

RZ-G2L-OSM

yocto User's Manual

REVISION HISTORY

Date	Version number	Reason for change	Modifiers	Remarks
2022-11-03	1.0	Create Document	wj	

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1. RZG2L-OSM Operating System

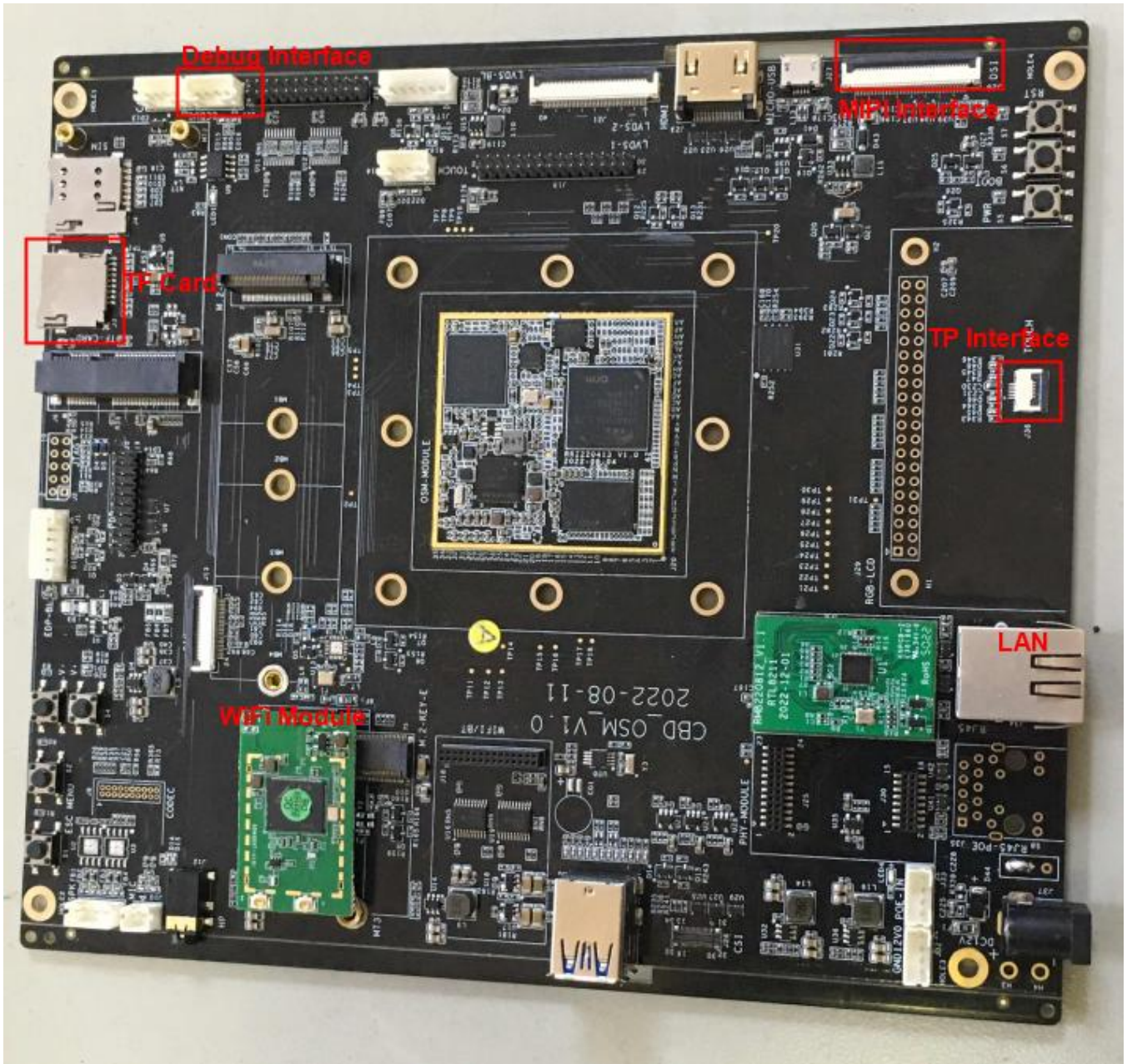
RZG2L-OSM is currently supported by Linux

2. Linux System Installation

Installation steps are described in the <RZG2L-OSM_yocto> burn-in instructions document>.

