SPECIFICATIONS

FOR LiFePO4 POLYMER LITHIUM-ION BATTERY

MODEL: EVPST1181245

CAPACITY： 15000mAh

CUSTOMER: _____

CUSTOMER CONFIRM : _____

DATE : _____

PREPARED	CHECKED	APPROVED

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History of specification

Revision	Description	Data
A	**New release**	

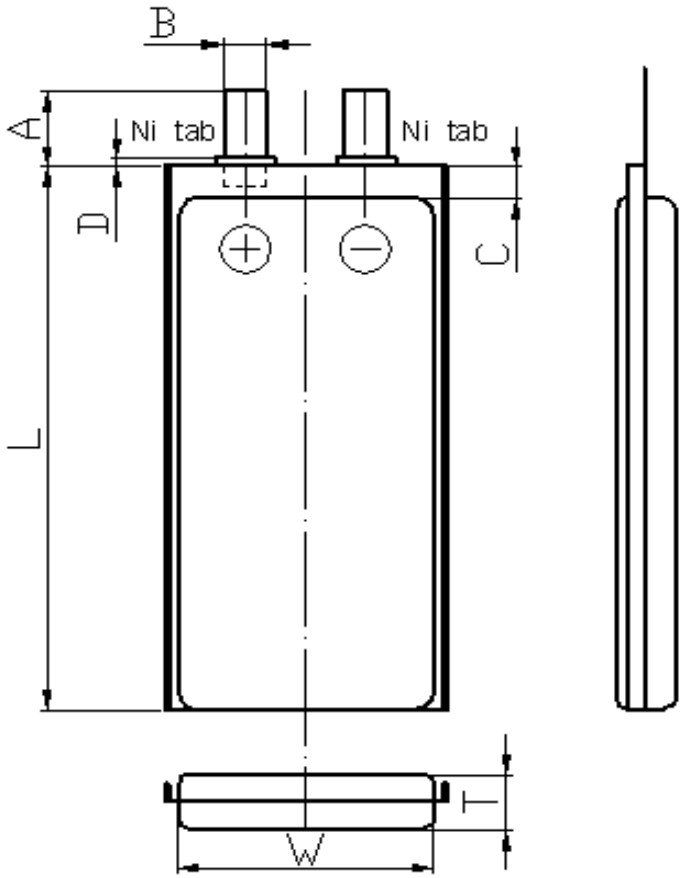
Content

1. Scope

The document describes the product specification of the LiFePO4 polymer lithium-ion rechargeable battery cell supplied by Electric Vehicle Power System Technology Co., Ltd.

2. Model：EVPST1181245

3. Dimensions：



Item	Description	Dimensions
T	Thickness	11.0mm max
W	Width	81.5mm max
L	Length	245.0 mm max

4. Specifications

NO.	Item	Specification
	Typical capacity	15000mAh@ 0.2C Discharge
	Minimal capacity	14700mAh@ 0.2C Discharge
	Nominal voltage	3.2V
	Internal impendance	15mΩ
	Charge voltage	3.65V
	Charge current	Standard charge：0.2C Rapid charge：0.5C
	Standard Charging method	0.2C constant current（CC）charge to 3.65V，then consrant voltage 3.65V（CV）charge till charge current decline to≤ 0.02C
	Charging time	Standard charge：7.0h（reference） Rapid charge：3.5h（reference）
	Standard discharge current	0.5C
	Max. discharge current	2.0C
	Discharge cut-off voltage	2.0V
	Operating temperature	Charge：0°C ~ 45°C Discharge：-20°C ~ 60°C
	Storage temperature	-10°C ~ 45°C
	Storage humidity	＜85％
	Cell Weight	Approx：390g

5. Battery Performance

5.1 Electrical characteristics

NO.	Item	Requirements	Test Mothed
1	Discharge Characteristics	Discharge capacity / Nominal capacity×100％ A）0.2C_5A ≥100％ B）0.5C_5A ≥90％ C）1C_5A ≥85％ D) 2C_5A ≥80％ The curves of charging and discharging should be smooth.	Standard charge at 0.2C_5A under the condition of normal atmospheric pressure and the environmental temperature of 25℃±5℃ and 45％～80％ RH（unless otherwise specified, storage and charging should be conducted as this regime）, then rest for 10min and discharge at 0.2C_5A、0.5C_5A、1C_5A、2C_5A to 2.0V respectively. Charge/discharge cycle can be conducted for 3 times before meeting the Standards（the same below）.

