amprius	**PRODUCT SPECIFICATION**	Spec No: Ver: A00 Date: 2025-04-24

Email: daisy.liu@amprius-china.com; Tel: +86 13921161976. Amprius Technologies, Inc.; Add: 1180 Page Avenue, Fremont, California

Customer no: _____

Rechargeable Cylindrical Lithium-ion Cell

可充电圆柱锂离子电池

Model/型号: INR21700/65

(6500mAh 3.46V)

Prepared by/Date 编 制/日 期	Checked by/Date 审 核/日 期	Approved by/Date 批 准/日 期

Customer approval 客户确认	Signature/签 字	Date/日 期
	Company name/公司名称	
	Company stamp/公司印章	

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Revision records/修订记录

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Content/目录

1. Model/型号 Page 4

2. Cell Specification/电池规格说明 Page 4/5

3. Cell Performance Test Criteria/电池性能标准 Page 6

3.1 Appearance Inspection by Visual/外观目测 Page 6

3.2 Environmental Test Condition/外界环境条件 Page 6

3.3 Electrical Characteristic/电气特性 Page 6/7

3.4 Safety Performance/安全性能 Page 8/9

4. Cell Initial Dimension /电池初始尺寸 Page 10

5. Cautions in Use/谨慎使用 Page 11

6. Period of Warranty/保质期 Page 11

7. Storage of the Cell/电池的存放 Page 11

8. Other Chemical Reaction/其它化学反应 Page 11

9. Environmental Requirement/环保要求 Page 11

10. The Remark of Production Duty/产品责任书 Page 11/12

11. Notes/注释 Page 12

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1 Model/型号：INR21700/65

2 Cell Specifications/产品规格

No.	Items/项目	Specifications/规格		Remarks/备注
1	Capacity 容量	Typical 典型	6600mAh	Charge: CC (1250mA)/CV (4.2V), 125mA cut-off Discharge: CC (1250mA), 2.5V cut-off 充电：1250mA 恒流充电至 4.2V，再 4.2V 恒压充至电流至 125mA 放电：1250mA 恒流放电至 2.5V
		Minimal 最小	6500mAh	
	Energy 能量	Minimal 最小	22.5Wh	
2	Nominal Voltage 标称电压	3.46V		
4	Limited Charge Voltage 充电限制电压	4.20V		
5	Upper Limited Charge Voltage 充电上限电压	4.23V		
6	Standard Charge 标准充电	CC (1250mA)/CV (4.2V), 125mA cut-off		1250mA 恒流充电至 4.2V，再 4.2V 恒压充至电流至 125mA
7	End of Discharge Voltage 放电终止电压	2.5V		
8	Discharge Cut-off Voltage 放电截止电压	2.5V		
9	Standard Discharge 标准放电	CC (1250mA), 2.5V cut-off		1250mA 恒流放电至 2.5V
10	ACIR 交流内阻	≤25mΩ (PTC-free)		ACIR measured at 1kHz AC at 30%SOC 30%SOC 下用交流法 1kHz 测量内阻
11	Weight of Cell 重量	≤74g		

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No.	Items/项目	Specifications/规格			Remarks/备注
12	Recommended Charge Current 推荐充电电流	3000mA			CC-CV 恒流恒压充电方式
13	Maximum Charge Current 最大充电电流	4500mA			
14	Recommended Discharge Current 推荐放电电流	7500mA			CC 恒流放电方式
15	Maximum Discharge Current 最大放电电流	12500mA			
16	Charge and Discharge Condition at Different Temperature 不同温度下充放电条件	项目 Items	温度 Temperature	最大电流 Maximum current	Charge and discharge efficiency will decrease at low temperature, and the cycle life will decrease when the temperature is higher or lower. It is prohibited to charge below -5°C. 低温充放电效率会下降，温度过高或过低使用会影响电池寿命。 严禁-5°C 以下充电。
		Charge/充电	-5≤T<5°C	650mA	
			5≤T<15°C	3000mA	
			15≤T<45°C	4500mA	
		Discharge/放电	45≤T<65°C	3125mA	
			35≤T<45°C	6250mA	
			0≤T<35°C	12500mA	
			-20≤T<0°C	3125mA	
17	Storage Temperature and Time 储存温度与时间 (Storage Condition: 25%-50%SOC, Humidity 湿度 60±25% RH)	-20≤T≤25°C	≤12 个月		After the cells reached the specified stored time, the cells must be charged to 25%-50%SOC. (Capacity and cycle life will decreased because of the long storage time in related environments, and they will decrease a lot if the environment exceeds the required) 电芯存储达到规定时间后，须对电池进行补电到 25%-50%SOC。 (在对应的环境温度下长时间存储，容量&循环会有一定下降，如果存储环境超出规定范围，容量&循环会急剧下降)
		25<T≤45°C	≤3 个月		
		45<T≤65°C	≤1 个月		

