

LiFePO₄ battery Specification

Model Number: LFR46140 25.6V 60Ah 8S2P

Prepared By/Date	Checked By/Date	Approved By/Date

Amendment Records

[illegible]

1 Scope

This specification is applied to the reference battery in this Specification and manufactured by Everwin Tech Co., Limited

2 Product Specification

Table 1 (表 1)

No.	Item	General Parameter		Remark
1	Rated Capacity	Typical	60Ah	Standard discharge (0.2C) after standard charge
		Minimum	58Ah	
2	Nominal Voltage	25.6V		Mean Operation Voltage
3	Cut-off Voltage Discharge	$17.6 \pm 0.2V$		Cut-off Voltage
4	Cut-off Voltage charge	$30.0 \pm 0.2V$		
5	Standard charge	Constant Current 0.2C Constant Voltage 30.0V 0.02C cut-off		Charge time: Approx 6.0h
	Standard discharge	Constant Current 0.2C end Voltage 17.6V		
7	Fast charge	Constant Current 0.5C Constant Voltage 30.0V 0.02C cut-off		Charge time: Approx 2.5h
8	Fast discharge	Constant Current 1C end Voltage 30.0V		
9	Maximum Continuous Charge Current	20A		
10	Maximum Continuous Discharge Current	25A		
11	Operation Temperature Range	Charge: $0 \sim 45^{\circ}C$		$60 \pm 25\%R.H.$ Bare Cell

		Discharge: -20~60℃	
12	Storage Temperature Range	Less than 1 year: -20~25℃	60±25%R.H. at the shipment state
		Less then 3 months: -20~40℃	
14	Weight	Approx: 10. 7±0. 5kg	

3 Performance And Test Conditions

Standard Test Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the cell shall not be cyded more than five times before the test. Unless otherwise specified test and measurement shall be done under temperature of $20\pm5^{\circ}\text{C}$ and relative humidity of 45~48%.if it is judged that the test results are not affected by such conditions the tests may be conducted at temperature 15~30℃ and humidity 25~85%R. H.

Measuring Instrument or Apparatus

Dimension Measuring Instrument

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

3.2.2 Voltage

Standard class specified in the national standard or more sensitive class having inner impedance more than $10\text{k}\Omega/\text{V}$.

Ammeter

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

Impedance

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

Standard Charge/Discharge

Standard charge: Test procedure and its criteria are referred as follows:

0. 2C=

Charging shall consist of charging at a 0. 2 C constant current rate until the cell reaches 3.65V. The cell shall then be charged at constant voltage 0f 3.65 volts while tapering the charge current Charging shall be terminated when the charging current has tapering to 0.02C Charge time: Approx 6.0h,The cell shall demonstrate no permanent degradation when charged between 0℃ and 45℃.

0.2C=

Cells shall be discharged at a constant current of 0.2C to 2.0 volts @ $20^{\circ}\text{C}\pm5^{\circ}\text{C}$.

If no otherwise specified the rest time between Charge and Discharge amount to 30min.

Appearance

There shall be no such defect as flaw crack ,rust, leakage, which may adversely affect commercial value of

battery.

Initial Performance Test

Table 2 (表 2)

Item	Test Method Condition	Requirements
(1) Open-circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	
(2) Internal impedance	Internal resistance measured at AC 1KHz after 50% charge.	
(3) Minimal Rated Capacity	The capacity on 0.2C discharge till the voltage tapered to 2.0V shall be measured after rested for 30min then finish standard charge.	Discharge Capacity

Temperature Dependence of discharge capacity

Cells shall be charged per 3.3.1 and discharged @0.5C to 2.0 volts. Except to be discharged at temperatures per Table 3. Cells shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature The capacity of a cell at each temperature shall be compared to the capacity achieved at 23°C and the percentage shall be calculated .Each cell shall meet or exceed the requirements of Table 3.

Table 3

Discharge Temperature	-10°C	0°C	23°C	60°C
Discharge Capacity(0.5C)	50%	80%	100%	95%

