



无人机专用智能电池管理系统

Smart Battery Management System for Drones

PRODUCT SPECIFICATION

产品名称: Product Name :

6S 45A UAV BMS

产品型号: Product Model :

EF-011

版本编号: Version No.:

AYEF011-M000

尺寸: Dimensions:

84mm*55mm*11mm

重量: Weight:

28.7g

规格 : Configuration:

三元锂电 6 串、同口、充 30A 放 45A、CAN

6S NMC Li-ion, Common Port, 30A Charge 45A Discharge, CAN

客户确认		
Customer Confirmation		
审核/日期	批准/日期	公司印章
Reviewed by / Date	Approved by / Date	Company Seal
编制/日期	审核/日期	批准/日期
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Revision History

[illegible]



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1、简介

1、 Introduction

1.1 产品简介

1.1 Product Overview

本产品为面向无人机锂电池组设计的 6S 45A 电池管理系统（BMS），适用于标称电压为 3.7V 的锂离子电芯。系统支持主控板与功率输出板一体式或分体式结构，可适配不同机型的空间与安装要求，同时支持开源(例如:DroneCAN 等)与非开源的飞控协议；功率输出部分支持最大持续 45A 放电电流。系统具备单体电压采集与均衡、单体过充/过放保护、电池组温度监测、充放电控制、热管理和数据通信等功能，可实时监控电池运行状态，并在异常工况下实施保护。内置高精度 SOC、SOH 估算算法，可提高剩余电量与电池健康状态的评估准确性，同时也具有无人机专用的预充预放、热拔插防打火、过流延时以及飞行模式关闭保护等功能，为无人机电池组的安全运行、可靠供电和使用寿命管理提供支持。

This product is a 6S 45A Battery Management System (BMS) designed for drone lithium-ion battery packs, suitable for lithium-ion cells with a nominal voltage of 3.7V. The system supports both integrated and modular configurations for the main control board and power output board, accommodating the space and installation requirements of different drone models. It also supports both open-source (e.g., DroneCAN) and proprietary flight control protocols; the power output section supports a maximum continuous discharge current of 45A. The system features cell-level voltage sensing and balancing, cell overcharge/overdischarge protection, battery pack temperature monitoring, charge/discharge control, thermal management, and data communication. It monitors the battery's operating status in real time and implements protective measures under abnormal conditions. It incorporates high-precision SOC and SOH estimation algorithms to improve the accuracy of remaining charge and battery health assessments. It also features functions specifically designed for drones, such as pre-charge and pre-discharge, hot-swap spark prevention, overcurrent delay, and flight mode shutdown protection, thereby supporting the safe operation, reliable power supply, and service life management of drone battery packs..

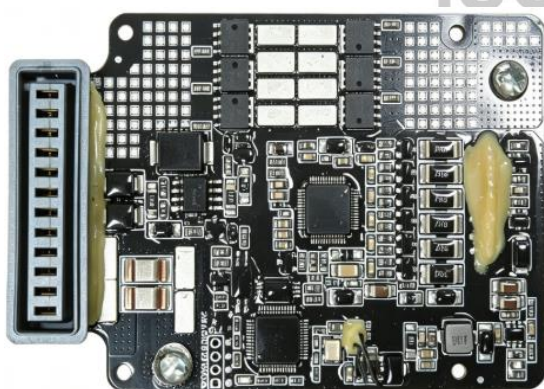
1.2 功能特性

1.2 Functional Features

序号 No.	项目 Item	参数规格 Specification	序号 No.	项目 Item	参数规格 Specification
1	支持电池串数 Supported Number of Series Cells	6 串 6 series	8	温度采集范围 Temperature Measurement Range	-40°C-105°C
2	单体电压检测范围 Cell Voltage Measurement Range	0-5V	9	温度采集精度 Temperature Measurement Accuracy	≤2°C
3	单体电压检测精度 Cell Voltage Measurement Accuracy	±5mV	10	温度传感器类型 Temperature Sensor Type	NTC
4	总电压检测范围 Total Voltage Measurement Range	15-30V	11	SOC 估算精度 SOC Estimation Accuracy	≤5%
5	总电压检测精度 Total Voltage Measurement Accuracy	±≥1%	12	保护板工作温度范围 Protection Board Operating Temperature Range	-20°C-70°C
6	电流检测精度 Current Measurement Accuracy	±≥100mA(<100A) ±≥3%(<500A)	13	保护板工作湿度范围 Protection Board Operating Humidity Range	/
7	温度采集个数 Number of Temperature Channel	1	14	尺寸(mm) Dimensions	84*55*11



