

LiFePO4 Battery Specification

12V 100Ah

1280Wh

MODEL: LFP100-12

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Product Specification

1. Scope

The specification shall be applied to Li-ion rechargeable battery pack Of 12.8V 100Ah which is manufactured by Swalle Technology CO.,LTD

2.Specification

NO	Items	Criteria	Remarks
2.1	Typical Capacity	1280Wh	0.2C charge discharge for voltage
2.2	Combination Method	4S1P	
2.3	Nominal Voltage	12.8V	
2.4	Internal Impedance	Battery: $\leq 0.7\text{m}\Omega$	AC 1KHz after standard charge
2.5	Charge Voltage (V)	14.6V	
2.6	Standard Charge Current	20A	
2.7	Max. Charge Current	100A	
2.8	Continuous discharge current	100A	
2.9	Pulse current	300A	
2.10	Shipping Voltage Requirements	$\geq 12.0\text{V}$	
2.11	Operating Temperature	0°C~+50°C	Charging
		-20°C~+60°C	Discharging
2.12	Storage Temperature	-20°C~+45°C	Less than 1 month
		-20°C~+35°C	Less than 6 months

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3.Battery Configuration

NO	Items	Criteria	Remarks
3.1	EVE-manufactured Cell	50158114-100Ah	LiFePO4
3.2	BMS	SH21FOB663X4-FB4S100A	
3.3	Connector		

4.Battery Performance Criteria

4.1 Appearance

There shall be no such defect as scratch, bur and other mechanical scratch, and the connector should be no rust dirt. The structure and dimensions see attached drawing of the battery. It's required that the battery must match well with the mobile phone of 12.8V100Ah.

4.2 Measurement Apparatus

(1) Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

(2)Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10 K Ω /V.

(3) Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01 Ω .

(4) Impedance Meter

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

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4.3 Standard Test Condition

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of $23\pm 2^{\circ}\text{C}$ and relative humidity of less 75%,air 86Kpa~106Kpa.

4.4 Standard Charge

Full charge condition: Constant current 0.1C,Constant voltage 14.6V for16 hours in all at $23\pm 2^{\circ}\text{C}$.

4.5 Common Performance

NO	Items	Testing method and determinant standard
1	Charge Performance	The battery can be charged when using the original charger. The standard charge mode :under the temperature of $23\pm 2^{\circ}\text{C}$,charge the battery with the current of 0.1C until the voltage reaches up to 14.6V,then charge with constant voltage until the charge current $\leq 0.02\text{C}$, then stop charging.
2	Discharge Performance	When connecting with load, the battery can supply power. Charge the battery with standard charge mode, then rest for 0.5h, then discharge with 0.1C until the voltage is 9.2V, and the discharge time is required $\geq 5\text{h}$. The cycle life is required 5 times.
3	Cycle Performance	Under the temperature of $23\pm 2^{\circ}\text{C}$,charge the battery with 0.1C, when the voltage reaches up to 14.6V charge with constant voltage until the charge current $\leq 0.02\text{C}$, then stop charging, then rest for 0.5h, then discharge with 0.1C to 9.2V. Cycle with the above mode, when the continuous discharge time $< 3\text{H}$ stop cycling. The cycle life is required ≥ 300 times.

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NO	Items	Testing method and determinant standard
4	Charged Storage Characteristics	Charge the battery with 0.1C, then shift to charge with constant voltage until the voltage reaches up to 14.6V, when the charge current $\leq 0.02C$ stop charging; rest under the temperature of $23\pm 2^{\circ}C$ for 28d then discharge with 0.1C to 9.2V. The discharge time is required $\geq 4.25h$.
5	Storage Characteristics	Charge the battery ,which is new manufactured shorter than 3 months, with 0.1C until the capacity reaches to 40~50%, after resting for 12 months under the temperature of $20\pm 5^{\circ}C$ and the humidity of 45~75%, then charge with 0.1C to 14.6V then shift to charge with constant voltage, under the temperature of $23\pm 2^{\circ}C$, after full-charge rest for 0.5h, then discharge with 0.1C to 9.2V. The discharge time is required $\geq 4h$. The cycle life is required 5 times.

