SMART DISPLAY MODULE SPECIFICATION

4.0 Inch Smart Display with TOUCH	
Model:	UEDX48480040E-WB-A
Version:	V3.2
Date:	2025-2-8

Customer Confirmation

Approved by	Notes

REVISION HISTORY

Revision	Date	Contents of Revision Change	Remark
V1.0	20240611	Preliminary release	
V1.1	20240623	Optimize PCB positioning holes	
V2.0	20240709	Change to English version	
V2.1	20240716	Change header	
V2.2	20240725	Updated mechanical drawing	
V3.0	20240807	Add schemata, GitHub project links, and environment configuration links	
V3.1	20241112	Add more hardware details and link to LCD specification	
V3.2	20250208	Updated GitHub project links	

TABLE of CONTENTS

1. Introduction

1.1 Features

Brief Info:

1) Button control: one is the reset button, the other is the boot button.
2) Backup IO: download ports and multiple IO leads to use on both sides of the periphery.
3) Power: DC 5V, 260mA

System

1) OS: RTOS
2) CPU: ESP32-S3-WROOM-1 240Mhz
3) RAM: 8MB
4) Flash: 16MB
5) Support 2.4GHz Wi-Fi、BLE 5、BLE Mesh
6) Support Peripherals:
   GPIO, SPI, LCD interface, Camera interface, UART, I2C, I2S, remote control, pulse counter,LED PWM, full-speed USB 2.0 OTG, USB Serial/JTAG controller, MCPWM, SDIO host, GDMA, TWAI® controller (compatible with ISO 11898-1), ADC, touch sensor, temperature sensor, timers and watchdogs

For more information on ESP32-S3-WROOM-1, please refer to the following link:datasheet_en.pdf

Display

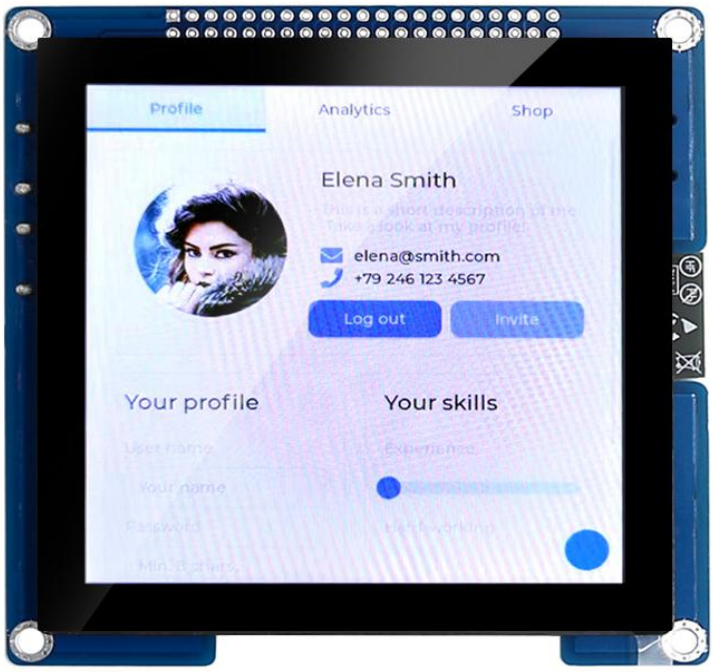
1) Size:4.0 Inch
2) Resolution:480*480
3) Pixel Arrangement：RGB Vertical Stripe
4) Interface Mode：3SPI-RGB 18bits
5) Driver IC： GC9503V TP IC: FT6336U
6) Brightness: 350 cd/m^2
7) Backlight Type：White LED
8) Display mode： Normally Black,
9) Pixel Density: 169 PPI

