一、规格说明（Specifications）：

1.使用范围： 此规格书仅适用于2串磷酸铁锂电池保护板：HXYP-2S-D20

This specification only applies to 2 lithium iron phosphate battery panels: HXYP-2S-D20

2 .产品功能： A.过充保护 B.过放保护 C.过流保护 D.短路保护

Product function: A. overcharge protection B. Overdischarge protection C. Overcurrent protection D. Short circuit protection

二、材料清单（List of Materials）：

组件名称 Component Name	规格说明 Specification	封装说明 Package	位置 position	用量 Dosage	品牌 brand
线路板 Circuit board	FR-4	46*20*1.2mm	PCB	1	嘉立创
集成电路 integrated	2122-AB1A	SOT-23-6	U1	1	宏康 HK
场效应管 ield effect tub	80N03	TO-252	Q1 Q2 Q3 Q4	4	- -
合金电阻 lloy resistanc	-	-	-	-	- -
热敏电阻 thermistor	-	-	-	-	- -
二极管 diode	-	-	-	-	-
	-	-	-	-	-
电容	104K	0603	C2 C3	2	国巨
	-	-	-	-	-
	-	-	-	-	-
电阻 resistance	330R	0603	R2 R3	2	国巨
	2K	0603	R1	1	国巨
	-	-	-	-	-
锰钢镍片 Nickel manganese	5*5*0.3MM		B+ B- BM	3	KXYC
	-	-	-	-	-

三、电气特性（Electrical characteristics）：

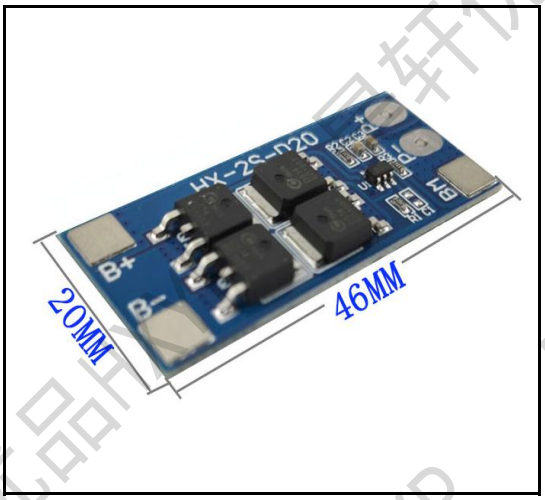
测试项目 Test items	参数 parameter	规格 specifications	单位 unit	备注 remarks
充电电压参数 Charging voltage parameter	充电电压 charging voltage	7.2	V	-
充电电流参数 Charging current parameter	持续充电电流 Continuous charging current	10	A	-
	上限充电电流 Maximum charging current	20	A	-
	持续放电电流	12	A	-

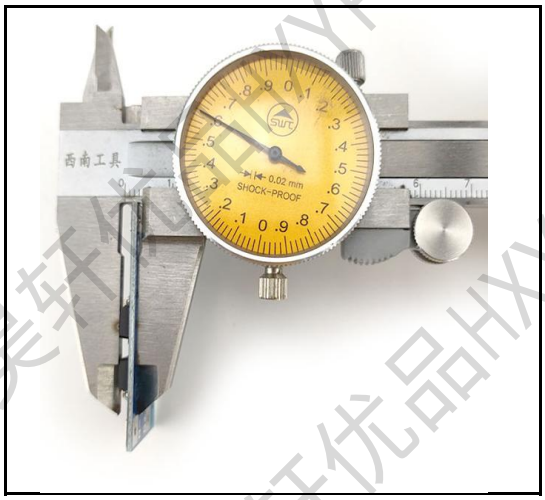
放电流参数 Discharge current parameter	Continuous discharge current	15	A	-
	瞬间放电电流 Instant discharge current	20	A	-
单电池过充参数 Single battery overcharge parameter	单电池过电压保护值 Single battery over voltage	3.65	V	-
	单电池过电压保护延迟值 Single battery over voltage	1	S	-
	单电池过电压保护恢复值 Single battery over voltage	3.45	V	-
单电池过放参数 Single battery overlay parameter	单电池过电压保护值 Single battery over voltage	2	V	-
	单电池过电压保护延迟值 Single battery over voltage	1	S	-
	单电池过电压保护恢复值 Single battery over voltage	2.5	V	-
均衡参数 Balance functions	电量均衡检测电压 Electric balance voltage	-	V	-
	电量均衡解除电压 Power balance devoltage	-	V	-
	均衡电流 Balance current	-	mA	-
短路保护 Short circuit protection	电池短路保护值 Battery short circuit protection	26	Ah	-
	电池短路保护延迟值 Battery short circuit protection	100	uS	-
	电池组短路保护恢复延迟值 Battery pack short circuit	1	S	-
	短路保护条件 Short circuit protection	-		禁止短路 No short
	短路保护解除条件 Short circuit protection release	-		断开负载 Disconnect
内阻 Internal resistance	主回路导通内阻 Main circuit lead internal	≦60	MΩ	-
静态功耗 Static power consumption	工作电流 Working current	≦40	uA	-
	睡眠电流（电流过放时） Sleep current(when the current	≦30	uA	-
	温度检测点 Temperature detection points	-		-
	温度获取误差 Temperature acquisition error	-	℃	-
	电池放电高温保护值 Battery discharge high temperature protection value	-	℃	-
	电池放电温度保护值延迟值 Battery discharge temperature protection value delay value	-	S	-

