WT32-SC01 Datasheet

Version **V3.3-2**
Wireless-tag
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Historical version			
Version	Author	Date	Describe
1.0	YAN	2020-01-25	First creation
3.2	YAN	2020-04-10	Modify physical picture and add board test parameters
3.3	YAN	2020-05-09	Correct typos and add software development
3.3-2	YAN	2020-12-04	Add SMD-RAP

Content

Overview

WT32-SC01 is a development board for visual touch screen, the board is equipped with GUI platform firmware developed independently, support graphic drag and drop programming to help users complete the development of customized control platform. The main controller of WT32-SC01 development board adopts esp32-wrover-b module, this module is a general-purpose WiFi + BT + BLE MCU module, 4MB SPI flash and 8MB PSRAM are configured in. WT32-SC01 development board can also develop and debug functions such as buttons, voice and camera through the expansion interfaces on both sides, greatly shorten the development cycle of users.

Board Size

As shown in the figure below is the dimension diagram of WT32-SC01 development board, the size of the board is 58mmx91mm, and there are 4.05mm diameter positioning holes at four feet of the board.
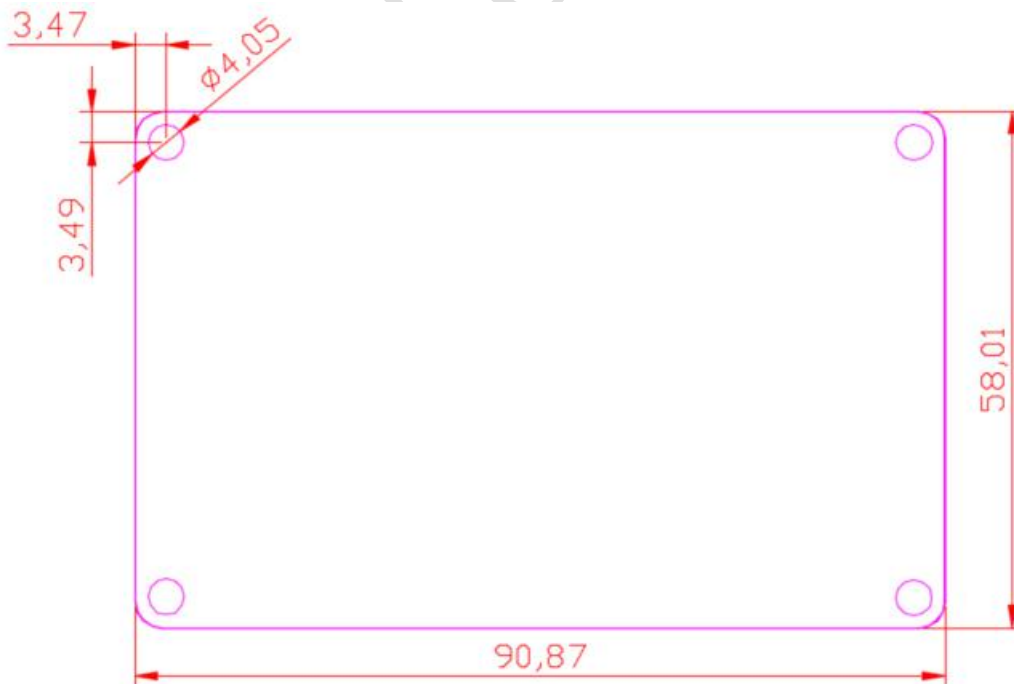

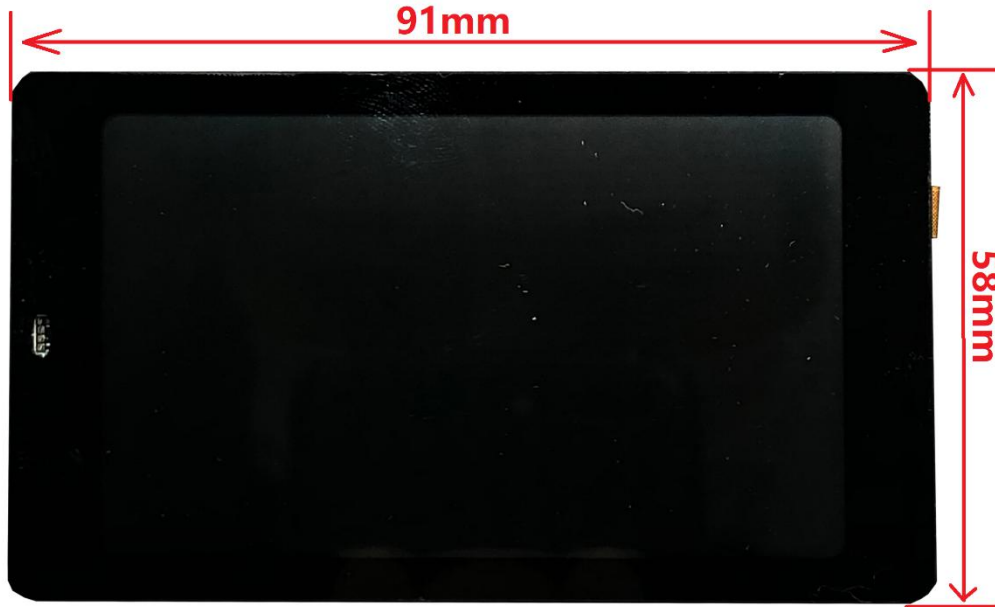
Figure 2-1：PCB dimension diagram

Figure 2-2：Physical dimension diagram 1

Figure 2-3：Physical dimension diagram 2

Hardware Resource

The hardware resources of the development board are as follows:
Figure 2 shows the physical front view of the development board. It consists of a 3.5-inch LCD screen with a resolution of 320x480 and a capacitive touch pad, and it Supports two touch.

Figure 3 is the physical figure on the back of the development board, which contains the following hardware resources:

1、ESP32-WROVER-B Module

Esp32-wrever-b is a Wi Fi + Bt + ble MCU module for all kinds of applications. It has powerful functions and wide applications. It can be used in low-power sensor networks and demanding applications, For example, voice coding, audio streaming and MP3 decoding. The parameters of this esp32-wrapper-b are:8Mbyte PSRAM+4Mbyte Flash.

