COF-H043A26-UART-A01

UART 串口版数据手册

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HotDisplay Technology Co.,Ltd

鑫洪泰科技（广东）有限公司

深圳市鑫洪泰电子科技有限公司

广东省东莞市凤岗镇东深公路凤岗段 208 号天安数码城 N3 栋 3 楼

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1 模块简介 Module Description

1.1 特点 Features

COF-H043A26-UART-A01 是 EzUIH(S)系列彩色液晶串口智能显示模块中的一款，模块显示器为 4.3 英寸（对角线）彩色 TFT 显示屏，800×480 点阵，16 位色彩深度；模块内部有 16M bytes 大小的资源存储器。模块需要 5V 直流供电，标准模块对外接口为串行 UART（TTL 电平）接口，接口简单、操作方便；与各种 MCU 均可进行方便简单的接口操作。

EzUIH(S)系列彩色液晶串口智能显示模块为鑫洪泰和铭正同创共同研发，自行生产销售的智能型人机界面显示模块；触摸版 EzUIH(S)系列模块基于 TFT 显示屏及触摸屏整合了自成体系的 GUI 系统，结合界面开发工具软件（EzUITool）可实现用户界面设计无代码的目标。而 EzUIH(S)系列为 EzUI 系列的高性价比版本；EzUIH(S)系列模块兼容全部 EzUI、EzUIH 模块的功能。

EzUIH(S)系列模块最大的特色为使用简便、功能丰富，用户对其使用可简可繁。用户可以使用界面开发工具软件（EzUITool）进行人机界面的设计、编辑、控件配置、响应设置等，将工具软件生成的资源文件复制到 EzUIH(S)系列模块之中，便可达成所需人机交互界面的设计制作，而无需用户单片机或其它控制器的编程控制。而为满足有特殊要求的用户，EzUIH(S)系列模块还保留有串口显示控制指令（如绘直线、矩形、圆、字符串显示等），以便于用户可以更自由的对模块显示进行直接控制。

COF-H043A26-UART-A01 is one of the EzUIH(S) series color LCD serial intelligent display modules. The module display is 4.3-inch (diagonal) color TFT display, 800×480 dot matrix, 16-bit color depth; the module has 16M bytes size of internal resource memory. The module needs 5V DC power supply, and the standard module external interface is serial UART (TTL level) interface, which is simple and easy to operate; it can be operated with various MCUs for convenient and simple interface.

EzUIH(S) series color LCD serial intelligent display module is jointly developed by Xinhongtai and Mingzheng Tongchuang, and the intelligent human-machine interface display module is produced and sold by themselves; the touch version of EzUIH(S) series module integrates a self-contained GUI system based on TFT display and touch screen, and combined with the interface development tool software (EzUITool) can realize the user interface design without code. The goal is to achieve a codeless user interface design with the interface development tool software (EzUITool). The EzUIH(S) series is a cost-effective version of EzUI series; EzUIH(S) series modules are compatible with the functions of all EzUI and EzUIH modules.

The most important feature of EzUIH(S) series modules is that they are easy to use and feature-rich, and users can use them in a simple or complicated way. Users can use the interface development tool software (EzUITool) to design, edit, configure controls, and set responses for the human-machine interface. By copying the resource files generated by the tool software into the EzUIH(S) series modules, the required human-machine interface can be designed and created without the need for programming and control by the user's microcontroller or other controllers. In order to meet the special requirements of users, EzUIH(S) series modules also retain serial display control commands (such as drawing lines, rectangles, circles, string display, etc.) so that users can have more freedom to directly control the module display.

- 5V 供电，UART 串行接口（TTL 电平，可选 RS232 电平）方式，支持 9600~1000000bps；
  5V power supply, UART serial interface (TTL level, optional RS232 level) mode, supporting 9600~1000000bps;
- 标准版模块内置 128M 位（16M bytes 可用）大小的资源存储器；
  Standard version of the module built-in 128M bits (16M bytes available) size of resource memory;
- 模块内部自带 6×10、8×16、10×20、16×32 点 ASCII 码西文字库；
  module comes with its own internal 6×10, 8×16, 10×20, 16×32 point ASCII western script library;
- 支持基本绘图指令（绘点、直线、矩形、圆形、字符串显示、位图显示、Jpeg 图片显示等）；supports basic drawing commands (drawing points, lines, rectangles, circles, string display, bitmap display, Jpeg picture display, etc.);
- 资源文件支持加载点阵字库（GBK2312 二级汉字库、ASCII 西文字库等）；
  resource file supports loading dot matrix font (GBK2312 secondary Chinese font, ASCII western font, etc.);
- 资源文件支持加载 BMP 位图、Jpeg 图片；
  resource file support for loading BMP bitmaps, Jpeg images;
- 支持矢量字库（多国语言、抗锯齿效果）；
  supports vector font (multi-language, anti-aliasing effect);
- 支持界面切换效果设置，如透明度渐入、随机快渐入、百叶窗渐入、缓冲区快速切换；
  support interface switching effect settings, such as transparency fade, random fast fade, shutter fade, buffer fast switching;
- 支持区域按钮控件，多种属性配置，控件消息响应可配置；
  supports area button controls with multiple property configurations and configurable control message response;
- 支持位图按钮控件，多种属性配置，控件消息响应可配置；
  supports bitmap button control with multiple property configurations and configurable control message response;
- 支持数值控件（整数、浮点数均可），多种属性配置，支持数值输入，支持数据关联同步；
  supports numeric controls (integers and floating point numbers are available), with multiple property configurations, numeric input and data association synchronization;
- 支持字符串控件（中英文均可），多种属性配置，支持中英文字符串输入；
  supports string controls (both English and Chinese), multiple property configurations, support for English and Chinese string input;
- 支持下拉选择控件，控件消息响应可配置，支持数据关联同步；
  supports drop-down selection controls, with configurable control message responses and support for data association synchronization;

