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Product confirmation

Customer Name		Customer Model	JBD-SP04S034-L4S-200A--200 A-B-U
Our Material Number		Customer Material Number	
Sample Submission Date	2021-01-25	Company Model	JBD-SP04S034 V1.0
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Approved by	Reviewed by		Prepared by
			Yuanbing yi
Material Number	JBD-SP04S031-L4S-200A-200A-B-U		
Customer Confirmation Column			
Confirmation Comments:			
Signature: Date:			

Special Instruction:

1. Please organize the test in time and give the test feedback to our company, so as to facilitate our company to arrange the follow-up work of this project after the customer receives the sample.

If no reply is received within 5 days, our company will assume that the test passed by the customer and the project will be completed normally.

2. If the customer passes the test, please mark the product name and product code in the customer comment column, and stamp the sign for confirmation. Otherwise, please point out the problem in the test unqualified column and put forward improvement suggestions.

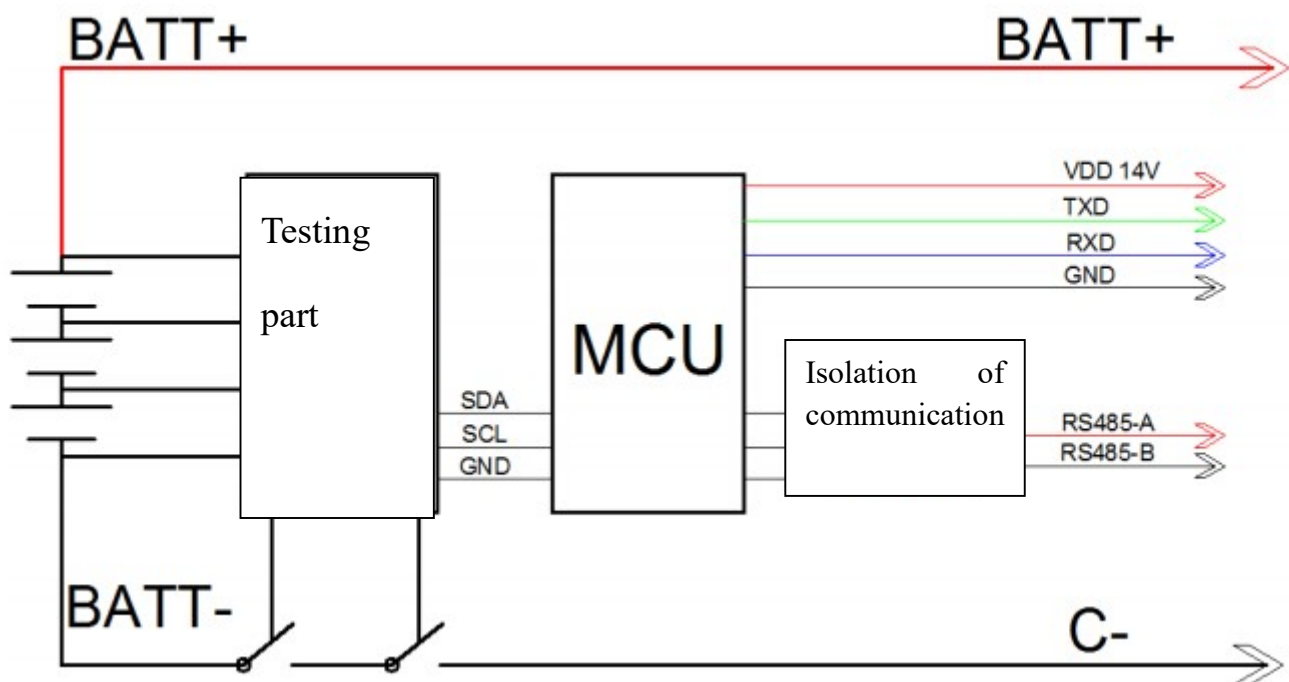
3. Our company can receive orders only after receiving the original signed and sealed by the customer and attaching the detailed description of the product.

I. Introduction and Features

JBD-SP04S031 is an intelligent protection board designed by Dongguan Jiabaida Electronic Technology Co., Ltd. specifically for starting batteries, energy storage and other products 4 series battery packs; Suitable for different chemical properties of lithium cells, such as lithium ion, lithium polymer, lithium iron phosphate, etc. Protection plate with strong load capacity, continuous discharge current up to 200A.

