

# LITHIUM IRON PHOSPHATE BATTERY

## SPECIFICATIONS

Model	: IFR18650(1.4)
Description	: Lithium Iron Phosphate rechargeable battery (RoHS compliant)
Dimension	: Max. 18.6(Ø) x 65.7(H) mm
Nominal Capacity	: 1.40Ah (Min. 1.30Ah) at 280mA rate discharge to 2.0V at 25°C 3 cycles allowed for incoming inspection Discharge capacity varies with discharge current and temperature
Nominal Voltage	: 3.2Volt (after charge)
Cut-Off Voltage	: 2.0Volt
Approximate Weight	: 41g (bare cell)
Internal Impedance	: <35mΩ (with 1KHz AC testing at full charge)
Cycle Life	: 2,000 standard charge/discharge cycles > 70% (0.98Ah) capacity
Charging	: Using dedicated CC/CV (3.65±0.03V) battery charger only Charging with CC (Constant Current) to 3.65V, then charge with CV (Constant Voltage) till charge current <70mA Standard Charge Current 280mA at 25°C below 8 hours Max. Charge Current 0.70A at 25°C below 3 hours
Discharging	: Standard Discharge Current 280mA at 25°C Max. Discharge Current 4.2A at 25°C (Conditions apply)
Temperature Range	: Charge 0°C to 45°C Discharge -10°C to 60°C Storage 10°C to 25°C (Recommended) -10°C to 45°C (within 1 month) -10°C to 35°C (within 3 months)
Warranty	: Limited warranty is provide against defects of poor workmanship for 12 months from date of shipment. Problem caused by misuse, mishandling, malfunction of equipment, or mix-use of cell is not under this warranty. Replacement of cell is limited to 1-to-1 only
Storage Characteristic	: Long term storage may cause loss of capacity. Capacity recoverable related to time of storage. Cell is recommended to store with 45% capacity charged, temperature 20±5°C, and relative humidity 45%-75%. After max. 12 months storage, capacity recovery will be > 70% initial capacity (~0.98Ah), after 5 recovery charge/discharge cycles.
Appearance	: No scratch, rust, discoloration, leakage which may adversely affect commercial value of the cell
Standard Test Condition	: Unless otherwise specified, all test are conducted at temperature 20±5°C and relative humidity 60±15% The ammeter and voltmeter with accuracy grade 0.5 or higher The slide caliper with scale 0.01mm The impedance meter with AC 1kHz measurement

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**Model : IFR18650(1.4)**  
**Version : 2.80**

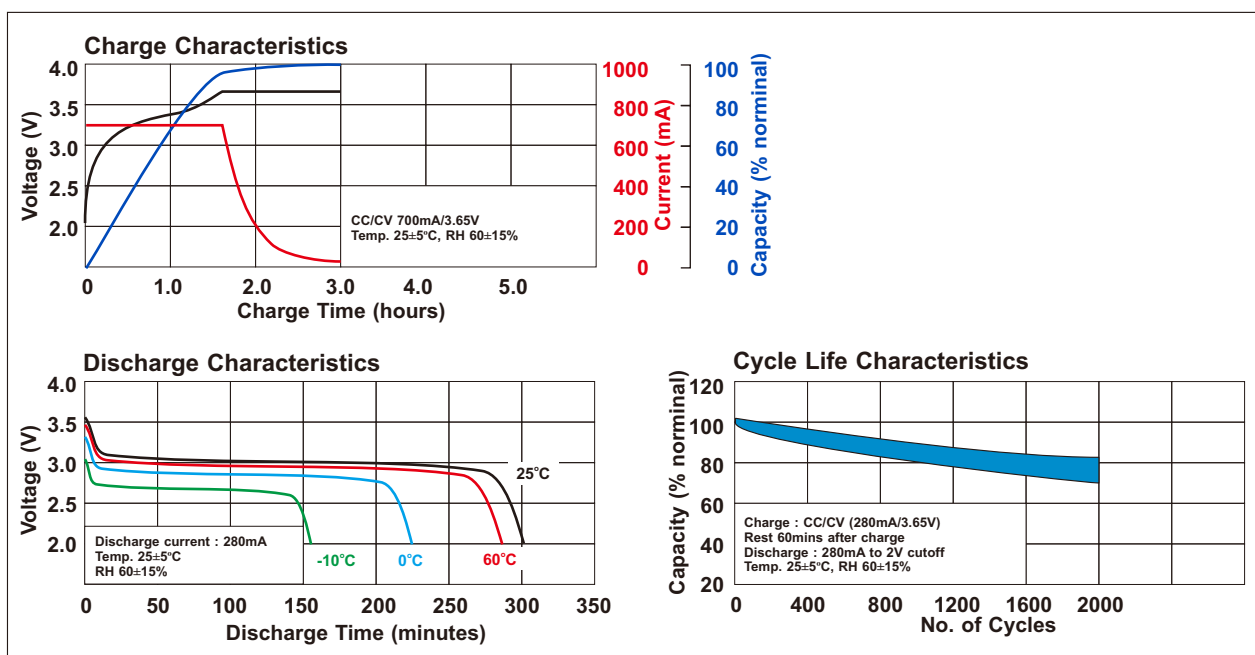
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Capacity Retention	: Discharge measured after the cell is stored for 28 days after standard charge. Capacity retention $\geq 85\%$ initial capacity ( $\sim 1.19\text{Ah}$ )
Maintenance Charging	: Maintenance charging is required for storage over 3 months or when battery open circuit voltage below 3.3V. Prolonged storage without maintenance may result is battery gassing and loss of performance.
Remarks :	: Charging voltage shall be less than 3.65V/cell. It must never exceed 3.68V/cell.
Ex-Factory Condition	: As per air shipment regulations, the battery must be shipped at a State of Charge (SoC) $\leq 30\%$ . We recommend customer to arrange supplementary charging of the battery after receiving the batteries.
External Short Circuit Test	: No fire, no explosion for short-circuiting of the positive and negative terminals of a fully charged cell with a total external resistance of $80\text{m}\Omega \pm 20\text{m}\Omega$ at $20 \pm 5^\circ\text{C}$ .
Free Fall Test	: No fire, no explosion for dropping a fully charged cell 3 times from a height of 1m at random orientations onto a concrete floor at $20 \pm 5^\circ\text{C}$ .
Thermal Abuse Test	: No fire, no explosion for placing a fully charged cell in an oven with temperature raised at a rate of $5^\circ\text{C}/\text{min} \pm 2^\circ\text{C}/\text{min}$ to a temperature of $130^\circ\text{C} \pm 2^\circ\text{C}$ .
Crush Test	: No fire, no explosion for crushing a fully charged cell between two flat surfaces with a force of $13\text{kN} \pm 1\text{kN}$ at $20 \pm 5^\circ\text{C}$ until maximum force has been applied, or an abrupt voltage drop of 1/3 of the original voltage has been obtained, or 10% of deformation has occurred.
Over-charging Test	: No fire, no explosion for charging a fully discharged cell at a constant current of 2.8A with a voltage limit of 4.8V for 8 hours.
Forced Discharge Test	: No fire, no explosion for reverse charging a fully discharged cell at a constant current of 1.4A for 90 min. at $20 \pm 5^\circ\text{C}$ .



