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Specification Approval Sheet

产品规格确认书

产品名称(Product Name)	锂电池保护板		
型号规格(Model)	JH20P-FL200		
客户名称(Customer)			
变更记录(History of revisions)			
Edition	变更内容(Description)	Prepared By	Date
A0	First Edition		

批准(Approved By)	审核(Checkup)	制定(Make)

如果样品确认, 请回签此规格书. Please sign on the underneath and send it back to us if the sample is approved!	
客户确认 Client Confirmation	

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一、基本性能参数 (Ta = 25 °C)

1、用途:

本电路适用于24节串联磷酸铁锂离子电池块的过充电、过放电、过电流、短路的保护。

This BMS apply for 24S LFP lithium iron phosphate battery, with protection functions of overcharge, over discharge, over current, and short circuit.

2、电气特性: (Ta=25°C)

序号	测试项目 project		检验方法及设备 Method and Device	检测标准 standard			单位 unit
				最小值 min	典型值 type	最大值 Max	
1	过充保护 Over charge protection	过充电检测电压 OVP voltage	锂电保护板测试仪 BMS tester	3.60	3.65	3.70	V
		检测延迟时间 Detection delay time	锂电保护板测试仪 BMS tester	0.9	1	1.1	S
		释放条件 Release Condition	锂电保护板测试仪 BMS tester	3.5	3.55	3.6	V
2	过放保护 Over discharge protection	过放电检测电压 Over discharge detection voltage	锂电保护板测试仪 BMS tester	2.25	2.3	2.35	V
		过放电检测延迟时间 Over discharge detection delay time	锂电保护板测试仪 BMS tester	0.9	1	1.1	S
		释放条件 Release Condition	锂电保护板测试仪 BMS tester	2.55	2.6	2.65	V
3	放电过流保护 Over discharge current protect	过电流保护电流 1 Over current detection current 1	锂电保护板测试仪 BMS tester	540	600	660	A
		检测延迟时间 1 Detection delay time	锂电保护板测试仪 BMS tester	0.9	1	1.1	S
		过电流保护电流 2 Over current detection current 2	锂电保护板测试仪 BMS tester	1080	1200	1320	A
		检测延迟时间 1 Detection delay time	锂电保护板测试仪 BMS tester	80	100	120	mS
		释放条件 Release Condition	锂电保护板测试仪 BMS tester	卸下负载 Remove load			
4	充电过流保护	检测电流 Over Charge Current	锂电保护板测试仪 BMS tester	270	300	330	A

	Over Charge Current Protection	检测延迟时间 Detection delay time	锂电保护板测试仪 BMS tester	400	512	600	mS
		释放条件 Release Condition	锂电保护板测试仪 BMS tester	解除充电器 Remove charger			
5	短路保护 short circuit protection	检测延迟时间 Detection delay time	锂电保护板测试仪 BMS tester	150	/	300	uS
		释放条件 Release Condition	锂电保护板测试仪 BMS tester	卸下负载或充电恢复 Remove load or Charging recovery			
6	充电高温保护 Over Temperature protectionin charging	温度 Temperature	温度计 thermometer		55		°C
		释放条件 Release Condition			50		°C
7	充电低温保护 Low Temperature protection in charging	温度 temperature	温度计 thermometer		-8		°C
		释放条件 Release Condition			0		°C
8	放电高温保护 Over Temperature protection in discharging	温度 temperature	温度计 thermometer		66		°C
		释放条件 Release Condition			61		°C
9	放电低温保护 Over Temperature protection in discharging	温度 temperature	温度计 thermometer		-15		°C
		释放条件 Release Condition			-10		°C
10	内阻 resistor	主回路通态电阻 Main loop electrify resistance	锂电保护板测试仪 BMS tester	/	5	10	mΩ
11	均衡不开启时自耗 电流 Self-consuming current	正常工作时消耗电流 Current consumption during normal operation	锂电保护板测试仪 BMS tester	/	/	3	mA
12	静态电流 static current	休眠时消耗电流 Current consumption during sleep	锂电保护板测试仪 BMS tester		/	70	uA

13	充电电流 Charge current	持续工作电流 Continuous charging current	直流电源 DC power supply			200A	A
14	二次过充保护电压		锂电保护板测试仪 BMS tester		/		V
15	放电电流 Discharge current	持续放电电流 Continuous discharge current	电子负载 Electronic load			200A	A
16	最大充电电压		直流电源 DC power supply	87.6V			

