



深圳宝嘉能源有限公司
SHENZHEN BAOJIA BATTERY CO., LTD.

DOC NO.: QR-WI-733-003-002/A
REV. : A
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Specification Approval Sheet (cylinder Cell)

产品规格确认书（圆柱电池）

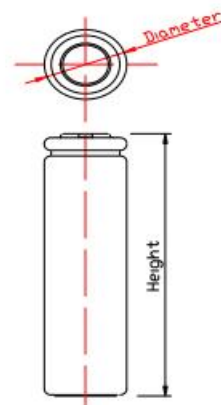
Model/型号: **BJ18650P**
Capacity/容量: **1300mAh**
Voltage/电压: **3.7V**

制定 (Prepared By)	审核 (Checked By)	批准 (Approved By)
孙良通 2010-06-28		

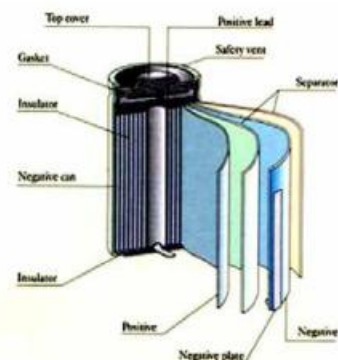
1.0 基本特性 Basic performance

型号 Model	BJ18650P	
外壳材质 Can Material	镀镍钢 Nickel-plated steel	
标称容量 Nominal Capacity, (0.2C ₅ A)	1300mAh	
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 ₅ A	
标准持续放电电流 Standard Discharge Current	10C ₅ A (最大 15C ₅ A)	
最大瞬间放电电流 Max. Discharge Current	20 C ₅ A	
电池最大直径 (光壳) Max. Diameter	18.5 mm	
电池最大高度 (光壳) Max. Height	66mm	
电池重量 (Approx.) Weight (Approx.)	约 36g	
内阻 (Max, at 1000Hz.) Cell Impedance	≤16mΩ (充电态)	
充电方法 Charge Method	标准 Standard	0.2C ₅ A × 7.5hrs
	快速 Quick	1 C ₅ 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

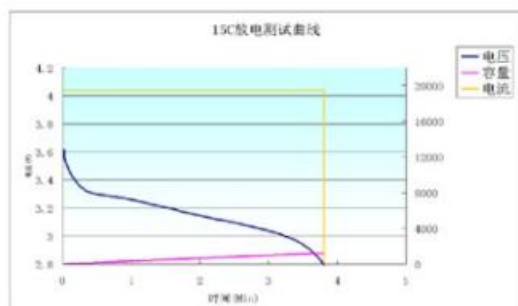


2.1 结构图 Structure

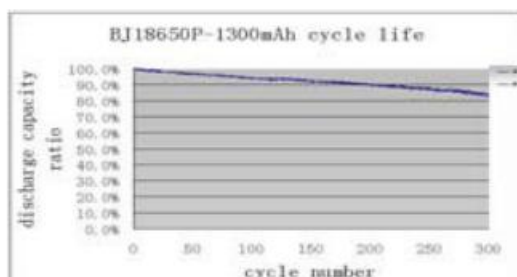


3.0 主要放电曲线 Mainly capability graph

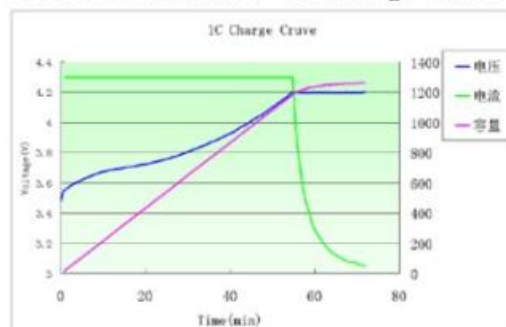
BJ18650P-1300mAh 15C Discharge Curve



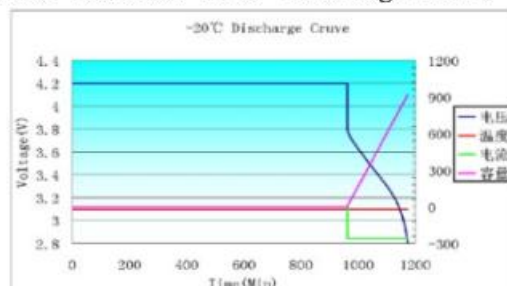
BJ18650P-1300mAh 13C Cycle Life



BJ18650P-1300mAh 1C Charge Curve



BJ18650P-1300mAh -20°C Discharge Curve





4.0 电池性能 Characteristic

若没有特别说明,电池在做各项试验前,均需在 86KPa~106 KPa 大气压,环境温度 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 相对湿度为 45%~75% 的条件下,以 $0.2C_5A$ 恒流放电至终止电压 2.8V,并在收到产品两周内进行以下试验。