3. Function Description

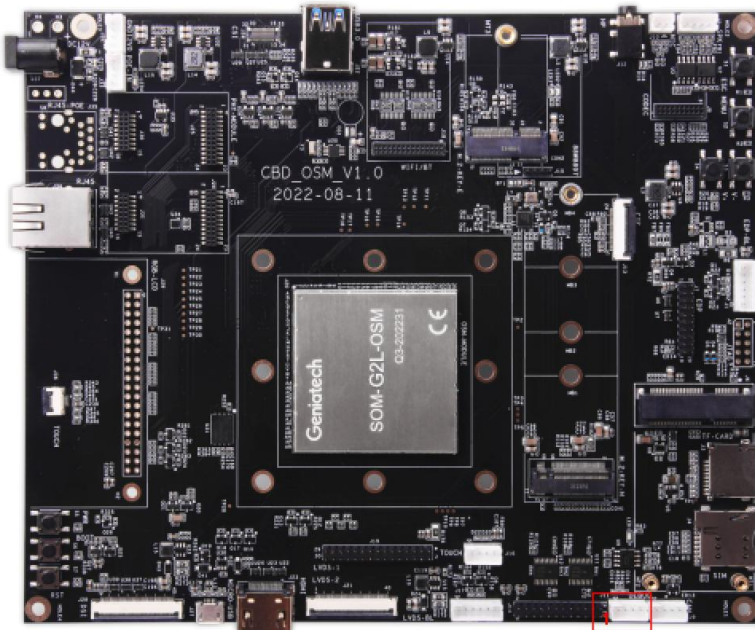
3.1 Hardware interface schematic



3.1.1 Test preparation:

(1) Serial cable*1, connect to the serial port (J11), open the serial debugging software to select COM port and baud rate 115200

Pin NO	Definition
1	UART_RX2
2	GND
3	UART_TX2
4	NC

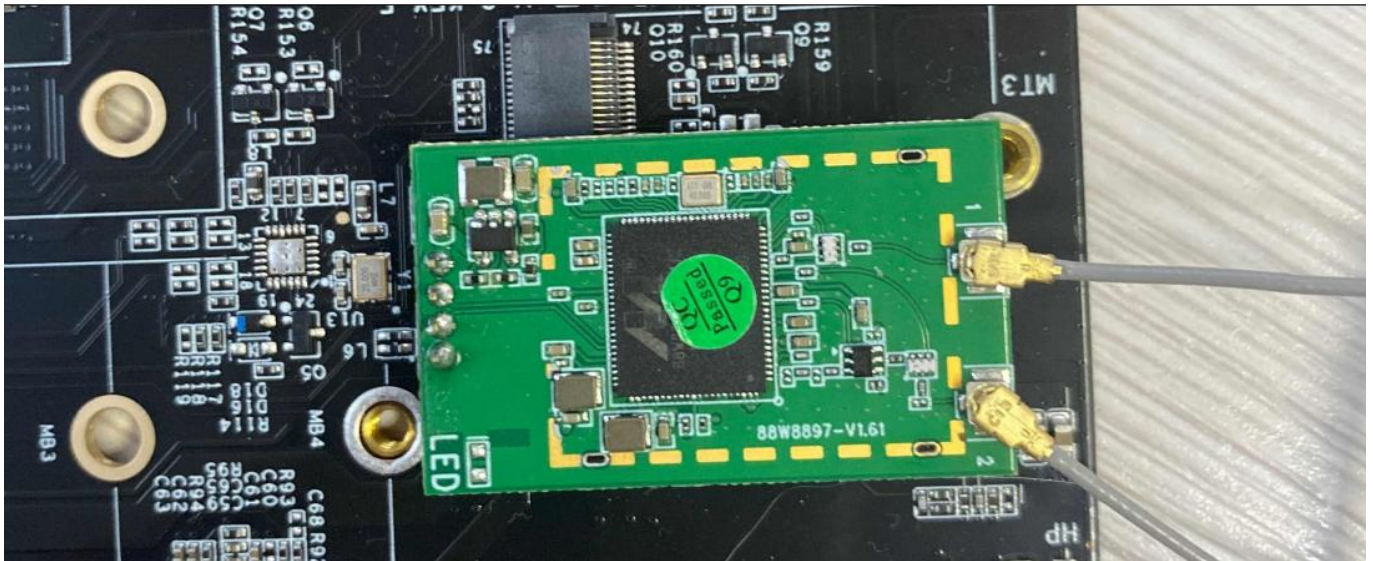


(2) After power on and boot up is complete, enter **root** to log in

```
smarc-rzg2l login:
smarc-rzg2l login:
smarc-rzg2l login: root
Last login: Sun Sep 20 10:44:02 UTC 2020
root@smarc-rzg2l:~#
root@smarc-rzg2l:~#
root@smarc-rzg2l:~#
```

