



中国认可  
国际互认  
检测  
TESTING  
CNAS L6957

报告编号 (Report No.) : S-24120437A0

# UN38.3检测报告

## UN38.3 TEST REPORT

NAME OF SAMPLE: Rechargeable Li-ion Polymer Battery  
产品名称: 锂离子聚合物电池

CLIENT: SUNWODA Electronic Co.,Ltd.  
委托单位: 欣旺达电子股份有限公司

CLASSIFICATION OF TEST: Commission test  
检测类别: 委托测试

深圳普瑞赛思检测科技股份有限公司  
**Shenzhen Precise Testing Technology Co., Ltd.**



# 深圳普瑞赛思检测科技股份有限公司

Shenzhen Precise Testing Technology Co., Ltd

Report No.: S-24120437A0

Page 2 of 15

## Applicant information

### 申请资料

|                                   |                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of samples:<br>样品名称:         | Rechargeable Li-ion Polymer Battery<br>锂离子聚合物电池                                                                                                                                                                                                                                                                                                             |
| Type/ Model:<br>型号规格:             | HB476594EGW-A 3.89V 5100mAh 19.84Wh                                                                                                                                                                                                                                                                                                                         |
| Lithium content:<br>锂含量:          | —                                                                                                                                                                                                                                                                                                                                                           |
| Trade mark:<br>商标:                | —                                                                                                                                                                                                                                                                                                                                                           |
| Commission by:<br>委托单位:           | SUNWODA Electronic Co.,Ltd.<br>欣旺达电子股份有限公司                                                                                                                                                                                                                                                                                                                  |
| Commissioner address:<br>委托单位地址:  | Floor 1,A,B,D District of Floor 2 and Floor 3 to 9 of Comprehensive Building, No.2 Yihe Road, Shilong Community, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, P.R. China深圳市宝安区石岩街道石龙社区颐和路2号综合楼1楼、2楼A-B区、2楼D区-9楼                                                                                                                       |
| Manufacturer:<br>生产单位:            | Shenzhen Sunwoda Intelligence Technology Co., Ltd.<br>深圳欣旺达智能科技有限公司                                                                                                                                                                                                                                                                                         |
| Manufacturer address:<br>生产单位地址:  | Floor 1 to 5 of Building A & E, Floor 1 to 4 of Building D, Floor 5 of Building B, Floor 1&2&4&5 of Building F, Tongfukang Shuitian Industrial Zone, Changcheng Road, Shuitian Community, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, P.R. China广东省深圳市宝安区石岩街道水田社区长城路同富康水田工业区A栋厂房一层-五层, D栋厂房一层-四层, E栋厂房一层-五层, B栋厂房五层, F栋厂房一层、二层、四层、五层 |
| Appearance:<br>样品外观颜色:            | Black<br>黑色                                                                                                                                                                                                                                                                                                                                                 |
| Sample Type<br>样品类型               | Rechargeable Li Polymer Single Cell Battery<br>可充式锂聚合物单电芯电池                                                                                                                                                                                                                                                                                                 |
| Sample status:<br>样品状态:           | Good<br>完好                                                                                                                                                                                                                                                                                                                                                  |
| Quantity of sample:<br>样品数量:      | 48pcs                                                                                                                                                                                                                                                                                                                                                       |
| Sample identification:<br>样品标识序号: | c1#-c48#                                                                                                                                                                                                                                                                                                                                                    |
| Receiving date:<br>接样日期:          | 2024-12-12                                                                                                                                                                                                                                                                                                                                                  |
| Testing date:<br>测试开始日期:          | 2024-12-14                                                                                                                                                                                                                                                                                                                                                  |
| Completing date:<br>测试完成日期:       | 2024-12-25                                                                                                                                                                                                                                                                                                                                                  |

### Conclusion/结论:

The submitted samples comply with the requirements of UNITED NATIONS Section 38.3 of the Eighth revised edition of the Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria(ST/SG/AC.10/11/Rev.8/Section 38.3)

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》第八修订版第38.3节的要求。

Seal/报告专用章:

Date of issue: 2025-01-02

Prepared by:

报告编写:

苏宏伟

Reviewed by:

报告审核:

莫明

Approved by:

报告批准:

郭德力

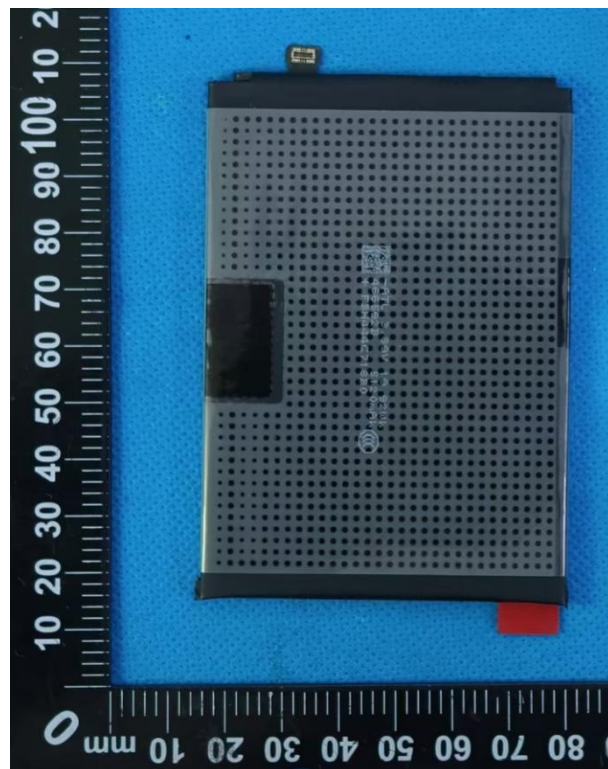


| Test Conclusion测试结论 |                                |                     |                    |
|---------------------|--------------------------------|---------------------|--------------------|
| No.<br>序号           | Name of test<br>测试项目名称         | Test result<br>测试结果 | Conclusion<br>本项结论 |
| 1                   | Altitude simulation<br>高度模拟    | See Appendix 1      | P                  |
| 2                   | Thermal test<br>温度测试           | See Appendix 2      | P                  |
| 3                   | Vibration<br>振动                | See Appendix 3      | P                  |
| 4                   | Shock<br>冲击                    | See Appendix 4      | P                  |
| 5                   | External Short-circuit<br>外部短路 | See Appendix 5      | P                  |
| 6                   | Crush<br>挤压                    | See Appendix 6      | P                  |
|                     | Impact<br>撞击                   | See Appendix 6      | N/A                |
| 7                   | Overcharge<br>过度充电             | See Appendix 7      | P                  |
| 8                   | Forced discharge<br>强制放电       | See Appendix 8      | P                  |

Photos of samples and markings

样品及标识照片

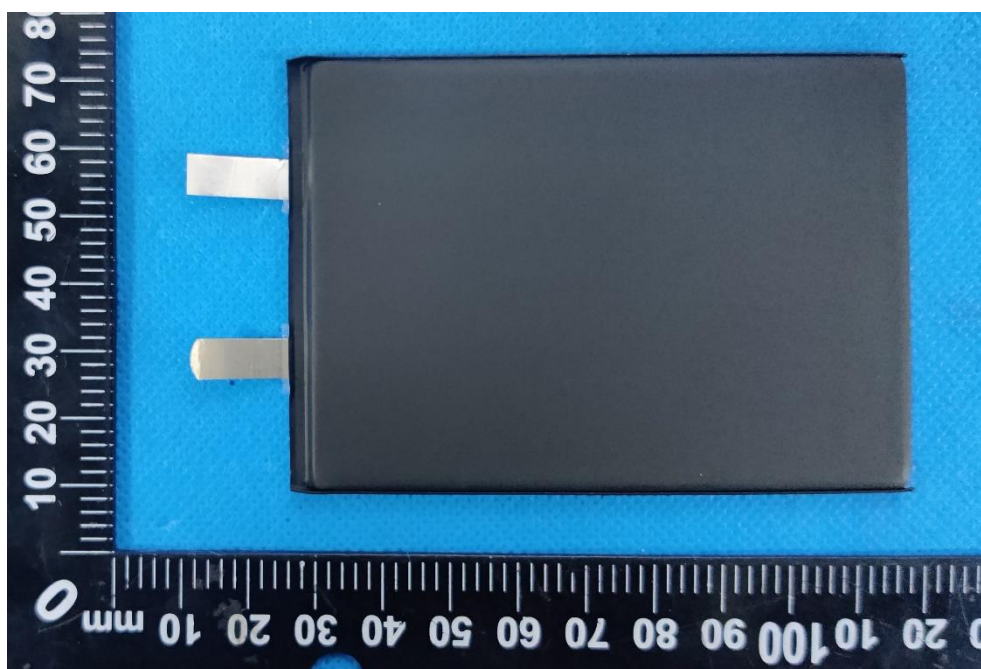
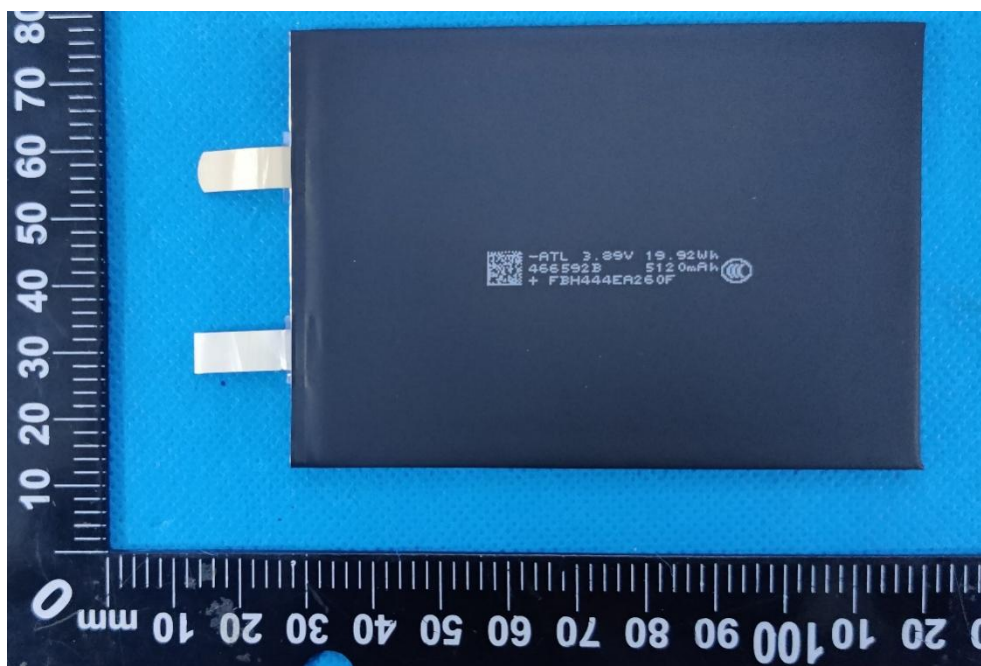
Battery(HB476594EGW-A 3.89V 5100mAh 19.84Wh)



