SHENZHEN EISTO ELECTRONICS CO.,LTD
ADD: Building 2,Zaimao Industry Park,Baoji Road,Bantian Street,Longgang District,Shenzhen,China
Tel: +86-755-33273114 Fax: +86-755-33273118
Website: www.eistoelectronics.com

文件版本：A0

Customer 客户: _____

Ni-MH Battery
Specification Approval Sheet
镍氢电池规格确认书

Model 型号:Ni-MH SCP 12S1P 14.4V 4500(4000)mAh-10C-（5）

Approved by 批准	Checked by 审核	Prepared by 编制	Date 日期
	/		

Customer signature 客户签署

Client Confirmation 客户确认	签字 盖章
Date 日期	

Shenzhen Eisto Electronics Co.,Ltd
深圳市亿盛弘电子有限公司
Tel: +86-755-33273114 Fax: +86-755-33273118
Website: www.eistoelectronics.com
Add:Building 2,Zaimao Industry Park,Baoji Road,Bantian Street,Longgang District,Shenzhen,China
深圳市龙岗区坂田街道宝吉路在茂工业园2栋

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1. Scope 范围

本规格书描述本公司设计开发的电池，它是产品设计、生产和检验的依据。其作用是让顾客了解产品的质量及正确使用方法。
This specification describes the design and development of the company's battery; it is the product of design, production and inspection basis. Its role is to understand the quality of the product and using the correct method for customers.

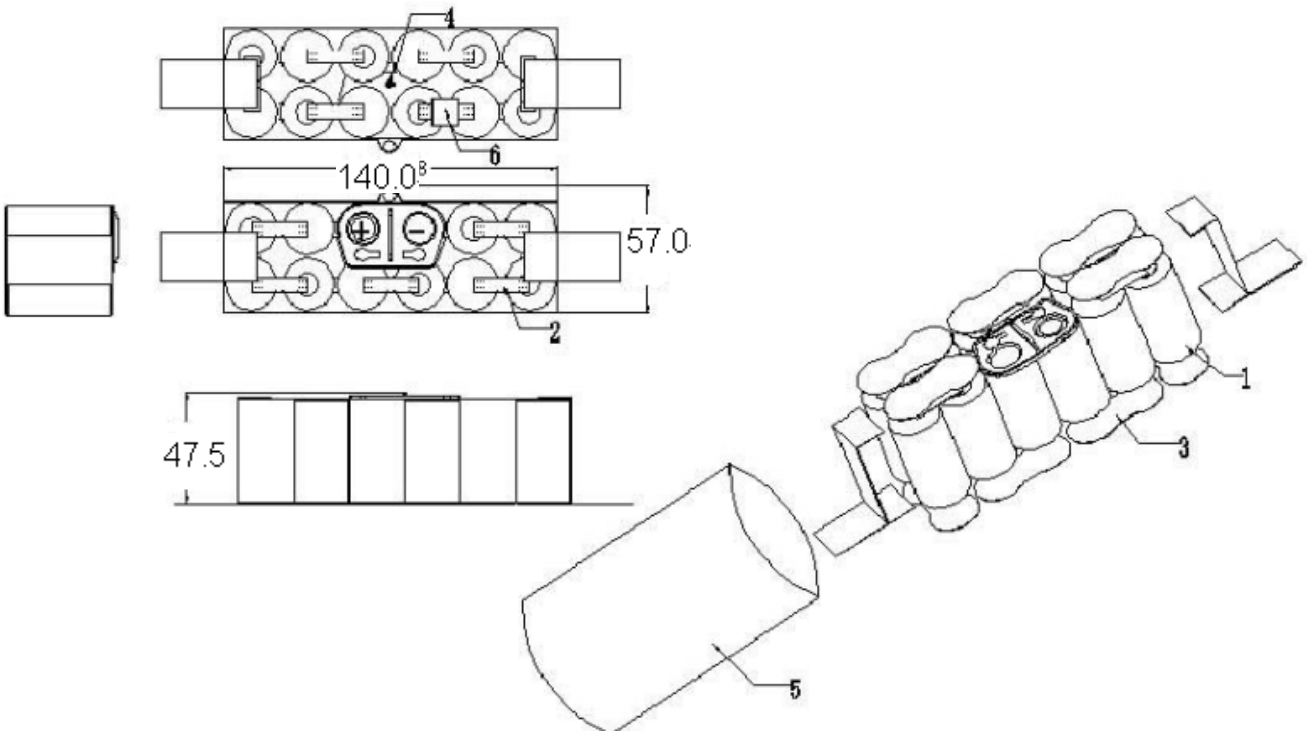
This specification shall be applied to Ni-MH battery/battery pack manufactured by Shenzhen Eisto Electronics Co., Ltd.

