1.28 inch ESP32 round TFT screen development board

Time 2024/09/24

Version V1.12

Revision History

Date Version		Release Notes
2023-08-31 V1.0 **ÿFirst** release		
2023-11-07 V1.01 **ÿAdd** some circuit descriptions so that users can modify as needed		
2024-03-28 V1.1		**ÿOptimize** the key feel and use better key quality
		ÿOptimize power efficiency to reduce heat and extend battery life
		ÿOptimize antenna matching circuit and add IPEX antenna base
		ÿAdd a power-on jumper, users can cancel the power on and off function by themselves Key functions
		ÿAdded Type-C port CC pin pull-down 5.1K Resistance
		ÿAdd FPC to expand IO and base plate for user convenience External sensors and other equipment
		ÿ Use diodes to prevent USB voltage from directly entering the power supply Battery, cancel the protection to prevent battery voltage from flowing into the USB port diode Tube (Battery voltage is low and generally cannot be plugged into USB)
2024-07-04 V1.11 **ÿCorrected** the manual content, the serial port needs to enable power identification		
2024-09-24 V1.12 **ÿAdded** FPC interface description		

1. Product Introduction

The development board uses a 1.28-inch round TFT screen, GC9A01 driver chip, 240*240

Resolution, 65K color display is clearer, the screen uses SPI interface to connect to the onboard ESP32

Make connections and provide driver examples to make use easier.

The development board provides a USB port for one-click program download or serial communication.

The port can also be used for power supply. There is also a battery interface and charging circuit on board.

Connect a 3.7V lithium battery and you only need to use the USB port to charge it.

The battery is connected to the IO port of ESP32 through two voltage divider resistors, and the ADC can be used to sample

The voltage after voltage division can be used to roughly judge the battery voltage.

In addition, there are three side buttons and a TF card interface on the board, which can be directly inserted into the TF card for

One of the buttons is the power switch button, and the other two are user-defined buttons.

The keys can be encoded according to your needs. If you think the keys are too small,

If it is not convenient to install it into your own shell, you can also weld wires on the pads on both sides of the button.

Connect to external buttons for use.

2. Parameter Introduction

Product Type: ESP32-TFT Development Board Series

Input voltage: USB-5V / 3.7V-BAT (battery only supports 3.7V lithium battery)

Working current: related to the code running situation, generally no more than 100ma

ESP32 Minimum System Parameters

Operating frequency: 240MHZ

Number of cores: 2

Flash size: 16Mbyte

Psram: 8Mbyte (the current version of ESP32 only supports 4Mbyte space)

Antenna: Yes, onboard + ipex (default onboard antenna)

