

SBC3566 Linux6.1 User Manual

V1.0



Boardcon Embedded Design

Overview

This document applies only to the SBC3566 development board. It is intended to help users quickly understand the hardware interfaces of the board and provides guidance for environment setup, source code compilation, firmware flashing, and functional testing of onboard hardware interfaces.

System Support

Development Board	Debian12	Buildroot
MINI3566_V1 + SBC3566-V1	Y	Y

Revision History

Version	Date	Author	Revision History
V1.0	2025-06-05	Liu Yuan	Initial version

Disclaimer

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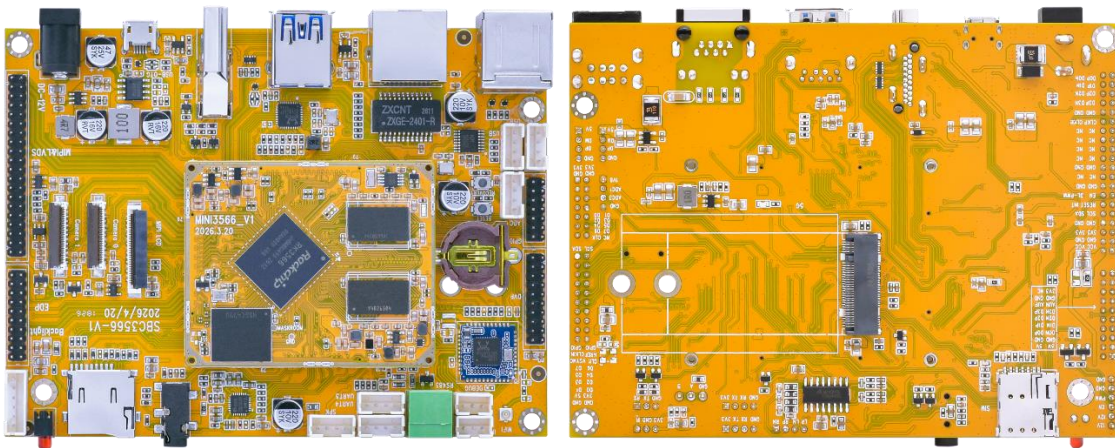
1. Introduction

1.1 Overview

The SBC3566 is based on the Rockchip RK3566 quad-core ARM Cortex-A55 processor and adopts Boardcon's MINI3566 core board solution. It features low power consumption, reliable performance, rich peripheral interfaces, and good thermal design, making it suitable for AIoT, industrial control, smart terminals, multimedia, and other embedded applications.

The SBC3566 uses a board-to-board connection design between the MINI3566 core board and the carrier board. The detachable B2B structure provides a stable and reliable hardware connection while allowing easier maintenance, replacement, and future product upgrades.

The board integrates a wide range of interfaces, including camera interfaces, eDP, MIPI, LVDS, HDMI, Ethernet, Wi-Fi, Bluetooth, USB 3.0, and 4G module interfaces. With multiple display interface options and rich peripheral expansion capability, the SBC3566 enables flexible product development and system integration.

