



新能源动力及储能系统专家

NEW ENERGY POWER AND ENERGY STORAGE SYSTEM EXPERT

瑞浦兰钧

瑞浦兰钧能源股份有限公司

REPT BATTERO ENERGY CO., LTD.

Production Specification

产品规格书

Cell model 电池型号: CB56-104Ah

Cell Type 电芯类型: Lithium-ion

Manufacturer 编制	Check 审核	Approval 批准
Customer Approval 客户签收:		

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Version 版本号	Date 更改时间	Event 更改内容
01	2021-09-08	新版发行
02	2021-12-01	① 电芯重量更新 ② 建议 SOC 使用范围调整 ③ 快速充电条件更新
03	2021-12-29	电芯尺寸更新
04	2022-8-3	更新公司名称
05	2022-11-25	补充推荐 SOC 使用范围对应的电压区间
06	2023-10-19	更新公司 logo

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1 Scope 适用范围

This document is applicable to the CB56-104Ah Li-ion cell produced by REPT co. LTD. This document covers performance requirements, test procedures, transportation and storage requirements and other items need to notice.

本产品规格书规定了 CB56-104Ah 型锂离子电池的性能要求、试验方法、运输、贮存要求和注意事项等。

2 规范性引用文件

The following documents are essential for this document. For reference documents with date, only dated versions apply to this document. For reference documents with date, the latest version (including all amendments) applies to this document.

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

GB/T 31484—2015 Cycle life requirements and test methods for traction cell of electric vehicle

GB/T 31484—2015 电动汽车用动力蓄电池循环寿命要求及试验方法

GB/T 31485—2015 Safety requirements and test methods for traction cell of electric vehicle

GB/T 31485—2015 电动汽车用动力蓄电池安全要求及试验方法

GB/T 31486—2015 Electrical performance requirements and test methods for traction cell of electric vehicle

GB/T 31486—2015 电动汽车用动力蓄电池电性能要求及试验方法

GB/T 19596 Terminology of electric vehicles

GB/T 19596 电动汽车术语

3 Performance Requirements 性能指标

Note: The following specifications are only available to fresh cells.

注：指标只针对于新电池

3.1 概要

No. 序号	Item 项目	Specification 规格	Comment 备注
3.1.1	Nominal Capacity 标称容量	104Ah (1C) 106Ah (1/3C)	25±2°C 恒温房测试
3.1.2	Nominal Energy 标称能量	341.32Wh	1/3C
3.1.3	Voltage 工作电压范围	2.5-3.65V 2.0-3.65V	T>0°C T≤0°C
3.1.4	Maximum Discharging Current 峰值放电电流	312A	25°C, 50%SOC, 30s
3.1.5	Maximum Charging Current 峰值充电电流	208A	25°C, 50%SOC, 10s
3.1.6	Working Temperature 使用温度	Charge 充电: 0°C~55°C Discharge 放电: -30°C~55°C	
3.1.7	Storage Temperature 贮存温度	-20°C~55°C	
3.1.8	Dimensions 电池尺寸	Thickness 厚度: 52.32±0.50mm Width 宽度: 148.40±0.50mm 总高: 119.00±0.60mm	Figure7
3.1.9	Cathode Material 正极材料	磷酸铁锂 Lithium-iron-phosphate	
3.1.10	Cell Weight 电池重量	1.94±0.1kg	
3.1.11	Energy Density 能量密度	176Wh/kg	1/3C
3.1.12	IMP 电池内阻 (1KHz)	≤0.5mΩ	
3.1.13	Shipping capacity 出货容量	17.7±1Ah	17%SOC
3.1.14	Cycle Life 循环寿命	≥3500 次	25±2°C, 3-100%DOD, Step charge/1C 循环至 容量衰减到 70%额定 容量
3.1.15	Recommended SOC Range 建议 SOC 使用范围	3%~100%	

3.2 充电模式/参数

3.2.1 标准充电条件

No.	参数	规格	条件
3.2.1.1	标准充电电流 Standard charge current	1/3C	25±2°C
3.2.1.2	标准充电电压 Standard charge voltage	3.65V	
3.2.1.3	标准充电模式 Standard charging mode	1/3C 恒流持续充电至 3.65V，然后在 3.65V 下恒压持续充电直至电流下限 0.05C。	
3.2.1.4	标准充电温度 Standard charge temperature	25±2°C	电芯温度

