

CUSTOMER NO: _____

Specification Approval Sheet 规格确认书

MODEL/型号:CR2**(900mAh 3.0V)**

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1 Scope/适用范围

This specification is applies to describe the related Battery product in this Specification and the Battery/cell supplied by Bonrex Technology CO., Ltd only.

本说明书只适用于描述本规格书中相关的产品以及深圳市鹏荃科技有限公司提供的电池。

2 Model/型号: CR2

3 Cell Specification/电芯产品规格

Table 1 (表 1)

No.	Items/项目	Specifications/规格	Remark 备注
1	Nominal Capacity 标称容量	900mAh	Discharge with 1mA to 2.0V at 25±5°C 在 25±5°C 环境下, 1mA 连续放电至 2.0V
2	Minimum Capacity 最小容量	850mAh	
3	Nominal Voltage 标称电压	3.0V	/
4	Delivery voltage 交货电压	3.05~3.40V	Open circuit voltage 开路电压
5	Cell Internal resistance 单电芯内阻	≤1.2Ω	Ac impedance 交流阻抗
6	Weight 重量	About 11 g 约 11g	/
7	Maximum discharge current 最大持续放电电流	800mA	Discharge continuously to 2.0v at 25±5°C, and the discharge capacity reaches half of the nominal capacity 在 25±5°C 环境下连续放电至 2.0V, 放电的容量达到标称容量的 50%
8	Maximum pulse discharge current 最大脉冲放电电流	1600mA	Pulse cycle discharge at 25±5°C, 3s on 27s off, discharge to 2.0V, the output capacity can reach half of the nominal capacity 在 25±5°C 环境下脉冲循环放电, 放 3s 停 27s, 放电至 2.0V, 放电的容量达到标称容量的 50%
9	Operation Temperature Range 工作温度范围	-40~70°C	The performance of the battery will decrease under low temperature 电池在低温环境下性能会下降
10	Storage life 储存寿命	10 years 10 年	Storage environment: 25±5°C, ≤65%RH 储存环境: 温度 25±5°C, 湿度≤65%RH

4 Battery/Cell performance test Criteria/电池性能标准

4.1 Appearance inspection by visual/外观目测

There shall be no such defect as rust, leakage, which may adversely affect commercial value of battery.

电池外观应没有锈渍、污渍、漏液等影响商业价值的缺陷存在。

4.2 Environmental test condition/外界环境条件

Unless otherwise specified, all test stated in this product specification are conduct at below test condition

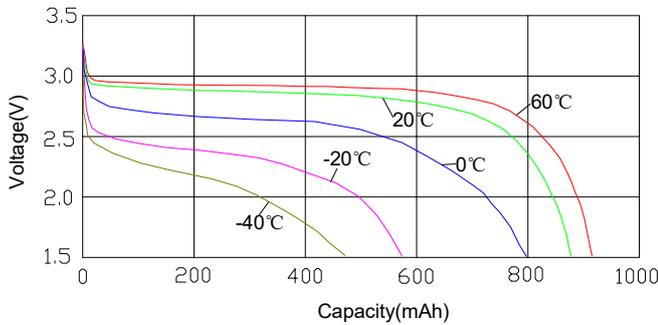
所有测试应按以下环境条件进行，除非特殊指定外。

Temperature: $20 \pm 5^\circ\text{C}$

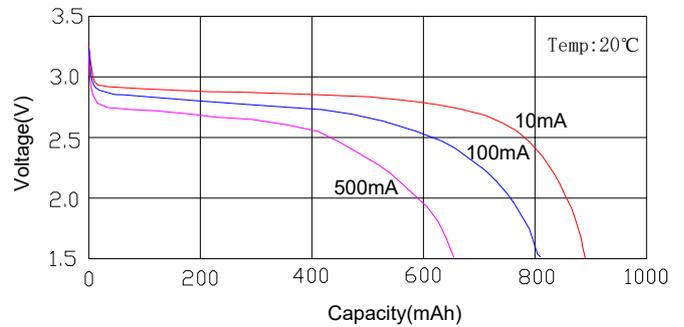
Relative Humidity: $\leq 65\%$ R.H.

4.3 Discharge characteristic/放电特性

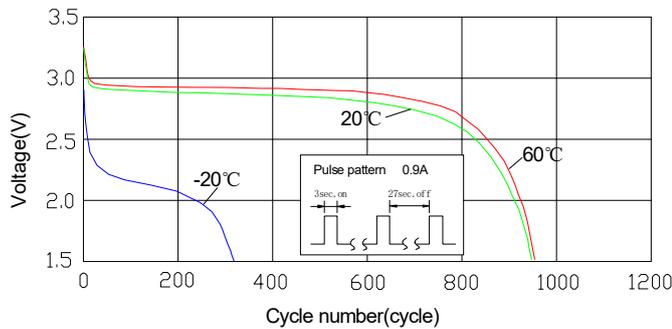
Temperature characteristics(10mA)