Wireless: Bluetooth + wifi 2.4G

Screen type: TFT IPS

Peripherals: TF card holder x1

User-defined buttons x2

1.28 inch GC9A01 driver chip TFT screen x1
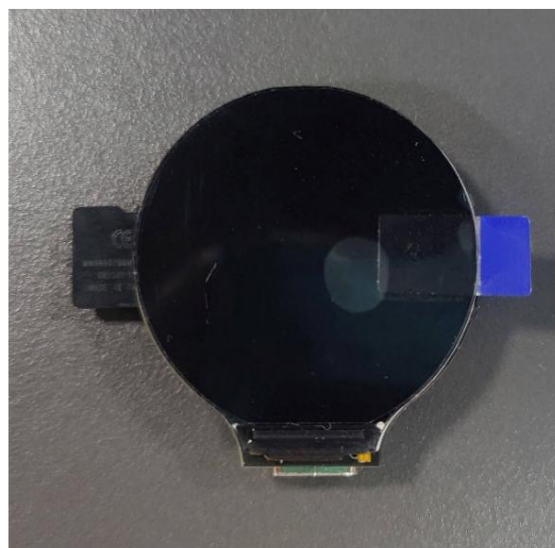
Power collection interface x1
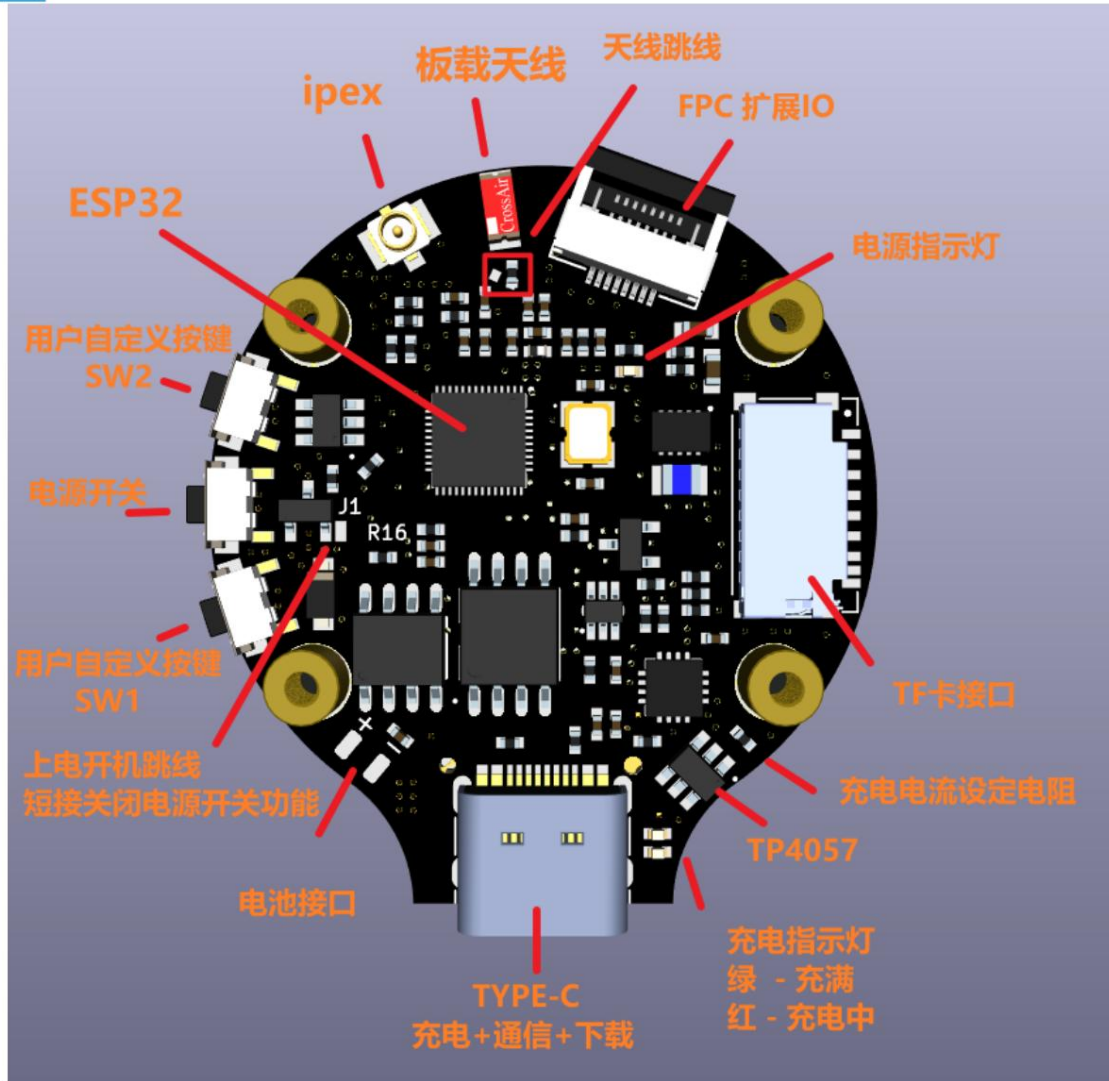
Fixing method: M2 copper column

Size reference: 41mm (H) x 37mm (W) - without card
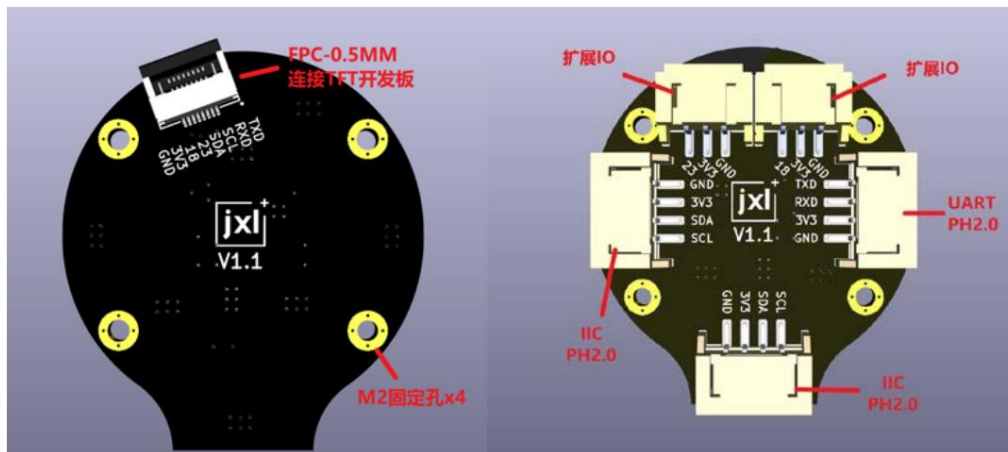
41mm (H) x 44mm (W) - Card

Manual measurement has deviations

3. Product Description

Base Plate

jxl⁺

4. Functional Section Description

1ÿ TYPE-C

The TYPE-C interface can be used for power supply, battery charging, program downloading, and serial communication.