2、TP Interface

Capacitive touchpad interface, I2C interface, 0.5mm spacing, 6pin, flip down type.

3、LCM Display interface

3.5-inch LCM display interface, SPI interface, 0.5mm spacing, 24pin. This SPI interface is connected to the hardware HSPI interface of esp32, the operating clock frequency can reach 80MHz. The screen parameters used are: Size-3.5Inch; Pixel density-165PPI; Resolution:320*RGB*480; Screen model: WT-352215-A2.

4、Power management

Two LDOS of 3.3V output, One supplies power to the board itself, The other supplies power to the external expansion board, The power supply is separated to prevent the expansion board from interfering with the power supply of esp32, it ensures the stability of the esp32.

5、External power interface

Reserved external power interface (positive and negative as shown in + - sign on the figure), input voltage range 5v-9v, maximum load current I > 2A.

6、RST Key

Touch the self-reset button to connect to the EN pin of ESP32. This button can be used to reset ESP32.

7、Type-C Interface

Universal USB-C interface (Type-C interface), this interface is used to power the development board, UART communication and firmware download. The hardware of the download circuit implements data flow control, so the firmware download supports one-click automatic download.

8-9、Expansion Board Interface

The interface of the external expansion board can be used for power supply,

communication, control, etc. So as to achieve functional expansion to meet the various needs of users. The 8 and 9 interfaces are connected by Pin to Pin, so the circuit connection of the expansion board inserted into the 8 interface and the 9 interface is the same, but only to meet the user's experience of installing the expansion board in different directions. Simultaneously: When the IO of the two expansion boards does not conflict, two expansion boards can be inserted at the same time to achieve two expansion functions. Expansion board interface specifications: 2.0mm pitch, 2X20Pin, can be installed on both sides of the horizontal row. The interface definition is shown in Figure 3-Extended Edition Interface Definition Diagram.
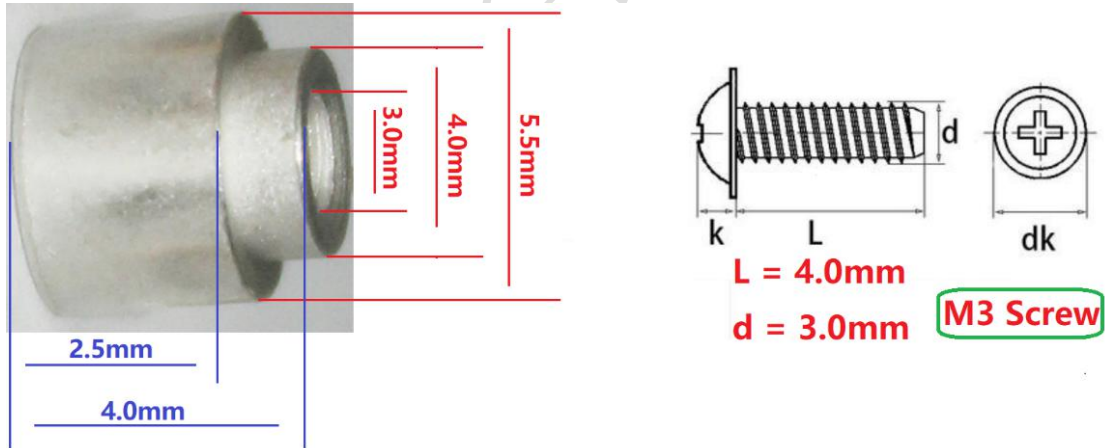
10、Power Indicator

The power indicator (red light) lights up when you plug in the USB cable.

11、UART Communication Indicator

The TXD indicator and RXD indicator in the UART will flash when there is data flow.

