商标/识别码	--	Sample Receiving Date 样品接收日期	2026.06.13

Cells Number 电池数量	1 PCS	Weight (g) 重量 (g)	17.395	Testing Date 测试日期	2026.06.13 - 2026.06.25
Testing standard 测试标准	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》（第八修订版）38.3节。				

Test item 检测项目	Sample No. 样板编号	State 状态	Remark 备注
T1, T2, T3, T4, T5	B01-B05	At first cycle, in fully charged states 第1个充放电周期, 完全充电状态	--
T1, T2, T3, T4, T5	B06-B10	At 25 cycles, in fully charged states 第25个充放电周期, 完全充电状态	--
T6	C01-C05	At first cycle at 50% of the design rated capacity 第1个充放电周期50%设计额定容量状态	--
T6	C06-C10	After 25 cycles at 50% of the design rated capacity 第25个充放电周期 50%设计额定容量状态	--
T7	B11-B14	At first cycle, in fully charged states 第1个充放电周期, 完全充电状态	--
T7	B15-B18	At 25 cycles, in fully charged states 第25个充放电周期, 完全充电状态	--
T8	C11-C20	At first cycle, in fully discharged states 第1个充放电周期, 完全放电状态	--
T8	C21-C30	At 25 cycles, in fully discharged states 第25个充放电周期, 完全放电状态	--

CXX is used as the sample number of cells CXX, "X" is 0-9.

CXX 代表电池（电芯）样板编号 CXX, X=0~9。

BXX is used as the sample number of batteries BXX, "X" is 0-9.

BXX代表电池组（电池）样板编号BXX, X=0-9。

Possible test case verdicts:

报告中可能用到的结论标识:

Test case does not apply to the test object: 测试项目不适用于该产品:	N/A 不适用
Test item does meet the requirement: 测试项目符合标准的要求:	P(ass) 合格
Test item does not meet the requirement: 测试项目不符合标准的要求:	F(ail) 不合格
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%。
Test conclusion: 检测结论:	After testing, the test sample has passed the standard requirements. 经测试, 试验样板符合标准要求。
Remark: 备注:	--

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定
38.3.4	TEST METHOD 测试方法		--
38.3.4.1	Test T.1: Altitude simulation 试验T.1: 高度模拟 Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C). 将试验电池和电池组在环境温度为20±5°C, 大气压力不大于11.6千帕的环境中存放至少6小时。 Requirement 标准要求 a) Cells and batteries mass loss limit reference: Table 38.3.1 a) 试验样品质量损失限值参考: 表38.3.1 b) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states b) 试验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 c) No leakage, no venting, no disassembly, no rupture and no fire c) 试验样品应无渗漏、无排气、无解体、无破裂和无起火现象的发生	Test samples: No leakage, no venting, no disassembly, No rupture and no fire 试验样品: 无渗漏、无排气、无解体、无破裂以及无起火现象 The data is shown in test table T.1 数据见表T.1	Pass 合格
38.3.4.2	Test T.2: Thermal test 试验T.2: 温度试验 Test cells and batteries are to be stored for: 试验样品的存储条件如下: a) For small cells and batteries: one temperature cycle: 72±2°C (6h) ~ -40±2°C (6h) For large cells and batteries: one temperature cycle: 72±2°C (12h) ~ 40±2°C (12h) a) 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) 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) b) The maximum time interval between test temperature extremes is 30minutes b) 温度转换最大间隔时间为30分钟 c) This procedure is to be repeated 10 times c) 重复10次循环 d) after which all test cells and batteries are to be stored for 24 hours at ambient temperature 20±5°C d) 循环结束后, 试验样品应在20±5°C的条件下存放24小时 Requirement 标准要求 a) Cells and batteries mass loss limit reference: Table 38.3.1 a) 样品质量损失限值参考: 表 38.3.1 b) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states b) 试验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 c) No leakage, no venting, no disassembly, no rupture and no fire c) 试验样品应无渗漏、无排气、无解体、无破裂和无起火现象的发生	Test samples: No leakage, no venting, no disassembly, no rupture and no fire 试验样品: 无渗漏、无排气、无解体、无破裂以及无起火现象 The data is shown in test table T.2 数据见表T.2	Pass 合格

