



Specification Approval Sheet

Name : RCR123a LiFePO4 Rechargeable Battery

Model : 30200

SPEC : 3.2V, 750mAh

Approved By	Checkup	Make

Customer Confirmation	Signature	Date
	Company Name :	
	Stamp :	

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GENERAL DESCRIPTION

Item Number:	30200
Chemistry:	Lithium Ion (LiFePO4)
Battery Model:	RCR123A

1. ELECTRICAL CHARACTERISTICS

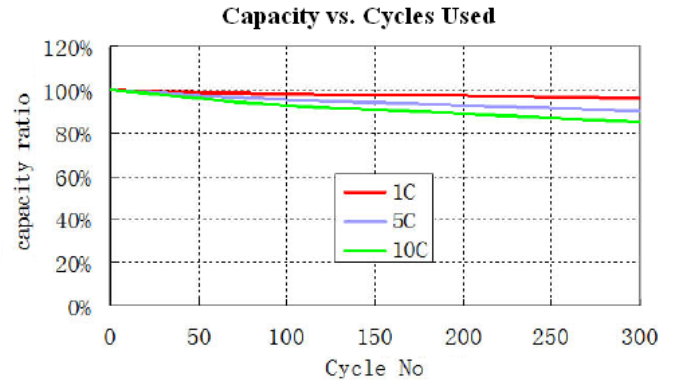
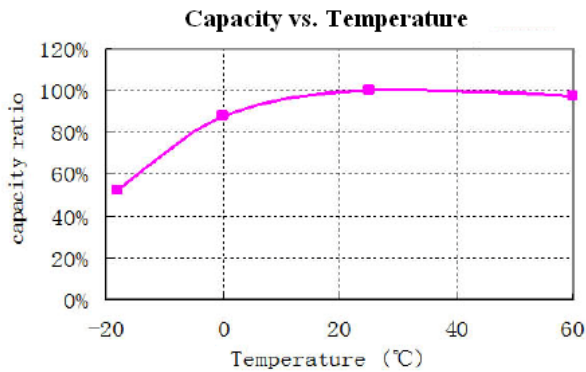
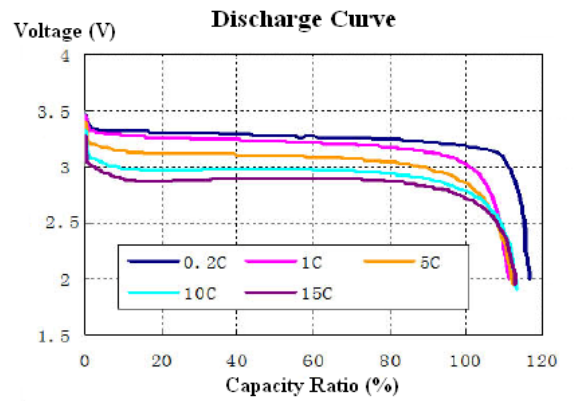
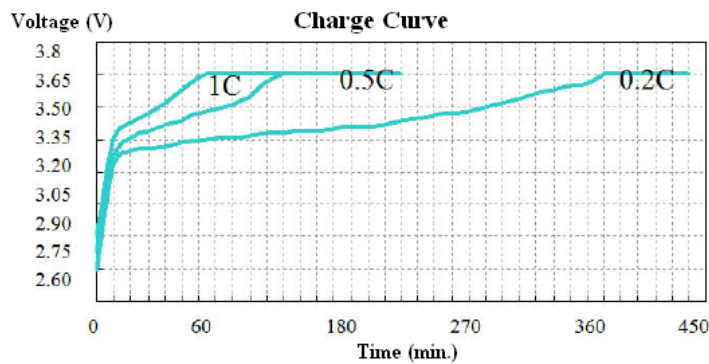
Nominal Capacity	750 mAh
Minimum Capacity	450 mAh
Nominal Voltage	3.2 V
Charge Cutoff Voltage	3.6 V
Discharge Cutoff Voltage	2.0 V
Maximum Charge Current	450 mA
Maximum Discharge Current	450 mA
Cell Internal Impedance (Max. @1KHz)	≤ 400mΩ (at fully charged state)
Charge Current (Using CC/CV Charging Method)	Standard = 90 mA
	Rapid = 450 mA
Cycle Life	≈ 300 (Charge/Discharge)

Capacity to Temperature Relation

Temperature	-10°C	0°C	23°C	60°C
Capacity (with respect to capacity at room temperature)	50%	70%	100%	100%



2. CHARACTERISTIC CURVES¹

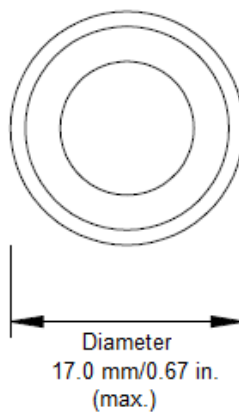
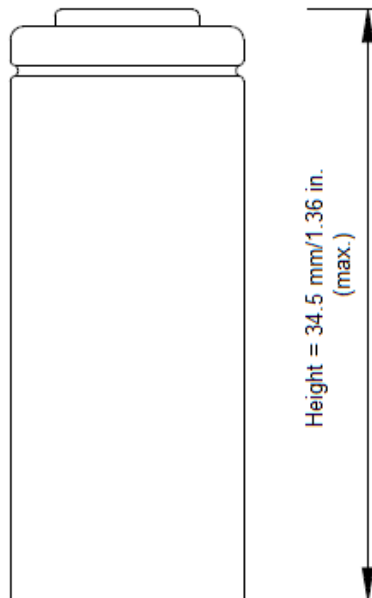


¹Curves represent typical LiFePO₄ chemistry cell characteristics.