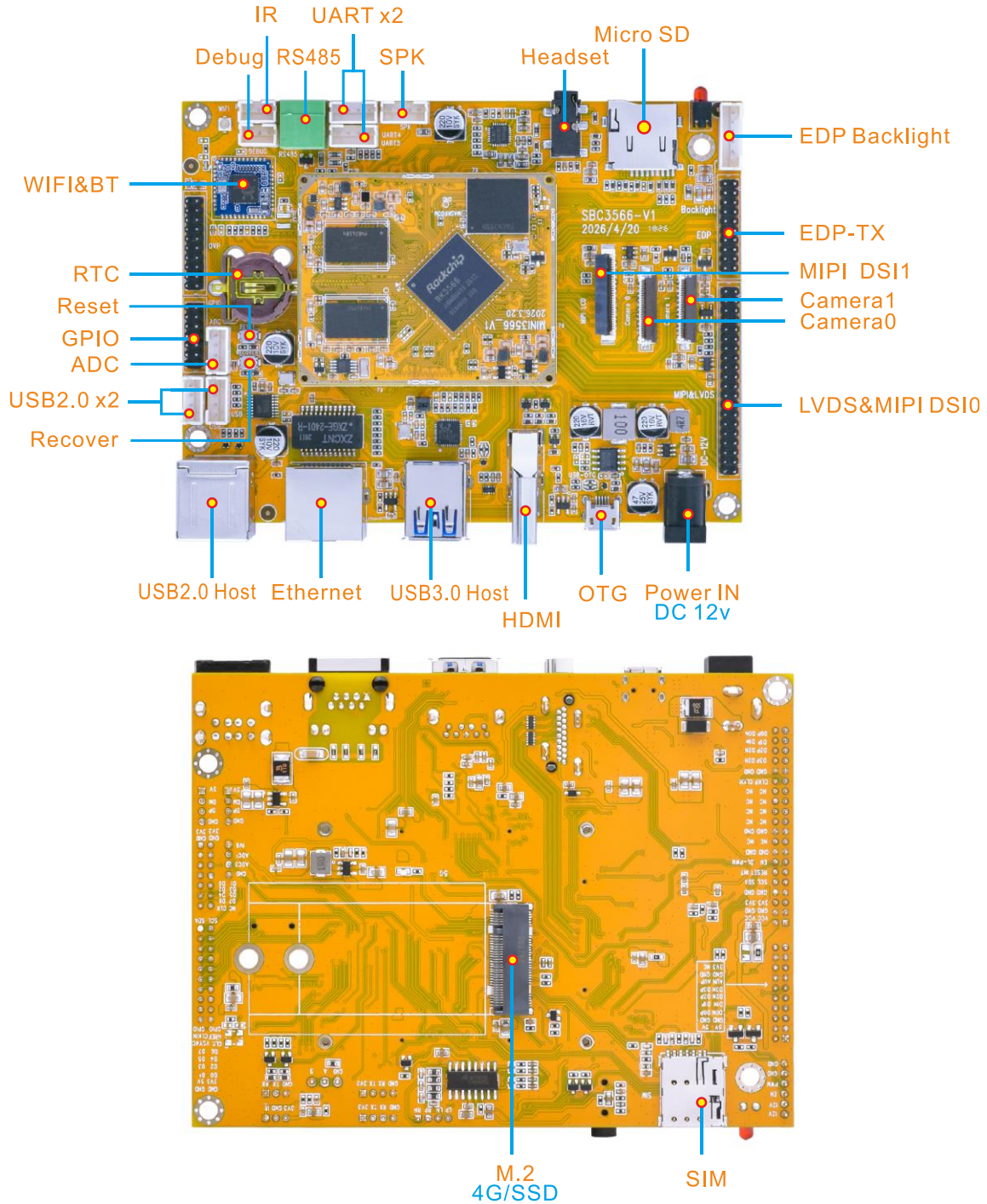


1.2 Product Parameters

Basic Parameters		
SOC	<ul style="list-style-type: none"> • RK3566 	
CPU	<ul style="list-style-type: none"> • Quad-core 64-bit ARM Cortex-A55@ up to 1.8GHz 	
GPU	<ul style="list-style-type: none"> • Supports OpenGL ES 1.1/2.0/3.2 • Supports OpenCL 2.0 Full Profile • Supports Vulkan 1.0 and 1.1 • 1600 MPix/s fill rate and 38.4 GFLOPs at 800 MHz 	
NPU	<ul style="list-style-type: none"> • Up to 1 TOPS • Supports INT8/INT16/FP16/BF16 MAC operations • Supports TensorFlow, TensorFlow Lite, PyTorch, Caffe, ONNX, MXNet, Keras, and Darknet 	
Video	Decoder	<ul style="list-style-type: none"> • Support 4096x2304@60fps H.265/H.264/VP9 video decoding • Support 1920x1088@60fps VP8/VC1/MPEG-4,2,1 video decoding • Support 720x576@60fps H.263 video decoding
	Encoder	<ul style="list-style-type: none"> • Support 1080P@60fps H.265/H.264 video encoding • Support YUV/RGB video source with rotation and mirror
RAM	<ul style="list-style-type: none"> • 2GB DDR3L (up to 4GB) 	
ROM	<ul style="list-style-type: none"> • 8GB eMMC (up to 64GB) 	
Support systems	Debian, Buildroot	
Hardware Parameters		
Extended Storage	<ul style="list-style-type: none"> • Supports M.2 PCIe SSD, shared with the 4G module interface • Support MicroSD Card 	
Display	<ul style="list-style-type: none"> • Support HDMI TX 4K@60fps display 	

	<ul style="list-style-type: none"> • Support LVDS/MIPI display • Support EDP display
Audio	<ul style="list-style-type: none"> • Support HDMI TX audio output • Support SPK audio output • Support Headset output/input
USB	<ul style="list-style-type: none"> • Support USB3.0 • Support 4x USB2.0
Network	<ul style="list-style-type: none"> • Support Gigabit Ethernet • Support WIFI/BT module • Support 4G module
Camera	<ul style="list-style-type: none"> • Support 2x Camera (ov13850)
Peripheral communication	<ul style="list-style-type: none"> • Support RS485 • Support 2x UART
Other parameters	Support Debug, ADC, IR, RTC, OTG.
Electrical Parameters	
Power supply input voltage	12V/3A
RTC input voltage	3V/0.6uA
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C
Structural Parameters	
Core board dimensions	55.0mm x 45.0mm
Motherboard dimensions	120.0mm x 90.0mm

1.3 Hardware Interface Introduction



Interface parameters

Power IN DC 12v	12V DC power input interface
USB OTG	OTG download interface

HDMI	HDMI TX interface
USB3.0 Host	USB3.0 Host interface
Ethernet	Gigabit Ethernet RJ45 interface
USB2.0 Host	Dual-layer USB2.0 HOST interface
Recover	Recovery key
USB2.0 x2	USB2.0 Host interface via 4-pin header
ADC	ADC interface
GPIO	GPIO extension interface
Reset	Reset key
RTC	RTC coin cell connector
WIFI&BT	Realtek RTL8723DS module
Debug	UART2 serial port for debugging
IR	IR interface
RS485	RS485 communication interface
UART x2	UART, TTL-level serial interface
SPK	Speaker L/R interface
Headset	Headset output/input
Micro SD	MicroSD card slot
EDP Backlight	EDP Backlight interface
EDP-TX	EDP display interface
MIPI DSI1	MIPI DSI1 display interface
Camera0	MIPI camera0 interface
Camera1	MIPI camera1 interface
LVDS&MIPI DSI0	LVDS or MIPI DSI0 display interface
SIM	Nano SIM card port
M.2 4G/SSD	M.2 B-Key interface, supports 4G or SSD module

2. Install Drivers and Tools

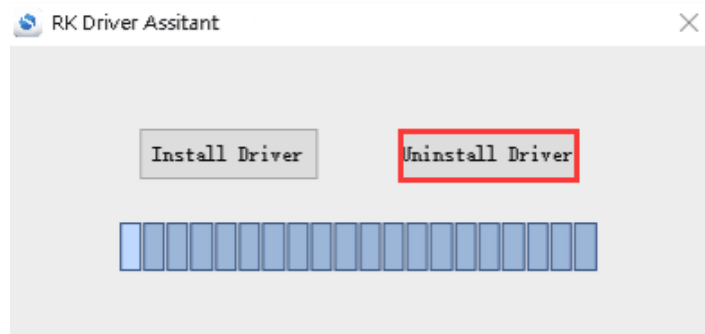
To download firmware and debug in the terminal, the following drivers and software need to be installed (for Windows computers):

Number	Driver name	Driver	Use
1	RK Driver Assistant	DriverInstall.exe	OTG USB driver installation assistant
2	CH9102x	SETUP.EXE	Serial port debugging driver
3	Serial Terminal Tool	SecureCRT.exe	Debugging tool

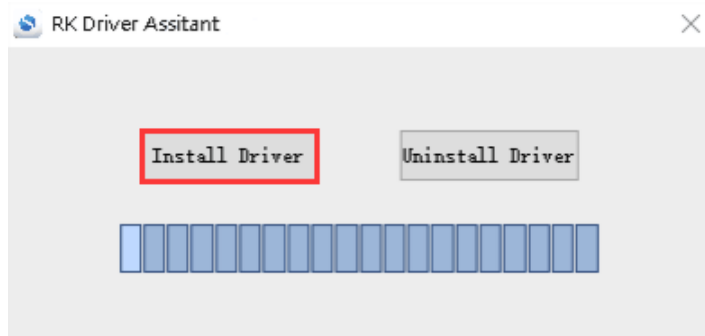
2.1 Install RK Driver Assistant

Step 1: Open *DriverAssistant/DriverInstall.exe*.

Step 2: To avoid driver conflicts, click “**Uninstall Driver**” to uninstall the driver.

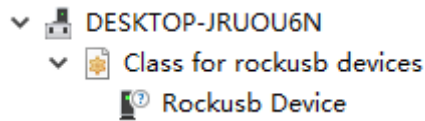


Step 3: Click button “**Install Driver**” to install.

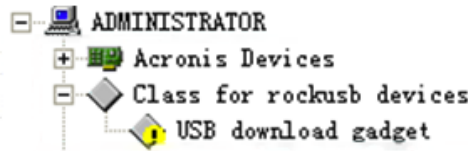


Step 4: After the installation is complete, connect the board and PC with Micro USB cable and press the **Recovery** key and hold then power the board, the following information is displayed in the Computer **Device Manager**, indicating that the USB

driver was successfully installed.

