深圳市迈洛克实业有限公司

SHENZHEN M&LAK INDUSTRY CO., LTD

产品承认书(Pack)

Product Specification

型号 Model: 18650 样品数量 NO. OF SAMPLES: _____

容量 Capacity : 2600mAh 送样日期 DATE : _____

版本 REV : A/1 客户代码 CUSTOMER CODE: _____

承认书编号 NO. OF CONFIRMATION: _____

拟定 Prepared by	审 核 Checked by	批 准 Approved by
		

客户名 CUSTOMER NAME _____

客户确认 CUSTOMER APPROVAL	签章 STAMP

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Revision History
版本履历表

Revision 版本号	**Description** 内容描述	**Prepared by** 修定人	**Approved by** 审批人	**Date** 生效日期
A/0	New released	杜洪强		2017-03-16

SHENZHEN M&LAK INDUSTRY CO.,LTD.

1. Scope 目的

本规格书描述深圳市迈洛克实业有限公司设计开发的电池，它是产品设计、生产和检验的依据。其作用是让顾客了解产品的质量及正确使用方法。

This document describes the performance characteristics and testing methods for Li-polymer battery produced by SHENZHEN M&LAK INDUSTRY CO., LTD.

2、Specification/基本特性

No. 序号	Item 项目	General parameter 常规参数	Remark 备注
1	Can Material 壳体材质	Ni-plate Steel 镀镍钢壳	
2	Nominal capacity 标称容量	2600mAh	0.2C_5A
3	Minimum capacity 最小容量	2580mAh	0.2C_5A
4	Nominal voltage 标称电压	3.7V	
5	Maximum charge voltage 充电最高电压	4.20V	
6	Discharge cut-off voltage 放电截止电压	2.75V	
7	Maximum continuous charge current 最大持续充电电流	1 C_5A	
8	Maximum continuous discharge current 最大持续放电电流	1 C_5A	
9	Internal impedance 内阻	＜60mΩ	Measured at AC1KHz of 50%DOD 半电态下交流 1KHz 测量
10	Battery weight 电池重量	Approx.44g 约 44g	
11	Battery diameter (d) 电池直径	18.2±0.2mm	
12	Battery height (h)	65.0±0.5mm	

	电池高度		
13	Standard charge 标准充电	Constant Current 0.2C_5A,Constant Voltage 4.2V,Cut-off Current 0.01C_5A 持续电流 0.2C_5A，持续电压 4.2V，截止电流 0.01C_5A	CC/CV
14	Rapid charge 快速充电	Constant Current 1C_5A,Constant Voltage 4.2V,Cut-off Current 0.01C_5A 持续电流 1C_5A，持续电压 4.2V，截止电流 0.01 C_5A	CC/CV
15	Standard discharge 标准放电	Constant Current 0.2C_5A, Cut-off Voltage 2.75V 持续电流 0.2C_5A，截止电压 2.75V	CC
16	Operation temperature 工作温度	Charge/充电：0℃～45℃ Diacharge/放电：-20℃～60℃	At 60±25%RH
17	Storage temperature 储存温度	Less than 3 months：-20～45℃ Less than 1 year：-20～25℃ 小于 3 个月：-20～45℃ 小于 1 年：-20～25℃	At 60±25%RH
18	Protect Performance 保护功能	Contain PTC heat-fuse 内置 PTC 热保险丝	

3. Battery Performance / 电池性能

3.1 Electric Performance/电性能

No. 序号	Test Item 检测项目	Test Method 测试方法	Test Standard 检测标准
1	Normal temperature discharge performance 常温放电性能	Standard charge,then rest for 10min and discharge at 0.2 C_5A、0.5C_5A、1C_5A to 2.75V respectively. 电池标准充电后，搁置 10min，然后以 0.2C_5A、0.5C_5A、1C_5A 放电至 2.75V。	Discharge capacity/Nominal capacity×100% 放电容量/标称容量×100% 0.2C_5A≥100% 0.5C_5A≥95% 1C_5A≥90%
2	Normal Temperature Storage 常温荷电保持能力	Store for 28days after standard charge, then discharge at 0.2C_5A to 2.75V measuring residual capacity; Then standard charge/discharge cycle for 3 times to obtain the recoverable capacity. （the same below）. 电池标准充电后，开路放置 28 天，然后标准放电至 2.75V。再以标准充放电测试电池的恢复容量，可循环三次，任一次容量达到标准要求，试验即可停止。	Residual capacity≥Nominal capacity×80% Recoverable capacity≥Nominal capacity×90% 剩余容量≥标称容量×80% 恢复容量≥标称容量×90%
3	Cycle Life 循环寿命	After 300 cycles in 100% DOD charge and discharge at 0.2C_5A current, the residual	≥300 cycles