When using the TYPE-C port for power supply, please connect to a USB3.0 port or a mobile phone charger.

The power supply is provided by the head to avoid the situation of restart due to insufficient current.

When the dock is powered and functions such as Wi-Fi and Bluetooth that consume too much current are turned on, it is easy to cause an error.

Now restarting.

The charging chip uses a maximum current of 500ma. Considering the smaller size,

The household battery will use a small capacity battery and the product itself will generate a lot of heat.

The maximum charging current is limited to about 300ma. If you need a higher current, you can

Replace the resistor to achieve this. In most cases, we do not recommend increasing the charging current, which will

The product generates more heat. For details, please refer to the table below.

Resistance(ÿ)	Charging current (mA)
20K	50
10K	100
5K	200
4K	250
3K	300
2K	400
1.6K	500

The code can be burned directly. There is an automatic download circuit on board, which can be used through the serial port.

RTS and DTR are used to control the ESP32 reset port and IO0 port, and are burned once before leaving the factory.

The firmware for playing video from SD card is shipped, so it cannot be burned into the user's device for more inspection

Settings or power supply problem, the default power switch is off, please press

Turn on the power switch before burning.

The serial port chip adopts CH343 high-speed serial port, with a communication rate of up to 6M, which is higher than

The maximum serial port rate of ESP32 is very good to avoid the CH340 and CP2102 used in the market.

Packet loss occasionally occurs during 4M communication.

2. Regarding the battery, please do not connect the positive and negative of the battery in reverse and be careful when welding.

The onboard lithium battery over-discharge circuit will still discharge the battery when the voltage is below 3V.

When choosing batteries, please try to choose batteries with protection to avoid over-discharge of the batteries.

The static current is less than 1ua when the product is not in use, so there is no need to worry about the battery

There will be a problem of power outage soon.

3. Currently, we have tested 1G, 2G and 32G TF cards and all of them are OK. Try to choose the ones on the market.

There are branded cards to use, and the factory can choose 2G TF card and no TF card version

This version, so if you need a TF card, you can buy the corresponding version, all of which are from the TF card

The video is played back in the factory for testing.

4. Battery power detection part, the battery passes through a Schottky and then a 20K

Resistor and pull-down 10K resistor detection, so the battery voltage detection needs to consider Schottky

The voltage drop (about 0.4V) is not very accurate, so it is not recommended to make a high-precision measurement of the power.

Degree detection function.

5. Due to the small size of the product, the wireless part has been greatly

The sacrifice was not made according to the standard for large area clearance and other treatments.

The wifi distance is about 20 meters indoors (shorter if the communication speed is fast), and in open areas

Not tested (the indoor area is small and only tested to about 20 meters, whether it can reach a larger area remains to be tested

Test), users can use IPEX external antenna by switching jumper resistors.

The signal will be greatly optimized after switching to IPEX. The following figure is for user reference
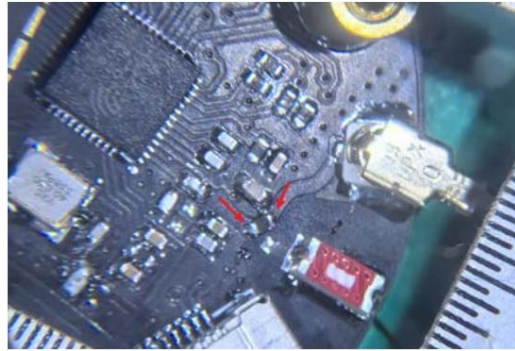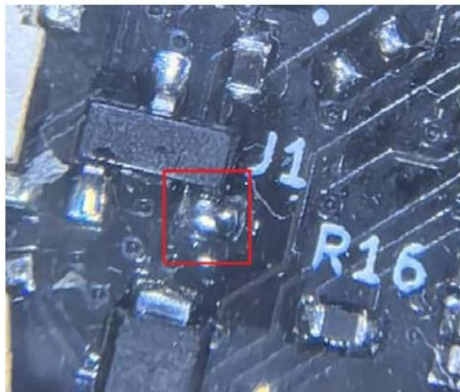