Without special instructions, the following tests should be done under the condition of : temperature($20^{\circ}\text{C} \pm 5^{\circ}\text{C}$), atmospheric pressure (86KPa~106 Kpa), relative humidity (45%~75%), and the tests should be done within two weeks after receiving the products.

一些术语的定义: the definitions of some nomenclatures of this specification

标准充电: 在环境温度 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 的条件下,以 $0.2C_5A$ 充电,当电池端电压达到充电截止电压时,改为恒压充电,直到充电电流小于或等于 $0.01C_5A$ 后停止充电。

standard Charge: Charge with current $0.2C_5A$ to limit charge voltage under the condition of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ surrounding temperature, then change to charge with constant voltage till the current less than or equal to $0.01 C_5A$.

4.1 电化学性能 Electrical Characteristic

序号 NO.	项目 Item	标准 Standard	测试方法 Test Method
1	常温放电性能 Discharge Characteristics	A) $1C_5A \geq 1h$ B) $10C_5A \geq 5.4min$ C) $15C_5A \geq 3.2min$	在 1 标准大气压,环境温度 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 相对湿度为 45%~75% 的条件下,电池标准充电后(以下若没有特别说明,均在此条件下放置,皆按此充电方式),搁置 30min,分别以 $1C_5A$ 、 $10C_5A$ 、 $15C_5A$ 进行放电至终止电压,循环三次,当有一次达到标准,即达到标准要求(下同)。 Standard charged under the condition of normal atmospheric pressure and the environmental temperature of $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and 45%~75%RH, then rest for 30min and discharge at $1C_5A$ 、 $10C_5A$ 、 $10C_5A$ to the discharge cut-off voltage respectively. Charge/discharge cycle can be conducted for 3 times before meeting the Standards (the same below)
2	常温荷电保持能力 Normal Storage	放电时间 $\geq 255min$ Discharge Time $\geq 255min$	电池标准充电后,开路放置 28 天,再以 $0.2C_5A$ 放电至终止电压。 Store for 28 days after standard charged, then discharge at $0.2C_5A$ to the discharge cut-off voltage.
3	循环寿命 Cycle Life	循环 300 次后放电时间 $\geq 3.23min$ Discharge Time $\geq 3.23min$	$1C_5A/13C_5A$ 放电至终止电压,搁置 30min,以此模式循环 300 次 Conduct $1C_5A / 13C_5A$ cycle for 300 times and measure final capacity.



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 No fire、No explosion	电池标准充电后,以 $3C_5A$ 电流充电至 $4.8V$,然后转恒压充电至截至电流 $0.01C_5A$ 时终止。 Standard charge. Charge at $3 C_5A$ to $4.8V$, then change to charge with constant voltage till the current less than or equal to $0.01 C_5A$. Observe the variation of the battery's appearance
2	过放性能 Over Discharge	不起火、不爆炸 No fire、No explosion	电池标准充电后,以 $1C_5A$ 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 $1C_5A$ 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 最高温度 $<150^{\circ}C$ No fire No explosion Max.temperature $<150^{\circ}C$	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 $50m\Omega$),当电池温度下降到比峰值约低 $10^{\circ}C$ 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 $50m\Omega$). Stop the test when the temperature falls to value $10^{\circ}C$ 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	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。 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.
6	热冲击安全性能 Hot Oven	不起火、不爆炸 No fire、 No explosion	电池标准充电后，放置于热箱中，并与热电偶相连，温度以 $(5\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C})/\text{min}$ 的速率升至 $130\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ 并保温 30Min。 Standard charge. Keep the battery connected with a thermocouple and put it into a circulating air oven. Temperature is raised at a rate of $5\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ per minute to a temperature of $130^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and remained for 30min at this temperature. Observe the variation of the battery's appearance.