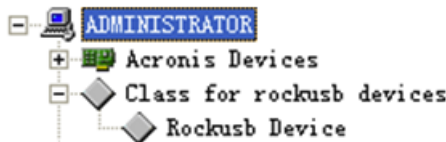


Step 5: If the following device information appears in the **Device Manager** after the operation in Step 4, user need to proceed to the next step.



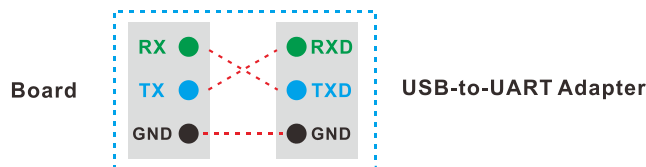
Step 6: The WINDOW will pop up found New Hardware Wizard dialog box, choose to install from the specified location, and then select: *DriverAssistant/ADBDriver*.

Step 7: After the installation is completed, the following device information can be seen in the Computer **Device Manager**.



2.2 Install CH9102X Driver

2.2.1 How to Connect the Serial Port Tool



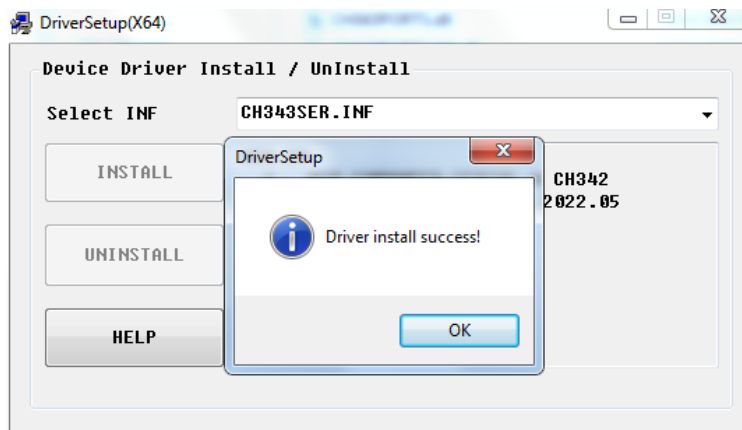
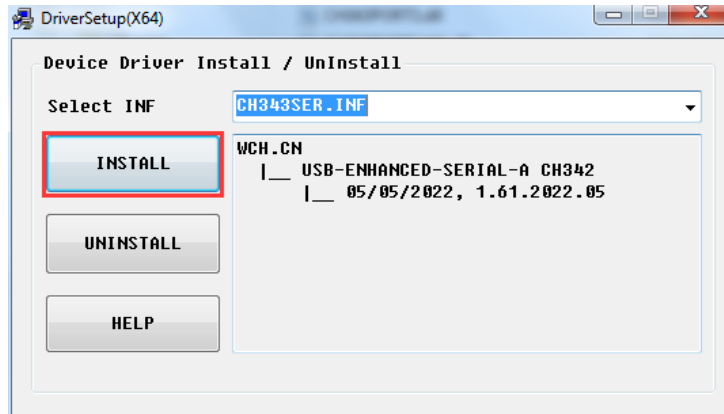
Pin	Connection Description
RXD	Receive, connect to TX pin of the board.
TXD	Transmit, connect to RX pin of the board.
GND	Ground, connect to GND pin of the board.
3V3	No need to connect.

2.2.2 Install Driver

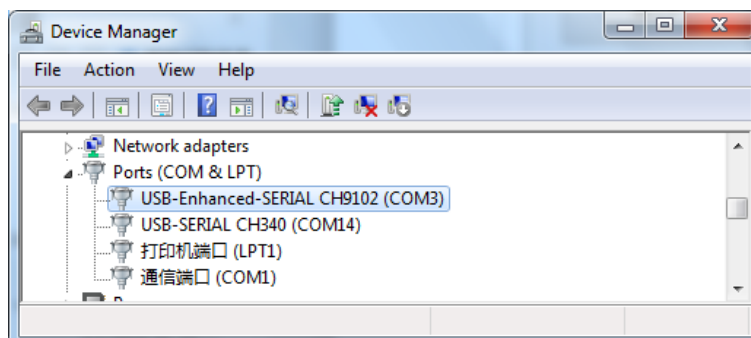
Step 1: Connect the CH9102X module to the PC.

Step 2: Unzip *CH343SER.ZIP* on Windows.

Step 3: Select and install the corresponding *SETUP.EXE* according to the computer properties.



Step 4: After the installation is completed, the device will be listed under **Device Manager** ports with unique serial port assigned.

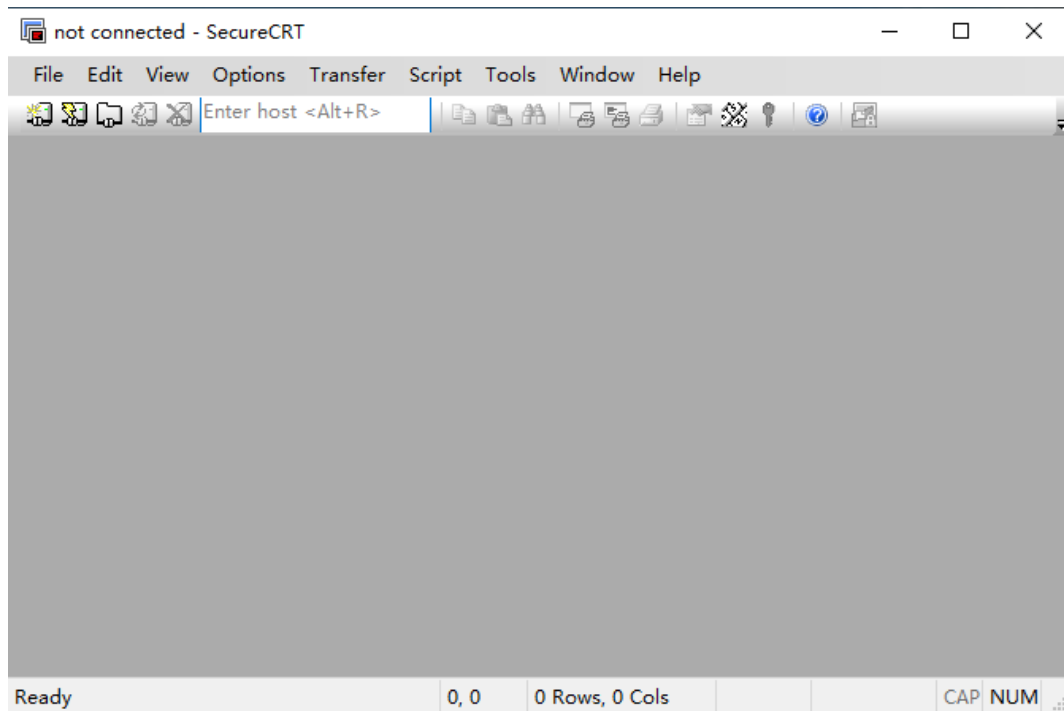


2.3 Install Serial Terminal Tool

The serial terminal SecureCRT is used for debugging in Windows. It can be used directly after decompression.

