

Specification For Approval

客户承认书

Customer 客户名称 : _____

Battery model 电池型号 : LP 523450-1000mAh 3.7V

Revision NO.版本: _____ A0

Sample Delivery Date 送样日期 : _____

Prepared by 拟定	Checked by 审核	Approved by 核准
易祯	钟耀斌	蒋德秀

Customer' s signature 客户回签	
Effective Date 生效日期	

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产品修订履历表
Product Revision History

版本号 Rev No.	修订内容描述 RevisionDescription	修改人 Modify	审批人 Approval	生效日期 Date
A0	首次发行	易祯	钟耀斌	2021-01-13

1 .Scope 适用范围

This document describes the Product Specification of the Lithium rechargeable battery cell

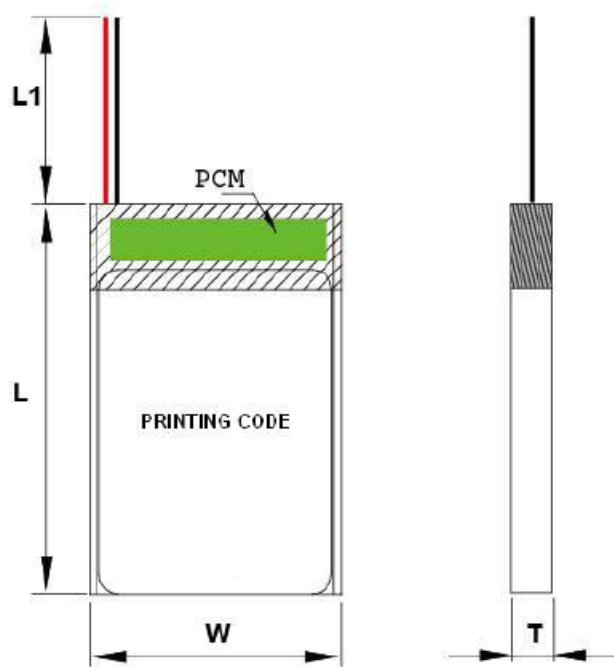
本规格说明书描述了深圳市欧亚美电子有限公司（以下简称欧亚美）生产的可充电锂离子电池的产品性能。

2. 依据标准 Performance

中华人民共和国国家标准 ‘GB31241-2014’ 《便携式电子产品用锂离子电池和电池组安全要求》。

Issued by national standard of the People's Republic of China ‘GB31241-2014’ 《Lithium ion cells and batteries used in portable electronic equipment safety requirements》 .

3. 电池尺寸及显示信息/Battery Dimension and showing information



Printing code:

- CT LP523450-1000mAh
+ 3.7V 3.7Wh YYWW

厚度/T	宽度/W	长度/L	线长/L1	单位
Max 5.2	Max34	Max52	100±5	mm
Wire	UL1007 24AWG	Connector		
PCM	DW01	Cell	523450-1000mAh	

4. 产品规格 Product Specification

序号 NO.	项目 Description	规格 Specification	备注 Remark
4.1	典型容量 Typical Capacity	1000mAh	用 0.2C 电流从 4.2V 恒流放电至 3.0V。 From 4.2V to 3.0V by discharge current 0.2C.
4.2	最小容量 Minimum Capacity	950mAh	
4.3	参考重量 Weight	Approx: 18g	
4.4	出货电压 Shipment voltage	$\geq 3.7V$	
4.5	内阻 Inner Impedance	$\leq 180m\Omega$	
4.6	标称电压 Nominal Voltage	3.7V	标准测试条件下测量 Measure Battery at standard testing condition.
4.7	满充电压 FC Fully charge voltage(FC)	4.2V	
4.8	满放电压 FD Fully discharge voltage(FD)	3.0V	
4.9	充电上限电压 Charge Upper Limit Voltage	同过充保护电压	Ref7.1.1
4.10	放电下限电压 Discharge Lower Limit Voltage	同过放保护电压	Ref7.1.1
4.11	标准充电方法 Standard Charge Method	0.2C 恒流充电至 FC 电压, 再 FC 电压恒压充电至电流降低 0.01C 0.2C CC (constant current) charge to FC Voltage, then CV (constant voltage) charge till charge current decline to 0.01C	恒流/恒压 CC/CV
4.12	标准放电方法 Standard Discharge Method	使用 0.2C 恒流放电至 FD 电压截止 Using 0.2C constant current discharge to FD Voltage	
4.13	最大充电电流 Max. Charge Current	0.2C	0~15°C
		0.5C	15~45°C
4.14	最大放电电流 Max. Discharge Current	0.2C	-20~15°C
		1C	15~60°C

