



新能源动力及储能系统专家
NEW ENERGY POWER AND ENERGY STORAGE SYSTEM EXPERT

瑞浦能源有限公司
RUIPU ENERGY CO., LTD.

产品规格书

Production Specification

电池型号 Battery Module: CB29148112EA
电芯类型 Cell Type: Li-ion
电芯型号 Cell Model: CB29148112EA-54Ah

Manufacturer	Prepare/Date	Check/Date	Approval/Date
Customer Approval	Prepare/Date		Approval/Date

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1 适用范围 Scope

本产品规格书规定了 CB29148112EA-54Ah 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。

This document is applicable to the CB29148112EA-54Ah Li-ion battery produced by REPT co. LTD. This document covers performance requirements, test procedures, transportation and storage requirements and other items need to notice.

2 规范性引用文件 Reference Documents

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。

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.

- 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 31484—2015 Cycle life requirements and test methods for traction battery 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
GB/T 31485—2015 Safety requirements and test methods for traction battery 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
31486—2015 Electrical performance requirements and test methods for traction battery of electric vehicle
- GB/T 19596 电动汽车术语
- GB/T 19596 Terminology of electric vehicles

3 性能指标 Performance Requirements

注：指标只针对于新电池。

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

序号 No.	项目 Item	规格 Specification	备注 Comment
3.1	标称容量 Typical Capacity	55Ah	25 ± 2°C, 0.33C/0.33 C
		54Ah	25 ± 2°C, 1.0C/1.0 C
3.2	标称电压 Typical Voltage	3.22 V	25 ± 2°C, 0.33 C
		3.17 V	25 ± 2°C, 1.0 C
3.3	工作电压范围 Operating Voltage	2.5-3.65 V	0°C < T < 60°C
		2.0-3.65 V	-30°C ≤ T ≤ 0°C
3.4	标准放电电流 Standard Discharging Current	54 A	25±2°C
3.5	最大持续放电电流 Maximum Continuous Discharging Current	108A	25±2°C
3.6	峰值放电电流 Maximum Discharging Current	324 A	@10s, SOC ≥ 50%, 25±2°C
3.7	标准充电电流 Standard Charging Current	54A	25±2°C
3.8	最大持续充电电流 Maximum Continuous Charging Current	54A	25±2°C
3.9	峰值充电电流 Maximum Charging Current	108 A	@10s, SOC ≤ 50%
3.10	使用温度 Operating Temperature	-20°C ≤ T ≤ 55°C	充电 Charge
		-30°C ≤ T < 60°C	放电 Discharge
3.11	贮存温度 Storage Temperature	-30°C ~ 55°C	存储环境湿度 ≤ 95%ROH, 无凝露 Storage ambient humidity < 95%ROH, no

			condensation
3.12	电池尺寸 Typical Dimension	厚度 Thickness: 29.72 ± 0.30 mm 宽度 Width: 148.66 ± 0.50 mm 肩高 Shoulder Height : 112.67 ± 0.50 mm 总高 Total Height : 114.61 ± 0.50 mm	@3000 $\pm$ 200 N, 27%SOC
3.13	正极材料 Cathode Material	LiFeO ₄	
3.14	电池重量 Cell Weight	1.082 $\pm$ 0.03kg	
3.15	能量密度 Energy Density	158Wh/kg 344Wh/L	1.0C
3.16	电池内阻 ACR (1 kHz)	≤ 0.50 m Ω	新鲜态 ~ 27% SOC
3.17	标准充电模式 Standard Charging Method (CC&CV)	在环境温度(25 $\pm$ 2) $^{\circ}$ C条件下, 采用先恒流再恒压方式充电。恒流电流为 1.0 I ₁ (A), 恒压电压为 3.65V, 在恒压过程中当电流降至 0.05I ₁ (A)终止充电, 静置 1 小时。 In an ambient temperature of 25 $\pm$ 5 $^{\circ}$ C, battery is charged with constant current of 1.0I ₁ (A) until 3.65V. Then it is charged at a constant voltage of 3.65V until the current is less than 0.05I ₁ (A), and rest one hour.	