- 支持波形控件，允许同一 ID 号控件内最多四条波形线，支持柱形图显示；
  supports waveform control, allowing up to four waveform lines within the same ID number control, supporting bar graph display;
- 支持进度条控件，控件消息响应可配置，支持叠加显示数值/字符串控件，支持数据关联同步；
  supports progress bar control, configurable control message response, support for overlay display of numeric/string controls, support for data correlation synchronization;
- 支持位图动画控件，控件消息响应可配置，支持数据关联同步，支持配置图片外置资源文件；
  support for bitmap animation controls, configurable control message response, support for data association synchronization, support for configuration of image external resource files;
- 支持时间显示、日期显示控件；
  supports time display, date display controls;
- 支持表盘显示控件，支持数据关联同步；
  supports dial display control, supports data association synchronization;
- 支持滑动条控件，控件消息响应可配置，支持数据关联同步；
  supports slider control, with configurable control message response and support for data association synchronization; supports slider control, with configurable control message response and support for data association synchronization;
- 支持二维码显示控件，二维码生成版本及纠错等级自动选择，自动放大显示；
  supports QR code display control, QR code generation version and error correction level are automatically selected and automatically enlarged display;
- 电容触摸版本模块支持滑屏切换界面。
  capacitive touch version module supports sliding screen switching interface.

1.2 主要功能与基本参数 Main functions and basic parameters

项目 Item	规格 Specification	单位 Unit	说明 Remarks
显示尺寸 Display Size	4.3	英寸 Inch	横屏显示 Horizontal display
分辨率 Number of Pixels	800(RGB) (H) x 480 (V)	像素 Pixel	
触摸面板 Touch Panel	默认不带 Default without		电容触摸选配 Capacitive Touch Option
外形尺寸 Outline Dimension	105.46(H) x 67.01(V) x 10.25(D) (NTP) 105.46(H) x 67.01(V) x 12.05(D) (W/TP)	毫米 mm	
显示区域 Active Area	108.00 (H) x 64.80 (V)	毫米 mm	
观看方向 Viewing Direction	U80/D80/R80/L80 (Typ.)	度 Deg.	
显示特征 Display Features	65K colors TFT		16 位色彩深度 16-bit color depth
背光 Back Light	白色 LED White LED		
模块供电 Module power supply	直流 5V DC 5V		推荐电流 1A 以上 Recommended current 1A or more

极限电器特性 Extreme electrical characteristics：

项目 Item	标号 Symbol	条件 Condition	最小值 Min	典型值 Type	最大值 Max	单位 Unit
供电电压 Supply voltage	VDD	-	4.5	5.0	5.5	伏 V
输入电压范围 Input Voltage Range	VIN	-	-0.3	-	VDD	伏 V
工作环境温度范围 Operating ambient temperature range	Topr	-	-30	+25	+70	摄氏度 ℃
储存环境温度范围 Storage ambient temperature range	Tstr	-	-40	+25	+80	摄氏度 ℃

模块工作电流：(5V 供电，工作温度为 25 摄氏度)

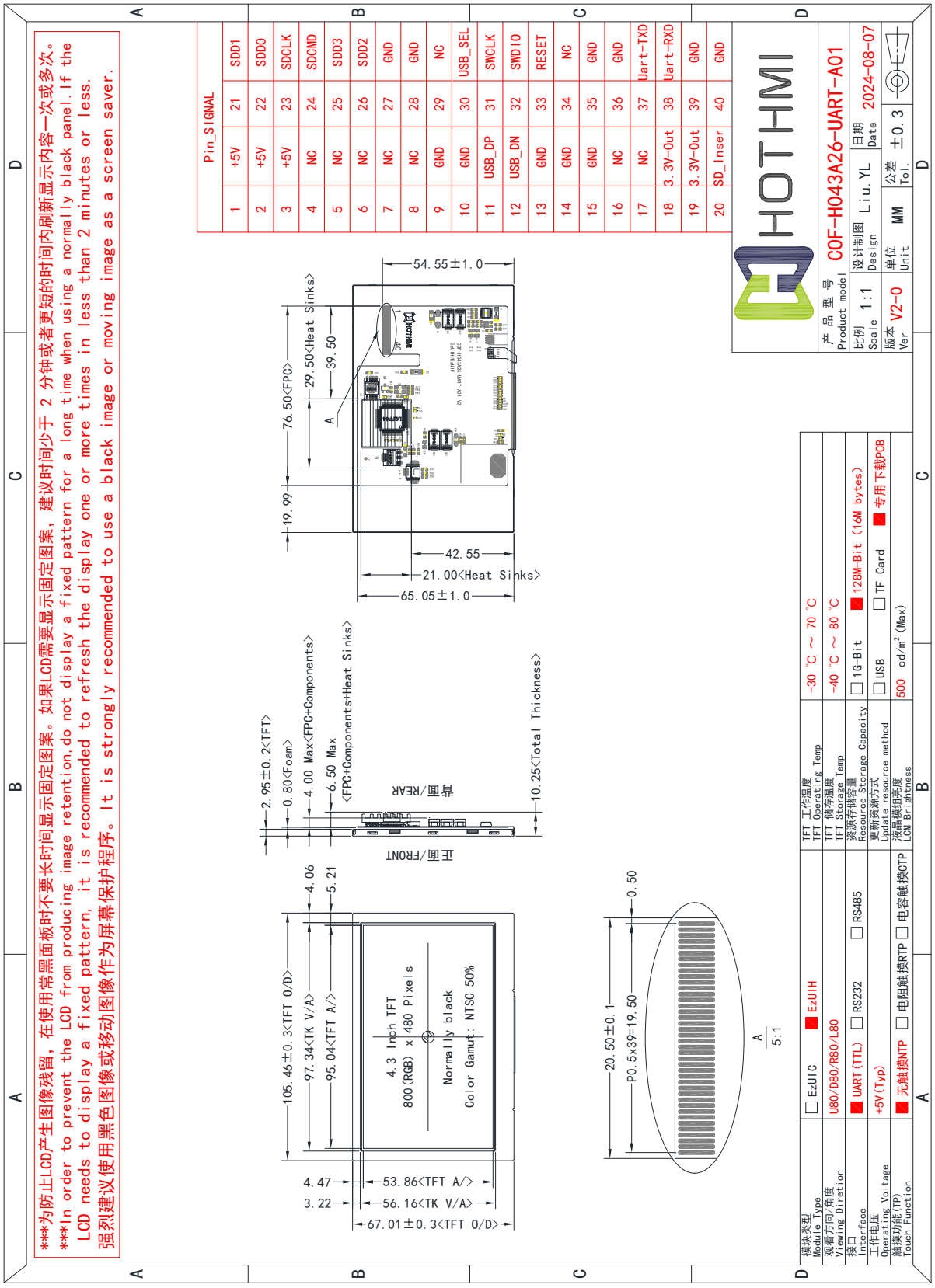
Module operating current: (5V power supply, operating temperature of 25 degrees Celsius)

项目 Item	标号 Symbol	条件 Condition	最小值 Min	典型值 Type	最大值 Max	单位 Unit
工作电流 Operating current	Is	动态显示，背光=300	-	-	-	毫安 mA

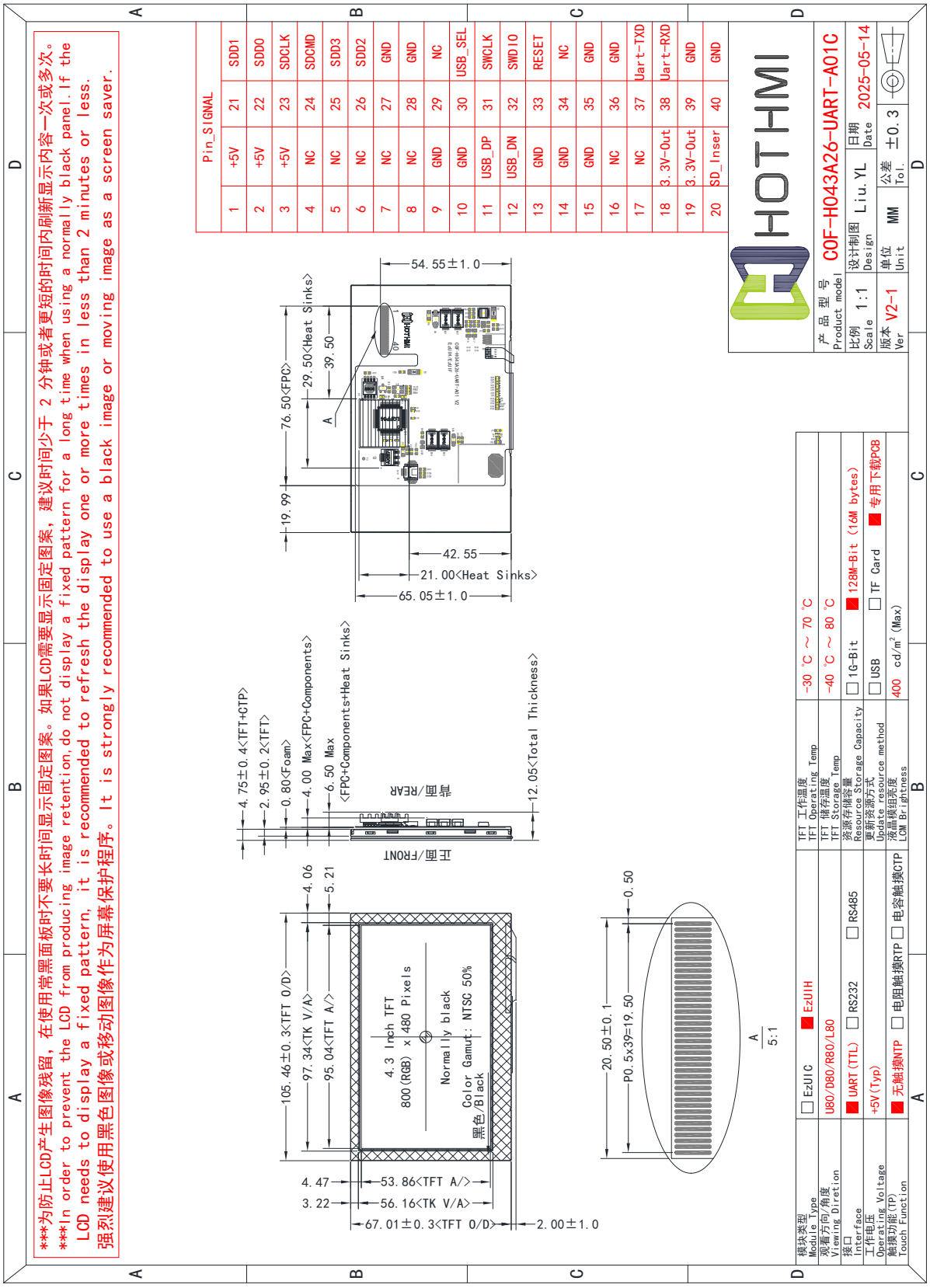
注意：以上测试均为模块控制引脚与 MCU 连接的条件下。

Note: The above tests are all under the condition that the module control pins are connected to the MCU.

1.3 模块尺寸 Module dimensions



COF-H043A26-UART-A01_V2-0（16-MByte/NTP_500 cd/m²）



COF-H043A26-UART-A01C_V2-1 (16-MByte/CTP_400 cd/m²)

1.4 引脚定义描述 Pin Definition Description

引脚序号 Pin NO.	标示符 Identifier	详细描述 Detailed description
1 ～ 3	+5V	5V 电源输入，电流1A或以上 5V power supply input, 1A or more current
4 ～ 8	NC	空引脚，不连接 Empty pins, not connected
9 ～ 10	GND	电源地 Power supply ground
11	USB_DP	默认升级资源方式：U盘模式数据引脚 Default upgrade resource approach: U disk mode data pins
12	USB_DN	
13 ～ 15	GND	电源地 Power supply ground
16 ～ 17	NC	空引脚，不连接 Empty pins, not connected
18 ～ 19	3.3V输出	直流3.3V输出引脚 DC 3.3V output pins
20	SD_Inser	备选升级资源方式：SD TF卡接口，建议16G以内。 Alternative approaches to upgrading resources: SD TF card interface, recommended within 16G.
21	SDD1	
22	SDD0	
23	SDCLK	
24	SDCMD	
25	SDD3	
26	SDD2	
27～ 28	GND	电源地 Power supply ground

- 下一页 -
- Next page -

引脚编号 Pin NO.	标号 Symbol	详细描述 Description
29	NC	空引脚，不连接 Empty pins, not connected
30	USB_SEL	USB升级方式控制引脚，低有效。不连接或不使用时默认进入正常显示状态 USB upgrade mode control pin, low active. Default to normal display when not connected or not in use
31	SWCLK	调试用，默认不连接 For debugging, not connected by default
32	SWDIO	调试用，默认不连接 For debugging, not connected by default
33	MCU_RES	调试用，默认不连接 For debugging, not connected by default 主控芯片复位引脚，低电平有效 Master chip reset pin, active low
34	NC	空引脚，不连接 Empty pins, not connected
35 ～ 36	GND	电源地 Power supply ground
37	Uart-TXD	UART 模块数据发送引脚 UART module data transmission pins
38	Uart-RXD	UART 模块数据接收引脚 UART module data reception pins
39 ～ 40	GND	电源地 Power supply ground
- 结束 - - END -		

1.5 模块下载资源文件 Module download resource files

UART 模块可以将 EzUITool 工具制作生成的资源文件（.ers）下载到其中，我司配套的测试板上有一个拨码开关“K1”或跳选排针用于 USB 模式选择，其拨至 USB 模式时（也即资源下载模式）可使用 USB 线将模块与 PC 机连接，会在 PC 机端识别出一个 U 盘，将资源文件拷贝到其中即可。资源文件保存在模块 U 盘当中时，需要注意，仅允许放置一个资源文件，且要求文件名为英文名。

