

# Li-ion Polymer Battery Specification

Pack Type: Cell +PCM  
组合类型: 电芯+保护板

Cell Model  
电芯型号: 401730-150mAh

Part Code  
产品编码: \_\_\_\_\_

Customer Code  
客户代码: C529

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Dept. 部门	Signature 签名	Date 日期
QA Dept 品质		
R&D Dept 研发		
Approved 批准		

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## 1.MODIFIED LIS

## 修订履历

## Product Modified Record List

## 产品变更履历表

Revision 版本	Date 日期	Mark 标记	Modified content 变更内容
A0	2021-09-30	/	新版发行

## 2.Scope 适用范围

This specification describes the basic performance, technical requirement, testing method ,warning and caution of the Li-ion Polymer rechargeable battery pack, the pack defined in this documentation is an assembly which include battery, PCM and wire, the specification only applies to SHENZHEN EISTO ELECTRONICS CO.,LTD.

本标准规定了锂聚合物可充电电池的基本性能、技术要求、测试方法及注意事项，电池组合定义的是包括电芯，保护板和连接线的组合，本规格说明书描述了深圳市亿盛弘电子有限公司所生产的锂聚合物电池。

## 3.Specification 产品规格

NO.	Item 项目		Specifications 规格要求	
3.1	Typical capacity	典型容量	150mAh	0.2C Discharge (0.2C 放电)
	Minimum capacity	最小容量	150mAh	0.2C Discharge (0.2C 放电)
3.2	Shipment voltage 出货电压		3.8V-4.0V	
3.3	Weight 重量		Approx (约): 2.9 g	
3.4	Nominal voltage 标称电压		3.7V	
	Fully charge voltage(FC) 满充电压 FC		4.2V	
	Fully discharge voltage(FD)满放电压 FD		3.0V	
3.5	Standard charge current 标准充电电流		0.2 C	
3.6	Standard charging method 标准充电方法		0.2C CC (constant current) charge to FC, then CV(constant voltage FC)charge till charge current decline to $\leq 0.01C$ 0.2C CC (恒流) 充电至 FC, 再 CV (恒压 FC) 充电直至充电电流 $\leq 0.01C$	
3.7	Standard Discharge Current 标准放电电流		0.2C	
3.8	Max. Continuous charge current 最大持续充电电流		0°C ~ 15°C	0.2C
			15°C ~ 45°C	1.0C max to 4.1V, then CV to 0.05Cmin
3.9	Max. Continuous discharge current 最大持续放电电流		-10°C ~ 15°C	0.5C
			15°C ~ 60°C	1C/150mA
3.10	Charge cut-off voltage 充电截止电压		Ref.5.2	
3.11	Discharge cut-off Voltage 放电截止电压		Ref.5.3	
3.12	Storage temperature 储存温度		-20°C ~ 60°C	$\leq 7$ day
			-20°C ~ 45°C	$\leq 1$ month
			-20°C ~ 30°C	$\leq 1$ year
Percentage of recoverable capacity no less than 80% of the initial capacities 恢复容量不低于初始容量的 80% Recommended storage temperature is $25 \pm 2^\circ\text{C}$ of half charge state (3.7~3.95v). 推荐储存温度 $25 \pm 2^\circ\text{C}$ , 电芯为半电状态(3.7~3.95v)储存。				
3.13	Storage Humidity 储存湿度		$\leq 75\%$ RH	
3.14	Appearance 外观		Without distortion and leakage 无变形、电解液泄露	
3.15	Standard testing condition 标准测试环境		Temperature(温度) : $25 \pm 3^\circ\text{C}$ Humidity (湿度) : $\leq 75\%$ RH Atmospheric Pressure (大气压) : 86-106 Kpa	

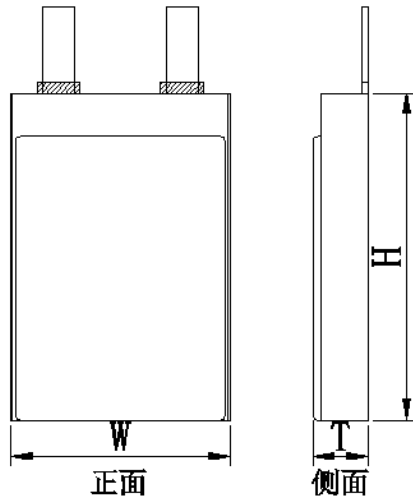
3.1 项测试结果以收到货 7 天内测试为准

从 3.1 至 3.13 项目，测试环境遵从 3.16 (标准测试环境),如果工作环境超出 3.16 范围，性能将会有一些偏移。

**4.0 Assembly Drawing 装配图**

电芯尺寸图:

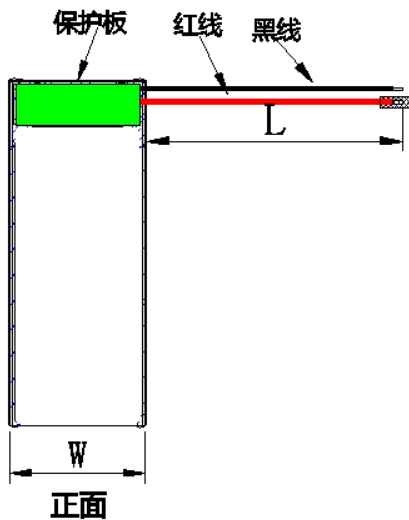
Cell dimension:



单位	mm
T	4.3 Max
W	17.5 Max
H	31 Max

成品尺寸图:

Battery Pack dimension:



厚度 T	宽度 W	长度 H	导线外露长度 L	单位
4.3 Max	17.5	32.0 Max	40±2	mm

**4.1 PACK BOM 清单**

物料名称	规格	数量 (PCS)
电芯 Cell	401730-150mAh	1
保护板 PCM	DAA+8205A (9.0*3.6*0.4MM)	1
红色导线 RED WIRE	3302 28#	1
黑色导线 BLACK WIRE	3302 28#	1

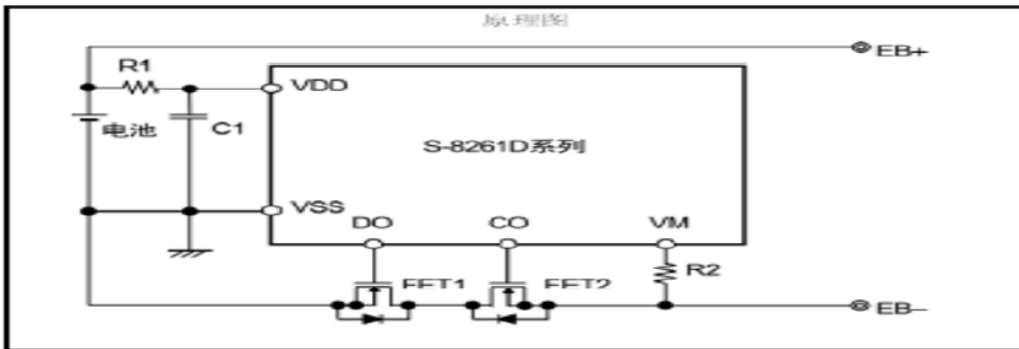
**5.0 Electronic Protection 电子保护**

5.1. Based on dual NMos transistor in series with the Li-polymer cell negative terminal, to be driven by a standard safety IC, e.g. FS/DW01A or equivalent. Protections which shall be provided are:

基于双 NMos 晶体管串联 Li-polymer 电池负极, 是由一个标准的安全集成电路, 如 FS / DW01A 或等价的。

**5.2 PCM (25°C) 参数表**

#	Parameter	Symbol	Unit	Limit Values		
				Min	Typ	Max
1	Max applicable voltage(NMOS breakdown voltage) MOS 击穿电压	V(BR) DSS	V	20	-	-
2	Over charge Voltage Protection Threshold 过充保护电压	OVP	V	4.26	4.28	4.30
3	Over Discharge(Under) Voltage Protection Threshold 过放电保护电压	UVP	V	2.95	3.0	3.05
4	Discharge over current Protection current 放电过流保护电流	DOP	A	1	-	3
5	Charge over current protection current 充电过流保护电流	COP-	A		-	
6	Supply current 自耗电流	-	$\mu A$	-	-	6

**5.3 Circuit Diagram (原理图)**

**5.5 PCB BOM**

	物料名称	规格型	单位	数量	备注
1	IC	DAA	PCS	1	U1
2	MOS	8205A(6个脚)	PCS	1	Q1
3	PCB 板	9.0*3.6*0.4MM	PCS	1	/
4	电阻 Resistance	330 $\Omega$ $\pm$ 5%	PCS	1	R1
5	电阻 Resistance	470 $\Omega$ $\pm$ 5%	PCS	1	R2
6	电容 Capacitance	0.1 $\mu$ F $\pm$ 10% 25V	PCS	1	C1

