ADD:9th Floor , Block B, Hongrongyuan North Station Center, No. 328, Mintang Road, Longhua District, Shenzhen,China,518110
Tel:86-755-86670672 Fax:86-755-86670609 Website:www.pkcell.com

Lithium Manganese Battery
Technology Specification

Customer _____

Part name Lithium Manganese Battery

Model No CR2032 240mAh 3.0V

Serial No _____

Produce No _____

Approved by		**Drafted by**	Wenfei liang
Checked by		**Signed by**	Xiaojun nie
Prepared by		**Date**	2023-03-04

Company address: 9th Floor, Block B, Hongrongyuan North Station Center, No. 328, Mintang Road, Longhua District, Shenzhen, China, 518110.
（Tel）： +86-755-86670672
（Fax）：+86-755-86670609
E-mail： pkcell@pkcell.net pkcell@pkcell.com
Website： http://www.pkcell.net http://www.pkcell.com

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1 Scope 适用范围

The specification applies to CR2032 (Li/MnO_2) battery supplied by Shenzhen pkcell battery Co.,Ltd 本技术规格书适用于深圳市比苛电池有限公司生产的 CR2032 锂/二氧化锰扣式电池。

2 Characteristics and Performance 技术参数

2.1 Battery type 电池型号： CR2032

2.2 Nominal voltage 标称电压: 3.0 V

2.3 Normal capacity 标准容量: 240 mAh (15KΩ to cut-off voltage 2.0V at 23℃±3℃时 15KΩ负载电阻连续放电至 2.0V)

2.4 Operating temperature range 使用温度: -20～60℃

2.5 Storage temperature range 保存温度: -5～30℃

2.6 Normal weight 平均重量: 3g

2.7 Structure and Outside dimensions 结构和外观尺寸 : Fig1.

2.8: Performance 电池特性表:

CR2032 Performance 特性表

Table 表 1.

Item 项目	Condition 条 件	Test temperature 试验温度	Characteristic 特 性 值	
Open circuit voltage 开路电压	No load 无负载	23℃±3℃	3.05-3.45V	
			3.05-3.45V	
Load voltage 负载电压	15kΩ, after 5s 15kΩ5 秒内	23℃±3℃	3.00-3.45V	
			3.00-3.45V	
Discharge Capacity 放电容量	Continually discharge at 15kΩ resistance to cut-off voltage 2.0V 15kΩ负载连续放电，终止电压 2.0V	23℃±3℃	Normal 标准值	1200h
			The lowest 最小值	1140h

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Table 表 2.

Item 项目	Condition 条件	Characteristic 特 性 值
Fast Discharge Capacity 快速放电容量	Continually discharge at 3kΩ resistance to cut-off voltage 2.0V 3kΩ负载连续放电，终止电压 2.0V	210h
Self-discharge rate 自放电率	The normal temperature and humidity under normal storage for 12 months 常温常湿下保存 12 个月	Less than 5% 不大于 5%

3 Test 测试

3.1 Conditions 测试环境:

Temperature 温度、湿度、大气压: 25±15℃, Relative Humidity：65±10% Pressure: 1.0atm, (unless otherwise specified) 若无特别规定，试验条件均指：常温（23±3℃），常湿（65±10%），常压（1.0 atm）。

3.2 Measure Instrument 测试仪器和设备:

3.2.1 Dimensional measurement 尺寸测量仪: Caliper with accuracy of ±0.02mm. 测量误差不大于 0.02mm 的游标卡尺或具有同等精度的量具。 -3-

3.2.2 Voltmeter 电压表: this has an accuracy of±0.2% and impedance of above 10MΩ. 精度不低于 0.25%的直流电压表，其内阻应不小于 10MΩ。

3.2.3 Exactitude resistance 精密电阻: tolerance should be ±0.5%.相对误差小于 0.5%

3.2.4 Resistance box 电阻箱: tolerance should be ±0.5%相对误差小于 0.5%.

3.2.5 constant temperature oven 电热恒温干燥箱: tolerance should be±2℃误差小于 2℃.

3.3 Initial test 样品电池测试:

Cells should be tested in the first 3 months after production 指电池下机后三个月以内开始进行的试验.

3.4 Outside dimensions 外形尺寸:

The measuring instrument as specified 3.2.1 is used. The result should meet the requirement of 2.7 采用 3.2.1 所规定的量具进行测量。结果应满足 2.7 之要求.

