UN38.3 Test Report

Recommendations on the TRANSPORT OF DANGEROUS GOODS

(Manual of Tests and Criteria, Fifth revised edition)

Customer: Lenovo
Model: L11M6F01
ASM P/N 45N1052
FRU P/N 45N1053
LC P/N 121500053
Rating: 11.1V, 62Wh / 5.6Ah

Approved By

Checked By

Prepared By

SIMPLO TECHNOLOGY CO., LTD.
ADD: No.471, Sec.2, Pa Teh Rd., Hu Kou, Hsin Chu, Hsien 303 Taiwan
TEL: +886-3-5695920 FAX: +886-3-5695931

SIMPLO ELECTRONICS (Changshu), LTD.
ADD: No.2 Dong Nan Road, Changshu, Jingsu Province, China
TEL: +86-512-52302255 FAX: +86-512-52302277

SIMPLO ELECTRONICS (CHONGQING), LTD.
ADD: No.2 Zongbao Avenue, Shapingba Distnct, Chongqing, China
TEL: +86-23-61718899 FAX: +86-23-61210488

SIMPLO ELECTRONICS (SHANGHAI), LTD.
ADD: No.28, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai
TEL: +86-21-57748286 FAX: +86-21-57748285
1. **Purpose of the Test**:

   To test each cell/battery is of the type proved to meet the requirements in the Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.

2. **Test Quantity**:

   2.1 Four batteries, at first cycle, in fully charged states. (for T.1~T.5 test)
   2.2 Four batteries, after fifty cycles ending in fully charged states. (for T.1~T.5 test)
   2.3 Five component cells, at first cycle at 50% of the design rated capacity. (for T.6 test)
   2.4 Four batteries, at first cycle, in fully charged states. (for T.7 test)
   2.5 Four batteries, after fifty cycles ending in fully charged states. (for T.7 test)

3. **Test Procedure**:

   3.1 All detail related test procedure shall be follow TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.
   3.2 Test flow shall be follow below statement.

![Test Flow Diagram]

---

The information contained herein is the exclusive property of SIMPLO TECHNOLOGY CO., LTD, and shall not be distributed, reproduced, or disclosed in whole or in part without prior written permission.

This test report is valid only to the items, Invalid for separation using.
4. Test Result:

4.1 T.1 ~ T.4 Test results: Pass
   4.1.1 All batteries could meet the requirement, mass loss less than 0.1% and voltage drop less than 10% after the test.
   4.1.2 No leakage, no venting, no disassembly, no rupture and no fire.

4.2 T.5 Test results: Pass
   4.2.1 All batteries could meet the requirement, external temperature did not exceed 170°C.
   4.2.2 All batteries were no disassembly, no rupture and no fire during the test and within six hours after the test.

4.3 T.6 Test results: Pass
   4.3.1 All component cells could meet the requirement, external temperature did not exceed 170°C.
   4.3.2 All component cells were no disassembly and no fire during the test and within six hours after the test.

4.4 T.7 Test result: Pass
   4.4.1 All batteries could meet no disassembly and no fire during the test and within seven days after the test.
# 5. Test Equipment

<table>
<thead>
<tr>
<th>Test Instruments Reference List</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Used Instrument ID</strong></td>
</tr>
<tr>
<td>V ML-052</td>
</tr>
<tr>
<td>V ML-053</td>
</tr>
<tr>
<td>V ML-055</td>
</tr>
</tbody>
</table>

## T.1 Altitude Simulation
- **V ML-522**
  - Instrument: Altitude
  - Range: 30-90
  - Manufacturer: SPEC
  - Calibration Date Last: 2011/10/29
  - Calibration Date Next: 2011/10/29

## T.2 Thermal Test
- **V ML-016**
  - Instrument: Thermal Shock
  - Range: 5-40 to 120°C
  - Manufacturer: WIT
  - Calibration Date Last: 2011/8/31
  - Calibration Date Next: 2011/8/31

## T.3 Vibration
- **V ML-283**
  - Instrument: Vibration
  - Range: 6-2000Hz
  - Manufacturer: King Design
  - Calibration Date Last: 2011/12/21
  - Calibration Date Next: 2011/12/21

## T.4 Shock
- **V ML-055**
  - Instrument: Shock
  - Range: 0.01-60G
  - Manufacturer: King Design
  - Calibration Date Last: 2011/12/24
  - Calibration Date Next: 2011/12/24

## T.5 External Short Circuit
- **V ML-339**
  - Instrument: Data Acquisition
  - Range: 1-100V, 0-50 to 160°C
  - Manufacturer: Yokogawa
  - Calibration Date Last: 2011/7/1
  - Calibration Date Next: 2012/7/1