6. The power switch button is in the off state by default.

The battery is charging, the serial port cannot be recognized, and the ESP32, TFT screen, and TF card power supply are turned off.
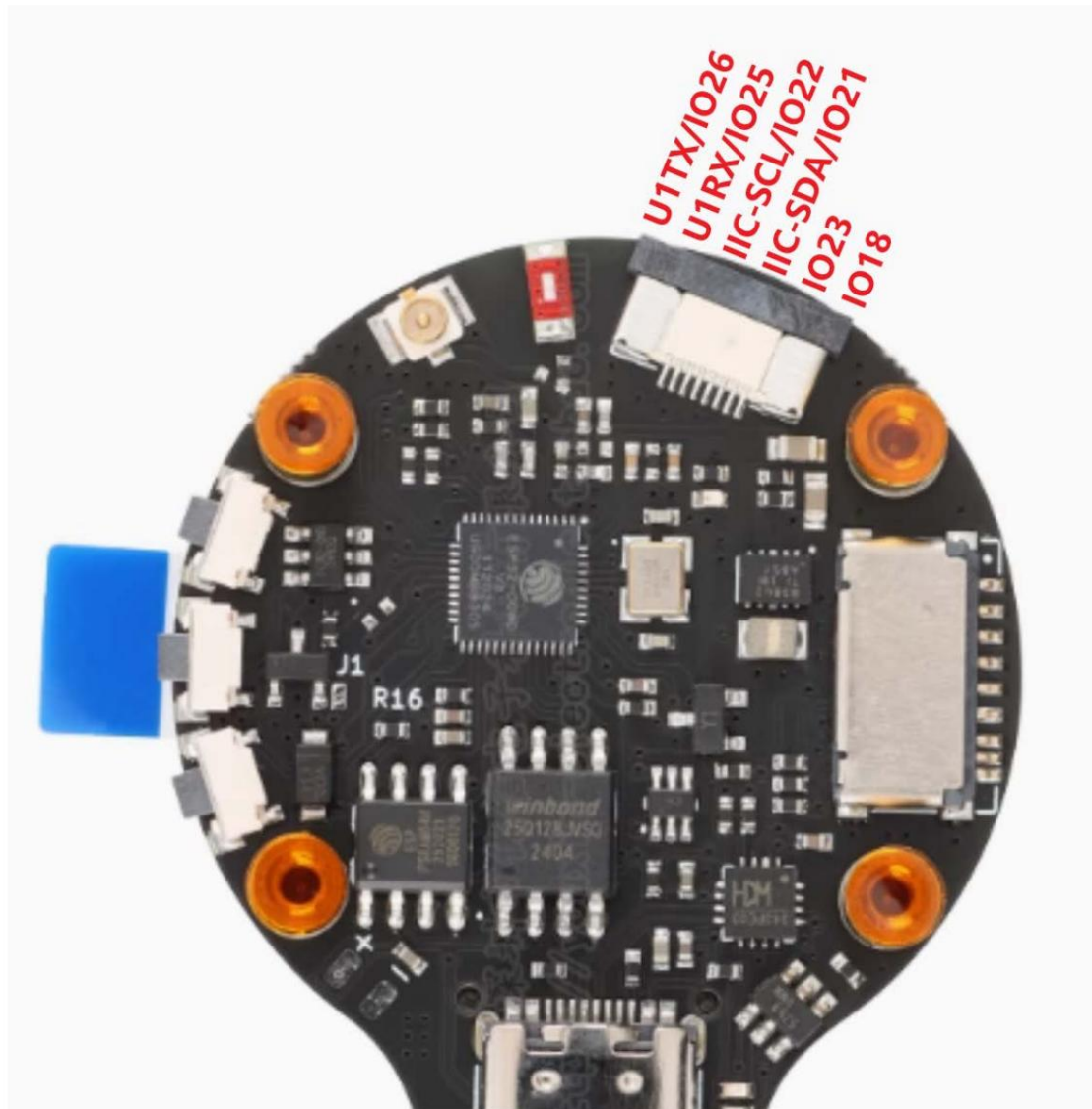
The user can switch to the power-on state through the J1 jumper pad, and the button function will

It will fail. The following figure shows the short circuit for user reference.