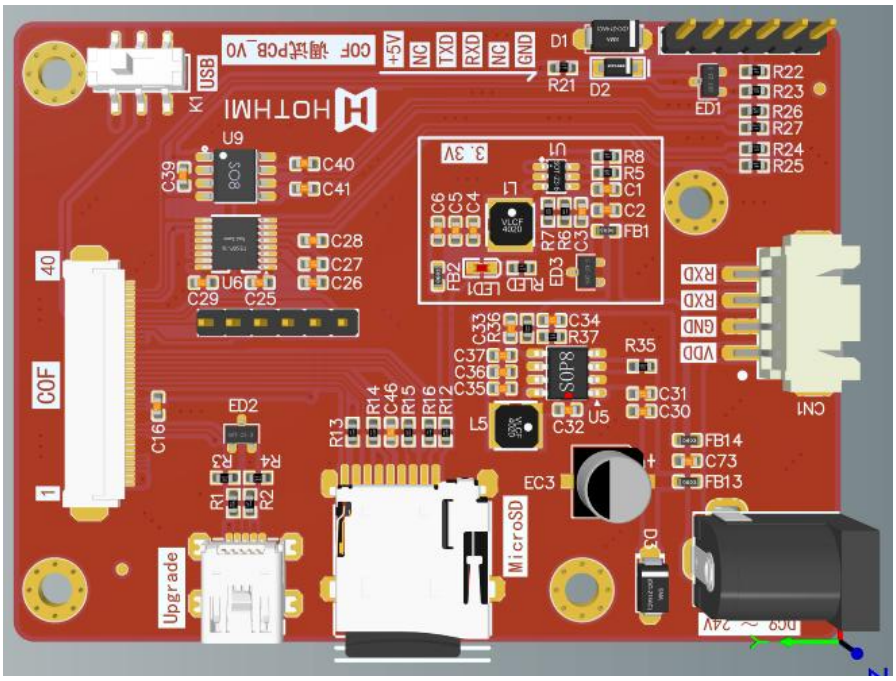
UART module can download the resource files (.ers) generated by the EzUITool tool into it, our supporting test board has a dip switch “K1” or jump select pin for USB mode selection, which is dialed to the USB mode (i.e., the resource download mode) can be used to connect the module to the PC with a USB cable, which will recognize a USB flash drive on the PC side and copy the resource files into it. When it is set to USB mode (i.e. resource download mode), you can use the USB cable to connect the module to the PC, and a USB flash disk will be recognized on the PC, and the resource files can be copied to it. When the resource file is saved in the module U disk, it should be noted that only one resource file is allowed to be placed, and the file name is required to be in English.

模块正常工作时，需将拨码开关拨到正常工作的模式一端，但需要注意，**切换模式后，模块需要重新上电**。

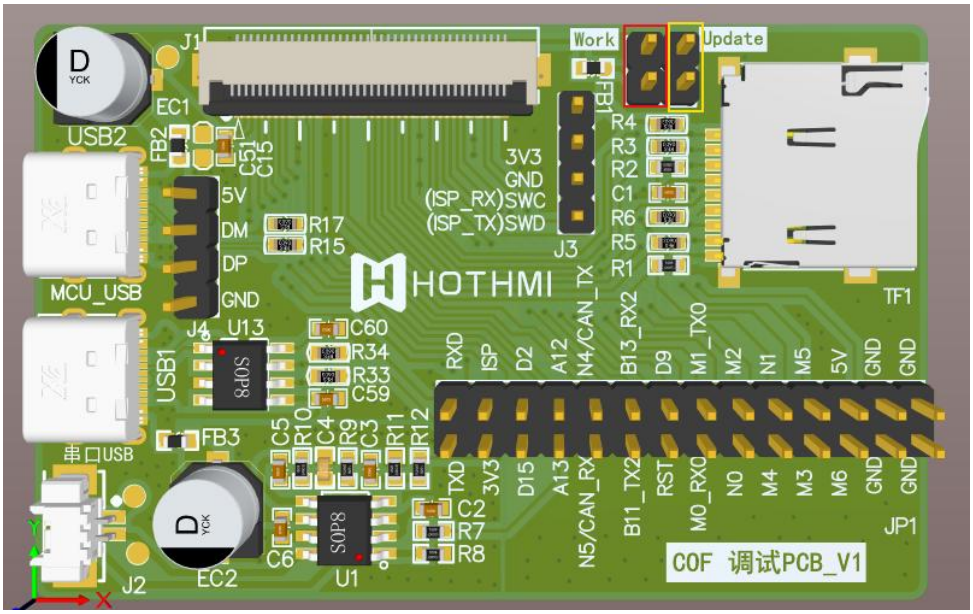
When the module is working normally, you need to turn the dipswitch to the normal working mode end, **but it should be noted that the module needs to be re-powered after switching modes.**

模块的 USB 接口为 Mini B 型 USB 口。需要注意，UART 模块**可从 USB 口取电**，但建议仅当模块处于 USB 模式时方可由 USB 口给模块供电，不建议用户在正常显示模式时，使用 USB 口给模块进行供电。

