SMART DISPLAY MODULE SPECIFICATION

7.0 Inch Smart Display with TOUCH	
Model:	PLCM-UEDX80480070E-WB-A
Version:	V2.1
Date:	2025-01-08

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Customer Confirmation

Approved by	Notes

REVISION HISTORY

Revision	Date	Contents of Revision Change	Remark
V1.0	20240814	Preliminary release	
V1.1	20240819	Optimize PCB positioning holes	
V1.2	20240823	Add examples and required libraries for Arduino	
V2.0	20241116	Add more hardware details and link to LCD specification	
V2.1	20250108	Update GitHub link	

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1. Introduction

1.1 Features

Brief Info:

1) Two buttons: a reset button and a boot button.
2) Backup IO: download ports and multiple IO leads to use on both sides of the periphery.
3) Power: DC 5V, 300mA

System

1) OS: RTOS
2) CPU: ESP32-S3 240Mhz
3) RAM: 8MB
4) Flash: 16MB
5) Interface: UART/USB
6) Support 2.4GHz Wi-Fi、BLE 5、BLE Mesh
7) upport 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: 7.0 Inch
2) Resolution: 800 *480
3) Mode: TN
4) Interface Mode：40PIN RGB 24bits
5) Driver IC：EK9716BD3+EK73002AB2
6) Touch IC：GT911
7) Brightness: 300 cd/m^2
8) Display Color：16.7M
9) Brightness: 300 cd/m^2
10) Touch: CTP

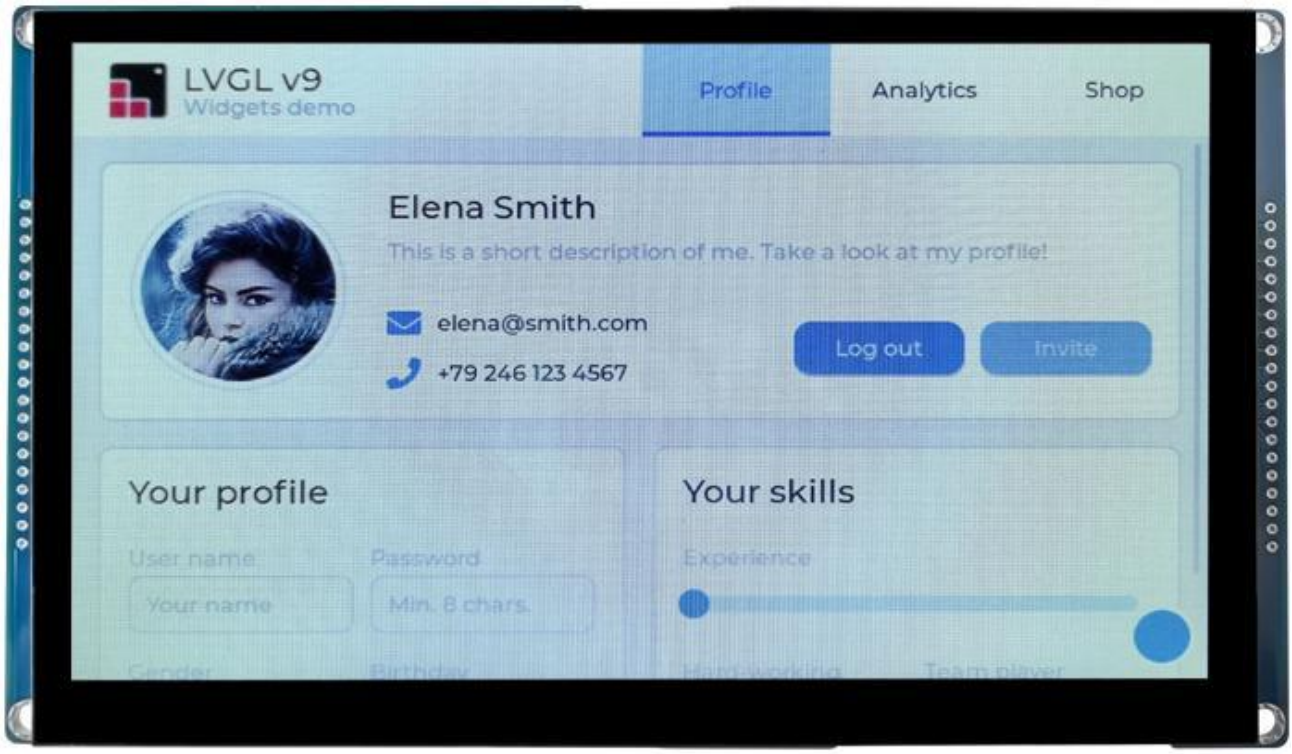
More information about Display can be found here:Display Specification.pdf