**6.General Performance 常规性能**

No.	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
6.1	0.2C Capacity 0.2C 容量	At standard testing condition, after standard charging, rest battery for 10min, then discharging at 0.2C to voltage FD, recording the discharging time. 在标准测试环境下, 标准充饱电后, 搁置 10 分钟, 然后用 0.2C 电流放电至 FD, 所记录放电时间	≥300min(分钟)
6.2	1C Capacity 1C 容量	At standard testing condition, after standard charging, rest battery for 10min, then discharging at 1C to voltage FD, recording the discharging Capacity 在标准测试环境下, 标准充饱电后, 搁置 10 分钟, 然后用 1C 电流放电至 FD, 记录容量	≥56min (分钟)
6.3	Cycle Life 循环寿命	At standard testing condition, constant current 0.2C charge to FC, then constant voltage charge to current declines to 0.01C, rest 10min, constant current 0.2C discharge to FD, rest 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells 在标准测试环境下, 先用 0.2 C 恒流充电至 FC, 再恒压 FC 充电直至充电电流 ≤0.01C, 搁置 10 分钟, 再用 0.2C 电流放电至 FD; 又搁置 10 分钟, 重复以上步骤, 直到放电容量是初始容量的 80%	≥300 times(次)
6.4	Capability of keeping electricity 荷电保持能力	At standard testing condition, After standard charging, no outer loading circuit, rest the pack 28days, discharging at 0.2C to voltage FD, recording the discharging time. 在标准测试环境下, 标准充饱电后, 无外接负载线路, 电池组合搁置 28 天, 然后用 0.2C 放电至 FD, 所记录放电时间.	≥270min (分钟)

**7. Battery Pack Safe Characteristic 电池组安全性能**

No.	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
7.1	Temperature 温度循环	In the standard test environment, after standard charging, the battery pack is placed in a controlled temperature box with a temperature of 20±5℃ drop the temperature of the test box to -40±2℃ and keep it for 6 hours; The temperature conversion time shall not exceed 30 min. C) raise the temperature of the test box to 72±2℃ again, and the temperature conversion time shall not exceed 30 min; D) repeat steps a)~c). After a total of 10 test cycles, continue one discharge charging cycle according to the standard charging and discharging method 在标准测试环境下, 标准充饱电后, 将电池组在温度为 20 °C ±5 °C 的可控温的箱体中进行如下步骤: a) 将样品放入温度为 72 °C ±2 °C 的试验箱中保持 6h;	No fire, no explosion, no liquid leakage. 不起火、不爆炸、不漏液。

		<p>b) 后将试验箱温度降为-40 °C ±2 °C，并保持 6 h；温度转换时间不大于 30 min；</p> <p>c) 再次将试验箱温度升为 72 °C ±2 °C，温度转换时间不大于 30 min；</p> <p>d) 重复步骤 a) ~c)，共循环 10 次。试验后按标准充放电方法继续进行一次放电充电循环。</p>	
7.2	Acceleration shock 加速度冲击	<p>In the standard test environment, the acceleration impact test was conducted in accordance with three vertical directions after standard charging. Fixed in the sample of the impact on the stage, half sine pulse impact test, within the first 3 ms, minimum average acceleration is designed. the gn 75, peak acceleration is designed. the 150±25 designed. the gn, pulse duration for 6 ms 1 ms sample three times in each direction acceleration shock test after test shall be carried out in accordance with the standard charge and discharge method to charge a discharge cycle</p> <p>在标准测试环境下，标准充饱电后，按照 3 个相互垂直的方向依次进行加速度冲击试验；将样品固定在冲击台上，进行半正弦脉冲冲击试验，在最初的 3ms 内，最小平均加速度为 75 gn，峰值加速度为 150 gn±25 gn，脉冲持续时间为 6 ms±1ms。样品每个方向进行三次加速度冲击试验。试验后按照标准充放电方法继续进行一次放电充电循环。</p>	<p>No fire, no explosion, no liquid leakage.</p> <p>不起火、不爆炸、不漏液。</p>
7.3	Drop test 跌落测试	<p>After the battery pack is fully charged according to the standard, the drop height: 1000mAh 1.5m, &gt;1000mAh, 1.0m. The sample with the power supply capacity of portable electronic products higher than 1.0m is scheduled to be used on the handheld device, and the drop height should be 1.5m 将电池组按标准充满电后，跌落高度：容量 ≤1000mAh 1.5 米，容量 &gt;1000mAh, 1.0 米，手持设备预定使用高度高于 1.0 米的便携式电子产品供电的容量超过 1000mAh 的样品，起跌落高度应为 1.5 米。自由落体跌落于混凝土板上。每个面各跌落一次，共进行 6 次试验。</p>	<p>No fire, no explosion, no liquid leakage.</p> <p>不起火、不爆炸、不漏液。</p>
7.4	Vibration measurement 振动测试	<p>In the standard test environment, vibration tests were conducted in three vertical directions after standard charging. Tighten the sample on the vibration test bench, and the scanning frequency is oscillated from 10hz-55hz in each direction in three directions of X, Y and Z for 30 min, and the scanning frequency rate is 1oct/min. 10hz-30hz, displacement amplitude (single amplitude): 0.38mm; 30 hz - 55 hz, displacement amplitude (single amplitude) : 0.19 mm, sine vibration test for 12 cycles in each direction, the cycle time of each direction of a total of 3 h after vibration test shall be carried out in accordance with the standard charge and discharge method to charge a discharge cycle</p> <p>在标准测试环境下，标准充饱电后，按照 3 个相互垂直的方</p>	<p>No fire, no explosion, no liquid leakage.</p> <p>不起火、不爆炸、不漏液。</p>