4 电性能 Electrical Performance

4.1 标准测试条件 Standard Test Conditions

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:

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.

Temperature : 25 $\pm$ 2 $^{\circ}$ C, Humidity : 15% ~ 90%RH , Pressure : 86 kPa~106 kPa.
Room temperature is 25 $\pm$ 2 $^{\circ}$ C, 1I₁(A) current is 54 A in this document.

(1) 充电模式 Charge mode

Temperature	Standard charging	Fast charging
T < -20 $^{\circ}$ C	不允许充电/Limited Charging	不允许充电/Limited Charging
-20 $^{\circ}$ C $\leq$ T < -10 $^{\circ}$ C	0.01I ₁ (A)	0.04 I ₁ (A) CC 5%-80% SOC
-10 $^{\circ}$ C $\leq$ T < -5 $^{\circ}$ C	0.03 I ₁ (A)	0.06 I ₁ (A) CC 5%-80% SOC
-5 $^{\circ}$ C $\leq$ T < 0 $^{\circ}$ C	0.06 I ₁ (A)	0.16 I ₁ (A) CC 5%-80% SOC

$0^{\circ}\text{C} \leq T < 5^{\circ}\text{C}$	$0.10 I_1(\text{A})$	$0.22 I_1(\text{A})$ CC 5%-80% SOC
$5^{\circ}\text{C} \leq T < 10^{\circ}\text{C}$	$0.20 I_1(\text{A})$	$0.27 I_1(\text{A})$ CC 5%-80% SOC
$10^{\circ}\text{C} \leq T < 15^{\circ}\text{C}$	$0.33 I_1(\text{A})$	$0.42 I_1(\text{A})$ CC 5%-80% SOC
$15^{\circ}\text{C} \leq T < 20^{\circ}\text{C}$	$0.50 I_1(\text{A})$	$0.58 I_1(\text{A})$ CC 5%-80% SOC
$20^{\circ}\text{C} \leq T < 25^{\circ}\text{C}$	$0.50 I_1(\text{A})$	$0.94 I_1(\text{A})$ CC 5%-80% SOC
$25^{\circ}\text{C} \leq T < 45^{\circ}\text{C}$	$1.00 I_1(\text{A})$	$1.15 I_1(\text{A})$ CC 5%-80% SOC
$45^{\circ}\text{C} \leq T < 55^{\circ}\text{C}$	$0.33 I_1(\text{A})$	$0.95 I_1(\text{A})$ CC 5%-80% SOC
$> 55^{\circ}\text{C}$	不允许充电/Limited Charging	不允许充电/Limited Charging

(2) 放电模式 Discharge method

参数	产品规格	条件
标准放电电流 Standard Discharging Current	54 A	$25 \pm 2^{\circ}\text{C}$
最大持续放电电流 Maximum Continuous Discharging Current	108 A	$25 \pm 2^{\circ}\text{C}$
最大脉冲放电电流（长脉冲） Maximum Discharging Current(long pulse)	270A	$25 \pm 2^{\circ}\text{C}$, $\geq 30\%\text{SOC}$, 30s
最小脉冲放电截止电压 Cut-off voltage	2.5 V	$25 \pm 2^{\circ}\text{C}$
标准放电温度 Standard Discharge Temperature	$25 \pm 2^{\circ}\text{C}$	

(3) 脉冲放电模式: Pulse discharge method

SOC	温度 Temperature							
	$< -30^{\circ}\text{C}$	$\geq -30^{\circ}\text{C}$	$\geq -20^{\circ}\text{C}$	$> 0^{\circ}\text{C}$	$\geq 10^{\circ}\text{C}$	$\geq 25^{\circ}\text{C}$	$\geq 55^{\circ}\text{C}$	$\geq 60^{\circ}\text{C}$
$\geq 30\%$	0	56W/60s	86W/60s	245W/60s	398W/60s	430W/60s	113W/60s	Limited
Cut-off voltage	0	2.0V	2.0V	2.5V	2.5V	2.5V	2.5V	Limited

4.2 测试设备精度 Test Equipment Requirements

(1) 测试设备精度: $\pm 0.1\%$ 。

Measurement instrument accuracy is $\pm 0.1\%$.

