PRODUCT SPECIFICATION

Rechargeable Lithium Ion Polymer Battery

Model: E63B 63Ah cell

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Contents

1. General Information

1.1 Scope

This product specification defines the requirements of the rechargeable lithium ion battery to be supplied to the Customer by LG Chem.

1.2 Application : Electric vehicle

1.3 Product classification : Rechargeable lithium ion polymer battery

2. Nominal Specification

2.1 Recommended specification

Item	Condition / Note	Specification
2.1.1 Capacity at RT	Std. discharge	Minimum 63Ah (C_{min})
2.1.2 Nominal voltage	Average	3.6V
2.1.3 Standard charge	Constant current Constant voltage End condition (Cut off) Temperature	18.9A 4.20V 2.9A 25 ± 2ºC
2.1.4 Cycle charge (Refer to 4.1.2)	Constant current Constant voltage End condition (Cut off) Temperature	18.9A 4.20V 2.9A 25 ± 2ºC
2.1.5 Standard discharge (Refer to 4.1.3)	Constant current End voltage (Cut off) Temperature	63A 2.5V 25 ± 2ºC

2.1.6 Cycle discharge (Refer to 4.1.4)	Constant current End voltage (Cut off) Temperature	63A 2.5V 25 ± 2ºC
2.1.7 Safety charge (Refer to 4.1.5)	Constant current Constant voltage End condition (Cut off) Temperature	18.9A 4.20V 2.9A 25 ± 2ºC
2.1.8 Weight	Approx.	Max. 882g

2.2 Safety specification

Item	Condition / Note	Specification
2.2.1 Operating Temperature	Charge[1]	0 ~ 45°C
	Discharge[2]	-20 ~ 60°C
2.2.2 Max. Charge (0 ~ 45°C)	Constant current Constant voltage End condition (Cut off)	31.5A 4.20V 2.9A
2.2.3 Max. Discharge (-20 ~ 60°C)	Constant current End condition (Cut off)	189A 2.5V
2.2.5 Storage Temperature (for shipping state[3])	1 month 3 month 1 year	-20 ~ 55°C -20 ~ 45°C -20 ~ 25°C

[1] There is no safety concern with this temperature range, but the battery cell's performance is optimized in the temperature range of 0~45°C.
[2] There is no safety concern with this temperature range, but the battery cell's performance is optimized in the temperature range of -20 ~ 60°C.
[3] Shipping state : 30 ± 5% capacity of fully charged state

3. Appearance and Dimension

3.1 Appearance

There shall be no such defects as deep scratch, crack, rust, discoloration or leakage, which may adversely affect the commercial value of the cell.

3.2 Bare Cell Dimension

Thickness[4]	Width	Length
Max. 14.5mm	Max. 100mm	Max.301mm

4. Performance Specification

Charging / discharging shall be performed at 25 ± 2ºC unless otherwise noted.

4.1 Standard test condition

Item	Condition / Note	Specification
4.1.1 Standard charge	Constant current Constant voltage End condition (Cut off)	18.9A 4.20V 2.9A
4.1.2 Cycle charge	Constant current Constant voltage End condition (Cut off)	18.9A 4.20V 2.9A
4.1.3 Standard discharge	Constant current End voltage (Cut off)	63A 2.50V
4.1.4 Cycle discharge	Constant current End voltage (Cut off)	63A 2.50V

4.1.5 Safety charge	Constant current Constant voltage End condition (Cut off)	18.9A 4.20V 2.9A

4.2 Electrical specification

Item	Condition	Specification
4.2.1 Initial voltage V	Cell shall be measured in a state of fresh.	3.570 ~ 3.600
4.2.2 Cycle life at RT	Cells shall be charged and discharged per 4.1.2 and 4.1.4 for 1200cycles at 25 ± 2°C. Cells are to rest 10 minutes after charge and 10 minutes after discharge. Recovery capacity shall be measured per	Recovery capacity ≥ 65% (of C_{min})