温度取样和保护功能 Temperature sampling and protection functions	电池放电高温保护恢复值 Battery discharge high temperature protection recovery value	-	℃	-
	电池放电低温保护值 Battery discharge low temperature protection value	-	℃	-
	电池放电低温保护值延迟值 Battery discharge low temperature protection value delay value	-	S	-
	电池放电低温保护恢复值 Battery discharge low temperature protection recovery value	-	℃	-
	电池充电高温保护值 Battery charge high temperature protection value	-	℃	-
	电池充电高温保护值延迟值 Battery charge high temperature protection value delay value	-	S	-
	电池充电高温保护恢复值 Battery charge high temperature protection recovery value	-	℃	-
	电池充电低温保护值 Battery charge low temperature protection value	-	℃	-
	电池充电低温保护值延迟值 Battery charge low temperature protection value delay value	-	S	-
	电池充电低温保护恢复值 Battery charge low temperature protection recovery value	-	℃	-
	温度保护 Temperature Protection	-	℃	-
结构尺寸 Structure Size	46*20*3.6mm			

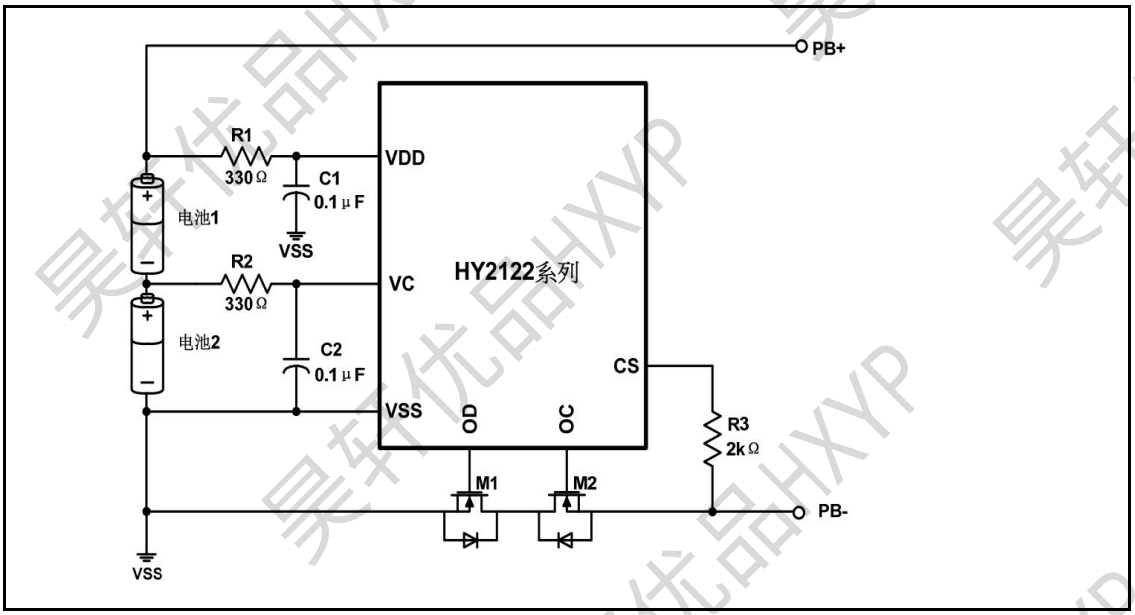
四、PCB板尺寸图(PCB board size diagram)：

长（long） 宽（wide） 高（high）



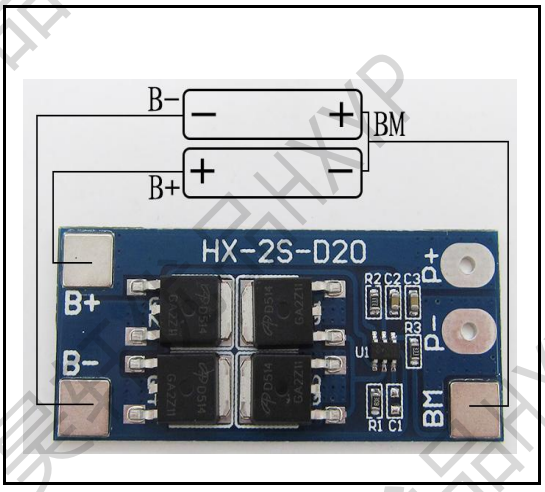


五、电路原理图（Circuit diagram）：



六、连线示意图及连接步骤（Linking diagram and connecting steps）：

接线图（connection diagram）



装配图(Assembly Diagram)

1、充电接线方式the charging connecting method：

充电器负极接P-；

P-connects to the cathode of the charging;

充电器正极接P+；

P+ connects to the Anode of the charging;

2、放电接线方式 the discharging connecting method：

负载负极接P-；

P- pads connects to the cathode of the loader;

负载正极接P+。

P+ connects to the anode of the charging.

3、电池接线方式 the Battery connecting method：

电池负极接B-；

Connect the negative electrode of the battery to B-;

电池正极接BM。

The positive electrode of the battery is connected to BM.

电池正极接B+。

The positive electrode of the battery is connected to B+.

4、注意事项notes：

将电池和本保护板组合好以后，初次上电时，如果发现无电压输出,请用专用充电器充电激活。若仍有异常，请与厂家联系。

