DONG GUAN JIABAIDA ELECTRONICS TECHNOLOGY.CO.,LTD

Product specification

CUSTOMER:	
SAMPLE NAME:	3-4 串 60-200A 软件板
MODEL NAME:	JBD-DP04S007 V1.8 铁锂系列
DATE:	2025-4-17
VERSION:	A06
SIGNATURES:	

Contents

1.Product introduction

●JBD-DP04S007 is a software protection board scheme specially designed for 3~4 strings of lithium battery packs. The product adopts architecture of front-end acquisition chip + MCU, and some parameters can be flexibly adjusted through the hostcomputer according to customer needs.

2.Configuration

Function	Configuration	Function	Configuration
Number of strings supported	3~4S	485 communication (isolated)	Not supported
(Cotinuous current)	60~200A	UART interface (isolated)	Not supported
(Number of NTC)	(1 external)	(CAN communication)	Not supported
(Balance Function)	(Passive balance)	(232 Communication)	Not supported
ART (non-isolated)	(Standard option)	(Heating function)	Optional
(Switch function)	(Optional)	(Module of Bluetooth)	Standard option
(Charging current limit)	(Not supported)	(Battery packs in series)	Optional
(Battery packs in parallel)	(Optional)	(Secondary protection)	Not supported
(History storage)	(Not supported)	(LCD display)	Optional
(Pre-discharge function)	(Not supported)	(Interface of LED indicator)	Not supported
(Buzzer)	(Not supported)	(Storage and transportation function)	supported

3.Parameter Setting

3.1.Basic parameter

Cell specifications		3~4 strings of LiFePO4 battery)
Interface type		Charge and discharge are both at the same port
Charging voltage		3.6V*Number of strings
Cell voltage range		2.30~3.75V
Continuous charging current		60~200A
Continuous discharging current		60~200A
Consumption of running		≤10mA
Consumption of sleep		≤800uA
Sleep conditions		Delay 1min±30s under no current \ communication \ protection state
Shutdown conditions		No communication Delay of120± 40s when the voltage of asingle section is lower than the underv oltage value.
Exit Shutdown conditions		UARTcommunication\Chargingexitshutdownmode
Circuit resistance		≤10mR
Operating temperature		-20℃~75℃
Structure size of PCB		
size	60~120A	160±2mm * 105±1mm * 10±1mm Length*Width*Height
	150~200A	160±2mm * 105±1mm * 17±1mm Length*Width*Height

Note: Test should be at temperature25±2°C, and relative humidity 65±20% of surroundings.

3.2.Main parameter

			Project	Specification			(Unit)
				MIN	TYP	MAX	
(Over-voltage and Under-voltage protection)			Over-voltage)	3.700	3.750	3.800	V
			Over-voltage delay)	1000	2000	3000	mS
			Over-voltage release)	3.550	3.600	3.650	V
			过Under-voltage)	2.250	2.300	2.350	V
			Under-voltage delay)	1000	2000	3000	mS
			Under-voltage release)	2.350	2.400	2.450	V
			Under-voltage release conditions	Self-recovery by increasing voltage or charging			
			Over-current Charge protection value	Refer to configuration table of over-current protection value below			
			Over-current Charge delay	7	10	13	S
			(Over-current Charge release conditions)	Automatic recover after a delay of 32S			
			1th Over-current Discharge value	Refer to configuration table of over-current protection value below			
			1th Over-current Discharge delay	7	10	13	S
			2th Over-current Discharge value	Refer to configuration table of over-current protection value below			
			2th Over-current Discharge delay	100	300	500	mS
			Over-current Discharge release	Automatic recover after a delay of 32S			
Short Circuit Protection			Short circuit protection current value	Refer to configuration table of over-current protection value below)			
			Short circuit protection delay time	-	560	900	uS
			Short circuit protection recovery	Recover by releasing load after approximately 5s			
			Short circuit protection function test condition:external load<80mR,connect air switch for test。				
			Short-circuit description: Use our internal battery cells to test for short-circuit protection. Before bulk production, please ensure that the client provides the actual application battery pack for short-circuit testing. It is recommended to further evaluate according to the actual application environment.				
			Short-circuit description: The short-circuit current is less than the minimum value or higher than the maximum value, which may cause the short-circuit protection to fail, and the short-circuit current exceeds 3000A, short-circuit protection is not guaranteed, and short-circuit protection testing is not recommended.				
Short Circuit Discharge	CHG		Temperature protection value	62	65	68	℃
			Temperature protection release value	52	55	58	℃
		Withouth eating	Temperature protection value	-13	-10	-7	℃
			Temperature protection release value	-8	-5	-2	℃
		With heating	Temperature protection value	-3	0	3	℃
			Temperature protection release value	2	5	8	℃

