E-paper Display Module

GooDisplay®

DESPI-K154

Dalian Good Display Co., Ltd.

Product Specifications

Customer	**Standard**
Description	**E-paper Display Module**
Model Name	**DESPI-K154**
Date	**2021/07/29**
Revision	**1.0**

	Design Engineering		
	Approval	Check	**Design**
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Contents

1.Overview

DESPI-K154 is designed for SPI e-paper display. It can boost the driving voltage of Good Display's 1.54'' black-white e-paper display and three-color (black, white and red/Yellow) e-paper display. It preserves interfaces for touch panel and front light, which users can test. And there are also integrated Flash chip and SD card slots for expanded development.

2.Mechanical Specifications

Parameter	**Parameter**
Model	DESPI-K154
Platform	STM32 、 Arduino 、 ESP32 、 ESP8266 、 Raspberry Pi、Raspberry Pi Pico
Dimension	41.80mm x 37.32mm
Power Supply	3.3V
Example Code	Available (please contact sales)
Operating Temp.	B/W EPDs:0 ℃ ~ 50 ℃ B/W/R EPDs:0 ℃ ~ 40 ℃
Main Function	Help users to learn how to drive the EPD with touch panel and front light
Additional Function	Expanded Flash, SD and customized LED

3.Functions

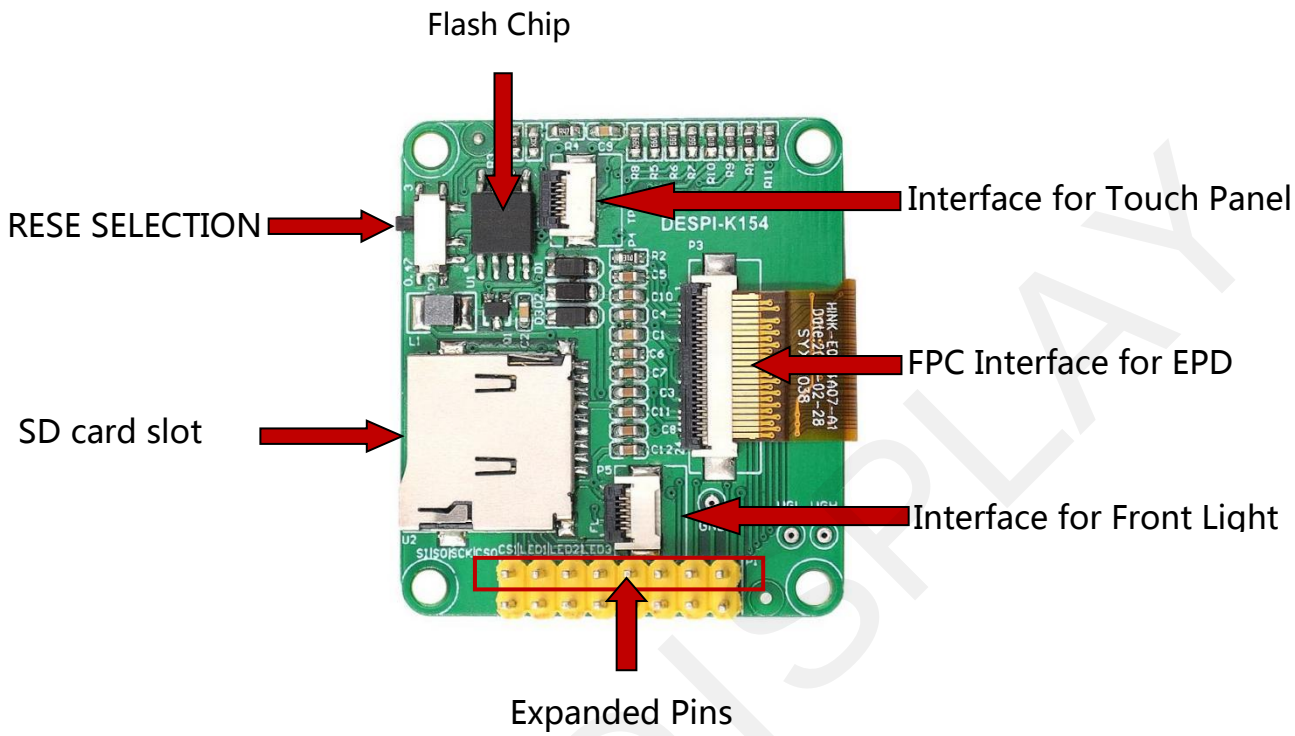

Figure 1 : DESPI-K154

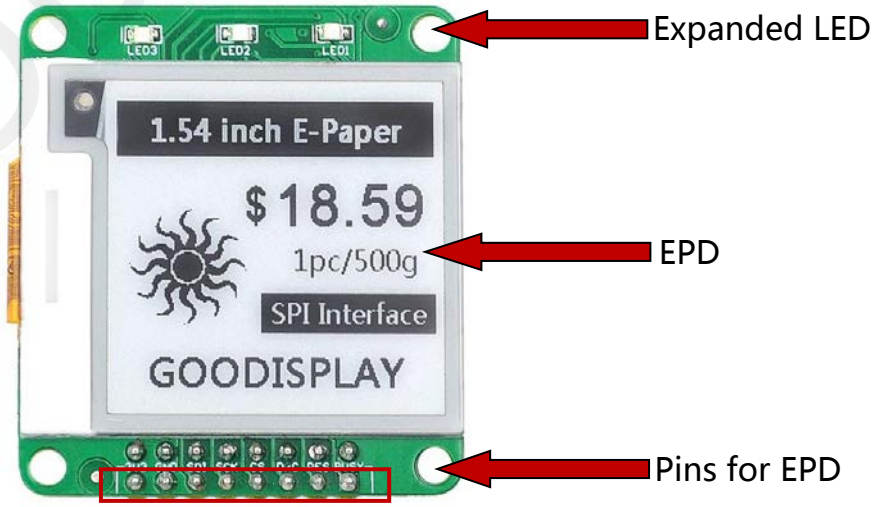

Figure 2 : DESPI-K154

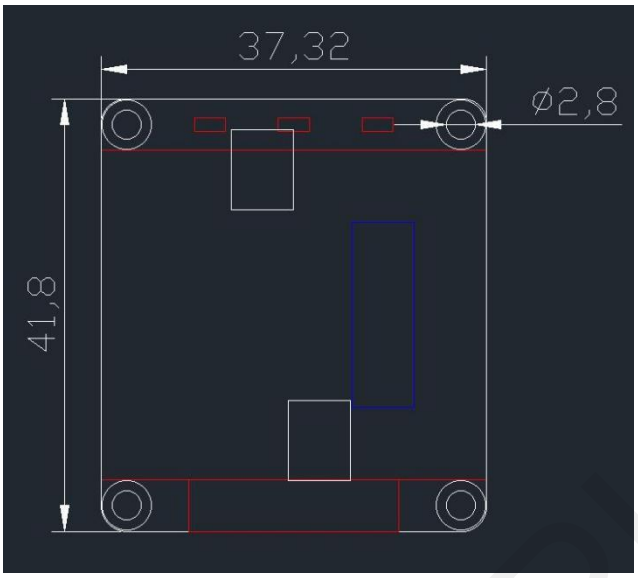

Figure 3 : Drawing of DESPI-K154

3.1 Pins for EPD

1) BUSY: Busy signal of e-paper. When the e-paper is refreshing, the 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 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) RES: Reset signal of e-paper. Low level effective.
3) D/C: Data / Command selection. High level for data, low level for command.
4) CS: Chip selection. Low level effective.