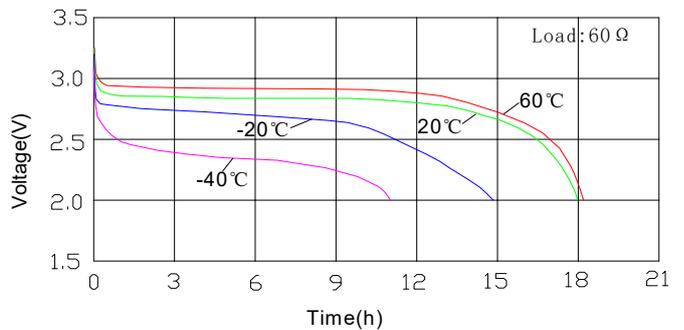
Different current discharge characteristics



Pulse discharge characteristics



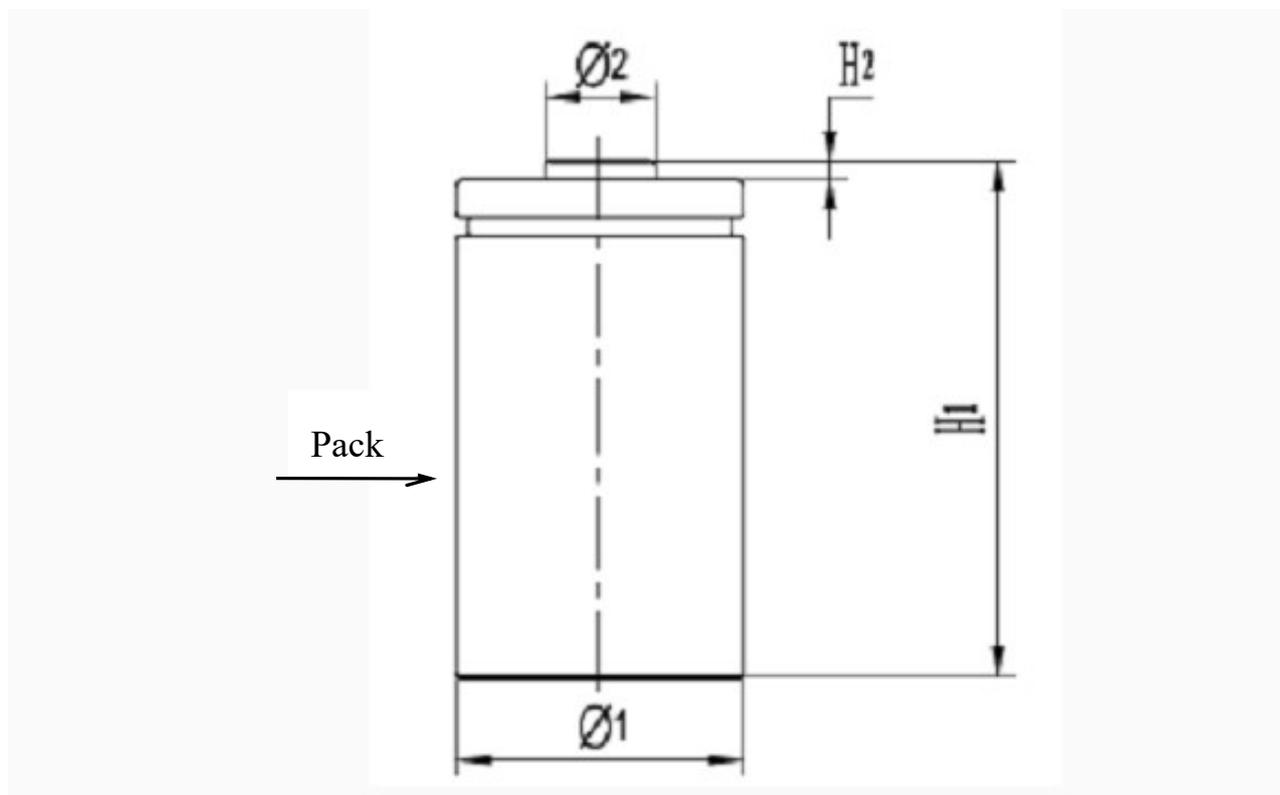
Discharge characteristics on temperature