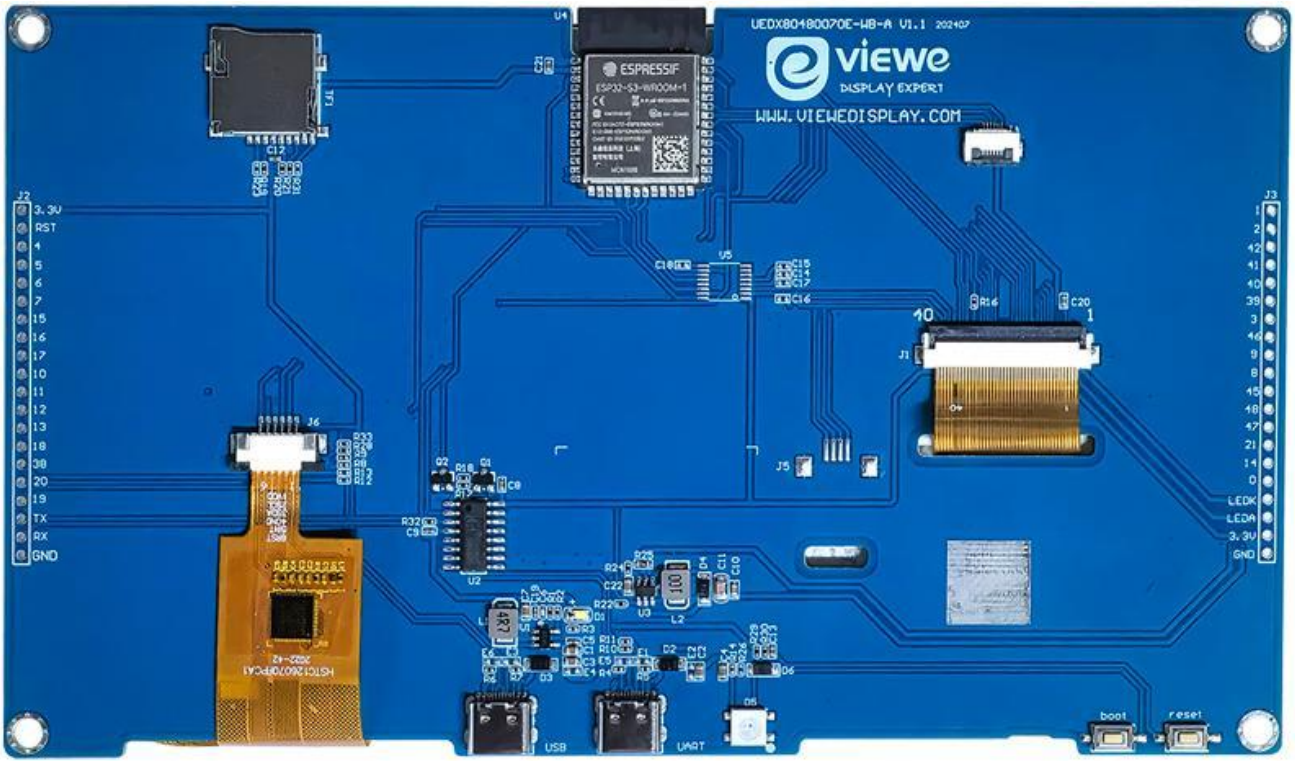
Other

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

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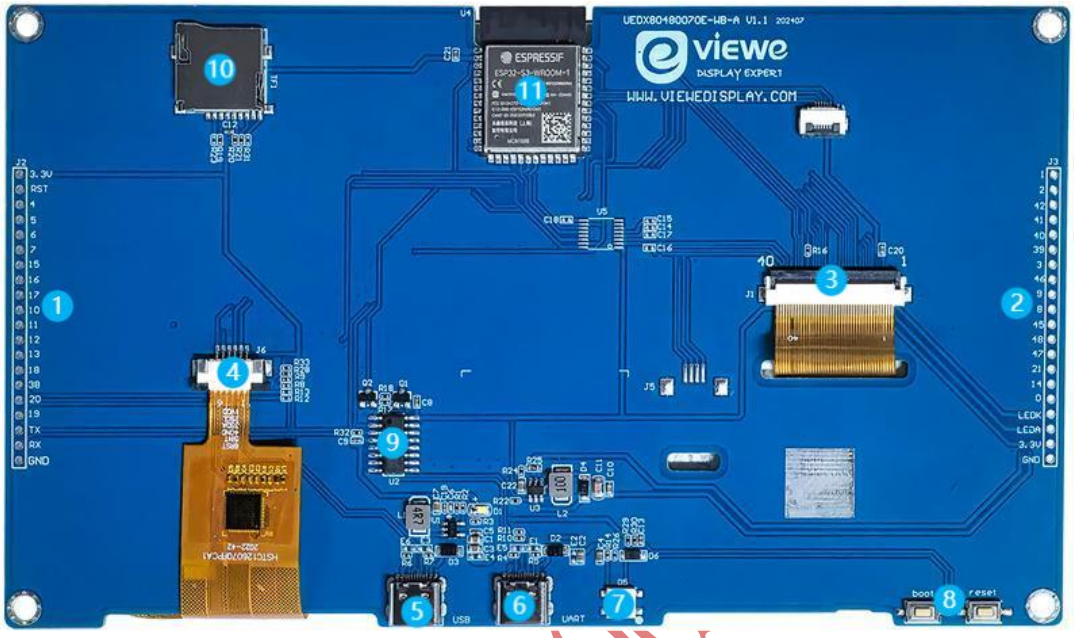
1.2 Appearance picture





2. Product information

2.1 Interface Description



① **External GPIO: J2**

Pin NO.	Symbol	Description	Current Usage
3.3V	3.3V	Power 3.3V	Power 3.3V
RST	CHIP-EN	High: on, enables the chip Low: off, the chip powers off. Note: Do not leave the EN pin floating	Note: Do not leave the EN pin floating
4	GPIO4	RTC_GPIO4, GPIO4, TOUCH4, ADC1_CH3	LCD G5
5	GPIO5	RTC_GPIO5, GPIO5, TOUCH5, ADC1_CH4	LCD G0
6	GPIO6	RTC_GPIO6, GPIO6, TOUCH6, ADC1_CH5	LCD G1
7	GPIO7	RTC_GPIO7, GPIO7, TOUCH7, ADC1_CH6	LCD G2
15	GPIO15	RTC_GPIO15, GPIO15, U0RTS, ADC2_CH4, XTAL_32K_P	LCD G3
16	GPIO16	RTC_GPIO16, GPIO16, U0CTS, ADC2_CH5, XTAL_32K_N	LCD G4
17	GPIO17	RTC_GPIO17, GPIO17, U1TXD, ADC2_CH6	Not used
10	GPIO10	RTC_GPIO10, GPIO10, TOUCH10, ADC1_CH9, FSPICS0, FSPIIO4, SUBSPICS0	SD-CS
11	GPIO11	RTC_GPIO11, GPIO11, TOUCH11, ADC2_CH0, FSPID, FSPIIO5, SUBSPID	RTP-DIN

