Product Specification Approval

Product Name	BMS 13S 48V 20A Common port with Balance
Product Number	DL-J13G3-TJ-13S48V20A

1.Introduction

With the wide application of lithium batteries in the lithium battery industry, requirements for high performance, high reliability and high cost performance are also put forward for battery management systems. This product is a BMS specially designed for lithium batteries. It can collect, process and store the information and data of the battery pack in real time during use to ensure the safety, availability and stability of the battery pack.

2. Product Overview and Features

- Using professional high-current trace design and technology, it can withstand the impact of ultra-large current
- The appearance adopts the injection molding sealing process to improve moisture resistance, prevent the oxidation of components, and prolong the service life of the product
- Dust proof, shockproof, anti-squeezing and other protective functions
- There are complete overcharge, over-discharge, over-current, short circuit, balance functions
- The integrated design integrates acquisition, management, communication and other functions into one

3.Product Selection

Product Selection list											
Battery Type	☐Li-ion ☐LiFePO4										
Battery Strings	3☐	4☐	5☐	6☐	7☐	8☐	9☐	☐10	11☐	12☐	☐13
Discharge current	☐20A ☐15A										
Control switch	☐yes ☐no										

Note：Only Li-ion can select 3 strings

4. Technical parameter

4.1 Parameter correspondence 1

Name of Parameter(unit)	content						
Battery Type	Li-ion				LiFePO4		
Battery Strings	3~4	5~7	8~10	11~13	4~7	8~10	11~13
Charge voltage(V)	=4.2*Battery Strings				=3.65*Battery Strings		
balance turn-on voltage(V)	4.125	4.125	4.075	4.125	3.525	3.475	3.525
Balance current(mA)	100±25	100±25	75±25	100±25	70±25		
Single Cell over-charge protection voltage(V)	4.25±0.05				3.65±0.05		
Single Cell over-charge protection release voltage(V)	4.15±0.05	4.15±0.05	4.10±0.05	4.15±0.05	3.55±0.05	3.50±0.05	3.55±0.05
Single Cell over-discharge protection voltage(V)	2.7±0.05	2.8±0.05	2.7±0.05	2.8±0.05	2.3±0.05		
Single Cell over-discharge protection release voltage(V)	3.0±0.05				2.7±0.05		
Charging high temperature protection temperature（℃）	55						
Charging high temperature protection release temperature（℃）	50						
Charging low temperature protection temperature（℃）	-20						
Charging low temperature protection release temperature（℃）	-15						
Discharge high temperature protection temperature（℃）	75						
Discharge high temperature protection release temperature（℃）	65	65	70	65	65	70	65
Discharge low temperature protection temperature（℃）	-40						
Discharge low temperature protection release temperature（℃）	-35						

4.2 Parameter correspondence 2

Name of Parameter(unit)	Content	
Rated discharge current (A)	15	20
Rated charging current(A)	15	20
Discharge over-current protection current(A)	50±10	60±10
Charge over-current protection current(A)	20±3	25±3

4.3 Basic parameters

Test content		default parameters	Unit
Passive balance function	balance turn-on voltage	Sheet4.1	V
	Balance current	Sheet4.1	mA
	Balancer On Condition：Achieving the set turn-on voltage		
	12.11S Balance stop conditions: 1. All individual cell voltages are higher than the balance activation voltage or all individual cell voltages are lower than the balance activation voltage; 2. In systems of 11S or above, if a cross-chip voltage distribution imbalance occurs (for example, when consecutive battery cells' voltages are respectively at the upper and lower limits of the balance activation voltage), the system may prematurely trigger the balance protection mechanism and stop the balancing operation.		
Single Cell over-charge protection	Single Cell over-charge protection voltage	Sheet4.1	V
	Single Cell over-charge protection delay	1±0.5	S
	Single Cell over-charge protection release voltage	Sheet4.1	V
	Single Cell over-charge protection release delay	1±0.5	S
Single Cell	Single Cell over-discharge protection voltage	Sheet4.1	V