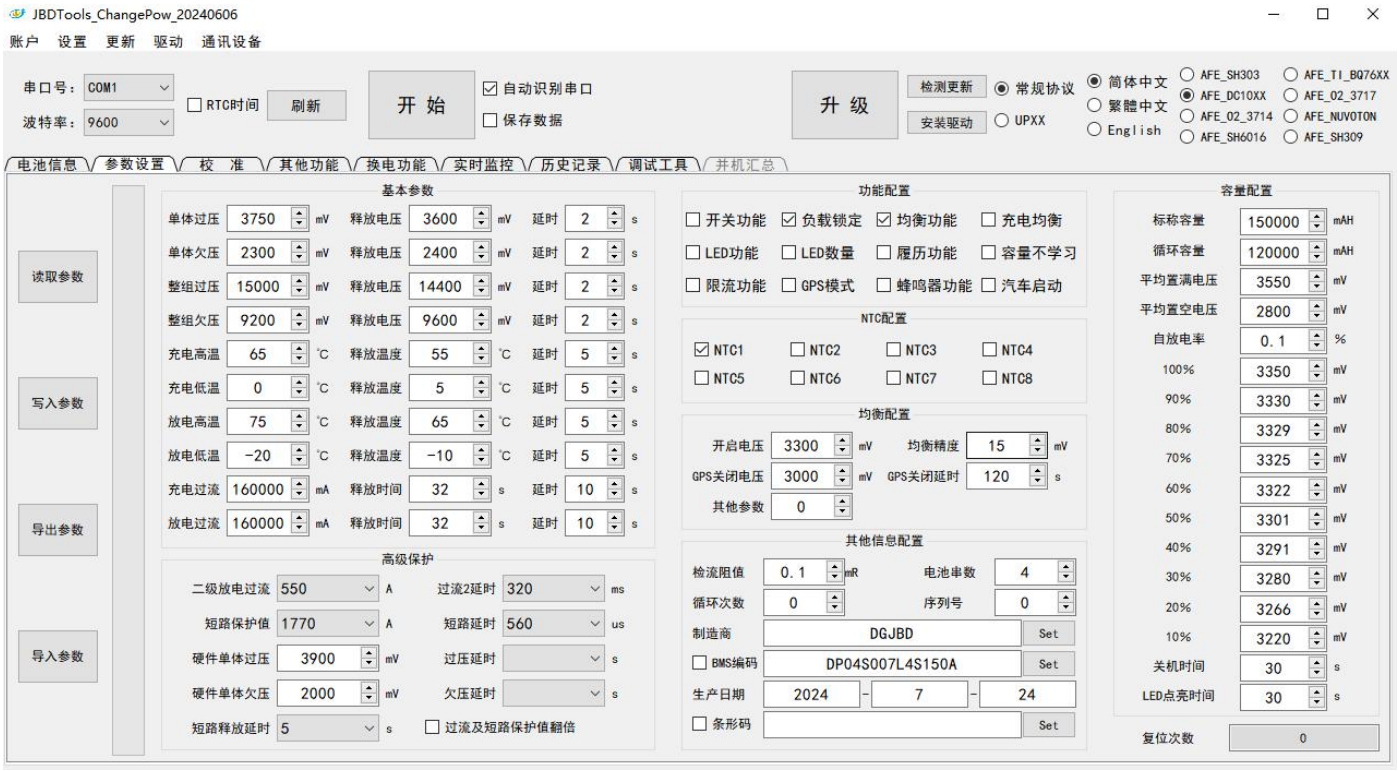
	放电 DSG	Temperature protection value	72	75	78	℃
		Temperature protection release value	62	65	68	℃
		Temperature protection value	-23	-20	-17	℃
		Temperature protection release value	-13	-10	-7	℃
	FET	Temperature protection value	100	105	110	℃
		Temperature protection release value	60	75	90	℃
Balance Function		Balance function turn-on voltage	3.27	3.30	3.33	V
		Difference opening voltage value		15		mV
		Balance current	150	200	250	mA
		Balance model	Idle equalization			
		Balance type	Pulsed model			
Heating function		Current of heater	Continuous current ≤ 10A			
		Charging heating	When the temperature is below 15 ℃ and the charger is connected, the protection board will turn on heating while charging, if low temperature protection is triggered during charging, only heating will occur without charging. Low temperature protection release during charging, restoring heating while charging, and stop heating when the temperature is above 15 ℃			