2. Product Configuration 产品配置

No.序号	Item 项目	Criteria 标准	Remark 备注
1	Ni-MH Battery pack	Ni-MH SCP(4500)4000mAh-10C 1.2V*12 节	12S*1P
2	Control components	/	
3	Wire &Connector	/	

3.Product Dimension 产品尺寸

3.1Pack Dimension PACK 尺寸



NO	电池类型 Battery type	电池尺寸 (mm)Dimensions	导线长度 Lead exposure	PTC	NTC
1	MH SC 电池组 SC Ni-MH Battery PACK	47.5*57.0*140.0	/	KT30-4200D	R-L30-10KΩB3950 ±5%-NTC -40℃ TO 125℃

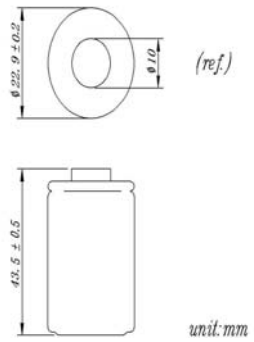
4.Product Specification 产品规范

此资料包括电池的额定电压和大约重量。
The data involving the nominal voltage and the approximate weight of the battery pack。

种类 **Description**	**Unit** 单位	**Specification** 规格	**Conditions** 条件
标称电压 Nominal Voltage	**V**	14.4	
额定容量 Rated Capacity	**mAh**	4500	Standard charging / discharging 标准充电/放电
最小容量 Minimum Capacity	**mAh**	4000-5%	0.1C charging / 0.2Cdischarging 0.1C 充电/0.2C 放电
标准充电 Standard Charge	**mA**	400(0.1C)	Ta 环境温度=0～45℃ （see note）
	hours	15	
涓流充电 Trickle Charge	**mA**	200(0.05C)~400(0.1C)	Ta 环境温度=0～40℃ （see note）
最大持续放电电流 Maximum Continuous Discharge Current	**A**	4	Ta 环境温度= 30℃
储存温度 Storage Temperature	℃	-20～25	(Percent-30-50charged state) 充电 30%-50%状态下
重量 Typical Weight	**g**	780	Approx. 大约

5 单粒电池规格（ Specifications of single cell）

Dimensions 外形尺寸(mm)



Nominal Voltage 标称电压: 1.2V

Rated Capacity额定容量: 4500mAh

Minimal Capacity 最小容量:4000mAh（0.2C）

Standard Charge 标准充电:400 mA, 16 hrs

Continuous Discharge 连续放电:less than 40A

Trickle Charge涓流充电:-200mA(0.05C)~400mA (0.1C)

Maximum Discharging Current 最大放电电流：40A

Weight 重量:68g (Approx)

Service Life 储存寿命: 3 year(Trickle Charge)

(According to IEC discharge characteristics standard)

根据 IEC 标准测试

Internal Resistance内阻: 5mΩ大约(Approx)

Ambient Temperature 周边温度: 20±5℃

Standard charge 标准充电: 0～45℃

Rapid charge 快速充电: 0～40℃

Discharge 放电: -20～50℃

Store(贮存) : (65±20% RH)

Less than 30 days(少于 30 天) : -20 ~40℃

Less than 90 days(少于 90 天) : -20 ~30℃

Less than360 days(少于 1 年) : -20 ~25℃

Note(注意) :

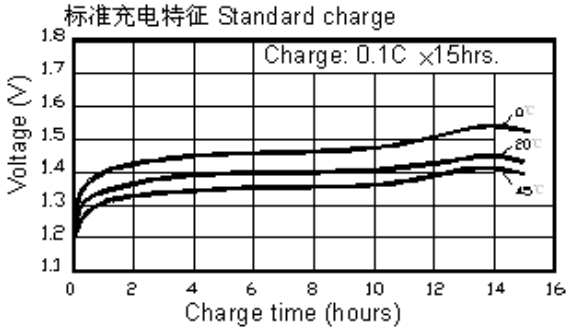
1.After charge at 0.1C for 14hrs and discharge at 0.2C to 1.0V at 20℃) 。

