1. Introduction to Testing Platform
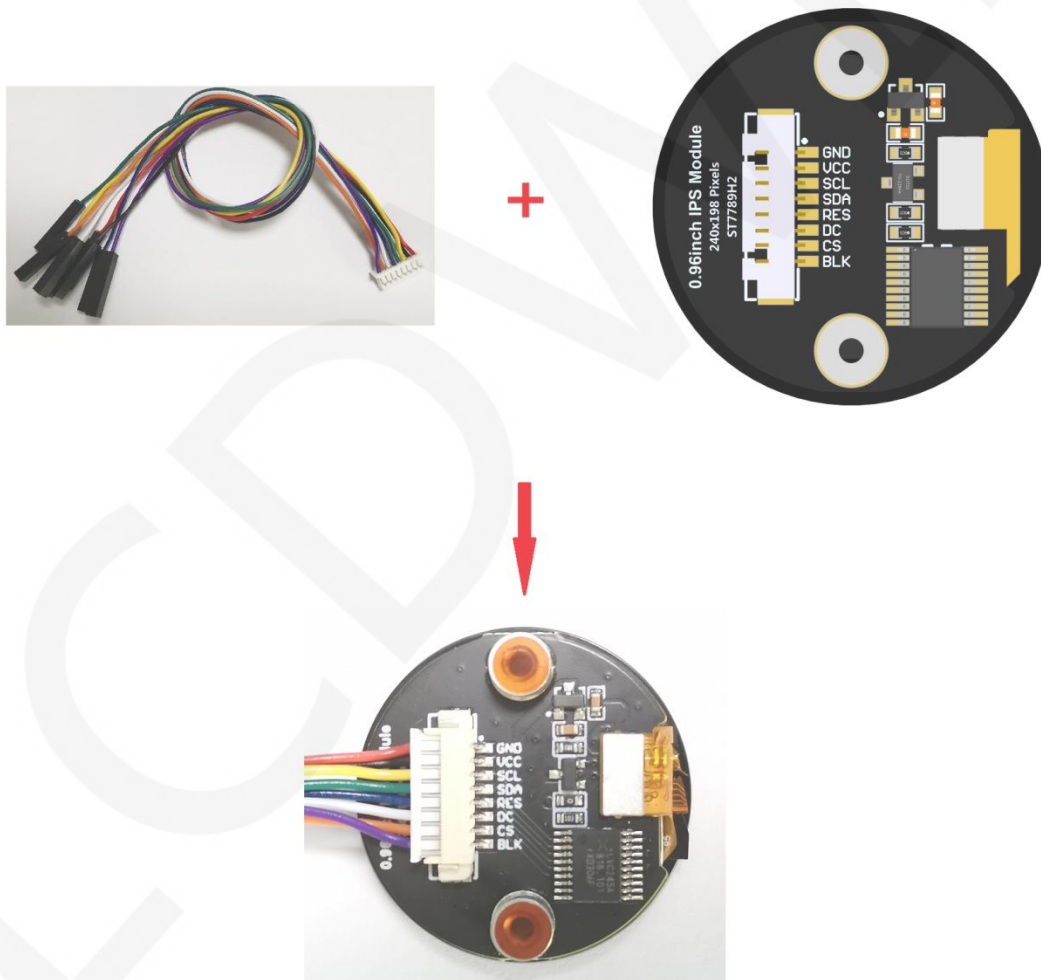
Development Board : ESP32-WROOM-32E devKit

MCU : ESP32-32E module

Frequency : 240MHz

2. Pin connection instructions

The display module is connected to the microcontroller using a 1.25mm spacing 8P DuPont cable with connectors. The module connection is shown in the following figure:
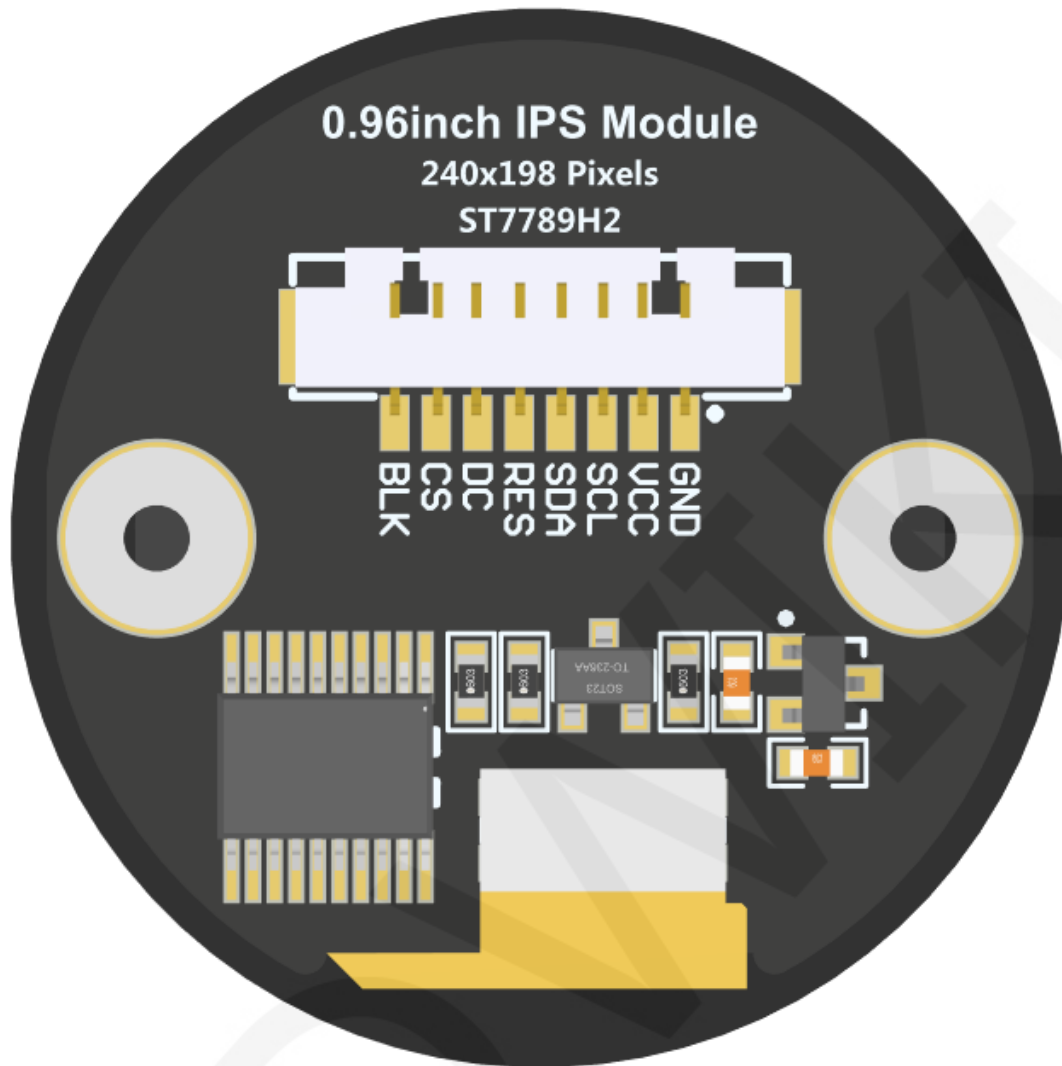

Picture1. Module wiring

Figure 2 Module Back Pins

ESP32-32E Test Program Pin Direct Insertion Instructions			
Number	Module pins	Corresponding ESP32-32E development board wiring pins	Remarks
1	GND	GND	LCD Power ground
2	VCC	5V/3.3V	LCD power positive(It is recommended to connect to 5V. When connected to 3.3V, the backlight brightness will be slightly dim)
3	SCL	IO14	LCD SPI bus clock signal
4	SDA	IO13	LCD SPI bus write data signal

5	**RES**	IO27	LCD reset control signal, Low level reset
6	**DC**	IO2	LCD command / data selection control signal High level: data, low level: command
7	**CS**	IO15	LCD selection control signal, Low level active
8	**BLK**	IO21	LCD backlight control signal (If you need control, please connect the pins. If you don't need control, you can skip it)