- 具有单体电压、总体电压检测，过充、过放告警及保护功能，短路保护功能。常温下静态电压采样精度可达 $\leq 5\text{mV}$ 。
- Provides cell-voltage and total-voltage measurement, overcharge and overdischarge warnings and protection, and short-circuit protection. Static voltage sampling accuracy at room temperature is $\leq 5\text{ mV}$.
- 具有充、放电电流检测，充、放电过流告警及保护功能。充电电流显示为正，放电电流显示为负，常温下电流采样精度可达 $\leq 3\%$ 。
- Provides charge/discharge current measurement and charge/discharge overcurrent warnings and protection. Charge current is displayed as positive and discharge current as negative. Current sampling accuracy at room temperature is $\leq 3\%$.
- 具有电芯、环境、MOS 温度检测，电芯高、低温告警及保护功能，MOS 高温告警及保护功能，环境高、低温告警功能。常温下温度采样精度可达 $\leq 2^{\circ}\text{C}$ 。
- Provides cell, ambient, and MOSFET temperature measurement; cell high/low-temperature warning and protection; MOSFET high-temperature warning and protection; and ambient high/low-temperature warning. Temperature sampling accuracy at room temperature is $\leq 2^{\circ}\text{C}$.
- 具有充电均衡功能，均衡电流 50mA。
- Provides charge balancing with a balancing current of 50 mA.
- 电芯容量估算功能。电池组满充容量、当前容量、设计容量可以通过上位机进行设置，在进行完整充放电循环后容量可自动更新。
- Provides cell-capacity estimation. The full-charge capacity, current capacity, and design capacity of the battery pack can be configured using the host-computer software; capacity is updated automatically after a complete charge/discharge cycle.
- SOC 静态校准功能，通过对比静态电压校准 SOC，降低 SOC 计算误差。
- Provides static SOC calibration based on open-circuit voltage comparison to reduce SOC calculation error.
- 上位机软件控制功能，可通过上位机软件对过充、过放、充放电过流、过温、欠温等保护参数，容量、等参数进行设置。
- Provides host-computer software control for configuring protection parameters—including overcharge, overdischarge, charge/discharge overcurrent, overtemperature, and undertemperature—as well as capacity and other parameters.
- CAN 通信接口，采用隔离通信，支持 CAN2.0B；可用程序包实现软件升级。
- Provides an isolated CAN communication interface supporting CAN 2.0B; firmware can be upgraded using an update package.



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2、电气特性

2 / Electrical Characteristics

2.1 基本参数设置

2.1 Basic Parameter Settings

(注：以下参数除特殊注明以外，25°C环温下测试)

Note: Unless otherwise specified, the following parameters are tested at an ambient temperature of 25°C.

序号 No	指标项目 Parameter		出厂默认参数 Factory Default	是否可设 Configurable	备注 Remarks
1	单体过充保护 Cell Overcharge Protection	单体过充警告 Cell Overcharge Warning	/	可设 Yes	单体过压仅关闭 充电 MOS Cell overvoltage only turns off the charge MOSFET
		单体过充保护电压 Cell Overcharge Protection Voltage	4280mV	可设 Yes	
		单体过充保护延时 Cell Overcharge Protection Delay	3.0S	可设 Yes	
	单体过压保护解除 Cell Overvoltage Protection Release	单体过充保护解除电压 Cell Overcharge Protection ReleaseVoltage	4150mV	可设 Yes	
		放电解除 Release by Discharging		电压低于解除电压 Voltage Below Release Threshold	
2	单体过放保护 Cell Overdischarge Protection	单体过放警告电压 Cell Overdischarge Warning Voltage	/	可设 Yes	单体过放保护关 闭放电 MOS ,飞 行中无效 Cell Overdischarge Protectionturns off the discharge MOSFET ,Inactive during flight
		单体过放保护电压 Cell Overdischarge Protection Voltage	2750mV	可设 Yes	
		单体过放保护延时 Cell Overdischarge Protection Delay	3.0S	可设 Yes	
	单体过放保护解除 Cell Overdischarge Protection Release	单体过放保护解除电压 Cell Overdischarge Protection ReleaseVoltage	3000mV	可设 Yes	
		有充电时解除 Release During Charging		高于解除电压可恢复 Recovery Above Release Threshold	
3	总体过充保护 Pack Overcharge Protection	总体过充警告电压 Pack Overcharge Warning Voltage	/	可设 Yes	总体过压关闭充 电 MOS Pack overvoltage turns off the charge MOSFET
		总体过充保护电压 Pack Overcharge Protection Voltage	4.28x6V	可设 Yes	
		总体过充保护延时 Pack Overcharge Protection Delay	5.0S	可设 Yes	
	总体过压保护解除 Pack Overvoltage Protection Release	总体过充保护解除电压 Pack Overcharge Protection Recovery Voltage	4.2x6V	可设 Yes	
		总体过充保护延时 Pack Overcharge Protection Delay	3.0S	可设 Yes	
		放电解除 Release by Discharging		电压低于解除电压 Voltage Below Release Threshold	
4	总体过放保护 Pack Overdischarge Protection	总体过放警告电压 Pack Overdischarge Warning Voltage	/	可设 Yes	总压过放不会关 闭放电 MOS Pack undervoltage does not turn off the discharge MOSFET
		总体过放保护电压 Pack Overdischarge Protection Voltage	2.75x6V	可设 Yes	
		总体过放保护延时 Pack Overdischarge Protection Delay	5.0S	可设 Yes	