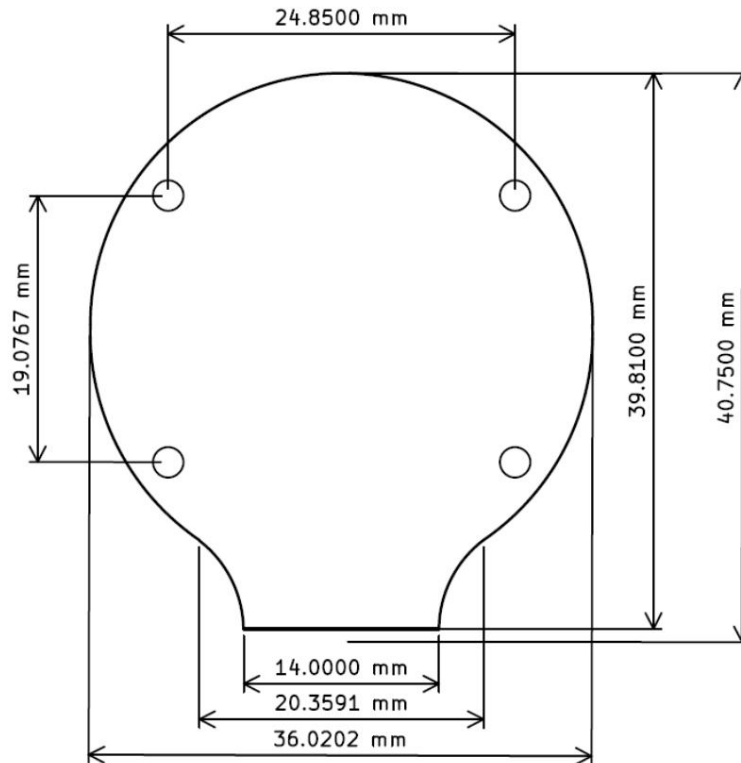7. Extended IO port function reference diagram

5. Dimensions

This size is the PCB board size, for reference only, and does not include some components on the board frame.
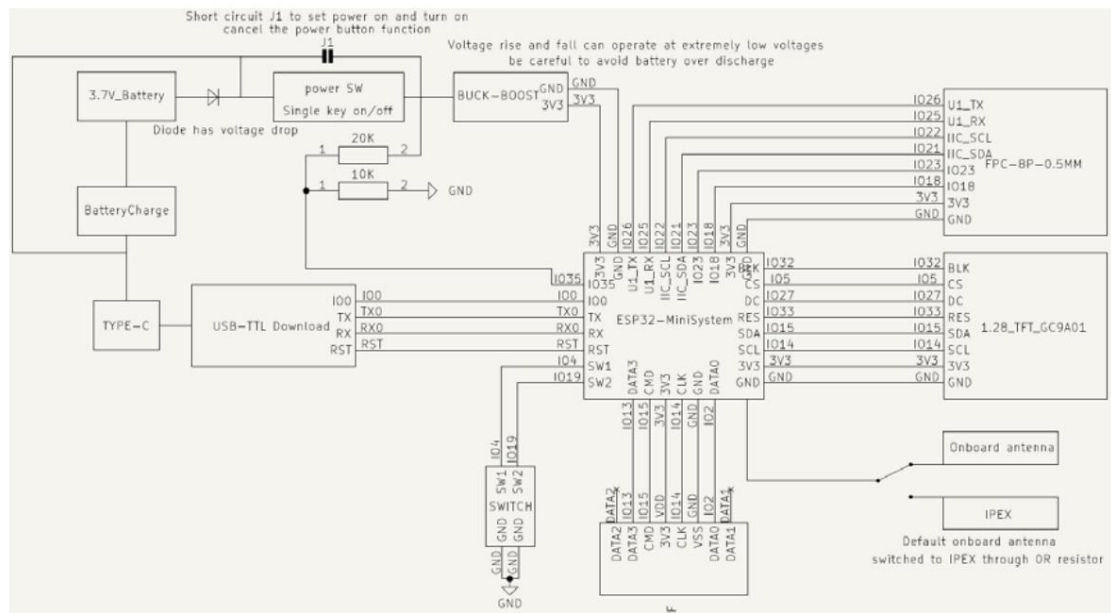
External

6. Functional board block diagram

The detailed schematic diagram of the product is not open source, and the connection diagrams of the functional modules below are provided.

This drawing is sufficient for secondary development of the product. For clear drawings, please view the PDF document in the document.

VII. Notes

1. The product is small in size and highly integrated, so the heat generated is high, which is normal and does not affect

Use it.

2. The height of the M2 copper column is 4.5mm, so the screws you use cannot exceed this height.

Degrees.

3. Regarding the external PFC interface, the 3.3V voltage output port provided is compatible with the ESP32

Therefore, when using the power supply on the expansion port to supply external power,

Be careful not to connect high-power devices, especially inductive devices such as motors.

Prevent such devices from affecting or even damaging ESP32.

4. The samples provided by the product can be used to initially test the main functions of each part, and more will be gradually added.

If you have more suggestions, we can provide them to you.

More perfect, thank you for your support.