V1.0

深圳智慧动锂电子股份有限公司

Shenzhen Intelligent Lithium Battery Electronic Co.,Ltd

产品技术规格书

Product technical specification

品名(Product Name)： BMS模组BMS Modules

产品型号(Model No.)： CN-BMS2F01L-16S-RC

产品编码(Product Code)：

www.szssyx.com

对以下供应商提供的该产品及资料我司经过测试验证，确认功能符合要求，达到量产标准，特予以确认！

The product and documents provided by the following supplier have been tested and verified by our company. The functions meet the requirements and meet the production standards.

客户签章/盖章：

Customer Approval

编制人 Compiler	销售 Sales	工程 PE	品质 QE	测试 TE	软件 Software	批准人 Approver

版本记录Version recard：

序号Version No.	修改记录Correction Record	日期Date
V1.0	第一版，初始版 First Version	2024/09/04

一、产品简介(Product Introduction)

智慧动锂CN-BMS2F01L是专门为8-16串家储系统设计的电池管理系统解决方案，可适用不同电化学特性的锂离子电芯，如三元锂（镍钴锰酸锂）、磷酸铁锂、磷酸锰铁锂、钠离子电池、超低温电芯等。电池管理系统采用模拟前端AFE+主控芯片MCU双重保护的方案，可以根据实际应用场景增加/修改控制策略，可以满足各种工况的实际应用需求。系统还可以选配蓝牙、4G、WIFI功能，实时查看电池健康状况、荷电量、充放电状态等信息。

CN-BMS2F01L is a battery management system solution specially designed for 8-16 series home storage system, which can be applied to lithium ion cells with different electrochemical characteristics, such as ternary lithium (lithium nickel-cobalt manganate), lithium iron phosphate, lithium iron manganese phosphate, sodium ion batteries, ultra-low temperature cells. The battery management system adopts the analog front-end AFE+ master chip MCU dual protection scheme, which can add/modify the control strategy according to the actual application scenario, and can meet the actual application needs of various working conditions. The system can also be equipped with Bluetooth, 4G, WIFI functions, real-time monitoring of battery health, carrying capacity charge/discharge status and other information.

二、功能配置(Functional Configuration)

功能(function)	配置(configuration)	功能(function)	配置(configuration)
支持串数 No.of strings supported	16S	充电限流功能 Charging voltage limit	标配 Support
支持持续电流 Continuous current	≤100A	预放功能 Pre-discharge	标配 Support
NTC数量 NTC number	环境温度*1 电池温度*5 Environment Temperature*1, battery temperature*5	电池组并联功能 Battery group parallel	标配 Support
均衡功能 Balance	标配(被动均衡) Passive balance	弱电开关功能 Weak power switch	标配 Support
CAN 通讯 CAN communication	选配 Optional	加热膜功能 Heating film	选配 Optional
RS485 通讯 RS485 communication	标配 Support	LED指示灯 LED light	标配 Support
RS232 通讯 RS232 communication	选配 Optional	LCD显示屏 LCD display	标配 Support
蜂鸣器 buzzer	标配 Support	NTC采集板 NTCacquisition board	选配 Optional

三、基本参数(Basic Parameter)

1. 使 用 范 围(Range of Application)

电池组结构：16串 100Ah 铁锂 方形铝壳

充电方式： CC-CV（恒流-恒压）

输出端子： P-

输入端子： B-，B-~B16+

通讯端口： RS485

Battery Packs structure: 16S 100Ah lithium-iron battery Square aluminum case

Charge Mode: CC-CV(constant voltage-constant current)

Output Socket: P-

Input Socket:B-，B-~B16+

Communication Socket: RS485

2. 额定最大值(除特殊注明外 Ta=25℃）Rated Value(Ta=25℃ unless specified)

项目 Item	内容 Content	最小值 Min	典型值 TYP	最大值 Max	单位 Unit	备注 Remark
1	单节电芯工作电压 single cell operation current	2.6		3.63	V	电路正常工作范围 regular operation range of circuit
2	工作温度 operation temperature	-20		+65	℃	正常工作温度范围 regular operation range of temperature
3	工作最大相对湿度 operation humidity			85%		无凝结 non-condensing
4	存储温度 storage temperature	-20		+60	℃	湿度低于90%无凝结 humidity under 90% no condensing
5	工作海拔高度 Operation altitude			4000	M	
6	PACK 充电电压 Ppack Charging current			58.08	V	CC-CV
7	PCB 尺寸 (BMS)dimension	100*300			mm	主板尺寸 Main board

四、功能与测试条件(Functions and testing conditions)

1. 测试条件(Testing conditions)

测试所用电池必须为生产时间不超过1周的新电池。除特别说明外，测试需在温度25±2℃，相对湿度 60+/-20% 的室内进行。

The batteries used for testing must be new batteries that have been in production for less than 1 week. Unless specified, the test should be performed indoors at a temperature of 25±2 ° C and a relative humidity of 60+/-20%.

2. 电气特性(Electrical Specification)

充电保护参数（时间单位：S） Charging Protection Parameter (Unit Time: S)							
故障名称 Fault Name	等级 Level	阈值 threshold value	告警延时 Alarm Dealay	报警状态 Alarm Status	执行动作 Executive Action	解除条件 Release Condition	解除延时 Release Delay
单体过压 cell over voltage（V）	1	≥3.60	5	-	-	≤3.33	5
	2	≥3.65	3	-	-	≤3.34	5
	3	≥3.70	1	保护 Protecting	断开充电MOS disconnect the charging MOS	≤3.40	5
单体欠压 Cell under voltage（V）	1	-	-	-	-	-	-
	2	-	-	-	-	-	-
	3	≤1.70	1	保护 protecting	断开充电MOS disconnect the charging MOS	≥2.60	5
压差过大 excessive voltage difference（mV）	1	≥300	10	告警 alarm	蜂鸣器报警 buzzing	≤200	5
	2	≥400	5	告警 alarm	蜂鸣器报警 buzzing	≤300	5
	3	≥500	3	保护 Protecting	断开充电MOS disconnect the charging MOS	≤400	5
总压过高 total voltage overtension（V）	1	-	-	-	-	-	-
	2	-	-	-	-	-	-
	3	≥59.20	1	保护 Protecting	断开充电MOS disconnect the charging MOS	≤54.40	5
充电过流 over current（A）	1	-	-	-	-	-	-
	2	-	-	-	-	-	-
	3	-	-	-	-	-	-
充电高温 charging over heat（℃）	1	≥50	10	告警 alarm	蜂鸣器报警 buzzing	≤45	5
	2	≥55	5	告警 alarm	蜂鸣器报警 buzzing	≤50	5
	3	≥60	3	保护 Protecting	断开充电MOS disconnect the charging MOS	≤55	5
MOS高温 MOS over heat（℃）	1	-	-	-	-	-	-
	2	≥80	5	告警 alarm	蜂鸣器报警 buzzing	≤65	5
	3	≥85	3	保护 Protecting	断开充电MOS disconnect the charging MOS	≤65	5
充电低温 Charging low-heat	1	≤8	10	告警 alarm	蜂鸣器报警 buzzing	≥10	5

（℃）	2	≤3	5	告警 alarm	蜂鸣器报警 buzzing	≥5	5
	3	≤0	3	保护 Protecting	断开充电MOS disconnect the charging MOS	≥3	5
电压采集断线 voltage acquisition disconnected	3	-	10	保护 protecting	断开充电MOS disconnect the charging MOS	电压恢复 voltage recovery	5
温度采集断线 temperature acquisition disconnected	3	-	10	保护 protecting	断开充电MOS disconnect the charging MOS	温度恢复 temperature recovery	5