3. Demo Function Description

This sample program uses the ESP32 hardware HSPI bus, which is located in

Demo_MSP0962_MSP0963_ESP32-WROOM-32E_HSPI directory, as shown in the

following figure:
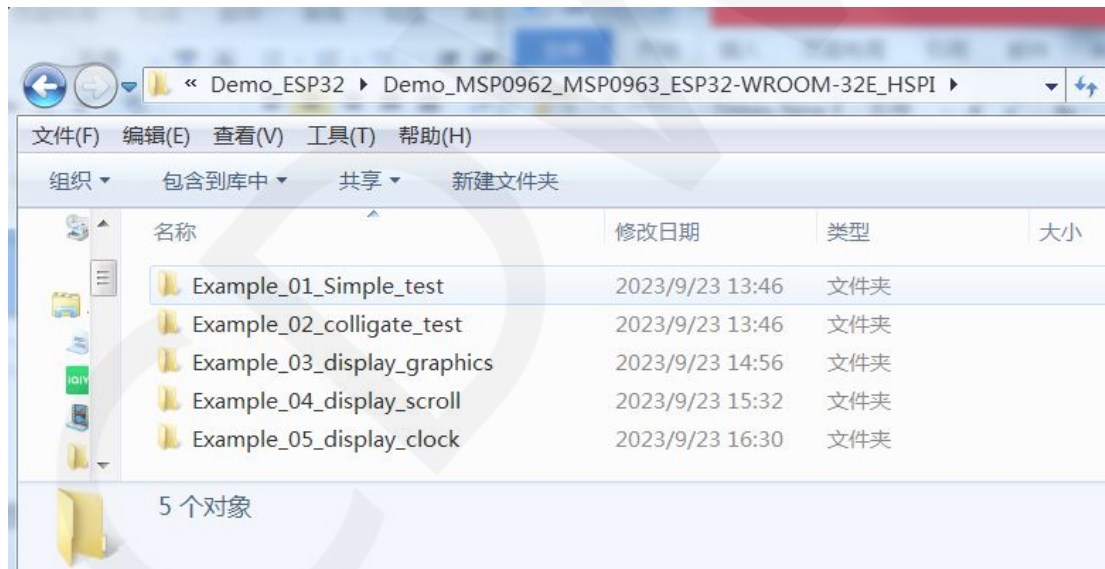
A. Example_ 01_ Simple_ Test is a screen brushing test program, which does not

rely on any software library;

B. Example_ 02_ colligate_ Test is a comprehensive testing program that displays

graphics, lines, and counts program runtime;

C. Example_ 03_ display_ Graphics is a graphic display testing program that displays

various graphics;

D. Example_ 04_ display_ Scroll is a scrolling test program that displays text

  scrolling;

E. Example_ 05_ display_ Scroll is a scrolling test that displays text scrolling;

4．Demo Usage Instructions

✧ Building Development Environment

   For specific methods of building a development environment, please refer to the

"**Arduino_development_environment_construction_for-ESP32-EN**" document in

this directory.

✧ Installing software library

   After the development environment is set up, the software library used by the

sample program needs to be copied to the project library directory so that the sample

program can be called. The software library is located in the **Install libraries** directory,

as shown in the following figure:
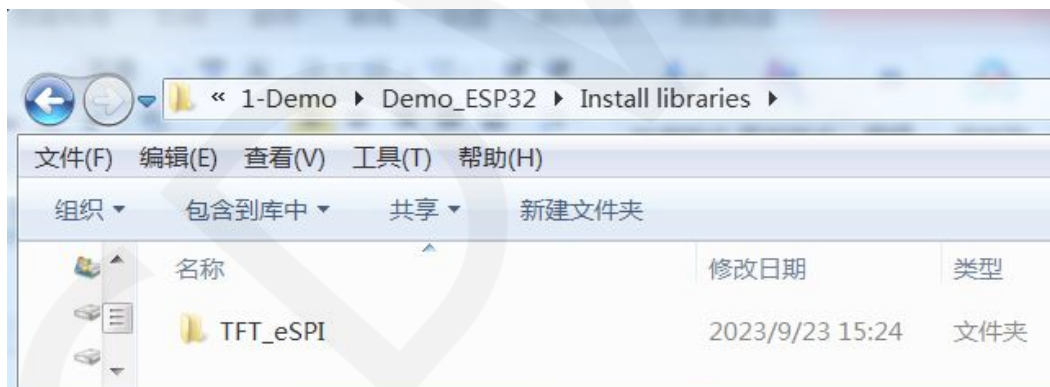
 Among them:

   TFT_ eSPI is an Arduino graphics library for TFT-LCD LCD screens, supporting

     multiple platforms and LCD driver ICs

 The software library have been configured and can be directly copied to the project

library directory for use. The default path for the engineering library directory is

C:\Users\Administrator\Documents\Arduino\libraries. You can also change the

project library directory: open the Arduino IDE software, click **File** ->**Preferences**, and

reset the **Sketchbook location** in the pop-up interface, as shown in the following figure:
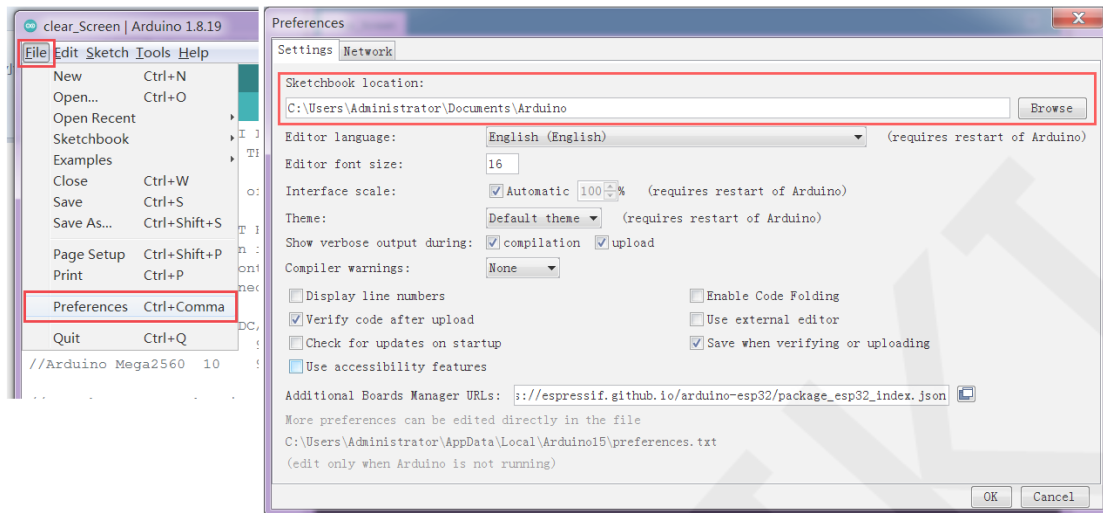
If you do not want to use the already configured library, you can download the latest version of the library from Github at the following download address and then configured:

https://github.com/Bodmer/TFT_eSPI

After the library download is completed, unzip it (for easy differentiation, rename the unzipped library folder, as shown in the Install libraries directory), and then copy it to the engineering library directory. Next, proceed with library configuration. The files that need to be replaced are located in the **Replaced files** directory, as shown in the following figure:
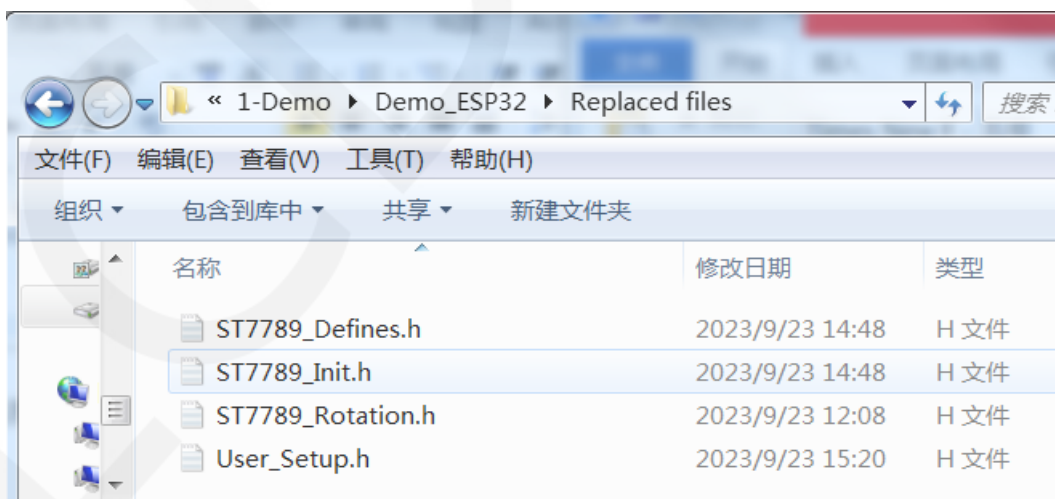
TFT_ eSPI library configuration:

First rename the **User_Setup.h** file which is in the top-level directory of the

TFT_eSPI library of the engineering library directory to **User_ Setup_ bak.h**,then

copy the **User_Setup.h** file which is in the **Replaced files** directory to the top-level

directory of the **TFT_eSPI** library, As shown in the following figure:

First, set the TFT in the engineering library directory_ ESPI Library TFT_ ST7789

in the Drivers directory_ Init. h, ST7789_ Rotation. h, ST7789_ Define. h These three

files are renamed as ST7789 respectively_ Init. h_ Bak. h, ST7789_ Rotation_ Bak. h,

ST7789_ Definitions_ Bak. h, and then replace ST7789 in the Replaced files

directory_ Init. h, ST7789_ Rotation. h, ST7789_ Define. h three copies to TFT in the

engineering library directory_ ESPI Library TFT_ Drivers directory, as shown in the

following figure:
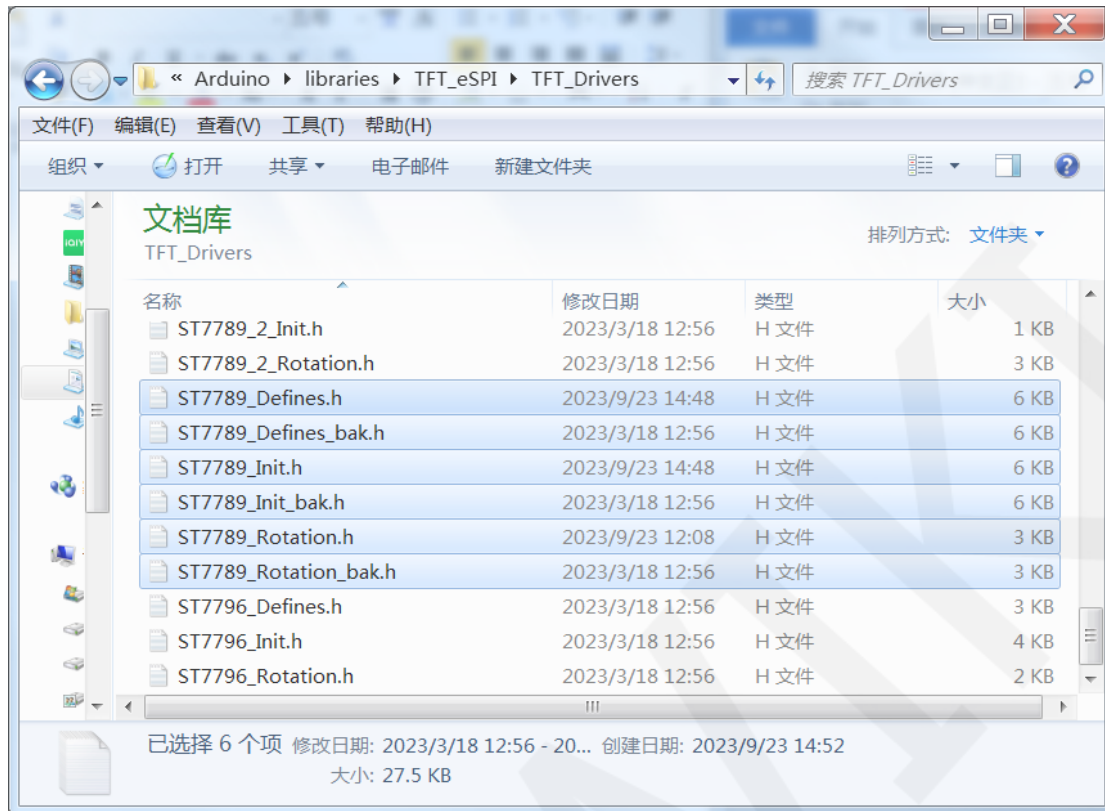
✧ **Compile and Run Programs**

After the library installation is completed, the sample program can be compiled and run as follows:

A. Plug the display module directly into the ESP32 development board, and connect   the development board to a PC to power on;
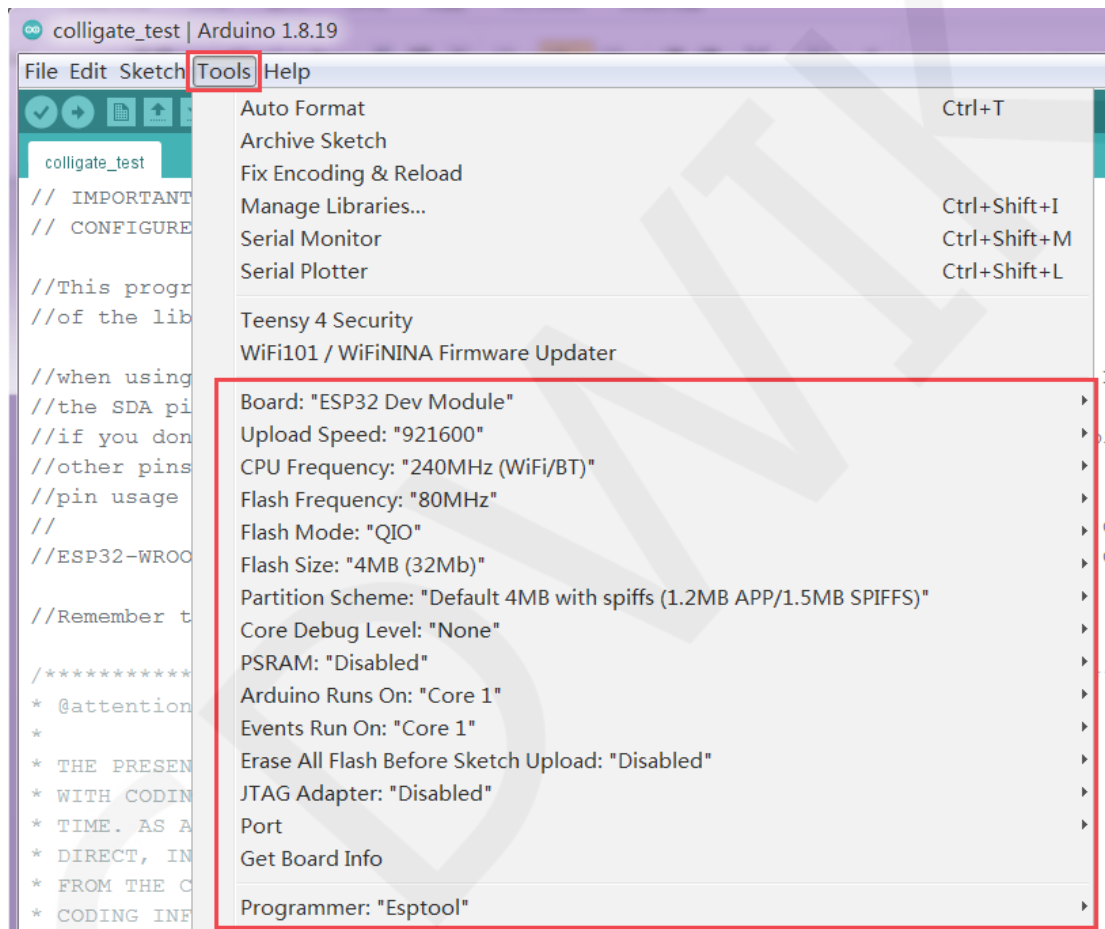
B. Open Any sample program in the **Demo_MSP0962_MSP0963_ESP32-WROOM-32E_HSPI** directory, as shown in the following figure (using the colligate test test program as an example):
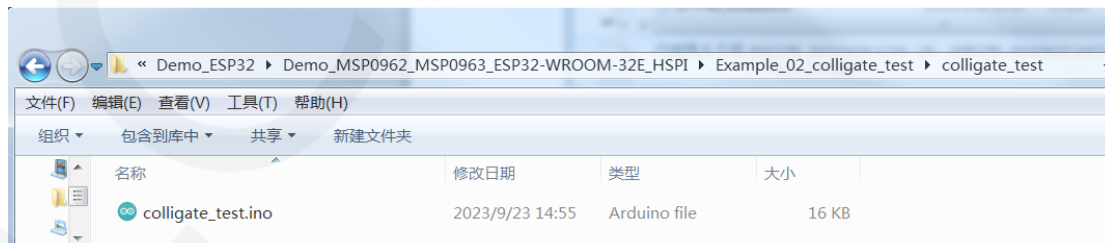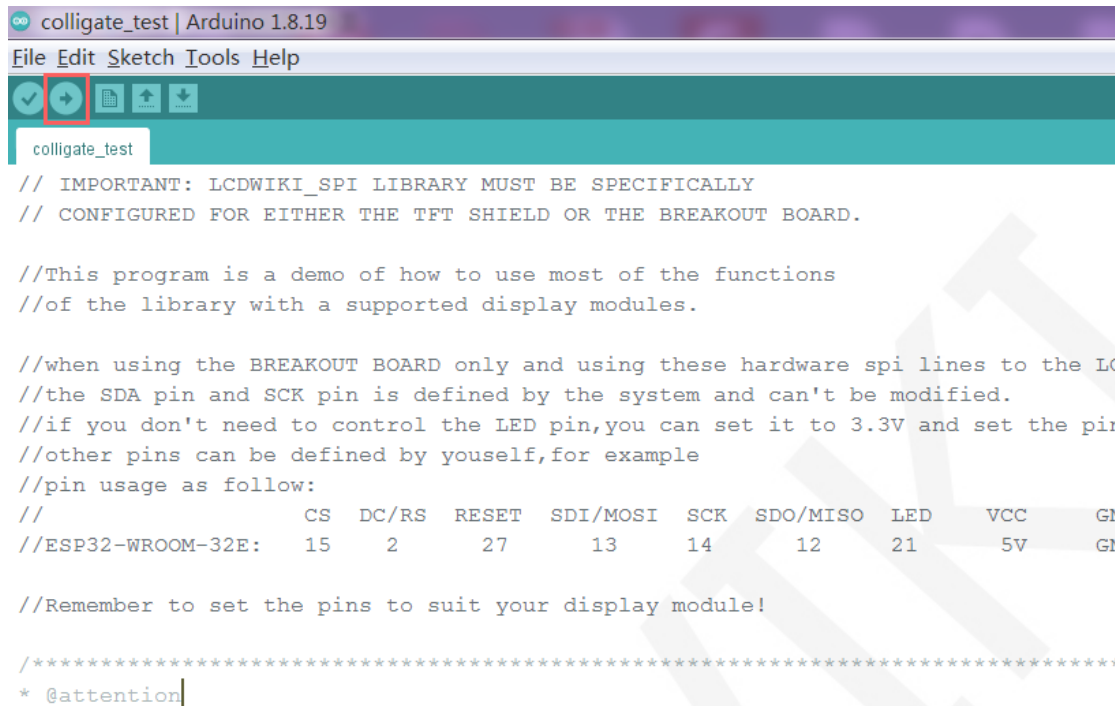

C. After opening the sample program, select the ESP32 device, as shown in the following figure:
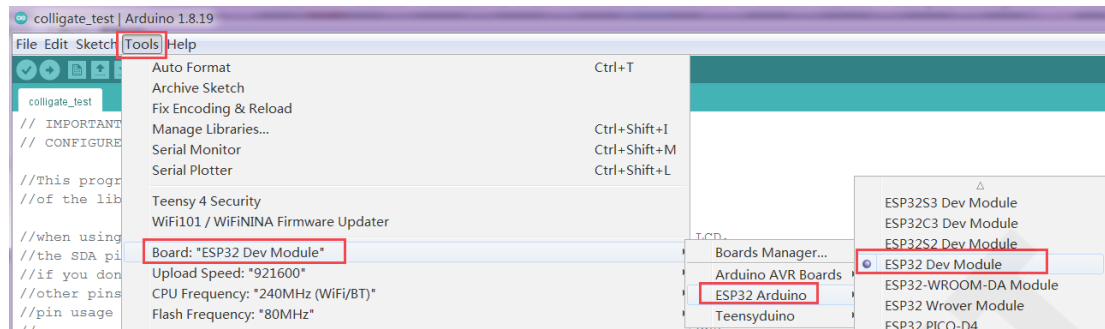
D. Configure ESP32 Flash, PSRAM, ports, etc. as shown in the following figure:

E. Click the **upload** button to compile and download the program, as shown in the following figure:

F. If the following prompt appears, it indicates that the program has been compiled

and downloaded successfully, and has already been run:

G. If the display module displays content, it indicates that the program has run

successfully.