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LIR18650-26 • Rechargeable Lithium Battery



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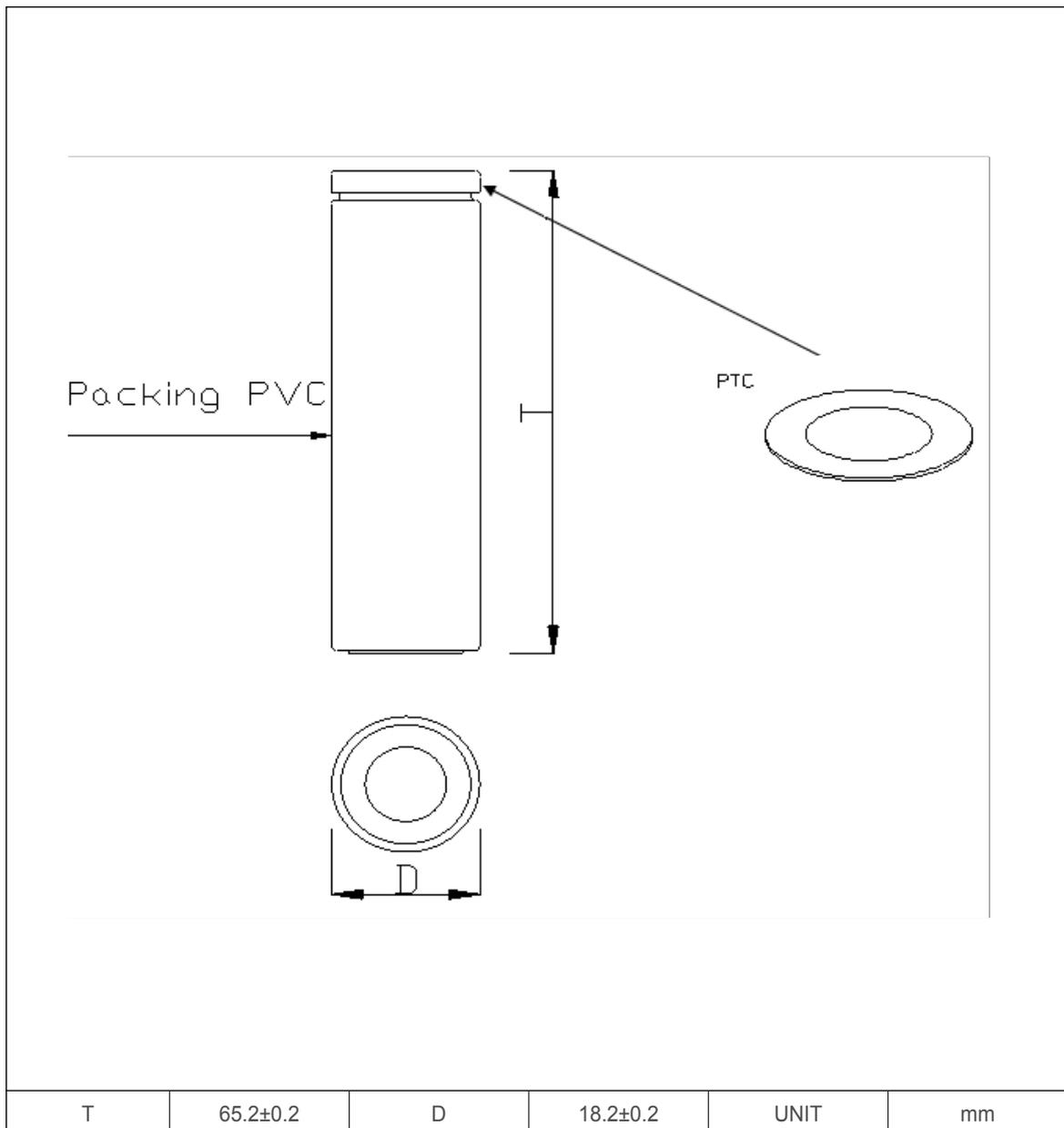
1. Model

LIR18650-26

2. Scope

This specification describes the basic performance, technical requirement, testing method, warning and caution of the Li-Ion cylindrical rechargeable battery. The specification only applies to FULLWAT.