2. Control required:充电控制条件

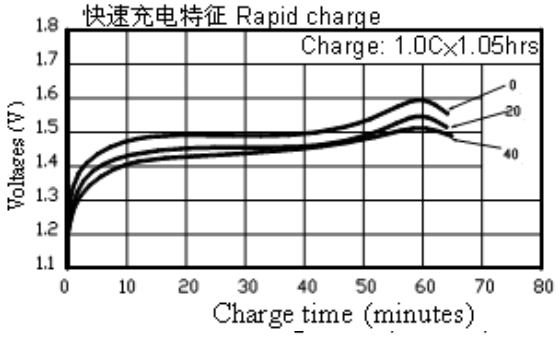
1) - Δ V:0~ 5mV 2) dT/ dt: 0.6℃/ min 3) Tco: -10℃~+50℃

典型特征 Typical characteristics

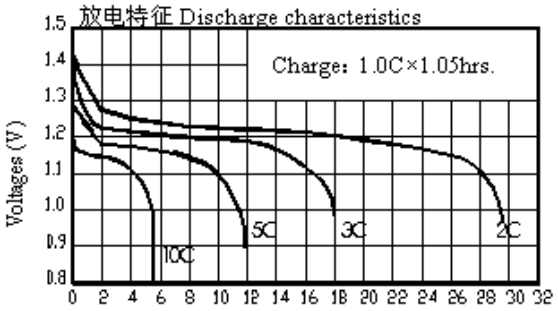
标准充电特征 Standard charge

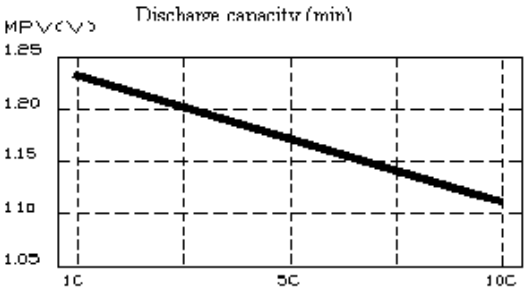


快速充电特征 Rapid charge



放电特征 Discharge characteristics





6.Security Testing Standard 安全测试标准

除非其它规定，测试应在到货之日起 1 个月内进行，并且符合以下测试条件:
相对湿度（Relative humidity）:65±20%。
环境温度（Ambient Temperature）(Ta) : 20±5℃。
***Notes: Standard charge / discharge condition（注意：标准充电/放电条件）
Charge（充电）:400mA(0.1C)×15hrs
Discharge（放电）:800mA(0.2C) to 1.0 V/cell。
***The batteries must be standard discharged before charging（电池充电前必须先放电）。

电池测试参见下文（Battery test vide infra）:

测试项目 Test	单位 Unit	规 格 Specification	条 件 Conditions	备 注 Remark
容量 Capacity	mAh	≥4000	标准充放电 Standard Charge / Discharge	允许循环 3 次 Up to 3 cycles Allowed
开路电压 Open Circuit Voltage (OCV)	V	≥1.25	电池标准充电后 1 小时内 Within 1 hr after standard charge	单位：只 Unit: cell
内阻 Internal Impedance	mΩ	≤5.0	电池充满电，在1Khz下测得Upon fully charge (1Khz)	单位：只 Unit: cell
快速放电 (1.0C) Rapid Discharge	min	≥56	标准充电，搁置 30 分钟后以 1.0C 放电至 1.0V/只 Standard charge, 30min rest before discharge at 1.0C to 1.0V/ cell	允许循环 3 次 Up to 3 cycles Allowed
过充电 Over charge	N/A	不漏液 不爆炸 No leakage nor explosion	用最大不超过 60mA 电流充电 1 个月 0.1C charge for 1 month	
荷电保持率 Charged retention	mAh	≥2400(60%)	标准充满电后在 20±2℃环境温度下存 28 天，以标准 0.2C 放电至 1.0V Standard charge, storage for 28 days, standard discharge20±2℃	
	mAh	≥2400(60%)	标准充满电后在 40±2℃环境温度下存 7 天，以标准 0.2C 放电至 1.0V Standard charge, storage for 7 days, standard discharge	
循环寿命测试 IEC Cycles Test	次 cycle	≥500	IEC 61951-2 (2011)/7.5.1.2	
短路测试 Short Circuit	N/A	允许变形或漏液，但不允许爆炸。Deformation & leakage may occur but no explosion	引线(lead wire =0.5mm² x 20mm) 标准充电方式充电后短路 1 个小时 After standard charge, short circuit for 1 hr	
振动测试 Vibration Test	N/A	△V<0.02	0.1C 充电 15 小时后放置 24 小时,检查电池振动前后的电压。Charge at 0.1C for 15 hrs, then leave for 24 hrs. Check battery before/after vibration。 振幅 Amplitude: 1.5mm, 振动 Vibration: 2500CPM	

			任意方向 60 分钟 any direction for 60mins
跌落测试 Drop Test	N/A	△V<0.02V	充电 15 小时后放置 24 小时后,电池从 50cm 高度任意方向自由坠落到厚 30mm 的木板上 3 次。 Charge at 0.1C for 15 hrs, then leave for 24 hrs. Check battery before / after drop on the wooden board of thickness: 30 mm Height: 50 cm Direction is not specified test for 3 times.

