LIMXPOWER

LP107110302N80 3.5V80Ah 锂离子单体电池

Lithium-ion LP107110302N80 3.5V80Ah

产品规格书

Product Specification

产品型号

Product Model：LP107110302N80 3.5V80Ah

制表 Prepared by	审核 Checked by	批准 Approved by

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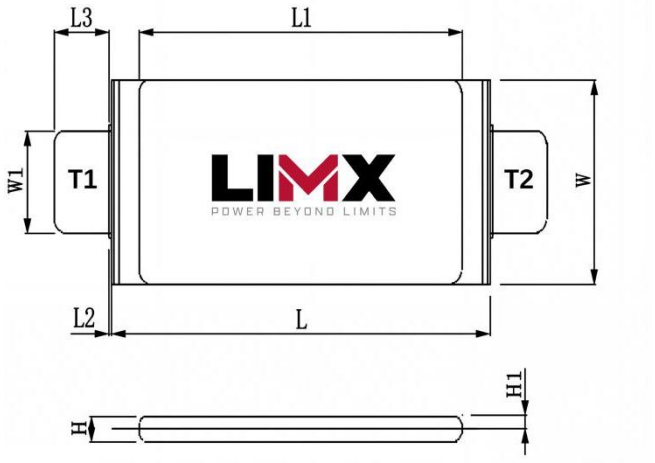
1. 适用范围 Application Scope

本产品规格书描述了 LP107110302N80 型号锂离子电池产品性能指标。

This product specification describes the performance of LP107110302N80 lithium-ion batteries.

2. 产品型号 Product Model

LP107110302N80 3.5V80Ah



3. 产品尺寸 Product Size

项目 (Item)	描述 (Description)	尺寸 (Dimension)
H	Maximum Cell Thickness 电芯最大厚度-50%SOC	10.2mm±0.2mm
	Maximum Cell Thickness 电芯最大厚度-100%SOC	10.7mm±0.2mm
W	Maximum Cell Width 电芯最大宽度	110mm±1mm
L	Maximum Cell Height 电芯最大高度	302mm±3mm
L3	Cell Tab Length 电芯极耳长度	28±2mm

W1	Cell Tab Width 电芯极耳宽度	80±0.2mm
T1	Cell Tab Thickness-Al 铝极耳厚度	0.4±0.02mm
T2	Cell Tab Thickness-Ni-Cu-Ni 铜镀镍极耳厚度	0.3±0.02mm
L1	Cell Packaging Film Length 电芯包装膜长度	270±0.2mm
L2	Exposed Height of Tab Glue 极耳胶外露高度	0.5~2.75mm
H1	Depth of The Packaging Film 包装膜坑深	5.75±0.1mm

4. 产品规格 Product Specification

序号 NO.	项目 Items	技术指标 Specifications
1	Nominal Capacity 标称容量	80.0Ah（Typ. 0.2C discharge）
2	Nominal Voltage 标称电压	3.5V (platform voltage at 0.2C discharge) (以 0.2C 放电的平台电压)
3	O.C.V 出货电压	3.6V~ 3.95V
4	AC Initial Impedance 初始内阻	≤0.7mΩ Measured at AC 1KHz
5	DC internal resistance 直流内阻	≤3.0mΩ 50%SOC 1.0C 10s 25±3℃
6	Charge Ending Voltage 充电截止电压	4.3V
7	Discharge Ending Voltage 放电截止电压	2.5V T≥0℃ 2.2V T<0℃

8	Charge Current 充电电流	25℃±5℃ 0.22C constant current charge to 4.3V; then 4.3V constant voltage charge till the current declines to 0.05C. 在 25℃±5℃的环境下，以 0.2C 恒流充至 4.3V；然后以 4.3V 恒定电压充电，截止电流为 0.05C。		
9	Maximum Charge Current 最大充电电流	Rapid charge: 1.0C@80%(20℃~+35℃) 快速充电：1.0C@80% (20℃~+35℃)		
10	Standard Discharge Current 标准放电电流	25±2℃, 0.2C constant current discharge to 2.5V. 在 25±2℃的环境下，以 0.2C 恒流放电至 2.5V。		
11	Maximum Continuous Discharge Current 最大持续放电电流	25±2℃, 2C constant current discharge to 2.5V. 在 25±2℃的环境下，以 2C 恒流放电至 2.5V。		
12	High Discharge Current 高倍率放电电流	3C≤3min		
13	Pulse Discharging Current 脉冲放电电流	5C≤10s（SOC > 50%）		
14	Operating Environment 工作环境	Charge 充电	60±25%R.H. 0~55℃	High/low temperature environment reduce battery charge efficiency and influence the service life of the battery. Prolonged working under environment higher than 60℃ will lead to battery abnormal. 高/低温充电效率会下降，会影响电池使用寿命，长期在高于 60℃环境中使用会导致电池异常。
		Discharge 放电	60±25%R.H. -40~55℃	
15	Cell Weight 电芯重量	About 706±35g 约 706±35g		
16	Storage performance 储存性能	Storage in a 50% SOC (Single Cell), humidity less than 90%RH. 50%SOC 电态储存(单体电芯)，湿度≤90%。		