3、均衡特性：（Ta=25℃）

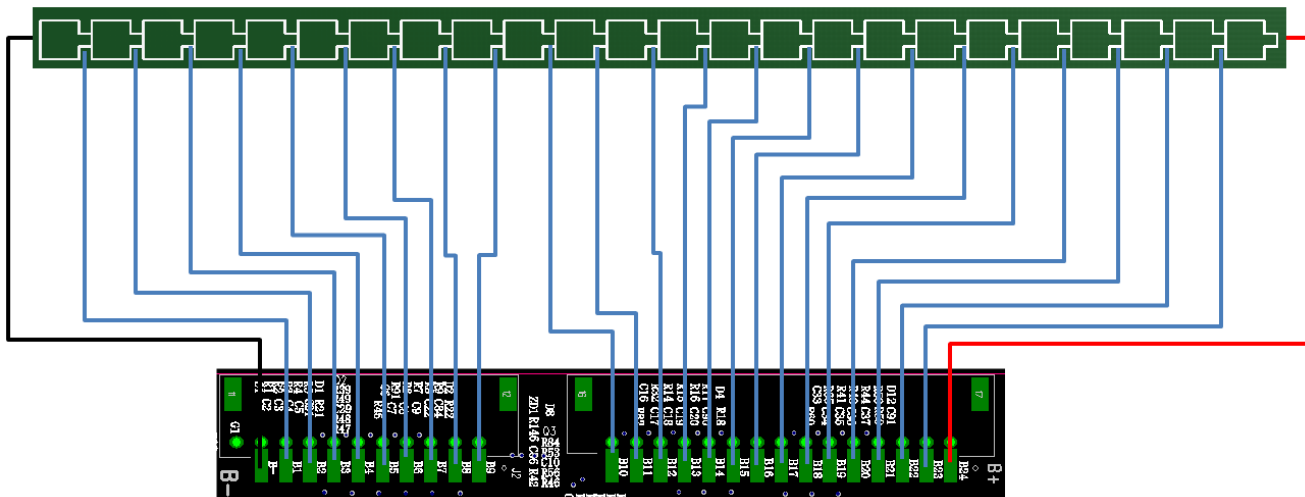
项目	详细内容	最小值	典型值	最大值	单位	备注
均衡起动条件 Balance start condition	单节电池间电压差大于 Voltage difference MAX		50	55	mV	
	充电	/	/	/	/	平均电池电压高于 2.4V 时开启均衡 Average Voltage up to 2.4V start balance
	放电	/	50	55	mV	平均电池电压高于 2.4V 时开启均衡 Average Voltage up to 2.4V start balance
均衡停止条件 Balance stop condition	平均电池电压小于 Average Voltage Less than	2.4	2.45	2.5	V	
	单节电池电压小于 Each cell Voltage Less than	2.3	2.35	2.4	V	
	均衡延时计时完成 Balance delay finish	/	0.5	1	H	可以设定, 0.5, 1, 2, 4 小时 Option 0.5/1/2/4H
均衡电流 Balance current	单节电流 Balance current	/	/	5	A	均衡电流和电池间电压差成正比 The balance current varies directly with the voltage difference for each cell
均衡精度 Tolerant	电池间电压差 Tolerant for each cell	/	/	10	mV	

二、电路板接线图 PCB Connection diagram

引出焊盘说明:

- 1、P+/B+、P-为充放电的正负端;P+/B+=Charge + /Discharge +;P-=charge-/Discharge-
- 2、B+、B-为电池的正负端; B+, B- are the positive and negative terminals of the battery cell;

产品接线图:



注意:

必须要先将采样线在电池端焊接好后, 确保线序正确, 再将接线端子B-到B+插到保护板, 否则保护板会损坏!

三、尺寸图 Dimension

1	长度 Length	192.6mm	5	层数 number of plies	2 层
2	宽度 Width	86.5mm	6	字符颜色 Character Color	白色
3	铜箔厚度 Copper foil thickness	20Z	7	阻焊油颜色 Resistance solder oil color	绿色
4	PCB 材质 material quality	FR4	8	PCB 板厚度	1.6mm

