

Date: 2008.9.20

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SPECIFICATION OF PRODUCT

Products Name: 9V Li-ion Battery Pack

Battery Model: LI-9V500

Customer: _____

Prepared By	Checked By
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一、外观、基本特性 Outside appearance and basic characteristics					
序号 NO.	项目 ITEM	规格 SPECIFICATION	备注 REMARK		
1	外观 Outside appearance	表面色泽均匀, 清洁, 无划痕及机械损伤, 触点无锈蚀, 与手机装置配合, 开机工作正常。 surface colour and lustre shall uniformity, clean, No scratches or damage, metal contact not rusted, fit to phone and operating in gear	目测 Visual check		
2	重量 Pack weight				
3	外壳颜色 Case Color				
4	适用手机 Mobile Phone fit				
二、电气性能 electrical characteristics					
序号 NO.	项目 ITEM	规格 SPECIFICATION	备注 REMARK		
1	电芯 Cell	562235A			
2	额定容量 Rated Capacity	500mAh	新威电池测试仪器 Test By Xin Wei Battery Testing System		
3	成品内阻 Internal resistance	<220m Ω	内阻仪 Test by Qin Tian Internal Resistance Testing Machine		
4	循环寿命 Cycle Life	>300次	新威电池测试仪器 Test By Xin Wei Battery Testing System		
5	标称电压 Nominal Voltage	7.4V~7.8V			
6	最大充电电压 Max. Charge Voltage	8.4V			
7	放电截止电压 Discharge Cut-off Voltage	5.5V			
8	过充电保护电压 Over-charge Protection	4.30V \pm 0.05V Single cell	锂保护板测试仪 Test by CS583M+ Lithium-ion Battery Protection Board checker		
9	过放电保护电压 Over-discharge Protection	2.4V \pm 0.1V Single cell	锂保护板测试仪 Test by CS583M+ Lithium-ion Battery Protection Board checker		
10	自耗电流 Supply current	<8uA	Test by CS583M+ Lithium-ion Battery Protection Board checker		
11	保护IC Protection IC	R5460	Test by CS583M+ Lithium-ion Battery Protection Board checker		
12	MOSFET	uPA1870	Test by CS583M+ Lithium-ion Battery Protection Board checker		
13	操作温度 Operating temperature	充电温度 Charging Temperature: 0~+45 $^{\circ}$ C			
		放电温度 Discharging Temperature: -20~+60 $^{\circ}$ C			
14	存储温度 Storage temperature	一个月 1 month: -20~45 $^{\circ}$ C 三个月 3 month: -20~30 $^{\circ}$ C			
		一年 1 year: -20~25 $^{\circ}$ C			