12	GPIO12	RTC_GPIO12, GPIO12, TOUCH12, ADC2_CH1, FSPICLK, FSPIIO6, SUBSPICLK	RTP-CLK
13	GPIO13	RTC_GPIO13, GPIO13, TOUCH13, ADC2_CH2, FSPIQ, FSPIIO7, SUBSPIQ	RTP-DOUT
18	GPIO18	RTC_GPIO18, GPIO18, U1RXD, ADC2_CH7, CLK_OUT3	INT(Not used)
38	GPIO38	GPIO38, FSPIWP, SUBSPIWP	RTP-csb-CTP-rst
20	GPIO20	RTC_GPIO20, GPIO20, U1CTS, ADC2_CH9, CLK_OUT1, USB_D+	TP SCL
19	GPIO19	RTC_GPIO19, GPIO19, U1RTS, ADC2_CH8, CLK_OUT2, USB_D-	TP SDA
TX	GPIO43	U0TXD, GPIO43, CLK_OUT1	UARTTX
RX	GPIO44	U0RXD, GPIO44, CLK_OUT2	UARTRX
GND	GND	Grounds	GND

② **External GPIO: J3**

Pin NO.	Symbol	Description	Current Usage
1	GPIO1	RTC_GPIO1, GPIO1, TOUCH1, ADC1_CH0	LCD B4
2	GPIO2	RTC_GPIO2, GPIO2, TOUCH2, ADC1_CH1	LCD-BL-EN
42	GPIO42	MTMS, GPIO42	LCD PCLK
41	GPIO41	MTDI, GPIO41, CLK_OUT1	LCD VS
40	GPIO40	MTDO, GPIO40, CLK_OUT2	LCD DE
39	GPIO39	MTCK, GPIO39, CLK_OUT3, SUBSPICS1	LCD HS
3	GPIO3	RTC_GPIO3, GPIO3, TOUCH3, ADC1_CH2	LCD B1
46	GPIO46	GPIO46	LCD B2
9	GPIO9	RTC_GPIO9, GPIO9, TOUCH9, ADC1_CH8, FSPIHD, SUBSPIHD	LCD B3
8	GPIO8	RTC_GPIO8, GPIO8, TOUCH8, ADC1_CH7, SUBSPICS1	LCD B0
45	GPIO45	GPIO45	LCD R0
48	GPIO48	SPICLK_N_DIFF,GPIO48, SUBSPICLK_N_DIFF	LCD R1
47	GPIO47	SPICLK_P_DIFF,GPIO47, SUBSPICLK_P_DIFF	LCD R2
21	GPIO21	RTC_GPIO21, GPIO21	LCD R3

14	GPIO14	RTC_GPIO14, GPIO14, TOUCH14, ADC2_CH3, FSPIWP, FSPIDQS, SUBSPIWP	LCD R4
0	GPIO0	RTC_GPIO0, GPIO0	Boot
LEDK	LEDK	BL-	BL-
LEDA	LEDA	BL+	BL+
3.3V	3.3V	Power 3.3V	Power 3.3V
GND	GND	Grounds	Grounds

Note: ① ②

- 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
- Where GPIO0 is the link to the boot button, but you can use it for other purposes; GPIO17 and GPIO18 are not used, you are free to use them
- If the Display interface is used but the SD is not used, then the SD pins are freely usable.