- 4 cell series protection
- Various protection functions for charging and discharging
- Discharge over current, short circuit protection functional processes of hardware
- Over voltage, under voltage, temperature and overload protection function processing of software
- Accurate SOC calculation with automatic SOC learning function
- UART/RS485 communication function, can read all data of battery in real time and upgrade online
- Hardware discharge over-current, short-circuit protection function processing
- Reserved switch control protection panel output and low temperature charging and heating function

II. Principle diagram



III. Basic parameters

3.1 Scope of use
 Battery pack structure:4S
 Charging mode: CC-CV (constant current constant voltage)
 Charging mode: constant current constant voltage
 Output terminal: C-
 Input terminal: B-, BC0-BC4

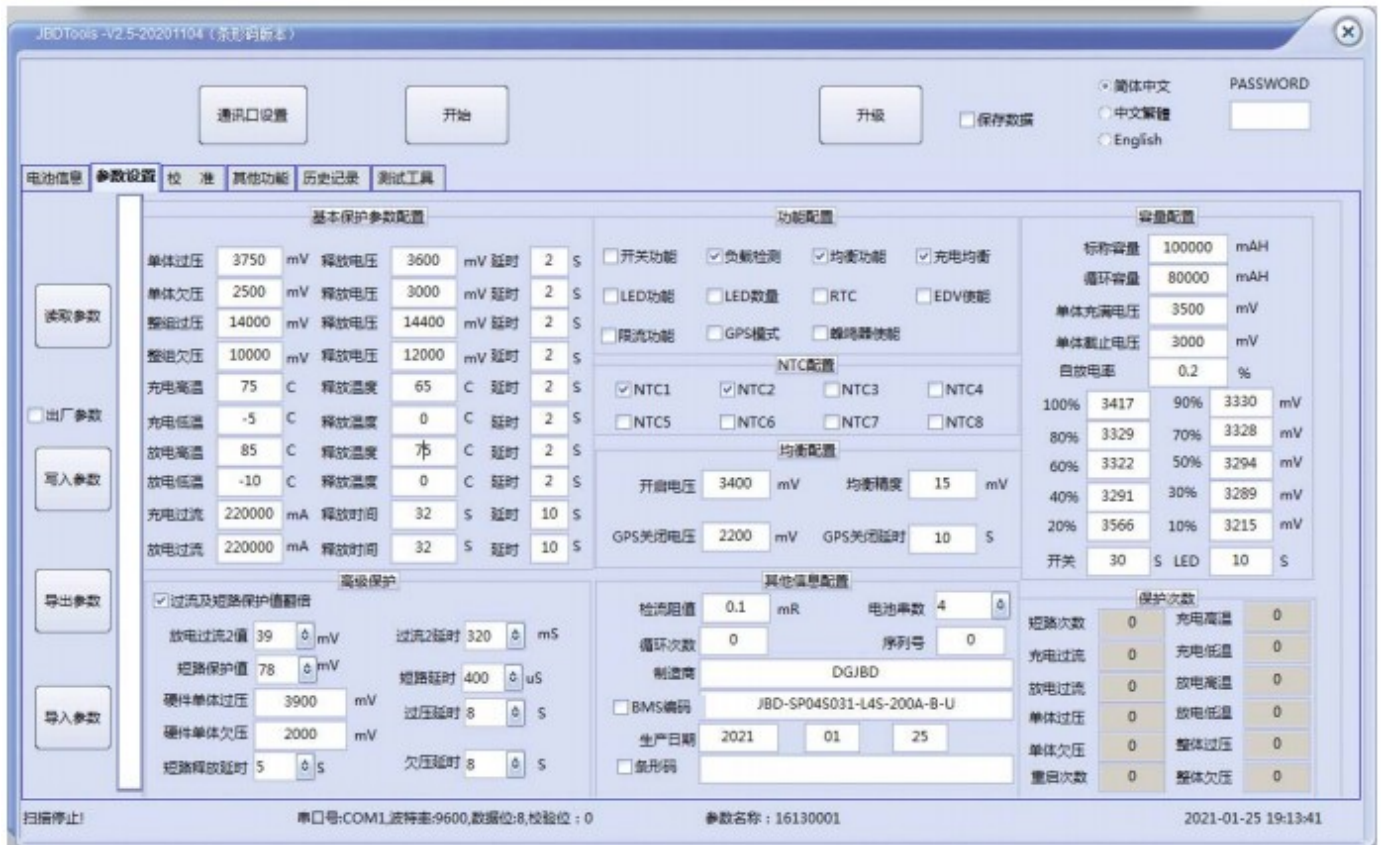
3.2 Electrical Characteristics (The test needs to be carried out in a room with a temperature of 25 ± 2 C and a relative humidity of 65 +/- 20 %)