4.15	外观 Cosmetic Appearance	无胀气, 无破裂, 无漏液 No gas, No rupture, No leakage.	
4.16	储存环境 Storage Environment	≤ 1 month: $-20^{\circ}\text{C}\sim 60^{\circ}\text{C}$	储存温度 $25\pm 2^{\circ}\text{C}$, 电池为半电状态储存。 Recommended storage temperature is $25\pm 2^{\circ}\text{C}$ of half charge state .
		≤ 3 months: $-20^{\circ}\text{C}\sim 45^{\circ}\text{C}$	
		≤ 1 year: $-20^{\circ}\text{C}\sim 30^{\circ}\text{C}$	
4.17	标准测试条件 Standard testing condition	温度 (Temperature)	$25\pm 2^{\circ}\text{C}$
		湿度 (humidity)	$\leq 85\%$ RH
		大气压 (Atmospheric Pressure)	86~106 kPa

5. 电性能 Electrical Performance

序号	内容 Item	条件 Testing Method	达到要求 Requirements
5.1	放电容量 Discharging Capacity	在 4.17 条件下, 标准充满电池后, 搁置 10 分钟, 然后分别用 0.2C、0.5C 电流放电至 FD 电压, 记录放电时间。 At 4.17 condition, after standard charging, rest for 10min, then discharge at 0.2C, 0.5C to voltage FD Voltage, record the discharge time.	0.2C: $\geq 300\text{min}$ (100%) 0.5C: $\geq 114\text{min}$ (95%) 1.0C: $\geq 54\text{min}$ (90%)
5.2	循环寿命 Cycle life	在 4.17 条件下, 先用 0.2C 将电池恒流充电至 FC 电压, 再 FC 电压恒压充电直至充电电流下降至 $\leq 0.01\text{C}$, 搁置 10 分钟, 再用 0.2C 电流恒流放电至 FD 电压; 搁置 10 分钟, 重复以上步骤, 直到放电容量降低至初始容量的 80%。 At 4.17 condition, constant current 0.2C charge to FC Voltage, then constant voltage FC Voltage charge to current declines to 0.01C, rest for 10min, constant current 0.2C discharge to FD voltage, rest for 10min. Repeat above steps till continuously discharge capacity higher than 80% of the initial capacity of the battery.	≥ 300 times
5.3	温度特性 Temperature Characteristics	在标准测试环境下, 标准充满电池后, 分别在 $60\pm 2^{\circ}\text{C}$ 、 $25\pm 2^{\circ}\text{C}$ 、 $0\pm 2^{\circ}\text{C}$ 或 $-10\pm 2^{\circ}\text{C}$ 下储存电池 4hrs, 然后在相同温度下用 0.2C 将电池放电至 FD 电压, 记录放电时间。 At standard testing condition, after standard charging, Stored the recharged battery for 3hrs at $60\pm 2^{\circ}\text{C}$, $25\pm 2^{\circ}\text{C}$, $0\pm 2^{\circ}\text{C}$ or -10°C , and discharged at 0.2C to FD Voltage at the same temp., record the discharge time.	

		放电温度 Discharge Temperature	-10°C	0°C	25°C	60°C
		放电容量 (0.2 C) Discharge Capacity(0.2 C)	60%	70%	100%	95%
5.4	荷电保持能力 Capability of keeping electricity	<p>在标准测试环境下, 标准充满电池后, 无外接负载线路, 电池搁置28天, 然后用0.2C 恒流放电至FD电压, 记录放电时间。</p> <p>At standard testing condition, after standard charging, no outer loading circuit, store the battery 28days, discharge at 0.2C to FD voltage, record the discharge time.</p>			≥240min(分钟)	

6. 安全性能 Safety Performance

序号	内容 Item	条件 Testing Method	达到要求 Requirements
6.1	过充测试 (无保护板) Overcharge Test (No PCM)	<p>在标准测试环境下, 电池在3C恒流恒压下过充至4.6V, 并保持7小时或者电池温度比峰值温度降低20%</p> <p>At standard testing condition, The cell is overcharged to 4.6V With a current of 3C and hold for 7 hours or the cell surface temperature reduce 20% than the maximum temperature.</p>	不起火, 不爆炸 No fire, No explosion
6.2	短路测试 (无保护板) Short - Circuit Test (No PCM)	<p>在标准测试环境下, 满充电电池用电阻$80 \pm 20m\Omega$的铜导线连接其正负极至24小时或者电池温度比峰值温度降低20%。</p> <p>At standard testing condition, After full charge, the positive and negative polarities are connected together by a copper wire whose resistance is $80 \pm 20m\Omega$, hold for 24 hours or the cell surface temperature reduce 20% than the maximum temperature.</p>	不起火, 不爆炸 No fire, No explosion
6.3	热冲击测试 Heating Test	<p>在标准测试环境下, 标准充满电池后, 将电池放进烘箱内, 以$5 \pm 2^\circ C/min$ 速度升高烘箱内温度至$130 \pm 2^\circ C$后, 恒温10min。</p> <p>At standard testing condition, after standard charging, Put the cells in the oven, the temperature of the oven is to be raised at $5 \pm 2^\circ C$ per minute to a temperature of $130 \pm 2^\circ C$ and remain for 10 minutes.</p>	不起火, 不爆炸 No fire, No explosion

