Li-ion Polymer Battery Specification

锂离子聚合物电池承认书

MODEL

型号 Typical Capacity	18650
标 称 容 量: Nominal volume	1800mAh
客 户 Guest households	
组合类型 Combination typ	3.7V

Registered 编制	Checked 审核	Approved 批准

Customer Approve 客户确认		
Dept. 部门	Signature 签名	Date 日期
QA Dept 品质		**2020-09**
R&D Dept 研发		
Approved 批准		

Content

目录

1. MODIFIED LIST
修订履历

Product Modified Record List
产品变更履历表

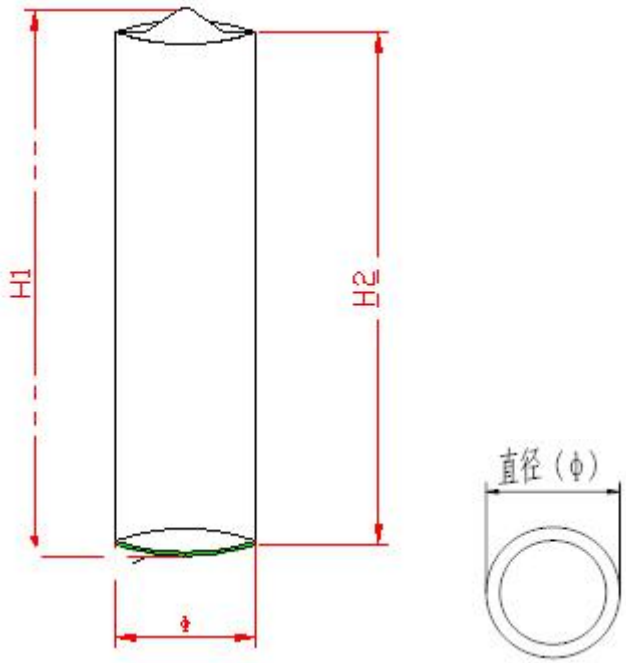
Revision 版本	Date 日期	Mark 标记	Modified content 变更内容	Approved by 批 准
A0/1				

1 .Scope 适用范围

This standard specifies the basic properties, technical requirements, test methods and precautions of lithium polymer rechargeable batteries. This standard is only applicable to lithium polymer batteries produced by Superstar Electronic Technology Co., Ltd.

本标准规定了锂聚合物可充电池的基本性能、技术要求、测试方法及注意事项，本标准只适用于巨星电子科技有限公司所生产的锂聚合物电池。

2. Initial Dimension 初始尺寸



H1 (高度)：≤69.5mm　　H2 (高度)：≤67.5mm			Φ（直径）：≤18.5mm　（底部加圆板
线型			
喷码			

4.Specification 产品规格

NO.	Item 项目	Specifications 规格要求
4.1	Nominal capacity 标称容量	1800mAh 0.2C Discharge (0.2C 放电)
	minimum capacity 最小容量	1750mAh 0.2C Discharge (0.2C 放电)
4.2	Nominal voltage 标称电压	3.7V
4.3	Charge current 充电电流	Standard Charge (标准充电) ：0.5C Rapid charge (快速充电) ：1.0C
4.4	Standard Charging method 标准充电方法	0.5C CC （ constant current ） charge to 4.2V,then CV(constant voltage 4.2V)charge till charge current decline to ≤0.01C 0.5C CC（恒流）充电至 4.2V，再 CV（恒压 4.2V）充电直至充电电流≤0.01C
4.5	Charging time 充电时间	Standard Charging (标准充电) Approx 3.5 hours 大约 3.5 小时 Rapid charge (快速充电) Approx 2 .5hours 大约 2.5 小时
4.6	Max.charge current 最大充电电流	Constant Current 1C Constant Voltage 4.2V 0.01 C cut-off（持续电流：1C 持续电压：4.2V 截止电流：0.01 C）
4.7	Max.discharge current 最大放电电流	Constant current 1.0 C end voltage2.4V（持续电流：1.0 C 截止电压：2.4V）
4.8	Standard Discharge Current 标准放电电流	Constant current 0.2C end voltage2.4V （持续电流：0.2C 截止电压：2.4V）
4.9	Discharge cut-off voltage 放电截止电压	2.4±0.1V
4.10	Charge cut-off Voltage 充电截止电压	4.2V
4.11	Initial Impedance 初始内阻	≤180mΩ
4.12	Operating temperature 建议工作温度	Charging(充电)： 10℃~45℃ Discharging(放电)：10℃~45℃
4.13	Storage temperature 建议储存温度	25±5℃
4.14	Storage Humidity 储存湿度	≤75% RH
4.15	Appearance 外观	Without scratch,distortion,contamination and leakage (无划痕、变形、污迹、电解液泄露)
4.16	Standard environmental condition 标准环境	Temperature(温度) ： 23±5℃ Humidity（湿度） ： 45-75%RH Atmospheric Pressure（大气压） ： 86-106 Kpa

