APPROVAL SHEET

产品承认书

Customer 客户名称：

Part No 产品型号： **HZT 18650CR-01**

Description 产品描述： **3.7V 3000mAh**

Application 应用机型:

SIGNATURE 制作方签名		
MADE BY 制作：	**李明英**	**DATE** 日期： **2018-01-04**
CHECKED BY 审核：		**DATE** 日期：
APPROVED BY 批准:		**DATE** 日期：

CUSTOMER APPROVAL 客户确认		
CONFIGURATION 结构确认：		**DATE** 日期：
FUNCTION 性能确认：		**DATE** 日期：
APPROVED BY 批 准：		**DATE** 日期：

NO.编号	HZT18650CR11-01		
DESCRIPTION 描述	3.7V 3000mAh Li-ion Rechargeable Battery 3.7V 3000mAh 可充电圆柱电池		
DATE 日期	2018/01/04	Version 版别	A/0

Amendment Record

修正记录

Revision 修订编号	Description 修订内容	Version 版别	Date 日期	Approval 审核
1	新发行 Initial Release	A/0	2018/01/04	

NO.编号	HZT18650CR11-01		
DESCRIPTION 描述	3.7V 3000mAh Li-ion Rechargeable Battery 3.7V 3000mAh 可充电圆柱电池		
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产 品 目 录

01. Scope 适用范围 ……4

02. Type 电池型号 ……4

03. General Performance 常规性能 ……4

04. Testing Item and Methods 性能及测试方法 ……5

05. Environment Performance 环境适应性能 …… 6

06. Safety Test 安全测试 ……7

07. Test Conditions 测试条件 …… 8

08. Cautions In Use 使用警告 …… 8

09. Battery Operation Instruction 电池操作说明 ……9

10. Period Of Warranty 保质期 ……10

11. Other The Chemical Reaction 其它化学反应……10

12. Note 备注 ……11

附图 1：Dimension 电池尺寸图 …… 12

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DATE 日期	2018/01/04	Version 版别	A/0

1. Scope 适用范围：

1.1 This product specification applies to the Well lithium ion battery.

1.2 The products are based on standards: PRC national standards GB/T 18287-2013(cellular phone use lithium ion batteries general norm) and PRC national standards GB4943-2001(IT technology equipment safety standards).

本产品基于国标 GB/T18287-2013 和 GB4943-2001

1.3 Please contact Vitacom if you have any questions.

2. Type 电池型号

2.1 Battery Type 电池型号： HZT18650CR-01

2.2 Cell Type 电芯型号： HDX18650CR 3.7V 3000mAh

2.3 The products of all materials are in compliance with ROHS requirements 本产品所有物料均符合 ROHS 要求。

3. General Performance 常规性能

Item 项目	Specifications **性能**	**Remark 备注**
3.01 Rated Capacity 额定容量	3000mAh	0.2C_5 charge and discharge system 0.2C_5A 充放制式 (Temperature 温度 23℃±2℃)
3.02 Min Capacity 最小容量	2950mAh	
3.03 Nominal Voltage 额定电压	3.7 V	/
3.04 Under Discharge Voltage 放电截止电压	3.0V	/
3.05 Limited charge voltage 充电限制电压	4.20V	/
3.06 Charge Method 充电方式	CC/CV(恒流恒压)	/
3.07 Standard charge current 标准充电电流	600mAh	0.2C_5A
3.08 Maximum charge current 最大充电电流	1500mAh	0.5C_5A`
3.09 Standard discharge current 标准放电电流	600mAh	0.2C_5A
Maximum discharge current 最大放电电流	3000mAh	1C_5A
3.10 Impedance 内阻	小于 60mΩ	AC Impedance 1kHz 交流阻抗值 1kHz
3.11 Weight 重量	48	About 大约
3.12 Max size 最大外形尺寸	/	
3.13 Operating Temperature 工作温度	Charging 充电:0~45℃	
	Discharging 放电:-10~60℃	
3.14 Storage Environment 存储环境	0℃～45℃	3 months 3 个月
	0℃～35℃	6 months 6 个月