序号 No	指标项目 Parameter		出厂默认参数 Factory Default	是否可设 Configurable	备注 Remarks
	总体过放保护解除 Pack Overdischarge Protection Release	总体过放保护解除电压 Pack Overdischarge Protection Recovery Voltage	3.0x6V	可设 Yes	
		有充电时解除 Release During Charging	高于解除电压可恢复 Recovery Above Release Threshold		
5	充电过流保护 Charge Overcurrent Protection	额定电流 Rated Current	≤30A		充电过流保护会关闭充电 MOS Charge overcurrent protection turns off the charge MOSFET
		充电过流保护电流 Charging Overcurrent Protection Current	45A	可设 Yes	
		充电过流保护延时 Charging Overcurrent Protection Delay	5.0S	可设 Yes	
	充电过流保护解除 Charge Overcurrent Protection Release	自动解除 Automatic Release	延时 30S 后恢复(当连续 3 次过流保护后，移除充电器才能恢复) Recovery after a 30 s delay(after three consecutive overcurrent protection events, remove the charger to recover)		
		放电解除 Release by Discharging	放电电流 > 0.6A Discharge Current > 0.6A		
		放电解除 Release by Discharging	放电电流 > 0.6A Discharge Current > 0.6A		
放电过流 1 级保护 Discharge Overcurrent 1 -Stage Protection		额定电流 Rated Current	≤45A	\	飞行中无效 Inactive during flight
	放电过流 1 保护电流 Discharge Overcurrent 1 Protection Current	67±10A	\		
	放电过流 1 保护延时 Discharge Overcurrent 1 Protection Delay	1±1S	\		
	放电过流保护解除 Discharge Overcurrent 1 Protection Release	自动解除 Automatic Release	移除负载恢复 (Recover after removing the load)		
		充电解除 Release by Charging	\		
	放电过流 2 级 Discharge Overcurrent Stage 2	放电过流 2 保护电流 Discharge Overcurrent 2 Protection Current	88±10A	\	
		自动解除 Automatic Release	移除负载恢复 (Recover after removing the load)		
7	放电过流 2 保护解除 Discharge Overcurrent 2 Protection Release	充电解除 Release by Charging	/		
8	短路保护 Short-Circuit Protection	短路保护电流 Short-Circuit Protection Current	360±20A		地面中有效，短路保护后关闭放电 MOS Active on the ground, After short-circuit protection, turns off the discharge MOSFET
		短路保护延时 Short-Circuit Protection Delay	200±100μS		
		短路保护解除 Short-Circuit Protection Release	移除负载解除 Release after removing the load		
			/		



序号 No	指标项目 Parameter		出厂默认参数 Factory Default	是否可设 Configurable	备注 Remarks
9	MOS 高温保护 MOS High-Temperature Protection	MOS 过温警告温度 MOS Overtemperature Warning Temperature	/	可设 Yes	MOS 过温保护会 关闭充电 MOS。 飞行中， MOS 过 温只警告，不保护。
		MOS 过温保护温度 MOS Over temperature Protection Temperature	90℃	可设 Yes	MOSFET overtemperature protection turns off the charge MOSFET.
		MOS 保护解除温度 MOS Protection Recovery Temperature	80℃	可设 Yes	During flight, MOSFET overtemperature generates a warning only and does not trigger protection.
10	电芯温度保护 Cell Temperature Protection	充电低温保护温度 Charging Low-Temperature Protection Temperature	-5℃	可设 Yes	充电高低温保护会 关闭充电 MOS； Charginghigh/low- temperature protection turns off the charge MOSFET;
		充电低温保护解除温度 Charging Low-Temperature Protection Recovery Temperature	0℃	可设 Yes	
		充电高温保护温度 Charging High-Temperature Protection Temperature	65℃	可设 Yes	
		充电高温保护解除温度 Charging High-Temperature Protection Recovery Temperature	55℃	可设 Yes	飞行中放电高低温只 有警告，不会关闭放 电 MOS。如果有放 电高低温保护，则不 允许开机。 During flight, Discharge High/Low- Temperature only Warning, does not turns off the discharge MOSFET.If Discharge High/Low- TemperatureProtectio n, power-on is not permitted Power-on.
		放电低温警告温度 Discharge Low-Temperature Warning Temperature	-20℃	可设 Yes	
		放电低温警告解除温度 Discharge Low-Temperature Warning Clear Temperature	-10℃	可设 Yes	
		放电高温警告温度 Discharge High-Temperature Warning	70℃	可设 Yes	
		放电高温警告解除温度 Discharge High-Temperature Warning Clear Temperature	60℃	可设 Yes	
		温度保护和解除延时 Temperature Protection and Release Delay	10.0S	/	
11	SOC	精度 Accuracy	3%~5%	初始上电后需经过一个充放电循环才能达到精度要求 One full charge/discharge cycle is required after initial power-on to meet the accuracy specification	
12	消耗电流 Current Consumption	工作时自耗电电流 Operating Self-Consumption Current	≤15mA	/	/
		低功耗模式电流 Low-Power Mode Current	≤100μA	/	/
13	均衡功能 Balancing Function	均衡开启电压 Balancing Enable Voltage	4000mV	/	/
		开启压差 Enable Voltage Difference	50mV	/	/
		关闭压差 Disable Voltage Difference	20mV	/	/
		均衡电流 Balancing Current	50mA	/	/



2.2 电气性能

2.2 Electrical Performance

(注：以下参数除特殊注明以外，25℃环温下测试)

Note: Unless otherwise specified, the following parameters are tested at an ambient temperature of 25°C.

项目 Item	描述 Description	最小值 Minimum	典型值 Typical	最大值 Maximum	单位 Unit	其它说明 Other Notes
1	工作电压 Operating Voltage	16.5	21.6	26.28	V	
2	工作功耗 Operating Current Consumption	-	10	15	mA	
3	深度休眠电流 Deep-Sleep Current	-	2	3	mA	
4	CAN 接口耐压 CAN Interface Withstand Voltage	-	-	30	V	
5	充电 MOS 耐压 Charging MOS Withstand Voltage	-	-	50	V	
6	放电 MOS 耐压 Discharge MOSFET Withstand Voltage	/	/	50	V	
7	加热接口耐压 Heating Interface Withstand Voltage	/	/	/	V	
8	加热接口最大电流 Maximum Heating Interface Current	/	/	/	A	
9	LED 驱动电流 LED Drive Current	/	3	5	mA	
10	峰值放电电流 Peak Discharge Current	/	/	50	A	
11	额定温升 Rated Temperature Rise	/	/	/	℃	
12	均衡和自放电时间 Balancing and Self-Discharge Time	/	0.5	/	S	每秒均衡时间 Balancing Time per Second



2.3 LED 指示说明

2.3 LED Indicator Description

PCB 板配置 led 指示灯三颗，通过短按+长按开机，三颗 LED 会依次亮起，然后一个 LED 常亮，

The PCB is equipped with three LED indicators. To power on, press briefly and then press and hold; the three LEDs illuminate in sequence, after which one LED remains steadily lit.

