

# POWER-XTRA

Model : Power-Xtra PX405486 2000 mAh Li-Polymer Battery with PCM Ver: A0 NO: 900.869.503.024

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## PX405486-M Battery Spec

**Model:** PX405486-M

**Stock Code :** 900.869.503.024

**Cell Type:** PX405486

**Nominal Voltage:** 3.7V

**Capacity:** 2000mAh

Draft	Checking	Approved	Customer Confirmation
Peter	Chun Qi Zeng		

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## 1. Product Specification 产品技术规格

(单电芯 Single cell)

No	Item	General Parameter		Remark
1	Rated Capacity	Typical	2000mAh	Standard discharge ( 0.2C) after Standard charge
		Minimum	1960mAh	
2	Nominal Voltage	3.7V		Mean Operation Voltage
3	Voltage at end of Discharge	2.75V		Discharge Cut-off Voltage
4	Charging Voltage	4.2±0.03V		
5	Internal Impedance	≤200mΩ		Internal resistance measured at AC 1KHZ after 50% charge The measure must uses the new batteries that within one week after shipment and cycles less than 5 times
6	Weight	About 50 g		
7	Standard charge	Constant Current 0.2C Constant Voltage 4.2V 0.01 C cut-off		
8	Standard discharge	Constant current 0.2C end voltage 2.75V		
9	Fast charge	Constant Current 1.0C Constant Voltage 4.2V 0.01C cut-off		
10	Fast discharge	Constant current 1.0C end voltage 2.75V		
11	Maximum Continuous Charge Current	1.0C		
12	Maximum Continuous Discharge Current	1.0C		
13	Operation Temperature Range	Charge (充电) : 0-45°C		60±25%R.H.
		Discharge (放电) : -20-60°C		Bare Cell
14	Storage Temperature Range	Less than 1 year: -20-25°C		60±25%R.H. at the shipment state
		less than 3 months: -20-40°C		
15	Single cell	Length 长(L)	86.0±0.5mm	Initial Dimension
		Width 宽(W)	54.0±0.5mm	
		Height 高(H)	4.0±0.2mm	

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## 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 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  $15\sim 30^{\circ}\text{C}$  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  $15\sim 30^{\circ}\text{C}$ ，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。

### 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%

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### 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 (0.5C)	Higher than 70% of the Initial Capacities of the Cells	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
2	Leakage-Proof	No leakage (visual inspection)	After full charge with standard charge, store at 55±3°C, 60±10%RH for 1 week.

### 3. 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 and 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 (短路试验 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 (冲击试验)	Fresh, Fully charged (充满电的新电 池)	A 56mm diameter bar is inlaid 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. (用一条直径为 56mm 的圆棒放置在电池中央, 将一 10Kg 的重锤从 1m 的高度垂直落在在电池的中心位置)	No explosion, No fire (无起火无爆炸)
Forced Discharge (过放试验)	Fresh, Fully charged (充满电的新电 池)	Discharge at a current of 1.0C for 2.5h. (以 1.0C 的电流放电 2.5 小时)	No explosion, No fire (无起火无爆炸)
Nail Pricking (针刺试验) (3mm)	Fresh, Fully charged (充满电的新电 池)	Prick through the sample battery with a nail having a diameter of 3mm and remain 2h. (用直径为 3mm 的钉子刺穿电池并保持 2 个小时)	No explosion, No fire (无起火无爆炸)

## 4. Protection circuit 保护电路

Battery Pack(PCM Standard 保护板标准)

Item	Symbol	Content	Criterion
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
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=2.5V,RDS≤34mΩ
Current consumption	IDD	Current consume in normal operation	3.0μA Type 6.0μA Max

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## 5. Handling of Cells 电池操作注意事项

### 5.1 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。

### 5.2 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.

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，产生有毒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。选用一个适当的保护电路可以在意外短路时保护电池。

### 5.3. 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。

### 5.4 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。

## 6. Storing the Batteries 电池的存放

The batteries should be stored at room temperature, charged to about 30% to 50% of capacity.

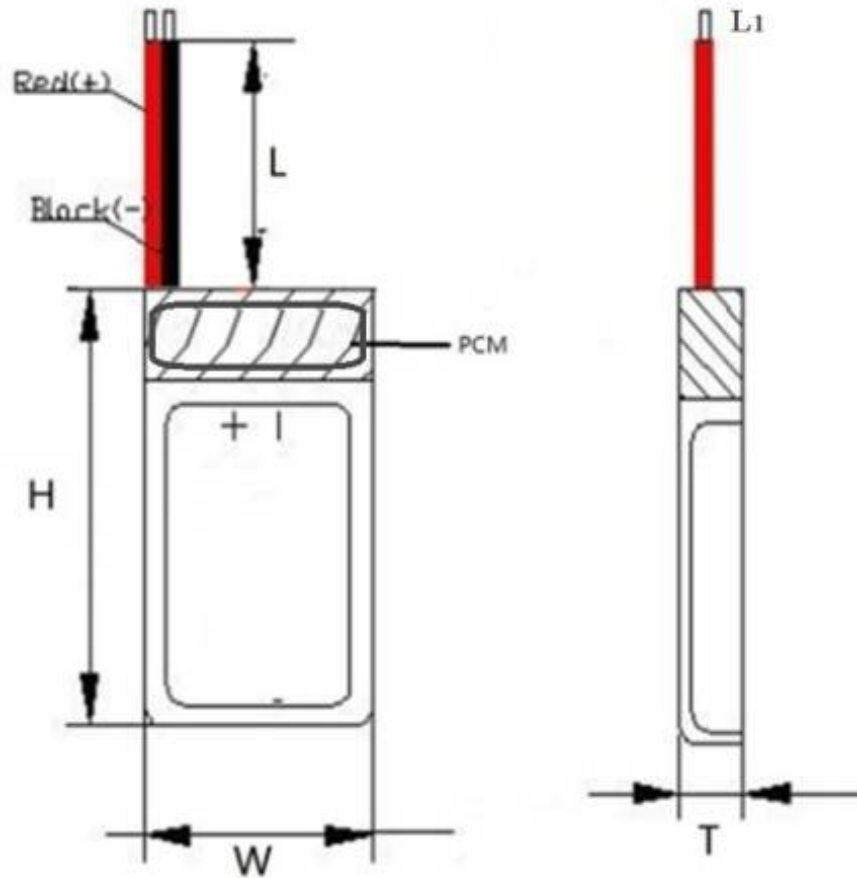
We recommend that batteries be charged about once per half a year to prevent over discharge.

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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## 7. Dimension 尺寸



Dimensions 尺寸 (Units 单位: mm)	PCM	Normal PCM 常规保护板 (1.5A)
	Length Cable 线长 (L)	100±5mm
	Width 宽(W)	54.0±1mm
	Height 高(H)	88.0±1mm
	Thickness 厚(T)	4.0±0.5mm
	Cable 线号	UL1007#24AWG (Tin plating 浸锡:2mm)

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## 8. Drawing of Label 标签图

PET 透明标签，2D(Data Matrix)二维码。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：



## 9. Drawing Packing 包装图

PP 袋单独包装，每箱不超 10KG；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）：

PO NO.	Order	← 根据每次订单更改
MODEL NO.	900.869.503.024	
QTY	500PCS	← 根据每箱数量更改
DATE	YYYY-MM-DD	← 根据出货日期更改
Made in China		
 8 680187 002077		