

# LCD 4" ESP32 evaluation module

## WT32S3-86S-AD-W



## Features:

- Based on Wireless-Tag's WT32-S3-WROVER-N16R8 (16MB Flash/8Line 8M die inside)
  - IEEE 802.11b/g/n protocol
  - Bit rate:802.11n up to 150Mbps
  - A-MPDU and A-MSDU aggregation
  - 0.4  $\mu$ s guard interval support
  - Center frequency range of operating channel: 2412~2484 MHz
  - Gain: 1.8~3.1dB

Frequency (Mhz)	2400	2450	2500
RL (dB)	-1.8	-2.3	-3.1
VSWR	9.5	7.4	5.5

- 480\*480 high-resolution RGB display with capacitive touch
- 86box product appearance, convenient for embedding in smart home applications
- Support online rapid prototyping on the 8MS development platform
- Onboard RS485 chip

## Core Materials (Tab. 0):

No.	Name	Model	Remark
1	ESP32-S3 module	WT32-S3-WROVER-N16R8	
2			
3			

## Naming instructions :

Specifications	illustrate	Remark
ZX3D95CE01S-TR	Contains temperature and humidity sensor and RS485, using on-board antenna	
ZX3D95CE01S-R	RS485 only, use onboard antenna	
ZX3D95CE01S-i-TR	Including temperature and humidity sensor and RS485, use IPEX external antenna	Batch to order
ZX3D95CE01S-i-R	RS485 only, use IPEX external antenna	Batch to order

## Hardware Interface:

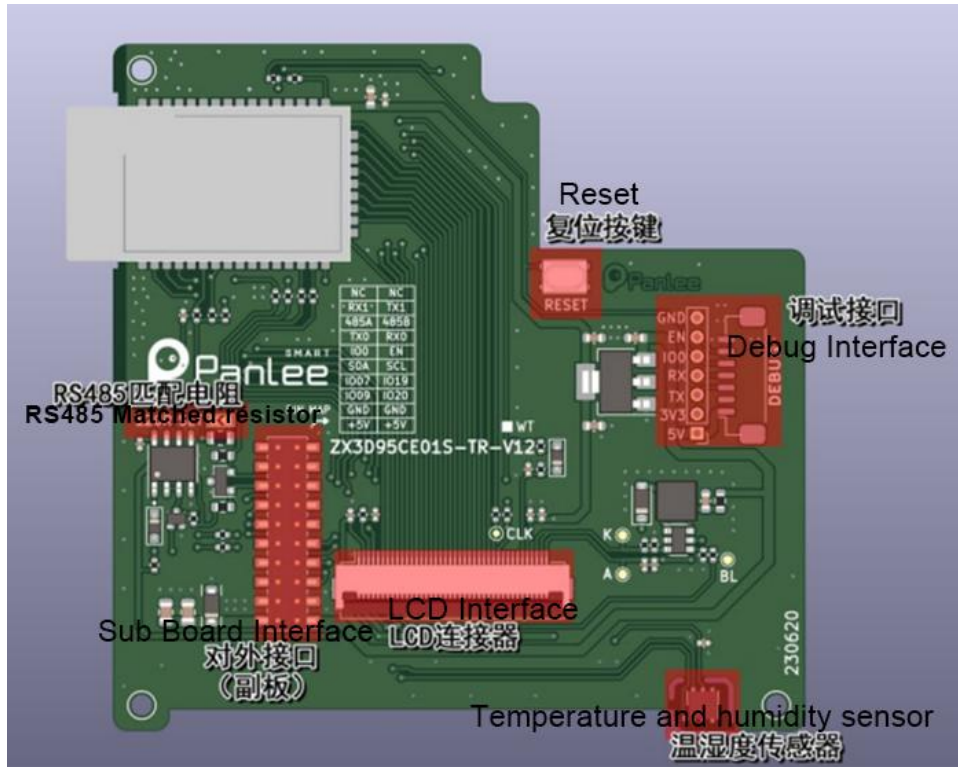


Fig.1 Hardware Interface

## Interface Description:

[1] Debugging Interface(Tab.1)

Pin	Description	Module Pin	Voltage Range	Remark
1	+5V	-	5V	
2	+3.3V	-	3.3V	
3	TXD0	TXD0	3.3V TTL	Burning serial port
4	RXD0	RXD0	3.3V TTL	Burning serial port
5	EN	CHIP_PU	3.3V MAX	Chip reset
6	IO0	GPIO 0	3.3V TTL	Boot mode
7	GND			Selection Grounding

