SMART DISPLAY MODULE SPECIFICATION

2.8 Inch Smart Display with TOUCH	
Model:	UEDX24320028E-WB-A
Version:	V1.0
Date:	2024-10-31

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Customer Confirmation

Approved by	Notes

REVISION HISTORY

Revision	Date	Contents of Revision Change	Remark
V1.0	202401031	Preliminary release	

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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, 200mA

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

Display

1) Size:1.9 Inch
2) Resolution: 240(W)*3(RGB)*320(H)
3) Mode: MCU 8/16BIT/SPI
4) Display mode：Normally Black
5) Driver IC： GC9307
6) Touch IC：CHSC6540
7) Pixel Density：167 PPI
8) Backlight Type：White LED
9) Brightness: 340 cd/m2

Other

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

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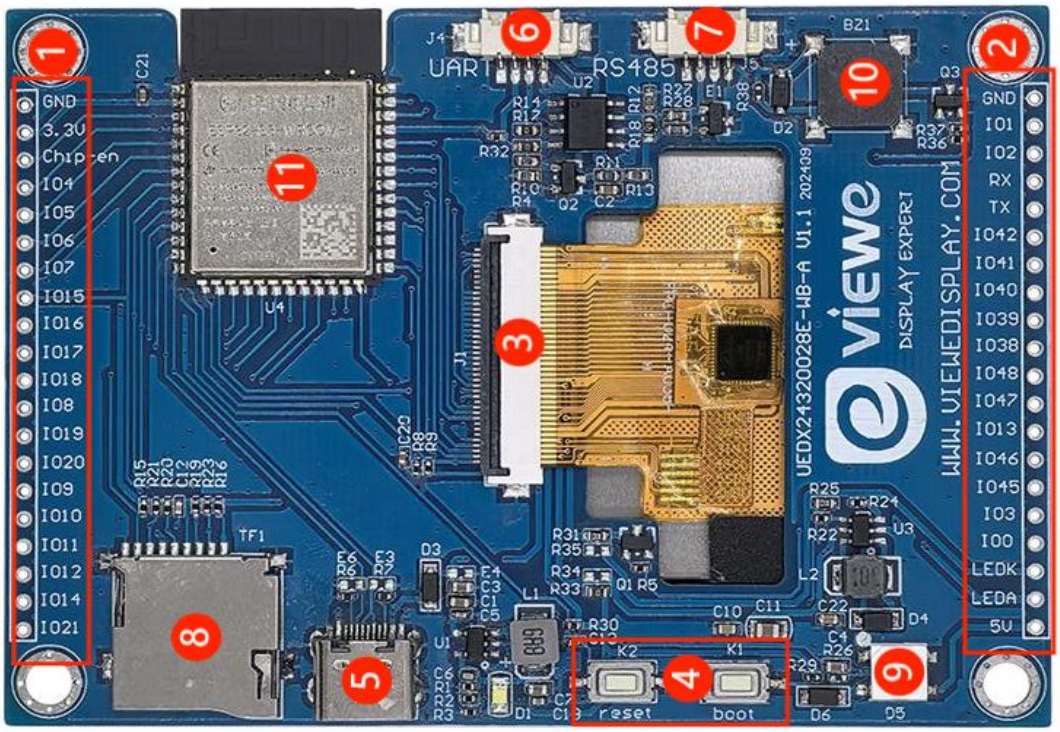
1.2 Appearance picture



The hardware marked above will be described one by number in 2

2. Product information

2.1 Interface Description

(1,2) External GPIO

Pin NO.	Symbol	Description	Voltage Range	Remarks
1	GPIO2	GPIO2, Reserve IO	0-3.3V	
2	TX	UART Transmit	0-3.3V	
3	RX	UART Receive	0-3.3V	
4	GPIO42	GPIO42, Reserve IO	0-3.3V	
5	GPIO41	GPIO41, Reserve IO	0-3.3V	
6	GPIO40	GPIO40, Reserve IO	0-3.3V	
7	GPIO39	GPIO39, Reserve IO	0-3.3V	
8	GPIO0	GPIO0, Reserve IO	0-3.3V	
9	GPIO45	GPIO45, Reserve IO	0-3.3V	
10	GPIO48	GPIO48, Reserve IO	0-3.3V	
11	GPIO47	GPIO47, Reserve IO	0-3.3V	
12	GPIO21	GPIO21, Reserve IO	0-3.3V	
13	GPIO14	GPIO14, Reserve IO	0-3.3V	
14	3.3V	Power 3.3V	3.3V	
15	GND	Grounds	0V	