3.2 WIFI Connection

3.2.1 Test preparation: two WiFi antennas, connected as shown



3.2.2 To connect to the environment without encrypted WiFi, enter the following command

(1) **ifconfig wlan0 up** Turn on the WiFi node, and then enter **ifconfig** to see if the node is on

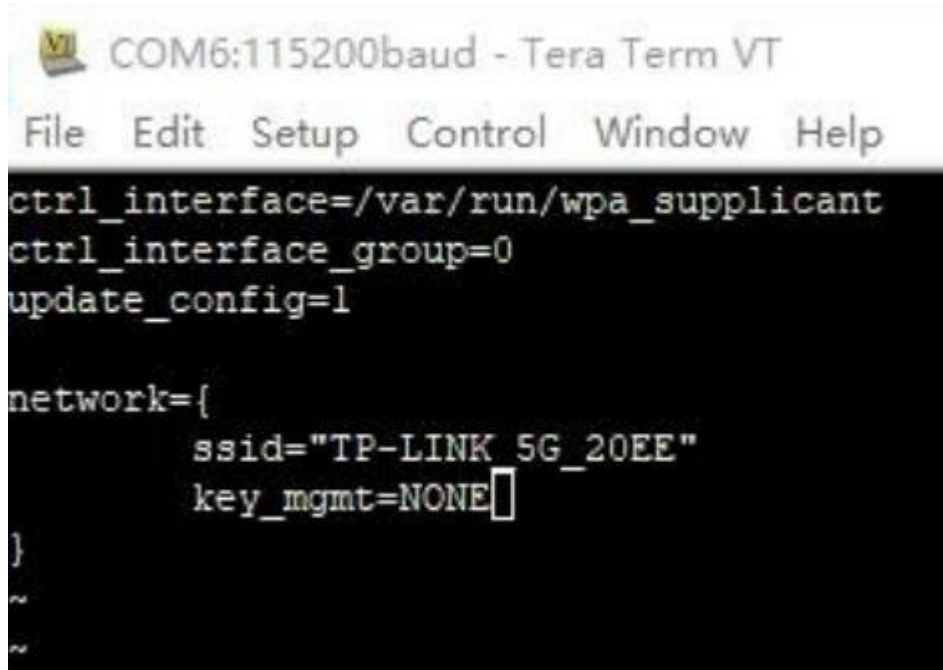
```
root@smarc-rzg21:~# ifconfig wlan0 up
root@smarc-rzg21:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 06:29:3D:2F:EA:71
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:107 DMA chan:ff

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

wlan0     Link encap:Ethernet  HWaddr 00:50:43:02:FE:01
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

(2) `vi /etc/wpa_supplicant.conf` Enter and press `i` to enter edit mode and change the configuration to the following

```
network={
ssid="TP-LINK_5G_20EE"      (this is set to the WiFi name in the environment)
key_mgmt=NONE
}
```

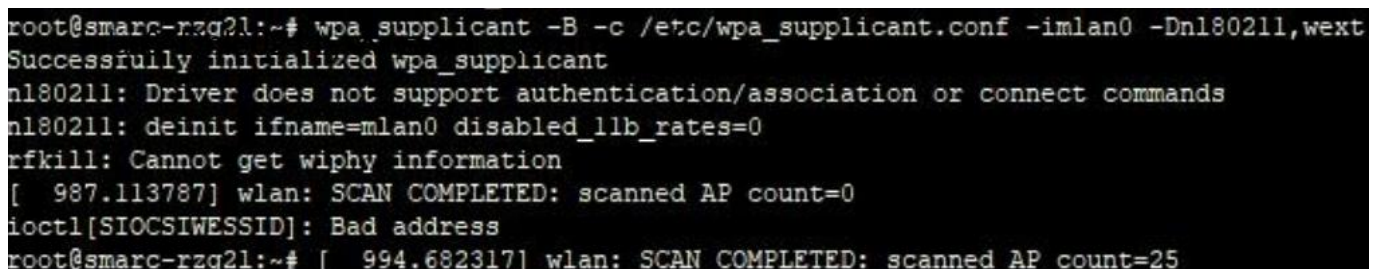