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<p>4.5 额定电压 Rated Voltage: 3.7V</p> <p>4.6 放电性能 Discharged Characteristic 标准放电时间不少于5小时 Time of Standard Discharge should be not less than 5hrs. 快速放电时间不少于1.0小时 Time of Quick Discharge should be not less than 1.0hrs.</p> <p>4.7 荷电保持能力 标准放电时间不少于4.25小时 Charge Retention: Time of Standard Discharge should be not less than 4.25hrs.</p> <p>4.8 循环寿命 大于300次 Cycle Life: more than 300 cycles</p> <p>4.10 环境性能 Environmental Characteristic</p> <p>4.10.1 高温性能: 测试后放电时间不低于51分钟, 并且外观符合4.2的要求。 Hi-temperature testing: discharging time is not less than 51 minutes and Visual inspection can meet item 4.2 after testing.</p> <p>4.10.2 低温性能: 测试后放电时间不低于3.5小时, 并且外观符合4.2的要求。 Low-temperature testing: discharging time is not less than 3.5 hours and Visual inspection can meet item 4.2 after testing.</p> <p>4.10.3 恒定湿热性能: 测试后放电时间不低于36分钟, 并且外观符合4.2的要求。 Constant temperature and constant humidity testing: discharging time is not less than 36 minutes and Visual inspection can meet item 4.2 after testing.</p> <p>4.10.4 振动: 测试后电压不低于3.6V, 并且外观符合4.2的要求。 Vibration: Voltage is not less than 3.6V and Visual inspection can meet item 4.2 after testing.</p> <p>4.10.5 碰撞实验: 测试后电压不低于3.6V, 并且外观符合4.2的要求。 Impacting testing: Voltage is not less than 3.6V and Visual inspection can meet item 4.2 after testing.</p> <p>4.10.6 自由跌落: 测试后放电时间不低于51分钟, 并且外观符合5.2的要求。 Free fall: discharging time is not less than 51 minutes and Visual inspection can meet item 5.2 after testing.</p> <p>4.11 安全性能 Safe Characteristic</p> <p>4.11.1 过充测试: 无破裂、无泄露现象。 Over charge testing: without break, leakage after testing.</p> <p>4.11.2 过放测试: 无破裂、无泄露现象。 Over discharge testing: without break, leakage after testing.</p> <p>4.11.3 短路保护测试: 不爆炸、不起火、不冒烟及无漏出物; 瞬时充电后, 电池电压应不小于3.6V。 Short Protecting Testing: without explosion, fire, fume and leakage. Voltage of the battery should be not less than 3.6V after being charged instantaneously.</p> <p>4.11.4 热冲击测试: 不爆炸、不起火。 Heat impact testing: without explosion, fire, fume.</p> <p>5. 试验方法 TESTING METHODS</p> <p>5.1 试验环境 Testing conditions 温度 Temperature: 15-35℃ 相对湿度 Relative Humidity: 45-75% 大气压力 Atmospheric pressure: 86-106Kpa</p> <p>5.2 测量仪表要求 Requirement of the Testing Equipment 电压仪表要求: 测量电压的仪表准确度应不低于0.5级, 内阻不小于10K Ω/V。 Voltage instrument: the precision of voltage tester is no less than degree 0.5, the internal resistance is not less than 10K Ω/V. 电流仪表要求: 测量电流的仪表的准确度应不低于0.5级。 Current instrument: the precision is no less than degree 0.5. 时间仪表要求: 测量时间的仪表的准确度不低于0.1%。 Stopwatch: the precision is not more than degree 0.1%.</p> <p>5.3 外观结构检查 Visual inspection 用目测法检查被测电池的微观、结构及标志, 应符合4.2的规定 Eyeballing will be used to inspect the appearance, construction and marking of the battery. And also its result can meet Item 4.2.</p> <p>5.4 额定容量试验 Rated capacity testing</p>					