Pin NO.	Symbol	Description	Voltage Range	Remarks
1	GPIO4	GPIO4, Reserve IO	0-3.3V	
2	GPIO5	GPIO5, Reserve IO	0-3.3V	
3	GPIO6	GPIO6, Reserve IO	0-3.3V	
4	GPIO7	GPIO7, Reserve IO	0-3.3V	
5	GPIO15	GPIO15, Reserve IO	0-3.3V	
6	GPIO16	GPIO16, Reserve IO	0-3.3V	
7	GPIO17	GPIO17, Reserve IO	0-3.3V	
8	GPIO18	GPIO18, Reserve IO	0-3.3V	
9	D-	USB D-	-	

10	D+	USB D+	-	
11	3.3V	Power 3.3V	3.3V	
12	3.3V	Power 3.3V	3.3V	
13	5V	Power 5V	5V	
14	GND	Grounds	0V	
15	GND	Grounds	0V	

The connector specifications is two 15PIN 2.54mm pitch

The following picture shows the pins with 2 15pind spacing between 2.54mm

(3) Display Interface

Pin No.	Symbol	I/O	Description
1	XL/CTP-SCL	I	I2C clock signals for CTP; Option XL for RTP
2	YU/CTP-SDA	I	I2C data signal for CTP,Option YU for RTP
3	XR/CTP-RST	I	The signal will reset the CTP,Signal is active low, Option XR for RTP
4	YD/CTP-INT	I/O	Interrupt signals for CTP,Option YD for RTP
5	GND	P	Power Ground
6	IOVCC	P	Power supply for I/O system
7	VCI	P	Power supply for analog circuits
8	TE	O	Tearing effect signal is used to synchronize MCU to frame memory
9	SPI_CS/MCU_CS	I	Chip selection pin. Low-active
10	SPI_SCL/MCU_RS	I	Display data/command selection pin in MCU interface In SPI mode, this pin is used as SCL
11	SPI_RS/MCU_WR	I	Write enable in MCU parallel interface RS=1 display data or parameter;RS=0 register index / command
12	MCU_RD	I	Read enable in 8080 MCU parallel interface. Low-active.
13	SPI_SDA	I/O	Serial communication data input and output, internal pull low.
14	SPI_SDO	O	SPI interface output pin
15	RESET	I	The signal will reset the LCM, Signal is active low.
16	GND	P	Power Ground
17-32	DB0-DB15	I/O	data bus for MCU
33	LED-A	P	Power supply for backlight anode
34-36	LED-K	P	Power supply for backlight cathode
37	GND	P	Power Ground
38	IM0	I	The MCU interface mode select.
39	IM1	I	The MCU interface mode select.
40	IM2	I	The MCU interface mode select.

The choice of IM is as follows: 1 means pull up, and 0 means pull down

IM2IM1IM0: 110-2.4inch 111-3.5inch 101-3.9/4.3inch

(4) button:

The following picture shows the boot button on the left and the reset button on the right.

(5) Power:

The following figure is the schematic diagram of USB. USB is used for power and download.

(6) UART:

a hardware communication protocol that enables asynchronous serial communication between devices, allowing for the transmission and reception of data using two wires: one for transmitting (TX) and one for receiving (RX).

(7) RS485:

a standard for serial communication that allows for long-distance data transmission and multi-point connections, using differential signaling to improve noise immunity and enabling communication over distances up to 1,200 meters at speeds of up to 10 Mbps.

(8) SD:

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

(9) RGB LCD:

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

(10) Passive Buzzer:

An external circuit is required to generate a driving signal (usually a square wave) to sound

(11) Main Control Chip: ESP32S3

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2.2 Display Information

Item	Specification	Unit	Remark
Pixel Driving element	IPS TFT	-	
Screen Size	2.8	Inch	-
Resolution	240(W)*3(RGB)*320(H)	Dots	-
Interface	MCU 8/16BIT/SPI	-	-
Module Power Consumption	0.367	Watt	Typ.
Active Area	43.2(W)*57.6(H)	mm	Typ.
Pixel pitch (W*H)	0.18(W)*0.18(H)	mm	Typ.
Module Size (W*H*D)	56.9(W)*74.1(H)*2.45(D)	mm	Typ.
Luminance	340	cd/m^2	Typ.
Viewing Direction	All	O'clock	-
Display Color	262K	Colors	18bits

