深圳市嘉佰达电子科技有限公司

SHENZHEN JIABAIDA ELECTRONICS TECHNOLOGY.CO.,LTD

产 品 规 格 书

Product specification

客户名（CUSTOMER）：	PT.Adyawinsa Electrical and Power
产品名（SAMPLE NAME）：	8 串铁锂 40A 同口硬件板
产品型号（MODEL NAME）：	HP08S001-L8S-40A-40A-B V1.2
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1.产品简介(Product introduction)

●JBD-HP08S001 是专门针对 8 串锂电池包而设计的硬件保护板方案。保护参数由元器件参数固定。

●JBD-HP08S001 is a hardware protection BMS scheme specially designed for 8 strings of lithium battery packs. The protection parameters are fixed by the component parameters.

2.功能配置(Configuration)

功能(Function)	配置(Configuration)	功能(Function)	配置(Configuration)
支持串数 (Number of strings supported)	8S	外置温控 (External temperature switch)	选配 (Optional)
持续电流 (Continuous current)	≤40A	内置温控 (Built-in temperature switch)	不支持 (Not supported)
外置 NTC External NTC	None	加热膜功能 (Heating function)	不支持 (Not supported)
均衡功能 (Cell balance)	被动均衡 (Passive balance)	掉线保护功能 (Divided condutor protection)	不支持 (Not supported)
加热膜功能 (Heating)	不支持 (Not supported)	0V 充电功能 (Zero-volve charging)	不支持 (Not supported)
开关功能 (Switch)	不支持 (Not supported)	禁止低压充电功能 (Charging prohibition in UVP)	不支持 (Not supported)
充电限流功能 (Charging current limit)	不支持 (Not supported)	电池组串联 (Battery packs in series)	不支持 (Not supported)
二次保护功能 (Secondary protection)	不支持 (Not supported)	电池组并联 (Battery packs in parallel)	不支持 (Not supported)

3.参数设置(Parameter Setting)

3.1.基本参数(Basic parameter)

(Cell specifications)	8 strings of $LiFePO_4$ battery
(Interface type)	Charge and discharge are both at the same port
(Charging voltage)	3.6V * Number of strings
(Cell voltage range)	2.1~3.75V
(Continuous charging current)	≤40A
(Continuous discharging current)	≤40A
(Consumption of running)	≤100uA
(Consumption of sleep)	
(Sleep conditions)	-
(Circuit resistance)	≤10mR
(Operating temperature)	-20℃~75℃
保护板结构尺寸(Structure size of PCB)	
尺寸(size)	110±1mm * 55±1mm * 8±2mm (Length*Width*Height)

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

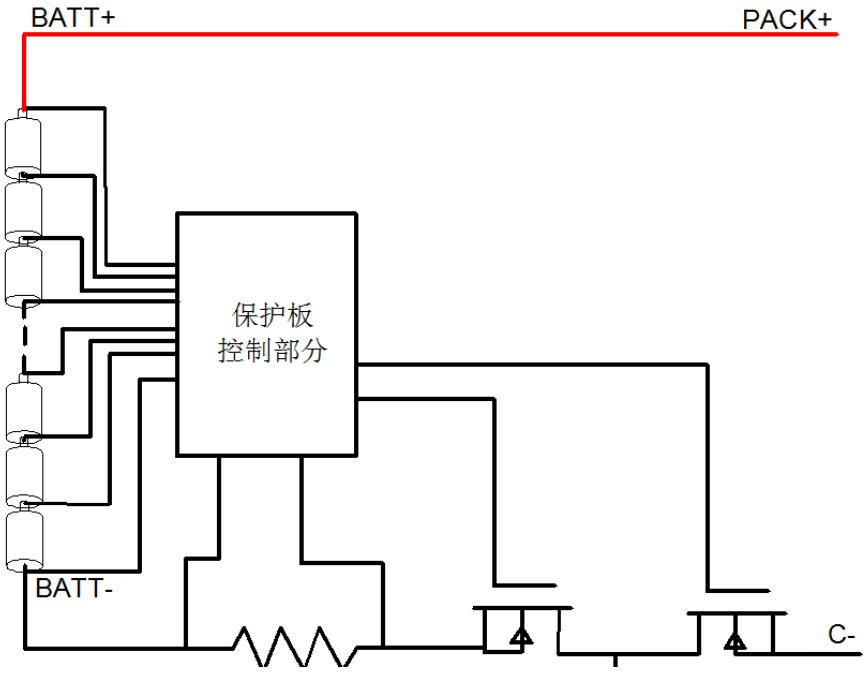


Figure of schematics

3.2.保护参数(Protection parameter)