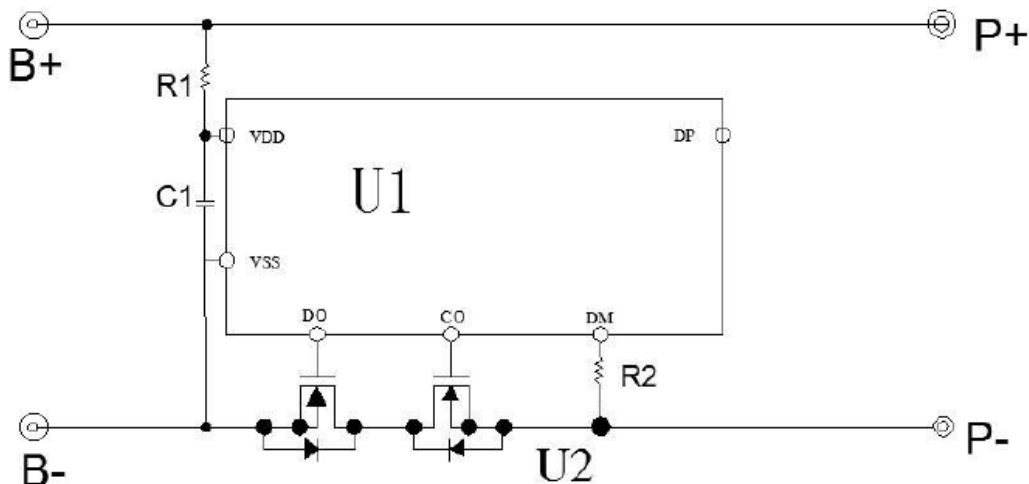
6.4	<p>跌落测试 Drop Test</p>	<p>在出货条件下将电池由高度1m的位置自由跌落到18~20mm厚的硬质木板上,X,Y,Z方向上各三次Drop the battery in the shipment condition from 1 m height onto 18~20mm thick hard board on it 3 times each of X, Y and Z directions at 25±3°C</p>	<p>不起火, 不爆炸 No fire, No explosion</p>
6.5	<p>振动测试 Vibration test</p>	<p>电芯标准充电后,固定在振动台上,然后沿XYZ每个坐标方向振动30分钟扫频速度: 1oct/min振动频率: 10Hz-30Hz位移幅值(单振幅): 0.38mm 振动频率: 30Hz-55Hz位移幅值(单振幅): 0.19mm After Standard Charging, fixed the cell to vibration table, then subjected to vibration test for 30 minutes per axis of XYZ axes Frequency rate :1 oct/min Vibration frequency :10Hz-30Hz Excursion(single amplitude):0.38mm Vibration frequency:30Hz-55Hz Excursion(single amplitude):0.19mm</p>	<p>不起火, 不爆炸 No fire, No explosion</p>
6.6	<p>挤压测试 Crush Test</p>	<p>在标准测试环境下,标准充饱电后,。将电芯放置在两个平行板中间进行挤压。压力通过液压油缸或其它的机械装置实现,平行板表面与电芯的宽面接触,逐渐加压至13±1kN (3000±224 lbs),然后释压,25±3°C下静置观察1h。 At standard testing condition, after standard charging, Then the cell is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar forcemechanism. The flatsurfaces are to be brought in contact with the cells'wide sides and the crushing is to be continued until an applied force of 13±1kN (3000±224 lbs) is reached. Once the maximum force has been obtained it is to be released, then rest for 1 hrs at 25±3°C.</p>	<p>不起火, 不爆炸 No fire, No explosion</p>