3. Initial dimension



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4. Specification

NO.	Item	Specifications
4.1	Nominal capacity	2600mAh Std. charge/discharge
	Min. capacity	2550mAh Std. charge/discharge
4.2	Nominal voltage	3.6V
4.3	Charge current	Standard Charge: 0.5C (1250mA) Rapid charge: 1C (2500mA)
4.4	Standard charging method	1250mA (constant current) charge to 4.2V, then CV (constant voltage 4.2V) charge till charge current decline to ≤50mA
4.5	Charging time	Standard Charging Approx 5 hours Rapid charge Approx 2 .5hours
4.6	Max.charge current	Constant Current 2500mA Constant Voltage 4.2V 50mA cut-off
4.7	Max.discharge current	Constant current 10000mA end voltage3.0V
4.8	Standard discharge current	Constant current 500mA end voltage3.0V
4.9	Discharge lower limit voltage	3.0V
4.10	Charge upper limit voltage	4.20V
4.11	Initial impedance	≤60mΩ
4.12	Weight	Approx. 46g
4.13	Operating temperature	Charging 0°C ~45°C Discharging -20°C ~60°C
4.14		-20°C ~60°C ≤1 month
	Storage temperature	-20°C ~45°C ≤3 month
		-20°C ~20°C ≤1 year
4.15	Recoverable capacity	Constant current 1250 charge to 4.2V, then constant voltage charge to current declines to 50mA, rest for 10min. constant current 1250 discharge to 3.0V, rest for 10min. Repeat above steps 3 times, recording the maximum capacity
4.16	Storage humidity	≤75% RH
4.17	A ppearance	Without scratch,distortion,contamination and leakage
4.18	Standard environmental condition	Temperature: 23±5°C Humidity: 45-75%RH Atmospheric Pressure: 86-106 Kpa

Note - Above testing of safe characteristic must be with protective equipment.

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5. Performance Specification

5.1 Standard test condition

5.1.1 Standard Charge

Unless otherwise specified, "Standard Charge" shall consist of charging at constant current of 1,250mA. The cell shall then be charged at constant voltage of 4.2V while tapering the charge current. Charging shall be terminated when the charging current has tapered to 50mA. For test purposes, charging shall be performed at 25°C ± 2°C.

5.1.2 Standard Discharge

"Standard Discharge" shall consist of discharging at a constant current of 500mA to 2.75V. Discharging is to be performed at 25 °C ± 2 °C unless otherwise noted (such as capacity versus temperature).

5.1.3 Fast Charge / discharge condition

Cells shall be charged at constant current of 1,250mA to 4.2V with end current of 125mA. Cells shall be discharged at constant current of 2,500mA to 2.75V. Cells are to rest 30 minutes after charge and 30 minutes after discharge.

5.2 Electrical Specification

No.	Item	Condition	Specification
5.2.1	Initial AC Impedance	Cell shall be measured at 1kHz after charge per 5.1.1	≤60mΩ
5.2.2	Initial Capacity	Cells shall be charged per 5.1.1 and discharged per 5.1.2 within 1h after full charge.	Cini≥2,500mAh (Cmin)
5.2.3	Cycle life	Cells shall be charged and discharged per 5.1.3, 500 cycles. A cycle is defined as one charge and one discharge. 501st discharge capacity shall be measured per 5.1.1 and 5.1.2	≥70% (of Cmin in 4.1)

5.3 Environmental Specification

Item	Condition	Specification	
5.3.1	Storage Characteristics	Cells shall be charged per 5.1.1 and stored in a temperature-controlled environment at 25°C ± 2°C for 30 days. After storage, cells shall be discharge per 5.1.2 to obtain the remaining capacity.*	Capacity remaining rate ≥ 90% of Cmin in 4.1
5.3.2	High Temperature Storage Test	Cells shall be charged per 5.1.1 and stored in a temperature-controlled environment at 60°C for 1 week. After storage, cells shall be discharged per 5.1.2 and cycled per 5.1.1 and 5.1.2 for 3 cycles to obtain recovery capacity*.	No leakage, Capacity recovery rate ≥ 80% of Cmin in 4.1
5.3.3	Thermal Shock Test	65°C (8h) ← 3hrs → -20°C (8h) for 8 cycles with cells charged per 4.1.1 After test, cells are discharged per 5.1.2 and cycled per 5.1.3 for 3 cycles to obtain recovery capacity.	No leakage Capacity recovery rate ≥ 80% of Cmin in 4.1
5.3.4	Temperature Dependency of	Cells shall be charged per 4.1.1 at 25°C ± 2°C and discharged per 4.1.2 at the following temperatures.	

* Remaining Capacity : After storage, cells shall be discharged with Std. condition(5.1.2) to measure the remaining capacity.