		项目(Project)	规格(Specification)			单位(Unit)
			最小值 MIN	典型值 TYP	最大值 MAX	
过压和欠压保护 (Over-voltage and Under-voltage protection)		过充保护电压(Over-voltage)	3.700	3.750	3.800	V
		过充保护延时(Over-voltage delay)	500	1000	1500	mS
		过充保护释放(Over-voltage release)	3.550	3.600	3.650	V
		过放保护电压(Under-voltage)	2.000	2.100	2.200	V
		过放保护延时(Under-voltage delay)	150	300	450	mS
		过放保护释放(Under-voltage release)	2.000	2.100	2.200	V
		过放保护释放条件 (Under-voltage release conditions)	断开负载或充电恢复 (Recovery by disconnecting load or charging)			
		充电过流保护值 (Over-current Charge protection value)	-	-	-	A
		充电过流延时 (Over-current Charge delay)	-	-	-	mS
		充电过流释放条件 (Over-current Charge release conditions)	断开充电器 (Recover by releasing charger)			
		一级放电过流保护值 (1th Over-current Discharge value)	-	-	-	A
		一级放电过流保护延迟 (1th Over-current Discharge delay)	-	-	-	mS
		二级放电过流保护电流值 (2th Over-current Discharge value)	-	-	-	A
		二级放电过流 2 保护延迟 (2th Over-current Discharge delay)	-	-	-	uS
		放电过流保护恢复条件 (Over-current Discharge release)	断开负载 (Recover by releasing load)			
短路保护 (Short Circuit Protection)		短路保护电流 (Short circuit protection current value)	-	-	-	A
		短路保护延迟时间 (Short circuit protection delay time)	80	100	200	uS
		短路保护恢复 (Short circuit protection recovery)	断开负载 (Recover by releasing load)			
		*短路说明：短路电流小于最小值或高于最大值可能会造成短路保护失效，短路电流超过**700A**，不保证有短路保护，也不建议做短路保护测试。 (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 **700A**, short-circuit protection is not guaranteed, and short-circuit protection testing is not recommended.)*				
内置温度保护 (Internal temperature protection)	FET	温度保护值 (High temperature protection value)	-	-	-	℃
		温度保护释放值 (Low temperature protection release value)	-	-	-	℃

	项目(Project)	规格(Specification)			单位(Unit)
		最小值 MIN	典型值 TYP	最大值 MAX	
均衡功能 (Balance Function)	均衡开启电压 (Balance function turn-on voltage)	3.550	3.600	3.650	V
	均衡电流 (Balance current)	30		35	mA
	均衡模式 (Balance model)	静态均衡 (Idle Balance)			
	均衡类型 (Balance type)	脉冲模式 (Pulsed model)			

注：测试需在温度 25±2℃，相对湿度 65±20% 的环境。

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

4.功能说明(Function Description)

4.1.过充保护和恢复(Overcharge protection and recovery)

当任意一节电芯电压高于单体过充电压设定值,并且持续时间达到单体过充延时,系统进入过充保护状态,关闭充电 MOS,不能对电池充电。

单体过充保护后，当所有单体电压降到单体过充恢复值以下时，解除过充保护状态。也可放电解除。

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.

4.2.过放保护和恢复(Over-discharge protection and recovery)

当最低节电压低于单体过放电压设定值，并且持续时间达到单体过放延时，系统进入过放保护状态，关闭放电 MOS，不能对电池放电。

发生单体过放保护后，对电池组充电可以解除过放保护状态。

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.

4.3.均衡功能(Balance function)

管理系统采用电阻旁路的方式进行电芯均衡, 充电过程中电池组最高节单体电芯电压达到设定的均衡启动电压值，且电池组单体电芯最低电压与最高电压压差大于设定值时，达到条件的电芯均衡功能开启，相邻的两路均衡不能同时开启。

当电芯压差小于设定值或者电芯电压小于均衡开启电压时均衡停止。

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.