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定
38.3.4.3	Test T.3: Vibration 试验T.3: 振动 a) Cells and batteries are firmly secured to the platform of the vibration machine a) 试验样品牢固地安装在振动的台面上 b) The vibration: a sinusoidal waveform with a logarithmic sweep between 7Hz and 200Hz and back to 7Hz traversed in 15 minutes b) 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 c) 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 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 c) 对于电池和小型电池组: 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 对于大型电池组: 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 d) 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 d) 振动过程须对三个互相垂直的电池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。 Requirement 标准要求 a) Cells and batteries mass loss limit reference: Table 38.3.1 a) 样品质量损失限值参考: 表 38.3.1 b) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. b) 试验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 c) No leakage, no venting, no disassembly, no rupture and no fire c) 试验样品应无渗漏、无排气、无解体、无破裂和无起火现象的发生	Test samples: No leakage, no venting, no disassembly, no rupture and no fire 试验样品: 无渗漏、无排气、无解体、无破裂以及无起火现象 The data is shown in test table T.3 数据见表T.3	Pass 合格

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定										
38.3.4.4	Test T.4: Shock 试验T.4：冲击 a) Test cells and batteries shall be secured to the testing machine a)用坚固的支架固定住试验样品的全部配件表面 b) Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 gn (or Acceleration(gn)= $\sqrt{\frac{100850}{\text{mass}^*}}$, which is smaller) acceleration of 50 gn (or Acceleration(gn)= $\sqrt{\frac{30000}{\text{mass}^*}}$, 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 b) 对每个电池以峰值为150gn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50gn 和脉冲持续时间11ms 的半正弦波冲击 对每个电池以峰值为 150gn（或与$\sqrt{\frac{100850}{\text{mass}^*}}$）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 50gn（或与$\sqrt{\frac{30000}{\text{mass}^*}}$）和脉冲持续时间 11ms 的半正弦波冲击 <table><tr><th>Battery 电池组</th><th>Minimum peak acceleration 最低限度最大加速度</th><th>Pulse duration 脉冲持续时间</th></tr><tr><td rowspan="2">Small batteries 小型电池组</td><td>150 gn or result of formula, Acceleration (gn) = $\sqrt{\frac{100850}{\text{mass}^*}}$ whichever is smaller</td><td rowspan="2">6 ms</td></tr><tr><td>150 gn 或计算公式，加速度 (gn) = $\sqrt{\frac{100850}{\text{mass}^*}}$ 取数值较小者</td></tr><tr><td rowspan="2">Large batteries 大型电池组</td><td>50 gn or result of formula, Acceleration (gn) = $\sqrt{\frac{30000}{\text{mass}^*}}$ whichever is smaller</td><td rowspan="2">11 ms</td></tr><tr><td>50 gn 或计算公式，加速度(gn) = $\sqrt{\frac{30000}{\text{mass}^*}}$ 取数值较小者</td></tr></table> c) 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 c) 试验样品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。 Requirement 标准要求 a) Cells and batteries mass loss limit reference: Table 38.3.1 a) 样品质量损失限值参考：表 38.3.1 b) Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. b) 试验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 c) No leakage, no venting, no disassembly, no rupture and no fire c) 试验样品应无渗漏、无排气、无解体、无破裂和无起火现象的发生 Test samples: No leakage, no venting, no disassembly, no rupture and no fire 试验样品：无渗漏、无排气、无解体、无破裂以及无起火现象 The data is shown in test table T.4 数据见表T.4 <td>Pass 合格</td>	Battery 电池组	Minimum peak acceleration 最低限度最大加速度	Pulse duration 脉冲持续时间	Small batteries 小型电池组	150 gn or result of formula, Acceleration (gn) = $\sqrt{\frac{100850}{\text{mass}^*}}$ whichever is smaller	6 ms	150 gn 或计算公式，加速度 (gn) = $\sqrt{\frac{100850}{\text{mass}^*}}$ 取数值较小者	Large batteries 大型电池组	50 gn or result of formula, Acceleration (gn) = $\sqrt{\frac{30000}{\text{mass}^*}}$ whichever is smaller	11 ms	50 gn 或计算公式，加速度(gn) = $\sqrt{\frac{30000}{\text{mass}^*}}$ 取数值较小者	Pass 合格
Battery 电池组	Minimum peak acceleration 最低限度最大加速度	Pulse duration 脉冲持续时间											
Small batteries 小型电池组	150 gn or result of formula, Acceleration (gn) = $\sqrt{\frac{100850}{\text{mass}^*}}$ whichever is smaller	6 ms											
	150 gn 或计算公式，加速度 (gn) = $\sqrt{\frac{100850}{\text{mass}^*}}$ 取数值较小者												
Large batteries 大型电池组	50 gn or result of formula, Acceleration (gn) = $\sqrt{\frac{30000}{\text{mass}^*}}$ whichever is smaller	11 ms											
	50 gn 或计算公式，加速度(gn) = $\sqrt{\frac{30000}{\text{mass}^*}}$ 取数值较小者												