12、SMD-RAP

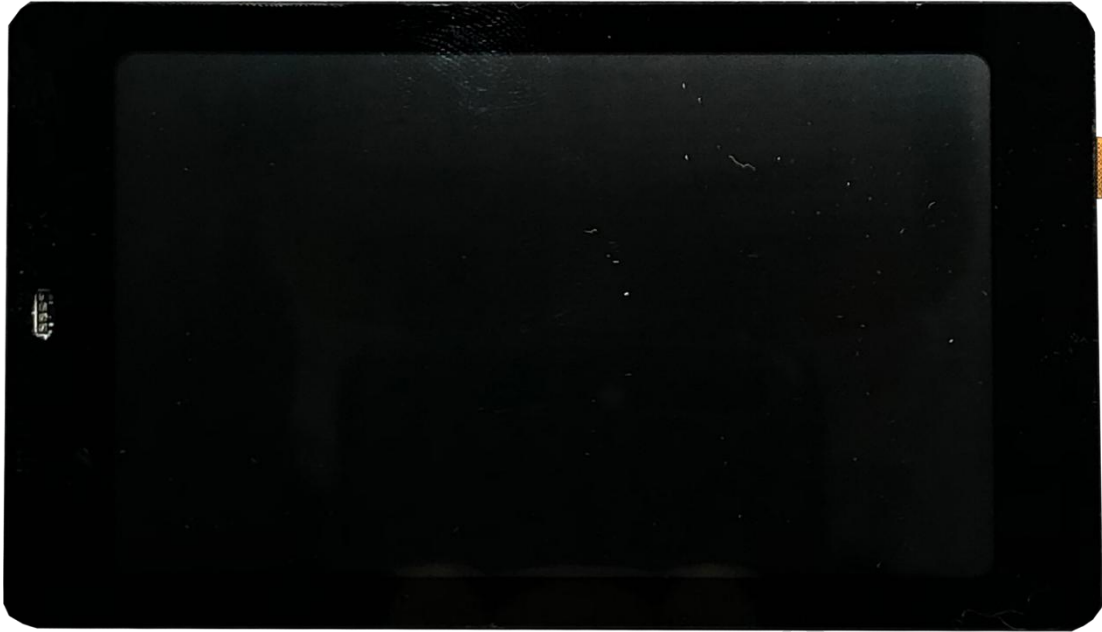The SMD-RAP is suitable for M3 screw。

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Figure 3-1: Front view of WT32-SC01 development board
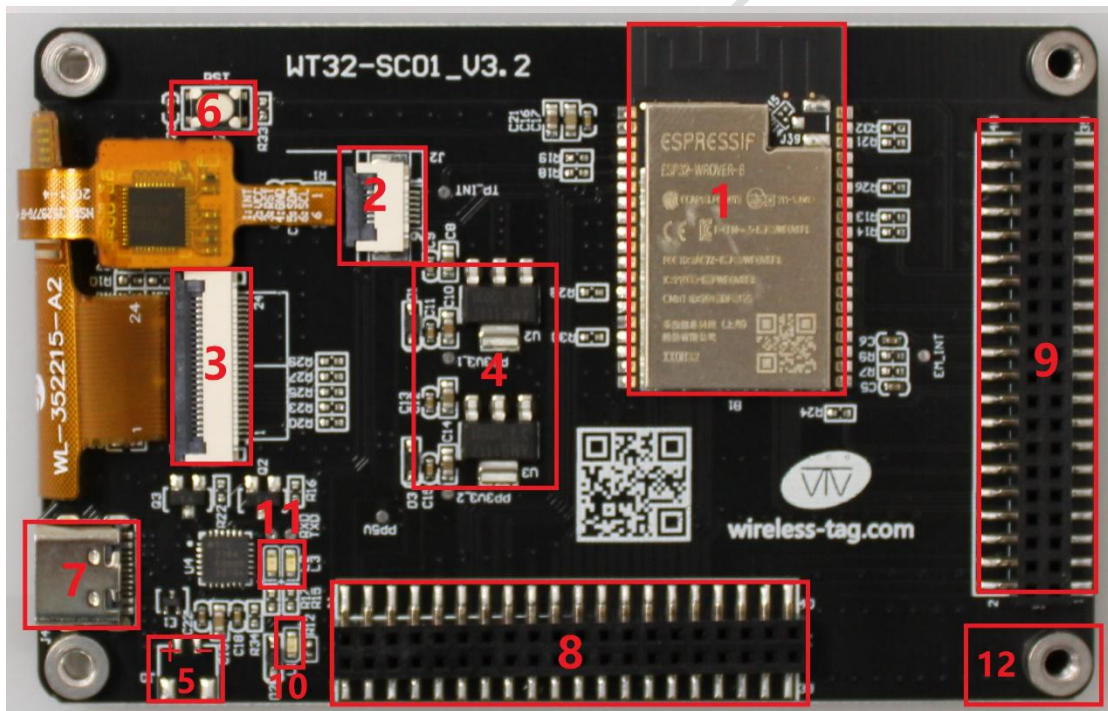

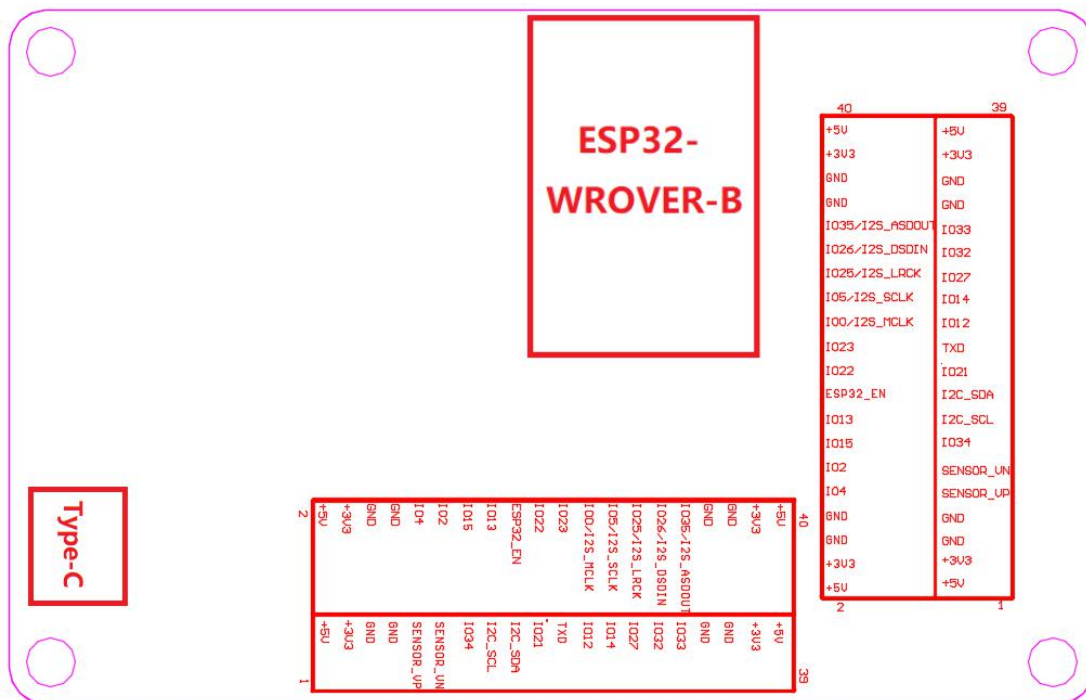**Figure 3-1: Rear view of WT32-SC01 development board**

Figure 3-3: WT32-SC01 board interface definition diagram

Power On Instructions

1、Power supply

This development board supports USB Type-C 5V power supply and reserved external power input interface (as shown by reference number 5 in Figure 3). It is recommended that the input voltage 5V support current is not less than 1A when other expansion boards are not inserted, and the input voltage 5V support current is not less than 2A when other expansion boards are inserted (refer to the actual power consumption of the expansion board for details). Note: When the external power supply is provided through the reserved power interface, the power supply voltage input range is 5V-9V, and the load current is recommended to be I> 2A.

2、Precautions

Please make sure that the FPC cables of the TP and LCM screens have been inserted into the corresponding FPC sockets before powering on the development board, otherwise the TP and LCM screens may be damaged.

