Development Kit for E-paper Display

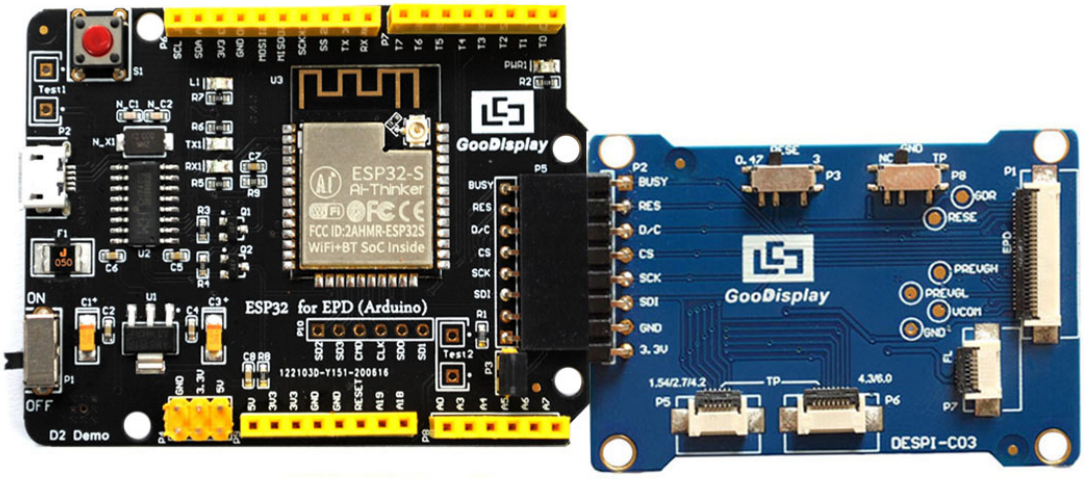
(For 1.54'', 2.04'', 2.13'', 2.6'', 2.7'', 2.9'', 3.71'', 4.2'', 5.83'' and 7.5'')

GooDisplay®

ESP32-03

Dalian Good Display Co., Ltd.

Product Specifications



Customer	**Standard**
Description	**Development Kit for E-paper Display**
Model Name	**ESP32-03**
Date	**2020/07/27**
Revision	**1.0**

	Design Engineering		
	Approval	**Check**	**Design**
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1.Overview

ESP32-03 development kit supports program development using Arduino development platform.This development kit is used to help users develop e-paper display projects with provided source code to create more differentiated solutions. It is designed for SPI e-paper display. It supports driving Good Display's black-white e-paper display and three-color (black, white and red/Yellow) e-paper display: 1.54'', 2.04'', 2.13'', 2.6'', 2.7'', 2.9'', 3.71'', 4.2'', 5.83'' and 7.5''. What’s more, DESPI-C03 can drive touch panel and front light panel.

ESP32-03 development kit consists of motherboard ESP32 for EPD and connector board DESPI-C03.

ESP32 development kit is only for driving the e-paper, WIFI and other functions need to be developed by users according to the project.

2.Mechanical Specifications

Parameter	Specification
Model	ESP32-03
Platform	Arduino
Dimension	70mm x 54mm (ESP32 for EPD) 52mm x 36mm (DESPI-C03)
Power Interface	USB interface
Sample Code	Available (please contact sales)
Operating Temp.	-20°C ~+70°C
Main Function	Learn to drive e-paper display, touch panel and front light panel; Test and evaluate e-paper display; For secondary development.
Additional Function	USB to serial port; Indicator light; Reset key; Current measurement.