3.2.2 快速充电条件

SOC/电压	0~80% (平均倍率)	90%	95%	3.6V	3.65V
< 0	不允许充电				
0	0.20	0.10	0.08	0.08	0.05
5	0.33	0.15	0.10	0.10	0.05
10	0.45	0.24	0.15	0.12	0.08
15	0.60	0.28	0.18	0.15	0.10
20	0.94	0.40	0.26	0.26	0.20
25	1.10	0.60	0.33	0.33	0.20
45	1.10	0.60	0.33	0.33	0.20
50	0.60	0.60	0.33	0.33	0.20
55	0.20	0.20	0.20	0.20	0.20
> 55	不允许充电				

充电窗口的单位为 C（倍率），充电时参考的容量默认按照 SOH 进行衰减；常温条件下，BOL 的 1C 容量为 104Ah，1C=104A，不同 SOH 下的充电电流 1C=104*SOH，采用 step-charge 分布充电的方式。

3.3 放电模式/参数

No.	参数	规格	条件
3.3.1	标准放电电流 Standard discharge current	1/3C	25±2°C
3.3.2	最大持续放电电流 Maximum continuous discharge current	2C	不支持循环
3.3.3	标准放电温度 Standard discharge temperature	25±2°C	电芯温度
3.3.4	放电温度范围 Discharge temperature range	-30-55°C	电芯温度超出放电温度范围，则停止放电

4 Electrical Performance 电性能

4.1 Standard Test Conditions 标准测试条件

The following parameters are only applicable to new products delivered to customers by REPT, not for the products after use. Storage time is less than one month and cycle number is less than 5 times

电池应为新产品(在制造后少于 1 个月储存)，循环次数少于 5 次。除非另有说明，本规范中的所有测试条件如下：

Temperature: 25±5°C, Humidity: 15%~90% RH, Pressure: 86kPa~106kPa. Room temperature is 25±2°C, 1C current is 104A in this document.

温度: 25±5°C，湿度: 15%~90% RH，气压: 86kPa~106kPa。规格书中室温指的是 25±2°C，1C 电流为 104A。

4.2 测试设备精度

- (1) The accuracy of the multimeter to measure voltage should be not less than grade 0.5.
电压测量精度: ≥ 0.5 级.
- (2) The accuracy of the multimeter to measure current should be not less than grade 0.5.
电流测量精度: ≥ 0.5 级.
- (3) Temperature measurement precision is not lower than $\pm 0.5^{\circ}\text{C}$.
温度测量精度: $\pm 0.5^{\circ}\text{C}$.
- (4) Time measurement precision is not lower than $\pm 0.1\%$
时间测量精度: $\pm 0.1\%$.
- (5) Size dimension accuracy: is $\pm 0.1\%$
尺寸测量精度: $\pm 0.1\%$.

4.3 Electrical Performance Test 测试过程

序号	项目	测试过程	标准
4.3.1	Initial discharge capacity 初始放电容量	1) Test temperature: $25 \pm 2^{\circ}\text{C}$. 测试温度: $25 \pm 2^{\circ}\text{C}$. 2) Fully charge the cell in standard charging mode. 将电池以标准充电模式充满电 3) Stand by 30min. 搁置 30min 4) Discharge the cell with a current at 1C to 2.5V. 将电池以 1C 电流放电至 2.5V 5) Repeat step 2)-step 4) for 5 times. If the range value of discharge capacity for 3 consecutive cycles is less than 3% of the rated capacity, it can be terminated early, and the average value of the last three discharge capacities is taken as the initial discharge capacity. 充放电循环 5 次, 如果连续 3 圈的放电容量的极差 $\leq$ 额定容量的 3%, 可提前终止, 取后三次放电容量的均值作为放电初始容量	Initial discharge capacity $\geq 104\text{Ah}$ 放电容量 $\geq 104\text{Ah}$

