

技术规格书确认表
SPECIFICATION APPROVAL SHEET

德赛型号/DESAY Model No.: 2532002

客户型号/Customer Model No.: COSMO

描述/Description: 3.7V/6000mAh/22.2Wh

修定/Issued	审核/Checked	批准/Approved
Bruce Shao	Bruce Shao	PC Zhou

客户确认栏 Customer Acceptance	签名/Signature	日期/Date
	公司名称 Company Name	
	公司盖章 Company Stamp	

更改记录

AMENDMENT RECORDS

版本 Revision	描述 Description	日期 Date	修订 Issued	审核 Checked	批准 Approved
01	New Release	2021/05/14	Bruce Shao	Bruce Shao	PC Zhou
02	Update Label	2021/06/04	Bruce Shao	Bruce Shao	PC Zhou

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1. 适用范围 Scope

本规格书描述了惠州市德赛电池有限公司生产的可充电锂聚合物电池 2532002 的产品性能指标。

This document describes the Product Specification of the Li-ion polymer rechargeable battery 2532002 supplied by Huizhou Desay Battery Co., Ltd..

2. 产品型号 Model No.: 2532002

3. 产品规格 Specification

序号/No.	项目/Items	规格/Specifications								
3.1	充电限制电压 Charge Cut-off Voltage	4.2V								
3.2	额定电压 Nominal Voltage	3.7V								
3.3	放电截止电压 Discharge Cut-off Voltage	3.0V (容量测试/ for capacity measure)								
3.4	典型容量 Typical Capacity	6000mAh@ 0.2 C Discharge/3.0 V Cut-off								
3.5	最小容量 Minimal Capacity	5900mAh@ 0.2 C Discharge/3.0 V Cut-off								
3.6	标准充电电流 Standard charging current	0.2C CC to 4.2V, then CV to 0.02C cut off at RT								
3.7	不同温度下充电要求 Charge method with temperature	<table border="0"> <tr> <td>充电温度 Charge Temperature</td> <td>充电电流 Charge Current</td> </tr> <tr> <td>0 °C ~15 °C</td> <td>≤1180mA CC to 4.2V</td> </tr> <tr> <td>15 °C ~45 °C</td> <td>≤4130mA CC to 4.2V</td> </tr> <tr> <td>45 °C ~60 °C</td> <td>≤2950mA CC to 4.1V</td> </tr> </table>	充电温度 Charge Temperature	充电电流 Charge Current	0 °C ~15 °C	≤1180mA CC to 4.2V	15 °C ~45 °C	≤4130mA CC to 4.2V	45 °C ~60 °C	≤2950mA CC to 4.1V
充电温度 Charge Temperature	充电电流 Charge Current									
0 °C ~15 °C	≤1180mA CC to 4.2V									
15 °C ~45 °C	≤4130mA CC to 4.2V									
45 °C ~60 °C	≤2950mA CC to 4.1V									
3.8	不同温度下放电要求 Discharge method with temperature	<table border="0"> <tr> <td>放电温度 Discharge Temperature</td> <td>放电电流 Discharge Current</td> </tr> <tr> <td>-20 °C ~0 °C</td> <td>≤1180mA CC to 3.0V</td> </tr> <tr> <td>0 °C ~60 °C</td> <td>≤8000mA CC to 3.0V</td> </tr> </table>	放电温度 Discharge Temperature	放电电流 Discharge Current	-20 °C ~0 °C	≤1180mA CC to 3.0V	0 °C ~60 °C	≤8000mA CC to 3.0V		
放电温度 Discharge Temperature	放电电流 Discharge Current									
-20 °C ~0 °C	≤1180mA CC to 3.0V									
0 °C ~60 °C	≤8000mA CC to 3.0V									
3.9	初始内阻值 Initial Impedance	≤115mΩ (半充状态下, 测量其 AC 1KHz 下的交流阻抗。) (Internal resistance measured at AC 1KHz after 50% charge)								
3.10	出厂开路电压 Shipping OCV	3.78V~3.90V								
3.11	NTC 阻值(20 °C ~30 °C)	8.21~12.22k Ω								
3.12	ID 电阻值	9.85~10.15k Ω								
3.13	电池外部尺寸 Outline Dimension	Length: 108 mm max Width: 92.12 mm max Height: 5 mm max 详细尺寸见成品电池结构图 Refer to the battery product drawing for detail dimensions								
3.14	电池重量 Pack Weight	120g for reference								

3.15	工作温度 Operating Temperature	充电/Charge: 0 °C to 60 °C 放电/Discharge: -20 °C to 60 °C
3.16	储存温度 Storage Temperature	-20°C ~ +45°C (恢复容量: 1 个月内 ≥85%/Recoverable capacity: ≥85% within 1 month) -20°C ~ +35°C (恢复容量: 3 个月内 ≥85%/Recoverable capacity: ≥85% within 3 months) -20°C ~ +25°C (恢复容量: 12 个月内 ≥85%/Recoverable capacity: ≥85% within 12 months)

4. 性能标准 Performance Criteria

4.1 电性能 Electrical Characteristics

序号/No.	项目/Items	测试方法和条件/Test Method and Condition	标准/Criteria
4.1.1	标准充电 Standard Charge	0.2C恒流充电至4.2V, 恒压4.2V充电至电流降至0.02 C。 0.2C CC (constant current) charge to 4.2V, then CV (constant voltage 4.2V) charge till charge current decline to 0.02C	N.A.
4.1.2	荷电保持能力及恢复容量 Capacity Retention & Recovery Capacity	1. 电池按规格标准规定充电, 在 23°C ± 5°C 的环境下, 将电池开路搁置 28 天后, 在 23°C ± 2°C 的环境下以 0.2C 电流进行放电至截止电压; After standard charge at ambient temperature (20 ± 5) °C, then storage at ambient temperature (23 ± 2) °C for 28 days, then 0.2C discharge to cut-off voltage. 2. 然后按规格标准规定充电后, 再在 23°C ± 2°C 的环境下以 0.2C 放电至终止电压。 After standard charge end, then discharge with 0.2C to cut-off voltage.	1. 残余容量 /Residual capacity > 90% 2. 残余容量 /Residual capacity > 94%
4.1.3	循环寿命 Cycle Life	0.7C标准充电至4.2V, 1.0C标准放电至3.0V, 连续充放电循环500次, 在第500次循环结束后进行充放电容量测试。 Charge the battery with 0.7C current to 4.2V and discharge the battery with 1.0C current until 3.0V. Repeat the charging and discharging and record remained capacity after 500 th cycles.	大于初始容量的 80% >80% of initial capacity 厚度膨胀 ≤ 8% THK swelling ≤ 8%