3.Functions

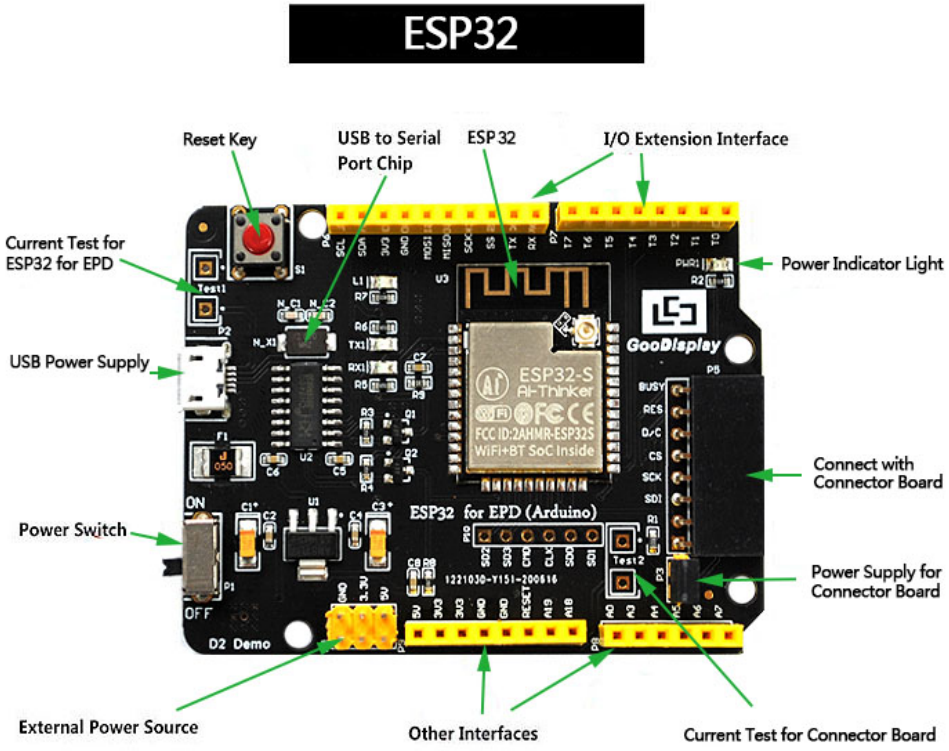

Figure 1 : ESP32 for EPD

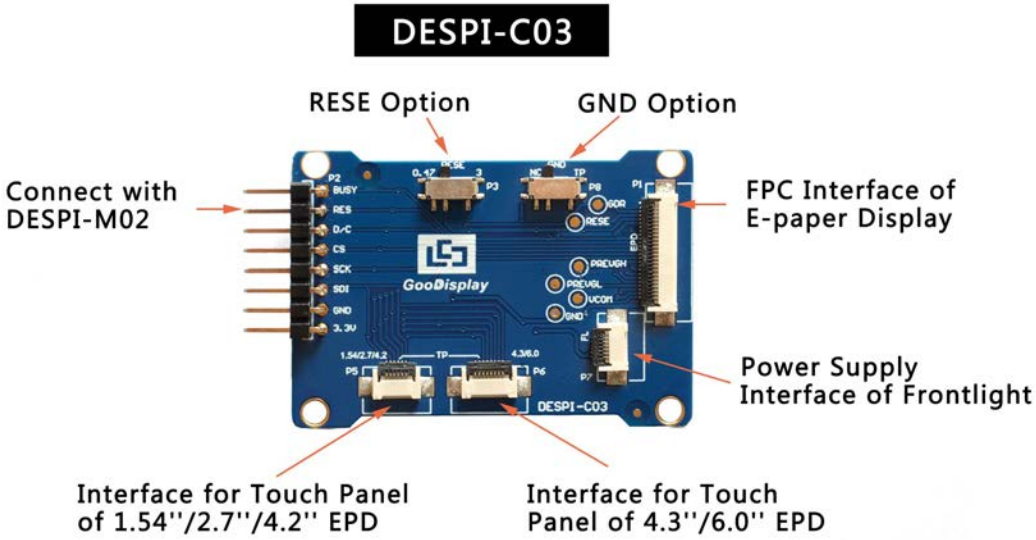

Figure 2 : DESPI-C03

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.

Tips: If you use 5V power supply, the e-paper can be driven theoretically, but it is not recommended, long-term operation will make e-paper damage.

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-C03'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 ESP32 for EPD and DESPI-C03.

1) ESP32 for EPD: Power off and make series connection between ampere meter and TEST1.