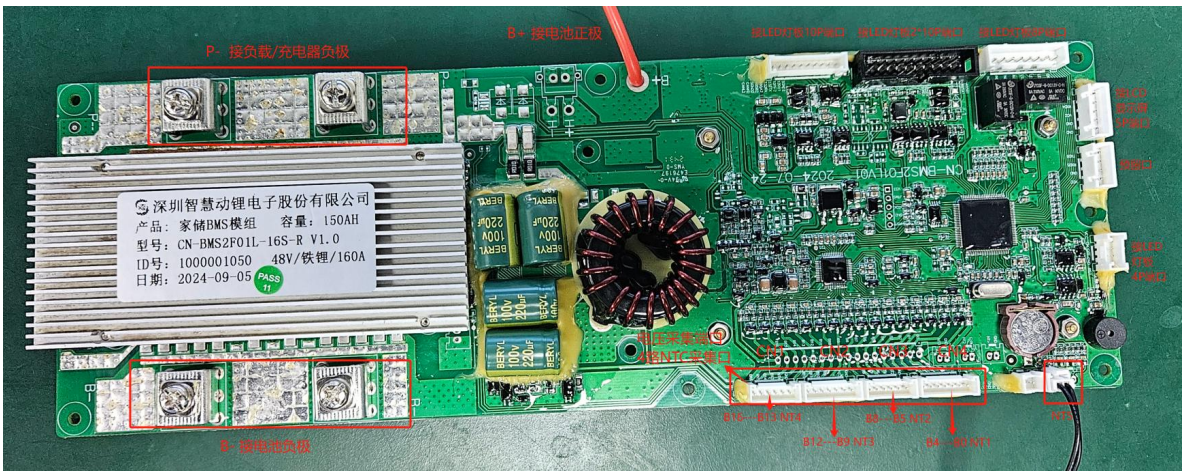
放电保护参数（时间单位：S）
Discharging Protecting Parameter (Unit Time: S)

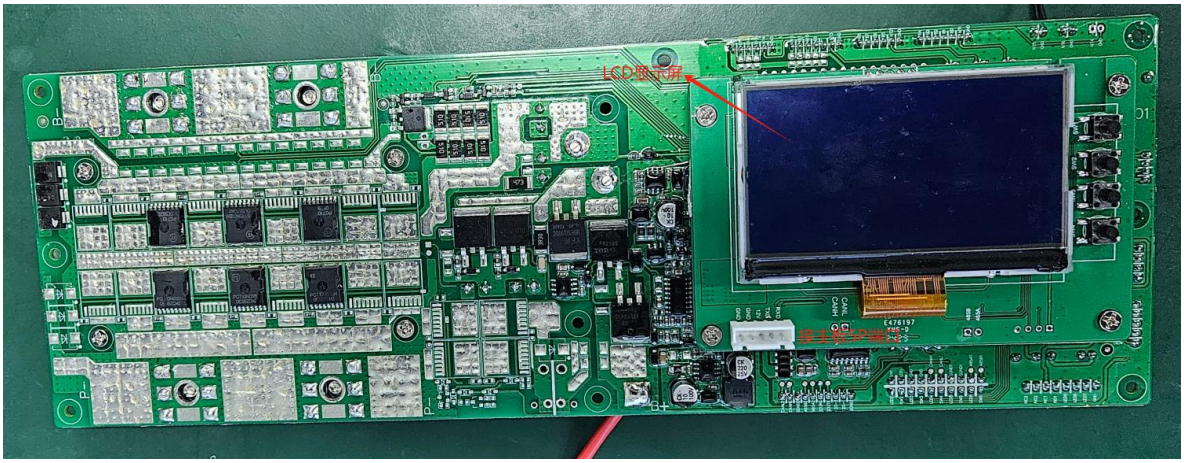
故障名称 Fault Name	等级 Level	阈值 Threshold value	告警延时 alarm delay	报警状态 alarm status	执行动作 executive action	解除条件 release condition	解除延时 release delay
单体欠压 cell under voltage（V）	1	≤2.8	10	告警 alarm	蜂鸣器报警 buzzing	≥3.0	5
	2	≤2.7	5	告警 alarm	蜂鸣器报警 buzzing	≥2.9	5
	3	≤2.6	3	保护 protecting	断开放电MOS disconnect the charging MOS	≥2.8	5
压差过大 excessive voltage difference（mV）	1	≥300	10	告警 alarm	蜂鸣器报警 buzzing	≤200	5
	2	≥400	5	告警 alarm	蜂鸣器报警 buzzing	≤300	5
	3	≥500	3	保护 protecting	断开放电MOS disconnect the charging MOS	≤400	5
总压过低 total voltage below level（V）	1	-	-	-	-	-	-
	2	-	-	-	-	-	-
	3	≤41.6	3	保护 protecting	断开放电MOS disconnect the charging MOS	≥44.8	5
放电过流 discharging over current（A）	-	-	-	-	-	-	-
	2	≥100	5	保护 protecting	断开放电MOS disconnect the charging MOS	自恢复3次锁定 locked after 3 times self-recovery	60
	3	≥120	1	保护 protecting	断开放电MOS disconnect the charging MOS	自恢复1次锁定 locked after 1 self-recovery	60
放电高温 discharge over heat（℃）	1	≥55	10	告警 alarm	蜂鸣器报警 buzzing	≤50	5
	2	≥60	5	告警 alarm	蜂鸣器报警 buzzing	≤55	5

	3	≥65	3	保护 protecting	断开放电MOS disconnect the charging MOS	≤60	5
MOS高温 MOS over heat（℃）	1	–	–	–	–	–	–
	2	≥80	5	告警 alarm	蜂鸣器报警 buzzing	≤65	5
	3	≥85	3	保护 protecting	断开放电MOS disconnect the charging MOS	≤65	5
放电低温 discharging low-heat（℃）	1	≤-10	10	告警 alarm	蜂鸣器报警 buzzing	≥-5	5
	2	≤-15	5	告警 alarm	蜂鸣器报警 buzzing	≥-10	5
	3	≤-20	3	保护 protecting	断开放电MOS disconnect the charging MOS	≥-15	5
SOC过低 SOC below level（%）	1	–	–	–	–	–	–
	2	≤20%	3	告警 alarm	蜂鸣器报警 buzzing	≥30%	5
	3	≤5%	3	告警 alarm	蜂鸣器报警 buzzing	≥8%	5
环境高温 environment over heat（℃）	1	–	–	–	–	–	–
	2	–	–	–	–	–	–
	3	–	–	–	–	–	–
电压采集断线 voltage acquisition disconnected	3	–	10	保护 protecting	断开放电MOS disconnect the charging MOS	电压恢复 voltage recovery	5
温度采集断线 voltage acquisition disconnected	3	–	10	保护 protecting	断开放电MOS disconnect the charging MOS	温度恢复 temperature recovery	5

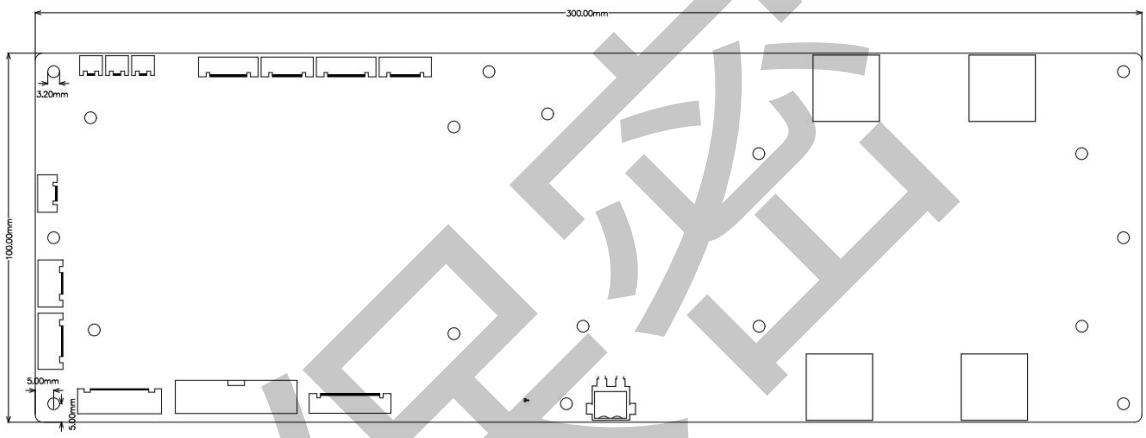
五、BMS板介绍(BMS Board Introduction)