4.2 安全性能 Safety Characteristics

序号/No.	项目/Items	测试方法和条件/Test Method and Condition	标准/Criteria
4.2.1	过压充电保护 Over-charge Voltage Protection	将电池按照规格标准充电的方式充满电后, 继续以最大充电电流 (I _{cm}) 恒流充电至 6V 或可能承受的最高电压值 (两者取最高者), 并保持该电压进行恒压充电, 充电至保护电路动作。 After charging the battery according to the standard, the battery will continue to charge the maximum charge current (I _{cm}) constant current to the 6V or the maximum voltage that may be the highest (both the highest), and keep the voltage to be charged at constant pressure and charge to the protection circuit.	不漏液、不起火、不爆炸 - No Leakage. - No Fire - No Explosion
4.2.2	欠压放电保护	将电池按照规格标准充电的方式充满电后, 以其最大放电电流 (I _{dm})	不漏液、不起

	Under-voltage Protection	恒流放电至保护电路动作。放电后静置 10min, 并继续按照规格标准充电的方法充满电。 After the standard charge, the battery will be discharged with maximum current (Idm) to the status of being protected. Then rest for 10mins, and charging the battery to full status following the standard charge.	火、不爆炸 - No Leakage. - No Fire - No Explosion
4.2.3	充电过流保护 Over-charge Current Protection	将电池按照规格标准的放电方式放完电后, 然后先以 1.5 倍的过流充电保护电流 (1.5Icp) 进行恒流充电, 充电至保护电路动作。 After the battery is discharged in accordance with the standard discharge mode, the battery is charged at 1.5 times over current charge protection current (1.5Icp) and charged to the protection circuit.	不漏液、不起火、不爆炸 - No Leakage. - No Fire - No Explosion
4.2.4	放电过流保护 Over-discharge Current Protection	将电池按照规格标准充电的方式充满电后, 然后先以 1.5 倍的过流放电保护电流 (1.5Idp) 进行恒流放电, 放电至保护电路动作。 After the battery is charged according to the standard, the battery is charged with 1.5 times over current discharge protection current (1.5Idp) and discharge to the protection circuit.	不漏液、不起火、不爆炸 - No Leakage. - No Fire - No Explosion
4.2.5	短路保护 Short Circuit Protection	将电池按照规格标准充电的方式充满电后, 短路电池输出的正负极端子, 外部短路总电阻为 (80±20) mΩ。短路至保护电路动作。 After the standard charge, short circuit the output terminals(positive and negative) with the condition of total resistance is (80±20) mΩ. The protection must be occurred.	不漏液、不起火、不爆炸 - No Leakage. - No Fire - No Explosion

4.3 环境适应性 Environmental Performance

序号/No.	项目/Items	测试方法和条件/Test Method and Condition	标准/Criteria
4.3.1	跌落试验 Drop Test	电池按照标准充电模式充满电后, 将电池按 1m 的跌落高度跌落于水泥地板上。电池随机跌落三次。 After standard charging, then drop the battery three times from 1.0m height to the concrete floor to obtain impacts in random orientations.	不起火、不爆炸 - No Fire - No Explosion.
4.3.2	振动测试 Vibration Test	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。 After standard charging, fix the battery to vibration table and test with the frequency varied at the rate of 1Hz per minute between 10Hz and 55Hz, and the excursion of the vibration as 1.6mm. The cell shall be vibrated for 30minutes per axis of XYZ.	不起火、不爆炸 - No Fire - No Explosion

4.4 外观检查 Visual Inspection

不允许有任何影响电性能的外观缺陷, 诸如裂纹、裂缝、泄露等。

There shall be no such defect as scratch, flaw, crack, and leakage, which may adversely affect commercial value of the battery.

4.5 标准测试环境 Standard Environmental Test Condition

除非特别说明, 本标准书中所有测试均在以下环境条件下进行:

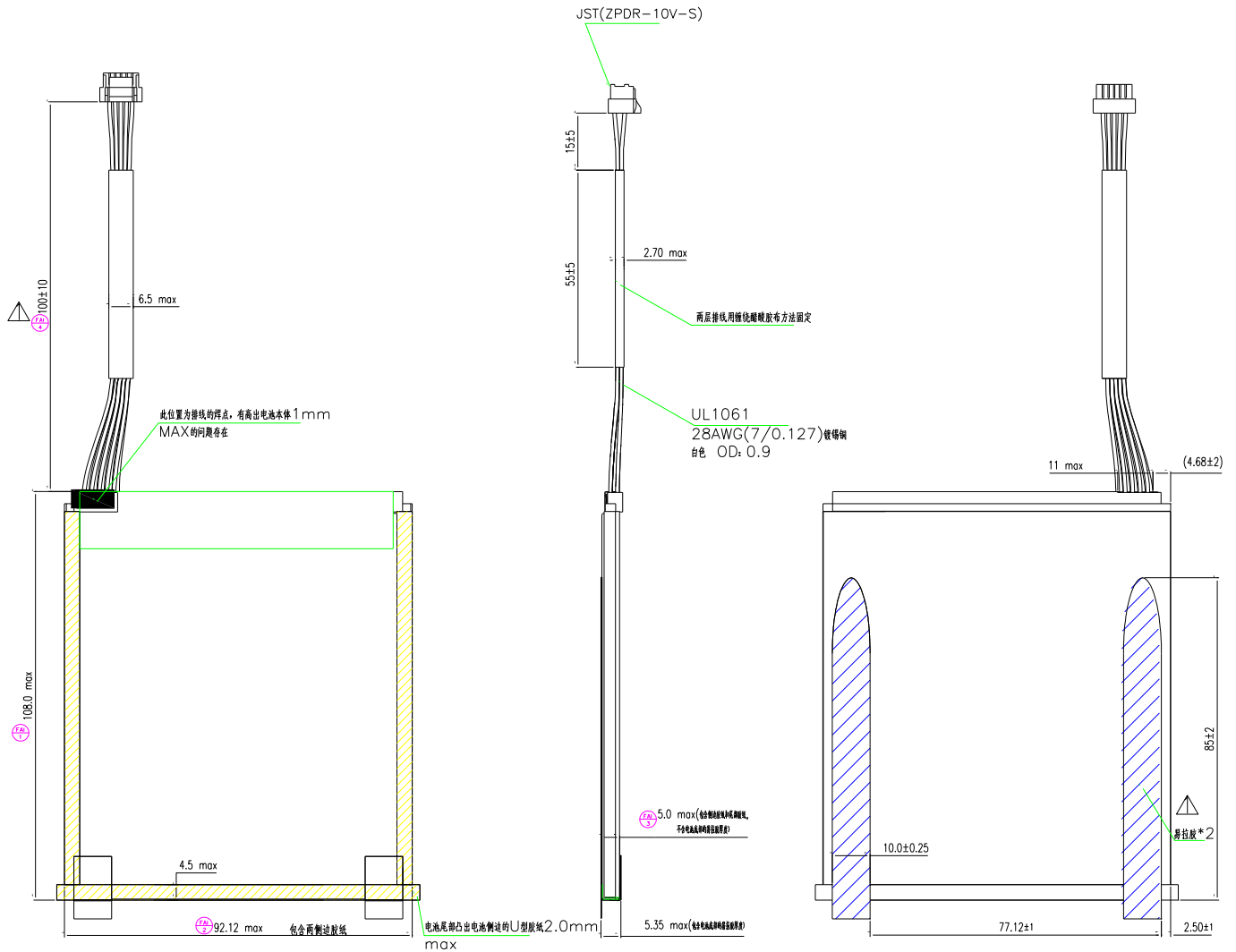
Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition:

