

江苏海四达镍镉电池产品规格书

HIGHSTAR NICD BATTERIES PRODUCT SPECIFICATIONS

MODEL NO.: Ni-Cd SC2000mAh(F) High Power 1.2V

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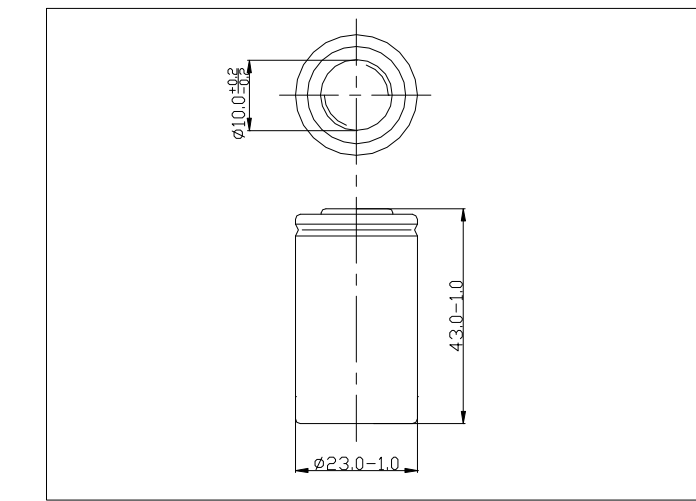
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型号(Type) : GNYSC2000mAh(F)HP

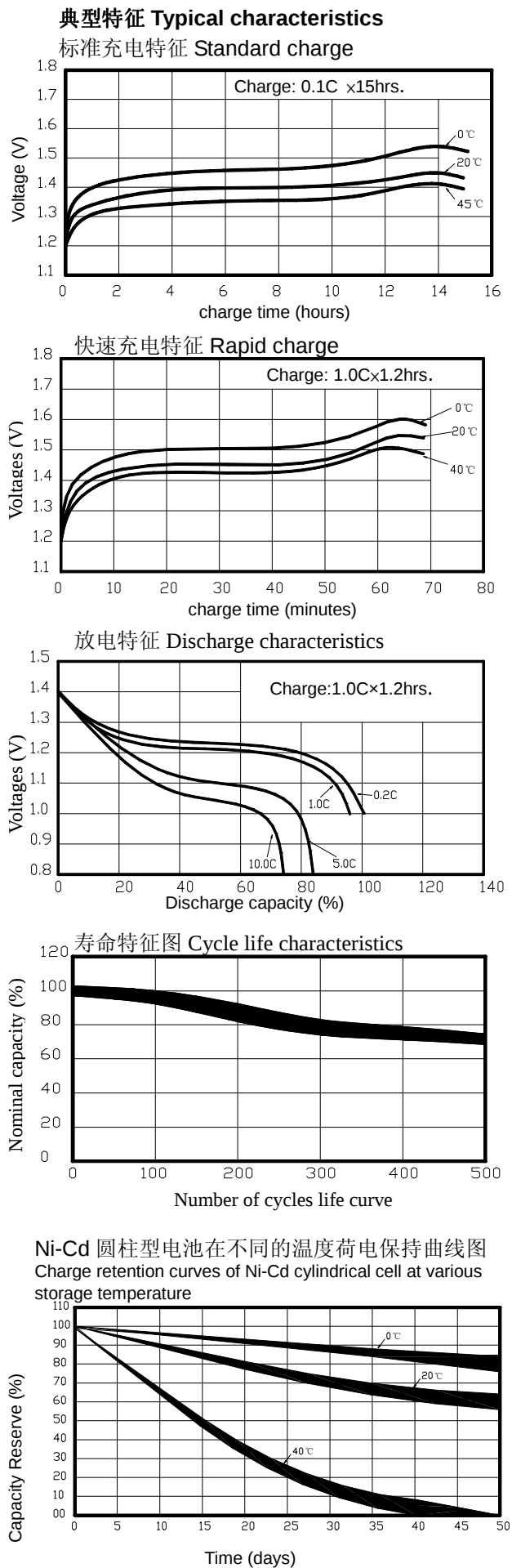
表 1 单颗电池规格 Specifications of single cell			
标称电压 Nominal voltage		1.2V	
容量 Capacity		0.2C 放电 Discharge	1.0C 放电 Discharge
	最小 Minimum	300min	54min
	典型 Typical	310min	60min
尺寸 Dimensions	直径 Diameter	mm	
		23.0 ^{-1.0}	
	高 Height	43.0 ^{-1.0}	
大约重量 Weight(Approximately)		克 gram	
		47.0	
电阻 Internal Impedance At 1000 Hz		12mΩ(Max) (充电后 After Charge)	
充电 Charge	标准 Standard		200mA(0.1C)×15hrs
	快 速 Rapid		2000mA(1.0C)×1.2hrs
环境温度 Ambient temperature	充电 Charge	标准 standard	℃
			0℃ to 45℃
		快速 Rapid	0℃ to 40℃
	放电 Discharge		-20℃ to 50℃
	贮藏 Storage		-20℃ to 40℃