(1) PCB-A实物图（此图片仅供参考，以实物为准This picture is for reference only, subject to the actual）





(2) BMS板尺寸图如下（Dimension Drawings）



(3) 接口说明（Interface Description）

序号 Item	位置 location	名称 Name	插座 Socket	配线型号 Cable Model	数量 QTY
1	CN1	采样线4 acquisition 4	HY2.0-6P	#1-900mm-6P-2.0 S-tin-16S-1.0	1
2	CN2	采样线3 acquisition 3	HY2.0-7P	#2-900mm-7P-2.0 S-tin-1.0	1
3	CN3	采样线2 acquisition 2	HY2.0-6P	#3-900mm-6P-2.0 S-tin-1.0	1
4	CN4	采样线1 acquisition 1	HY2.0-7P	#4-900mm-7P-2.0 S-tin-1.0	1
5	NTC401	外置NTC 6 external NTC 6	HY2.0-2P	10K（103AT B3435） ±1%,cable length 50cm（with HY2.0 socket）,26AWG	1

6	NTC403	预留口 reserved socketl	HY2.0-2P		1
7	B+	B+线	/	耐高温105° C，对插线，红色 14AWG,20CM heat-resistant 105 °C,red 14AWG 20cm	1
8	B- B1-	接B- connect to B-	KXB-503	不配接线 cable not provided	2
9	P-/C- P1-/C1-	接C- connect to C-	KXB-503	不配接线 cable not provided	2
10	J707	预加热接口 pre-heat socket	XT30PW-M	耐高温105° C，红黑线，14AWG，20CM heat-resistant 105 °C,black 14AWG length 20CM	预留口 reserved socketl
11	J706	弱电开关端口 weak power switch socket	HY2.0-4A	HY-4P双头，UL1007 22AWG线材，线长300mm（见尺寸图） HY-4P dual sockets,UL1007 22AWG,length 300mm（refer to the dimension drawing）	1
12	J705	转接板灯型号 interface board light model no.	XH2.54-8A	XH2.54-8P双头 UL1007 22AWG线材线长300mm（见尺寸图） XH2.54-8P dual sockets,UL1007 22AWG,length 300mm（refer to dimension drawing）	1
13	J703	预留口 reserved socket	XH2.54-4P	XH2.54-4P双头，UL1007 22AWG线材， 线长300mm（见尺寸图） XH2.54-4P dual sockets,UL1007 22AWG,length 300mm（refer to dimension）	1

14	J702	接显示屏端口 socket connects to display	XH2.54-5A	XH2.54-5P双头，UL1007 22AWG线材，线长300mm（见尺寸图） XH2.54-5P dual sockets,UL1007 22AWG,length 300mm（refer to dimension）	1
15	J708	转接板信号线 interface board signal cable	牛角座 DC3-2.54-20P	FC2.54mm灰排线，2*10P(20P)，线长30cm，同方向 FC2.54mm gray flat cable,2*10P(20P),length 30cm,same way	1
16	J700	转接板灯信号 interface board light	HY2.0-10P	HY-10P双头，UL1007 22AWG线材，线长 300mm（尺寸图） HY-10P dual sockets,UL1007 AWG,length 300mm（refer to dimension drawing）	1
17	P400	MCU调试端口 MCU debug socket	HDR1X4直插座子 HDR1X14 socket	不配接线 cable not provided	预留口 reserved socket

(4) 采集线说明（Acquisition Cable Description）

线长900mm，线径1.0mm，端子间距2.0mm，每束排线套上序号（CN4-1,CN3-2,CN2-3,CN1-4）

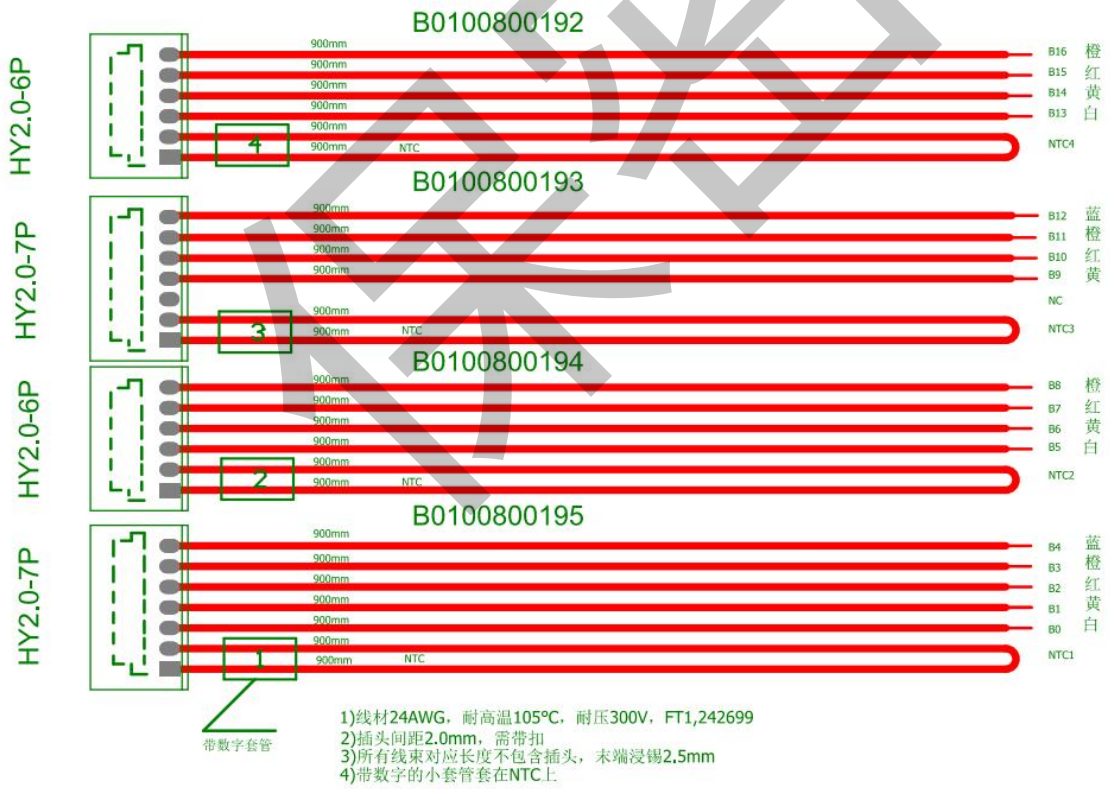
Length 900mm, diameter 1.0mm, sockets pitch 2.0mm, serial number on each bundle of cable sets (CN4-1,CN3-2,CN2-3,CN1-4).