over-discharge protection	Single Cell over-discharge protection delay	1±0.5	S
	Single Cell over-discharge protection release voltage	Sheet4.1	V
	Single Cell over-discharge protection release delay	1±0.5	S
Charge/discharge over-current protection	Discharge over-current protection current	Sheet4.2	A
	Discharge over-current protection delay	1±0.5	S
	Release condition：Removing the load is lifted		
	Charge over-current protection current	Sheet4.2	A
	Charge over-current protection delay	0.5±0.5	S
	Release condition：Remove the charger to release		
Short circuit protection	Short circuit protection conditions：External load short circuit		
	Short circuit protection delay	10~500	uS
	Short circuit protection released：Remove the load or insert the charger to release it		
	Note：The actual test is subject to the customer's battery sent back to our company for testing.		
Temperature protection	Charging high temperature protection temperature	Sheet4.1	℃
	Charging high temperature protection release temperature	Sheet4.1	℃
	Charging low temperature protection temperature	Sheet4.1	℃
	Charging low temperature protection release temperature	Sheet4.1	℃
	Discharge high temperature protection temperature	Sheet4.1	℃
	Discharge high temperature protection release temperature	Sheet4.1	℃
	Discharge low temperature protection temperature	Sheet4.1	℃
	Discharge low temperature protection release temperature	Sheet4.1	℃
	Temperature protection release conditions：The release temperature is reached and the load is disconnected		
Internal impedance	Main circuit on-resistance	<20	mΩ

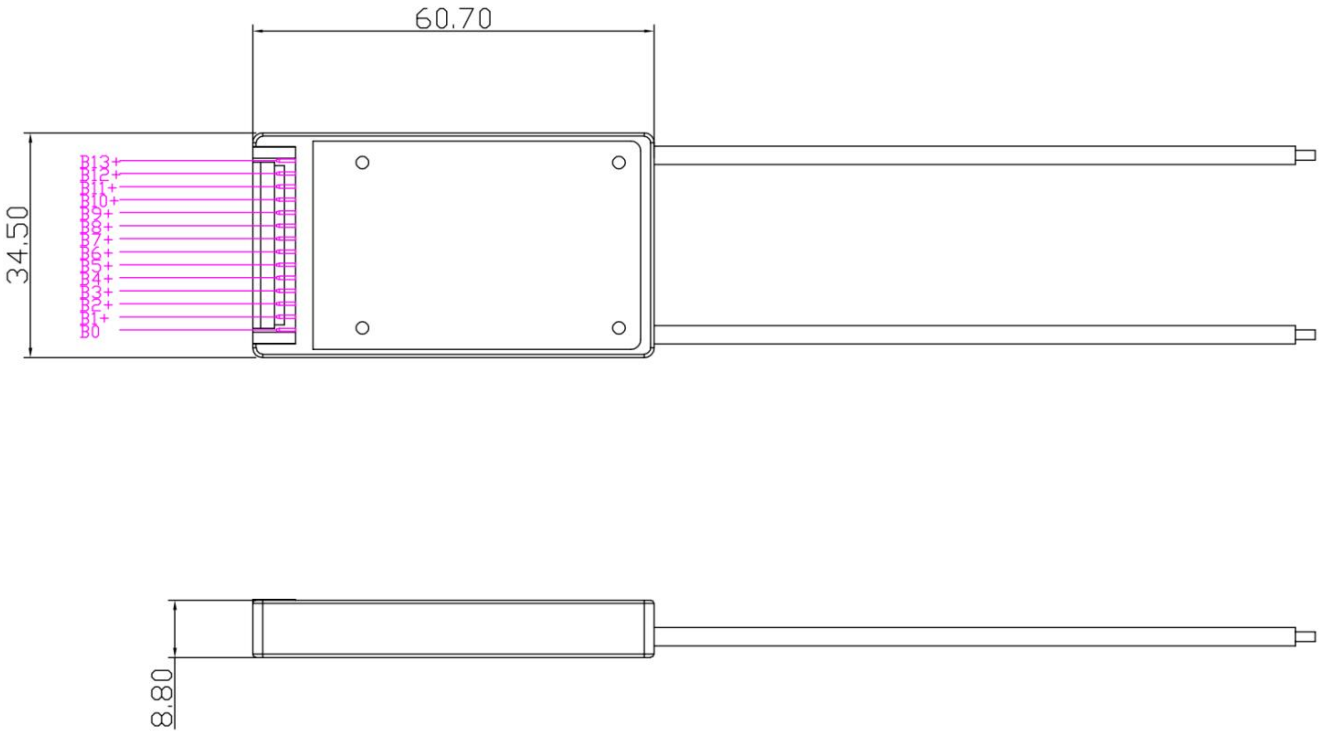
Current consumption	Self-consumption current during operation	<400	uA
BMS size	L * W * H (mm)=61±1*35±1*9±1		
weight	60g±35g		