(2) 电流测量精度: ≥ 0.5 级, 电压测量精度: ≥ 0.5 级。

The accuracy of the multimeter to measure voltage and current should be not less than grade 0.5.

(3) 温度测量精度: $\pm 0.5^{\circ}\text{C}$ 。

Temperature measurement precision is not lower than $\pm 0.5^{\circ}\text{C}$.

(4) 时间测量精度: $\pm 0.1\%$ 。

Time measurement precision is not lower than $\pm 0.1\%$.

(5) 尺寸测量精度: $\pm 0.1\%$ 。

Size dimension accuracy: is $\pm 0.1\%$

4.3 测试过程 Electrical Performance Test

序号 No.	项目 Item	测试过程 Testing method	标准 Criteria
4.3.1	室温放电容量 (初始容量) Room temperature capacity (Initial capacity)	1) 测试温度: $25 \pm 2^\circ\text{C}$ Test temperature: $25 \pm 2^\circ\text{C}$ 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 3) 将电池以 $1.0 I_1(\text{A})$ 电流放电至 2.5V 并记录放电容量(Ah). Discharge with a current at $1.0 I_1(\text{A})$ to 2.5V and record as discharge capacity and initial capacity.	$110\% \times \text{额定容量} \geq \text{放电容量}$ $\geq 100\% \times \text{额定容量}$ $110\% \times \text{Nominal capacity}$ $\geq \text{Discharge capacity} \geq 100\% \times \text{Nominal capacity}$
4.3.2	室温倍率充电 Room temperature charge rate	1) 测试温度: $25 \pm 2^\circ\text{C}$. Temperature: $25 \pm 2^\circ\text{C}$. 2) 将电池以 $1 I_1(\text{A})$ 放电至 2.5V , 并静置 1h. Discharge with a current at $1 I_1(\text{A})$ to 2.5V and rest 1 hour. 3) 将电池以 $2 I_1(\text{A})$ 电流充电至 3.65V , 3.65V to $0.05 I_1(\text{A})$ 并静置 1h. Charge with a current at $2 I_1(\text{A})$ to 3.65V , 3.65V constant voltage to $0.05 I_1(\text{A})$ and rest 1 hour. 4) 将电池以 $1.0 I_1(\text{A})$ 电流放电至 2.5V 并记录放电容量 Discharge with a current at $1.0 I_1(\text{A})$ to 2.5V and record discharge capacity.	$\text{放电容量} \geq 85\% \times \text{初始容量}$ $\text{Discharge capacity} \geq 85\% \times \text{Nominal capacity}$
4.3.3	室温倍率放电 Room temperature discharge rate	1) 测试温度: $25 \pm 2^\circ\text{C}$. Temperature: $25 \pm 2^\circ\text{C}$. 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 3) 将电池以 $2 I_1(\text{A})$ 电流放电至 2.5V 并记录放电容量(Ah). Discharge with a current at $2 I_1(\text{A})$ to 2.5V and record discharge capacity.	$\text{放电容量} \geq 95\% \times \text{初始容量}$ $\text{Discharge capacity} \geq 95\% \times \text{Nominal capacity}$
4.3.4	高温放电 High temperature discharge capacity	1) 根据 3.17 将电池充满电 Full charge cell according to No. 3.17. 2) 将电池在 $55 \pm 2^\circ\text{C}$ 静置 5h. Temperature: $55 \pm 2^\circ\text{C}$ rest 5 hours. 3) 在 $55 \pm 2^\circ\text{C}$ 下将电池以 $1.0 I_1(\text{A})$ 电流放电至 2.5V 并记录放电容量(Ah). Discharge with a current at $1.0 I_1(\text{A})$ to 2.5V and record discharge capacity(Ah). 4) 将电池在 $25 \pm 2^\circ\text{C}$ 静置 12h 并检查电池的外观. Temperature: $25 \pm 2^\circ\text{C}$ for 12 hours and check the	无变形、膨胀、漏液 No apparent deformation and leakage $\text{放电容量} \geq 99\% \times \text{初始容量}$ $\text{Discharge capacity} \geq 99\% \times \text{Nominal capacity}$

