

Illustrative render generated from published specifications

21.7 × 70.8 mm
70 g

Amprius
INR21700-50Q



Live page & updates

Amprius · released 2025

21700 NMC

MOOCH-TESTED · 50 A

5,000 mAh CAPACITY	50 A MOOCH CONTINUOUS	3.6 V NOMINAL · 2.5 – 4.2 V	18 Wh ENERGY · 257.14 WH/KG
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REFERENCE ONLY — NOT AN OFFICIAL DOCUMENT

This information is gathered from multiple sources, including manufacturer datasheets, independent third-party testing, and community contributions. Cell specifications vary between production batches and change over time, and no figure here is guaranteed to be correct or current. **Always consult the manufacturer's spec sheet directly.** Use this sheet for reference only — never as the sole basis for a safety-critical decision about charging, discharging, or assembling cells. The cell image is an illustrative render generated from published specifications, not a photograph.

CAPACITY AMONG 21700S #19 of 72 Lowest in database Highest Top tier for both capacity and discharge. One of the best all-around 21700 cells.	VOLTAGE OPERATING WINDOW 1.7 V usable Cutoff 2.5 V Nominal 3.6 V Max 4.2 V Below nominal the cell sags fast under load; above it, the last of the capacity fills slowly on the constant-voltage taper.
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APPLICATION SUITABILITY

Rule-of-thumb ratings from this cell's capacity and continuous discharge. Check your own load before committing.

Powerwalls	High capacity means more stored energy per cell. Fewer cells needed for a given kWh target.
Ebike packs	Good balance of capacity for range and discharge for hills. Works well in most ebike packs.
Car audio	Enough discharge to handle amplifier bursts without voltage sag.
High-drain vaping	Above the 25A Mooch CDR threshold. Suitable for regulated and mechanical mods.
Flashlights	High capacity means long runtime. Great for everyday carry and extended use.
Power tools	Sufficient discharge and capacity for most power tool packs.

IDENTITY		PHYSICAL	
Manufacturer	Amprius	Diameter	21.7 mm
Model	INR21700-50Q	Length	70.8 mm
Format	21700	Weight	70 g
Chemistry	NMC	ELECTRICAL	
Year released	2025		
Terminal	Flat top		
Protection	Unprotected		
OPERATING TEMPERATURE			
Charging	0°C to 45°C	Rated capacity	5,000 mAh
Discharging	-20°C to 80°C	Nominal voltage	3.6 V
ENERGY & POWER DENSITY		Max charge voltage	4.2 V
		Discharge cutoff	2.5 V
		Energy	18 Wh
		Internal resistance	5 mΩ
		Max continuous discharge	50 A (mooch)
Energy	18 Wh	Discharge C-rate	10C
Specific energy	257.14 Wh/kg	Cycle life	500 cycles
Volumetric density	687.43 Wh/L		
Power density (mass)	2,571 W/kg		
Power density (volume)	6,874 W/L		
Capacity ranking	#19 of 72 21700s		
C-RATE CONVERSION · 5,000 MAH			
C-RATE	CURRENT	THEORETICAL RUNTIME	
0.2C	1 A	5h 00m	
0.5C	2.5 A	2h 00m	
1C	5 A	1h 00m	
2C	10 A	30m	
3C	15 A	20m	
5C	25 A	12m	
8C	40 A	7m 30s	

10C	50 A	6m
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Highlighted row is closest to the rated 50 A continuous discharge.

CHARGING

RATE	CURRENT	ESTIMATED TIME TO FULL
0.5C	2,500 mA	~2h 00m
1C	5,000 mA	~1h 00m

Constant-current phase only. Real charge time runs longer because of the constant-voltage taper at the end.

SERIES PACK CONFIGURATIONS

Voltages calculated from this cell's own nominal and maximum charge voltage. The 3P columns show one common parallel count as a worked example — scale the parallel group to the capacity you need.

SERIES	NOMINAL	FULLY CHARGED	CELLS AT 3P	CAPACITY	ENERGY
3S	10.8 V	12.6 V	9	15 Ah	162 Wh
7S	25.2 V	29.4 V	21	15 Ah	378 Wh
10S	36 V	42 V	30	15 Ah	540 Wh
13S	46.8 V	54.6 V	39	15 Ah	702 Wh
14S	50.4 V	58.8 V	42	15 Ah	756 Wh

EXAMPLE PACKS

7S2P 24V ebike / small pack 14 cells · 25.2 V 10,000 mAh · 252 Wh 100 A max · ≈0.98 kg cells	13S4P 48V ebike standard 52 cells · 46.8 V 20,000 mAh · 936 Wh 200 A max · ≈3.64 kg cells	16S4P DIY powerwall 64 cells · 57.6 V 20,000 mAh · 1,152 Wh 200 A max · ≈4.48 kg cells	4S6P Power tool replacement 24 cells · 14.4 V 30,000 mAh · 432 Wh 300 A max · ≈1.68 kg cells
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SIMILAR CELLS

Same format and chemistry, within ± 500 mAh.

CELL	MAH	CONTINUOUS	WH	WEIGHT	WH/KG
Amprius INR21700-50Q (this cell)	5,000	50 A	18	70 g	257
Linkdata 55P	5,500	40 A	19.8	—	—
Samsung INR21700-55E	5,490	10 A	19.8	—	—
BAK 53E	5,300	10 A	19.1	69 g	277
Samsung INR21700-53G	5,300	10 A	19.1	72 g	265
LG M50T	5,014	14 A	18.1	70 g	258

HANDLING & SAFETY

- Never charge above 4.2V or discharge below 2.5V.
- Store cells at around 3.6-3.8V (roughly 40-60% charge) for long-term storage.
- Don't mix cells with different capacities, chemistries, or states of charge in a pack.
- Inspect wraps before use. A torn wrap can cause a short circuit.
- Always use a BMS or balance charger appropriate for your pack configuration.
- Keep cells away from metal objects, keys, and coins. A short across the terminals can cause fire.

SOURCES & FURTHER READING

Cell Savors page	cellsaviors.com/cell-database/amprius-inr21700-50q
Manufacturer datasheet	https://amprius.com/documents/Amprius_Product_Catalog.pdf
Independent test (Mooch)	https://www.e-cigarette-forum.com/threads/bench-test-results-a...
Full cell database	cellsaviors.com/cell-database