5 General Performance 常规性能

No.	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
5.1	0.2C Capacity 0.2C 容量	After standard charging, laying the battery 5min, then discharging at 0.2C to voltage 2.4V, recording the discharging time. 标准充饱电后,搁置 5 分钟,然后用 0.2C 电流放电至 2.4V,所记录放电时间	≥300min
5.2	1C Capacity 1C 容量	After standard charging, laying the battery 5min, then discharging at 1C to voltage 2.4V, recording the discharging time. 标准充饱电后,搁置 5 分钟,然后用 1C 电流放电至 2.4V,记录放电时间	≥50min
5.3	Cycle Life 循环寿命	Constant current 0.5C charge to 4.2V, then constant voltage charge to current declines to 0.01C, stay 5min， constant current 0.5C discharge to 2.4V， stay 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells 先用 0.5 C 恒流充电至 4.2V，再恒压 4.2V 充电直至充电电流≤0.01C,搁置 5 分钟,再用 0.5C 电流放电至 2.4V;又搁置 10 分钟,重复以上步骤,直到放电容量是初始容量的 80%	≥300 times(次)
5.4	Capability of keeping electricity 荷电保持能力	20±5℃, After standard charging, laying the battery 28days, discharging at 0.2C to voltage 2.4V, recording the discharging time. 在 20±5℃状态下,标准充饱电后,电芯搁置 28 天,然后用 0.2C 放电至 2.4V,所记录放电时间.	≥200min

6 Environment Performance 环境性能

No.	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
6.1	Discharge at high temperature 高温放电	After standard charging, laying the Cells 4h at 60±2℃, then discharging at 1C to voltage 2.4V, recording the discharging time. 标准充电后，在 60±2℃条件下贮存 4h，然后用 1C 放电至 2.4V,所记录放电时间.	≥50min
6.2	Discharge at low temperature 低温放电	After standard charging, laying the Cells 16h at -20±2℃, then discharging at 0.2C to voltage2.4V, recording the discharging time. 标准充电后，在-20±2℃条件下贮存 16h，然后用 0.2C 放电至 2.4V,所记录放电时间.	≥190min
6.3	Thermal shock 热冲击	Put the battery in the oven. The temperature of the oven is to be raised at 5±2℃ per minute to a temperature of 130±2℃ and remains 30 minutes.	No fire, no smoke 不起火,不冒烟

		将电池放进烘箱内，以 5±2℃/min 速度升高烘箱内温度至 130±2℃后，恒温 30min.	

7 Safe Characteristic　安全性能

No.	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
7.1	Over discharge testing/ NOPCM 过放测试/没有保护板	At 23±5℃, According to the requirements of standard charge,the battery will be discharge to cut-off voltage, then connect with external load of 30 ohm for 24 hours. 在 23±5℃状态下，按标准放电的要求放电至终止电压后，外接 30Ω负载放电 24 小时.	No fire, no smoke, no leakage. 无起火,无冒烟,无泄液
7.2	Short-circuittesting/NO PCM 短路测试/没有保护板	At 23 ± 5 ℃, After standard charging, connect batteries' anode and cathode by wire which impedance less than 50mΩ, keep 6h. 在 23±5℃状态下，标准充电后，将电池的正负极用一根小于 50mΩ的导线连接，放置 6 小时.	No smoke or fire 不起火，不冒烟

※ Above testing of safe characteristic must be with protective equipment.(安全性能测试应在有保护措施下进行)

8.Protection circuit(保护电路)

