



No.: BL-DG2010011-301



中国认可
国际互认
检测
TESTING
CNAS L6791

UN38.3 检测报告

UN38.3 Test Report

物品名称: 锂电池
Sample name: Lithium Battery

型号规格: VT48100E
Model/ Type: 48V, 100Ah, 4800Wh

申请商: 杭州微慕科技有限公司
Client: Hangzhou Weimu Technology Co., Ltd.

东莞市巴能检测技术有限公司
Dongguan BALUN Testing Technology Co., Ltd.

UN38.3 检测报告 UN38.3 TEST REPORT			
Report Number 报告编号	BL-DG2010011-301		
Applicant's name 委托单位名称	Hangzhou Weimu Technology Co., Ltd. 杭州微慕科技有限公司		
Address..... 地址.....	Floor3, Building 1, Yongle Countryside, Cangqian Street, Yuhang District, Hangzhou, Zhejiang 浙江省杭州市余杭区仓前街道永乐村1幢3楼		
Testing Laboratory..... 测试实验室.....	Dongguan BALUN Testing Technology Co., Ltd. 东莞市巴能检测技术有限公司		
Testing Location 测试地点	Room 104, 204, 205, Building 1, No. 6, Industrial South Road, Songshan Lake District, Dongguan, Guangdong Province, P. R. China 523808 广东省东莞市松山湖园区工业南路6号1栋104、204、205室		
Test method and criterion..... 测试方法和判定标准	ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3		
Date(s) of performance of tests..... 测试时间	2020.01.10 – 2020.01.27		
Name of samples..... 样品名称	Lithium Battery 锂电池	Trade Mark 商标	--
Model..... 型号.....	VT48100E	Ratings: 额定参数	48V, 100Ah, 4800Wh
Apperance 样品外观	Approx. 138(H) x 483(W) x 480(T)(mm), Black prismatic battery. Weight approx. 41.05kg 约138(H) x 483(W) x 480(T)(mm), 黑色方形电池, 重约41.05kg。		
Manufacture's name 制造商名称.....	Hangzhou Weimu Technology Co., Ltd. 杭州微慕科技有限公司		
Manufacture's Address..... 制造商地址.....	Floor3, Building 1, Yongle Countryside, Cangqian Street, Yuhang District, Hangzhou, Zhejiang 浙江省杭州市余杭区仓前街道永乐村1幢3楼		
Name of Factory (ies)..... 生产厂名称.....	Hangzhou Weimu Technology Co., Ltd. 杭州微慕科技有限公司		
Address of Factory (ies) 生产厂地址.....	Floor3, Building 1, Yongle Countryside, Cangqian Street, Yuhang District, Hangzhou, Zhejiang 浙江省杭州市余杭区仓前街道永乐村1幢3楼		
Conclusion 结论.....	The sample has passed the test items of UNITED NATIONS "Recommendations of the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3 经测试, 该样品符合联合国《关于危险货物运输的建议书 试验和标准手册》ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3 标准要求。		
主检 Appraiser: 徐雄峰	审核 Checker: [Signature]	批准 Approver: [Signature]	
日期/Date: 2020.02.24	日期/Date: 2020.02.24	日期/Date: 2020.02.24	



Description and illustration of the sample: 样品说明及描述:	<input checked="" type="checkbox"/> Large cells and batteries	<input type="checkbox"/> Small cells and batteries
	<input type="checkbox"/> Primary cells and batteries	<input checked="" type="checkbox"/> Rechargeable cells and batteries

Parameter 参数	Nominal capacity 额定容量	Nominal voltage 标称电压	Nominal Charge Current 标准充电电流	Nominal Discharge Current 标准放电电流	Maximum Charge Current 最大充电电流	Maximum Discharge Current 最大放电电流	Limited Charge Voltage 充电限制电压	Cut-off Voltage 放电截止电压
Product 成品	100Ah	48V	20A	20A	100A	100A	54V	40V
Cell 电芯	100Ah	3.2V	100A	30A	200A	300A	3.65V	2.5V