2	Normal Storage	Residual Capacity≥ Nominal capacity*85％ Recoverable capacity≥ Nominal capacity *90％ OCV decrease≤3％	Measure initial status and initial capacity. Store for 28 days after standard charge, then measure final status and residual capacity at 0.2C_5A to 2.0V; After charge/discharge(0.2C/0.2C) cycle can be conducted for 3 times , recoverable capacity will be tested at 0.2C_5A
3	Cycle Life	Discharge Capacity≥ Nominal apacity*80％	Measure initial status and initial capacity, then conduct 0.5C/0.5C cycle for 1000 times .The discharge capacity shall be measured after1000 cycles.
4	High-low Temperature Discharge	Discharge Capacity/ Nominal Capacity×100％ A)60 ℃:≥95%; B)0 ℃:≥80％; C)-10 ℃:≥60%;	Measure initial capacity and initial status. After standard charging. Then store for 3h at 60±2℃ and discharge at 0.2C_5A to 2.0V, then standard charge at room temperature and store for 20h according to the order of 0±2 ℃/-10±2 ℃and discharge at 0.2C_5A measuring corresponding discharge capacity. Then store for 2h at room temperature.

5.2 Safety Performance

NO.	Item	Requirements	Test Mothed
1	Overcharge	No fire，no explosion ，	After standard charging，Measure initial status to make sure the status of the battery is normal(the same below). Charge at 3 C_5A to 4.7V, then change to charge with constant voltage till the current less than or equal to 0.01 C_5A. Observe the variation of the battery's appearance and temperature.
2	Overdischarge	No fire，no explosion	After standard charging，Measure initial status，Discharge 0.2C_5A to 2.0V then connect the positive and negative terminals with a resistor of 10Ω for 2 week. Observe the variation of the battery's appearance.。
3	Short Circuit at Room Temperature	No fire，no explosion	After standard charging, measure initial status. Keep the battery into a ventilation cabinet and short-circuit the positive and negative terminals directly (general resistance shall be less than or equal to 100mΩ). Stop the test when the temperature falls to value 10 ℃ lower than the peak value. Observe the variation of the battery's appearance and temperature.
4	Hot Oven	No fire, no explosion	Measure initial status. After standard charging. Keep the battery connected with a thermocouple and put it into a gravity convection or circulating air oven. Temperature is raised at a rate of 5 ℃±2 ℃ per minute to a temperature of 130 ℃ ± 2 ℃ and remained for 10min at this temperature. Observe the variation of the battery's appearance.

5. 3 **Mechanical characteristics**

NO.	Item	Requirements	Test Mothed
1	Drop	No fire, no explosion.	After standard charaging.Then let it self fall off from a height of 1.0m(the lowest height) to a smooth concrete surface. The drop is implement totally for 2 times.
2	Vibration	No smoking, no fire, no explosion.	After standard charging. Measure initial status. Equip it to the vibration platform, adjust and prepare the test equipment according to following vibration frequency and relevant swing, doing frequency sweeping from X, Y, Z three directions, each from 10Hz to 55Hz for 30 minutes of recycling, rating of which is 1oct/min: A)vibration frequency:10Hz～30Hz Displacement breadth (single swing): 0.38mm B) vibration frequency: 30Hz～55Hz Displacemen tbreadth(single swing): 0.19mm。 Measure final status after sweeping and Observe the variation of the battery's appearance.

Commets：The definitions of some nomenclatures of this specification.

（1）0.2C standard charge：Charge with current 0.2C_5A to limit charge voltage 3.65V under the condition of 25℃±5℃ surrounding temperature, then change to charge with constant voltage till the current less than or equal to 0.02 C_5A.

（2）Initial Status: Initial voltage、internal impedance and thickness of the battery.

（3）Final Status: Final voltage、internal impedance and thickness of the battery.

（4）Residual Capacity: The first discharge capacity after being tested by the specific procedure.