4.3.2	High Temperature Discharge Capacity 高温放电	1) Fully charge the cell in standard charging mode. 将电池以标准充电模式充满电 2) Leave the cell at $55\pm 2^{\circ}\text{C}$ for 5h . 将电池在 $55\pm 2^{\circ}\text{C}$ 下搁置 5h. 3) Discharge with a current at 1C to 2.5V and record discharge capacity (Ah). 在 $55\pm 2^{\circ}\text{C}$ 下将电池以 1C 电流放电至 2.5V 并记录放电容量(Ah).	Discharge capacity $\geq 104\text{Ah}$ 放电容量 $\geq 104\text{Ah}$
4.3.3	Low Temperature Discharge Capacity 低温放电	1) Fully charge the cell in standard charging mode. 将电池以标准充电模式充满电 2) Leave the cell at $-20\pm 2^{\circ}\text{C}$ for 24h. 将电池在 $-20\pm 2^{\circ}\text{C}$ 下搁置 24h. 3) Discharge with a current at 1C to 2.0V and record discharge capacity (Ah). 在 $-20\pm 2^{\circ}\text{C}$ 下将电池以 1C 电流放电至 2.0V 并记录放电容量(Ah).	Discharge capacity $\geq 78\text{Ah}$ 放电容量 $\geq 78\text{Ah}$
4.3.4	Cycle Life 循环寿命	1) Test temperature: $25\pm 2^{\circ}\text{C}$. 测试温度: $25\pm 2^{\circ}\text{C}$. 2) Preload force: $300\pm 20\text{kgf}$ 初始夹紧力: $300\pm 20\text{kgf}$ 2) Step charge the cell to 3.65V, then stand by 60min. 以 Step charge 的方式充电至 3.65V, 搁置 60min. 4) Discharge with a current at 1C to 2.5V, then stand by 60min. 将电池以 1C 电流放电至 2.5V, 搁置 60min. 5) Cycle step 2) and 3) until capacity loss is more than 30% and record cycle number. 重复 3 和 4)步骤, 直到电池容量小于 70% 的初始容量, 并记录循环次数。	Cycle number ≥ 3500 times 循环寿命 ≥ 3500 次
4.3.5	Self-Discharge 自放电率	Within three months of cell cell's shipping. Test temperature: $25\pm 3^{\circ}\text{C}$, 17%SOC storage 出货三个月以内电芯, 标准充电到 17% 的充电状态, 25°C 温度储存	$\leq 3\%/ \text{月}$
4.3.6	Discharge	Discharge cell with a current of 1C for	$\leq 10^{\circ}\text{C}$

	Temperature rise 持续放电温升	10min 每个电池以 1C 电流放电 10min	
4.3.7	Pulse Discharge Temperature rise 脉冲放电温升	Discharge cell with a current at 3C for 30 seconds. 在任何充电状态下, 每个电池以 3C 电流放电 30 秒	$\leq 10^{\circ}\text{C}$

5 Safety 安全性能

序号	项目	测试过程	标准
5.1	Temperature Cycle 温度循环	1) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 2) Put the cell into an oven, set temperature based on table 5.1 and figure 5.1 for 5 cycles 将电池放入烘箱.烘箱温度根据表 5.1 和图 5.1 变化 5 次. 3) Observe the cell for 1 h 观察电池 1h.	No fire or explosion or leakage、 无着火、爆炸或者泄露
5.2	Thermal stability 热稳定性	1) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 2) Put the cell into an oven. The temperature of the oven is raised at a rate of $5^{\circ}\text{C}/\text{min}$ to $130\pm 2^{\circ}\text{C}$ and remain for 30min. 将电池放入烘箱. 电池温度以 $5^{\circ}\text{C}/\text{min}$ 达到 $130\pm 2^{\circ}\text{C}$ 并保持 30min. 3) Observe the cell for 1h 观察电池 1h.	No fire or explosion 无着火或爆炸
5.3	Drop 跌落	1) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 2) face down the terminal of cell and free drop from 1.5m height to cement floor 将电池正负极端子向下从 1.5m 高度处自由跌落到水泥地面上; 3) Observe the cell for 1h 观察电池 1h.	No fire or explosion Or leakage 无着火、爆炸或者泄露
5.4	Vibration 振动	1) Fully charge cell according to No..3.15 将电池以标准充电模式充满电. 2) Fix the cell on the vibration platform, processing the linear sweep vibration test by following conditions: Discharge current 1/3 C	No current fluctuation. Abnormal voltage 无电流波动, 异常电压; No form change,