3.5 Open circuit voltage 开路电压:

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Cells should be stored for not less than 24 hours at the normal conditions as specified 3.1, at the same circumstance use voltmeter, specified in 3.2.2 to measure voltage between "+" and"-". Results should meet the requirement of table 1 电池在 23℃±3℃下放置 24 小时以上，用 3.2.2 所规定的直流电压表进行测量。结果应满足表 1 之要求.

3.6 Load voltage 负载电压:

Cells should be stored for not less than 24 hours at the normal conditions as specified 3.1, at the same circumstance, Parallel connect meter and 15kΩresistance specified in 3.2.2 to measure voltage between "+" and"-". Result should meet the requirement of table 1 电池在 23℃±3℃下放置 24 小时以上，用 15kΩ负载电阻连接在电池两极，用 3.2.2 所规定的直流电压表测量电池两极间的电压。结果应满足表 1 之要求.

3.7 Discharge capacity 放电容量:

Cells should be stored for not less than 24 hours at the normal conditions as specified 3.1, Continually discharge at 15kΩ resistance to cut-off voltage 2.0v. Results should meet the requirement of table 1 测试的样品电池应在 23℃±3℃下放置 24 小时以上，用 15kΩ负载电阻连接电池两极进行连续放电，到 2.0V 终止。放电时间应满足表 1 之要求.

3.8 Appearance 外观: -4-

No scathe, no crackle, no rust, no dirty spots, and mark clearly 目视检查，电池表面应光洁,无漏液，无划伤变形,标志清晰.

3.9 Terminal arrangement 极端:

Have good conduction performance, no deformation and leakages 具有良好的导电性能，无漏液、锈蚀现象.

3.10 leakage proof characteristic 耐漏液性能

Store sample cells 30 days at 45±3℃, relative humidity below 70%, then check appearance at normal temperature and normal humidity with naked eyes. Cells should be no leakage 电池在 45℃±3℃，相对湿度 70%以下条件下贮存 30 天，然后在常温、常湿环境中目测，应无漏液现象.

3.11 Self-discharge rate 自放电率

Self-discharge rate can calculated as below equation, result should meet the requirement of table 2 自放电率按下式计算，结果应满足表 2 之要求.

A1-A2

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$$\text{Self-discharge rate 自放电率(\%)} = \frac{A2}{A1} \times 100\%$$

A1 —— Cell average discharge capacity in initial period 电池初始期平均放电容量;

A2 —— average discharge capacity after storage 电池贮存后平均放电容量;

3.12 Vibration Test 耐振动性:

The battery is to be subjected to simple harmonic motion with amplitude of 0.8mm. The frequency is to be varied at the rate of 1 Hz per minute between 10 and 55 Hz, and return back between 90 and 100 minutes. The battery is to be tested in three mutually perpendicular directions 试验电池承受以下振动后电池性能应符合表 1 之要求。（单振幅 0.8 mm,双振幅 1.6 mm，频率在 10-55Hz 之间以 1Hz/min 的速率变化，并在 90-100min 复原，振动要在 X、Y、Z 三个方向进行。）

3.13 Drop Test 耐跌落性:

Cell should be dropped 10 times from the height of 1.9m onto cement ground. Result should be no leakage, no fire and no explosion 试验电池从 1.9m 的高度任意取向跌落到水泥地面上 10 次。电池应无漏液、无起火、无爆炸

3.14 Short- circuit test 短路试验:

The cell is to be short-circuited by connecting the positive and negative terminals of the cell with copper wire having a resistance about 0.1Ω. Cell is to be completely discharged or its surface temperature has returned to ambient temperature. During the process, cell should be no fire and no explosion 用Φ1.3mm 的最短铜线将试验电池的正、负极连接起来，直到完全放电或外壳温度恢复到测试环境温度。全过程应不出现火焰或爆炸;

4 Mark 标志

4.1 Cell type 电池型号: CR2032

4.2 Nominal voltage 标称电压: 3V

4.4 Polarity 极性: +

5 Inspection rules 检验规则

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5.1 Deliver inspection: Depending on GB2828 交收检验：依据 GB2828

Table 3 表 3

Number	Test 试验项目	Item 条款	IL	AQL
1	Dimensions 外形尺寸	3.4	S-2	0.4
2	Appearance 外观	3.8	II	1.0
3	Open circuit voltage 开路电压	3.6	II	0.4
4	Discharge capacity 放电容量	3.7	--	--