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	-	200	-	mA
	VCC= +5V,backlight off	-	100	-	mA
Recommended power supply:5V 1A DC					

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	80	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	Working on configuration	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)

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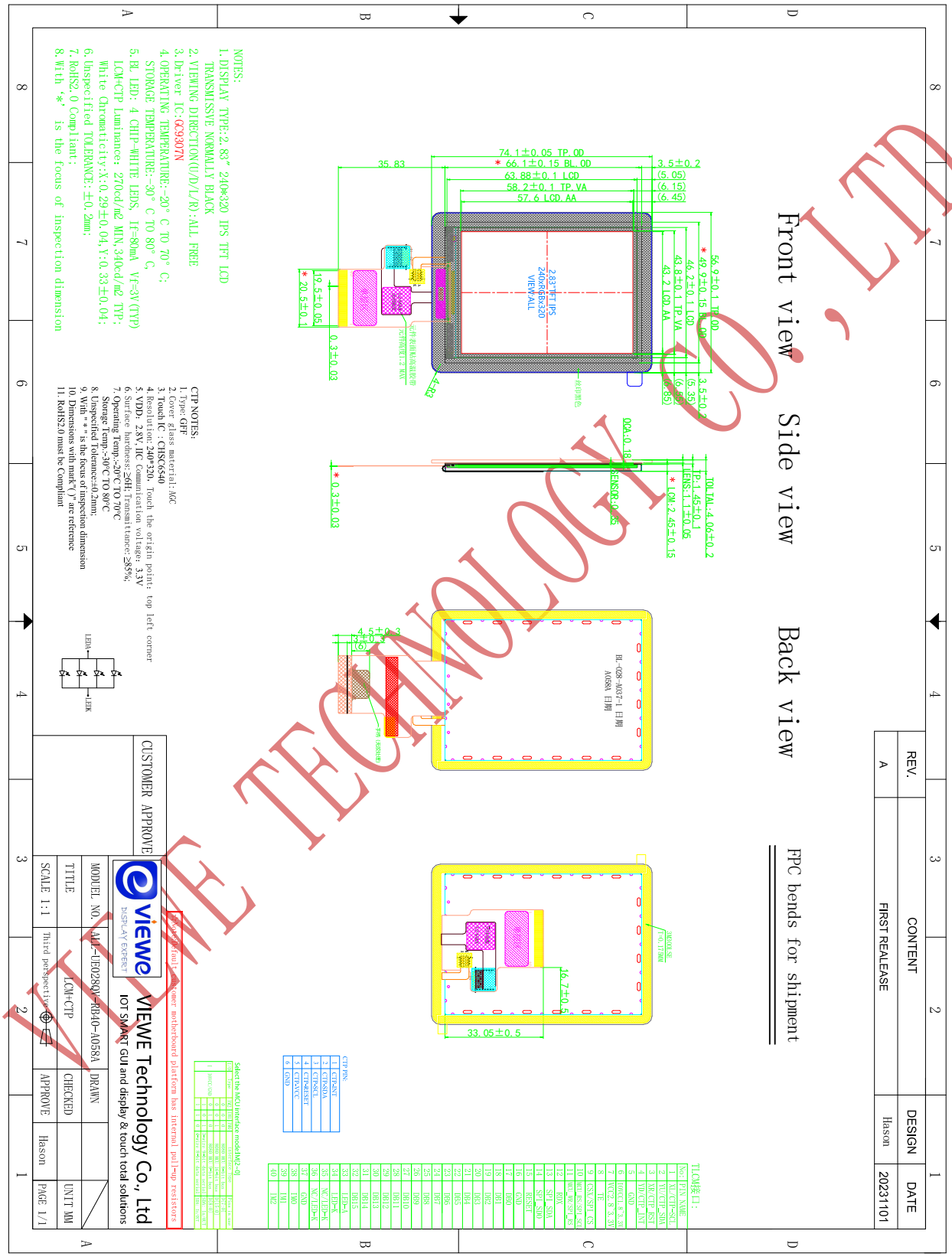
3. MECHANICAL DRAWING