```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window Help
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=0
update_config=1

network={
    ssid="TP-LINK_5G_20EE"
    key_mgmt=NONE
}
~
~
```

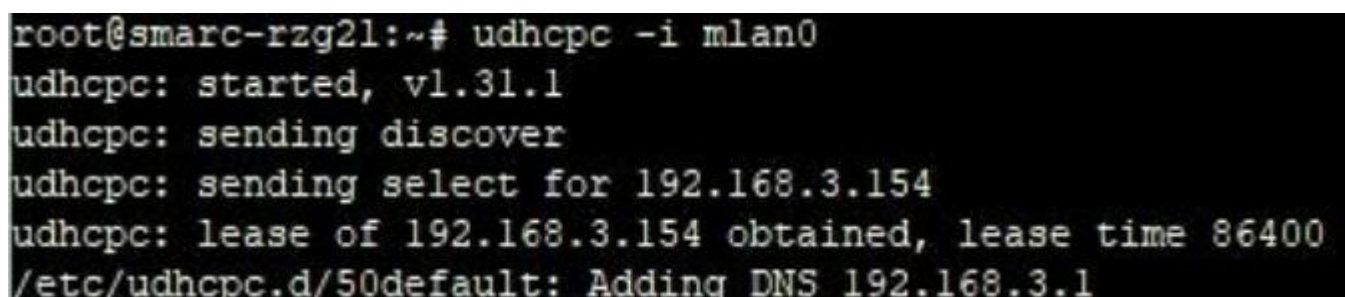
(3) When finished editing, press `esc`, then type `:wq` and enter to save the configuration

(4) Input `wpa_supplicant -B -c /etc/wpa_supplicant.conf -imlan0 -Dnl80211,wext` command



```
root@smarc-rzg21:~# wpa_supplicant -B -c /etc/wpa_supplicant.conf -imlan0 -Dnl80211,wext
Successfully initialized wpa_supplicant
nl80211: Driver does not support authentication/association or connect commands
nl80211: deinit ifname=mlan0 disabled_11b_rates=0
rfkill: Cannot get wiphy information
[ 987.113787] wlan: SCAN COMPLETED: scanned AP count=0
ioctl[SIOCSIWESSID]: Bad address
root@smarc-rzg21:~# [ 994.682317] wlan: SCAN COMPLETED: scanned AP count=25
```

(5) Then enter the `udhcpc -i mlan0` command to dial the number



```
root@smarc-rzg21:~# udhcpc -i mlan0
udhcpc: started, v1.31.1
udhcpc: sending discover
udhcpc: sending select for 192.168.3.154
udhcpc: lease of 192.168.3.154 obtained, lease time 86400
/etc/udhcpc.d/50default: Adding DNS 192.168.3.1
```

(6) Type `ifconfig` to see if mlan0 gets IP, if it has IP, it is successfully connected.


```
root@smarc-rzg2l:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 06:29:3D:2F:EA:71
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:107 DMA chan:ff

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

mlan0     Link encap:Ethernet  HWaddr 00:50:43:02:FE:01
          inet addr:192.168.3.154  Bcast:192.168.3.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:110 errors:0 dropped:30 overruns:0 frame:0
          TX packets:11 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:10534 (10.2 KiB)  TX bytes:1632 (1.5 KiB)
```

3.2.3 Encrypted WiFi in the connected environment

- (1) **ifconfig mlan0 up** Enter this command to turn on the WiFi node
- (2) **vi /etc/wpa_supplicant.conf** enter the configuration and press **i** to enter edit mode. Set the following network={

ssid="l11" (the name of the encrypted WiFi in the environment)

key_mgmt=WPA-PSK

psk="12345678" (WiFi password)

}

```
File Edit Setup Control Window Help
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=0
update_config=1

network={
    ssid="l11"
    key_mgmt=WPA-PSK
    psk="12345678"
}
```

- (3) Press **esc** to exit editing, type **:wq** and enter to save
- (4) input **wpa_supplicant -B -c /etc/wpa_supplicant.conf -imlan0 -Dnl80211,wext** command

```
root@smarc-rzg21:~# wpa_supplicant -B -c /etc/wpa_supplicant.conf -imlan0 -Dnl80211,wext
Successfully initialized wpa_supplicant
nl80211: Driver does not support authentication/association or connect commands
nl80211: deinit ifname=mlan0 disabled_llb_rates=0
rfkill: Cannot get wiphy information
[ 61.855951] wlan: SCAN COMPLETED: scanned AP count=0
ioctl[SIOCSIWESSID]: Bad address
root@smarc-rzg21:~# [ 69.427259] wlan: SCAN COMPLETED: scanned AP count=26
```

- (5) Then enter the **udhcpc -i mlan0** command to dial the number

```
root@smarc-rzg21:~# udhcpc -i mlan0
udhcpc: started, v1.31.1
udhcpc: sending discover
udhcpc: sending select for 172.20.10.2
udhcpc: lease of 172.20.10.2 obtained, lease time 86400
/etc/udhcpc.d/50default: Adding DNS 172.20.10.1
```

- (6) Enter **ifconfig** to see if mlan0 gets an IP, and if it has an IP, it is successfully connected

```
root@smarc-rzg21:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 06:29:3D:2F:EA:71
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:107 DMA chan:ff

