



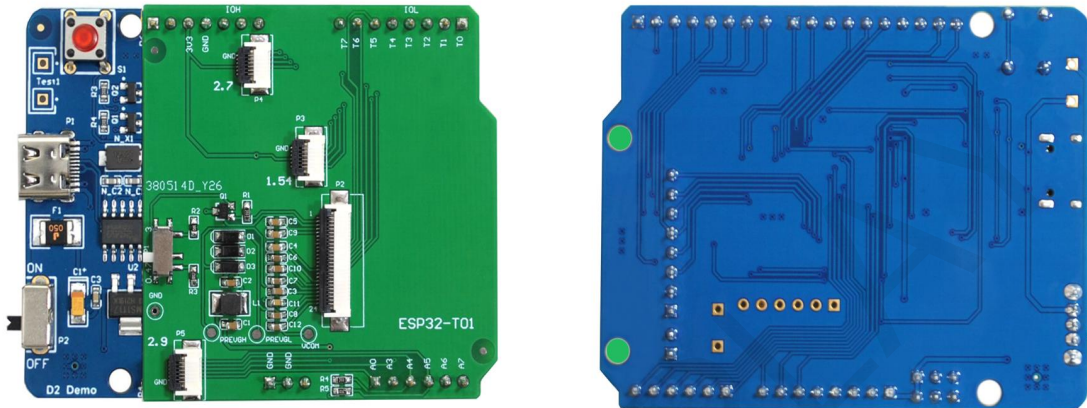
E-paper Display Demo Kit

ESP32-L(T01)



Dalian Good Display Co., Ltd.

Product Specifications



Customer	Standard
Description	E-paper Display Demo Kit
Model Name	ESP32-L(T01)
Date	2023/03/15
Revision	1.0

	Design Engineering		
	Approval	Check	Design
			

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1. Overview

ESP32-L(T01) can assist developers in the development of E-paper display projects. It is specially designed for SPI E-paper display and supports 0.97 inch, 1.54 inch, 2.13 inch, 2.6 inch, 2.7 inch, 2.9 inch, 3.71 inch, 4.2 inch, 5.83 inch and 7.5 inch E-paper in monochrome and three colors; it also supports 1.54-inch, 2.7-inch, and 2.9-inch E-paper display with touch screen and supports E-paper and touch working simultaneously so to provide with convenience for users in the early stage of development.

The main board has LED indicator, reset button, font chip, FLASH chip, etc. The ESP32-L(T01) development kit includes two parts: the main board ESP32-L and the adapter board ESP32-T01. The ESP32-L(T01) development kit only provides programs to drive the electronic paper display and touch screen. The application of other functions such as WiFi and Bluetooth needs to be developed by the customer according to the project.

2. Structure Specification

Parameter	Specification
Model	ESP32-L(T01)
Platform	Arduino
Dimension	Mother board : 70mm x 54mm (ESP32-L) Adapter : 53mm x 51mm (ESP32-T01)
Power Supply	Type-C 5.0V
Example Code	Available
Operating Temp.	-20 °C ~ 70 °C
Main Function	Learn to drive E-paper display; Test and evaluate E-paper displays; Secondary development based on this board
Additional Function	Type-C interface, LED indicator, reset button, current detection, font chip, flash chip, etc., touch screen port