单颗电池尺寸包括 PVC (Dimensions with PVC of single cell)



备注 Note:

1. 标称容量是指 20℃ 时 0.2C 放电容量
Nominal capacity, rated at 0.2C 20℃.
2. 重量作为参考
Weight are For reference.
3. 寿命测试依照 IEC 标准
Standard according as IEC of test cycle life.



1 序言 PREFACE

此规格书适用于江苏海四达电源股份有限公司的镍镉可充电电池产品。

The specification is suitable for the performance of NI-CD rechargeable battery produced by the JIANGSU HIGHSTAR BATTERY MANUFACTURING CO., LTD.

2 型号 MODEL

GNYSC2000mAh(F)HP 1.2V

3 外观 APPEARANCE

没有类似变色、污点、电解液泄漏和零伏现象。

There shall be no such details as discoloration or electrolyte leakage or 0 voltage.

4 定额 RATINGS

表 2 技术参数

种类 Description	单位 Unit	规格 Specification	条件 Condition
标称电压 Nominal Voltage	V	1.2	单位颗 Unit cell
典型容量 Typical Capacity	min	310	标准充放电 Standard Charge/Discharge
标称容量 Nominal Capacity	mAh	2000	标准充放电 Standard Charge/Discharge
最小容量 Minimum Capacity	min	300	标准充放电 StandardCharge/ Discharge
标准充电 Standard Charge	mA	200(0.1C)	Ta=0~40℃ (see note 1)
	hour	15	
快速充电 Fast Charge	mA	400(0.2C)~2000(1.0C) 用充电控制 with charge termination control	-△V=8~10mV/cell Timer cutoff=110% input capacity Temp. cutoff=45℃ dT/dt=0.8℃/min(0.5 to 1.0C); 0.8~1℃/min(1C)
	hour	6.5 approx.(0.2C) 1.2 approx.(1.0C)	
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	单位颗 Unit cell
最大放电电流 Maximum Discharging Current	A	25	Ta =0~50℃ 0.7V cut off
贮藏温度 Storage Temperature	℃	-20~+25(within 1 year) -20~+30(within 3 month) -20~+40(within 1 month) -20~+50(within 1 week)	*
典型重量 Typical Weight	g	47.0 approx	*

5 性能测试 PERFORMANCE

在进行下列各项测试前每颗电池应用 0.2C 放至 1.0V。如果没有特别规定，测试应在电池交付 1 个月内按以下各项条件进行：

Before proceed the following tests, the cells should be discharged at 0.2C to 1.0V cutoff. Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

环境温度 Ambient temperature: 20℃ ± 5℃

相对湿度 Relative Humidity: 65% ± 20%

注意标准充放电为 Note Standard Charge/Discharge Conditions:

充电 Charge: 200mA(0.1C) × 15hrs

放电 Discharge: 400mA(0.2C) to 1.0V/cell

表 3 性能测试

测试项目 Test	单 位 Unit	规格 Specification	条 件 Condition	备 注 Remarks
容量 Capacity	min	≥300	标准充放电 Standard Charge / Discharge	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	单位颗 Unit cell
内阻 Internal Impedance (Ri)	mΩ	≤12	充满电后用 1kHz 测试 Upon fully charge at 1kHz	*
高倍率放电 High Rate Discharge (1.0C)	min	≥54	标准充电/休息 30 分钟 用 1.0C 放电至 0.9V Standard Charge/rest 30min discharge at 1.0C to 0.9V	允许循环 3 次 Up to 3 cycles are allowed
高倍率放电 High Rate Discharge (10.0C)	min	≥4.2	标准充电/休息 30 分钟 用 10.0C 放电至 0.7V Standard Charge/rest 30min discharge at 10.0C to 0.7V	允许循环 3 次 Up to 3 cycles are allowed
过充测试 Overcharge	N/A	没有显著的变型和漏液 No conspicuous deformation and/or leakage	0.1C 充电 28 天 0.1C charge for 28 days	*
自放电 Charge reserve	min	≥195min	标准充满电后贮藏 28 天， 标准 0.2C 放电 Standard charge Storage: 28 days Standard discharge (0.2C)	1.0V/cell Cut-off
IEC 寿命测试 IEC Cycle Life Test	Cycle	≥500	IEC61951-1(2003)7.4.1.1	*

