	<i>Model</i> 型号:	<i>Date</i> 日期:	<i>Rev.</i> 版本:
	GMB042541 15 mAh 3.7 V	2011-2-11	1.0

PRODUCT SPECIFICATION

Rechargeable Polymer Lithium Ion Battery

聚合物锂离子电池产品规格书

Model: GMB042541

型号: GMB042541

Received Marking

客户确认

Customer's Name:

客户名称: _____


Signature : _____

签 名: _____

Company Stamp : _____

公司印章: _____

Prepared by	Checked by	Approved by
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History of revision

修改履历表

Revision 版本	Description 变更描述	Date 日期	Approved by 批准
1.0	First issue 首次发行	2011-2-11	杨洪



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1 Scope 范围

This specification is applied to GMB Lithium Ion Polymer Battery manufactured by Guangzhou Markyn Battery Co., Ltd.

本规格书适用于广州基安彼电池有限公司生产的聚合物锂离子电池。
需严格按照本规格书指定的方法测试，如对测试项目或测试方法有异议，
请与广州基安彼电池有限公司协调解决。

2 Product Model : GMB042541

产品型号 : GMB042541

3 Ratings 技术参数

Item 项目		Rating 额定参数	Note 备注	
3.1 Capacity 容量	Nominal 典型值	18 mAh	Standard discharge, 0.2 C (CC) discharge, 3.0 V cutoff. 标准放电, 0.2 C 恒流放电至 3.0 V 截止。	
	Minimum 最小值	15 mAh		
	3.2 Nominal Voltage 标称电压			3.7 V
	3.3 Standard Charge Current 标准充电电流			0.2 C mA
3.4 Maximum Charge Current 最大充电电流		0.5 C mA		
3.5 Maximum Charge Voltage 最大充电电压		4.25 V		
3.6 Standard Discharge Current 标准放电电流		0.2 C mA	0.2 C mA, 3.0 V (CC) cutoff. 0.2 C mA 恒流放电至 3.0 V	
3.7 Maximum Discharge Current 最大放电电流		0.5 C mA	Continuous Current 持续电流	
		1 C mA	Peak Current 瞬间电流	
3.8 Discharge Cut-off Voltage 放电截止电压		3.0 V		
3.9 Voltage as of shipment 运输电压		3.7~3.9 V		
3.10 Cell Weight 电芯重量		Approx. 1.0 g		
3.11 Operating Temperature 工作温度		0~45°C	Charge 充电	
		-20~60°C	Discharge 放电	
3.12 Storage Temperature 贮存温度		-20~45°C	1 month 1个月	
		-20~35°C	3 months 3个月	
		-20~20°C	1 year 1年	



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4 Outline Dimensions and Appearance 外形尺寸及外观

4.1 Outline Dimensions 外形尺寸

See attached drawing for GMB042541 (Fig.1).

见附图1 GMB042541 外形尺寸示意图。

Thickness 厚度: 0.4 ± ### mm (Measured with weighting 300gf at 23±2°C)
(测量时测量仪器作用于电池上的压力为300gf, 温度23±2°C)

Width 宽度 : 25 ± 1.0 mm (measured with weighting 300gf at 23±2°C)
(测量时测量仪器作用于电池上的压力为300gf, 温度23±2°C)

Length 长度 : 41 ± 1.0 mm (without lead film)
(不包括极耳)

This thickness will be swelling when high temperature storage or operation in high temperature.

4.2 Appearance 外观

There shall be no such defect as remarkable scratches, breaks, crack, discoloration, leakage, or deformation, which may adversely affect commercial value of the cell.

电池表面无明显的划痕、破裂、裂纹、污点、泄漏、变形等影响电池商业价值的缺陷。

5 Performance 性能

5.1 Standard Test Condition 标准充电条件

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Test condition shall be at 23±2°C and 65±20%RH as long as there is no doubt. The humidity can be any condition unless it affects the test results.

测试电池必须是本公司出厂时间不超过一个月的新电池, 且电池未进行过五次以上充放电循环。除非其它特殊要求, 本产品规格书规定的测试条件为: 温度 23±2°C, 相对湿度65±20%。如果已经证明测试结果不受这些测试条件影响, 实验时的相对湿度不做明确要求。

5.2 Measuring Instrument or Apparatus 测试仪器或设备

5.2.1 Dimension Measuring Instrument 尺寸测量仪器

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

测量尺寸的仪器精度应大于或等于0.01mm。

5.2.2 Voltmeter 万用表

Standard class specified in the national standard or more sensitive class having inner impedance more than 10 MΩ/V.