[2] Sub Board Interface (Tab.2)

Pin	Description	Module Pin	Voltage Range	Remark
1、 2	+5V	-	+5V±5%	Board power supply
3、 4	GND	-	0V	Grounding
5	EXT_IO2	GPIO 20	0~3.3V	Output interface 2
6	EXT_IO1	GPIO 9	0-3.3V	Output interface 1
7	EXT_IO3	GPIO 19	0-3.3V	Output interface 3
8	EXT_IO4	GPIO 7	0-3.3V	Output interface 4
9	IIC_SCL	GPIO 6	3.3V TTL	IIC bus clock, multiplexed with touch screen
10	IIC_SDA	GPIO 15	3.3V TTL	IIC bus data, multiplexed with touch screen
11	EN	EN	0~VCC	Chip enable
12	GPIO 0	GPIO 0	0~VCC	BOOT selection
13	RXD	RXD0	3.3V TTL	Download debugging serial port
14	TXD	TXD0	3.3V TTL	Download debugging serial port
15	485 B	-	RS485	485 bus negative, not available when output interface is used
16	485 A	-	RS485	485 bus positive, not available when output interface is used
17	TXD_EXT	GPIO 2	3.3V TTL	Multiplexed with 485 serial port
18	RXD_EXT	GPIO 1	3.3V TTL	Multiplexed with 485 serial port
19、 20	NC	-	-	not connect

## [3] Display Interface (Tab.3)

Description	Module Pin	Remark
TP_RST	-	Using RC reset
TP_SCL	GPIO 6	Touch IIC bus clock, multiplexed with external interface
TP_SDA	GPIO 15	Touch IIC bus data, multiplexed with external interface
TP_INT	GPIO 4	Touch interrupt
LCD_RST	-	LCD auto reset, use RGB_VS signal to keep working
LCD_CS	GPIO 38	LCD SPI bus CS
LCD_SCLK	GPIO 45	LCD SPI bus SCLK
LCD_MOSI	GPIO 48	LCD SPI bus MOSI
RGB_PCLK	GPIO 39	LCD RGB INTERFACE PCLK
RGB_DE	GPIO 40	LCD RGB INTERFACE DE
RGB_VS	GPIO 41	LCD RGB INTERFACE VS
RGB_HS	GPIO 42	LCD RGB INTERFACE HS
RGB_D0	GPIO 45	LCD RGB INTERFACE D0
RGB_D1	GPIO 48	LCD RGB INTERFACE D1
RGB_D2	GPIO 47	LCD RGB INTERFACE D2
RGB_D3	GPIO 0	LCD RGB INTERFACE D3
RGB_D4	GPIO 21	LCD RGB INTERFACE D4
RGB_D5	GPIO 14	LCD RGB INTERFACE D5
RGB_D6	GPIO 13	LCD RGB INTERFACE D6
RGB_D7	GPIO 12	LCD RGB INTERFACE D7
RGB_D8	GPIO 11	LCD RGB INTERFACE D8
RGB_D9	GPIO 16	LCD RGB INTERFACE D9
RGB_D10	GPIO 17	LCD RGB INTERFACE D10
RGB_D11	GPIO 18	LCD RGB INTERFACE D11

RGB_D12	GPIO 8	LCD RGB INTERFACE D12
RGB_D13	GPIO 3	LCD RGB INTERFACE D13
RGB_D14	GPIO 46	LCD RGB INTERFACE D14
RGB_D15	GPIO 10	LCD RGB INTERFACE D15
LCD_BL	GPIO 5	LCD backlight control, high level enable