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3 Cell Performance Test Criteria (Refer to IEC62133-2, UN38.3, UL1642, GB31241)

电池性能标准(参照 IEC62133-2, UN38.3, UL1642, GB31241)

3.1 Appearance Inspection by Visual/外观目测

There shall be no such defect as rust, leakage, which may adversely affect commercial value of cell.

电池外观应没有锈渍、污渍、漏液等影响商业价值的缺陷存在。

3.2 Standard Test Conditions/标准测试条件

Unless otherwise specified, all test stated in this product specification are conducted at below test conditions.

所有测试应按以下环境条件进行，除非特殊指定外。

Temperature 温度: 25±5°C

Relative humidity 相对湿度：≤85% RH

Atmosphere pressure 大气压力：86~106Kpa

Test cell selection: Flesh cells within one month after shipment from the factory and the cells shall not be cycled more than five times before the test. 测试电池选择：新电池不超过出厂时间 1 个月且循环次数低于 5 次。

3.3 Cell Electrical Characteristics/电气特性

No.	Items/项目	Test Methods and Conditions/测试方法及条件	Criteria/标准
1	Rate Discharge 倍率放电	After standard charge, the discharge capacity shall be measured on different current till the voltage to 2.5V. 标准充电后，测量不同电流放电容量，放电截止电压为 2.5V。	Current 电流 / Capacity Retention 容量保持率 1250mA / 100% 3125mA / ≥95% 6250mA / ≥93% 12500mA / ≥90%
2	RT Cycle 25±2°C 常温循环 25±2°C	Cycle condition: Temperature: 25±2°C A. Charge: CC (3A)/CV (4.2V), 125mA cut-off; B. Rest: 30min; C. Discharge: CC (7.5A), 2.5V cut-off; D. Rest: 30min; Repeat A-D Steps 500cycles. 循环条件：温度：25±2°C A. 充电：3A 恒流充电置 4.2V，4.2V 恒压充电置 125mA 截止； B. 搁置：30min； C. 放电：7.5A 恒流放电置 2.5V 截止； D. 搁置：30min 重复 A-D 工步 500 次。	Capacity Retention@500cycles ≥80% 500 周循环保持率≥80%
3	HT Cycle 45±2°C 高温循环 45±2°C	Cycle condition: Temperature: 45±2°C A. Charge: CC(3A)/CV(4.2V), 125mA cut-off; B. Rest: 30min; C. Discharge: CC(7.5A), 2.5V cut-off; D. Rest: 30min; Repeat A-D Steps 500cycles. 循环条件：温度：45±2°C A. 充电：3A 恒流充电置 4.2V，4.2V 恒压充电置 125mA 截止； B. 搁置：30min； C. 放电：7.5A 恒流放电置 2.5V 截止； D. 搁置：30min 重复 A-D 工步 500 次。	Capacity Retention@500cycles ≥70% 500 周循环保持率≥70%

