

UN38.3 检测报告

UN38.3 Test Report

报告编号

: MTi260703023-0702B1

Report No.

签发日期

: 2026-08-20

Date of Issue

委托单位

深圳零零无限科技有限公司

Applicant

: Shenzhen Zero Zero Infinity Technology Co.,
Ltd.

产品名称

可充式锂离子电池组

Product Name

: Rechargeable Li-ion Battery

检测类别

委托检测

Test Type

: Commissioned Inspection

深圳市微测检测有限公司

Shenzhen Microtest Co., Ltd.

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

委托单位 Applicant	名称 Name	深圳零零无限科技有限公司 Shenzhen Zero Zero Infinity Technology Co., Ltd.		
	地址 Address	深圳市前海深港合作区南山街道港城街99号深国际前海颐都大厦塔楼401、402 4th Floor, Qianhai E-metro Tower, Shenzhen-Hong Kong Cooperation Zone, Shenzhen, China		
制造商 Manufacturer	名称 Name	重庆市紫建电子股份有限公司 Chongqing VDL Electronics Co., Ltd.		
	地址 Address	重庆市开州区赵家街道浦里工业新区1-4号楼 Building 1-4, Puli Industrial New Area, Zhaojia Street, Kaizhou District, Chongqing, China		
	电话 Phone No.	13570883308	邮箱 Email address	xiayuansheng@zerozero.cn
	网址 Website	/		
工厂 Factory	名称 Name	重庆市紫建电子股份有限公司 Chongqing VDL Electronics Co., Ltd.		
	地址 Address	重庆市开州区赵家街道浦里工业新区1-4号楼 Building 1-4, Puli Industrial New Area, Zhaojia Street, Kaizhou District, Chongqing, China		
测试实验室 Testing laboratory	名称 Name	深圳市微测检测有限公司 Shenzhen Microtest Co., Ltd.		
	地址 Address	广东省深圳市宝安区福海街道新和社区福海大道新兴工业园二区7号101 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.		
测试标准 Test 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)			
测试日期 Test date	2026-08-05 to 2026-08-20			
试验结果 Test result	通过 Pass			
编 制: Prepared by	陈 怡 项目工程师 Project engineer			
审 核: Reviewed by	孙存浩 项目经理 Project manager			
批 准: Approved by	连 平 技术总监 Technical director			

1.样品信息 Sample Information

样品名称 Sample name	可充式锂离子电池组 Rechargeable Li-ion Battery		
类别 Classification	单电芯锂离子电池 Single Cell Li-ion Battery	商标 Trade mark	/
型号 Model	372223PF2	额定能量 Rated energy	193mAh/0.72Wh
标称电压 Nominal voltage	3.7V	外观 Appearance	黑色近长方体 Approximate Black Cuboid
标准充电电流 Standard charge current	38.6mA	最大持续充电电流 Max continuous charge current	386mA
标准放电电流 Standard discharge current	38.6mA	最大持续放电电流 Max continuous discharge current	193mA
最大充电电压 Max charge voltage	4.2V	放电终止电压 Cut-off voltage	2.765V
尺寸 Dimension	23.80*21.53*3.78 mm	重量 Weight	3.990g
电芯个数 Cell numbers	1 PCS	组成方式 Configurations	1S 1P

内部电芯信息 Internal cell information:

型号 Model	372223PF2		
标称电压 Nominal voltage	3.7V	额定容量 Rated capacity	195mAh
标准充电电流 Standard charge current	97.5mA	最大持续充电电流 Max continuous charge current	390mA
标准放电电流 Standard discharge current	39mA	最大持续放电电流 Max continuous discharge current	195mA
最大充电电压 Max charge voltage	4.2V	放电终止电压 Cut-off voltage	2.765V

检测结论

Test conclusion:

委托单位送检的样品, 依据联合国《试验和标准手册》第八修订版 第 38.3 节进行检测, 测试结果符合标准相关要求。
The Applicant submitted samples are tested according to UNITED NATIONS "Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.8 Section 38.3) The test results comply with the relevant requirements of the standard.