（5）Standard Cycle：After standard charge at 0.2C_5A, rest for 10min, then discharge at 0.2C_5A to 2.0V.

（6）Recovery Capacity: The discharge capacity by implementing charge-discharge cycle repeatedly after being tested by the specific procedure.

（7）Test should be conducted with new batteries within one month after shipment from our factory，Unless otherwise defined.

6. Visual Inspection

There shall be no such defect as scratch, flaw, crack, and leakage, which may adversely affect commercial value of the cell.

7. Standard environmental test condition

Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition:
Temperature: 23 ± 5°C
Humidity: 65 ± 20% RH

8. Storage and Others

8.1 Long Time Storage

If the cell is stored for a long time(exceed three months)，the cell should be stored in drying and cooling place. The cell should be charged and discharged each six months. The cell's storage voltage should be 3.2~3.35V and the cell is to be stored in a condition as NO.7.

8.2 Others

Any matters that this specification does not cover should be confered between the customer and EVPST.

9. Warranty Period& Product Liability

Warranty period of this product is 6 months from manufacturing code.

EVPST is not responsible for the troubles caused by mishandling of the battery which is clearly against the instructions

in this specification. When EVPST find any new facts which require modification of this document, we will inform you.

10. Handling of Cells

Since the battery is packed in soft package,to easure its better performance,it's very important to carefully handle the battery.

10.1 Soft aluminum packing foil

The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs,pins and needles.

- Don't strike battery with any sharp edge parts
- Clean warktable to make sure no any sharp particle

10.2 Sealed edge

Sealing edge is very flimsy

- Don't bend or fold sealing edge

10.3 Folding edge

The folding edge is form in battery process and passed all hermetic test

- Don't open and deform folding edge

10.4 Tabs

The battery tabs are not so stubborn especially for aluminum tab

- Don't bend tab

10.5 Mechanical shock

- Don't Foll,hit,bend battery body

10.6 Short

- Short terminals of battery is strictly prohibited,it may damage battery.

10.7 Notice Designing Battery Pack

- Batterry pack should have sufficient strength and battery should be protected form mechancial shock
- No Sharp edge components should be inside the pack containing the battery

10.8 Tab connection

- Ultrasonic welding or spot welding is recommended to connect battery with PCM or other parts
- If apply manual solder method to connect tab with PCM, below notice is very important to ensure battery performance.

a. The solder iron should be temperature controlled and ESD safe
b. Soldering temperature should not exceed 350°C；
c. Soldering time should not be longer than 3s
d. Soldering times should not exceed 5 times
e. Keep battery tab cold down before next time soldering.
f. Directly heat cell body is strictly prohibited, Battery may be damaged by heat above approx. 100°C

11. Indications on battery pack

The following warnings should be indicated on the battery packs

- Use a specified charger
- Do not throw the battery into fire or heat
- Do not short-circuit the battery terminals
- Do not disassemble the battery

12. Warnings and Cautions in using the battery

To prevent a possibility of the battery from leaking, heating or explosion please observe the following precautions:

WARNINGS!

- Do not immerse the battery in water or seawater, and keep the battery in a cool dry surrounding if it stands by.
- Do not use or leave the battery near a heat source as fire or heater.
- Use the battery charger specifically for that purpose when recharging.
- Do not reverse the position and negative terminals.
- Do not connect the battery to an electrical outlet.
- Do not discard the battery in fire or a heater.
- Do not short-circuit the battery by directly connecting the positive and negative terminals with metal objects.

- Do not transport or store the battery together with metal objects such as hairpins, necklaces, etc.
- Do not strike, trample or throw the battery.
- Do not directly solder the battery and pierce the battery with a nail or other sharp objects.

CAUTIONS!

- Do not use or leave the battery at high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be decreased.
- Do not use the battery in a location where static electricity and magnetic field is great, otherwise, the safety devices may be damaged, causing hidden trouble of safety.
- If the battery leaks, and the electrolyte get into the eyes, do not rub the eyes, instead, rinse the eyes with clean water, and immediately seek medical attention. Otherwise, it may injure eyes.
- If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear 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 performance may occur due to the poor connection with the instrument.
- Be aware discarded batteries may cause fire or explosion, tape the battery terminals to insulate them.