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# JBD 48V 100A BMS Specification

JBD-SP25S003

Made by [Energie Panda](#)

According JBD original specification Chinese version V1.2

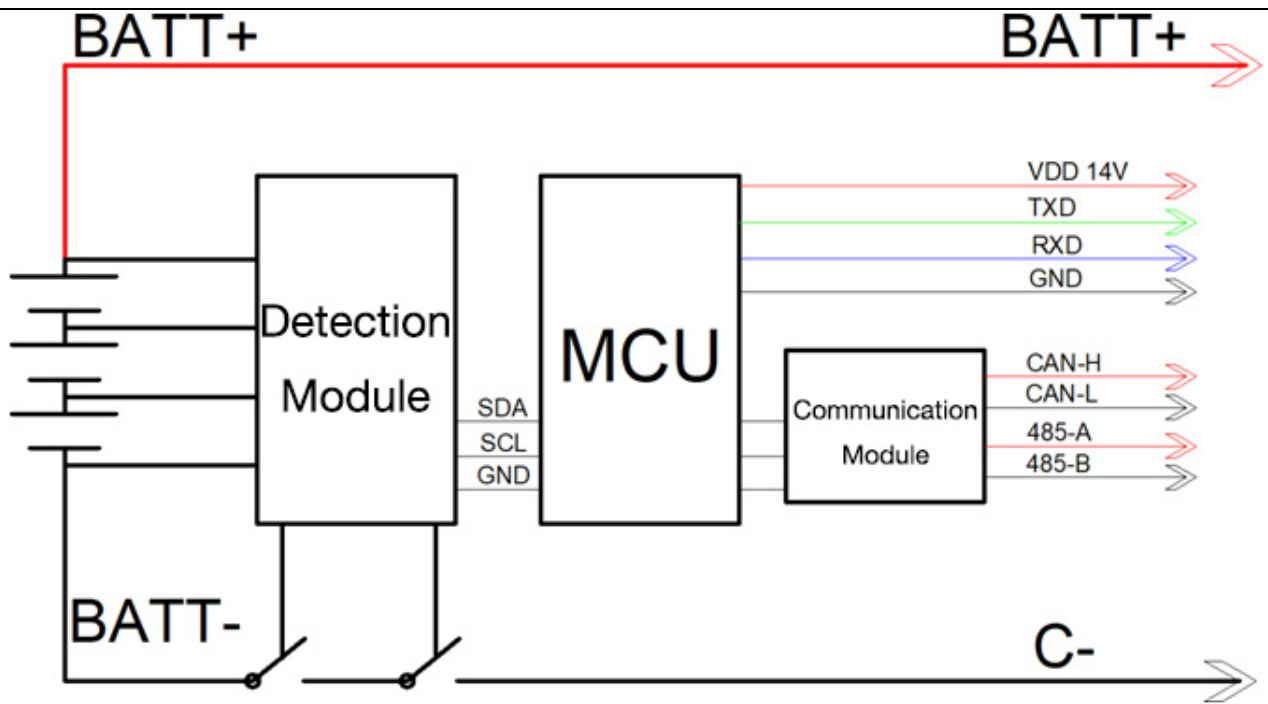
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## 1, Features

JBD-SP25S003 is an intelligent protection board solution designed by Dongguan Jiabaida Electronic Technology Co., Ltd. for 13-25 series battery packs of power batteries, electric bicycles, electric motorcycles, etc.; it can be applied to lithium batteries with different chemical properties, such as lithium ion, lithium polymer, lithium iron phosphate, etc. The protection board has strong loading capacity, and the maximum continuous discharge current can reach 100A.

- 13-25 cells in series protection
- Various protection functions for charging and discharging
- Hardware discharge overcurrent and short circuit protection function processing
- Discharge control switch and pre-discharge function
- Software over-voltage, under-voltage, temperature, and overload protection function processing
- Precise SOC calculation with automatic SOC learning function
- RS485 communication function, which can read all data of battery in real time, and online upgrade
- RS485 and UART (Bluetooth) can work at the same time.

## 2. Block Diagram



### 3. Basic Parameters

#### 3.1 Use Range.

Battery pack structure: 16S

Charging mode: CC-CV (constant current - constant voltage)

Discharge mode: constant current discharge

Output terminal: C-.

Input terminal: B-, BC0~BC25

#### 3.2 Electrical Parameters (The test should be conducted in a room with temperature 25 $\pm 2^{\circ}\text{C}$ and relative humidity 65 $\pm$ 20%.)