Note: Test should be at temperature25±2°C, and relative humidity 65±20% of surroundings.

Over-current protection value configuration table

(Continuous current)		(Charge Over-current value)	(1st discharge Over-current value)	(The second discharge Over-current value)	(Short circuit protection value)
Charge	Discharge				
60A	60A	70±5A	70±5A	210±50A	750±150A
80A	80A	90±5A	90±5A	280±60A	1000±200A
100A	100A	110±5A	110±5A	330±80A	1350±300A
120A	120A	130±5A	130±5A	440±120A	1550±400A
150A	150A	160±5A	160±5A	550±120A	1800±400A
200A	200A	210±5A	210±5A	760±120A	2400±400A

3.3.parameter settings



The diagram of the host computer

*Attention:

1、The upper computer is the latest date version of JBDToolsChangePow, and please choose the 'AFE_DC10XX' at top right corner.

2、The continuous current is 200A, and the actual discharge overcurrent protection value and short-circuit protection value are 2 times the set value on the upper computer.

4.Function Description

4.1.Overcharge protection and recovery

4.1.1.Cell overcharge protection and recovery

When the voltage of any cell is higher than the set value of the cell overcharge voltage, and the duration reaches the cell overcharge delay, the system enters the overcharge protection state, the charging MOS will turn off, and the battery cannot be charged.

After the cell overcharge protection, when the voltage of all cells drops below the cell overcharge recovery value, the overcharge protection state is released. It can also be released by discharge.

4.1.2.Entire overcharge protection and recovery

When the entire voltage is higher than the entire Over-voltage set value, and the duration reaches the entire overcharge delay, the system enters the overcharge protection state, turns off the charging MOS, and cannot charge the battery.

When the entire voltage drops below the recovery value of the entire voltage Over-voltage protection, the overcharge protection state is released, and it can also be released by discharge.

4.2.Over-discharge protection and recovery

4.2.1.Cell over-discharge protection and recovery

When the minimum cell voltage is lower than the set value of the over-discharge voltage of the cell, and the duration reaches the over-discharge delay of the cell, the system enters the over-discharge protection state, turns off the discharge MOS, and cannot discharge the battery.

After the cell over-discharge protection occurs, charging the battery pack can release the over-discharge protection state.

4.2.2.Entire over-discharge protection and recovery

When the entire voltage is lower than the entire over-discharge voltage set value, and the duration reaches the entire over-discharge delay, the system enters the over-discharge protection state, turns off the discharge MOS , and cannot discharge the battery.

After the entire over-discharge protection occurs, charging the battery pack can release the over-discharge protection state.

4.3.Over-current protection and recovery in charging

When the charging current exceeds the charging protection current and the duration reaches the Over-current detection delay time, the system enters the charging Over-current protection state and cannot charge the battery. After the charging Over-current protection occurs, it will automatically recover after a delay. If you want to automatically recover or not, you can set the corresponding release time to be longer; the charging Over-current state can also be released by discharging.

4.4.Over-current protection and recovery in discharging

When the discharge current exceeds the discharge Over-current protection current and the duration reaches the Over-current detection delay time, the system enters the discharge Over-current protection state and turns off the discharge MOS. Delayed automatic recovery after discharge Over-current occurs, and the corresponding release time can be set longer if automatic recovery is required. Charging can also release the discharge Over-current protect condition. Discharge has two-level Over-current protection function, which has different response speeds for different current values, and protects the battery more reliably.

