锂电池 UN38.3 测试报告
Lithium Battery UN38.3 Test Report

报告编号： Report No.：	LA2025B2144001U

样品名称 Sample	锂离子电池 Li-ion Battery
样品型号 Model	18650
委托单位 Applicant	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD
签发日期 Issue Date	2025-10-21

深圳市莱恩瑞斯科技有限公司

Shenzhen Lionaces Technology Co., Ltd.

报告专用章

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Website:www.lionaces.com E-mail:service@lionaces.com
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1. 样品描述 Sample Description			
样品名称 Sample Name	锂离子电池 Li-ion Battery	样品型号 Model Name	18650
电池规格 Battery specification	3.7V, 2000mAh, 7.4Wh	商标 Trade mark	N/A
组成方式 Composing mode	1S1P	电池重量 Mass of battery	45.7g
电池外观 Battery appearance	蓝色近圆柱体 Approximate Blue Cylinder	电池尺寸 Battery Size	Φ18.5mm*65.8mm
电池类型 Battery Type	可充电单芯锂离子电池 Rechargeable Single Cell Lithium-ion Battery		
测试实验室 Testing laboratory	深圳市莱恩瑞斯科技有限公司 Shenzhen Lionaces Technology Co., Ltd.		
测试地址 Testing Address	广东省深圳市宝安区福海街道和平社区永和路骏丰工业区 B6 栋 301 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China		
电话 Telephone	0755-28280690	邮箱 Email	service@lionaces.com
网址 website	www.lionaces.com		
委托单位 Applicant	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD		
委托单位地址 Applicant address	深圳市龙岗区坂田街道社区吉华路 489 号乐荟科创中心 12 栋 18 层 F Room F, 18F, Building 12, Lehui Science and Technology Innovation Center, No.489 Jihua Road, Bantian Community, Longgang District, Shenzhen, China.		
制造商 Manufacturer	东莞市启飞电子科技有限公司 Dongguan QiFei Electronic Technology Co., Ltd.		
制造商地址 Manufacturer address	广东省东莞市清溪镇三中村金腰路 62 号 B 栋 4 楼 No.62 Jin Yao Road, No. B, 4th Floor, Sanzhong Village, Qingxi Town, Dongguan City, Guangdong Province		
生产单位 Factory	东莞市启飞电子科技有限公司 Dongguan QiFei Electronic Technology Co., Ltd.		
生产单位地址 Factory address	广东省东莞市清溪镇三中村金腰路 62 号 B 栋 4 楼 No.62 Jin Yao Road, No. B, 4th Floor, Sanzhong Village, Qingxi Town, Dongguan City, Guangdong Province		
电话 Telephone	13928450588	邮箱 Email	3067661529@QQ.com
网址 website	N/A		

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2、测试标准 Standard

联合国《试验和标准手册》（第 8 版)38.3 节
UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3

3、测试项目及结论 Test Item And Conclusion

测试项目 Item	测试样品编号 Samples Number	结论 Conclusion
38.3.4.1 高度模拟 Altitude simulation	Z1~Z5, X1~X5	通过 Pass
38.3.4.2 温度试验 Thermal test		通过 Pass
38.3.4.3 振动 Vibration		通过 Pass
38.3.4.4 冲击 Shock		通过 Pass
38.3.4.5 外部短路 External Short Circuit		通过 Pass
38.3.4.6 撞击 Impact	Z6~Z10, X6~X10	通过 Pass
38.3.4.7过度充电Overcharge	Z11~Z14, X11~X14	通过 Pass
38.3.4.8 强制放电 Forced discharge	Z15~Z24, X15~X24	通过 Pass

参考组装电池测试要求，如果适用(38.3.3(f)和 38.3.3(g):不适用
Reference to assembled battery testing requirements, if applicable (i.e., 38.3.3(f) and 38.3.3(g)): Not applicable

说明 Notes: P--Pass; N/A--不适用 not applicable; Y--Yes; N--No;
Z1~Z5、Z11~Z14：第一个充放电周期完全充电状态的电池；Batteries at first cycle in fully charged states;
Z6~Z10：第一个充放电周期 50%设计额定容量状态的电池芯；Cells at first cycle at 50% of the design rated capacity;
Z15~Z24：第一个充放电周期完全放电状态的电池芯； Cells at first cycle in fully discharged states;
X1~X5、X11~X14：25 个充放电周期后完全充电状态的电池芯；Batteries after 25 cycles ending in fully charged states;
X6~X10：25 个充放电周期 50%设计额定容量状态的电池芯；Cells at after 25 cycles at 50% of the design rated capacity;
X15~X24：25 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.

送检样品符合联合国《试验和标准手册》（第 8 版)38.3 节的要求。
The submitted samples complied with UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3.

版本号：V1.0

收样日期 Receiving Date	2025-09-29	测试日期 Test Date	2025-09-29 to 2025-10-13	签发日期 Issue Date	2025-10-21
主检人： Prepared by		审核人： Checked by		批准人： Approved by	

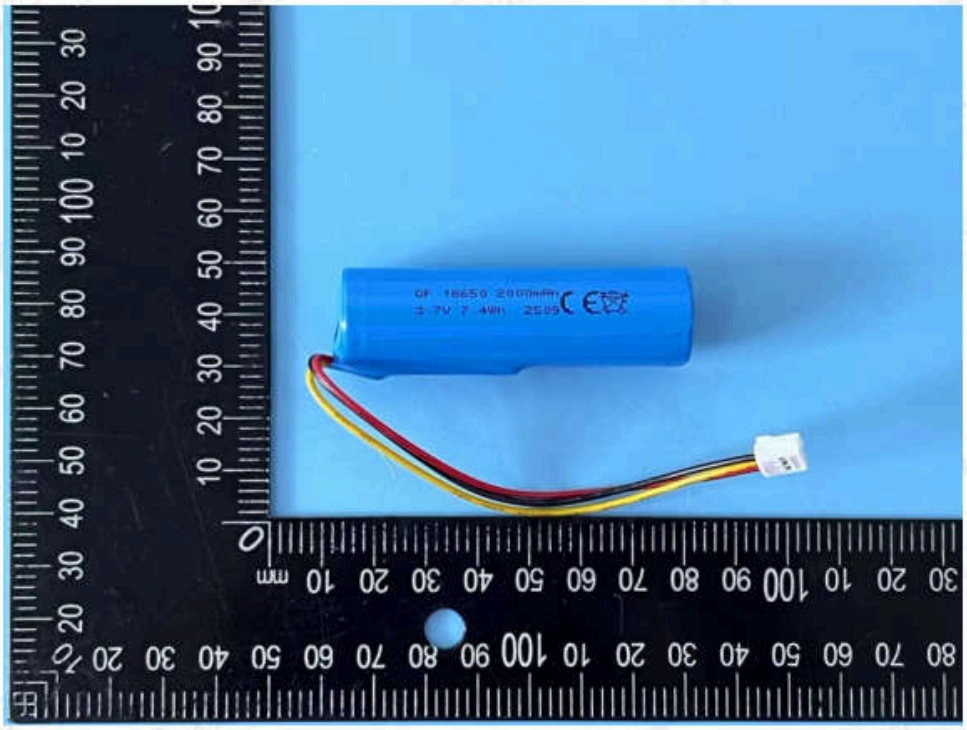
李　雯 Li Wen：测试工程师 Quality Testing Engineer
曾　强 Allen Zeng：实验室经理 Lab Manager
刘海滨 Liu haibin：授权签字人 Authorized Signatory