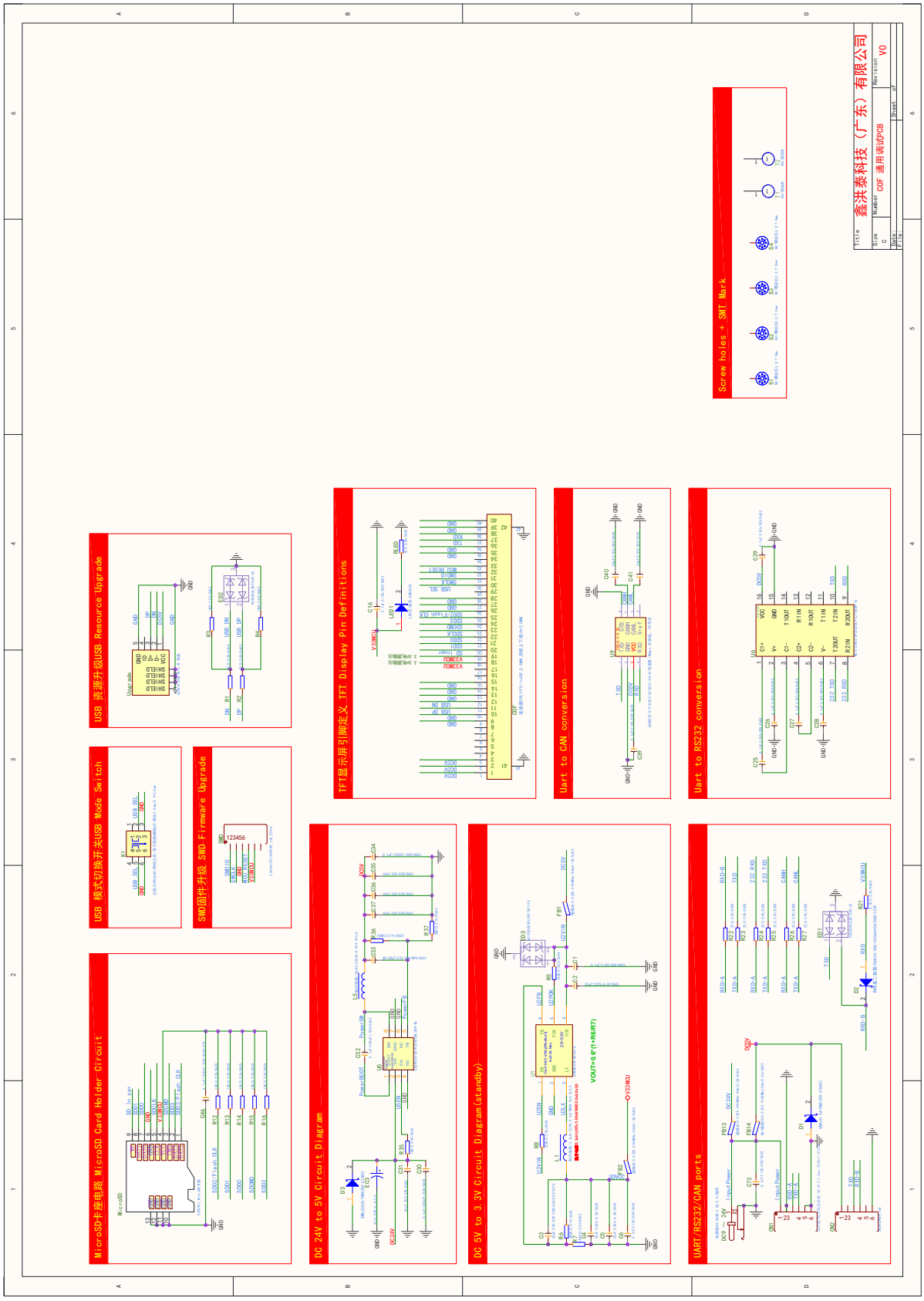
The USB port of the module is a Mini B type USB port. Note that the UART module can draw power from the USB port, **but it is recommended that the module be powered by the USB port only when the module is in USB mode,** and it is not recommended that users use the USB port to power the module in normal display mode.