After combining the battery and the protective plate, if there is no voltage output during the initial power supply, please use a special charger to charge and activate it.If there is still any abnormality, please contact the manufacturer.

七、使用和组装的注意事项 The notes of using and assembling

1、焊接电池引线时，一定要小心，不可接错或反接。如发觉接错后，这块电路板有可能已经损坏，需要经过重新测试合格后才可以再次使用。

Be careful and make sure not connect wrong or oppositely when weld the lead wire. It can be used after the re-test is ok because the PCBA may have been destroyed when the wrong connection.

2、装配时BMS不要直接接触到电芯表面，以免损坏电芯。装配要牢固可靠。

BMS do not touch the cell surface in order to prevent from destroying cell when you assembling. Make sure assembling stable and reliable.

3、使用中注意引线头、烙铁等不要碰到电路板上的元器件，否则有可能损坏本电路板。

Do not touch the components in the PCBA in order to prevent from destroying the board when use the wire, soldering iron.

4、使用过程要注意防静电，防潮和防水等。

Pay attention to the antistatic, damp proof, waterproof and so on.

5、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，否则有可能损坏本保护板。

Make sure the design parameters and working condition which are under the value in the specification, or else may destroy the PCBA.

八、环境物质要求 Environmental Requirements

本规格书内容符合欧盟RoHS指令要求，有害物质含量符合以下标准：

The specification subjects to the EU Directive about RoHS, and the hazardous substance conforms to the following standard.

有害物质 hazardous substance	基准 standard	
Cadmium and its compounds: 镉(Cd)及其化合物	<100PPM	
Lead and its compounds: 铅(Pb)及其化合物	<1000PPM	
Mercury and its compounds: 汞(Hg)及其化合物	<1000PPM	
Chromium(VI) and its compounds: 六价铬(Cr6+)及其化合物	<1000PPM(非电镀)	
	禁用(电镀) forbid plating	
Polybrominated biphenyls(PBBs): 多溴联苯	<1000PPM	
Polybrominated diphenylethers(PBDEs): 多溴二苯醚	<1000PPM	

说明：上表为欧盟指令的要求，如客户要求严于欧盟标准请以客户标准为依据。

Declaration: the above standard is the requirements of EU Directive, we will base on the customer’s requirements when it is stricter than the EU standard.