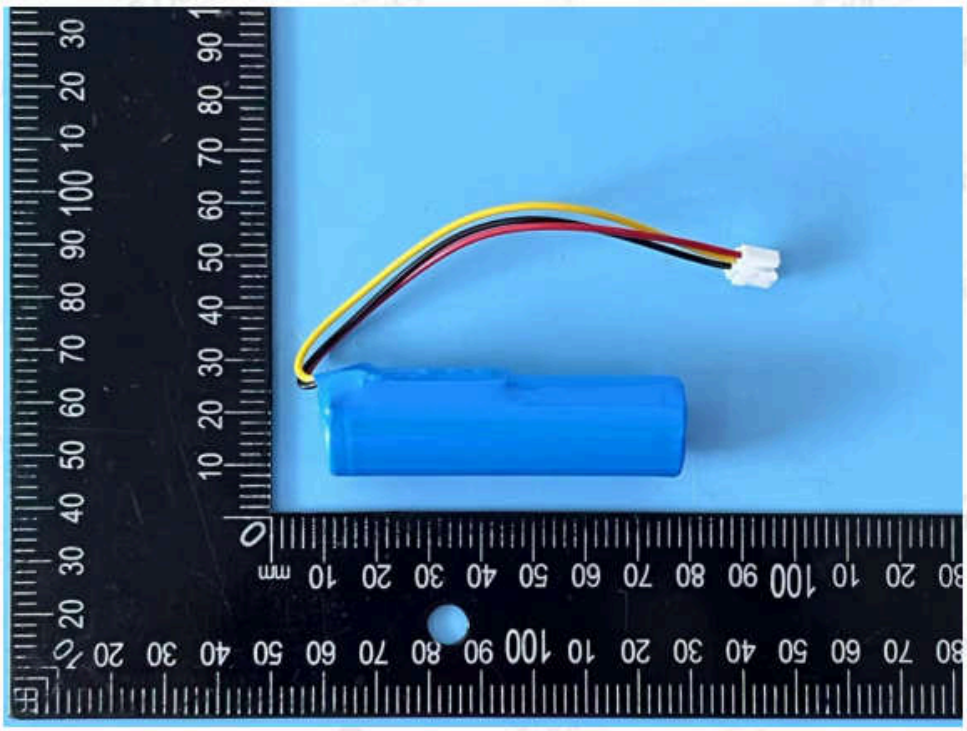
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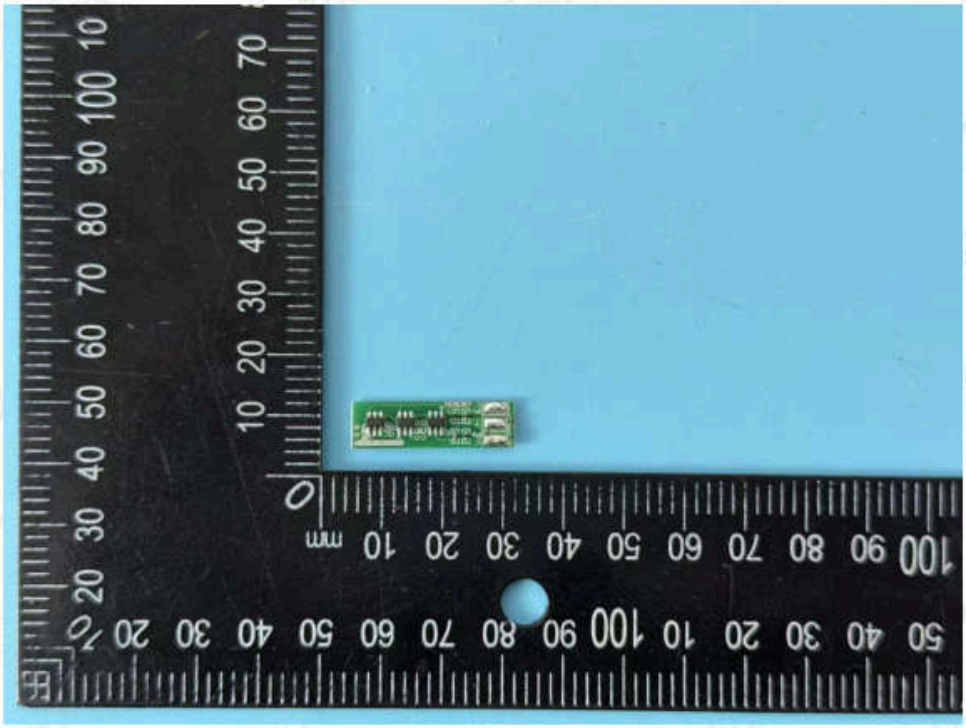
4、样品图片Sample Photos

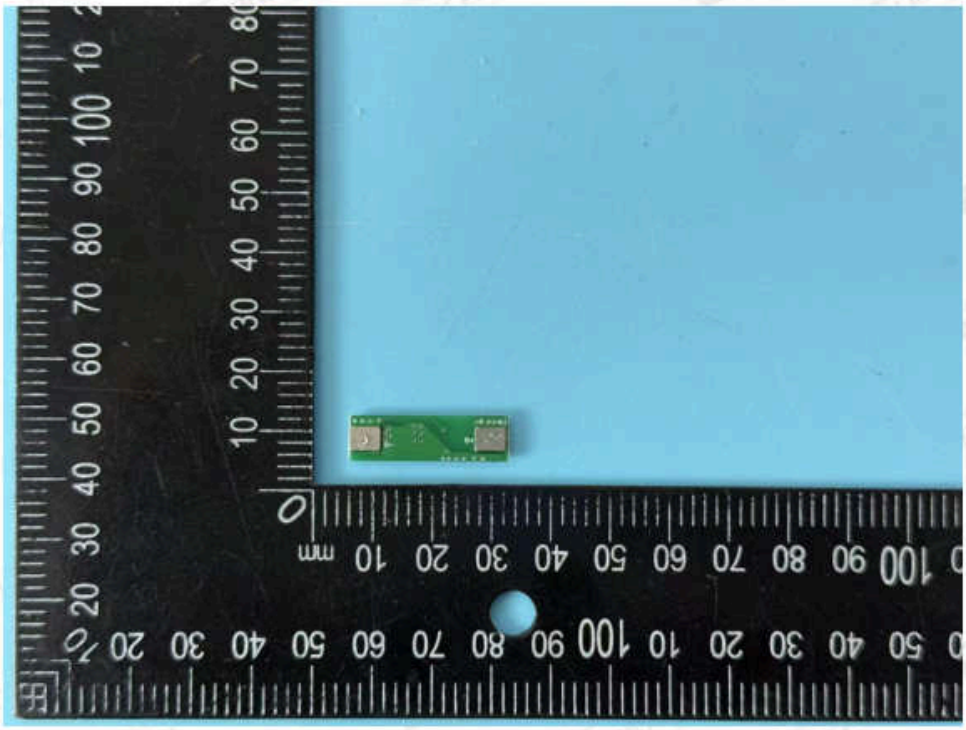
电池/Battery（18650 3.7V, 2000mAh, 7.4Wh）





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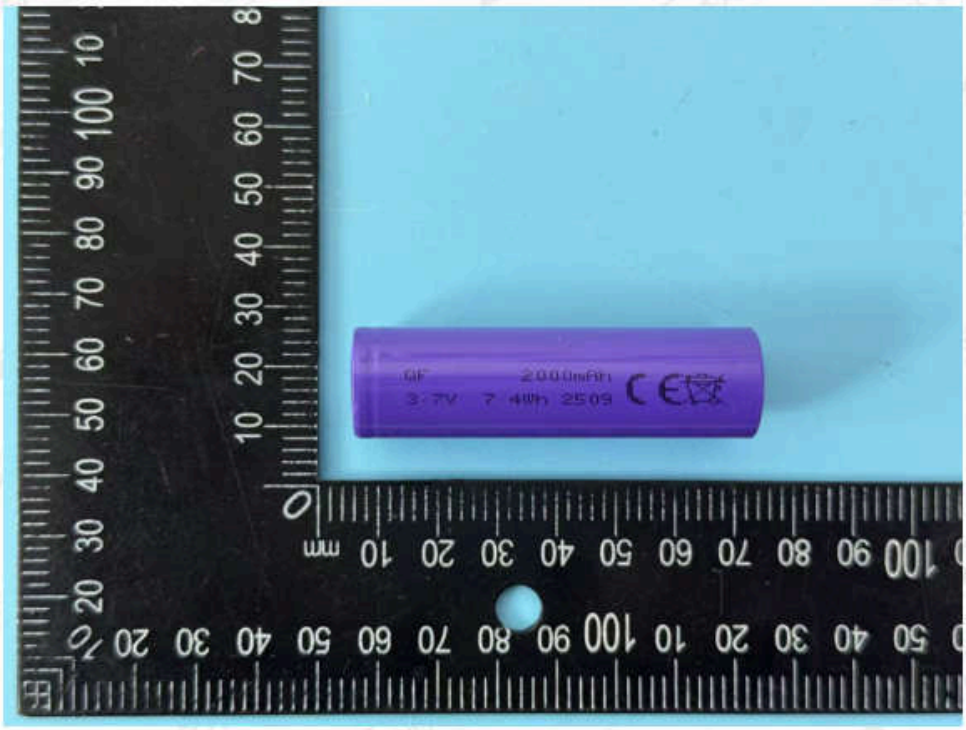
Shenzhen Lionaces Technology Co., Ltd.

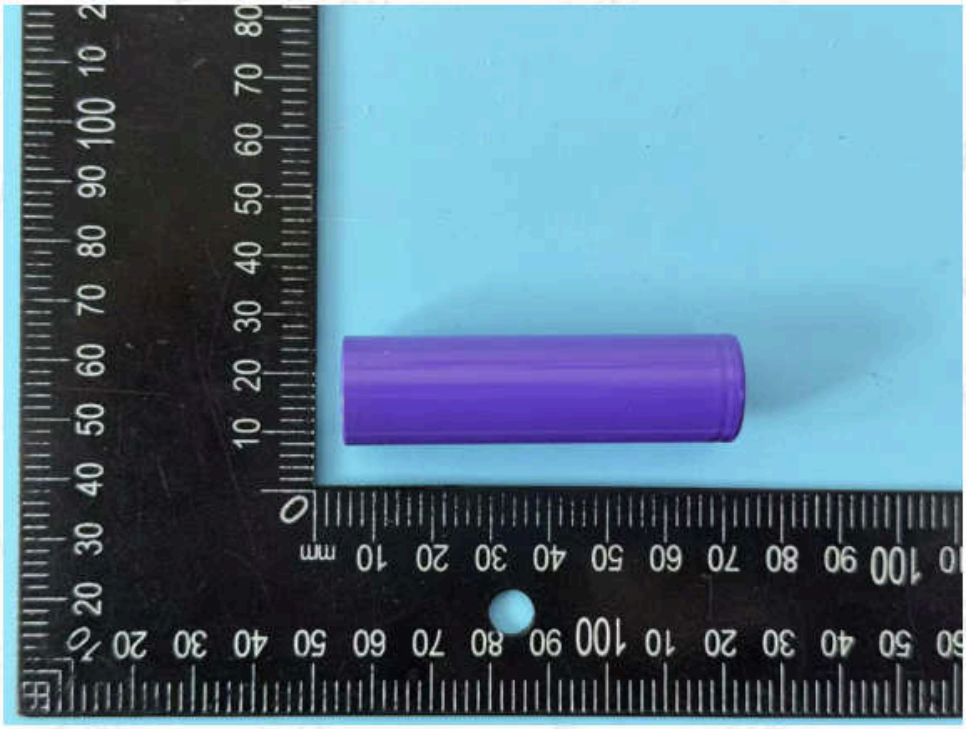
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Tel:(86-755)-28280690

电芯/Cell（18650　　3.7V, 2000mAh, 7.4Wh）





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5、测试方法及判定 Test Method And Verdict

章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
38.3.4.1	**测试 1：高度模拟 Test 1: Altitude simulation**	见表 1 See Table 1	P
	试验电池和电池组应压力不大于11.6kpa和环境温度为20±5℃的条件下贮存不少于6个小时。 Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hour at ambient temperature (20±5℃)	无渗漏，无排气，无解体，无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P
	要求电池和电池组无渗漏、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%。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 meet this requirement if there is no leakage, no venting, no disassemble, 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.		
38.3.4.2	**测试 2：温度试验 Test 2: Thermal test**	见表 2 See Table 2	P
	试验电池和电池组先在试验温度等于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，接着将所有试验电池和电池组在环境温度（20℃±5℃）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。 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.	无渗漏，无排气，无解体，无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P
	要求电池和电池组无渗漏、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%。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 meet this requirement if there is no leakage, no venting, no disassemble, 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.		