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No.	Items/项目	Test Methods and Conditions/测试方法及条件	Criteria/标准
4	RT Storage 25±2°C 室温存储 25±2°C	The cell is to be check the initial capacity in accordance with standard charge and discharge condition at 25±2°C, then full charge the cell using standard charge condition and storage the full cell at 25±2°C for 28 days. Measure the capacity after 28 days with standard discharge condition at 25±2°C as retention capacity. Then charge and discharge with standard condition at 25±2°C as recover capacity. 在 25±2°C 使用标准充放电条件确认初始容量，然后用标准充电条件满充电，并在 25±2°C 的环境中存放 28 天。28 天后，测试电池在 25±2°C 环境下用标准放电条件测量容量作为保持容量。然后在 25±2°C 环境下用标准充放电条件测试容量为恢复容量。	Retention capacity 容量保持≥85%$C_{initial}$ Recover capacity 容量恢复≥90% $C_{initial}$
5	HT Storage 60±2°C 高温存储 60±2°C	The cell is to be check the initial capacity in accordance with standard charge and discharge condition at 25±2°C, then full charge the cell using standard charge condition at 25±2°C for 28 days. Storage the full cell at 60±2°C for 7 days. After Storage, measure the capacity after 2hrs storage at 25±2°C with standard discharge condition as retention capacity. Then charge and discharge with standard condition at 25±2°C as recover capacity. 在 25±2°C 使用标准充放电条件确认初始容量，然后用标准充电条件满充电，并在 60±2°C 的环境中存放 7 天。7 天后，将电芯在 25±2°C 环境下放置 2 小时，并在 25±2°C 环境下用标准放电条件测量容量作为保持容量。然后在 25±2°C 环境下用标准充放电条件测试容量为恢复容量。	Retention capacity 容量保持≥85%$C_{initial}$ Recover capacity 容量恢复≥90% $C_{initial}$
6	Temperature Dependence of Discharge Capacity 放电温度特性	1. Charge: CC (3A)/CV (4.2V), 125mA cut-off(25±2°C); 2. Rest: 2hrs(25±2°C/10±2°C/0±2°C/-10±2°C); 3. Discharge: CC (7.5A), 2.5V cut-off (25±2°C/10±2°C/0±2°C/-10±2°C); 1. 充电：3A 恒流充电置 4.2V，4.2V 恒压充电置 125mA 截止(25±2°C)； 2. 搁置：2hrs(25±2°C/10±2°C/0±2°C/-10±2°C)； 3. 放电：7.5A 恒流放电置 2.5V 截止(25±2°C/10±2°C/0±2°C/-10±2°C)；	Discharge capacity refer to the following Table 1 不同温度放电容量要求参照下表 1

Table 1/表 1

Discharge Temperature/放电温度	-10°C	0°C	10°C	25°C
Discharge Capacity/放电容量	≥5043mAh	≥5227mAh	≥5596mAh	≥6150mAh

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3.4 Safety performances/安全性能