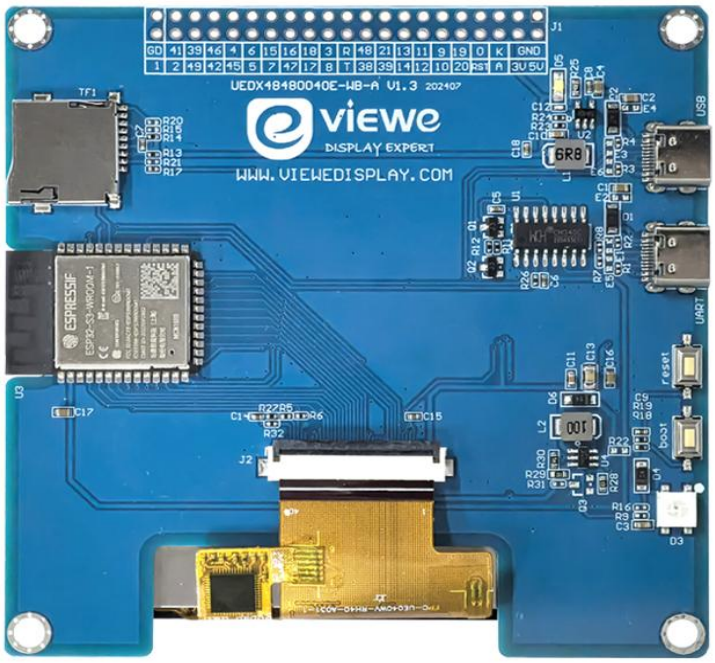
More information about Display can be found here:Display Specification.pdf

Other

1) Operation Temperature：-20~70℃
2) Storage Temperature：-30~80℃

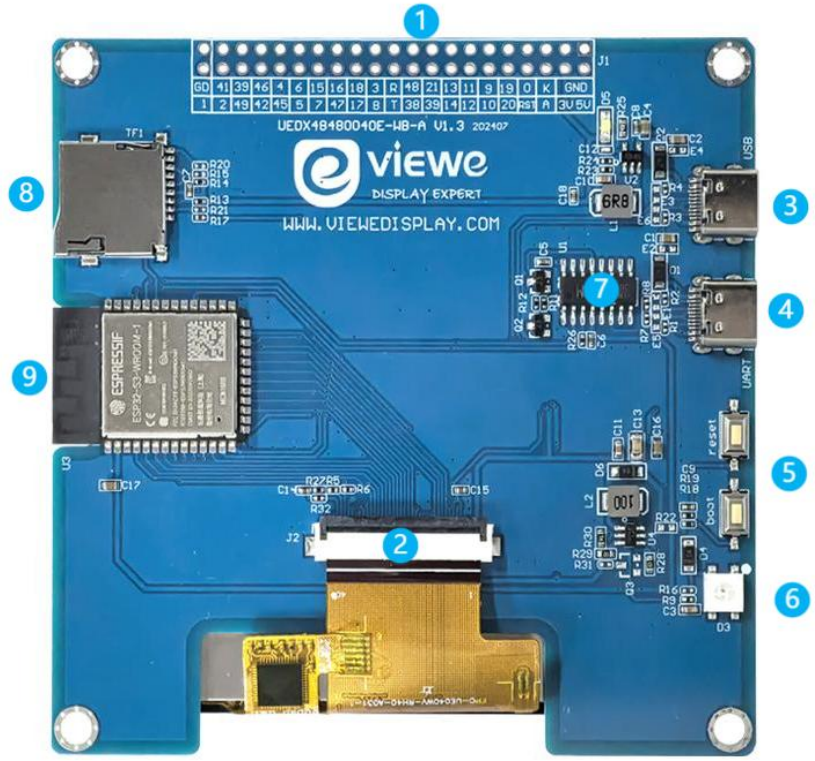
1.2 Appearance picture





2. Product information

2.1 Interface Description



① **External GPIO**

Pin NO.	Symbol	Description	Voltage Range	Remarks
1	GD	Grounds	0V	
2	41	GPIO41, Reserve IO	0-3.3V	
3	39	GPIO39, Reserve IO	0-3.3V	
4	46	GPIO46, Reserve IO	0-3.3V	
5	4	GPIO4, Reserve IO	0-3.3V	
6	6	GPIO6, Reserve IO	0-3.3V	
7	15	GPIO15, Reserve IO	0-3.3V	
8	16	GPIO16, Reserve IO	0-3.3V	
9	18	GPIO18, Reserve IO	0-3.3V	
10	3	GPIO3, Reserve IO	0-3.3V	