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章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
38.3.4.3	**测试3：振动** **Test 3: Vibration**	见表 3 See Table 3	P
	电池和电池组紧固于振动机平台，但不得造成电池变形，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 赫兹和 200 赫兹之间，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。 Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. 作对数式频率扫描，对总质量不足 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）有所不同。 The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries). 对电池和小型电池组：从 7 赫兹开始，保持 $1g_n$ 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 $8g_n$（频率约为 50 赫兹）。将最大加速度保持在 $8g_n$ 直到频率增加到 200 赫兹。 For cells and small batteries: from 7 Hz a peak acceleration of $1g_n$ 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 $8g_n$ occurs (approximately 50 Hz). A peak acceleration of $8g_n$ is then maintained until the frequency is increased to 200 Hz. 对大型电池组：从 7 赫兹开始，保持 1gn 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 $2g_n$（频率约为 25 赫兹）。将最大加速度保持在 $2g_n$ 直到频率增加到 200 赫兹。 For large batteries: from 7 Hz to a peak acceleration of $1g_n$ 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 2gn occurs (approximately 25 Hz). A peak acceleration of $2g_n$ is then maintained until the frequency is increased to 200 Hz.	无渗漏，无排气，无解体，无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P
	要求电池和电池组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		

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<table>
<tr><th>章节
Clause</th><th>标准要求
Requirements</th><th>测试结果
Result</th><th>判定
Verdict</th></tr>
<tr><td></td><td>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。

Cells and batteries meet this requirement if there is no leakage, no venting, no disassemble, 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.</td><td></td><td></td></tr>
<tr><td>38.3.4.4</td><td>测试4：冲击
Test 4: Shock</td><td>见表 4
See Table 4</td><td>P</td></tr>
<tr><td></td><td>试验电池和电池组用坚硬支架紧固在试验装置上，支架支撑着每个试验电池组的所有安装面。

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

每个电池需经受最大加速度150g_n和脉冲持续时间6毫秒的半正弦波冲击。针对大型电池需经受最大加速度50g_n和脉冲持续时间11毫秒的半正弦波冲击。

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

每个电池组应根据电池组的质量而受到峰值加速度的半正弦波冲击。对于小型电池组的脉冲持续时间应6毫秒，对于大型电池组的脉冲持续时间应为11毫秒，下面的公式用于计算适当的最小峰值加速度。

<table>
<tr><th>电池
Battery</th><th>最小峰值加速度
Minimum peak acceleration</th><th>脉冲持续时间
Pulse duration</th></tr>
<tr><td>小型电池
Small batteries</td><td>150g_n 或公式结果中的较小值
150g_n or result of formula
$\text{Acceleration } (g_n) = \sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$
whichever is smaller</td><td>6毫秒
6ms</td></tr>
<tr><td>大型电池
Large batteries</td><td>50g_n 或公式结果中的较小值
50g_n or result of formula
$\text{Acceleration } (g_n) = \sqrt{\left(\frac{3000}{\text{mass}^*}\right)}$
whichever is smaller</td><td>11毫秒
11ms</td></tr>
<tr><td colspan="3">* 质量单位用千克计算 Mass is expressed in kilograms.</td></tr>
</table>

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</td><td>无渗漏，无排气，无解体，无破裂和无起火。
No leakage, no venting, no disassemble, no rupture and no fire.</td><td>P</td></tr>
</table>

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章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
	milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations. 每个电池或电池组需在三个互相垂直的安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受18次冲击。 Each cell or battery is subjected to three shocks in the positive direction followed by three shocks in the negative direction of each of three mutually perpendicular mounting positions of the cell for a total of 18 shocks.		
	要求电池和电池组无渗漏、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%。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 meet this requirement if there is no leakage, no venting, no disassemble, 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.		
38.3.4.5	**测试 5：外部短路** **Test 5: External Short Circuit**	见表 5 See Table 5	P
	待测试的电池或电池组应加热一段时间，以使其外表面温度达到均匀稳定的 57±4℃的温度。加热时间取决于电池或电池组的大小和设计，并应进行评估和记录。如果这种评估是不可行的，对于小型电池和小型电池组至少在 57±4℃的环境下存放 6 小时，对于大型电池和大型电池组至少在 57±4℃的环境下存放 12 小时。然后电池或电池组在 57±4℃的环境中，应接受一个外部总阻值小于 0.1 欧姆的短路条件。 The cell or battery to be tested shall be 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. 这一短路条件应在电池或电池组的外壳温度回到 57±4℃后继续短路 1 小时，或对于大型电池组其外壳温度已下降了一半的最大升温，并保持低于该值。短路和冷却过程至少在环境温度中进行。 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	无解体，无破裂，无起火。No disassemble , no rupture and no fire.	P

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章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
	phases shall be conducted at least at ambient temperature.		
	要求电池和电池组外壳温度不超过 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。 Cells and batteries meet this requirement if their external temperature does not exceed 170℃ and there is no disassemble, no rupture and no fire within six hours of this test.		
38.3.4.6	**测试 6：撞击/挤压** **Test 6: Impact / Crush**	见表 6 See Table 6	P
	撞击（适用于直径大于等于 18 毫米的圆柱形电池） Impact (applicable to cylindrical cells not less than 18mm 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。 The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8mm±0.1mm diameter, at least 6cm 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 friction less, 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. 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±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 samples is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm±0.1mm diameter curved surface lying across the centre of the test samples. Each sample is to be subjected to only a single impact.	无解体，无破裂，无起火。No disassemble , no rupture and no fire.	P
	要求电池和电池组外壳温度不超过 170℃，并且在试验过程中及试验后 6 小时内无解体，无起火。 Cells and component cells meet this requirement if their external temperature does not exceed 170℃ and there is no disassemble and no fire during the test and within six hours after this test.		

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章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
	挤压（适用于棱柱形、袋装、硬币/纽扣电池和直径小于 18 毫米的圆柱形电池） Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18mm 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±0.78千牛； (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。 A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5cm/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 13kN±0.78kN; (b) The voltage of the cell drops by at least 100mV; or (c) The cell is deformed by 50% or more of its original thickness. 一旦达到最大压力、电压下降 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。 Once the maximum pressure has been obtained, the voltage drops by 100mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released. 棱柱形或袋装电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。 A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. 每个试样电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。 Each test cell or component cell is to be subjected to one crush only. The test Samples 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.	N/A	N/A
	要求电池和电池组外壳温度不超过170℃，并且在试验过程中及试验后6小时内无解体，无起火。 Cells and component cells meet this requirement if their external temperature does not exceed 170℃ and there is no disassemble and no fire during the test and within six hours after this test.		
38.3.4.7	**测试 7：过充电** **Test 7: Overcharge**	见表 7 See Table 7	P

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章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
	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。 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 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. Tests are to be conducted at ambient temperature; the duration of the test shall be 24 hours.	无分解，无起火。No disassemble and no fire.	P
	要求充电电池组在试验过程中和试验后 7 天内无解体，无起火。 Rechargeable batteries meet this requirement if there is no disassemble and no fire during the test and within seven days after the test.		
38.3.4.8	**测试 8：强制放电** **Test 8: Forced discharge**	见表 8 See Table 8	P
	每个电池应在环境温度下与 12V 直流电源上进行强制放电，此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条件下强制放电。 Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. 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）。 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).	无分解，无起火。No disassemble and no fire.	P
	要求原电池或充电电池在试验过程中和试验后 7 天内无解体，无起火。Primary or rechargeable cells meet this requirement if there is no disassemble and no fire during the test and within seven days after the test.		

