Shenzhen zhuoNeng New Energy Corporation Limited

深圳市卓能新能源股份有限公司

Lithium ion Battery

Battery Classification 电池类型 _____

Battery Type 电池型号 SZNS18650-2600mAh

Revisoin 版本号 A0

Client 客户 _____

【The client 's agreement】客户协议

Signature 签名 _____

Name in block letters 正楷签名 _____

Date 日期 _____

Add: Room 101, 201, 301 of Building A; Building B; Building D; Building G, No.1 Sifangpu Vilage, Nianfeng Community, Pingdi Sub-district, Longgang District, Shenzhen
(Also engaged in production activity at Building A2,A3,A4,Tongfuyu Industrial Area, No.6, Fuping Middle Road, Pingdong Community)
地址：深圳市龙岗区坪地街道年丰社区四方埔村 1 号 A 栋 101, 201, 301, B 栋，D 栋，G 栋(在坪东社区富坪中路 6 号同富裕工业园 A2,A3,A4 处设有经营场所从事生产经营活动)

Approved by 核准	
Checked by 审核	
Checked by 审核	
Prepared by 拟定	

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1、Revision History 版本更改记录

NO. 编号	Date 日期	Revision 版本	Items 项目		
1	2017 / 3/ 9	A0	首次发行	DFT.	
				CHK.	
				APP.	
				DFT.	
				CHK.	
				APP.	
				DFT.	
				CHK.	
				APP.	

2、Application Scope 适用范围

This document describes the product specification of the rechargeable lithium battery cells supplied by Shenzhen ZhuoNeng New Energy Corporation Limited

本规格说明书描述了深圳市卓能股份有限公司生产的可充电锂离子电池的产品性能。

3、Technology parameters 技术参数

3.1 The main technical parameters of the battery 电池主要参数

NO. 序号	Items 项目	Units 单位	Specifications 参数	Remark 备注
1	Nominal voltage 标称电压	V	7.4	Average Voltage At 0.2C_5A discharge
2	Nominal capacity 标称容量	mAh	2600	0.2 C_5A discharge
3	Minimum capacity 最小容量	mAh	2550	0.2 C_5A discharge

4	Internal resistance 内阻		mΩ	≤220	
5	Max. charge voltage 充电上限电压		V	8.4±0.015V	
6	Cut-off voltage 放电终止电压		V	5.6V	
7	Max. continuous charge current 最大连续充电电流		mA	≤2600mA	
8	Max. continuous discharge current 最大连续放电电流		mA	≤2600mA	
9	Storage Temperature 存储温度	3 month	℃	-20~45℃	
		1 Year	℃	-20~20℃	
10	Operating temperature 工作温度	Charging 充电	℃	0~45℃	
		Discharging 放电	℃	-20~50℃	
11	Charging time 充电时间	Standard charge 标准充电	H	6.0H	0.2 C_5A 520mA
		quick charge 快速充电	H	4.5H	0.5 C_5A 1300mA
12	weight 重量		g	≤100g	

3.2 Performance inspection and testing 性能检查及测试

NO. 序号	Items 项目	Content 内容	Requirement 要求
1	Standard charge 标准充电	Charging the cell initially with constant current at 0.5C and then with constant voltage at 8.4V till charge currentdeclines to 0.01C 以 0.5C 恒流充电至 8.4V，再改为恒压充电，直至充电电流≤0.02C 时停止	CC/CV 恒流恒压源
2	Normal capacity 标称容量	The capacity means the discharge capacity of the cell, which is measured with discharge current of 0.2C with 7.5 V cut-off voltage after standard charge. 标称容量是指电池标准充电后,以标准放电（0.2C）至终止电压 5.6V 的容量。	Type.2600mAh
3	Cycle life 循环寿命	Test condition： Charge: 0.2C to8.4 V Discharge: 0.2C to 5.6V 60% or more of 1st cycle capacity at 0.2C discharge of Operation. 测试条件： 充电：0.2C 充电到 8.4V 放电：0.2C 放电到 5.6V 当放电容量降至初始容量的 60%时，所完成的循环次数定义为该电池的循环寿命。	≥300 次 ≥300 times
4	Temperature Characteristics 温度特性	1. According to item Standard Charge. 2. Capacity comparison at each temperature, measured with constant discharge current 0.2C with 2.5V cut-off. Percentage as an index of the capacity compared with 100% at 25℃. 1.将电池标准充电。 2.在不同温度条件下，用 0.2C 的电流恒流放电至截止电压 5.6V。以 25℃时放电容量为基准计算百分比。	-10℃: ≥50% 25℃: 100% 60℃: ≥85%