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	针刺测试前电池用 0.2C 充满电，搁置 24 小时。用 $\Phi 4\text{mm}$ 钢针刺穿电池 Charge at 0.2C, and then leave for 24hrs, check battery before / after cut through battery with $\Phi 4\text{mm}$ needle
2	恒定湿热性能 Static Humidity	电池不起火、不爆炸 放电时间 $\geq 180\text{min}$ Discharge Time $\geq 180\text{min}$ No remarkable deformation No smoking\ explosion	电池标准充电后，置于温度为 $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ，相对湿度为 90% 的恒温恒湿箱中，搁置 48h 后，取出电池 $20 \pm 5^{\circ}\text{C}$ 环境下搁置 2h。观察电池外观变化。然后以 0.2C ₅ A 放电至终止电压。 Standard charge. Put the battery into a $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 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 ₅ A to discharge cut-off voltage, measuring final capacity.



3	跌落性能 Drop	不起火、不爆炸 放电时间 $\geq 255\text{min}$ No smoking 、 No fire、No explosion Discharge time $\geq 255\text{min}$	标准充电后，将电池样品由高度(最低点高度)为 1m 的位置自由跌落到 18~20mm 的硬木板上，要求各面各跌落一次。然后将电池以 0.2C ₅ A 放电至终止电压，做 0.2C ₅ /0.2C ₅ 循环达到要求停止，充放电循环次数不高于 3 次 Standard charge. Then let it self fall off from a height of 1.0m (the lowest height) to a smooth wooden surface. The self fall off should be conducted from every positive and negative direction. Then discharge at 0.2C ₅ A to discharge cut-off voltage. Conduct 0.2C ₅ A /0.2C ₅ A cycle for 3 times.
4	不同温度下的 放电性能 High-low Temperature Discharge	A)60℃时 $\geq 285\text{min}$ B)0℃时 $\geq 240\text{min}$; C)-20℃时 $\geq 180\text{min}$ 电池不爆炸、不起火。 A)60℃时 $\geq 285\text{min}$ B)0℃时 $\geq 240\text{min}$; C)-20℃时 $\geq 180\text{min}$ No fire\explosion	电池标准充电后，在 60 $\pm 2^\circ\text{C}$ 条件下恒温搁置 2h、以 0.2C ₅ A 放电至终止电压，然后在室温条件下标准充电，依次按照 0 $\pm 2^\circ\text{C}$ /-20 $\pm 2^\circ\text{C}$ 的顺序在相应的恒温条件下搁置 16h，以 0.2C ₅ A 放电至终止电压。 Standard charge. Then store for 2h at 60 $\pm 2^\circ\text{C}$ and discharge at 0.2C ₅ A to discharge cut-off voltage. then standard charge at room temperature and store for 20h according to the order of 0 $\pm 2^\circ\text{C}$ /-20 $\pm 2^\circ\text{C}$ and discharge at 0.2C ₅ A measuring corresponding discharge capacity.
5	振动环境 适应性性能 Vibration	电池外观无明显损伤、不漏液、不冒烟、不爆炸 No remarkable damage、 No smoking 、 No explosion	电池标准充电后，安装在振动台面上，按下面的振动频率和对应的振幅调整好试验设备，X、Y、Z 三个方向每个方向上从 10Hz~55Hz 循环扫频振动 30min，扫频速率为 1oct/min: A)振动频率: 10Hz~30Hz ; 位移幅值 (单振幅): 0.38mm ; B)振动频率: 30Hz~55Hz ; 位移幅值 (单振幅): 0.19mm。 Standard charge. Measure initial status. Equip it to the vibration platform, adjust and prepare the test equipment according to following vibration frequency and relevant swing, doing frequency sweeping from X, Y, Z three directions, each from 10Hz to 55Hz for 30 minutes of recycling, rating of which is 1oct/min:A)vibration frequency:10Hz~30Hz ; Displacement breadth (single swing): 0.38mm ; B) vibration frequency: 30Hz~55Hz ; Displacement breadth(single swing): 0.19mm。 Measure final status after sweeping and Observe the variation of the battery's appearance.



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 **12** 个月；深圳宝嘉能源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 12 months from manufacturing code. Baojia Battery 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



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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.