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6、测试数据 Test Data

表 1 Table 1	高度模拟 Altitude simulation						P
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 Remaining voltage（%）	有无渗漏，排气，解体，破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
Z1	45.700	4.18	45.689	4.16	0.02	99.52	N
Z2	45.635	4.18	45.609	4.17	0.06	99.76	N
Z3	45.612	4.18	45.603	4.17	0.02	99.76	N
Z4	45.663	4.18	45.655	4.17	0.02	99.76	N
Z5	45.668	4.18	45.637	4.18	0.07	100.00	N
X1	45.674	4.18	45.658	4.17	0.04	99.76	N
X2	45.684	4.18	45.651	4.18	0.07	100.00	N
X3	45.635	4.18	45.606	4.17	0.06	99.76	N
X4	45.667	4.18	45.655	4.17	0.03	99.76	N
X5	45.634	4.17	45.631	4.16	0.01	99.76	N

表 2 Table 2	温度试验 Thermal test						P
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 Remaining voltage（%）	有无渗漏，排气，解体，破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
Z1	45.689	4.16	45.666	4.08	0.05	98.08	N
Z2	45.609	4.17	45.577	4.10	0.07	98.32	N
Z3	45.603	4.17	45.575	4.12	0.06	98.80	N
Z4	45.655	4.17	45.633	4.12	0.05	98.80	N
Z5	45.637	4.18	45.601	4.11	0.08	98.33	N
X1	45.658	4.17	45.607	4.12	0.11	98.80	N
X2	45.651	4.18	45.606	4.13	0.10	98.80	N
X3	45.606	4.17	45.605	4.10	0.00	98.32	N
X4	45.655	4.17	45.605	4.11	0.11	98.56	N
X5	45.631	4.16	45.579	4.12	0.11	99.04	N

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表 3 Table 3	振动 Vibration						P
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 Remaining voltage （%）	有无渗漏，排气，解体，破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
Z1	45.666	4.08	45.655	4.08	0.02	100.00	N
Z2	45.577	4.10	45.575	4.08	0.00	99.51	N
Z3	45.575	4.12	45.566	4.10	0.02	99.51	N
Z4	45.633	4.12	45.618	4.12	0.03	100.00	N
Z5	45.601	4.11	45.572	4.11	0.06	100.00	N
X1	45.607	4.12	45.604	4.09	0.01	99.27	N
X2	45.606	4.13	45.601	4.11	0.01	99.52	N
X3	45.605	4.10	45.570	4.10	0.08	100.00	N
X4	45.605	4.11	45.580	4.09	0.05	99.51	N
X5	45.579	4.12	45.548	4.12	0.07	100.00	N

表 4 Table 4	冲击 Shock						P
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 Remaining voltage （%）	有无渗漏，排气，解体，破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
Z1	45.655	4.08	45.626	4.07	0.06	99.75	N
Z2	45.575	4.08	45.540	4.07	0.08	99.75	N
Z3	45.566	4.10	45.553	4.08	0.03	99.51	N
Z4	45.618	4.12	45.618	4.11	0.00	99.76	N
Z5	45.572	4.11	45.550	4.10	0.05	99.76	N
X1	45.604	4.09	45.581	4.07	0.05	99.51	N
X2	45.601	4.11	45.588	4.10	0.03	99.76	N
X3	45.570	4.10	45.552	4.08	0.04	99.51	N
X4	45.580	4.09	45.574	4.08	0.01	99.76	N
X5	45.548	4.12	45.527	4.12	0.05	100.00	N

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表 5 Table 5	外短路 External short circuit	P
样品编号 Sample No.	最高温度 Peak temperature (˚C)	有无解体，破裂，起火 Whether disassemble, rupture, fire (Y/N)
Z1	58.1	N
Z2	58.8	N
Z3	58.2	N
Z4	58.7	N
Z5	58.8	N
X1	57.8	N
X2	58.1	N
X3	58.1	N
X4	58.2	N
X5	58.1	N

表 6 Table 6	撞击 Impact	P
样品编号 Sample No.	最高温度 Peak temperature (˚C)	有无解体，起火 Whether disassemble, fire (Y/N)
Z6	112.7	N
Z7	118.4	N
Z8	112.6	N
Z9	104.4	N
Z10	113.6	N
X6	122.8	N
X7	113.9	N
X8	102.0	N
X9	113.6	N
X10	114.9	N

表 7 Table 7	过度充电 Overcharge	P
样品编号 Sample No.	有无解体，起火 Whether disassemble, fire (Y/N)	
Z11	N	

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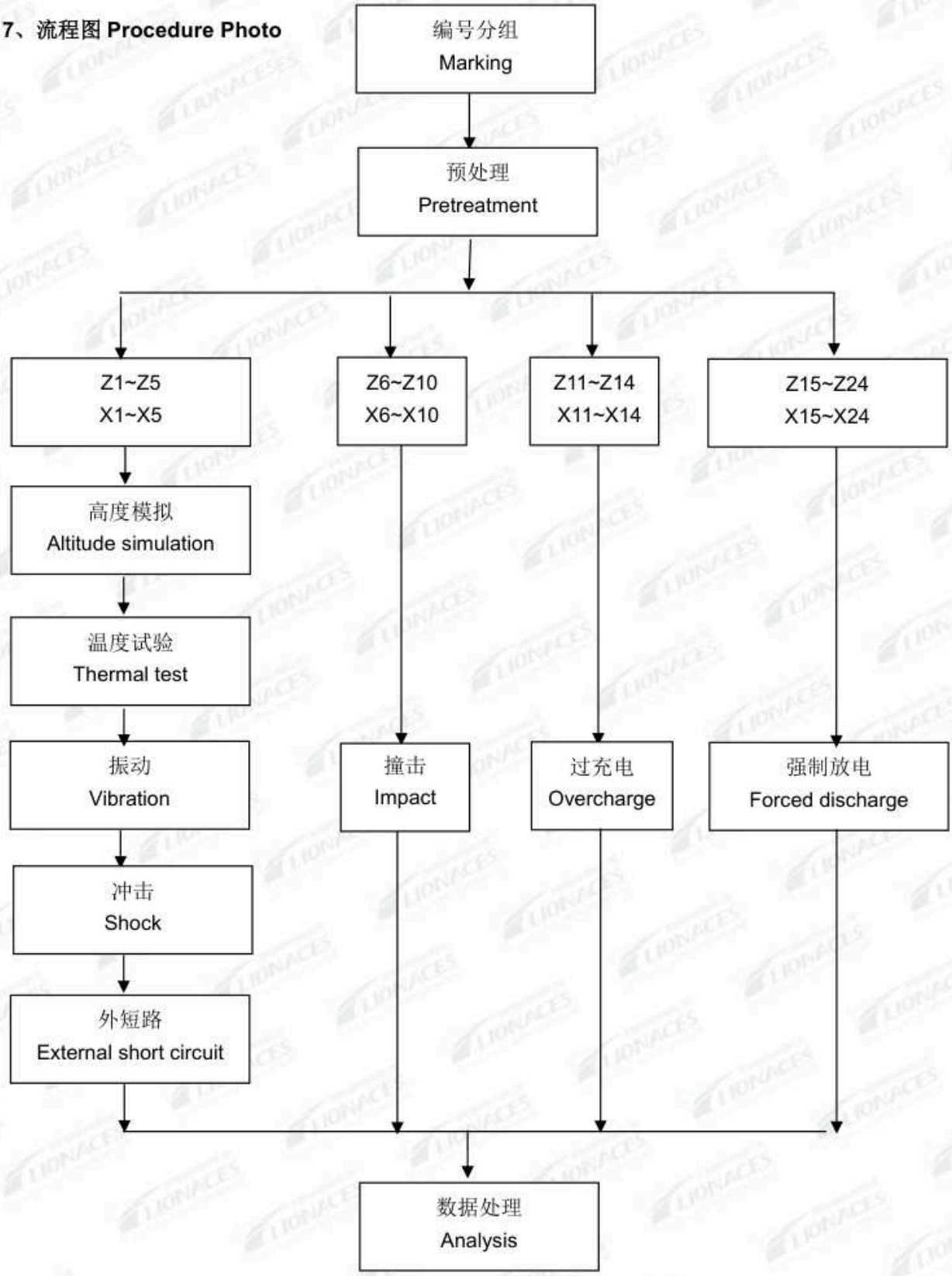
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Z12	N
Z13	N
Z14	N
X11	N
X12	N
X13	N
X14	N

表 8 Table 8	强制放电 Forced discharge	P
样品编号 Sample No.	有无解体，起火 Whether disassemble, fire (Y/N)	
Z15	N	
Z16	N	
Z17	N	
Z18	N	
Z19	N	
Z20	N	
Z21	N	
Z22	N	
Z23	N	
Z24	N	
X15	N	
X16	N	
X17	N	
X18	N	
X19	N	
X20	N	
X21	N	
X22	N	
X23	N	
X24	N	

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7、流程图 Procedure Photo



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8、测试设备 Test equipment

LA-BT-E068	电子天平秤 Electronic balance
LA-BT-E024	万用表 Multimeter
LA-BT-E004	电池低气压高空模拟试验箱 Battery pressure simulation test tank
LA-BT-E014	高低温(交变)湿热试验箱 High and low temperature (alternating) hot and heat test box
LA-BT-E013	电磁式振动试验机 Electromagnetic vibration testing machine
LA-BT-E086	机械式冲击试验机 Mechanical impact tester
LA-BT-E096	数字式温度记录仪 Digital temperature recorder
LA-BT-E097	电池短路实验机 Battery short circuit tester
LA-BT-E003	电池重物冲击试验机 Battery heavy impact testing machine
LA-BT-E079 LA-BT-E080 LA-BT-E081 LA-BT-E082	直流稳压电源 DC power supply
LA-BT-E091 LA-BT-E092 LA-BT-E093 LA-BT-E094	直流稳压电源 DC power supply
LA-BT-E106 LA-BT-E107 LA-BT-E108	直流电子负载 DC Electronic Load

----报告结束----
----End of report----

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海 运 By Sea

非限制性货物
Non-restricted Goods

货物运输条件鉴定报告
Report for Safe Transport of Goods

报告编号： Report No.：	LA2025B2977001H

物品名称 Name of Goods	手持式红外热成像仪 YXI96（内置锂离子电池 18650 3.7V, 2000mAh, 7.4Wh） HANDHELD THERMAL IMAGERr YXI96 (Containing Li-ion Battery 18650 3.7V, 2000mAh, 7.4Wh)
委托单位 Applicant	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD
生效日期 Effective Date	2026-01-01

深圳市莱恩瑞斯科技有限公司
报告专用章

Shenzhen Lionaces Technology Co., Ltd.