通过短按+长按关机，三颗 LED 会依次灭，然后全部 LED 灭；

To power off, press briefly and then press and hold; the three LEDs turn off in sequence, after which all LEDs remain off.

3、无人机 BMS 工作模式

3 / UAV BMS Operating Modes

3.1 工作模式说明

3.1 Operating Mode Description

系统有二种运行模式：

- (1) 一是正常工作模式：系统开机后，即进入此模式。此时，BMS 实时检测电池组状态并侦测外部系统输入信息，以执行电池组充放电，异常保护以及通信等动作；
- (2) 二是深度休眠模式当 BMS 检测到有任一单串电压低于过放保护值时，BMS 延时一分钟后，将自动进入深度休眠模式，此时，充电器信号能唤醒 BMS 重新工作。

The system has two operating modes.

(1) Normal operating mode: the system enters this mode after power-on. The BMS monitors the battery-pack status and external system inputs in real time to control charging/discharging, fault protection, and communication.

(2) Deep-sleep mode: if the BMS detects that any individual cell voltage is below the overdischarge protection threshold, it automatically enters deep-sleep mode after a one-minute delay. A charger signal can then wake the BMS and restore operation.

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3.2 历史记录数据

3.2 Historical Data Records

历史数据记录 Historical Data Recording	
状态 State	记录条件 Recording Conditions
充电状态下 During Charging	充电开关打开时/关闭时各记录一条；单体电压波动+25mV 或者-100mV 时记录一条； Record once when the charge switch turns on and once when it turns off; Cell-voltage change+25mV or-100mV triggers one record;
放电状态下 During Discharging	放电开关打开时/关闭时各记录一条；单体电压波动-25mV 或者+100mV 时记录一条； Record once when the discharge switch turns on and once when it turns off; Cell-voltage change-25mV or+100mV triggers one record;
静置模式下 In Idle Mode	单体电压波动-100mV 或者+100mV 时记录一条； Cell-voltage change-100mV or+100mV triggers one record;

3.3 充电 MAP

3.3 Charging MAP

充电 MAP 只针对智能充电器，并根据电芯规格书设定。
The charging map applies only to smart chargers and is configured according to the cell specification.

3.4 均衡功能

3.4 Balancing Function

保护板内置被动均衡功能，均衡电流 50mA 左右，均衡开启后每次均衡最高串，每次均衡时间为 0.5S，每秒均衡一次；
The BMS incorporates passive balancing with a balancing current of approximately 50 mA. Once balancing is enabled, the highest-voltage cell is balanced for 0.5 s during each one-second cycle.

3.4.1 均衡开启

3.4.1 Balancing Enable

满足以下条件均衡会打开：
Balancing is enabled when any of the following conditions is met:
保护板充电状态下，压差大于 50mV，则开启最高串均衡；
While the BMS is charging, if the cell-voltage difference exceeds 50 mV, balancing of the highest-voltage cell is enabled.