4.4 Reliability parameters

Project	Condition
Detection accuracy	voltage detection accuracy：≤±15mV Temperature detection accuracy：≤2℃（Room temperature）
Working environment conditions	Operating temperature:-40℃~85℃
	Relative humidity: 5%～90%RH
Storage environment conditions	Storage temperature: -40℃~85℃
	RH Relative humidity: 5%～75%

5. Structural parameter

5.1 Dimensional drawing of BMS



Note: This size does not include the wiring harness/fitting size, please reserve the appropriate space for installing the wiring harness/fitting

5.2 Interface pin instructions

Interface name	Pin	Label	Definition description
□B-interface Standard Parts	/	B-	connect to battery total negative
□P-interface Standard Parts	/	P-	the BMS is connected to the negative terminal of the charge and discharge
collecting cable interface Standard Parts	1	B0	Connect to the negative terminal of the first battery
	2	B1+	Connect to the positive terminal of the first battery
	3	B2+	Connect to the positive terminal of the second battery
	...	...	Connect the positive terminal of the last battery
	collecting cable interface specification please refer to Sheet5.4		

5.3 Cable instructions

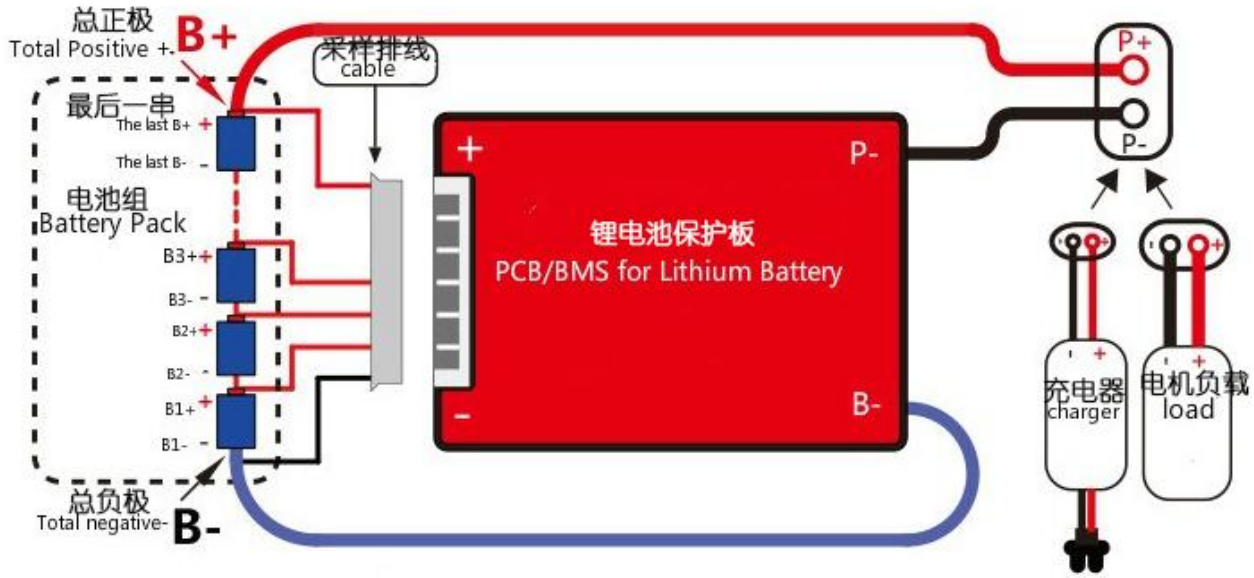
Name	Default specification	Quantity/Pcs
P- Cable	14AWG / 16AWG（15A 16AWG，20A 14AWG）3135 _100mm_Black	1
B- Cable	14AWG / 16AWG（15A 16AWG，20A 14AWG）3135_100mm_Blue	1
Sampling cable	Refer to Sheet5.4	1

