

诚信神火科技有限公司  
Shenzhen TrustFire Technology Co., Ltd.

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# Specification Approval Sheet (cylinder Cell)

## 产品规格确认书（圆柱电池）

**Model/型号: YHHH-18650P**

**Capacity/容量: 2400mAh**

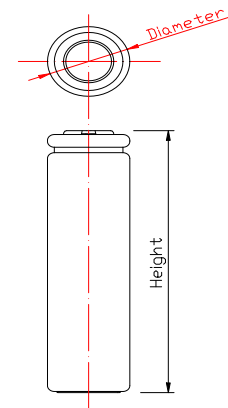
**Voltage/电压: 3.7V**

制定 (Prepared By)	审核 (Checked By)	批准 (Approved By)
王道虎 2012-07-23		李金勇 2012-07-23

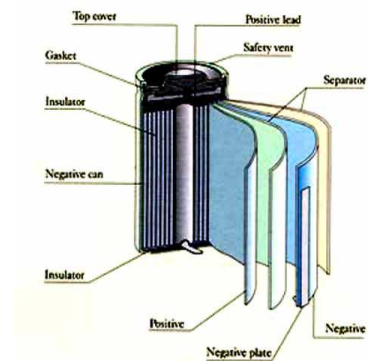
## 1.0 基本特性 Basic performance

型号 Model	YHHH18650P	
外壳材质 Can Material	镀镍钢 Nickel-plated steel	
标称容量 Nominal Capacity, (0.2C <sub>5</sub> A)	2400mAh	
额定电压 Nominal Voltage	3.70V	
充电截止电压 Max Charge Voltage	4.20 V	
放电终止电压 Discharge Cut-off Voltage	2.80V	
最大充电电流 Max. Charge Current	1C <sub>5</sub> A	
标准持续放电电流 Standard Discharge Current	10C <sub>5</sub> A (最大 15C <sub>5</sub> A)	
最大瞬间放电电流 Max. Discharge Current	20 C <sub>5</sub> A	
电池最大直径 (光壳) Max. Diameter	18.3 mm	
电池最大高度 (光壳) Max. Height	65.5mm	
电池重量 (Approx.) Weight (Approx.)	约 45g	
内阻	45mΩ	
充电方法 Charge Method	标准 Standard	0.2C <sub>5</sub> A × 7.5hrs
	快速 Quick	1 C <sub>5</sub> A × 2.5hrs.
操作温度 Operating Temperature	充电 Charge	0°C ~ 45°C 32°F ~ 113°F
	放电 Discharge	-20°C ~ 60°C -4°F ~ 140°F
	贮存 Storage	-10°C ~ 45°C 14°F ~ 113°F

## 2.0 外形图 figure

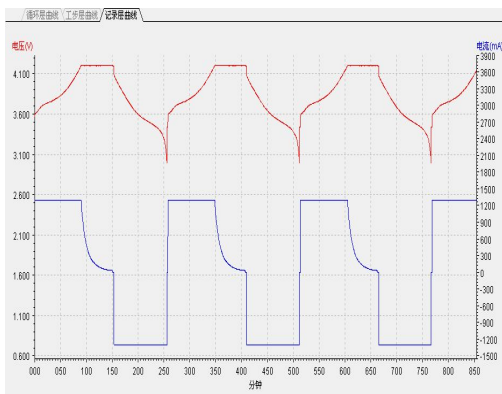


## 2.1 结构图 Structure

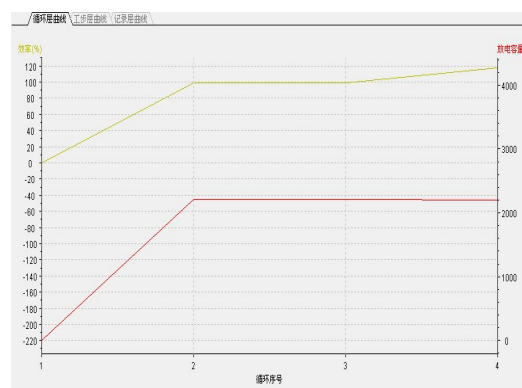


## 3.0 主要充放电曲线 Mainly capability graph

### YHHH18650P-2400mAh 0.5C 充放电



恒流恒压充放电曲线



实际容量曲线

#### 4.2 安全性能 Safety Characteristic

序号 NO.	项目 Item	标准 Standard	测试方法 Test Method
1	过充性能 Overcharge	不爆炸、不起火，不 漏液 No fire、No explosion No leakage	电池以 3C <sub>5</sub> A 电流充电电压 5V 充 7 小时。 Battery could be charged 7 hours in 3C <sub>5</sub> A charging and 5V charging voltage
2	过放性能 Over Discharge	不爆炸、不起火，不 漏液 No fire、No explosion No leakage	电池标准充电后，以 1C <sub>5</sub> A 进行放电至终止电压，然后用 10Ω 的电阻将电池正负极相连，搁置 14 天。 Standard charged. Discharge at 1C <sub>5</sub> A to discharge cut-off voltage and then connect the positive and negative terminals with a resistor of 10Ω for 14 days.
3	常温短路性能 Short Circuit at Room Temperature	不爆炸、不起火，不 漏液 No fire、No explosion No leakage 最高温度 <150℃ No fire No explosion Max.temperature<150 ℃	电池标准充电后，置于防爆玻璃罩中直接短路其正负极（线 路总电阻不大于 50mΩ），当电池温度下降到比峰值约低 10℃时试验结束。观察电池的温度及外观变化。Standard charged. Keep the battery into a ventilation cabinet and short-circuit the positive and negative terminals directly (general resistance shall be less than or equal to 50mΩ). Stop the test when the temperature falls to value 10℃ lower than the peak value. Observe the variation of the battery's appearance and temperature.
4	挤压测试 Crush	不着火不爆炸 No fire and no explosion	挤压测试前电池用 0.2C 充满电，搁置 24 小时。从径向挤压 压力达到 13KN。 Charge at 0.2C, and then leave for 24hrs, The crushing was continued until a force of 3000 lb (13 kN)