5.2 Routine inspection: Depending on GB2829 and QB/T2389 例行检验：依据 GB2829 和 QB/T2389

6. Inspection for service output 容量检验

6.1 9 samples shall be tested for service output 样品数为 9 只

6.2 If the average value is equal to or more than the value of table 1, and if the number of batteries showing a value less than 80% of the value of table 1 is 1 or less. The batteries are considered to conform to the requirement. 当平均放电容量不低于表 1 所规定的标准值，且低于标准值 80%的电池数不大于 1 时，判定电池容量合格。

6.3 If the average value is less than the value of table 1,or if the number of batteries showing a value less than 80% is 2 or more, the test shall be repeated with other 9 pieces. At the second test, if the average value is equal to or more than the value of table 1,and if the number of batteries showing a value less than 80% of the value of table 1 is 1 or less, these batteries are considered to conform to the requirement. 当平均放电容量低于表 1 所规定的标准值，或低于标准值 80%的电池数大于 1 时，重新取 9 只样品进行试验，若平均放电容量不低于表 1 所规定的标准值，且低于标准值 80%的电池数不大于 1 时，判定电池容量合格。

6.4 At above second test, if the average value is less than the value of table 1, or if the number of batteries showing a value less than 80% of the value of table 1 is 2 or more, the

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batteries are considered not to conform to the requirement. third test shall not be performed. 若第二次试验中平均放电容量低于表 1 所规定的标准值，或低于标准值 80%的电池数大于 1 时，判定电池容量不合格，不再进行第三次试验。

7 Disply and storage 陈列和贮存

7.1 Batteries shall be stored in well-ventilateddry and cool conditions 电池应贮存在通风良好,阴凉干燥处

7.2 Battery cartons should not be piledup in severa layers,or should not exceed a specified height 电池箱不应层叠,或不应超过规定的高度;

7.3 Batteries should not be exposed to direct sun ray for a long time or placed in areas where they get wet by rain. 电池不应当长时间暴露在阳光直射处或放于雨淋之处;

7.4 Do not mix unpacked batteries so as to avoid mechanical damage and/or short circuit among each other 不要将去掉包装的电池混堆在一起.

8 Storage life 保存期限

Storage life of batteries are two years long at 20℃±2℃ and RH 60±15% 在 20℃±2℃,相对湿度 60±15%贮存条件下, 保存期限为 2 年.

9 Warnings and Cautions 警告和注意事项

9.1 Do not short circuited, recharge, heat, disassemble nor dispose in fire 不要将电池短路、充电、加热、拆卸或投入火中

9.2 Do not force-discharge.不要过放电

9.3 Do not make the anode and the cathode reversed 不要接反正负极

9.4 Do not solder directly 不要直接在电池上焊接

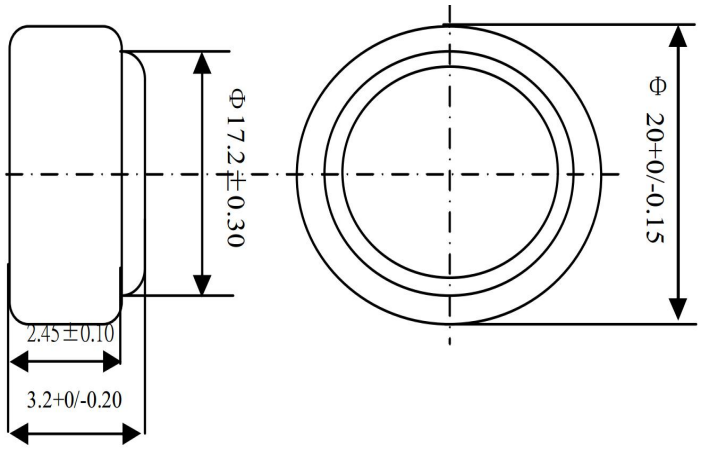
9.5 Keep battery out of children’s reach 将电池放置在儿童触及不到的地方

9.6 Do not store or use in the environment of over 85℃. 不要在温度超过 85℃的环境下使用和贮存电池

10 Note 注释

According to the need, this technical specification may be modified at any time. For more information, please consult with us 该技术规格书在需要时可能会随时进行修改，如需要详细的资讯请联系我们。

Fig1. Structure of CR2032 CR2032 结构图



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