(5) 采集端子定义（Definition of Acquisition Socket）

CN4	CN4-1	温度探头 NTC1	CN2	CN2-1	温度探头 NTC3
	CN4-2			CN2-2	
	CN4-3	B0接最低节电芯负级 B0 connect to the 1st cell-		CN2-3	NC(空)
	CN4-4	B1接第一串电芯正级 B1 connect to the 1st cell+		CN2-4	B9接第九串电芯正级 B9 connect to the 9th cell+
	CN4-5	B2接第二串电芯正级 B2 connect to the 2nd cell+		CN2-5	B10接第十串电芯正级 B10 connect to the 10th cell+
	CN4-6	B3接第三串电芯正级 B3 connect to the 3rd cell+		CN2-6	B11接第十一串电芯正级 B11 connect to the 11th cell+

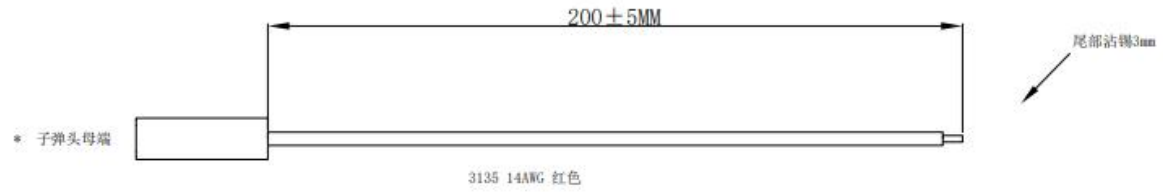
	CN4-7	B4接第四串电芯正级 B4 connect to the 4th cell+		CN2-7	B12接第十二串电芯正级 B12 connect to the 12th cell+
CN3	CN3-1	温度探头 NTC2	CN1	CN1-1	温度探头 NTC4
	CN3-2			CN1-2	
	CN3-3	B5接第五串电芯正级 B5 connect to the 5th cell+		CN1-3	B13接第十三串电芯正级 B13 connect to the 13th cell+
	CN3-4	B6接第六串电芯正级 B6 connect to the 6th cell+		CN1-4	B14接第十四串电芯正级 B14 connect to the 14th cell+
	CN3-5	B7接第七串电芯正级 B7 connect to the 7th cell+		CN1-5	B15接第十五串电芯正级 B15 connect to the 15th cell+
	CN3-6	B8接第八串电芯正级 B8 connect to the 8th cell+		CN1-6	B16接第十五串电芯正级 B16 connect to the 16th cell+

(6) 采集线尺寸图如下（Acquisition cable dimension drawing）：



(7) B+电源线（耐高温105° C，母头，红色，14AWG,20CM）

B+ power supply cable(heat-resistant 105℃, female, red, 14AWG, 20cm)



(8) 蜂鸣器动作说明（Buzzer Description）

故障时，每 1s 鸣叫 0.25s；

保护时，每 2s 鸣叫 0.25s（过压保护除外）；

告警时，每 3S 鸣叫 0.25s（过压告警除外）；

蜂鸣器功能可通过上位机使用或关闭，出厂默认为关闭。

Fault: buzzing 0.25s/1s;

Protecting:buzzing 0.25s/2s(except over voltage protecting);

Alarming:buzzing 0.25s/3s(except over voltage alarming);

Buzzer could be switched on and off by upper computer, factory default off.

(9) 休眠及唤醒（Sleep Mode and Wake up）

1. 休眠（Sleep Mode）

当满足以下任意一条件时，系统进入低功耗模式：

A.单体或总体过放保护30秒内仍未解除；

B.最低单体电压低于休眠电压，并且持续时间达到休眠延迟时间（同时满足无通信、无保护、无均衡、无电流）；

C.待机时间超过 1小时（无通信、无充放电，无市电）；

D.通过上位机软件强制关机；

进入休眠前，需确保输入端未接入充电设备，否则将无法进入低功耗模式。

When any of the following conditions are met, the system enters the low-power mode:

A. Single or total over discharging protection is not released within 30 seconds;

B. The minimum cell voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (no communication, no protection, no equalization, no current);

C. Standby time more than 1 hour (no communication, no charge and discharge, no mains);

D. Forced shutdown through the upper computer software;

Before sleeping, ensure that the input end is not connected to a charging device. Otherwise, the low-power mode cannot be entered.

2. 唤醒（Wake Up）

A. 电池发生单体电压或总压过放进入休眠模式，可通过充电激活（检测到有外部电压，且电压＞电池组电压）或人工复位，可唤醒 BMS 进入工作状态。

B. 因电芯失效保护、压差保护进入休眠状态时，禁止充电激活，可人工复位激活，激活时充放电 MOS 仍断开；

C. 其他状态时，电池组应可以充电激活、通信激活及人工复位激活。

A. The battery enters sleep mode when the cell voltage or total voltage over discharge occurs, which can be activated by charging (external voltage is detected, and electricity voltage > battery voltage) or manual reset to wake up the BMS.

B. When the battery cell failure protection or voltage difference protection enters the sleep-mode, it is prohibited to activate by charging, and can be manually activated by resetting; the charge and discharge MOS is still disconnected while activated;

C. In other modes, the battery packs could be activated by charging, communication activation and manual resetting.

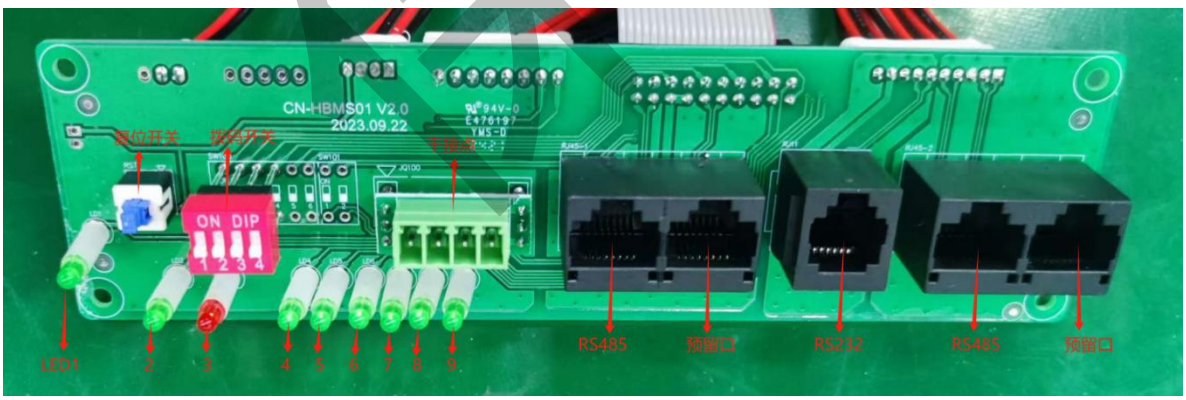
（10） 限流说明（Current Limit Description）

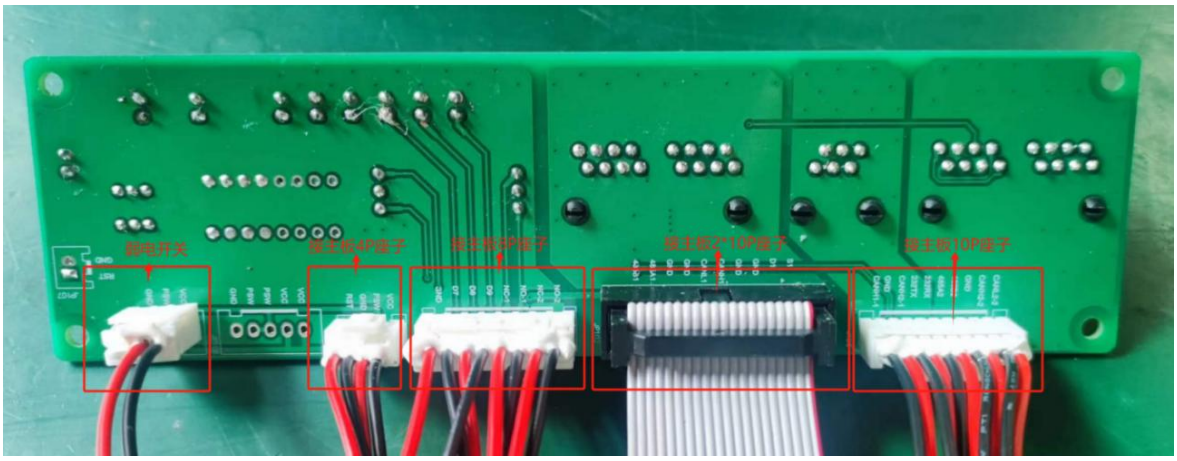
当充电电流大于22A时限流板开始工作，限制充电电流10A。

When the charging current is greater than 22A, the current limit board starts to work, and the charging current is limited to 10A.