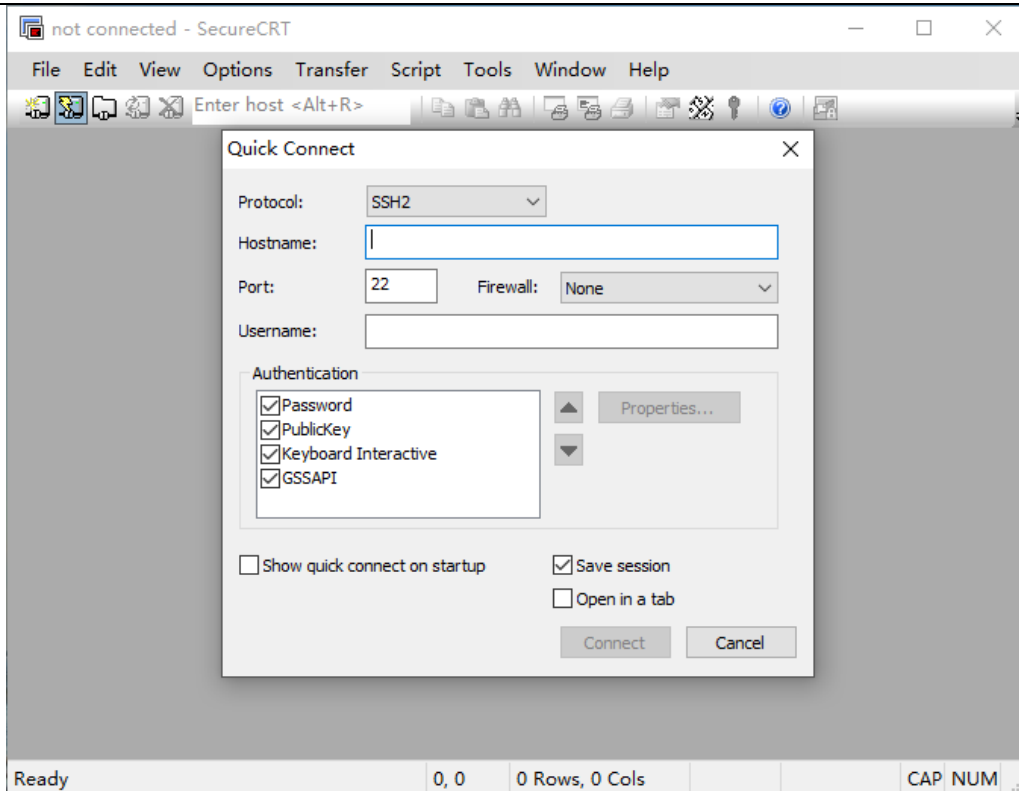
Step 1: Unzip *Platform/SecureCRT.rar* on PC.

Step 2: Click *SecureCRT/SecureCRT.exe* open to the SecureCRT.

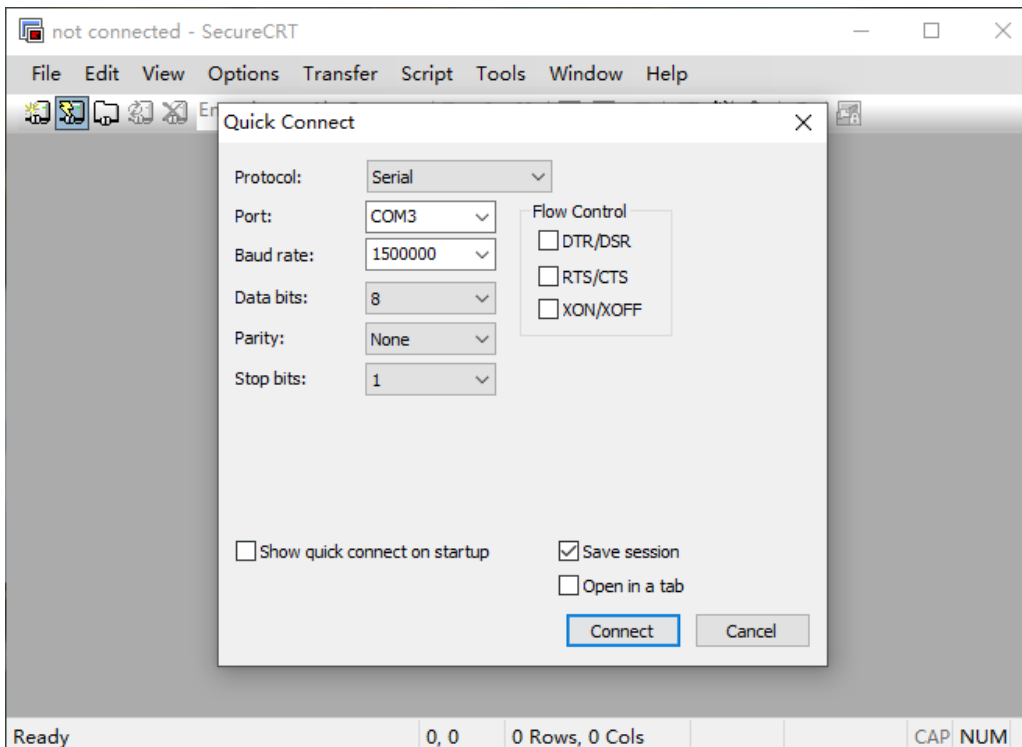


Step 3: Confirm that the CH9102X driver has been installed and the CH9102X module is connected to the PC.