		appearance of battery.	
4.3.5	低温放电 Low temperature discharge capacity	1) 根据 3.17 将电池充满电 Full charge cell according to No. 3.17. 2) 将电池在 $-20\pm 2^{\circ}\text{C}$ 下静置 24h. Temperature: $-20\pm 2^{\circ}\text{C}$ rest 24 hours. 3) 将电池以 $1.0I_1(\text{A})$ 电流放电至 2.0V 并记录放电容量(Ah). Discharge with a current at $1.0 I_1(\text{A})$ to 2.0V and record discharge capacity(Ah). 4) 将电池在 $25\pm 5^{\circ}\text{C}$ 静置 12h 并检查电池的外观. Temperature: $25\pm 5^{\circ}\text{C}$ for 12 hours and check the appearance of battery.	无变形、膨胀、漏液 No apparent deformation and leakage 放电容量 $\geq 70\%$ * 初始容量 Discharge capacity $\geq 70\%$ * Nominal capacity
4.3.6	循环寿命 Cycle Life	1) 测试温度: $25\pm 2^{\circ}\text{C}$. Test temperature: $25\pm 2^{\circ}\text{C}$. 2) 初始夹紧力 $300\pm 20\text{Kgf}$ Under $300 \pm 20 \text{ Kgf}$ preload 3) 采用 StepCharge 方式充电, 静置 30min 。 Use StepCharge mode to charge and stand by 30min. 4) 将电池以 $1.0I_1(\text{A})$ 电流放电至 2.5V, 并静置 30min Discharge with a current at $1.0I_1(\text{A})$ to 2.5V and stand by 30min. 5) 重复 3) 和 4) 步骤, 直到电池容量小于 80% 的初始容量, 并记录循环次数。 Cycle step 2) and 3) until capacity loss is more than 20% and record cycle number.	循环寿命 ≥ 3000 次 Cycle number ≥ 3000 times
4.3.7	室温存储和恢复 Room temperature storage capacity remaining and recovery	1) 测试温度: $25\pm 2^{\circ}\text{C}$. Temperature: $25\pm 2^{\circ}\text{C}$. 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 3) 将电池在室温下存储 28 天. Storage cell battery at temperature of $25\pm 2^{\circ}\text{C}$ for 28 days. 4) 将电池以 $1.0I_1(\text{A})$ 电流放电至 2.5V, 并记录剩余容量(Ah). Discharge with a current at $1.0I_1(\text{A})$ to 2.5V and record as remaining capacity. 5) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 6) 将电池以 $1.0I_1(\text{A})$ 电流放电至 2.5V, 并记录恢复容量(Ah). Discharge with a current at $1.0I_1(\text{A})$ to 2.5V and record as recovery capacity.	无变形、膨胀、漏液 No apparent deformation and leakage 剩余容量 $\geq 90\%$ * 初始容量; Residual capacity $\geq 90\%$ * nominal capacity. 恢复容量 $\geq 95\%$ * 初始容量 Recovery Capacity $\geq 95\%$ * Initial capacity
4.3.8	高温存储和恢复 High Temperature Charged Storage and Recovery Test	1) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 2) 将电池在 $55\pm 2^{\circ}\text{C}$ 下存储 7 天. Storage cell battery at temperature of $55\pm 2^{\circ}\text{C}$ for 7 days. 3) 将电池以 $1.0I_1(\text{A})$ 电流放电至 2.5V, 并记录剩余容量(Ah). Discharge with a current at $1.0I_1(\text{A})$ to 2.5V and record as remaining capacity. 4) 根据 3.17 将电池充满电.	无变形、膨胀、漏液 No apparent deformation and leak-out 剩余容量 $\geq 90\%$ * 初始容量; Residual capacity $\geq 90\%$ * nominal capacity. 恢复容量 $\geq 95\%$ * 初始容量 Recovery Capacity $\geq 95\%$ * Initial capacity