Functions	Test items	specification			Unit
		Min.	Type	Max.	
Operating Voltage	voltage range	10		15	V
Operating current	recharging current	--	--	200	A
	Discharging current	--	--	200	A
Charging protection	Charger voltage (CC -CV)	15			V
	Over-charge protection voltage	3.600	3.650	3.700	V
	Over-charge protection delay time	1000	2000	3000	M S
	Over-charge protection recovery voltage	3.400	3.450	3.500	V
Discharge protection	Over-discharge protection voltage	2.400	2.500	2.600	V
	Over-discharge protection delay time	1000	2000	3000	M S
	Over-discharge protection recovery voltage	2.900	3.000	3.100	V
Equalization function	Balanced turn-on voltage	3.350	3.400	3.450	V
	Balanced turn-on voltage difference		15		M V
	Equilibrium mode	Charge equalization			
	Equilibrium current	50		150	MA
Over current protection	Charging over current protection value	210	230	250	A
	Charging over current delay	5	10	15	S
	charge over current protection recovery condition	Delay 32S release			
	Discharge over current 1 protection current value	210	230	250	A

	Discharge over current 1 protection delay	15	20	25	S
	Discharge over current 2 protection current value	400	440	480	A
	Discharge over current 2 protection delay	150	320	500	M S
	Discharge over current protection recovery condition	Delay 60S release			
Temperature protection	High temperature protection value of charging	72	75	78	℃
	Release value of charging high temperature protection	62	65	68	℃
	Low temperature protection value of charging	-8	-5	-2	℃
	Charging low temperature protection release value	-3	0	3	℃
	High temperature protection value of discharge	82	85	88	℃
	Release value of discharging high temperature protection	72	75	78	℃
	Low temperature protection value of discharging	-13	-10	-7	℃
	Discharging low temperature protection release value	-3	0	3	℃
Short circuit protection	Short circuit protection delay time	200		600	U S
	Short circuit protection recovery	Disconnect load			
Internal resistance	Discharge loop internal resistance	/	5	10	M R
Self-consuming	Operating mode			20	M A
	Sleep mode			250	U A
	Sleep condition and delay	Delay 10s under no current / communication / protection status			
Operating temperature	Normal working range	-20		70	℃
storage temperature	Humidity is lower than 90%,	-40		85	℃

Protection board size	length*Width*Height	195*105*22	mm
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3.3 Software parameter description



3.4 Protection function description:

Overcharge protection: When the battery is under the charging state, the voltage keeps going up. When the protection board detects that the voltage of any cell is higher than the overcharge protection value, the protection board will start timing immediately. When the time reaches the overcharge protection delay, the protection board will turn off the charging MOS tube, at that time, it cannot be charged.

Overcharge protection recovery: After the overvoltage protection appears on the protection board, the battery voltage will going down under the static or discharge state of the battery. When the protection board detects that each voltage is lower than the recovery voltage of the overcharge protection, the protection board will output a signal and turn on the charging MOS tube to charge.

Over-discharge protection: When the battery is under the discharge state, the voltage keeps going down. When the protection board detects that the voltage of any cell is lower than the overcharge protection value, the protection board will start timing immediately. When the time reaches the over discharge protection delay, the output signal of the protection board will turn off the discharge MOS tube, the load lock circuit will work, but, it cannot discharge at this time.

Over discharge protection recovery: After the over discharge protection appears on the protection board, the battery voltage will going up under the static or discharge state of the battery. When the protection board detects that each voltage is higher than the recovery voltage of the over discharge protection. At this time, disconnect the load or charge, the protection board will output a signal and turn on the charging MOS tube to charge.

