

Cell Specification Approval Sheet
电池芯规格书

Model/型号: J7N0700-S01

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Customer Approval 审核-客户	Signature 签名	Date 日期
	Company Name: 公司名称	
	Company Stamp : 公司盖章	

	PRODUCT SPECIFICATION		DOC NO.: <u>TPS-FC-J7N0700-S01</u>	
			REV.: <u> A1 </u>	
			SHEET: <u> 2 </u> of <u> 10 </u>	
AMENDMENT RECORDS				
修改记录				
Revision /版本	Description/ 描述	Date/ 日期	Prepared/ 准备	Approval/审核
A0	New Release 新版本	2023/12/15	Eason Yi/易欣	Bob Hu/胡海波
A1	Modify cell weight, capacity, charge and discharge cut-off voltage.修改电芯重量、容量、充放电截止电压等	2024/07/25	Carl Lu/卢涛	Eason Yi/易欣

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1. General Information/基本信息

1.1. Scope/范围

This document describes the Product Specification of the Rechargeable Sodium-ion Battery J7N0700-S01 supplied by Li-Fun (Li-Fun Technology Co., Ltd).

本产品规格书描述的是由湖南立方新能源科技有限责任公司供应的型号为 J7N0700-S01 之钠离子二次电池单体。

1.2. Model/型号: J7N0700-S01

1.3. Application/应用:

Rechargeable Sodium-ion Battery for EV or ESS or other specified application.

电动车或储能系统或其他指定用途使用的钠离子二次电池单体。

2. Specification/规格

2.1. Normal Specification/基本规格

No.	Items/项目	Specification/规格	
1	Charge voltage /充电截至电压	3.30V	
2	Nominal voltage /标称电压	2.85V	
3	Minimal capacity(@0.5C Discharge)最小容量(C _m)	180 Ah	
4	Typical capacity(@0.5C Discharge)标称容量(C _t)	183 Ah	
5	Standard charging method(@25±2°C)标准充电方法	0.2C _m CC Charge to 3.3V, then CV to 0.05C _m cut off	
6	Charging time (@25±2°C)充电时间	~5h	
7	Max continuous charge power最大连续充电功率	0.5P@ RT	
8	Max. continuous discharge power最大连续放电功率	0.5P@ RT	
9	Max. pulse discharge current最大脉冲放电电流	5C (≤10s)	
10	Discharge Cut-off Voltage /放电截至电压	@ > 0 °C	1.5V
		@ ≤ 0°C	1.0V
11	Operating temperature (°C)/充放电温度窗口	Charging temperature: 0 ~45 Discharging temperature: -40 ~ 60	
12	Storage environment (°C)/存储环境	-20 to 45	1month recovery capacity ≥ 90%
		0 to 35	3month recovery capacity ≥ 90%
		0 to 25	12month recovery capacity ≥ 90%
		After ~50% charged Cell are stored at 35°C for 3months or RT for 12months or 45°C for 1 month, measure the recovered capacity with Standard charge/discharge method @ RT environment ≥90% of initial capacity.	
13	ACIR@RT, 50%-SOC /交流阻抗	≤ 0.5 mohm	
14	Cell Weight Approx. /电芯重量	5.7±0.1 kg	

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2.2. Recommended Charge Specification/建议充电规格

电芯温度/℃ Cell Temperature/℃	<-0	0-15	15-25	25-45
电压上限/V Upper Voltage Limit/V	不支持 Nonsupport	3.1	3.2	3.3
最大充电倍率/C Max Charge Rate/C	不支持 Nonsupport	0.2	0.5	1.0
恒压截止电流倍率/C Constant voltage cut-off current/A	不支持 Nonsupport	0.05	0.05	0.05