11	R	UART Receive	0-3.3V	
12	48	GPIO48, Reserve IO	0-3.3V	
13	21	GPIO21, Reserve IO	0-3.3V	
14	13	GPIO13, Reserve IO	0-3.3V	
15	11	GPIO11, Reserve IO	0V	
16	9	GPIO9, Reserve IO	0-3.3V	
17	19	GPIO19, Reserve IO	0-3.3V	
18	0	GPIO0, Reserve IO	0-3.3V	
19	K	BL-	TDB	
20	GND	Grounds	0V	
21	GND	Grounds	0V	
22	1	GPIO1, Reserve IO	0-3.3V	
23	2	GPIO2, Reserve IO	0-3.3V	
24	49	GPIO49, Reserve IO	0-3.3V	
25	42	GPIO42, Reserve IO	0-3.3V	
26	45	GPIO45, Reserve IO	0-3.3V	
27	5	GPIO5, Reserve IO	0-3.3V	
28	7	GPIO7, Reserve IO	0-3.3V	
29	47	GPIO47, Reserve IO	0-3.3V	
30	17	GPIO17, Reserve IO	0-3.3V	
31	8	GPIO8, Reserve IO	0-3.3V	
32	T	UART Transmit	0-3.3V	
33	38	GPIO38, Reserve IO	0-3.3V	
34	39	GPIO39, Reserve IO	0-3.3V	
35	14	GPIO14, Reserve IO	0-3.3V	
36	12	GPIO12, Reserve IO	0-3.3V	
37	10	GPIO10, Reserve IO	0-3.3V	
38	20	GPIO20, Reserve IO	0-3.3V	
39	RST	Reset signal, do not connect if not in use	0-3.3V	

40	A	BL+	TDB	
41	3V	Power 3.3V	3.3V	
42	5V	Power 5V	5V	

The following picture shows the pins with 2*21pind spacing between 2.54mm

Note:

- A pin can be used for other purposes when it is not used at the same time,When using Display interface, most of the pins are occupied because the RGB interface is used.
- You can also use an external gpio to drive other interface types, such as SPI interface, MCU interface, MIPI interface, etc., without using the Display interface provided by us
- If the Display interface is used but the SD is not used, then the SD pins are freely usable.
- For all pin occupancy, please see 2.2 pin occupancy

② **Display Interface:**

Pin No.	Symbol	I/O	Description
1	LEDA	P	Power supply for backlight anode,Controlled by GPIO38
2	LEDK1/GND	P	Power supply for backlight cathode,Control the backlight with LEDA
3	LEDK2/GND	P	Power supply for backlight cathode,Control the backlight with LEDA
4	GND	P	Power Ground
5	VDD_3V3	P	Power supply to the internal logic power regulator(3.3V)
6	RESET	I	The signal will reset the LCM, Signal is active low.but no connection
7-8	NC	-	no connection
9	SDA,GPIO47	I/O	Serial in/out signal，for initial RGB I/F。 The data is applied on the rising edge of the SCL signal.
10	SCK,GPIO48	I	serial interface clock，for initial RGB I/F。
11	CS,GPIO39	I	Chip select input pin (“Low” enable)，for initial RGB I/F。
12	PCLK,GPIO21	I	Pixel clock input pin, Negative polarity
13	DE,GPIO18	I	Data input enable. Display access is enabled when DE is “H”