Overcurrent protection: When the battery is under the static or discharge state, the current suddenly increases. When the protection board detects that the current reaches the overcurrent protection value, the protection board will start timing at that time. When the current duration in

the circuit reaches the overcurrent protection delay time, the output signal of the protection board will turn off the discharge MOS tube, and the load lock circuit will work. At this time, the discharge cannot be conducted.

Overcurrent protection recovery: After the discharge overcurrent protection appears on the protection board, the discharge MOS tube is turned off, and the current in the loop becomes 0. At this time, the load is disconnected or charged, the output signal of the protection board will turn on the discharge MOS tube to discharge.

Please note: If the parameters of the protection board are adjusted, please read the internal parameters of the protection board first and then change them. After the change is completed, click write. If you do not inform us of the nominal capacity of the battery pack, please change it after communication.

IV. Detailed Notes to the number:

JBD – SP04S031 – L4S – 200A -200A- B - U

(1) (2) (3) (4) (5) (6) (7)

(1) Jia Bai Da Electronic Technology Co., Ltd: JBD, for short

(2) Our protection board model: SP04S031, the maximum support 4 strings

(3) L4S, namely, the sample of this time is a 4-string protective board for lifepo4 battery.

(4) Maximum charge , if this current is exceeded, it may cause permanent damage to the protection board.

(5) Maximum discharge current, if this current is exceeded, it may cause permanent damage to the protection board.