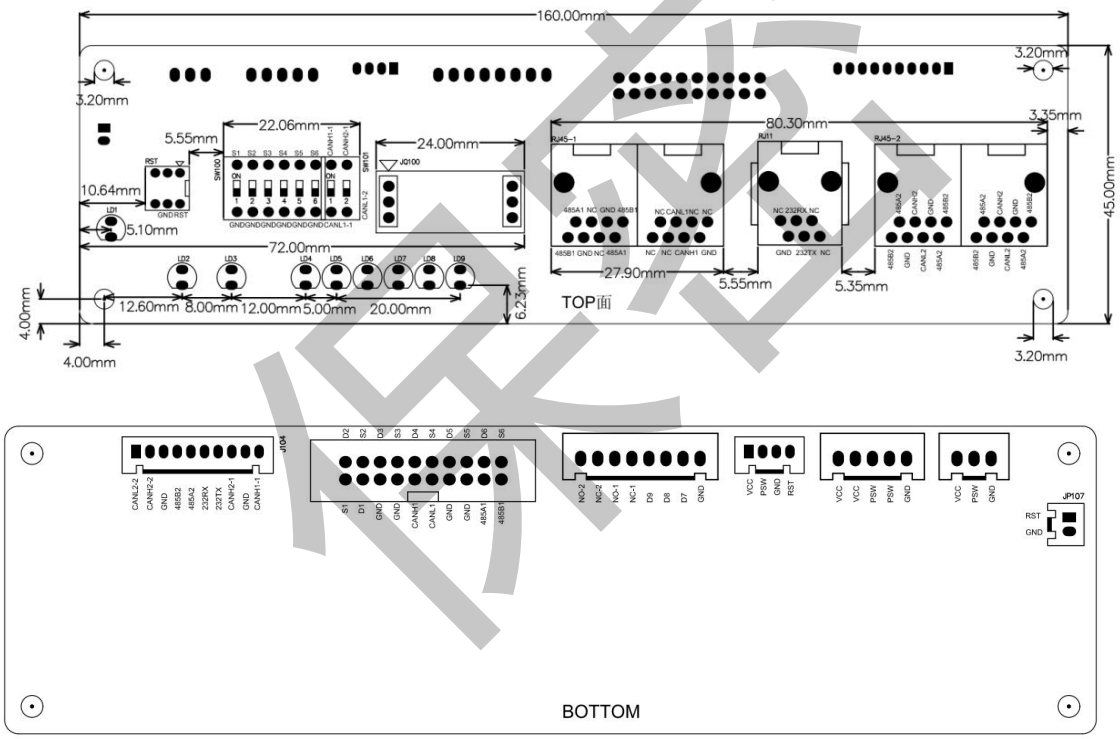
六、LED指示灯介绍（Indication Light Description）

（1）实物图（此图片仅供参考，以实物为准This picture is for reference only, subject to the actual）

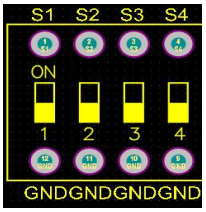




(2) 尺寸图及接口说明（Dimension and Interface Description）



(3) 拨码开关（DIP Switch）



当PACK 作并联使用时，可通过BMS 上的拨码开关设置地址区分不同的PACK，需避免地址设为相同，BMS 拨码开关的定义参照下表

When packs are used in parallel, you can use the DIP switch on the BMS to set addresses to distinguish different packs. Do not set the same addresses. For the definition of the DIP switch on the BMS, see the following table:

Address	拔码开关位置 DIP switch				说明 Description
	1#	2#	3#	4#	
0	OFF	OFF	OFF	OFF	单机用485通讯时选“ MASTER(0000)”，choose“ MASTER(0000)”when single pack operation with 485 communication
1	ON	OFF	OFF	OFF	并机通讯时地址“SLAVE1(0001)”是主机，2-15是从机 “SLAVE1(0001)”is the host and 2-15 are the slaves while parallel communication
2	OFF	ON	OFF	OFF	从机1 通讯时选“SLAVE2(0010)”
3	ON	ON	OFF	OFF	从机2 通讯时选“SLAVE3(0011)”
4	OFF	OFF	ON	OFF	从机3 通讯时选“SLAVE4(0100)”
5	ON	OFF	ON	OFF	从机4 通讯时选“SLAVE5(0101)”
6	OFF	ON	ON	OFF	从机5 通讯时选“SLAVE6(0110)”
7	ON	ON	ON	OFF	从机6 通讯时选“SLAVE7(0111)”
8	OFF	OFF	OFF	ON	从机7 通讯时选“SLAVE8(1000)”
9	ON	OFF	OFF	ON	从机8 通讯时选“SLAVE9(1001)”
10	OFF	ON	OFF	ON	从机9 通讯时选“SLAVE10(1010)”
11	ON	ON	OFF	ON	从机10 通讯时选“SLAVE11(1011)”
12	OFF	OFF	ON	ON	从机11 通讯时选“SLAVE12(1100)”
13	ON	OFF	ON	ON	从机12 通讯时选“SLAVE13(1101)”
14	OFF	ON	ON	ON	从机13 通讯时选“SLAVE14(1110)”
15	ON	ON	ON	ON	从机14 通讯时选“SLAVE15(1111)”

(4) LED指示说明（LED Lights Description）

电池状态 Battery Status	开机/关机 Power on/off	运行 Running	故障 Fault	电量指示 Electrical Capacity Indication					
	D1	D2	D3	D4	D5	D6	D7	D8	D9
关机 power off	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off

待机 stand by	正常 normal	常亮 steady on	闪 flashing	灭 off	SOC 小于 17% 亮 1 颗；17%-33% 亮 2 颗；33%-50% 亮 3 颗；50%-67% 亮 4 颗；67%-84% 亮 5 颗；大于 84% 亮 6 颗；SOC<17% 1 light on; 17-33% 2 lights on; 33-50% 3 lights on; 50-67% 4 lights on; 67-84% 5 lights on; SOC>84% 6 lights on.					
	告警 alarming	常亮 steady on	灭 off	闪 flashing						
	保护 protecting	常亮 steady on	灭 off	常亮 steady on	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off
充电 charging	正常 normal	常亮 steady on	闪 flashing	灭 off	SOC 小于 17% 闪烁 1 颗；17%-33% 亮 1 颗，闪烁 1 颗；33%-50 亮 2 颗，闪烁 1 颗；50%-67% 亮 3 颗，闪烁 1 颗；67-84 亮 4 颗，闪烁 1 颗；大于 84% 亮 5 颗，闪烁 1 颗 SOC<17% 1 light flashing;17-33% 1 light on 1 light flashing; 33-50% 2 lights on 1 light flashing;50-67% 3 lights on 1 light flashing;67-84% 4 lights on 1 light flashing; SOC>84% 5 lights on 1 light flashing					
	告警 alarming	常亮 steady on	常亮 steady on	闪 flashing						
	保护 protecting	常亮 steady on	灭 off	常亮 steady on	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off
放电 discharging	正常 normal	常亮 steady on	常亮 steady on	灭 off	SOC 小于 17% 亮 1 颗；17%-33% 亮 2 颗；33%-50% 亮 3 颗；50%-67% 亮 4 颗；67%-84% 亮 5 颗；大于 84% 亮 6 颗；SOC<17% 1 light on; 17-33% 2 lights on; 33-50% 3 lights on; 50-67% 4 lights on; 67-84% 5 lights on; SOC>84% 6 lights on					
	告警 alarming	常亮 steady on	常亮 steady on	闪 flashing						
	保护 protecting	常亮 steady on	灭 off	常亮 steady on	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off

(5) 通信说明（Communication Description）

1. RS232通信（RS232 Communication）--预留口reserved socket

BMS可以通过RS232通信查看PACK的信息或修改保护参数，默认波特率为 9600bps。

The BMS can view PACK information or modify protection parameters through RS232 communication, and the default baud rate is 9600bps。

	引脚Pin	定义说明Description
RS232--采用6P6C立式RJ11插座 RS232-6P6C vertical RJ11 socket	1、5、6	NC
	2	GND
	3	RX
	4	TX

2. RS485/CAN通信--预留口（RS485/CAN Communication--reserved socket）

BMS可以通过485通信查看PACK的信息或修改保护参数，从而在上位机端监控电池的各种信息，包括电池电压、电流、温度、状态、SOC、SOH 及电池生产信息等默认波特率为9600bps。

BMS可以通过CAN通信查看PACK的信息或修改保护参数，默认波特率为500K。

The BMS can view PACK information or modify protection parameters through 485 communication, so as to

monitor various information of the battery on the upper computer, including battery voltage, current, temperature, status, SOC, SOH, and battery production information. The default baud rate is 9600bps.

