

PX9140200 3.2V 20Ah LiFePo4 Battery

This product specification describes the polymer lithium-ion batteries made by Power-Xtra Technology Co.,Ltd.

Please using the test methods that recommend in this specification.If you any opinions or advices about the test items and methods,please contact us.Please read the cantions recommended in the sepecifications first,take the credibility measure of the cell's using.

If the cells should be using at the environment that not preferred in this document, please connect us first and get our authorization .It is claimed that we should have no any responsibility with the contingency and loss due to the cell's wrong usage.

Product Type, Model and Dimension:

Type: Polymer lithium-ion battery

Model: PX9140200 3.2V 20Ah LiFePo4 Battery

Dimension (Max. T*W*L) mm: 9*140*200

Specification :

Item	Parameter	Remark
Nominal Capacity	<u>20000</u> mAh \pm 5%	0.5CA discharge, 25°C
Nominal Voltage	3.3V	Average Voltage at 0.5CA discharge
Standard Charge Current	0.5CA	Working temperature: 0~45°C
	3.0CA	0~45°C
Max Charge Current		Working temperature: 0~45°C
Charge cut-off Voltage	3.65V	CC/CV
Discharge Current	Cont.0.5CA~3.0CA	Working temperature: -10~60°C

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Discharge cut-off Voltage	2.5V	
Cell Voltage	3.3~3.4V	When leave factory
Impedance	$\leq 1.5m\ \Omega$	AC 1KHz after 50% charge, 25°C
Weight	Approx: 450g	
	≤ 1	-10~45°C
	≤ 3	0~30°C
	≤ 12	0~30°C
Storage Temperature	65 ± 20% RH	Best 20 ± 5°C for long-time storage

General Performance:

Definition of Standard charging method: At 20±5°C, charging the cell initially with constant current 0.5CA till voltage 3.65V, then with constant voltage 3.65 till current declines to 0.02CA.

	0.5C Capacity	After Standard charging, laying the battery 0.5h, then discharging at 0.5CA to 2.5V, recording the discharging time.	$\geq 120min$
	1C Capacity	0.5h 1CA 2.5V After Standard charging, laying the battery	$\geq 57min$

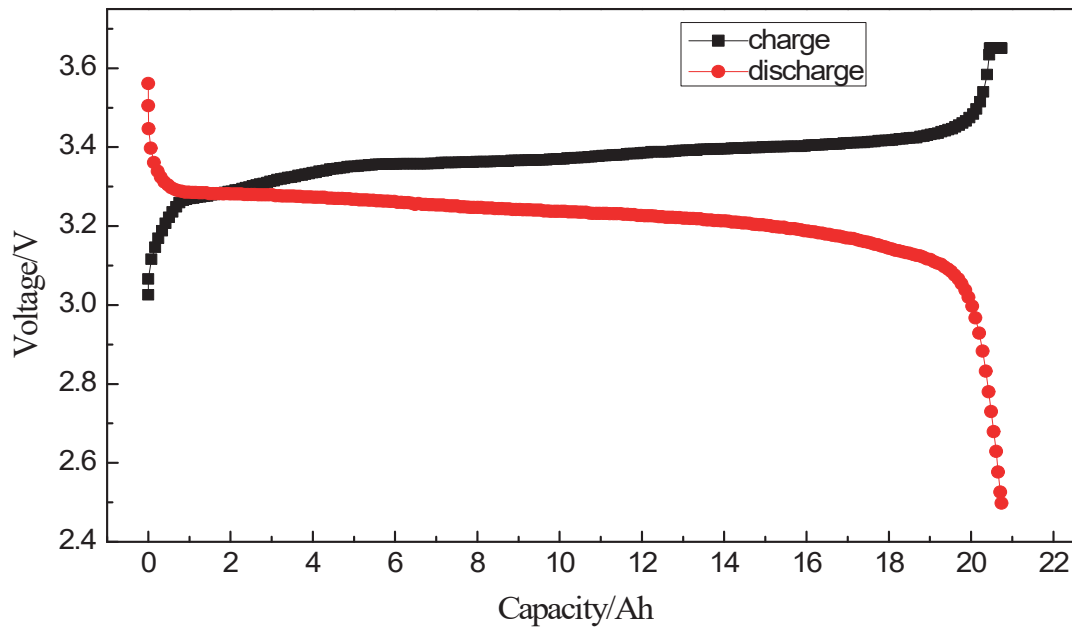
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		0.5h,then discharging at 1CA to 2.5V,recording the discharging time.2.5V,recording the discharging time.	
	3C Capacity	After Standard charging,laying the battery 0.5h,then discharging at 3CA to 2.5V,recording the discharging time.	$\geq 18\text{min}$
	Cycle life	Constant current 1 CA charge to 3.65V,then constant voltage charge to current declines to 0.02CA,stay 5 min,constant current 1CA discharge to2.5V,stay 5 min.Repeat above steps till the capacity below 80% of the nominal capacity.	≥ 2000
	Capability of keeping electricity	$20 \pm 5^{\circ}\text{C}$,After standard charging, laying the bettery 28 days, discharging at 0.5CA to voltage 2.5V,recording the discharging time.	$\geq 108\text{min}$

