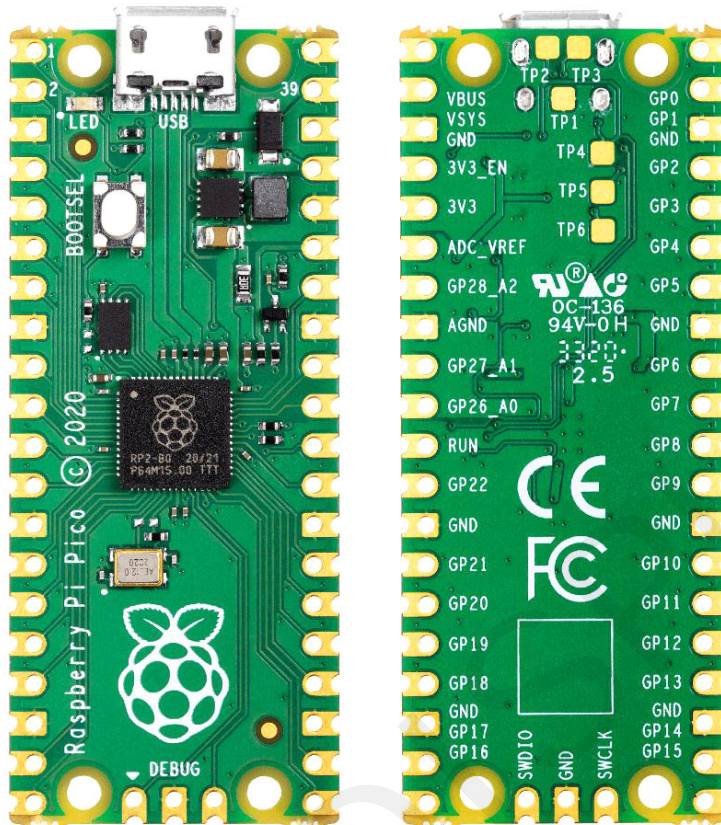




Instruction of Raspberry Pi Pico

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	Design Engineering		
	Approval	Check	Design
			

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Cotents

一. Overview.....	4
二. Raspberry Pi Pico Operating Procedures.....	5
1. Accessories and Tools.....	5
2. Raspberry Pi Pico Pin Definition.....	5
3. Installation of Thonny Software.....	6
4. Connection of Hardware.....	7
5. Driver Compiling and Downloading.....	7

—. Overview

Raspberry Pi Pico is a Cortex M0 main board for single-chip microcomputer based on ARM. It is designed to be a low-cost but flexible RP2040 platform.

Main Features

- RP2040 with 2MB of on-board Flash memory
- Micro USB B port for power supply and data
- 40 pin 21x51 'DIP' 1mm PCB with 0.1 through-hole and edge groove
 - 26 multi-functional 3.3V I/O (GPIO) are exported
 - 23 GPIO are only for numbers, 3 GPIO supports ADC
 - supports surface-mount as a module
- 3 pin ARM serial line debugging SWD interface
- simple but highly flexible power supply structure
 - supports powering through micro USB, external power supply or batteries
- high quality, low cost and high availability
- complete SDK, software samples and documents

Detailed information about RP2040 please check the data sheet :

- Dual-core Arm Cortex M0+ processor, flexible clock running up to 133 MHz
 - phase locked loop supports changeable core frequency
- multiple sets of high performance 264kByte SRAM