		vibration direction: up and down Vibration rate: 10-55Hz Max acceleration: 30 m/s Sweep cycle: 10 times Vibration time: 3h 将电池固定到振动实验台上，按下述条件进行线性扫频振动试验： --- 放电电流: 1/3 C --- 振动方向: 上下单振动 --- 振动频率: 10~55Hz --- 最大加速度: 30m/s² --- 扫面循环: 10 次 --- 振动时间: 3h 3) Observe the cell 测试过程中观察电池现象.	leakage, or other abnormal 无变形、泄露或其他异常;
5.5	Seawater Immersion 海水浸泡	1) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 2) Put cell in NaCl of 3.5% concentration for 2 h 将电池浸入 3.5% NaCl 溶液中 2h. 3) Depth of water should not over cell 水深应完全没过电池.	No fire or explosion 无着火或爆炸
5.6	Low Air-Pressure 低气压	1) Test temperature 25±2°C 测试温度: 25±2°C. 2) Fully charge cell according to No. 3.15 将电池以标准充电模式充满电. 3) Put the cell in a low-pressure tank, pressure set as 11.6Kpa, rest for 6 h 将电池放入低气压箱中，气压保持为 11.6kPa，搁置 6h. 4) Observe for 1 h 观察电池 1h.	No fire or explosion Or leakage 无着火、爆炸或者泄露
5.7	Over-Charge 过充	1) Test temperature: 25±2°C 测试温度: 25±2°C. 2) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 3) Charge with current at 1C for 1h or voltage reach 5.5V 将电池以 1C 电流充电 1h 或者电压达到 5.5V. 4) Observe for 1 h 观察电池 1h.	No fire or explosion 无着火或爆炸

5.8	Over-Discharge 过放	1) Test temperature: 25 ±2°C 测试温度: 25±2°C. 2) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 3) Discharge with current at 1C for 90 min 将电池以 1C 电流放电 90min. 4) Observe for 1 h 观察电池 1h.	No fire or explosion Or leakage 无着火、爆炸或者泄露
5.9	Short Circuits 短路	1) Test temperature: 25 ±2°C 测试温度: 25±2°C. 2) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 3) External short circuit cell 10 mins, resistance of external circuit no larger than 5mΩ 将电池经外部短路 10min, 外部线路的电阻 ≤5mΩ. 4) Observe cell for 1h 观察电池 1h.	No fire or explosion 无着火或爆炸
5.10	Crush 挤压	1) Fully charge the cell in standard charging mode 将电池以标准充电模式充满电. 2) Crush direction: perpendicular to the direction of the cell monomer plate, or the same direction that the cell monomer is most likely to be crushed in vehicle; Form of crush plate: semi-cylinder with a radius of 75mm, the length (L) of the semi-cylinder is greater than the size of the extruded cell monomer; speed: no more than 2 mm/s; terminal condition: voltage reaches 0V or the deformation reaches 15% or force reaches 100 kN or 1000 times the weight of cell. 挤压方向: 垂直于电池单体极板方向施压, 或与电池单体在整车布局上最容易受到挤压的方向相同; 挤压板形式: 半径 75 mm 的半圆柱体, 半圆柱体的长度 (L) 大于被挤压电池单体的尺寸; 挤压速度: 不大于 2 mm/s; 挤压程度: 电压达到 0 V 或变形量达到 15%或挤压力达到 100 kN 或 1000 倍试验对象重量后停止挤压;	No fire or explosion 无着火或爆炸

	3) Hold for 10 minutes 保持 10 min	
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表 5.1 温度循环中时间和温度的变化

温度(°C)	时间间隔 (min)	累计时间(min)	温度变化速率(°C/min)
25	0	0	0
-40	60	60	13/12
-40	90	150	0
25	60	210	13/12
85	90	300	2/3
85	110	410	0
25	70	480	6/7

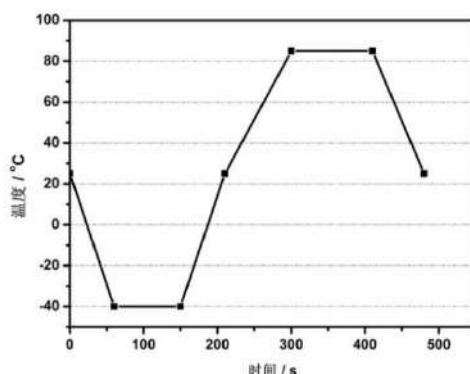


图 5.1 温度循环中温度时间曲线

使用条件说明: 安全测试、寿命测试、系统成组设计需要施加预紧力，电芯的预紧力范围为 1500N~5000N，建议的预紧力控制公差为 $\pm 200\text{N}$ 。

Description of service conditions: safety test、 cycle life test and pack design need to add preload force, and the range of preload force of cell is 1500N~5000N, the recommended preload tolerance is $\pm 200\text{N}$.

6 Cell Transportation and Storage 运输和存储

6.1 Transportation 运输

Transport the cell in forms of package by truck, railway, ship or airplane. Severe vibration, impact, crush, exposure to the sun and rain during transportation should be avoided. The SOC of cell should be kept between 10-30%.