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定
38.3.4.5	Test T.5: External short circuit 试验T.5: 外部短路 a) The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature $57\pm4^{\circ}\text{C}$ a) 对于待测的试验样品, 应加热直到温度稳定在 $57\pm4^{\circ}\text{C}$ b) The cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $57\pm4^{\circ}\text{C}$ b) 试验样品应在$57\pm4^{\circ}\text{C}$条件下经受总外电阻小于0.1欧姆的条件下短路 c) If the assessment is not feasible of the homogeneous stabilized temperature, the test samples (small cells and small batteries) must be observed at least 6 hours before the tests can be conducted If the assessment is not feasible of the homogeneous stabilized temperature, the test samples (large cells and large batteries) must be observed at least 12 hours before the tests can be conducted c) 如果无法对均匀稳定的温度进行准确评估, 那么在进行测试之前, 必须先对测试样品(小型电池和小型电池组)进行至少6小时的观察。 如果无法对均匀稳定的温度进行准确评估, 那么在进行测试之前, 必须先对测试样品(大型电池和大型电池组)进行至少12小时的观察 d) Short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57\pm4^{\circ}\text{C}$ For large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value d) 试验样品表面温度回到 $57\pm4^{\circ}\text{C}$后继续至少持续短路1小时 大型电池组表面温度下降至最大温升一半或低于$57\pm4^{\circ}\text{C}$ Requirement 标准要求 a) Cells and batteries external temperature not exceed 170°C a) 试验样品的最高表面温度应不超过170°C b) No disassembly, no rupture and no fire during the test and within six hours after the test b) 测试中与测试后6小时内无解体、无破裂、无起火现象的发生	Test samples: No disassembly, no rupture and no fire 试验样品: 无解体、无破裂以及无起火现象 The data is shown in test table T.5 数据见表T.5	Pass 合格

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定
38.3.4.6	Test T.6: Impact/Crush 试验T.6: 撞击/挤压 ☐ Impact (applicable to cylindrical cells not less than 18.0 mm in diameter) ☐ 撞击 (适用于直径不小于18.0毫米的圆柱形电池) a) This test sample cell or component cell is to be placed on a flat smooth surface a) 将试验样品放在一个平坦光滑的平面上 b) A 15.8±0.1 mm diameter bar is to be placed across the center of the sample, A 9.1±0.1 Kg mass is to be dropped from a height of 61±2.5 cm onto the sample b) 将一直径为15.8±0.1毫米的不锈钢圆棒横过电池中部放置后, 将一质量为9.1±0.1千克的重锤从61±2.5厘米的高度落向试验样品。 c) 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±0.1 mm diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact c) 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。 Requirement 标准要求 a) Cells external temperature not exceed 170°C a) 试验样品的最高表面温度应不超过170°C b) No disassembly, no rupture and no fire during the test and within six hours after the test b) 试验中与测试后6小时内无解体、无破裂、无起火现象的发生	--	N/A 不适用

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定
38.3.4.6	Test T.6: Impact/Crush 试验T.6: 撞击/挤压 ☒ Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter) ☒ 挤压 (适用于棱柱形、袋装、硬币/纽扣电池和直径小于18.0毫米的圆柱形电池) a) 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) 将电池或组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 (i) The applied force reaches 13 kN±0.78kN (i) 施加的压力达到13千牛顿±0.78千牛顿 (ii) The voltage of the cell drops by at least 100mV (ii) 电池的电压下降至少100毫伏 (iii) The cell is deformed by 50% or more of its original thickness (iii) 电池变形达到原始厚度的50%或以上 b) 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 b) 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。 Requirement 标准要求 a) Cells external temperature not exceed 170°C a) 试验样品的最高表面温度应不超过170°C b) No disassembly, no rupture and no fire during the test and within six hours after the test b) 测试中与测试后6小时内无解体、无破裂、无起火现象的发生	Test samples: No disassembly, no rupture and no fire 试验样品: 无解体、无破裂以及无起火现象 The data is shown in test table T.6 数据见表T.6	Pass 合格