** Recovery Capacity : After storage, cells shall be discharged with Std. discharge condition(5.1.2), and then cells shall be charged with std. charge condition(5.1.1), and then discharged with Std. condition(5.1.2). This charge / discharge cycle shall be repeated three times to measure the recovery capacity.

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Capacity

Charge	Discharge	Capacity
25°C	-10°C	70% of C _{min}
	0°C	80% of C _{min}
	25°C	100% of C _{min}
	60°C	95% of C _{min}

5.4 Mechanical Specification

No	Item	Condition	Specification
5.4.1	Drop Test	Cells charged per 5.1.1 are dropped onto an oak board from 1 meter height for 1 cycle, 2 drops from each cell terminal and 1 drop from side of cell. (Total number of drops =3).	No leakage No temperature rising
5.4.2	Vibration Test	Cells charged per 5.1.1 are vibrated for 90 minutes per each of the three mutually perpendicular axes (x, y, z) with total excursion of 0.8mm, frequency of 10Hz to 55Hz and sweep of 1Hz change per minute.	No leakage

5.5 Safety Specification

No	Item	Condition	Specification
5.5.1	Overcharge Test	Cells are discharged per 5.1.2, then charged at constant current of 3 times the max. charge condition and constant voltage of 4.2V while tapering the charge current. Charging is continued for 7 hours (Per UL1642).	No explode, No fire
5.5.2	External Short - Circuited Test	Cells are charged per 5.1.1, and the positive and negative terminal is connected by a 100mΩ-wire for 1 hour (Per UL1642).	No explode, No fire
5.5.3	Overdischarge	Cells are discharged at constant current of 0.2C to 250% of the minimum capacity.	No explode, No fire
5.5.4	Heating Test	Cells are charged per 5.1.1 and heated in a circulating air oven at a rate of 5°C per minute to 130°C. At 130°C, oven is to remain for 10 minutes before test is discontinued (Per UL1642).	No explode, No fire
5.5.5	Impact Test	Cells charged per 5.1.1 are impacted with their longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm diameter bar (Per UL1642).	No explode, No fire
5.5.6	Crush Test	Cells charged per 5.1.1 are crushed with their longitudinal axis parallel to the flat surface of the crushing apparatus (Per UL1642).	No explode, No fire

Note - Above testing of safe characteristic must be with protective equipment.

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6. Battery Protection

The battery shall be with the over-charging prevention, over-discharging prevention, and over-current prevention during use. Protective circuit shall have protective functions as follows:

1. Over-charging protection

Overcharging prevention stops charging if any cell of the battery pack reaches 4.25V.

2. Over-discharging protection

The Over-discharging protection monitors the voltage of every cell in the pack and works to avoid a drop in the cell voltage to 2.8V or less.

3. Over-current protection

The cell shall be discharged at less than the maximum discharge current specified in the Specification Approval Sheet. A high discharging current may reduce the discharge capacity significantly or cause overheating.

7. Caution in use

To ensure proper use of the battery please read the manual carefully before using it.

Handling

- Do not expose to, dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid shorting the battery
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different make, type, or model batteries.
- Keep out of the reach of children.

Charge and discharge

- Battery must be charged in appropriate charger only.
- Never use a modified or damaged charger.
- Do not leave battery in charger over 24 hours.

Storage

- Store the battery in a cool, dry and well-ventilated area.

Disposal

- Regulations vary for different countries. Dispose of in accordance with local regulations.

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8. Battery operation instruction

Charging

- Charging current: Cannot surpass the biggest charging current which in this specification book stipulated.
- Charging voltage: Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.
- Charge temperature: The battery must carry on the charge in the ambient temperature scope which this specification book stipulated

Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the battery positive electrode and the cathode meet instead, can damage the battery.

Discharging current

The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the oversized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat.

Discharge temperature

The battery discharge must carry on in the ambient temperature scope which this specification book stipulated.

Over-discharges

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

Storing the Batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for six months the long time storage, suggested you should carry on additional charge to the battery.

9. Warranty

The warranty is specified in our warranties section of Terms of Sales. If the product is to be stored for more than three months it is necessary to perform the appropriate maintenance to ensure the good condition of the batteries. Consult our annex to the Terms of Sales on the recommended maintenance.

10. Other The Chemical Reaction

Because batteries utilize a chemical reaction, battery 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 battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

11. Note:

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

Note - Above testing of safe characteristic must be with protective equipment.