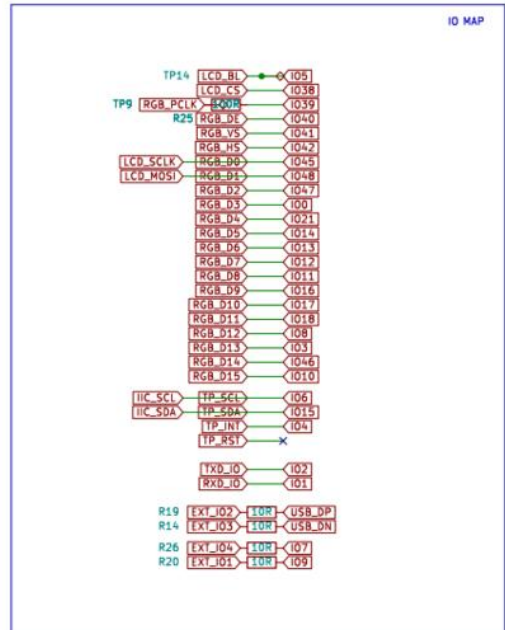
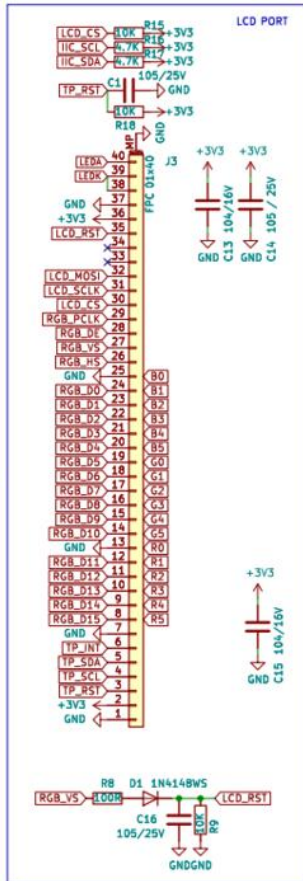
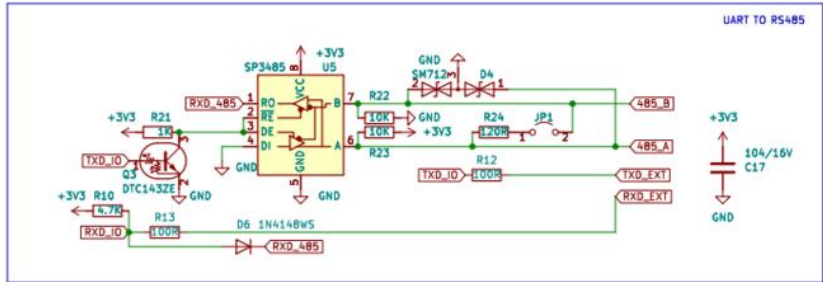
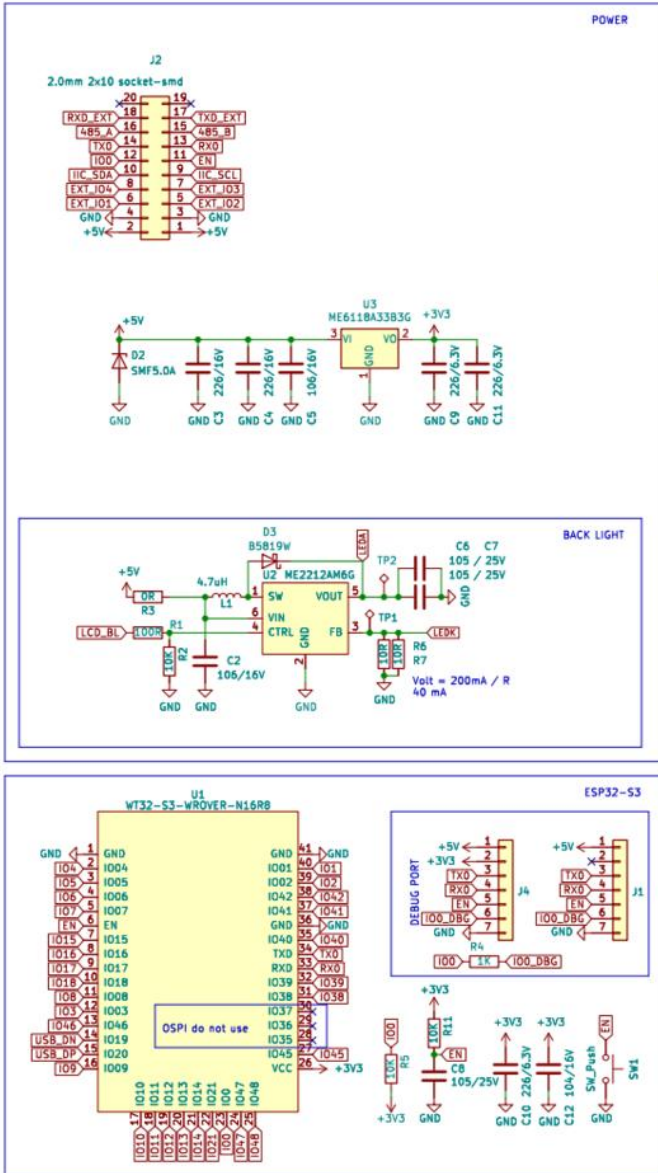
### Interface Encapsulation (Tab.4):