Note: Gooddisplay only provides with instructions on e-paper

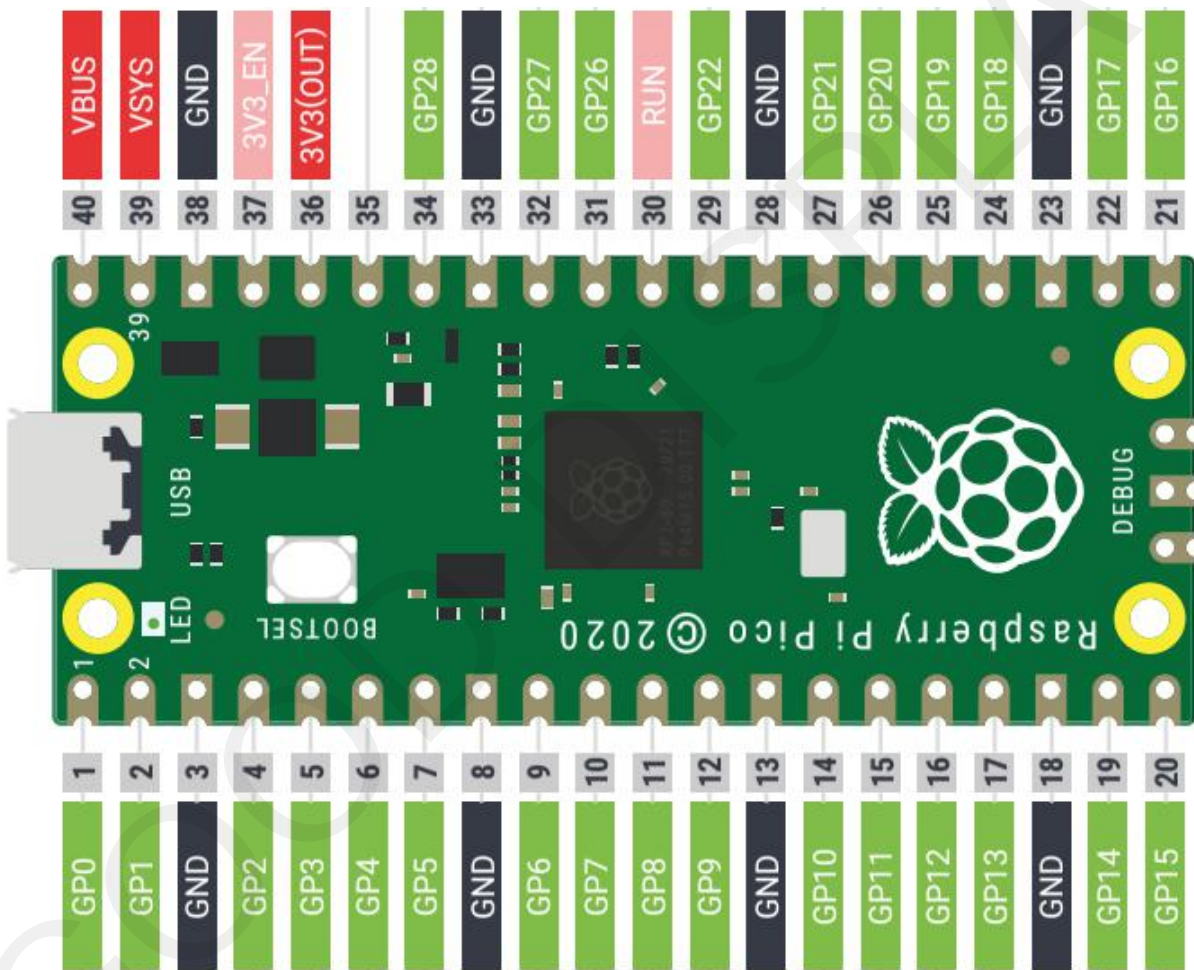
driver and users need to purchase voluntarily for Raspberry Pi Pico and related accessories or tools.

II. Raspberry Pi Pico Operating Procedures

1. Accessories and Tools

- 1) computer (Win7 and above)
- 2) Raspberry Pi Pico
- 3) Micro USB Data Line
- 4) Thonny Programming Software

2. Raspberry Pi Pico Pin Definition



3. Installation of Thonny Programming Software




1) Click  `thonny-3.3.3.exe` in the development tool, click Next to undergo the installation as shown below:



Figure 1: Installation of Thonny

2) Connect Raspberry Pi Pico through Micro USB to the USB interface on the computer where later will  Pi Pico Serial Port (COM10) appear.

Note: Users can manually upgrade  `pico-serial.inf` USB device driver if the port fails to be recognized.