2) DESPI-C03: 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 D0~D12 and the analog I/O A0 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 Touch panel and front light panel driving

DESPI-C03 supports 1.54-inch, 2.7-inch, 4.2-inch, 4.3-inch and 6.0-inch touch panel driving and 3.3V-powered front light panel driving.

3.9 Raspberry Pi interface

There is a Raspberry Pi interface in the back of DESPI-C03, which can connect Raspberry Pi motherboard to the e-paper.

4.Connection Mode and Switches

4.1 Connection between ESP32 for EPD and DESPI-C03

Connect DESPI-C03 to ESP32 for EPD as shown in Figure 3.

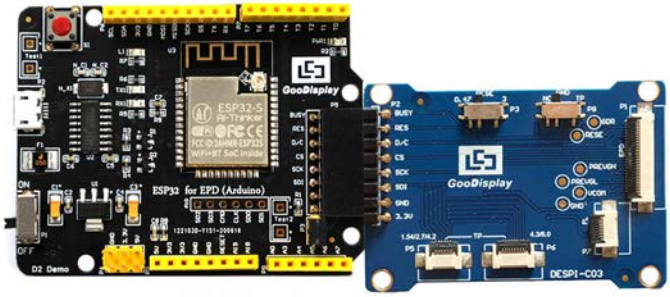

Figure 3 : Connection between ESP32 for EPD and DESPI-C03

4.2 Connection between DESPI-C03 and e-paper

Connect the e-paper FPC to DESPI-C03 as shown in Figure 4.

(Pay attention to the direction of the e-paper.) And set P8 to NC.

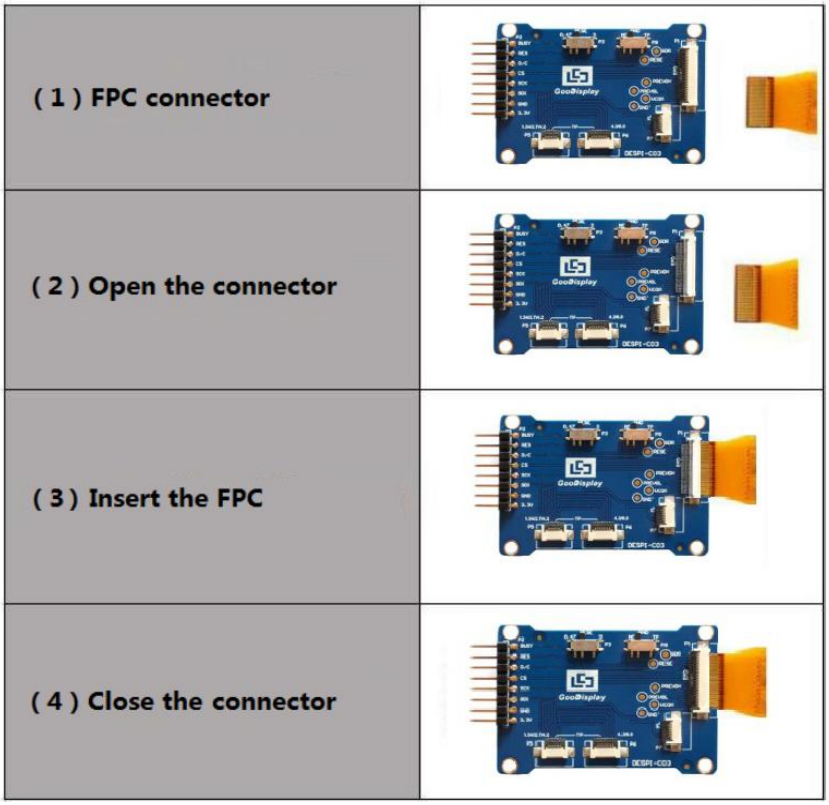

Figure 4 : Connection between DESPI-C03 and e-paper

4.3 Connection between DESPI-C03 and front light panel

DESPI-C03 supports 3.3 V powered front light panel driving, the corresponding interface is P7 as shown in Figure 5. The pin definitions are as follows: 3.3V (1,2), NC (3,4), GND (5,6). The power supply of front light panel must be divided from the power supply of e-paper, otherwise it may affect the display of e-paper.