修订说明:

Revision note :

N/A

2. 总结 Conclusion

章节 Clause	测试项目 Test item	Sample No. 样品编号	结论 Conclusion
T.1	高度模拟Altitude simulation	B1#-B10#	通过 Pass
T.2	温度试验Thermal test		通过 Pass
T.3	振动Vibration		通过 Pass
T.4	冲击Shock		通过 Pass
T.5	外部短路External short circuit		通过 Pass
T.6	撞击/挤压Impact/Crush	C1#-C10#	通过 Pass
T.7	过度充电Overcharge	B11#-B18#	通过 Pass
T.8	强制放电Forced Discharge	C11#-C30#	通过 Pass

说明Notes:

B1#-B5#、B11#-B14#	为第一个充放电周期完全充电状态的电池组 Batteries at first cycle in fully charged states
B6#-B10#、B15#-B18#	为25个充放电周期后完全充电状态的电池组 Batteries after 25 cycles ending in fully charged states
C1#-C5#	为第一个充放电周期后50%设计额定容量状态的电池 Cells at first cycle at 50% of the design rated capacity
C6#-C10#	为25个充放电周期后50%设计额定容量状态的电池 Cells after 25 cycle at 50% of the design rated capacity
C11#-C20#	为第一个充放电周期后完全放电状态的电池 Cells at first cycle in fully discharged states
C21#-C30#	为25个充放电周期后完全放电状态的电池 Cells after 25 cycles ending in fully discharged states

3.测试方法和数据 Test Method and Data

程序

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 T.7 可以使用原先在试验 T.1 至 T.5 中使用过的未损坏电池组进行,以便测试经过充放电的电池组。

Procedure

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.

质量损失依照下式计算:

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

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

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 below, it shall be considered as “no mass loss”.

电池或电池组质量 M Mass M of cell or battery	质量损失限值 Mass lost limited
$M < 1g$	0.5%
$1g \leq M \leq 75g$	0.2%
$M > 75g$	0.1%

T.1: 高度模拟: Altitude simulation

试验电池和电池组应在压力等于或低于 11.6 千帕和环境温度(20±5)°C下存放至少 6 小时。

如果无渗漏、无排气、无解体、无破裂和无起火,并且每个试验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%,电池和电池组即符合这一要求。有关电压的要求不适用于完全放电状态的试验电池和电池组。

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).

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

试验电池和电池组应先在试验温度等于 (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,接着将所有试验电池和电池组在环境温度(20±5)°C下存放 24小时。对于大型电池和电池组,暴露于极端试验温度的时间至少应为 12小时。

如果无渗漏、无排气、无解体、无破裂和无起火,并且每个试验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%,电池和电池组即符合这一要求。有关电压的要求不适用于完全放电状态的试验电池和电池组。

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.

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

电池和电池组紧固于振动机平台,但紧固程度不能造成电池变形以致不能准确传递振动。振动应是正弦波形,对数频率扫描从7赫兹到200赫兹,再回到7赫兹,跨度为15分钟。这一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。

作对数式频率扫描,对总质量不足12千克的电池和电池组(电池和小型电池组),和对12千克及更大的电池组(大型电池组)应有所不同。

对电池和小型电池组:从7赫兹开始,保持1 gn的最大加速度,直到频率达到18赫兹。然后将振幅保持在0.8毫米(总偏移1.6毫米),并增加频率直到最大加速度达到8 gn(频率约为50赫兹)。将最大加速度保持在8 gn直到频率增加到200赫兹。

对大型电池组:从7赫兹开始,保持1 gn的最大加速度,直到频率达到18赫兹。然后将振幅保持在0.8毫米(总偏移1.6毫米),并增加频率直到最大加速度达到2 gn(频率约为25赫兹)。将最大加速度保持在2 gn直到频率增加到200赫兹。

如果试验中和试验后无渗漏、无排气、无解体、无破裂和无起火,并且每个试验电池或电池组在第三个垂直安装方位上的试验后立即测得的开路电压不小于在进行这一试验前电压的90%,电池和电池组即符合本项要求。有关电压的要求不适用于完全放电状态的试验电池和电池组。

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.

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).

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.

