

LiFePO₄ Battery Rechargeable Specification

MODEL : LiFePO4 72173200-280Ah

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Revised List

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1. Scope

This product specification describes HiMAX's LiFePO₄ battery. Please using the test methods that recommend in this specification. If you have any opinions or advices about the test items and methods, please contact us.

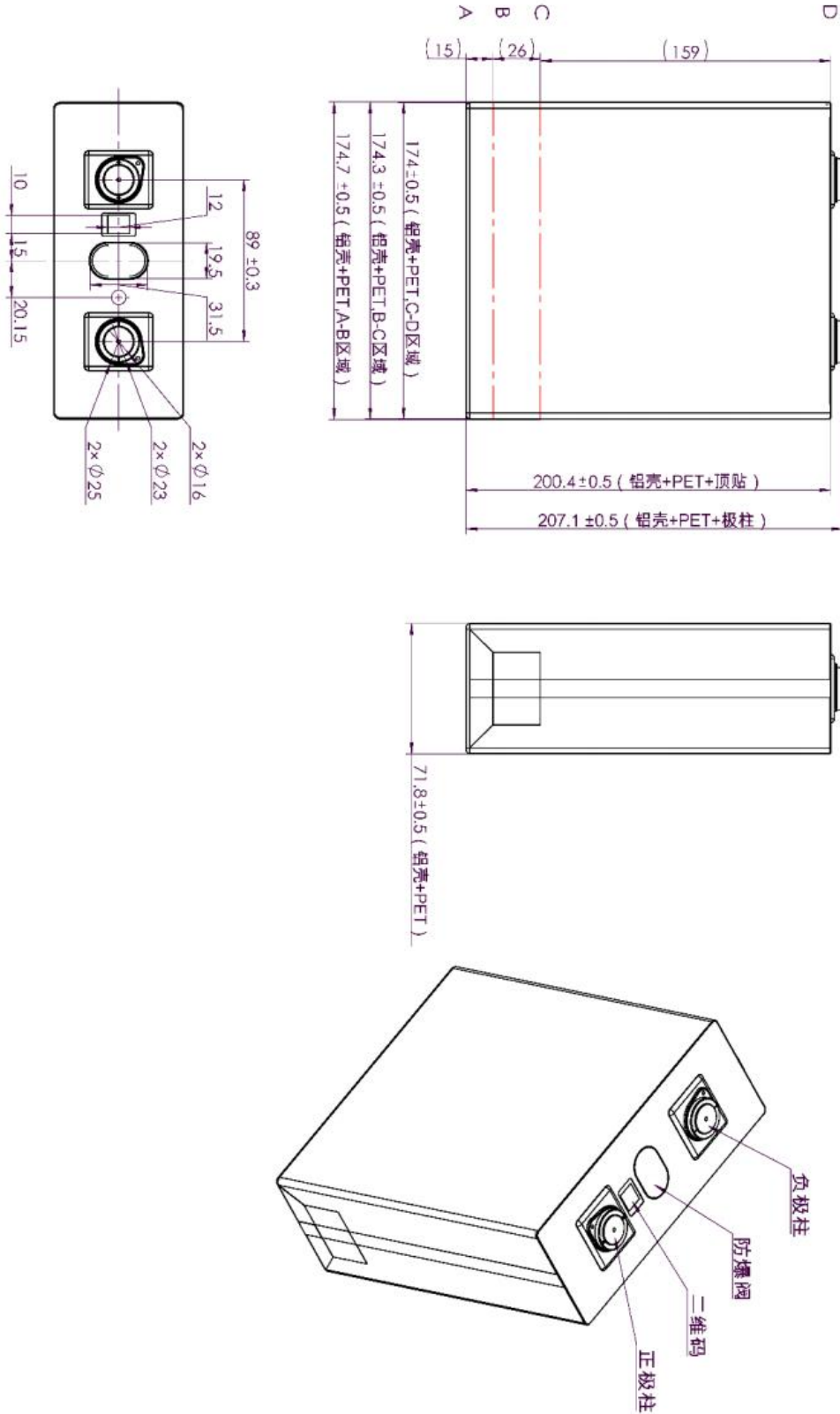
2. Reference standard

The standard reference GB/T18287-2013, UL1642 and CE61960 technology standards compiled.