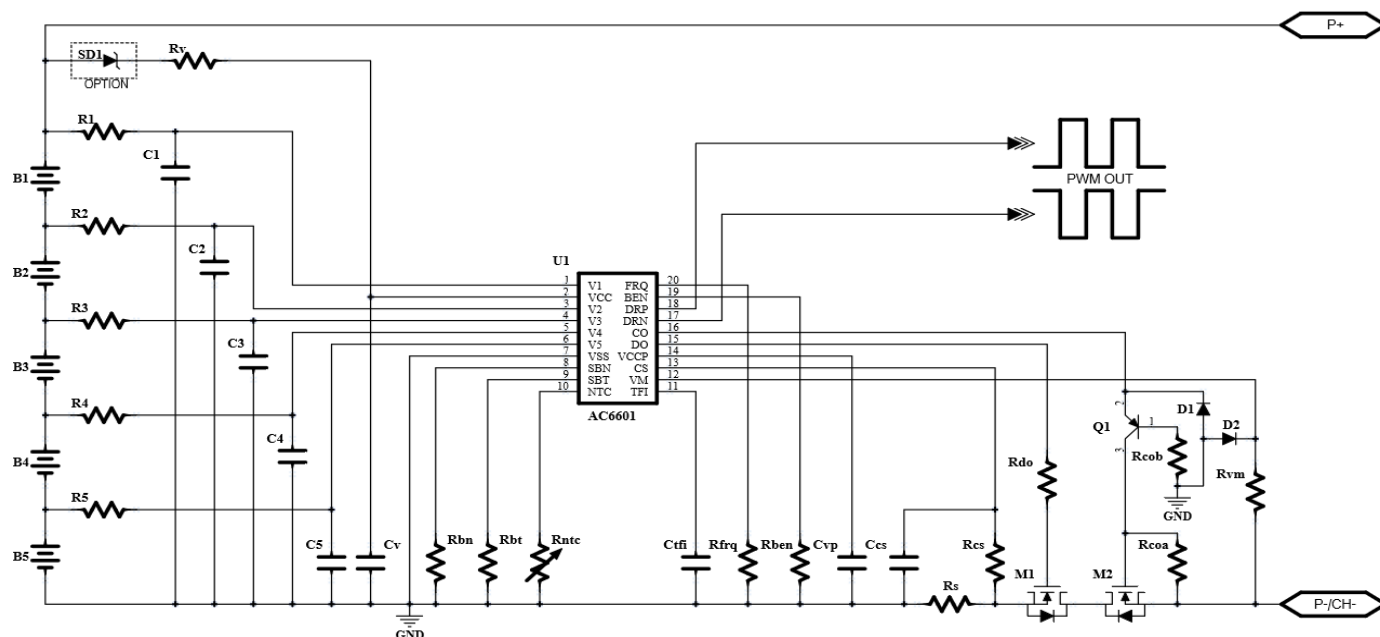
四、PCB LAYOUT

1. TOP LAYOUT (顶层线路)

2. BOTTOM LAYOUT (底层线路)

3. 顶层元器件位置 Top level components location

五、原理图



六、关键物料

NO.	P/N 物料编号	Part name 元件名称	Specification 元件规格	Pack type 封装式	Q' ty 数量	Maker/Remar k 厂商/备注
1		Battery protection IC	AC6611	TSSOP-28	1	猿芯半导体
2		Silicon MOSFET	60N03	PDFN3.3* 3.3-8L	50	APM
3		APM MOSFET	AP220N10	TOLL	28	
4		Resistance	R002/2512/1%/4W	2512	24	
5		PCB	PCB/192.6mm*86.5mm *1.6mm±0.15mm/ 绿油白字		1	JLC

七、包装 packaging

1. 运输过程中，应注意防潮、防湿，避免挤压、碰撞等，以免保护板变形。用快递或派专人送货为客户仓库。

During transportation, attention should be paid to moisture-proof, anti-moisture, squeezing, collision, etc. to avoid deformation of the protective plate.

Delivery to the customer's warehouse by courier or a special person.

八、安装方法 Installation method

1. 电芯连接顺序为:先接 B-,再按顺序从 B1 到 B+连接电芯电压检测线, 拆下时顺序相反。

The sequence of cell connection is: first connect B -, then connect the cell voltage detection line, and the sequence is reverse when removing

2. 电芯电压检测线使用标准的排线, B-, P-, 需要根据持续放电和充电电流的大小选择合适线径的导线。

The cell voltage detection line uses standard wires, B -, P -, and the wire with appropriate diameter should be selected according to the continuous discharge and charging current

3. 电池和保护板联接好后,测量 B+和 P-之间的电压,如果测测试的电压等于电池 组的总电压,说明保护板已正常工作。

After connecting the battery and the protection board, measure the voltage between B + and P -, if the measured voltage is equal to the total voltage of the battery pack, the protection board has been working normally.

4. 电池的正负极及每节电池的引线不能与外部安装盒短路

The positive and negative poles of the battery and the lead wires of each battery shall not be short circuited to the external mounting box.

九、警告及注意事项 Warning and Cautions

1. 请避免机械损伤保护板, 在规范内使用产品!

Please avoid mechanical damage Protection PCM!

2. 使用中的铅. 锡渣. 铁屑等请勿落入保护板, 否则可能损坏保护板!

Note that the use of lead.iron.tin slag.etc.Do not touch the circuit board.may damage the Circuit PCM!

3. 使用中有问题, 请联系我们!

If something goes wrong.please contact us!