Figure 5 : Connection between DESPI-C03 and front light panel

4.4 Connection between DESPI-C03 and touch panel

As shown in Figure 6, 1.54-inch, 2.7-inch, 4.2-inch touch panel use interface P5, and 4.3-inch, 6.0-inch touch panel use interface P6. Connect the touch panel to DESPI-C03 with the touch area upside. In addition, P8 needs to be set to TP when driving touch panels.

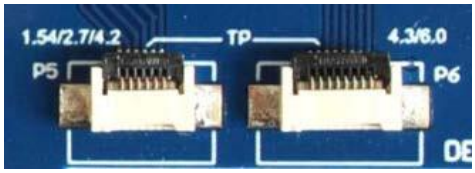

Figure 6 : Connection between DESPI-C03 and touch panel

4.5 Switch P8 on DESPI-C03

The switch P8 on DESPI-C03 is used to select GND. It needs to be set to NC when driving e-papers (default NC), and to TP when driving touch panels.

4.6 Switch P3 on DESPI-C03

The switch P3 on DESPI-C03 is used to select the RESE resistor, different e-papers need to match different RESE resistors, a wrong RESE resistor will cause the e-paper cannot be refreshed.

When RESE is set to 0.47 :

1.54 inch： GDEW0154T8, GDEW0154I9F, GDEW0154C39, GDEW0154M09, GDEW0154M10, GDEW0154Z17

2.13 inch： GDEW0213T5, GDEW0213I5F, GDEW0213C38, GDEH0213Z19, GDEW0213V7LT

2.6 inch： GDEW026T0

2.7 inch： GDEW027W3, GDEW027C44

2.9 inch： GDEW029T5, GDEW029I6F, GDEW029C32, GDEH029Z13, GDEH029Z13

3.71 inch： GDEW0371W7, GDEW0371Z80, GDEW0371Z01

4.2 inch： GDEW042T2, GDEW042C37, GDEH042Z21

5.83 inch： GDEW0583T8, GDEW0583Z83

7.5 inch： GDEW075T7, GDEW075Z08

When RESE is set to 3 :

1.54 inch： GDEH0154D67, GDEM0154E97LT, GDEH0154Z90, GDEM0154C90

2.13 inch： GDEH0213B72, GDEH0213B73, GDEH0213D30LT, GDEH0213Z98, GDEM0213C90

2.9 inch： GDEH029A1, GDEH029D57LT, GDEH029Z92, GDEM029E97, GDEM029C90

4.2 inch： GDEH042Z96

7.5 inch： GDEH075Z90

11.6 inch： GDEH116T91, GDEH116Z91

4.7 Connection between DESPI-C03 and Raspberry Pi

Connect DESPI-C03 to Raspberry Pi motherboard in the direction shown in Figure 7. The pins of DESPI-C03 should in the same direction with the USB interface of Raspberry Pi.

