

# Specification of Lithium-ion Battery

Classification      Li-ion battery  
Model                **IFR26650LT3.0Ah**  
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## 1. Preface

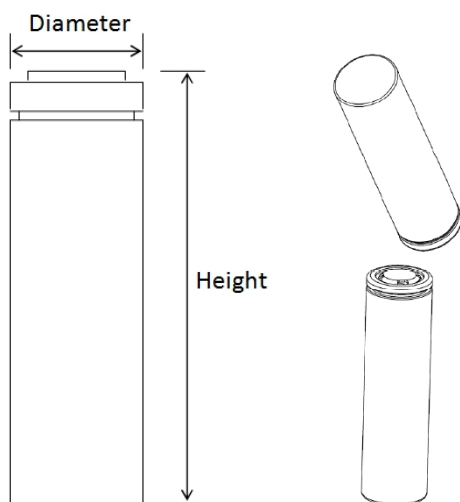
This Specification only applies to IFR26650LT3.0Ah cell supplied by Dongguan Wiltson New Energy Technology Co., Ltd.

## 2. Description and model

2.1 description: Cylindrical Li-ion battery

2.2 model: IFR26650LT3.0Ah

2.3 Dimension:



No.	Item	Specification
1	Height	65.7 ± 0.2mm
2	Diameter	26.3 ± 0.2mm

## 3. Definition

3.1 Rated capacity

Rated capacity: Cap=3000mAh. under 25±2°C, It means the capacity value of being discharged by 2-hours rate to end voltage 2.00V, which is signed Cap, the unit is mAh.

3.2 Standard charge method

Under 25 ± 2°C, it can be charged to 3.65V with constant current of 0.5C, and then, charged continuously with constant voltage of 3.65V until the charged current is 0.02C.

3.3 Standard discharge method

Under 25 ± 2°C, it can be discharged to 2.00V with constant current of 1C.

3.4 Low temperature test standard

3.4.1 Low temperature discharge

After the battery is charged in accordance with 3.2, nickel spot welding is used to weld the battery core, and the test equipment is double-wire welded to the nickel sheet, which is placed in the low temperature environment for 16~24h. The test point is sealed, and the current of 1C is constant discharged to the minimum discharge voltage of the single cell.

### 3.4.2 Low temperature charging

After the discharge of the cell as specified in 3.3, the nickel sheet spot welding is used to weld the cell, and the test equipment is welded to the nickel sheet with two wires. It is placed in the low temperature environment for 16~24h, and the test point is sealed. After the current of 0.2C is constant current charging to the single cell voltage of 3.65V, it is converted to constant voltage 3.65V charging, and when the charging current is less than 0.05C, the charging stops.

## 4. Nominal Specification

Item	Specification		
Nominal capacity	3000mAh@0.5C		
minimum capacity	3000mAh@0.5C		
nominal voltage	3.2V		
energy density	113Wh/kg		
min. discharging voltage	2.00V ( ambient temperature > -20℃ ) 1.50V ( ambient temperature ≤ -20℃ )		
max. charging voltage	3.65 ± 0.03V		
std. charging current	0.5C <sub>5</sub> A		
std. discharging current	1.0C <sub>5</sub> A		
max. charging current	3.0C <sub>5</sub> A ( ambient temperature > 0℃ ) 0.5C <sub>5</sub> A ( ambient temperature ≤ 0℃ ) 0.2C <sub>5</sub> A ( ambient temperature ≤ -20℃ )		
max. discharging current	10.0C <sub>5</sub> A ( ambient temperature ≥ -20℃ ) 7.0C <sub>5</sub> A ( ambient temperature < -20℃ )		
Operating temperature range	Charge: -30~60℃ Discharge: -50~60℃		
Internal Impedance	≤9mΩ ( AC Impedance,1kHz )		
weight	≈85g		
Cell dimension	height: 65.7 ± 0.2mm diameter: 26.3 ± 0.2mm		
Cell storage and transportation environment and temperature ranges	<1 month	-20~+45℃ ; <75%RH*	Cell 50% SOC, the capacity lost during shipment < 10%. Capacity recover rate >90%
	<3 months	-20~+35℃ ; <75%RH*	
	<12 months	-20~+25℃ ; <75%RH*	

## 5. Electrical Characteristics

Discharge rate capability	<p>Temperature: <math>25 \pm 2^{\circ}\text{C}</math></p> <p>Charger: CC/CV 0.5C 3.65V; End current: 0.05c</p> <p>Discharger: CC Tect current; End voltage: 2.00V</p> <p><math>\frac{\text{discharge capability at } 5\text{C}}{\text{discharge capability at } 1\text{C}} \geq 98\%</math></p> <p><math>\frac{\text{discharge capability at } 8\text{C}}{\text{discharge capability at } 1\text{C}} \geq 96\%</math></p> <p><math>\frac{\text{discharge capability at } 10\text{C}}{\text{discharge capability at } 1\text{C}} \geq 95\%</math></p>
Cycle life	<p>Temperature: <math>25 \pm 2^{\circ}\text{C}</math></p> <p>Charger: CC/CV 0.5C 3.65V; End current: 0.05c; Rest time: 0.5 h</p> <p>Discharger: CC 0.5C; End voltage: 2.00V; Rest time: 0.5 h</p> <p>Capacity retention <math>\geq 80\%</math></p> <p>1500cycle @100%DOD      2000cycle @80%DOD</p>
temperature discharge performance	<p>According to the low temperature test standard in 3.4, discharge to 1.5V with 1C current</p> <p><math>\frac{\text{discharge capability at } -40^{\circ}\text{C}}{\text{discharge capability at } 25^{\circ}\text{C}} \geq 90\%</math></p> <p>According to the low temperature test standard in 3.4, discharge to 2.0V with 1C current</p> <p><math>\frac{\text{discharge capability at } -20^{\circ}\text{C}}{\text{discharge capability at } 25^{\circ}\text{C}} \geq 90\%</math></p> <p>After charging as specified in 3.2, discharge at constant current of 1C to 2.0V</p> <p><math>\frac{\text{discharge capability at } 60^{\circ}\text{C}}{\text{discharge capability at } 25^{\circ}\text{C}} \geq 98\%</math></p>
Storage performance	<p>After the battery is charged according to 3.2, it is set aside for 28 days at an ambient temperature of <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> and discharged to 2.0V with a current of 0.5C to measure the remaining capacity of the battery; after the battery is charged according to 3.2, it is discharged to 2.0V with a current of 0.5C to measure the recovered capacity of the battery.</p> <p><math>\frac{\text{Remaining capacity}}{\text{Original discharge capacity}} \geq 90\%</math></p> <p><math>\frac{\text{Recovery capacity}}{\text{Original discharge capacity}} \geq 95\%</math></p>