Function	Test Item	Specification			Unit
		Minimum	Typical	Max	
Operating Voltage	Voltage Range	40		60	V
Working Current	Charging Current(Continuous)			100	A
	Discharging Current(Continuous)			100	A
Charging Protection	Charger Voltage(CC-CV)	60			V
	Overcharge Protection Voltage	3.700	3.750	3.800	V

	Overcharge Protection Delay Time	1000	2000	3000	mS
	Overcharge Protection Recovery Voltage	3.550	3.600	3.650	V
Discharge Protection	Over Discharge Protection Voltage	2.400	2.500	2.600	V
	Over Discharge Protection Delay Time	1000	2000	3000	mS
	Over Discharge Protection Recovery Voltage	2.900	3.000	3.100	V
Over Current Protection	Charge Over Current Protection Value	105	110	115	A
	Charge Over Current Delay	7	10	13	S
	Charge Over Current Release Recovery Conditions	Delay 32 seconds release			
	Discharge Over Current 1 Protection Current Value	105	110	115	A
	Discharge Over Current 1 Protection Delay	7	10	13	S
	Discharge Over Current 2 Protection Current Value	350		450	A
	Discharge Over Current 2 Protection Delay	200		700	mS
	Discharge Over Current Protection Recovery Conditions	Delay 32 seconds release			
Short Circuit Protection	Short Circuit Protection Delay Time	200		600	uS
	Short Circuit Protection Recovery	Disconnect the load and release with a delay of 5S			
Balance Function	Balance Turn-on Voltage	3.350	3.400	3.450	V
	Balance Turn-on Voltage Difference		15		mV
	Balance Mode	Charge Balance			
	Balance Current	40		60	mA
	High Temperature Protection for Charging	57	60	63	°C
	High Temperature Protection Release Value for Charging	47	50	53	°C

Temperature Protection	Low Temperature Protection Value for Charging	-5	-2	1	°C
	Low Temperature Protection Value for Charging	2	5	8	°C
	High Temperature Protection Value for Discharge	67	70	73	°C
	High Temperature Protection Release Value for Discharge	57	60	63	°C
	Low Temperature Protection Value for Discharge	-18	-15	-12	°C
	Low Temperature Protection Release Value for Discharge	2	5	8	°C
Internal Resistance	Internal Resistance of Discharge Circuit	/	5	10	mR
Self-consumption	Working Mode(Relay Closed)			20	mA
	Sleep Mode			300	uA
	Sleep Conditions and Delay	Delay 10 seconds in the state of no current/communication/protection			
Operating Temperature	Normal Working Range	-20		70	°C
Storage Temperature	The Humidity is below 90%	-40		85	°C
Size of BMS Board with Shell	Lengh*Width*Height	MAX: 145±2*120±2*17±2			mm

### 3.3 PC Tool Parameters



### 3.4 Description of Protection Functions

#### Over Charge Protection

When the BMS detects that the voltage of any cell is higher than the overcharge protection value, the BMS immediately starts timing, and when the time reaches the overcharge protection delay, the BMS turns off the MOSFET tube and the charge is cut off.

#### Over Charge Protection Recovery

After overvoltage protection occurs, when the BMS detects that each cell voltage is below the overcharge protection recovery voltage, the BMS turns on the MOSFET and resumes charging.

#### Over Discharge Protection

When the BMS detects that the voltage of any cell is below the over-discharge protection value when the battery is discharged, it immediately starts timing. When the time reaches the over-discharge protection delay, the BMS turns off the MOSFET and the discharge is cut off.

#### Over Discharge Protection Recovery

When the BMS detects that each cell voltage is higher than the over-discharge protection recovery voltage in the discharge protection state, it will turn on the MOSFET and continue

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discharging.

### **Over Current protection**

When the BMS detects a sudden increase in current and reaches the overcurrent protection value, the protection board starts timing, and when the duration of the current in the circuit reaches the overcurrent protection delay time, the BMS turns off the MOSFET and the load lock circuit works, which cannot discharge at this time.

### **Over Current Protection Recovery**

After the BMS waits for 32S or is charged in the overcurrent protection state, the BMS turns on the discharge MOSFET and the discharge resumes.

Note: If you want to change the BMS parameters, please read the internal BMS parameters before changing them and click Write to do so. Please set the battery pack capacity as priority after establishing communication with BMS.