4.5.Temperature Protection and Recovery

4.5.1.High temperature protection and recovery in charging and discharging

When the NTC detects that the temperature of the battery cell surface is higher than the setting of high temperature protection value during charging and discharging,
the management system enters the high temperature protection state,
the charging or discharging MOSFET is turned off, and the battery pack cannot be charged or discharged in this state.

When the temperature of the surface of the cell drops to the high temperature recovery set value, the management system recovers from the high temperature state and turns on the charge and discharge MOS again.

4.5.2.Low temperature protection and recovery in charging and discharging

When the NTC detects that the temperature of the cell surface is lower than the setting of low temperature protection value during charging and discharging,
the management system enters the low temperature protection state,
the charging or discharging MOSFET is turned off,
and the battery pack cannot be charged or discharged in this state.

When the temperature of the cell surface rises to the low temperature recovery set value, the management system recovers from the low temperature state and turns on the charge and discharge MOS again.

4.6.Balance function

The management system uses the resistance bypass method to balance the cells. During the charging process, the voltage of the highest single cell of the battery pack reaches the set equilibrium starting voltage value, and the voltage difference between the minimum voltage and the maximum voltage of the single cell of the battery pack is greater than the set value. When the value is set, the equalization function of the cells that meet the conditions is enabled, and the two adjacent equalizers cannot be enabled at the same time.

The equalization stops when the cell voltage difference is less than the set value or the cell voltage is less than the equalization turn-on voltage.

4.7.Capacity calculation

The SOC calculation of the battery pack can be accurately performed by integrating current and time. The full capacity and cycle capacity of the battery pack can be set through the host computer, and the capacity can be automatically updated after a complete charge and discharge cycle. It has the function of calculating the number of charge and discharge cycles. When the cumulative discharge capacity of the battery pack reaches the set cycle capacity, the number of cycles increases once.

Note: For newly installed batteries, please set the nominal capacity and cycle capacity according to the battery capacity, and conduct a capacity study, otherwise the capacity inaccuracy may occur. Capacity learning operation: first fully charge to Over-voltage protection, then discharge to under-voltage protection, and then charge it again.

4.8.Sleep function

When the BMS is in static state (no communication, no current, no balance and Over-voltage protection), after a delay of 1minutes, it will enter the sleep state.

After entering this state, the BMS will only reduce the frequency of detecting and its own power consumption.Communication, dial switch, charging and discharging can automatically exit the sleep mode

4.9.Communication

4.9.1.Serial Communication

UART communication box

Note: The above tools need to be purchased separately.

The connection method: After installing the special driver for our communication box on the computer, insert the USB end of the communication box into the USB port of the computer, and connect the other end to the corresponding interface of the protection board that has been connected to the battery. Open the upper computer, click the communication port settings, select the CMO port corresponding to the communication box, and do not change other options. After confirming, click Start to read the data in the protection.

If you need to change the parameters of the protection board, you must click on the parameter page to read the parameters before changing the parameters.

COM Settings:

- Baud rate:9600;
- Parity Bit:NONE;
- Data Bit:8 bits;
- Stop Bit:1 bit

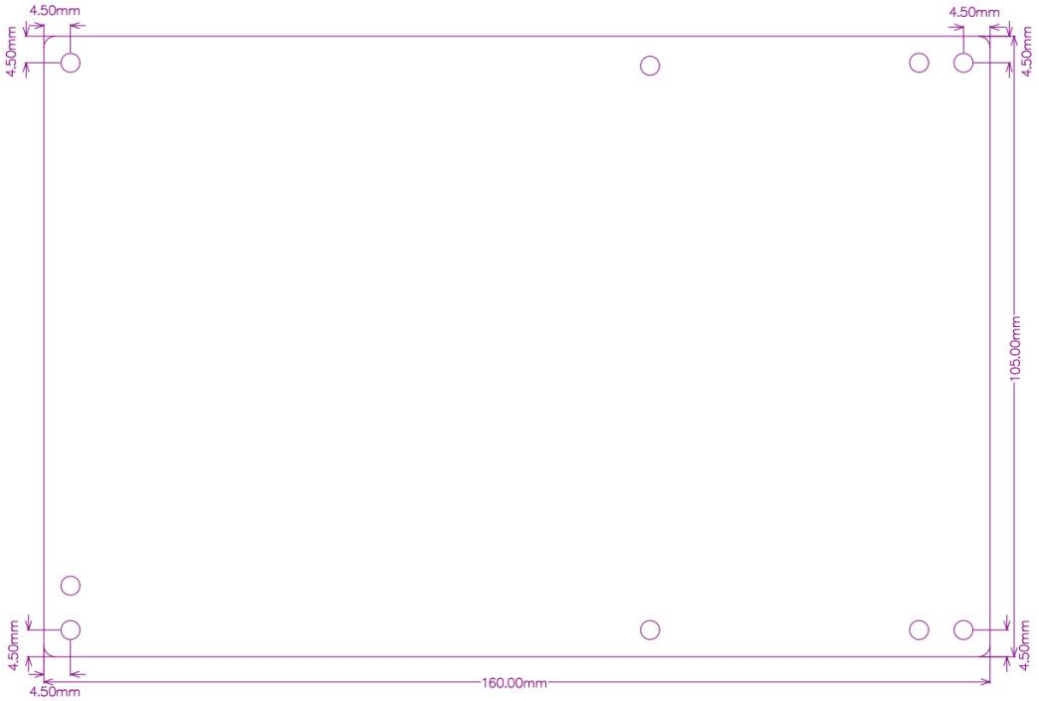
5.Main material

Number	Name of Material	Manufacturer	Quantity
1	IC\SSOP24\DVC1006	Devechip	1PCS
2	IC\TQFN32\TLSR8250F512ET32	Telink)	1PCS
3	MOS 管\HYG011N04LS1TA\TOLL-8	华羿微	
	MOS 管\DP038NE8BGN\TO-263	德普微	
	MOS 管\DP016NE8TGN/TOLL-8	德普微	
	MOS 管\PES016N08R\TOLL-8	芯电元	
	MOS 管\LSGT085R014HC\TOLL-8	龙腾	
4	NTC\10K\3950\250mm\带端子\HY2.0		1PCS
5	PCB-JBD-DP04S007		1PCS
Accessories			
1	采集线\5PIN\HY2.0\带卡扣\24AWG\550mm\黑白红	电压采集线	1PCS
2	采集线\2PIN\HY2.0\带卡扣\24AWG\550mm\黑红	开关线	1PCS

Note: The above materials may be replaced by materials with the same specifications or better specifications. If there are certification requirements, the replacement of materials is not allowed, and we need to notify our business to send samples again. The controlled specifications, the final interpretation right belongs to JBD.

6.Schematic and Dimensions

6.1.Dimensions and installation point drawing

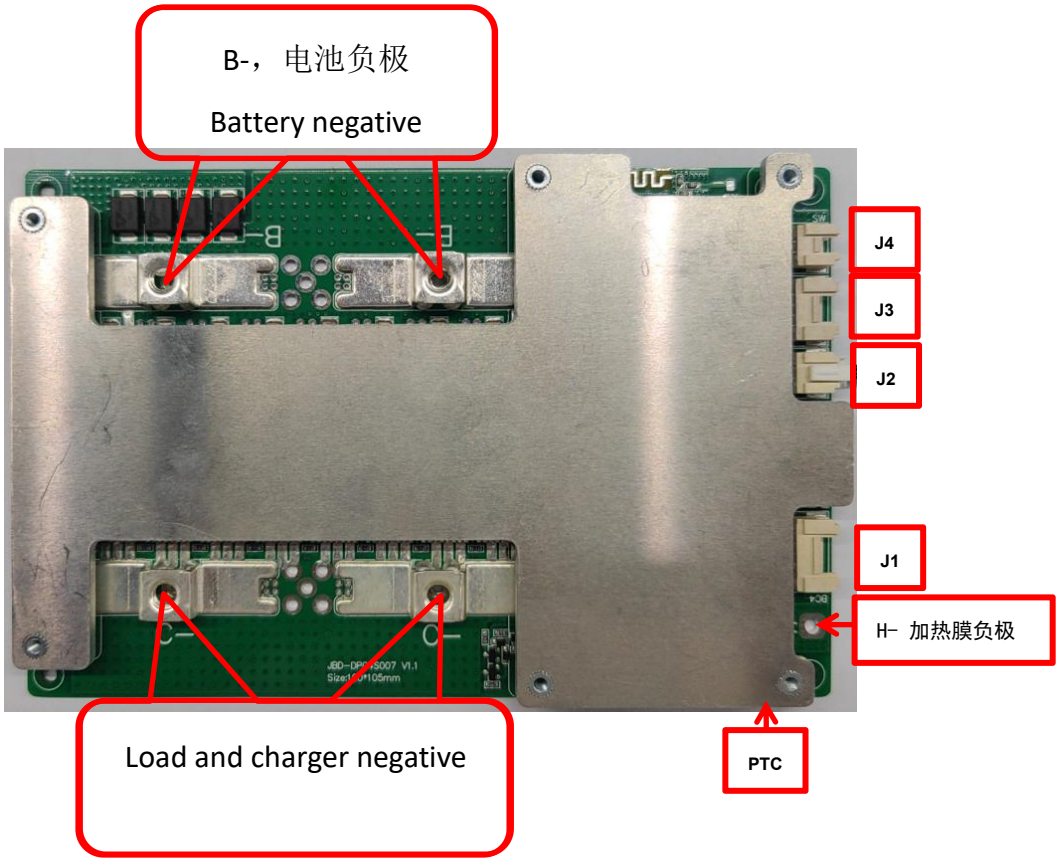


Structure size

7.Definition of signal port

7.1.Illustration annotation

Schematic marking the interface label (Refer to the following figures)



Label	Tag number	Connector	Schematic diagram	PIN	Pin function definition	Note
1	J1 (HY2.0-5P)	Voltage detection socket		1	Connect to Negative Side of Cell 1	BC0
				2	Connect to Positive Side of Cell 1	BC1
				3	Connect to Positive Side of Cell 2	BC2
				4	Connect to Positive Side of Cell 3	BC3
				5	Connect to Positive Side of Cell 4	BC4
2	J2 (HY2.0-2P)	NTC		1	Connect to the temperature detection	
				2		
3	J3 (HY2.0-4P)	UART\Blue-tooth		1	UART - GND	
				2	UART - RXD	
				3	UART - TXD	
				4	UART – VDD	B+
4	J4 (HY2.0-2P)	Switch		1	K +	Reserve
				2	K -	