5	重物冲击性能 Impact	不爆炸、不起火 No fire No explosion	<p>电池标准充电后，放在平面上，并与热电偶相连，将一直径为 15.8mm 的棒放在电池高度方向中间位置，让重量 9.1kg 的重物从 610mm 高度自由垂落至冲击台面。</p> <p>Standard charge. Keep the battery connected with a thermocouple and put it on a impaction platform, place a 15.8mm diameter bar across the center of the biggest surface, then let a 9.1kg heavy hammer self fall off to the platform from a height of 610mm. Observe the variation of the battery's appearance.</p>
6	热冲击安全性能 Hot Oven	不起火、不爆炸 No fire、 No explosion	<p>电池标准充电后，放置于热箱中，并与热电偶相连，温度以 (5 °C ± 2 °C)/min 的速率升至 130 °C ± 2 °C 并保温 30Min。</p> <p>Standard charge. Keep the battery connected with a thermocouple and put it into a circulating air oven. Temperature is raised at a rate of 5 °C ± 2 °C per minute to a temperature of 130 °C ± 2 °C and remained for 30min at this temperature. Observe the variation of the battery's appearance.</p>

#### 4.3 环境适应性能 Environment Adaptation Performance

序号 NO.	项目 Item	标准 Standard	测试方法 Test Method
1	针刺性能 Needle	不着火、不爆炸 No fire no explosion	<p>针刺测试前电池用 0.2C 充满电，搁置 24 小时。用 Φ4mm 钢针刺穿电池</p> <p>Charge at 0.2C, and then leave for 24hrs, check battery before / after cut through battery with Φ4mm needle</p>
2	恒定湿热性能 Static Humidity	<p>电池不起火、不爆炸 放电时间 ≥ 180min</p> <p>Discharge Time ≥ 180min</p> <p>No remarkable deformation No smoking\ explosion</p>	<p>电池标准充电后，置于温度为 40°C ± 2°C，相对湿度为 90% 的恒温恒湿箱中，搁置 48h 后，取出电池 20 ± 5°C 环境下搁置 2h。观察电池外观变化。然后以 0.2C<sub>5</sub>A 放电至终止电压。</p> <p>Standard charge. Put the battery into a 40 °C ± 2 °C and 90 % RH chamber for 48h, then get it out and store it for 2h at room temperature. Observe the variation of the battery's appearance and then discharge at 0.2C<sub>5</sub>A to discharge cut-off voltage, measuring final capacity.</p>

## 5.0 保质期及产品责任 Warranty Period & Product Liability

保质期是从出厂日期（喷码）开始起 6 个月；深圳诚信神火科技有限公司对因没有按本规格书规定操作而导致的意外不负责任。

Warranty period of this product is 6 months from manufacturing code. Trustfire Corporation Limited is not responsible for the troubles caused by mishandling of the battery which is clearly against the instructions in this specification.

## 6.0 电池使用时警告事项及注意事项 Warnings and Cautions in Using the Battery

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 a possibility of the battery from leaking, heating or explosion please observe the following precautions:

- 严禁将电池浸入海水或水中,保存不用时,应放置于阴凉干燥的环境中.

Do not immerse the battery in water or seawater, and keep the battery in a cool dry surrounding if it stands by.

- 禁止将电池在热高温源旁,如火、加热器等使用和留置

Not use or 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.

Use the battery charger specifically for that purpose when recharging.

- 严禁颠倒正负极使用电池

Do not reverse the position and negative terminals.

- 严禁将电池直接插入电源插座.

Do not connect the battery to an electrical outlet.

- 禁止将电池丢于火或加热器中

Do not discard the battery in fire or a heater.

- 禁止用金属直接连接电池正负极短路.

Do not short-circuit the battery by directly connecting the positive and negative terminals with metal objects.

- 禁止将电池与金属,如发夹、项链等一起运输或贮存

Do not transport or store the battery together with metal objects such as hairpins, necklaces, etc

- 禁止敲击或抛掷、踩踏电池等

Do not strike, trample or throw 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 objects.

- 禁止在高温下（炙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 high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). 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 the battery in a location where static electricity and magnetic field is great, otherwise, the safety devices may be damaged, causing hidden trouble of safety.

- 如果电池发生泄露,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 has leaked, and the electrolyte get into the eyes, do not rub the eyes, instead, rinse the eyes with clean water, and immediately seek medical attention. Otherwise, it may injure eyes.

- 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,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 charger and stop using it

- 如果电极弄脏,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 dirty, clean the terminals with a dry cloth before use. Otherwise performance 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 discarded batteries may cause fire or explode, tape the battery terminals to insulate them.