Test item 测试项目	Samle No. 样品编号	State 状态	Remark 备注
T1~T5	B01~B02	at first cycle, in fully charged state 一次循环的满电状态;	--
	B03~B04	after twenty five cycles ending in fully charged state 二十五次循环后完全满电状态;	--
T6	C01~C05	at first cycle at 50% of the design rated capacity 一次循环50%满电状态;	--
	C06~C10	after twenty five cycles ending at 50% of the design rated capacity 二十五次循环50%满电状态;	--
T7	B05~B06	at first cycle, in fully charged state 一次循环的满电状态;	--
	B07~B08	after twenty five cycles ending in fully charged state 二十五次循环后完全满电状态;	--
T8	C11~C20	at first cycle, in fully discharged state 一次循环后完全放电状态;	--
	C21~C30	after twenty five cycles ending in fully discharged state 二十五次循环后完全放电状态。	--

Possible test case verdicts:

可能的试验情况判定:

- test case does not apply to the test object 试验样品不适用该条款.....	N/A
- test object does meet the requirement 试验样品满足要求.....	P (Pass)
- test object does not meet the requirement 试验样品不满足要求.....	F (Fail)

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Clause 章节	Requirement 标准要求	Result 测试结果	Verdict 判定
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38.3 Lithium batteries / 锂电池

38.3.4	Procedure / 测试步骤		P
	<p>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.</p> <p>小型电池或电池组应按顺序进行试验T.1至T.5。试验T.6和T.8应使用未另外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。</p>		-
38.3.4.1	Test 1: Altitude simulation / 测试1: 高度模拟		P
	<p>Test procedure / 测试步骤:</p> <p>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.</p> <p>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。</p>		-
	<p>Requirement / 标准要求</p> <p>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.</p> <p>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。</p>	<p>The test results meet the requirements. See table 1.</p> <p>测试结果符合要求。见表1。</p>	P
38.3.4.2	Test 2: Thermal test / 测试2: 热冲击		P
	<p>Test procedure / 测试步骤:</p> <p>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 10 times, 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.</p> <p>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。</p>		-
	<p>Requirement / 标准要求:</p> <p>Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no</p>	<p>The test results meet the requirements. See table 1.</p> <p>测试结果符合要求。见表1。</p>	P

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Clause 章节	Requirement 标准要求	Result 测试结果	Verdict 判定
	<p>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.</p> <p>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。</p>		
38.3.4.3	<p>Test 3: Vibration / 测试3: 振动</p> <p>Test procedure / 测试步骤:</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>For large batteries: from 7 Hz to a peak acceleration of 1gn 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 2gn is then maintained until the frequency is increased to 200 Hz.</p> <p>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。</p> <p>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。</p> <p>对电池和小型电池组：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8gn(频率约为50赫兹)。将最大加速度保持在8gn直到频率增加到200赫兹。</p> <p>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2gn(频率约为25赫兹)。将最大加速度保持在2gn直到频率增加到200赫兹。</p>		P
	<p>Requirement / 标准要求:</p> <p>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</p>	<p>The test results meet the requirements. See table 1. 测试结果符合要求。见表1。</p>	P

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Clause 章节	Requirement 标准要求	Result 测试结果	Verdict 判定
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procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

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。

Test 4: Shock / 测试4: 冲击

P

Test procedure / 测试步骤:

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

38.3.4.4

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

* Mass is expressed in kilograms.

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 g_n 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 g_n 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。

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。

Requirement / 标准要求:

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no

The test results meet the requirements. See table 1.
测试结果符合要求。见表1。

P

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Clause 章节	Requirement 标准要求	Result 测试结果	Verdict 判定
	<p>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.</p> <p>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。</p>		
<p>38.3.4.5</p>	<p>Test 5: External short circuit / 测试5: 外部短路</p> <p>Test procedure / 测试步骤:</p> <p>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 °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.</p> <p>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.</p> <p>The short circuit and cooling down phases shall be conducted at least at ambient temperature.</p> <p>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。</p> <p>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到试验中所观察的的最高温升幅的二分之一并保持低于该数值。</p> <p>短路和降温阶段的温度应至少相当于环境温度。</p>		<p>P</p>
	<p>Requirement / 标准要求:</p> <p>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 within six hours after this test.</p> <p>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。</p>	<p>The test results meet the requirements. See table 1. 测试结果符合要求。见表1。</p>	<p>P</p>
<p>38.3.4.6</p>	<p>Test 6: Impact / Crush / 测试6: 撞击 / 挤压</p> <p>Test procedure / 测试步骤:</p> <p>Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)</p>		<p>P</p>