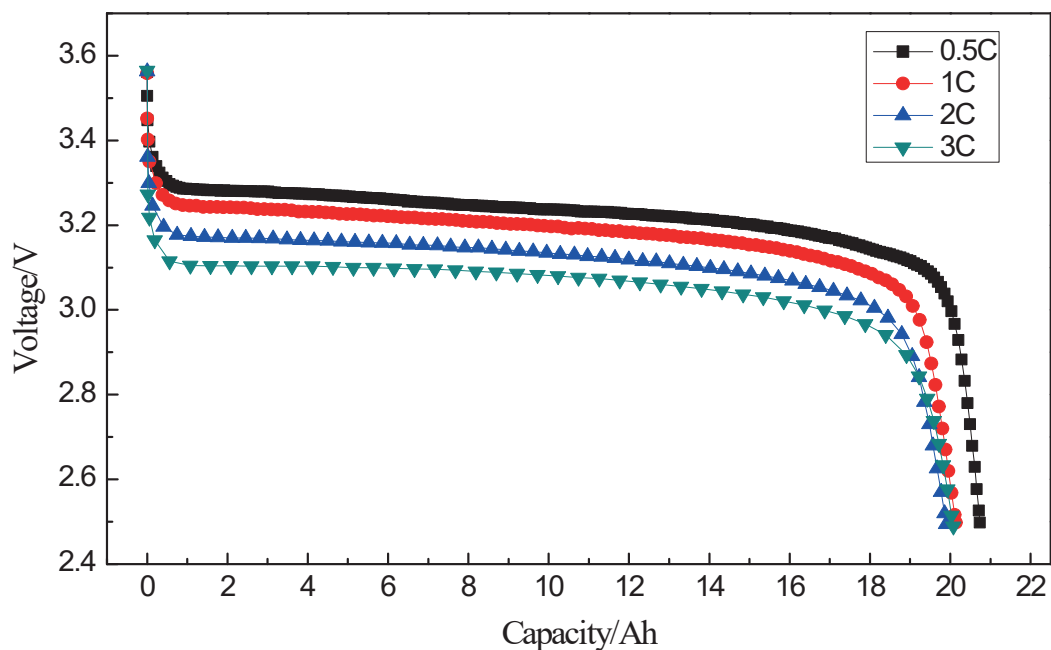
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Characteristics Curves:

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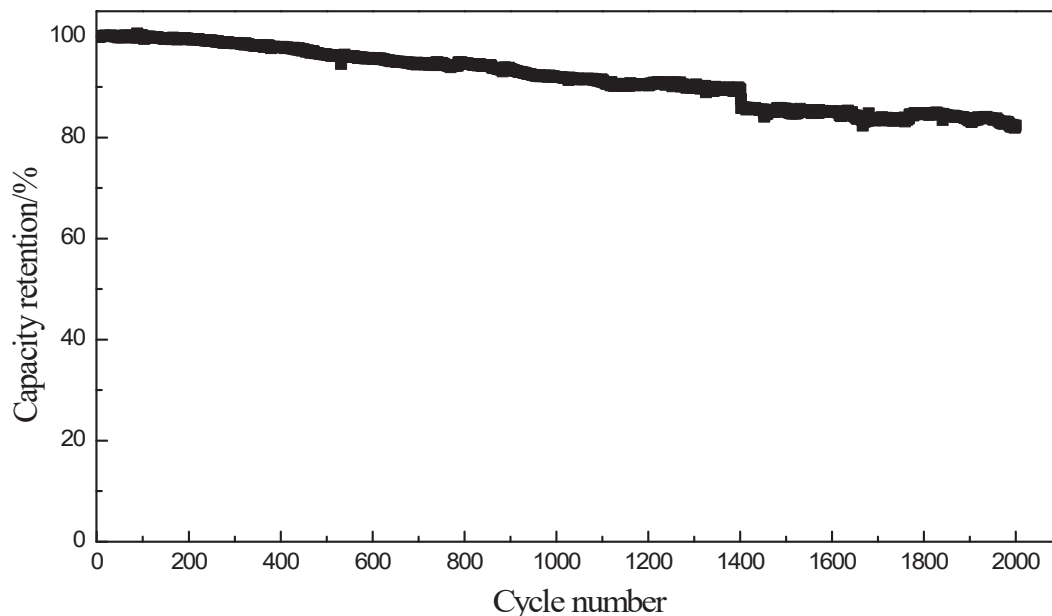


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Environment Performanceance:

Item	Test Methods	Performance
High temperature	After standard charging, laying the battery 5h at $55 \pm 2^\circ\text{C}$, then discharging at 0.5CA to voltage 2.5V, recording the discharging time.	$\geq 114\text{min}$
Low temperature at -20°C	After standard charging, laying the battery 12h at -20°C , then discharging at 0.5CA to voltage 2V, recording the discharging time.	$\geq 87\text{min}$
Low temperature at -40°C	After standard charging, laying the battery 12h at -20°C , then discharging at 0.5CA to voltage 2V, recording the discharging time.	$\geq 36\text{min}$