振动测试 Vibration	N/A	不起火, 不爆炸, 不漏液。 No fire, no explosion and no Leakage.	充满电的电池起进行振动试验。 对电池施以振幅为 0.76mm (双振幅为 1.52mm) 的正弦振动。 -振动频率范围 10Hz~55Hz, -振动时间为 90min±5min, -三个相互垂直的方向上进行。 Fully charged cells are vibration-tested -A simple harmonic motion is applied to the cells with an amplitude of 0.76mm (a total maximum excursion of 1.52mm) -The entire range of frequencies:10Hz~55Hz -Traversed time :90min±5min, -The vibration is applied in each of three mutually perpendicular	*
外部短路测试 External Short Circuit	N/A	不起火, 不爆炸。 No fire and no explosion.	充满电的电池搁置在 20℃±5℃ 的环境温度中, 用外部总电阻不高于 100mΩ 的电阻将电池短路。满足下列任意条件时即可停止试验: -电池短路持续 24h -外壳的温度下降了最高温升的 20% Fully charged cells are stored in an ambient temperature of 20℃±5℃, Each cell is then short-circuited by connecting the positive and negative terminals with a total resistance of less than 100mΩ, Stop the test , whichever is meet -the test lasts 24 hours -the case temperature declines by 20% of the maximum temperature rise	*
自由跌落测试 Free fall	N/A	不起火, 不爆炸。 No fire and no explosion.	充满电的电池三次从 1.0m 高度的位置自由跌落到混凝土地面上, 以此获得随机方向的冲击。 Each fully charged cell is dropped three times from a height of 1.0m onto a concrete floor. The cell are dropped so as to obtain impacts in random orientations.	*
机械冲击测试 Mechanical Shock(crash hazard)	N/A	不起火, 不爆炸, 不漏液。 No fire, no explosion and no Leakage.	充满电的电池采用刚性固定方法(该方法能支撑电池所有的固定表面)固定在试验设备上。在三个相互垂直的方向上承受一次等值的冲击。至少一个方向垂直于蓄电池的宽面。 测试方法: 在最初的 3ms 内, 最小平均加速度为 75g _n , 峰值加速度应在 125g _n 和 175g _n The fully charged cell is secured to the testing machine by mean of a rigid mount. The cell is subjected to a total of three shocks of equal magnitude. The shocks are applied in each of three mutually perpendicular directions. At least one of them shall be perpendicular to a flat face. Test method: - The minimum average acceleration is 75g _n during initial 3 milliseconds. The peak acceleration shall be between 125g _n and 175g _n	*
强制放电 Forced discharge	N/A	不起火不爆炸 No fire and no explosion	将电池用 0.2C 强迫放电至 1.0V 后转用 1C 强迫放电 90 分钟。 Forced discharge at 0.2C to 1.0V, then the current to be increased to 1C and continue for 90 min.	*

备注 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. 请每隔 3 个月按下面方法激活电池一次:

0.1C 充电 15 小时, 休息 10 分钟, 然后用 0.2C 放电至每颗电池 1.0V。

please activate the battery once every 3 months according to the following method:

Charge at 0.1C for 15 hrs, rest 10 min, then discharge with 0.2C to 1.0V/cell.

6 注意事项 PRECAUTIONS TO ENSURE THE SAFETY ON BANDING BATTERY

- 6.1 电池在使用前必须充电。

Batteries should be charged prior to use.

- 6.2 在使用新电池前, 或者长期存放后第一次使用电池, 在使用前请将电池充满电。

When using a new battery for the first time or after long term storage, please fully charge the battery before use.

- 6.3 充电方法请参考我们的技术手册。

For charging methods please reference to our technical handbook.

- 6.4 使用 Ni-Cd 或 Ni-MH 专用充电器。

Use the correct charger for Ni-Cd or Ni-MH batteries.

- 6.5 不要对电池进行反充电。

Do not reverse charge batteries.

- 6.6 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.

- 6.7 不要燃烧或毁坏电池, 可能导致有毒气体释放或爆炸。

Do not incinerate or mutilate batteries, may burst or release toxic material.

- 6.8 不要直接对电池进行焊接。

Do not solder directly to cells or batteries.

- 6.9 不要让电池处于不利环境中, 比如极端的温度, 深度循环, 或者经常过充/过放电。

Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive overcharge/overdischarge.