③ **Display Interface:J1**

Pin No.	Symbol	I/O	Description
1	**LEDK**	P	Power supply for backlight cathode
2	**LEDA**	P	Power supply for backlight anode
3	**GND**	P	Power Ground
4	**VDD**	P	Power supply to the internal logic power regulator(3.3V)
5-12	**R0-R7**	I	Red data input.
13-20	**G0-G7**	I	Green data input.
21-28	**B0-B7**	I	Blue data input.
29	**GND**	P	Power Ground
30	**CLK**	I	Pixel clock input pin, Negative polarity
31	**DISP**	I	Standby mode. Normally pulled high.
32	**HSYNC**	I	Horizontal sync signal, Negative polarity
33	**VSYNC**	I	Vertical sync signal, Negative polarity
34	**DEN**	I	Data input enable. Display access is enabled when DE is "H"
35	**NC**	I	Dummy
36	**GND**	P	Power Ground
37	**XR**	-	Dummy

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38	**YD**	-	Dummy
39	**XL**	-	Dummy
40	**YU**	-	Dummy

I：Input；O：Output；P：Power

④ **TP Interface:J4**

Pin No.	Symbol	I/O	Description
1	**GPIO20**	P	TP SCL
2	**GPIO19**	P	TP SDA
3	**GPIO18**	P	CTP INT(It's not actually used)
4	**GND**	P	Power Ground
5	**VDD**	I	Power supply to the internal logic power regulator(3.3V)
6	**GPIO38**	I	RTP-csb-CTP-rst
7	**GND**	P	Power Ground
8	**GND**	P	Power Ground

⑤ **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.

⑥ **UART:**

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

⑦ **RGB LCD:**

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

⑧ **button:**

Boot button and the reset button.

⑨ **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.

⑩ **SD:**

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

⑪ **Main Control Chip: ESP32S3-MCN16R8**

Dual-core processor, up to 240MHz operating frequency

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2.2 Display Information

Item	Specification	Unit	Remark
Pixel Driving element	TN TFT	-	-
Screen Size	7.0	Inch	Diagonal
Resolution	800(W)*3(RGB)*480(H)	Dots	-
Module Power Consumption	1.8	Watt	
Active Area	153.84(W)*85.63(H)	mm	-
Pixel pitch (W*H)	0.1923(W)*0.1784(H)	mm	-
Module Size (W*H*D)	165W)*100(H)*5.48(D)	mm	
Driver IC	EK9716BD3+EK73002AB2	-	
Interface Mode	40PIN RGB 24bits	-	
Display mode	Normally White	-	
Luminance	300	cd/m^2	Typ.
Viewing Direction	6.0	O'clock	-
Display Color	16.7M	Colors	24bits
LED life time	20,000 Hours	-	

2.3 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		300		mA
	VCC= +5V,backlight off	-	150	-	mA
Recommended power supply:5V 1A DC					