If the development board is abnormal, please test the voltage of the three TestPad points (PP5V, PP3V3_1 and PP3V3_2) on the board first. Among them, the output of PP3V3_1 is used to supply 3.3v power to the board, PP3V3_2 is used to supply 3.3v power to the external expansion board, and PP5V is the USB input 5V power supply which also

provides external expansion board. Figure 5 is a schematic diagram of the test points of the power supply of the development board.

Figure 4-1: Schematic diagram of power supply test points of the development board
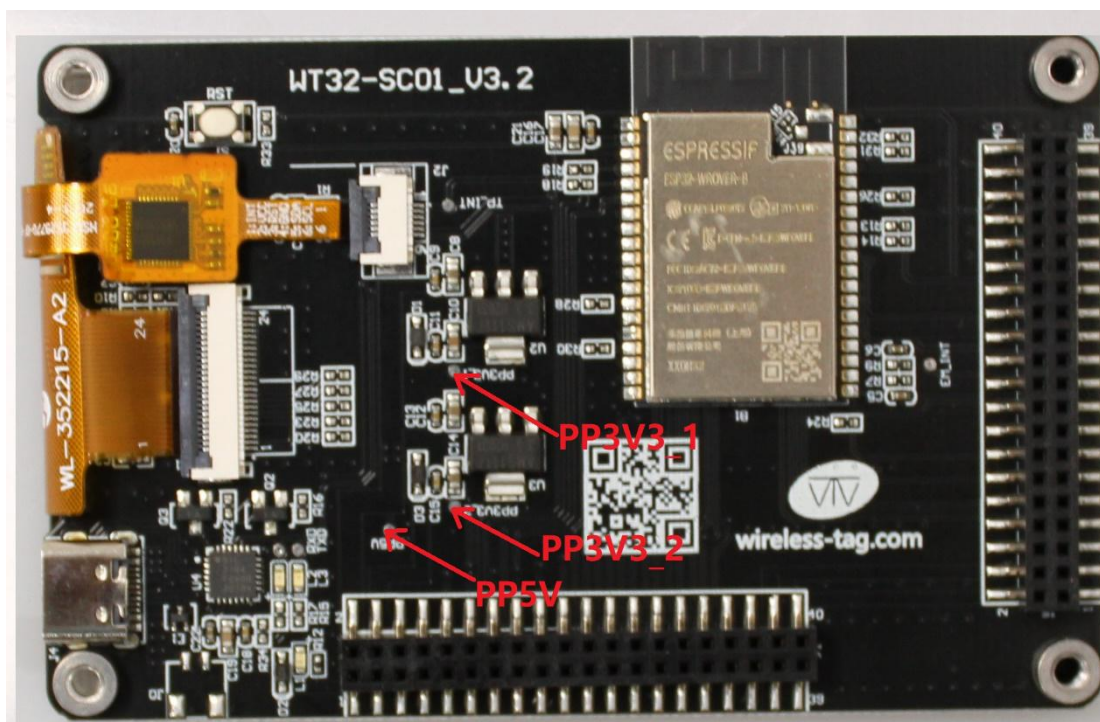
Board Electrical Parameters

Test environment:

1、Temperature: Room temperature 25 ℃

2、Power supply: 5.0V Voltage ripple V < 100mA

Test parameters:

1、Normal working current: 240mA（Average current）
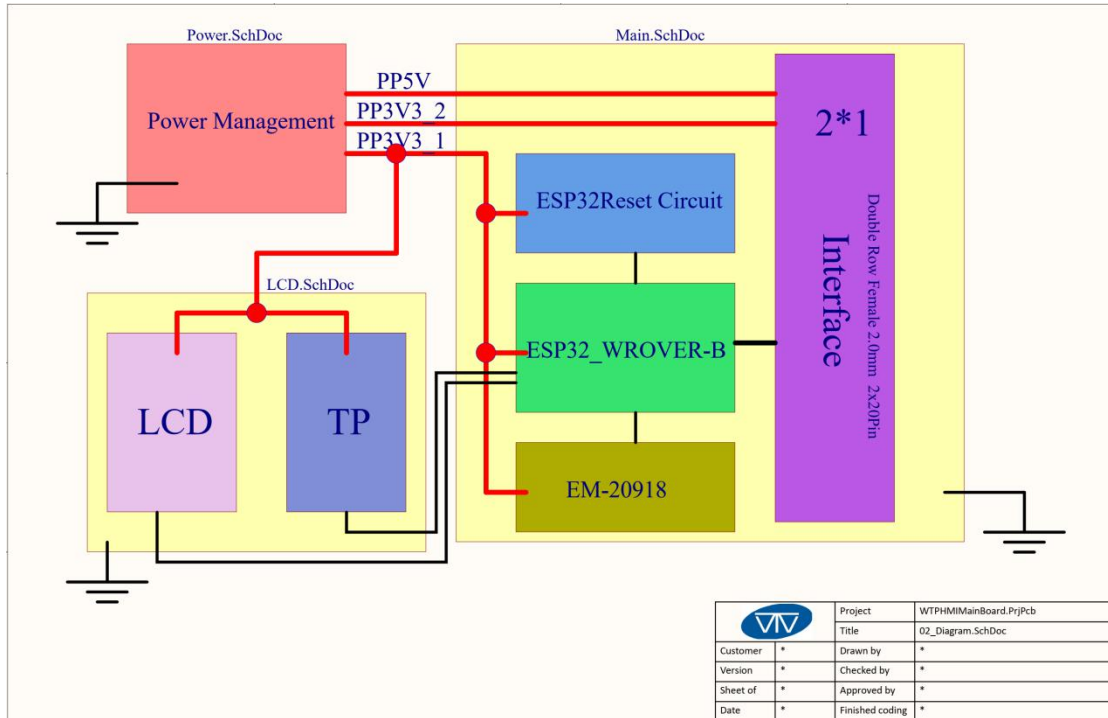2、Working current under sleep: Less than 18mA（Average current）