4.4 Reliability test/可靠性测试

No.	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准
1	Free fall test 自由跌落测试	The full battery drops from a height of 1M to a concrete floor, dropping three times at random. 满电电池从1m高度跌落电池到一个水泥地面，随机跌落三次。	No Fire, No explosion 不起火，不爆炸
2	Vibration test 振动测试	The full cell was fixed on the shaking table and vibrated along X, Y and Z directions for 30 minutes with an amplitude of 1.6 mm and a frequency of 10 hz ~ 55 hz, varying 1 hz per minute. 将满电电芯固定在振动台上，沿 X、Y、Z 三个方向各振动 30 分钟，振幅 1.6mm，振动频率为 10Hz~55Hz，每分钟变化 1Hz。	No leakage, No fire, No explosion 无泄漏，不起火，不爆炸
3	Thermal exposure test 高温热冲击测试	After the full battery temperature is stabilized to normal temperature, it is placed in a recirculating air oven. After the normal temperature is raised from 5 ° C/min ± 2 ° c/min to 130 ° C, it is placed at 130 ° C for 30 minutes. 满电电池温度稳定到常温后，放置入循环空气烘箱里，从常温以5 °C/分± 2 °C/分的速率升至130°C后，在130°C放置30分钟	No Fire, No explosion 无起火，无爆炸
4	Thermal cycling test 高低温循环测试	Test cells and batteries shall be stored for at least 6 h at a test temperature of 75 ° C, followed by storage for at least 6 h at a test temperature of - 40 ° C. The maximum time for transfer to each temperature shall be 30 min. Each test cell and battery shall undergo this procedure 10 times. This is then followed by storage for at least 24 h at ambient temperature. 测试电池须在 75 ° C 的测试温度下贮存至少 6 小时，然后在 -40 ° C 的测试温度下贮存至少 6 小时。转移到每个温度的最大时间为 30 分钟。每个测试电池循环 10 次。然后在环境温度下储存至少 24 小时。	No mass loss, No leakage, No short-circuit, No rupture, No explosion and No fire 无质量损失，无泄漏，无短路，无破裂，无爆炸，不起火
5	Short test 短路测试 (25 ± 5 ° C)	At Room temperature of 25 ± 5 ° C, the positive and negative electrodes of a full battery are connected with a load not exceeding 100 m ω, which shortens the external circuit of the battery 在室温 25 ± 5°C把满电电池的正负极用不超过 100m Ω 的负载连接起来，连接起来使电池外部短路	No Fire, No explosion Surface temperature does not exceed 150 ° C 无起火，无爆炸 表面温度不超过 150°C
6	Forced discharge test 过放电测试	Each test battery shall be discharged to 100% depth of discharge. It shall then be connected in series with three undischarged additional batteries of the same type and the circuit load is lower than 0.1 Ω stop the test when battery temperature come back to The environment temperature 将完全放完电的电池与 3 个同型号满电电池串联，用电阻小于 0.1 Ω 的导线连接短路。电池短路结束条件：电池起火、爆炸、漏液或电池完全放电至 0.1V 并且电池外壳温度降到环境温度。	No Fire, No explosion 无起火，无爆炸
7	Over charge test 过充电测试	Charge the battery with full charge and charge it with dc power supply. The charging current is 3 times (5mA 3=15mA) of the specified maximum charging current I _c = 0.004a and keep it for 12 hours 取满电荷电池，用直流电源对电池充电，充电电流为规定的最大充电电流 I _c =0.004A 的 3 倍 (5mA×3=15mA)，保持 12 小时	No Fire, No explosion 无爆炸，无起火
8	Crush 挤压	Each cell is crushed between two surfaces. The force for the crushing is applied by a hydraulic ram exerting a force of 13kN ± 1kN.crushing is performed in a manner that will cause the most adverse result. Once the maximum fore has been applied, or an abrupt voltage drop of one-third of the original voltage has been obtained, the force is released. 将电池平躺在压力机的两平面钢板中间，开启阀门在电池上施加 13kN±0.78kN 的压力，此压力一旦达到即可释放压力。	No Fire, No explosion 无爆炸，无起火

5 Cell initial Dimensions/电芯初始尺寸



NO	Items	Units: mm
1	H1	Max27.0
2	H2	Min1.0
3	$\Phi 1$	15.2 ± 0.2
4	$\Phi 2$	6.3 ± 0.2

6 CAUTIONS IN USE/谨慎使用

To ensure proper use of the battery please read the manual carefully before using it.

(为确保正确使用电池，使用前请仔细阅读本细则)

Handling (电池操作)

- Do not expose to, dispose of the battery in fire. (不要靠近和放置电池于火中)
- Do not put the battery in a charger or equipment with wrong terminals connected (请勿将电池反极放入充电器或设备中)
- Avoid shorting the battery (避免电池短路)
- Avoid excessive physical shock or vibration. (避免电池过多的物理撞击和震动)
- Do not disassemble or deform the battery. (不要解剖和使电池变形)
- Do not immerse in water. (不要把电池浸泡在水中)
- Do not use the battery mixed with other different make, type, or model batteries. (不要和其它不同类型的电池混和使用)
- Keep out of the reach of children. (放置电池于儿童不易接触的地方)

storage(储存): Store the battery in a cool, dry and well-ventilated area. (应把电池置于凉爽、干燥及通风良好的区域)

disposal (电池处理)

- Regulations vary for different countries. Dispose of in accordance with local regulations. (电池处理要符合当地的规定)

7 Period of Warranty/保质期

The period of warranty is one year from the date of shipment. Bonrex guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

电池的保质期从出货之日算起为一年。如果电池的缺陷是在制造过程中形成的而不是由于用户滥用及错误使用造成，本公司负责退换电池。

8 Storage of the Batteries/电池的存放

Batteries should be stored in a cool, dry environment, rain proof, sunscreen. Recommended storage environment: $25 \pm 5^{\circ}\text{C}$, humidity is less than 65%

电池应存放在凉爽、干燥、防雨、防晒的环境中。建议贮存环境: $25 \pm 5^{\circ}\text{C}$ ，湿度小于 65%。

9 Note/注释

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

本说明书未包括事项应由双方协议确定。