温度 Temperature: 20±5°C

相对湿度 Relative Humidity: ≤75%

5. 成品电池 Battery

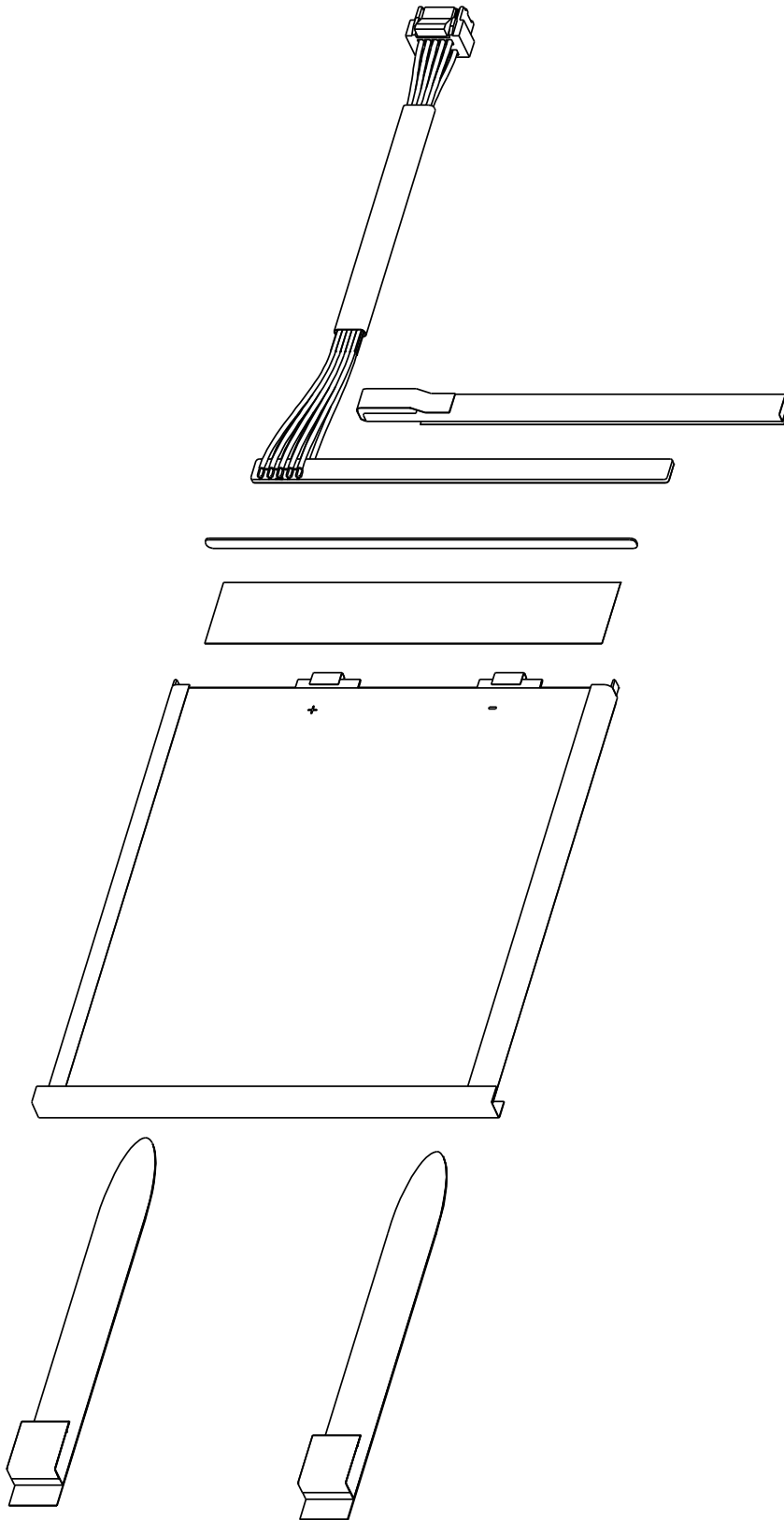
5.1 成品电池图纸 Battery Drawing



5.2 电池输出端口定义 Battery Output Definition

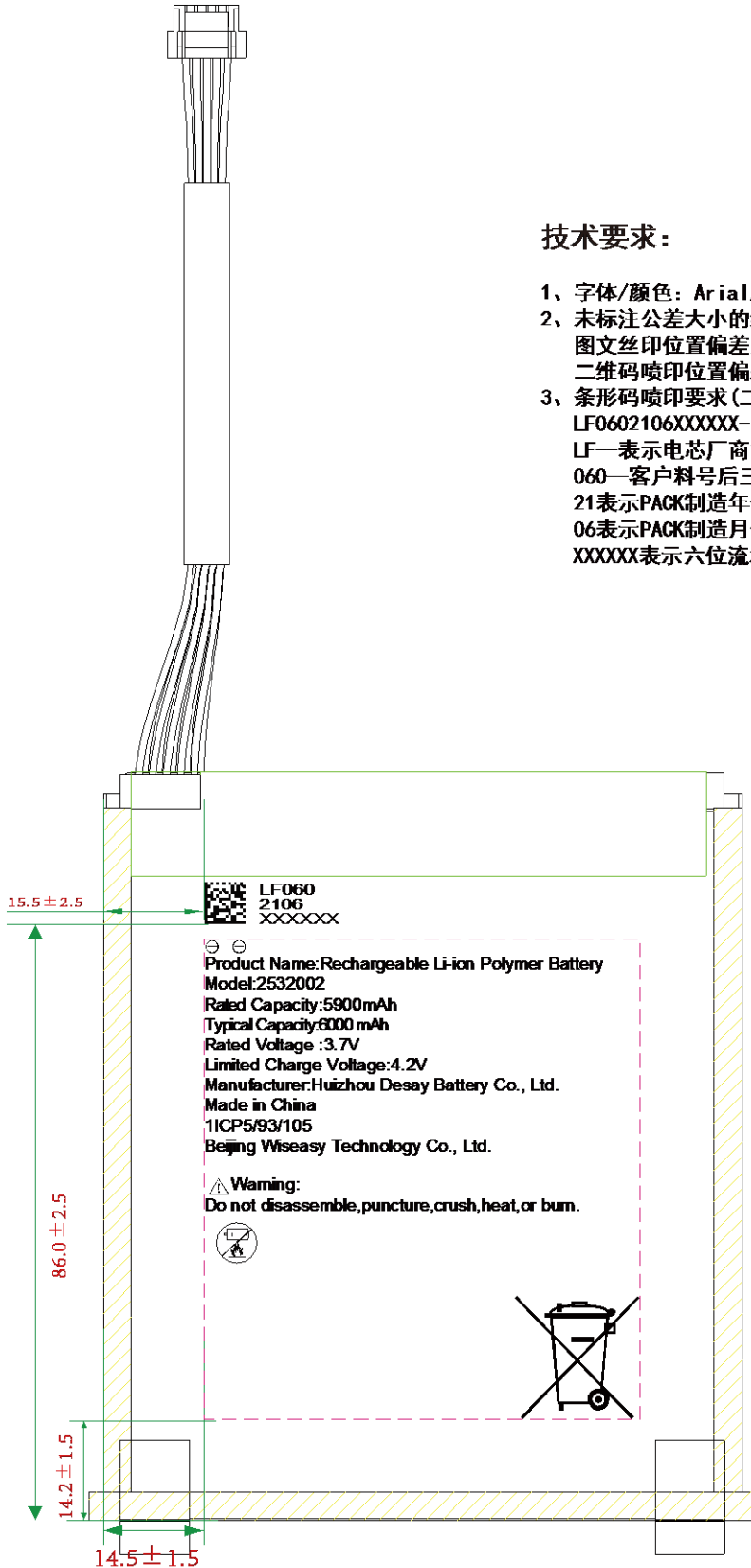
引脚/PIN	名称/PINName	功能/Function	备注/ Note
1,2,9,10	pack-p	充放电端口 (正极) Charge and discharge port (positive)	<p>电池接口位置示意图 Battery interface position schematic diagram</p>
3	ntc	NTC	
4,5,6,7	pack-n	充放电端口 (负极) Charge and discharge port (negative)	
8	Bat-id	ID 电阻端口	