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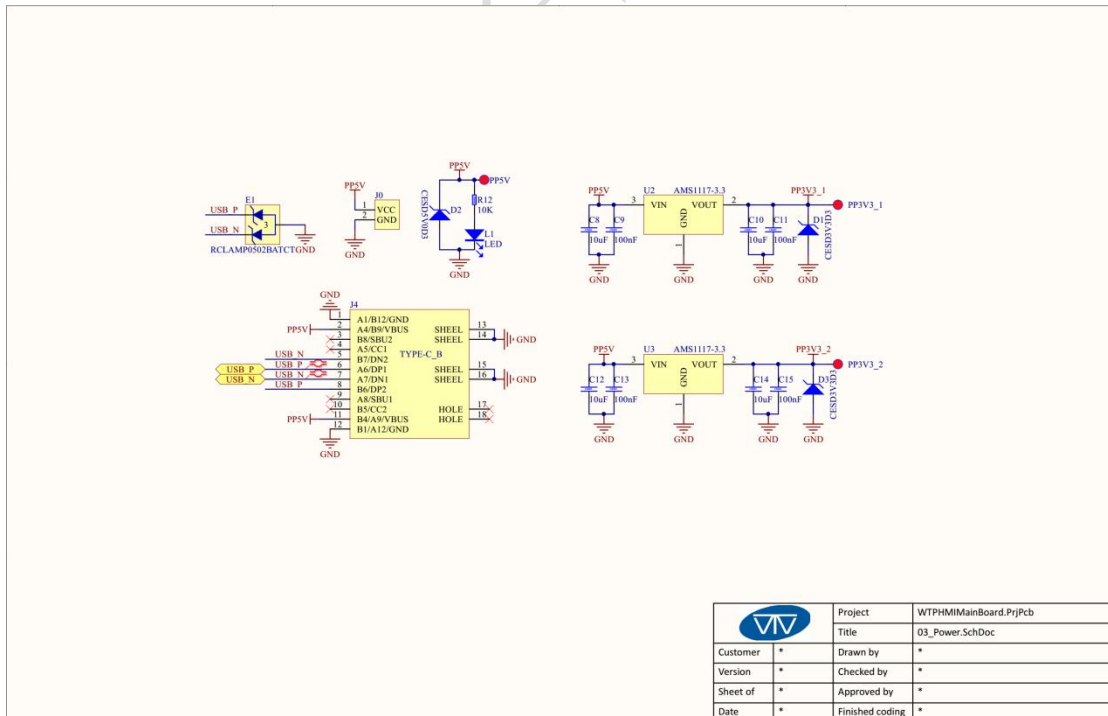
Circuit Schematic

