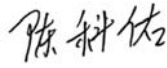



# UN38.3 Test Report

## UN38.3 测试报告

Report No.: 报告编号:	SZ1231103-64996E-SF-01
Applicant: 申请商:	Shenzhen Youmi Intelligent Technology Co., Ltd 深圳优米智能科技有限公司
Address: 地址:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road Nanshan District, Shenzhen China 深圳南山区塘岭路 1 号金琪智谷大厦四楼 406-407
Manufacturer: 制造商:	Shenzhenshi jiuliyuan electronic technology co., LTD. 深圳市玖利源电子科技有限公司
Address: 地址:	201, Jiuli Yuan Factory, Building A, No. 470, Pingshan Jinbi Road, Biling Community, Biling Street, Pingshan District, Shenzhen, China. 深圳市坪山区碧岭社区碧岭金碧路 470 号玖利源厂 201
Factory: 工厂:	Shenzhenshi jiuliyuan electronic technology co., LTD. 深圳市玖利源电子科技有限公司
Address: 地址:	201, Jiuli Yuan Factory, Building A, No. 470, Pingshan Jinbi Road, Biling Community, Biling Street, Pingshan District, Shenzhen, China. 深圳市坪山区碧岭社区碧岭金碧路 470 号玖利源厂 201
Sample name: 样品名称:	Li-ion Polymer Battery 聚合物锂离子电池
Model: 型号:	BL616
Date of issue: 签发日期:	2024-01-04

Testing Laboratory: 测试实验室:	Bay Area Compliance Laboratories Corp.(Dongguan) 倍科质量技术服务（东莞）有限公司	
Address: 地址:	No.12, Pulong East 1st Road,Tangxia, Dongguan, Guangdong, China 广东省东莞市塘厦镇浦龙东一路12号	
Testing Location: 测试地址:	Room 301, No. 113 Pingkang Road, Dalang Town,Dongguan,Guangdong, China 广东省东莞市大朗镇屏康路113号301室	
Test Methods: 测试方法:	UN " Manual of Tests and Criteria " ST/SG/AC.10/11/Rev.7/Amend 1/ Subsection 38.3 联合国《试验和标准手册》（第7版修订1）38.3节	
Date of Sample Received: 样品接收日期:	Nov. 06, 2023 2023年11月06日	
Date of Test: 测试日期:	Nov. 06, 2023 to Nov.29, 2023 2023年11月06日至2023年11月29日	
Test Conclusion: 测试结论:	The sample has passed the test items of UN " Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7/Amend1/ Subsection 38.3. 经测试，样品符合联合国《试验和标准手册》（第7版修订1）38.3节 标准 要求。	
Tested by: 测试:	陈科佑	
Reviewed by: 审核:	代欣	
Approved by: 批准:	杨明军	

## 1、Sample Information 样品信息

Sample Model 样品型号	BL616	Rated Capacity 额定容量	5000mAh/19.35Wh
Nominal Voltage 标称电压	3.87V	Limited Charge Voltage 充电限制电压	4.45V
Standard Charge Current 标准充电电流	1000mA	Maximum Charge Current 最大充电电流	4500mA
Standard Discharge Current 标准放电电流	1000mA	Maximum Discharge Current 最大放电电流	4500mA
Cell Shape 电芯形状	Prismatic 棱形	Cell Number 内含电芯数量	1pcs
Cell Model 电芯型号	456591	Discharge Cut-off Voltage 放电截止电压	3.0V

## 2、Conclusion 总结

Standard 标准	Sample number 样品编号	Test Item 测试项目	Conclusion 结论
UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7/ Amend 1/ Subsection 38.3 联合国《试验和标准手册》 (第7版修订1) 38.3节	B01-B05, B06-B10	Altitude simulation 高度模拟	Pass 合格
		Thermal test 温度试验	Pass 合格
		Vibration 振动	Pass 合格
		Shock 冲击	Pass 合格
		External short circuit 外部短路	Pass 合格
	C01-C05,C06-C10	Crush 挤压	Pass 合格
	B11-B14, B15-B18	Overcharge 过度充电	Pass 合格
	C11-C20,C21-C30	Forced discharge 强制放电	Pass 合格

