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产品规格书
Approval Sheet

客户名称

Customer_____

客户料号

Part Number_____

电池规格

Model No NIMH 4/5SC2000MAH 1.2V BHP

版本

Revision_____

制造商确认

Manufacture Signature

	核准 Approved	审核 Checked	制表 Prepared
	杨恒学		赖尚文
日期 Date	2018.01.17		2018.01.17

客户确认 Customer Signature

	部门 Dept	签名 Sign	日期 Date

该规格书适用于联科实业有限公司镍氢圆柱形可充电电池产品

This specification is suitable for the performance of nickel-metal hydride rechargeable battery produced by the Shenzhen Unitech Battery Limited

型号 Model NIMH 4/5SC2000MAH 1.2V BHP

组合电池的标称电压与重量应当为单体电池的标称电压和重量与该组电池单体数量的乘积,

The data involving nominal voltage and approximate weight of stack-up batteries shall be equal to the value of the unit cell multiplied by the number of unit cells in the battery pack.

单体电池标称电压 = 1.2V

Nominal voltage of unit cell = 1.2V

2. 基本性能 RATINGS

种类 Description	单位 Unit	规格 Specification	条件 Condition
标称电压 Nominal Voltage	V	1.2	单颗 Unit Cell
标称容量 Nominal Capacity	mAh	2000	标准充放电(0.1C 充 0.2C 放) Standard Charge/Discharge
最小容量 Minimum Capacity	mAh	1900	标准充放电(0.1C 充 0.2C 放) Standard Charge/Discharge
标准充电 Standard Charge	mA	200(0.1C)	Ta=0~40℃ (see note 1)
	hour	16	
快速充电 Fast Charge	mA	400(0.2C)~1000(0.5C) 用充电控制 with charge termination control	-△V=5mV/Cell Timer cutoff=105%input capacity Temp.cutoff=40~45℃ dT/dt=0.8℃/min(0.5 to 1.0C); 0.8~1℃/min(1C)
	hour	7.0 approx.(0.2C) 2.4 approx (0.5C) (see note 2)	
涓流充电 Trickle Charge	mA	60(0.03C)~100(0.05C)	Ta=0~40℃ (see note 1)
放电截止电压 Discharge Cut-off Voltage	V	1.0	单颗 Unit Cell
最大放电电流 Maximum Discharging Current	A	20（10C)	Ta =0~50℃ 0.8Vcut off
贮藏温度 Storage Temperature	℃	-20~+35	*

3.性能和测试方法(Performance and Test Methods)

除特殊情况外，测试应按下列条件在一个月内完成测试

Unless special stated, tests should be done within one month of delivery under the following conditions:

环境温度: 20±5℃.

Ambient Temperature: 20±5℃.

环境湿度: 65±20%.

Ambient Humidity: 65±20%.

测试项目 Test	单位 Unit	规格 Specification	条 件 Condition	备 注 Remarks
容量 Capacity	min	≥285	标准充放电 0.1C 充 16h,0.2C 放 5h Standard Charge 16h/ Discharge 5h	允许循环 3 次 Up to 3 cycles are allowed
开路电压 Open circuit Voltage (OCV)	V	≥1.25	标准充电后 1 个小时内 Within 1 hr after standard charge	单颗 Unit cell
内阻 Internal Impedance (Ri)	mΩ	≤10	充满电后用 1kHz 电流测试 Upon fully charge at 1kHz	单颗 Unit cell
高倍率放电 High Rate Discharge(0.5C)	min	≥110	标准充电/休息 30 分钟 用 0.5C 放电至 1.0V Standard Charge/rest 30min discharge at 0.5C to 1.0V	允许循环 3 次 Up to 3 cycles are allowed
高倍率放电 High Rate Discharge(10C)	min	≥4.0	标准充电/休息 30 分钟 用 10C 放电至 0.8V Standard Charge/rest 30min discharge at 10C to 0.8V	允许循环 3 次 Up to 3 cycles are allowed
低温放电测试 Low Temperature Discharge	min	≥240	标准充电后贮藏在 0±2℃环境中 24 小时 然后用 0.2C 放电 Standard Charge, Storage:24hrs at 0±2℃ 0.2C discharge at 0±2℃	1.0V/cell Cut-off
过充测试 Over charge	N/A	没有显著的变型和漏液 No conspicuous deformation and/or leakage	0.1C 充电 48 小时 0.1C charge for 48hrs	*
自放电 Charge reserve	min	≥180min	按标准充满电后贮藏 28 天， 按标准用 0.2C 放电 Standard charge Storage: 28 days Standard discharge (0.2C)	1.0V/ cell Cut-off
高湿度测试 Humidity	N/A	无漏液 No leakage	标准充电后贮藏在温度 33±3℃相对湿度 80±5%环境 10 天 Standard charged, stand for 10 days at 33±3℃ and 80±5% of relative humidity	
短路测试 External Short Circuit	N/A	不着火不爆炸 No fire and no explosion	标准充电后，在 20℃±5 环境中用超过 0.75mm² 金属丝将单颗电池短路至电池恢复到常温。 After standard charge, short-circuit the cell at 20℃±5℃ until the cell temperature returns to ambient temperature.(cross section of the wire or connector should be more than 0.75mm²)	*
安全阀启动 Safety Device	N/A	不爆炸 No explosion	将电池用 0.2C 强迫放电至 0V 后转用 1C 强迫放电 60 分钟。	电池电解液泄漏和电池变型