应根据运输的目的地和运输方式，选定合适的电池包包装方式。在运输过程中应防

The warranty period follows the contract. However, even though the problem occurs within warranty period, REPT won't replace a new cell for free as long as the problem is not due to the failure of REPT's manufacturing/shipping process, but due to customer's misuse.

电池的保质期限依商务合同而定。在此期限内，如果非制造厂商的制程和品质管理原因，而是用户误用造成的电池问题，瑞浦兰钧能源股份有限公司可提供技术指导意见，不承诺免费更换服务。

REPT will not undertake responsibility under the following situations.

瑞浦兰钧能源股份有限公司对以下几种情况产生的问题及安全事故不承担任何责任：

- 1) Issues and safety accidents caused due to the violation of safety instruction.

违反安全使用指南所产生的问题及安全事故；

- 2) Bad cell during assembling by customer after delivery.

出货后用户在电池组装过程中产生的不良电池；

- 3) Issues caused due to the connection of cell, circuit and cell charger.

电池与电路、电池组和充电器搭配使用所产生的问题。

For safety consideration, the customer should contact REPT in advance if other special applications are needed, especially equipment design, Li-ion cell system circuit protection, high current and so on.

为了安全起见，如有配套设备设计、锂离子电池系统保护电路或大电流等其它方面的特殊应用，请先咨询瑞浦兰钧能源股份有限公司相关事宜。

9 Safety Instruction 安全使用指南

Read the following advice carefully to ensure the right use of REPT Prismatic lithium-ion cell.

为避免滥用方形锂离子电池模块造成的电池损害或人身伤害，在使用方形锂离子电池之前，请认真阅读下面的安全指南：

CAUTION 警告!



- 1) Risk of fire, explosion, and burns. Do not disassemble, crush, heat the cell or dispose it into fire;

电池非正确使用和存放具有火灾、爆炸和烧伤的风险，勿将电池分解、压碎、焚化、加热和投入火中；

- 2) Keep the cell out of reach of children and don't remove the original package before use.

Dispose the used cell according to local recycling or waste disposition regulations;

将电池置于儿童能接触的范围之外，使用之前不得将电池原包装移除，应根据当地的回收或废弃物法规及时处理废旧电池；

- 3) Replace the cell manufactured by the same manufacture only. Mixed use of cell from

other manufacture might cause fire and explosion;

如需更换电池，应使用同一制造商生产的电池， 使用其他制造商提供的电池可能存在起火和爆炸的风险；

- 4) Do not throw the cell into water or make it wet;

勿将电池投入水中或将其弄湿；

- 5) Do not connect positive and negatives with metal cover; ‘

勿将电池正负极与金属壳体同时接触；

- 6) Do not make the cell short circuit, over-charge or over-discharge;

勿将电池短路、过充或过放；

- 7) Do not use or store the cell near the heat source (such as fire or heater):

勿在热源(如火或加热器) 附近使用或贮存电池；

- 8) Do not connect the position (+) and negative (-) terminals in the opposite way;

勿将电池正负极接反；

- 9) Do not put the cell together with coin, metal jewelry and other metal objects;

勿将电池与硬币，金属饰品或其它金属物品放置在一起；

- 10) Do not put the cell together with coin, metal jewelry and other metal objects;

勿用钉子或其它尖锐物体刺穿电池壳体，禁止锤击或脚踏电池；

- 11) Do not weld the cell directly;

勿直接焊接电池；

- 12) Do not disassemble or modify the cell in any way;

勿擅自以任何方式拆卸或修整电池；

- 13) Do not disassemble or modify the cell in any way;

勿撞击、投掷或者使电池受到机械震动及自然跌落；

- 14) Mixed use of different types, brand of cell is forbidden;

勿将不同种类、不同品牌的锂离子电池混合使用；

- 15) Do not connect the negative pole with the shell which is positive;

勿将负极柱与壳体(正电性)相连；

- 16) Stop use the cell and relocate the cell to a safe place it if cell gives off peculiar smell,

temperature increase, deforms, color change or any other abnormal phenomena.

如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用

并将电池转移出使用环境;

- 17) If cell catch fire, use dry powder, foam fire extinguisher or sand to extinguish flames and remove it from the operating environment;

如果电池起火, 需用干粉、泡沫灭火器、沙子等熄灭并远离使用环境。

10 Shipment Status 出货状态

The cells should be shipped with 17% SOC if customer has no special requirements.

客户若无特殊要求, 电池出厂时具有 17%左右的电量。

11 Technical Consultant 制造商信息

Manufacturer: REPT BATTERO Energy Co., Ltd.

制造商: 瑞浦兰钧能源股份有限公司

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