		5) Full charge cell according to No. 3.17. 将电池以 1.0I₁(A) 电流放电至 2.5V，并记录恢复容量(Ah)。 Discharge with a current at 1.0I₁(A) to 2.5V and record as recovery capacity.	
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5 Safety 安全性能

NO. 序号	Item 项目	Testing method 测试过程	Criteria 标准
5.1	温度循环 Temperature Cycle	1) 根据 3.17 将电池充满电。 Full charge cell according to No. 3.17 2) 将电池放入烘箱.烘箱温度根据表 5.1 和图 5.2 变化 5 次。 Put the cell into an oven. Set temperature curve as shown in Book 5.1 and Figure 5.2 for 5 cycles. 3) 观察电池 1h. Observe the cell for 1h	无着火、爆炸或者泄露 No fire or explosion or leakage
5.2	热箱 Hotbox	1) 根据 3.17 将电池充满电。 Full charge cell according to No. 3.17 2) 将电池放入烘箱. 电池温度以 5°C/min 达到 130±2°C 并保持 30min. Put the cell into an oven. The temperature of the oven is raised at a rate of 5°C/min to 130±2°C and remain for 30min. 3) 观察电池 1h. Observe the cell for 1h.	无着火、爆炸或者泄露 No fire or explosion or leakage
5.3	跌落 Drop	1) Full charge cell according to No. 3.17 根据 3.17 将电池充满电。 2) Drop the cell (free drop) from 1.5 meters onto a hard flat surface, with terminal-side down. 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	振动 Vibration	1) 根据 3.17 将电池充满电。 Full charge cell according to No. 3.17 2) 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 I₁(A) --- 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 a cell is to be subjected to vibration desk and do linearity scanning, the swept vibration parameters are	无电流波动, 异常电压; 无变形、泄露或其他异常; No current shock, abnormal voltage; No deformation, leakage or other unusual phenomena;

		as follows: --- discharge current: $1/3 I_1$ (A) --- vibration orientation: vertically vibrate --- frequency: 10~55Hz --- highest acceleration: 30m/s^2 --- swept cycle: 10 cycles --- vibration time: 3h 3) 测试过程中观察电池现象. Observe the cell during the test.	
5.5	海水浸泡 Immersion	1) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17 2) 将电池浸入 3.5% NaCl 溶液中 2h. Immerse the cell in salt water (3.5wt.% NaCl in H_2O) for 2h. 3) 水深应完全没过电池. The water depth must be enough to completely submerge the cell.	无着火或爆炸 No fire or explosion
5.6	低气压 Low Pressure	1) 测试温度: $25\pm 2^\circ\text{C}$. Test temperature: $25\pm 2^\circ\text{C}$. 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17 3) 将电池放入低气压箱中, 气压保持为 11.6kPa, 静置 6h. Store the cell in a low pressure tank for 6h in 11.6kPa. 4) 观察电池 1h. Observe the cell for 1h.	无着火、爆炸或者泄露 No fire or explosion or leakage
5.7	过充电 Overcharge	1) 测试温度: $25\pm 2^\circ\text{C}$. Test temperature: $25\pm 2^\circ\text{C}$. 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 3) 将电池以 $1I_1(\text{A})$ 电流充电 1h 或者电压达到 5.475V. Charge cell at $1I_1(\text{A})$ for 1h or to 5.475V. 4) 观察电池 1h. Observe the cell for 1h.	无着火或爆炸 No fire or explosion
5.8	过放电 Overdischarge	1) 测试温度: $25\pm 2^\circ\text{C}$. Test temperature: $25\pm 2^\circ\text{C}$. 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 3) 将电池以 $1I_1(\text{A})$ 电流放电 90min. Discharge cell at $1I_1(\text{A})$ for 90min. 4) 观察电池 1h. Observe the cell for 1h.	无着火、爆炸或者泄露 No fire or explosion or leakage
5.9	短路 Short	1) 测试温度 $25\pm 2^\circ\text{C}$. Test temperature: $25\pm 2^\circ\text{C}$. 2) 根据 3.17 将电池充满电. Full charge cell according to No. 3.17. 3) 用一个小于 $5\text{m}\Omega$ 的电阻将正负极短路保持 10min Use an conductor $\leq 5\text{m}\Omega$ between the positive and	无着火、爆炸或者泄露 No fire or explosion or leakage

		negative terminals of cell for 10min. 4) 观察 1 小时. Observe the cell for 1h.	
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Book 5.1 Temperature cycle vs time