3. Functions

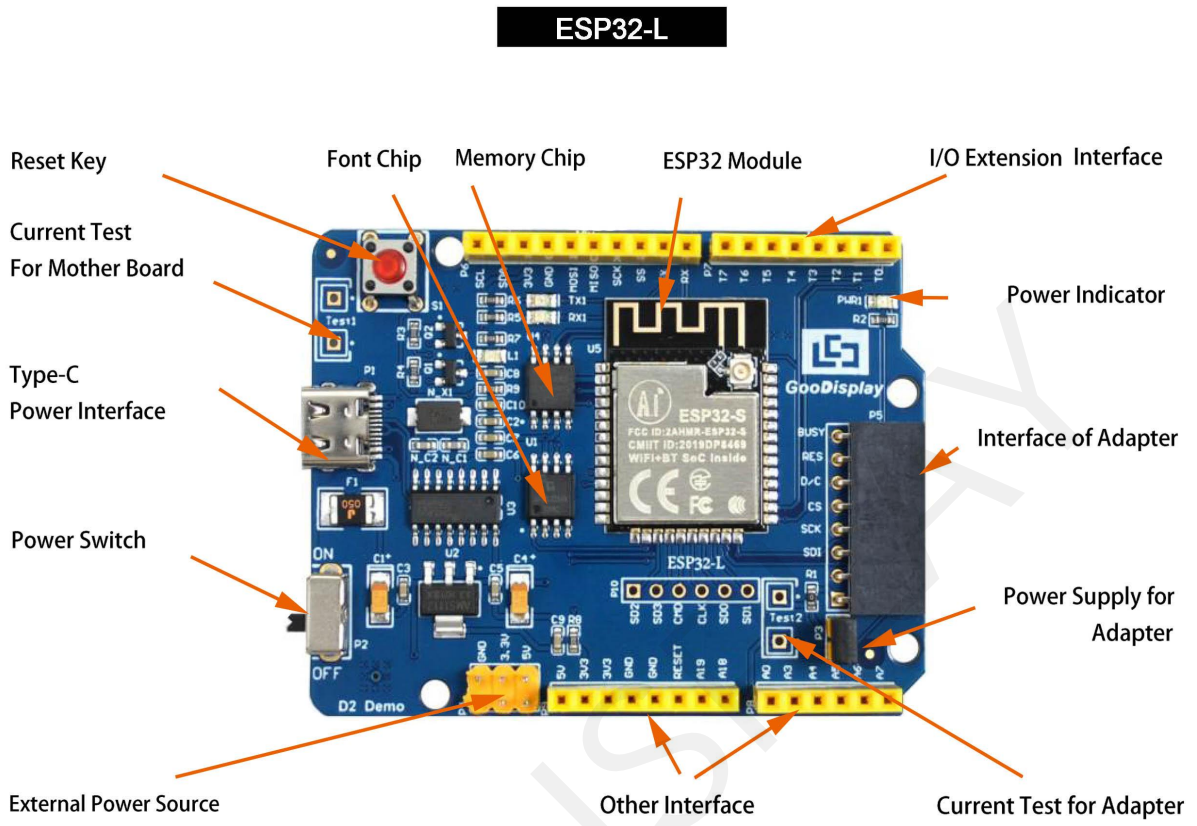


Figure 1 Mother Board ESP32-L

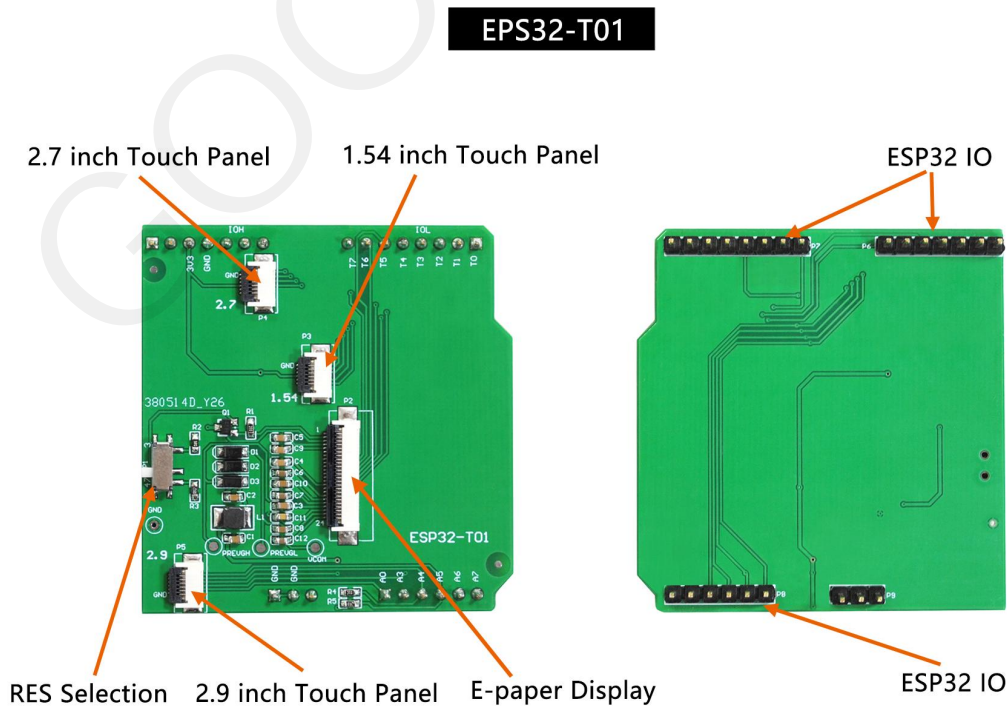


Figure 2 Adapter ESP32-T01

3.1 Power Supply

The input voltage of this board is DC5V, which is powered by the USB port. Since the e-paper is 3.3V powered, it is necessary to connect VCC at P6 to 3.3V when using.

3.2 USB to serial port transmission

This development board uses USB to serial port communication. Users should install CH340 driver on computer before downloading program.

3.3 P3 short-circuit jumper

P3 short-circuit jumper controls DESPI-C02's power supply, which is e-paper's power supply. Be sure to short it when using.

3.4 Current measurement

The development kit supports current measurement of motherboard ESP32-L and DESPI-C02.

- 1)motherboard ESP32-L: Power off and make series connection between ampere meter and TEST1.
- 2)DESPI-C02: Power on and take off the short-circuit jumper P3, then make series connection between ampere meter and TEST2. Put on the short-circuit jumper P3 after measurement.

3.5 I/O port extension

This development board led out the digital I/O 0~13 and the analog I/O 0~5 for development.

3.6 LED indicator light

There is a indicator light reserved for developing.

3.7 Reset key

This development board contains a reset key for users operation.

3.8 DESPI-T01 Adapter

In addition to driving E-paper, the adapter also supports 1.54 inch, 2.7 inch, 2.9 inch E-paper touch screen.

3.9 Expanded Functions

Built-in Chinese font chip GT30L32S4W.

Built-in data storage chip W25Q16.

4. Connection and RESE Switch

4.1. Connecting the adapter to the mother board

Connect the mother board and the adapter as shown in Figure 3, and connect the E-paper FPC to the adapter as shown in Figure 4 (note the connection of E-paper).