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<p>在环境温度$20\pm 5^{\circ}\text{C}$条件下, 按标准充电的要求进行充电, 充电结束后放置1~12小时, 再按标准放电的要求放电到终止电压。放电时间应不低于5小时。</p> <p>Under $20\pm 5^{\circ}\text{C}$, the battery will be charged according to the requirement of standard charge, after keeping the battery for 1~12hrs., The battery will be discharged until the voltage reaches end voltage, according to the requirement of standard discharge. The discharging time is not less than 5 hours.</p> <p>5.5 荷电保持能力试验 Charge retention Testing</p> <p>经6.4试验合格后, 在平均环境温度为$20\pm 5^{\circ}\text{C}$条件下, 按标准充电的要求进行充电, 充电结束后放置28天, 再按标准放电的要求放电到终止电压。放电时间应符合4.7的要求。</p> <p>At average temperature $20\pm 5^{\circ}\text{C}$, the battery will be charged according to the requirement of standard charge after being past item 6.4, and to keep the battery open-circuit 28 days, then the battery will be discharged according to the requirement of standard discharge. The discharging time can meet the requirement of item 4.7.</p> <p>5.6 循环寿命试验 Cycle life testing</p> <p>试验前, 按标准放电的要求对电池进行放电。在平均环境温度为$20\pm 5^{\circ}\text{C}$条件下, 按快速充电要求充电2.5小时后, 搁置30分钟, 以1C_5 mA的电流进行放电, 至电池端电压达到终止电压, 完成一次循环。重复以上循环, 连续二次循环的放电时间小于36分钟, 寿命终止。</p> <p>The battery will be discharged according to the requirement of standard discharge before cycle life testing. At average temperature $20\pm 5^{\circ}\text{C}$, the battery will be charged for 2.5hrs, according to the requirement of quick charge, after 30 minutes, then it will be discharged with current 1C_5 mA until the voltage reaches the end voltage. So one cycle will be finished. To do the cycle continuously, consecutive two times the discharge time of any cycles is less than 36 min., the cycle life testing will be stopped.</p> <p>5.7 环境性能 Environment Characteristic</p> <p>5.7.1 高温性能试验 Hi-temperature testing</p> <p>a) 室温 ($20\pm 5^{\circ}\text{C}$), 正常大气条件下, 对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。</p> <p>At room temperature ($20\pm 5^{\circ}\text{C}$) and normal atmospheric pressure, to inspect the sample battery visually, then the battery will be charged according to standard charge.</p> <p>b) 把电池放在温度$55\pm 2^{\circ}\text{C}$烘箱中, 持续时间2小时, 然后按快速放电要求放电, 放电时间应不低于51分钟。</p> <p>Keeping the battery in the oven of $55\pm 2^{\circ}\text{C}$ for 2hrs., then the battery will be discharged according to the requirement of quick discharge, the discharging time is not less than 51 minutes.</p> <p>c) 试验结束后, 将电池取出, 在正常大气条件, $20\pm 5^{\circ}\text{C}$下搁置1~2小时, 对电池进行外观目测检查, 应符合4.2的要求。</p> <p>After above testing, to keep the battery at $20\pm 5^{\circ}\text{C}$ and the environment of normal atmospheric pressure for 1~2hrs., the result of visual inspection can meet item 4.2.</p> <p>5.7.2 低温性能 Low temperature testing</p> <p>a) 室温 ($20\pm 5^{\circ}\text{C}$), 正常大气条件下, 对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。</p> <p>At room temperature ($20\pm 5^{\circ}\text{C}$) and normal atmospheric pressure, to inspect the sample battery visually, then the battery will be charged according to standard charge.</p> <p>b) 试验温度$-20\pm 2^{\circ}\text{C}$, 持续16~24小时, 然后按标准放电要求放电, 放电时间不少于3.5小时。试验结束后, 将电池取出, $20\pm 5^{\circ}\text{C}$下搁置1~2小时, 目测电池外观, 应符合4.2的要求。</p> <p>To keep the battery in the oven of $-20\pm 2^{\circ}\text{C}$ for 16~24 hrs., Then the battery will be discharged according to standard discharge, and the time of Standard Discharge should be not less than 3.5hrs.. After above testing, to keep the battery at $20\pm 5^{\circ}\text{C}$ and the environment of normal atmospheric pressure for 1~2hrs. The result of visual inspection can meet item 4.2.</p> <p>5.7.3 恒定湿热试验 Constant temperature and constant humidity testing</p> <p>a) 室温 ($20\pm 5^{\circ}\text{C}$), 正常大气条件下, 对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。</p> <p>At room temperature ($20\pm 5^{\circ}\text{C}$) and normal atmospheric pressure, to inspect the sample battery visually, then the battery will be charged according to standard charge.</p> <p>b) 试验温度$40\pm 2^{\circ}\text{C}$, 相对湿度90~95%, 持续48小时。试验结束后, 将电池取出, $20\pm 5^{\circ}\text{C}$下搁置2小时, 目测电池外观, 应符合4.2的要求。</p> <p>To keep the battery in the case of $40\pm 2^{\circ}\text{C}$, 90~95%RH for 48hrs.. After above testing, to keep the battery at $20\pm 5^{\circ}\text{C}$ and the environment of normal atmospheric pressure for 2hrs. The result of visual inspection can meet item 4.2.</p> <p>c) 将电池按快速放电要求放电后, 放电时间应不低于36分钟。</p> <p>According to the requirement of quick discharge, the time discharge is not less than 36 minutes.</p> <p>5.7.4 振动试验 Vibration testing</p> <p>a) 室温 ($20\pm 5^{\circ}\text{C}$), 正常大气条件下, 对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。</p> <p>At room temperature ($20\pm 5^{\circ}\text{C}$) and normal atmospheric pressure, to inspect the sample battery visually, then the battery will be charged according to standard charge.</p>					