For large batteries: from 7 Hz to 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.

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position 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

试验电池和电池组用坚固支架紧固在试验机上, 支架支撑着每个试验电池组的所有安装面。

每个电池须经受最大加速度**150 gn**和脉冲持续时间**6毫秒**的半正弦波冲击。不过, 大型电池须经受最大加速度**50 gn**和脉冲持续时间**11毫秒**的半正弦波冲击。

每个电池须经受的正弦波冲击的最大加速度取决于电池组的质量。小型电池组的脉冲持续时间**6毫秒**, 大型电池组的脉冲持续时间**11毫秒**。以下公式用于计算合适的最低限度最大加速度。

每个电池或电池组须在三个互相垂直的电池或电池组安装方位的正极方向经受三次冲击, 接着在负极方向经受三次冲击, 总共经受**18次冲击**。

电池组	最低限度最大加速度	脉冲持续时间
小型电池组	150 gn 或 公式计算 $\text{加速度 } g_n = \sqrt{\left(\frac{100850}{\text{质量}^*}\right)}$ 取数值较小者	6 ms
大型电池组	50 gn 或 公式计算 $\text{加速度 } (g_n) = \sqrt{\left(\frac{30000}{\text{质量}^*}\right)}$ 取数值较小者	11 ms

*质量单位为千克。

如果无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验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%**, 电池和电池组即符合这一要求。有关电压的要求不适用于完全放电状态的试验电池和电池组。

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.

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 subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

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.

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.

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

* The unit of measurement is kilograms.

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure.

T.5: 外部短路: External short circuit

对于待试电池或电池组, 应加温一段必要的时间, 使从外壳测量的温度达到均匀的稳定温度 (57±4) °C。这段时间的长短取决于电池或电池组的大小和设计, 对于这个持续时间应加以评估和记录。如无法进行这种评估, 则小型电池和小型电池组的暴露时间应至少 6 小时, 大型电池和小型电池组的暴露时间应至少 12 小时。然后, 电池或电池组应在 (57±4) °C条件下经受总外电阻小于0.1欧姆的短路条件。

这一短路条件应在电池或电池组外壳温度回到 (57±4) °C后继续至少1小时, 或在大型电池组的情况下外壳温度降幅达试验中所观察的最高温升幅的二分之一并保持低于该数值。短路和降温阶段的温度应至少相当于环境温度。

如果外壳温度不超过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, 电池和电池组即符合本项要求。

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.

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.

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

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 the test.

T.6: 撞击/挤压 Impact / Crush

撞击(适用于直径不小于18.0毫米的圆柱形电池)

Impact (applicable to cylindrical cells not less than 18.0 mm in diameter:

试样电池或元件电池放在平坦光滑的表面上。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, 或电池最长端的尺寸, 取二者之长者。将一块9.1千克±0.1千克的重锤从61±2.5厘米高处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。

接受撞击的试样, 纵轴应与平坦表面平行并与横放在试样中心的直径15.8毫米±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 cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1 mm 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 ± 0.1kg 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.

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 $\pm$ 0.1 mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

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)

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

将电池或元件电池放在两个平面之间挤压, 挤压力度逐渐加大, 在第一个接触点上的速度大约为1.5厘米/秒。挤压持续进行, 直到出现以下三种情况之一:

(a) 施加的力量达到13千牛顿 $\pm$ 0.78千牛顿;

例如: 用一个活塞直径32毫米的液压顶施力, 直到液压顶的压力达到17兆帕。

(b) 电池的电压下降至少100毫伏; 或

(c) 电池变形达原始厚度的50%或以上。

一旦达到最大压力、电压下降100毫伏或更多, 或电池变形至少达原厚度的50%, 即可解除压力。

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。

每个试样电池或元件电池只做一次挤压试验。试样应继续观察6小时。试验应使用之前未做过其他试验的电池或元件电池进行。

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) The applied force reaches 13 kN $\pm$ 0.78 kN;

Example: The force shall be applied by a hydraulic ram with a 32 mm diameter piston until a pressure of 17 MPa is reached on the hydraulic ram.

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

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

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.

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.

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.