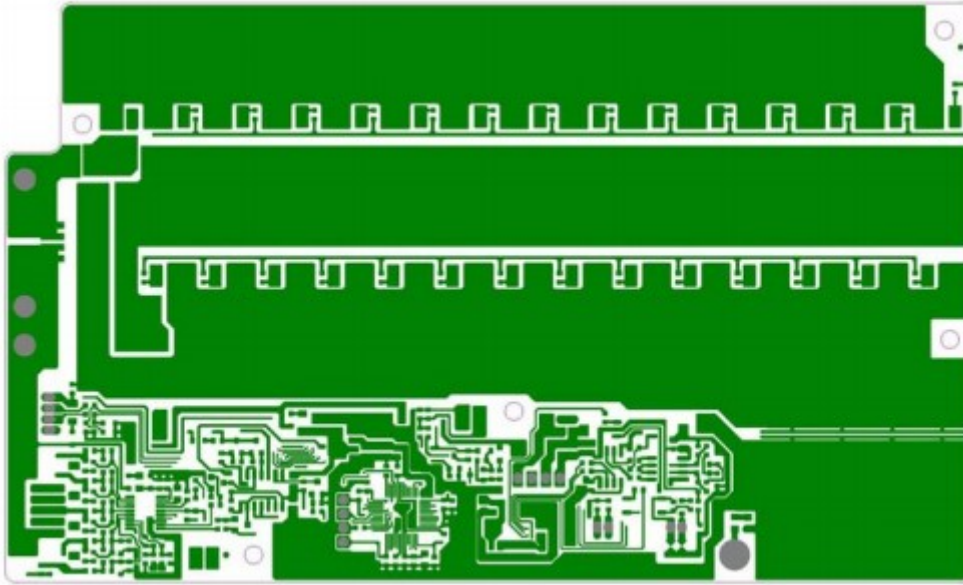
(6) Equalization function

(7) With UART communication function

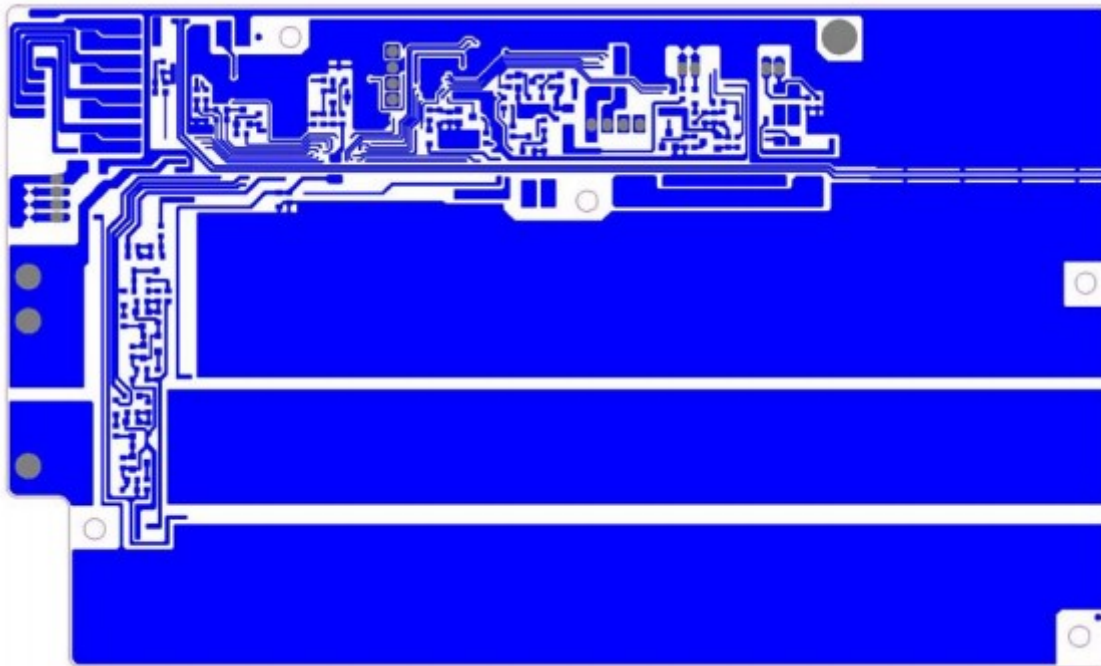
After your company receives the specification and sample, the verification test is completed, if you company need subsequent batches, please sign this specification and send it back to our company. Our company will provide your company with batches according to the parameters in this specification.

This specification defines the functions, electrical parameters, mechanical parameters and package and transportation, installation and use of the lithium battery pack management system designed and manufactured by Dongguan City Jia Bai Da Electronic Technology Co., Ltd (hereinafter referred to as “our company” later) according to the design requirements provided by your company. Upon confirmation by your company, this specification is only for our company and your company's internal use, and shall not be given to a third party without our company's permission, and our company has the right of final interpretation with regard to this specification.

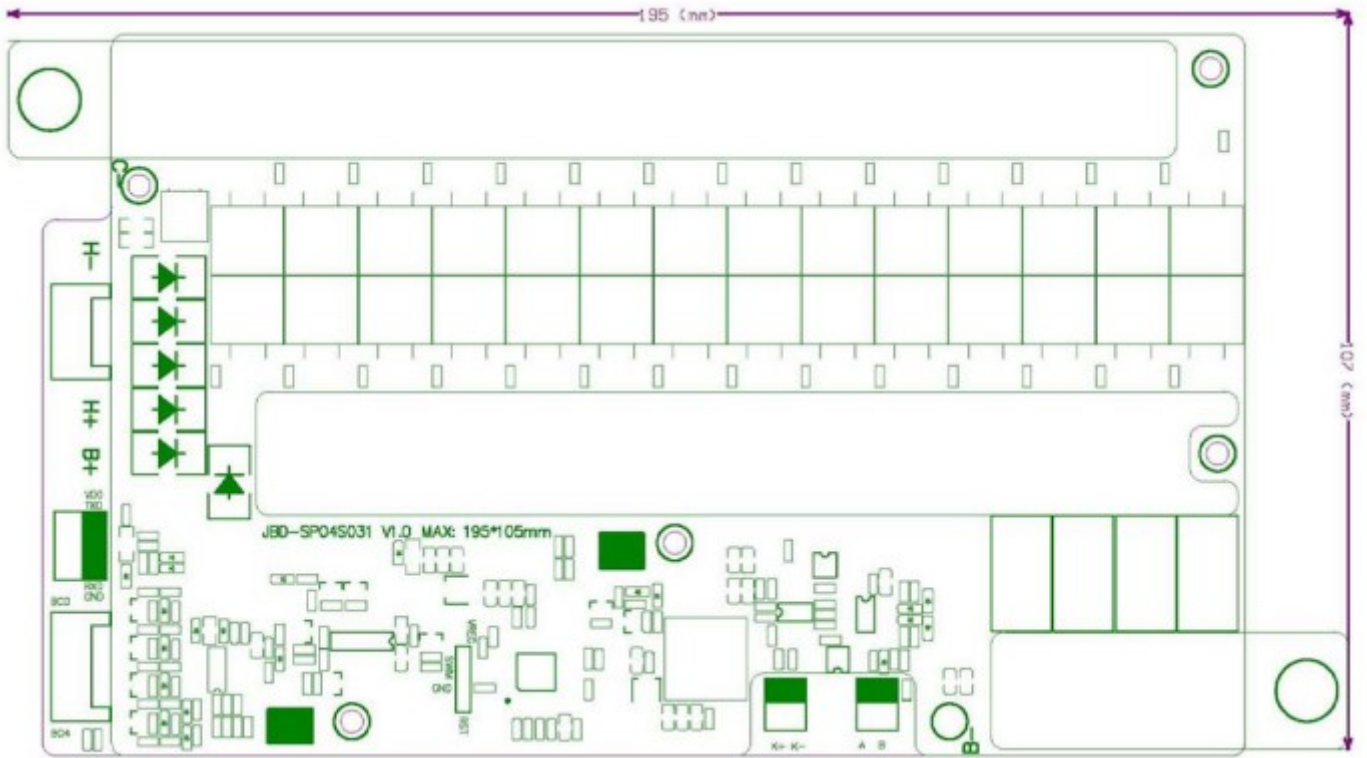
V. PCB routing and dimension structure drawing