Photos of samples and markings

样品及标识照片

CELL(466592B 3.89V 5120mAh 19.92Wh)



## Appendix 1

### 附表 1

| Test Items<br>测试项目                                                                                                                                                                               | Altitude simulation<br>高度模拟                                                                                                                                                         |                        |                     |                        |                          |                                   |                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------|------------------------|--------------------------|-----------------------------------|------------------------|
| 1.1                                                                                                                                                                                              | <b>Test procedure</b><br>测试步骤                                                                                                                                                       |                        |                     |                        |                          |                                   |                        |
|                                                                                                                                                                                                  | 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℃).<br>试验电池芯和电池在环境温度(20±5℃)下, 储存在小于等于11.6kPa的压力下至少六小时。 |                        |                     |                        |                          |                                   |                        |
| 1.2                                                                                                                                                                                              | <b>Sample status</b><br>样品状态                                                                                                                                                        |                        |                     |                        |                          |                                   |                        |
|                                                                                                                                                                                                  | c1# ~ c5#, at first cycle in fully charged states; c6# ~ c10#, after 25 cycles ending in fully charged states.<br>c1# ~ c5#, 在第一个循环完全充电; c6# ~ c10#, 在第25个循环完全充电。                   |                        |                     |                        |                          |                                   |                        |
| 1.3                                                                                                                                                                                              | <b>Result</b><br>测试结果                                                                                                                                                               |                        |                     |                        |                          |                                   |                        |
| Sample No.<br>样品编号                                                                                                                                                                               | Before Test测试前                                                                                                                                                                      |                        | After Test测试后       |                        | Mass loss<br>质量损失<br>(%) | Residual<br>OCV<br>剩余电压<br>(≥90%) | Test<br>result<br>测试结果 |
|                                                                                                                                                                                                  | Mass<br>样品质量<br>(g)                                                                                                                                                                 | Voltage<br>开路电压<br>(V) | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) |                          |                                   |                        |
| c1#                                                                                                                                                                                              | 66.409                                                                                                                                                                              | 4.449                  | 66.409              | 4.442                  | 0.000                    | 99.84                             | O                      |
| c2#                                                                                                                                                                                              | 66.435                                                                                                                                                                              | 4.453                  | 66.433              | 4.446                  | 0.003                    | 99.84                             | O                      |
| c3#                                                                                                                                                                                              | 66.293                                                                                                                                                                              | 4.450                  | 66.292              | 4.442                  | 0.002                    | 99.82                             | O                      |
| c4#                                                                                                                                                                                              | 66.239                                                                                                                                                                              | 4.452                  | 66.239              | 4.446                  | 0.000                    | 99.87                             | O                      |
| c5#                                                                                                                                                                                              | 66.310                                                                                                                                                                              | 4.449                  | 66.310              | 4.443                  | 0.000                    | 99.87                             | O                      |
| c6#                                                                                                                                                                                              | 66.224                                                                                                                                                                              | 4.452                  | 66.221              | 4.446                  | 0.005                    | 99.87                             | O                      |
| c7#                                                                                                                                                                                              | 66.294                                                                                                                                                                              | 4.452                  | 66.291              | 4.444                  | 0.005                    | 99.82                             | O                      |
| c8#                                                                                                                                                                                              | 66.637                                                                                                                                                                              | 4.453                  | 66.637              | 4.447                  | 0.000                    | 99.87                             | O                      |
| c9#                                                                                                                                                                                              | 66.475                                                                                                                                                                              | 4.453                  | 66.473              | 4.446                  | 0.003                    | 99.84                             | O                      |
| c10#                                                                                                                                                                                             | 66.542                                                                                                                                                                              | 4.453                  | 66.542              | 4.445                  | 0.000                    | 99.82                             | O                      |
| Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.<br>注: L- 泄漏; V- 排气; D- 解体; R- 破裂; F - 起火; O- 无泄漏、无排气、无解体、无破裂、无起火。 |                                                                                                                                                                                     |                        |                     |                        |                          |                                   |                        |

## Appendix 2

### 附表 2

| Test Items<br>测试项目                                                                                                                                                                                         | Thermal test<br>温度测试                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |                     |                        |                          |                                            |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------|------------------------|--------------------------|--------------------------------------------|------------------------|
| 1.1                                                                                                                                                                                                        | <b>Test procedure</b><br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |                     |                        |                          |                                            |                        |
|                                                                                                                                                                                                            | <p>Test cells and batteries are to be stored for at least six hours at a test temperature equal to <math>72\pm 2^{\circ}\text{C}</math>, followed by storage for at least six hours at a test temperature equal to <math>-40\pm 2^{\circ}\text{C}</math>, The maximum time interval between test temperature extremes in 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 (<math>20\pm 5^{\circ}\text{C}</math>).</p> <p>将电芯和电池在温度为<math>72\pm 2^{\circ}\text{C}</math>的条件下贮存不少于6个小时，然后，在温度<math>-40\pm 2^{\circ}\text{C}</math>条件下贮存不少于6个小时，两个温度间的间隔最长为30min,重复操作上述步骤直到10次，然后，将其在环境温度为<math>20\pm 5^{\circ}\text{C}</math>的条件下放置24个小时。</p> |                        |                     |                        |                          |                                            |                        |
| 1.2                                                                                                                                                                                                        | <b>Sample status</b><br>样品状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                        |                     |                        |                          |                                            |                        |
|                                                                                                                                                                                                            | <p>c1# ~ c5#, at first cycle in fully charged states; c6# ~ c10#, after 25 cycles ending in fully charged states.</p> <p>c1# ~ c5#, 在第一个循环完全充电; c6# ~ c10#, 在第25个循环完全充电。</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                        |                     |                        |                          |                                            |                        |
| 1.3                                                                                                                                                                                                        | <b>Result</b><br>测试结果                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                     |                        |                          |                                            |                        |
| Sample No.<br>样品编号                                                                                                                                                                                         | Before Test测试前                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                        | After Test测试后       |                        | Mass loss<br>质量损失<br>(%) | Residual<br>OCV<br>剩余电压<br>( $\geq 90\%$ ) | Test<br>result<br>测试结果 |
|                                                                                                                                                                                                            | Mass<br>样品质量<br>(g)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Voltage<br>开路电压<br>(V) | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) |                          |                                            |                        |
| c1#                                                                                                                                                                                                        | 66.409                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.442                  | 66.409              | 4.360                  | 0.000                    | 98.15                                      | O                      |
| c2#                                                                                                                                                                                                        | 66.433                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.446                  | 66.433              | 4.360                  | 0.000                    | 98.07                                      | O                      |
| c3#                                                                                                                                                                                                        | 66.292                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.442                  | 66.292              | 4.360                  | 0.000                    | 98.15                                      | O                      |
| c4#                                                                                                                                                                                                        | 66.239                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.446                  | 66.239              | 4.359                  | 0.000                    | 98.04                                      | O                      |
| c5#                                                                                                                                                                                                        | 66.310                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.443                  | 66.310              | 4.359                  | 0.000                    | 98.11                                      | O                      |
| c6#                                                                                                                                                                                                        | 66.221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.446                  | 66.221              | 4.361                  | 0.000                    | 98.09                                      | O                      |
| c7#                                                                                                                                                                                                        | 66.291                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.444                  | 66.291              | 4.361                  | 0.000                    | 98.13                                      | O                      |
| c8#                                                                                                                                                                                                        | 66.637                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.447                  | 66.637              | 4.356                  | 0.000                    | 97.95                                      | O                      |
| c9#                                                                                                                                                                                                        | 66.473                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.446                  | 66.473              | 4.362                  | 0.000                    | 98.11                                      | O                      |
| c10#                                                                                                                                                                                                       | 66.542                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.445                  | 66.542              | 4.362                  | 0.000                    | 98.13                                      | O                      |
| <p>Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.</p> <p>注: L- 泄漏; V- 排气; D- 解体; R- 破裂; F- 起火; O- 无泄漏、无排气、无解体、无破裂、无起火。</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |                     |                        |                          |                                            |                        |