3. PHYSICAL CHARACTERISTICS

Maximum Diameter	17.0 mm. (\approx 0.67 in.)	
Maximum Height	34.5 mm. (\approx 1.36 in.)	
Approximate Weight	16.5 grams (0.6 ounces)	
Operating Temperature Range	Charge:	0°C to 45°C (32°F to 113°F)
	Discharge:	-20°C to 60°C (4°F to 140°F)
	Storage:	Less than 3 months: -20°C to 40°C (-4°F to 104°F)
Less than 1 year: -20°C to 25°C (-4°F to 77°F)		





4. NOTES

- All measurements performed to determine the electrical parameters in this datasheet were conducted under the following conditions:
 - Ambient Temperature = 20°C ± 5°C
 - Relative Humidity = between 65% ± 20%
 - Using Standard Charging current (0.2C)
 - Discharge cycle started 30 minutes (rest period) after completion of charge cycle.
- Charge and discharge cycles are noted using the parameter “C” which refers to the capacity rating of the mentioned battery with units of 1/hrs. Hence, the charge or discharge current is a fraction or multiple of the capacity of the battery, in units of milliamps. The following table gives examples to demonstrate this:

For example if a battery has a rated capacity of 1300mAh:

Charge/Discharge Current Rating	Equivalent Charge/Discharge Current (mA)
0.2C	260
1.0C	1300
2.0C	2600

- Charging is performed using a constant-current/constant-voltage (CC/CV) charging method. This charging method, generally, has two main stages:
 - Stage 1: Charge with constant current specified by battery datasheet. This is performed until the battery voltage reaches the fully charged cutoff voltage, also mentioned in the datasheet.
 - Stage 2: Once the maximum cutoff voltage of the battery has reached, charge with constant voltage. The current should slowly decrease as charging continues. Once the charging current has dropped to ≤ 5% (ideally ≤ 1%) of the initial current value the battery is fully charged.

Storage:

30 days after fully charging cell (using standard charging method and values), and stored at 20°C ±5°C, residual capacity ≥ 90% of nominal capacity rating.

Transportation:

UN38.3 certified



5. SAFETY CHARACTERISTICS (UN compatible)

Each of the tests in this section was conducted with a battery fully charged using standard charging cycle parameters. Tests performed at room temperature unless otherwise specified.

Test	Testing Details	Test Results
Short Circuit	The battery is shorted for the duration of 1 day, by connecting the negative and positive terminals to each other using a copper wire.	No leakage. No explosion.
Impact Test	A 56mm diameter bar with mass of 10Kg is dropped across the center of the cell from a height of 1 meter.	No fire. No explosion.
Overcharge	Charge cell with constant current of 1,350 mA until the voltage reaches 12 Volts. Then charge at constant voltage of 12V for 1 hour.	No leakage. No explosion.
Over-Discharge	After fully discharging battery at standard discharge current, continue to discharge cell at constant current of 450mA for 2.5 hours.	No fire. No explosion.
Crush	Cell is placed between two flat plates and a force of 13KN is applied for 30 minutes.	No fire. No explosion.
Nail Penetration	A 3mm diameter nail is penetrated through the cell and kept inside for 2 hours.	No fire. No explosion.
Drop Test	Cell is dropped twice on each face from a height of 1 meter onto a concrete floor.	No leakage. No fire. No explosion.

6. WARRANTY PERIOD & PRODUCT LIABILITY

Warranty period of this product is 6 months from the manufacturing date code. Tenergy is NOT responsible for the failures caused by mishandling the battery against the instructions in this datasheet. Specifications and data are subject to change without notice. Contact Tenergy for the latest information.



7. BATTERY USAGE WARNINGS & CAUTIONS

To prevent the possibility of battery leakage, excessive heat damage, fire or explosion, please observe the following precautions:

WARNINGS!

- Do NOT immerse the battery in water or other liquids. Keep or store the battery in a cool and dry place/environment.
- Do NOT use or store the battery near any source of heat.
- Use a charger that is clearly specified to be compatible for charging the battery and has appropriate charging protection (voltage, current, temperature)
- Do NOT install the battery in reverse polarity.
- Do NOT connect the battery to an electrical outlet or other incompatible power source.
- Do NOT discard the battery in fire.
- Do NOT short circuit the battery. Do NOT connect the positive and negative terminals to each other with metallic object(s) or other conductive material(s).
- Do NOT transport or store the battery together with metal objects, such as hairpins, necklaces, or any other conductive object or material.
- Do NOT strike, crush, puncture, disassemble, or throw the battery.
- Do NOT directly solder the battery or battery terminals. Do NOT pierce the battery.
- Lithium batteries should be used only with proper voltage, current, and temperature protection circuitry and protection.

CAUTIONS!

- Do NOT use or leave the battery in a high temperature environment (for example, under direct sunlight or in a vehicle in hot weather). Failure to take this precaution can lead to overheating of battery and/or fire or explosion. Also, performance of battery will degrade and lifetime will be reduced.
- Do NOT use battery in a location where there is high static-electricity or magnetic fields, otherwise safety devices may be damaged which cannot be visible.
- If the battery leaks and the electrolyte get into the eyes, do NOT rub eyes. Instead, rinse and wash eyes with clean water, and immediately seek medical attention.
- If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appears abnormal during use, recharging, or storage, immediately remove it from the device or battery charger and stop using it.
- In case the battery terminals are dirty, clean the terminals with a dry cloth before use. Otherwise, poor performance may occur due to the poor connection with the instrument or device.
- Be aware that discarded batteries may cause fire or explosion. Therefore, apply a non-conductive tape to the battery terminals to insulate them before discarding.