如果外壳温度不超过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, 电池和电池组即符合本项要求。

Cells 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 this test.

T7: 过度充电:Overcharge

充电电流必须是制造商建议的最大持续充电电流的两倍。试验的最小电压如下:

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

(b) 制造商建议的充电电压大于18伏时, 试验的最小电压应为最大充电电压的1.2倍。

试验应在环境温度下进行。进行试验的时间应为24小时。

可充电电池组如在试验过程中和试验后7天内无解体, 无起火, 即符合本项要求。

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) when the manufacturer's recommended charge voltage is not more than 18 V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22 V.

(b) when the manufacturer's recommended charge voltage is more than 18 V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.

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

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

T8: 强制放电:Forced discharge

每个电池应在环境温度下与12伏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。

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)。

原电池或可充电电池如在试验过程中和试验后 7 天内无解体, 无起火, 即符合本项要求。

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.

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).

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.

测试数据:

38.3.4.1 T.1: 高度模拟: Altitude simulation							
样品编号 Sample No.	测试前 Before test		测试后 After Test		质量损失 Mass loss (%)	剩余电压 Residual OCV (%)	测试结果 Test result
	样品质量M ₁ Mass	开路电压 Voltage	样品质量M ₂ Mass	开路电压 Voltage			
B1#	3.990g	4.18V	3.989g	4.16V	0.03	99.52	O
B2#	3.953g	4.18V	3.952g	4.18V	0.03	100.00	O
B3#	3.927g	4.18V	3.924g	4.17V	0.08	99.76	O
B4#	3.973g	4.18V	3.971g	4.17V	0.05	99.76	O
B5#	3.952g	4.17V	3.950g	4.16V	0.05	99.76	O
B6#	3.928g	4.18V	3.927g	4.17V	0.03	99.76	O
B7#	3.933g	4.18V	3.930g	4.17V	0.08	99.76	O
B8#	3.964g	4.18V	3.964g	4.18V	0.00	100.00	O
B9#	3.949g	4.18V	3.947g	4.16V	0.05	99.52	O
B10#	3.949g	4.18V	3.948g	4.17V	0.03	99.76	O

其他补充: 测试结果“O”代表判定该测试无渗漏, 无排气, 无解体, 无破裂, 无起火, 并且每个试验样品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池和电池组)

Supplements: Test result "O" decides that the test shows no leakage, no exhaust, no disintegration, no rupture, no fire, and the open-circuit voltage of each test sample after the test is not less than 90% of its voltage before the test was conducted. (The requirements for voltage do not apply to cells and batteries in a fully discharged state.)

38.3.4.2 T.2: 温度测试: Thermal test							
样品编号 Sample No.	测试前 Before test		测试后 After Test		质量损失 Mass loss (%)	剩余电压 Residual OCV (%)	测试结果 Test result
	样品质量M ₁ Mass	开路电压 Voltage	样品质量M ₂ Mass	开路电压 Voltage			
B1#	3.989g	4.16V	3.988g	4.10V	0.03	98.56	O
B2#	3.952g	4.18V	3.949g	4.14V	0.08	99.04	O
B3#	3.924g	4.17V	3.922g	4.11V	0.05	98.56	O
B4#	3.971g	4.17V	3.968g	4.12V	0.08	98.80	O
B5#	3.950g	4.16V	3.948g	4.10V	0.05	98.56	O
B6#	3.927g	4.17V	3.924g	4.10V	0.08	98.32	O
B7#	3.930g	4.17V	3.925g	4.10V	0.13	98.32	O
B8#	3.964g	4.18V	3.963g	4.10V	0.03	98.09	O
B9#	3.947g	4.16V	3.943g	4.11V	0.10	98.80	O
B10#	3.948g	4.17V	3.945g	4.13V	0.08	99.04	O

其他补充: 测试结果“O”代表判定该测试无渗漏, 无排气, 无解体, 无破裂, 无起火, 并且每个试验样品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池和电池组)

Supplements: Test result "O" decides that the test shows no leakage, no exhaust, no disintegration, no rupture, no fire, and the open-circuit voltage of each test sample after the test is not less than 90% of its voltage before the test was conducted. (The requirements for voltage do not apply to cells and batteries in a fully discharged state.)