3.4.2 均衡关闭

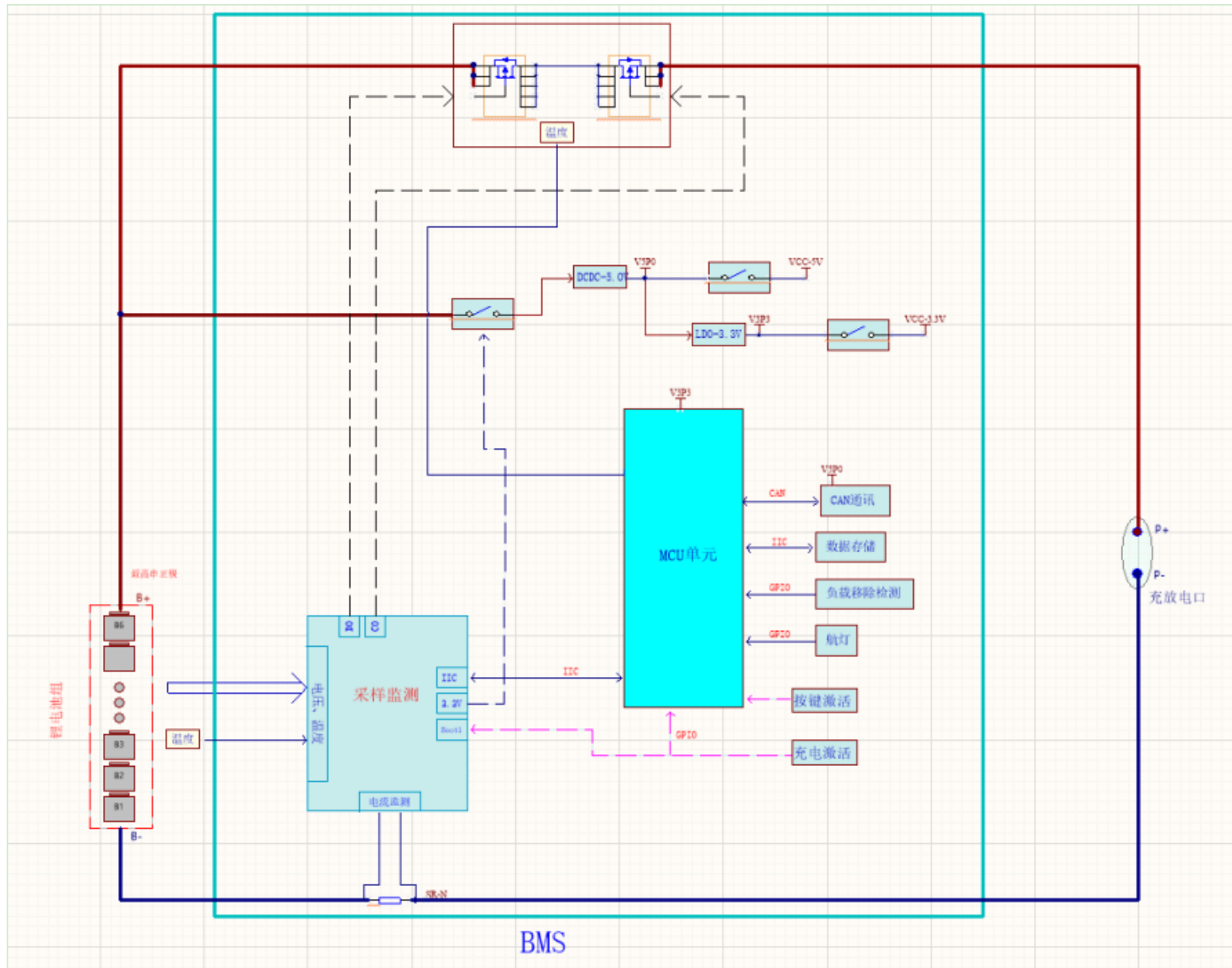
3.4.2 Balancing Disable

满足以下任一条件均衡会关闭：
Balancing is disabled when any of the following conditions is met:
(1) 放电状态下；
The battery is discharging;
(2) 任何状态下，压差小于等于 20mV；
In any state, the cell-voltage difference is ≤ 20 mV.



4、功能示意图

4 / Functional Diagram

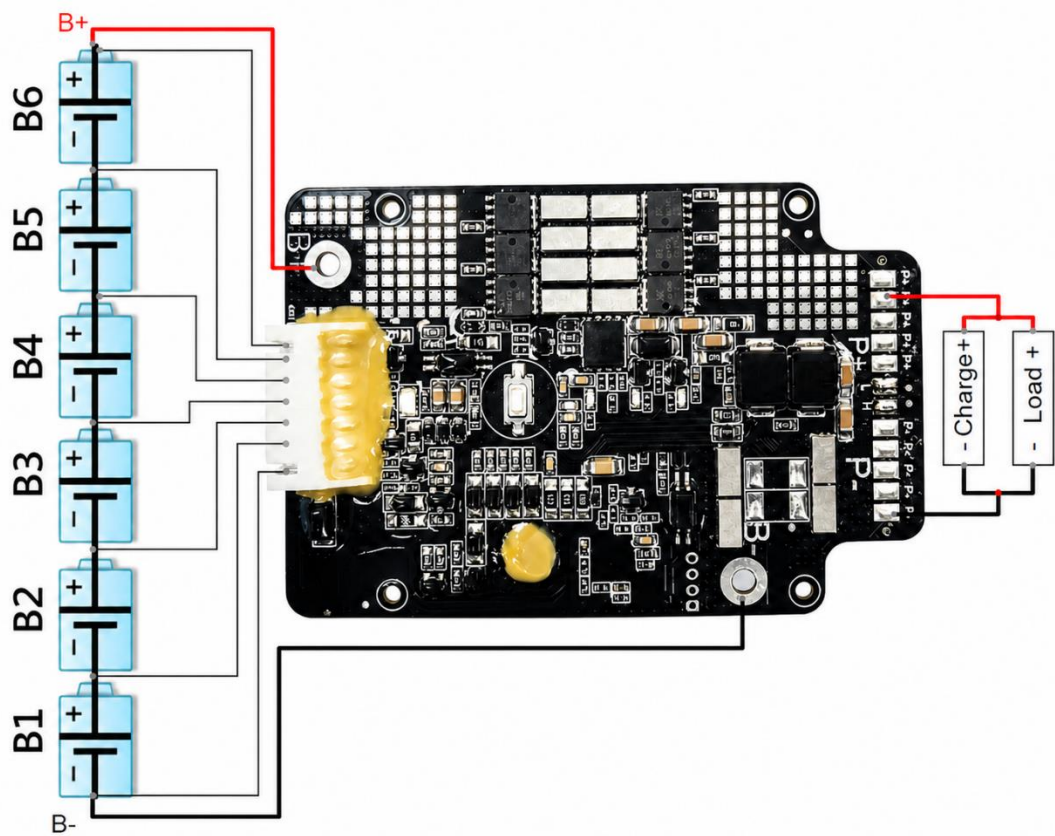




5、PCB 端口分布与定义

5 / PCB Port Layout and Definitions

端口 <i>Port</i>	符号 <i>Symbol</i>	描述 <i>Description</i>
电池负极 <i>Battery Negative</i>	B-	电池主回路负极连接端子，连接电池 1 的负极 <i>Battery main-circuit negative terminal; connect to the negative terminal of Cell 1</i>
输入输出负极 <i>Input/Output Negative</i>	P-	充放电负极主回路连接端子 <i>Charge/discharge negative main-circuit terminal</i>
输入输出正极 <i>Input/Output Positive</i>	P+	输入输出正极需另从电池总的正极引出 <i>The input/output positive lead shall be routed separately from the pack positive terminal</i>
CN1	CN1	电池电压采集端口 <i>Battery Voltage Sensing Port</i>
H	H	CAN H 接口 <i>CAN H Interface</i>
L	L	CAN L 接口 <i>CAN L Interface</i>



注意：PCM 与电芯连接时请按如下顺序连接先接B-后接BAT+，再按顺序接 B1.....B6，断开连接时的顺序则反之，如果不按此顺序连接有可能会造成 PCM 损坏的风险。

Caution: When connecting the PCM to the cells, connect B- first, then BAT+, followed by B1 through B6 in sequence. Disconnect in the reverse order. Failure to follow this sequence may damage the PCM.