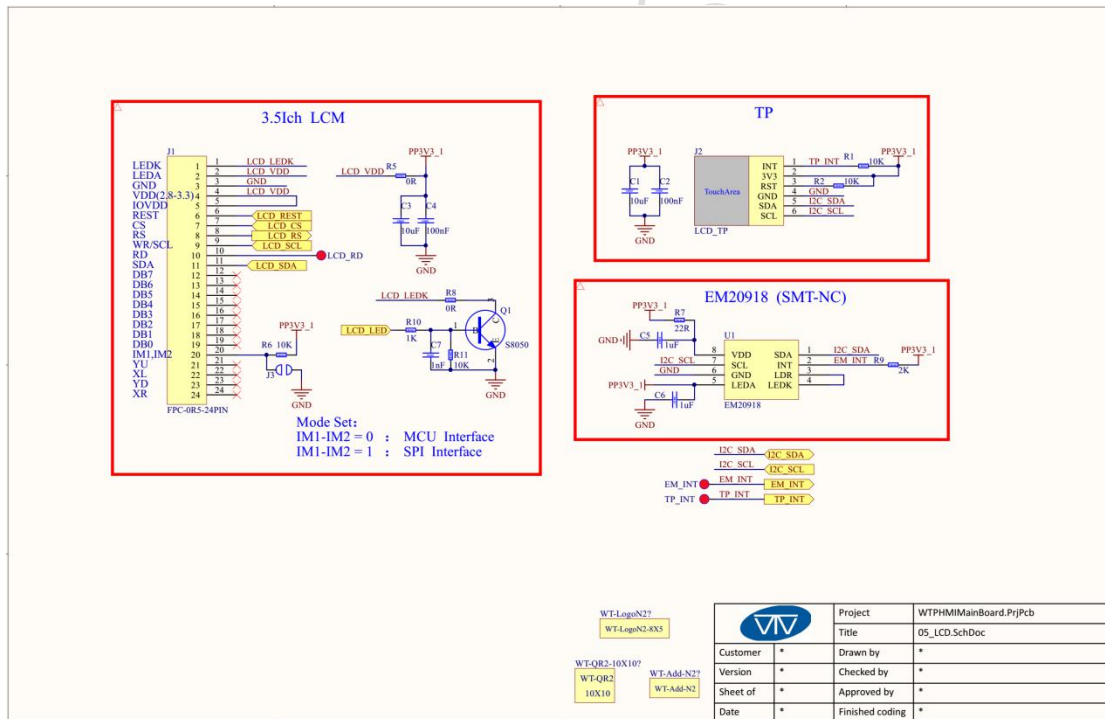**Figure 6-1: Schematic diagram one**

Figure 6-2: Principle 2

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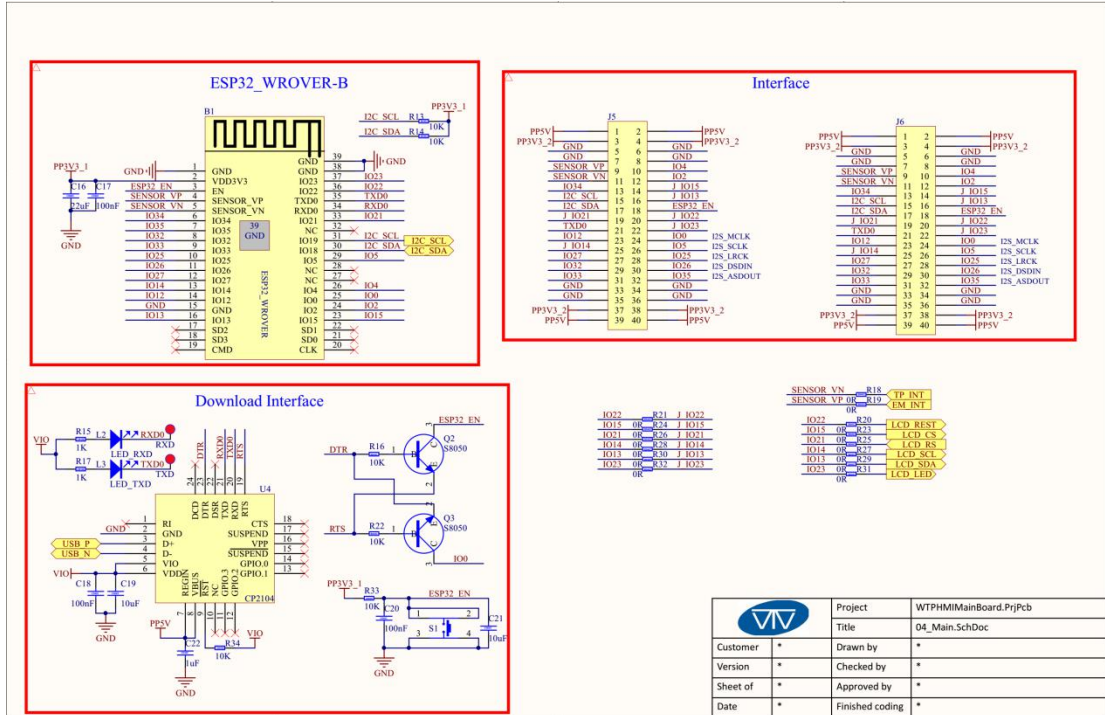
Figure 6-3: Schematic diagram three

Schematic diagram 4

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Firmware Burning

1、Step One:

Connect the WT32-SC01 board to the computer via the USB-TypeC data cable. Since this development board has automatic data flow control processing, the firmware can be automatically downloaded through ESP32 Flash_Download_Tools.

2、Step Two:

As shown in Figure 7-1 below: Select the firmware path to be burned at 1. The address is usually 0X00. After setting, remember to tick the front; Select the system clock to be 40MHz at 2 locations; Choose the size of Flash as 32Mbit in 3 places; Select SPI MODE as DIO mode at 4 places; Select the port number of the current board recognized by the computer at 5; Select the serial port baud rate at 6 places (the larger the value, the faster the firmware download rate, and the maximum support is 1152000bps); After completing the previous configuration, click at 7 to start burning the firmware.

3、Step Three:

After completing the above two steps, press the reset button on the back of the development board to start running the firmware just burned.
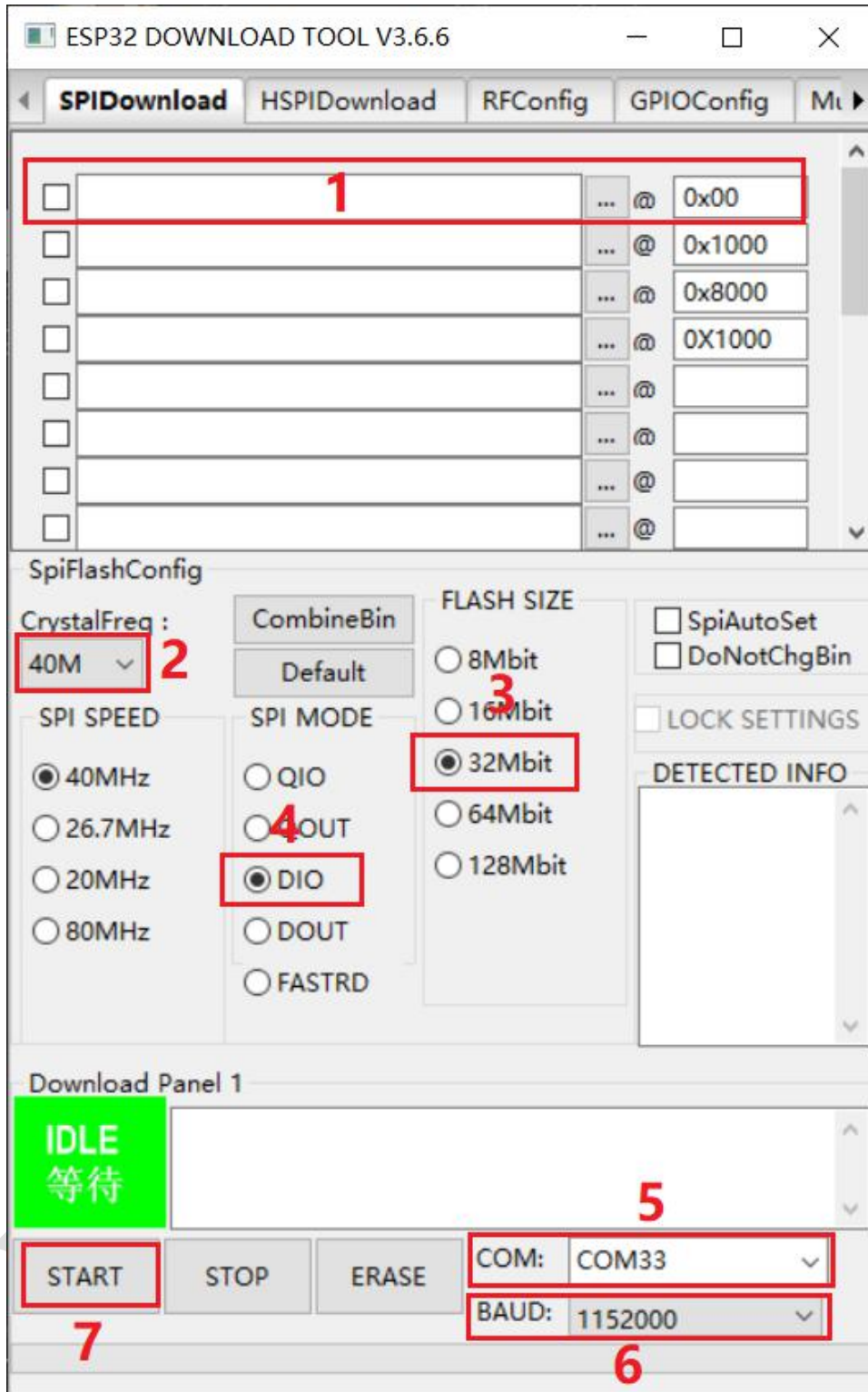
Figure 7-1: Burning instructions