		discharge capacity is above 80% of nominal capacity. 将电池进行 0.2 C_5A 充放电循环 300 次，电池残余容量≥80%*标称容量。	
4	Storage Characteristics 储存性能	Stored for 12 months in room-temperature at 50%DOD.After storage cell shall be conductded standard charge/discharge cycle for 5 times to obtain the recoverable capacity. 电池在50%放电深度条件下室温储存 12 个月后，以标准充放电循环 5 次，有一次达到标准要求，试验即可停止。	Recoverable capacity≥Nominal capacity×90% 恢复容量≥标称容量×90%
5	Discharge temperature Characteristics 放电温度特性	Standard charged in normal temperature,stored under the following temperature for 3h,then discharged at constant current of 0.2 C_5A to 2.75V. 常温条件下电池标准充电后，电池在放电温度环境中放置 3h，然后测试标准放电的容量。	Discharge capacity/Nominal capacity×100% 放电容量/标称容量×100% -10℃ ≥70% 0℃ ≥80% 23℃ ≥100% 60℃ ≥90%

Remark：Measurements are carried out at normal atmospheric pressure、ambient temperature 23±5℃ and relative humidity of 60±25% without other specified condition. Accuracy of voltmeters and ammeters used in test is equal to or better than the grade 0.5.

注：如没有特殊要求测试应在 1 标准大气压、环境温度 23±5℃、相对湿度 60±25%条件下进行，测试中所使用的电压表和电流表的精度等级≤0.5。

3.2Safety Performance/安全性能

No. 序号	Test Item 检测项目	Test Method 测试方法	Standard 检测标准
1	Overcharge 过充电	Charge at 3C_5A constant current to 10.0V. 电池以 3C_5A 电流充电，充电电压限制 10V	No fire、No explosion 不起火、不爆炸
2	Overdischarge 过放电	Standard discharged ,then discharge at 0.1C_5A contant current to 0V. 电池标准充电后，以 0.1C_5A 电流放电至电压为 0.	No fire、No explosion 不起火、不爆炸
3	External Short-circuit 外部短路	After standard charge, short-circuit the cell by connecting the positive and negative terminals of the cell directly with Cu wire with a resistance less than 0.1Ω for 1h. 电池标准充电后，直接短路电池正负极 1 小时，线路总电阻不超过 0.1Ω	No fire 、 No explosion,the cell surface-temperature is less than 150℃. 不起火、不爆炸，电池表面温度不超过 150℃
4	Impact 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.The hammer of 9.1Kg is to be dropped from a height of 610mm onto the bar. 电池标准充电后，将一直径 15.8mm 的金属棒平放在电池最大平面中心, 金属棒的中心轴与电池高度方向垂直。将 9.1kg 的重物从 610mm 高度自由垂落冲击金属棒。	No fire、No explosion 不起火、不爆炸
5	Crush 挤压	After standard charge,Cells are crushed with their longitudinal axis parallel to the flat surface of the crushing apparatus.The crushing is to be continued until a pressure reached to 13KN.Once the maximum pressure has been	No fire、No explosion 不起火、不爆炸

		obtained it is to be released. 电池标准充电后，平放于挤压装置上，用最大 13KN 的力进行挤压，压力达到最大值后立即释放。	

3.3 Environmental tests/环境适应性

No. 序号	Test Item 检测项目	Test Method 测试方法	Standard 检测标准
1	Temperature Cycle 高低温循环	After standard charge,Cells are stored at 75±2℃ for 48h, then -20±2℃ for 6h and room temperature for 24h.Then standard charge/discharge cycle for 5 times to obtain the recoverable capacity. 电池标准充电后，在 75±2℃环境下搁置 48h，放在-20±2℃环境中 6h，再在室温环境搁置 24h。然后将电池进行标准充放电循环 5 次测试恢复容量	Recoverable capacity≥Nominal capacity×70% No deformation，No fire，No explosion. 恢复容量≥标称容量×70% 电池不变形、不起火、不爆炸
2	Drop 跌落	After standard charge,Cells are dropped from a height of 1m to wooden board in X,Y,Z directions twice respectively(total 6 times). Then discharge at 0.2C_5A to 2.75V. 电池标准充电后，由 1m 高度自由跌落到木板上，任意方向跌落 2 次（共 6 次）。然后以 0.2C_5A 放电至 2.75V。	Residual capacity ≥ Nominal capacity *85％ No leakage， No fire， No explosion. 放电容量≥标称容量×85% 电池不漏液、不起火、不爆炸
3	Vibration 振动	After standard charge, cells are fixed on the platform and be subjected to vibrate on following frequency 10~55Hz and amplitude vibration for 30 minutes recycling rate of 1 oct/min with direction of X, Y. A. Vibration Frequency: 10~30Hz, Vibration amplitude(single swing): 0.38mm. B. Vibration Frequency: 30~55Hz, Vibration amplitude(single swing): 0.19mm. Then discharge at 0.2C_5A to 2.75V to obtain residual capacity. 电池标准充电后，固定在振动台上，沿 X、Y 方向各振动 30min，振动频率为 10Hz～55Hz，扫频速率为 1oct/min 位移幅值 0.38mm(10-30Hz);0.19mm（30-55Hz） 振动后以 0.2C_5A 放电至 2.75V。	Residual capacity ≥ Nominal capacity *95％ No leakage， No fire， No explosion. 放电容量≥标称容量×95% 电池不漏液、不起火、不爆炸
4	Low pressure (altitude simulate) 低压性能 （高度模拟）	After standard charge, cells are stored under the atmosphere pressure of 11.6KPa for 6 hours. 电池标准充电后，在 11.6kPa 气压下搁置 6h	No leakage， No fire， No explosion. 电池不漏液、不起火、不爆炸

Remark: All safety and environmental tests should be conducted by the professional under the good safeguard.Otherwise the test possibly causes damage to the test equipment or the operator.