万用表测量电压及电流的准确度应不低于0.5级, 测量电压时内阻不应小于10kΩ/V。

5.2.3 Impedance Meter 内阻测试仪

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

内阻测试仪测量原理应为交流阻抗法 (1kHz LCR)。

5.2.4 Battery Test System 电池测试系统

The precision of scale of test system is demanded as follow:

测试系统精度须满足下表要求:

项目名称Item	电压Voltage	电流Current	时间Time
测量公差tolerance	±0.2%	± %	±0.1%



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5.3 Standard Charge Definition 标准充电定义

Standard charge is defined by charging for 3.5 hrs at 4.20 V of constant voltage and 0.2 CmA of constant current.

0.2 C mA = 3 mA

0.2 C 恒流充电至 4.2 V, 转恒压充电, 电流截止为 0.03 CmA, 总充电时间不超过 6 小时。

5.4 Rest Period 搁置时间

Unless otherwise defined, 10min rest period after full charge, 10min rest period after discharge.

如无其它特殊要求, 充放电过程之间的时间间隔为10min。

5.5 Standard Discharge Definition 标准放电定义

Standard Discharge is defined by discharging at 0.2 CmA down to 3.0 V.

0.2 CmA 电流恒流放电至 3.0 V。

5.6 Initial Performance 初始性能

Item 项目	Test Condition 测试条件	Criteria 标准
5.6.1 Open-Circuit Voltage 开路电压	The open-circuit voltage shall be measured within 24 hours after standard charge. 23±2°C 环境下标准充电后, 24小时内测量电池的开路电压。	≥ 4.15 V
5.6.2 Impedance Resistance 内阻 (光身电芯)	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 23±2°C. 23±2°C 环境下标准充电后, 采用交流法测量电池内阻 (1kHz LCR meter)。	≤ 1500 mΩ
5.6.3 Initial Capacity 初始容量	The capacity on standard discharge condition shall be measured after standard charge at 23±2°C. 23±2°C 环境下标准充电后, 以标准放电测试电池容量。	≥ 15 mAh

5.7 Electrical Performance 电性能

5.7.1 Discharge Rate Capabilities 倍率放电性能

Discharge Capacity is measured with the currents in under table and 3.0 V cut-off after rated discharge.

在不同倍率下对电池进行放电测试, 容量满足以下要求。

Discharge Current 放电电流	0.2 C (3 mA)	0.5 C (7.5 mA)
Discharge Capacity 放电容量	100%	≥80%

5.7.2 Temperature Dependence of Capacity 放电温度特性

Cells shall meet the discharge capacity requirements listed in the below table under respective discharge temperatures. Cells should be stored at required temperatures up to 8 hours.

The capacities are to be measured with constant discharge current 0.2 C mA (3.0 V cut-off) after standard charge at 23±2°C.

电池在23±2°C 标准充电, 然后在30分钟内冷却或加热到测试温度。放电前电池在此温度下保持8小时, 放电电流为 0.2 CmA, 放电截止电压 3.0 V, 要求如下:



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Discharge Temperature 放电温度	-20℃	0℃	23℃	60℃
Discharge Capacity 放电容量	50%	85%	100%	95%

5.7.3 Cycle Life 循环寿命

Cells shall be charged at constant current of 0.2 C mA to 4.20 V with end current of 0.03 CmA.

