

Illustrative render generated from published specifications

18.25 × 65 mm
48 g

Samsung
ICR18650-22E



Live page & updates

Samsung · released 2004

18650 NMC

2,200 mAh CAPACITY	4.4 A RATED CONTINUOUS	3.7 V NOMINAL · 2.8 – 4.2 V	8.14 Wh ENERGY · 169.58 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 18650S #87 of 169 Lowest in database Highest A mid-range 18650 cell. Solid for builds that don't need extreme capacity or discharge.	VOLTAGE OPERATING WINDOW 1.4 V usable Cutoff 2.8 V Nominal 3.7 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	Usable for powerwalls but lower capacity means you'll need more cells to hit your target kWh.
Ebike packs	Not enough discharge for ebike use. Voltage sag would be a problem under load.
Car audio	Not enough discharge for car audio amplifiers. You need at least 15-20A continuous for most setups.
High-drain vaping	Below the 25A Mooch CDR threshold that high-drain vaping needs. Use a higher-drain cell.
Flashlights	Lower capacity means shorter runtime. Better cells are available for flashlight use.
Power tools	Not enough discharge or capacity for power tool use.

IDENTITY

Manufacturer	Samsung
Model	ICR18650-22E
Format	18650
Chemistry	NMC
Year released	2004
Wrap colour	Teal
Insulator	White
Terminal	Flat top
Protection	Unprotected

OPERATING TEMPERATURE

Charging	0°C to 45°C
Discharging	-20°C to 60°C

ENERGY & POWER DENSITY

Energy	8.14 Wh
Specific energy	169.58 Wh/kg
Volumetric density	478.74 Wh/L
Power density (mass)	339 W/kg
Power density (volume)	957 W/L
Capacity ranking	#87 of 169 18650s

C-RATE CONVERSION · 2,200 MAH

C-RATE	CURRENT	THEORETICAL RUNTIME
0.2C	0.44 A	5h 00m
0.5C	1.1 A	2h 00m
1C	2.2 A	1h 00m
2C	4.4 A	30m

Highlighted row is closest to the rated 4.4 A continuous discharge.

PHYSICAL

Diameter	18.25 mm
Length	65 mm
Weight	48 g

ELECTRICAL

Rated capacity	2,200 mAh
Nominal voltage	3.7 V
Max charge voltage	4.2 V
Discharge cutoff	2.8 V
Energy	8.14 Wh
Internal resistance	9 mΩ
Max continuous discharge	4.4 A (datasheet)
Discharge C-rate	2C
Standard charge current	1,100 mA
Typical charge time	2 h
Standard discharge	440mA
Cycle life	500 cycles

CHARGING

RATE	CURRENT	ESTIMATED TIME TO FULL
0.5C	1,100 mA	~2h 00m
1C	2,200 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	11.1 V	12.6 V	9	6.6 Ah	73 Wh
7S	25.9 V	29.4 V	21	6.6 Ah	171 Wh
10S	37 V	42 V	30	6.6 Ah	244 Wh
13S	48.1 V	54.6 V	39	6.6 Ah	317 Wh
14S	51.8 V	58.8 V	42	6.6 Ah	342 Wh

EXAMPLE PACKS

7S2P 24V ebike / small pack 14 cells · 25.9 V 4,400 mAh · 114 Wh 9 A max · ≈0.67 kg cells	13S4P 48V ebike standard 52 cells · 48.1 V 8,800 mAh · 423 Wh 18 A max · ≈2.5 kg cells	16S4P DIY powerwall 64 cells · 59.2 V 8,800 mAh · 521 Wh 18 A max · ≈3.07 kg cells	4S6P Power tool replacement 24 cells · 14.8 V 13,200 mAh · 195 Wh 26 A max · ≈1.15 kg cells
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SIMILAR CELLS

Same format and chemistry, within ± 500 mAh.

CELL	MAH	CONTINUOUS	WH	WEIGHT	WH/KG
Samsung ICR18650-22E (this cell)	2,200	4.4 A	8.14	48 g	170
Panasonic NCR18650D	2,700	5.1 A	10	—	—
Sanyo UR18650ZT	2,650	5.3 A	9.8	46 g	213
LG LGDB118650	2,600	—	9.8	—	—
LG LGDBB11865	2,600	—	9.8	—	—
Sanyo UR18650ZTA	2,620	5.8 A	9.7	48 g	202

HANDLING & SAFETY

- Never charge above 4.2V or discharge below 2.8V.
- 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/samsung-icr18650-22e
Manufacturer datasheet	https://www.dnkpowers.com/wp-content/uploads/2018/04/Samsung-IC...
Full cell database	cellsaviors.com/cell-database