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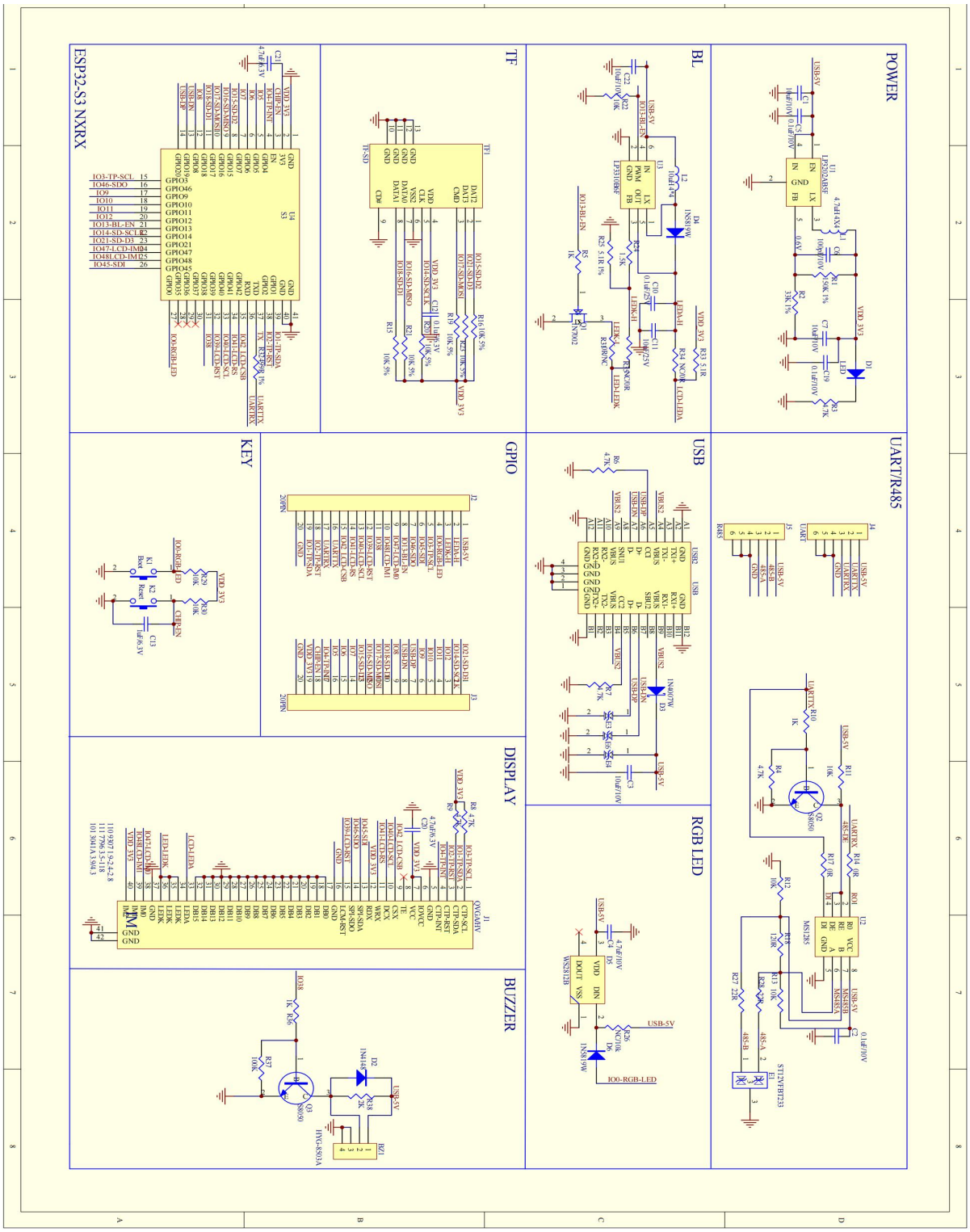
4. Schematic


POWER
BL
TF
ESP32-S3 NXRX
UART/R485
USB
RGB LED
GPIO
KEY
DISPLAY
BUZZER

5. Related downloads

5.1 Arduino relevant information

We are working hard to debug it. Please forgive the inconvenience caused to you

5.2 Libraries required for Arduino

We are working hard to debug it. Please forgive the inconvenience caused to you

5.3 IDF relevant information

enjoy looking forward to

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