5. 电池性能 Battery Performance

5.1 标准充电 Standard Charge

在 25℃±5℃的环境下，以 0.2C 恒流充至 4.3V；然后以 4.3V 恒定电压充电，截至电流为 0.05C。

25℃±5℃ 0.22C constant current charge to 4.3V; then 4.3V constant voltage charge till the current declines to 0.05C

5.2 标准放电 Standard Discharge

在 25±2℃的环境下，以 0.2C 恒流放电至 2.5V。

25±2℃, 0.2C constant current discharge to 2.5V.

5.3 电化学性能 Electrochemical Characteristics

序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
1	Nominal Capacity 标称容量(0.2C)	≥标称容量*100%	The capacity shall be measured when the cell is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C under the condition of 25℃±5℃ after standard charge. 电池按规定充电结束后，在 25℃±5℃的条件下以 0.2C 电流放电到终止电压 2.5V 时的测量值。
2	Nominal Capacity 标称容量(1.0C)	≥标称容量*95%	The capacity shall be measured when the cell is discharged to a cut-off voltage of 2.5V at a discharge current of 1.0C under the condition of 25℃±5℃ after standard charge. 电池按规定充电结束后，在 25℃±5℃的条件下以 1.0C 电流放电到终止电压 2.5V 时的测量值。
3	High Rate Discharge Capacity 高倍率放电容量(2C)	Not less than 80% of nominal capacity 不低于标称容量的 80%	The capacity shall be measured when the cell is discharged to a cut-off voltage of 2.5V at a discharge current of 2C after standard charge. 电池按标准充电方式结束后，2C 电流放电到终止电压 2.5V 时的测量值。

序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
4	Discharge Capacity at -20℃ -20℃放电容量 (0.2C)	Not less than 80% of nominal capacity 不低于标称容量的 80%	The capacity shall be measured when the cell is discharged to a cut-off voltage of 2.0V at a discharge current of 0.2C after standing under an ambient temperature of -20±2℃ for 4 hours at the end of standard charge. 电池按标准充电方式结束后，在环境温度为-20±2℃条件下保持 4 小时，以 0.2C 电流放电到终电压 2.0V 时的测量值。
5	Discharge Capacity at -40℃ -40℃放电容量 (0.2C)	Not less than 60% of nominal capacity 不低于标称容量的 60%	The capacity shall be measured when the cell is discharged to a cut-off voltage of 2.0V at a discharge current of 0.2C after standing under an ambient temperature of -40±2℃ for 4 hours at the end of standard charge. 电池按标准充电方式结束后，在环境温度为-40±2℃条件下保持 4 小时，以 0.2C 电流放电到终电压 2.0V 时的测量值。
6	Discharge Capacity at 55℃ 55℃放电容(0.2C)	Not less than 95% of nominal capacity 不低于标称容量的 95%	The capacity shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C after standing under an ambient temperature of 55± 2℃ for 5 hours at the end of standard charge. 电池按标准充电方式结束后，在 55±2℃中保持 5h，以 0.2C 电流放电到终止电压 2.5V 时测容量。
7	Storage Characteristics at 25℃ 25℃储存特性	Capacity retention≥95% Capacity recovery≥97% 容量保持率≥95% 容量恢复率≥97%	The capacity retention shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C after standing for 28 days at 25±2℃ at the end of standard charge. The capacity recovery shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C at the end of standard charge after measuring the capacity retention. 容量保持量应在电池按标准充电方式结束后，在环境温度为 25±2℃条件下，将电池开路搁置 28 天，再以