4、PCM parameter PCM 参数

4.1、PCM 参数

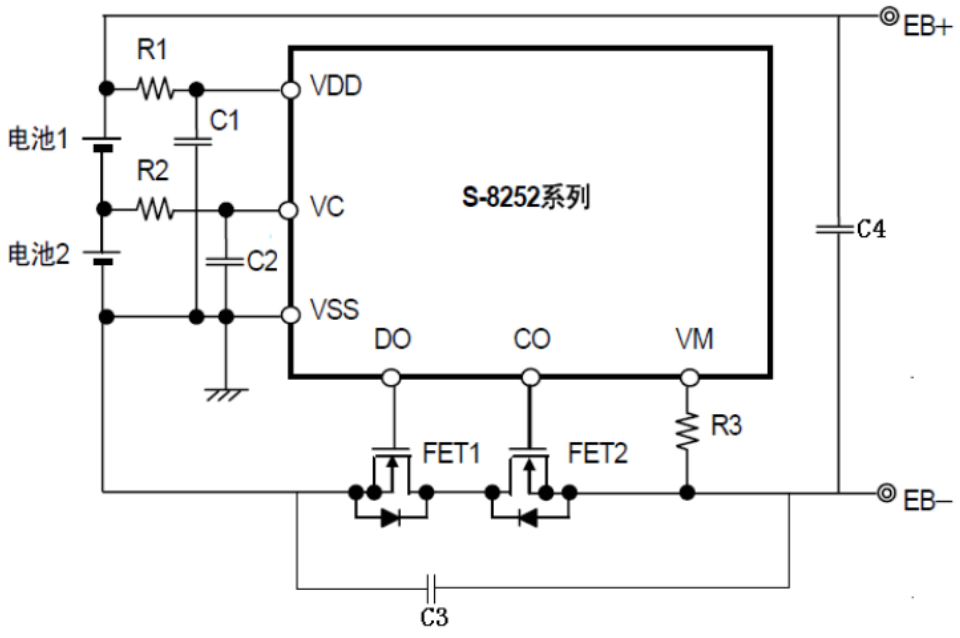
Items 项目	Symbol 符号	Content 详细内容	Criterion 标准
Over charge Protection 过充保护	V_{DET1}	Over charge detection voltage 过充电检测电压	4.30±0.05V
	tV_{DET1}	Over charge detection delay time 过充电检测延迟时间	800-1200ms
	V_{REL1}	Over charge release voltage 过充电解除电压	4.15±0.05V
Over discharge protection 过放保护	V_{DET2}	Over discharge detection voltage 过放电检测电压	2.8±0.1V
	tV_{DET2}	Over discharge detection delay time 过放电检测延迟时间	96-146ms
	V_{REL2}	Over discharge release voltage 过放电解除电压	3.0±0.1V
Over current protection 过流保护	V_{DET3}	Over current detection voltage 过电流检测电压	0.15±0.015V
	I_{DP}	Over current detection current 过电流保护电流	5.5-10A
	tV_{DET3}	Detection delay time 检测延迟时间	4-20ms
		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	160μs-500us max
		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	R_{DS}≤60mΩ

Current consumption 消耗电流	I_{DD}	Current consume in normal operation 工作时电路内部消耗	6μA Max
0V battery charge function 0V 电池充电功能		maybe 可能	

4.2、PCB main components 主要元件清单

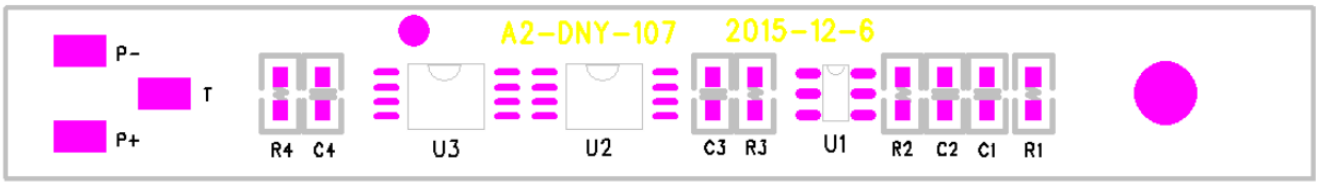
序号	名称	位号	规格	用量	备注
1	保护 IC	U1	S8252AAG，SOT-23-6	1	精工
2	MOS	U2	A08822，TSSOP-8	2	AO
3	电阻	R1 R2	SMD 470R，±5% 0603	2	国巨/厚声
4	电阻	R3	SMD 2K ±5% 0603	1	国巨/厚声
5	电容	C1-C4	SMD 0.1uF 50V 0603	4	国巨/厚声
6	镍块	B- B+	6*2.5*0.3mm	4	镀镍
7	尺寸	PCB	62.0*8*0.8mm	1	FR-4 绿油