5.主要物料(Main material)

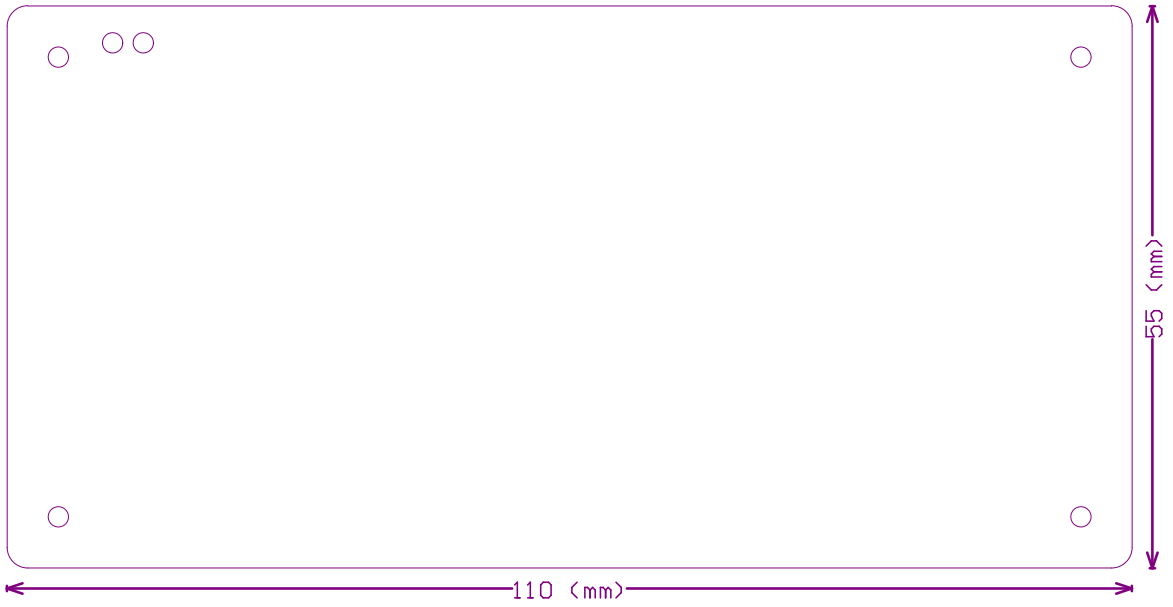
序号 (Number)	物料名称 (Name of Material)	生产厂家 (Manufacturer)	数量 (Quantity)
1	IC\QFP\R5478N368CK\SOT23-6	Ricoh(理光)	8PCS
2	IC\QFP\HY2212-BB3A\SOT23-6	Hycon(宏康)	8PCS
3	MOS\		PCS
配件(Accessories)			
1	Power wire\9PIN\HY2.0\24AWG\400mm\RedWhiteBlack	---	1PCS
2	Screw\M2*5mm	---	4PCS

注：以上物料可能用同等规格参数或者更好的规格参数的物料替代，如有认证需求不允许更换物料，需要通知我司业务重新送样，受控规格书，最终解释权归嘉佰达所有。

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.示意图及尺寸(Schematic and Dimensions)

6.1.尺寸及安装点标注图(Dimensions and installation point drawing)

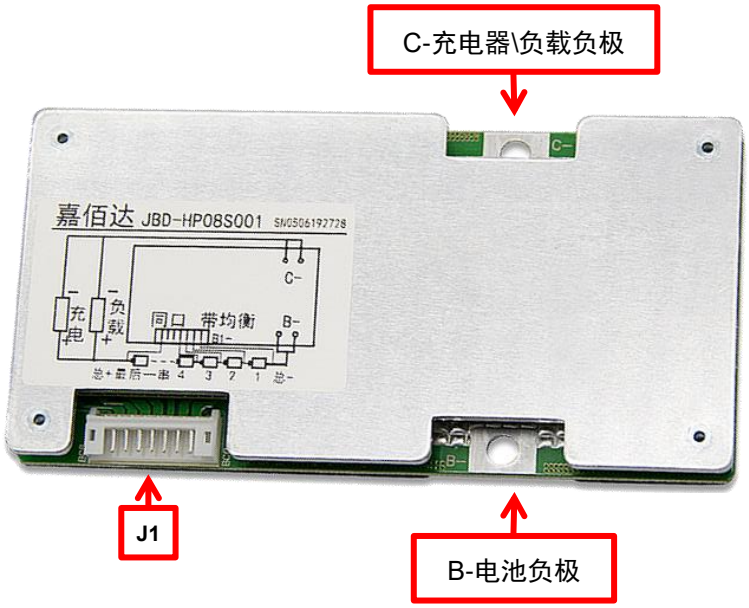


Structure size

7.信号口定义(Definition of signal port)