3. Performance Specification/性能规格

3.1. Electrical Characteristics 电性能特性

No	Item	Specification
1	0.5P Charge/ 0.5P 充电	Unless otherwise specified, “0.5P charge” shall consist of charging at constant power of 0.5P to 3.3V at 25 ± 2°C. 除非另有说明, “0.5P充电” 应包括在25 ± 2°C.下, 以 0.5P(242.25W)的恒功率充电至3.3V
2	0.5P Discharge/ 0.5P 放电	“0.5P Discharge” shall consist of discharging at a constant power of 0.5Pto 2.0V. Discharging shall be performed at 25±2°C unless otherwise noted (such as capacity versus temperature). “0.5 P 放电” 应包括以 0.5P 恒功率放电至 2.0V。放电应在 25 ± 2°C 下进行, 除非另有说明(例如容量与温度的关系)。
3	0.5P-Charge/0.5P-Dis charge Cycle/ 0.5P 充电/0.5P 放电循 环@25℃	At 1368 kgf pretightening force, cells shall be discharged at constant power of 0.5P to 2.0V. Then charged at constant power of 0.5Pto 3.3V. Cells shall be left for 15 minutes after charge to discharge and left for 10minutes after discharge to charge. 在 1368 kgf 预紧力下, 电芯用 0.5P 恒功率放电至 2.5V, 用 0.5P 恒功率充电至 3.3V, 电芯充电后间隔 10 分钟放电。
4	0.5P-Charge/0.5P-Dis charge Cycle/ 0.5P 充电/0.5P 放电循 环@35℃	At 1368 Kgf pretightening force, cells shall be discharged at constant power of 0.5P to 2.0V. Then charged at constant power of 0.5P to 3.3V. Cells shall be left for 10 minutes after charge to discharge and left for 15minutes after discharge to charge. 在 1368 kgf 预紧力下, 电芯用 0.5P 恒功率放电至 2.0V, 用 0.5P 恒功率充电至 3.3V, 电芯充电后间隔 10 分钟放电。

3.2. Electric Specification/电性能

No.	Item	Specification	Condition
1	Cycle Life at 25℃ 25℃循环寿命 带测试夹具	≥Cm70%	Cells shall be discharged and charged per 3.1.3 6000 cycles at 25± 2°C. Record the last discharge capacity. 电池应在25 ± 2°C 下按3.1.3进行6000次循环放电和充电。记录最后一次放电容量。
2	Cycle Life at 35℃/ 35℃循环寿命 带测试夹具	≥Cm70%	Cells shall be charged and discharged per 3.1.4 4500 cycles at 35± 2°C. Record the last discharge capacity. 电池应在35 ± 2°C 下按3.1.4进行4500次循环放电和充电。记录最后一次放电容量。

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	3	25℃能量效率 （0.5P，带测试 夹具）	Ec/Ed≥93.0%	At 25± 2℃， cells shall be discharge to 2.0V with 0.5P, then charge to 3.3V and discharge to 2.5V with 0.5P. Record the charge energy Ec and discharge energy Ed. 在25±2℃下， 电芯用0.5P放电到2.0V， 然后用0.5P充电到3.3V再放电到2.0V， 记录充电能量Ec和放电能量Ed。	
	4	0.5P充放电容量	≥170Ah	Cells shall be 0.5P charged to 3.3V and 0.5P discharged to 2.0V at 25± 2℃. Record the discharge capacity. 电池应在25±2℃下 0.5P 恒功率充电到3.3V, 0.5P恒功率放电到2.0V， 记录放电容量。	
	5	1.0P充放电容量	≥155Ah	Cells shall be 1.0P charged to 3.3V and 1.0P discharged to 2.0V at 25± 2℃. Record the discharge capacity. 电池应在25±2℃下 1.0P 恒功率充电到3.3V, 1.0P恒功率放电到2.0V， 记录放电容量。	
3.3. Safety Specification/安全特性					
No	Item		Specification	Condition	
1	Free Drop Test/ 自由跌落测试		No Explode, No Fire 不爆炸， 不起火	Reference GB/T 36276-2023 参考GB/T 36276-2023	
2	Heating Test/ 热冲击测试		No Explode, No Fire 不爆炸， 不起火		
3	Low Pressure/ 低压测试		No Explode, No Fire, No leakage 不爆炸， 不起火， 不漏液		
4	Over-discharge Test/ 过放电测试		No Explode, No Fire 不爆炸， 不起火		
5	External Short-Circuiting Test/ 外短路测试		No Explode, No Fire 不爆炸， 不起火		
6	Crush Test/ 挤压测试		No Explode, No Fire 不爆炸， 不起火		
7	Overcharge Test/ 过充测试		No Explode, No Fire 不爆炸， 不起火		
8	Thermo runaway Test/ 热失控测试		No Explode, No Fire 不爆炸， 不起火		
3.4. Standard environmental test condition/标准测试环境条件					
Unless otherwise specified, all tests stated in this Product Specification are conducted at below conditions: 除特殊注明外， 本规格指定的所有测试应在以下环境中进行。					
Temperature /温度: 25 ± 3 °C					
Humidity/相对湿度: 65 ± 20% RH					
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4. Cell Application Instruction 电池使用说明