Cycle Life and Leakage-Proof

Table 4

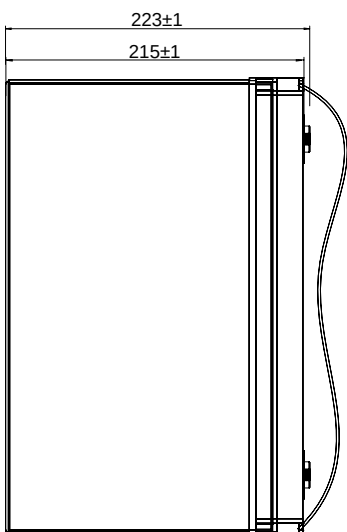
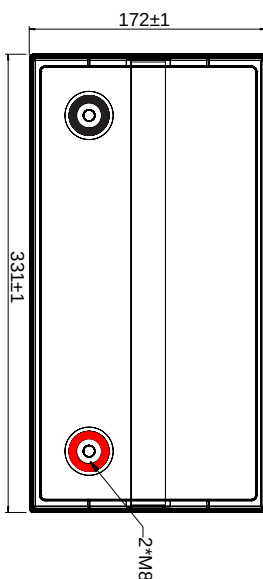
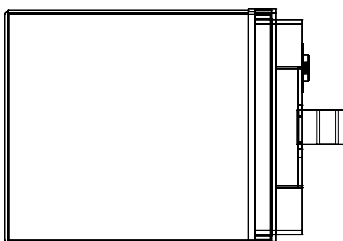
No.	Item	Criteria	Test Conditions
1	Cycle Life (0.2 C)	Higher than 70% of the Initial Capacities of the Cells	Carry out 2500 cycle Charging/Discharging in the below condition. ◆ Charge: Standard Charge, per 3.3.1 ◆ Discharge:0.2 C to 20.0V ◆ Rest Time between charge discharge:30min. ◆ Temperayure:20±5°C
2	Leakage-Proof	No leakage (visual inspection)	After full charge with standard charge store at 60 ±3°C,60±10%RH for 1 month.

4 . Protection circuit

4.1 PCM Specification

Details 详细项目		Min.	Typ.	Max	Error	Unit
Battery Gas 电池类型		3.2V				
Battery Link 电池组组合方式		8S				
Input Charging Voltage 充电电压			15.0		±0.2	V
Input Charging Current 充电电流			20			A
Continuous Output Discharging Current (可持续工作电流)			25			A
Ambient Condition 工作环境	Operating Temperature 工作温度	-20	25	60		℃
	Humidity (No Water-Drop) 工作湿度	0%		90%		RH
Storage Condition 存储环境	Temperature 存储温度	-40		85		℃
	Humidity (No Water-Drop) 存储湿度	0%		90%		RH
Protection Parameters (for Individual Cell). 保护参数 (对于每节电芯)						
Over-Charge Voltage Protection (OVP) 过充保护电压			3.75		±0.05	V
Over-Charge Voltage Protection Release (OVPR) 过充恢复电压			3.6		±0.01V	
Over-Discharge Voltage Protection (UVP) 过放保护电压			2.2		±0.1	V
Over-Discharge Voltage Protection Release (UVPR) 过放恢复电压			2.4		±0.1	V
Over-Current Discharge Protection (OCDP) 放电过流保护			70		±20	A
Over-Current Protection Delay Time (OCPDT) 过流保护延时			20		±5	mS
Over-Discharge Protection Release 过放保护恢复方式		Release load 断开负载				
Over-Current Discharge Protection Release 放电过流保护恢复方式		Release load 断开负载				
Short circuit current protection 短路保护		Enable 有短路保护				
Short circuit current protection delay time 短路保护延时			200	600	±100	uS
Short circuit protection Release 短路保护恢复方式		Release load 断开负载				
Discharging Temperature 放电保护温度			/		/	℃
Discharging Temperature Protection Release 放电保护恢复温度			/		/	℃
charging Temperature 充电保护温度						
charging Temperature Protection Release 充电保护恢复温度						
Cell balance 均衡						
Equalizing open voltage 均衡开启电压			3.65		±0.05	V
Bleed Current 均衡电流			48		±10	mA
Idle mode 静态模式		≤100				uA
Main loop electrify resistance 主回路通态电阻 MOS-R _{DS}		≤25				mΩ

5 电池图纸（单位 MM） Battery drawings （Unit MM）



Model:	Min.Capacity(0.2C,25±3℃ (Ah)	58	Overcharge Detection Voltage(V)		30±0.2
	Typical Capacity(0.2C,25±3℃ (Ah)	60			
	Nominal Voltage (V)	25.6			17.6±0.2
	Internal Impedance(≤) (mΩ, AC 1KHz)	100			Maximum continuous discharge current(A)
	Equalizing voltage (V)	3.6±0.05			25
Battery Pack Specification	Equalizing current (mA)	58±10	Battery Protection Related Value		Over current protection current(A)
	BMS battery management system	Yes ☒ No ☐			70±20
	Equalizing current	Yes ☒ No ☐			Temperature protection switch (℃)
	Charging current (A)	20			65±5
	Charge discharge	Yes ☒ No ☐			If actual application loading current is bigger than EWT suggested,please indicate.The application profile is important for an appropriate PCM design
Ambient conditions	Capacity display	Yes ☒ No ☐			
	Charge Temp (℃)	0~45			
	Discharge Temp (℃)	-10~50			
	Humidity	65±20%			