5) SCK: SPI serial communication clock signal line.

6) SDI: SPI serial communication data signal line.

7) GND: Negative power supply.

8) 3.3V: Positive power supply.

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

3.2 Expanded Pins

1）SI: Master Output Slave Input for SPI；INT pin for TP.

2）SO: Master Input Slave Output for SPI；RST pin for TP.

3）SCK: Clock signal line for SPI ；SCL pin for TP.

4）CS0: Chip selection for Flash；SDA pin for TP.

5）CS1: Chip selection for SD.

6）LED1: Control pin for LED1.

7）LED2: Control pin for LED2.

8）LED3: Control pin for LED3.

3.3 Switch P3

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, GDEW0154T8D, GDEW0154M09, GDEW0154M10

When RESE is set to 3 :

1.54 inch：GDEH0154D67, GDEY0154D67, GDEH0154Z90

3.4 Storage Expansion

There are onboard W25Q128 and Micro SD expansion for users to store images, library and etc.

3.5 FPC Interface for EPD

EPD is connected to the module via this interface. Please follow the Image 2, FPC face-up, to complete the connection.

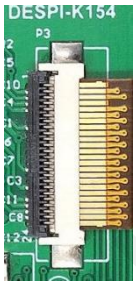

Figure 4 : EPD Interface of DESPI-K154

3.6 Interface for FL Power Supply

It is for 3.3V FL panel and the interface is P5.

Electrodes Description：3.3V（1、2），NC（3、4），GND（5、6）

Figure 5 : Interface for FL Power Supply

3.7 Interface for Touch Panel

It also supports connecting TP and the interface is P4.

Figure 6 : Interface for Touch Panel

3.8 Voltage measurement

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

1）VGH ： Boost circuit positive high voltage.

2）VGL ： Boost circuit negative high voltage.

3）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 PREVGH and PREVGL 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-K154 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.