- 6.10 电池贮存在阴凉干燥处。

Store batteries in a cool dry place.

6.11 不要将 HIGHSTAR 电池与其他品牌的电池或者不同种类的电池，比如碱性锌电池混用。

Do not mix HIGHSTAR batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.

6.12 不要将新旧电池混用，可能会导致过放电。

Do not mix new batteries in use with semi-used batteries, overdischarge may occur.

6.13 防止将电池在密闭环境中使用，需要保持通风；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.

6.14 把电池放入充电器中时，注意保证极性正确。

When connecting a battery pack to a charger, ensure correct polarity.

6.15 如出现噪音，温度异常，或者漏液，请停止使用。

If find any noise, excessive temperature or leakage from a battery, please stop its use.

6.16 如电池发烫，请勿触摸，直至冷却。

When the battery is hot, please do not touch it and handle it, until it has cooled down.

6.17 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.

6.18 电池使用时发现功率下降，请关闭用电器开关以防止电池过放。

When find battery power down during use, please switch off the device to avoid overdischarge.

6.19 电池不使用时，请把它从装置上取下。

When not using a battery, disconnect it from the device.

6.20 下电池组时，用手抓住插头而不是拉线。

Unplug a battery by holding the connector itself and not by pulling at its cord.

6.21 电池使用后，如果电池发热，再次充电前，请在通风环境中冷却。

After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

6.22 不要将电池放入水中或海水中。

Never put a battery into water or seawater.

6.23 经过长时间存放，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.

6.24 尝试分离，挤压，撞击电池，电池会发热或起火。电池中的碱液对皮肤和眼睛有害，而且会损伤衣服。

Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.

6.25 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.

7 补充: IEC61951-1 7.4.1.1 循环寿命条款 APPEND: ENDURANCE IN CYCLES

在进行循环测试前, 电池应以 0.2C 放电至 1.0V。然后进行以下的测试, 不考虑电池的型号, 在环境温度 20℃±5℃充放电必须保持恒流, 条件如表 4 中描述。在测试过程中注意预防电池温度高于 35℃, 如果需要的话对电池进行强制空气制冷。注意: 实际上是电池的温度, 而不是环境温度决定电池的性能。

表 4 循环测试

循环数	充电	搁置	放电
1	0.1C for 16h	None	0.25C for 2h20min ^a
2 to 48	0.25C for 3h10min	None	0.25C for 2h20min ^a
49	0.25C for 3h10min	None	0.25C to 1.0V
50	0.1C for 16h	1h to 4h	0.2C to 1.0V ^b
a 如果电池电压低于 1.0V, 可以终止放电。 b 在做完第 50 个循环后允许电池搁置一定的时间, 然后再开始第 51 个循环, 同样的程序适用于 100,150,200,250,300,350,400 and 450 周。			

重复 1-50 次循环, 直至出现任一个第 50 次循环的放电时间少于 3h 为止, 这时按照第 50 次循环的规定再进行一次循环。

当两这样的连续循环的持续放电时间均少于 3h 时, 寿命测试终止。实验结束时, 循环次数不得少于 500 次。

Append: IEC61951-1 7.4.1.1 Endurance in cycles
Before the endurance in cycles test, the cell shall be discharged at 0.2C to a final voltage of 1.0V/cell. The following endurance test shall then be carried out, irrespective of cell designation, in an ambient temperature of 20℃±5℃. Charge and discharge shall be carried out at constant current throughout, using the conditions specified in table 4. Precautions shall be taken to prevent the cell-case temperature from rising above 35℃ during the test, by providing a forced air draught if necessary.

NOTE-Actual cell temperature, not the ambient temperature, determines cell performance.

Table 4 Endurance in cycles

Cycle number	Charge	Stand in Charged condition	Discharge
1	0.1C for 16h	None	0.25C for 2h20min ^a
2 to 48	0.25C for 3h10min	None	0.25C for 2h20min ^a
49	0.25C for 3h10min	None	0.25C to 1.0V/cell
50	0.1C for 16h	1h to 4h	0.2C to 1.0V/cell ^b
a If cell discharge voltage drops below 1.0V/cell, discharge may be discontinued. b It is permissible to allow sufficient open-circuit rest time after the completion of discharge at cycle 50, so as to start cycle 51 at an exact two-week interval. A similar procedure may be adopted at cycles 100,150,200,250,300,350,400 and 450.			

Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3h at this stage, a further cycle as specified for cycle 50 shall be carried out.
The endurance test is considered complete when two such successive cycles give a discharge duration less than 3h. The number of cycles obtained when the test is completed shall be not less than 500.