5.3 电池爆炸图图纸 Battery Explosive Drawing



6. 商标 Label

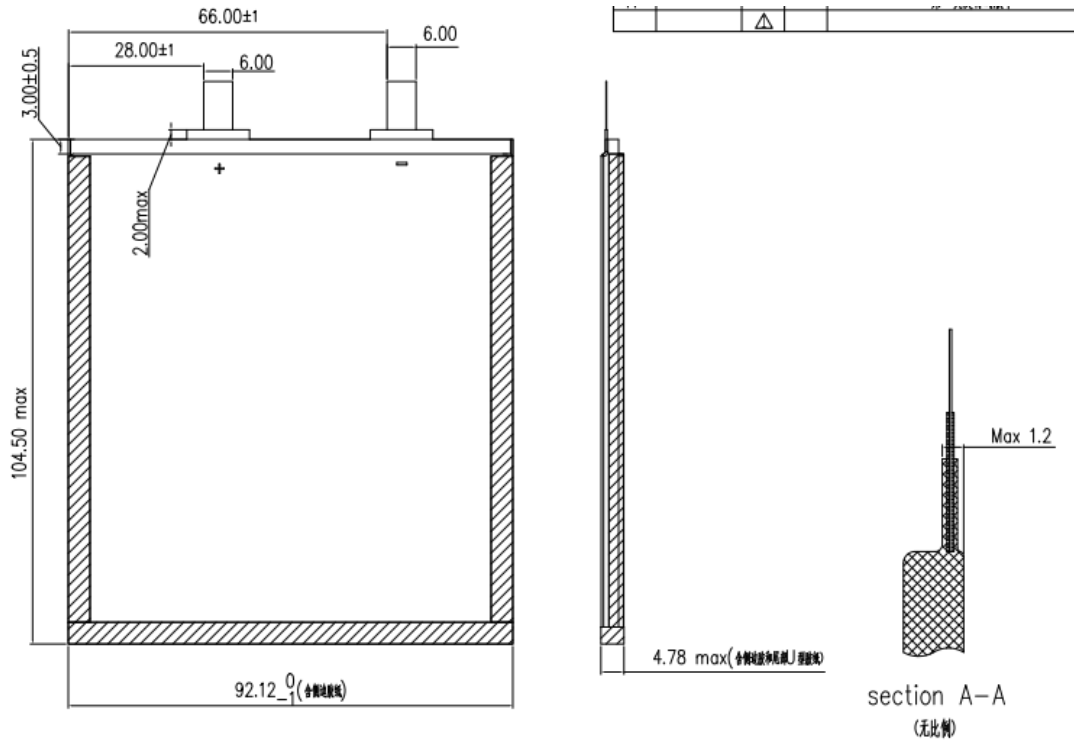
(单位/Unit: mm, 未按比例/ Not in scale)



技术要求:

- 1、字体/颜色: Arial/黑色
- 2、未标注公差大小的统一按 ± 0.2 mm;
图文丝印位置偏差为 ± 1.5 mm;
二维码喷印位置偏差为 ± 2.5 mm;
- 3、条形码喷印要求(二维码尺寸 $5*5 \sim 7*7$ mm, DM码), 打码规则如下:
LF—表示电芯厂商简称;
060—客户料号后三位, 固定;
21表示PACK制造年份(如“21”表示2021; “22”表示2022...);
06表示PACK制造月份(如“06”表示6月; “07”表示7月...);
XXXXXX表示六位流水号000001-999999, 10进制排列不得重码

7. 电芯 Cell



8. 保护板 PCM

8.1 保护板材料清单 PCM BOM

名称	规格/品牌	单位	位号	用量
IC	HY2113-LB1A, SOT-23-6, HF, 宏康	PCS	U1	1
IC	HY2113-CB1A, SOT-23-6, HF, 宏康	PCS	U2	1
MOS	MS3312M, DFN3*3-8L, MOORES, HF	PCS	Q1-Q4	4
电阻	RC0402JR-07100RL, 0402, 100 Ω, ±5%, 1/16W, HF, YAGEO	PCS	R1, R6	2
电阻	RC0402FR-072KL, 0402, 2K Ω, ±1%, 1/16W, HF, YAGEO	PCS	R2, R7	2
NTC	ECTH100505103F3435FST, 0402, 10K, ±1%, B=3435, HF, 卓英社	PCS	R4	1
电阻	RC0402FR-0710KL, 0402, 10K Ω, ±1%, 1/16W, HF, YAGEO	PCS	R3	1
电阻	RLM25FEER007, 2512, 7m Ω, ±1%, 2W, HF, 金属膜, 大毅	PCS	R5	1
电阻	RLP25FEER002, 2512, 2m Ω, ±1%, 2W, HF, 金属膜, 大毅	PCS	R8	1
电容	CC0402JRX7R8BB104, 0402, 0.1UF, 25V, X7R, ±5%, HF, YAGEO	PCS	C1-C10	10
镍片	7.5*3.5*3.5*0.1mm, L型, 纯镍, 底部镀铜, 编带	PCS	B+, B-	2
插头线	ZPDR-10V-S, UL21016-28#, L=105mm (不含插头), 醋酸胶布, 剥线 1.5mm, 线头浸锡, JST	PCS	/	1
PCB	XA112972-E, 87*5*0.8mm FR-4, 喷锡, 黑油, 白字, 2层, 20Z, 吉瑞达	PCS	/	1