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# LITHIUM-ION POLYMER RECHARGEABLE BATTERY

## SPECIFICATIONS

Customer of lithium iron phosphate battery should employ appropriate cautions in order to obtain optimum performance and safety.

Charging	<ul style="list-style-type: none"><li>: Charging current should less than the maximum charging current specified in the specification</li><li>Charging voltage must up to the voltage specified in the specification</li><li>Do not charge battery over the specified time in the specification</li><li>Charging temperature should be within the specified range in the specification</li><li>Reverse charging should be strictly prohibited</li><li>Improper charging may generate heat, smoke, rupture or flame, and cause damage to the battery</li></ul>
Discharging	<ul style="list-style-type: none"><li>: Discharging current should be less than the maximum discharging current specified in the specification</li><li>Discharging temperature should be within the specified range in the specification</li><li>Do not over discharge the battery below 2.5V/cell</li><li>Over discharge may occur by self-discharge if the battery is left for a very long time without any use</li><li>Improper discharge may cause loss of performance</li></ul>
Storage	<ul style="list-style-type: none"><li>: Storage temperature should be within the specified range in the specification</li><li>Storage is recommended in low humidity, nop corrosive gas atmosphere</li><li>Long term storage may cause loss of capacity</li></ul>
Cycle Life	<ul style="list-style-type: none"><li>: Cycle life differs by conditions of charging, discharging, operating temperature and/or storage condition</li><li>Level of capacity differs by cycles of battery used</li></ul>
Product Design	<ul style="list-style-type: none"><li>: Do not solder directly on bare cell</li><li>Battery should be positioned far from heat source and heat components</li><li>Appropriate shock absorber should be equipped to minimize shock on the battery</li><li>Protection circuit against overcharge, over discharge, over current should be equipped to insure safety in case of misuse</li><li>Battery should be designed to connect only to specified charger and system</li><li>Reverse connection of battery should be avoided in system design</li><li>Improper product and system design may cause loss of battery performance</li></ul>
Product Assembly	<ul style="list-style-type: none"><li>: Battery cell should be inspected visually before product assembly to avoid usage of damaged cell (for example, sleeve damage, battery distortion, or leaking)</li><li>Excessive force on the battery terminals and battery surface should be avoided</li><li>Precaution should be taken when battery is moved / transported to other place</li><li>Do not disassembly, short-cutcuit, incinerate, immersion in water, and mix use of battery</li><li>Battery should be disposed in discharged state</li><li>Improper handling may cause loss of battery performance</li></ul>
Warning	<ul style="list-style-type: none"><li>: The battery may present risk of fire and chemical burn if mistreated. Keep away battery from children.</li></ul>

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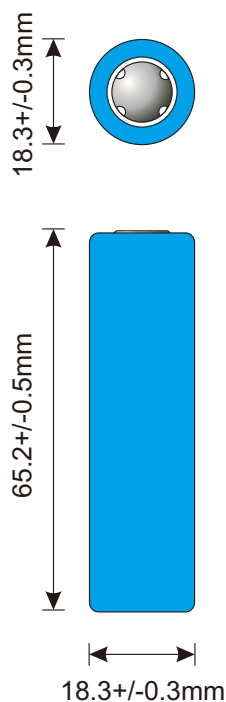
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# LITHIUM-ION POLYMER RECHARGEABLE BATTERY

## PRODUCT DRAWING



Dimensions with PVC Jacket

**Ink Jet**

**KINETIC (Lot. YYYY)**  
**+ IFR18650(1.4) LiFePO<sub>4</sub>**  
**3.2V 1.4Ah 4.48Wh**



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