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	<p><i>NOTE: Diameter here refers to the design parameter (for example the diameter of 18650 cells is 18.0 mm).</i></p> <p>The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.</p> <p>The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact.</p> <p>撞击(适用于直径不小于18.0毫米的圆柱形电池)</p> <p>备注: 这里的直径指的是设计参数 (如18650电芯的直径是18.0mm)。</p> <p>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。</p> <p>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。</p>	
	<p>Test procedure / 测试步骤:</p> <p>Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)</p> <p><i>NOTE: Diameter here refers to the design parameter (for example the diameter of 18650 cells is 18.0 mm).</i></p> <p>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.</p> <p>(a) The applied force reaches 13 kN ± 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.</p> <p>(b) The voltage of the cell drops by at least 100 mV; or</p> <p>(c) The cell is deformed by 50% or more of its original thickness.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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)</p> <p>备注: 这里的直径指的是设计参数 (如18650电芯的直径是18.0mm)。</p> <p>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:</p>	

ST/SG/AC.10/11/Rev.6/ Amend.1 Section 38.3

Clause 章节	Requirement 标准要求	Result 测试结果	Verdict 判定
	<p>(a) 施加到电芯上的压力达到13 kN ± 0.78 kN;</p> <p>(b) 电芯电压下降至少100mV; 或</p> <p>(c) 电芯形变与原电芯相比变化50%或以上。</p> <p>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。</p> <p>棱柱形或袋装电芯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。</p> <p>每个样品只经受一次挤压。试验后样品应再观察6个小时, 试验应使用之前未做过其他试验的电池或元件电池进行。</p>		
	<p>Requirement / 标准要求:</p> <p>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.</p> <p>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。</p>	<p>The test results meet the requirements. See table 2. 测试结果符合要求。见表2。</p> <p><input checked="" type="checkbox"/> 挤压 Crush</p> <p><input type="checkbox"/> 撞击 Impact</p>	P
38.3.4.7	<p>Test 7: Overcharge / 测试7: 过充电</p> <p>Test procedure / 测试步骤:</p> <p>The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:</p> <p>(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.</p> <p>(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.</p> <p>Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.</p> <p>充电电流应是制造商建议的最大连续充电电流的两倍。最小试验电压应满足如下所述:</p> <p>(a) 制造商建议的充电电压不大于18V时, 最小试验电压应是电池最大充电电压的2倍或22V两者中的较小值。</p> <p>(b) 制造商建议的充电电压大于18伏特时, 最小试验电压应是最大充电电压的1.2倍。</p> <p>试验应在环境温度下进行。进行试验的时间应为24小时。</p>		P
	<p>Requirement / 标准要求:</p> <p>Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.</p> <p>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。</p>	<p>The test results meet the requirements. See table 3. 测试结果符合要求。见表3。</p>	P
38.3.4.8	<p>Test 8: Forced discharge / 测试8: 强制放电</p> <p>Test procedure / 测试步骤:</p> <p>Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum</p>		P

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Clause 章节	Requirement 标准要求	Result 测试结果	Verdict 判定
	<p>discharge current specified by the manufacturer.</p> <p>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).</p> <p>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。</p> <p>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)。</p>		
	<p>Requirement / 标准要求:</p> <p>Primary or rechargeable cells meet this requirement if there is no disassembly and no fire within seven days of the test.</p> <p>原电池或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。</p>	<p>The test results meet the requirements. See table 4.</p> <p>测试结果符合要求。见表4。</p>	<p>P</p>