4.3、Application Schematic 原理图



4.4 PCB Layout 层面

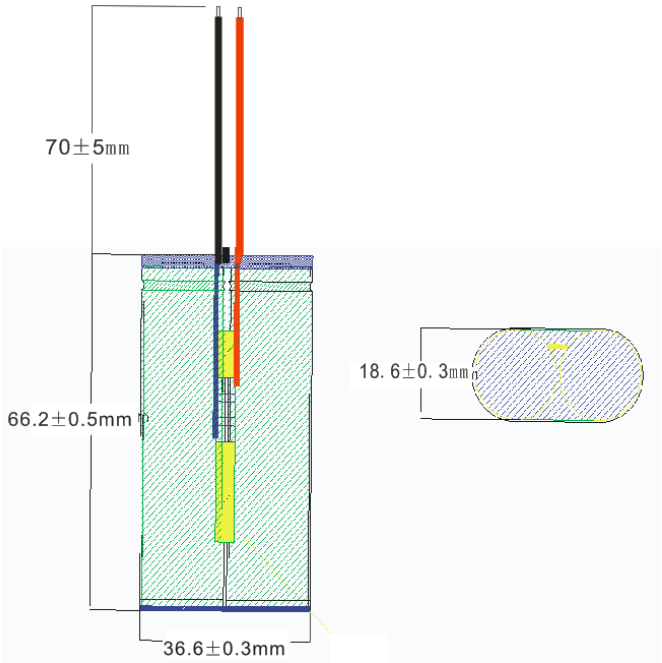
Toplayer



Bottomlayer

B+,B-串联电芯正负极
P+,P-输出正负极
BM+ BM-电芯串接口

5、Dimensions of battery pack 成品结构尺寸



Item 项目	Description 说明	Specification 尺寸
电子线	1007 24#线	

6、Maintainance and transportation 贮存、维护与运输

6.1 Storage 贮存

●If the battery need to be stored for a long time, charge the battery for 40%-70% electric quantity .

电池需长期贮存时，请将电池充电至 40%-70%的电量。

●Battery and the charger should be stored in clean, dry and ventilating place, and should not be together with corrosive material, keep the battery away from fire and heat source.

电池与充电器应贮存在清洁、干燥、通风处，应避免与腐蚀性物质接触，远离火源。

6.2 Transportation 运输

●Battery should be transported after packaging, and should avoid severe vibrating, impacting , extrusion, and direct light and rain. They can be transported by train, ship and plane, etc.

电池应包装后进行运输，在运输过程中应防止剧烈振动、冲击或挤压，防日晒雨淋。可使用汽车、火车、轮船、飞机等交通工具进行运输。

6.3 Maintainance 维护

●If the battery won't be used for a long period, charge it every 3 months, and each time 2~3h.

电池长期不使用时，建议每三个月进行补充一次电，用充电器补充 2~3h 即可。

7、Battery Handling Precautions 使用电池注意事项

●Forbid to immerse battery in water or allow it to get wet!

勿将电池投入水中或将其弄湿！

●Don't charge, use and store battery near a heat source such as fire and heater! If the battery leaks or releases strange odor, pls remove it from place near fire place immediately.

禁止在火源或极热条件下给电池充电！勿在热源（如火或加热器）附近使用或贮存电池。如果电池泄漏或发出异味，应远离火源并停止使用。

●Forbid to reverse the positive and negative pole!

勿将正负极接反！

●Forbid to throw the battery into fire or heat it!

勿将电池投入火中或给电池加热!

●Forbid to short-circuit battery with wire or other metal objects!

禁止用导线或其他金属物体将电池正负极短路！

●Forbid to nail, knock or trample battery!

禁止用钉子或其他尖锐物体刺穿电池壳体，禁止锤击或脚踏电池！

●Forbid to disassemble the battery in any way!

禁止以任何方式分解电池！

●If the battery gives off odor, gets heat, deformation, discoloration or appears any abnormal phenomenon, stop using it; please remove the battery from electrical appliances and stop using it, when the battery is being used or charged!

如果电池发出异味、发热、变形、变色或出现其他任何异常现象时不得使用,如果电池正在充电或使用，应立即从用电器或充电器上取出并停止使用！

●If the battery leaks and electrolyte leakage enters into the eyes, do not rub, rinse with water immediately and seek immediate medical assistance. If not in time, eyes will be hurt!

如果电池漏液后电解液进入眼睛，不要擦，应立即用水冲洗，立即寻求医疗救助。如不及时处理，眼睛将会受到伤害!

●During charging or discharging, if there is odor and unusual noise, immediately stop charging and discharging.

电池在充电或放电过程中，如果出现异味、异常声响，请立即停止充电或放电。

●Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used .In addition ,if the various usage conditions such as charge ,discharge ,ambient temperature ,etc are not maintained with in the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage ,If the batteries cannot maintain a charge for long periods of time ,even when they are charged correctly ,this may indicate it is time to charge the battery .

由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使是存放很长一段时间而不使用。如果使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，会缩短电池使用寿命，或者会产生漏液导致设备损坏。如果电池长周期不能充电，即使充电方法正确，这样需要更换电池了。

●Lipolymer battery cells have less mechanical endurance than metal-can-cased Lithium battery.Falling , hitting ,bending ,etc may cause degradation of soft Lipolymer types

characteristics.

聚合物电池比金属壳方形电池的机械耐久性更小。跌落、碰撞、弯曲等等都可能会降低聚合物电池性能。

●The period of warranty is one year from the date of shipment .Shenzhen Apollo Battery guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

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制造过程中形成的而不是由于用户滥用及错误使用造成，本公司负责退换电池。