4 Test Method And Standard 性能及测试方法

4.1 Quick Charge Method 快速充电制式	The "Quick Charge" means charging the Cell at a constant current of 0.5C_5A until the voltage is 4.2V, then charged at a constant voltage of 4.2V until its current is less than0.01C_5A. “快速充电”即在环境温度为 23℃±2℃的条件下,先以恒定电流 0.5C_5A 充电至 4.2V,再以 4.2V 的恒压充电至电流小于 0.01C_5A.	
4.2 Standard Charge Method 标准充电制式	The "Standard Charge" means charging the Cell at a constant current of 0.2C_5A until the voltage is 4.2V, then charged at a constant voltage of 4.2V until its current is less than 0.01C_5A. “标准充电”即在环境温度为 23℃±2℃的条件下,先以恒定电流 0.2C_5A 充电至 4.2V,再以 4.2V 的恒压充电至电流小于 0.01C_5A.	
4.3 Capacity 容量	①Battery lay aside 1 hour after standard charging ,under the temperature 23±2℃, discharge by 0.2C_5A with CC to terminal voltage to 3.0V 标准充电后，搁置 1h，在环境温度为(23±2)℃条件下，以 0.2C_5A 电流恒流放电到 3.0V。	≥300min
	②Battery lay aside 1 hour after quick charging ,under the temperature 20±5℃, discharge by 0.5C_5A with CC to terminal voltage to 3.0V 快速充电后，搁置 1h，在环境温度为(20±5)℃条件下，以 0.5C_5A 电流恒流放电到 3.0V.	≥110min
4.4 Cycle Life 循环寿命	A cell is charged in accordance with 4.1,and stored for 0.5h～1h,then discharged to the end-off voltage with the current of 0.5C_5A,after that, stored 0.5h～1h prior to next charge-discharge cycle. The cell shall be continuously charged and discharged for 400 times. 电芯按 4.1 规定充电,而后搁置 0.5～1h,然后以 0.5C_5A 电流放电至终止电压,放电结束后,搁置 0.5～1h,再进行下一次充放电循环,连续进行充放电循环 400 次.	≥70%
4.5 Temperature Performance 温度特性		
4.5.1 High Temperature Performance 高温放电特性	A cell is charged in accordance with 4.1 or 4.2,and stored in an ambient temperature of 50℃±2℃ for 2h,then discharged to cut-off voltage at a constant current of 0.2C_5A. After that, fetch out the cell and place it in the ambient temperature of 23℃±2℃ for 2h, then check its appearance. 电芯按 4.1 或 4.2 规定充电结束后,将电芯放入 50℃±2℃的高温箱中恒温 2h,然后以 0.2C_5A 电流放电至终止电压,实验结束后,将电芯取出在环境温度为 23℃±2℃的条件下搁置 2h,然后目测电芯外观.	1.the discharging time is not less than 51min; 放电时间不低于 51min; 2. No distortion, no leakage no explosion. 电芯外观无变形、 漏液、爆裂.

4.5.2 Low Temperature Performance 低温放电性能	A cell is charged in accordance with 4.1 or 4.2,and stored in an ambient temperature of -10℃±2℃ for 16h～24h,then discharged to cut-off voltage at a constant current of 0.2C_5A. After that, fetch out the cell and place it in the ambient temperature of 23℃±2℃ for 2h. 电芯按 4.1 或 4.2 规定充电结束后,将电芯放入-10℃±2℃的低温箱中恒温 16～24h,然后以 0.2C_5A 电流放电至终止电压,实验结束后,将电芯取出在环境温度为 23℃±2℃的条件下搁置 2h。	1.The discharging time is not less than 3h; 放电时间不低于 3h; 2. No distortion, no leakage no explosion. 电芯外观无变形、 漏液、爆裂.
4.6 Charge(Capacity) Retention 荷电保持能力	A cell is charged in accordance with 4.2 or 4.3,and stored in an ambient temperature of 23℃±2℃ for 28d,then discharged to cut-off voltage at a constant current of 0.2C_5A. 电芯按 4.1 或 4.2 规定充电结束后,在环境温度为 23℃±2℃条件下,将电芯搁置 28 天,再以 0.2C_5A 电流放电至终止电压.	Retention:85%C_5A 容量保持率:85%C_5A