检测结果/ Results of Test

Table:1 T1-T5 / 表1: 试验1-试验5											P
Sample NO. 样品 序号	Mass prior to test / 试验前质量 (kg)	OCV prior to test / 试验前电压 (V)	Test 1: Altitude simulation 测试1: 高度模拟		Test 2: Thermal test 测试2: 热冲击		Test 3: Vibration 测试3: 振动		Test 4: Shock 测试4: 冲击		Test 5: External Short Circuit 测试5: 外部短路
			Mass loss 质量损失 (%)	Change ratio 电压比 (%)	Mass loss 质量损失 (%)	Change ratio 电压比 (%)	Mass loss 质量损失 (%)	Change ratio 电压比 (%)	Mass loss 质量损失 (%)	Change ratio 电压比 (%)	Max. Temp. 最高温度 (°C)
B01	41.05	50.09	0.024	99.98	0.049	99.60	0.000	99.98	0.024	99.98	57.5
B02	41.00	50.04	0.000	100.00	0.049	99.44	0.000	100.00	0.000	100.00	57.0
B03	41.03	50.12	0.000	99.98	0.024	99.60	0.024	99.98	0.000	99.98	57.2
B04	41.00	50.08	0.000	100.00	0.049	99.50	0.000	99.98	0.024	100.00	56.7

Remark: / 备注:
 Test 1-Test 4: No leakage, No venting, No disassembly, No rupture and no fire; Mass loss <0.1%.
 测试1-测试4: 无漏液、无排气、无解体、无破裂以及无着火现象; 质量损失小于0.1%。
 Test 5: no disassembly, no rupture and no fire; external temperature does not exceed 170 °C.
 测试5: 无解体、无破裂和无起火现象; 表面温度不超过170 °C。

Table2: T6 / 表2 试验6			<input type="checkbox"/> Impact / 撞击	<input checked="" type="checkbox"/> Crush / 挤压	P
Sample No, 样品编号	OCV Prior to test (V) 试验前电压	External Peak temperature(°C) 表面最高温度(°C)		Results 结果	
C01	3.302	26.5		P	
C02	3.303	26.0		P	
C03	3.286	26.4		P	
C04	3.308	25.8		P	
C05	3.302	26.5		P	
C06	3.304	26.8		P	
C07	3.306	25.9		P	
C08	3.291	26.4		P	
C09	3.297	26.4		P	
C10	3.306	26.0		P	

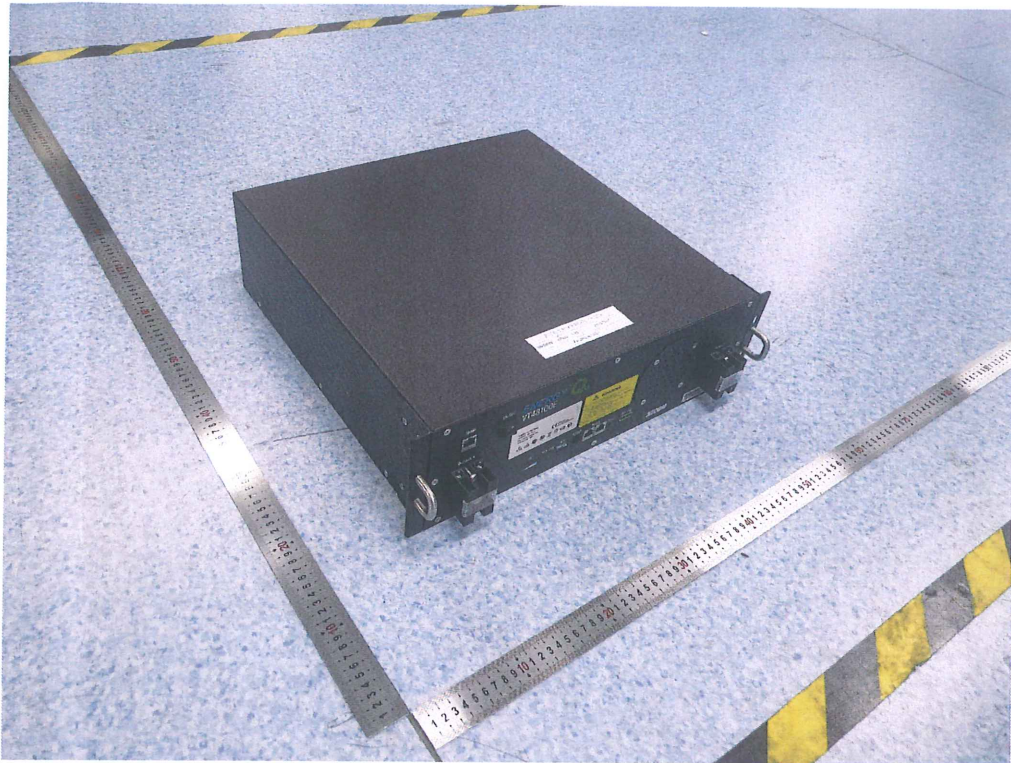
Remark: / 备注:
 No disassembly, no rupture and no fire; external temperature does not exceed 170 °C.
 无解体、无破裂和无起火现象; 表面温度不超过170 °C。