## **4, Part Number Explanation**

JBD - SP25S003 - L16S - 100A - 100A - B - U  
(1) (2) (3) (4) (5) (6) (7)

(1) Vendor name: JBD

(2) BMS model: SP25S003 , maximum support 25 strings.

(3) L16S is 16 series BMS for LiFePO4 type battery.

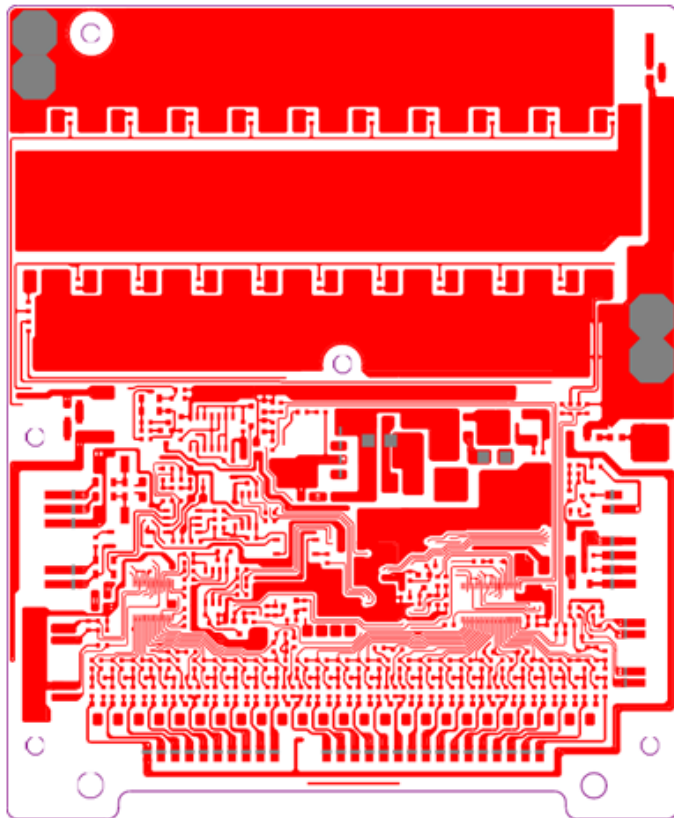
(4) Maximum charging current, if exceeded, may cause permanent damage to the BMS.

(5) Maximum discharge current, if exceeded, may cause permanent damage to the BMS.

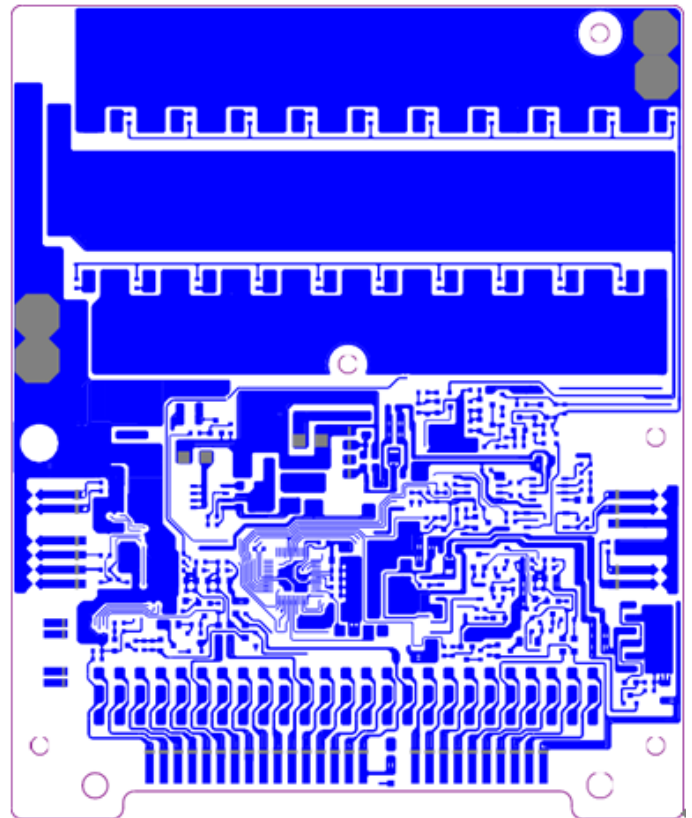
(6) With balance function flag bit.

(7) With UART function flag bit.

