

# SPECIFICATION

## 电池规格书

Customer Name 客户名称	
Model Name 产品名称	AA 1.5V 保护锂电池
Product number 产品料号	XBL01004
Description 规格描述	AA 1.5V 锂电池/输出 1.5V 2A/3300mWh/充电电流 0.5A
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# Content

## 目录

1、Scope 适用范围.....	4
2、Revise 修订.....	4
3 Test conditions 电池测试条件.....	4
3.1 Standard test conditions 标准测试条件.....	4
4、Battery overview 电池概述.....	5
4.1 Category 类别.....	5
4.2 Product Composition (Model) 产品组成 (型号) .....	5
5、Electrical performance of batteries 电池电性能.....	5
5.1 Testing conditions 测试条件.....	5
5.2 Electrical performance of batteries 电池电性能.....	5
6、Battery reliability test 电池可靠性测试.....	6
6.1 Testing conditions 测试条件.....	6
6.2 Battery reliability test 电池可靠性试验.....	6
7、Battery Safety Testing 电池安全性测试.....	8
8、Component drawing 组件图纸.....	10
8.1 Assembly Dimension Diagram(mm) .....	10
装配尺寸图 (单位 mm).....	10
8.2 Packaging method 包装方式.....	11
9、Main parameters of battery protection panel 电池保护板主要参数.....	11
9.1 Testing conditions 测试条件.....	11
9.2 Main parameters of protective plate 保护板(IC)主要参数.....	11
10、Battery schematic diagram 电池原理图.....	13
10.1 Battery schematic diagram 电池原理图.....	13
10.2 Layout/PCB 图.....	13
11、Battery precautions 电池注意事项.....	13
12、Other considerations 其他注意事项.....	14

## 1、Scope 适用范围

It is only suitable for batteries produced by Shenzhen XTAR Electronics Co., Ltd., including lithium ion batteries and protective components.  
仅适用于深圳爱克斯达电子有限公司生产的电池, 包括锂离子电芯和保护组件。

## 2、Revise 修订

If the raw materials, production process, production system or battery use environment and requirements change, the proposed change party shall notify the other party in writing of the change information and obtain the consent of both suppliers and buyers before revising it.

如果原材料、生产过程、生产系统或电池使用环境及要求发生改变, 提出更改方须将改变的信息以书面形式通知对方取得供需双方同意后再行修订。

## 3 Test conditions 电池测试条件

The specifications and test methods of rechargeable lithium ion secondary batteries produced by Shenzhen XTAR Electronics Co., Ltd. are standardized to avoid errors caused by different test conditions and methods.

对深圳市爱克斯达电子有限公司生产的可充电锂离子二次电池产品的规格、测试方法进行规范, 避免因测试条件、方法的不同引起误差。

### 3.1 Standard test conditions 标准测试条件

All tests described in this specification are carried out in the following temperature and humidity ranges: 20+5 C and 65 +20% relative humidity. If the test results are not affected by the temperature and humidity environment, these tests can be carried out in the following temperature and humidity ranges: temperature 15 ~30 C, relative humidity 25%~85%.

本规格书所陈述的所有测试均是在以下温湿度范围进行: 20±5℃, 相对湿度 65±20%. 如果测试结果不受温湿度环境影响时, 这些测试可以在以下温湿度范围进行: 温度15℃ ~ 30℃, 相对湿度 25% ~ 85%.

## 4、Battery overview 电池概述

### 4.1 Category 类别

Rechargeable lithium-ion batteries.  
可充电锂离子电池。

### 4.2 Product Composition (Model) 产品组成 (型号)

Assembly 组件	Manufacturer 厂商	Specification type 规格型号	Number 数量
电芯			1
PCM	爱克斯达		1

## 5、Electrical performance of batteries 电池电性能

### 5.1 Testing conditions 测试条件

Atmospheric pressure: 86-106 Kpa  
大气压: 86~106Kpa

### 5.2 Electrical performance of batteries 电池电性能

NO. 序号	Items 项目	Standards 标准
1	Nominal Voltage 标称电压	持续恒定1.5V
2	Nominal capacity 标称容量	2000mAh
3	Mini capacity 最小容量	1900mAh
4	Standard charging voltage 标准充电电压	5V
5	Maximum continuous discharge current	2000mA (25°C or below )

	最大持续放电电流	
6	Weight (g) 重量(g)	≤20g
7	Dimension (mm) 尺寸 (mm)	φ (14.5±0.3)*L(50±0.5)
8	Working temperature 工作温度	Charging: 0~45℃ Discharge : -20~60℃ 充电: 0~45℃ 放电: -20~60℃
9	Storage temperature 贮存温度	-20~50℃ (Recommended at 25±5℃) -20~50℃ (建议在 25±5℃)
10	Storage humidity 贮存湿度	65±20%

## 6、Battery reliability test 电池可靠性测试

### 6.1 Testing conditions 测试条件

Atmospheric pressure: 86~106 KPa  
大气压力: 86~106KPa

### 6.2 Battery reliability test 电池可靠性试验

NO. 序号	Items 项目	Test methods and conditions 测试方法及条件	Standards 标准
1	Free fall testing 自由跌落	The charged battery PACK is dropped from a height of 1.0m to a hardwood board of 18mm thickness placed on the cement floor, once at both ends of the positive and negative electrodes of the core and once at the cylindrical surface. 将充满电的电池PACK 从1.0m 的高度上跌落到放置在水泥地面上的18mm 厚的硬木板上, 电芯正负极两端各一次, 圆柱面一次。	Batteries do not leak, fire or explode. 电池不漏液, 不起火, 不爆炸
	Shock testing	Fixed the charged battery on the vibration platform, and vibrated for	Batteries do not leak, fire or explode.

2	震动	<p>90 minutes in three directions of X, Y and Z according to the vibration frequency of 10-55 HZ, displacement single amplitude of 0.8 mm.</p> <p>将充满电的电池固定在振动平台上, 按振动频率10-55HZ, 位移单振幅: 0.8mm, 以 X, Y, Z三个方向分别振动90min。</p>	<p>电池不漏液, 不起火, 不爆炸</p>
3	<p>High temperature performance</p> <p>高温性能</p>	<p>The standard charged cores were placed in the thermostat for 2 hours at 55 ± 2 °C, then discharged with 1C current to the termination voltage.</p> <p>在55±2 °C条件下, 将标准充电后的电芯放入恒温箱中2h 后, 再以1C 电流放电至终止电压。</p>	<p>85% of the initial capacity can be released.</p> <p>可放出初始容量80%</p>
4	<p>Low temperature performance</p> <p>低温性能</p>	<p>The standard charged cores were placed in the thermostat for 2 hours at - 10 ± 2 °C, and then discharged with 0.2C current to the termination voltage.</p> <p>在-10±2°C条件下, 将标准充电后的电芯放入恒温箱中2h 后, 再以0.2C 电流放电至终止电压。</p>	<p>65% of the initial capacity can be released.</p> <p>可放出初始容量65%</p>
5	<p>Storage at high and low temperatures</p> <p>高低温贮存</p>	<p>After the battery is fully charged, the battery is placed in a high temperature box of 55 ± 2 for 2 hours at constant temperature, then placed at ambient temperature of 20 ± 5 for 4 hours in a low temperature box of - 20 ± 2 and then placed at ambient temperature of 20 ± 5 for 4 hours. The battery is continued to circulate 10 times according to high temperature - normal temperature - low temperature - normal temperature - high</p> <p>电池充满电后, 将电池放入55±2 °C的高温箱中恒温2小时, 再在环境温度20±5 °C下放置4小时, 然后放入-20 ± 2 °C的低温箱中恒温2小时, 再在环境温度20±5°C下放置4小时, 继续按高温—常温—低温—常温—高温循环10次。</p>	<p>There is no deformation or explosion in the appearance of the battery, and the battery is normally charged and discharged.</p> <p>电池外观无变形或爆裂现象, 电池充放电正常。</p>
	Humidity and heat test	<p>The standard charged cores were placed in boxes with temperature of 40</p>	<p>No explosion, no fire</p> <p>无爆炸、无起火</p>

6	湿度和热度测试	+2 C and relative humidity of 90%-95%, and kept for 48 hours. 将标准充电后的电芯放入温度为40±2℃，相对湿度90%~95%的箱子中，保持48h。	
7	Cycle life 循环寿命	1. After charging according to the standard charging system, put it aside for 30min; 2. Discharge to battery protection with 0.1A, and keep for 30min; 3. Repeat steps 1-2 until the discharge capacity is 70% of the initial capacity; 1. 按标准充电制式充电后，搁置30min; 2. 以0.1A放电到电池保护后，搁置30min; 3. 重复步骤1-2，直到放电容量是初始容量的70%;	≥1000 times(次)
8	Thermal shock 热冲击	Put the cells in the oven. The temperature of the oven is to be raised at 5±2℃ per minute to a temperature of 130±2℃ and remains 30 minutes. 将电池放进烘箱内，以5±2℃/min速度升高烘箱内温度至130±2℃后，恒温30min.	No explosion, no fire 无爆炸、无起火
9	Capability of keeping electricity 荷电保持能力	After full charging, the battery was stored for 28 days at ambient temperature of 20±5℃, and then discharged at constant current of 0.5C until the battery could not be discharged. 完全充电后在环境温度为20±5℃的条件下，储存28天，然后进行0.5C恒流放电至电池不能放电止。	Discharge capacity (>85%) 放电容量≥85%

## 7、Battery Safety Testing 电池安全性测试

NO. 序号	Items 项目	Test methods and conditions 测试方法及条件	Standards 标准
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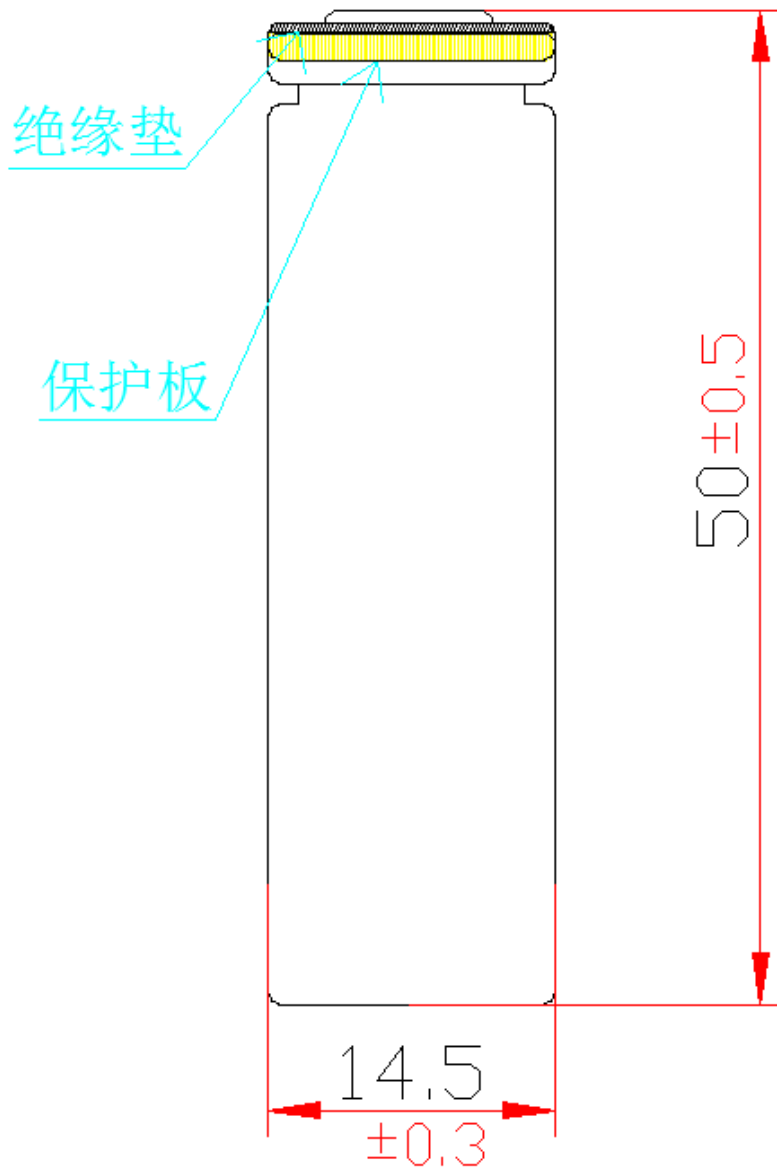


1	Overcharging test 过充电试验	Charging 2H with 10V Voltage and 2C Current. 用10V电压、2C电流充电2h。	No explosion, no fire 无爆炸、无起火
2	Over-discharge protection test 过放保护试验	After charging according to the standard charging system, discharge to the protection according to the current of 0.2C, and then connect the positive and negative poles with 30 mΩ wires for 24 hours. 按标准充电制式充电后,按0.2C电流放电至保护,再用30 mΩ的导线连接正负极24小时。	No explosion, no fire 无爆炸、无起火
3	Short circuit test 短路试验	After full charge in standard mode, the positive and negative poles of lithium batteries are connected by conductors (internal resistance $\leq 30\text{m}\Omega$ ) 标准制式充满电后,用导线(内阻 $\leq 30\text{ m}\Omega$ )连接锂电池正负极。	No explosion, no fire 无爆炸、无起火

## 8、Component drawing 组件图纸

### 8.1 Assembly Dimension Diagram(mm)

装配尺寸图 (单位 mm)



## 8.2 Packaging method 包装方式

(待定)

## 9、Main parameters of battery protection panel 电池保护板主要参数

### 9.1 Testing conditions 测试条件

Temperature:  $20 \pm 5^{\circ}\text{C}$

温度:  $20 \pm 5^{\circ}\text{C}$

Relative humidity: 45~75%

相对湿度: 45~75%

Atmospheric pressure: 86~106KPa

大气压: 86~106KPa

### 9.2 Main parameters of protective plate 保护板(IC)主要参数

Parameter 参数	Symbol 符号	Testing conditions 测试条件	MIN. 最小值	TYP 典型值	MAX. 最大值	Unit 单位
VP output voltage VP输出电压	Vout	--	--	1.5	--	V
Vbat input voltage VBAT 输入电压	VBAT		2.8	--	5.5	V
Maximum output current 最大输出电流	Io_max	--	2.0	--	--	A
Efficiency 效率		--	--	--	91	%
No load working current 无负载工作电流		Ivp=0mA	--	13	--	uA

Current limit 电流限制	$I_{LIM}$	--	2.5	--	--	A
Switching frequency 开关频率	$F_S$	--	1.2	--	--	MHz
Soft start time 软启动时间	$T_{SS}$		--	120	--	us
Over discharge protection voltage 过放保护电压	$V_{OD}$	Vbat由高到低	2.72	2.8	2.88	V
Delay time of over discharge protection 过放保护延迟时间	$T_{OD}$		80	100	120	ms
Delay time of over-radiation detection 过放检测延迟时间	$T_{OD}$	VDD=3.6~ 2.0V	--	40	100	ms
Working current of over discharge protection 过放保护工作电流	$I_{SLEEP}$	VBAT=2.0V	--	30	--	nA
Output short circuit voltage threshold 输出短路电压阈值	$V_{SHORT}$	--	--	0.2	--	V
VP power supply VP端供电电源	$V_{VP}$		4.5	--	5.5	V
Charger overvoltage protection threshold 充电器过压保护阈值	$V_{VP-OVH}$		--	5.8	--	V
Charger overvoltage recovery threshold 充电器过压恢复阈值	$V_{VP-OVL}$		--	5.5	--	V
Constant current charging current of Vbat terminal VBAT端恒流充电电流	$I_{CHG}$	$R_{PROG}=1K$		800		mA
		$R_{PROG}$ 悬空		450		
Full voltage 充满电压	$V_{REG}$	$R_{PROG}=10K$ $I_{VBAT}=40mA$	4.158	4.2	4.242	V
Trickle charging voltage threshold 涓流充电电压阈值			2.8		3.0	V

Trickle charge current 涓流充电电流				10%*ICHG		
Overheat protection threshold 过热保护阈值	T <sub>OTP</sub>			150		°C
Overheating protection recovery delay 过热保护恢复迟滞	T <sub>OTP-HYS</sub>			40		°C

## 10、Battery schematic diagram 电池原理图

### 10.1 Battery schematic diagram 电池原理图

### 10.2 Layout/PCB 图

## 11、Battery precautions 电池注意事项

### 1. Disassembly is prohibited 禁止拆卸

#### 1) Do not disassemble the battery 不要拆卸电池

Removal of batteries can lead to short circuit inside batteries, which can cause fire, explosion, harmful gases or other problems. Problem.

拆卸电池会发生电池内部短路，会引起起火、爆炸、有害气体或者其它问题。

#### 2) Electrolyte is harmful 电解液是有害的

In case the electrolyte touches the skin and enters the eyes, it should be washed with clean water immediately and the doctor should be consulted.

万一电解液沾到皮肤、进入眼睛，应立即用清水冲洗以及求助医生。

### 2. Don't dump batteries in the fire 不要把电池倾倒在火中

Do not burn batteries or they will explode. This is dangerous and must be prohibited.

不要焚毁电池，否则会致电池爆炸，这个很危险，必须禁止。

### 3. No immersion of batteries 禁止浸泡电池

Please do not immerse the battery in liquids, such as clear water, sea water, and non-alcoholic drinks, juices, coffee or other beverages.

请不要把电池浸泡在液体中，像清水、海水，及非酒精饮料、果汁、咖啡 或者其他饮料。

### 4. Replacement of batteries 更换电池

Replacement of batteries should be completed by battery manufacturers or equipment suppliers. Users should not replace batteries by themselves.

更换电池应由电池生产商或设备供应商完成，用户不要自行更换。

### 5. Prohibit the use of damaged batteries 禁止使用损坏的电池

Batteries may be damaged by collision during shipment. If abnormal batteries are found, such as damaged packaging, Batteries are wrapped and deformed, smells of electrolyte, leaks are found, etc. Don't use these batteries anymore. electric If the battery has the odor of electrolyte or leaks, the battery should be kept away from the source of fire to avoid fire and explosion.

电池可能在出货途中碰撞而受损。如果发现电池有异常，例如包装损坏、电池包裹变形，有电解液的味道、发现漏液等等，不要再使用这些电池。电池如果有电解液的味道或者出现漏液，电池放置应该远离火源避免起火及爆炸。

## 12、Other considerations 其他注意事项

- ★ Do not put batteries in heaters, washing machines or high-pressure containers
- ★ Do not charge the battery with an unspecified or unsafe charger.
- ★ If the battery is found to be hot, odorous, discolored, deformed or other abnormal during charging or storage, it should be discontinued.
- ★ Put the battery out of reach of the child to avoid swallowing it.
- ★ When children use batteries, the guardian should explain the operation method in detail.
- ★ Before using batteries, you should read the operation guide in detail and have a deep understanding of the matters needing attention in use.
- ★ Batteries should be charged, used and stored away from static electricity.
- ★ Do not use or leave behind batteries in cars near the source of fire or at temperatures over 60 degrees. Do not charge or discharge in these environments.
- ★ Do not put batteries in handbags with metal items such as necklaces, hairpins, coins or screws, or store batteries with the above items.
- ★ It is forbidden to store lithium batteries in damp places or expose them to moisture, rain and water.
- ★ In use, attention should be paid to the positive and negative poles of the battery.
- ★ Do not use batteries with severe deformation.

- ★ 不要把电池放在加热器皿、洗衣机或高压容器中。
- ★ 不要使用非指定的和没有安全认证的充电器给电池充电。
- ★ 在使用充电或储存期间如发现电池有变热、散发气味、变色、变形或其它反常之处应停止使用。
- ★ 把电池放到小孩够不到的地方以免吞服。
- ★ 儿童使用电池时，监护人应详细解释操作方法。
- ★ 在使用电池之前，应仔细阅读操作指南并对使用中的注意事项有足够深刻的理解。
- ★ 电池应在远离静电的场所进行充电、使用和储存。
- ★ 不要在火源附近或温度超过60度的轿车中使用或遗留电池，也不要这些环境中进行充放电。
- ★ 不要把电池同项链发夹硬币或螺钉等金属品一起放在手提包中，也不要把电池同上述物品一起储存。
- ★ 禁止将锂电池粒储存在潮湿的地方或者暴露在水汽、雨水和水打湿的地方。
- ★ 在使用时应注意电池的正、负极不要反装。
- ★ 不要使用带有严重变形的电池。