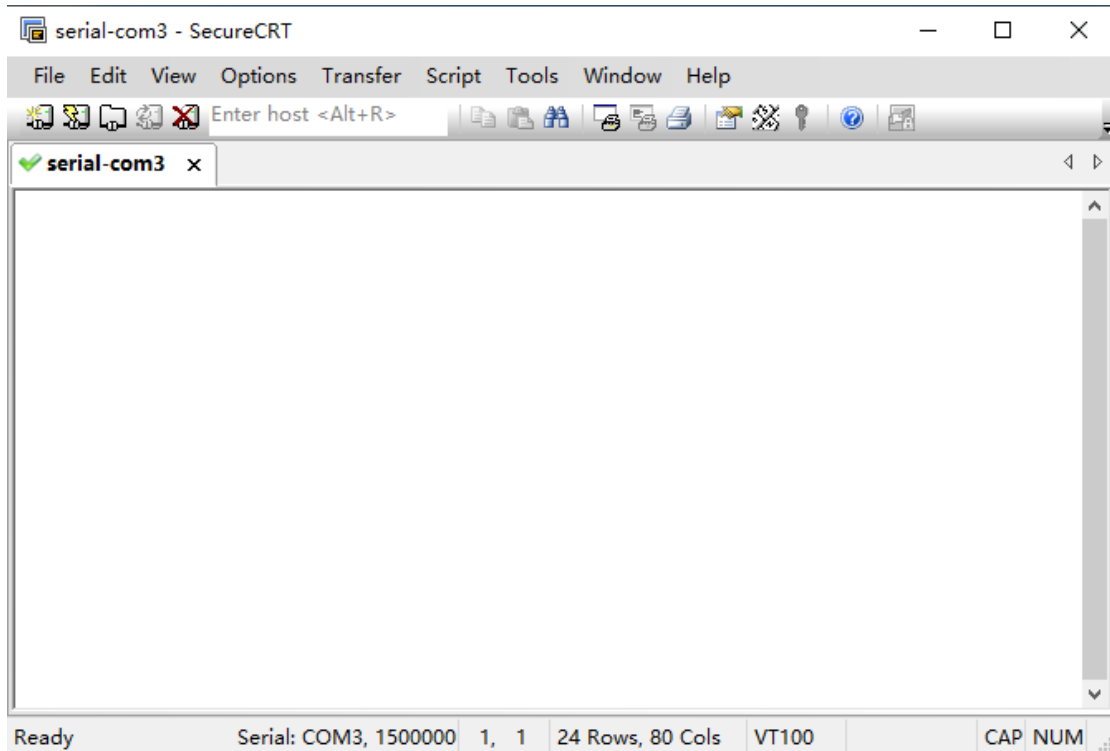
Step 4: Click the “**Quick Connect**” button to go to the Quick Connect configuration screen.



Step 5: Configure as shown in the following figure.



Step 6: After clicking the “**Connect**” button, the terminal serial interface will be successfully accessed.



3. Upgrade Introduction

3.1 Upgrade Mode

The firmware can be upgraded via a USB cable in the following two modes:

1. Loader Mode:

Loader Mode is the standard mode used for firmware upgrade.

2. MaskRom Mode:

MaskRom Mode is a recovery mode used when the device cannot enter Loader Mode or fails to boot properly. Entering MaskRom Mode requires hardware operation and may involve certain risks. It is recommended to use this mode only when Loader Mode is unavailable.

Prerequisite:

Before upgrading the firmware via USB cable, make sure the required USB driver has been installed on the PC. For driver installation instructions, refer to the section [Install](#)

[RK Driver Assistant.](#)

3.1.1 How to Enter Loader Mode

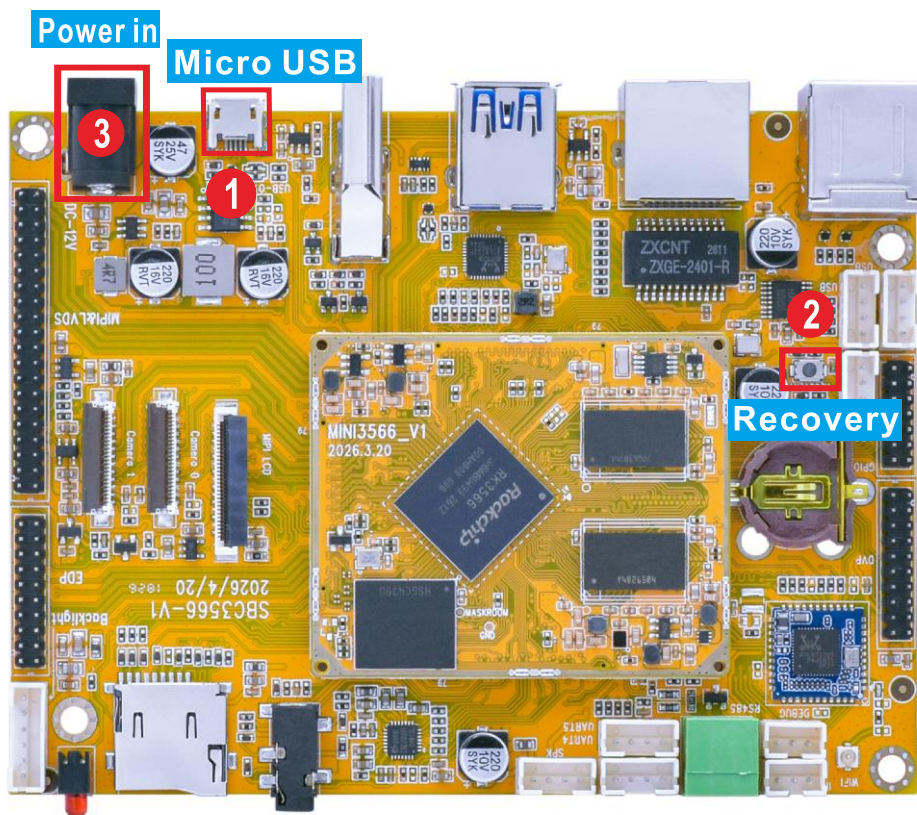
3.1.1.1 Hardware Method

Step 1: Disconnect the power adapter.

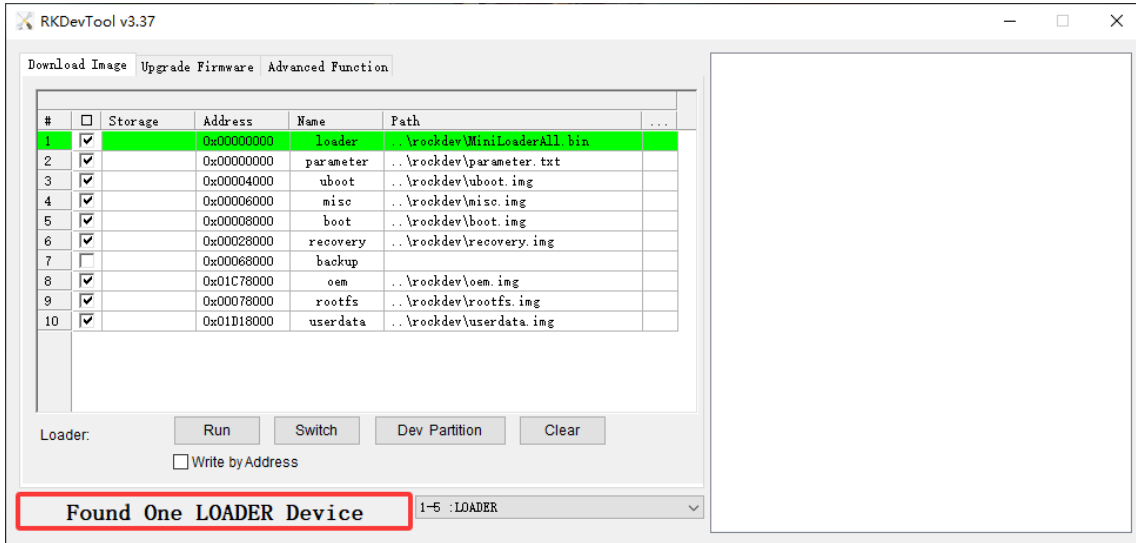
Step 2: Connect one end of the Micro USB cable to the host PC and the other end to the development board.