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

mlan0     Link encap:Ethernet  HWaddr 00:50:43:02:FE:01
          inet addr:172.20.10.2  Bcast:172.20.10.15  Mask:255.255.255.240
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4 errors:0 dropped:0 overruns:0 frame:0
          TX packets:12 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:918 (918.0 B)  TX bytes:1826 (1.7 KiB)
```


3.3 Ethernet

3.2.1 Test tool preparation: network cable*1

- (1) Power up the board and connect the network cable to the network port
- (2) After the system has finished booting, wait about 5 seconds and type `ifconfig` to see if the eth0 node has an IP

```
root@smarc-rzg21:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 06:29:3D:2F:EA:71
          inet addr:192.168.6.104  Bcast:192.168.6.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:29 errors:0 dropped:3 overruns:0 frame:0
          TX packets:20 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7222 (7.0 KiB)  TX bytes:2257 (2.2 KiB)
          Interrupt:107 DMA chan:ff

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:1 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:90 (90.0 B)  TX bytes:90 (90.0 B)

lan0      Link encap:Ethernet  HWaddr 00:50:43:02:FE:01
          inet addr:192.168.3.154  Bcast:192.168.3.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:159 errors:0 dropped:41 overruns:0 frame:0
          TX packets:13 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:18950 (18.5 KiB)  TX bytes:1716 (1.6 KiB)
```

- (3) Obtain IP means successful connection

3.4 TF card

Note: the system cannot start when the TF card is inserted, it needs to be inserted after the start-up is completed

3.4.1 Test tool preparation: a TF card

- (1) Insert the TF card into the (hot-swappable) card slot
- (2) `fdisk -l` View partition

```

root@smarc-rzg21:~# fdisk -l
Disk /dev/mtdblock0: 512 KiB, 524288 bytes, 1024 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xffffffff

Device            Boot      Start         End      Sectors  Size  ID  Type
/dev/mtdblock0p1                4294967295  8589934589  4294967295    2T  ff  BBT
/dev/mtdblock0p2                4294967295  8589934589  4294967295    2T  ff  BBT
/dev/mtdblock0p3                4294967295  8589934589  4294967295    2T  ff  BBT
/dev/mtdblock0p4                4294967295  8589934589  4294967295    2T  ff  BBT

Disk /dev/mtdblock1: 256 KiB, 262144 bytes, 512 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mtdblock2: 256 KiB, 262144 bytes, 512 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mtdblock3: 0 KiB, 0 bytes, 0 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mmcb128: 14.6G, 15738000000 bytes, 30777344 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mmcb131: 14.67 GiB, 15814268160 bytes, 30835680 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x5f0ae3db

Device            Boot      Start         End      Sectors  Size  ID  Type
/dev/mmcb1k1p1                8192 30535679 30527488 14.6G  c  W95 FAT32 (LBA)

```

(3) **mount /dev/mmcb1k1p1 /media** Manual mount

(4) **df -h** View