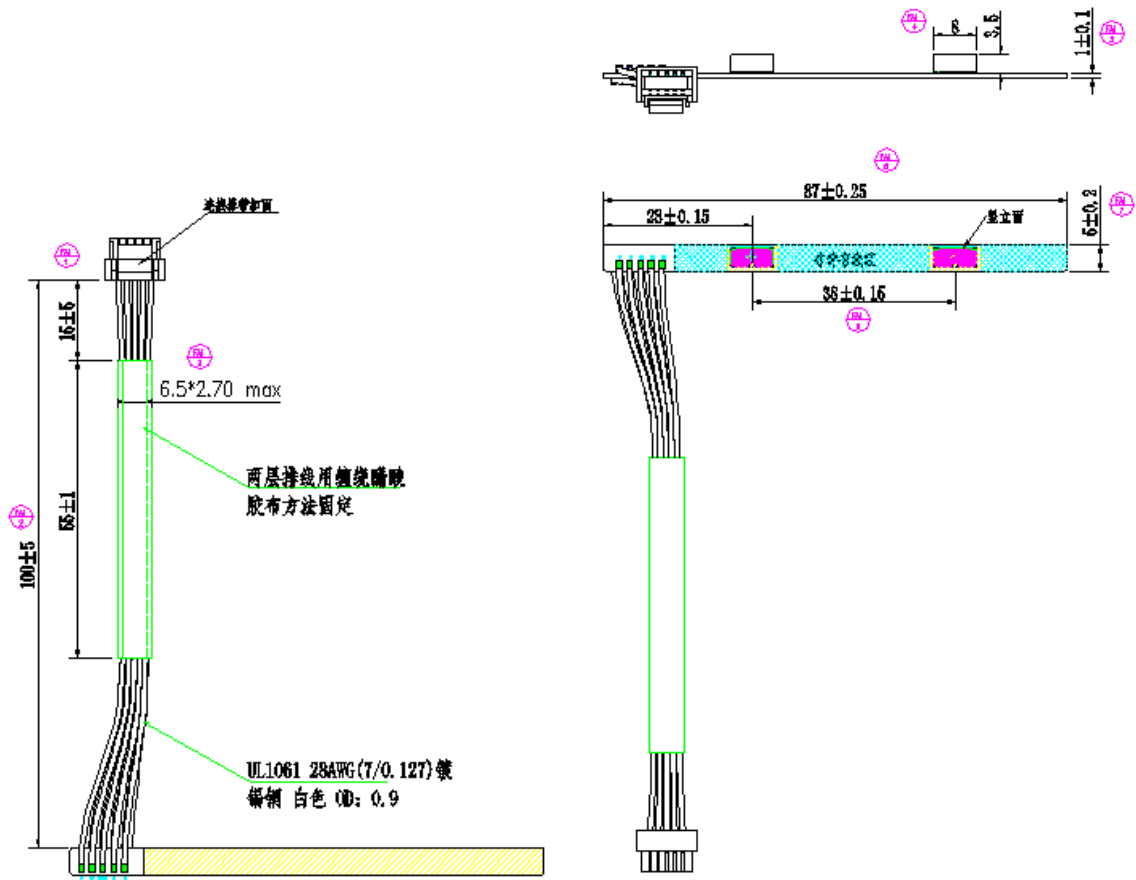
UV 胶	RC326B 蓝色 UV 胶 1kg/桶 常富	g	/	0.1
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8.2 保护板主要参数规格 PCM Specification

保护 IC: Protection IC:	HY2113-LB1A	参数值 parameter value			
		常温25°C			
项目 item	最小值 Min	典型值 Type value	最大值 Max	单位 Unit	
过充保护电压 Over charge protection voltage	4.175	4.200	4.225	V	
过充恢复电压 Over charge release voltage	4.150	4.200	4.250	V	
过放保护电压 Over discharge protection voltage	2.450	2.500	2.550	V	
过放恢复电压 Over discharge release voltage	2.450	2.500	2.550	V	
放电过流检测电压 Over current detection voltage	0.135	0.150	0.165	V	
放电过流保护电流 Over current protection current	8.0	10.0	12.0	A	
充电过流检测电压 charge over current detection voltage	-0.120	-0.100	-0.080	V	
充电过流保护电流 charge over current detection current	-8.0	-6.0	-4.0	A	
过充保护延迟时间 Over charge protection delay time	1.0	1.3	1.6	s	
过放保护延迟时间 Over discharge protection delay time	115	145	175	ms	
放电过流保护延迟时间 Over current protection delay time	9	12	15	ms	
充电过流保护延迟时间 Over current protection delay time	6	8	10	ms	
短路保护延迟时间 Short protection delay time	200	300	400	uS	
正常状态下静态电流 Current consumption (Normal mode at 3.9V)	/	/	10	uA	
过放状态下静态电流 Current consumption (standby mode at 1.5V)	/	/	0.1	uA	
导通内阻/Impedance	/	/	75	mΩ	
输入电压(B+与B-间) Input voltage(B+ to B-)	1.5	/	5.0	V	
最大持续充电电流 Max continuous charge current	/	/	6	A	
NTC	8.21	10	12.22	KΩ	
ID	9.9	10	10.1	KΩ	
最大持续放电电流 Max continuous discharge current			8	A	
工作温度/Operating temperature	-40		85	°C	
推荐存储条件/Recommendatory storage condition	Temperature range: -5~+35°C Humidity: 0%~75%RH				
0V 电池充电功能 0V battery charge function	允许 available				

