Li-ion Polymer Battery Specification

锂离子聚合物电池规格书

Series 产品系列	Rechargeable Lithium ion Cell
Model and Capacity 型号及容量	5565110/5000mAh/3.7V
Customer Name or code 客户名称或代码	
File No. 文件编号	TIMES-3-GY-SPC-002
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制定 Prepared by	审核 Checked by	批准 Approved by

客户承认 Customer Approval	公司名： Company Name：	
	客户签名： Customers Signature:	

Content

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1. Modified List 修订履历

Product Modified Record List
产品变更履历表

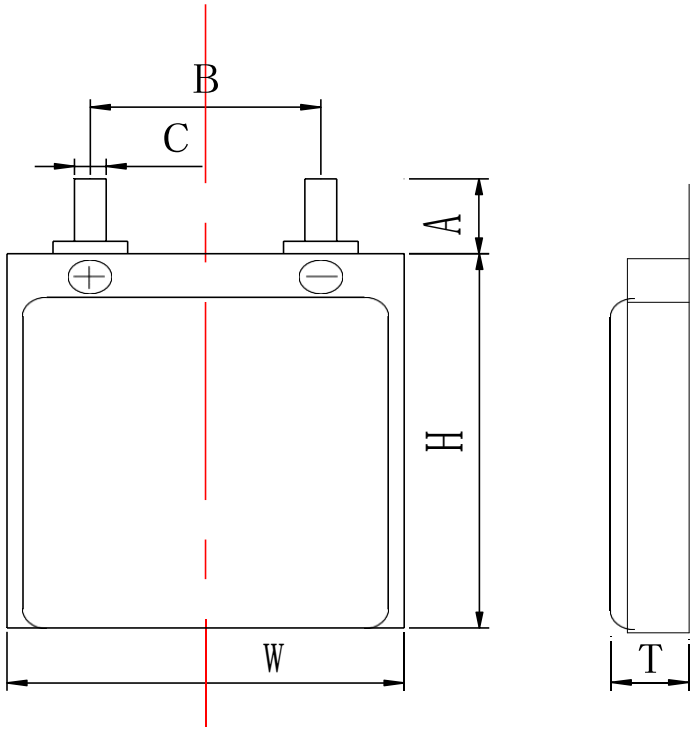
Revision 版本	Date 日期	Mark 标记	Modified content 变更内容
C.0	2019-3-5	/	NEW RELEASE/新版本

2. Scope 适用范围

This specification describes the basic performance, technical requirement, testing method, warning and caution of the Li-Ion Polymer rechargeable battery. The specification only applies to Hunan TIMES New Energy 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。本标准只适用于湖南泰和美新能源科技有限公司所生产的锂聚合物电池。

3. Initial Dimension 初始尺寸



Unit单位（mm）					
T （厚度）	$5.5^{+0}_{-0.3}$	W （宽度）	$65.0^{+0}_{-1.0}$	H （高度）	$110.0^{+0}_{-1.0}$
B（极耳中心距）	39.0±1.0	A（极耳长）	10.0±1.0	C（极耳宽）	4.0±0.2

4. Specification 产品规格

NO.	Item 项目		Specifications 规格要求
4.1	Typical capacity 典型容量		5125 mAh 0.2C Discharge (0.2C 放电)
4.2	Min capacity 最小容量		5000 mAh 0.2C Discharge (0.2C 放电)
4.3	Initial impedance 初始内阻		≤40mΩ
4.4	Weight 重量		Approx(约)：90g
4.5	Outgoing Voltage 出货电压		3.8～4.0V
4.6	Nominal voltage 标称电压 Charging Limited Voltage 充电截止电压 Discharge Cut-off Voltage 放电截止电压		3.7V 4.20V Defined in this DOC: FC=4.20V 2.75V Defined in this DOC: FD=2.75V
4.7	Standard charge current 标准充电电流		0.2C
4.8	Standard charging method 标准充电方法		0.2C CC（constant current）charge to FC, then CV(constant voltage FC)charge till charge current decline to ≤0.01C 0.2C CC（恒流）充电至 FC，再 CV（恒压 FC）充电直至充电电流≤0.01C
4.9	Charging time 充电时间		Standard charging (标准充电) Approx 8 hours 大约 8 小时
4.10	Standard discharge current 标准放电电流		Constant current 0.2 C, end voltage FD 持续电流：0.2C，截止电压：FD
4.11	Max.charge current 最大充电电流	0～45℃	0.7C CC to 4.2V, 4.2V CV to 0.01C) 0.7C恒流充电至4.2V，再恒压充电直至电流≤0.01C
4.12	Max. continued discharge current 最大放电电流	-10～60℃	1C
4.13	usage temperature 使用温度		-20℃～60℃
4.14	Storage Temperature Range 储存温度	-5～35℃	Recoverable capacity / Initial Capacity≥80% by discharge current 0.2C. Storage in 50% charged state or 3.70V～3.80V at 20±5℃ 。 恢复容量≥80%（0.2C 常温检测）电芯应在带电 50%或电压在3.70～3.80V 的状态下储存，长期储存温度：20±5℃
	Storage Humidity Range 储存湿度	≤ 75RH%	