检测结果/ Results of Test

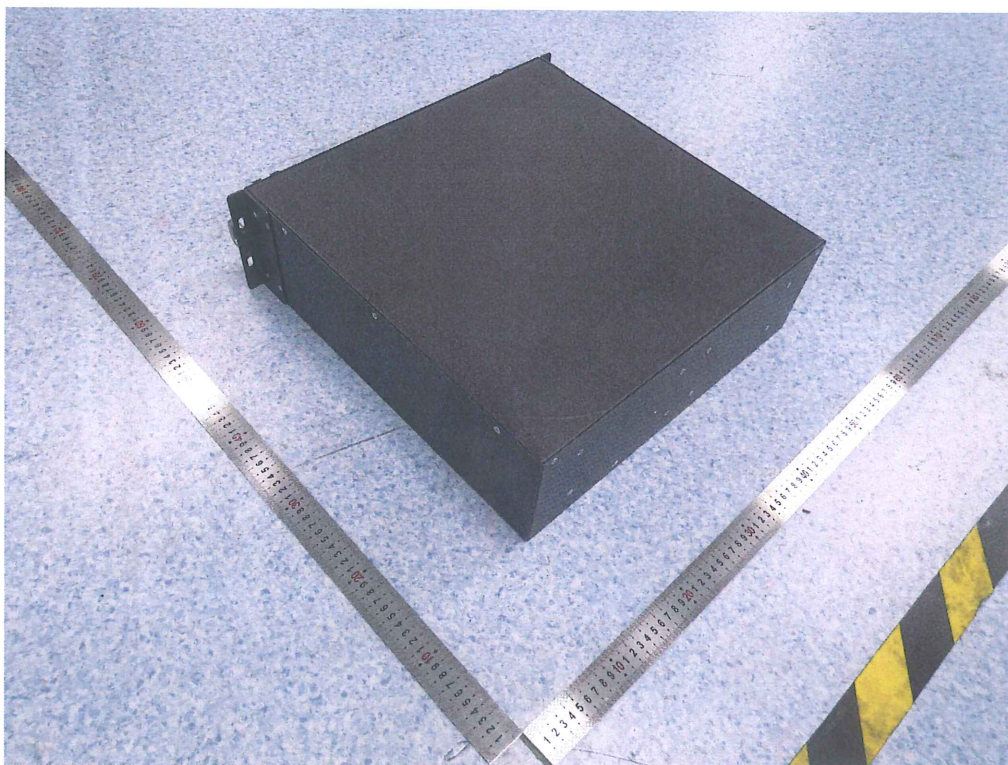
Table3: T7 Overcharge / 表3: 测试7 过充电				P
Charge voltage / 充电电压 (V)		64.8	Charge current / 充电电流 (A)	200
Sample NO. 样品序号	OCV Prior to test (V) 试验前电压 (V)	Phenomenon 现象		Results 结果
B05	13.65	No disassembly, no fire / 无解体, 无着火		P
B06	13.61	No disassembly, no fire / 无解体, 无着火		P
B07	13.65	No disassembly, no fire / 无解体, 无着火		P
B08	13.66	No disassembly, no fire / 无解体, 无着火		P

Table4: T8 Forced discharge / 表4: 测试8 强制放电		P
Sample NO. 样品序号	Phenomenon / 现象	Results 结果
C11	No disassembly, no fire / 无解体, 无着火	P
C12	No disassembly, no fire / 无解体, 无着火	P
C13	No disassembly, no fire / 无解体, 无着火	P
C14	No disassembly, no fire / 无解体, 无着火	P
C15	No disassembly, no fire / 无解体, 无着火	P
C16	No disassembly, no fire / 无解体, 无着火	P
C17	No disassembly, no fire / 无解体, 无着火	P
C18	No disassembly, no fire / 无解体, 无着火	P
C19	No disassembly, no fire / 无解体, 无着火	P
C20	No disassembly, no fire / 无解体, 无着火	P
C21	No disassembly, no fire / 无解体, 无着火	P
C22	No disassembly, no fire / 无解体, 无着火	P
C23	No disassembly, no fire / 无解体, 无着火	P
C24	No disassembly, no fire / 无解体, 无着火	P
C25	No disassembly, no fire / 无解体, 无着火	P
C26	No disassembly, no fire / 无解体, 无着火	P
C27	No disassembly, no fire / 无解体, 无着火	P
C28	No disassembly, no fire / 无解体, 无着火	P
C29	No disassembly, no fire / 无解体, 无着火	P
C30	No disassembly, no fire / 无解体, 无着火	P