14	VSYNC,GPIO17	I	Vorizontal sync signal, Negative polarity
15	HSYNC,GPIO16	I	Hertical sync signal, Negative polarity
16-21	B0-B5,GPIO15-11	I	Blue data input.
22-27	G0-G5,GPIO10-5	I	Green data input.
28-33	R0-R5,GPIO4-0	I	Red data input.
34	GND	P	Power Ground
35	TP_INT	O	Interrupt signals for TP,but no connection
36	TP_SDA,GPIO40	I/O	I2C data signals for TP
37	TP_SCL,GPIO41	I	I2C clock signals for TP
38	TP_RST	I	The signal will reset the TP, Signal is active low,but no connection
39	TP_VCI	P	TP_VDD(2.8V) Power Supply for TP
40	GND	P	Power Ground

③ **USB:**

The USB interface belongs to Type-C and is mainly used to power the board. The picture on the left shows serial communication and the picture on the right shows the download port.

④ **UART:**

Used for serial communication, such as burning, serial debugging, etc

⑤ **button:**

Boot button and the reset button.

⑥ **RGB LCD:**

Can emit red, green, blue three colors of light, and through different combinations to produce a variety of colors

⑦ **USB to serial chip: CH340C**

The CH340 is a USB bus conversion chip that implements USB-to-serial port or USB-to-print port.In serial port mode, the CH340 provides common MODEM communication signals, which can be used to extend the asynchronous serial port for a computer or upgrade a common serial device to the USB bus.

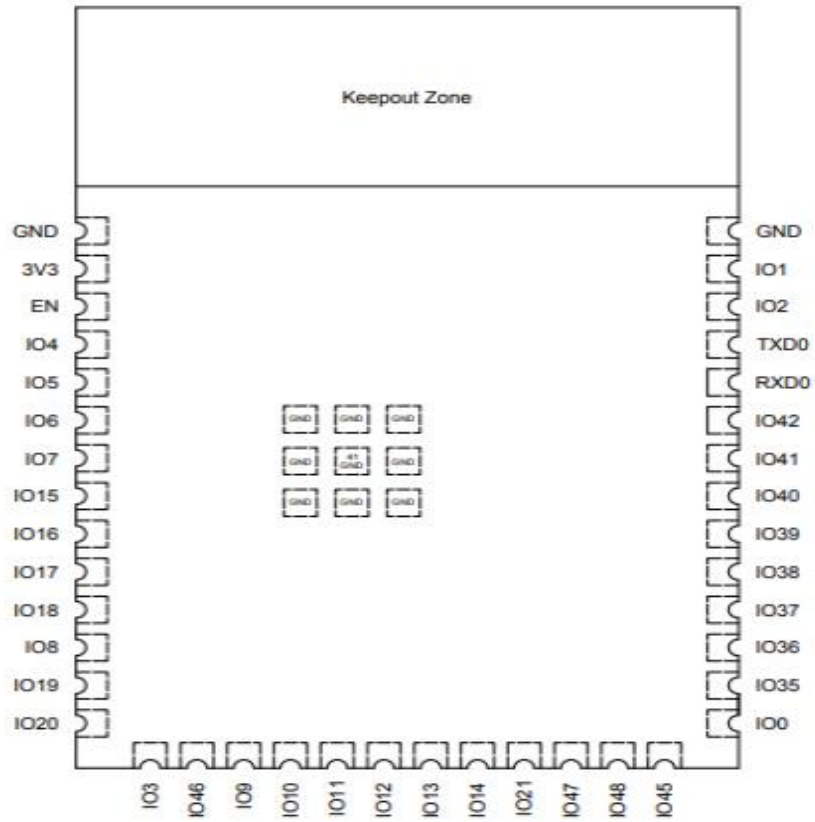
⑧ **SD:**

A port or slot for inserting an SD card, usually for storing data

⑨ **Main Control Chip: ESP32S3-MCN16R8**

Dual-core processor, up to 240MHz operating frequency

2.2 pin occupancy



Symbol	service condition	Remarks
GPIO0	Display interface R4	
GPIO1	Display interface R3	
GPIO2	Display interface R2	
GPIO3	Display interface R1	
GPIO4	Display interface R0/KEY-Boot	But the boot button is not used
GPIO5	Display interface G5	
GPIO6	Display interface G4	
GPIO7	Display interface G3	
GPIO8	Display interface G2	
GPIO9	Display interface G1	
GPIO10	Display interface G0	
GPIO11	Display interface B4	
GPIO12	Display interface B3	
GPIO13	Display interface B2	
GPIO14	Display interface B1	
GPIO15	Display interface B0	
GPIO16	Display interface HS	
GPIO17	Display interface VS	