Step 3: Press and hold the **Recovery** button on the board.

Step 4: Connect the power supply.



Step 5: After a few seconds, release the **Recovery** button when the flashing tool shows “Found one **LOADER** Device”.



3.1.1.2 Software Method

After the Micro USB cable is connected and the board is powered on, run the following command from the serial debug terminal or ADB shell:

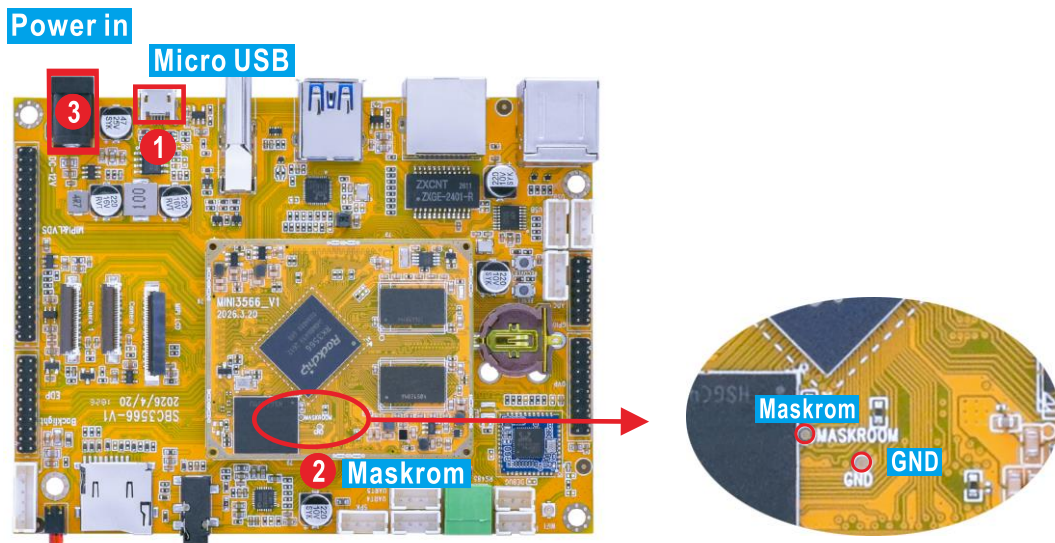
```
# reboot loader
```

3.1.2 How to Enter MaskRom Mode

Step 1: Disconnect the power adapter.

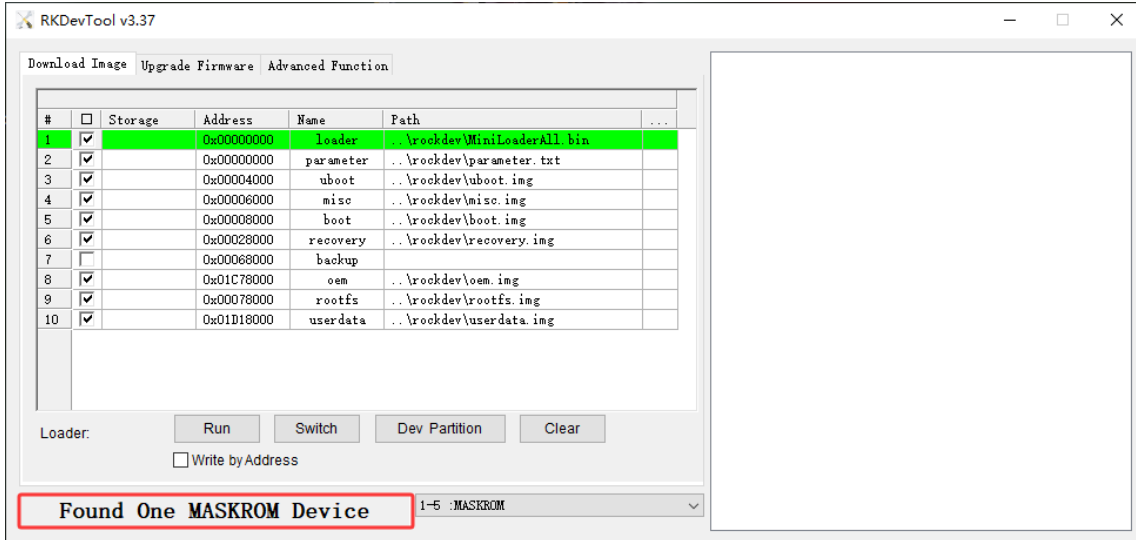
Step 2: Connect one end of the Micro USB cable to the host PC and the other end to the development board.

Step 3: Use tweezers to short the two MaskRom test points on the MINI3566.



Step 4: While keeping the test points shorted, connect the power supply.

Step 5: After the flashing tool shows “**Found one MASKROM Device**”, release the tweezers. The device has now entered MaskRom mode.