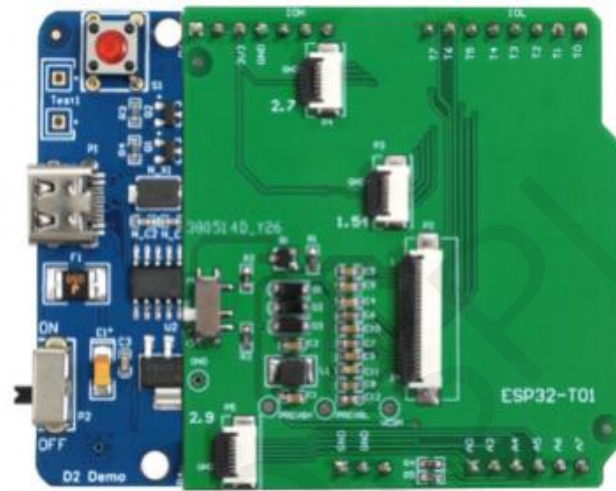


Figure 3 Connecting Mother Board and Adapter

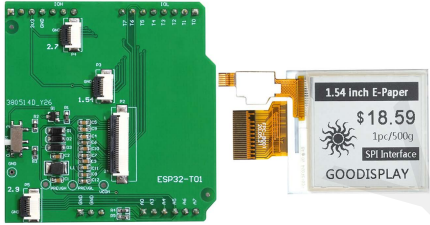
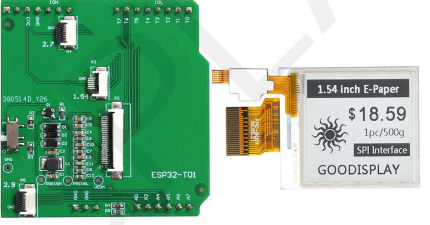
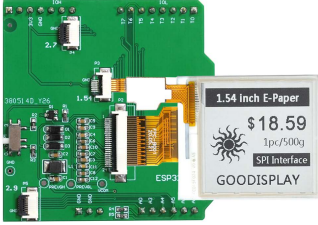
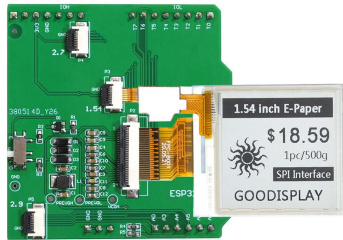
4.2. Connecting E-paper display to the adapter

1) Identify the front and back of the E-paper, and insert the E-paper into the adapter with the front facing up

Note: The mirror surface of E-paper display facing down, the display facing up.



Figure 4 Connecting Adapter and E-paper display

<p>1. Getting ready the adapter and the display. EPD facing up as shown in the right.</p>	
<p>2. Open FPC Connectors</p>	
<p>3. Insert the gold fingers of EPD and touch screen to the connectors</p>	
<p>4. Close connectors</p>	

4.3. RESE Resistance Selection

The switch P1 is a selection switch for the matching resistance (RESE resistance) of the current feedback part of the peripheral boost circuit of the E-paper. Different types of E-paper need to be matched with different RESE resistors. Choosing the wrong RESE resistor will cause the E-paper to fail to refresh.

Note: Users should strictly follow the circuit design in the E-paper specification when designing the actual product.

1) When RESE is set to 0.47 : Applicable to ULTRACHIP series driver ICs (starting with UC), fiti power series driver ICs (starting with JD)

1.54 inch: GDEW0154T8D、GDEW0154I9FD、GDEW0154M09、GDEW0154M10

2.13 inch: GDEW0213T5D、GDEW0213I5FD、GDEW0213M21

2.6 inch: GDEW026M01

2.7 inch: GDEW027W3

2.9 inch: GDEW029M06、GDEW029Z13

3.71 inch: GDEW0371W7、GDEY037T03、GDEY037Z03

4.2 inch: GDEW042T2、GDEQ042Z21

5.83 inch: GDEW0583T8、GDEW0583Z83

7.5 inch: GDEY075T7、GDEY075Z08

2) When RESE is set to 3: Applicable to Solomon series driver ICs (starting with SSD)

1.54 inch: GDEY0154D67、GDEY0154D90LT、GDEY0154Z90、GDEY0154T94

2.13 inch: GDEY213B74、GDEY213B75、GDEY0213D32LT

2.66 inch: GDEY0266T90、GDEY0266Z90

2.7 inch: GDEY027T91

2.9 inch: GDEY029T94

4.2 inch: GDEY042T91

5. Program Downloading

This development board adopts serial port to download programs, which requires Arduino programming software, type-C cable, CH340 driver and esp32_ package_ v1_ 0_ 2 firmware package and python-2.7.17 plug-in. The operation steps are as follows:

For the first download, install CH340 driver and ESP32 on the computer_ package_ v1_ 0_ 2 firmware package, python-2.7.17 plug-in.

Firmware package: esp32_ package_ v1_ 0_ 2. The unzipped file name is espressif. Unzip the espressif folder and put it in the arduino/hardware directory. During installation, the Arduino programming software must be closed, and the firmware package can also be searched directly in the Arduino library manager.

Use the default installation path for CH340 driver and python-2.7.17 plug-in.

Run the program file get.exe in esp32/tools(you must have installed the python plug-in), as shown in Figure 6.