Operation			Forced discharge at 0.2C to a final voltage of 0V,then the current be increased to 1C and forced discharge continue for 60 min	是可接受的。 Leakage of electrolyte and Deformation are acceptable
振动测试 Vibration Resistance		电压变化＜0.02V/只 内阻变化＜5mΩ/只 Change of voltage should be under 0.02V/cell, change of impedance should be under5milli-ohm/ cell	电池用 0.1C 充 16 小时，开路 24 小时，检查振动前后电池状况，振动幅度 1.5mm,次数 2500 次，时间 60 分钟 Charge the battery 0.1C 16hrs,then leave for 24hrs,check battery before/after vibration, Amplitude:1.5mm Vibration:2500CPM Any direction for 60 mins	
跌落测试 Drop Test	N/A	△V<0.02V/ cell △Ri<5%/cell	跌落测试前电池用 0.1C 充 16 小时，搁置 24 小时。从 50CM 高任意方向自由跌落 30MM 厚木板 3 次 Charge at 0.1C for 16hrs,and then leave for 24hrs,check battery before / after drop Height: 50 cm Thickness of wooden board: 30mm Direction is not specified Test for 3 times	*
IEC 寿命测试 IEC Cycle Life Test	Cycle	≥500	IEC61951-2(2003)7.4.1.1	见备注 3 See note 3

4.图形、尺寸和标识(Configuration, Dimensions and Markings)

请参阅附图（Please refer to the attached drawings）

5. 一般特性 （General Characteristics）

请参阅附图（Please refer to the attached drawings）

6. 建议与注意(Suggestions & Cautions):

6.1 电池终止电压为 1.0±0.1V/ cell

The cut-off voltage is recommended at 1.0±0.1V/ cell

6.2 初次使用或长期存放后第一次使用前请先对电池充电.

Charge the batteries prior to use. The cell/batteries are delivered in an uncharged state

6.3 请勿在电池上直接焊接.

Don’t solder directly to the battery.

6.4 请勿将电池反向充电.

Reverse charging is not acceptable.

6.5 请勿将电池投入火中或破坏. 可能导致爆炸

Do not dispose of in fire and keep away from damage. May burst or release toxic material.

6.6 请将电池于阴凉干燥处进行储存.

Store the batteries uncharged in a cool and dry place.

6.7 电池组如遇下列因素可能会减少使用寿命：高温、深度循环、过充、过放。

The batteries' life may be reduced if they are subjected to adverse conditions such as: extreme temperature, deep cycling, excessive overcharge/discharge.

6.8 禁止将电池在密闭环境中使用，应保持通风，否则电池可能产生氢气，导致爆炸

Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment; otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source.

6.9 不要将电池短路,那可能永久的损坏电池。

Do not short circuit batteries, permanent damage to batteries may result.

6.10 当电池发生漏液，不要让液体接触到皮肤或眼睛。如果曾接触，用大量的清水冲洗患处并咨询医生

In the event of a cell leaking, do not allow the liquid to come into contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.

6.11 请不要将不同种类、容量、尺寸的电池混用

Do not mix cells of different manufacture, capacity, size or type within a battery.

6.12 要使电池远离儿童，如发现吞食，立即联系医生

Keep away from children, if swallowed, contact a physician at once

6.13长时间存放，电池应每三个月进行一次充放电

During long term storage, battery should be charged and discharged once every 3 months

6.14 当电池长期不使用时，请把它从装置上取下

When not using a battery, disconnect it from the device

6.15 不要把电池（电池组）的外套去除

Do not remove the outer sleeve from a battery pack nor cut into its housing

6.16 充电方法请参考第2项的基本性能

For charging methods please reference no.2 ratings

6.17使用完的电池请不要随意丢弃，请交专门的回收机构或退回生产商

The used battery please not throw, please pay special recovery mechanism or returned to the manufacturer.

7.注释 Notes

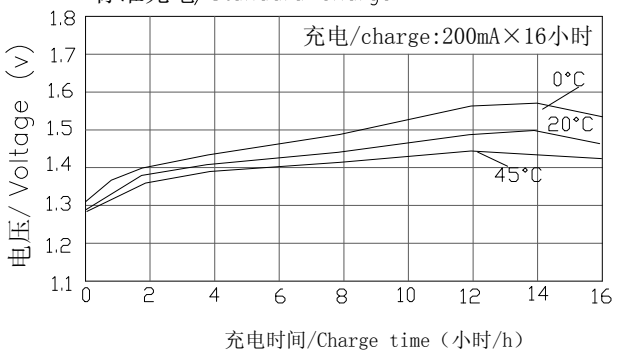
1：Ta: 环境温度
Ta:Ambient Temperature
2: 充电时间仅供参考
Approximate charge time from discharged state, for reference only
3.IEC61951:2003 循环寿命测试
IEC61951：2003Cycle Life Test:

循环次数 Cycle number	充电 Charge	搁置 Rest	放电 Discharge
1	0.1C×16hrs	无 none	0.25C×2hrs20mins
2~48	0.25C×3hrs10mins	无 none	0.25C×2hrs20mins
49	0.25C×3hrs10mins	无 none	0.25C×1.0V/ cell
50	0.1C×16hrs	1~4hr(s)	0.20C×1.0V/ cell
循环寿命按上述条件重复进行测试，如果测试过程中任意一个第 50 次循环放电时间低于 3 小时，则寿命测试结束，实验结束时，循环次数不得少于 500 次 Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs. The number of cycles obtained when the test is completed shall be not less than 500.			

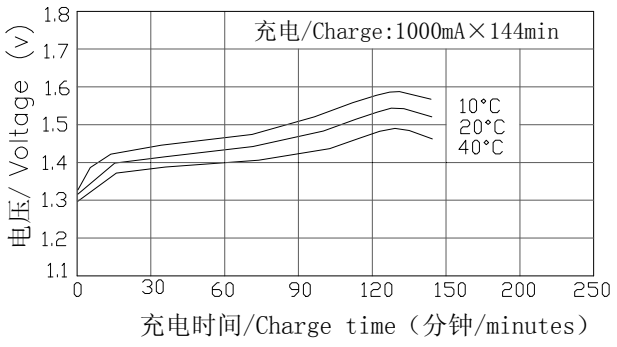
单体电池特性 Single Specification		
产品名称 Products Name		镍氢圆柱形可充电电池 Sealed Nickel Metal Hydride Cylindrical Rechargeable
型号 Model		镍氢/Ni-MH 4/5SC2000mAh
标准电压 Nominal Voltage		1.2V
标准容量 Nominal Capacity		2000mAh
尺寸 Dimension (包括外膜) (with tube)	直径(mm) Diameter	$23.0^{+0}_{-0.7}$
	高度(mm) Height	$33.5^{+0}_{-1.0}$
内阻 Internal Resistance		≤10mΩ (充满电后) (After charge)
Charge 充电方法	标准充电 Standard	200mAX16h
	快充 Rapid	1000mAX2.4h
	小电流充电 Trickle	60~100mA
终止电压 Discharge Cut-off Voltage		1.0V
循环寿命 Cycle Life		≥ 500 循环/ Cycle
环境温度 Ambient Temperature	标准充电 Standard Charge	0°C to 45°C
	快速充电 Rapid Charge	10°C to 40°C
	小电流充电 Trickle Charge	0°C to 45°C
	放电 Discharge	-20°C to 50°C
	储存 Storage	-20°C to 35°C
环境湿度/Environmental humidity		65±20%

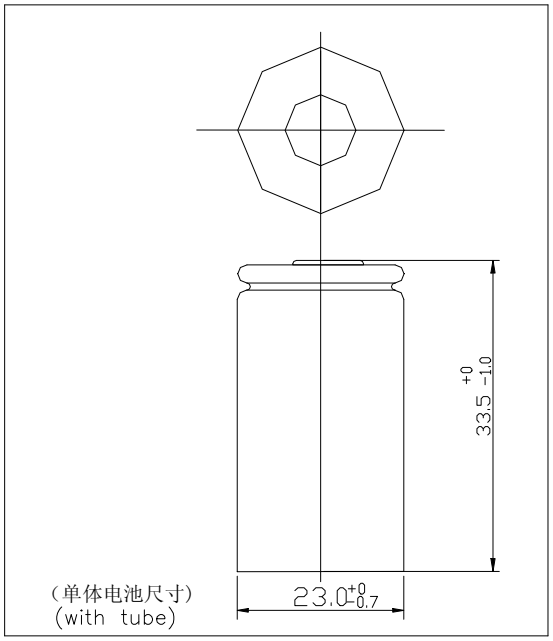
一般特性
General Characteristics

标准充电/Standard charge

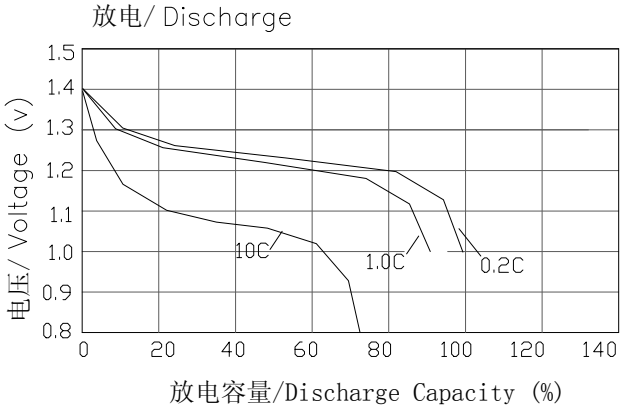


快速充电/ Rapid charge





放电/ Discharge



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