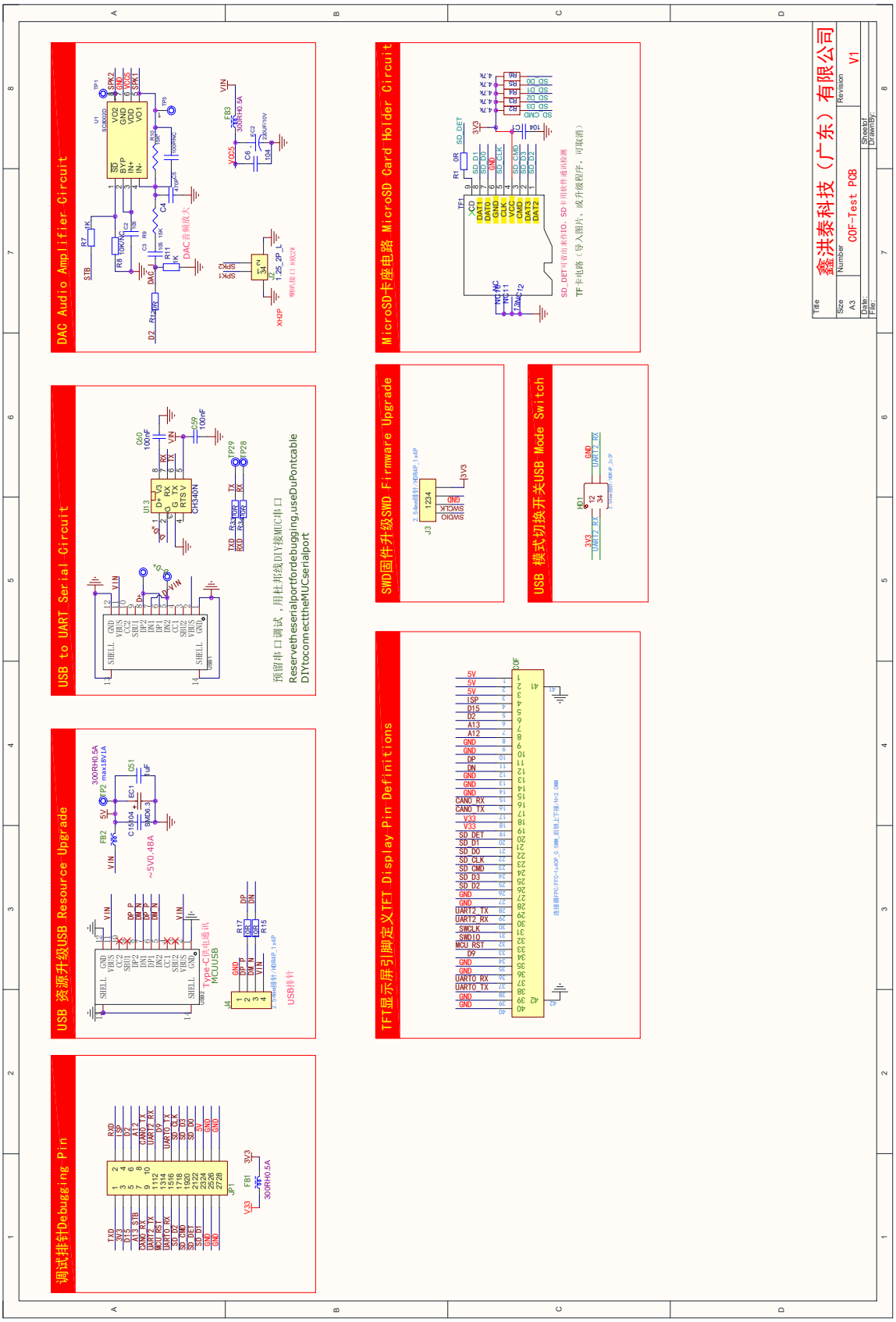
PCBA_V0



PCBA_V1



Debug PCBA_V0 Schematic



Debug PCBA_V1 Schematic

1.6 显示屏坐标点映射关系

Display coordinate point mapping relationship

以 4.3 英寸普清屏模块（480×272 点阵）为例，4.3 英寸 TFT-LCD 显示面板上，共分布着 480×272 个像素点，而模块内部的 TFT-LCD 驱动控制芯片内置有与这些像素点对应的显示数据 RAM（简称显存）。模块中每个像素点需要 16 位的数据（即 2 字节长度）来表示该点的 RGB 颜色信息，所以模块内置的显存共有 480 × 272 × 16bit 的空间，通常我们以字节（byte）来描述其的大小。

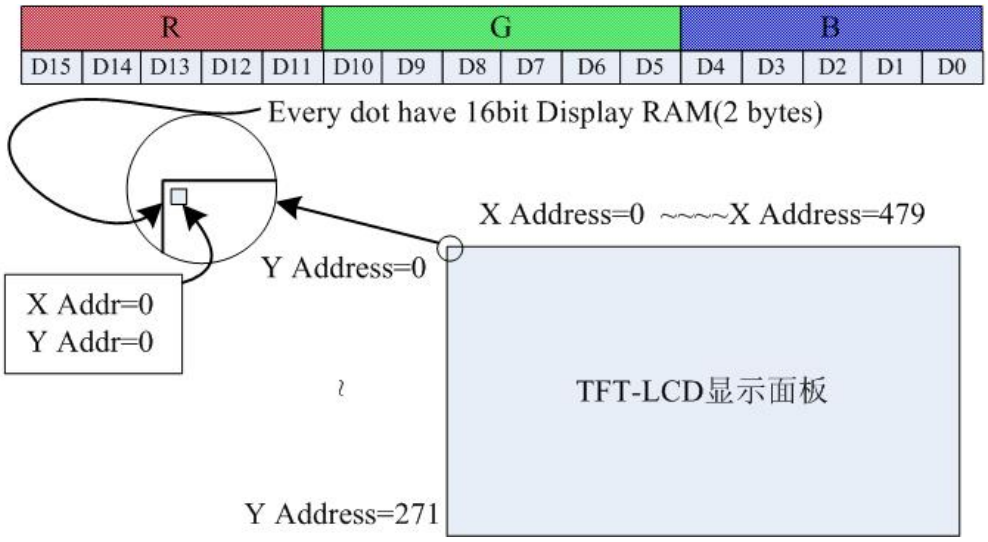
The 4.3-inch TFT-LCD display panel has a total of 480 × 272 pixels, and the TFT-LCD driver controller chip inside the module has a display data RAM (memory for short) corresponding to these pixels. Each pixel in the module requires 16 bits of data (i.e., 2 bytes in length) to represent the RGB color information of the dot, so the module's built-in memory has a total space of 480 × 272 × 16 bits, which is usually described in terms of bytes.

而为了便于索引操作，模块将所有的显存地址分为 X 轴地址（X Address）和 Y 轴地址（Y Address），横屏显示时分别可以寻址的范围为 X Address=0~479，Y Address = 0~271，X Address 和 Y Address 交叉对应着一个显存单元（2byte）。

And in order to facilitate the indexing operation, the module divides all the memory addresses into X-axis address (X Address) and Y-axis address (Y Address), which can be addressed in the range of X Address = 0~479 and Y Address = 0~271 respectively when displayed in landscape, and the cross of X Address and Y Address corresponds to one memory cell (2byte).

横屏模式的 UART 模块的像素点与显存对应关系下图所示 ：

The pixel dots of the UART module in landscape mode correspond to the video memory as shown in the following figure:



触摸版的 UART 模块将触摸面板集成于模块之中，在出厂前已经过校对，在屏幕显示的有效区域内，触摸的点的位置数据也以 X 轴、Y 轴坐标表示；X 轴从 0~479，Y 轴从 0~271，与模块的显示屏的坐标相同。

The touch version of the UART module integrates the touch panel into the module and has been calibrated before leaving the factory. The position data of the touch points in the effective area of the screen display is also expressed in X-axis and Y-axis coordinates; X-axis from 0 to 479 and Y-axis from 0 to 271, the same coordinates as the module's display.