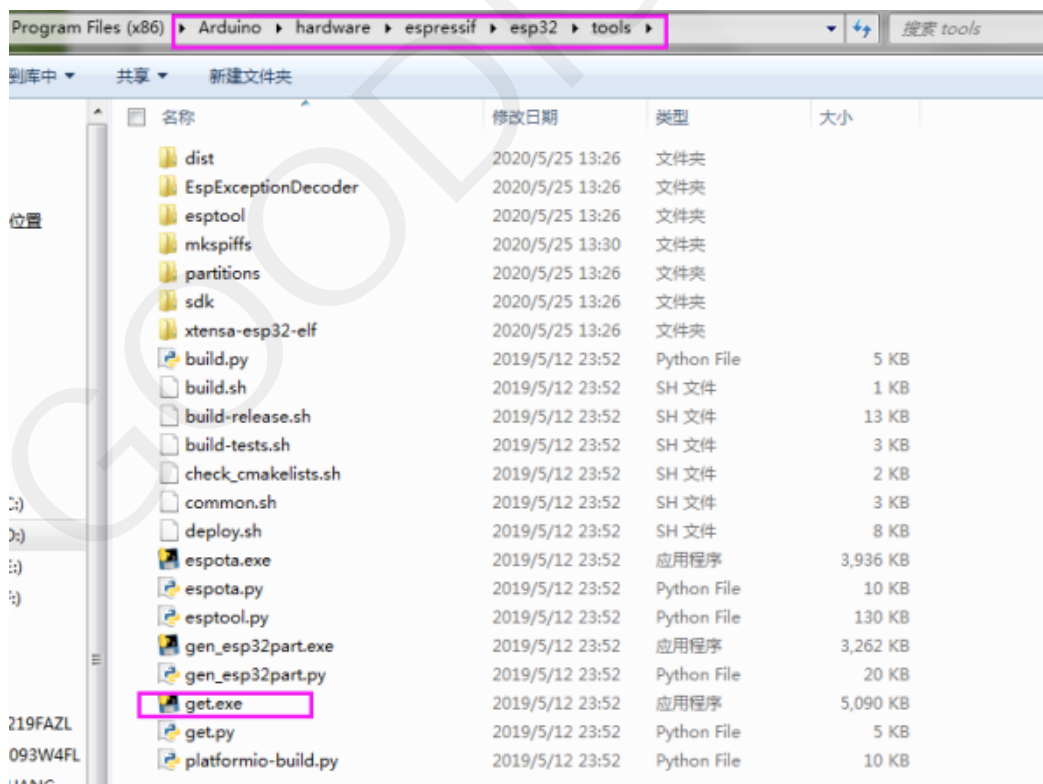


Figure 6 Run get.exe

1. Connect the Type-C interface of the development board to the computer with USB cable.
2. Open Arduino in the driver folder shown in Figure 7 with Arduino 1.8.6 ino engineering document.