```
root@smarc-rzg2l:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        1.3G  894M  286M   76% /
devtmpfs         743M    0  743M    0% /dev
tmpfs            936M    0  936M    0% /dev/shm
tmpfs            936M  9.7M  926M    2% /run
tmpfs            936M    0  936M    0% /sys/fs/cgroup
tmpfs            936M    0  936M    0% /tmp
tmpfs            936M   24K  936M    1% /var/volatile
tmpfs            188M    0  188M    0% /run/user/0
/dev/mmcblkpl1   15G   128K   15G    1% /media
```

3.5 MIPI Screen & Touch

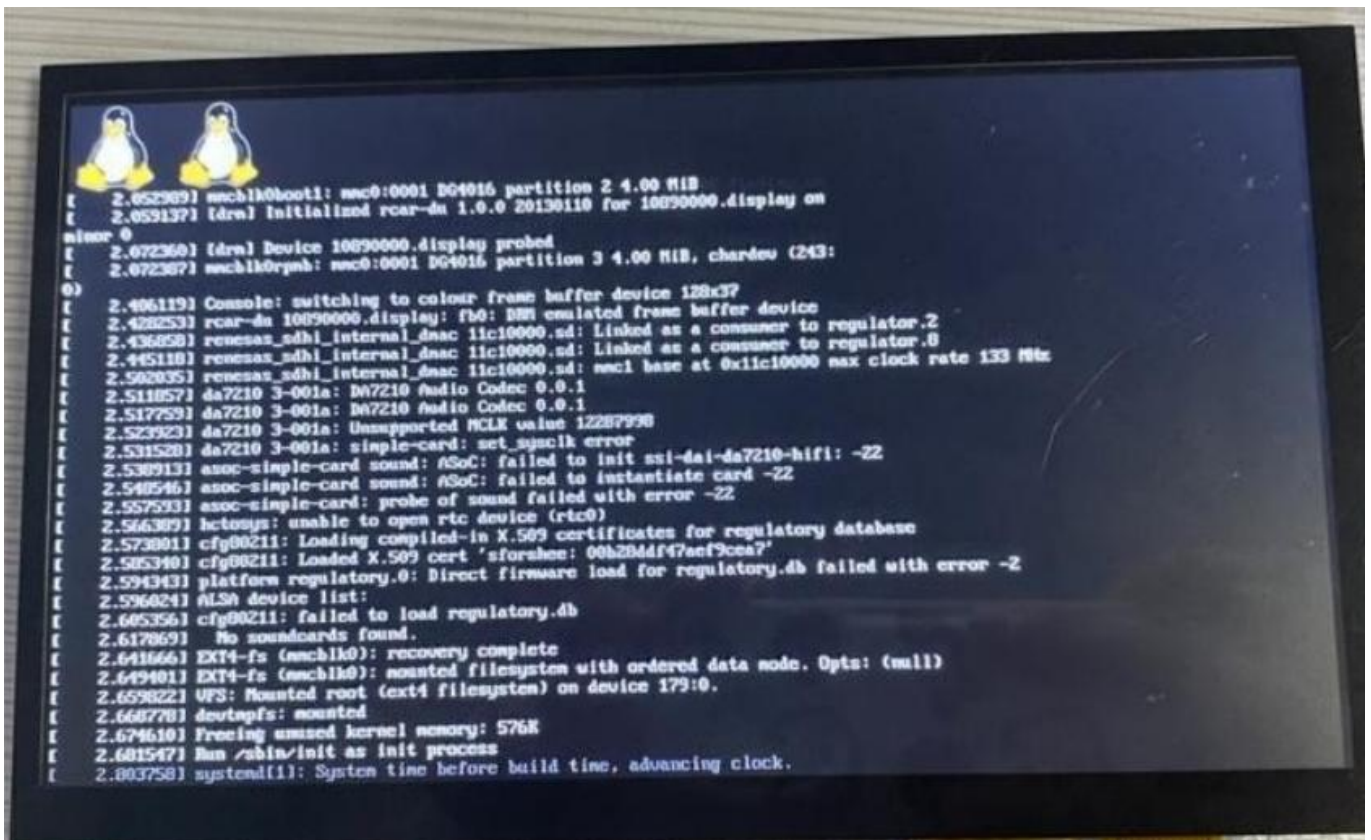