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Clause 章节	Requirements 标准要求	Test Result 测试结果	Verdict 判定
38.3.4.7	Test T.7: Overcharge 试验T.7: 过度充电 a) 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) 以制造商建议的最大持续充电电流的两倍对试验样品进行充电, 试验的最小电压如下 i) 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 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 ii) 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 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 b) Tests are to be conducted at ambient temperature $20\pm5^{\circ}\text{C}$, the duration of the test shall be 24 hours b) 试验应在环境温度$20\pm5^{\circ}\text{C}$下进行。进行试验的时间应为24小时。 Requirement 标准要求 No disassembly and no fire during the test and within seven days after the test 试验过程中和试验后7天内无解体, 无起火	Test Samples: No disassembly, no fire 试验样品: 无解体、无起火现象 The data is shown in test table T.7 数据见表T.7	Pass 合格
38.3.4.8	Test T.8: Forced discharge 试验T.8: 强制放电 Each cell shall be forced discharged at ambient temperature ($20\pm5^{\circ}\text{C}$) 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 每个电池应在环境温度 ($20\pm5^{\circ}\text{C}$) 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) 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) Requirement 标准要求 No disassembly and no fire during the test and within seven days after the test 试验过程中和试验后7天内无解体, 无起火	Test samples: No disassembly, no fire 试验样品: 无解体、无起火现象 The data is shown in test table T.8 数据见表T.8	Pass 合格

ST/SG/AC.10/11/Rev.8/Subsection 38.3**General terms and definitions****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 电池或电池组质量M	Mass lost limited 质量损失限值
$M < 1\text{g}$	0.5%
$1\text{g} \leq M \leq 75\text{g}$	0.2%
$M > 75\text{g}$	0.1%

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

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

Where M_1 is the mass before the test and M_2 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”.

质量损失的量化比，可依照下式计算：

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

式中 M_1 是试验前的质量， M_2 是试验后的质量。如质量损失不超过表38.3.1所列数值，即视为“无质量损失”。

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 or batteries. 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.

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.

小型电池或电池组必须按顺序进行试验T1至T5。试验T6和T8应使用未试验过的电池或电池组。试验T7可以使用原先在试验T1至T5中使用过的未损坏的电池组进行，以便测试交替充电放电的电池组。

要求电池和电池组无渗漏、无漏气、无解体、无破裂和无起火并且每个电池或电池组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电池和电池组。

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25cm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。

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Test Data 检测数据

Table T1: Altitude simulation 表 T.1: 高度模拟

Sample No. 样品编号	Before 测试前		After 测试后		Mass loss 质量损失 (%)	Residual OCV 剩余电压(%)	Verdict 结果判定
	Mass (g) 质量 (g)	Voltage (V) 电压 (V)	Mass (g) 质量 (g)	Voltage (V) 电压 (V)			
B01	17.298	4.371	17.296	4.367	0.012	99.908	PASS/合格
B02	17.190	4.372	17.189	4.367	0.006	99.886	PASS/合格
B03	17.395	4.379	17.393	4.375	0.011	99.909	PASS/合格
B04	17.195	4.373	17.193	4.370	0.012	99.931	PASS/合格
B05	17.349	4.375	17.348	4.372	0.006	99.931	PASS/合格
B06	17.228	4.373	17.226	4.369	0.012	99.909	PASS/合格
B07	17.389	4.380	17.388	4.375	0.006	99.886	PASS/合格
B08	17.306	4.385	17.304	4.382	0.012	99.932	PASS/合格
B09	17.369	4.377	17.368	4.373	0.006	99.909	PASS/合格
B10	17.275	4.383	17.274	4.379	0.006	99.909	PASS/合格

Notes 注释:

After the test, the sample showed no leakage, no exhaust, no disintegration, no rupture and no fire. The voltage ratio was not less than 90%.

检测后, 试验样品未出现渗漏、排气、解体、破裂和起火现象。电压比不小于90 %。

Table T.2: Thermal test 表T.2: 温度测试

Sample No. 样品编号	Before 测试前		After 测试后		Mass loss 质量损失 (%)	Residual OCV 剩余电压(%)	Verdict 结果判定
	Mass (g) 质量 (g)	Voltage (V) 电压 (V)	Mass (g) 质量 (g)	Voltage (V) 电压 (V)			
B01	17.296	4.367	17.293	4.328	0.017	99.107	PASS/合格
B02	17.189	4.367	17.186	4.327	0.017	99.084	PASS/合格
B03	17.393	4.375	17.391	4.336	0.011	99.109	PASS/合格
B04	17.193	4.370	17.191	4.328	0.012	99.039	PASS/合格
B05	17.348	4.372	17.345	4.330	0.017	99.039	PASS/合格
B06	17.226	4.369	17.224	4.326	0.012	99.016	PASS/合格
B07	17.388	4.375	17.386	4.334	0.012	99.063	PASS/合格
B08	17.304	4.382	17.301	4.339	0.017	99.019	PASS/合格
B09	17.368	4.373	17.366	4.330	0.012	99.017	PASS/合格
B10	17.274	4.379	17.271	4.336	0.017	99.018	PASS/合格