The BMS CAN view PACK information or modify protection parameters through CAN communication. The default baud rate is 500K.

	引脚Pin	定义说明Description
RS485--采用8P8C立式RJ45插座（位号：RJ45-1） RS485-8P8C vertical RJ45 socket(bit number:RJ45-1)	1、8	485B1
	2、7	485A1
	3、6	GND
	4、5	NC
CAN（预留口）-采用8P8C立式RJ45插座（位号：RJ45-1） CAN（reserved socket）- 8P8C vertical RJ45 socket(bit number:RJ45-1)	9、10、11、14、16	NC
	12	CANL1）
	13	CANL1
	15	GND

3. 并联通讯口：RS485/CAN--预留口（Parallel Communication：RS485/CAN--reserved socket）

BMS可以通过485通信查看PACK的信息或修改保护参数，从而在上位机端监控电池的各种信息，包括电池电压、电流、温度、状态、SOC、SOH 及电池生产信息等默认波特率为9600bps。

BMS可以通过CAN通信查看PACK的信息或修改保护参数，默认波特率为500K。

BMS can view PACK information or modify protection parameters through 485 communication, so as to monitor various information of the battery on the upper computer, including battery voltage, current, temperature, status, SOC, SOH, and battery production information. The default baud rate is 9600bps.

The BMS CAN view PACK information or modify protection parameters through CAN communication. The default baud rate is 500K.

	引脚 Pin	定义说明 Description
并联通信RS485/CAN（预留口）--采用8P8C立式RJ45插座（位号：RJ45-2） parallel communication RS485/CAN（reserved socket）--8P8C vertical RJ45 socket(bit number:RJ45-2)	1、8、9、16	485B2
	2、7、10、15	485A2
	3、6、11、14	GND
	4、12	CANL2
	5、13	CANL2

(6) 弱电开关按键（Weak Power Switch）

OFF：弱电开关休眠（sleep mode）

ON：弱电开关唤醒（wake up）

(7) 复位按键说明（Reset Button Description）

BMS处于休眠状态时，按下按键（3~6S）后松开，BMS被激活。

BMS处于激活状态时，按下按键（3~6S）后松开，BMS被休眠。

BMS处于激活状态时，按下按键（6~10S）后松开，BMS被复位。

BMS被复位后仍保留通过上位机设置的参数和功能，如果需要恢复到初始参数可以通过上位机的“恢复默认值”来实现，但相关运行记录和存储数据保持不变（如电量、循环次数、保护记录等）。

When the BMS is in the sleep-mode, press the button for 3 to 6S and release it to activate the BMS.

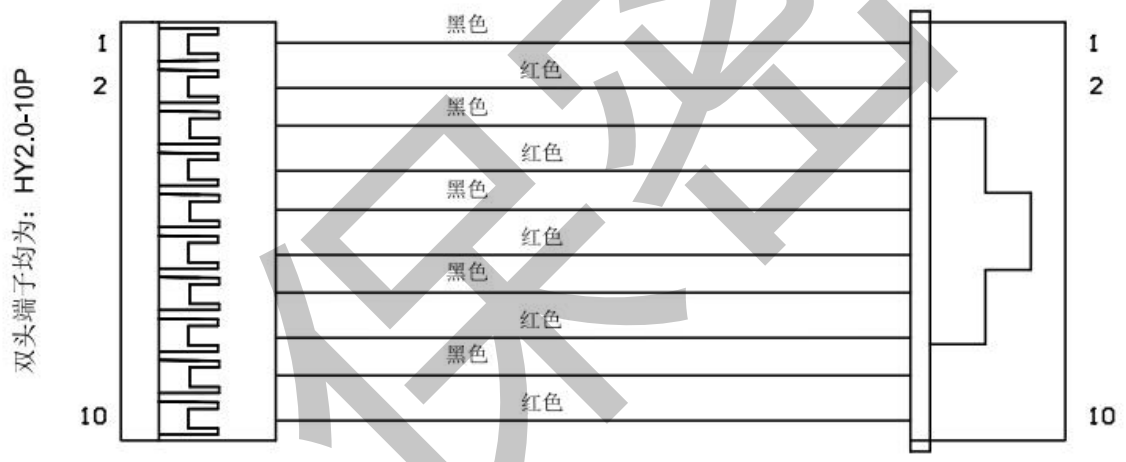
When the BMS is active, press the button for 3 to 6S and release it. The BMS sleeps.

When the BMS is in the active state, press the button (6-10s) and release it, and the BMS is reset.

After the BMS is reset, the parameters and functions set by the upper computer are still retained. If the initial parameters need to be restored, they can be achieved by "restoring default values" of the upper computer, but the relevant running records and stored data remain unchanged (such as power consumption, cycle times, protection records, etc.).