4.6 Safety Performance

NO	Items	Testing method and determinant standard
1	High Temperature Characteristics	Under the temperature of $23\pm 2^{\circ}C$, after charging the battery with 0.1C, then put the battery into the constant temperature and humidity oven with $65\pm 2^{\circ}C$ for 2h, then discharge with 0.1C to 9.2V. The discharge time is required $\geq 4h$ and the battery should no deformation and smoking.
2	Low Temperature Characteristics	Under the temperature of $-20^{\circ}C$, after charging the battery with 0.1C, then put the battery into the constant temperature and humidity oven with $-40\pm 2^{\circ}C$ for 4h, then discharge with 0.1C to 9.2V. The discharge time is required $\geq 0.1h$ and the battery should no deformation and smoking.
3	Overcharge Protection Characteristics	After full-charging the battery with 0.1C and set the constant current and voltage supplier with 2times of the nominal voltage and current, then load it to the battery for 7h. It is required the battery should be no leakage, deformation, smoking and explosion during the test processes.

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NO	Items	Testing method and determinant standard
4	Over-discharge Protection Characteristics	Under the temperature of $23\pm 2^{\circ}\text{C}$, after discharging the battery with 0.1C to 9.2V, then connect the load with $n \times 30\Omega$ then discharge for 7h. It is required the battery should be no leakage, in fire, smoking and explosion during the test processes.
5	Short-circuit Protection Characteristics	Under the temperature of $23\pm 2^{\circ}\text{C}$, after full-charging the battery with 0.1C, then make the battery's anode and cathode short-circuit for 1h (the connecting resistance is smaller than $80\pm 20\text{m}\Omega$), and there should be no leakage, deformation, smoking and explosion during the test processes.
6	Constant Humidity and Temperature Characteristics	Under the temperature of $23\pm 2^{\circ}\text{C}$, after charging the battery with 0.1C, then put the battery into the constant temperature and humidity oven with $40\pm 2^{\circ}\text{C}$ and 90 ~ 95% for 48h, the battery should be no obvious deformation, leakage, rust, smoking and explosion. After testing take out the battery then rest for 2h under the temperature of $23\pm 2^{\circ}\text{C}$, discharge with 0.1C to 9.2V. The discharge time is required $\geq 3\text{H}$.
7	Drop Test	After charging the battery, put it aside for 1H ~ 4H for testing. 1. Drop the battery onto the concrete with a free fall height of 1m. Drop one on each side of the battery Times, a total of six tests. After the test, measure the voltage and visually inspect the appearance of the battery. 2. Drop the battery pack onto the concrete with a free fall height of 1.5m. Each side of the battery falls Once, a total of six tests were conducted. After the test, measure the voltage and visually inspect the battery appearance. There should be no leakage, fire or explosion.

4.7 Rest Period

Unless otherwise defined, 30min, rest period after charge, 30min, rest period after discharge.

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5. Storage and Others

5.1 Long Time Storage

If stored for a long time(exceed three months), the cell should be stored in drying and cooling place. The cell's storage voltage should be 12.0~12.8V and the cell is to be stored in a condition that the temperature of $23\pm2^{\circ}\text{C}$ and the humidity Of 45%- 75%.

5.2 Others

Any matters that this specification does not cover should be conferred between the customer and Swalle.