九、如果没有特别说明以下均为25℃环境下的参数

If the following parameters are not specified at 25 ° C

项目project	符号symbol	额定值Valuation	单位 unit
电池输入电压（BT+与BT-） Battery input voltage(BT + and BT-)	VBT	-0.3到+10	V
充电输入电压（P+与P-） Charge input voltage(P + and P-)	VCH	-0.3到+20	V
工作温度范围 Operating temperature range	TOP	-20到+65	℃
储存温度范围 Storage temperature range	TST	-20到+85	℃

十、重要声明 Important notes

1.本手册为昊轩优品科技有限公司及其关联公司(“公司”)的财产。本手册，包括本手册中描述的本公司的任何产品(“产品”)。均为本公司根据相关可适用法律或条约所拥有。本公司保留该等法律和条约下的所有权利，不授予其专利、版权、商标或其他知识产权下的任何许可。

This manual is the property of HAOXUANYOUPIN Technology Co. , Ltd. and its affiliated companies (“The company”) . This manual, including any of the company's products (“Products”) described in this manual. Are owned by the company in accordance with applicable laws or treaties. The company reserves all rights under such laws and treaties and does not grant any license under patents, copyrights, trademarks or other intellectual property rights.

2.本手册内的任何技术信息， 句括功能介绍和原理图， 不应理解为使用或执行任何知识产权的许可。本手册若引述相关第三方的名称和品牌(如有)等为其各自所有者的财产，仅供识别用途。

Any technical information contained in this manual, including functional descriptions and schematics, shall not be construed as a license to use or enforce any intellectual property. This manual shall be used for identification purposes only if the names and brands (if any) of the relevant third parties are cited as the property of their respective owners.

3.本公司不对本手册或任何产品作任何明示或暗示的保证，包括但不限于对适销性和适合特定用途的暗示保证。本公司不承担超出规格书或我司产品标准的保证范围使用本手册所诉而产生的任何责任。除适用协议中明确规定的定制产品外，产品仅为普通商业、工业、个人和/或家庭应用而设计、开发和制造。禁止用于军事、国防、核能、医疗以及可能导致人身伤害、死亡，或是环境破坏等领域。用户应采取任何和所有行动，确保按照适用的法律法规使用和销售产品。

We do not make any express or implied warranties for this manual or for any product, including but not limited to implied warranties of marketability and fitness for a particular purpose. We do not accept any liability arising from the use of this manual beyond the warranty of the specifications or our product standards. The products shall be designed, developed and manufactured for general commercial, industrial, personal and/or household applications only, except for those specifically specified in the applicable agreement. It is prohibited to be used in military, defense, nuclear energy, medical treatment, and other fields that may cause personal injury, death, or environmental damage. Users shall take any and all actions to ensure that products are used and sold in accordance with applicable laws and regulations.

4.半导体产品自身存在一定的失效概率。为防止因故障或误工作而产生的人身损害、火灾事故或其他社会性损害，请注意冗余设计、消防设计以及其他安全防护设计。特别说明:参考应用电路不保证能够适用于特定应用的量产。

There is a certain failure probability in semiconductor products. To prevent personal injury, fire accident or other social damage due to malfunction or misoperation, please pay attention to redundant design, fire protection design and other safety protection design. Note: the reference application circuit is not guaranteed to be suitable for a specific application of mass production.

6.若用户违反上述声明，本公司不承担全部或部分责任，用户应在此免除本公司及其供应商和/或分销商因产品的所有非预期用途有关的任何索赔、损害或其他责任；与此同时，用户应赔偿并确保本公司及其供应商和/或分销商免受因产品的任何非预期用途的使用而产生的与之相关的所有索赔、成本、损害赔偿和其他责任，包括人身伤害或死亡的索赔。

If the user violates the above declaration, the company shall not be held liable in whole or in part, the user shall hereby release the company and its suppliers and/or distributors from any claims, damages or other liability in respect of all unintended uses of the products; in the meantime, the user shall indemnify and ensure that the company and its suppliers and/or distributors are protected from all claims, costs, damages and other liabilities arising out of any unintended use of the product, include claims for personal injury or death.

7.本手册中的信息仅与产品有关。本公司保留随时对本手册及所述的产品和服务进行更改、修改或改进的权利，恕不另行通知。订购前建议用户咨询销售代表。

The information in this manual relates only to products. We reserve the right to change, modify or improve this manual and the products and services mentioned herein at any time without prior notice. Users are advised to consult the sales representative before ordering.

8.本公司对本手册拥有最终解释权。
The company shall have the final authority to interpret this manual.