3. Parameter

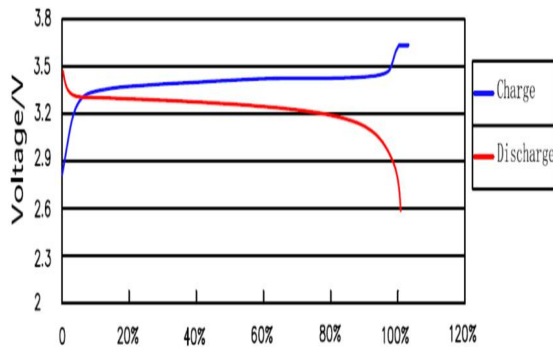
Item	Rating	Note
Nominal Capacity	280Ah	Discharge: 0.5C Cut-off Voltage:2.5V
Minimum Capacity	277Ah	Discharge: 0.5C Cut-off Voltage:2.5V
Nominal voltage	3.2V	
Internal Impedance	≤0.4mΩ	
Dimension	Max. 72.3*175.2*207.6mm	
Weight	Approx.5.54Kg	
Standard Charge Current	138.5A	
Max. Charge Current	138.5A	
Standard Discharge Current	138.5A	
Max. Continues Discharge current	138.5A	(277A 2min)
Cycle Life	3000 times (次)	80% SOC 100%DOD
Working Temperature Range	Charge: 0°C~55°C Discharge: -20°C~55°C	
Storage Temperature	-20~ 55°C	

4. Appearance and size (mm)

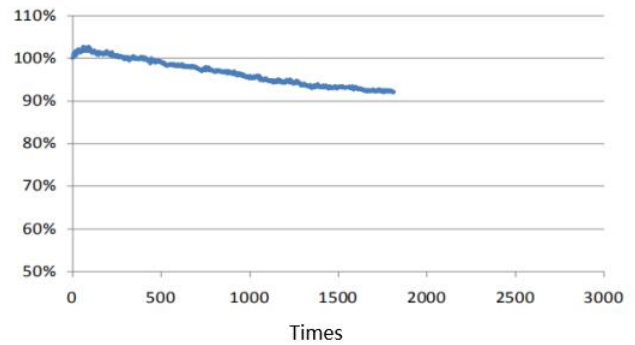


5. Charging & Discharging Curve

Standard Charging / Discharging



Service Life @1C Discharging



6. Electrical Performance & test condition

6.1 Standard Test Condition

The battery shall be evaluated within 1 month from the arrival date.

Unless otherwise stated in these specifications, the following test shall be carried out in an ambient temperature of $20 \pm 5^\circ\text{C}$, relative humidity of $65 \pm 20\%$,

Discharge capacity when the battery is discharged at 138.5A to 2.5V after being standard charged. Five cycles are permitted for this test. The test shall be terminated at the end of the first cycle which meets the requirement.

6.2 Testing Instrument or Apparatus

6.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision

scale of 0.01mm specified.

6.2.2 Voltmeter and Ammeter

Voltmeters and ammeters shall be equal or more precision instruments of 10KΩ/V and 0.01Ω.

6.2.3 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter)

6.3 Standard Charge

Standard charge : charging with constant current 138.5A to 3.65V, then charging with constant voltage 3.65V to 0.02C .

6.4 Standard Discharge

Standard discharge means discharging at 138.5A down to 2.5V

6.5 Electrical Performance

Item	Condition	Specification
Battery Capacity	a. Charge the battery at standard charging condition b. Store for one hour at 20°C c. Discharge at 0.5C, cut-off at 2.5V	Measured Capacity \geq 100% of Nominal Capacity
Cycle Life	a.Charge and discharge the battery with standard cycle life test b.Stop charging after 3000 cycles and discharge at 0.5C with cut off at 2.5V	Measured capacity \geq 80% of Nominal Capacity
Charge(capacity) retention	a.Charge the battery at standard charging condition b.Store for 28 days at 20°C c.Discharge at 0.5C, cut-off at 2.5V	Measured capacity \geq 95% of Nominal Capacity
Temperature	a. Charge the battery at standard charging condition at 20°C b.Discharge at different temp of -20°C	Discharged capacity at, -20°C \geq 70% of Nominal capacity