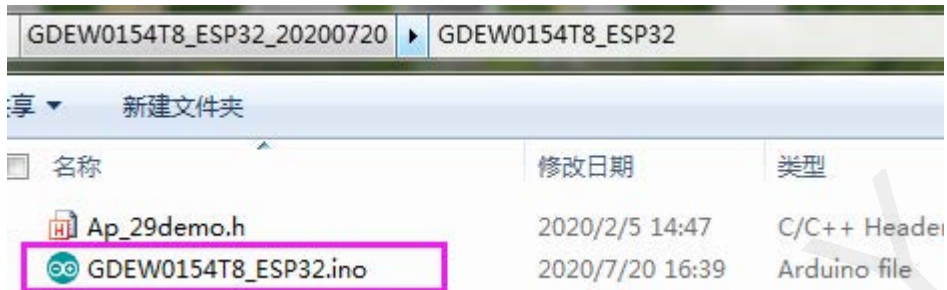


Figure 7 : Open Arduino.ino

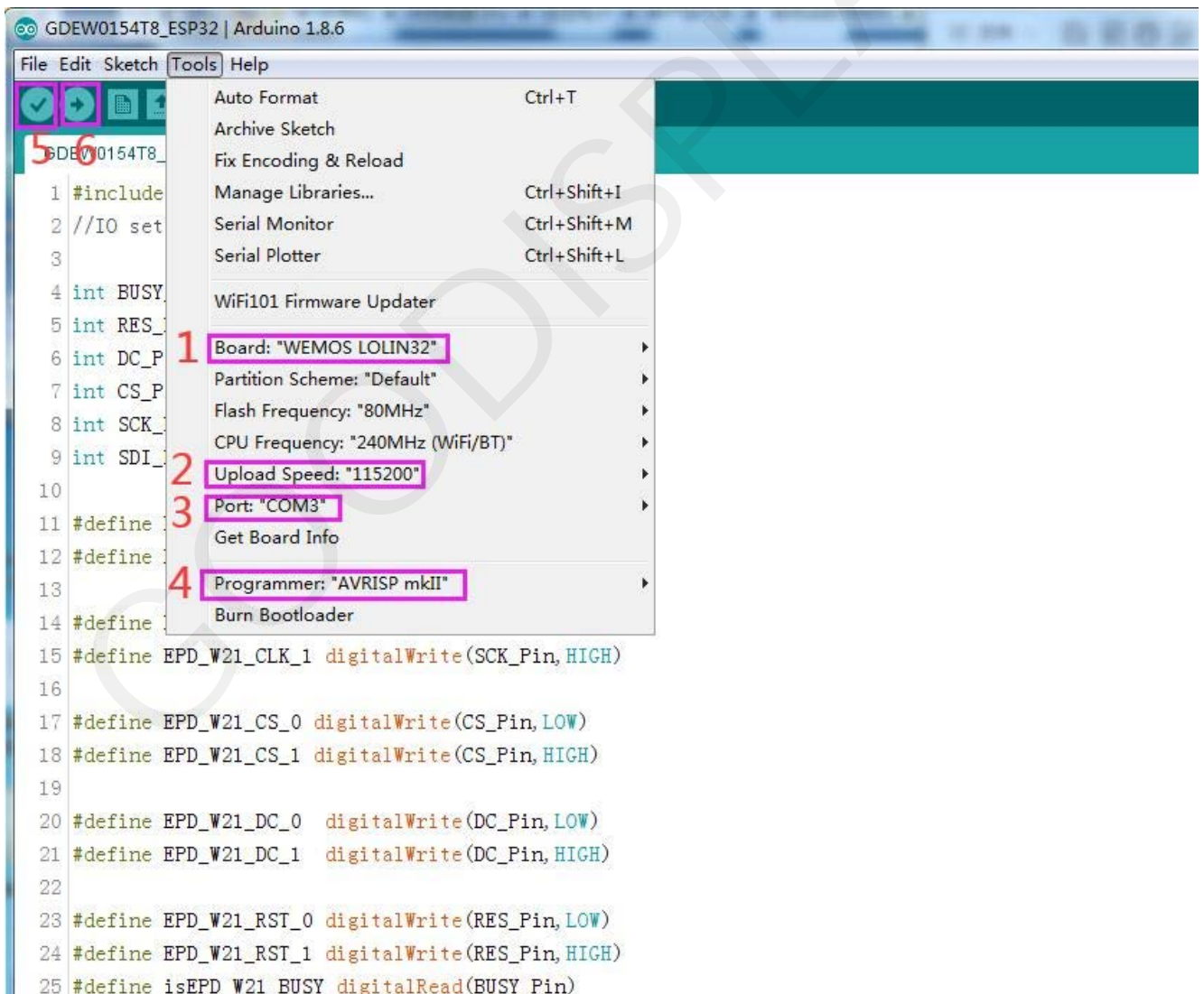




Figure 8 : Steps of downloading program

4. Set in "tools".
5. Click position 1 to select the development board model "WEMOS LOLIN32".
6. Click position 2 to select serial port baud rate "115200".
7. Click position 3 to select COM port.
8. Click position 4 to select the programmer model, and here select "AVRISP mkII".
9. Click position 5  to compile the program.
10. Click position 6  to download the program to the development board.
11. After the downloading, first power off the development board, connect the electronic paper display screen to the adapter board, and then power on again so that E-paper can display normally.

Note: if the compiler prompts "invalid library found" during program compilation, please ignore this prompt, which will not affect the actual program download.

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