4.3 Environmental specification

Item	Condition	Specification
4.3.1 Storage characteristics	Cells charged per 4.1.1 are stored at 25 ± 2ºC for 30 days. After storage, cells shall be discharged per 4.1.3 to obtain the remaining capacity and cycled per 4.1.1 and 4.1.3 for 3 cycles to obtain recovered capacity.	Remaining capacity ≥ 85% (of C_{min}) Recovered capacity ≥ 90% (of C_{min})

4.4 Safety specification

Item	Condition	Specification
4.4.1 External Short-Circuit Test	Cells are charged per 4.1.5, and the positive and negative terminal is connected by 80 ±20mΩ-wire for 1 hour.	No explosion No fire

4.4.2 Hotbox Test	Cells charged per 4.1.5 are heated in a circulating air oven at a rate of 11ºC/min to 150ºC. At 150ºC, oven is to remain for 10 minutes before test is discontinued.	No explosion No fire

5. Caution and Prohibition in Handling

Warning for using the lithium ion rechargeable battery. Mishandling of the battery may cause heat, fire and deterioration in performance. Be sure to observe the following.

Caution

- When a cell assembled with Bus Bar by using Ultra Sonic welding method, do not apply the high energy or the internal structure of the cell will be damaged.
- For the welding method to assemble the external lead terminal, LGC strongly recommend the Laser Welding system.
- The Aluminum Pouch is very susceptible to metallic particle contamination, The battery pack assembly process should ensure the control of contamination
- The Aluminum Pouch is easy to get damaged with metallic enclosure, The cell module/pack structure should be free from any sharp edge/burr/protrusion
- The facing part to Aluminum Pouch should ensure the electrical isolation or covered by isolated protective material(Anodizing Al or Protective Film)
- For the cooling method, LGC strongly recommend liquid direct cooling system. If the battery pack designed with air cooling system, the air circulation geometry of pack should consider the expansion of battery cell(10% swelling over time)
- When battery packs for any applications are assembled with cells, following functions must be designed into the battery packs and/or in the BMS (Battery Management System). The detailed levels, values, conditions for each following functions should be referring to the contents specified in this Product Specification. If one or more than one function is/are to be omitted, the Packer Company (and/or System Integration Company) must be informing to LG Chem's or to LG Chem's sales Agent company. Without informing to LGC, LGC will not be liable for any field quality issues happened due to exclusion of following functions.

  (1) Over voltage protection circuit

  (2) Under voltage protection circuit

  (3) Over Charge current protection circuit

  (4) Over Discharge current protection circuit

  (5) Short circuit protection

  (6) Over Temperature protection circuit

(7) 2nd over voltage protection

(8) FET failure protection (in case FET is out of order)

(9) Cell imbalance protection circuit (only for battery packs assembled with more than one cell)

(10) Cell Voltage balancing function (only for battery packs assembled with more than one cell)

Prohibition

- ✓ Do not charge the Cell whose voltage is less than 2 V.
- ✓ Do not charge the Cell in the place where static electricity is generated.
- ✓ Do not reverse-charge.
- ✓ Do not continue trickle charge beyond 12 hours.
- ✓ Do not over-discharge the Cell (less than 2.0 V per cell at RT).
- ✓ Do not short-circuit the Cell.
- ✓ Do not disassemble the Cell.
- ✓ Do not put the Cell into fire.
- ✓ Do not put the Cell into water.
- ✓ Do not subject the Cell to abnormal vibration and impact.
- ✓ Do not put the Cell into a microwave oven, dryer, or high pressure container.
- ✓ Do not use the Cell in proximity of organic solvents.
- ✓ Do not use the Cell mixed with any other type of batteries, including lithium ion and lithium ion polymer batteries.
- ✓ If any smell, discoloration, or excessive heat is noticed, stop using the Cell.
- ✓ If any cracks, deformation, or other damage is found on the Cell or container, or if any leakage of the electrolyte is found, stop using the Cell immediately.
- ✓ If the electrolyte from the Cell comes in contact with your skin or clothes, wash immediately with soap and water. If the electrolyte comes in contact with your eyes, wash thoroughly with water and immediately consult a physician.