7. Mechanical Performance

Item	Condition	Specification
Crush Test	<p>a. A battery is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram with a 32mm diameter piston.</p> <p>b. The crushing is to be continued until a pressure reading of 17.2mmPa is reached on the hydraulic ram, applied force of 13kN.</p> <p>c. Once the maximum pressure has been obtained it is to be released.</p>	No fire, No explosion
Drop Test	<p>a. The battery is to be dropped from a height of 1 meter twice onto concrete ground</p> <p>b. The battery has only two axes of symmetry in which case only two directions shall be tested.</p>	No explosion, No fire, No smoke
Vibration	<p>a. A full-charged battery is to be subjected to simple harmonic motion with an amplitude of 1.6mm total maximum excursion.</p> <p>b. The frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz.</p> <p>c. The cell shall be vibrated for 30 minutes per axis o XYZ axes.</p>	No leakage No Fire No explosion

8. Cell Safety Performance

Item	Condition	Specification
Over charge	<p>a. At $20 \pm 5 \text{ }^\circ\text{C}$,Fully charge the battery at standard charging condition</p> <p>b. Continue to charge at 3C, constant 4.8V for 8 hrs</p>	No explosion, No fire
Over discharge	<p>a. At $20 \pm 5 \text{ }^\circ\text{C}$, the cell are fully charged with standard charging method</p> <p>b. Standby at least 1 hour.</p> <p>c. The cell should be discharged at a current of 1C for 2.5h.</p>	No explosion, No fire
Short-circuit	<p>a. At $20 \pm 5 \text{ }^\circ\text{C}$, The cells are fully charged with standard charging method and standby at least 1hour.</p> <p>b. Positive and negative terminal connect with wire (maximum load of $50\text{m } \Omega$) to cause short circuit until its voltage is lower than 0.1V or cell temperature on the surface is back to room temperature $\pm 10^\circ\text{C}$.</p>	No explosion, No fire The temperature of the surface of the cell are lower than 150°C
Heating	<p>a. Battery is heated in a circulating air oven at a rate of $5 \pm 2 \text{ }^\circ\text{C}$ per mins to 130°C</p> <p>b. Placed 30 mins</p>	No explosion, no fire

9. Delivery/Packing/Storage and Shipment

9.1 Approx. 30-70% charged before delivery. Shipment voltage: 3.1-3.3V

9.2 Pre shipment inspection

The battery should be checked the voltage, resistance and the function of protective circuit before shipment.

9.3 Packing and Shipping

9.3.1 The battery should be transported to the factory assembly, to pay special attention to the packing, in order to avoid transport stress.

9.3.2 The battery should be in a half state of charge packaging boxes for transport, in the transport process, prevent severe vibration, shock, extrusion, prevent the sun and rain, should be in automobile, train, ship, airplane and other forms.

9.4 Abnormal Condition

Do not use the battery when it's smell like abnormal cell electrolyte because of transport stress, sag, short circuit or any other.

10. Period of Warranty

The period of warranty is one year from the date of shipment. HiMAX guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer abuse and misuse.

11. Warnings

To prevent the possibility of the battery from leaking, heating, fire, Please READ this specification carefully before usage and observe the following precautions:

- Ⓞ When recharging, use the LiFePO4 battery charger specifically for that purpose
- Ⓞ Do not strike battery with any sharp edge parts, such as Ni-tabs, pins and needles
- Ⓞ Do not immerse the battery in water and seawater
- Ⓞ Do not use and leave the battery near a heat source as fire or heater
- Ⓞ Do not reverse the positive and negative terminals
- Ⓞ Do not connect the battery to an electrical outlet
- Ⓞ Do not discard the battery in fire or heat it
- Ⓞ The battery tabs are not so stubborn especially for aluminum tab. Do not bend tab.
- Ⓞ Do not short-circuit the battery by directly connecting the positive and negative terminal with metal object.
- Ⓞ Do not transport and store the battery together with metal objects such as necklaces, hairpins etc.
- Ⓞ Do not directly solder the battery and pierce the battery with a nail or other sharp object.

12. Battery operation instruction

12.1 Charging

Charging current: Do not surpass the biggest charging current which in this specification.

Charging voltage: Do not surpass the highest voltage which in this specification.

Charge temperature: The charge temperature is in according to this specification.

12.2 Discharging

Discharge current: Do not surpass the biggest discharge current which in this specification.

Discharge voltage: Do not be less than the lowest voltage which is in this specification.

Discharge temperature: The discharge temperature is in according to this specification,

12.3 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.

12.4 Storing the Batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for 3 months the long time storage, suggested you should carry on additional charge to the battery.

12.5 Please do not continuously charge the battery over 5hours.

13. Others

◎The customer is requested to contact HIMAX in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

◎HIMAX will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.

◎HIMAX will inform, in a written form, the customer of improvement(s) regarding proper use and handing of the battery, if it is deemed necessary.