## T.6 Impact (Component cell)
- **V ML-340**
  - Instrument: Data Acquisition
  - Range: 1-100V, 0-50 to 160°C
  - Manufacturer: Yokogawa
  - Calibration Date Last: 2011/5/26
  - Calibration Date Next: 2012/5/26

## I.7 Overcharge
- **V ML-139**
  - Instrument: Power Supply
  - Range: 0-50V 0-1-20A
  - Manufacturer: LOCK
  - Calibration Date Last: 2011/3/4
  - Calibration Date Next: 2012/3/4

**Note:** DC Voltage: 0-1000V; AC Voltage: 0.5-700V at 60Hz; 1kHz; Resistance: 10Ω-1MΩ; DC Current: 0.1mA-3A; AC Current: 0.01-3A at 50Hz, 0.01-1A, at 1kHz.
### T.1 Altitude Simulation

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Sample Status</th>
<th>Before</th>
<th>After</th>
<th>Variation</th>
<th>Results</th>
<th>Before</th>
<th>After</th>
<th>Variation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 Cycle, Fully charged</td>
<td>Mass (g)</td>
<td>317.5</td>
<td>317.5</td>
<td>0.00%</td>
<td>Mass (g)</td>
<td>317.6</td>
<td>317.4</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OCV (V)</td>
<td>12.84</td>
<td>12.84</td>
<td>100.00%</td>
<td>OCV (V)</td>
<td>12.85</td>
<td>12.85</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

### T.2 Thermal Test

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Sample Status</th>
<th>Before</th>
<th>After</th>
<th>Variation</th>
<th>Results</th>
<th>Before</th>
<th>After</th>
<th>Variation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 Cycle, Fully charged</td>
<td>Mass (g)</td>
<td>317.5</td>
<td>317.5</td>
<td>0.00%</td>
<td>Mass (g)</td>
<td>317.6</td>
<td>317.4</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OCV (V)</td>
<td>12.84</td>
<td>12.84</td>
<td>100.00%</td>
<td>OCV (V)</td>
<td>12.85</td>
<td>12.85</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

### T.3 Vibration

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Sample Status</th>
<th>Before</th>
<th>After</th>
<th>Variation</th>
<th>Results</th>
<th>Before</th>
<th>After</th>
<th>Variation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 Cycle, Fully charged</td>
<td>Mass (g)</td>
<td>317.5</td>
<td>317.5</td>
<td>0.00%</td>
<td>Mass (g)</td>
<td>317.5</td>
<td>317.5</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OCV (V)</td>
<td>12.84</td>
<td>12.84</td>
<td>100.00%</td>
<td>OCV (V)</td>
<td>12.85</td>
<td>12.85</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

This test report is valid only to the items, Invalid for separation using.
# 3.4 Shock

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Below</th>
<th>Above</th>
<th>Variation</th>
<th>Results</th>
<th>Sample No.</th>
<th>Below</th>
<th>Above</th>
<th>Variation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mass (g) 317.4</td>
<td>317.3</td>
<td>0.1%</td>
<td>P</td>
<td>Mass (g) 317.5</td>
<td>317.4</td>
<td>0.01%</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OCV (V) 12.68</td>
<td>12.62</td>
<td>0.06%</td>
<td>P</td>
<td>OCV (V) 12.61</td>
<td>12.59</td>
<td>0.02%</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

# 3.5 External/Short Circuit

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>55.5</td>
<td>54.4</td>
<td>55.6</td>
<td>52.9</td>
<td>57.7</td>
<td>56.4</td>
<td>52.8</td>
<td>55.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# 3.6 Impact (Component cell)

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>OCV before (V)</th>
<th>Sample No.</th>
<th>OCV before (V)</th>
<th>Results</th>
<th>Sample No.</th>
<th>OCV before (V)</th>
<th>Results</th>
<th>Sample No.</th>
<th>OCV before (V)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>01C</td>
<td>3.73</td>
<td>3.73</td>
<td>3.79</td>
<td>3.72</td>
<td>3.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# 3.7 Overcharge

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>OCV before (V)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>12.84</td>
<td>P</td>
</tr>
<tr>
<td>02</td>
<td>12.94</td>
<td>P</td>
</tr>
<tr>
<td>03</td>
<td>12.84</td>
<td>P</td>
</tr>
<tr>
<td>04</td>
<td>12.84</td>
<td>P</td>
</tr>
<tr>
<td>05</td>
<td>12.85</td>
<td>P</td>
</tr>
<tr>
<td>06</td>
<td>12.85</td>
<td>P</td>
</tr>
<tr>
<td>07</td>
<td>12.85</td>
<td>P</td>
</tr>
<tr>
<td>08</td>
<td>12.84</td>
<td>P</td>
</tr>
</tbody>
</table>

This test report is valid only to the items, Invalid for separation using.
7. Equipment for Test: