Rechargeable Li-ion Battery Product Specification

可充锂离子电池产品规格书

Product Model/成品型号：5422078 100Ah 51.2V

Cell Model/电芯型号：5422078 100Ah 3.2V

Prepared By/Date 编 制/日 期	Checked By/Date 审 核/日 期	Approved By/Date 批 准/日 期
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	PRODUCT SPECIFICATION	Version:	A/0
		Date:	2024-05-21
		Sample Number: 5422078-16S1P-20240521	

For Any Detail and question, Please Tel Engineer:

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1 Scope/适用范围

2 Model/型号：5422078

3 Cell Specification/电芯产品规格

No.	Items/项目	Specifications/规格		Remark 备注
1	Nominal Capacity 标称容量	100Ah		0.2C Standard discharge 0.2C 标准放电
2	Minimum Capacity 最小容量	98Ah		
3	Nominal Voltage 标称电压	3.2V		Mean Operation Voltage 即工作电压
4	Delivery voltage 交货电压	≥3.2V		Within 10 days from Factory 在出厂 10 天内
5	Charge Voltage 充电电压	3.65±0.03V		By standard charge method 标准充电方式
6	Standard charging method 标准充电方式	23±3℃， 0.2C constant current,3.65V constant voltage charge to 3.65V,continue charging till current decline to ≤0.02C		23±3℃，0.2C 恒流 3.65V 恒压充至电流≤0.02C,时间约 7h(供参考)
7	Charge current 充电电流	0.2C	20A	Standard charge, charge time about 7h(Ref) 标准充电，时间约 7h(供参考)
		0.5C	50A	Rapid Charge, charge time about: 2h(Ref) 快速充电，时间约 2h(供参考)
8	Standard discharging method 标准放电方式	0.2C constant current discharge to 2.0V		0.2C 恒流放电至 2.0V
9	Cell Internal Impedance 单电芯内阻	≤1mΩ		Internal resistance measured at AC 1KHz after 50% charge 半电态下用交流法测量内阻

3 Cell Specification/电芯产品规格(continuous/续上表)

No.	Items/项目	Specifications/规格		Remark 备注
10	Maximum charge current 最大充电持续电流	0.5C	50A	For continuous charging mod 连续充电模式
11	Maximum discharge current 最大放电持续电流	1C	100A	For continuous discharging mode 连续放电模式
12	Operation Temperature and relative humidity Range 工作温度和湿度范围	Charge/充电	0.2C(0~10℃) 0.5C(10~45℃) 60±25%R.H.	Charge at a very low temperature such as blew 0℃,will be get a lower capacity and reduce cycle life of the battery 低温充电效率会下降，会影响电池使用寿命
		Discharge/放电	0.5C(-10~5℃) 1C(5-60℃) 60±25%R.H.	
13	Storage temperature for a long time 长时间储存温度	0~45℃ 60±25%R.H.		Do not storage exceed half year. Must charge once when storage for half year. must charge the battery which with protect circuit when storage for three months. 不可超过半年,达到半年须充电一次 带保护板电池 3 个月充电一次

4 Battery/Cell performance test Criteria/电池性能标准

4.1 Appearance inspection by visual/外观目测

There shall be no such defect as rust, leakage, which may adversely affect commercial value of battery.

电池外观应没有锈渍、污渍、漏液等影响商业价值的缺陷存在。

4.2 Environmental test condition/外界环境条件

Unless otherwise specified, all test stated in this product specification are conduct at below test condition

所有测试应按以下环境条件进行，除非特殊指定外。

Temperature: 20℃~25℃

Relative Humidity:60%±25% R.H.

4.3 Cell Electrical characteristics/电芯电气特性

No	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准	
1	Rated Capacity at 0.2C(Min.) 0.2C 最小额定容量	After standard charge, the capacity shall be measured on 0.2C discharge till the voltage discharge to2.0v, 标准充电后，放电至 2.0v 截止，测量 0.2C 放电容量	≥98Ah	≥98%
	Rated Capacity at 0.5C(Min.) 0.5C 最小额定容量	After standard charge, the capacity shall be measured on 0.5C discharge till the voltage discharge to 2.0v, 标准充电后，放电至 2.0v 截止，测量 0.5C 放电容量	≥97Ah	≥97%
	Rated Capacity at 1C(Min.) 1C 最小额定容量	After standard charge, the capacity shall be measured on 1C discharge till the voltage discharge to 2.0v, 标准充电后，放电至 2.0v 截止，测量 1C 放电容量	≥95Ah	≥95%
2	Cycle Life 循环寿命	Charging and discharging battery as blew conditions 0.2C standard charge to 3.65V end-off 0.2C standard discharge to 2.0v cut-off Continuous charge and discharge for 2000 cycles ,the capacity will be measure after the 2000th cycle 充放电按以下条件： 0.2C 标准充电至 3.65V，0.2C 标准放电至 2.0v，连续充放电循环 2000 周，在第 2000 周结束后测量容量	≥80% of initial capacity	
3	Capacity retention 容量保持	The battery to be charge in accordance with standard charge condition at 20~25℃,then storage the battery at an ambient temperature 20~25℃ for 28 days. Measure the capacity after 28 days with 0.2C at 20~25℃ as retention capacity 将电池在 20~25℃标准充电后储存在 20~25℃的环境中 28 天,28 天后，测试电池在 20~25℃环境下 0.2C 放电容量作为保持容量	Retention capacity 容量保持 ≥80%	

4	Temperature Dependence of discharge capacity（放电温度特性）	Cells shall be charged per 3.3.1 and discharged @0.2 C_5A to 3.0 volts. Except to be discharged at temperatures per Table 3. Cells shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature. The capacity of a cell at each temperature shall be compared to the capacity achieved at 23 ºC and the percentage shall be calculated. . 电池按 3.3.1 规定充电。按表 3 的温度中放电，电池必须先在该试验温度中放置 3 个小时。	Each cell shall meet or exceed the requirements of Table 3 温度中的放电容量应不小于表 3 的要求

Table 3 （表 3）

Discharge Temperature（放电温度）	-20℃	-10℃	0℃	23℃	55℃
Discharge Capacity （0.2 C_5A）（放电容量/0.2 C_5A）	＞70%	＞75%	＞85%	＞100%	＞98%

4.4 **Mechanical characteristics/机械特性**

No	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准
1	Free fall test 自由跌落测试	The battery to be fully charged in accordance with standard charge condition, then drop the battery three times from a height of 1,0 m onto a concrete floor. The batteries are dropped so as to obtain impacts in random orientations. 电池按照标准充电条件充满电，然后从1m高度跌落电池到一个水泥地面，随机跌落三次。	No Fire, 不起火，不爆炸
2	Vibration test 振动测试	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz and 55Hz, the excursion of the vibration is 1.6mm. The cell shall be vibrated for 30 minutes per axis of XYZ axes. 将标准充电后的电芯固定在振动台上，沿 X、Y、Z 三个方向各振动 30 分钟，振幅 1.6mm，振动频率为 10Hz~55Hz，每分钟变化 1Hz。	No explosion ,No leakage, No fire 无泄漏,不起火，不爆炸

4.5 Safety performance/安全性能

No	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准
1	Thermal exposure test 高温热冲击测试	Each fully charged cell, stabilized at room temperature, is placed in a circulating air-convection oven. The oven temperature is raised at a rate of 5 °C/min ± 2 °C/min to a temperature of 130 °C ± 2 °C. The cell remains at this temperature for 10 min before the test is discontinued. 充满电的电池温度稳定到常温后，放置入循环空气烘箱里，从常温以5 °C/分± 2 °C/分的速率升至130°C后，在130°C放置10分钟	No explosion, No fire 无起火,无爆炸
2	Short test 短路测试(20℃)	The fully charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with resistance load not exceed 100mΩ.Tests are to be conducted at room temperature 20~25℃. 在室温 20~25℃把充满电的电池的正负极用不超过80mΩ的负载连接起来，连接起来使电池外部短路	No explosion, No fire The Temperature of the Battery surface not exceeded than 150℃ 无起火,无爆炸 电池表面温度不超过 150℃
3	Short test 短路测试(60℃)	The fully charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with resistance load not exceed 100mΩ.Tests are to be conducted at room temperature about 60-65℃ 在室温约为 60-65℃把充满电的电池的正负极用不超过 80mΩ的负载连接起来，连接起来使电池外部短路	No explosion, No fire The Temperature of the Battery surface not exceeded than 150℃ 无起火,无爆炸 电池表面温度不超过 150℃
4	Forced discharge test 过放电测试	A discharged cell is subjected to a reverse charge at 1C for 90 min. 将电芯放完电，再用 1C 反接充电 90 分钟	No explosion, No fire 无起火,无爆炸
5	Over charge test 过充电测试	After standard charge, continue to charge with a constant voltage 1C/4.2V per a cell, holding 12h. 电芯标准充满电后，以 1C/4.2V 的恒定电压继续充电，保持 2 小时	No explosion, No fire 无起火,无爆炸

6 Battery specifications/电池组产品规格

No.	Items/项目	Specifications/规格		Remark 备注
1	Capacity for assembled cell discharging by 0.2C 电芯组装后 0.2C 标准放电的容量	≥98Ah		Standard discharging method 标准放电方式
2	Battery Voltage 电池电压	≥51.2V		Delivery Voltage, Within 10 days from Factory 交货电压，在出厂 10 天内
3	Standard charge condition 标准充电条件	Charge with 20A constant current and 58.4V constant voltage, charge to 58.4V,continue charging till current decline to ≤0.01C 充电电流用 20A 恒流, 58.4V 恒压充至电流≤0.01C		Charge voltage: 58.4V±0.02V Charge current:20A 充电电压：58.4V±0.02V 充电电流：20A
4	Standard discharging method 标准放电方式	0.2C constant current discharge to 45V		0.2C 恒流放电至 45V
5	Operation Temperature and relative humidity Range 工作温度和湿度范围	Charge/充电	0~45℃ 60±25%R.H.	Charge at a very low temperature such as blew 0℃,will be get a lower capacity and reduce cycle life of the battery 低温充电效率会下降，会影响电池使用寿命
		Discharge/放电	-20~60℃ 60±25%R.H.	
6	Maximum charge current 最大充电持续电流	100A		For continuous charging mod 连续充电模式
7	Maximum discharge current 最大放电持续电流	100A		For continuous discharge mod 连续放电模式
8	Internal Impedance 内阻	Assemblage Impedance 装配后内阻≤150mΩ		Measure the Red and black wire of the connector after assembling. 装配后测试电池插头红黑线
9	Weight 重量	About 48Kg		

9 Battery Pack Dimensions/电池组尺寸

备注：上图为效果图，实物会存在细微差别，协议和 LOGO 可按照客户要求定制。

Items	Units:mm		Remark	
Thickness/厚度	T	136	Max	
Height/长度	H	730	Max	
Width/宽度	W	495	Max	