6、通信说明

6 / Communication

6.1 CAN 通信

6.1 CAN Communication

波特率：1000 kps，BMSID:20

Baud Rate：1000 kps, BMSID:20

6.2 上位机 CAN 通讯

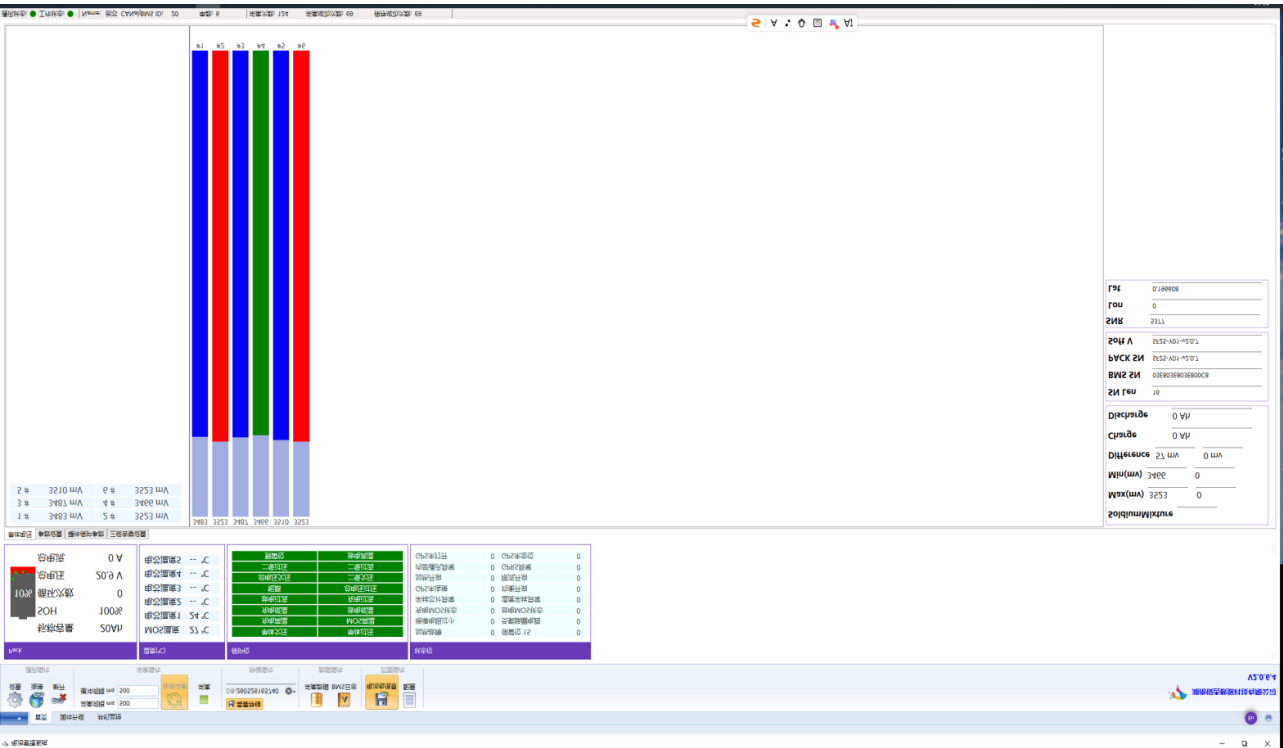
6.2 Host Computer CAN Communication

6.2.1 调试上位机说明

6.2.1 Commissioning Software Instructions

调试上位机使用 CAN 接口，软件界面如下，

The commissioning software uses the CAN interface. The software interface is shown below.



上位机主界面分为单体电芯电压显示，单体 1 电压为第一串电压（最低串，靠近总负极 B-），温度显示，电池信息显示（包括电池总压、SOC，剩余容量，充放电电流，充电电流为正，放电电流为负），MOS 状态包括充电 MOS、放电 MOS、和加热 MOS，导通即 MOS 管打开。

The main host-computer interface includes individual cell-voltage display (Cell 1 is the first series cell, nearest the pack negative terminal B-), temperature display, and battery information (including total pack voltage, SOC, remaining capacity, and charge/discharge current; charging current is positive and discharging current is negative). MOSFET status includes the charge, discharge, and heating MOSFETs; “on” indicates that the corresponding MOSFET is enabled.

(1) 单体电压可显示每串的电池电压，以及最高电压和最低电压，最高电压为红色背景框，最低电压为绿色背景框。

The cell-voltage panel displays the voltage of each series cell together with the maximum and minimum values. The maximum voltage is highlighted in red and the minimum voltage in green.

(2) 电池工作状态可显示各种保护标志以及单串电池状态，若变红且显示故障，则表示有相应的故障触发。

The battery operating-status panel displays protection indicators and individual-cell status. A red fault indication means that the corresponding fault has been triggered.

(3) 通讯状态可显示通讯状态，若没有数据显示，则通讯异常。

The communication-status panel indicates the communication state. If no data is displayed, communication is abnormal.

