



深圳市立泰能源科技有限公司
SHENZHEN LITHTECH ENERGY CO.,LTD

SPECIFICATION

Lithium Battery Cell LFP27148134-50Ah

深圳市立泰能源科技有限公司

Shenzhen Lithtech Energy Co., Ltd



1 Scope of application

This specification is applicable to LFP27148134 lithium ion battery produced by Shenzhen Lihotech Energy Co., Ltd

2 General indicator

1. Symbols and abbreviations

C——1h rate rated capacity (A·h). 1C(A)=50.0A in this specification.

SOC - state of charge

DOD - depth of discharge

2. General indicator of the product

NO	ITEM	表	SPEC
1	Battery type		Lithium Ion Battery
2	Model		LFP27148134
3	Nominal capacity☆		50.0Ah
4	Rated Voltage☆		3.20V
5	AC internal resistance☆		≤1.50mΩ
6	Weight		≤1180g
7	Maximum charging current		1.5C (continuous) 2C (30s)
8	Charging voltage		3.65V
9	Maximum discharge current		2C (continuous)
10	Discharge termination voltage		2.5V (1C)
	Pulse discharge termination voltage		2.5V, 0°C > T > -10°C
			2.2V, T < -10°C
11	Maximum operating temperature range:		-20°C / + 60°C
	Charging		0°C ~ 45°C
	Discharge		-20°C ~ 60°C
12	Optimum operating temperature range:		
	Charging		15°C ~ 35°C
	Discharge		15°C ~ 35°C
13	stored temperature:		-40°C / + 60°C
	Within 1 month		-40°C ~ 45°C



	Within 6 months	-20℃~35℃
*The storage state of the battery is: the battery voltage is 3.275V~3.305V, and the 20%-40% SOC state is saved.		

3 Appearance and size

Appearance and dimensions are shown in Figure 1.

4 performance

1. Test Conditions

The test is carried out within one month of purchase, and the number of cycles of charge and discharge before the test shall not exceed five times. The experiment and measurement shall be carried out at a standard temperature $(25 \pm 2)^\circ\text{C}$ and a standard humidity $(65 \pm 20)\%$. Unless otherwise specified, all tests shall be carried out in the state of the clamp plate. The recommended size of the splint (T*W*L): 10mm*160mm*200mm, recommended material: aluminum; set screw torque: 2.5Nm.

65. measuring equipment

- a) Voltmeter Internal resistance > 1000 Ω/V
- b) Vernier caliper Accuracy is 0.02 mm
- c) Internal Measured at AC 1kHz
resistance table
- d) Balance Accuracy 0.001g

3. Test process and its standards

1. Charging system

Under the condition of ambient temperature $(25 \pm 2)^\circ\text{C}$, it is charged by constant current and then constant voltage. The constant current is 1C (A), the constant voltage is 3.65V, and the current is reduced to 0.05C (A) during the constant voltage to terminate the charging and stand for 1 hour.

2. Test items and standards

The specific test items and standards are shown in Table 2.

表 2

NO	ITEM	test program	standard
1	Appearance and size	Visual inspection and vernier caliper measurement, thickness test must be clamped using tooling, recommended pressure 50N-200N, without clamping the test splint.	No obvious scratches, no leakage, the size is shown in the paper
2	Weight	Electronic balance	$\leq 1180\text{g}$
3	Open circuit voltage☆	The open circuit voltage was measured within 1 hour after charging according to 4.3.1, without clamping the plate.	$\geq 3.35\text{V}$