Top layer routing drawing

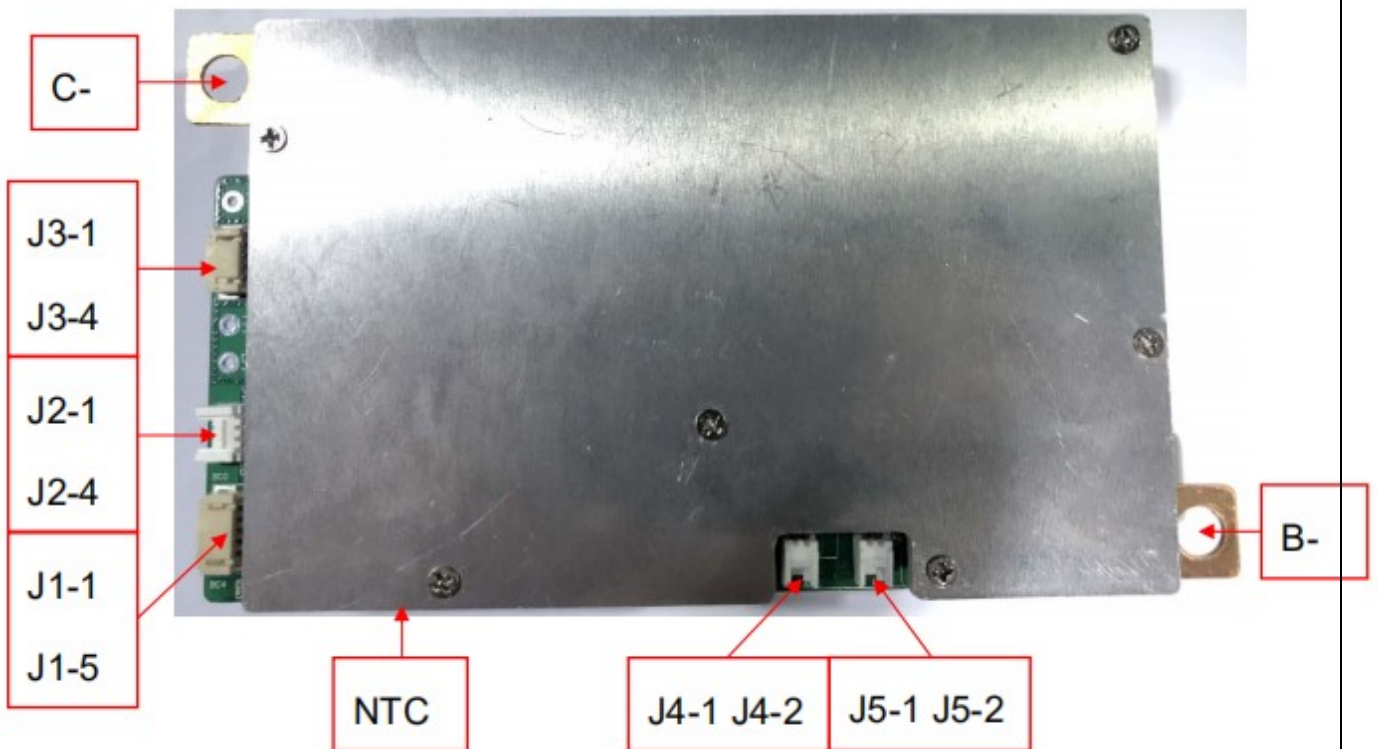


Bottom layer routing drawing



Border dimension drawing

VI.Wiring diagram



Port Description:

port	Description
C-	Charge and discharge negative poles

	B-	Connect the first series of negative poles of the battery pack, i.e. the total negative pole of the battery pack
J1	1	Connect the first string of negative pole of the battery pack
	2	Connect the first string of positive pole of the battery pack
	3	Connect the second string of positive pole of the battery pack
	4	Connect the 3rd string of positive pole of the battery pack
	5	Connect the 4th string of positive pole of the battery pack
J2 UART / Bluetooth communi- cation port	1	VDD, The b-level is 12V
	2	TXD
	3	RXD
	4	GND
J3 Heating port	1	Heating film positive electrode interface
	2	Heating film positive electrode interface
	3	Heating film negative electrode interface
	4	Heating film negative electrode interface
J4 Reserved switch function	1	K+
	2	K-
J5 Reserve RS485 communi- cation	1	RS485-A
	2	RS485-B

VII. Order of connection

When assembling the wiring, weld the cable and the cell correctly, connect the B- of the PCM with the total negative pole of the cell, and then insert the cable into the needle base on the PCM. **(Note: different connection modes for different strings, and different connection modes for the same port)**

VIII. Precautions for use

1. When in use, design parameters and work conditions must be followed, and the parameters in this specification must not be violated, otherwise it is easy to damage the protection plate, and then damage the

battery pack.

2. When in use, there should be corresponding electro static-free measures for testing, installation and contacting with the protection board.

3. The charging port can withstand the specified DC voltage. If the charger is higher than this voltage, it cannot guarantee that the protection board will not be damaged. Please use the charger according to this specification. It is better to choose the charger with the function of closing the trickle current at the end of charging current, so as to achieve double security. Chargers without trickle current closed are designed for lead-acid batteries and do not work with lithium.

4. When in use, Pay attention to the electric lead, electric soldering iron and solder splash. Do not enable them to touch the components and parts on the circuit board; otherwise the protection board may be damaged.

5. The maximum discharge current is the maximum current that lasts for a few seconds. During the test, it cannot last too long to avoid overheating damage of power MOS.

6. When assembling the protection board and the battery pack, do not place the heat dissipating aluminum plate close to the surface of the cell. Otherwise, the heat will be transferred to the cell, affecting the safety of the battery pack.

7. If abnormal conditions occur during use, please stop using it immediately, return it to the original factory or ask professional maintenance personnel for maintenance.

8. If it is a split protection board, P- is prohibited to be used as charging port. Because when p- is used as charging port, the battery pack has no overcharge protection. C- is forbidden to be used as discharge port.

9. The protection board has already done a lot of reliability tests, the reliability is far higher than the general protection board on the market, and the process of the cell must be ensured at the same time, so as to reduce the occurrence of combustion as much as possible.

10. This protection board is not equipped with 0V battery charging function. Once the battery shows 0V, the battery performance will be seriously degraded and may even be damaged.

12. In order not to damage the battery, the user needs to charge regularly to replenish the electric quantity when not in use for a long time (the battery pack capacity is more than 2AH, storage is more than 3 months). And when in use, it must be charged within 12 hours after being discharged, so as to prevent the battery from discharging to 0V due to its power consumption. Customers are required to have a clear identification for periodic maintenance of the battery on the battery case.

13. This protection board does not have anti-charge protection function. If the pole of the charger is reversed, the protection board may be damaged.

Safety Precautions:

Our company is committed to improvement of quality and reliability, but in general, there will be a certain probability of failure in electrical components and parts, with different environment and conditions, the durability will be different. When in use, the lengthy design is adopted to avoid overload abnormal fever, smoking, and even casualty, fire accidents, social damage, etc.