Notes 注释:

After the test, the sample showed no leakage, no exhaust, no disintegration, no rupture and no fire. The voltage ratio was not less than 90%.

检测后, 试验样品未出现渗漏、排气、解体、破裂和起火现象。电压比不小于90 %。

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Test Data 检测数据

Table T.3: Vibration 表T.3: 振动

Sample No. 样品编号	Before 测试前		After 测试后		Mass loss 质量损失 (%)	Residual OCV 剩余电压(%)	Verdict 结果判定
	Mass (g) 质量 (g)	Voltage (V) 电压 (V)	Mass (g) 质量 (g)	Voltage (V) 电压 (V)			
B01	17.293	4.328	17.292	4.324	0.006	99.908	PASS/合格
B02	17.186	4.327	17.185	4.322	0.006	99.884	PASS/合格
B03	17.391	4.336	17.390	4.333	0.006	99.931	PASS/合格
B04	17.191	4.328	17.189	4.324	0.012	99.908	PASS/合格
B05	17.345	4.330	17.344	4.325	0.006	99.885	PASS/合格
B06	17.224	4.326	17.223	4.321	0.006	99.884	PASS/合格
B07	17.386	4.334	17.384	4.331	0.012	99.931	PASS/合格
B08	17.301	4.339	17.299	4.334	0.012	99.885	PASS/合格
B09	17.366	4.330	17.365	4.327	0.006	99.931	PASS/合格
B10	17.271	4.336	17.270	4.332	0.006	99.908	PASS/合格

Notes 注释:

After the test, the sample showed no leakage, no exhaust, no disintegration, no rupture and no fire. The voltage ratio was not less than 90%.

检测后, 试验样品未出现渗漏、排气、解体、破裂和起火现象。电压比不小于90 %。

Table T4: Shock 表T.4: 冲击

Sample No. 样品编号	Before 测试前		After 测试后		Mass loss 质量损失 (%)	Residual OCV 剩余电压(%)	Verdict 结果判定
	Mass (g) 质量 (g)	Voltage (V) 电压 (V)	Mass (g) 质量 (g)	Voltage (V) 电压 (V)			
B01	17.292	4.324	17.290	4.321	0.012	99.931	PASS/合格
B02	17.185	4.322	17.184	4.317	0.006	99.884	PASS/合格
B03	17.390	4.333	17.388	4.330	0.012	99.931	PASS/合格
B04	17.189	4.324	17.188	4.321	0.006	99.931	PASS/合格
B05	17.344	4.325	17.342	4.321	0.012	99.908	PASS/合格
B06	17.223	4.321	17.222	4.317	0.006	99.907	PASS/合格
B07	17.384	4.331	17.382	4.326	0.012	99.885	PASS/合格
B08	17.299	4.334	17.298	4.331	0.006	99.931	PASS/合格
B09	17.365	4.327	17.363	4.322	0.012	99.884	PASS/合格
B10	17.270	4.332	17.268	4.328	0.012	99.908	PASS/合格

Notes 注释:

After the test, the sample showed no leakage, no exhaust, no disintegration, no rupture and no fire. The voltage ratio was not less than 90%.

检测后, 试验样品未出现渗漏、排气、解体、破裂和起火现象。电压比不小于90 %。

Table T.5: External short circuit 表T.5: 外短路测试

Sample No. 样品编号	Maximum External Temperature (°C) 样品表面最高温度 (°C)	Verdict 结果判定
B01	56.9	PASS/合格
B02	57.9	PASS/合格
B03	57.0	PASS/合格
B04	57.9	PASS/合格
B05	57.7	PASS/合格
B06	57.7	PASS/合格
B07	57.5	PASS/合格
B08	58.0	PASS/合格
B09	57.4	PASS/合格
B10	57.6	PASS/合格

Notes 注释:

The test samples external temperature did not exceed 170°C. And there is no disassembly, no rupture and no fire during the testing and within 6 hours after the test.

