



Lithium-ion Battery

DATA SHEET

Battery Model: [LIR18650](#)

Prepared	Authorized	Approved

Manufacturer: EEMB Co., Ltd.

Website: <http://eemb.com>

This Specification describes the requirements of the lithium ion battery with Lithium nickel manganese cobalt material supplied by EEMB Co., Ltd.

1. BASIC CHARACTERISTICS

ITEM	SPECIFICATION	REMARK
Nominal capacity	3000mAh	Std.charge/discharge
Minimum capacity	2900mAh	Std.charge/discharge
Standard Charge	0.3C (900mA) 4.35V 30mA	Constant current Constant voltage End current
Max. Charge Voltage	4.35±0.005V	/
Max.Charge current	0.5C (1500mA)	/
Standard Discharge	0.2C (600mA) 2.75V	Constant current End Voltage
Max.Discharge current	0.5C (1500mA)	Constant current
Approx Weight	46.50g	/
Internal resistance	≤60mΩ (with PTC)	AC Impedance, 1000Hz

2. Definition

2.1 Standard charge method

“Standard charge” shall consist of charging at constant current of 0.3C .The cell shall then be charged at constant voltage of 4.35V while tapering the charge current ,charging shall be terminated when the charging current has tapered to 30mA.For test purpose ,charging shall be performed at 25°C±2 °C

2.2 Standard discharge method

“Standard Discharge” shall consist of discharging at a constant current of 0.2C to 2.75V. Discharging is to be performed at 25°C±2 °C unless otherwise noted (such as capacity versus temperature)

2.3 Fast charge/discharge method

Tested at 25°C±2 °C Cell shall be charged at constant current of 0.3C to 4.35V with end current of 30mA. Cells shall be discharge at constant current of 0.5C to 2.75V. Cells are to rest 10 minutes after charge and 20minutes after discharging.

3. Technical characteristic

3.1 Electrical characteristic

ITEM	CRITERION	Specification
Discharge rate capacity	discharge capacity at 0.5C/discharge capacity at 0.2C	≥97%
Cycle life	Cells shall be charged and discharged per 4.3 300cycles.A cycle is defined as one charge and one .	≥75%
High-Low temperature	Cells shall be charged per 2.1 at 25°C±2 °C and discharge	

discharge performance	per 2.2 at the following temperatures		
	Charge	Discharge	Capacity
	25°C	-15°C -10°C 0°C 25°C 50°C	≥55% ≥70% ≥80% ≥100% ≥95%
Storage characteristic	Cells shall be charged per 2.1 and storage in a temperature-controlled environment at 25°C±2 °C for 30 days.After storage,cells shall be discharged per 2.2 to obtain the capacity remaining .		Capacity remaining rate ≥90%
High temperature storage test	Cells shall be charged per 2.1 and storage in a temperature-controlled environment at 60 °C for 1 week.After storage,cells shall be discharged per 2.2 and cycled per 2.2 for 3 cycles to obtain recovered capacity		Capacity recovery rate≥90%

3.2 Environment characteristic

ITEM	CRITERION	Specification
Constant Temperature and High Humidity	Cells are charged per 2.1 and stored at ambient temperature of 40°C±5 °C(95%RH) for 48H,then placed in room temperature for 2h,after that,check its appearance prior to being discharged cut -off voltage at a constant current of 0.2C.	no distortion,no rust,no fume,no explosion; The discharging time is not less than 180min
Drop test	Cells charge per 2.1 are dropped onto wooden floor from 1.0 meter height for 1cycle,2 drops from each cell terminal and 1 drop from the side of cell can (Total number of drops=3)	No leakage,no fume,no explosion
Vibration Test	After Standard charge,cells are fixed on vibration table and subjected to vibration cycling at the rate of 1Hz per minute between 10HZ and 55HZ。 The excursion of the vibration is 1.52mm.The test has to be carried out for 90 minutes at x,y and z axes individually.	No leakage, fire or explosion

3.3 Safety Test

All below tests are carried out on the equipment with forced ventilation and explosion-proof device.Before test all cells are charged in accordance with 2.1,and stored 24 prior to testing.

ITEM	CRITERION	Specification
Crush Test	A cell is to be placed on the crush flat,the axis is parallel to the crush flat,it is to be crushed between two flat surfaces.Crushing force is approximately 13KN and hold for 1 min	No fire,no explosion

Impact Test	Cells charge per 2.1 are impacted with their longitudinal axis parallel to the flat surface to the flat surface and perpendicular to the longitudinal axis of the 15.8±0.2mm diameter bar. A 9.1±0.1 Kg weight is to be dropped from a height of 610±25mm onto the cell	no fume, no explosion
Heating Test	Cells are charged per 2.1 and heated in a circulation air oven at a rate of (5±2)°C per minute to (130±2)°C. At 130°C oven is to remain for 10 minutes before test is discontinued	No fire or explosion
Overcharge Test	A cell is discharged to cut-off voltage at CC of 0.2C, then it is to be subjected to CC /CV power by connecting its positive & negative terminal, then set the current of 3 times the max. set the voltage as 10V, after that, charge the cell up to 10V at 3 times current at the max, until that last 7h at the voltage of 10V or the voltage is no more increased.	No fire, no explosion
Short-circuit test	Cells are charged per 2.1, and the positive and negative terminal is connected by a (80±20)mΩ-wire. Monitor its temperature while testing, the cell is to be discharged until the cell case temperature has returned to be 20% less than peak temperature	no fire, no explosion Max. temp. <150°C

4. PROTECTION

When Li-ion rechargeable battery is used over the permitted voltage or current, electrolyte may disassemble, and this case will affect safety performance of Li-ion rechargeable battery. So protection circuit module were used in order to prevent overcharge, over discharge and over current.

WARNINGS!

- 1) Do not immerse the battery in water or seawater, and keep the battery in a cool dry surrounding if it stands by.
- 2) Do not use or leave the battery near a heat source as fire or heater
- 3) When recharging, use the battery charger specifically for that purpose
- 4) Do not reverse the position (+) and negative (-) terminals
- 5) Do not connect the battery to an electrical outlet
- 6) Do not discard the battery in fire or heat it
- 7) Do not short-circuit the battery by directly connecting the positive (+) and negative (-) terminal with metal objects such as wire.
- 8) Do not transport or store the battery together with metal objects such as necklaces, hairpins etc.
- 9) Do not strike or throw the battery
- 10) Do not directly solder the battery and pierce the battery with a nail or other sharp object.

CAUTIONS!

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- 1) Do not use or leave the battery at very high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be decreased.
 - 2) Do not use it in a location where static electricity is great, otherwise, the safety devices may be damaged, causing hidden trouble of safety.
 - 3) If the battery leaks, and the electrolyte get into the eyes. Do not rub eyes, instead, rinse the eyes with clean running water, and immediately seek medical attention. Otherwise, it may injure eyes or cause a loss of sight.
 - 4) If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charger and stop using it.
 - 5) In case the battery terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.
 - 6) Be aware discarded batteries may cause fire, tape the battery terminals to insulate them.

Special notice!

Keep the cells in **50% charged state** during long period storage. We recommend to charge the battery up to 50% of the total capacity every 3 months after receipt of the battery and maintain the voltage 3.7~4.0V. And store the battery in cool and dry place.