No.	Items/项目	Test Method and Conditions/测试方法及条件	Criteria/标准
1	Low Pressure 低气压	After standard charge, to be stored for 6 hours at an absolute pressure of 11.6kPa and a temperature of 25 ±5°C. The cell shall be observed for 1h afterwards. 电池标准充满电后，放置在 25±5°C 的真空箱中，箱内压强降至 11.6kPa，并保持 6h。之后观察电芯 1h。	No Explosion, No Fire, No Leakage 无爆炸，无起火，无漏液
2	Thermal Shock 温度循环	After standard charge: the batteries are to be placed in a test chamber and subjected to the following cycles: 标准充电后，将电芯放入温控箱中，并进行以下循环: a) Raising the chamber-temperature to 72±3°C within 30 min and maintaining this temperature for 4 h. b) Reducing the chamber temperature to 20±3°C within 30 min and maintaining this temperature for 2 h. c)Reducing the chamber temperature to minus -40±3°C within 30 min and maintaining this temperature for 4 h. d) Raising the chamber temperature to 20±3°C within 30 min. e) Repeating the sequence for a further 9 cycles. f) After the 10th cycle, storing the batteries for a minimum of 24 h, at a temperature of 20±5°C prior to examination.	No Explosion, No Fire, No Leakage 无爆炸，无起火，无漏液
3	Drop Test 跌落测试	The cell is to be fully charged in accordance with standard charge condition, then drop the cell three times from a height of 1.0m onto a concrete floor. One fall on each end surface and two falls on the cylinder, A total of four falls. 电池按照标准充电条件充满电，然后从1.0m高度跌落电池到一个水泥地面，端面各跌落一次，圆柱面跌落2次，共跌落4次。	No Explosion, No Fire, No Leakage 无爆炸，无起火，无漏液
4	Hot-box 热冲击测试	Each fully charged cell, stabilized at room temperature, is placed in a circulating air-convection oven. The oven temperature is raised at a rate of 5±2°C/min to a temperature of 130±2°C. The cell remains at this temperature for 30 minutes before the test is discontinued. The cell shall be observed for 1h afterwards. 按标准充满电的电池温度稳定到常温后，放置入循环空气烘箱里，从常温以5±2°C/分的速率升至130±2°C后，在130± 2°C放置30分钟。之后观察电芯1h。	No Explosion, No Fire 无爆炸，无起火
5	Seawater Immersion 海水浸泡	After standard charge, immerse the cell completely in 3.5wt% NaCl solution for 2h. The cell shall be observed for 1h afterwards. 电池标准充满电后，将电芯完全浸入 3.5wt% NaCl 水溶液中 2h。之后观察电芯 1h。	No Explosion, No Fire 无爆炸，无起火
6	Overcharge 过充	After standard discharge, continue to charge with a constant voltage 3C/4.6V per a cell, holding for 12h. 电池标准放电后，以 3C/4.6V 的恒定电压继续充电，保持 12 小时。	No Explosion, No Fire 无爆炸，无起火

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3.4 Safety Performances/安全性能

No.	Items/项目	Test Method and Conditions/测试方法及条件	Criteria/标准
7	Forced Discharge 强制放电测试	The discharged cell is subjected to a reverse charge at 1C for 90 minutes. 将电池放完电，再用1C反接充电90分钟。	No Explosion, No Fire 无爆炸，无起火
8	External-Short 短路测试 (20±5°C)	After standard charge, the cell is to be short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a resistance load of 80 ±20 mΩ. The temperature of the Battery case is to be recorded during the test. The battery is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2V and the battery case temperature has returned to ±10°C of ambient temperature. 标准充电后，被测电池依次用阻值为 80±20mΩ 电阻线正负极短路，持续监测并记录电池外壳温度。放电持续至出现以下任一情形即终止：发生起火或爆炸，或者电池达到完全放电状态（电压<0.2V）且电池外壳温度恢复至环境温度±10°C范围内。	No Explosion, No Fire 无爆炸，无起火
9	External-Short 短路测试 (55±5°C)	After standard charge, the cell is to be short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a resistance load of 80 ±20 mΩ. The temperature of the Battery case is to be recorded during the test. The battery is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2V and the battery case temperature has returned to ±10°C of ambient temperature. 标准充电后，被测电池依次用阻值为 80±20mΩ 电阻线正负极短路，持续监测并记录电池外壳温度。放电持续至出现以下任一情形即终止：发生起火或爆炸，或者电池达到完全放电状态（电压<0.2V）且电池外壳温度恢复至环境温度±10°C范围内。	No Explosion, No Fire 无爆炸，无起火

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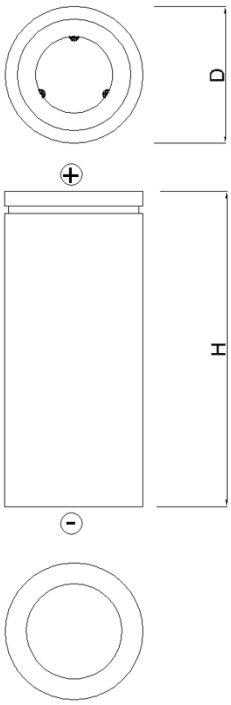
4 Cell Initial Dimensions (PET film included) /电池初始尺寸(含 PET)