4. Hardware Connection

Raspberry Pi Pico supports SPI interface and the defaults of the part which drives the e-paper adopts SPI interface so that it can speed up the data transmission. Specifics see below:

GP0- - -BUSY

GP1- - -RESE

GP2- - -DC


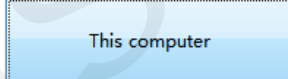
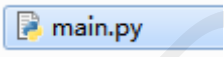
GP3- - -CS

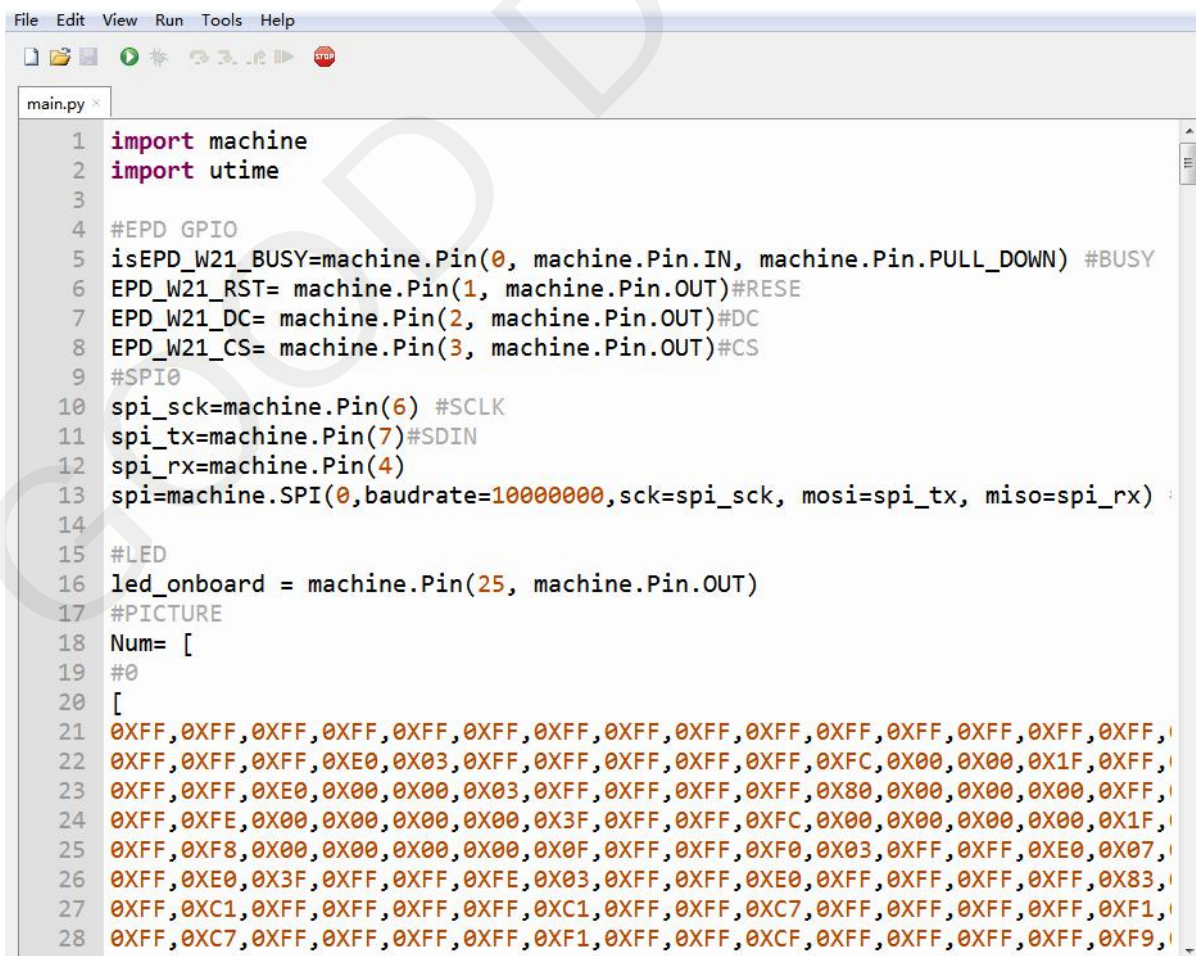
GP6- - -SCLK (SPI0 SCK)