## 6. Environmental characteristics

Item	Test Method	Criterion
Vibration	A cell is charge in accordance with 3.2, then installed onto the vibration desk with clamps, Equipment parameters of frequency and amplitude are as follow(the frequency is to be varied at the rate of 1 oct/min between 10 and 55 herts, and repet vibration for 30 min. The cell is to be tested in three mutually perpendicular directions); Frequency: 10Hz~30Hz amplitude:0.38mm Frequency: 30Hz~55Hz amplitude:0.19mm	1) NO scratch, no leakage, no fire, no explosion, no vent; 2) The voltage is not less than 3.0V.
Temperature Test	A cell is charge in accordance with 3.2, then heated the cell to be in a oven. Then the temperature of the oven is to be raised to the temperature of $65 \pm 3^{\circ}\text{C}$ and remain for 4 h at that temperature,then the temperature of the oven is to be dropped to the temperature of $20 \pm 3^{\circ}\text{C}$ and remain for 4 h at that temperature, then the temperature of the oven is to be dropped to the temperature of $-20 \pm 3^{\circ}\text{C}$ and remain for 4 h at that temperature, repeat this for another 9 cycles,after that put the cell in room temperature for at least 24 hrs, then chack cell's appearance.	No leakage, no fire, no explosion, no vent

## 7. Safety Characteristics

Item	Test Method	Criterion
Short Circuit	A cell is to be short-circuited by connecting the positive and negative terminals of the battery with an external load of less than 50 mΩ until the surface temperature decrease 10 degree from the highest point.	No fire, no explosion
Over charge	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 as 10A,the voltage as 10V,after that, Charge the cell up to 10V at CC of 10A ,until that last 7h at the voltage of 10V.	No fire, no explosion
Forced-Discharge	A cell is discharged to voltage 0V at a constant current of 1C.	No fire, no explosion

Heating	A cell is to be heated in a circulating air oven. The temperature of the oven is to be raised at a rate of $5^{\circ}\text{C} \pm 2^{\circ}\text{C}$ per minute to a temperature of $130^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and remain for 30min at that temperature before the test is discontinued.	No fire, no explosion
Drop	A cell is charged in accordance to standard charge method and stored for 1~4h, then dropped from a height of 1000mm to a wooden board(18-20mm thick) which is placed on the concrete ground. Cells shall be dropped from top, bottom and diameter side. Each side drop 3 and repeat two times.	No leakage, no smoking, no fire, no explosion
Remarks	All above safety tests will be conducted at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ except where specified differently. Use proper ventilation with protective equipment.	

### 8. Warning and cautions in handling the lithium-ion cell

TO prevent the possibility of the cell from leaking, heating, explosion, please observe the following precautions:

#### Warning!

- Don't immerse the cell in water.
- Don't use and leave the cell near a heat source such as fire or heater.
- When charging, use a cell charge specifically for that purpose.
- Don't reverse the positive and negative terminals.
- Don't connect the cell to an electrical outlet directly.
- Don't discard the cell in fire or heater.
- Don't connect the positive and negative terminal directly with metal objects.
- Don't transport and store the cell together with metal objects such as necklaces, hairpins.
- Don't strike, throw or trample the cell.
- Don't pierce the cell with a nail or other sharp object.

#### Caution!

- Don't use or leave the cell at very high temperature conditions ( for example, strong direct or a vehicle in extremely hot conditions ).
- If the cell leaks and the electrolyte get into your eyes, don't wipe eyes, instead, thoroughly rinse the eyes with clean running water for at least 15 minutes, and immediately seek medical attention. Otherwise, eyes injury an result.
- If the cell gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during usage, recharging or storage, immediately remove it from the device or cell charger and stop using it.
- In case the terminals get dirty, clean the terminals with a dry cloth before use.
- If the cell beyond the useful-life, please fully discharge, sticks the cell with insulating tape, then put the cell to the specialized recycle bin.



## 9. Warranty

Dongguan Wiltson New Energy technology Co., Ltd. will be responsible for replacing the cell against defects or poor workmanship for 1year from the date of shipping. Any other problems caused by malfunction of the equipment or unsuitable use of the cell are not under this warranty. The warranty set forth in proper use, handing conditions described above, and excludes in the case of a defect witch is not related to manufacturing of the cell.

## 10. Contact information

If you have any questions regarding the cell, please contact the following address:

Headquarter: No.3 Nengda Road, Shipai District, Dongguan.

Tel: 86-0769-81007293 Fax: 86-0769-89611196