No.	Items/项目	Flat Cap/平帽	Remarks/备注
1	Diameter/直径(D)	≤21.75mm	盖帽有 CID 保护装置（不含 PTC） The cap contains CID protection devices (PTC-free)
2	Height/高度(H)	≤71.00mm	

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5 Cautions in Use(谨慎使用)

To ensure proper use of the cell please read the manual carefully before using it.（为确保正确使用电池，使用前请仔细阅读本细则）

Handling（电池操作）：

- Do not expose to, dispose of the cell in fire.（不要靠近和放置电池于火中）
- Do not put the cell in a charger or equipment with wrong terminals connected.（在充电器或设备仪器中不要把电池接错电极）
- Avoid shorting the cell（避免电池短路）
- Avoid excessive physical shock or vibration.（避免电池过多的物理撞击和震动）
- Do not dismantle, open or shred the cell.（不要私自拆除、打开或分解电池）
- Do not immerse in water.（不要把电池浸泡在水中）
- Do not use the cell mixed with other different make, type, or model cells.（不要和其它不同类型的电池混和使用）
- Keep out of the reach of children. If swallowed, see a doctor immediately.（电池放置于儿童不易接触的地方。如发现吞食，立即联系医生）

Charge and discharge（充电和放电）：

- Cell must be charged in appropriate charger only.（电池必须用合适的充电器充电）
- Do not maintain the cell on charge when not in use.（当电池不使用时，不要把电池一直放置于充电器中）

Storage（储存）：Store the cell in a cool, dry and well-ventilated area.（应把电池置于凉爽、干燥及通风良好的区域）

Disposal（电池处理）：Dispose of in accordance with local regulations.（电池处理要符合当地的规定）

6 Period of Warranty/保质期

The period of warranty is one year from the date of shipment. Amprius guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

电池的保质期从出货之日算起为一年。如果证明电池的缺陷是在制造过程中形成的，而不是由于用户滥用及错误使用造成，本公司负责退换电池。

7 Storage of the Cells/电池的存储

The cells should be stored at room temperature, charged to about 30% to 50% of capacity. If stored for a long period of time, we recommend that charged about once per half a year to prevent over discharge.

电池应当充电到 30%~50%电量后在室温下存放。如需要长时间储存，建议每半年充一次电以防止电池过放电。

8 Other Chemical Reaction/其它化学反应

Because cells utilize a chemical reaction, cell performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the cell may be shortened or the device in which the cell is used may be damaged by electrolyte leakage. If the cells cannot maintain a charge for long periods of time, even when they are charged and discharged correctly, this may indicate it is time to change the cell.

因为电池是利用化学反应实现其充放电功能，即使电池不使用，长期储存也会导致电池性能随着时间的推移而恶化。此外，如果充电、放电、环境温度等各种使用条件不在规定范围内，则可能缩短电池的寿命或导致电池漏液而损坏使用电池的设备。如果电池按正确方法充放电，长时间充不进电，这说明电池需要更换了。

9 Environmental Requirement/环保要求

This product complies with corporation class I controlled substance standard, such as ROHS2.0, REACH and EU cell directives.

本产品符合公司 I 类管控物质标准：ROHS2.0、REACH 法规(EC N0.1907/2006)和欧盟电池指令(2006/66/EC)等。

10 The Remark of Production Duty/产品责任书

Customers are responsible to confirm and assure the matching and reliability of cells under actual application.

在实际应用中，客户有责任确认和保证电池与设备装置的匹配性和可靠性。

Customers must strictly operate according to this specification. Please fully evaluate the possible shortening of service life at higher than ambient temperature before use. The company will be an exemption from liability if the cell is improperly used or abused and then cause a fire, explosion, the human body or property damage.

在使用电池之前，必须严格遵照本产品规格书进行操作。高于环境温度的使用可能会导致使用寿命的减少，使用前请充分评估。误用将会引起电池出现发热、爆炸，而造成人体伤害或财产损失。对于没有按照产品规格书进行操作而造成的任何意外事故，本公司将不承担任何责任。

11 Notes/注释

Any other items which are not covered in this specification shall be agreed by both parties.

本说明书未包括事项应由双方协议确定。