Temperature (°C)	Time interval (min)	Total time (min)	Temperature rate (°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

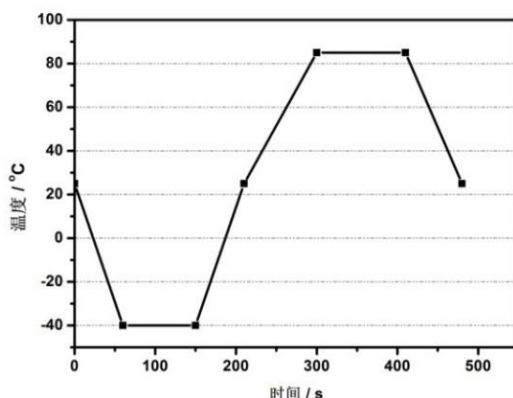


Fig 5.2 Temperature cycle curve vs time

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 1500 N~5000 N， 建议的预紧力控制公差为 ± 200 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 1500 N~5000 N, the recommended preload tolerance is ± 200 N.

6 运输和存储 Battery Transportation and Storage

6.1 运输 Transportation

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。在运输过程中应防止剧烈振动、外力冲击或挤压，防止日晒雨淋，可使用车、火车、轮船、飞机等交通工具进行运输，在运输过程中应保持 10-30% 的电量。

Transport the battery 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 battery should be kept between 10-30%.

6.2 Storage 存储

电池应存储允许环境温度为-30~55℃，建议保存温度为-10~40℃，相对湿度为10% RH ~90% RH 的条件下。电池应避免与腐蚀性物质或磁性环境接触，电池存储在清洁、干燥、通风的环境中，远离火源及热源。电池不使用时，连续存放建议不超过 3 个月。

Store the cell in a clean, dry, and well ventilated location with ambient temperature between -30℃~60℃, better between -10℃ and 40℃. And relative humidity of 10%RH ~90%RH. Keep away from corrosive materials and magnetic field, fire and heat sources. Do not upside down, crush and press. If battery is not in use, total storage time is not recommended for more than 3 months.