GPIO18	Display interface DE	
GPIO19	USB-DN	
GPIO20	USB-DP	
GPIO21	Display interface PCLK	
GPIO35	Not used	However, the pin is not led out
GPIO36	Not used	However, the pin is not led out
GPIO37	Not used	However, the pin is not led out
GPIO38	Display interface LCD-BL-EN	
GPIO39	Display interface SPI-CS	
GPIO40	TP-SDA	The data line used to touch the I2C
GPIO41	TP-SCL	The clock line used to touch the I2C
GPIO42	SD-MOSI/RGB-LED	If SD or RGB-LED is not used, it can be used for other purposes
RXD0/GPIO43	UARTRX	
TXD0/GPIO44	UARTTX	
GPIO45	SD-CLK	If SD is not used, it can be used for other purposes
GPIO46	SD-MISO	If SD is not used, it can be used for other purposes
GPIO47	SPI-SDA	
GPIO48	SPI-CLK	

2.3 Display Information

Item	Specification	Unit	Remark
Pixel Driving element	A-Si TFT	-	
Screen Size	4.0	Inch	Diagonal
Resolution	480(W)*3(RGB)*480(H)	Dots	
Interface	3SPI_RGB 18bits	-	40PIN
Module Power Consumption	0.883	Watt	Typ.
VActive VArea	72.46(W)*71.78(H)	mm	
CTP_Pixel pitch (W*H)	0.1497(W)*0.1462(H)	mm	
Module Size (W*H*D)	84(W)*84(H)*3.22(D)	mm	
Luminance	350	cd/m^2	Typ.
Viewing Direction	All	O'clock	-
Display Color	262K	Colors	18bits

2.4 Voltage & Current

Item	Conditions	Min	Typ	Max	Unit
Power Voltage	DC	4. 0	5.0	5.5	V
Operation Current	VCC= +5V, Maximum backlight current		260		mA
	VCC= +5V,backlight off	-	150	-	mA
Recommended power supply:5V 1A DC					