5 Environment Characteristic 环境适应性能

5.1 Constant Temperature and Humidity 恒定湿热性能	A cell is charged in accordance with 4.1 or 4.2,and stored in an ambient temperature of 40±2℃(90～95%RH) for 48h,then placed in room temperature for 2h. After that, check its appearance prior to being discharged to cut-off voltage at a constant current of 0.2C_5A. 电芯按 4.1 或 4.2 规定充电结束后,将电芯放入 40±2℃(90～95%RH)的恒温恒湿箱中搁置 48h 后,将电芯取出在室温下搁置 2h,目测电芯外观,再以 0.2C_5A 电流放电至终止电压.	the discharging time is not less than 180min. 放电时间应不低于 180min.
5.2 Vibration Test 振动测试	A cell is charged in accordance with 4.1 or 4.2, then installed onto the vibration desk with clamps. Equipment parameters of frequency and amplitude are as follows(the frequency is to be varied at the rate of 1oct/min between 10 and 55 hertz, and repeat vibration for 30min.The cell is to be tested in three mutually perpendicular directions): frequency:10Hz~30Hz amplitude: 0.38mm frequency:30Hz~55Hz amplitude: 0.19mm check the appearance of the cell and test the voltage 电芯按 4.1 或 4.2 的规定充电结束后,将电芯用夹具安装在振动台的台面上，按下面的振动频率和对应的振幅调整好实验设备.X,Y,Z 三个方向每个方向上从 10～55Hz 循环扫频振动 30min，扫频速率为 1oct/min: 振动频率：10Hz～30Hz 位移幅值(单振幅)：0.38mm; 振动频率：30Hz～55Hz 位移幅值(单振幅)：0.19mm. 振动结束后,观察电池外观，检测电池电压。	1.no scratch, no leakage, no fume, no explosion; 电芯外观应无明显损伤，漏液，冒烟或爆炸; 2. the voltage is min3.7V. 电芯电压不低于 3.7V.
5.3 Shock Test 碰撞测试	A cell is tested in accordance with 6.2, then secured to the testing machine by means of rigid mount which supports all mounting surfaces of the cell. Each cell shall be subjected	1.no scratch, no leakage, no fume, no explosion;

	to a total of three shocks of equal magnitude. The shocks are to be applied in each of three mutually perpendicular directions. The acceleration and impulse time are as follows: acceleration of impulse peak value:100m/s2,shock frequency: 40~80times/min,impulse lasting time:16min,shock times:1000±10 电池按 6.2 的规定试验结束后,将电池分别按 X,Y,Z 三个互相垂直轴通过夹具坚固在台面上,按下述要求调好加速度,脉冲持续时间进行碰撞实验:脉冲峰值加速度:100m/s2,每 min 碰撞次数:40～80,脉冲持续时间:16ms,碰撞次数：1000±10.	电芯外观应无明显损伤，漏液，冒烟或爆炸; 2.the voltage is Min n*3.7V. 电芯电压不低于 n*3.7V.
5.4 Drop test 自由跌落	A cell is charged in accordance with 6.3,then dropped from a height of 1000mm to a wooden board(18-20mm thick) which is placed on the concrete ground. Cells shall be dropped in each of three mutually perpendicular directions. Total drop times are 6.After that, the cell is discharged to cut-off voltage at CC of $0.5C_5A$,then repeat charge & discharge at a current of $0.5C_5A$ until the discharge time is not less than 51min,the cycle times should be not more than 3. 电池按6.3的规定试验结束后,将电芯样品由高度为1000mm的位置自由跌落到置于水泥地面上的 18-20mm 厚的木板上，从 X,Y,Z 正负方向(六个方向)每个方向自由跌落 1 次.自由跌落结束后,将电池以 $0.5C_5A$ 电流放电至终止电压,然后以 $0.5C_5A$ 的电流进行充放电循环,直至放电时间不低于 51min,即可终止充放电循环,	1charge and discharge cycle are on more than 3 times. 充放电循环次数应不多于 3 次. 2 no leakage, no fume, no explosion. 电芯应不漏液，冒烟或爆炸

6． Safety Test 安全测试

All below tests are carried out on the equipments with forced ventilation and explosion-proof device. Before test, all cells are charged in accordance with 4.1 or 4.2, and stored 24h prior to testing.