GP7- - -SDIN (SPI0 MOSI)

5. Driver Compiling and Downloading

1) Program Import

Open 'Thonny', click the  and then select  to import related main function  . Specifics shown as below:



```

1 import machine
2 import utime
3
4 #EPD GPIO
5 isEPD_W21_BUSY=machine.Pin(0, machine.Pin.IN, machine.Pin.PULL_DOWN) #BUSY
6 EPD_W21_RST= machine.Pin(1, machine.Pin.OUT)#RESE
7 EPD_W21_DC= machine.Pin(2, machine.Pin.OUT)#DC
8 EPD_W21_CS= machine.Pin(3, machine.Pin.OUT)#CS
9 #SPI0
10 spi_sck=machine.Pin(6) #SCLK
11 spi_tx=machine.Pin(7)#SDIN
12 spi_rx=machine.Pin(4)
13 spi=machine.SPI(0,baudrate=1000000,sck=spi_sck, mosi=spi_tx, miso=spi_rx)
14
15 #LED
16 led_onboard = machine.Pin(25, machine.Pin.OUT)
17 #PICTURE
18 Num= [
19 #0
20 [
21 0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
22 0xFF,0xFF,0xFF,0xE0,0X03,0XFF,0XFF,0XFF,0XFF,0XFF,0XFC,0X00,0X00,0X1F,0XFF,
23 0XFF,0XFF,0XE0,0X00,0X00,0X03,0XFF,0XFF,0XFF,0XFF,0X80,0X00,0X00,0X00,0XFF,
24 0XFF,0XFE,0X00,0X00,0X00,0X00,0X3F,0XFF,0XFF,0XFC,0X00,0X00,0X00,0X00,0X1F,
25 0XFF,0XF8,0X00,0X00,0X00,0X00,0X0F,0XFF,0XFF,0XF0,0X03,0XFF,0XFF,0XE0,0X07,
26 0XFF,0XE0,0X3F,0XFF,0XFF,0XFE,0X03,0XFF,0XFF,0XE0,0XFF,0XFF,0XFF,0X83,
27 0XFF,0XC1,0XFF,0XFF,0XFF,0XFF,0XC1,0XFF,0XFF,0XC7,0XFF,0XFF,0XFF,0XF1,
28 0XFF,0XC7,0XFF,0XFF,0XFF,0XFF,0XF1,0XFF,0XFF,0XCF,0XFF,0XFF,0XFF,0XF9,

```

Figure 2: Use Thonny to Load E Paper Driver

2) Data Connection

Click 'Tools--options' **File Edit View Run Tools Help** to enter the settings and then click 'Interpreter' where set the interpreter to be MicroPython (Raspberry Pi Pico) , specifics shown as below:

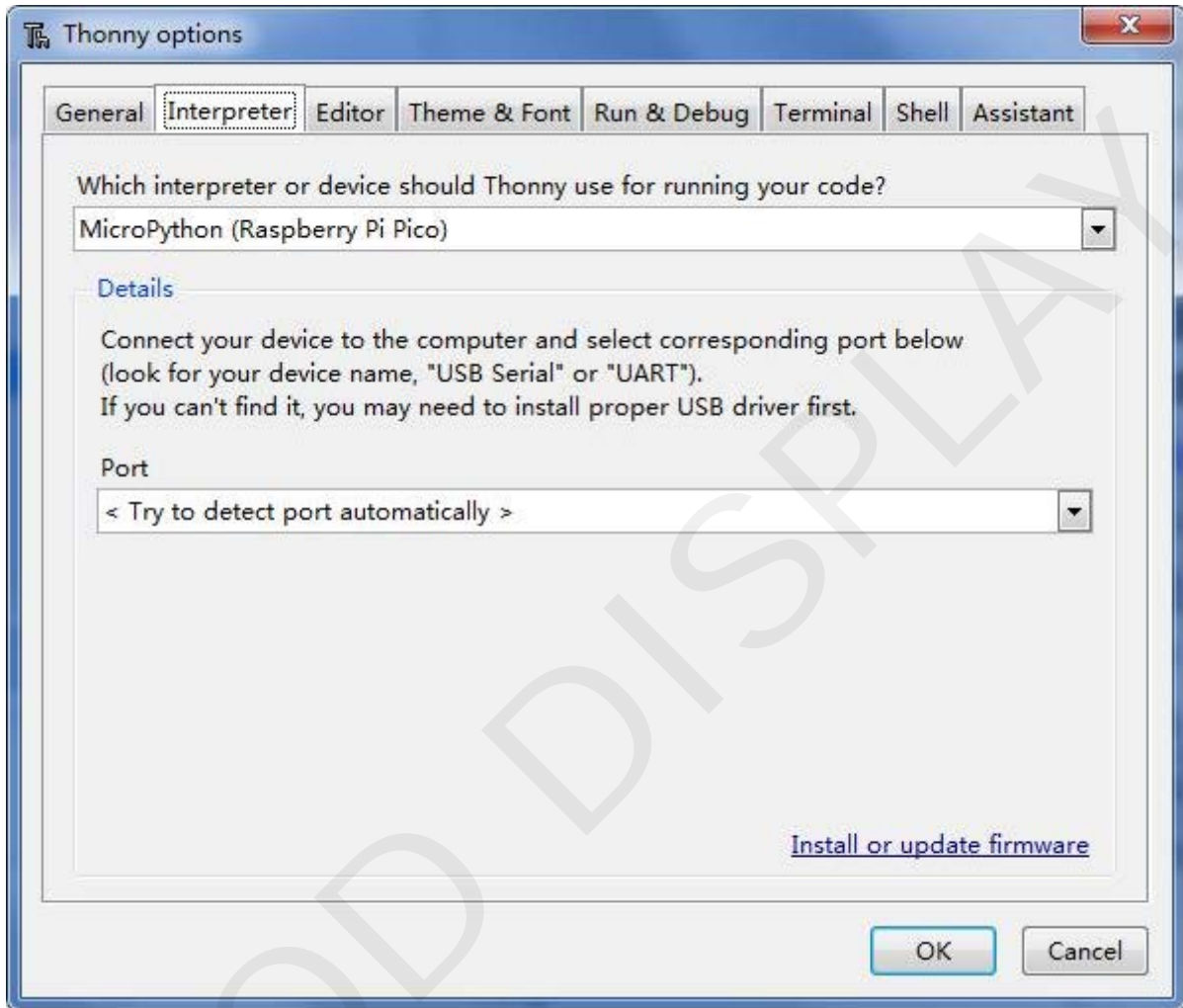



Figure 3: Interpreter Setting

Click  button and if the following text appears, it means that Raspberry Pi Pico has been connected to Thonny as shown in figure 3. Otherwise, please confirm the USB connection.

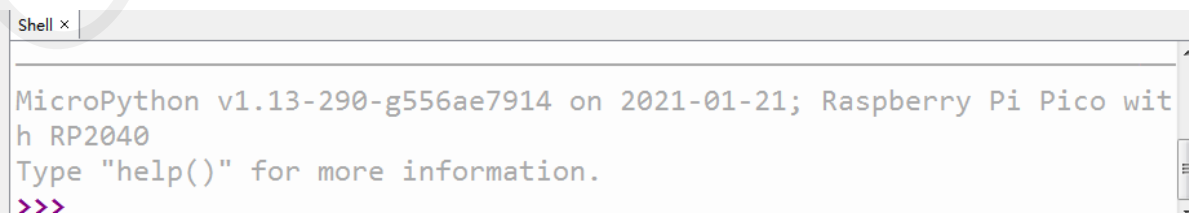

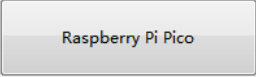


Figure 4: Connection of USB Driver

3) Online Program Debugging

Click  button to online debug the present device driver.