### Possible test case Verdicts:

报告中可能用到的结论标识:

Test case does not apply to the test object.....:	N/A
测试项目不适用于该产品:	不适用
Test item does meet the requirement.....:	Pass
测试项目符合标准的要求:	合格
Test item does not meet the requirement.....:	Fail
测试项目不符合标准的要求:	不合格

### 3、Main Test Equipment 主要测试设备

Instrument Name 仪器名称	No. 编号	Model	Due Date 校准有效期
Low Pressure Chamber 低压高空模拟试验箱	T-08-BT001	GX-3020-Z50	2024/10/15
Vibration Test Machine 振动试验机	T-08-BT012	ES-10-240	2024/03/15
Hydraulic Shock Test Machine 液压冲击试验机	T-08-BT013	SKT30	2024/03/15
Digital Multimeter 数字万用表	T-08-BT017	15B+	2024/10/15
Multi-channel Temperature Tester 多路温度测试仪	T-08-BT025	TWC-2A	2024/10/15
Electronic Balance 电子天平	T-08-BT027	JCS-W	2024/10/12
Battery Charge-Discharge Testing System 电池充放电测试系统	T-08-BT028	CT-4008-5V6A-S1	2024/10/15
DC Electronic load 直流电子负载	T-08-BT030	IT8511A+	2024/10/15
DC Power Supply 直流稳压电源	T-08-BT031	QJ3005N	2024/10/15
DC Power Supply 直流稳压电源	T-08-BT032	QJ3005N	2024/10/15
DC Power Supply 直流稳压电源	T-08-BT033	QJ3005N	2024/10/15
High-Low Temperayure short-circuit Tester 高低温电池短路试验机	T-08-BT037	GX-6055-B5HL	2024/10/15
Battery Charge-Discharge Testing System 电池充放电测试系统	T-08-BT038	CT-4008-5V6A-S1	2024/10/15
Multi-channel Temperature Tester 多路温度测试仪	T-08-BT039	TWC-2A	2024/10/15
Battery Charge-Discharge Testing System 电池充放电测试系统	T-08-BT041	CT-4008Tn-5V6A-S1	2024/10/15
Battery Charge-Discharge Testing System 电池充放电测试系统	T-08-BT043	CT-4008-10V6A-A	2024/10/15
DC Electronic load 直流电子负载	T-08-BT046	IT8510	2024/03/14
High-low Temperature Test Chamber 高低温试验箱	T-08-BT049	BTH-150-40	2024/07/26
Battery External short-circuit Test Device 电池外部短路测试装置	T-08-BT050	ANB61032-80	2024/10/15

Note:The test data was only valid for the test sample(s).This test report is prepared for the customer shown above and for the specific product described herein.It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

#### 4、 Test Method and Data 测试方法和数据

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.

必须用相同的电芯或电池按照顺序进行试验1到试验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。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.

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电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的90%。有关电压的要求不适用于完全放电状态的电池和电池组。

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

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

质量损失依照如下公式计算:

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

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".

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”。

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

## Test T.1: Altitude simulation 高度模拟

### Test procedure 试验程序

Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hours at ambient temperature (20±5)°C.

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℃)下存放至少6小时。

### Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

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。

The state of sample 样品状态	No. 编号	Before the test测试前		After the test测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Test result 测试结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Fully charged state after first cycle 第一个充放电周期完全充电状态	B01	64.668	4.396	64.668	4.395	0.00	0.02	PASS/合格
	B02	65.125	4.398	65.122	4.398	0.00	0.00	PASS/合格
	B03	64.677	4.398	64.675	4.398	0.00	0.00	PASS/合格
	B04	64.765	4.397	64.762	4.397	0.00	0.00	PASS/合格
	B05	64.445	4.398	64.445	4.398	0.00	0.00	PASS/合格
Fully charged state after 25 cycles 二十五个充放电周期后完全充电状态	B06	65.141	4.399	65.139	4.398	0.00	0.02	PASS/合格
	B07	64.728	4.396	64.726	4.396	0.00	0.00	PASS/合格
	B08	64.316	4.395	64.314	4.395	0.00	0.00	PASS/合格
	B09	64.578	4.397	64.577	4.397	0.00	0.00	PASS/合格
	B10	64.538	4.397	64.536	4.397	0.00	0.00	PASS/合格

## Test T.2: Thermal test 温度试验

### Test procedure 试验程序

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.