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<p>b) 试验条件: 频率10~55HZ, 位移振幅为0.35mm, X、Y、Z每个方向扫频循环次数为10次, 扫频速率为每分钟一个倍频。 The battery will be vibrated 10 times in each direction of X, Y, Z with changing frequency of 10~55HZ and amplitude of 0.35mm. The rate of scan frequency is from 10~55HZ per min.</p> <p>c) 试验结束后, 将电池取出, 在正常大气条件, 20±5℃下搁置1~2小时, 对电池进行外观目测检查, 应符合4.2的要求。 After above testing, to keep the battery at 20±5℃ and the environment of normal atmospheric pressure for 1~2hrs. The result of visual inspection can meet item 4.2</p> <p>d) 电压应不低于3.7V。Voltage is not less than 3.7V.</p> <p>5.7.5 碰撞实验 Impact Testing</p> <p>a) 室温 (20±5)℃, 正常大气条件下对电池进行外观目测检查, 并按标准充电的要对电池进行充电。 At the temperature of (20±5)℃ and the normal atmospheric pressure, to inspect the sample battery visually. And the battery will be charged according to the requirement of standard charge.</p> <p>b) 碰撞脉冲峰值加速度为100m/s², 脉冲持续时间为16ms, 碰撞次数为1000±10次。 The battery will be impacted 1000±10 times with the acceleration of 100m/s² and pulse lasting time 16ms.</p> <p>c) 实验结束后, 将电池取出, 在正常大气条件下, (20±5)℃下搁置1-2h, 对电池进行外观目测检查, 应符合4.2的规定。 After above testing, to keep the battery at (20±5)℃ and the environment of normal atmospheric pressure for 1-2hrs. The result of Visual inspection can meet item 4.2.</p> <p>d) 电压应不低于3.7V. Voltage is not less than 3.7V.</p> <p>5.7.6 自由跌落试验 Free fall testing</p> <p>a) 室温 (20±5)℃, 正常大气条件下对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。 At the temperature of (20±5)℃ and the normal atmospheric pressure, to inspect the sample battery visually. And the battery will be charged according to the requirement of standard charge.</p> <p>b) 高度为1000mm, 试验台面厚度为20mm硬木板, X,Y,Z每个方向试验次数6次。 The battery will be dropped free six times in each direction of X, Y, Z from the height of 1000mm onto the hard board with the thickness of 20mm.</p> <p>c) 试验结束后, 将电池取出, 在正常大气条件下, (20±5)℃下搁置, 对电池进行外观目测检查, 应符合4.2条的规定。 After above testing, to keep the battery at (20±5)℃ and the environment of normal atmospheric pressure for 1-2hrs. The result of Visual inspection can meet item 4.2.</p> <p>d) 按标准放电的要求进行放电, 放电时间应不低于51分钟。 According to the requirement of standard discharge, the battery will be discharged and the discharge time is not less than 51 minutes.</p> <p>5.8 安全性能 Safe Characteristic</p> <p>5.8.1 过充电性能 Over charge Testing</p> <p>a) 室温 (20±5)℃, 正常条件下对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。 At the temperature of (20±5)℃ and the normal atmospheric pressure, to inspect the sample battery visually. And the battery will be charged according to the requirement of standard charge.</p> <p>b) 电池充满电后, 1C电流恒流充电至电压4.8V后现再4.8V恒压充电2h, 应符合4.11.1的要求。 The battery charged completely will be charged continuously at 1C current to 4.8V, and then, charged continuously with constant voltage of 4.8V for 2h. The result of Visual inspection can meet item 5.11.1.</p> <p>5.8.2 过放电试验 Over Discharge Testing</p> <p>a) 室温 (20±5)℃, 正常大气条件下对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。 At the temperature of (20±5)℃ and the normal atmospheric pressure, to inspect the sample battery visually. And the battery will be charged according to the requirement of standard charge.</p> <p>b) 按标准放电的要求放电到终止电压后, 外接30Ω负载放电24h。应符合4.11.2的要求。 According to the requirement of standard discharge, the battery will be discharged to end voltage, then connected with external load of 30Ω for 24hrs. The result of Visual inspection can meet item 4.11.2.</p> <p>5.8.3 短路保护试验 Short Protecting Testing</p> <p>a) 室温 (20±5)℃, 正常大气条件下对电池进行外观目测检查, 并按标准充电的要求对电池进行充电。 At the temperature of (20±5)℃ and the normal atmospheric pressure, to inspect the sample battery visually. And the battery will be charged according to the requirement of standard charge.</p> <p>b) 电池按标准要求充电之后, 将正负极用0.2Ω电阻短路1h, 将正负极断开, 瞬时充电后用电压表测量电池电压, 应符合4.11.3规定的要求。 After standard charge, connect with the positive electrode and the cathode electrode, after being shorted by resistance of 0.2Ω for 1hrs., then disconnect. Being changed instantaneously, then measure the battery voltage. The result of visual inspection can meet item 4.11.3.</p> <p>5.8.4 热冲击试验 Heat impact testing</p>					