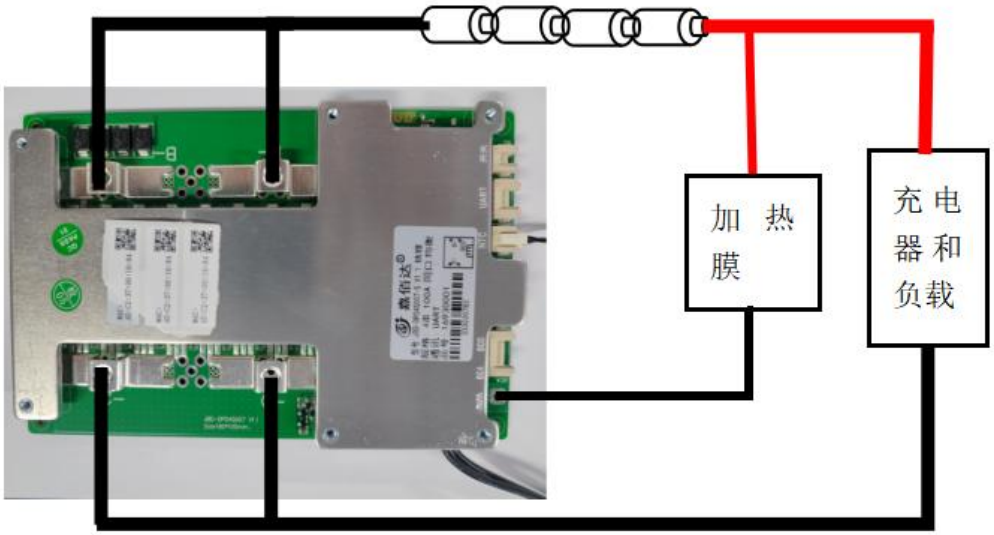
3S wire connection

Label	Tag number	Connector	Schematic diagram	PIN	Pin function definition	Note
1	J1 (HY2.0-5P)	Voltage detection socket		1	Connect to Negative Side of Cell 1	BC0
				2	Connect to Positive Side of Cell 1	BC1
				3	Connect to Positive Side of Cell 2	BC2
				4	Connect to Positive Side of Cell 3	BC3
				5		

Remarks:

1、The ground wire of J4-UART is B-, which is a non-isolated UART port and does not support communication with chargers or loads.

7.2.Heating pads wiring diagram (models with heating function)



8.Environmental suitability

8.1.The environment of working

- BMS The protective plate allows normal operation under the following conditions:
- Ambient temperature: -20°C ~ 75°C;
- Relative humidity: 5% ~ 90%;
- Atmospheric pressure: 86kPa~106kPa;

8.2.The environment of storage

BMS should be stored in a clean and well-ventilated warehouse with an ambient temperature of -5°C~+40°C, a relative humidity of not more than 70%, and the air must not contain corrosive gases and media that affect electrical insulation, and must not be affected by any mechanical Shock or heavy pressure. Not subject to direct sunlight, and the distance from the heat source (heating equipment, etc.) should not be less than 2m. Under the above storage conditions, the BMS protection board can be stored for one year.

9.Packing and shipping

9.1.Logo

●The packaging should meet the requirements of moisture-proof and anti-vibration, the packing box should be firm and reliable, the inside of the box should be lined with moisture-proof material, and the product should not move in the box.

●External carton box, veneer anti-static bag plus bubble bag packaging;

9.3.transportation

●During transportation, the product shall not be subject to severe mechanical impact, exposure to the sun, rain, chemical corrosive substances and harmful gases; During the loading and unloading process, the product should be handled with care, and it is strictly forbidden to throw or press it.

●The height of the packing boxes shall be less than 5 layers.

10.Precautions

1.This battery management system cannot be used in series generally, and requires a customized version to support series use.

2.When multiple battery packs using this management system are connected in parallel, make sure that the maximum voltage difference of each battery pack is lower than 3V before parallel connection.

3.When multiple battery packs using this management system are used in parallel, the total charging inrush current of the adapter may be applied to a single battery pack. It should be ensured that the total charging inrush current of the adapter does not exceed the maximum charging inrush current of a single management system.

4.The short-circuit protection function of this management system is suitable for a variety of application scenarios, but it does not guarantee that it can be short-circuited under any conditions. When the total internal resistance of the battery pack and the short-circuit loop is lower than 40mΩ, the capacity of the battery pack exceeds the rated value by 20%, the short-circuit current exceeds 2000A, the inductance of the short-circuit loop is very large, or the total length of the short-circuit wire is very long, please test yourself to determine whether This management system can be used.

5.When soldering the battery leads, there must be no wrong or reverse connection. If it is indeed connected incorrectly, the circuit board may be damaged and needs to be re-tested before it can be used.

6.When assembling, the management system should not directly touch the surface of the cell to avoid damage to the circuit board. Assembly should be firm and reliable.

7.During use, be careful not to touch the components on the circuit board such as lead tips, soldering iron, solder, etc., otherwise the circuit board may be damaged. Please do not use paste flux when soldering this circuit board, otherwise it may cause this circuit board to work abnormally.

8.During use, pay attention to anti-static, moisture-proof, waterproof, etc.

9.During use, please follow the design parameters and conditions of use, and must not exceed the values this specification, otherwise the management system may be damaged.

10.After the battery pack and the management system are combined, please check whether the wiring is correct if you find that there is no voltage output or charging fails when the battery is powered on for the first time.

11.The Parameter,function and outlook of BMS in this specification are for reference only,please refer to actual product.