序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
			0.2C 电流进行放电到终止电压 2.5V 时测量。而容量恢复量在测量容量保持量后按标准充电方式结束后，以 0.2C 电流放电到终止电压 2.5V 时测量。
8	Storage Characteristics At 45℃ 45℃储存特性	Capacity retention≥90% Recovery capacity≥95% 容量保持率≥90% 容量恢复率≥95%	The capacity retention shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C after standing for 28 days at 45±2℃ at the end of standard charge. The capacity recovery shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C at the end of standard charge after measuring the capacity retention. 容量保持量应在电池按标准充电方式结束后，在环境温度为 45±2℃条件下，将电池开路搁置 28 天，再以 0.2C 电流进行放电到终止电压 2.5V 时测量。而容量恢复量是在测量容量保持量后按标准充电方式结束后，以 0.2C 电流放电到终止电压 2.5V 时测量。
9	Storage Characteristics at 55℃ 55℃储存特性	Capacity retention≥ 90% Capacity recovery ≥ 95% 容量保持率≥90% 容量恢复率≥95%	The capacity retention shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C after standing for 7 days at 55±2℃ at the end of standard charge. The capacity recovery shall be measured when the battery is discharged to a cut-off voltage of 2.5V at a discharge current of 0.2C at the end of standard charge after measuring the capacity retention. 容量保持量应在电池按标准充电方式结束后，在环境温度为 55±2℃条件下，将电池开路搁置 7 天，再以 0.2C 电流进行放电到终止电压 2.5V 时测量。而容量恢复量是在测量容量保持量后按标准充电方式结束后，以 0.2C 电流放电到终止电压 2.5V 时测量。
10	Cycle Life 循环寿命	Cycle number≥300 (80% nominal capacity) 循环圈数≥300	The cycle life test should be set at 25±2℃ according to the following steps: 循环寿命测试应在 25±2℃条件下按以下工步设置：

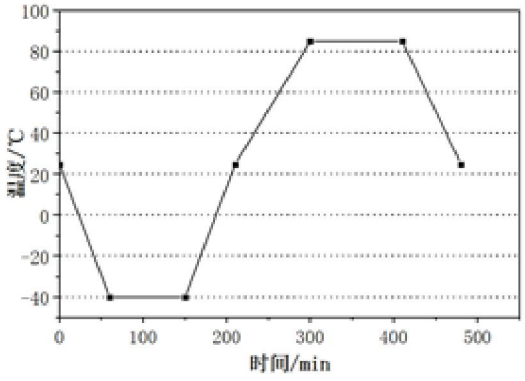
序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
		(80%标称容量)	Step 1 Standard charge; Step 2 Standing for 30 minutes; Step 3 Discharge the cell at 0.5C to 2.5V; Step 4 Standing for 30 minutes; Step 5 Repeat Step 1、Step 2、Step 3 and Step 4. 第一步 标准充电； 第二步 静置 30 分钟； 第三步 以 0.5C 电流放电到 2.5V； 第四步 静置 30 分钟； 第五步 重复第一步、第二步、第三步和第四步。 All the tests shall be conducted with splints. (Unless otherwise specified) The clamping force shall be 50±5Kgf/pcs. 所有测试均需在带夹板状态下进行。(除非特别说明) 夹具力：50±5 Kgf/pcs

5.4 安全性能 Safety performance

序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
1	Over Charge 过充电	No explosion, no fire 不爆炸，不起火	After standard charge, the cell shall be charged at the current of 1C, till the voltage is 4.73V or the charging up to 115% SOC, observe 1h. 电池按标准充电方式结束后，电池以 1C 电流充电，直到电压达到 4.73V 或充电到 115%SOC，观察 1h。
2	External Short Circuit 外部短路	No explosion, no fire 不爆炸，不起火	After standard charge, the cell shall be shorted for 10min by a wire (internal resistance less than 5mΩ), observed for 1h. 电池按标准充电方式结束后，用内阻小于 5mΩ的线路短路电池 10min，观察 1h。