7. 保护板规格与特性 PCM Specification and Characteristics

7.1 保护板参数 PCM Electrical Characteristics

Item (项目)	Symbol (符号)	Content (详细内容)	Criterion (标准)
Overcharge Protection (过充保护)	VDET1	Over charge detection voltage (过充电检测电压)	4.25±0.025V
	tVDET1	Over charge detection delay time (过充电检测延迟时间)	1000ms
	VREL1	Over charge release voltage (过充电解除电压)	4.08±0.05V
Overdischarge protection (过放保护)	VDET2	Over discharge detection voltage (过放电检测电压)	2.5±0.05V
	tVDET2	Over discharge detection delay time (过放电检测延迟时间)	115~175ms
	VREL2	Over discharge release voltage (过放电解除电压)	3.0±0.1V
	IDP	Over current detection current (过电流保护电流)	3-5.5A
	tVDET3	Detection delay time (检测延迟时间)	7.2~11ms
		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)
	TSHORT	Detection delay time (检测延迟时间)	500uS
		Release condition (保护解除条件)	Cut short circuit (断开短路电路)
Interior resistance (内阻)	RDS	Main loop electrify resistance (主回路通态电阻)	VC=4.2V,RDS≤65mΩ
Current consumption (消耗电流)	IDD	Current consume in normal operation (工作时电路内部消耗)	3.5μA Type 10μA Max

7.2 保护板原理图 PCM Schematic Diagram



7.3 保护板元器件清单 Bill of PCM

序号 NO.	元件编号 Symbol	元件名称 Material Name	元件规格 Material Specification	封装 Package	数量 Qty	厂商 Manufacturer
1	U1	IC	DW01	SOT-23-6	1	
2	Q1	MOSFET	8205A	TSS0P-8	2	
3	PCB	印制电路板	绿油/白字, FR4/ROHS		1	

8. Warnings 警告

Load circuit may cause voltage and current, and the voltage or current may add to pack, the voltage or current must be controlled as lower than RWV and RWI, larger voltage or current may damage the PCM of pack.

☆负载可能产生电压和电流,该电压和电流会反加在电池组合(含PCM)上,该电压和电流不能超过保护板自身反向耐压耐流值,过高电压或电流会损坏电池组合中的保护板。

To prevent the possibility of the pack from leaking, heating, fire .please observe the following precautions:

☆为防止电池组合可能发生的泄漏,发热,起火,请注意以下预防措施:

The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs, pins and needles .Do not strike at pack with any sharp edge parts.

☆ 电池组合外包装膜易被镍片,尖针等尖锐部件损伤,禁止用尖锐部件碰伤电池.

Do not immerse the pack in water and seawater

☆ 严禁将电池组合浸入海水或水中.

Do not use and leave the pack near a heat source as fire or heater

☆ 禁止将电池组合在热高温源旁,如火,加热器等使用设备.

When recharging, use the battery charger specifically for that purpose

☆ 充电时请选用锂离子电池专用充电器.

Do not reverse the positive and negative terminals

☆ 禁止颠倒正负极使用电池组合

Do not connect the pack to an electrical outlet

☆ 禁止将电池组合直接接入电源插座

Do not discard the pack in fire or heat it

☆ 禁止将电池组合丢入火或加热器中

Do not short-circuit the pack by directly connecting the positive and negative terminal with metal object such as wire

☆ 禁止用金属直接将电池组合的正负极进行短路连接.

Do not transport and store the battery together with metal objects such as necklaces, hairpins etc.

☆ 禁止将电池组合与金属,如发夹,项链等一起运输或贮存. Do not strike or throw the pack.

☆ 禁止敲击或抛掷,踩踏电池组合等.

Do not directly solder the pack or battery and pierce the battery with a nail or other sharp object.

☆ 禁止直接焊接电池组合或电芯, 禁止用钉子或其它利器刺穿电池组合或电芯.

9.Cautions 注意

Do not use or leave the pack at very high temperature (for example, at strong direct sunlight or a vehicle in extremely hot conditions).Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be decreased.

△ 禁止在高温下(直热的阳光下或很热的汽车中)使用或放置电池组合,否则可能会引起电池过热,起火或功能失效,从而导致电池组合寿命减短.

Do not use it in a location where static electricity is great, otherwise, the safety devices in the pack may be damaged, which will cause hidden trouble of safety.

△ 禁止在强静电和强磁场的地方使用,否则易破坏电池组合的安全保护装置,带来安全隐患.

If the pack leaks and the electrolyte get into the eyes, do not rub eyes, instead, rinse the eyes, with clean running water, and immediately seek medical attention. Otherwise, eye injury can result.

△ 如果电池发生泄漏,电解液进入眼睛,请不要揉擦,应用清水冲洗眼睛,并立即送医院治疗,否则会伤害眼睛.

If the pack takes off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.

△ 如果电池组合在使用或贮存中发出异味,发热,变色,变形,或者是在充电过程中出现任何异常现象,立即将

电池从充电器或装置中移开,并停止使用.