Peripheral Name	Description
Debugging interface	Debugging interface MX1.25-7P
External interface	External interface 2.0mm 2x10P female header

### Hardware peripherals:

Appearance Name	Description
SHT20	Temperature and humidity sensor, hanging on IIC bus
LCD	480*480 resolution, RGB565
RS485	Use automatic transceiver 485 circuit

# Schematic:



## Specification Parameters:

### [1] Electricity parameters (Tab.5)

	MIN.	Type	MAX.
<b>Operating current</b>	-	230mA	-
<b>Operating voltage</b>	4.8V	5.0V	5.2V
<b>Operating temperature</b>	-20°C	25°C	60°C
<b>Storage temperature</b>	-30°C	25°C	70°C
<b>ESD protection voltage (contact)</b>	-	8kV	-
<b>ESD protection voltage (air)</b>	-	12kV	-

Note:

(\*1) The working current is the current when ESP32-S3 works normally under 5V power supply, LCM backlight brightness is 100%

(\*2&\*3) The ESD protection status refers to the case of the whole machine (including the shell), and the ESD verification is performed on the whole machine.

### [2] Display Parameters (Tab.6)

<b>LCD panel size</b>	3.95inch
<b>Display type</b>	IPS
<b>Drive IC model</b>	GC9503V
<b>Visual angle</b>	FREE
<b>Physical dimensions</b>	84.00*84.00*3.13mm
<b>Resolution</b>	480(H)x3(RGB)x480(V)
<b>Interface</b>	RGB

<b>Color</b>	16.7M
<b>Backlit mode</b>	8 white LEDs in 4S2P
<b>Backlight brightness</b>	

## [3] Touch Parameters (Tab.7)

<b>Touchscreen type</b>	Capacitive touch
<b>Drive IC model</b>	FT6336U
<b>Interface</b>	I2C
<b>Touchscreen structure</b>	GF
<b>Touch mode</b>	Surface touch
<b>Surface hardness</b>	6H
<b>Light transmittance</b>	85%



## Firmware Burning:

1. Connect the downloader (ZXACC-ESPDB) via a USB-Type C cable. And then connect the WT32S3-86S (ZX3D95CE01S-TR) board with the downloader (ZXACC-ESPDB) through an cable. As the downloader (ZXACC-ESPDB) has automatic data flow processing capabilities, the firmware can be downloaded automatically through the ESP32 Flash Download Tools.



Fig.3

Download Tools.

2. As shown in Fig. 4: Select the firmware path at mark 1, and then fill in the burning address, usually 0X00. Note that this checkbox must be checked; Set the crystal frequency to be 40MHz at mark 2; Select 32Mbit for Flash size at mark 3; Select DIO for SPI MODE at mark 4; Select the COM port number recognized by the computer at mark 5; Select the baud rate at mark 6 (the higher the value is, the faster the firmware will be downloaded. Max. 1152000bps).

3. After the previous configuration, click START at mark 7 to start burning the firmware.

Complete the above steps, and then press the reset button on the back of the development board to start running the firmware you just burned.