试验样品的表面温度未超过170摄氏度。在检测中以及检测结束后6小时内，未出现解体、破裂和起火现象。

Table T.6: ☐ Impact ☒ Crush 表T.6: ☐ 撞击 ☒ 挤压

Sample No. 样品编号	Maximum External Temperature (°C) 样品表面最高温度 (°C)	Verdict 结果判定
C01	23.3	PASS/合格
C02	23.3	PASS/合格
C03	23.7	PASS/合格
C04	23.3	PASS/合格
C05	23.3	PASS/合格
C06	23.5	PASS/合格
C07	23.5	PASS/合格
C08	23.8	PASS/合格
C09	23.4	PASS/合格
C10	23.2	PASS/合格

Notes 注释:

The test samples external temperature did not exceed 170°C. And there is no disassembly, no rupture and no fire during the test and within 6 hours after the test.

试验样品的表面温度未超过170摄氏度。在检测中以及检测结束后6小时内，未出现解体、破裂和起火现象。

Table T.7: Overcharge 表T.7: 过度充电

Sample No. 样品编号	Verdict 结果判定
B11	PASS/合格
B12	PASS/合格
B13	PASS/合格
B14	PASS/合格
B15	PASS/合格
B16	PASS/合格
B17	PASS/合格
B18	PASS/合格

Notes 注释:

There is no disassembly and no fire during the test and within 7 days after the test.

试验样品在检测中以及检测结束后7天内未出现解体 and 起火现象。

Table T.8: Forced discharge 表 T.8: 强制放电

Sample No. 样品编号	Verdict 结果判定	Sample No. 样品编号	Verdict 结果判定
C11	PASS/合格	C21	PASS/合格
C12	PASS/合格	C22	PASS/合格
C13	PASS/合格	C23	PASS/合格
C14	PASS/合格	C24	PASS/合格
C15	PASS/合格	C25	PASS/合格
C16	PASS/合格	C26	PASS/合格
C17	PASS/合格	C27	PASS/合格
C18	PASS/合格	C28	PASS/合格
C19	PASS/合格	C29	PASS/合格
C20	PASS/合格	C30	PASS/合格

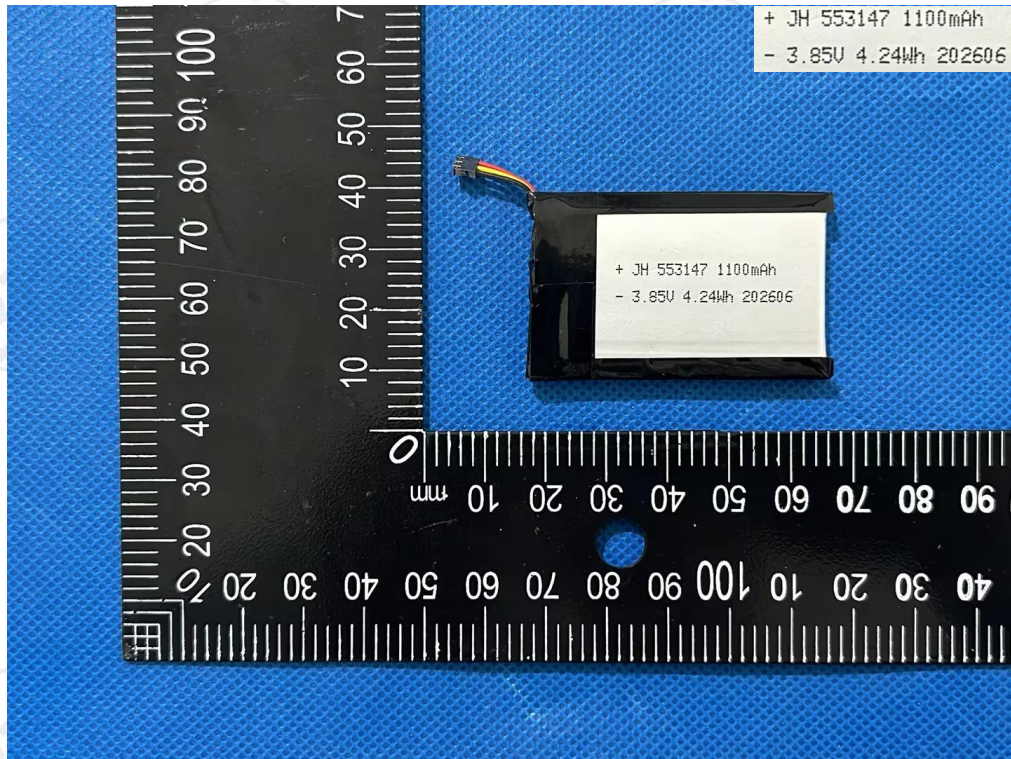
Notes 注释:

There is no disassembly and no fire during the test and within 7 days after the test.