- (1) Connect the MIPI screen as shown in the diagram

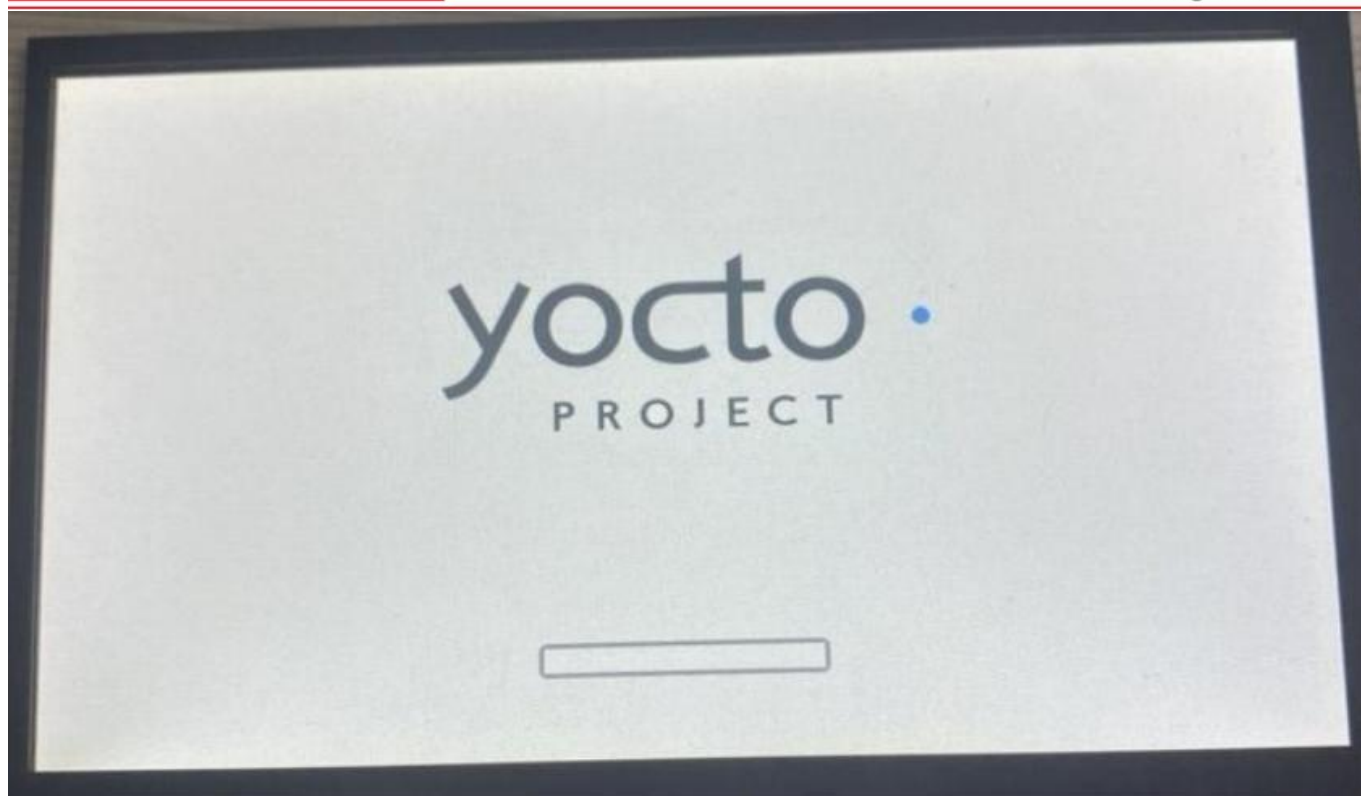


- (2) Power on and start, observe whether there is backlight



(3) The boot screen is as follows



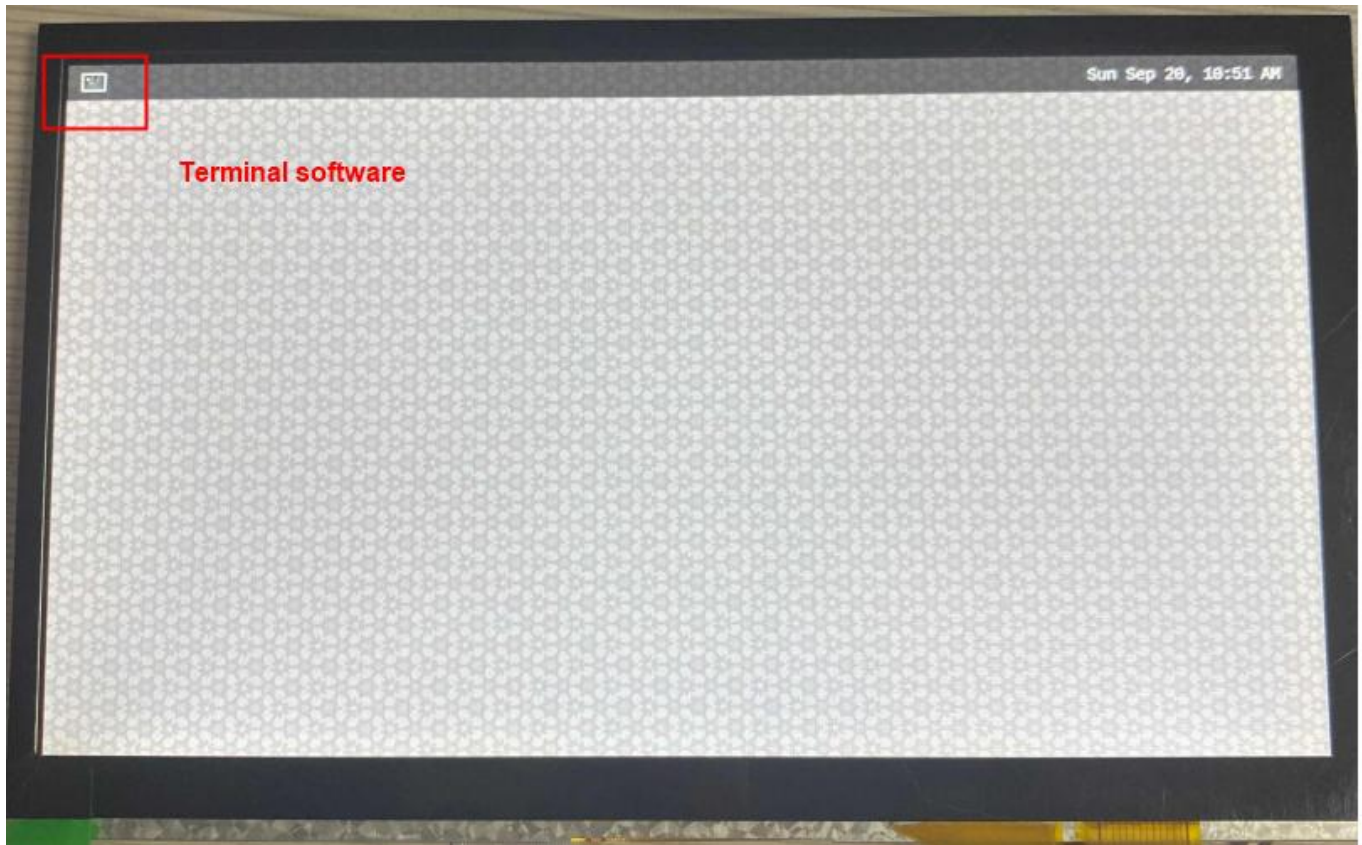


(4) Desktop

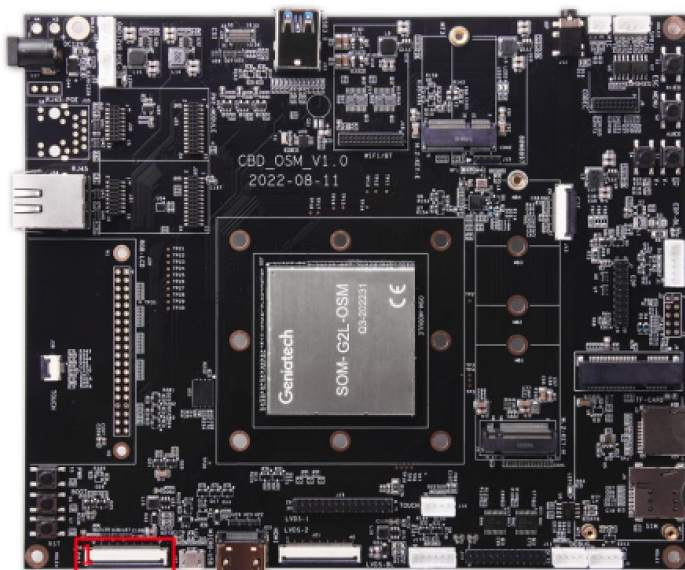


(5) TP Test: Click on the software with your finger touch screen, for example, the terminal software

in the upper left corner, you can click to open that is normal

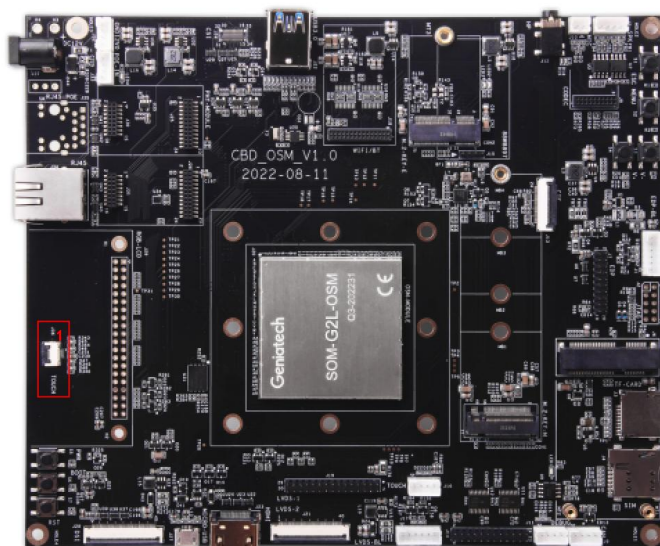


MIPI-DSI Connector (J28)



Pin NO	Definition	Pin NO	Definition
1	NC	21	DSI_DATA3_P
2	VCC_LCD0	22	GND
3	IOVCC_1.8V/3.3V	23	NC
4	GND	24	NC
5	MIPI_DSI_nRST	25	GND
6	NC	26	NC
7	GND	27	PWMO
8	DSI_DATA0_N	28	NC
9	DSI_DATA0_P	29	NC
10	GND	30	GND
11	DSI_DATA1_N	31	VCC1_LED-
12	DSI_DATA1_P	32	VCC1_LED-
13	GND	33	NC
14	DSI_CLOCK_N	34	NC
15	DSI_CLOCK_P	35	NC
16	GND	36	NC
17	DSI_DATA2_N	37	NC
18	DSI_DATA2_P	38	NC
19	GND	39	VCC1_LED+
20	DSI_DATA3_N	40	VCC1_LED+

I2C TOUCH Connector (J36)



Pin NO	Definition
1	I2C_A0_SCL
2	I2C_A0_SDA
3	VDD_3V3
4	TP_nRST_C
5	TP_nINT_C
6	GND