7 外形尺寸 Overall Dimensions

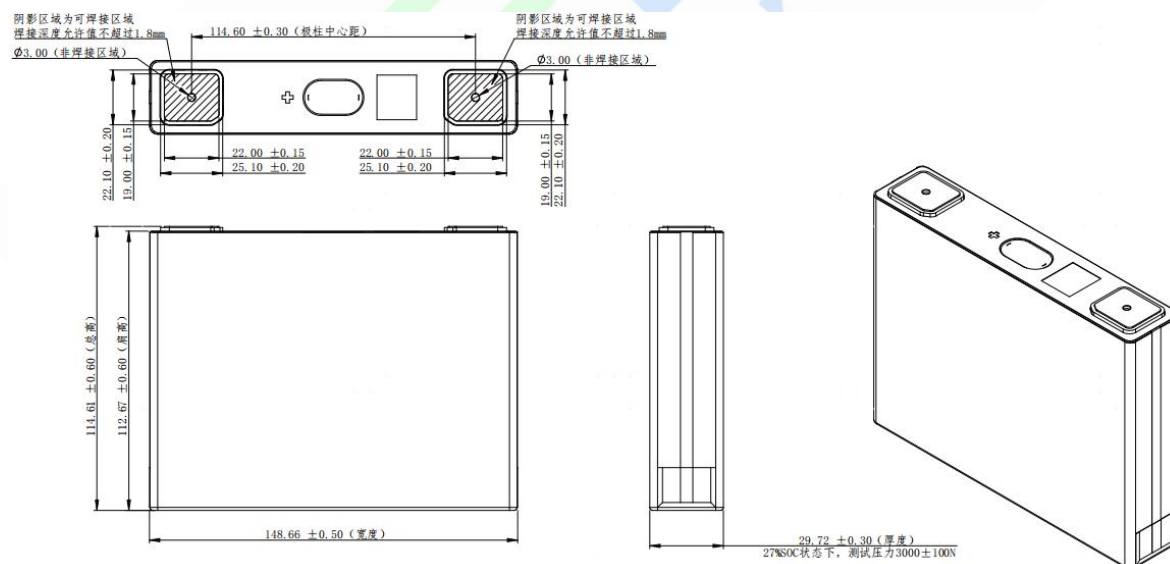


Figure 7 电池尺寸 /mm

8 质量保证 Quality Assurance

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原因，而是用户误用造成的电池问题，瑞浦能源有限公司可提供技术指导意见，不承诺

免费更换服务。

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 misusage.

瑞浦能源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。

REPT will not undertake responsibility under the following situations.

- 1) 违反安全使用指南所产生的问题及安全事故；

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

- 2) 出货后用户在电池组装过程中产生的不良电池；

Bad battery cell during assembling by customer after delivery.

- 3) 电池与电路、电池组和充电器搭配使用所产生的问题。

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，请先咨询瑞浦能源有限公司相关事宜。

Issues caused due to the connection of battery, circuit and battery charger.

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.

9 安全使用指南 Safety Instructions

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：

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



CAUTION!

- 1) 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；

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

- 2) 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；
Keep the cell out of reach of children and don't remove the original package before use. Dispose the used battery according to local recycling or waste disposition regulations;
- 3) 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；
Replace the battery manufactured by the same manufacture only. Mixed use of battery from other manufacture might cause fire and explosion;
- 4) 勿将电池投入水中或将其弄湿；
Do not throw the battery into water or make it wet;
- 5) 勿将电池正负极与金属壳体同时接触；
Do not connect positive and negatives with metal cover;
- 6) 勿将电池短路、过充或过放；
Do not make the cell short circuit, over-charge or over-discharge;
- 7) 勿在热源(如火或加热器)附近使用或贮存电池；
Do not use or store the cell near the heat source (such as fire or heater);
- 8) 勿将电池正负极接反；
Do not connect the position (+) and negative (-) terminals in the opposite way;
- 9) 勿将电池与硬币，金属饰品或其它金属物品放置在一起；
Do not put the battery together with coin, metal jewelry and other metal objects;
- 10) 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；
Do not puncture the battery by nail or other sharp objects. Hammering and crush the battery is forbidden;
- 11) 勿直接焊接电池；
Do not weld the battery directly;
- 12) 勿擅自以任何方式拆卸或修整电池；
Do not disassemble or modify the battery in any way;
- 13) 勿撞击、投掷或者使电池受到机械震动及自然跌落；

Do not hit, throw or subject the battery to mechanical vibration and free fall;

- 14) 勿将不同种类、不同品牌的锂离子电池混合使用;

Mixed use of different types, brand of battery are forbidden;

- 15) 勿将负极柱与壳体(正电性)相连;

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

- 16) 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到安全的位置。

Stop use the battery and relocate the battery to a safe place it if battery gives off peculiar smell, temperature increase, deforms, color change or any other abnormal phenomena.

- 17) 如果电池泄漏, 电解质进入眼睛, 不要揉眼睛。用干净的自来水冲洗, 并立即就医;

If battery leaks, and electrolyte enters into eyes, do not rub. Rinse with clean running water, and seek medical assistance immediately;

- 18) 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。

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

10 出货状态 Shipment Status

客户若无特殊要求, 电池出厂时具有约 20-50%的电量。

The batteries should be shipped with 20%-50% SOC if customer has no special requirements.

11 制造商信息 Technical Consultant

制造商: 瑞浦兰钧能源股份有限公司

Manufacturer: REPT BATTERO Energy Co., Ltd.

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