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Add: 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China.
Website:www.lionaces.com E-mail:service@lionaces.com
Tel:(86-755)-28280690

货物运输条件鉴定报告

Report for Safe Transport of Goods

实验室 Laboratory	深圳市莱恩瑞斯科技有限公司 Shenzhen Lionaces Technology Co., Ltd.		
实验地址 Testing Address	广东省深圳市宝安区福海街道和平社区永和路骏丰工业区 B6 栋 301 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China		
委托单位 Applicant	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD		
委托单位地址 Applicant Address	深圳市龙岗区坂田街道社区吉华路 489 号乐荟科创中心 12 栋 18 层 F Room F, 18F, Building 12, Lehui Science and Technology Innovation Center, No.489 Jihua Road, Bantian Community, Longgang District, Shenzhen, China.		
生产单位 Factory	东莞市启飞电子科技有限公司 Dongguan QiFei Electronic Technology Co., Ltd.		
生产单位地址 Factory address	广东省东莞市清溪镇三中村金腰路 62 号 B 栋 4 楼 No.62 Jin Yao Road, No. B, 4th Floor, Sanzhong Village, Qingxi Town, Dongguan City, Guangdong Province		
电池信息 Battery information		包装件信息 Package information	
电池名称 Battery name	锂离子电池 Li-ion Battery	包装件毛重 Gross weight	11.81Kg
电池型号 Battery model	18650	包装件电池净重 Net weight	0.686Kg
电池尺寸 Battery dimension	Φ18.5mm*65.8mm	包装件尺寸 Dimension	560mm*282mm*475mm
电池规格 Battery specification	3.7V, 2000mAh, 7.4Wh	电池数量 Battery number	15Pcs
电池商标 Trade mark of battery	N/A	物品商标 Trade mark of goods	N/A
电池外观 Battery appearance	蓝色近圆柱体 Approximate Blue Cylinder	包装类型 Package type	装在设备中 Contained In Equipment
收样日期 Receiving Date	2025-12-18	完成日期 Completing Date	2025-12-18
报告有效期 The period of validity	2026 年 01 月 01 日至 2026 年 12 月 31 日		
参考方法 Reference method	《国际海运危险货物规则》(42-24) << International Maritime Dangerous Goods >>(42-24)		

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Report for Safe Transport of Goods

结果（Conclusion）					
1. 电池经测试已通过联合国《试验和标准手册》第III部分 38.3 小节相应测试要求。（报告编号：LA2025B2144001U） Lithium cells and batteries listed in this report are of the types proven to meet the requirement of each applicable test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3. (Report No.: LA2025B2144001U) 2. 电池装在设备中，不需要做 1.2m 跌落测试。 Transport installed in equipment, 1.2m drop test is not needed. 3. 可按非限制性货物条件办理，包装要求参照 IMDG 特殊规定 188。 The goods are not subject to IMDG, the packaged according to the special provision 188.					
注意事项 Remark	1、电池或电芯必须加以保护，防止短路。锂电池完全封装在内包装内，位于坚固的外包装中，有设备的包装件必须采取措施防止意外启动。 Battery or cell must be protected so as to prevent short circuits, Lithium cell and battery are packed in inner packaging that completely enclose the cell or battery and placed in a strong outer packaging equipment equipped with an effective means of preventing accidental activation.				
	2、每票货物均需有随附文件说明，包装件中含有锂电池，必须小心操作，如包装件破损，有易燃危险性，包装破损时应采取特殊措施，包括必要时的检查和重新包装，应急电话号码。 Each consignment should have accompanied with a document with an indication that: the package contains lithium battery, the package must be handled with care, and that a flammability hazard exists if the package is damaged, special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary, and a telephone number for additional information.				
备注 Remark	适用于海运。 Be applicable to transport by sea.				
主检人： Prepared by		审核人： Checked by		批准人： Approved by	

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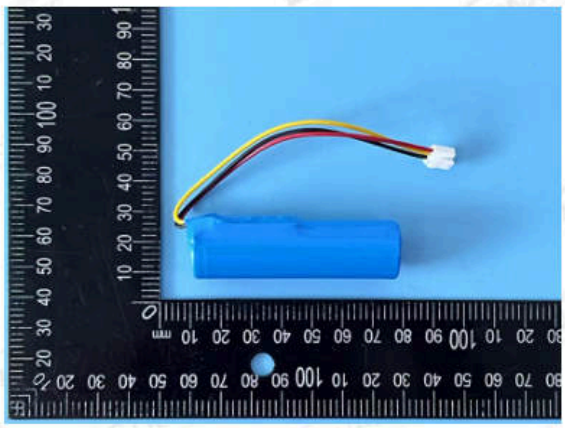
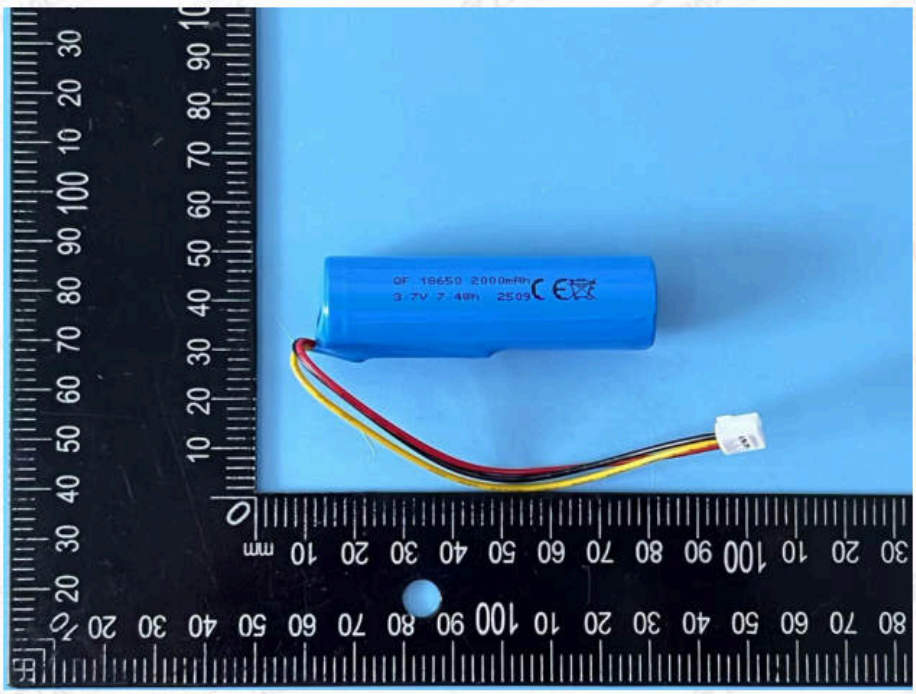
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图片（Photo）







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声 明

Statement

1、 本报告无本单位报告专用章和批准人签章无效。

This report is invalid without the special seal for report of Lionaces and the signatures of approver.

2、 本报告涂改和删除无效。

This report is invalid if it is blotted out and deleted.

3、 委托单位对检测结果有异议，应于收到报告之日起十五日内向我司提出。

If the applicant has any questions about results, shall submit to Lionaces within 15 days.

4、 本报告仅对客户所送样品负责。

This report is responsible for the sample provided by the client only.

5、 未经本单位许可，不得部分复制、摘用本报告书内容。

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All of information such as product information, parameters, drawings, components, etc. are provided by the applicant. The applicant must provide samples and materials truthfully. Otherwise we will not take on any relevant responsibilities for this report.

----报告结束----

----End of report----

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MSDS 报告
MSDS Report

报告编号： Report No.：	LA2025B2977001M

样品名称 Samples	锂离子电池 Li-ion Battery
样品型号 Model	18650
委托单位 Applicant	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD
生效日期 Effective Date	2026-01-01

深圳市莱恩瑞斯科技有限公司

Shenzhen Lionaces Technology Co., Ltd.

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材料安全技术说明书
Material Safety Data Sheet

依据 GB/T16483-2008&ISO11014:2009 编制
According to GB/T16483-2008&ISO11014:2009

第一部分 化学品及企业标识
Section 1 - Chemical Product and Company Identification

化学品信息 Chemical product information					
样品名称 Sample Name	锂离子电池 Li-ion Battery				
型号与规格 Model and specification	18650 3.7V, 2000mAh, 7.4Wh				
产品推荐及限制用途 Sample Uses	N/A				
单位信息 Company information					
实验室 Laboratory	深圳市莱恩瑞斯科技有限公司 Shenzhen Lionaces Technology Co., Ltd.				
实验地址 Testing Address	广东省深圳市宝安区福海街道和平社区永和路骏丰工业区 B6 栋 301 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China				
委托单位 Applicant	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD				
委托单位地址 Applicant address	深圳市龙岗区坂田街道社区吉华路 489 号乐荟科创中心 12 栋 18 层 F Room F, 18F, Building 12, Lehui Science and Technology Innovation Center, No.489 Jihua Road, Bantian Community, Longgang District, Shenzhen, China.				
生产单位 Factory	东莞市启飞电子科技有限公司 Dongguan QiFei Electronic Technology Co., Ltd.				
生产单位地址 Factory address	广东省东莞市清溪镇三中村金腰路 62 号 B 栋 4 楼 No.62 Jin Yao Road, No. B, 4th Floor, Sanzhong Village, Qingxi Town, Dongguan City, Guangdong Province				
应急电话 Emergency telephone	13928450588				
备注 Remark	V1.0				
收样日期 Receiving Date	2025-12-18		完成日期 Completing Date	2025-12-18	
主检人： Prepared by		审核人： Checked by		批准人： Approved by	

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第二部分 危险性概述
Section 2 - Hazards Identification

紧急情况概述：无相关详细资料。
Emergency overview：No information available.
GHS 危险性分类：根据化学品全球统一分类与标签制度(GHS)的规定，不是危险物质。
Classification according to GHS：Not a dangerous substance according to GHS.