保护 IC: Protection IC:	HY2113-CB1A	参数值 parameter value			
		常温25°C			
项目 item	最小值 Min	典型值 Type value	最大值 Max	单位 Unit	
过充保护电压 Over charge protection voltage	4.250	4.275	4.300	V	
过充恢复电压 Over charge release voltage	4.025	4.075	4.125	V	
过放保护电压 Over discharge protection voltage	2.250	2.300	2.350	V	
过放恢复电压 Over discharge release voltage	2.250	2.300	2.350	V	
放电过流检测电压 Over current detection voltage	0.140	0.150	0.160	V	
放电过流保护电流 Over current protection current	10	13.0	15.0	A	
充电过流检测电压 charge over current detection voltage	-0.120	-0.100	-0.080	V	
充电过流保护电流 charge over current detection current	-10.0	-8.0	-6.0	A	
过充保护延迟时间 Over charge protection delay time	1.0	1.3	1.6	s	
过放保护延迟时间 Over discharge protection delay time	115	145	175	ms	
放电过流保护延迟时间 Over current protection delay time	9	12	15	ms	
充电过流保护延迟时间 Over current protection delay time	6	8	10	ms	
短路保护延迟时间 Short protection delay time	200	300	400	uS	
正常状态下静态电流 Current consumption (Normal mode at 3.9V)	/	/	10	uA	
过放状态下静态电流 Current consumption (standby mode at 1.5V)	/	/	0.1	uA	
导通内阻/Impedance	/	/	75	mΩ	
输入电压(B+与B-间) Input voltage(B+ to B-)	1.5	/	5.0	V	
最大持续充电电流 Max continuous charge current	/	/	6	A	
NTC	8.21	10	12.22	KΩ	
ID	9.9	10	10.1	KΩ	
最大持续放电电流 Max continuous discharge current			8	A	
工作温度/Operating temperature	-40		85	°C	
推荐存储条件/Recommendatory storage condition	Temperature range: -5~+35°C Humidity: 0%~75%RH				
0V 电池充电功能 0V battery charge function	允许 available				

8.3 保护板结构图 PCM Drawing

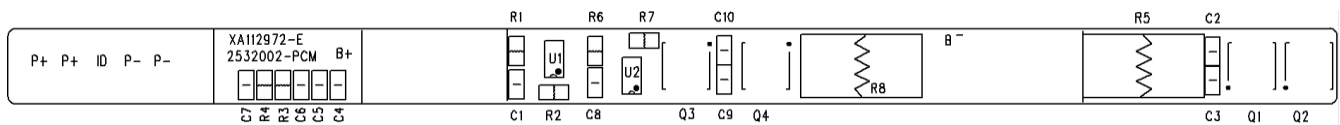


8.4 印刷电路板布局图 PCB Layout

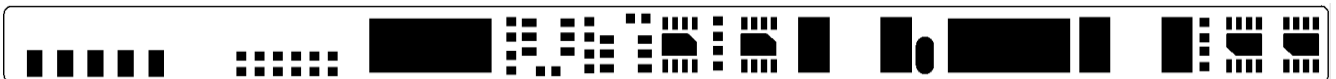
顶层走线



顶层丝印



顶层焊盘



底层走线



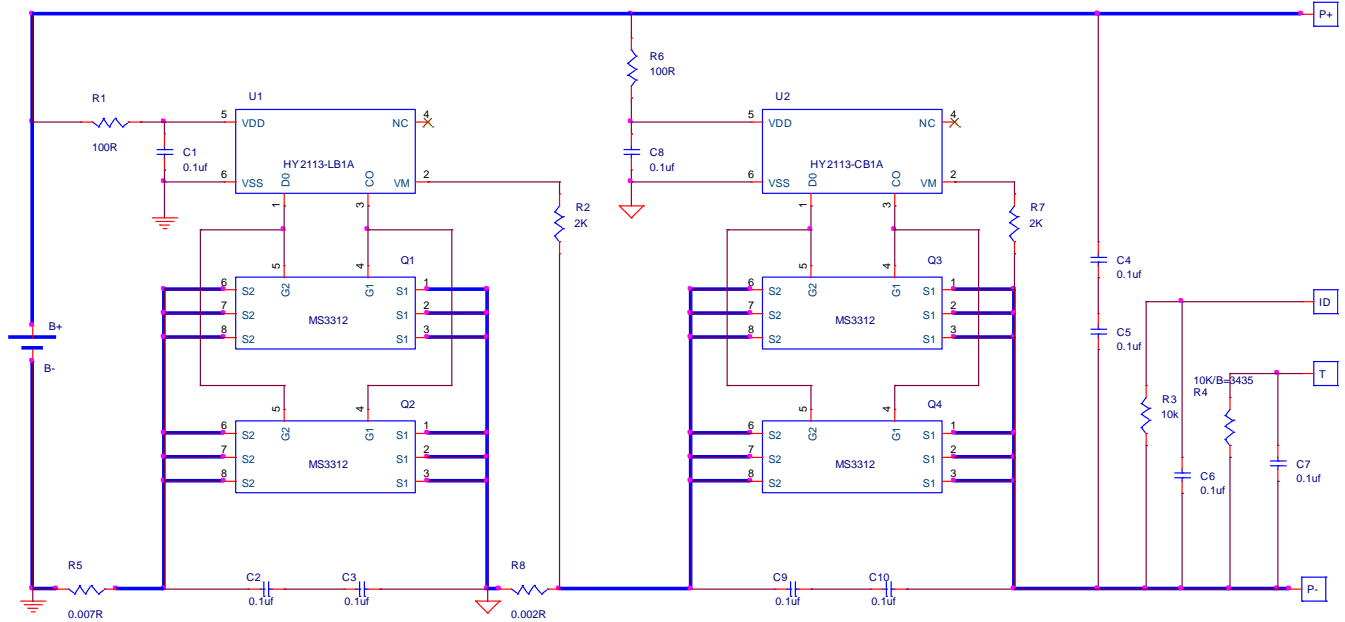
底层丝印



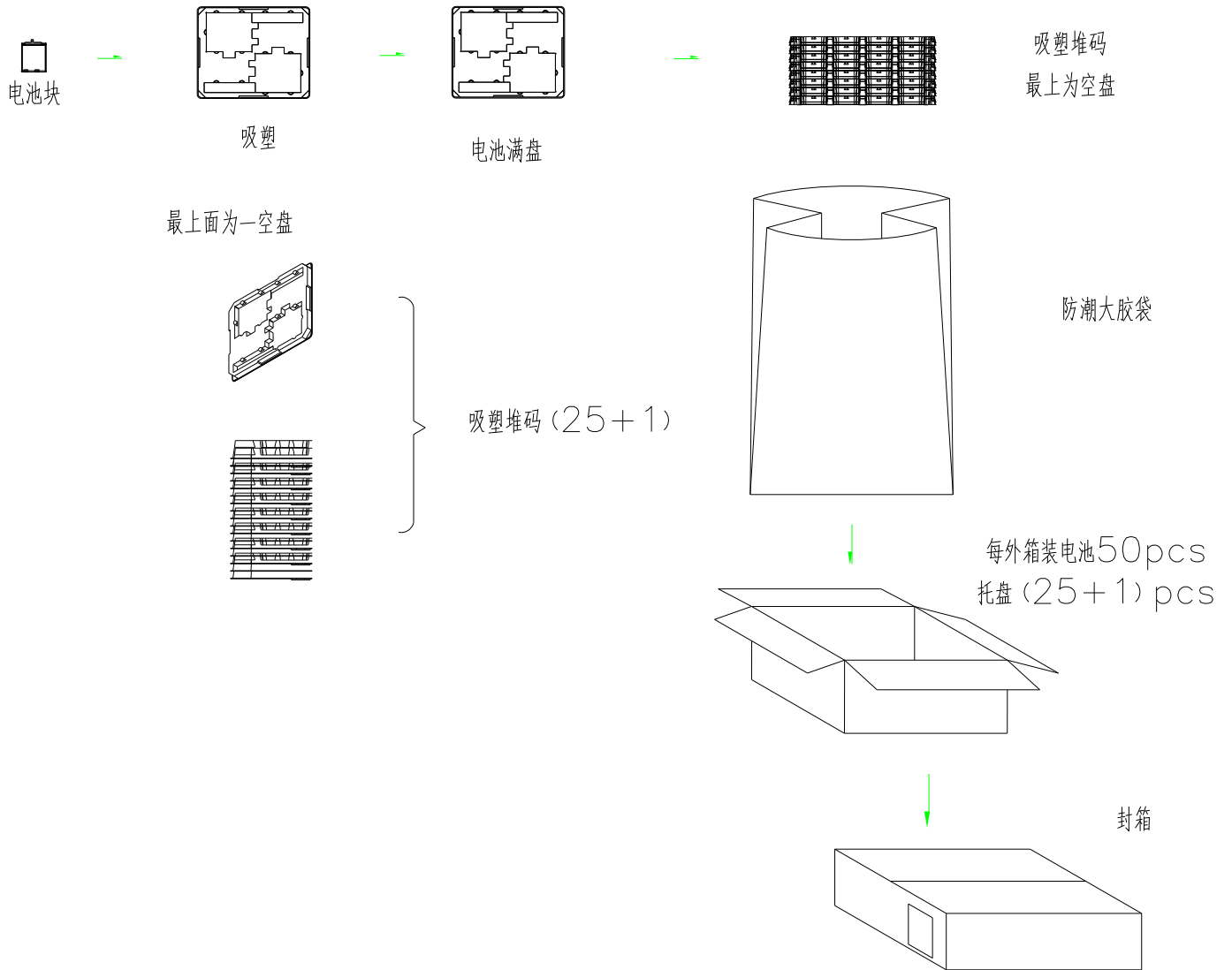
底层焊盘



8.5 保护板电气原理图 PCB Schematic



9. 成品电池包装示意图 Battery Package Method



10. 附录 Appendix**聚合物锂离子充电电池操作指示及注意事项****Handling Precautions And Guideline For Li-ion Rechargeable Batteries****前言 Preface**

本文件“锂聚合物充电电池操作指示及注意事项”适用于惠州市德赛电池有限公司生产的电池。

This document of 'Handling Precautions and Guideline Li Polymer Rechargeable Batteries' shall be applied to the batteries manufactured by Huizhou Desay Battery Co., Ltd..

声明 Note (1) :

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惠州市德赛电池有限公司。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。

The customer is requested to contact Huizhou Desay Battery Co., Ltd. in advance, if and when 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.

声明 Note (2) :

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惠州市德赛电池有限公司概不负责。

Huizhou Desay Battery Co., Ltd. will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.

声明 Note (3) :

如有必要惠州市德赛电池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。

Huizhou Desay Battery Co., Ltd. will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the battery, if it is necessary.

10.1 充电 Charging**1.1 充电电流 Charge current:**

充电电流不得超过本标准书中规定的最大充电电流。使用高于推荐值电流充电将可能引起电芯的充放电性能、机械性能和安全性能的问题并可能会导致发热或泄漏。

Charge current should be less than maximum charge current specified in the Product Specification. Charging with higher current than recommended value may cause damage to battery electrical, mechanical, and safety performance and could lead to heat generation or leakage.

1.2 充电电压 Charge voltage:

充电电压不得超过本规格书中规定的额定电压。4.2V 为充电电压的最高极限，充电器的设计应满足此条件，电池电压高于额定电压时将可能引起电池的电性能，机械性能以及安全性能的问题，可能导致发热或者漏液。

Charge voltage shall be less than that specified in the Product Specification. Charging beyond 4.2V, which is the absolute maximum voltage, must be strictly prohibited. The charger shall be designed to comply with this condition. It is very dangerous that charging with higher voltage than maximum voltage may cause damage to the battery electrical, mechanical safety performance and could lead to heat generation or leakage.

1.3 充电温度 Charge temperature:

请参考本文“3.7 项”。Please refer to “article 3.7”.

1.4 禁止 0V 充电 Prohibition of Charge to 0V Cell

禁止对 0V 电压的电芯进行充电。It is prohibited to charge the Cells which are with 0V voltage.

1.5 禁止反向充电 Prohibition of reversed charge:

禁止反向充电。正确连接电池正负极。请在接线前确认极性。若将电池正负极接反，电池将不能充电。同时，反向充电会降低电池的充放电性能以及安全性，并会导致发热或漏液。

Reverse charge is prohibited. The battery shall be connected correctly. The polarity has to be confirmed before wiring. In case of the battery is connected improperly, the battery cannot be charged. Simultaneously, the reverse charging may cause damaging to the battery which may lead to degradation of battery performance and damage the battery safety, and could cause heat generation or leakage.

10.2 放电 Discharge

2.1 放电电流 Discharge current:

放电电流不得超过本标准书规定的最大放电电流，大电流放电会导致电芯容量剧减并导致过热。

The battery shall be discharged at less than the maximum discharge current in the Product Specification. High discharge current may reduce the discharging capacity significantly or cause over-heat.

2.2 放电温度 Discharge temperature:

电池必须在-20℃~60℃的环境温度范围内进行放电。

The battery shall be discharged within -20℃~60℃ range specified in the Product Specification.

2.3 过放电 Over-discharge:

需要注意的是，在电池长期未使用期间它可能会由于其自放电特性而处于过放电状态。为防止过放电的发生，电池应定期充电，将其电压维持在 3.78V 至 3.9V 之间。

It should be noted that the battery would be at an over-discharged state by its self-discharge characteristics in case the battery is not used for long time. In order to prevent over-discharging, the battery shall be charged periodically to maintain between 3.78V and 3.9V.

过放电会导致电池性能、电池功能的损失。

Over-discharge may causes defect of battery performance, characteristics, or battery functions.

充电器应配有装置来防止电池过放电至低于本规格书规定的截止电压。此外，充电器还应有装置以防止重复充电。步骤如下：

电池在快速充电之前，应先以一小电流（0.01C）预充电 15~30 分钟。每个电池的电压达到 3V 以上后再进行快速充电。可用一计时器来实现该预充电步骤。如果在预充电规定时间内个别电池的电压仍未达到 3V，充电器应能够停止下一步快速充电，并显示该电池正处于非正常状态。

The charger shall be equipped with a device to prevent further discharging exceeding a cut-off voyage specified in the Product Specification. Also the charger shall be equipped with a device to control the recharging procedures as follows:

The battery pack shall start with a low current (0.01C) for 15 - 30 minutes, i.e. pre-charging, before rapid charging starts. The rapid charging shall be started after the (individual) battery voltage has been reached above 3V within 15 - 30 minutes that can be determined with the use of an appropriate timer for pre-charging. In case the (individual) battery voltage does not rise to 3V within the pre-charging time, then the charger shall have functions to stop further charging and display the pack is at abnormal state.