## Appendix 3

### 附表 3

| Test Items<br>测试项目                                                                                                                                                                                    | Vibration<br>振动                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                     |                        |                          |                                   |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------|------------------------|--------------------------|-----------------------------------|------------------------|
| 1.1                                                                                                                                                                                                   | <b>Test procedure</b><br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |                     |                        |                          |                                   |                        |
|                                                                                                                                                                                                       | <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 wave form 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 position of the cell.</p> <p>将电芯和电池牢固地安装在振动台的台面上，然后开始振动。振动以正弦波形式，以7Hz增加至200Hz，然后再减少回到7Hz为一个循环，一个循环持续15分钟的对数扫频。每个电芯和电池从三个互相垂直的方向上循环12次，3个小时。</p> |                        |                     |                        |                          |                                   |                        |
| 1.2                                                                                                                                                                                                   | <b>Sample status</b><br>样品状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |                     |                        |                          |                                   |                        |
|                                                                                                                                                                                                       | <p>c1# ~ c5#, at first cycle in fully charged states; c6# ~ c10#, after 25 cycles ending in fully charged states.</p> <p>c1# ~ c5#, 在第一个循环完全充电；c6# ~ c10#, 在第25个循环完全充电。</p>                                                                                                                                                                                                                                                                                                                                                                                                       |                        |                     |                        |                          |                                   |                        |
| 1.3                                                                                                                                                                                                   | <b>Result</b><br>测试结果                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |                     |                        |                          |                                   |                        |
| Sample No.<br>样品编号                                                                                                                                                                                    | Before Test测试前                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        | After Test测试后       |                        | Mass loss<br>质量损失<br>(%) | Residual<br>OCV<br>剩余电压<br>(≥90%) | Test<br>result<br>测试结果 |
|                                                                                                                                                                                                       | Mass<br>样品质量<br>(g)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Voltage<br>开路电压<br>(V) | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) |                          |                                   |                        |
| c1#                                                                                                                                                                                                   | 66.409                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.360                  | 66.409              | 4.356                  | 0.000                    | 99.91                             | O                      |
| c2#                                                                                                                                                                                                   | 66.433                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.360                  | 66.433              | 4.355                  | 0.000                    | 99.89                             | O                      |
| c3#                                                                                                                                                                                                   | 66.292                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.360                  | 66.292              | 4.356                  | 0.000                    | 99.91                             | O                      |
| c4#                                                                                                                                                                                                   | 66.239                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.359                  | 66.239              | 4.356                  | 0.000                    | 99.93                             | O                      |
| c5#                                                                                                                                                                                                   | 66.310                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.359                  | 66.310              | 4.356                  | 0.000                    | 99.93                             | O                      |
| c6#                                                                                                                                                                                                   | 66.221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.361                  | 66.221              | 4.358                  | 0.000                    | 99.93                             | O                      |
| c7#                                                                                                                                                                                                   | 66.291                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.361                  | 66.291              | 4.357                  | 0.003                    | 99.91                             | O                      |
| c8#                                                                                                                                                                                                   | 66.637                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.356                  | 66.637              | 4.351                  | 0.000                    | 99.89                             | O                      |
| c9#                                                                                                                                                                                                   | 66.473                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.362                  | 66.473              | 4.359                  | 0.000                    | 99.93                             | O                      |
| c10#                                                                                                                                                                                                  | 66.542                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.362                  | 66.542              | 4.357                  | 0.000                    | 99.89                             | O                      |
| <p>Note: L-Leakage, V-Venting, D -Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.</p> <p>注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                     |                        |                          |                                   |                        |

## Appendix 4

### 附表 4

| Test Items<br>测试项目                                                                                                                                                                            | Shock<br>冲击                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                  |                     |                       |                             |                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|---------------------|-----------------------|-----------------------------|---------------------|
| 1.1                                                                                                                                                                                           | <b>Test procedure</b><br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                  |                     |                       |                             |                     |
|                                                                                                                                                                                               | <p>Test cells and batteries shall be secured to the testing machine, and each cell shall be subjected to a half-sine shock of peak acceleration of 150g<sub>n</sub> and pulse duration of 6 milliseconds. Large cells may be subjected to a half-sine shock of peak acceleration of 50g<sub>n</sub> and pulse duration of 11 milliseconds. Small batteries shall be subjected to a half-sine shock of peak acceleration of 150g<sub>n</sub> (or Acceleration(g<sub>n</sub>)= <math>\sqrt{\frac{100850}{mass}}</math>, which is smaller) and pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak acceleration of 50g<sub>n</sub> (or Acceleration(g<sub>n</sub>)= <math>\sqrt{\frac{30000}{mass}}</math>, which is smaller) and pulse duration of 11 milliseconds. 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</p> <p>以稳固的托架固定住每个电芯和电池样品的全部配件表面。对每个电芯以峰值为150g<sub>n</sub>的半正弦的加速度撞击, 脉冲持续6毫秒, 大型电芯须经受最大加速度50g<sub>n</sub>和脉冲持续时间11毫秒的半正弦波冲击。对每个电池以峰值为150g<sub>n</sub> (或与<math>\sqrt{\frac{100850}{mass}}</math>中的较小值) 的半正弦的加速度撞击, 脉冲持续6毫秒, 大型电池组须经受最大加速度50g<sub>n</sub> (或与<math>\sqrt{\frac{30000}{mass}}</math>中的较小值) 和脉冲持续时间11毫秒的半正弦波冲击。每个电池或电池组须在三个互相垂直的电池安装方位的正方向经受三次冲击, 接着在反方向经受三次冲击, 总共经受18次冲击。</p> |                     |                  |                     |                       |                             |                     |
| 1.2                                                                                                                                                                                           | <b>Sample status</b><br>样品状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                  |                     |                       |                             |                     |
|                                                                                                                                                                                               | <p>c1# ~ c5#, at first cycle in fully charged states; c6# ~ c10#, after 25 cycles ending in fully charged states.</p> <p>c1# ~ c5#, 在第一个循环完全充电; c6# ~ c10#, 在第25个循环完全充电。</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                  |                     |                       |                             |                     |
| 1.3                                                                                                                                                                                           | <b>Result</b><br>测试结果                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                  |                     |                       |                             |                     |
| Sample No.<br>样品编号                                                                                                                                                                            | Before Test测试前                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     | After Test测试后    |                     | Mass loss<br>质量损失 (%) | Residual OCV<br>剩余电压 (≥90%) | Test result<br>测试结果 |
|                                                                                                                                                                                               | Mass<br>样品质量 (g)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Voltage<br>开路电压 (V) | Mass<br>样品质量 (g) | Voltage<br>开路电压 (V) |                       |                             |                     |
| c1#                                                                                                                                                                                           | 66.409                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.356               | 66.409           | 4.356               | 0.000                 | 100.00                      | O                   |
| c2#                                                                                                                                                                                           | 66.433                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.355               | 66.433           | 4.355               | 0.000                 | 100.00                      | O                   |
| c3#                                                                                                                                                                                           | 66.292                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.356               | 66.292           | 4.356               | 0.000                 | 100.00                      | O                   |
| c4#                                                                                                                                                                                           | 66.239                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.356               | 66.239           | 4.356               | 0.000                 | 100.00                      | O                   |
| c5#                                                                                                                                                                                           | 66.310                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.356               | 66.310           | 4.356               | 0.000                 | 100.00                      | O                   |
| c6#                                                                                                                                                                                           | 66.221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.358               | 66.221           | 4.358               | 0.000                 | 100.00                      | O                   |
| c7#                                                                                                                                                                                           | 66.291                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.357               | 66.291           | 4.357               | 0.000                 | 100.00                      | O                   |
| c8#                                                                                                                                                                                           | 66.637                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.351               | 66.637           | 4.351               | 0.000                 | 100.00                      | O                   |
| c9#                                                                                                                                                                                           | 66.473                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.359               | 66.473           | 4.359               | 0.000                 | 100.00                      | O                   |
| c10#                                                                                                                                                                                          | 66.542                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.357               | 66.542           | 4.357               | 0.000                 | 100.00                      | O                   |
| Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.<br>注: L- 泄漏; V- 排气; D- 解体; R- 破裂; F- 起火; O- 无泄漏、无排气、无解体、无破裂、无起火。 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |                  |                     |                       |                             |                     |

