1. Preface
The purpose of this product specification is to provide technical information for the rechargeable Lithium-ion Polymer battery GMB052030, manufactured and supplied by Guangzhou Markyn Battery Co., Ltd.

2. Description and Model
   2.1 Description
   Rechargeable Lithium-ion Polymer battery
   2.2 Model
   GMB 052030

3. Specification
   3.1 Capacity
   - Typical: 240mAh
   - Minimum: 200mAh
   3.2 Charging Voltage
   4.20V
   3.3 Nominal Voltage
   3.7V at 0.2C mA
   3.4 Standard Charging Method
   Constant current: 0.5C, 5mA
   Constant voltage 4.20V
   3.5 Cut-off Discharge Voltage
   3.00V
   3.6 Max. Discharge Current
   1.5C, 5mA
   3.7 Max. Charge Current
   1C, 5mA
   3.8 Cycle Life
   >500 cycles
   3.9 Ambient Temperature
   - for Standard Charge: 0°C ~ 45°C
   - for Discharge: -20°C ~ 60°C
   3.10 Storage
   - for within the temperature: -20°C ~ 60°C
   - for within the humidity: ≤75%
   3.11 Energy Density
   - Wh/L: ~350
   - Wh/Kg: ~180
   3.12 Weight of Bare Cell
   ~5g
   3.13 Charge State Internal Impedance
   <150mΩ

4. Appearance
Appearance shall be free from any remarkable scratch, flaws, rust, discoloration or electrolyte leakage (visible or by smell).

5. Standard Test condition
5.1 Environment Conditions
Unless otherwise specified, all test stated in this Product Specification are conducted within the temperature 15~25°C and the humidity 45~85%RH.
5.2 Test Equipment

(1) Impedance meter

The impedance meter with AC 1kHz should be used

### 6. Test Procedure and Its Standard

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<th>Item</th>
<th>Measureing Procedure</th>
<th>Standard</th>
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<td>6.1 Appearance</td>
<td>Visual</td>
<td>No Defect and Leak</td>
</tr>
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<td>6.2 Dimension</td>
<td>Caliper</td>
<td>As item 8</td>
</tr>
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<td>6.3 Weight</td>
<td>Scale</td>
<td>As item 3.12</td>
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<tr>
<td>6.4 Maximum Charge Current</td>
<td>CCCV (Constant Current Constant Voltage)</td>
<td>1C&lt;sub&gt;3&lt;/sub&gt;mA</td>
</tr>
<tr>
<td>6.5 Full charge</td>
<td>CCCV</td>
<td>CC-0.5C&lt;sub&gt;3&lt;/sub&gt;mA CV- 4.2V End-Current 0.01C&lt;sub&gt;3&lt;/sub&gt;mA</td>
</tr>
<tr>
<td>6.6 Open Circuit Voltage</td>
<td>Within 1hr after full charge, measure Open circuit voltage</td>
<td>&gt;4.10V</td>
</tr>
<tr>
<td>6.7 Internal Impedance</td>
<td>Measure the battery with 1kHz AC</td>
<td>&lt;150m Ω</td>
</tr>
<tr>
<td>6.8 Discharge Capacity</td>
<td>Within 1hr after full charge, discharge until final discharge, at 0.2C&lt;sub&gt;3&lt;/sub&gt;mA and measure the capacity</td>
<td>&gt;240mAh</td>
</tr>
<tr>
<td>6.9 Maximum Discharge Current</td>
<td>Until final discharge voltage</td>
<td>1.5C&lt;sub&gt;3&lt;/sub&gt;mA</td>
</tr>
<tr>
<td>6.10 Charge/Discharge Cycle Life</td>
<td>Charge: CCCV, CC- 0.5C&lt;sub&gt;3&lt;/sub&gt;mA, CV- 4.2V End-Current 0.01C&lt;sub&gt;3&lt;/sub&gt;mA</td>
<td>Discharge capacity should be &gt;70% of item 6.8</td>
</tr>
<tr>
<td></td>
<td>Discharge: 0.5C&lt;sub&gt;3&lt;/sub&gt;mA to 3.00V, This charge/discharge shall be repeated 500 times</td>
<td></td>
</tr>
<tr>
<td>6.11 Leakage Proof</td>
<td>After full charging, the battery shall be stored at 40±2℃ and humidity 80±5% for 21 days</td>
<td>No leakage should be observed by visual inspection</td>
</tr>
<tr>
<td>6.12 Temperature Characteristics</td>
<td>1) After full charge at 20±5℃, stand at -20±2℃ for 18h, then discharge at 0.2C&lt;sub&gt;3&lt;/sub&gt;mA and measure the capacity</td>
<td>Discharge capacity should be &gt;60% of item 6.8 and no abnormality on its appearance and structure</td>
</tr>
<tr>
<td></td>
<td>2) After full charge at 20±5℃, stand at 55±2℃ for 2hrs, then discharge at 1C&lt;sub&gt;3&lt;/sub&gt;mA and measure the capacity</td>
<td></td>
</tr>
<tr>
<td>6.13 Charge Retension</td>
<td>After full charging, stand at 20±5℃ for 28 days, measure the discharge capacity according to item 6.8</td>
<td>Discharge capacity should be &gt;85% of item 6.8</td>
</tr>
</tbody>
</table>
7.1 Charge/Discharge Characteristics
Charge: CC/CV 4.2V, 0.5C₃mA,
   End- current 0.01C₃mA
Discharge: 0.5C₃mA Cut-off at 3.00V
Temperature: 25°C

7.2 Charge/Discharge Cycle Life
Charge: CC/CV 4.2V, 0.5C₃mA,
   End-Current 0.01C₃mA
Discharge: 0.5C₃mA, Cut-off at 3.00V
Temperature: 25°C

7.3 Temperature Characteristics
Charge: CC/CV 4.2V 0.5C₃mA,
   End-CURRENT 0.01C₃mA
Discharge: As item 6.10

8. Dimension (Bare cell) mm

<table>
<thead>
<tr>
<th>Unit</th>
<th>Thickness (t)</th>
<th>width (w)</th>
<th>Height (H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>5.0 ± 0.2</td>
<td>20 ± 0.5</td>
<td>30 ± 1</td>
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