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将电池放置于热箱中，温度以 $(5\pm 2^\circ\text{C})/\text{min}$ 的速率升至 $130^\circ\text{C}\pm 2^\circ\text{C}$ ，保温30min电池应符合4.11.4要求。

Put a battery into a ain oven .The temperature in the oven should rise at the rate of speed of $(5\pm 2^\circ\text{C})/\text{min}$ to be $130^\circ\text{C}\pm 2^\circ\text{C}$ (Holding the Temperature for 30 min).The battery should be up to standard of 5.11.4.

注：以上安全性能实验应在有保护措施的条件下进行。

Note: Above testing of safe characteristic must be with protective equipment.

6. 电池使用时警告事项及注意事项 WARNINGS AND CAUTIONS IN HANDING THE LITHIUM-ION BATTERY

警告 Warning

危险警告：（应在使用说明手册或说明书中，特别注明）

Danger warning (it should be described in manual or instruction for users, indicated especially)

为防止电池可能发生泄漏，发热，爆炸，请注意以下预防措施：

To prevent the possibility of the battery from leaking, heating, explosion, please observe the following precautions:

● 严禁将电池浸入海水或水中，保存不用时，应放置在阴凉干燥的环境中。

Don't immerse the battery in water and seawater. Please put it in cool and dry entirnement if no using.

● 禁止将电池在热高温源旁，如火，加热器等使用和留置。

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

● 充电时请选用锂离子电池专用充电器。

Being charged, using the battery charger specifically for that purpose

● 严禁颠倒正负极使用电池。

Don't reverse the positive and negative terminals

● 严禁将电池直接接入电源插座。

Don't connect the battery to an electrical outlet directly.

● 禁止将电池丢入火或加热器中。

Don't discard the battery in fire or heater.

● 禁止用金属直接连接电池正负极短路。

Don't connect the positive and negative terminal directly with metal objects such as wire.

● 禁止将电池与金属，如发夹，项链等一起运输或贮存。

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

● 禁止敲击或抛掷，踩踏电池等。

Do not strike , throw or trample the battery.

● 禁止直接焊接电池和用钉子或其它利器刺穿电池。

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

小心 Caution

◆ 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，否则可能会引起电池过热，起火或功能失效，寿命减短。

Do not use or leave the battery at very high temperature conditions(for example, 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.

◆ 禁止在强静电和强磁场的地方使用，否则易破坏电池安全保护装置，带来不安全的隐患。

Do not use it in a location where is electrostatic and magnetic greatly, otherwise, the safety devices may be damaged, causing hidden trouble of safety.

◆ 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，并立即送医治疗，否则会伤害眼睛。

If the battery leaks, and the electrolyte get into the eyes. Do not wipe eyes, instead, rinse the eyes with clean running water, and immediately seek medical attention. Otherwise, eyes injury can result.

◆ 如果电池发出异味，发热，变色，变形或使用，贮存，充电过程中出现任何异常现象，立即将电池从装置或充电器中移除并停用。

If the battery gives 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.

◆ 如果电池弄脏，使用前应用干布抹净，否则可能会导致接触不良功能失效。

In case the battery 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.

◆ 废弃之电池应用绝缘纸包住电极，以防起火，爆炸。

Be aware discharged batteries may cause fire; tape the terminals to insulate them.