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Mechanical Performanceance:

	Vibration	After standard charging,put battery on the vibration table.30 min experiment from X,Y,Z axis. Scan rate: 1oct/min;Frequency 10-30Hz,Swing 0.38mm; Frequency 30-55Hz, Swing 0.19mm	No influency to batteries electaical performance and appearance
	Collision	After vibration test batteries were laying on the vibration table above X,Y,Z axis,Max	No influency to batteries electaical performance
		frequency acceleration: 100m/s^2 ;collision times per minutes: 40~80; frequency keeping time 16ms; all collision times: 1000 ± 10 .	and appearance
	Drop	Random drop the bettery from 1.0m height onto woodboard one times.	No explosion or fire

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Safety Test:

Test conditions: The following tests must be measured at flowing air and safety protection conditions. All batteries must standard charge and lay 24h.

Over charge	At $20 \pm 5^{\circ}\text{C}$, charging batteries with constant current 3 CA to voltage 10V, then with constant voltage 10V till current declines to 0A.	No explosion or fire , no smoke
Over discharge	At $20 \pm 5^{\circ}\text{C}$, discharging the cell initially with constant current 0.5CA till voltage declines to 0V,	No explosion or fire No electrolytes leakage
Short-circuit	At $20 \pm 5^{\circ}\text{C}$,connect batteries' anode by wire which impedance less than $50\text{m}\Omega$,keep 10min.	No explosion , no fire , no smoke
Nail test	After standard charge , a nail (diameter 3-5mm) is penetrated vertically through the center of the battery with the speed of $10\text{mm/s} \sim 40\text{mm/s}$ (the nail kept inside) .	No explosion or fire
Extrusion	At $20 \pm 5^{\circ}\text{C}$,put the battery on the platform of the extrusion equipment, the semi-cylinder extrusion axis is parallel to the extrusion plane, add pressure 13kN.	No explosion or fire
Thermal shock	Put the battery in the oven. The temperature of the oven is to be raised at $5 \pm 1^{\circ}\text{C}$ per minute to a temperature of 130°C and remains 30 minutes.	No explosion no fire , no smoke

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Cautions:

Cautions of batteries' operation:

The batteries must be careful of proceed the operation for it's soft package.

Aluminum packing materials:

The aluminum packing material was easily damaged by the sharp edge part, such as nickel-tabs.

- Forbid to use the sharp part touching the battery
- should cleaning working condition,avoiding the sharp edge part existence
- Forbid to pierce the battery with nail and other sharp items
- The battery was forbidden with metal, such as necklace, hairpin ect in transportation and storage

Sealed edge:

- Sealing edge is very easily damaged and don't bend it.
- The Al interlayer of package has good electric performance. It's forbidden to connect with exterior component for preventing short-circuits.(Short the anode and the Al interlayer of package with cause corrosion or swollen of the cell).

Folding edge:

- The folding dege is formed in batteries' processes and passed all hermetic test,don't open or deform it.
- The Al interlayer of package has good electric performance. It's forbidden to connect with exterior component for preventing short-circuits.

Mechanical shock:

- Don't fall, hit, bent the batteries'body;
- Don't knock on by sinker or trample the batteries;
- Don't sling the batteries.

Short-circuit:

Short-circuit is strictly prohibited.It should damage batteries badly.

- Don't connect the anode and cathode of the batteries to avoid short-circuit;
- Prohibit short-circuit of the anode (or cathode) and aluminum layer of Aluminum packing materials.

Standard test environmet for polymer lithiumion batteries:

Environment temperature: $20\pm 5^{\circ}\text{C}$, Humidity: 45~85%

Cautions of charge & discharge:

•**Charge:** Charging current should be lower than values that recommend below.Higher current and voltage charging may cause damage to cell electrical,mechanical,safety performance and could lead heat generation or leakage.

- Batteries charge should charging with constant current and contant voltage mode;
- Charging current should be lower than 3CA;
- Temperature 0~45°C is preferred when charging;
- Charging voltage must be lower than 3.7V.

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• Discharge:

- Discharging current must be lower than 3CA;
- Temperature -10~60°C is preferred when discharging;
- Discharging voltage must be lower than 2.0V.

Transportation of polymer lithium-ion batteries:

The batteries should transportation with 10%~50% charged states.

Others:

Please note cautions below to prevent cell's leakage, heat generation and explosion:

- Prohibit disassembling cells;
- Prohibit immerse cells into liquid such as water or seawater;
- Prohibit dumping the battery into fire;
- Prohibit soldering directly the battery;
- Prohibit charging the battery near fire or in the hot circumstance;
- Prohibit palcing the battery in a microwave oven or pressurized container;
- Prohibit use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and shorten service life.
- If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.
- Prohibit using the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charge immediately and discontinue use. If the battery leaks or gives off an odor, move it away from a fire source to avoid fire or explosion.

Schematic of Battery:

