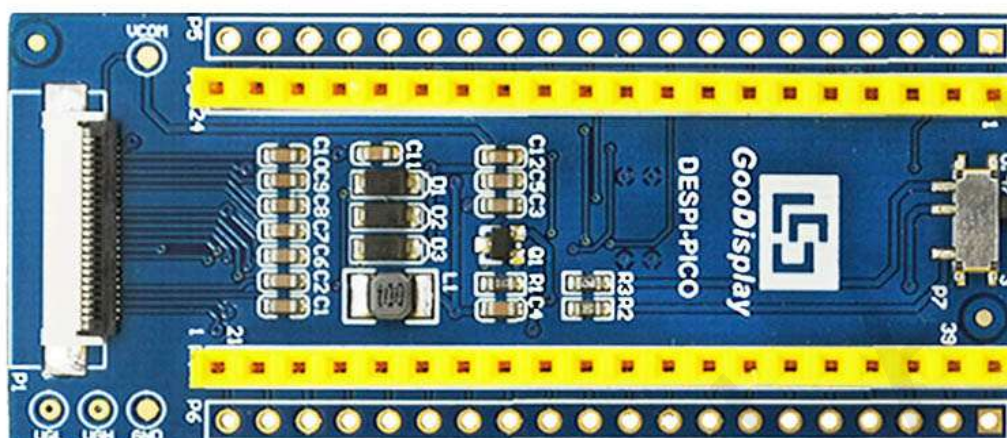




# Connector Board for E-paper Display

# Product Specifications



<b>Customer</b>	<b>Standard</b>
<b>Description</b>	<b>Connector Board for E-paper Display</b>
<b>Model Name</b>	<b>DESPI-PICO</b>
<b>Date</b>	<b>2021/06/01</b>
<b>Revision</b>	<b>1.0</b>

	Design Engineering		
	Approval	Check	Design
			

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## 1. Overview

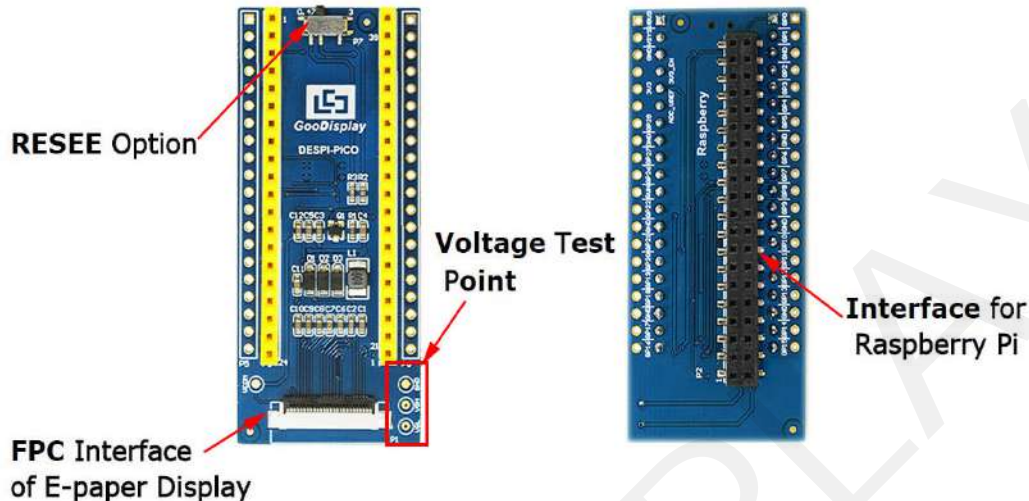
DESPI-PICO is designed for SPI e-paper display. It can boost the driving voltage of Good Display's black-white e-paper display and three-color (black, white and red/Yellow) e-paper display: 1.54", 2.13", 2.6", 2.7", 2.9", 4.2", 5.83" and 7.5".

## 2. Mechanical Specifications

Parameter	Specification
Model	DESPI-PICO
Platform	Raspberry Pi Pico
Dimension	64mm x 29mm
Power Supply	3.3V
Sample Code	Available (please contact sales)
Operating Temp.	-20°C ~+70°C
Main Function	Provide driving voltage for e-paper; Provide interface for e-paper and Raspberry Pi Pico; Help users operate e-paper quickly.
Additional Function	Test of e-paper working conditionf.



## 3.Functions



**Figure 1 : DESPI-PICO**

### 3.1 Pin function

- 1) GP0(BUSY):BUSY signal of e-paper. When the e-paper is refreshing, the GP0(BUSY) pin sends out "busy" signal to MCU, then MCU can not read and write the e-paper IC; When the e-paper refresh is completed, the GP0(BUSY) pin sends out "free" signal, then MCU can read and write the e-paper IC. GDEW series e-paper busy state is high level (GDEH series is low level), and free state is opposite.
- 2) GP1(RES): Reset signal of e-paper. Low level effective.
- 3) GP2(D/C): Data / Command selection. High level for data, low level for command.
- 4) GP3(CS): Chip selection. Low level effective.

- 5) GP6(SCK): SPI serial communication clock signal line.
- 6) GP7(SDI): SPI serial communication data signal line.
- 7) GND: Negative power supply.
- 8) 3V3: Positive power supply.

Tips: When setting IO during programming, the GP0(BUSY) pin should set to input mode, others should set to output mode.

### 3.2 Switch P2

The switch P2 on DESPI-PICO 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、GDEW0154T8D、GDEW0154I9F、  
GDEW0154I9FD、GDEW0154M09、GDEW0154M10
- 2.13 inch : GDEW0213T5、GDEW0213T5D、GDEW0213I5F、  
GDEW0213I5FD、GDEW0213Z19、GDEW0154M21
- 2.6 inch : GDEW026T0、GDEW026T0D、GDEW0266Z90、  
GDEW0266T90
- 2.7 inch : GDEW027W3、GDEW027C44
- 2.9 inch : GDEW029T5、GDEW029T5D、GDEW029I6F、  
GDEW029I6FD、GDEW029Z13、GDEW0129M06