样品图片/ Photos of Sample

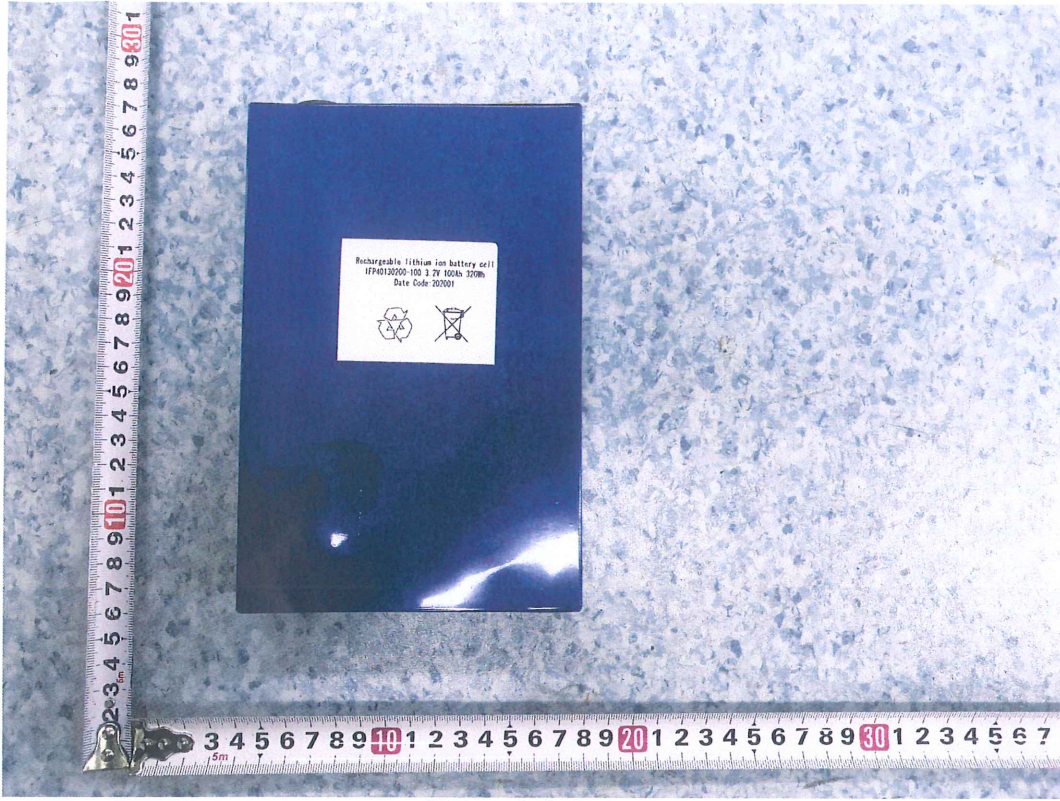


Picture 1 Front view of battery
图1 电池正面



Picture 2 Back view of battery
图2 电池反面

样品图片/ Photos of Sample



Picture 3 Cell view

图3 电芯照



Picture 4 Battery Label

图4 电池标签

声明

1. 本实验室是经过中国合格评定国家认可委员会认可的检测实验室，证书号：L6791。

The Laboratory has met the requirements of the CNAS Accreditation Criteria, The accreditation certificate number is L6791.

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The test report is invalid without the "Special detection stamp".

3. 报告无检测、批准人员签字无效。

The report is invalid without the signatures of testing engineer and Ratifier.

4. 报告涂改无效。

The test report is invalid if altered.

5. 本报告仅对送检样品有效。

The test report is valid for the tested samples only.

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