8.1 Electrical characteristics 电气特性

Topt=25℃

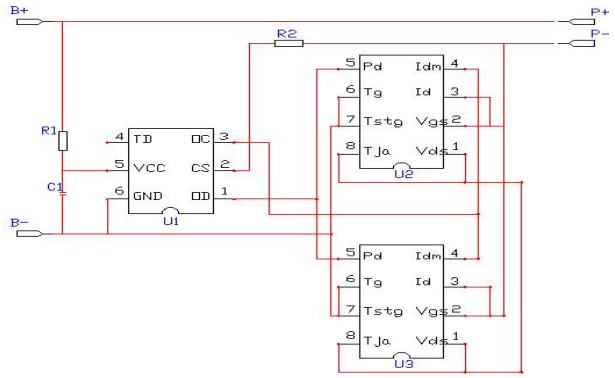
Item 项目	Symbol 符号	Content 详细内容	Criterion 标准
Over charge Protection 过充保护	V_{DET1}	Over charge detection voltage 过充电检测电压	4.30±0.05V
	tV_{DET1}	**Over charge detection delay time** 过充电检测延迟时间	50-100ms
	V_{REL1}	Over charge release voltage 过充电解除电压	4.08±0.05V
Over discharge protection 过放保护	**V_{DET2}**	**Over discharge detection voltage** 过放电检测电压	2.4±0.1V
	tV_{DET2}	Over discharge detection delay time 过放电检测延迟时间	15～25ms

Over current protection 过流保护	V_{DET3}	Over current detection voltage 过电流检测电压	0.15±0.025V
	I_{DP}	Over current detection current 过电流保护电流	4.0A～10.0A
	tV_{DET3}	Detection delay time 检测延迟时间	5.0～20.0ms
		Release condition 保护解除条件	Cut load 断开负载
Short protection 短路保护		Detection condition 保护条件	Exterior short circuit 外部电路短路
	T_{SHORT}	Detection delay time 检测延迟时间	≤500us
		Release condition 保护解除条件	Cut short circuit 断开短路电路
Interior resistance 内阻	R_{DS}	Main loop electrify resistance 主回路通态电阻	V_C=4.2V; R_{DS}≤70mΩ
Current consumption 消耗电流	I_{DD}	Current consume in normal operation 工作时电路内部消耗	2.0μA Type 6.0μA Max

8.2 Parts list 元件清单

NO.	Location 元件编号	Part name 元件名称	Specification 元件规格	Pack type 封装式	Q'ty 数量	Maker/Remark 厂商/备注
1	U1	Battery protection IC	DW01	SOT-23-6	1	DP
2	U2	Silicon MOSFET	8205A	TSSOP-8	2	DP
3	R1	Resistance	SMD 100Ω±5%	0603	1	YAGEO
4	R2	Resistance	SMD 1KΩ±5%	0603	1	YAGEO
5	C1	Capacitance	SMD 0.1μF	0603	1	TDK
6	PCB	Print circuit board			1	DX

8.3 Application Circuit 线路板原理图



9.Warnings 警告

To prevent the possibility of the battery from leaking,heating,fire please observe the following precautions:

为防止电池可能发生的泄漏,发热,起火,请注意以下预防措施:

The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs,pins and needles .Do not strike battery with any sharp edge parts.

☆ 电池外包装膜易被镍片,尖针等尖锐部件损伤,禁止用尖锐部件碰伤电池.

Do not immerse the battery in water and seawater

☆ 严禁将电池浸入海水或水中.

Do not use and leave the battery near a heat source as fire or heater

☆ 禁止将电池在热高温源旁,如火,加热器等使用设备.

When recharging,use the battery charger specifically for that purpose

☆ 充电时请选用锂离子电池专用充电器.

Do not reverse the position and negative terminals

☆ 禁止颠倒正负极使用电池

Do not connect the battery to an electrical outlet

☆ 禁止将电池直接接入电源插座

Do not discard the battle in fire or heat it

☆ 禁止将电池丢入火或加热器中

The battery tabs are not so stubborn especially for aluminum tab.Do not bend tab.

☆ 电池极耳的机械强度不坚固,特别是铝极耳,禁止弯折.

Do not short-circuit the battery by directly connecting the positive and negative terminal with metal object such wire

☆ 禁止用金属直接将电池的正负极进行短路连接.