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2.4 Reliability Test

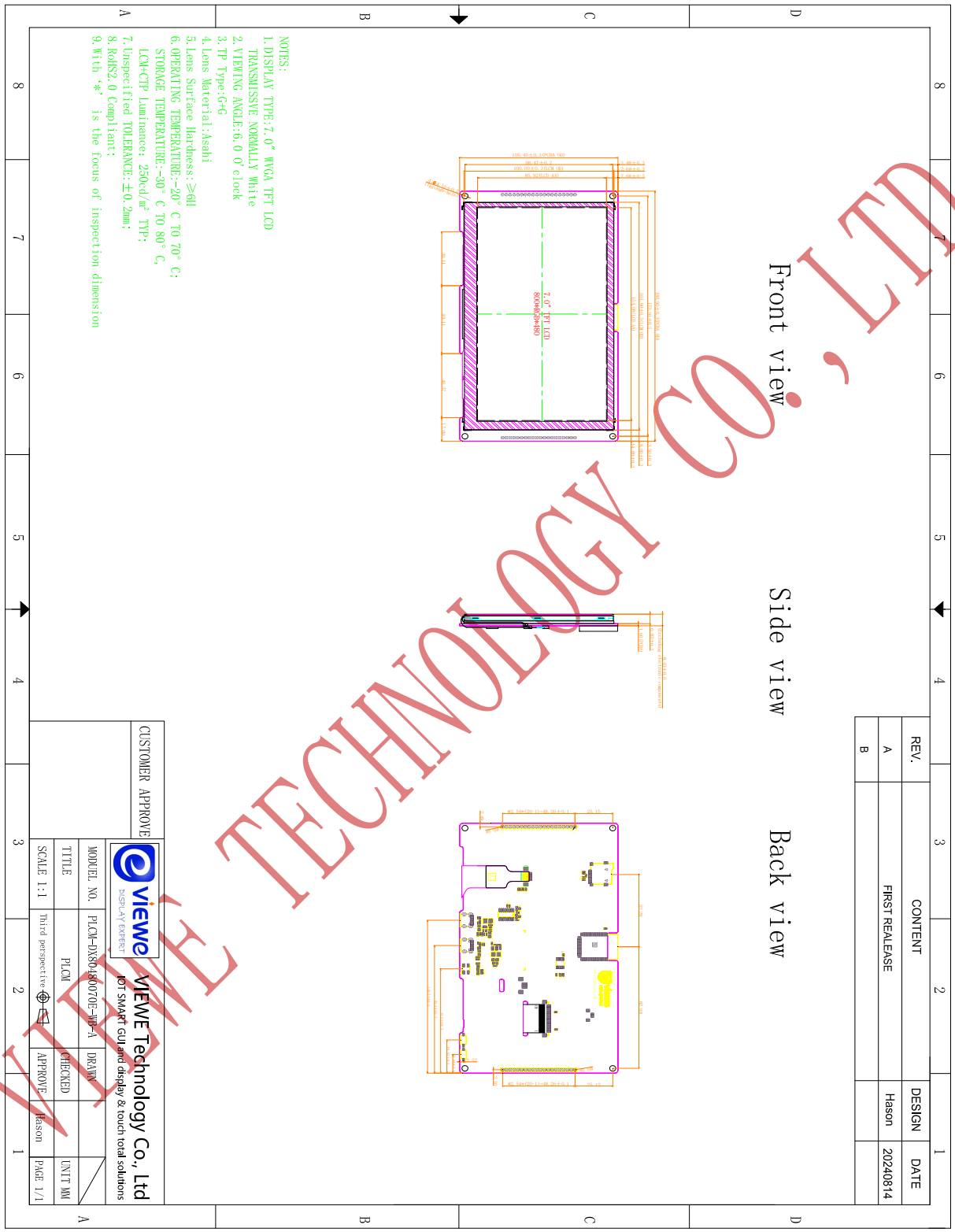
Item	Conditions	Min	Typ	Max	Unit
Working Temperature	60%RH at 5V voltage	-20	25	70	C
Storage Temperature	---	-30	25	85	C
Working Humidity	25°C	10%	60%	90%	RH
ESD	---	Contact: ±4KV Air: ±8KV			KV

2.5 Related software

Software name	Version	Software associated configuration	Development environment configuration link
Arduino IDE	3.0.x (esp32) Special instructions development board must be esp32 3.0 and above	1. Board: ESP32S3 Dev Module 2. CPU Frequency: 240MHz (WiFi) 3. Flash Frequency: NO 4. Flash Mode: QIO 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)