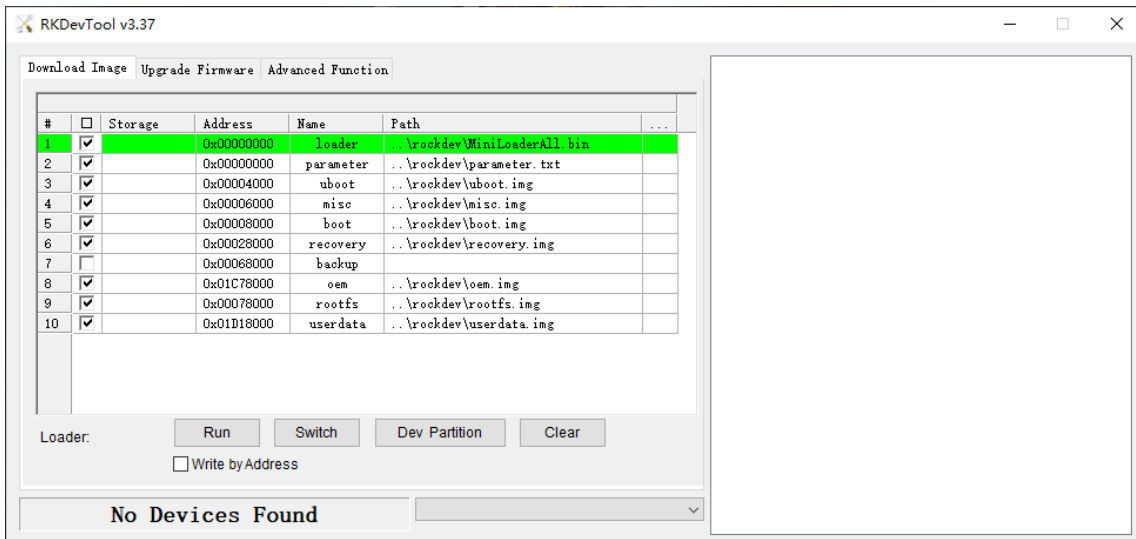


3.2 Firmware Flashing

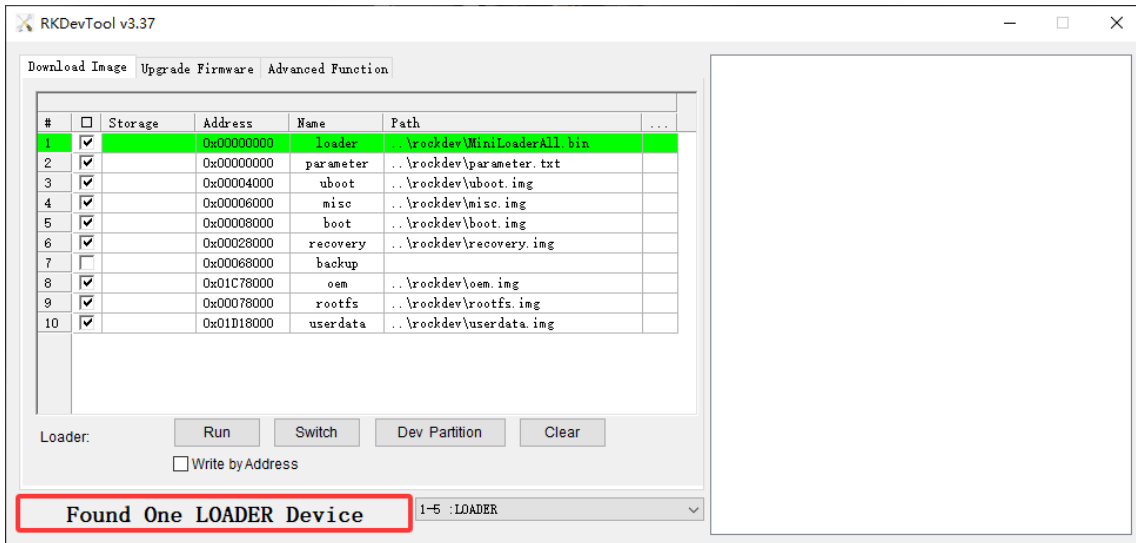
Environment: Windows OS

3.2.1 Flash update.img Firmware

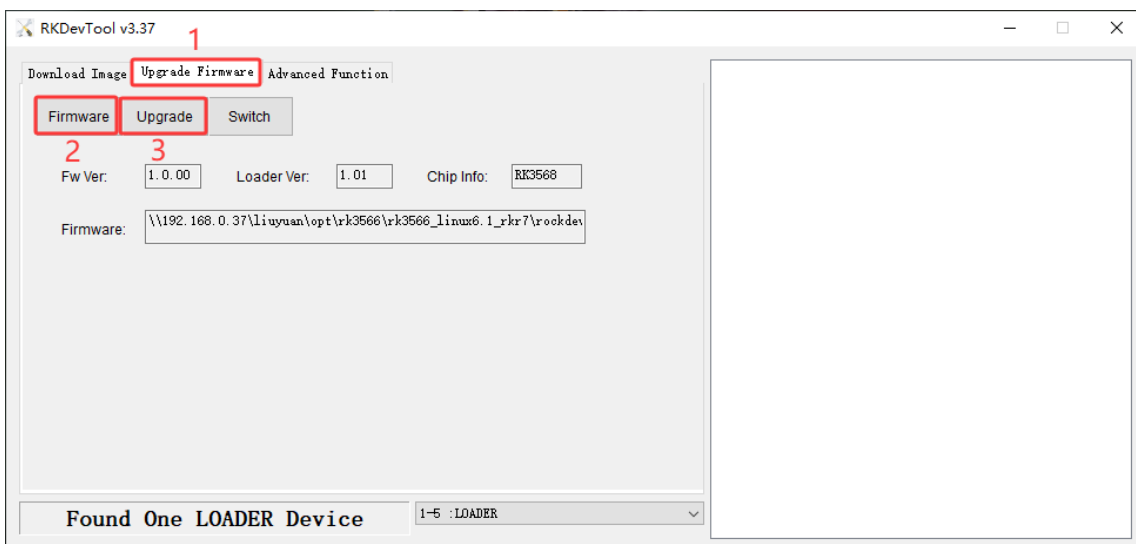
Step 1: Open *RKDevTool\RKDevTool_Release\RKDevTool.exe*.



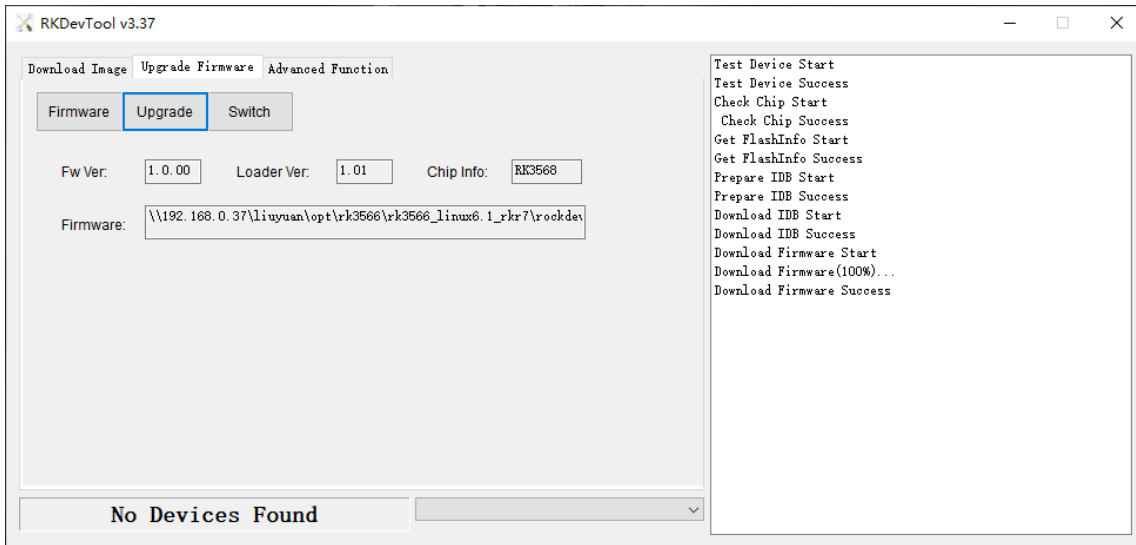
Step 2: Put the board into Loader mode. For details, refer to Section [3.1.1 How to Enter Loader Mode](#).