Do not transport and store the battery together with metal objects such as necklaces,hairpins etc.

☆ 禁止将电池与金属,如发夹,项链等一起运输或贮存.

Do not strike or throw the battery.

☆ 禁止敲击或抛掷,踩踏电池等.

Do not directly solder the battery and pierce the battery with a nail or other sharp object.

☆ 禁止直接焊接电池和用钉子或其它利器刺穿电池.

10. Cautions 注意

Do not use or leave the battery at very high temperature (for example,at strong direct sunlight or a vehicle in extremely hot conditions).Otherwise,it can overheat or fire or its performance will be degenerate and its service life will be drcreased.

△ 禁止在高温下(直热的阳光下或很热的汽车中)使用或放置电池,否则可能会引起电池过热,起火或功能失效,从而导致电池寿命减短.

Do not use it in a location where static electricity is great, otherwise, the safety devices may be damaged ,causing hidden trouble of safety.

△ 禁止在强静电和强磁场的地方使用,否则易破坏电池安全保护装置,带来不安全隐患.

If the battery leaks, and the electrolyte get into the eyes. Do not rub eyes, instead, rinse the eyes, with clean running water, and immediately seek medical attention. Otherwise, eye injury can result.

△ 如果电池发生泄漏,电解液进入眼睛,请不要揉擦,应用清水冲洗眼睛,并立即送医院治疗,否则会伤害眼睛.

If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.

△ 如果电池在使用或贮存中发出异味,发热,变色,变形,或者是在充电过程中出现任何异常现象,立即将电池从充电器或装置中移开,并停止使用.

In case the battery terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.

△ 如果电池弄脏,使用前应用干布抹净,否则可能会因接触不良而影响性能失效.

Be aware discharged battery may cause fire or smoke, tape the terminals to insulate them.

△ 废弃之电池应用绝缘纸包住电极,以防起火, 冒烟.

If the battery is stored for a long time, the battery storage should be 3.7V and the battery is to be stored in a condition ， Temperature23±5℃ , Humidity 45-75%RH

△ 长期贮存的电池（超过 3 个月）须置于干燥、凉爽处。贮存电压为 3.7V 且贮存环境要求.温度在 23±5℃ 湿度在 45-75%RH

11.Period of Warranty 保质期

The shelf life of the battery is half a year from the date of shipment. If it is proved that the defect of the battery is caused in the manufacturing process of our company and not caused by abuse or misuse by the customer, the company is responsible for the replacement of the battery.

电池的保质期从出货之日算起为半年。如果证明电池的缺陷是在我们公司制造过程中造成的而不是客户户滥用或错误使用造成，本公司负责退换电池。

12. Others 其它事项

12.1. If the customer needs to use the battery for equipment beyond the requirements of the document, or to use the battery under conditions other than the requirements of the document, he should contact Superstar Electronic Technology Co., Ltd in advance, because specific experimental tests are required to verify the performance and safety of the battery under the conditions of use.

客户若需要将电池用于超出文件规定以外的设备，或在文件规定以外的使用条件下使用电池，应事先联系巨星电子科技有限公司，因为需要进行特定的实验测试以核实电池在该使用条件下的性能及安全性。

12.2. Superstar Electronic Technology Ltd. is not responsible for any accidents caused by the use of batteries under conditions other than those specified in the document.

对于在超出文件规定以外的条件下使用电池而造成的任何意外事故，巨星电子科技有限公司概不负责。

12.3. If necessary, Superstar Electronic Technology Ltd. will inform its customers in writing about the proper operation of the battery improvement measures.

如有必要，巨星电子科技有限公司会以书面形式告之客户有关正确操作使用电池的改进措施。

12.4. Any matters not mentioned in this specification shall be determined by negotiation between the parties

任何本说明书中未提及的事项，须经双方协商确定

12.5 Battery storage for more than 3 months must charge the battery, such as non-rechargeable battery caused by excessive discharge of the battery caused by gas expansion, such as non-rechargeable bad battery itself is not a problem, we do not assume after-sale responsibility.

电池储存超过 3 个月以上必须对电池进行充电，如不充电造成的电池过放导致电池胀气，无法充电等不良不属于电池自身问题，我司不承担售后责任。