## Appendix 5

### 附表 5

|                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|
| Test Items<br>测试项目                                                                                                                                                                                                                                                                                                                  | External short circuit<br>外部短路                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |              |
| 1.1                                                                                                                                                                                                                                                                                                                                 | <b>Test procedure</b><br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |              |
|                                                                                                                                                                                                                                                                                                                                     | <p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches <math>57\pm4^{\circ}\text{C}</math> and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at <math>57\pm4^{\circ}\text{C}</math>. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to <math>57\pm4^{\circ}\text{C}</math>, the cell or battery must be observed for a further six hour for the test to be concluded.</p> <p>保持试验环境温度稳定在<math>57\pm4^{\circ}\text{C}</math>，以使电芯或电池样品外表温度达到<math>57\pm4^{\circ}\text{C}</math>，然后，在此温度下，将其正负极用小于0.1欧姆的线路短接，待电芯或电池的外表温度恢复到<math>57\pm4^{\circ}\text{C}</math>之后再持续1小时以上，对电芯或电池必须进一步观察6个小时才能下结论。</p> |                     |              |
| 1.2                                                                                                                                                                                                                                                                                                                                 | <b>Sample status</b><br>样品状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |              |
|                                                                                                                                                                                                                                                                                                                                     | <p>c1# ~ c5#, at first cycle in fully charged states; c6# ~ c10#, after 25 cycles ending in fully charged states.</p> <p>c1# ~ c5#, 在第一个循环完全充电; c6# ~ c10#, 在第25个循环完全充电。</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |              |
| 1.3                                                                                                                                                                                                                                                                                                                                 | <b>Result</b><br>测试结果                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |              |
| Sample No.<br>样品编号                                                                                                                                                                                                                                                                                                                  | Max. External Temperature<br>样品表面最高温度<br>( $^{\circ}\text{C}$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Test result<br>测试结果 | Remark<br>备注 |
| c1#                                                                                                                                                                                                                                                                                                                                 | 57.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c2#                                                                                                                                                                                                                                                                                                                                 | 57.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c3#                                                                                                                                                                                                                                                                                                                                 | 57.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c4#                                                                                                                                                                                                                                                                                                                                 | 56.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c5#                                                                                                                                                                                                                                                                                                                                 | 57.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c6#                                                                                                                                                                                                                                                                                                                                 | 57.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c7#                                                                                                                                                                                                                                                                                                                                 | 57.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c8#                                                                                                                                                                                                                                                                                                                                 | 57.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c9#                                                                                                                                                                                                                                                                                                                                 | 57.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c10#                                                                                                                                                                                                                                                                                                                                | 57.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| <p>Note: <b>D</b> –Disassembly, <b>R</b> –Rupture, <b>F</b> –Fire, <b>OT</b> –Over Temperature, <b>O</b> –no disassembly, no rupture, no fire, no Over temperature</p> <p>注: <b>D</b>- 解体; <b>R</b>- 破裂; <b>F</b>- 起火; <b>OT</b>- 超过<math>170^{\circ}\text{C}</math>; <b>O</b>- 无解体、无破裂、无起火、不超过<math>170^{\circ}\text{C}</math></p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |              |