(8) 线材尺寸图（Cable Dimension）

a. HY2.0-10P 连接线尺寸图如下（HY2.0-10P cable dimension as below）：

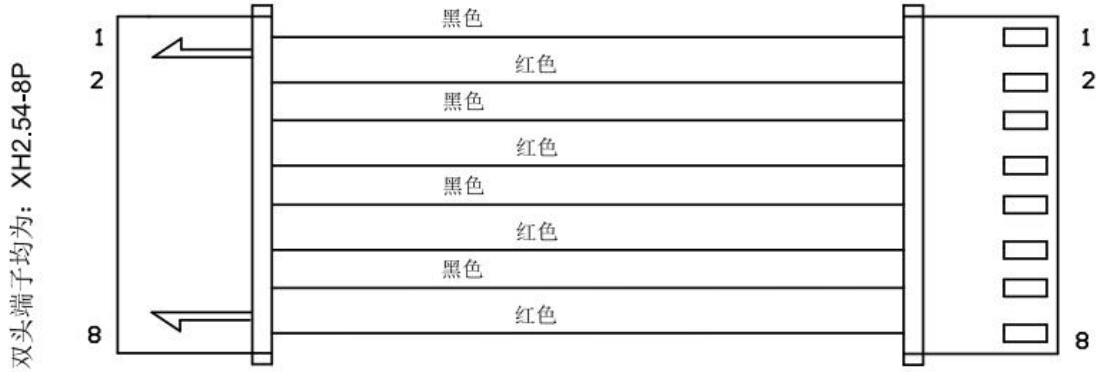


1）所有线束对应的线长不包含插头,双头端子均为：HY2.0-10P

2)线材UL-1007-22AWG电子线（17*0.16TC），线长300mm

3）端子处需要打胶固定

b. XH2.54-8P 连接线尺寸图如下 （XH2.54-8P cable dimension as below）：



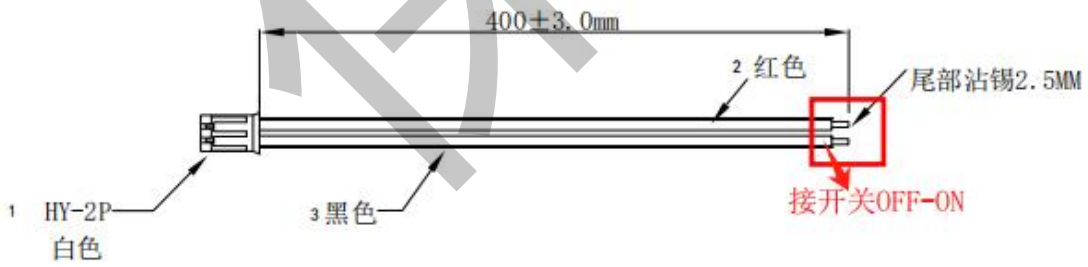
1）所有线束对应的线长不包含插头,双头端子均为：XH2.54-8P

2)线材UL-1007-22AWG电子线（17*0.16TC），线长300mm

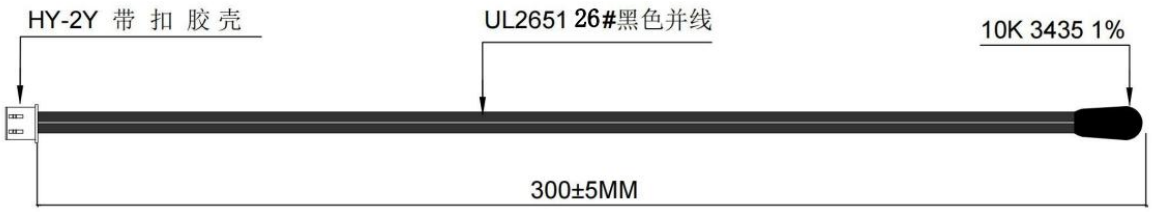
3）端子处需要打胶固定

c. HY2.0-4P 连接线尺寸图如下（HY2.0-4P cable dimension as below）：

d. HY2.0-2P 连接线尺寸图如下（HY2.0-2P cable dimension as below）：



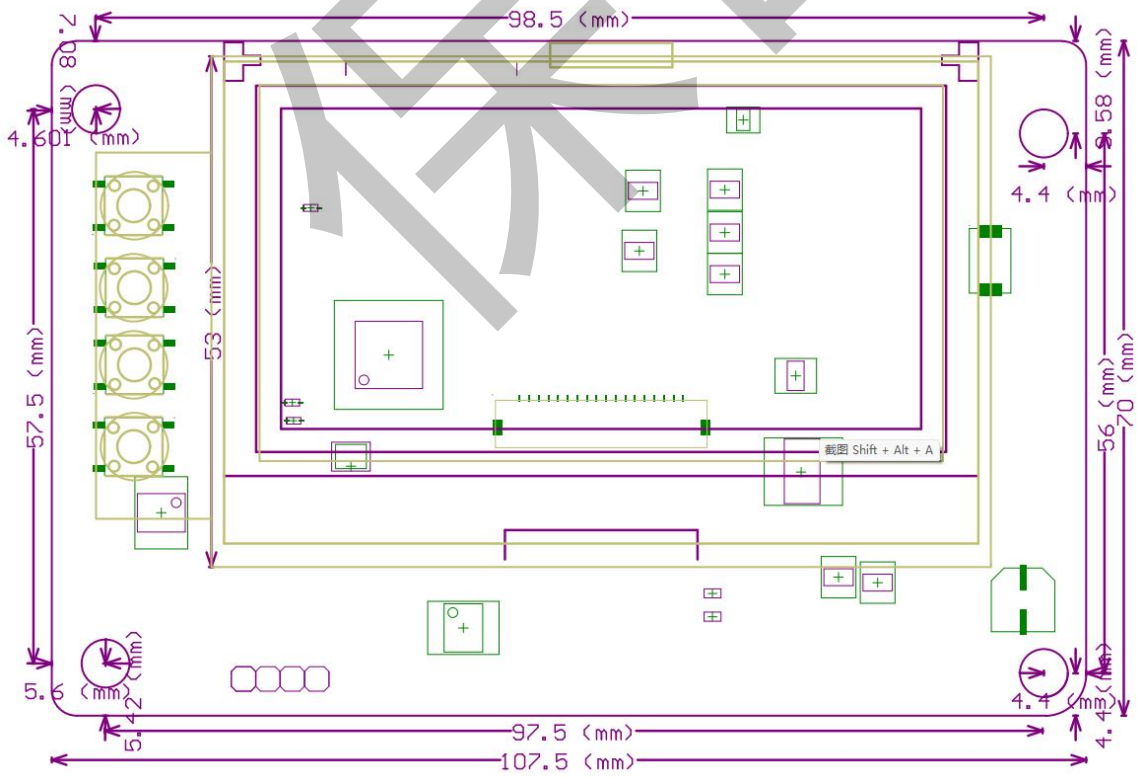
e. NTC线尺寸图如下（10K（103AT B3435 ）±1% 线长30cm(带HY2.0插头),#26号线）：



七、LCD显示屏介绍 LCD Display Description

(1) 实物图（此图片仅供参考，以实物为准）The picture is for reference, refer to the actual.