3	Over Discharge 过放电	No explosion, no fire, no leakage 不爆炸，不起火，不漏液	After standard charge, the cell shall be discharged 90min at 1C, observed for 1h. 电池按标准充电方式结束后，以 1C 放电 90min，观察 1h。
4	Heating 加热	No explosion, no fire 不爆炸，不起火	After standard charge, the cell shall be heated up to 130±2℃ at a rate of 5±2℃/min and kept at this temperature for 30min, observed for 1h. 电池按标准充电方式结束后，以 5±2℃/min 升温至 130±2℃, 此温度下保持 30min，观察 1h。
5	Crush Test 挤压测试	No explosion, no fire 不爆炸，不起火	After standard charge, the cell shall be extruded with semi-cylinder (R 75mm) perpendicular to the direction of the plate, at a extrusion rate of (5 ± 1) mm/s until the voltage reaches 0V or the deformation degree reaches 30% or the extrusion pressure reaches 100kN, observed for 1h. 电池按标准充电方式结束后，用 R 75mm 半圆柱体垂直于极板方向挤压电池，挤压速度（5±1）mm/s，直至电压达到 0V 或形变量达 30%或挤压力达 100kN 后停止，观察 1h。
6	Seawater Immersion 海水浸泡	No explosion, no fire 不爆炸，不起火	After standard charge, the cell shall be immersed in 3.5% NaCl solution (mass fraction, simulating the composition of seawater at room temperature) for 2h, and should be completely submerged in the water. 电池按标准充电方式结束后，将电池浸入 3.5%NaCl 溶液（质量分数，模拟常温下的海水成分）中 2h，水深应完全没过电池。
7	Free Falling(drop) 自由跌落测试	No explosion, no fire, no leakage 不爆炸，不起火，不漏液	After standard charge, the cell shall be dropped freely from the height of 1.5m to cement board with its positive and negative terminals pointing downward, observed for 1h. 标准充电后，正负端子向下，电池从 1.5m 高度自由跌落到水泥板面，观察 1h。

<table>
<tr><td>8</td><td>Low Pressure
低气压</td><td>No explosion, no fire, no leakage
不爆炸、不起火、不漏液</td><td>After standard charge, the cell shall be put into a low-pressure box, whose pressure is adjusted to 11.6 kPa and the temperature is kept at room temperature, standing for 6h, observed for 1h.
标准充电后，将电池放入低气压箱中，调节试验箱气压为 11.6 kPa，温度为室温，静置 6h，观察 1h。</td></tr>
<tr><td>9</td><td>Temperature Cycling Test
温度循环</td><td>No explosion, no fire
不爆炸，不起火</td><td>After standard charge, the cell shall be put into a temperature box whose temperature is adjusted according to the following table and fig.2., observed for 1h after 5 cycles.
电芯按照标准充电方式结束后，放入温度箱中，温度箱温度按下表和图 2 进行调节，循环 5 次后，观察 1h。

Temperature and time for one cycle of the temperature Test.
<table>
<tr><th>温度
℃</th><th>时间增量
min</th><th>累计时间
min</th><th>温度变化率
℃/min</th></tr>
<tr><td>25</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>-40</td><td>60</td><td>60</td><td>13/12</td></tr>
<tr><td>-40</td><td>86</td><td>150</td><td>0</td></tr>
<tr><td>25</td><td>60</td><td>210</td><td>13/12</td></tr>
<tr><td>85</td><td>86</td><td>300</td><td>2/3</td></tr>
<tr><td>85</td><td>110</td><td>410</td><td>0</td></tr>
<tr><td>25</td><td>70</td><td>480</td><td>6/7</td></tr>
</table>
温度实验一个循环的温度和时间
 
</td></tr>
</table>

6. 外观检查 Visual Inspection

不允许有任何影响电池性能的外观缺陷，如裂纹、裂缝、泄漏等。

There shall be no such defects as scratch, flaw, crack, and leakage, which may adversely affect the commercial value of the cell.

7. 标准测试环境 Standard Test Conditions

除非特别说明，本规格书中所有测试均在以下环境条件下进行:

Unless otherwise specified, all tests in this Product Specification are conducted at below conditions:

温度 Temperature: 25±3℃

湿度 Humidity: ≤75%RH

大气压 Atmosphere: 86kPa~106kPa

8. Shipment 运输

Cells should be shipped at about 50% SOC.

电池应该在 50%左右的荷电状态下运输。

9. Warning 警告

- Do not disassemble a cell. Do not pierce the cells with sharp objects.

不要拆解电池。不要使用尖锐物体刺穿电池。

- Do not heat or dispose the cell into fire, water or other liquids.

不要将电池加热或将电池扔进火里，水里或是其它液体中。

- Do not use damaged cells.