Cells shall be discharged at constant current of 0.2 CmA to 3.0 V. Cells are to be rest 10minutes after charge and 10 minutes after discharge. A cycle is defined as one charge and one discharge. The capacity shall be measured after 300 cycles of charge and discharge at 23±2℃.

$$\text{Discharge capacity(301 th cycle)} \geq 70\% \times 3\text{th cycle discharge capacity}$$

23±2℃环境下，采用 0.2 CmA 电流恒流充电到 4.20 V，然后恒压充电，截止电流 0.03 C mA；搁置10min；采用 0.2 CmA 电流恒流放电至 3.0 V；搁置10min。一次完整的充放电过程定义为一个循环。300 次充放电循环后电池的容量要求如下：

$$\text{第 301 次循环放电容量} \geq 70\% \times \text{第3次循环放电容量}$$

5.7.4 Shelf Life 荷电保持能力

Item	Test Condition	Criteria
Storage Characteristic s 常温贮存	1 The capacity on 0.5C discharge shall be measured after standard charge and then storage at 23±2℃ for 28 days. 标准充电后，电池在23±2℃环境下储存28天，测试标准放电容量（保持容量）。	Remaining Capacity ≥85% Initial capacity 保持容量 ≥85% 初始容量
	2 After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge. 测试完保持容量后，标准充电，测试标准放电容量（恢复容量）。	Recovery capacity ≥90% Initial capacity 恢复容量 ≥90% 初始容量
Storage Characteristic s 高温贮存	1 The capacity on 0.5C discharge shall be measured after standard charge and then storage at 60±2℃ for 7 days. 标准充电后，电池在60±2℃环境下储存7天，测试放电容量（保持容量）。	Remaining Capacity ≥60% Initial capacity 保持容量 ≥60% 初始容量
	2 After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge. 测试完保持容量后，标准充电，测试标准放电容量（恢复容量）。	Recovery capacity ≥80% Initial capacity 恢复容量 ≥80% 初始容量



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5.7.5 High Temperature and High Humidity Test 高温高湿测试

After standard charge, cells shall be stored at 60°C (95% RH) for 168 hours. After test, cells are discharged and cycled for 3 cycles to obtain recovered capacity.

No leakage. Recovery capacity \geq 80% Initial capacity

标准充电后，电池在60°C (95% RH)条件下储存168小时。储存结束后，先将电池放电，然后进行3次标准充放电循环，测试电池的恢复容量，要求如下：

电池不漏液。恢复容量 \geq 80%初始容量

5.7.6 Thermal Shock Test 温度循环测试

65°C (8hrs) \leftarrow 23°C (3hrs) \rightarrow -20°C (8hrs) for 8 cycles with full charged cells. After test, cells are discharged and cycled for 3 cycles to obtain recovered capacity.

No leakage. Recovery capacity \geq 80% Initial capacity

标准充电后，65°C (8小时) \leftarrow 23°C (3小时) \rightarrow -20°C (8小时)，8次温度循环。先将电池放电，然后进行3次标准充放电循环，测试电池的恢复容量，要求如下：

电池不漏液。恢复容量 \geq 80%初始容量

5.8 Mechanical Performance 机械性能

Item 项目	Test Condition 测试条件	Criteria 标准
Vibration Test 振动	<p>After standard charge, cells are to be tested as following conditions:</p> <p>Amplitude: 0.8mm</p> <p>Frequency: 10~55Hz (sweep: 1Hz/min)</p> <p>Direction: X/Y/Z axis for 90~100min. The battery is to be tested in three mutually perpendicular to each axis.</p> <p>电池充电后, 按下列条件进行试验:</p> <p>振幅: 0.8mm</p> <p>频率: 10~55Hz (扫描速度: 1Hz/min)</p> <p>方向: X/Y/Z轴振动90~100min. 电池在X、Y、Z三个垂直方向进行实验。</p>	<p>No leakage, no explosion, no fire, no smoke.</p> <p>不漏液、不爆炸、不起火、不冒烟</p>
Drop Test 跌落	<p>Drop cells in the shipment condition (50% charge) from 1.2m height onto 5cm or thicker concrete with p-tile on it 3 times each of X, Y, and Z directions at 23\pm2°C.</p> <p>将电池在运输条件(50%充电)下从1.2m的高度自由跌落到5cm或更厚的水泥地面上，从X,Y,Z三个方向上每个方向跌落一次，环境温度23\pm2°C。</p>	<p>No leakage, no explosion, no fire, no smoke.</p> <p>不漏液、不爆炸、不起火、不冒烟</p>



