ABL-NC 电池规格书

ABL-NC Battery Specification

产品类型 Product Type:	圆柱形锂离子充电电池组 Li-ion Cylindrical Rechargeable Battery Pack
产品型号 Product Y2ŘŜf:	ABL-NC
产品料号 Product No:	RH5G09010194

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Created Date

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Project manager Date

批准 :_____ 日期:_____
Approved Date

客户 **Customer**	**确认 Confirm**	**批准 Approved**

修订记录/Revision history

版本 Version	日期 Date	描述 Description	修订者 Reviser
V1.0	20240625	初版	阮传灿
V1.1	20240703	1、根据客户规格重新调整充电电压及保护参数	阮传灿
V1.2	20240715	1、更改循环寿命英文循环次数; 2、增加 5.3.2 器件清单； 3、增加 5.3.4 最新 layout 图示； 4、增加成品尺寸图； 5、二级过充保护参数下调为 3.65±0.3V。 6、调整最大瞬时放电电流为 8A(3S)，同步调整过流保护点。	阮传灿
V1.3	20240805	1、更新成品尺寸图； 2、电芯配阻调整为 3mV,2mΩ； 3、增加产品包装，铭牌图档； 4、出厂电压调整为 13-13.5V。	阮传灿
V1.4	20240910	1、更新项目型号为 ABL-NC; 2、更新电池重量为 About 265g; 3、更新标称容量描述为典型容量，更新铭牌； 4、依最新客户参数更新过流，温度恢复，短路参数； 5、出货 SOC 调整为 55%-75%； 6、更新电池内阻为 180mΩ	阮传灿

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1. Scope/范围

The specification describes the requirements for ABL-NC Rechargeable Li-Ion battery pack. Battery supplied by Fujian SCUD Power Technology Co., Ltd.
本规格书适用于 ABL-NC 锂离子电池组，由福建飞毛腿动力科技有限公司生产。

2. Standard compliance/参考标准

SJT11778、BSMI, TISI, CE, UKCA, CB, IECEE, UN38.3

3. Product name and model/产品型号名称

3.1 Product Name/**产品名称**

Li-ion Cylindrical Rechargeable Battery Pack

3.2 Product Model/**产品型号**

ABL-NC

3.3 Series parallel Construction/**串并联结构**

4S1P

4. Typical Characteristics/主要参数

4.1 Cell Characteristics/电芯参数

Supplier /电芯厂家	Cell Model /电芯型号	Nominal Voltage /标称电压	Capacity 容量（mAh）	Cell Impedance /电芯内阻
Great Power	Lithium-ion rechargeable cell Model : IFR21700-3000	3.2 V	3000 (Standard.) .	≤ 25 mΩ （AC IR）

4.2 Battery Characteristics/电池组参数

No.	Item	Specification	Remarks
4.2.1	Typical Capacity /典型容量	3000mAh	Capacity test with standard charge and standard discharge at 23℃±2℃
	Rated Capacity /额定容量	2700mAh/34.56Wh	
4.2.2	Nominal voltage /标称电压	12.8V	
4.2.3	Charge method /充电模式	CC/CV	
4.2.4	Upper Limited charging Voltage /充电限制电压	14.25V	
4.2.5	Upper limited of safe Voltage range /充电上限电压	14.25V	电池组安全充电电压上限
4.2.6	End of discharging Voltage /放电终止电压	10V	

4.2.7	Lower limit of safe voltage range /放电截止电压		10V	Cut-off voltage is 2.5V/cell
4.2.8	Standard Charge Current /标准充电电流		540mA (0.2C_5A)	Standard Charge Current (Recommend charging current)
4.2.10	Max. Charging Current /最大充电电流		1500mA	
4.2.11	Standard Discharge Current /标准放电电流		540mA (0.2C_5A)	23±2°C , 65% ±20%RH （Recommend discharging current)
4.2.12	Max. Continuous Discharge Current /最大持续放电电流		4200mA	
4.2.13	Max. Pulse Discharge Current /最大瞬时放电电流		8000mA(≤3S)	
4.2.14	Weight (g) /重量		About 270g	
4.2.15	Shipping OCV /出厂电压		13.0～13.5V	电量 55%-75%
4.2.16	Internal impedance /内阻		≤180 mΩ	AC 1kHz
4.2.16 4.2.17	Operating ambient temperature /工作环境温度	Charge	0℃～+45℃	
		Discharge	-20℃～+60℃	/
4.2.17 4.2.18	Operating cell surface temperature /工作电芯表面温度	Charge	0℃～+58℃	Charging
		Discharge	-20℃～+65℃	Discharge
4.2.18	Storage temperature /存储温度	Within 1 month	-20℃～+45℃	/
		Within 3 month	-20℃～+30℃	
		Within 1 year	-20℃～+20℃	
4.2.20	Cell sorting specifications /电芯分选规格		≤3mV/2mΩ	Voltage difference/Impedance difference

5. Performance/性能

5.1 Electrical characteristics/电气性能

Items	Conditions and others	Performances
Environment /环境	Unless otherwise specified, all test stated in this specification are conducted at ： 1)temperature: 23±2℃; 2)humidity: ≤75% RH ; 3)atmospheric pressure：86kPa~106kPa	
Measure Equipment /测试设备	1）Ammeter and Voltmeter: The ammeter and voltmeter should have an accuracy of the grade 0.2 or higher. 2)Slide caliper: The slide caliper should have less than 0.05mm scale. 3)Impedance meter: The impedance meter with AC 1kHz should be used.	
Standard Charge /标准充电	Charging the battery with 0.2C_5A of constant current and constant voltage 14.25V to limited charging voltage at 23±2℃. Charge cut-off current 100 mA. /在环境温度 23±2℃条件下，以 0.2C_5A 充电，当电池组端电压达到充电限制电压 14.25V 时，改为恒压充电， 充电截止电流 100 mA。	
Standard Discharge Capacity /标准放电容量	Within 10min after standard charge, discharge with 0.2C_5A to end of discharging voltage at 23±2℃. repeat charge and discharge for 2times. The smaller value of the capacity after 2 cycles is taken as the standard discharge capacity. /电池组按标准充电后搁置 10 分钟后，在 23±2℃的温度下以 0.2C_5A 电流放电到放电终止电压。上述实验可以重复 2 次，取两次充放电完整循环后容量的较小值作为标准放电容量。	Discharge capacity ≥Rated capacity /放电容量≥额定容量

High Temperature discharge /高温放电	After standard charged, battery should be stored in a temperature-controlled environment at 55±2℃ for 2 hours. after storage, battery should be discharged with 0.2C_5A to end of discharging voltage. /电池组按标准充电结束后，将电池组放入 55℃±2℃的高温箱中恒温 2h，然后以 0.2C_5A 电流放电至放电终止电压。	Discharge capacity ≥90% Rated capacity /放电容量≥90%额定容量
Low Temperature discharge /低温放电	After standard charged, battery should be stored in a temperature-controlled environment at -10±2℃ for 4 hours. after storage, battery should be discharged with 0.2 C_5A to end of discharging voltage. /电池组按标准充电结束后，将电池组放入-10℃±2℃的低温箱中恒温 4h 后，以 0.2 C_5A 电流放电至放电终止电压。	Discharge capacity ≥50% Rated capacity /放电容量≥50%额定容量
Storage Characteristics (28 days) /荷电保持容量（28 天）	A standard charged battery should be stored in a temperature-controlled environment at 23±2℃ for 28 days. after storage, battery should be discharged with 0.2 C_5A to end of discharging voltage，the discharge time should meet the requirement. Then, battery should be standard charged and discharged with 0.2 C_5A to end of discharging voltage at 23±2℃. The discharge time should meet the requirement. /在环境温度为 23℃±5℃条件下，将充满电电池组开路搁置 28 天后，在 23℃±2℃的环境温度下以 0.2 C_5A 放电至放电终止电压，放电容量需要满足规定要求；然后电池组再以标准充电方式充电后以 0.2 C_5A 电流进行放电至放电终止电压。放电容量需要满足规定要求。	Remaining Capacity (after the storage) ≥80% of the standard discharge capacity; Recovery Capacity (after the storage) ≥90% of the standard discharge capacity 储存后的剩余容量为标准放电容量的 80%以上；恢复容量为标准放电容量的 90%以上

Cycle Life /循环寿命	Charging/discharging is repeated in the below condition 23℃±3℃. Charge:14.25V/0.56A to CC/CV charging, cut off current 100mA. Discharge: 0.56A discharge to End of 10V. Pack is to be rested for 0.5~1 hour after charged and discharge,and record it. /在环境温度 23℃±3℃的条件下，以 14.25V/0.2 C_5A 进行 CC/CV 模式充电，充电截止电流 100mA，搁置 0.5~1h，然后以 4A 电流放电至 10V，放电结束后，搁置 0.5~1h，再进行下一个充放电循环。	The battery capacity should be more than 80 % of Initial capacity after 1000 cycles. /循环 1000 次后电池组容量为初始容量 80%以上。

5.2 Environmental Safety Test/环境安全试验

Items	Conditions and others	Performances
Free fall test 自由跌落测试	Drop the battery in the shipment condition(full charge)from 1m height onto 18~20 mm or thicker concrete with p-tile on it 1 times each of obverse and inverse directions at 23±2℃ 电池振动试验结束后按下列条件进行自由跌落试验： 跌落高度：1.0m； 承接物：18~20mm 混凝土板上； 跌落方向：沿水平方向正反面各跌落一次。	The battery should be no leakage, no venting, no rupture, no fire or no explosion. /电池组应不泄露、不泄气、不破裂、不起火和不爆炸。
Vibration test 振动测试	After standard charge, the battery is to be tested as following conditions: Amplitude:1.6mm Frequency:10~55Hz(sweep:1Hz/min) Direction: X/Y/Z axis for 30min. The battery is to be tested in three mutually perpendicular to each axis. 标准充电后，将电池安装在振动台上，在 X、Y、Z 三个垂直方向进行实验，振动频率在 10~55Hz 间以 1Hz/min 的速度变化，振幅：1.6mm，往复振动 30min。	The battery should be no leakage, no venting, no rupture, no fire or no explosion. /电池组应不泄露、不泄气、不破裂、不起火和不爆炸。

High and low temperature thermal exposure test 高低温热冲击测试	Each fully charged cell was placed in a low temperature environment at a temperature of -40℃ for 1 h, and then left at 85 ℃ for 1 h, the cycle was terminated 32 times. After the test, the sample was taken out and left in the standard environment for 6 h to visually inspect the sample. 充满电的电池放入温度-40℃的低温环境中搁置 1h，再在 85℃条件搁置 1h，如此循环 32 次结束试验。试验结束后将样品取出，在标准环境下搁置 6h。	The battery should be no leakage, no venting, no rupture, no fire or no explosion. /电池组应不泄露、不泄气、不破裂、不起火和不爆炸。
Acceleration Test /加速度冲击	A standard charged battery is to be firmly secured to the platform of acceleration test equipment. Each shock is to be applied in a direction normal to the face of the battery. For each shock the cell is to be accelerated in such a manner that during the initial 3 milliseconds the minimum average acceleration is 75g.N. The peak acceleration should be between 125 and 175g. N. The acceleration shock test last for 6+/-1ms. After testing, charge and discharge the battery with standard method. /电池组按规定充电结束后，固定在冲击台上，最初 3ms 内，最小平均加速度为 75g.N,峰值加速度为 150+/-25g.N,持续脉冲时间为 6+/-1ms,电池组每个方向进行三次加速度冲击。测试后，电池组按标准充电方式进行一次放电充电循环。	The battery should be no fire, no explosion, or no leakage. /电池组应不起火，不爆炸，不漏液。
High temperature stress relieving /高温应力消除	The standard charged battery is to be placed in a 70+/-2 ℃ circulating air oven for 7 hours. After finishing the test, remove it and restore to room temperature. /将电池组按照标准充电方法充满电后，在 70+/-2℃的鼓风恒温箱中搁置 7h，取出并恢复至室温。	The battery does not result in the physical deformation that causes the internal components to be exposed or affect safety. /外壳不能发生导致内部组成暴露或影响安全的物理变形。

Short-circuit Test 短路测试	After fully charge, shorted battery for 1h (load 80±20mΩ). There should be no fire and explosion. （23±5℃） 电池充满电后，（23±5℃）将电池正负极短路（外接电阻 80±20mΩ）持续 1h，要求试验过程中电池不起火、不 爆炸。	The battery should be no leakage, no venting, no rupture, no fire or no explosion.the surface of the Cells are lower than 150℃ /电池组应不泄露、不泄气、不破裂、不起火和不爆炸。 电池表面温度应低于 150℃
Constant temperature damp heat test 恒温湿热测试	The fully charged battery is placed in a constant temperature and humidity chamber with a temperature of (40 ± 2)℃ and a relative humidity of 90% to 95% for 48 hours, and is allowed to stand for 6 hours under standard environmental conditions. 将满电的电池放入温度（40±2）℃，相对湿度 90%~95%的恒温恒湿箱中，持续时间 48h,在标准环境条件下搁置 6h。	The battery should be no leakage, no venting, no rupture, no fire or no explosion. /电池组应不泄露、不泄气、不破裂、不起火和不爆炸。

5.3 BMS Specification/保护板规格

5.3.1 Function of BMS/保护板参数

No.	Item	Unit	Min.	Typ.	Max.	Remark
Voltage protection						
1	电芯一级过压保护电压 Cell 1st overcharge protection voltage	V	3.535	3.56	3.585	/此保护通过主机软件控制保护，电池包不管控
2	电芯一级过压保护延时 Cell 1st overcharge protection delay time	s	1	2	5	/此保护通过主机软件控制保护，电池包不管控
3	电芯二级过压保护电压 Cell 2nd overcharge protection voltage	V	3.62	3.65	3.68	/AFE
4	电芯二级过压保护延时 Cell 2nd overcharge protection delay time	s	1	2	4	/AFE
5	电芯一级过压保护解除电压 Cell 1st overcharge protection release voltage	V	3.35	3.40	3.45	/AFE
6	电芯三级过压保护电压（硬件）Cell 3nd overcharge protection voltage(hardware)	V	3.775	3.8	3.825	永久失效 Permanent failure(blown Self Control Protector)

7	电芯三级过压保护延时（硬件）Cell 3nd overcharge protection delay time (hardware)	s	0.1	1	3	永久失效 Permanent failure(blown Self Control Protector)
8	电芯一级欠压保护电压 Cell 1st undervoltage protection voltage	V	2.45	2.5	2.55	
9	电芯一级欠压保护延时 Cell 1st undervoltage protection delay time	s	2	3	5	
10	电芯一级欠压保护解除电压 Cell 1st undervoltage protection release voltage	V	2.70	2.75	2.80	
11	电芯二级欠压保护电压 2nd Cell Undervoltage Protection Voltage	V	1.5	1.6	1.7	永久失效 Permanent failure(blown Self Control Protector)
12	电芯二级欠压保护电压延时 2nd Cell Undervoltage Protection Voltage Delay Time	s	4	5	6	
电流保护 Current protection						
13	一级充电过流保护电流 Charge 1st over current protection	A	4	5	6	
14	一级充电过流保护延时 Charge 1st over current protection delay time	S	4	5	7	
15	二级充电过流保护电流 Charge 2nd over current protection	A	6	8	10	正常充电模式 Normal charge and Dumb charge mode
16	二级充电过流保护延时 Charge 2nd over current protection delay time	s	0.1	1	3	
17	充电过流保护解除条件 Charge over current protection release condition	/	等待 5s 自恢复			

18	一级放电过流保护电流 Discharge 1st over current protection	A	9	10	11	
19	一级放电过流保护延时 Discharge 1st over current protection delay time	s	2	3	5	
20	二级放电过流保护电流 Discharge 2nd over current protection	A	13	14	15	
21	二级放电过流保护延时 Discharge 2nd over current protection delay time	S	0.1	1	2	
22	放电过流保护解除条件 Discharge over current protection release condition	/	等待 10s 自恢复			
23	短路保护电流 Short-circuit protection current	A	37.25	43.75	50.25	外部短路 External short circuit
24	短路保护延时 Short-circuit protection delay time	us	200	350	500	
25	短路保护解除条件 Short-circuit protection release condition	/	保护后过 10 S 自动恢复，连续触发 2 次后自动锁 存，经过 60 S 后解除锁存。 Automatic recovery after 10s after protection, automatic latching after 2 consecutive triggers, unlocking after 60s.			
Temperature protection						
26	电芯充电高温保护温度 Charge High Temperature Protection	℃	52	55	58	
27	电芯充电高温保护延时 Charge High Temperature Protection Delay Time	s	1	2	4	
28	电芯充电高温保护解除温度 Charge High Temperature Protection Release	℃	49	52	55	

29	电芯充电低温保护温度 Charge Low Temperature Protection	℃	-2	1	4	
31	电芯充电低温保护温度延时 Charge Low Temperature Protection Delay Time	s	1	2	4	
32	电芯充电低温保护解除温度 Charge Low Temperature Protection Release	℃	2	5	8	
33	电芯放电高温保护温度 Discharge High Temperature Protection	℃	59	62	65	
35	电芯放电高温保护延时 Discharge High Temperature Protection Delay Time	s	1	2	4	
36	电芯放电高温保护解除温度 Discharge High Temperature Protection Release	℃	53	56	59	
37	电芯放电低温保护温度 Discharge Low Temperature Protection	℃	-20	-17	-14	
39	电芯放电低温保护延时 Discharge Low Temperature Protection Delay Time	s	1	2	4	
40	电芯放电低温保护解除温度 Discharge Low Temperature Protection Release	℃	-16	-13	-10	

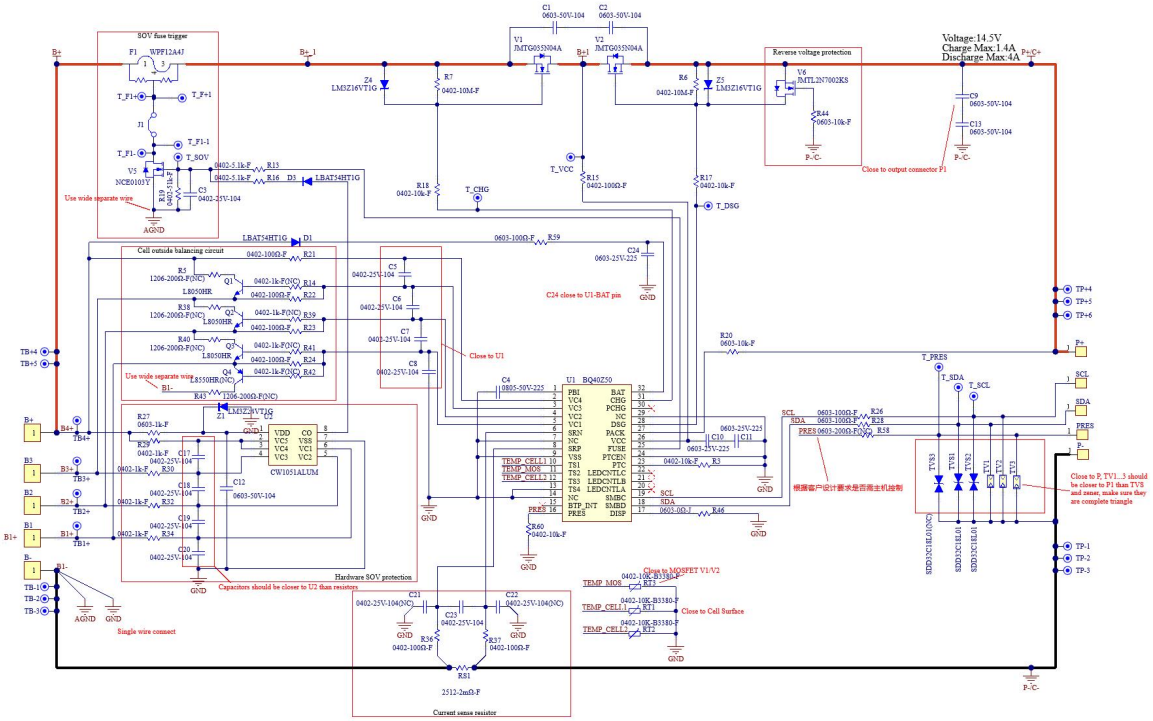
5.3.2 Parts List/器件清单

No.	Reference	Description	Part name	Qty.	Maker
1	U1	IC	BQ40Z50	1	TI
2	U2	IC	CW1051ALUM	1	CELLWISE
3	V1, V2	Mosfet	JMTG035N04A	2	JJW
4	V1, V2	Mosfet	CRMGTL0404A	2	CRM(替代料)
5	V5	Mosfet	NCE0103Y	1	NCE
6	V5	Mosfet	SI2392-TP		MCC(替代料)
7	V6	Mosfet	JMTL2N7002KS	1	JJW
8	V6	Mosfet	L2N7002LT1G		LRC(替代料)
9	Z1	Zener	24V-SOD-323	1	LRC/MCC
10	Z4, Z5	Zener	16V-SOD-323	2	LRC/MCC
11	C1, C2, C9, C12, C13	Cap	0603-50V-104	5	SAMSUNG
12	C3, C5, C6, C7, C8, C17, C18, C19, C20, C23	Cap	0402-25V-104	10	Yageo/SAMSUNG
13	C4	Cap	0805-50V-225	1	Yageo/SAMSUNG
14	C10, C11, C24	Cap	0603-25V-225	3	Yageo/SAMSUNG
15	D1, D3	Diode	SOD-323-30V-200mA	2	LRC/JCET
16	F1	三端 FUSE	WPF12A4J	1	WAYON
17	F1	三端 FUSE	SFJ-1412W	1	Dexerials(替代料)
18	R3, R17, R18, R60	Chip Resistor	0402-10k-F	4	Yageo
19	R6, R7	Chip Resistor	0402-10M-F	2	Yageo
20	R13, R16	Chip Resistor	0402-5.1k-F	2	Yageo/ViKing
21	R15, R21, R22, R23, R24, R36, R37	Chip Resistor	0402-100Ω-F	7	Yageo
22	R19	Chip Resistor	0402-51k-F	1	Yageo
23	R20, R44	Chip Resistor	0603-10k-F	2	Yageo
24	R26, R28, R59	Chip Resistor	0603-100Ω-F	3	Yageo
25	R27	Chip Resistor	0603-1k-F	1	Yageo
26	R29, R30, R32, R34	Chip Resistor	0402-1k-F	4	Yageo
27	R46	Chip Resistor	0603-0Ω-J	1	Yageo

28	RS1	Chip Resistor	2512-2mΩ-F	1	TA-I/信维/普森美
29	RT1, RT2, RT3	NTC	0402-10K-B3380-F	3	TDK/muRata
30	TVS1, TVS2	TVS	ESD-18V-1mA-SDD32	2	BrightKing/LRC
31	-	PCB	LFP320G-A02	1	福强/汇芯

*All listed above are RoHS.

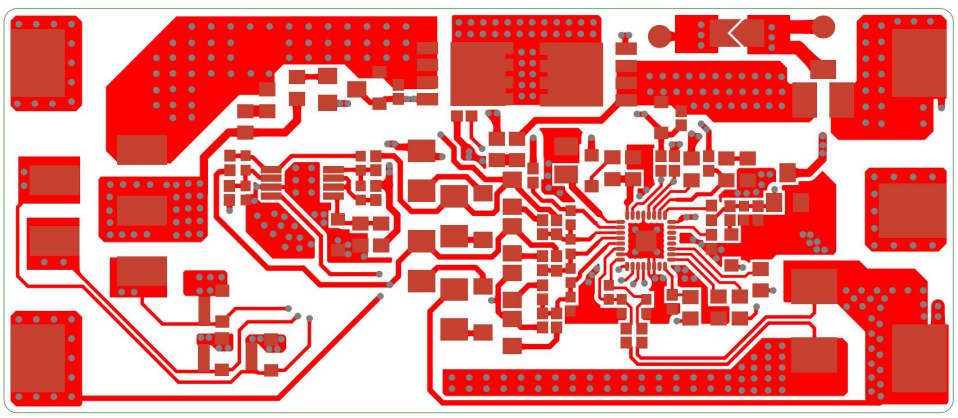
5.3.3 Circuit Diagram/电路原理图



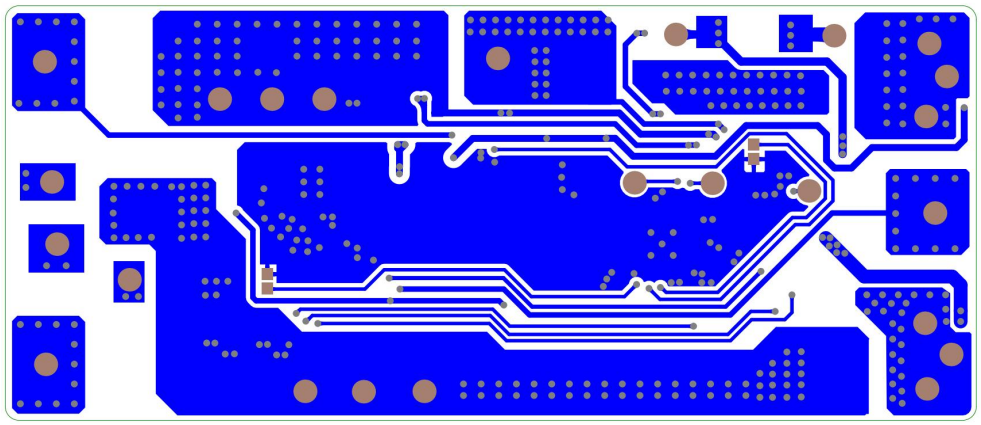
5.3.4 PCB Layout

5.3.4.1 PCB

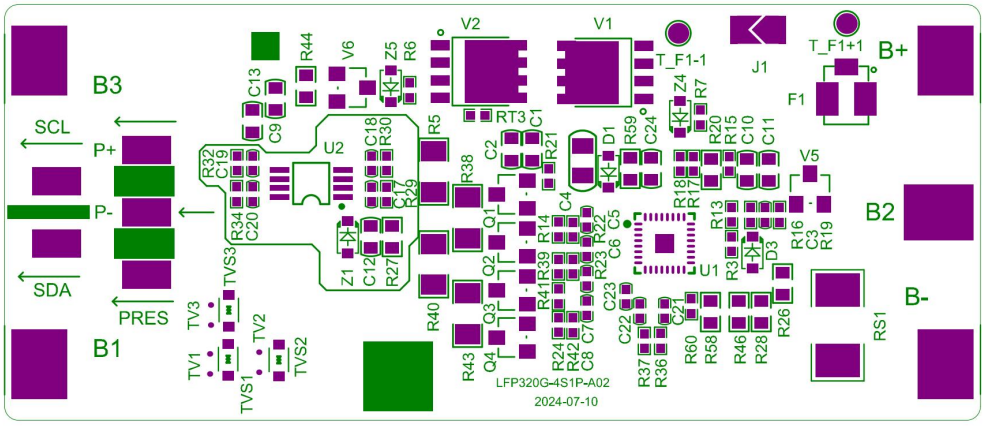
Toplayer:



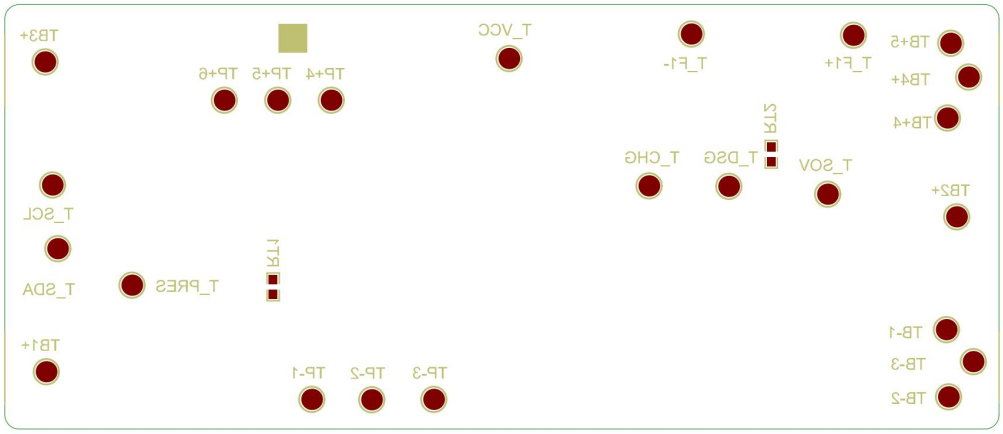
Bottomlayer:



Top Silkscreen & Paste:



Bottom Silkscreen & Paste:



5.4 Safety Requirement/安全性能

Items	Conditions and others	Performances
Charge Over Voltage Protection /过压充电	The standard charged battery is continue to be charged with maximum charging current to n*6V or the highest possible voltage(Choose the best one), and keep the voltage by CV charging, until the protection circuit starts. 将电池组按标准充电方式充满电后，继续以最大充电电流恒流充至 n*6V 或者电池组可能承受的最高电压值（两者取较高者），并保持该电压进行恒压充电，充电至保护电路起动。	The battery should be no fire, no explosion or no leakage. 电池组应不起火，不爆炸，不漏液。
Charge Over Current Protection /过流充电	The standard discharged battery is to be charged with 1.5 times charge protection current, until the protection circuit starts. 电池组按标准放电方式放完电后，然后以 1.5 倍的过流充电保护电流进行恒流充电，直至保护电路起动。	The battery should be no fire, no explosion or no leakage. 电池组应不起火，不爆炸，不漏液。
Over Discharge Protection /欠压放电	The standard charged battery is to be discharged with maximum continuous discharge current, until the protection circuit starts. then keep for 10 minutes, recharging the battery with standard charge method. 将电池组按标准充电方式充满电后，以其最大持续放电电流放电至保护电路起动，然后静置 10min,继续按标准充电方法充满电。	The battery should be no fire, no explosion or no leakage. 电池组应不起火，不爆炸，不漏液。
Over Load Protection /过载	The standard charged battery is to be discharged with 1.5 times discharge protection current, until the protection circuit starts. 将电池组按标准充电方式充满电后，然后以 1.5 倍过流保护电流恒流放电至保护电路起动。	The battery should be no fire, no explosion or no leakage. 电池组应不起火，不爆炸，不漏液。
External Short Circuit /外部短路	The test should be conducted under 25±5℃. The standard charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with copper wire having a resistance about 80mΩ±20mΩ,	The battery should be no fire, no explosion, no smoke or no leakage. 电池组应不起火，不爆炸，不冒烟或漏液。

	until the protection circuit starts. 将电池组按照标准充电方式充满电后，短路电池组组的正负极端子，外部短路总电阻为80+/-20mΩ,直至保护电路起动。	
Reverse Charge /反向充电	The standard charged battery should be reverse charged with recommending current for 90 minutes. 将电池组按标准充电方式充满电后，然后以推荐充电电流反向充电 90min。	The battery should be no fire, no explosion, no smoke or no leakage. 电池组应不起火，不爆炸，不冒烟或漏液。
ESD /静电放电	The standard charged battery should be test under ESD ±8kV contact discharge and ±16kV air discharge for each 5 times. The interval of discharge is 1min. 对充饱电后的电池组（金属端子）进行±8kV 接触放电与±16kV 空气放电各 5 次，每次放电间隔 1 分钟。	The function of battery should be work well. 电池组所有功能正常。

6 Mechanical characteristics/机械性能

6.1 Appearance and diagrams/外观和尺寸

Sheet 6 Appearance

NO.	Item	Conditions and others	Remark
1	Dimension/外形尺寸	Refer to the structure diagram /参见机械结构图表	
2	Connection PIN/接触极片	Refer to the structure diagram /参见机械结构图表	
3	The material of housing/塑壳材料	Combustion proof grade:V-0 /阻燃等级：V-0	
4	Mark and Label/标签	Refer to the attachment of battery label. /参见结构标签部分	

Structure diagrams/机械结构图表：

Refer to the attachment of battery structure diagram./参考附件电池结构图表
详见附页

6.2 Connector/连接器定义

Refer to the attachment of battery structure diagram./参考附件电池结构图表
详见附页

7 Label/标签

Refer to the attachment of battery label./ 参考附件电池标签

8 Package/包装

According to the attached./参考附件包装

包装箱外应标明产品名称、型号、数量、毛重、制造厂商及联络地址、出厂日期；其包装储运的标志应符合 GB-191-7000 的规定。

9 9 Others/其他

9.1 Odor/气味

The battery do not product special smell or harmful odor./本电池组不会产生特别或有害的气味

9.2 Protection for Environment/环境保护

The material used for packing should meet the criterion to protect environment RoHs 2.0、Reach. /封装电池组所用材料须全部符合环境保护标准 RoHs 2.0、Reach .

10 Warning and notice/注意事项

⚠WARNING

1、 Do not put the battery into a fire, or heat the battery. /请勿将电池组放入火中或加热电池组。

2、 Do not store the battery in high temperature environment. /请勿将电池组储存在高温环境中

3、 Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment. /请勿将电池组反接在充电器或设备的正极(+)和负极(-)上。

4、 Do not let the battery terminals (+ and -) contact a wire or any metal (like a metal necklace or a hairpin) with which it carried or stored together, may cause short-circuit. /不要让电池组(+和-)端子与随身携带或储存在一起的电线或任何金属(如金属项链或发夹)接触，可能导致短路。

5、 Do not drive a nail in, hit with a hammer, or stamp on the battery, do not strike the battery in other ways. /禁止钉、锤、戳电池组，禁止用其他方式敲击电池组。

6、 Do not disassemble or alter the batteries' outside structure. /禁止拆卸或改变电池组的外部结构。

7、 Do not submerge the battery in water, do not wet the battery when store the battery. /请勿将电池组浸入水中，储存电池组时请勿弄湿电池组。

⚠NOTICE

1 、 Battery should be charged and discharged with proper charger, in compliance with correct operation

contents. /电池组应按照正确的操作内容，使用合适的充电器进行充放电。

2、Do not use the battery with other maker's batteries, different types and /or models of batteries such as dry batteries, nickel-metal hydride batteries, or nickel-cadmium batteries, or new and old lithium batteries together. /请勿与其他厂商的电池、干电池、镍氢电池、镍镉电池、新旧锂电池等不同型号和类型的电池或电池组混用。

3、Do not leave the battery in a charger or equipment if it generates an older and/or heat, changes color and/or shape, leaks electrolyte, or cause any other abnormality. /如果电池组产生老化和/或发热、变色和/或形状改变、电解液泄漏或导致其他任何异常，请不要将电池组留在充电器或设备中。

4、Do not discharge the battery continuously when it is not charged. /电池组未充电时，请勿连续放电。

⚠Caution

1、Before using the battery, carefully read and follow battery specification and the information on the surface of the batteries./使用电池组前，请仔细阅读和遵守电池组组规格书，以及电池组组表面的信息。

2、Children should not be allowed to play with them. /避免儿童玩弄电池组。

3、The batteries should only be charged with a matching charger. /本电池组只能使用配套充电器充电。

4、Caution – The battery used in this device may present a risk of fire or chemical burn if mistreated. Do no disassemble, heat above (manufacturer’s maximum temperature limit), or incinerate. Replace battery with (battery manufacturer’s name or end product manufacturer’s name and part number) only. Use of another battery may present a risk of fire or explosion. /注意事项-在设备中使用的电池组如果使用不当，可能存在着火或化学灼伤的风险。请不要拆卸、加热超过规格书定义的最高温度限制，或焚烧。只使用(电池组制造商名称或最终产品制造商名称和零件号)替换电池组。使用其他电池组可能会有起火或爆炸的危险。

5、When the batteries are not be used for a long time, please store them safely, the battery shall be charged every three months so that they will stay in a half-charged state. Please wrap the batteries with non-conductive materials in order that metallic materials will not contact the batteries directly, which may result in damage to the batteries. Keep the batteries in a cool and dry place. /长期不用时，请将电池组储存完好，电池组应每隔 3 个月补电一次，让电池组处于半荷电状态。请用不导电材料包裹电池组，以避免金属直接接触电池组造成电池组损坏。将电池组保存于阴凉干燥处。

PART NUMBER APPLICATION TABLE

ITEM	PART No.	SPECIFICATION	REMARK
1	RH5G09010194	LFP320G-鹏辉-IFR21700-3000-4S1P	
2			
3			

REVISONS LIST

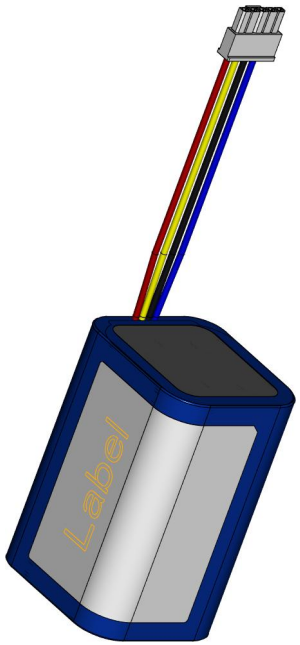
ITEM	MARK	QTY	CONTENTS OF CHANGE	REVISER	DATE
1					
2					
3					

通用技术要求：

1. 所有材料和涂层必须符合所有适用的国际环境相关法规，包含但不限于RoHS、REACH、HF；
2. 所提供的3D数据将用于生产和检验；
3. 几何尺寸公差参照ASME Y14.5-2018；
   本图未注几何公差按：