4) Program Downloading

Click 'Save as' in the 'File' and select  to download the device driver. Specifics shown as below:

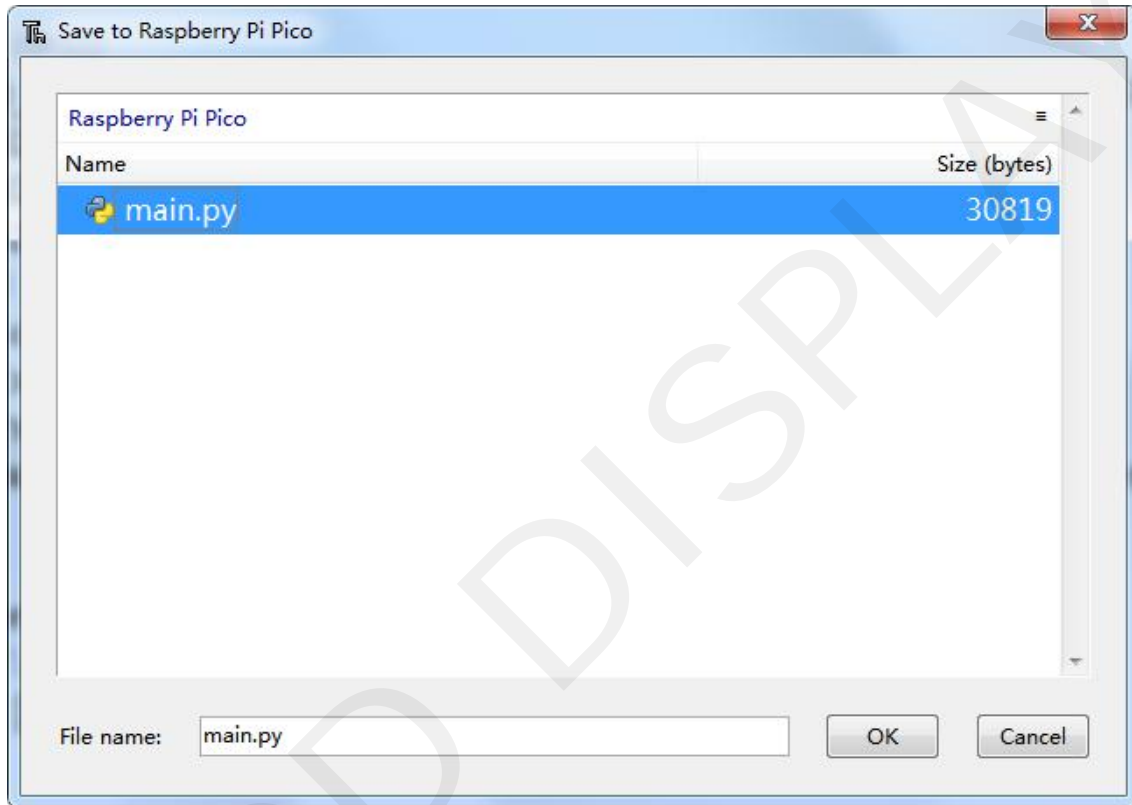


Figure 5: Saving Program to Pico

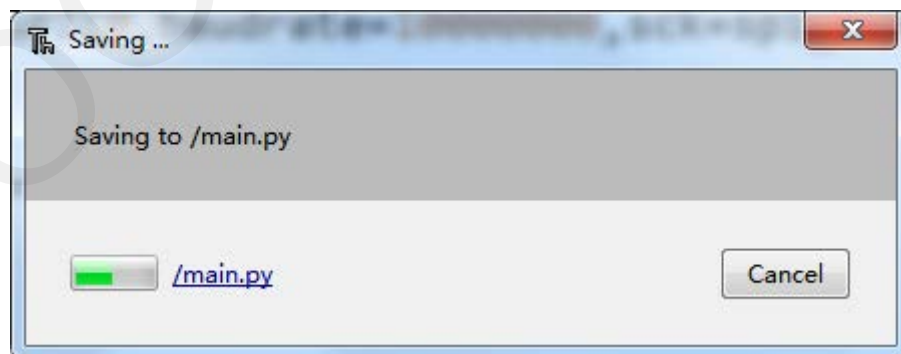


Figure 6: Program Downloading