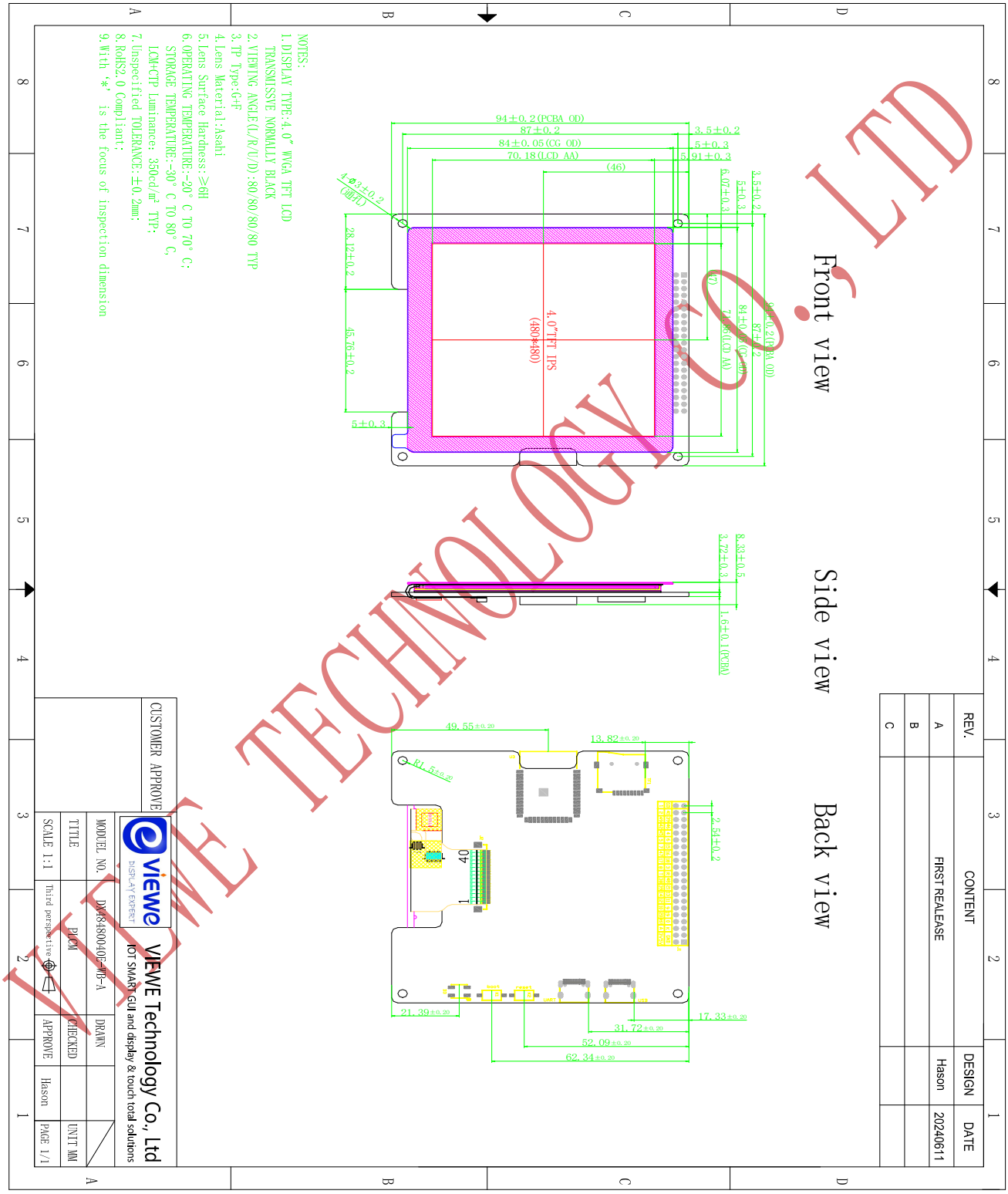
2.5 Reliability Test

Item	Conditions	Min	Typ	Max	Unit
Working Temperature	60%RH at 5V voltage	-20	25	70	C
Storage Temperature	---	-30	25	85	C
Working Humidity	25°C	10%	60%	90%	RH
ESD	---	Contact: ±4KV Air: ±8KV			KV