试验电池和电池组应先在试验温度等于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。

### Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

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。

The state of sample 样品状态	No. 编号	Before the test测试前		After the test测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Test result 测试结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Fully charged state after first cycle 第一个充放电周期完全充电状态	B01	64.668	4.395	64.642	4.317	0.04	1.77	PASS/合格
	B02	65.122	4.398	65.105	4.315	0.03	1.89	PASS/合格
	B03	64.675	4.398	64.653	4.320	0.03	1.77	PASS/合格
	B04	64.762	4.397	64.738	4.319	0.04	1.77	PASS/合格
	B05	64.445	4.398	64.426	4.321	0.03	1.75	PASS/合格
Fully charged state after 25 cycles 二十五个充放电周期后完全充电状态	B06	65.139	4.398	65.115	4.320	0.04	1.77	PASS/合格
	B07	64.726	4.396	64.708	4.315	0.03	1.84	PASS/合格
	B08	64.314	4.395	64.295	4.318	0.03	1.75	PASS/合格
	B09	64.577	4.397	64.551	4.316	0.04	1.84	PASS/合格
	B10	64.536	4.397	64.514	4.323	0.03	1.68	PASS/合格

### Test T.3: Vibration 振动

#### Test procedure 试验程序

1. 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.

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。

2. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7Hz and 200Hz and back to 7Hz traversed in 15minutes. This cycle repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell. One of the directions of vibration must be perpendicular to the terminal face.

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。

3. For cells and small batteries: from 7Hz a peak acceleration of 1g<sub>n</sub> is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8g<sub>n</sub> occurs (approximately 50Hz), A peak acceleration of 8 g<sub>n</sub> is then maintained until the frequency is increased to 200Hz. For large batteries: from 7Hz a peak acceleration of 1gn is

Note:The test data was only valid for the test sample(s).This test report is prepared for the customer shown above and for the specific product described herein.It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).



maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of  $2g_n$  occurs (approximately 25Hz), A peak acceleration of  $2g_n$  is then maintained until the frequency is increased to 200Hz.

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。对大型电池组: 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 $2g_n$  (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。

### Requirement 要求

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.

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。

The state of sample 样品状态	No. 编号	Before the test测试前		After the test测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Test result 测试结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Fully charged state after first cycle 第一个充放电周期完全充电状态	B01	64.642	4.317	64.640	4.317	0.00	0.00	PASS/合格
	B02	65.105	4.315	65.102	4.315	0.00	0.00	PASS/合格
	B03	64.653	4.320	64.650	4.318	0.00	0.05	PASS/合格
	B04	64.738	4.319	64.735	4.319	0.00	0.00	PASS/合格
	B05	64.426	4.321	64.423	4.321	0.00	0.00	PASS/合格
Fully charged state after 25 cycles 二十五个充放电周期后完全充电状态	B06	65.115	4.320	65.112	4.319	0.00	0.02	PASS/合格
	B07	64.708	4.315	64.705	4.315	0.00	0.00	PASS/合格
	B08	64.295	4.318	64.293	4.317	0.00	0.02	PASS/合格
	B09	64.551	4.316	64.548	4.316	0.00	0.00	PASS/合格
	B10	64.514	4.323	64.512	4.322	0.00	0.02	PASS/合格

### Test T.4: Shock 冲击

#### Test procedure 试验程序

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

试验电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。

2. 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.

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).



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

3. 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 acceleration.

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。

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g <sub>n</sub> or result of formula	6 ms
	$Acceleration(g_n) = \sqrt{\frac{100850}{mass^a}}$ whichever is smaller	
Large batteries	50 g <sub>n</sub> or result of formula	11 ms
	$Acceleration(g_n) = \sqrt{\frac{30000}{mass^a}}$ whichever is smaller	

<sup>a</sup> Mass is expressed in kilograms.

4. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

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 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

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。

The state of sample 样品状态	No. 编号	Before the test测试前		After the test测试后		Mass loss 质量损失 (%)	Voltage loss 电压损失 (%)	Test result 测试结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Fully charged state after first cycle 第一个充放电周期完全充电状态	B01	64.640	4.317	64.638	4.317	0.00	0.00	PASS/合格
	B02	65.102	4.315	65.102	4.315	0.00	0.00	PASS/合格
	B03	64.650	4.318	64.649	4.318	0.00	0.00	PASS/合格
	B04	64.735	4.319	64.734	4.319	0.00	0.00	PASS/合格
	B05	64.423	4.321	64.421	4.321	0.00	0.00	PASS/合格

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

Fully charged state after 25 cycles 二十五个充放电周期后完全充电状态	B06	65.112	4.319	65.110	4.319	0.00	0.00	PASS/合格
	B07	64.705	4.315	64.705	4.315	0.00	0.00	PASS/合格
	B08	64.293	4.317	64.292	4.317	0.00	0.00	PASS/合格
	B09	64.548	4.316	64.545	4.316	0.00	0.00	PASS/合格
	B10	64.512	4.322	64.512	4.322	0.00	0.00	PASS/合格

### Test T.5: External short circuit 外部短路

#### Test procedure 试验程序

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of  $57\pm 4^{\circ}\text{C}$ , 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  $57\pm 4^{\circ}\text{C}$  shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

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  $57 \pm 4^{\circ}\text{C}$ 。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  $57\pm 4^{\circ}\text{C}$  条件下经受总外电阻小于0.1欧姆的短路条件。

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to  $(57\pm 4)^{\circ}\text{C}$ , 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.

这一短路条件应在电池或电池组外壳温度回到  $57\pm 4^{\circ}\text{C}$  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到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。

#### Requirement 要求

Cells and batteries meet this requirement if their external temperature does not exceed  $170^{\circ}\text{C}$  and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

如果外壳温度不超过  $170^{\circ}\text{C}$ , 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 state of sample 样品状态	No. 编号	Sample Peak Temperature( $^{\circ}\text{C}$ ) 样品表面最高温度	Test result 测试结果
Fully charged state after first cycle 第一个充放电周期完全充电状态	B01	57.3	PASS/合格
	B02	57.1	PASS/合格
	B03	57.2	PASS/合格
	B04	56.9	PASS/合格
	B05	56.7	PASS/合格

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

Fully charged state after 25 cycles 二十五个充放电周期后完全充电状态	B06	57.4	PASS/合格
	B07	57.1	PASS/合格
	B08	56.5	PASS/合格
	B09	57.1	PASS/合格
	B10	57.2	PASS/合格

**Test T.6: Impact /Crush (applicable to cylindrical cells not less than 18.0mm in diameter) / Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0mm in diameter) 撞击(适用于直径不小于18.0mm的圆柱形电池)/ 挤压(适用于棱形、袋状、硬币/纽扣电芯和直径小于18.0mm的圆柱形电芯)**

**Test procedure 试验程序– Impact 撞击**

The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm±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 9.1kg±0.1kg mass is to be dropped from a height of 61±2.5cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

试样电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。

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm±0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

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。

**Test procedure 试验程序– Crush 挤压**

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 13kN±0.78kN;

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

(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.

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.

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±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。

### Requirement 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.

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。

Test Item 检测项目	The state of sample 样品状态	No. 编号	Sample Peak temperature (°C) 样品表面最高温度	Test result 测试结果
Crush 挤压	The 50% design rated capacity after at first cycle 第一个充放电周期50%设计额定容量状态	C01	24.3	PASS/合格
		C02	24.4	PASS/合格
		C03	23.6	PASS/合格
		C04	23.8	PASS/合格
		C05	25.2	PASS/合格
	The 50% design rated capacity after 25 cycles 二十五个充放电周期后50%设计额定容量状态	C06	24.1	PASS/合格
		C07	24.8	PASS/合格
		C08	23.6	PASS/合格
		C09	24.3	PASS/合格
		C10	25.1	PASS/合格

### Test T.7: Overcharge 过度充电

#### Test procedure 试验程序

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.

