

Lithium Manganese Battery Technology Specification

Customer _____

Part name Lithium Manganese Battery

Model No CR2032 210mAh 3.0V

Serial No _____

Produce No _____

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Product Modified Record List

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1 Scope 适用范围

The specification applies to CR2032 (Li/MnO₂) 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: 210 mAh (15K Ω to cut-off voltage 2.0V at 23°C $\pm$ 3°C时 15K Ω 负载电阻连续放电至 2.0V)
- 2.4 Operating temperature range 使用温度: -20-60°C
- 2.5 Storage temperature range 保存温度: 25 $\pm$ 15°C
- 2.6 Structure and Outside dimensions 结构和外观尺寸 : Fig1.
- 2.7: 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°C $\pm$ 3°C	3.05-3.45V	
			3.05-3.45V	
Load voltage 负载电压	15k Ω , after 5s 15k Ω 5 秒内	23°C $\pm$ 3°C	3.00-3.45V	
			3.00-3.45V	
Discharge Capacity 放电容量	Continually discharge at 15k Ω resistance to cut- off voltage 2.0V 15k Ω 负载连续放电, 终止电压 2.0V	23°C $\pm$ 3°C	Normal 标准值	1100h
			The lowest 最小值	1000h

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 3k Ω resistance to cut-off voltage 2.0V 3k Ω 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: $25 \pm 15^{\circ}\text{C}$, Relative Humidity: $65 \pm 10\%$
Pressure: 1.0atm, (unless otherwise specified) 若无特别规定, 试验条件均指: 常温 ($23 \pm 3^{\circ}\text{C}$), 常湿 ($65 \pm 10\%$), 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 $\pm 0.02\text{mm}$. 测量误差不大于 0.02mm 的游标卡尺或具有同等精度的量具。

3.2.2 Voltmeter 电压表: this has an accuracy of $\pm 0.2\%$ and impedance of 10^4 above $10\text{M}\Omega$. 精度不低于 0.25% 的直流电压表, 其内阻应不小于 $10\text{M}\Omega$ 。

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

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

3.2.5 constant temperature oven 电热恒温干燥箱: tolerance should be $\pm 2^{\circ}\text{C}$ 误差小于 2°C .

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:

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

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should meet the requirement of table 1 电池在 $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 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 $15\text{k}\Omega$ resistance specified in 3.2.2 to measure voltage between "+" and "-". Result should meet the requirement of table 1 电池在 $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 下放置 24 小时以上，用 $15\text{k}\Omega$ 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 $15\text{k}\Omega$ resistance to cut-off voltage 2.0v. Results should meet the requirement of table 1 测试的样品电池应在 $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 下放置 24 小时以上，用 $15\text{k}\Omega$ 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:

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。

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3.10 leakage proof characteristic 耐漏液性能

Store sample cells 30 days at $45 \pm 3^{\circ}\text{C}$, relative humidity below 70%, then check appearance at normal temperature and normal humidity with naked eyes. Cells should be no leakage 电池在 $45^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ，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。

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

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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

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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

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 batteries are considered not to conform to the requirement. third test shall not be performed. 若

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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 Display and storage 陈列和贮存

- 7.1 Batteries shall be stored in well-ventilated dry 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 piled up in several 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 $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and RH $60 \pm 15\%$
在 $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 相对湿度 $60 \pm 15\%$ 贮存条件下, 保存期限为 2 年。

9 Warnings and Cautions 警告和注意事项

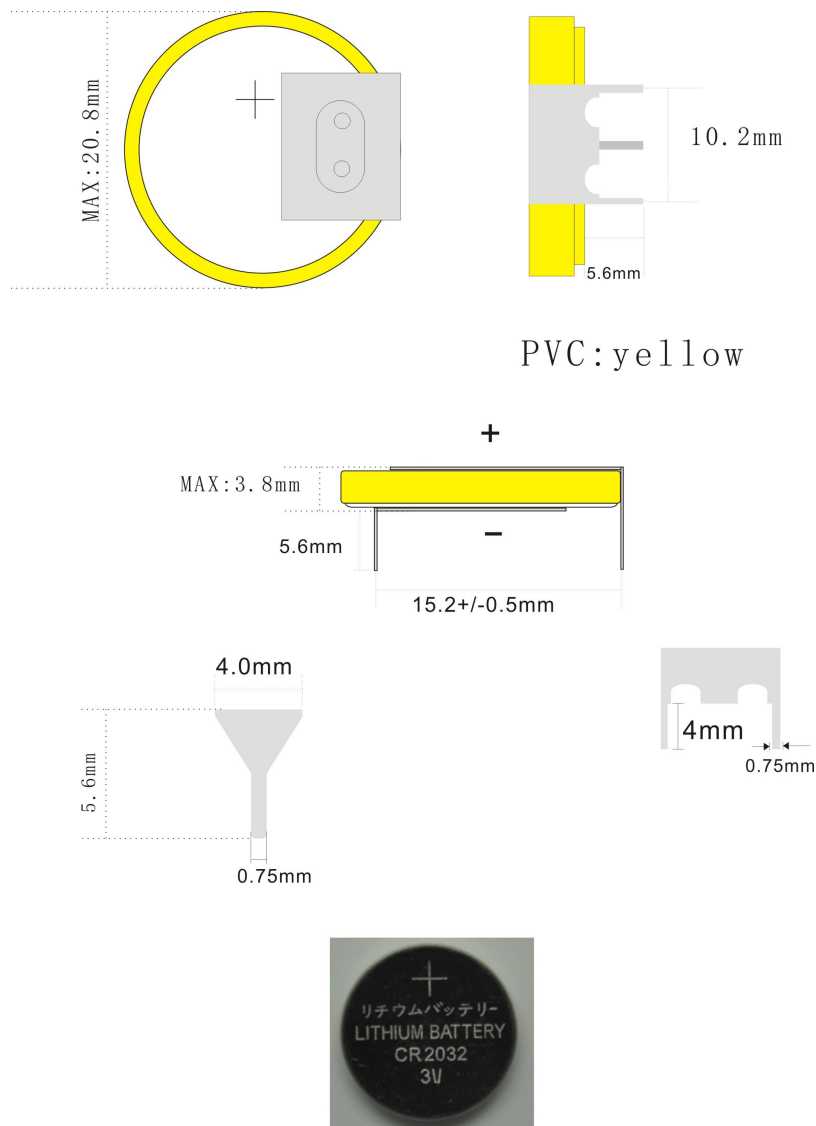
- 9.1 Do not short circuited, recharge, heat, disassemble nor dispose in fire
不要将电池短路、充电、加热、拆卸或投入火中
- 9.2 Do not force-discharge. 不要过放电
- 9.3 Do not make the anode and the cathode reversed
不要接反正负极
- 9.4 Do not solder directly
不要直接在电池上焊接
- 9.5 Keep battery out of children's reach
将电池放置在儿童触及不到的地方
- 9.6 Do not store or use in the environment of over 85°C .
不要在温度超过 85°C 的环境下使用和贮存电池

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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



.....结束.....