4.1 Welding parameters recommendation 焊接参数建议

Items/项目		Specifications/规格	Remarks/备注
Welding Parameter of Al Busber 铝巴焊接参数	Laser Welding Depth 激光焊接熔深	≤2.5mm	/
	Max Pressure on poles 极柱承受最大压力	850N	Max force in longitudinal direction, no deformation 极柱承受最大垂直力，不发生变形
	Max Torque on poles 极柱承受最大扭矩	6N · m	Max torsion, non-loosen 极柱承受最大扭曲，不松动
	Max Temperature on poles 极柱承受最大温度	130℃	Max Temperature on poles, The plastic pad does not deform 极柱承受最大温度，塑胶垫不发生变形

4.2 Caution and Prohibition in Handing/操作提示和禁止事项

Below is warning for using the Sodium ion rechargeable battery. Mishandling of the battery may cause heat, fire and deterioration in performance. Be sure to observe the following. /以下为钠离子二次电池的操作提示及禁止事项。

Cautions/注意事项

◆ When using the application equipped with the battery, refer to the user’s manual before usage. Please read the specific charger manual before charging. /使用设备前请参照用户手册.给电池充电前请阅读专用充电器操作手册。

◆ When the cell is not charged after long exposure to the charger, discontinue charging. /长时间置于充电器上而不充电，请切断充电。

◆ Please check the positive (+) and negative (-) direction before packing. /进行成组前，请检查电池的正负极性。

◆ When a lead plate or wire is connected to the cell for packing, check out insulation not to short-circuit. /当使用导柱或线材进行电池包组装时，做好绝缘防护，避免短路。

◆ Battery must be stored separately. /电池必须隔离存放。

◆ Battery must be stored in a dry area with low temperature (≤25℃) for long-term storage. /电池如需长期存储，应存储在干燥和低温(≤25℃)环境下。

◆ Do not place the battery in direct sunlight or heat.不要将电池放在阳光直射处或热源附件。

◆ Do not use the battery in high static energy environment where the protection device can be damaged. /不要将电池放置在可能损害电池保护装置的高能态环境下。

◆ When rust or smell is detected on first use, please return the product to the seller immediately. /在第一次使用电池时，如发现有生锈或有味道，请立即退回厂商。

◆ The battery must be away from children or pets. /电池必须远离儿童或宠物。

◆ When cell life span shortens after long usage, please exchange to new cells. /当电池长期使用后至寿命终止后，请更换新电池。

◆ Do not wear metallic objects (ex. ring, watch, accessory, etc.) while handling battery cells. /不要穿戴金属物品（例如：戒指、手表等配饰）操作电池。

◆ When use cells for an assembly of module or pack, the “first-in, first-out” (FIFO) principle should be applied. /当用电芯组装模组或电池组时，适用“先入先出的原则”。

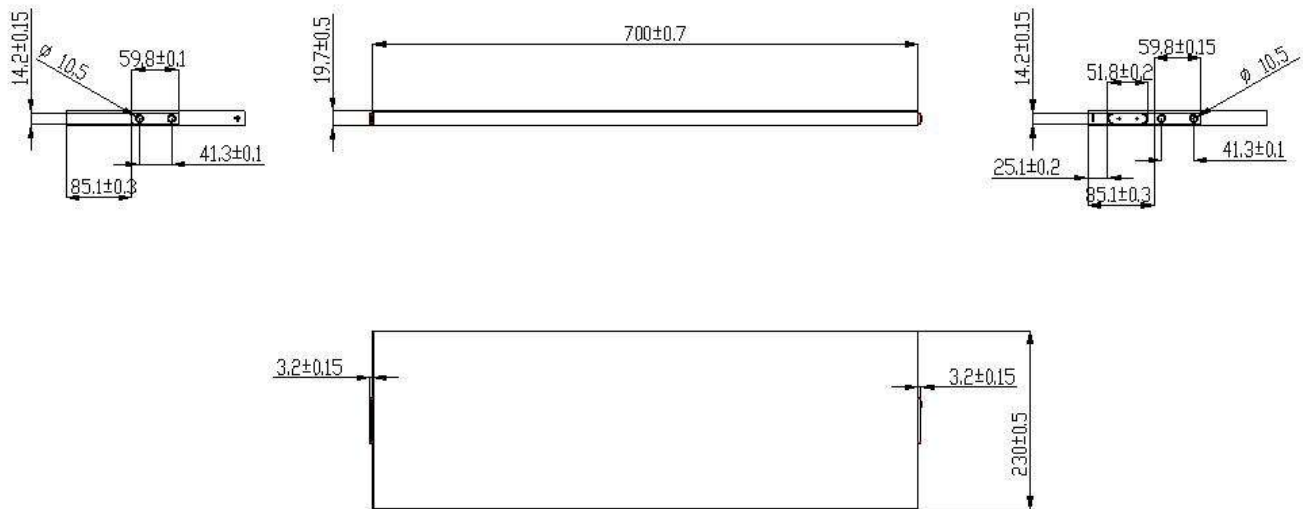
◆ Charge time should not be longer than specified in the manual. /充电时间不应超出手册中规格。