注：如需进行上述试验，均须在良好的安全措施保护下，由专业人员进行。否则可能会对试验设备和人身造成意外伤害！

4. Warranty period and Product responsibility/保质期限及产品责任

Warranty period of this product is 6 months from leaving plant date (code).

产品保质期限为自出厂日期（喷码）开始算起 6 个月内。

Please be sure to take to comply with the specifications and the following precautions to use with batteries, did not follow the specifications for the operation caused any accidents, M&LAK INDUSTRYCO.Ltd. will not accept any responsibility.请您务必需遵守本规格书和以下使用注意事项使用电池，对于没有按照规格书进行操作所造成的任何意外事故，迈洛克实业有限公司将不承担任何责任.

5.Mark of Packaging/电池包装标识

The following notice shoud mark on the packaging of batteries.

以下警告应注明在包装后的电池上

Use the prescribed charger for Li-ion batteries.

- 使用规定的锂离子电池充电器

Never put batteries into fire or heat.

- 不要将电池投入火中或加热

Do not short circuit batteries.

- 不要将电池两端短路

Never disassemble batteries.

- 不要将电池分解拆散

Please read the specification carefully and according to the following to install or use the cell, as improper handling of li-ion cell may result in lose of efficiency, heating ignition, electrolyte leakage or even explosion.

请仔细阅读并遵照以下条款安装使用电池，不正确的安装使用可能会导致电池发热、鼓胀、泄漏、冒烟或爆炸着火等。

⚠ 警告/ Warning

Never put a battery into water or seawater. Store batteries in a cool dry place.

禁止将电池浸入海水或水中，保存不用时，应放置于阴凉干燥的环境中。

Never put batteries into fire or heat.

禁止将电池放入火中，或对电池加热。

Never reverse positive and negative terminals to use batteries.

严禁颠倒正负极使用电池。

Never disassemble or modify batteries.

禁止拆解电池，请勿随意改变电池结构。

Do not short circuit the (+) and (-) terminals with other metals

禁止用金属直接连接电池正负极造成短路。

Hair-pins, coins or screws. Do not store batteries with such objects.

禁止将电池与金属物，如发夹、硬币等一起运输或贮存。

Do not hit with a hammer, step on or throw batteries.

禁止敲击或抛掷、踩踏电池等。

Do not solder batteries directly.

禁止直接焊接电池。

Do not penetrate batteries by nail or other tools.

禁止用钉子或其它利器刺穿电池。

⚠ 注意/Notice

If liquid leaks onto your skin or clothes, wash well with fresh water immediately.

If liquid leaking from the battery gets into your eyes, do not rub your eyes. Wash them well with clean water and go to see a doctor immediately.

如果电池发生泄露，电解液接触皮肤或衣物，应立即用清水冲洗干净；

如果电解液进入眼睛，请不要揉擦，应立即用清水冲洗眼睛，并及时送医院治疗。

While using, testing or reserving batteries, if you find the battery become hot , distribute smell , change color, deform or any other abnormality, please stop using or testing immediately, and attempt to isolate and keep away from the battery.

如果电池发出异味、发热、变色、变形或在使用、贮存、充电过程中出现任何异常，应在有安全防护的条件下，立即将电池从装置或充电器中移至安全的地方并停止用。

Store batteries out of reach of children so that they are not accidentally swallowed.

把电池放到儿童接触不到的地方，避免发生意外。

When the battery is thrown away, be sure it is non-conducting by applying insulating tape to the (+) and (-) terminals.

废弃之电池应用绝缘纸包住电极，以防起火、爆炸。

⚠ 提醒/Caution

Batteries have been examined before shipment.If you find the battery become hot , distribute smell, deform or any other abnormality, please contact with us immediately.

电池出货前已经严格检查，如发现所购电池有变形、发热、异味等现象，请与我司联系；

Keep the batteries at the half-fully charged state in room temperature. During long term storage, batteries should be charged once every half a year to avoid over-discharged.

电池应当在室温下存放，应充到 50%左右的电量存放。长时间储存时，建议每半年充电一次，防止电池过放电。

Do not use unqualified charger or equipment. Please referrance to the using recommendation.

充放电时请勿用不合格设备，并遵循正确的使用说明。

Do not use battery with dry cells and other primary batteries, or batteries of a different package, type or brand.

请勿将不同厂家或不同种类、型号的电池以及新旧电池混用.

Figure: External Dimension Drawing:
附：电池外形尺寸图示：