(4) 打开串口后，需要点击‘采集’才会开始通讯，打开后部分功能才会使能。

After opening the communication port, click “Acquire” to start communication. Some functions are enabled only after acquisition begins.



6.2.2 参数设置

6.2.2 Parameter Settings

(1) 参数设置分为系统信息、保护阈值、恢复阈值、延时和其它。

Parameter settings are divided into system information, protection thresholds, recovery thresholds, delays, and other settings.

(2) 系统信息包括了板子的一些基本信息。（警告参数仅用于客户特定需求，若不需要，则忽略不影响使用）

System information contains basic board information. (Warning parameters are intended only for customer-specific requirements; if not required, they may be ignored without affecting operation.)

(3) 保护阈值包括过冲过放电压、高低温保护、以及充放电过流阈值。

Protection thresholds include overcharge/overdischarge voltage, high/low-temperature protection, and charge/discharge overcurrent thresholds.

(4) 恢复阈值包括过冲过放、高低温恢复阈值。

Recovery thresholds include overcharge/overdischarge and high/low-temperature recovery thresholds.

(5) 延时包括过冲过放电压、高低温保护、以及充放电过流延时。

Delay settings include overcharge/overdischarge voltage, high/low-temperature protection, and charge/discharge overcurrent delays.

6.2.3 程序更新

6.2.3 Firmware Update

BMS 支持固件在线升级，在保证 BMS 通讯正常的情况下，可以通过 CAN 或者 UART 下载固件更新程序。

The BMS supports online firmware upgrades. When BMS communication is operating normally, firmware updates can be downloaded through CAN or UART.

6.2.4 历史数据

6.2.4 Historical Data

(1) BMS 具有历史故障和数据记录功能，可通过上位机查看故障记录和电池历史工作状态；

The BMS records historical faults and operating data. Fault records and historical battery operating status can be viewed using the host-computer software.

(2) 点击读取故障后，会出现相应的故障触发次数以及循环次数；

After clicking "Read Faults," the number of occurrences of each fault and the cycle count are displayed.

实时数据可实时显示上位机读取的电池状态信息，并可以表格的形式导出到上位机根目录下。

The real-time data view displays battery-status information read by the host computer and can export the data as a table to the host-computer root directory.

告警数据										
Addr: 20		Cell count: 6		读取告警数据	读取充放电运行数据	读取充放电运行数据 Flash	导出			
Index	Time	Alarm flag bit	Protection flag bit	SOC	Electric current (A)	#1 Voltage(mv)	#2 Voltage(mv)	#3 Voltage(mv)	#4 Voltage(mv)	#5 Voltage(mv)
1	2021-1-2 0:2:51	1[OCWDSG]	33280-3072[UV;OC_DSG;CHG;DSG]	0	-105.7	2380	2534	2536	2565	
2	2021-1-2 0:0:11	1[OCWDSG]	512-3072[OC_DSG;CHG;DSG]	3	-30.1	2897	2937	2946	2950	
3	2021-1-2 0:0:10	0	512-3072[OC_DSG;CHG;DSG]	3	-27.3	2906	2947	2956	2959	
4	2021-1-2 0:8:13	0	512-3072[OC_DSG;CHG;DSG]	3	-62.4	2735	2853	2865	2882	
5	2021-1-2 0:7:59	1[OCWDSG]	0-3072[CHG;DSG]	5	-96.4	2768	2875	2887	2903	
6	2021-1-2 0:3:51	8192	32768-3072[UV;CHG;DSG]	10	0	2265	3450	3444	3450	
7	2021-1-2 0:3:32	8192	0-3072[CHG;DSG]	10	0	2382	3450	3444	3450	
8	2021-1-2 0:0:1	8[OTWBDSG]	1-3072[OT_DSG;CHG;DSG]	12	-0.9	3298	3298	3297	3298	
9	2021-1-1 23:59:58	8[OTWBDSG]	0-3072[CHG;DSG]	12	-0.9	3299	3300	3299	3299	
10	2021-1-1 23:59:34	4[OTWBCHG]	8192-1024[OT_Bat;DSG]	0	1.6	3321	3321	3322	3319	
11	2021-1-1 23:59:30	4[OTWBCHG]	0-3072[CHG;DSG]	0	1.6	3320	3318	3320	3318	



6.2.5 历史放电数据

6.2.5 Historical Discharge Data

- (1) BMS 具有历史充放电数据记录功能，当开启充电或者开机放电后，每秒记录一次，可记录运行时间、电池电压、电流、温度、状态标志、容量等；

The BMS records historical charge and discharge data. Once charging is enabled or power-on discharge begins, data is recorded once per second, including operating time, battery voltage, current, temperature, status flags, and capacity.

- (2) 每次从静置状态进入充电或者放电状态，都会重新开始记录；

Recording restarts whenever the battery transitions from idle to charging or discharging.

- (3) 点击‘历史信息’，则会显示 BMS 存储的历史数据记录；

Click “Historical Information” to display the historical data records stored in the BMS.

- (4) 点击导出数据可将历史数据以表格的形式保存到上位机目录下；

Click “Export Data” to save the historical data in table format to the host-computer directory.