2 模块配置 Module Configuration

2.1 模块 UART 波特率及其它基本配置

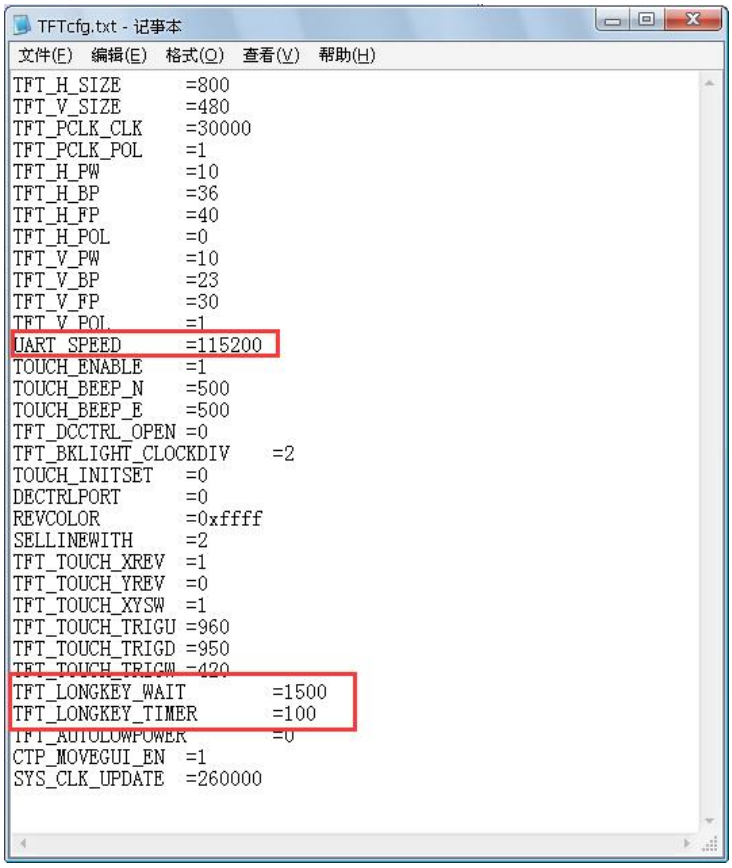
Module UART baud rate and other basic configurations

EzUIH(S)系列模块需要在资源存储器当中预置一个配置文件，在模块连接电脑 USB 接口时，模块所被电脑认出的 U 盘当中该配置文件为一个“.TXT”文件；配置文件中有多项参数可设置，但仅有部份项是对用户开放的，其它的参数请不要随意改动，否则可能会造成模块的显示不正常。

EzUIH(S) series modules need to preset a configuration file in the resource memory, and the configuration file is a ".TXT" file in the USB disk recognized by the computer when the module is connected to the computer USB interface; there are many parameters in the configuration file that can be set, but only some of them are open to the user, other Please don't change the other parameters, otherwise it may cause the module to display abnormally.

配置文件如下图所示 The configuration file is shown below：

配置文件打开后，如下图所示 After the configuration file is opened, the following image shows：



上图中，红框中的三项是可供用户配置的，其它内容请不要修改，以免模块无法正常显示。

In the above figure, the three items in the red box are available for user configuration. Please do not modify the other contents so that the module will not be displayed properly.

UART_SPEED：

该配置选项为模块上电后的 UART 波特率设置，用户可以自行修改该项配置，以适应需求。

This configuration option is the UART baud rate setting after the module is powered up, and the user can modify this configuration to suit the needs.

TFT_LONGKEY_WAIT：

该配置为模块长按键触发时间设置，该值小于 800 时，表示模块将不提供长按键功能，该数值以 ms 为单位。

This configuration is the module long key trigger time setting, the value is less than 800, it means the module will not provide the long key function, the value is in ms.

TFT_LONGKEY_TIMER：

该配置为模块长按键连续触发时间，该值也以 ms 为单位。

This configuration is the module long key continuous trigger time, the value is also in ms.

其它部分配置项说明：

TOUCH_ENABLE：

触摸使能及类型配置，0 无触摸　1 电阻触摸屏　2 电容触摸屏

Touch enable and type configuration, 0 no touch 1 resistive touch screen 2 capacitive touch screen

TFT_AUTOLOWPOWER：

模块自动关屏时间设置，0~9999 表示关闭该功能；ms 为单位 有效数值为 10000~1200000 10S~20Min。

Module automatic screen off time setting, 0~9999 means turn off the function; ms is the unit Valid values are 10000~1200000 10S~20Min.

CTP_MOVEGUI_EN：

电容触摸屏版本滑屏切换界面使能。

Capacitive touch screen version sliding screen switching interface enable.

文档修订记录 Document revision history:

版本 Version	日期 DATE	修改说明 Modify description	编著 Editorial
V1.0	2024-06-29	初次编制 First compilation.	YL
V1.1	2025-05-14	1、增加调试 PCBA 原理图 Add Debug PCBA Schematic 2、增加公司商标 Add company logo.	YL

- - 结束 - -

- - END - -