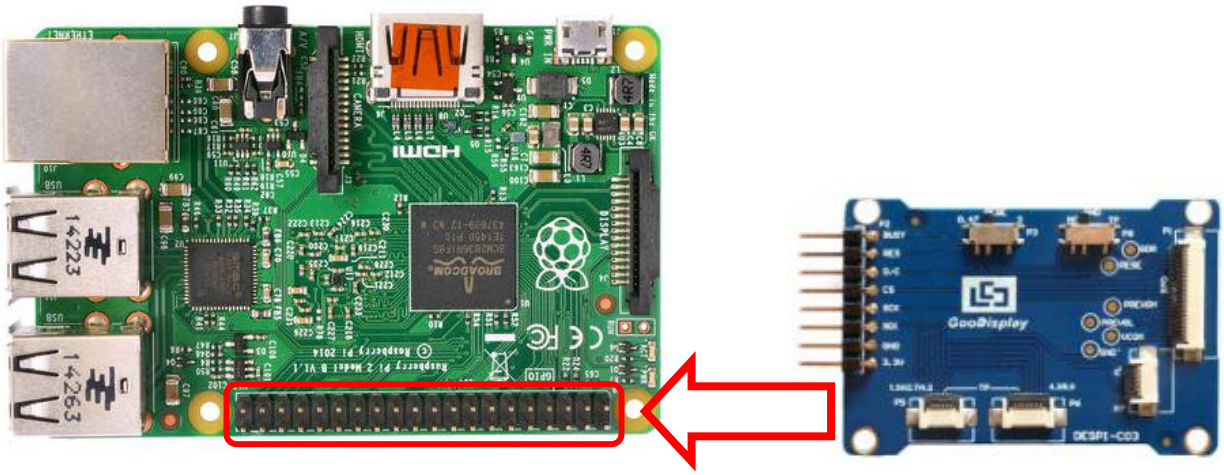

Figure 7 : Connection between DESPI-C03 and Raspberry Pi

5.Program Downloading

This development board uses serial port to download the program, need to use data cable with micro USB interface, CH340 driver, esp32_package_v1_0_2 firmware package,python-2.7.17 plug-in and Arduino programming software, the operation steps are as follows:

1. Install CH340 driver,esp32_package_v1_0_2 firmware package and python-2.7.17 plug-in in computer before downloading for the first time.

1) The unzipped file for the esp32_package_v1_0_2 firmware package is named espressif,unzip the espressif folder and put it in the Arduino/hardware directory,the Arduino programming software must be turned off during installation,the firmware package can also be searched directly in the Arduino Library manager.

2) CH340 driver and python-2.7.17 plug-in can use the default installation path.

3) Run "get.exe" in esp32/tools(the premise is that the python plug-in is installed.) as shown in Figure 8.