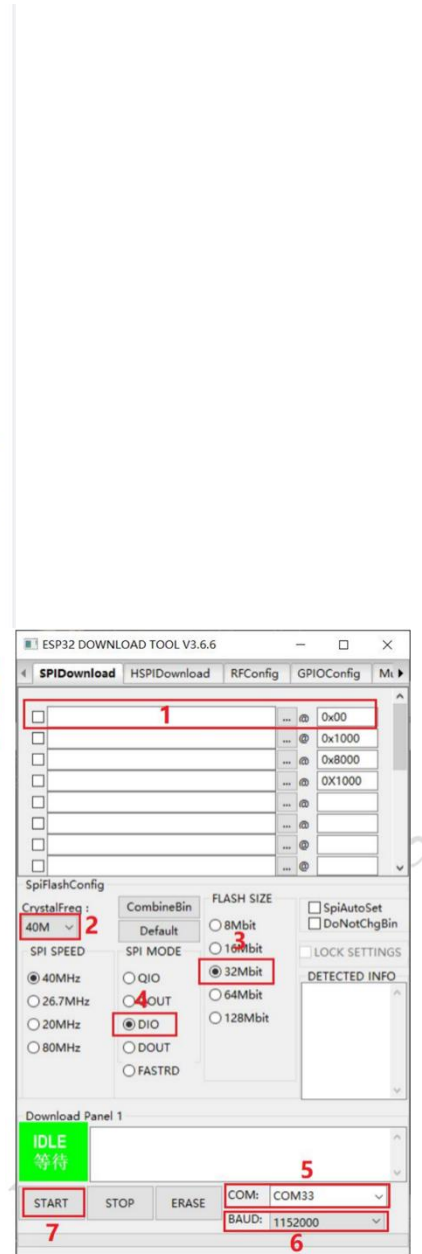


Fig.4

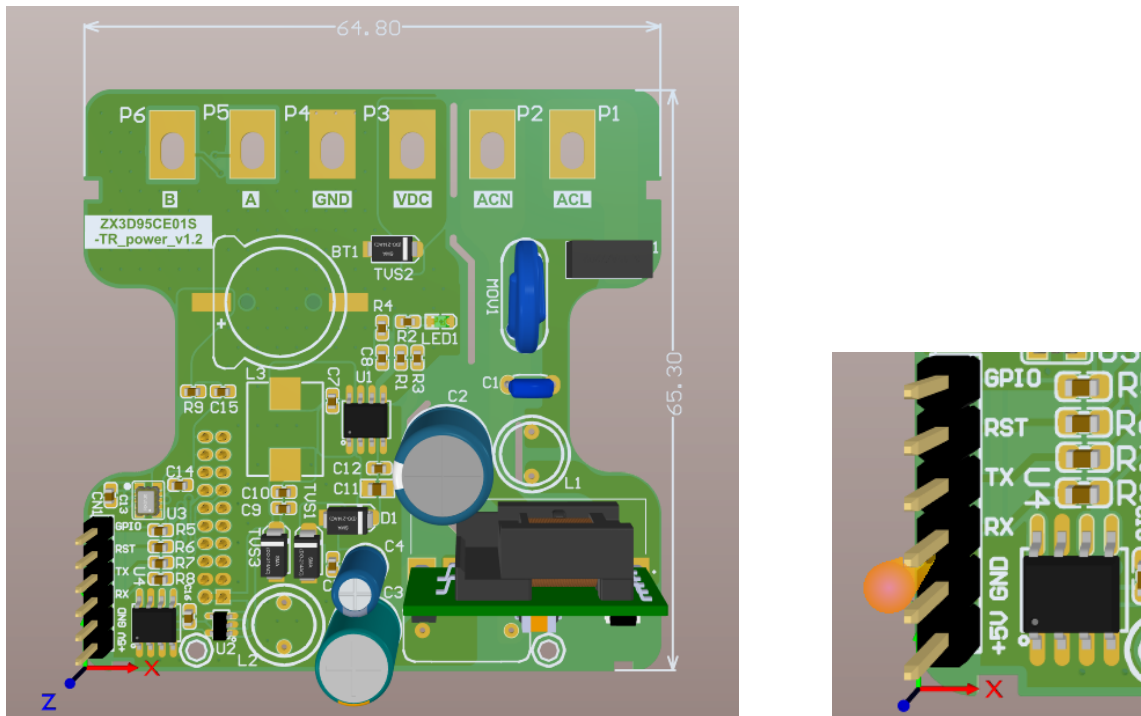


## Power supply and RS485 Interface Board:



THE MODULE CAN USE Both AC AND DC POWER SUPPLY INPUT

## Power supply and RS485 Interface Board:



Programming PIN	
PIN	Description
<b>GPIO0</b>	ขาสั่งเข้า Download mode
<b>RST</b>	ขาสำหรับ Reset ESP32
<b>TX</b>	ขา TX ของ ESP32
<b>RX</b>	ขา RX ของ ESP32
<b>GND</b>	ขา GND
<b>+5V</b>	สามารถใช้เป็นไฟเลี้ยง ESP32 ได้โดยต่อผ่าน Regulator 3.3V