38.3.4.3 T.3: 振动: Vibration							
样品编号 Sample No.	测试前 Before test		测试后 After Test		质量损失 Mass loss (%)	剩余电压 Residual OCV (%)	测试结果 Test result
	样品质量M ₁ Mass	开路电压 Voltage	样品质量M ₂ Mass	开路电压 Voltage			
B1#	3.988g	4.10V	3.987g	4.08V	0.03	99.51	O
B2#	3.949g	4.14V	3.948g	4.13V	0.03	99.76	O
B3#	3.922g	4.11V	3.921g	4.08V	0.03	99.27	O
B4#	3.968g	4.12V	3.967g	4.12V	0.03	100.00	O
B5#	3.948g	4.10V	3.947g	4.07V	0.03	99.27	O
B6#	3.924g	4.10V	3.922g	4.10V	0.05	100.00	O
B7#	3.925g	4.10V	3.923g	4.08V	0.05	99.51	O
B8#	3.963g	4.10V	3.961g	4.08V	0.05	99.51	O
B9#	3.943g	4.11V	3.940g	4.09V	0.08	99.51	O
B10#	3.945g	4.13V	3.945g	4.11V	0.00	99.52	O

其他补充: 测试结果“O”代表判定该测试无渗漏, 无排气, 无解体, 无破裂, 无起火, 并且每个试验样品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池和电池组)

Supplements: Test result "O" decides that the test shows no leakage, no exhaust, no disintegration, no rupture, no fire, and the open-circuit voltage of each test sample after the test is not less than 90% of its voltage before the test was conducted. (The requirements for voltage do not apply to cells and batteries in a fully discharged state.)

38.3.4.4 T.4: 冲击: Shock							
样品编号 Sample No.	测试前 Before test		测试后 After Test		质量损失 Mass loss (%)	剩余电压 Residual OCV (%)	测试结果 Test result
	样品质量M ₁ Mass	开路电压 Voltage	样品质量M ₂ Mass	开路电压 Voltage			
B1#	3.987g	4.08V	3.984g	4.08V	0.08	100.00	O
B2#	3.948g	4.13V	3.947g	4.12V	0.03	99.76	O
B3#	3.921g	4.08V	3.919g	4.06V	0.05	99.51	O
B4#	3.967g	4.12V	3.964g	4.12V	0.08	100.00	O
B5#	3.947g	4.07V	3.945g	4.07V	0.05	100.00	O
B6#	3.922g	4.10V	3.922g	4.08V	0.00	99.51	O
B7#	3.923g	4.08V	3.920g	4.07V	0.08	99.75	O
B8#	3.961g	4.08V	3.960g	4.07V	0.03	99.75	O
B9#	3.940g	4.09V	3.938g	4.09V	0.05	100.00	O
B10#	3.945g	4.11V	3.944g	4.11V	0.03	100.00	O

其他补充: 测试结果“O”代表判定该测试无渗漏, 无排气, 无解体, 无破裂, 无起火, 并且每个试验样品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池和电池组)

Supplements: Test result "O" decides that the test shows no leakage, no exhaust, no disintegration, no rupture, no fire, and the open-circuit voltage of each test sample after the test is not less than 90% of its voltage before the test was conducted. (The requirements for voltage do not apply to cells and batteries in a fully discharged state.)

38.3.4.5 T.5: 外部短路: External short circuit		
样品编号 Sample No.	样品表面最高温度 Max external temperature (°C)	Test result 测试结果
B1#	58.5	O
B2#	58.6	O
B3#	57.0	O
B4#	57.2	O
B5#	58.0	O
B6#	57.7	O
B7#	58.1	O
B8#	57.5	O
B9#	58.5	O
B10#	57.5	O
其他补充: 测试结果“O”代表判定样品外壳温度不超过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。 Supplements: Test result "O" decides that the sample's outer shell temperature did not exceed 170°C, and there was no disintegration, no cracking, and no fire during the test and within the 6-hour period after the test.		