6.Protection Circuit

Item	Content	Criterion
Voltage	Charging voltage	DC:14.4V CC/CV
	Balance voltage for single cell	$3.525\pm0.025\text{V}$
Current	Balance current for single cell	$35\pm10\text{mA}$
	Current consumption	$\leq70\mu\text{A}$
	Max charge current	$\leq100\text{A}$
	Max continues discharge current	$\leq100\text{A}$
	Pulse current(time)	300A (3S)
Over Charge Protection	Over charge detection voltage	$3.65\pm0.025\text{V}$
	Over charge detection delay time	0.5~1.5S
	Over charge release voltage	$3.55\pm0.05\text{V}$

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Item	Content	Criterion
Over Discharge Protection	Over discharge detection voltage	2.30±0.05V
	Over discharge detection delay time	500~1500mS
	Over discharge release voltage	2.7±0.10V
Over Current Protection	Over discharge current detection	300±50A
	Detection delay time 1	50~150mS
	Detection delay time 2	5~15mS
	Over charge current detection current	119±21A
	Detection delay time	300~800mS
Short Protection	Short Circuit Protection Current	约 1260A
	Detection delay time	450~800uS
	Detection condition	Exterior short circuit
	Release condition	Cut load, Auto Recovery
Temperature	Detect the temperature of the Mosfet	90±5°C
	Charging high temperature protection	65±5°C
	Charging low temperature protection	0±5°C
	Discharge high temperature protection	70±5°C
	Discharge low temperature protection	-20±5°C
	Temperature protection release condition	Drop to 45°C, charge
	Operating temperature range	-20~+80°C
	Storage temperature range	0~60°C
Internal Resistance	Main loop electrify resistance	≤5mΩ

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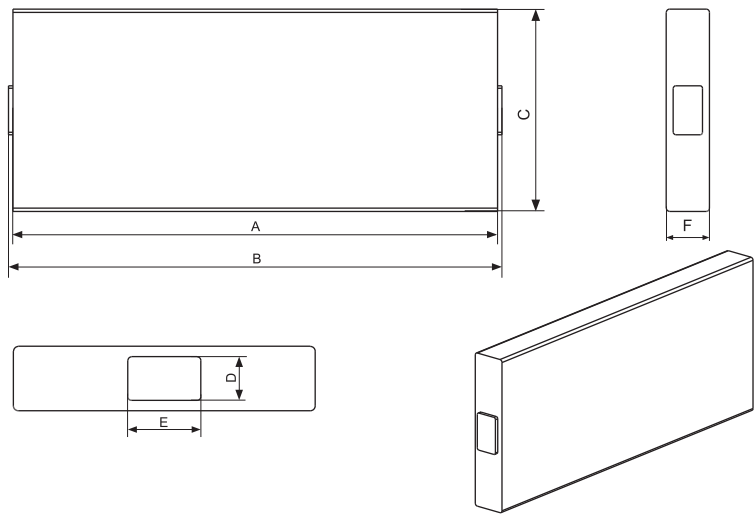
7. Assembly Drawing

7.1 Pack Battery



Length	Width	Height
327mm±2mm	170mm±2mm	218mm±2mm

7.2 Cell



Length	Width	Height
300mm±0.5mm	123.3mm±0.3mm	25.7mm±0.3mm

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Appendix

Handling Precautions and Guideline For Li-ion Rechargeable Batteries

Preface

This document of 'Handling Precautions and Guideline Li-ion Rechargeable Batteries' shall be applied to the battery cells manufactured by Swalle Technology CO., LTD

Note 1:

The customer is requested to contact Swalle Technology CO., LTD. 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.

Note 2:

Swalle Technology CO., LTD will take no responsibility for any accident when the cell is used under other conditions than those described in this Document.

Note 3:

Swalle Technology CO., LTD will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the cell, if it is deemed necessary.

Caution!

Do not 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/or 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.

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Danger!

- Do not immerse the battery in water or allow it to get wet.
- Do not use or store the battery near sources of heat such as a fire or heater.
- Do not use any chargers other than those recommended by JHY.
- Do not reverse the positive(+) and negative(-) terminals.
- Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
- Do not put the battery into a fire or apply direct heat to it.
- Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
- Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
- Do not strike, throw or subject the battery to sever physical shock.
- Do not directly solder the battery terminals.
- Do not attempt to disassemble or modify the battery in any way.
- Do not place the battery in a microwave oven or pressurized container.
- Do not use the battery in combination with primary batteries(such as dry-cell batteries) or batteries of different capacity, type or brand.
- Do not use 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 charger immediately and discontinue use.