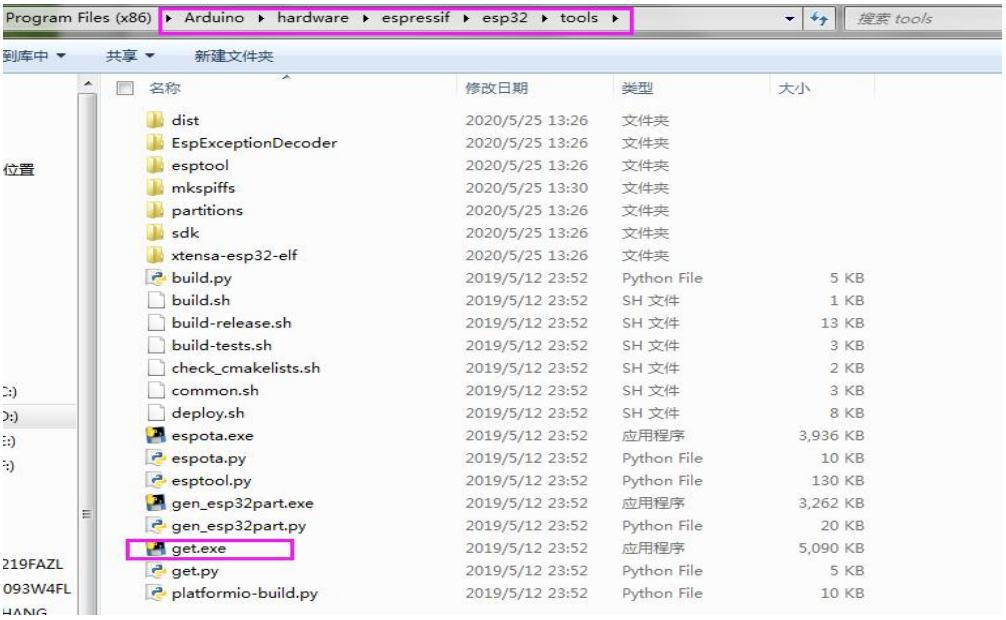

Figure 8 : Run the "get.exe" file

2. Connect the micro USB port of the development board to computer with a USB data cable.

3. Open the Arduino file in the folder shown in Figure 9 with Arduino 1.8.6.

Figure 9 : Open Arduino file

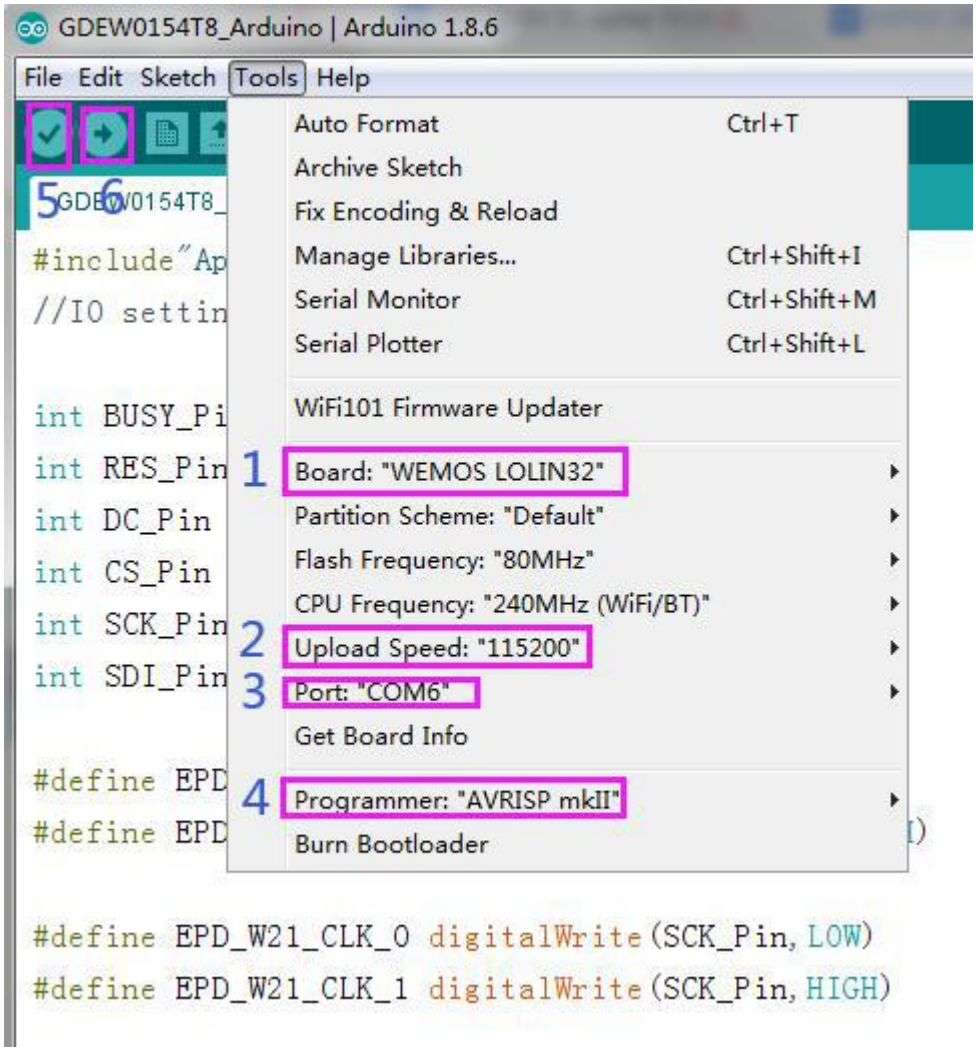

Figure 10 : Steps of downloading program

4. Configure in “Tools” in Figure 10.
5. Select development board model “WEMOS LOLIN32” in position 1 of Figure 10.
6. Select upload speed “115200” in position 2 of Figure 10.
7. Select COM port in position 3 of Figure 10.
8. Select programmer model “AVRISP MKII” in position 4 of Figure 10.
9. Click position 5 of Figure 10 to compile the program.
10. Click position 6 of Figure 10 to download the program to development board.
11. After downloading successfully, power off the development board, connect the e-paper to DESPI-C02 and power the development board. Then the e-paper can display the image normally.

Note: If the compiler prompts "Invalid library found" during program compilation, please ignore the prompt. This will not affect the actual program download.