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4	Nominal discharge capacity☆	Discharge at 1C (A) current to the discharge termination voltage of 2.5V within 1 hour after charging according to 4.3.1, and measure the capacity. The above cycle can be repeated 5 times, and when there are 3 cycles of capacity that do not meet the requirements, the test can be terminated.	1C (A) capacity \geq nominal capacity
5	Maximum charging current	After charging according to 4.3.1, discharge at a current of 1C (A) to a discharge termination voltage of 2.5 V, and record the capacity. Charge to 3.65V with n times 1C (A) or a specified current constant current, and then charge to 0.05C (A) with a constant voltage of 3.65V.	1.5C (A) (continuous;
6	Pulse charging current	After charging according to 4.3.1, discharge to 1C (A) current to discharge to 50% SOC, let stand for 30min, charge with pulse current, the voltage reaches 3.65V or the charge reaches the charging time.	2C (A) (50%SOC, 30s)
7	Maximum discharge current	After charging according to 4.3.1, discharge at a current of 1C (A) to a discharge termination voltage of 2.5 V, and record the capacity. Charge at 1C (A) and discharge to 2.5V at n times 1C (A) or at the specified current.	2C (A) (continuous);
8	Pulse discharge current	After charging according to 4.3.1, discharge at 1C (A) current to discharge to 50% SOC, let stand for 30 min, discharge with maximum pulse current, voltage 2.5V or discharge to reach the end of time.	5C (A) (50%SOC, 30s)
9	Charge and discharge cycle☆	Good splint on the battery; Charging: 1C (A) constant current charging to 3.65V, constant voltage charging until the current drops 0.05C (A) can terminate charging; Sleep: 10min Discharge: 1C (A) constant current discharge to 2.5V Sleep: 10min One cycle is defined as one charge and one discharge The battery was charged and discharged more than 2,500 times, and the capacity was recorded. Test temperature: (25 ± 2) °C.	Cycle life \geq 2500 times, Remaining capacity \geq 80% of nominal capacity
10	Charge retention capability☆	After charging according to 4.3.1, open the circuit at ambient temperature (25 ± 2) °C. In the day, the current is discharged at a constant current of 1 C (A) to a discharge end voltage of 2.5 V. After charging according to 4.3.1, it is placed in a high temperature chamber at a temperature of (60 ± 2) °C for 7 days, then discharged at a constant current of 1 C (A) to 2.5 V, and the capacity is recorded.	Capacity \geq 90% of nominal capacity
11	High temperature performance	After charging according to 4.3.1, place it in a high temperature box at a temperature of (60 ± 2) °C for 5 hours, then discharge it to 2.5V with a constant current of 1C (A), and record the capacity.	Capacity \geq 90% of nominal capacity
12	Low temperature performance	After charging according to 4.3.1, place it in a low temperature box at a temperature of (-20 ± 2) °C for 24 hours, then discharge it to 2.2V with a constant current of 1C (A), and record the capacity.	Capacity \geq 70% of nominal capacity
13	Sealing☆	The battery was weighed by an electronic balance having a sensitivity of 0.001 g before and after the test of the charge retention ability, and the weight loss of the battery was calculated.	Weight loss < 300 mg



14	Vibration test★	After charging according to 4.3.1, the battery is fixed on the vibration table, and the current is discharged to 2.5V with a constant current of 1/3C (A), the vibration direction is up and down, the vibration acceleration is 30m/s ² , the frequency is 10-55Hz, and the vibration 10 cycles, repeated vibration for 3 hours	There is no abnormality in the discharge process
15	Short circuit test★	After charging according to 4.3.1, the battery with the thermocouple is placed in the ventilator and short-circuited. The battery is short-circuited by an external circuit with a line resistance of less than 5mΩ.	The battery does not ignite and does not explode
16	Overcharge test★	After charging according to 4.3.1, the battery with the thermocouple is subjected to the overcharge test and charged in the following manner: charging at 1C (A) current until the battery voltage reaches 5.475V or charging time reaches 1h (one of the conditions is prioritized Stop the test).	The battery does not ignite and does not explode
17	Over discharge test★	After charging according to 4.3.1, discharge at 1C (A) current at (25 ± 2) °C, discharge for 90 min, and end the test.	The battery does not ignite and does not explode No leakage
18	Hot box test★	Put the battery with thermocouple into the incubator close the box door, turn on the oven to heat, monitor the temperature change in the incubator (the temperature rise rate of the incubator is 5 °C ± 2 °C / min), the box temperature reaches (130 ± 2) °C. The test was terminated after 30 minutes at °C.	The battery does not ignite and does not explode
19	Drop test★	After charging according to 4.3.1, at (25±2) °C, free fall from the height of 1.5m on the concrete floor, and the positive and negative terminals are required to fall downward before the drop.	The battery does not ignite, does not explode, does not leak

5 Precautions

1. Charging

- a) Do not overcharge, the charging voltage should not be higher than 3.65 V.
- b) Reverse charging is strictly prohibited.
- c) Charger starts charging at 0 °C ~ 45 °C.
- d) It is recommended that the best charging temperature is 15 °C ~ 35 °C, it is not suitable to charge for a long time outside this temperature range.

2. Discharge

- a) Short circuit.
- b) The discharge voltage must not be lower than 2.5V (-10 °C or more) / 2.2V (below -10 °C).
- c) Discharge temperature range is -20 °C ~ 60 °C.
- d) It is recommended that the best discharge temperature is 15 °C ~ 35 °C, it is not suitable for long-term discharge outside this temperature range.