3.71 inch : GDEW0371W7、GDEW0371Z02

4.2 inch : GDEW042T2、GDEW042Z21、GDEW042M01

5.83 inch : GDEW0583T8、GDEW0583M09

7.5 inch : GDEW075T7、GDEW075Z08、GDEW075M10、  
GDEY075T7、GDEY075Z08

### **When RESE is set to 3 :**

1.54 inch : GDEH0154D67、GDEY0154D67、GDEM0154E97LT  
GDEH0154Z90

2.13 inch : GDEH0213B73、GDEH0213B74、GDEY0213B74、  
GDEH0213D30LT、GDEH0213Z98

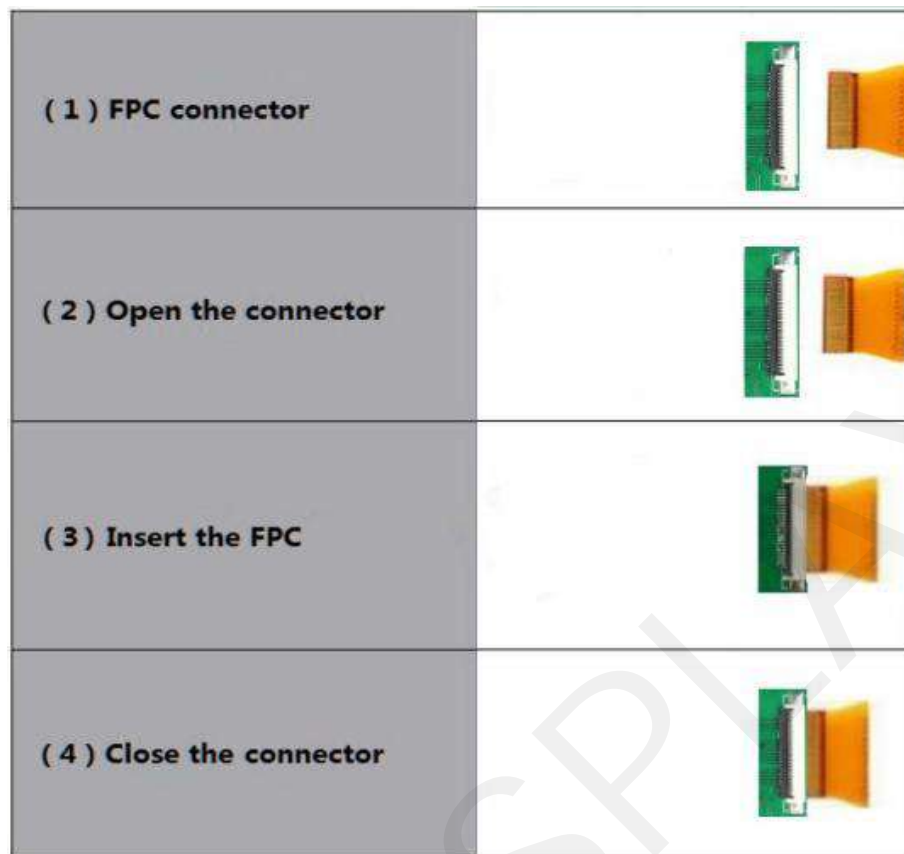
2.9 inch : GDEM029T94、GDEY029T94、GDEH029D57LT、  
GDEH029Z92

4.2 inch : GDEH042Z96、GDEY042T91、GDEY042Z98

**Note :** If the product model you are using is not in this list,  
please contact us.

### **3.3 Connection between DESPI-PICO and e-paper**

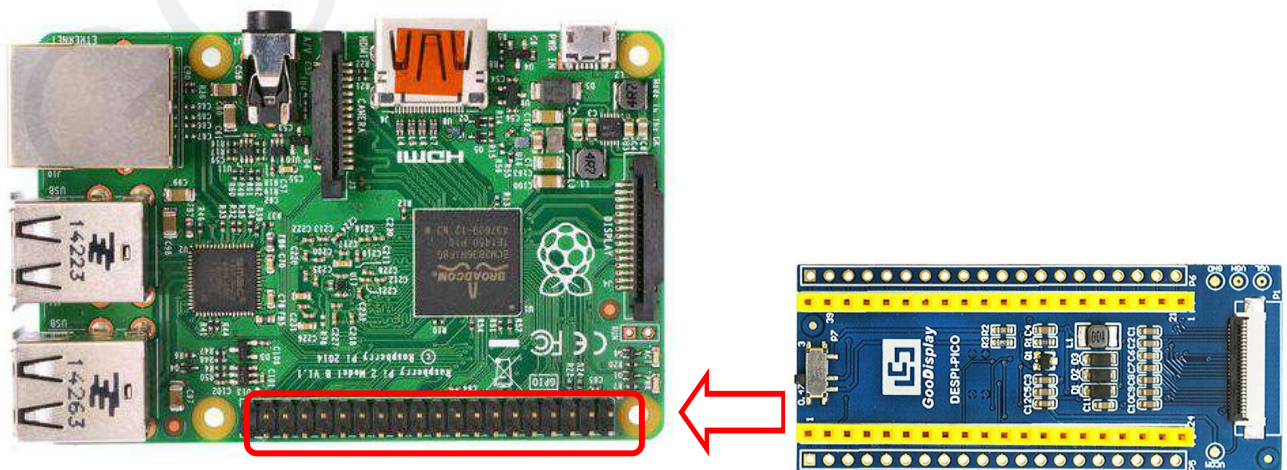
There is a FPC interface P1 on DESPI-PICO, which can connect the e-paper. Users should connect the e-paper FPC to P1 as shown in Figure 2. (Pay attention to the direction of the e-paper.)