In case the pack terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.

△ 如果电池组合的连接点弄脏,使用前应用干布抹净,否则可能会因接触不良而影响性能失效. Be aware discharged battery may cause fire or smoke, tape the terminals to insulate them.

△ 废弃之电池应用绝缘纸包住电极,以防起火, 冒烟.

The pack should be stored at room temperature, charged to about 40% to 60% of capacity. In case of over-discharge, pack should be charged for one time every 3 months while storing and batteries should be discharge and charge after being stored more than a year in order to activate it and restore energy.

△ 电池组合应当在室温下存放, 应充到 40%至 60%的电量。为防止电池过放, 建议每 3 个月进行一次充电,

如储存时间超过一年, 建议每年进行一次充、放电以激活电池。

10.Notice for Designing Battery Pack 电池外壳设计注意事项

10.1 Pack toughness (外壳坚韧度)

Battery pack should have sufficient strength and the LIP cell inside should be protected from mechanical shocks.

电池外壳应该有足够的机械强度使聚合物电池免受机械撞击。

10.2 Cell fixing (电池的固定)

The LIP cell should be fixed to the battery pack by its large surface area.

No cell movement in the battery pack should be allowed.

电池最大面积的一面应该固定在外壳上，安装后电池不能有松动。

10.3 Inside design (外壳内部设计)

No sharp edge components should be inside the pack containing the LIP cell.

外壳内安装电池的部位不应有锋锐边。

10.4 Tab connection (极片连接)

Ultrasonic welding or spot welding is recommended for LIP tab connection method. Battery pack should be designed that shear force are not applied to the LIP tabs.

If apply manual solder method to connect tab with PCM, below notice is very important to ensure battery performance:

The solder iron should be temperature controlled and ESD safe;

Soldering temperature should not exceed 350°C;

Soldering time should not be longer than 3s;

Soldering times should not exceed 5 times, Keep battery tab cold down before next time soldering;

Directly heat cell body is strictly prohibited, Battery may be damaged by heat above approx. 100°C

建议使用超声波或点焊焊接方法；外壳设计应使极片不受外力。

如果使用人工焊接保护板，下面的注意事项对于确保电池性能非常重要：

焊接烙铁的温度必须可控且可防静电；

焊接时烙铁的温度不能超过 350°C；

焊锡时间不能超过 3 秒钟；

焊锡次数不能超过 5 次，待极片冷却后才能进行下一次焊锡；

严禁直接加热电芯，高于 100°C 度会损害电芯。

11. Handling of Battery 电池操作注意事项

1 Soft Aluminum foil (铝箔软包装)

Easily damaged by sharp edge parts such as pins and needles, Ni-tabs, comparing with metal-can-cased LIB.

相对于金属壳的方形电池，铝箔软包装比较容易被锐利部件刺损，如针尖、镍带。

△Don't strike battery with any sharp edge parts 勿用尖锐处撞击电池。

△Trim your nail or wear glove before taking battery 剪掉指甲，或者戴手套。

△Clean worktable to make sure no any sharp particle 清理工作台，避免尖锐零部件。

Sealed edge may be damaged by heat above 100°C, bend or fold sealed edge.

封边被加热到 100°C 以上以及弯折封边都容易使封边受损。

Prohibition short circuit (禁止电池短路)

Never make short pack circuit. It generates very high current which causes heating of the cells and may cause electrolyte leakage, gassing or explosion that are very dangerous. The LIP tabs may be easily short-circuited by putting them on conductive surface. Such outer short circuit may lead to heat generation and damage of the cell.

避免电池短路。短路会产生很高的电流而使电池发热以及电解液泄漏，产生气体或爆炸是非常危险的。

极片连接在导电物体表面很容易短路，外部短路会导致发热及损害电池。

.Mechanical shock (机械撞击)

△LIP cells have less mechanical endurance than metal-can-cased LIB.

△Falling, hitting, bending, etc. may cause degradation of LIP 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的性能。

12.Period of Warranty 保质期

The period of warranty is one year from the date of shipment. Continent guarantees to give a replacement in case of battery 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我们公司制造过程中造成的而不是客户滥用或错误使用造成，本公司负责退换电池。

13.Others 其它事项

The customer is requested to contact Continent 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.

客户若需要将电池用于超出文件规定以外的应用，或在文件规定以外的使用条件下使用电池，应事先联系欧亚美，因为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。

Continent will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.

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，欧亚美概不负责。

Continent will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the battery, if it is deemed necessary.

如有必要，欧亚美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。

Any matters that this specification does not cover should be conferred between the customer and Continent.

任何本说明书中未提及的事项，须经双方协商确认