

# POWER-XTRA

Model: Power-Xtra Power-Xtra PX502050 500Mah Li-polymer Battery with PCM Ver: A2 NO: 900.869.503.086

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## PX502050-M Battery Spec

Model : PX502050

Stock Code: 900.869.503.086

Cell Type : PX502050

Nominal Voltage: 3.7V

Capacity: 500mAh

Draft	Checking	Approved	Customer Confirmation
Peter	Chun Qi Zeng		

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Revision	Date	Editor	Contents
版本	日期	编著	内容
A0		Peter	Draft
A1	2017-05-24	Peter	更正标签内容,更新抬头
A2	2017-06-07	Peter	更改包装

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## 1 Product Specification (产品技术规格)

Single cell (单电芯)

No. (序号)	Item (项目)	General Parameter (常规参数)		Remark (备注)
1	Rated Capacity (额定容量)	Typical (标称容量)	500mAh	Standard discharge (0.2C C <sub>5</sub> A) after Standard charge (标准充电后 0.2C <sub>5</sub> A 标准放电)
		Minimum (最小容量)	450mAh	
2	Nominal Voltage (正常电压)	3.7V		Mean Operation Voltage (即工作电压)
3	Voltage at end of Discharge (放电终止电压)	2.75V		Discharge Cut-off Voltage (放电截止电压)
4	Charging Voltage (充电电压)	4.2±0.03V		
5	Internal Impedance (内阻)	≤280mΩ		Internal resistance measured at AC 1KHz after 50% charge (半电态下用交流法测量内阻) The measure must uses the new batteries that within one week after shipment and cycles less than 5 times (使用出货后不到一个星期及循环次数 少于 5 次的新电池测量)
6	Standard charge (标准充电)	Constant Current 0.5C <sub>5</sub> A Constant Voltage 4.2V 0.01 C <sub>5</sub> A cut-off (持续电流: 0.5C <sub>5</sub> A 持续电压: 4.2V 截止电流: 0.01 C <sub>5</sub> A)		Charge time : Approx 4.0h (充电时间: 大约 4 个小时)
7	Standard discharge (标准放电)	Constant current 0.2 C <sub>5</sub> A end voltage 2.75V (持续电流: 0.2C <sub>5</sub> A 截止电压: 2.75V)		
8	Fast charge (快速充电)	Constant Current 1C <sub>5</sub> A Constant Voltage 4.2V 0.01 C <sub>5</sub> A cut-off (持续电流: 1C <sub>5</sub> A 持续电压: 4.2V 截止电流: 0.01 C <sub>5</sub> A)		Charge time : Approx 2.5h (充电时间: 大约 2.5 个小时)
No. (序号)	Item (项目)	General Parameter (常规参数)		Remark (备注)

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9	Fast discharge (快速放电)	Constant current 1 C <sub>5</sub> A end voltage 2.75V (持续电流: 1 C <sub>5</sub> A 截止电压: 2.75V)	
10	Maximum Continuous Charge Current (最大充电持续电流)	1.0 C <sub>5</sub> A	
11	Maximum Continuous Discharge Current (最大放电持续电流)	1.0C <sub>5</sub> A	
12	Operation Temperature Range (工作温度范围)	Charge (充电) : 0-45°C	60±25%R.H. Bare Cell (单体电池储存湿度范围)
		Discharge (放电) : -20-60°C	
13	Storage Temperature Range (储存温度范围)	Less than 1 year: -20-25°C (小于一年: -20-25°C)	60±25%R.H. at the shipment state (出货状态时的湿度范围)
		less than 3 months: -20-40°C (小于3个月: -20-40°C)	
14	Single cell (单电芯)	Length 长(L)	Initial Dimension (初始尺寸)
		Width 宽(W)	
		Thickness 厚(T)	

## 2 Performance And Test Conditions 电池性能及测试条件

### 3.1 Standard Test Conditions 标准测试条件

Test should be conducted with new batteries within one week after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise specified, test and

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measurement shall be done under temperature of  $20\pm 5^{\circ}\text{C}$  and relative humidity of 45-85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15-30°C and humidity 25-85%RH.

测试必须使用出厂时间不超过一个星期的新电池，且未进行过五次以上的充放电循环。除非特别说明，否则测试会在温度  $20\pm 5^{\circ}\text{C}$ ，相对湿度 45-85%的条件下进行。如果经鉴定测试结果不受上述条件影响，测试也可以在温度 15-30°C，相对湿度 25-85%RH 的条件下进行。

## 3.2 Measuring Instrument or Apparatus 测量器具及设备

### 3.2.1 Dimension Measuring Instrument 尺寸测量器具

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

尺寸测量器具的精度等级应不小于 0.01 mm。

### 3.2.2 Voltmeter 伏特计

Standard class specified in the national standard or more sensitive class having inner impedance more than  $10\text{k}\Omega/\text{V}$

按照国家标准指定规格等级或采用灵敏度更高的，测量电压时内阻不应小于  $10\text{k}\Omega/\text{V}$ 。

### 3.2.3 Ammeter 安培计

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than  $0.01\Omega$ .

按照国家标准指定规格等级或采用灵敏度更高的，包括电流表及电线在内的总外阻应小于  $0.01\Omega$ 。

### 3.2.4 Impedance Meter 电阻计

Impedance shall be measured by a sinusoidal alternating current method(1kHz LCR meter).

内阻测试仪测量原理应为交流阻抗法（1kHz LCR）。

## 3.3 Appearance 外观

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

电池外观应没有划伤、破裂、污渍、生锈、漏液等影响市场价值的缺陷存在。

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## 3.4 Temperature Dependence of discharge capacity 放电温度特性

Table 3 (表 3)

Discharge Temperature (放电温度)	-10°C	0°C	23°C	60°C
Discharge Capacity (0.2C) (放电容量/0.2C)	50%	80%	100%	95%

## 3.5 Cycle Life and Leakage-Proof 循环寿命及漏液试验

Table 4 (表 4)

No.	Item	Criteria	Test Conditions
1	Cycle Life (循环寿命) (0.5C)	Higher than 70% of the Initial Capacities of the Cells (初始容量的 70%)	Carry out 500cycle Charging/Discharging in the below condition. ◆Charge:Standard Charge ◆Discharge:0.5C to 2.75 V ◆Rest Time between charge/discharge:30min. ◆Temperature:20±5°C ◆放电:0.5C 放至 2.75V ◆搁置:30min. ◆温度:20±5°C
2	Leakage-Proof	No leakage (visual inspection)	After full charge with standard charge, store at 55±3°C, 60±10%RH for 1 week.

## 1. Mechanical characteristics and Safety Test for Cell 电芯安全测试及机械特性

Table 5 (表 5)

(Mechanical characteristics)

No.	Items	Test Method and Condition	Criteria
1	Vibration Test	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz, the excursion of the vibration is 1.6mm. The cell shall be vibrated for 30 minutes per axis of XYZ axes.	No leakage No fire
2	Drop Test	The cell is to be dropped from a height of 1 meter twice onto concrete ground.	No explosion, No fire, no leakage.

Table 6 (表 6)

(Safety Test)

Item	Battery Condition	Test Method	Requirements
Crush	Fresh, Fully charged	Crush between two flat plates. Applied force is about 13kN(1.72Mpa) for 30min.	No explosion, No fire
Short Circuit (20°C)	Fresh, Fully charged)	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω. Tests are to be conducted at room temperature(20±2°C ).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150°C
Short Circuit (60°C)	Fresh, Fully charged	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω. Tests are to be conducted at temperature(60±2°C ).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150°C

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Impact	Fresh, Fully charged	A 56mm diameter bar is inlayed into the bottom of a 10kg weight. And the weight is to be dropped from a height of 1m onto a sample battery and then the bar will be across the center of the sample.	No explosion, No fire
Forced Discharge	Fresh, Fully charged	Discharge at a current of 1.0C for 2.5h.	No explosion, No fire
Nail Pricking (3mm)	Fresh, Fully charged	Prick through the sample battery with a nail having a diameter of 3mm and remain 2h.	No explosion, No fire

### 3 Protection circuit 保护电路 (Battery Pack PCM Standard 保护板标准)

Item	Symbol	Content	Criterion
Current	IDP	Max. Charging Current	1.5A
		Max. Discharging Current	1.5A
Over charge Protection	VDET1	Over charge detection voltage	4.28±0.05V
	tVDET1	Over charge detection delay time	80—200ms
	VREL1	Over charge release voltage	4.10±0.05V
Over discharge protection	VDET1	Over discharge detection voltage	2.40±0.10V
	tVDET1	Over discharge detection delay time	40-120ms
	VREL1	Over discharge release voltage	3.00±0.1V
Over current protection	VDET3	Over current detection voltage	1.30±0.5V
	IDP	Over current detection current	3.5±1.0A
	tVDET3	Detection delay time	5-20ms
		Release condition	Cut load



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Short protection		Detection condition	Exterior short circuit
	TSHOR	Detection delay time	5-120ms
		Release condition	Cut short circuit
Interior resistance	RDS	Main loop electrify resistance	VC=4.2V, RDS≤70mΩ
Current consumption	IDD	Current consume in normal operation	3.0μA Type 6.0μA Max

## 4 Handling of Cells 电池操作注意事项

### 4.1 Consideration of strength of film package 包装薄膜注意事项

#### 1) Soft Aluminium 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。

#### 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。

### 4.2 Prohibition short circuit 禁止电池短路

Never make short circuit cell. It generates very high current which causes heating of the cells and may cause electrolyte leakage, gassing or explosion that are very dangerous.

The Power-Xtra 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.

An appropriate circuitry with PCM shall be employed to protect accidental short circuit of the battery pack.

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## 4.3. Mechanical shock 机械撞击

Power-Xtra cells have less mechanical endurance than metal-can-cased LIB.

Falling, hitting, bending, etc. may cause degradation of Power-Xtra 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。

## 4.4 Handling of tabs 极片操作注意事项

The battery tabs are not so stubborn especially for aluminum tab.

Don't bend tab.

Do not bend tabs unnecessarily.

极片的机械强度并非异常坚固，特别是铝片。没有必要时禁止弯折极片。

## 5 Storing the Batteries 电池的存放

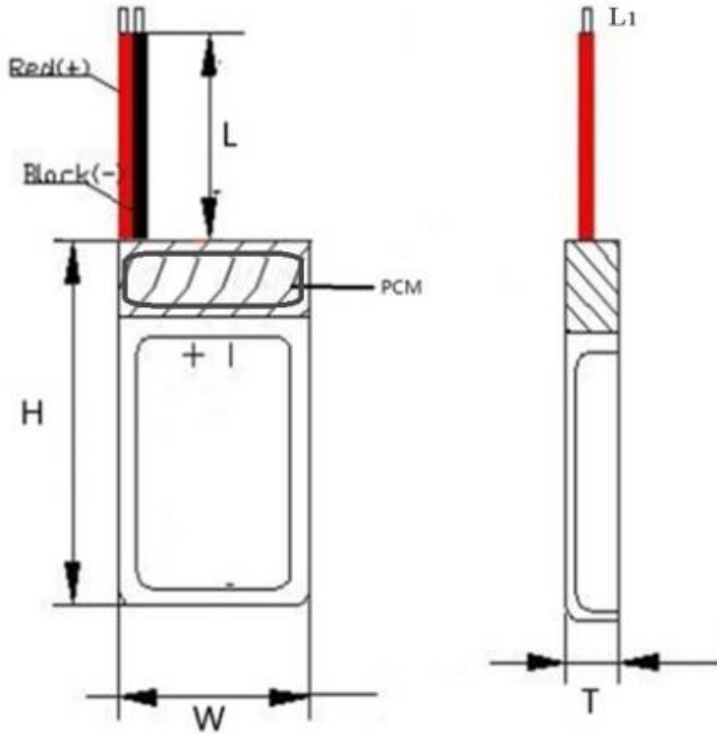
The batteries should be stored at room temperature, charged to about 30% to 50% of capacity. We recommend that batteries be charged about once per half a year to prevent over discharge.

电池应当在室温下存放，应充到 30%至 50%的电量。如长时间储存，建议每半年充一次电以防止电池过放电。

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## 6 Dimension 尺寸



(注：保护板与线焊锡处打固定胶)

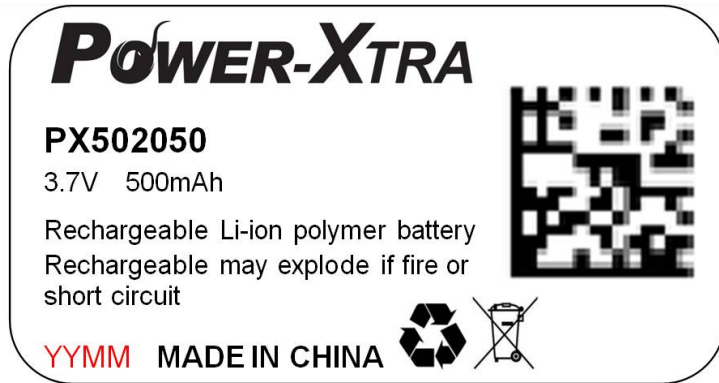
Units (单位)		mm	PCB (保护板)		IC:DW01 / MOS:8205A*1	
Wire(引线)		1007/24#	L(线长)	70±2	L1 (剥线)	3mm
T (厚度)		5.2 <sup>+0.2</sup> <sub>-0.2</sub>	W (宽度)	20.0 <sup>-0.5</sup> <sub>0.5</sub>	H (高度)	50.0 <sup>+1.5</sup> <sub>-1.5</sub>
Drawer (绘图)		Checked (审核)		Approved (批准)		Date (期)
			<b>PX502050 DRAWING</b>			
			Drawing ID (图号)			

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## 7 Drawing of Label (标签图)

PET 透明标签, 2D(Data Matrix)二维码, 内容为: “8680187002626”。日期按出货月份更改。MM 为月, YY 为年, 月份在前, 年在后 (月年), 如: 0716 (2016 年 07 月)。标签格式如下:



## 8 Packing (包装)

整齐装入托盘, 每箱不超 10KG; 中性纸箱 (或定制 Logo 纸箱), 贴箱唛; 箱唛格式如下:

中性纸箱, 贴箱唛:

箱唛格式如下:

唛头

贴于纸箱正/背两面, 唛头尺寸 200\*70mm (唛头尺寸视情况而定):



## ENA-13 Bar code 条形码 / 侧唛:

贴于纸箱正/背两侧, 侧唛尺寸 130\*100mm (侧唛尺寸视情况而定):

标签尺寸 10\*13CM (按情况而定) 每箱两面侧面都要贴

PO NO.	order 16-8	根据每次订单而更改
MODEL NO.	900.869.503.086	
QTY	500PCS	根据每箱数量而定
DATE	2016-07-20	根据出货日期而更改
Made in China		