**Figure 2 : Connection between DESPI-PICO and e-paper**

### 3.4 Connection between DESPI-PICO and Raspberry Pi

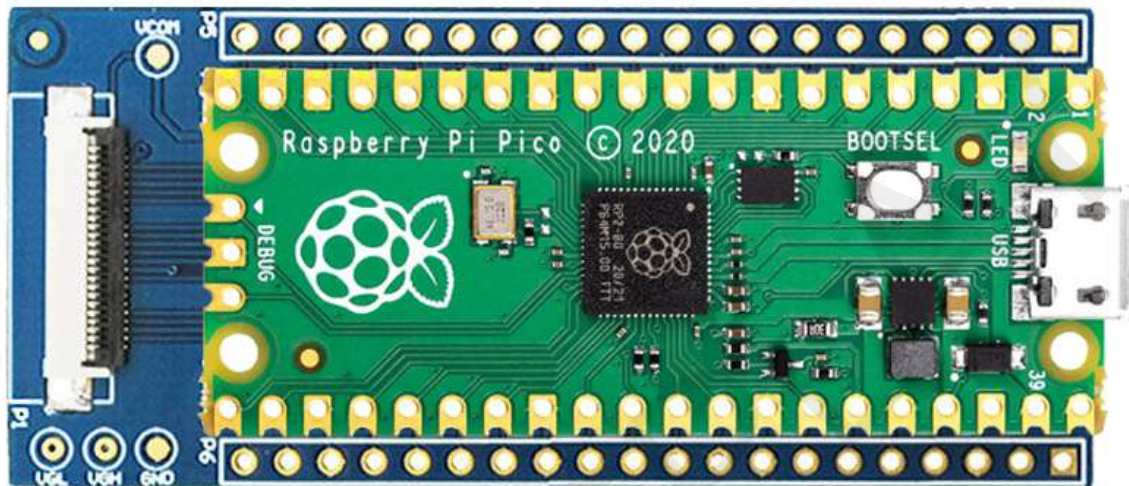
Connect DESPI-PICO to Raspberry Pi motherboard in the direction shown in Figure 3. The pins of DESPI-PICO should in the same direction with the USB interface of Raspberry Pi.



**Figure 3 : Connection between DESPI-PICO and Raspberry Pi**

### 3.5 Connection between DESPI-PICO and Raspberry Pi Pico

Connect DESPI-PICO to Raspberry Pi motherboard in the direction shown in Figure 4.



**Figure 4 : Connection between DESPI-PICO**

### 3.6 Voltage measurement

This connector board supports voltage measurement. The points for measurement include VGH, VGL, VCOM and GND the functions are as follows:

- 1) VGH: Boost circuit positive high voltage.
- 2) VGL: Boost circuit negative high voltage.
- 3) VCOM: Common ground of e-paper.
- 4) GND: Power negative. (Common ground for measurement.)



## **4.Problems of designing drive circuit**

### **4.1 Self-made drive board cannot drive e-papers**

Measure the voltage of VGH and VGL to see if it boost successfully. If it doesn't boost successfully, check if the boost part of the schematic is correct and the components meet the requirements. (Make sure the max voltage of the booster capacitor is adequate. If it is not enough, the capacitor will be burned out during boost.) Check the welding, the most likely problem is the MOS tube. If it boost successfully, please check whether there is virtual welding in FPC socket and so on, and finally check the software.

### **4.2 Inductors selection for e-paper drive circuit**

A 10uH 1A winding inductor is recommended.

### **4.3 MOS tube selection for e-paper drive circuit**

Si1304BDL or Si1308EDL is recommended. If these two are difficult to get, AO3400 can be a substitute.

### **4.4 Diode selection for e-paper drive circuit**

A schottky diode equivalent to the MBR0530 parameters is recommended. And the switching frequency should meet the actual requirements.

### **4.5 FPC socket for e-paper selection**

Select the 24 PIN FPC socket with 0.5mm pin spacing which has contact at up side or both side.

## 4.6 High current in deep sleep mode

The high current in deep sleep mode may be due to the larger capacitance in the boost part.

Tips: The capacitor parameters in DESPI-C03 may be different from the e-paper specification. So users need to strictly refer to the component parameters in specification when designing according to this circuit.

GOODDISPLAY