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5.9 Safety Performance 安全性能

Item项目	Test Condition测试条件	Criteria标准
Overcharge Test 过充测试	After standard discharge, cells are charged at constant current of 3.0 CmA and constant voltage of 4.5 V	No explosion, no fire, no smoke. 不爆炸、不起火、不冒烟
	while tapering the charge current. Charging is continued for 48 hours.	
	电池放电后，以恒流 3.0 CmA 充电至 4.5 V 后	
	恒压充电，充电过程持续48小时。	
Heating Test 热冲击	Cells are to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of $5\pm 2^{\circ}\text{C}/\text{min}$ to a temperature of $130\pm 2^{\circ}\text{C}$ at which temperature the oven is to remain for 30 minutes before the test is discontinued. 电池放置于热箱中，温度以 $5\pm 2^{\circ}\text{C}/\text{min}$ 的速率升至 130°C 并保温30min。	No explosion, no fire, no smoke. 不爆炸、不起火、不冒烟
External Short-Circuit Test 外部短路	After standard charge, cells are to be short-circuited by connecting the positive and negative terminals of cells with copper wire having a maximum resistance load of 0.1Ω . 电池充电后，以铜线将正负极短路（铜线内阻小于 0.1Ω ）。	No explosion, no fire, no smoke. 不爆炸、不起火、不冒烟
Impact Test 重物冲击	After standard charge, cells are impacted with their longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm diameter bar. 电池充电后，以15.8mm直径的横木撞击，电池纵轴平行于撞击平面，垂直于横木的纵轴。	No explosion, no fire, no smoke. 不爆炸、不起火、不冒烟
Crush Test 挤压	After standard charge, cells are crushed with their longitudinal axis parallel to the flat surface of the crushing apparatus. 电池充电后，将其纵轴平行于冲击装置(Per UL1642)的平面进行挤压。	No explosion, no fire, no smoke. 不爆炸、不起火、不冒烟

6 Period of Warranty 保质期

The period of warranty is 6 months from the date of shipment. GMB guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer's abuse and misuse. 电池保质期为出厂后6个月。GMB承诺如果在一年中由于电池本身的质量问题，本公司将负责进行调换，如果是由于用户误用或进行破坏性测试而产生的问题，恕不负责。

7 Shipment 运输

Cells shall be shipped in 50% state of charge. 电池在充电50%的状态下进行运输。

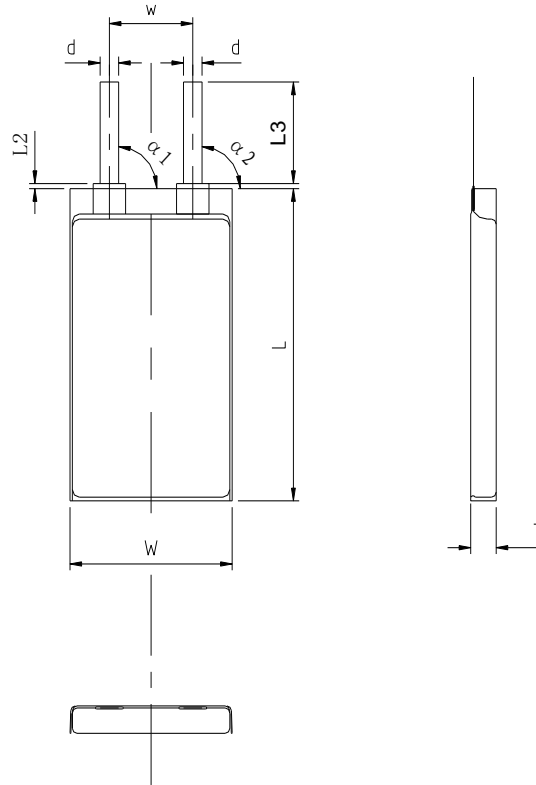
8 Amendment of this Specification 产品规格书的修订

This specification is subject to change with prior notice. 产品规格书如需更改，GMB将预先通知客户。

9 Others 其他

Any matters that this specification doesn't cover should be conferred between the customer and GMB. 其它产品规格书未涉及到的内容可由客户与GMB共同商议。

Fig.1 Dimensional Drawing 外形尺寸示意图



Item项目	Specific参数
T	0.35 ± 0.05 mm
W	25.0 ± 1.0 mm
L	41.0 ± 1.0 mm
L2	1.0 ± 0.5 mm
L3	8.0 ± 2.0 mm
w	14.0 ± 1.0 mm
d	2.0 ± 0.2 mm