(2) 尺寸图（Dimension）



(3) XH2.54-5P 连接线尺寸图如下（XH2.54-5P cable dimension as below）：

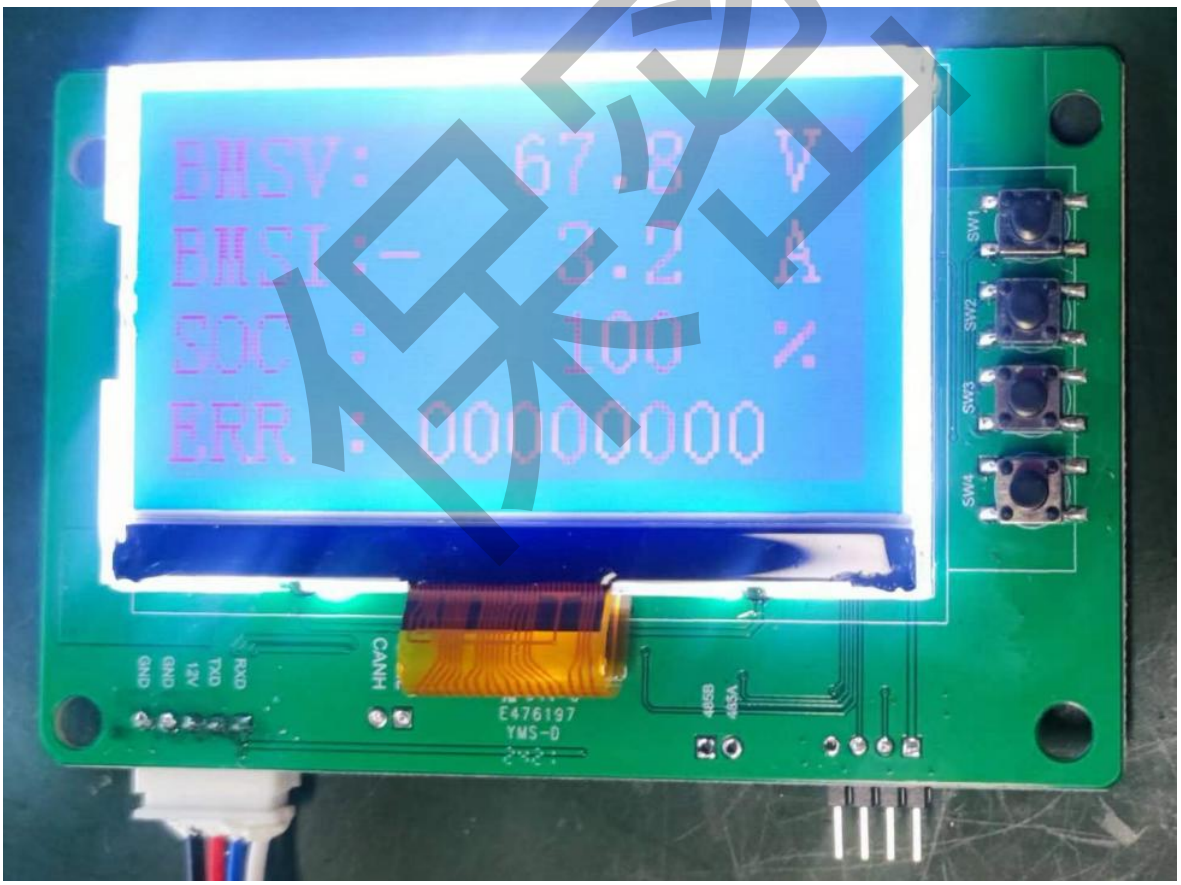
(4) LCD液晶屏主页显示内容（LCD display menu）

a. BmsV ：总电压（Total Voltage）

b. BmsI ：总电流（Total Current）

c. SOC ：容量百分比（Percentage of Electrical Capacity）

d. Err ：参考第4节显示屏故障码定义（Refers to the default code definition）



(5) 按键说明（Button Description）

SW1：下一页（page up）

SW2：上一页（page down）

SW3：返回主页（back to menu）

SW4：熄屏（screen off）

(6) 显示屏故障码定义（Display Fault Code Definition）

告警内容 Alarming Content	位 Bit	描述 Description
压差报警标志位 voltage difference	Bit 15	压差过高报警位 excessive voltage difference
通讯异常异常报警位 communication fault	Bit 14	内部通讯异常 internal communication fault
器件损坏报警位 component damage	Bit 13	充放电MOS损坏 charge/discharge MOS damage
MOS高温报警位 MOS over heat	Bit 12	MOS高温 MOS over heat
放电温度点1高温报警位 (HTD1) HTD1 over heat	Bit 11	电池放电，温度过高 battery discharging over heat
放电温度点1低温报警位 (LTD1) LTD1 low heat	Bit 10	电池放电，温度过低 battery discharge low heat
充电温度点1高温报警位 (HTC1) HTC1 over heat	Bit 9	电池充电，温度过高 battery charging over heat
充电温度点1低温报警位 (LTC1) LTC1 low heat	Bit 8	电池充电，温度过低 batter charging low heat
过充报警位（HV） high voltage	Bit 7	电池已充满 battery full
过放报警位(LV) low voltage	Bit 6	电池电压过低（提示进入最低功耗） low voltage(reminding to minimum power consumption mode)
充电过流报警位(OCC) over charge current	Bit 5	电池充电时，电流过大 charging excessive current
放电过流报警位(OCD) over discharge current	Bit 4	电池放电时，电流过大 discharging excessive current
硬件保护报警位(AE) hardware protection	Bit 3	电池短路保护 battery short circuit protection
卸载电池报警位 battery removed	Bit 2	预留 reserved
低电报警位 low capacity	Bit 1	电池电压过低（提示及时充电） battery low voltage(reminding to charge in time)
振动报警位 vibration	Bit 0	预留 reserved

八、主要器件清单（Main components list）

序号 Item	物料名称 Component Name	品牌 Brand	数量PCS QTY
1	STM32F105VCT6 LQFP100	ST意法半导体	1
2	SH367309 TQFP48	中颖电子 Sino Wealth	1
3	PGT10N018H To11	金誉HT	18
4	ZHDL\CN-BMS2F01L V01 (储能BMS板energy storage BMS board)	智慧动锂 ZHDL	1

5	ZHDL\CN-HBMS01_V2.0 (转接板interface board)	智慧动锂 ZHDL	1
6	ZHDL\LCD2864-V5.0 (LCD显示屏 LCD display)	智慧动锂 ZHDL	1

九、配件清单（Accessories List）

序号 Item	料号 Material No	物料名称 Material Name	规格型号 Model No	数量 PCS
1	B0100800192	采集线 acquisition cable	HY2.0-6P,900mm, （见尺寸图refer to the dimension）	1
2	B0100800193	采集线 acquisition cable	HY2.0-7P,900mm, （见尺寸图refer to the dimension）	1
3	B0100800194	采集线 acquisition cable	HY2.0-6P,900mm, （见尺寸图refer to the dimension）	1
4	B0100800195	采集线 acquisition cable	HY2.0-7P,900mm, （见尺寸图refer to the dimension）	1
5	B0100800196	温控NTC线 temperature control NTC cable	线材26AWG阻燃线,线长90.5cm,剥线0.25mm,耐高温150度300V,(见尺寸图) 26AWG fire retardant cable, length 90.5cm, stripped cable 0.25mm, heat resistance 150 degrees 300V(refer to the dimension)	4
6	B0100800169	灰色排线 gray flat cable	FC2.54mm灰排线,2*10P(20P),线材30cm,同方向 FC2.54mm gray cable, 2*10P(20P),length 30cm, same way	1
7	B0100800312	双头排线 Dual sockets flat cable	HY-10P双头 UL1007 22AWG线材长300mm（见尺寸图） HY-10P dual sockets, UL1007 22AWG, cable length 300mm（refer to the dimension）	1
8	B0100800313	双头排线 Dual sockets flat cable	XH-8P双头 UL1007 22AWG线材长300mm（见尺寸图） XH-8P dual sockets,UL1007 22AWG,cable length 300mm（refer to the dimension）	1
9	B0100800265	双头排线 Dual sockets flat cable	HY-4P双头 UL1007 22AWG线材长300mm（见尺寸图） HY-4P dual sockets, UL1007 22AWG, cable length 300mm（refer to the dimension）	1
10	B0100800037 改	弱电开关线 weak power switch cable	HY2.0-2P单头带扣，UL1007 22AWG，线长400mm Hy2.0-2p single dual sockets, UL1007 22AWG, cable length 400mm	1
11	B0100800191	B+线 （母头female）	耐高温105°C，对插线，红色，14AWG,20CM heat resistance 105℃, red, 14AWG,20cm	1
12	A0300300145	螺丝 screw	M5螺丝+方垫 M5 screw+ square washer	4
13	A0100200254	温控NTC线 temperature control NTC cable	10K（103AT B3435 ）±1% 线长30cm(带HY2.0插头),#26号线 10K（103AT B3435) ±1%,cable length 50cm（with HY2.0 socket）,26AWG	1
14	B0100800314	双头排线 Dual sockets flat cable	XH-5P双头 UL1007 22AWG线材长300mm（见尺寸图） XH-5P dual sockets, UL1007 22AWG, cable	1

			length 300mm（refer to the dimension）	

十、电池连接相关事项（Battery connection relative matters）：

1. 电池与PCB连接顺序，先连接B-,焊接好采样线后，再接连接器,绝不可颠倒顺序；

2. 生产过程须使用有静电防护的电烙铁，操作工必须佩带静电手环；

3. 接入电压采集线之前，需要先检查线序是否正确，一定不可有错接或反接。若操作失误接错，这套BMS可能已损坏，需要重新测试合格后才可继续使用；

4. 装配时BMS不要直接接触到电芯表面，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电子元件，否则有可能影响产品性能；

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使用范围，否则无法保证产品的性能及安全；

8. 将电池模组和BMS组装好后，初次上电若发现无电压输出或无法充电，请检查接线是否正确。

1. Battery and PCB connection sequence, first connect B-, connect the connector after welding the acquisition cable.Must not reverse the order;

2. Electric soldering iron with electrostatic protection must be used in the production process, and the operators must wear an electrostatic bracelet;

3. Before connecting the voltage acquisition cable, check whether the cable sequence is correct. Do not misconnect or reverse the cable sequence. If misconnected, this set of BMS may be damaged, and it needs to be retested and make sure it is qualified to application.

4. BMS should not directly contact the surface of the battery cell during assembly, and the assembly should be firm and reliable;

5. In use, pay attention to the Pin, soldering iron, solder, etc., do not touch the electronic components on the circuit board, otherwise it may affect the product performance;

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

7. Please follow the design parameters and conditions of use, shall not exceed the scope of use in this specification, otherwise the performance and safety of the product cannot be guaranteed;

8. When the battery module and the BMS assembling finished, if no voltage output or no charge is found during the initial power-on, check whether cables are correctly connected.