下述试验应在有强制排风条件及防爆措施的装置内进行,在试验前所有的电池都按 4.1 或 4.2 规定充电,并搁置 24h 后,再进行以下试验.

Test Item 测试项目	Test Method 测试方法	Criteria 检验标准
6.1 Impact Test 重物冲击	A cell is to be placed on the impact flat. A 10 kg weight is to be dropped from a height of 1m onto the cell. 将电池放在冲击台上,将 10kg 重锤自 1m 高度自由落下,冲击电芯。	With no fire, no explosion 不起火,不爆炸
6.2 Heating Test 热冲击	A cell is to be heated in a circulating air oven. The temperature of the oven is to be raised at a rate of 5℃±2℃ per minute to a temperature of 130℃±2℃ and remain for30min at that temperature before the test is discontinued. 将电芯放在电热鼓风干燥箱中,温度以 5℃±2℃/min 的速率由室温升至 130℃±2℃并保持 30min.	no fire, no explosion 电芯不起火,不爆炸
6.3 overcharge test 过充电	A cell is to be subjected to CC/CV power by connecting its positive & negative terminal, then set the current as $3C_5A$,the voltage as 4.8V,after that, Charge the cell up to 4.8V at CC of $3C_5A$ and last 2h at the voltage of 4.8V. 将电芯正负极连接于恒压电源,调节电流至 $3C_5A$,电压为	no fire, no explosion 电芯不起火,不爆炸

	4.8V,然后对电芯以3C_5A充电,直到电压为4.8V,并恒压保持2h.	
6.4 Over discharge testing 过放测试	At 23±2℃, According to the requirements of standard charge, the battery will be discharge to cut-off voltage, then connect with external load of 30 ohm for 24 hours. 在 23±2℃状态下, 按标准放电的要求放电至终止电压后,外接 30Ω 负载放电 24 小时.	No fire, no smoke, no leakage. 无起火,无冒烟,无泄液
6.5 Short-circuit test 短路测试	A Cell is to be short-circuited by connecting the positive and negative terminals of the cell with copper wire having a maximum resistance load of 50m?.Monitor its temperature while testing, the cell is to be discharged until the cell case temperature has returned to be 10℃ less then peak temperature. 将接有热电偶的电芯置于通风橱中,用铜线短路其正负极(线路总电阻不大于 50 毫欧),实验过程中监视电芯温度变化,当电芯温度下降到比峰值低约 10℃时,结束实验.	no fire, no explosion 电芯不起火,不爆炸

7. Testing conditions 测试条件

7.1 Circumstance 测试环境条件

Unless otherwise specified, all tests stated in this product specifications
Should be conducted under the following atmosphere conditions:
除非另有规定，本规格书中各项试验应在标准大气条件下进行：
Temperature:21℃～25℃
温度：21℃～25℃
Relative humidity:45％～75%
相对湿度：45%～75%
Atmospheric pressure: 86kpa～106kpa
大气压力：86kPa～106kPa

8. CAUTIONS IN USE 使用警告

8.1 To ensure proper use of the battery please read the manual carefully before using it. Handling
为了使电池安全的使用及处理请在使用前认真的阅读操作说明

- Do not expose to, dispose of the battery in fire.
  不能把电池曝晒或丢在火中
- Do not put the battery in a charger or equipment with wrong terminals connected.
  电池充电时不能把正负极性装反
- Avoid shorting the battery
  避免短路电池
- Avoid excessive physical shock or vibration.
  避免过分的物理震动和冲击电池
- Do not disassemble or deform the battery.
  不能拆解或使电池变形

- Do not immerse in water.
  不能将电池浸入水中
- Do not use the battery mixed with other different make, type, or model batteries.
  不能将其它不同厂家，类型，型号的电池混合使用
- Keep out of the reach of children.
  禁止小孩接触电池

8.**2** charge and discharge 充放电

- Battery must be charged in appropriate charger only.
  电池必须在合适的条件下充电
- Never use a modified or damaged charger.
  决不能用故障的充电器给电池充电
- Do not leave battery in charger over 24 hours.
  电池持续充电不能超过 24h

8.3 storage 贮存

- Store the battery in a cool, dry and well-ventilated area.
  电池贮藏在通风干燥的环境中

8.4 disposal 处理

- Regulations vary for different countries. Dispose of in accordance with local regulations.
  不同国家法规的不同，处理时根据当地的法规。