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：

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

(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。

#### Requirement 要求

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

充电电池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 state of sample 样品状态	No. 编号	Test result 测试结果
Fully charged state after first cycle 第一个充放电周期完全 充电状态	B11	PASS/合格
	B12	PASS/合格
	B13	PASS/合格
	B14	PASS/合格
Fully charged state after 25 cycles 二十五个充放电周期后 完全充电状态	B15	PASS/合格
	B16	PASS/合格
	B17	PASS/合格
	B18	PASS/合格

#### Test T.8: Forced discharge 强制放电

##### Test procedure 试验程序

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).

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)。

##### Requirement 要求

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

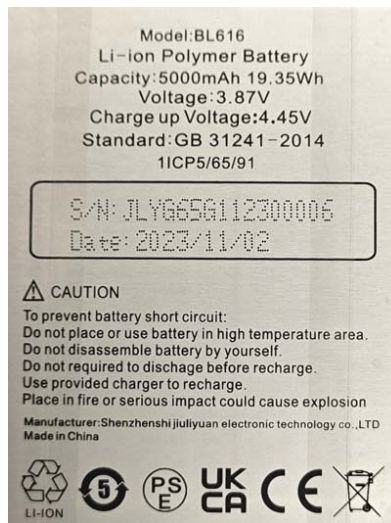
原电池或充电电池如在试验过程中和试验后7天内无解体，无起火，即符合本项要求。

The state of sample 样品状态	No. 编号	Test result 测试结果
Fully discharged state after first cycle 第一个充放电周期完全放电状态	C11	PASS/合格
	C12	PASS/合格
	C13	PASS/合格
	C14	PASS/合格
	C15	PASS/合格
	C16	PASS/合格
	C17	PASS/合格
	C18	PASS/合格
	C19	PASS/合格
	C20	PASS/合格
Fully discharged state after 25 cycles 二十五个充放电周期完全放电状态	C21	PASS/合格
	C22	PASS/合格
	C23	PASS/合格
	C24	PASS/合格
	C25	PASS/合格
	C26	PASS/合格
	C27	PASS/合格
	C28	PASS/合格
	C29	PASS/合格
	C30	PASS/合格

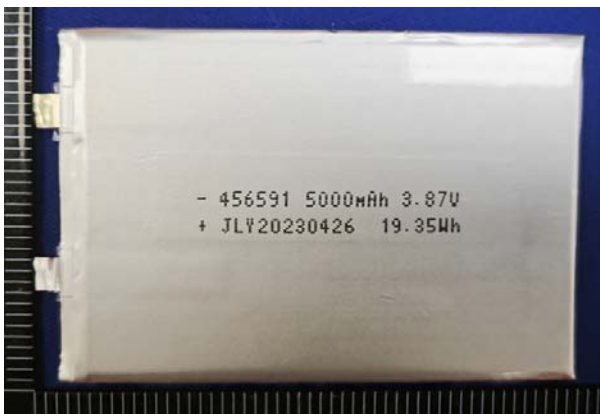


## 5、Sample Photos 样品照片

### Battery 电池



### Cell 电芯



Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

# Important Notice

## 注意事项

- 1.The test report is invalid without the signature of test person, reviewer.  
本报告无测试人员、审核人员签名无效。
- 2.This report cannot be reproduced except in full, without prior written approval of the Company.  
除全文复制外, 未经实验室批准不得部分复印报告。
- 3.The test report is invalid if illegal transfer, altered or tampering in any media form.  
本报告私自转让、涂改或以任何媒体形式篡改无效。
- 4.Objections to the test report must be submitted to lab within 7 days.  
对检测报告若有异议, 应于收到报告之日起七天内向检测单位提出。
- 5.The test report is valid for the tested sample only.  
本报告仅对测试样品有效。
- 6.The customer should provide samples and relevant information, otherwise we will not bear any related responsibilities.  
客户必须如实提供样品及资料, 否则本单位不承担任何相关责任。
- 7.Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.  
除非申请商要求或产品法规另有规定, 否则本报告判定规则不考虑不确定度。
- 8.The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.  
本报告给出的扩展不确定度是由合成标准不确定度乘以包含概率约为95%时对应的包含因子k得到的。
- 9.本报告中的数据结果用于学习、研究、内部质量控制、产品研发、科研, 教学等目的。

**\*\*\*\*\*End of Report 报告结束\*\*\*\*\***