38.3.4.6 T.6: 挤压 Crush		
样品编号 Sample No.	样品表面最高温度 Max external temperature (°C)	Test result 测试结果
C1#	23.2	O
C2#	24.5	O
C3#	23.2	O
C4#	23.7	O
C5#	23.5	O
C6#	23.5	O
C7#	23.4	O
C8#	23.6	O
C9#	23.5	O
C10#	24.7	O
其他补充: 测试结果“O”代表判定样品外壳温度不超过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。 Supplements: Test result "O" decides that the sample's outer shell temperature did not exceed 170°C, and there was no disintegration, no cracking, and no fire during the test and within the 6-hour period after the test.		

38.3.4.7 T7: 过度充电:Overcharge			
样品编号 Sample No.	测试结果 Test result	样品编号 Sample No.	测试结果 Test result
B11#	O	B15#	O
B12#	O	B16#	O
B13#	O	B17#	O
B14#	O	B18#	O
其他补充: 测试结果“O”代表判定试验过程中和试验后7天内无解体,无起火。 Supplements : Test result "O" decides that during the test and within 7 days after the test, no disassembly, no fire.			

38.3.4.8 T8: 强制放电:Forced discharge			
样品编号 Sample No.	测试结果 Test result	样品编号 Sample No.	测试结果 Test result
C11#	O	C21#	O
C12#	O	C22#	O
C13#	O	C23#	O
C14#	O	C24#	O
C15#	O	C25#	O
C16#	O	C26#	O
C17#	O	C27#	O
C18#	O	C28#	O
C19#	O	C29#	O
C20#	O	C30#	O
其他补充: 测试结果“O”代表判定试验过程中和试验后7天内无解体,无起火。 Supplements : Test result "O" decides that during the test and within 7 days after the test, no disassembly, no fire.			