5.4 Collection and string number mapping sheet

Strings	collecting cable interface specification	collecting cable specification	collecting cable cutting
3	PHB2.0 4pin with buckle	1007 24AWG L=300mm（4PIN）with buckle	/
4	PHB2.0 5pin with buckle	1007 24AWG L=300mm（5PIN）with buckle	/
5	PHB2.0 7pin with buckle	1007 24AWG L=300mm（7PIN）with buckle	cutting the last cable of the 7PIN cable
6	PHB2.0 7pin with buckle	1007 24AWG L=300mm（7PIN）with buckle	/
7	PHB2.0 8pin with buckle	1007 24AWG L=350mm（8PIN）with buckle	/
8	PHB2.0 9pin with buckle	1007 24AWG L=450mm（9PIN）with buckle	/
9	PHB2.0 11pin with buckle	1007 24AWG L=450mm（11PIN）with buckle	cutting the last cable of the 11PIN cable
10	PHB2.0 11pin with buckle	1007 24AWG L=450mm（11PIN）with buckle	/
11	PHB2.0 13pin with buckle	1007 24AWG L=450mm（13PIN）with buckle	cutting the last cable of the 13PIN cable
12	PHB2.0 13pin with buckle	1007 24AWG L=450mm（13PIN）with buckle	/
13	PHB2.0 14pin with buckle	1007 24AWG L=450mm（14PIN）with buckle	/

6.Wiring

6.1 Wiring diagram



6.2 Wiring Instructions

- First connect the B-cable of the BMS (thick blue cable) to the total negative pole of the battery pack

- The cable starts from the thin black wire connected to B-, the second wire is connected to the positive electrode of the first string of batteries, and the positive electrode of each string of batteries is connected in turn; then insert the cable into the BMS

- After the cable is completed, measure whether the voltages of battery B+ and B- are the same as those of P+ and P-. The same means that the BMS is working normally; otherwise, please re-operate according to the above;

- When removing the BMS, first unplug the cable (if there are two cables, first pull out the high-voltage cable, then pull out the low-voltage cable), and then disconnect the power cable B-.

8. Precautions

1. BMS of different voltage platforms cannot be mixed. For example, NMC BMSs cannot be used on LFP batteries.

2. The cables of different manufacturers are not universal, please make sure to use our company's matching cables 3

3. Take measures to discharge static electricity when testing, installing, touching and using the BMS

4. Do not let the heat dissipation surface of the BMS directly contact the battery cells, otherwise the heat will be transferred to the battery cells and affect the safety of the battery

5. Do not disassemble or change BMS components by yourself

6. The company's protective plate metal heat sink has been anodized and insulated. After the oxide layer is damaged, it will still conduct electricity. Avoid contact between the heat sink and the battery core and nickel strip during assembly operations.

7. If the BMS is abnormal, please stop using it and use it after the problem is solved

8. Do not use the two BMS in series or in parallel