4.15	Appearance 外观	Without distortion and leakage 无变形、电解液泄露
4.16	Standard testing condition 标准测试环境	Temperature(温度)：23±5℃ Humidity（湿度）：≤75% RH Atmospheric pressure（大气压）：86-106 Kpa

1. Remark: From 4.1 to 4.13 and 4.15, the testing condition is following 4.16 (standard testing condition)

从 4.1 至 4.13 及 4.15项目，测试环境遵从 4.16（标准测试环境）

2. If the working condition is out of 4.16, the performance will be some shift.

如果工作环境超出 4.16 范围，性能将会有一些偏差。

5. Basic Electrical Characteristics 电性能

No.	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
5.1	Cycle Life 循环寿命	Carry out 300 cycles （0.5C fully charged till charge current decline to ≤0.05C and rest 10min/0.5C discharge with 3.0V cut-off voltage） at 23±2℃, Initial capacity means the third discharged capacity。 在环境温度23±2℃的条件下，电芯以0.5C恒流恒压充电，截止电流0.05C,静置10min，0.5C恒流放电至3.0V,静置10min；重复300次；第三周放电容量定义为初始容量。	300 Cycles Retention Capacity ≥ 80% Initial Capacity 300周循环容量/初始容量≥80%
5.2	Capability of Keeping Electricity 荷电保持能力	The time which is measured with discharge current of 0.2C CC（constant current）and 2.75V cut-off voltage after stored at 20±5℃ for 28 days at a full charged state。 电芯在标准充满电后，在20±5℃条件下搁置28天，再以0.2C电流放电至截止电压2.75V所需的时间。	Discharged Time ≥ 255min 放电时间≥255min

6. Environment Performance 环境适应性

6.1	Discharge at high temperature 高温放电	The time which is measured with discharge current of 0.2C CC(constant current) and 2.75V cut-off voltage after stored at 55±2 ℃ for 2 hours at a full charged state. 电芯标准充满电后，贮存在 55±2℃的高温箱内恒温2h,记录在此条件下以0.2C 恒流放电至2.75V 的时间。	Discharged Time≥255min 放电时间≥255min
6.2	Discharge at low temperature 低温放电	The time which is measured with discharge current of 0.2C CC(constant current) and 2.75V cut-off voltage after stored at -10±2 ℃ for 4 hours at a full charged state. 电芯标准充满电后，贮存在-10℃±2 ℃的高低温箱中搁置4h，记录在此条件下 0.2C 放电至2.75V的时间。	Discharged Time≥180min 放电时间≥180min
6.3	Free fall 自由跌落	Each fully charged cell is dropped from a height of 1m onto a concrete floor for six panels (each panel once).The cells are dropped so as to obtain impacts in random orientations. 电芯充满电后,将电芯从1m的跌落高度自由落体跌落到混凝土板上，每个面跌落一次，共六次。	No fire, No explosion. 无起火,无爆炸
6.4	Low pressure 低气压	After rapid charged, the cells are to be stored for 6 hours under the condition of 20±5 ℃ at anabsolute pressure of 11.6 kPa. 电芯充满电后，将电芯置于20±5 ℃的真空箱中，抽真空将箱内压降降低至11.6kPa,并保持6h。	No fire, no explosion, no leakage. 无起火,无爆炸,无泄液