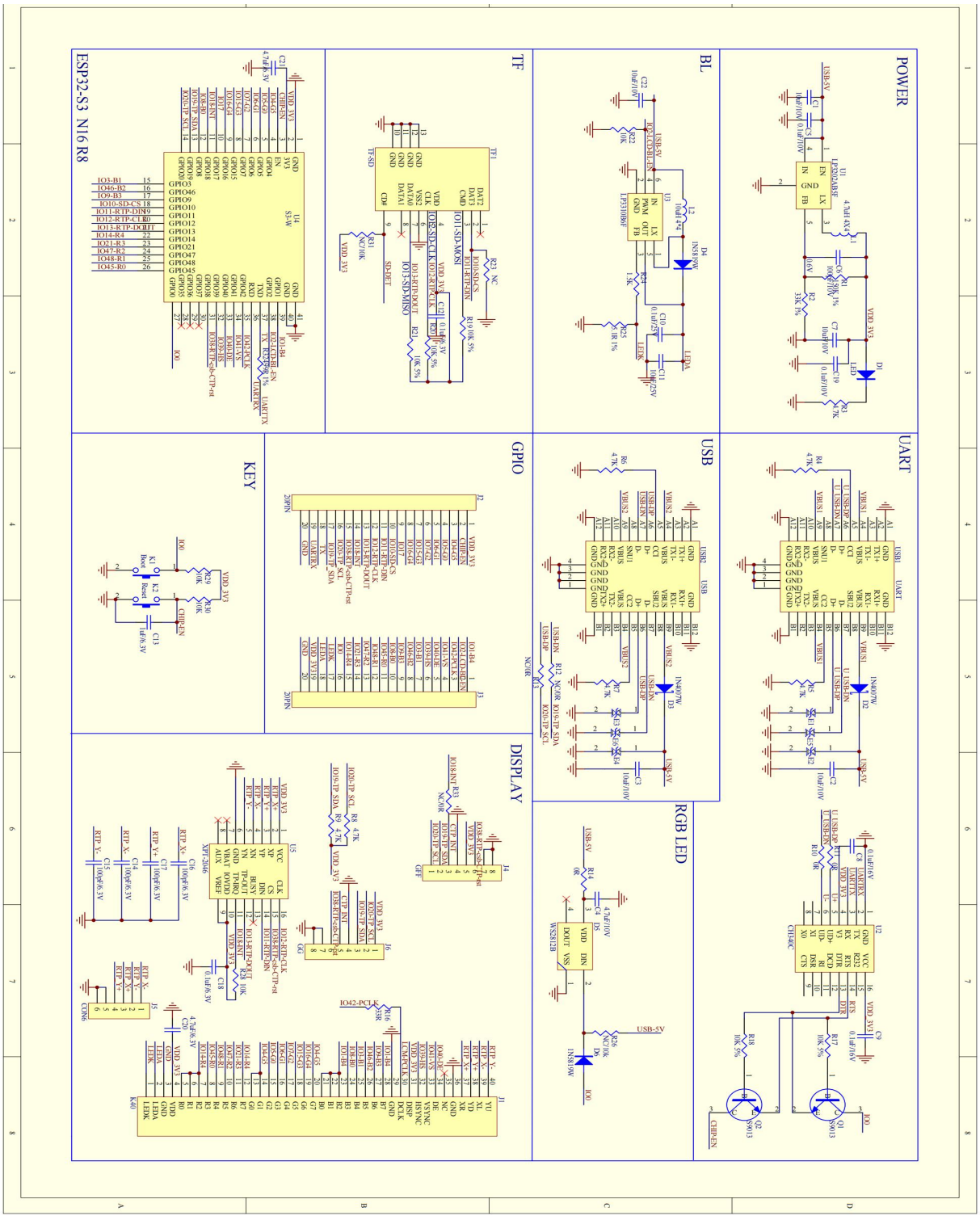
Note: If you are compiling in Arduino architecture and using WIFI or have other questions, please refer to:FAQ

3. MECHANICAL DRAWING



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4. Schematic


POWER
UART
BL
USB
TF
GPIO
RGB LED
KEY
DISPLAY
ESP32-S3 N16 R8

5. Related downloads

5.1 Arduino and IDF relevant information

https://github.com/VIEWESMART/UEDX80480070ESP32-7inch-Touch-Display

5.2 Libraries required for Arduino

https://github.com/VIEWESMART/UEDX80480070ESP32-7inch-Touch-Display/tree/main/Libraries

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