10.3 贮存 Storage

电池储存温度必须在-20℃~35℃的范围内。

The battery shall be storied within the range of -20℃~35℃ environmental condition.

长期存储电池（超过 3 个月），须置于温度为 20±5℃、相对湿度不大于 75%的环境中。

If the battery has to be storied for a long time (Over 3 months), the environmental condition should be:

Temperature: 20±5℃

Relative Humidity: ≤75%

长期贮存的电压应为 3.78V~3.9V。

The voltage for a long time storage shall be 3.78V~3.9V range.

10.4 电池使用注意事项 Caution When Using The Battery

4.1 严禁将电池弄湿或浸泡在淡水、海水或其他液体中。如果电池中的保护装置被损坏，可能出现非正常电流和电压的充电，这可能会导致电池发热、爆炸或者起火。

Do not dip or wet the battery in water, seawater, or other liquid. If the protection device assembled in the battery is damaged, the battery may be charged with an abnormal current and voltage, which may result in the cause of heat generation, explosion, or fire of the battery.

4.2 电池的极性已经预定，如果电池无法连接到充电器或者设备，请不要尝试去强行连接。先检查极性，如果电池被反接，发生的反向充电可能会导致非正常化学反应，从而出现漏液，发热，爆炸或起火。

The battery has a predetermined polarity. If the battery will not connect will to the charger or equipment, do not try to connect the battery forcefully. Check the polarity first. In the case the battery is connected in reverse, it is charged reversely and may cause acid leakage, heat generation, explosion, or fire due to an abnormal chemical reaction.

4.3 严禁将电池投入火中或者加热电池。电池中的绝缘物质将会被融化，安全功能和结构将被破坏，从而导致电池发热，爆炸或者起火。

Do not put the battery into a fire or heat it. In such a case, the insulator in the battery may be melted, the safety vent and structure may be damaged, all of which may cause heat generation, explosion, or fire.

4.4 严禁将电池的正负极用导线连接，也不要将电池与金属放在一起存储和移动。如果电池被短路，将会有超大电流流过，将会损坏电池，造成电池发热、冒烟、变形或燃烧。

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. In such a case, the battery is shorted and causes an excessive current, which may result in heat generation, explosion, or fire.

4.5 严禁重击，投掷或者跌落电池。重击将会破坏保护装置，可能造成电池发热、发热或者起火。

Do not apply heavy impact to the battery, or throw or drop it. Strong impact may damage the protecting device, which may result in heat generation, explosion, or fire.

4.6 禁止用钉子凿入电池、锤打或踩踏电池，可能会使电池变形和短路，保护装置损坏，造成电池发热、爆炸或起火。

Do not drive a nail in, hit with a hammer, or stamp on the battery. In such a case, the battery may be deformed and shorted, and the protecting device may be damaged, which may cause heat generation, explosion, or fire of the battery.

4.7 不要直接焊接电池。焊接过程中的高温可能会使电池中的绝缘物质融化，安全功能和结构被破坏，从而导致电池发热，爆炸或者起火。

Do not solder the battery directly. Heat applied during soldering may damage the insulator or the safety vent and mechanism, which may result in acid leakage, heat generation, explosion, or fire of the battery.

4.8 禁止拆装电池。电池设计有安全机制和保护装置以避免危险。如果这些被损坏，电池可能会发热，爆炸或者起火。

Do not disassemble or alter the battery. The battery contains a safety mechanism and a protecting device in order to avoid any danger. If these are damaged, heat, explosion or fire may be caused.

4.9 即使电池未被使用，每三个月按照生产商所规定方法为电池充电。过放电可能引发非正常化学反应，从而导致电池漏液或者起火。

Charge the battery every 3 months to the amount specified by the manufacturer, even if the battery is not used. An excessive over-discharge may cause an abnormal chemical reaction, which may result in the cause of acid leakage, or fire of the battery.

10.5 其他 Others

5.1 防止电池短路 Prevention of short circuit within a battery pack

为了确保更好的安全保护，线路和电芯之间设计有足够的绝缘层。电池的结构设计可以避免内部短路的发生，保

护电池不会冒烟和起火。

Enough insulation layers between wiring and the batteries shall be used to maintain extra safety protection. The battery pack shall be structured with no short circuit within the battery pack, which may cause generation of smoke or firing.

5.2 禁止拆解 Prohibition of disassembly

1) 任何情况下严禁拆解电池 Never disassemble the batteries

拆解电池可能导致电池内部微短路，进而引起鼓气、着火及其它问题。

The disassembling may generate internal short circuit in the battery, which may cause gassing, firing, or other problems.

2) 电解液有害 Electrolyte is harmful

聚合物锂电池理论上不存在流动的电解液，但万一有电解液泄漏而接触到皮肤、眼睛或身体其它部，应立即用清水冲洗电解液并就医。

LIP battery should not have liquid from electrolyte flowing, but in case the electrolyte come into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with freshwater and medical advice is to be sought.

5.3 严禁将电池投入火中 Prohibition of dumping of batteries into fire

在任何情况下不得燃烧电池或将电池投入火中。否则会引起电池燃烧，这是非常危险的，应绝对禁止。

Never incinerate nor dispose the batteries in fire. These may cause firing of the batteries, which is very dangerous and is prohibited.

5.4 严禁将电池浸入液体，如水 Prohibition of batteries immersion into liquid such as water

不得将电池浸泡在液体中如淡水、海水、饮料、果汁、咖啡等。

The batteries shall never be soaked with liquids such as water, seawater, drinks such as soft drinks, juices, coffee or others.

5.5 电池的更换 Battery batteries replacement

更换电池应由电池供应商或设备供应商完成，用户不得自行更换。

The battery replacement shall be done only by either batteries supplier or device supplier and never be done by the user.

5.6 禁止使用已损坏的电池 Prohibition of use of damaged batteries

电芯在运输过程中可能因撞击等原因而损坏。若发现电芯有任何异常特征，如电池外壳破损变形，能闻到电解液气味，电解液泄漏等，该电池不得使用。有电解液泄漏或散发电解液气味的电池应远离火源以避免着火。

The batteries might be damaged during shipping by shock. If any abnormal features of the batteries are found such as damages in a plastic envelop of the battery, deformation of the battery package, smelling of an electrolyte, an electrolyte leakage and others, the batteries shall never be used any more. The batteries with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing.

5.7 运输过程中应防止剧烈振动、冲击或挤压 Avoid severe vibration, shock or press during shipment

请小心地搬运电池。

Handle carefully when moving battery.