7. Storage and Transportation 储藏运输

7.1.1 The Ni-MH battery pack should be stored in a cool, dry and well-ventilated area, and should be far from the fire and the high temperature.
镍氢电池需保存在阴凉，干燥，通风的环境中，避免接触火源与热源。

7.1.2The battery should store in the product specification book stipulation temperature range, the best storage temperature is 20±5℃. The best humidity is 65±20%.
电池需按规格书规定温度范围进行储存，最佳储存温度为 20±5℃，最佳湿度为 65±20%。

7.1.3The battery should be stored within room temperature, and charged to 40%~60% electric quantity（1.3V）. In order to avoid over-discharge, we suggest charge and discharge the batteries every three months, then charge to 40%~60% electric quantity (1.3V).
电池应当在室温下存放，应充到 40%至 60%的电量(1.3V)。为防止电池过放，建议每 3 个月按标准充放电方式进行一次充电,然后按标准充电方式进行充电至 40%~60%的电量（1.3V）。

7.2 Transportation 运输:

7.2.1 Do not mix the battery products with other cargos.
请勿与其他货物混合。

7.2.2 Do not immerse the battery products in water or allow it to get wet.
请勿将电池浸入水中或使其受潮。

7.2.3 Do not over 7 layers staking and upside-down.
请勿叠放超过 7 层或倒置。

7.2.4 The highest temperature in transportation is lower than 55℃.
最高运输温度不超过 55℃。

8 warning 使用注意事项

1. 电池在使用前必须充电.
   Batteries should be charged prior to use.
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.
3. 充电方法请参考我们的技术手册.
   For charging methods please reference to our technical handbook.
4. 使用 Ni-Cd 或 Ni-MH 专用充电器.
   Use the correct charger for Ni-Cd or Ni-MH batteries.
5. 不要对电池进行反充电.
   Do not reverse charge batteries.
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.
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.
8. 不要直接对电池进行焊接.
   Do not solder directly to cells or batteries.
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/over discharge.
10. 将电池贮存在阴凉干燥处.
    Store batteries in a cool dry place.
11. 不要将 GREPOW 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 GREPOW batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.
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, over-discharge may occur.
13. 禁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.
14. 当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.
15. 如果出现噪音，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.
16. 如果电池发烫，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.
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.
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 over discharge.
19. 当电池不使用时，请把它从装置上取下.
    When not using a battery, disconnect it from the device.
20. 取下电池组时，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.
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.
22. 不要将电池放入水中或海水中.
    Never put a battery into water or seawater.
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.

24. 不要尝试分离，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.
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.

9. 保质期限 warranty period

保质期是从出厂日期(喷码)开始起 12 个月。
Warranty period of this product is 12 months from manufacturing code.

9.1 产品责任 Product responsibility

您必须严格遵守我司规格书和文件后面的注释使用电池，由于误用会引起电池过热，发生火灾或爆炸。对于没有按照规格书进行操作所造成的任何以外事故，我司不负担任何责任。
You must strictly adhere to our specifications and documentation comment later, due to the misuse of batteries can cause the battery to overheat, fire or explosion. For the specification for any accidental, I Secretary does not bear any responsibility.
如果规格书、原材料、生产过程或生产控制系统发生改变，改变的信息将会随质量和可靠性数据以书面形式通知消费者。
If the specification, raw materials, production processes or production control system is changed, the change of information will vary depending on the quality and reliability data to inform consumers in writing.

10.Others 其他

因为电池是利用化学反应，电池的性能会随时间恶化，即使存放很长一段时间没有被使用。此外，如果使用条件如充电，放电，温度，等不在指定的范围内的电池的寿命可能会缩短或设备中的电池使用的电解质渗漏损坏的可能。如果电池无法保持长时间的充电，即使充电正确，这可能表明是时候更换电池。
Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

11. Note: 备注

其他项目不包括在本规范应经双方同意。

Any other items which are not covered in this specification shall be agreed by both parties.

12. Label: 标贴

85*30