		<p>向依次进行振动试验；将样品紧固在振动试验台上，X、Y、Z三个方向上每个方向上从10Hz-55Hz循环扫频振动30 min，扫频速率为1oct/min；</p> <p>10Hz-30Hz，位移幅值（单振幅）：0.38mm；30Hz-55Hz，位移幅值（单振幅）：0.19mm，正弦振动测试。每个方向进行12个循环，每个方向循环时间共计3h的振动。试验后按照标准充放电方法继续进行一次放电充电循环。</p>	
7.5	Extrusion test 挤压测试	<p>In the test environment, the standard charge, the battery in two plane, perpendicular to the direction of the plate by extruding, applied between the two tablet 13.0 kN 0.78 kN extrusion Once the pressure reaches the maximum value can stop pressing test, test battery cannot occur in the process of external short circuit 1 as a sample only do an extrusion test</p> <p>在标准测试环境下，标准充饱电后，将电池置于两个平面内，垂直于极板方向进行挤压，两平板间施加 13.0 kN±0.78 kN 的挤压力。一旦压力达到最大值即可停止挤压试验，试验过程中电池不能发生外部短路。1个样品只做一次挤压试验。</p>	<p>No fire, no explosion, no liquid leakage.</p> <p>不起火、不爆炸。</p>

※ Above testing of safe characteristic must be with protective equipment.(安全性能测试应在有保护措施下进行)

### 8. Warnings 警告

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 battery in liquid such as water, beverages, or other fluids.

☆严禁将电池组合浸入水或饮料或其它液体中。 .

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

☆禁止将电池组合放在热高温源旁,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(超出 3.9,3.10,3.13 范围)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.

It is prohibited to use or place the battery combination at high temperature (beyond the range of 3.9,3.10,3.13), or it may cause the battery to overheat, catch fire or function failure, which may result in the short battery life.

△电池只能在 0° C~45° C 温度范围充电.超出此温度范围可能导致电池漏液、发热,或导致电池严重的损坏.它也可能导致电池的性能和寿命的恶化.

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,带来不安全隐患.

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(about 3.7~3.95V).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（3.7~3.95V）。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。The battery pack should be stored at room temperature and should be charged 40 to 60 percent (3.7 ~ 3.95V).In order to prevent battery overdischarge, it is recommended to charge the battery every 3 months. If the storage time is longer than one year, it is recommended to charge and discharge the battery once a year to activate the battery.

## 10. Handling of Cells 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。



2 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。



### 3 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 outershort 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。

### 4 .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。



**11. Period of Warranty 保质期**

The period of warranty is one year from the date of shipment. We 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。

**12. Others 其它事项**

1. The customer is requested to contact our EISTO 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，应事先联系我们，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。

2. EISTO 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，概不负责。

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

如有必要，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。

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

任何本说明书中未提及的事项，须经双方协商确定。

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