## Appendix 6

### 附表 6

| Test Items<br>测试项目 | Crush 挤压/Impact 撞击                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1                | <b>Test procedure</b><br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                    | <p><input checked="" type="checkbox"/> <b>Crush 挤压</b></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> <ul style="list-style-type: none"> <li>(a) The applied force reaches 13kN±0.78kN;</li> <li>(b) The voltage of the cell drops by at least 100 mV; or</li> <li>(c) The cell is deformed by 50% or more of its original thickness.</li> </ul> <p>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.</p> <p>电池芯或组成电池芯在两个平面间挤压。挤压在第一个接触点以约1.5cm/s 的速度慢慢进行，直到下面三个选项之一达到为止：</p> <ul style="list-style-type: none"> <li>(a)作用力达到 13kN±0.78kN；</li> <li>(b)电池芯电压降至少达到100mV；</li> <li>(c)电池厚度和最初比较变形至少50%。</li> </ul> <p>一旦达到最大压力，电压降超过100 mV或者电池芯变形超过50%，压力应该解除。</p> <p><input type="checkbox"/> <b>Impact 撞击</b></p> <p>(applicable to cylindrical cells not less than 18mm in diameter)</p> <p>The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1 mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 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 ± 0.1 mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.</p> |

## Appendix 6

### 附表 6

| Test Items<br>测试项目                                                                                                                                                                                                       | Crush 挤压/Impact 撞击                                                                                                                                                                                                                                                                                                                                                                                        |                     |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|
|                                                                                                                                                                                                                          | <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>(适用于直径不小于18毫米的圆柱形电池) 将电池或元件电池样品平放在一个平面上, 其纵轴平行于测试台面, 将一直径为15.8mm±0.1 mm的316型不锈钢棒横放在电池中心位置。然后, 将一质量为9.1kg±0.1kg的物体从61±2.5 cm的高度落向样品。样品在进行试验时, 其外表温度应不超过170°C。且试验结束后6个小时之内, 样品应无解体、无起火现象发生。</p> |                     |              |
| <b>1.2</b>                                                                                                                                                                                                               | <b>Sample status</b><br>样品状态                                                                                                                                                                                                                                                                                                                                                                              |                     |              |
|                                                                                                                                                                                                                          | <p>c11# ~ c15#, at first cycle at 50% of the design rated capacity; c16# ~ c20#, after 25 cycles ending at 50% of the design rated capacity.</p> <p>c11# ~ c15#, 在第一个循环50%的额定容量; c16# ~ c20#, 在第25个循环50%的额定容量。</p>                                                                                                                                                                                        |                     |              |
| <b>1.3</b>                                                                                                                                                                                                               | <b>Result</b><br>测试结果                                                                                                                                                                                                                                                                                                                                                                                     |                     |              |
| Sample No.<br>样品编号                                                                                                                                                                                                       | Max. External Temperature<br>样品表面最高温度(°C)                                                                                                                                                                                                                                                                                                                                                                 | Test result<br>测试结果 | Remark<br>备注 |
| c11#                                                                                                                                                                                                                     | 23.7                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c12#                                                                                                                                                                                                                     | 23.9                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c13#                                                                                                                                                                                                                     | 23.7                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c14#                                                                                                                                                                                                                     | 23.6                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c15#                                                                                                                                                                                                                     | 23.7                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c16#                                                                                                                                                                                                                     | 23.8                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c17#                                                                                                                                                                                                                     | 23.4                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c18#                                                                                                                                                                                                                     | 23.4                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c19#                                                                                                                                                                                                                     | 23.4                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| c20#                                                                                                                                                                                                                     | 23.3                                                                                                                                                                                                                                                                                                                                                                                                      | O                   | /            |
| <p>Note: <b>D</b> -Disassembly, <b>R</b> -Rupture, <b>F</b>-Fire, <b>OT</b> –Over Temperature, <b>O</b>- no disassembly, no fire, no Over temperature</p> <p>注: D- 解体; R- 破裂; F- 起火; OT- 超过170°C; O-无解体、无起火、不超过170°C</p> |                                                                                                                                                                                                                                                                                                                                                                                                           |                     |              |