## 5, PCB Alignment and Dimensional Structure Diagram



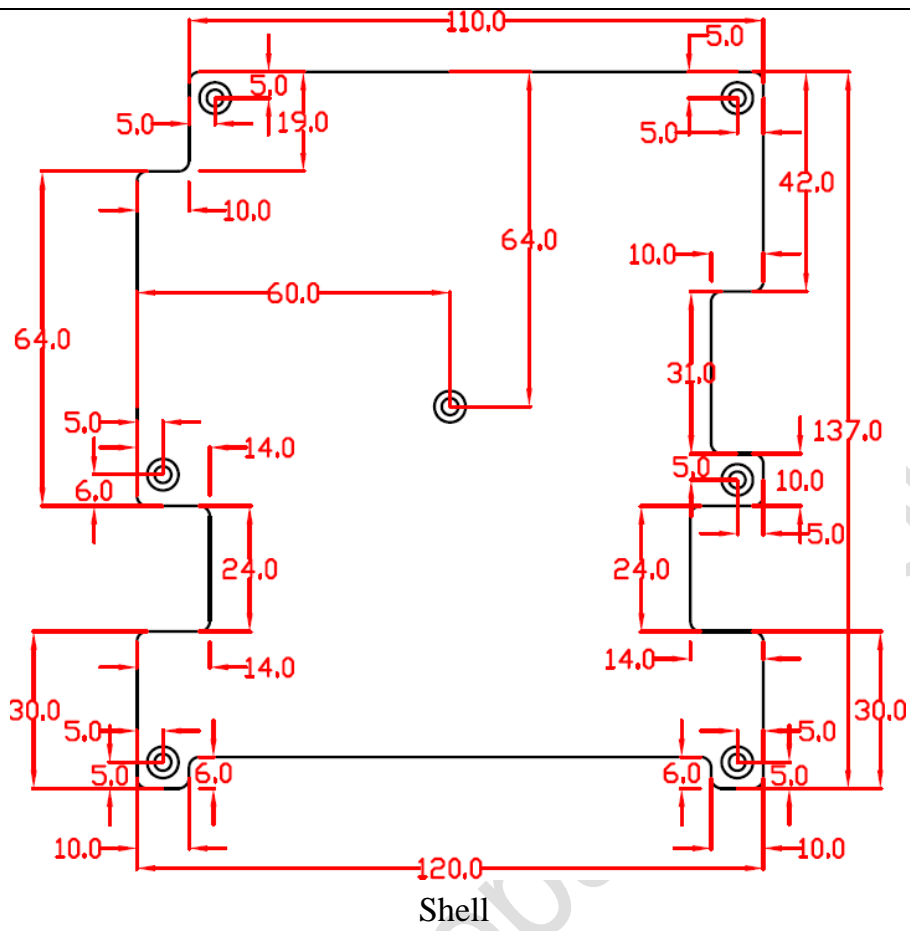
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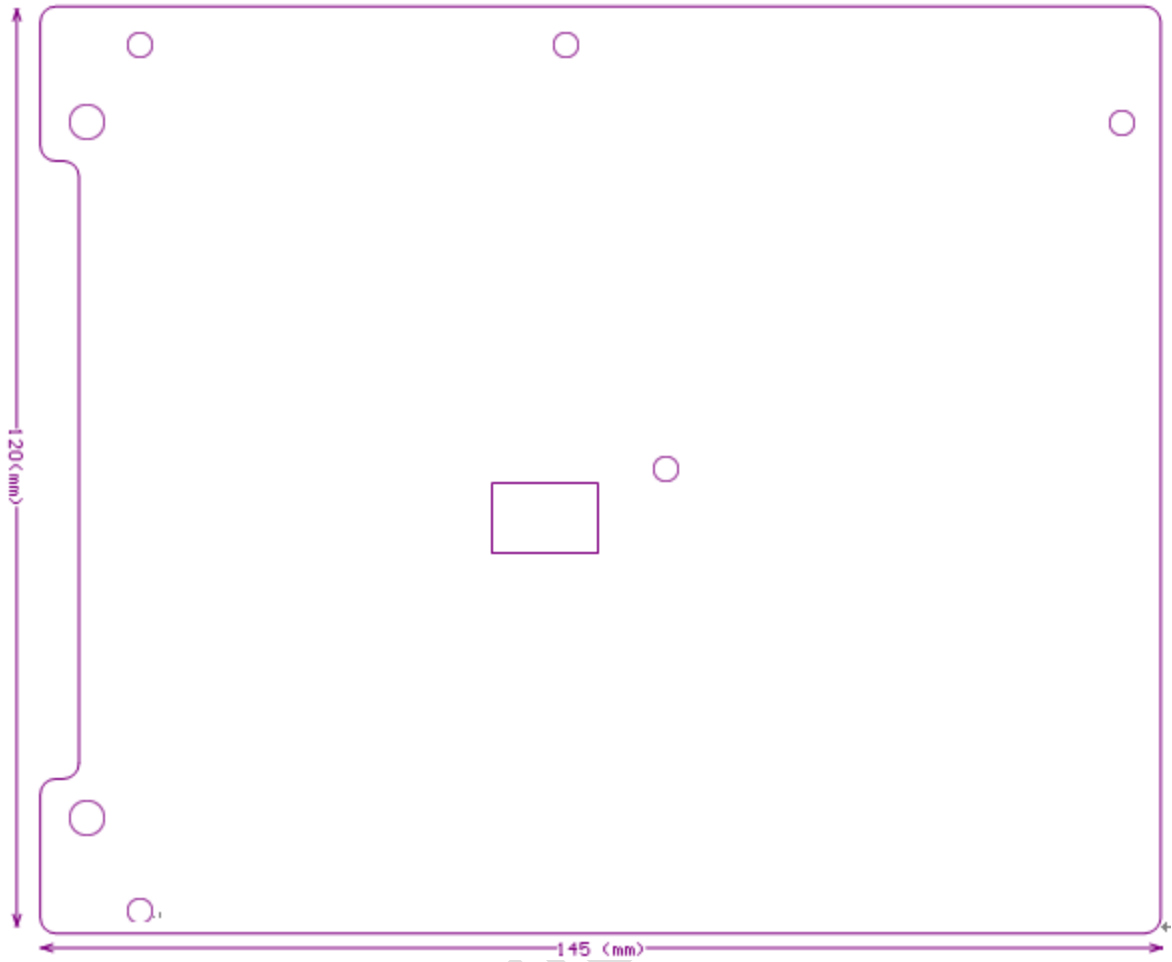