Function Development

1、Screen Brightness Adjustment

As shown in Figure 8-1, GPIO23 of ESP32 is a pin to control the LCD backlight, Users can control the backlight on and off through IO23 or adjust the backlight brightness of the LCD through PWM modulation.
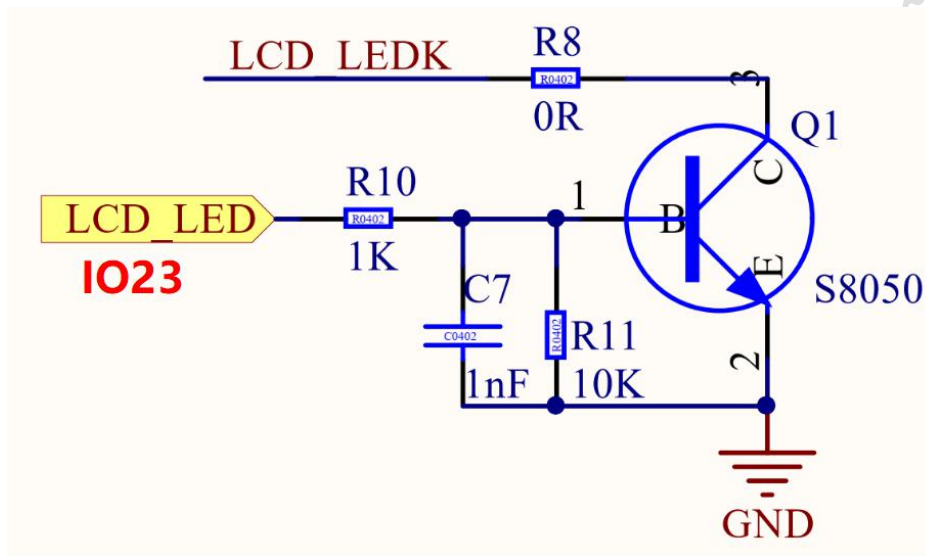

Figure 8-1: LCD backlight control diagram

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2、Graphical Interface Development

Users can quickly develop through our online platform, the platform is similar to MIT APP Inventor, it realizes the rapid development of building blocks. At present, the platform has improved the development of graphical interface, more driver code blocks will be continuously improved in the future. The login URL of the online platform is as follows: **http://esp32.8ms.xyz/login** .
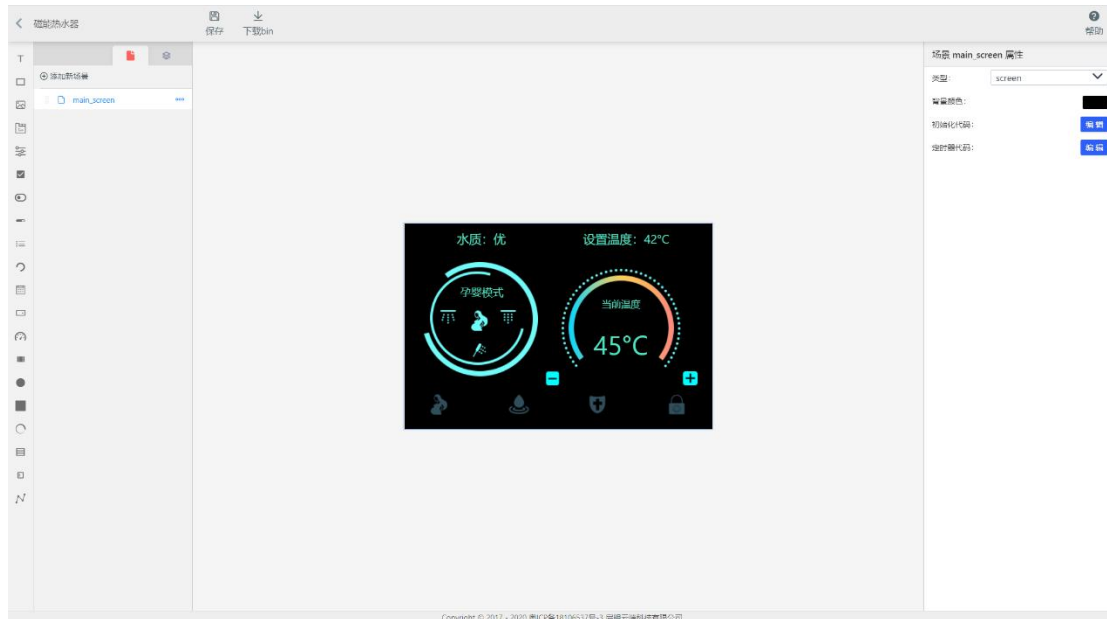