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	Overcharge Characteristics 过充电	The cells firstly 0.2C discharged to 2.75V at 20±5℃, then charged at a 3C current with a voltage limit of 4.6V, thturn to charge at constant voltage. The test canterminated after 7 hours or perform fire and explosion,alternatively when the cells temperature is reduced to top 20%. 在环境温度20±5℃的条件下，以0.2C恒流放电至2.75V,以指定3C恒流充电到指定电压4.6V,转为恒压充电，当出现以下情况时终止测试，①电芯失效（如起火、爆炸）；②电芯温度下降到比峰值低20%；③总的测试时间达到7h。	No fire, No explosion. 无起火,无爆炸
7.2	Hot Oven Characteristics 热滥用	The standard fully charged cell is to be heated in a circulating air oven, the temperature of the oven is to be raised at a rate of 5±2 ℃/min to 130±2 ℃ and remain for 30 minutes at that temperature. Then check the cells' appearance. 将满电电芯用绝缘线悬挂在温度冲击箱（远红外鼓风烘箱或真空烤箱）中，冲击箱温度以5℃±2℃/min的速率上升到130℃±2℃，保持 30min，观察电芯状态。	No fire, No explosion. 无起火,无爆炸
7.3	(Room temperature) Short-circuit Characteristics 常温外部短路	A fully charged cell is to be short circuited by connecting the positive and negative terminals with a electric resistance (80±20 mΩ) at room temperature 20℃±5 ℃ will cells kept in the temperature for 30min. 电芯充满电后，放置在环境温度20℃±5℃的条件下，在电芯表面温度达到要求温度后，再放置30min,在防爆箱内用电阻80±20mΩ的导线将电芯正负极短接。	No fire, No explosion. Temperature on the cells' surface should no more than 150℃ 不着火，不爆炸，电芯的外部表面温度不超过150℃。

7.4	Forced Discharge 强制放电	A fully discharged cell is to be forced discharged at a 1C current for 90min reversed。 将电芯放完电后，以1C电流反向充电90min。	No fire, No explosion. 无起火,无爆炸
7.5	Vibration 振动	Fully charged cells fixed on the vibration table, using the sine vibration, and within 15 min in logarithmic sweep from 7hz frequency sweep to 200hz and return to the 7hz. Vibration along three mutually perpendicular direction of sample must match the sample,according to the logarithmic sweep in each direction way to 12 repetitions, vibration 3 hours 将充满电的电芯固定在振动台上，采用正弦波振动试验，并以对数扫频方式从7~200Hz(15min内循环增减)；X、Y、Z三个方向每个方向循环扫频振动12个循环，每个方向震动3h。	No fire, No explosion, No leakage. 无起火,无爆炸, 无泄液
7.6	Crush 挤压	After fully charged, the cells are to be crushed between two flat surfaces, the crushing is to be continue until the pressure reach of 13kN±0.78KN.Once the maximum pressure obtained it is to be released. Outside short circuit is not allowed while test. 将满电的电芯放在两平板间使用挤压机进行挤压，使挤压作用力逐步达到13kN±1kN，一旦达到压力即可卸压,试验过程中不能发生外部短路。	No fire, No explosion. 无起火,无爆炸

※ 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. 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 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 or seawater.

☆ 严禁将电池浸入海水或水中。

Do not use and leave the battery near a heat source such 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 positive 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 battery 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 as wire.

☆ 禁止用金属直接将电池的正负极进行短路连接。

Do not transport or 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。

9.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 decreased.

△ 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 and cause 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, 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。

The batteries should be stored at room temperature, charged to about 40% to 60% of capacity. In case of over-discharge, batteries should be charged with standard charging method for one time every 3 months while storing and batteries should be charging-discharge with standard method for one time after being stored more than a year in order to activate it and restore energy.

△电池应当在室温下存放，应充到 40%至 60%的电量。为防止电池过放，建议每 3 个月按标准充电方式进行一次充电，如储存时间超过一年，建议每年按标准充放电方式进行一次充、放电循环以激活电池。

10.Period of Warranty 保质期

The period of warranty is one year from the date of shipment. TIMES guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer’s abuse.

电池的保质期从出货之日算起为一年。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错误使用造成，本公司负责退换电池。

11.Others 其它事项

11.1 The customer is requested to contact Hunan TIMES New Energy Technology Co.Ltd in advance, if the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

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，应事先联系湖南泰和美新能源科技有限公司，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。

11.2 Hunan TIMES New Energy Technology Co.Ltd will take no responsibility for any accident when the battery is used under other conditions than those described in this 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，湖南泰和美新能源科技有限公司概不负责。

11.3 Hunan TIMES New Energy Technology Co.Ltd will inform of the customer in a written form regarding proper use and handing of the battery, if it is deemed necessary.

如有必要，湖南泰和美新能源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。

11.4 Any matters that this specification does not cover should be conferred between the customer and TIMES.

任何本说明书中未提及的事项，须经双方协商确定。