试验样品在检测中以及检测结束后7天内未出现解体 and 起火现象。

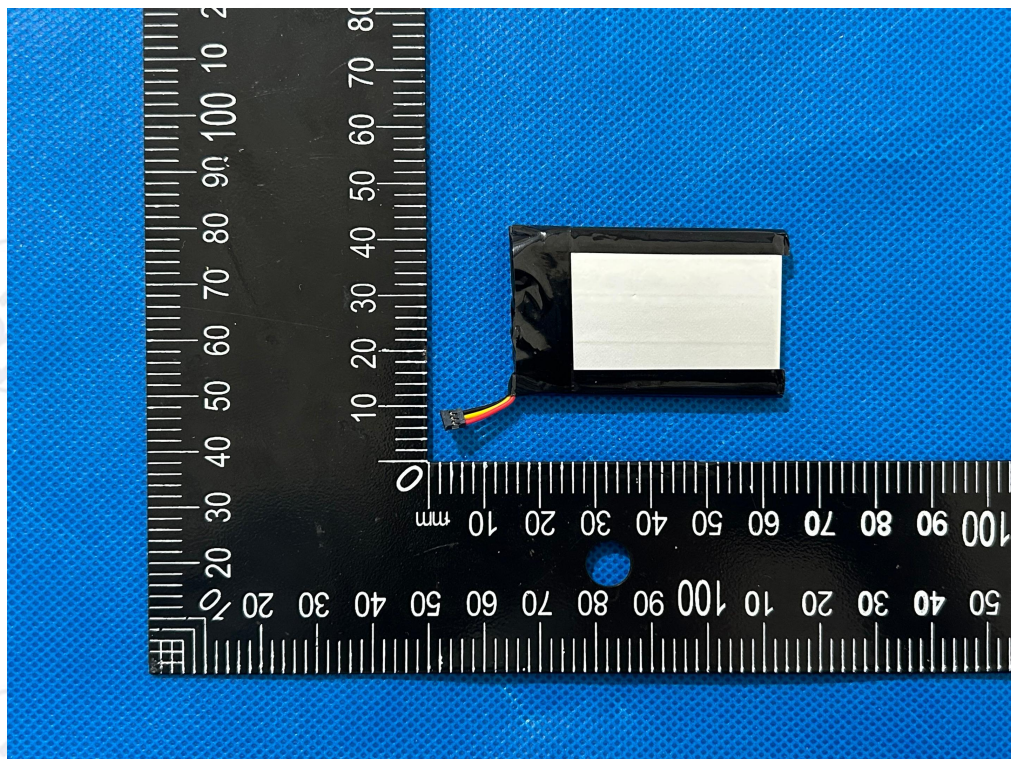
Photo of Sample

样品照片



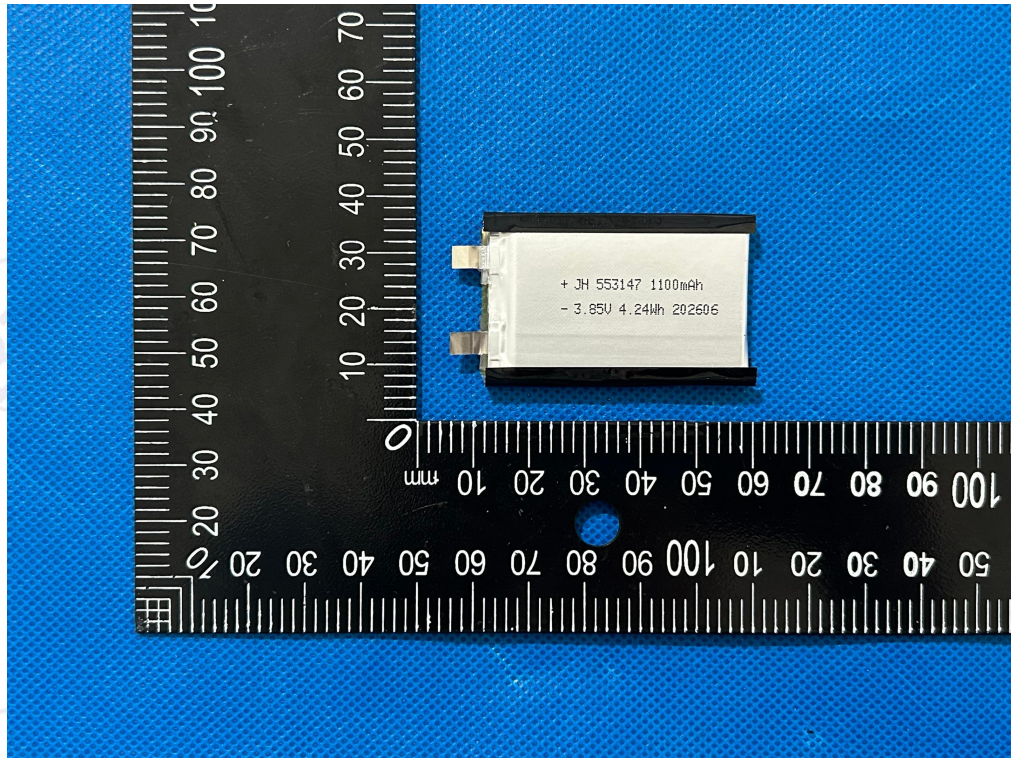
Picture 1. Front view of battery

图片1. 电池组正面图



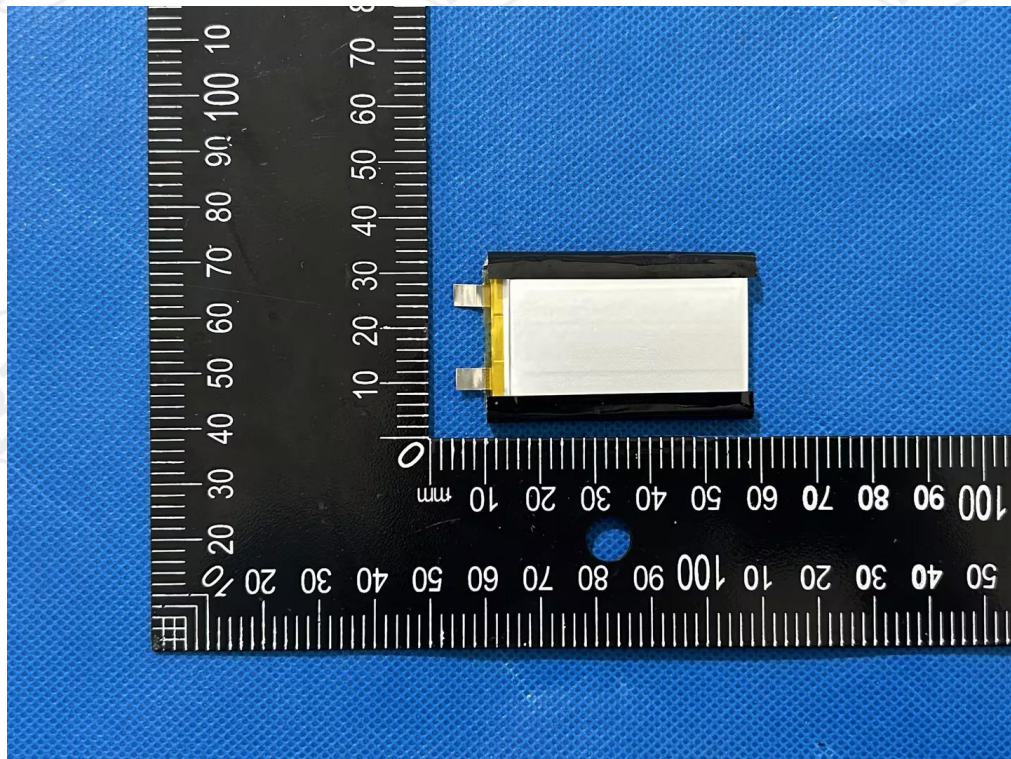
Picture 2. Back view of battery

图片2. 电池组背面图



Picture 3. Front view of cell

图 3. 电池正面图



Picture 4. Back view of cell

图 4. 电池背面图

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 BTI 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深圳市信宝检测技术有限公司提出。
7. As for the Verdict, “--” means “no need for judgement”, “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”。
8. 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.
本报告仅对所测试样本的测试结果负责，测试结果及相关的判断结论仅反映对所测试样本的评估。

---End of Report---

---报告结束---