Figure 8-2: Platform development interface one

Figure 8-2: Platform development interface two

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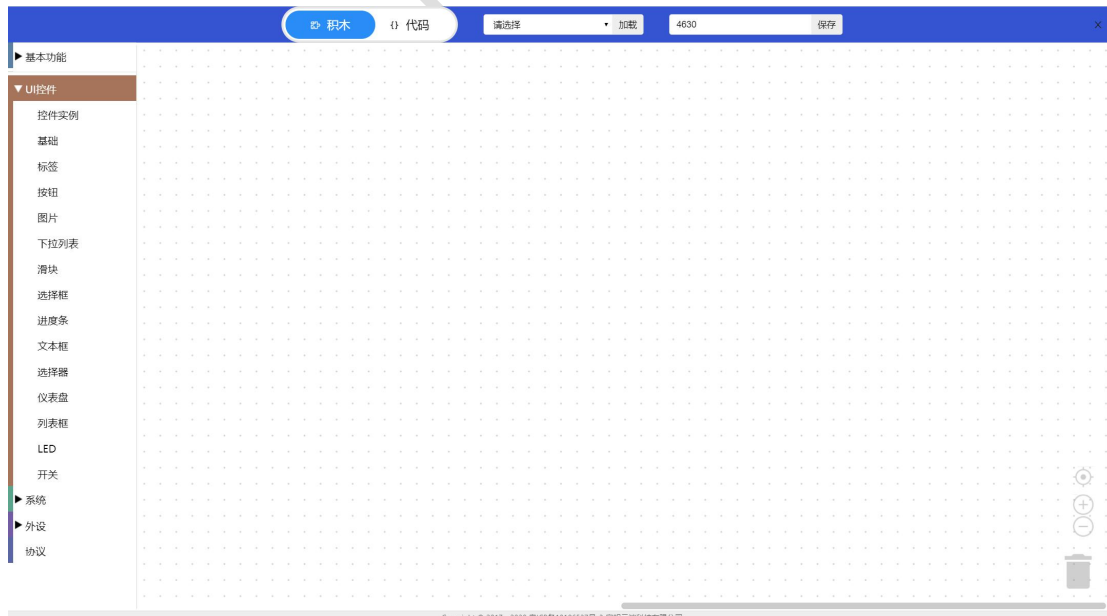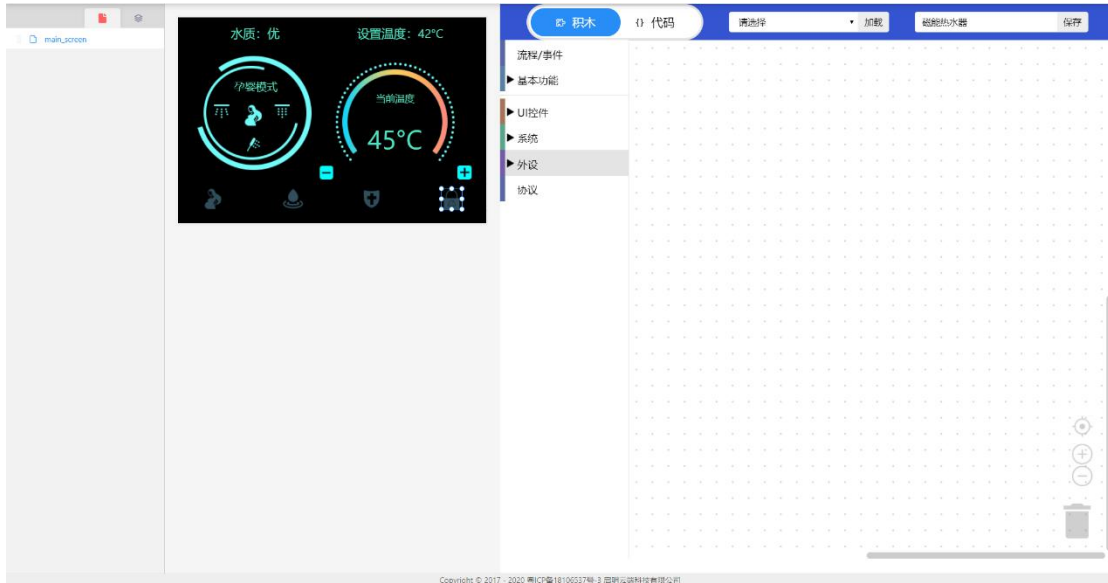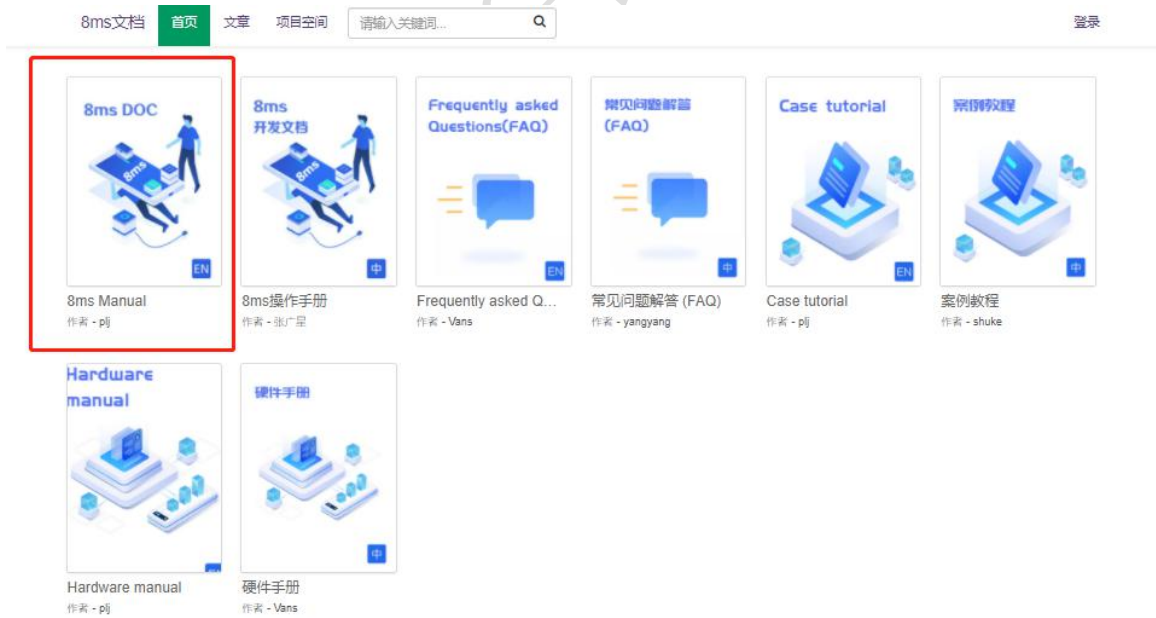
Figure 8-3: Platform development interface three

3、Blockly Development

Please refer to the following link and then find "8ms Manual"------ "Blockly".

https://doc.8ms.xyz/

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