GHS 标签要素 Label elements	
危害类型象形图 Hazard pictogram(s)	无数据 No data available
警示词 Signal word	无数据 No data available
危险性说明 Hazard statement(s)	无数据 No data available
防范说明 Precautionary statement(s)	
预防措施 Prevention	无数据 No data available
事故响应 Response	无数据 No data available
安全储存 Safe storage	无数据 No data available
废弃处置 Disposal	无数据 No data available

物理和化学危险：无相关详细资料。
Physical and chemical risk: No information available.
健康危害：无相关详细资料。
Health hazard: No information available.
环境危害：无相关详细资料。
Environmental hazards: No information available.
其它危害：无相关详细资料。
Other hazards: No information available.

第三部分 成分/组成信息
Section 3 - Composition, Information on Ingredients

该物质或混合物的分类：☐ 物质 ☒ 混合物
Classification of the substance or mixture: ☐ substance ☒ mixture

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化学名称 Chemical Composition	CAS No.	百分含量 Weight（%）
钴酸锂 Lithium Cobalt Oxide	12190-79-3	39.63
石墨 Graphite	7782-42-5	19.72
电解液 Organic electrolyte	N/A	13.61
铝 Aluminum	7429-90-5	5.79
聚(亚乙烯氟) PVDF Polyvinylidene fluoride	24937-79-9	0.58
铜 Copper	7440-50-8	9.53
丁苯橡胶 SBR Styrene-Butadiene polymer	9003-55-8	0.51
聚乙烯 Polyethylene	9002-88-4	0.05
聚丙烯 Polypropylene	9003-07-0	0.96
其他 Other	N/A	9.62

注Note：CAS：化学文摘社Chemical Abstracts Service (Division of the American Chemical Society).
"N/A"：无数据No Data

第四部分 急救措施
Section 4 - First Aid Measures

总说明：正常情况下，不需要特别的措施。
General information: No special measures required.
吸入：立即将人员移至通风处，如果呼吸困难，速进行人工呼吸抢救。如症状持续，速就医。
After inhalation: Remove victim to fresh area. Administer artificial respiration if breathing is difficult. Seek medical attention.
皮肤接触：脱去污着衣物，用大量的水清洗，然后清洗双手，衣物清洗后再使用。如果症状持续，速就医。
After skin contact: Remove contaminated clothing and shoes. Immediately wash with water and soap and rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.
眼睛接触：张开眼睛在流水下冲洗数分钟，如果症状仍然持续，请咨询医生。
After eye contact: Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.
食入：禁止催吐，速就医。
After swallowing: Do not induce vomiting. Get medical attention.
急性和迟发效应
Acute and delayed effects

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主要症状：无相关详细资料。
The main symptoms: No relevant details information.
健康影响：无相关详细资料。
Health effects: No relevant details information.
对保护施救者的忠告：无相关详细资料。
To protect the rescuers advice: No relevant details information.
对医生的建议：需要及时的医疗处理及特别处理的症状，无相关详细资料。
To the doctor's advice: Need timely medical treatment and special symptoms, no relevant details information.

第五部分 消防措施
Section 5 - Fire Fighting Measures

灭火剂：使用适合当地情况和周围环境的灭火剂，如干粉，CO_2。
Suitable extinguishing agents: Use extinguishing agent suitable for local conditions and the surrounding environment . Such as dry powder , CO_2.
特别危险性：在起火条件下，电池可能会破裂，释放出有害的分解产物。在经受高温(> 150℃(302℉))时，含有易燃电解液的电池，可能泄漏，点燃，产生火花，当损坏或滥用(如机械损伤或过度充电)时，可能燃烧迅速与耀斑燃烧效果，也可能引燃其他在电池附近衣服。
Special hazards arising from the substance or mixture: Battery may burst and release hazardous decomposition products when exposed to a fire situation. Battery contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature(>150℃(302℉)), when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.
灭火方法注意事项及防护措施：如起火，佩戴自主呼吸机和防护服。
Attention extinguishing method and protective measures: Wear self-contained respirator. Wear fully protective impervious suit.

第六部分 泄露应急处理
Section 6 - Accidental Release Measures

作业人员防护措施、防护装备和应急处置程序：穿上保护装备，疏散人群，确保有足够的通风。
Homework personnel protective measures, protective equipment and emergency disposal procedures: Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation
环境保护措施：若无政府许可，勿将材料排入周围环境。
Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.
泄漏化学品的收容、清除方法及所使用的处置材料：从泄露区移除所有的火源，隔离人员。用一个不产生粉尘的方法打扫处理泄漏物，尽可能多地收集泄漏处理物于有标签的合适的容器中。泄露处理物禁止倒入下水道，沟渠或水源。所有废弃物必须参照联合国，国家，地方性法规进行处置。
Steps to be taken in case material is spilled or released and Waste disposal method: Remove ignition sources, evacuate area. Sweep up using a method that does not generate dust. Collect as much of the spilled material as possible, placed the spilled material into a suitable disposal container. Keep spilled material out of sewers, ditches and bodies of water. All waste must refer to the United Nations, the national and local regulations for disposal.

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防止次生灾害的预防措施：有关安全处理的资料请参阅第七部分。有关个人保护装备的资料请参阅第八部分。有关弃置的资料请参阅第十三部分。
To prevent the secondary disasters prevention measures: See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

第七部分 操作处置与储存
Section 7 - Handling and Storage

操作注意事项：储存时远离食物和水源。吃饭喝水前彻底清洗双手。储有化学物的容器搬用时需防止静电的产生和积聚。
Precautions for safe handling: Consumption of food and beverage should be avoided in work areas. Wash hands with soap and water before eating, drinking. Ground containers when transferring liquid to prevent static accumulation and discharge.
有关火灾及防止爆炸的资料：电池在拆开、挤压、遇火或高温情况下，会引起起火或爆炸，严禁短路或非正确操作。
Information about fire and explosion protection: Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.
储存注意事项：储存在一个低温，干燥，通风良好的环境。远离热源，避免长时间阳光照射。未使用时密封容器。
Conditions for safe storage, including any incompatibilities: Requirements to be met by storerooms and receptacles. Store in a cool, dry, well-ventilated place. Keep away from heat, avoiding the long time of sunlight.

第八部分 接触控制/个体防护
Section 8 - Exposure Controls, Personal Protection

职业接触限值
Occupational exposure limit

在工作场需要监控的限制成分 Ingredients with limit values that require monitoring at the workplace:	
12190-79-3 钴酸锂 Lithium Cobalt Oxide	
TLV (USA)	0.02mg/m^3.
MAK(Germany)	0.1mg/m^3.

Note:TLV：Threshold Limit Value
生物限值：无相关详细资料。
Biological limit: no relevant details information.
检测方法：无相关详细资料。
Detection: no relevant details information.
工程控制
Engineering control
一般保护和卫生措施：当处理化学物品时，应遵循一般的预防措施。远离食物和水源。立即脱掉所有脏衣服或被污染的衣物。在休息之前和工作结束之后洗手。

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General protective and hygienic measures:The usual precautionary measures for handling chemicals should be followed.Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work.
呼吸防护：高浓度的情况时，使用适当的呼吸器。
Respiratory Protection: Use suitable respirator when high concentrations are present.
个体防护设备Personal Protection

手防护 Hand protection	眼睛防护 Eye protection
 *Protective gloves*	 *Tightly sealed goggles*

第九部分 理化特性
Section 9 - Physical and Chemical Properties

外观：蓝色
Appearance: Blue
形状：近圆柱体
Form: Approximate cylinder
气味：泄漏时，有刺激性气味。
Odour: If leaking, smells of medical ether
酸碱度：不适用
pH: Not applicable as supplied.
闪点：针对单个组分暴露情况，其他不适用。
Flash Point: Not applicable unless individual components exposed.
易燃度：针对单个组分暴露情况，其他不适用。
Flammability: Not applicable unless individual components exposed.
相对密度：针对单个组分暴露情况，其他不适用。
Relative density: Not applicable unless individual components exposed.
溶解性（水溶性）：针对单个组分暴露情况，其他不适用。
Solubility (water): Not applicable unless individual components exposed
溶解性（其他）：针对单个组分暴露情况，其他不适用
Solubility (other): Not applicable unless individual components exposed.

第十部分 稳定性和反应活性
Section 10 - Stability and Reactivity

稳定性：正常情况下稳定。
Chemical stability：Stable in normal circumstances.
危险反应：无资料。
Possibility of hazardous reactions：Data not available.
应避免条件：火焰，火花和其他热源，禁忌物。
Conditions to Avoid: Flames, sparks, and other sources of ignition, incompatible materials.