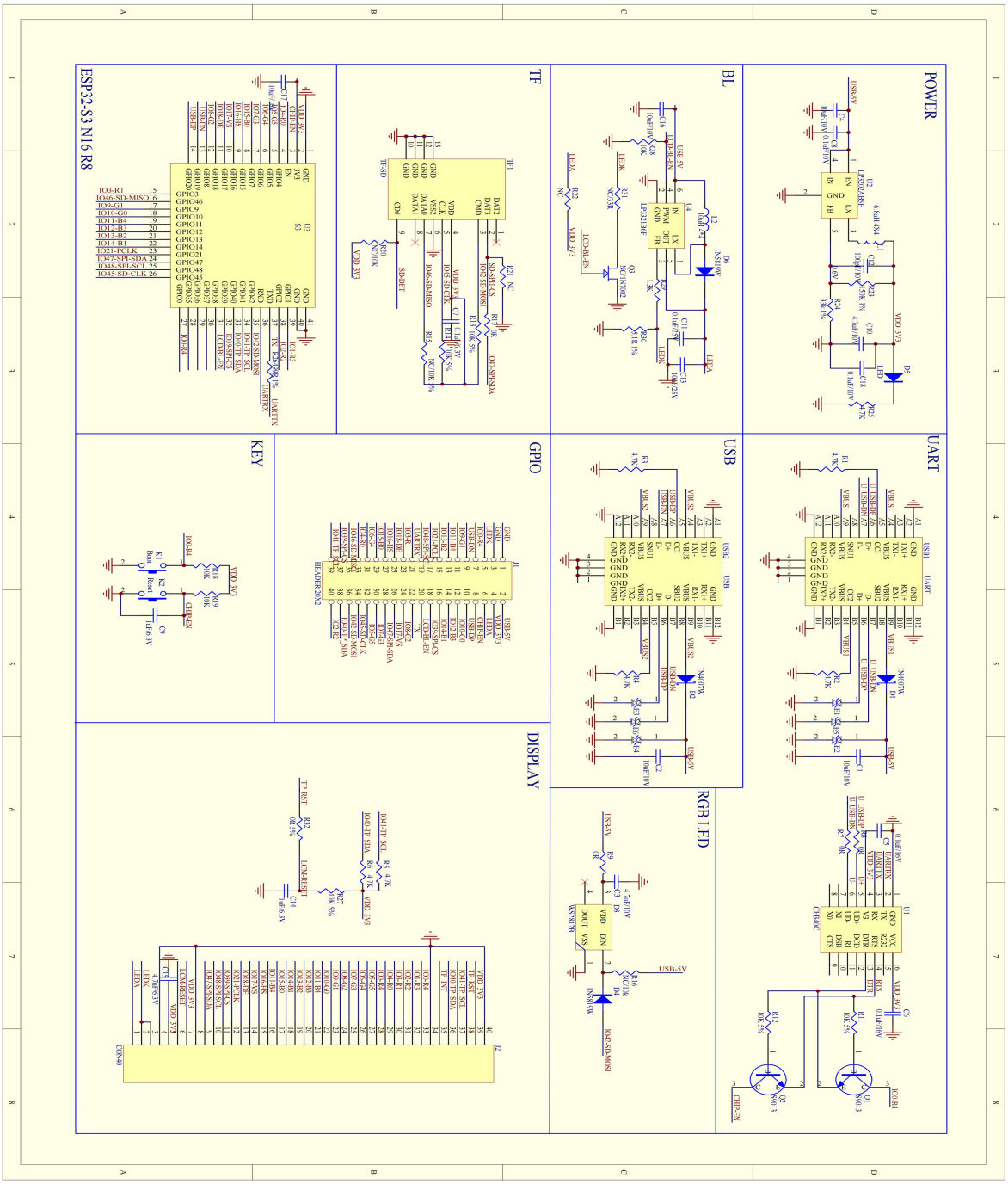
2.6 Related software

Software name	Version	Software associated configuration	Development environment configuration link
Arduino IDE	3.0.4 (esp32)	1. Board: ESP32S3 Dev Module 2. CPU Frequency: 240MHz (WiFi) 3. Flash Frequency: NO 4. Flash Mode: QlO 80MHz 5. Flash Size: 16MB (128Mb) 6. Partition Scheme: Default 4MB with spiffs (1.2MB APP/1.5MB SPIFFS) 7. PSRAM: OPI PSRAM 8. Programmer: Esptool	ESP32-Arduino config (github.com)
ESP-IDF	5.1.1 5.2.2	Once configured, no configuration is required （If you have any problem with the configuration, please contact us, we will help you）	ESP-IDF config (github.com)

3. MECHANICAL DRAWING



4. Schematic



5. Related downloads

5.1 Arduino and IDF relevant information

https://github.com/VIEWESMART/UEDX48480040ESP32-4inch-Touch-Display/tree/main/examples

5.2 Libraries required for Arduino

You can directly download the ESP32_Display_Panel library and its dependent libraries in the library manager of the Arduino IDE.

5.3 Arduino relevant information

You can directly download the ESP32_Display_Panel library and its dependent libraries in the library manager of the Arduino IDE, and then use the examples within them.