7.1.示意图标注接口标号(Illustration annotation)

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



标号 (Label)	位号 (Tag number)	接插件功能 (Connector)	接插件示意图 (Schematic diagram)	PIN	PIN 功能定义 (Pin function definition)	备注 (Note)
1	J1 (HY2.0-9P) (带卡扣)	电压检测插座 (Voltage detection)		1	接最低节电芯负极 Connect to Negative Side of Cell 1	B-
				2	接第 1 节电芯正极 Connect to Positive Side of Cell 1	
				3	接第 2 节电芯正极 Connect to Positive Side of Cell 2	
				4	接第 3 节电芯正极 Connect to Positive Side of Cell 3	
				5	接第 4 节电芯正极 Connect to Positive Side of Cell 4	
				6	接第 5 节电芯正极 Connect to Positive Side of Cell 5	
				7	接第 6 节电芯正极 Connect to Positive Side of Cell 6	
				8	接第 7 节电芯正极 Connect to Positive Side of Cell 7	
				9	接第 8 节电芯正极 Connect to Positive Side of Cell 8	B+
B-		Negative of battery cell 1				
C-		Negative of Charger\load				

8.环境适用性(Environmental suitability)

8.1.工作环境(The environment of working)

●BMS 保护板允许在下列条件下正常工作:
●环境温度：-20℃ ~ 75℃;
●相对湿度：5% ~ 90%;
●大气压力：86kPa~106 kPa;

●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.存储环境(The environment of storage)

●BMS 保护板应存储在环境温度为-5° C~+40° C、相对湿度不大于 70%、清洁通风良好的库房 内，空气中不得含有腐蚀性气体及影响电气绝缘的介质，不得受任何机械冲击或重压。不受阳光直射，与热源(暖气设备等)之间的距离不得少于 2m。在以上存储条件下，BMS 保护板可存放一年。

●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.包装运输(Packing and shipping)

9.1.标志(Logo)

BMS 保护板应有下列清晰耐久标志:

●产品名称、型号

●电芯型号

●出厂日期及编号

9.2.包装(Package)

●包装应符合防潮、防振动的要求，包装箱应牢固可靠，箱内应衬有防潮材料，产品在箱内不应窜动。

●外部纸箱包装箱，单板防静电袋加气泡袋包装;

●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.运输(transportation)

●在运输中，产品不得受剧烈机械冲撞、暴晒、雨淋、化学腐蚀性物品及有害气体侵蚀；在装卸过程中，产品轻搬轻放，严禁摔掷、重压。

●包装箱码放高度小于 5 层。

●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.注意事项(Precautions)

1.本电池管理系统常规是不能串联使用的，需要定制版本才支持串联使用。

2.本管理系统的短路保护功能适用于多种应用情景，但并不能保证可以在任意条件下短路。当电池包和短路回路的内阻值总和低于 40mΩ、电池组容量超出额定值 20%、短路电流超过 700A、短路回路的电感非常大或者短路的导线总长度非常长时，请自行测试确定是否可以使用本管理系统。

3.焊接电池引线时，一定不可有错接或反接。如果确实已接错，这块电路板可能已损坏，需要重新测试合格后才可使用。

4.装配时管理系统不要直接接触到电芯表面，以免损坏电路板。装配要牢固可靠。

5.使用中注意引线头、烙铁、焊锡等不要碰到电路板上的元器件，否则有可能损坏本电路板。焊接本电路板请不要使用膏状助焊剂，否则有可能导致本电路板工作不正常。

6.使用过程要注意防静电、防潮、防水等。

7.使用过程中请遵循设计参数及使用条件，不得超过本规格书中的值，否则有可能损坏管理系统。

8.将电池组和管理系统组合好以后，初次上电如发现无电压输出或充不进电，请检查接线是否正确。

9.本规格书中的参数、功能和外形仅供参考，请以保护板实物为准。

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

2.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 700A, 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.

3.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.

4.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.

5.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.

6.Please Pay attention to anti-static, moisture-proof, waterproof, etc.

7.Please follow the design parameters and conditions of use, and must not exceed the values in this specification, otherwise the management system may be damaged.

8.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.

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