4.样品照片 Photos

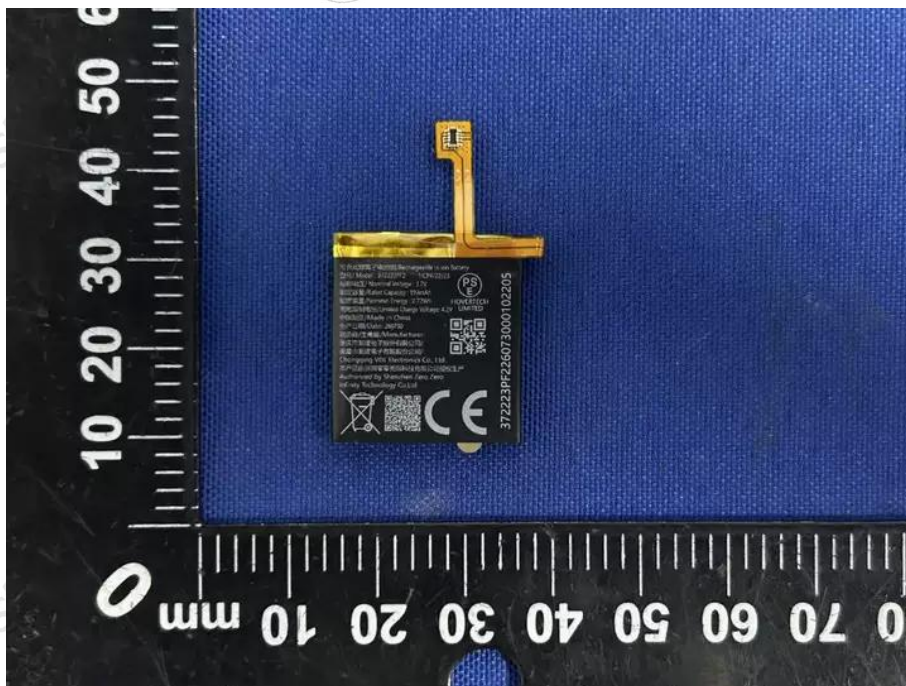


Photo 1 电池组正面 Front view of battery

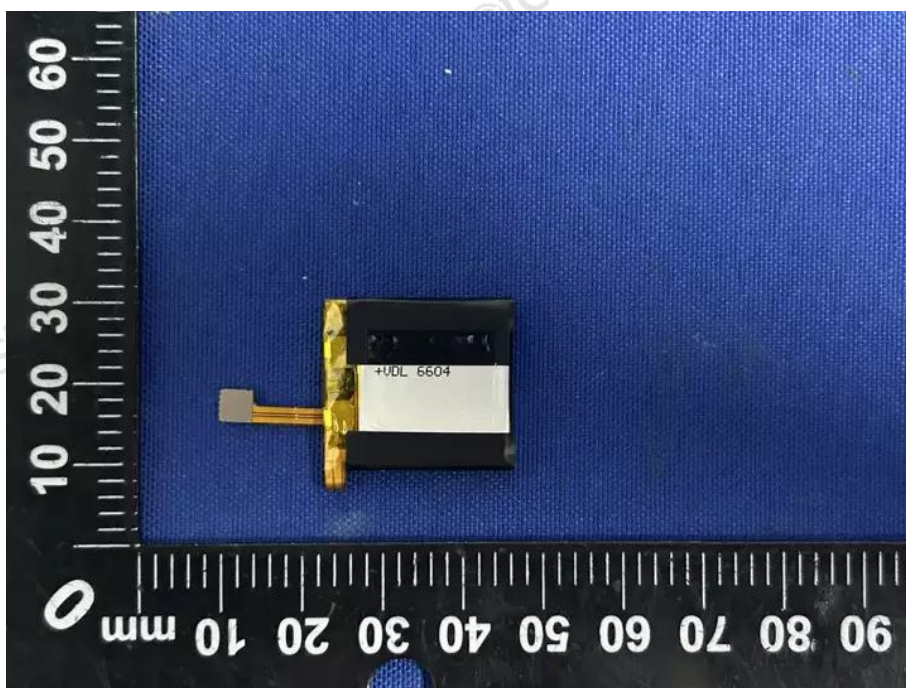


Photo 2 电池组背面 Back view of battery



Photo 3 标签 Label

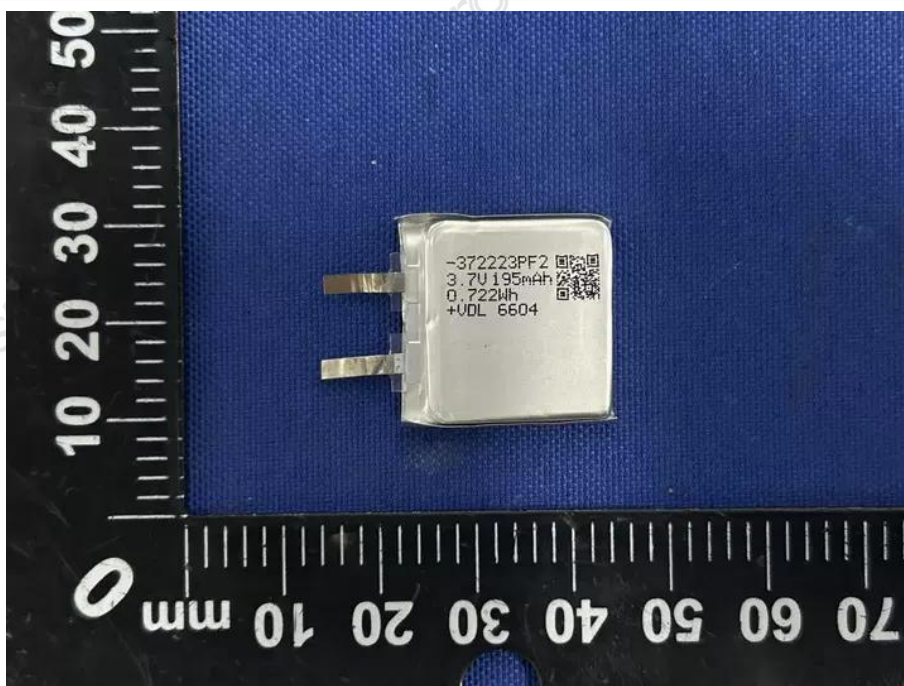


Photo 4 电池正面 Front view of Cell

声明

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