HistoryData

列表

查找

导出

个 文件名	创建时间	时间	标志位	总电压	总电流	SOC	SOH	循环次数	cell1	cell2	cell3	cell4	cell5	cell6	温度1	温度2	温度3	温度4	温度5	温度6
260724095001	26-07-24 09:50:01	2026-07-24 09:53:39.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3515	3527	26	22	1000	1000	1000	1000
260724095336	26-07-24 09:53:36	2026-07-24 09:53:40.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	22	1000	1000	1000	1000
260724100614	26-07-24 10:06:14	2026-07-24 09:53:41.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	22	1000	1000	1000	1000
260724104741	26-07-24 10:47:41	2026-07-24 09:53:42.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	22	1000	1000	1000	1000
260724104815	26-07-24 10:48:15	2026-07-24 09:53:43.0-3072	20.8	0	10	100	0	0	3458	3450	3445	3450	3515	3527	26	22	1000	1000	1000	1000
260724104846	26-07-24 10:48:46	2026-07-24 09:53:44.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	22	1000	1000	1000	1000
260724110102	26-07-24 11:01:02	2026-07-24 09:53:45.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	22	1000	1000	1000	1000
260806094447	26-08-06 09:44:47	2026-07-24 09:53:46.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3515	3527	26	22	1000	1000	1000	1000
260806100559	26-08-06 10:05:59	2026-07-24 09:53:47.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3515	3527	26	22	1000	1000	1000	1000
260806100630	26-08-06 10:06:31	2026-07-24 09:53:48.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3515	3527	26	22	1000	1000	1000	1000
260806103716	26-08-06 10:37:16	2026-07-24 09:53:49.0-3072	20.8	0	10	100	0	0	3458	3450	3444	3450	3515	3527	26	22	1000	1000	1000	1000
260806104237	26-08-06 10:42:37	2026-07-24 09:53:50.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	22	1000	1000	1000	1000
		2026-07-24 09:53:51.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3515	3527	26	22	1000	1000	1000	1000
		2026-07-24 09:53:52.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3515	3527	26	22	1000	1000	1000	1000
		2026-07-24 09:53:53.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	22	1000	1000	1000	1000
		2026-07-24 09:53:54.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	22	1000	1000	1000	1000
		2026-07-24 09:53:55.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	22	1000	1000	1000	1000
		2026-07-24 09:53:56.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:53:57.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:53:58.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:53:59.0-3072	20.8	0	10	100	0	0	3458	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:00.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3515	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:01.0-3072	20.8	0	10	100	0	0	3458	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:02.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:03.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3515	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:04.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:05.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:06.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:07.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:08.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:09.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:10.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:11.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:13.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:14.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:15.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:16.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:17.0-3072	20.8	0	10	100	0	0	3458	3450	3445	3450	3515	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:18.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:19.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3515	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:20.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:21.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:22.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:23.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:24.0-3072	20.8	0	10	100	0	0	3457	3450	3445	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:25.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000
		2026-07-24 09:54:26.0-3072	20.8	0	10	100	0	0	3457	3450	3444	3450	3514	3527	26	23	1000	1000	1000	1000



7、保修条款

7 / Warranty Terms

7.1 保修条款

7.1 Warranty Terms

本产品的保修期为 12 个月，在这期间正常使用下损坏的由爱雅科技有限公司提供服务，以下任——种情况损坏的，不在保修范围：

This product is covered by a 12-month warranty. AYA Technology Co., Ltd. will provide service for failures occurring under normal use during this period. Damage resulting from any of the following is excluded from warranty coverage:

(1) 不正确的操作或使用

Incorrect operation or use

(2) 使用环境条件超过了规格

Operating conditions exceeding the specification

(3) 擅自拆装和维修

Unauthorized disassembly or repair

(4) 人为蓄意之破坏

Intentional human damage

(5) 进水或受潮

Water ingress or moisture exposure

(6) 不可抗拒的自然因素

Force majeure or natural causes

(7) PCB 条码损坏或撕毁

PCB barcode damaged or removed

7.2 重要通知

7.2 Important Notice

此规格书只有深圳市爱雅科技有限公司有权更改和更新,更改、更新新版本时不会告知客户，客户应在订单之前获取最新的相关信息，应当确认最新信息是否能满足当前使用。

Only Shenzhen AYAA Technology Co., Ltd. is authorized to revise and update this specification. Customers will not be notified when a revised or updated version is issued.

Before placing an order, customers shall obtain the latest relevant information and confirm that it meets the requirements of the intended application.

7.3 重要说明

7.3 Important Notice

客户签字或盖章确认本产品规格书，即表示客户已充分阅读、理解并认可本规格书所载全部产品技术参数、配置要求、质量标准及其他约定内容，并确认其符合客户的采购及使用需求。

深圳市爱雅科技有限公司将以经客户确认的本产品规格书作为本订单生产、检验及交付的技术依据，严格按照本规格书约定的产品参数和要求组织生产并完成订单履行。

本产品规格书经双方签字及/或盖章确认后，将作为《合同书》的组成部分，与合同书一并回传、留存，并与合同书具有同等法律效力。如本规格书与合同书约定存在不一致，以双方书面确认的补充协议或合同中约定的优先适用条款为准。

By signing or affixing a seal to confirm this Product Specification Sheet, the Customer acknowledges that it has fully read, understood, and accepted all product technical parameters, configuration requirements, quality standards, and other agreed-upon terms set forth herein, and confirms that they meet the Customer's procurement and usage requirements.

SHENZHEN AYAA TECHNOLOGY CO., LTD. will use this Product Specification Sheet, as confirmed by the Customer, as the technical basis for the production, inspection, and delivery of this order, and will organize production and fulfill the order in strict accordance with the product parameters and requirements specified herein.

Upon confirmation by the signatures and/or seals of both parties, this Product Specification Sheet shall constitute an integral part of the "Contract," be returned and retained together with the Contract, and have the same legal effect as the Contract. In the event of any inconsistency between this Specification Sheet and the Contract, the terms of any supplementary agreement confirmed in writing by both parties or the priority provisions stipulated in the Contract shall prevail.