◆ Do not expose the battery to the outside of the operating temperature range specified in this document. /不要超出

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规定的温度范围操作电池。 ◆ Do not charge and discharge with the maximum current for uninterrupted cycle. /规格书中的最大充电或放电电流不适用于不间断循环。 ◆ If manual soldering is used, please pay attention to the following to ensure the function of the electric cell: a) the temperature control of the soldering iron can prevent static electricity; b) the temperature of the soldering iron shall not exceed 350°C; c) the soldering time shall not exceed 3s; d) no more than 5 times of soldering; e) secondary welding must be carried out after the polar ear is cooled; f) direct heating of the cell is prohibited. Above 100°C will cause cell damage. /如使用手工锡焊，须注意以下事项，以保证电芯的功能：a) 烙铁的温度可控能防静电；b) 烙铁温度不能超过 350°C；c) 锡焊时间不能超过 3s；d) 锡焊次数不能超过 5 次；e) 必须在极耳冷却后再进行二次焊接；f) 禁止直接加热电芯，高于 100°C 会导致电芯损坏 Prohibitions/禁止 ◆ Do not use different charger. /禁止使用非标充电器。 ◆ Do not charge with more than maximum charge rate. /禁止超出最大充电倍率充电。 ◆ Do not disassemble or reconstruct the battery. 禁止拆解和重组电池。 ◆ Do not throw or cause impact.禁止丢抛电池或其他可能引起撞击的动作。 ◆ Do not pierce a hole in the battery with sharp things. (such as nail, knife, pencil, drill) /禁止尖锐物插入电池 ◆ Do not use with other batteries or cells. /禁止和其他电池混用。 ◆ Do not solder on battery directly. /禁止直接在电池上面上锡。 ◆ Do not press the battery with overload in manufacturing process. /禁止在制程中过度挤压。 ◆ Do not use old and new cells together for packing. /禁止新老电芯在同一个电池模组内混搭使用。 ◆ Do not expose the battery to high heat. (such as fire) /禁止将电池暴露在高温或过热处,例如火中。 ◆ Do not put the battery into a microwave or high-pressure container. /禁止将电池放入微波或高压容器内。 ◆ Do not use the battery reversed. /禁止反转。 ◆ Do not connect positive (+) and negative (-) with conductive materials (such as metal, wire). /禁止正负极直接短接（如使用金属、电线等） ◆ Do not allow the battery to be immersed in or wet with water or sea-water. /不允许将电池浸入水中和被水淋。 ◆ Do not deform the battery cell (e.g. bending the terrace area or the pouch sealing area) without written agreement with the battery manufacturer. /在没有征得制造商书面同意前，禁止将电池弄变形(例如弯折易于形变的台阶或封装区域)。 Others/其他 Any matters that this specification does not cover should be conferred between the customer and Li-Fun. /本规格书中之未尽事宜需客户与敝司共同确认。		

5. Drawing /图纸

(all unit in mm, not in scale/单位为毫米)



Customer Inquiry/客户调查

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The customer is requested to write down your information and contact Li-Fun in advance, When the customer needs applications or operating conditions other than those described in this document. Li-Fun could design and build such products according to your special request.

尊敬的客户，如您需要在此规格书描述之外的范围内应用产品，可将需求信息反馈给敝司。立方将根据您的特殊要求设计和制造相关产品。

No.	Special Request /要求	Criteria /条件
1		
2		
3		
4		
5		

Company Name: _____ Signature: _____ Date: _____