9. Battery operation instruction 电池操作说明

9.1 Charging 充电

9.1.1 **Charging current**：Cannot surpass the biggest charging current which in this specification book stipulated。

充电电流：不能超过规格书规定的最大的充电电流

9.1.2 **Charging voltage**：Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage。

充电电压：不能超过规格书规定的最高的限制电压

9.1.3 **Charge temperature**：The battery must carry on the charge in the ambient temperature scope which this specification book stipulated。

充电温度：电池充电温度必须按照规格书的温度范围执行

9.1.4 Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the battery positive electrode and the cathode meet instead, can damage the battery。

先恒流后恒压方式充电，禁止颠倒的方式充电。如果电池正负极颠倒充电会损坏电池并随时有爆炸的危险。

9.2 Discharging 放电

9.2.1 **Discharging current** The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the oversized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat。

放电电流：电池放电电流不能超过规格书规定的最大放电电流，过大的电流放电会造成电池发热和

容量衰减。

9.2.2 **discharge temperature**：The battery discharge must carry on in the ambient temperature scope which this specification book stipulated

放电温度：电池放电温度必须按照规格书的温度范围执行

9.2.3 **Over-discharges：**After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity。

过放电：短时间的的过充过放不影响电池的使用，但是长时间的过放电会使电池的功能失效、能量消失，则电池永久性不能使用。

9.3 Storing the Batteries 贮存电池。

The battery should store in the product specification book stipulation temperature range. If has surpasses above for three months the long time storage, suggested you should carry on additional charge to the battery。

电池贮存在规格书规定的温度范围内，如果电池贮存超过三个月，要求给电池做 1-3 次循环，以激活电芯内的化学物质，否则会使电芯内化学物质逐渐僵滞而降低容量，缩短其使用寿命,电池过放可能产生漏液,鼓胀现象。另外电池存在静耗，长时间不使用也不激活，一旦电量耗完电池能量也将基本消失，出现电池不能充电使用现象。

10．Period of Warranty 保质期

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

电池的保质期从出货之日算起为半年。如果证明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。

11. Other The Chemical Reaction 其它化学反应

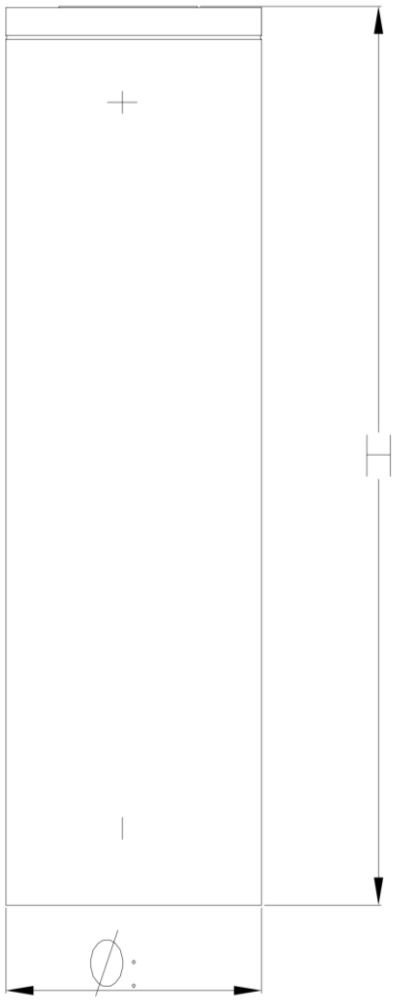
Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the 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.

由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使未使用，存放太长一段时间也一样会使电池性能降低。如果使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，也会缩短电池的使用寿命，或者产生漏液导致设备损坏。

12. Note: 备注

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。

附图 1：Dimension 电池尺寸图



序号	型号	尺寸	备注
1	H（高度）	65.05+-0.15mm	包含外面 PET 的尺寸
2	Φ（直径）	18.45+-0.15mm	

NO.编号	HZT18650CR11-01		
DESCRIPTION 描述	3.7V 3000mAh Li-ion Rechargeable Battery 3.7V 3000mAh 可充电圆柱电池		
DATE 日期	2018/01/04	Version 版别	A/0