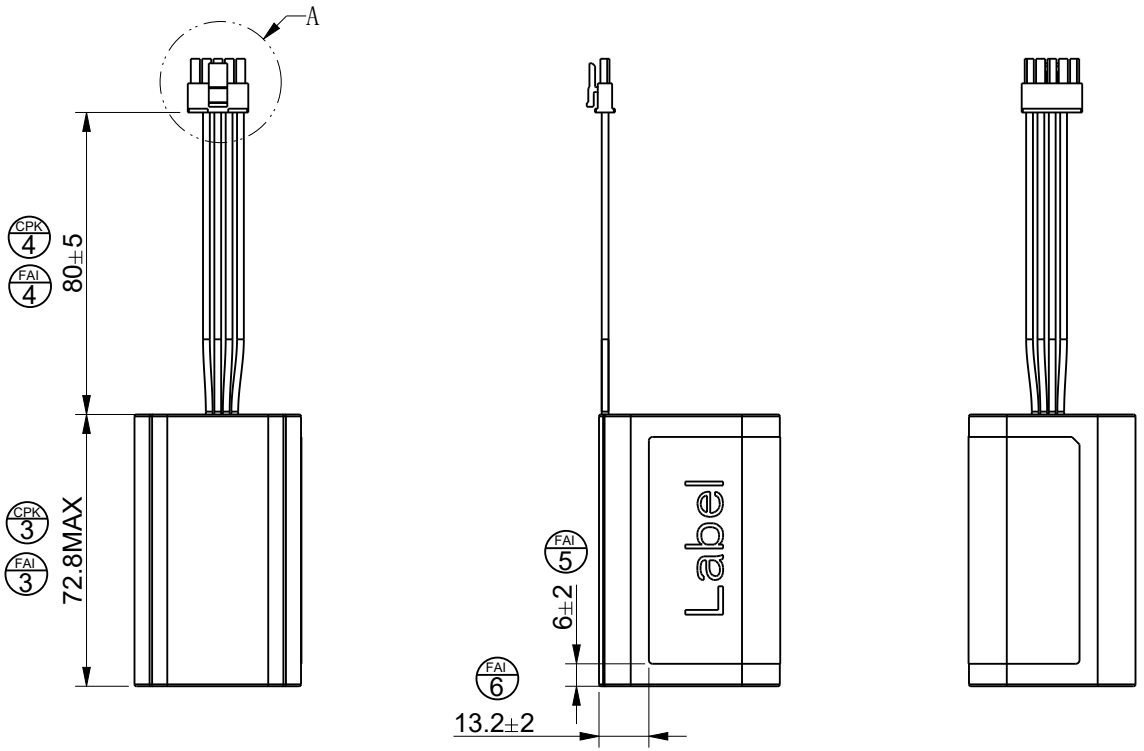
0.8 A BⓂ CⓂ	0.8 A BⓂ CⓂ	∅尺寸±0.25 ⌖ ∅0.8Ⓜ A BⓂ CⓂ	尺寸±0.25 ⌖ ∅0.8Ⓜ A BⓂ CⓂ
所有混合面	所有切边线	圆形尺寸要素	非圆形尺寸要素

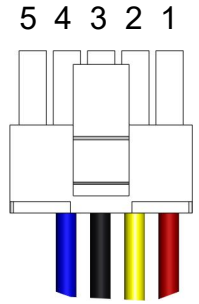
4. (FAI)表示FAI尺寸，(CPK)表示CPK尺寸，（）表示参考尺寸，△X表示变更版本，未注尺寸公差按附表；
5. 在运输和搬运过程中，部件必须包装，以防止损坏、变形或污染；
6. 所有部品表面应符合SCUD外观规格标准和封样品；
   外观表面无缺陷，没有流痕、烧伤痕迹、凹痕、裂纹、熔接线、污垢、氧化等缺陷；
   毛刺应控制在材料厚度的10%以内；
7. 不得含有二次料，未经SCUD允许不得更改原材料或量产后的注塑参数；
8. 其他未注项目对比封样，参考部品承认书，依据SCUD进料检验通用规范执行。



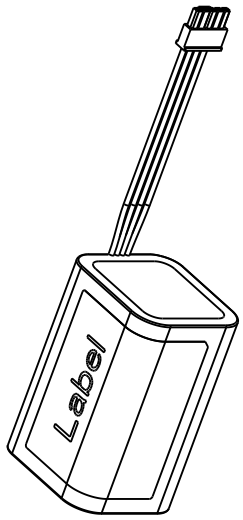
mm<size(A)<=mm	TOL
-	-
0<A<=30	+/-0.10
30<A<=50	+/-0.15
50<A<=100	+/-0.20
100<A<=200	+/-0.25
200<A	+/-0.30

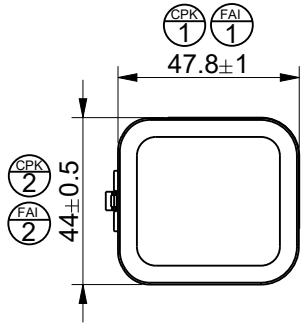
DRW. No.		福建飞毛腿动力科技有限公司 FUJIAN SCUD POWER TECH. CO.,LTD					
NAME	成品尺寸图						
DESIGNED			UNIT	mm	MATERIAL		
STANDARD			SCALE	NTS			
CHECKED			SIZE	A4		PROJECT	LFP320G
APPROVED			SHEET No.	1/2		REV	A 1.0





视图A





定义：
连接器型号：康瑞 H3000M1050201A
端子型号：康瑞 T3000FPT0101A

5Pin: Empty

4pin: SDA BLUE UL1007 AWG20

3Pin: P- BLACK UI1007 AWG20

2Pin: SCL YELLOW UL1007 AWG20

1Pin: P+ RED UL1007 AWG20

mm<size(A)<=mm	TOL
-	-
0<A<=30	+/-0.10
30<A<=50	+/-0.15
50<A<=100	+/-0.20
100<A<=200	+/-0.25
200<A	+/-0.30

DRW. No.		福建飞毛腿动力科技有限公司 FUJIAN SCUD POWER TECH. CO.,LTD					
NAME	成品尺寸图						
DESIGNED			UNIT	mm	MATERIAL		
STANDARD			SCALE	NTS			
CHECKED			SIZE	A4		PROJECT	LFP320G
APPROVED			SHEET No.	2/2		REV	A 1.0