3. Place the battery pack away from children

4. Storage



Short-term storage (within 1 month) should be placed in an environment that is clean, humidity below 65% RH, temperature -40 °C to 45 °C, and semi-full state.

Long-term storage (within 6 months) should be placed in an environment that is clean, humidity below 65% RH, temperature -20 °C to 35 °C, and semi-full state.

6 Warning

1. Before using, you should read the specifications in detail and have a deep enough understanding of the warnings and precautions.

6 Do not overheat the battery; it is forbidden to modify or disassemble the battery; these actions are very dangerous and may cause the battery to catch fire, leak or explode.

2. Do not expose the battery to extreme heat or fire, and do not place the battery in direct sunlight. 6 It is strictly forbidden to connect the positive and negative poles of the battery directly with metal or other wires to form a passage. This will cause the battery to be short-circuited, which may cause the battery to catch fire or even explode.

3. It is strictly forbidden to use the positive and negative columns upside down.

4. Do not immerse the battery in water or other conductive liquid, or make it moisture-absorbent

5. It is strictly forbidden to subject the battery to excessive mechanical shock.

6 It is strictly forbidden to directly solder the battery. Overheating may cause deformation of the battery components (such as gaskets), which will cause the battery to swell, leak, ignite or even explode.

6. It is strictly forbidden to use batteries that are subject to squeezing, dropping, short circuit, liquid leakage and other abnormal problems during transportation.

7. During use, it is strictly forbidden to directly contact the outer casings of the batteries or to form a passage through the conductors.

8. The battery should be stored and used in a place away from static electricity.

6 Do not use the battery with other primary or secondary batteries, or with batteries of different packaging, different models, or other brands.

9. During use, charging, discharging or storage, it is found that the battery is rapidly heated, smelling, discolored, deformed or other reactions should be stopped immediately and treated accordingly.

10. If the battery leaks to the skin or clothing, please rinse immediately with water to avoid skin discomfort.

7 transport

During the transportation process, it should prevent severe vibration, shock, sun and rain. The

battery should be in a state of SOC below 50% during transportation.



8 Others

If the customer needs to operate or apply the battery under the conditions of this document, please consult Shaanxi Coal Chemical Technology Research Institute Co., Ltd. first. The company does not assume any responsibility for accidents resulting from the use of the battery outside the conditions described in this document. The company does not assume any responsibility for problems caused by improper use of single cells and circuits, battery packs, and chargers. After the shipment, the defective cores produced by the customer during the battery assembly process are not included in the scope of quality assurance.

9 product picture

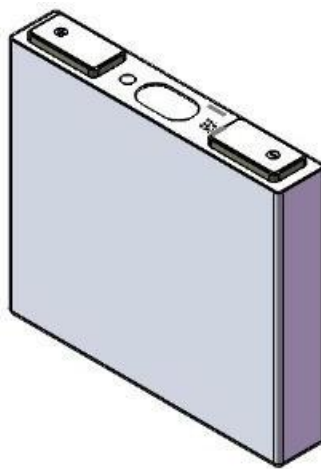


Figure 1 Battery outline drawing

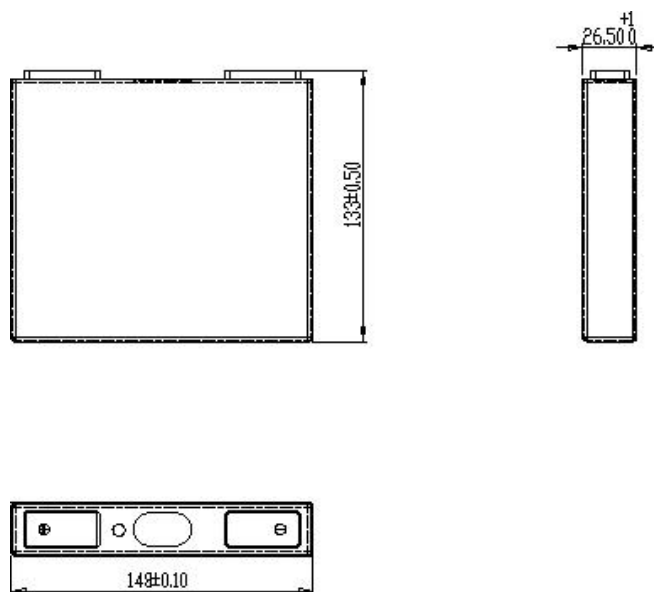


Figure 2 battery size chart