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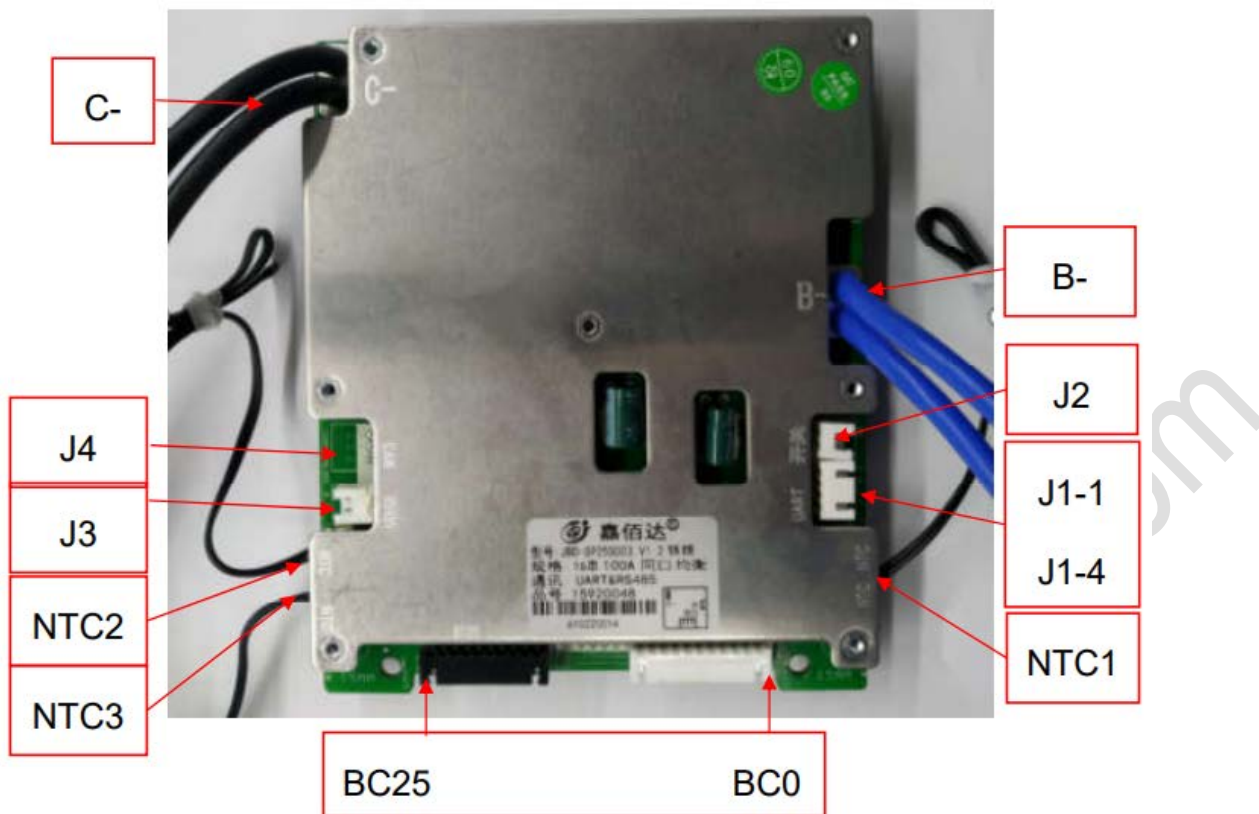
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PCB Dimension