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禁配物：氧化剂，酸，碱。
Incompatibilities: Oxidizing agents, acid, base.
危险的分解产物：二氧化碳，一氧化碳。
Hazardous Combustible Products: Carbon monoxide, carbon dioxide, lithium oxide fumes.

第十一部分 毒理学资料
Section 11 - Toxicological Information

对毒理学影响的信息
Information on toxicological effects
急性毒性LC50/LD50：无相关详细资料。
Acute toxicity LD/LC50 Values relevant for classification: Not available.
注：LC50：半数致死浓度（lethal concentration, 50 percent kill）
LD50：半数致死剂量（lethal dose, 50 percent kill）
皮肤刺激/腐蚀：无相关详细资料。
Skin irritation/corrosion: No further relevant information available.
眼睛刺激/腐蚀：无相关详细资料。
Eyes stimulus/corrosion: No further relevant information available.
呼吸或皮肤过敏：无相关详细资料。
Breathing or skin irritation: No further relevant information available.
生殖细胞突变性：无相关详细资料。
Germ cell respectively: No further relevant information available.
致癌性：无相关详细资料。
Carcinogenicity: No further relevant information available.
生殖毒性：无相关详细资料。
Reproductive toxicity: No relevant details information.
特异性靶器官系统毒性——一次性接触：无相关详细资料。
Specific target organ system toxicity disposable contact: No further relevant information available.
特异性靶器官系统毒性——反复接触：无相关详细资料。
Specific target organ system toxicity, repeated contact: No further relevant information available.
吸入危害：无相关详细资料。
Inhalation hazard: No further relevant information available.
潜在的有害效应：无相关详细资料。
Potentially harmful effects: No further relevant information available.

第十二部分 生态学资料
Section 12 - Ecological Information

生态毒性
Ecological toxicity
水生毒性：无相关详细资料。
Aquatic toxicity: No further relevant information available.
持久性和降解性：无相关详细资料。
Persistence and degradability: No further relevant information available.
环境系统习性
Behaviour in environmental systems

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潜在的生物累积性：无相关详细资料。
Bioaccumulative potential: No further relevant information available.
土壤内移动性：无相关详细资料。
Mobility in soil: No further relevant information available.
生态学资料
Ecological effects
额外的生态学资料：无相关详细资料。
Additional ecological information :No further relevant information available.
总括注解：若无政府许可，勿将材料排入周围环境。
General notes:Do not allow material to be released to the environment without proper governmental permits.
其他副作用：无相关详细资料。
Other adverse effects: No further relevant information available.

第十三部分 废弃处置
Section 13 - Disposal Considerations

废弃处置方法建议：请参考国家和地方的相关法规正确进行处理。
Waste treatment methods and Recommendation: Consult state, local or national regulations to ensure proper disposal.
受污染的容器和包装建议：必须根据官方的规章来丢弃。
Uncleaned packaging and Recommendation: Disposal must be made according to official regulations.

第十四部分 运输信息
Section 14 - Transport Information

运输标签：电池标签，或锂电池和钠离子电池第九类危险品标签，或仅限货机标签
Label for conveyance: Battery Label, or Lithium Battery or Sodium Ion Battery Class 9 Label, or Cargo Aircraft only
UN 编号：3480 & 3481
UN Number: 3480 & 3481
包装等级：N/A
Packaging Group: N/A
海洋污染物：无
Marine pollutant: No
正确的装运名称：锂离子电池(包括锂聚合物电池)，或锂离子电池与设备包装在一起，或锂离子电池安装在设备中
Proper Shipping name: Lithium Ion Battery (Including Lithium Polymer Battery) , Lithium Ion Battery Packed With Equipment, Lithium Ion Battery Contained In Equipment
运输信息：锂电池已通过联合国《试验和标准手册》第III部分 38.3 小节相应测试要求，（报告编号：LA2025B2144001U）。
锂离子电池瓦时额定值不超 100Wh，或者锂离子电芯瓦时额定值不超 20Wh，根据第 67 版（2026 版）DGR 手册 965 第 IB 节或 966~967 第 II 节的指令可以运输。货物运输应遵守 IMDG CODE (Amdt. 42-24) 特殊规定 188 的要求，该货物属于非限制性货物。

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Tel:(86-755)-28280690

Transport information: Lithium battery is of a type proved to meet the Requirements of each test in the UN Manual of Tests And Criteria, Part Ⅲ, sub-section 38.3. (Report No. : LA2025B2144001U) The lithium-ion battery with a watt-hour rating not exceeding 100Wh or the cell with the watt-hour rating is not exceeding 20Wh, The lithium-ion battery according to Section IB of Packing Instruction 965, or Section II of Packing Instruction 966~967 of the Dangerous Goods regulations 67th (2026 Edition) Edition may be transported. The goods shall be complied with the requirements of special provision 188 of IMDG CODE (Amdt. 42-24) , The goods to be transport as Unrestricted goods.

第十五部分 法规信息
Section 15 - Regulatory Information

法律信息
Law information
《危险物品规则》
《Dangerous Goods Regulations》
《对危险货物运输的有关规定的建议》
《Recommendations on the Transport of Dangerous Goods Model Regulations》
《国际海运危险货物规则》
《International Maritime Dangerous Goods》
《危险品安全运输技术指令》
《Technical Instructions for the Safe Transport of Dangerous Goods》
《危险货物分类和品名编号》
《Classification and code of dangerous goods》
《职业安全卫生法》
《Occupational Safety and Health Act》(OSHA)
《有毒物质控制法》
《Toxic Substance Control Act》(TSCA)
《消费产品安全法》
《Consumer Product Safety Act》(CPSA)
《联邦环境污染控制法》
《Federal Environmental Pollution Control Act》(FEPCA)
《石油污染法案》
《The Oil Pollution Act》(OPA)
《超级基金修正案和再授权法案III(302/311/312/313)》
《Superfund Amendments and Reauthorization Act TitleIII (302/311/312/313)》(SARA)
《资源保护及恢复法案》
《Resource Conservation and Recovery Act》(RCRA)
《安全饮用水法》
《Safety Drinking Water Act》(CWA)
《加州 65 提案》
《California Proposition 65》
《美国联邦法规》
《Code of Federal Regulations》(CFR)
《全球化学品统一分类和标签制度》

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《Globally Harmonized System of Classification and Labelling of Chemicals》 (GHS)
In accordance with all Federal, State and local laws
根据所有联邦、州和地方法律。
此MSDS符合法规 (EU) No 2020/878 ;
（EC）No 1907/2006，Article 31，附件II;
GB/T 17519-2013《化学品安全技术说明书编写指南》。
This Material Safety Data Sheet complies with the requirements of Regulation (EU) No 2020/878; (EC) No 1907/2006，Article 31，appendix II;
GB/T 17519-2013, Guidance on the compilation of safety data sheet for chemical products.

第十六部分 其他信息
Section 16 - Additional Information

注意 Declare to reader：
上述信息是基于现有的数据信息，在实际应用过程中可能出现其他未预料的情况，其相应信息可能需要修改，我方不承担此项责任。在操作中请根据实际情况作出相应的正确的处置。
The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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声　明
Statement

1、本报告无本单位报告专用章和批准人签章无效。

This report is invalid without the special seal for report of Lionaces and the signatures of approver.

2、本报告涂改和删除无效。

This report is invalid if it is blotted out and deleted.

3、委托单位对检测结果有异议，应于收到报告之日起十五日内向我司提出。

If the applicant has any questions about results, shall submit to Lionaces within 15 days.

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The applicant must provide samples and materials truthfully. All of information such as product information, parameters, drawings, components, etc. are provided by the applicant. Otherwise we will not take on any relevant responsibilities for this report.

----报告结束----
----End of report----

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Tel:(86-755)-28280690

中国认可
检验
INSPECTION
CNAS IB0078

此报告本年度有效
有效期至2026年12月31日

航空运输危险性鉴别报告

Identification and Classification Report for Air Transport of Goods

符合DGR锂电池相关包装
说明SECTION II要求

报告编号：
Issued No.: PEKXM202512182365JM080001

生效日期：
Effective Date: 2026.01.01

委托单位：深圳优瑞星科技有限公司

Applicant: SHENZHEN YOURUIXING TECHNOLOGY CO., LTD

物品名称：手持式红外热成像仪 YXI96(内置锂离子电池 18650 3.7V 2000mAh 7.4Wh)

Name of Goods: HANDHELD THERMAL IMAGER YXI96(Containing Li-ion Battery 18650 3.7V 2000mAh 7.4Wh)

北京迪捷姆空运技术开发有限公司

Beijing DGM Air Transport Technology Development Co.,Ltd.

报 告 书 使 用 约 定
Terms of the Using of the Report

1. 本公司依据本年度国际航协《危险品规则》以及委托人（托运人或其代理人）提供的物品及其运输信息，确定物品的航空运输危险性并出具此报告书。
   The report is issued by DGM China according to IATA ***Dangerous Goods Regulations*** published in the current year and the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要，本公司要求委托人提供真实、完整的样品及资料。
   According to the demand of identification and classification, DGM China requires the applicant to provide true and exact sample and data of the goods.

3. 委托人保证申报的物品和/或提供的样品与交运的货物是同一种物质。
   The applicant guarantees that the declared goods and/or the sample who provides should be identical with the contents of cargo that is to be transported.

4. 本公司仅对委托方所提供样品的鉴别结果负责。
   DGM China is only responsible for the identification and classification of the sample provided by the applicant.

5. 本报告书经主检员、审核人和批准人签字并加盖本公司印章后生效。
   This report will be effective only after it is signed by the inspector, checker and approver, and stamped by DGM China.