不要使用已损坏的电池。

- Do not connect the positive (+) and negative (-) Tab directly.

不要将正负极直接导通。

- Do not mix cells.

不要混用电池。

- Do not mix different types of batteries; avoid pairing new and old batteries, or batteries with different chemical compositions.

不要将不同型号的电池混用；避免将新的和旧的、不同化学成份的电池配对。

10.Cautions 注意事项

10.1 Operating Temperature 操作温度

The cells shall be operated (stored, charged and discharged) within a proper temperature range specified by this specification.

电池的储存、充电、放电温度应遵照本规格书的相关规定。

Keep away from heat sources. Do not place cell near a heat source or exposed it to direct sunlight for long periods of time; Elevated temperatures will result in reduced cell service life.

远离热源。不要将电池放置在热源附近或长时间暴露在阳光下；温度的上升会缩短电池的使用寿命。

10.2 Charge 充电

Use only chargers and procedures licensed by the manufacturer. Improper charging method may result in overheating or damage to the cell;

Do not charge the cell with a current or voltage higher than the specified maximum value in this specification; Prohibit reverse charging of the cell (reversing the positive and negative terminals), No floating charge shall be applied to lithium cell charging.

应使用制造商许可的充电器和充电程序；不恰当的充电方式会导致电池过热或损坏；不要使用高于本规格书规定的最大电流或电压充电；严禁反充电池（正负极接反），禁止浮充。

10.3 Discharge 放电

Discharge current should not be higher than the specified maximum current in this specification; If you plan to use a discharge current higher than the maximum current, please consult us first;

Do not over discharge the cell. Over discharging the cell may result in cell obsolescence and cause safety hazard.

放电电流应该不高于本规格书规定的最大电流放电；如计划使用高于最大电流的电流放电，请先咨询

本司；避免过放电；若电池过放电，将导致电池报废并产生安全隐患。

10.4 Avoid Cell Short Circuit 电池短路

A short circuit can result in overheating, which may even lead to fire and danger.

电池短路会使电池发热，严重的会导致起火，发生危险。

10.5 Cell Operation 电池操作

Avoid the contact of cell tabs with aluminum plastic film.

避免电池极耳接触铝塑膜。

Avoid deforming the cell by external force, do not bend, fold or throw the cell which may damage the cell even result in cell swelling, leakage, ignition or explosion.

避免外力使电池变形，不要将电池弯曲、折叠或抛掷；这样会破坏电池，严重会导致电池鼓涨、漏液、起火或爆炸。

Do not open or arbitrarily fold the folded edges of the cell.

不要打开或任意地折叠电池的折边。

10.6 Cell Warranty 电池质保

If possible, please charge and discharge the cells every three months for maintenance. With proper storage and maintenance methods, the cells' life can be prolonged.

如果条件允许，请每三个月充放电维护一次。适当的存储和维护方法，可以延长电池的寿命。

From the date of shipment, the warranty period of the cell depends on the contract. However, within this period, LIMXPOWER Co., Ltd. does not promise to replace the cells free of charge if the quality problems of the cells are not caused by LIMXPOWER Co., Ltd. but by the improper use of the customers.

自出货之日起，电芯的保质期限依合同而定。但是在此期限内，如果不是 LIMXPOWER 公司的原因，而是客户的误用造成的电芯质量问题，LIMXPOWER 公司不承诺免费更换。

LIMXPOWER Co., Ltd. accepts no liability for problems arising from operation in violation of the safety

rules.

LIMXPOWER 公司对违反安全守则操作所产生的问题不承担任何责任。

LIMXPOWER Co., Ltd. accepts no liability for problems arising from the use of circuits, cell packs, and chargers.

LIMXPOWER 公司对与电路、电池组、充电器搭配使用所产生的问题不承担任何责任。

The defective cells generated by the customers during the assembly process of the cell after shipment are not within the scope of the warranty of LIMXPOWER Co., Ltd.

出货后客户在电芯组装过程中产生的不良电芯不在 LIMXPOWER 公司质量保证的范围之内。

11.Remarks 备注

If there is any objection to this specification, both parties can address the problem in a spirit of consensus. Other matters such as accidents occur when fail to operate as specified shall have no liability for us.

如对本规格有异议，双方可协商解决。其他事项如不按以上规定操作导致发生意外，与本司无关。

l If there are any items not mentioned in this specification, please consult us.

任何本规格书中未提及的事项，请咨询本公司。