## 6, Wiring Diagram

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Port	Description
C-	Charge and discharge negative terminal
B-	Connect the negative terminal of the battery pack
BC0	Connect the negative terminal of the 1st cell
BC1	Connect the positive terminal of the 1st cell
BC2	Connect the positive terminal of the 2nd cell
BC3	Connect the positive terminal of the 3rd cell
BC4	Connect the positive terminal of the 4th cell
BC5	Connect the positive terminal of the 5th cell
BC6	Connect the positive terminal of the 6th cell
BC7	Connect the positive terminal of the 7th cell
BC8	Connect the positive terminal of the 8th cell
BC9	Connect the positive terminal of the 9th cell
BC10	Connect the positive terminal of the 10th cell
BC11	NC
BC12	
BC13	
BC14	
BC15	

BC16		Connect the positive terminal of the 11th cell
BC17		Connect the positive terminal of the 12th cell
BC18		
BC19		
BC20		Connect the positive terminal of the 13th cell
BC21		Connect the positive terminal of the 14th cell
BC22		Connect the positive terminal of the 15th cell
BC23		
BC24		
BC25		Connect the positive terminal of the 16th cell
J3 (Uart/BLE)	1	GND
	2	RXD
	3	TXD
	4	VDD(12)
J4(reserved)		Switch for discharge
NTC		External temperature probe

## 7, Wiring Sequence

- 1) Unplug all balance cables;
- 2) Connect BC0 to the negative terminal of the 1st cell (here the 1st cell is the cell where the negative terminal of the battery pack is located, and the last cell is the cell where the positive terminal of the battery pack is located); connect BC1 to the positive terminal of the 1st cell, connect BC2 to the positive terminal of the 2nd cell, all the way to connecting BC16 to the positive terminal of the 16th cell;
- 3) Connect the negative terminal of the battery to the B- port of the BMS;
- 4) Insert the balance wire to the socket.

## 8, Cautions

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- 1) Please follow the design parameters range listed in this specification during use, otherwise it will easily damage the BMS board and thus the battery pack;
  - 2) When testing, installing, touching and using the BMS, please pay attention to the appropriate anti-static measures;
  - 3) The maximum DC voltage that the charger port can withstand is specified. Chargers above this voltage will not guarantee that the BMS will not be damaged. Please use the charger according to this specification. It is better to choose the charger with the trickle-off function at the end of the charging current. Chargers that do not have the trickle-off function are designed for lead-acid batteries and do not meet the use of lithium batteries;
  - 4) Be careful not to touch the components on the circuit board with bare wires, soldering irons, or tin dross, otherwise the BMS may be damaged.
  - 5) The maximum discharge current is only supported for a few seconds, when testing, do not last too long to avoid power MOS overheating damage.
  - 6) When assembling the BMS and battery pack, do not put the heat dissipation aluminum plate near the surface of the battery cell, otherwise, the heat will be transferred to the battery cell and affect the safety of the battery pack.
  - 7) If abnormal conditions occur during use, please stop using immediately.
  - 8) This BMS has no charging function for 0V battery. If the battery voltage is 0V, the battery performance will be seriously degraded and may even be damaged.
  - 9) The BMS is not equipped with reverse charging protection function, if the charger polarity is reversed, the BMS may be damaged.