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8. 为适应国际航协《危险品规则》的年度变化，报告书仅在本年度内有效。
   This report is only valid within the year in which the IATA ***Dangerous Goods Regulations*** is effective.

地址：北京首都国际机场货运北路天竺综合保税区BGS货运楼249室　　邮编：101300

电话：010-69479673　　传真：010-69479621

网址：www.dgmchina.com.cn　　E-mail: test@dgmchina.com.cn

项目编号 Item No.		PEKXM202512182365	签发日期 Issued Date	2025.12.18
鉴别目的 Identification Purpose		是否属于航空运输危险物品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2025.12.18
鉴别依据 Identification Criteria		IATA DGR 67th, 2026		
物品名称 Name of Goods	中文 Chinese	手持式红外热成像仪 YXI96(内置锂离子电池 18650 3.7V 2000mAh 7.4Wh)		
	英文 English	HANDHELD THERMAL IMAGER YXI96(Containing Li-ion Battery 18650 3.7V 2000mAh 7.4Wh)		
生产厂家 Manufacturer		东莞市启飞电子科技有限公司 Dongguan QiFei Electronic Technology Co., Ltd		
件数 Pieces			托运人或托运人代理人声明 本人（本单位）声明：上述运输信息填写真实、准确，鉴别报告已获得委托单位的授权使用，实际运输的货物情况与本鉴别报告一致。如因信息填写错误、实际运输的货物情况与本鉴别报告不一致造成的一切后果，由本人（本单位）承担全部责任，并赔偿对承运人造成的全部损失。 托运人或托运人代理人签字：　　盖章：	
运单号 Air waybill No.				
目的港 Destination				
物品信息 Nature of the goods		该样品为蓝色近圆柱体电池。 型号：18650 尺寸：Φ18.5mmx65.8mm 每包装件中电池/电芯数量：15 每包装件中电池/电芯净重：0.686kg 该电池属于单芯锂电池。该锂电池不属于召回电池，不属于废弃和回收电池，并按照DGR3.9.2.6.1(e)规定的质量体系进行制造。装有电池（或电芯）的包装件或完整的包装件经评估，能满足3m堆码试验的要求。 该设备已经做好防意外启动措施。该电池安装在手持式红外热成像仪上，每个手持式红外热成像仪含电池一块。单个电池样品重量：45.7g。 This sample is blue approximate cylinder battery. Model: 18650 Size: Φ18.5mmx65.8mm Number of batteries / cells per package: 15 Net quantity of batteries/cells per package: 0.686kg The batteries belong to single cell lithium batteries. The lithium batteries don't belong to batteries returned to the manufacturer for safety reasons, are not waste lithium batteries and not lithium batteries being shipped for recycling or disposal, are manufactured under a quality management program as described in 3.9.2.6.1(e). Each package of cells or batteries or the completed package has been assessment, is capable of withstanding force applied to the top surface for a duration of 24 hours, equivalent to the total mass of identical packages if stacked to a height of 3m(including the sample).		

项目编号 Item No.		PEKXM202512182365
物品名称 Name of Goods	中文 Chinese	手持式红外热成像仪 YXI96(内置锂离子电池 18650 3.7V 2000mAh 7.4Wh)
	英文 English	HANDHELD THERMAL IMAGER YXI96(Containing Li-ion Battery 18650 3.7V 2000mAh 7.4Wh)
鉴别结论 Conclusions		该物品为锂离子/聚合物电池，安装在设备上。额定瓦特小时为7.4Wh。已通过 UN38.3 测试，每个包装件上均有电池标记。 根据IATA DGR，锂离子电池符合包装说明967第II部分。 This goods is lithium ion/polymer battery, contained in equipment. Watt-hour rating is 7.4Wh. Each battery is of a type proved to meet the Requirements of each test in the UN MANUAL OF TESTS AND CRITERIA, Part III, sub-section 38.3, Each package is marked with battery mark. According to IATA DGR, lithium ion batteries in compliance with Section II of PI 967.

运输危险性建议 Suggestion for Transport	UN/ID 编号 UN/ID No.	运输专用名称 Proper Shipping Name	类或项 Class or Div. (次要危险性) (Subsidiary Risk)	包装等级 Packing Group
	/	/	/	/

包装说明 Packing Inst.	客货机 Passenger and Cargo Aircraft	/
	仅限货机 Cargo Aircraft only	/
注意事项 Remarks	电池或电芯必须加以保护，防止短路，设备必须采取措施防止意外启动。 Batteries or cells must be protected so as to prevent short circuits, and the equipment must be equipped with an effective means of preventing accidental activation.	

主检员 Prepared by: 纪靖娟

审核人 Checked by: 李超平

批准人 Approved by:

报告单位（盖章） Stamp

制单： 纪靖娟03

手持式红外热成像仪 YXI96(内置锂离子电池 18650 3.7V 2000mAh 7.4Wh)

PEKXM202512182365

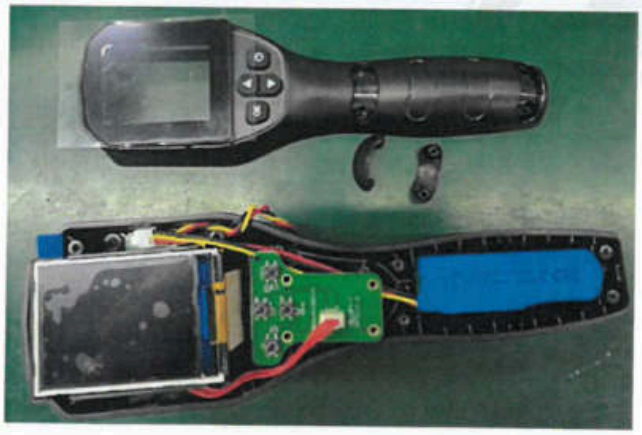


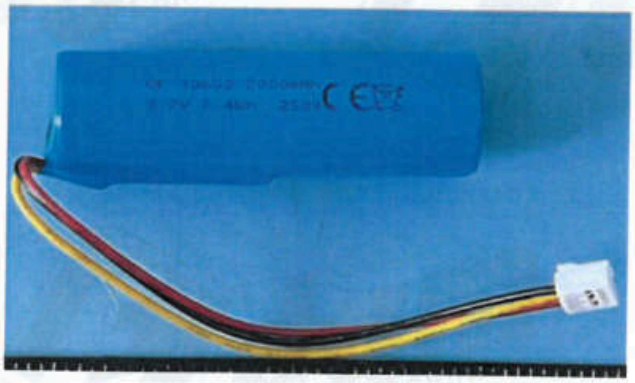












锂电池/钠离子电池 UN38.3 试验概要 Test Summary

项目编号：PEKXM202512182365

单位信息 Company Information	
委托单位 Consignor	深圳优瑞星科技有限公司 SHENZHEN YOURUIXING TECHNOLOGY CO.,LTD 深圳市龙岗区坂田街道社区吉华路 489 号乐荟科创中心 12 栋 18 层 F Room F, 18F, Building 12, Lehui Science and Technology Innovation Center, No.489 Jihua Road, Bantian Community, Longgang District, Shenzhen, China. 电话/Tel：15240781067　　邮箱/Mail：chenyongqiang@yourealstar.com
生产单位 Manufacturer	东莞市启飞电子科技有限公司 Dongguan QiFei Electronic Technology Co., Ltd. 广东省东莞市清溪镇三中村金腰路 62 号 B 栋 4 楼 / No.62 Jin Yao Road, No. B, 4th Floor, Sanzhong Village, Qingxi Town, Dongguan City, Guangdong Province 电话/Tel：13928450588　邮箱/Mail：3067661529@QQ.com
测试单位 Test Lab	深圳市莱恩瑞斯科技有限公司 / Shenzhen Lionaces Technology Co., Ltd. 广东省深圳市宝安区福海街道和平社区永和路骏丰工业区 B6 栋 301 301, Building B6, Junfeng Industrial Zone, Yonghe Road, Heping Community, Fuhai Street, Baoan District, Shenzhen, Guangdong, China 电话/Tel：0755-28280690　邮箱/Mail：service@lionaces.com 网址/Website: www.lionaces.com

电池信息 Battery Information			
名称 Name	锂离子电池 Li-ion Battery	电池/电芯类别 Battery/Cell Classification	单电芯锂离子电池 Single Cell Li-ion Battery
型号 Type	18650	商标 Trademark	/
额定电压 Normal Voltage	3.7V	额定容量 Rated Capacity	2000mAh
额定能量 Watt-hour rating	7.4Wh	外观 Appearance	蓝色近圆柱体 Approximate Blue Cylinder
质量/Mass	45.7g	锂含量/Li Content	不适用 N/A

测试信息 Test Information					
测试报告编号 Test Report Number	LA2025B2144001U		测试报告签发日期 Date of Test Report	2025-10-21	
测试标准 Edition of UN Manual of Tests and Criteria Used	联合国《试验和标准手册》（第 8 版）38.3 节 UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3				
T.1：高度模拟 Altitude Simulation	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	通过 Pass
T.7：过度充电 Overcharge	通过 Pass	T.8：强制放电 Forced Discharge	通过 Pass	/	
UN38.3.3.1(f)或/or UN38.3.3.2(d)	不适用 N/A		UN38.3.3.1(g) 或/or UN38.3.3.2(e)	不适用 N/A	
备注 Note	/				
签名 Signatory 职务 Title	检验员		签发日期 Issued Date	2025-12-18	