## Appendix 7

### 附表 7

|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |              |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|
| Test Items<br>测试项目                                                                                  | Overcharge<br>过度充电                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |              |
| 1.1                                                                                                 | Test procedure<br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |              |
|                                                                                                     | <p>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 or 22V, whichever is less. When the manufacturer's recommended charge voltage is more than 18V, the charging voltage of the test shall be 1.2 times maximum charge voltage. The charging current is 2 times of the maximum charging current recommended by the manufacturer.</p> <p>如果厂家推荐的充电电压不超过18V, 本测试的最小充电电压应该是两倍的厂家标定最大充电电压或者是22V, 取其中较小者。如果厂家推荐的充电电压超过18V, 充电电压应该为 1.2 倍的厂家标定最大充电电压。充电电流为厂家推荐的最大充电电流2倍。</p> |                     |              |
| 1.2                                                                                                 | Sample status<br>样品状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |              |
|                                                                                                     | <p>c21# ~ c24#, at first cycle in fully charged states; c25# ~c28#, after 25 cycles ending in fully charged states.</p> <p>c21# ~ c24#, 在第一个循环完全充电; c25# ~c28#, 在第25个循环完全充电。</p>                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |              |
| 1.3                                                                                                 | Result<br>测试结果                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |              |
| Sample No.<br>样品编号                                                                                  | Voltage Before test(V)<br>测试前开路电压(V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Test result<br>测试结果 | Remark<br>备注 |
| c21#                                                                                                | 4.451                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c22#                                                                                                | 4.450                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c23#                                                                                                | 4.452                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c24#                                                                                                | 4.450                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c25#                                                                                                | 4.449                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c26#                                                                                                | 4.452                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c27#                                                                                                | 4.453                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| c28#                                                                                                | 4.453                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O                   | /            |
| <p>Note: D -Disassembly, F-Fire, O- no disassembly, no fire.</p> <p>注: D- 解体; F- 起火; O-无解体、无起火。</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |              |

## Appendix 8

### 附表 8

|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                                       |                     |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|---------------------------------------|---------------------|
| Test Items<br>测试项目                                                                        | Forced discharge<br>强制放电                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                    |                                       |                     |
| 1.1                                                                                       | <b>Test procedure</b><br>测试步骤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                                       |                     |
|                                                                                           | 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 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).<br>在20±5℃的环境温度下, 将单个电芯连接在12V的直流电源上进行强制放电, 此直流电源提供每个电芯初始电流为制造厂指定的最大放电电流, 放电时间为额定容量除以初始电流。 |                     |                    |                                       |                     |
| 1.2                                                                                       | <b>Sample status</b><br>样品状态                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |                                       |                     |
|                                                                                           | c29# ~ c38#, at first cycle in fully discharged states; c39# ~ c48#, after 25 cycles ending in fully discharged states.<br>c29# ~ c38#, 在第一个循环完全放电; c39# ~ c48#, 在第25个循环完全放电。                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |                                       |                     |
| 1.3                                                                                       | <b>Result</b><br>测试结果                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                    |                                       |                     |
| Sample No.<br>样品编号                                                                        | Voltage Before test<br>测试前开路电压<br>(V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Test result<br>测试结果 | Sample No.<br>样品编号 | Voltage Before test<br>测试前开路电压<br>(V) | Test result<br>测试结果 |
| c29#                                                                                      | 3.408                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c39#               | 3.409                                 | O                   |
| c30#                                                                                      | 3.409                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c40#               | 3.413                                 | O                   |
| c31#                                                                                      | 3.390                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c41#               | 3.411                                 | O                   |
| c32#                                                                                      | 3.397                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c42#               | 3.398                                 | O                   |
| c33#                                                                                      | 3.398                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c43#               | 3.400                                 | O                   |
| c34#                                                                                      | 3.399                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c44#               | 3.403                                 | O                   |
| c35#                                                                                      | 3.404                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c45#               | 3.416                                 | O                   |
| c36#                                                                                      | 3.404                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c46#               | 3.408                                 | O                   |
| c37#                                                                                      | 3.411                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c47#               | 3.416                                 | O                   |
| c38#                                                                                      | 3.409                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O                   | c48#               | 3.406                                 | O                   |
| Note: D -Disassembly, F-Fire, O- no disassembly, no fire.<br>注: D- 解体; F - 起火; O-无解体、无起火。 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                    |                                       |                     |

## 注 意 事 项

### Important Information

1. 本报告无批准人签名和“报告专用章”无效。  
The test report is effective only with both the signature of approver and the report stamp of the laboratory.
2. 除全文复制外，未经批准不得部分复制报告。  
This report can't be reproduced except in full, without approval of the laboratory.
3. 本报告私自转让、盗用、冒用、涂改、或以任何媒体形式篡改均属无效。  
The test report is invalid when anything of the following happens-illegal transfer, embezzlement, imposture, modification or tampering in any media form.
4. 对检测报告若有异议，应于收到报告之日起十五天内向检测单位提出。  
Objections to the test report must be submitted to lab within 15 days.
5. 本报告检测结果仅对受试样品有效。  
The results shown in the report only apply to the sample(s) as tested.
6. 本检测结果中“N/A”表示“不适用”，“P”表示“通过”，“F”表示“不通过”。  
As for the test result “N/A” means “Not Applicable”, “P” means “Pass” and “F” means “Fail”.

深圳普瑞赛思检测科技股份有限公司

Shenzhen Precise Testing Technology Co., Ltd.

广东省深圳市宝安区石岩街道上屋社区爱群路同富裕工业区4-7#厂房一层-五层  
1-5/F., Factory Building 4-7#, Tongfuyu Industrial Park, Aiqun Road, Shangwu Community,  
Shiyan Subdistrict, Bao' an District, Shenzhen, Guangdong, China

TEL: 0755-23406061

E-mail: precise@ptl-global.com

URL: <http://www.ptl-global.com>

\*\*\*报告结束\*\*\*

\*\*\*END OF REPORT\*\*\*