Step 3: Click **Upgrade Firmware** -> **Firmware**, select **update.img**, and then click **Upgrade** to start flashing.



After the flashing is complete, the board will automatically reboot.



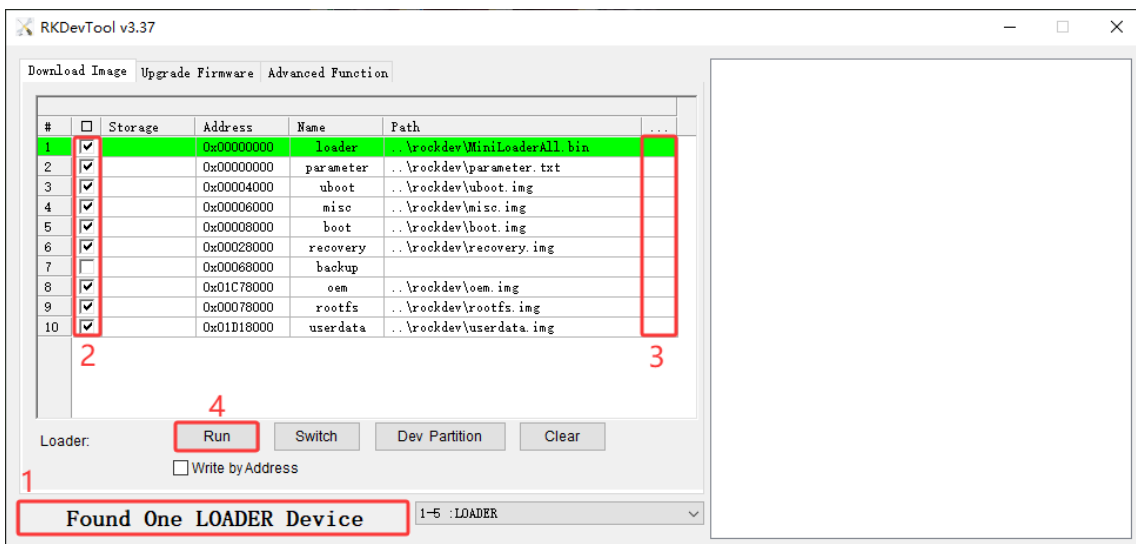
3.2.2 Flash Split Firmware

Step 1: Put the board into Loader mode. For details, refer to Section [3.1.1 How to Enter Loader Mode](#).

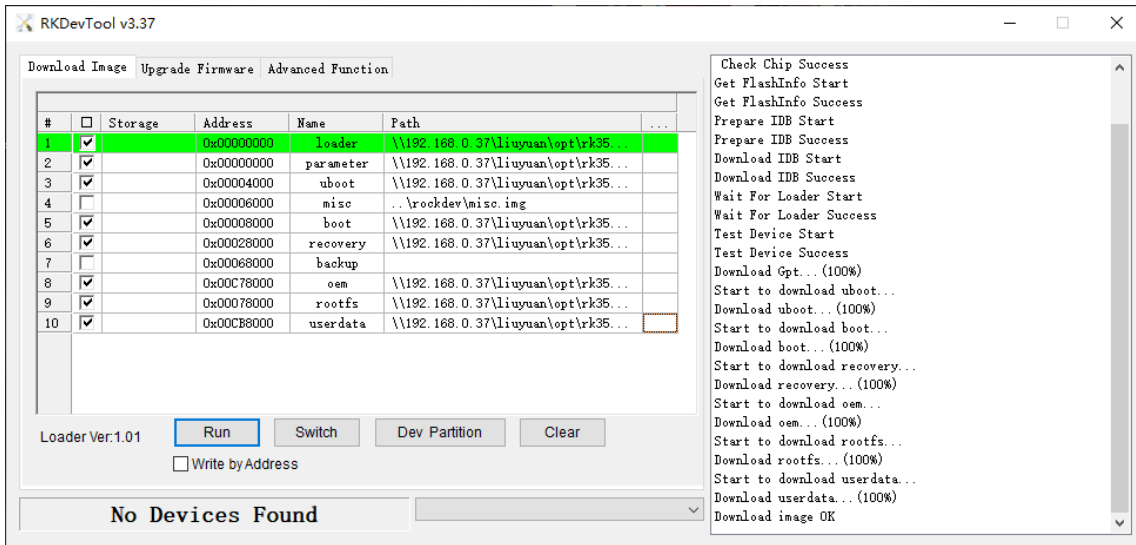
Step 2: Select the partitions to be flashed. Multiple partitions can be selected.

Step 3: Make sure the image file paths are correct. If necessary, click the blank cell next to each path to reselect the corresponding image file.

Step 4: Click **Run** to start flashing.



After flashing is complete, the board will automatically reboot.



4. Development Environment

4.1 Preparing the Development Environment

Ubuntu 22.04 or later is recommended for SDK compilation. If an error occurs during compilation, check the error message and install the required software packages accordingly. For other Linux distributions, the package names or installation commands may need to be adjusted.

In addition to the operating system requirements, the following hardware and software requirements should be met:

Hardware requirements	Software requirements
64-bit system, hard disk space should be greater than 200G. If you do multiple builds, you will need more hard drive space.	Ubuntu 22.04

4.2 Installing Libraries and Toolkits

This section provides the commands for installing the software packages required to build the SDK compilation environment. Other tools, such as Samba and SSH, should

be installed as needed.

PC OS	Network	Permission
Ubuntu 22.04	online	root

To install the required tools, execute the following commands:

```
$ sudo apt-get install git ssh make gcc libssl-dev liblz4-tool libmpc-dev
$ sudo apt-get install expect g++ patchelf chrpath gawk texinfo chrpath diffstat
$ sudo apt-get install binfmt-support live-build bison flex fakeroot libgmp-dev
$ sudo apt-get install cmake gcc-multilib g++-multilib unzip device-tree-compiler
$ sudo apt-get install ncurses-dev libgucharmap-2-90-dev bzip2 expat gpgv2
$ sudo apt-get install cpp-aarch64-linux-gnu g++-aarch64-linux-gnu
$ sudo apt install python2 python-is-python3
```

5. Compile Source Code

Step 1: Extract the Source Code

To extract the source files, execute the following commands:

```
$ tar xvf rk3566_linux6.1_rk*.tar.bz2
$ cd rk3566_linux6.1_rkr7
```

Step 2: Configure the Target Board

To configure the target board, execute the following command:

```
$ ./build.sh lunch
```

After running `./build.sh lunch`, the system will list available defconfig files.

- For EDP display, select:

11. boardcon_sbc3566_edp_defconfig

- For HDMI display, select:

12. boardcon_sbc3566_hdmi_defconfig

- For LVDS display (1280x800), select:

13. boardcon_sbc3566_lvds_defconfig

- For MIPI DSI0 display (800x1280), select:

14. boardcon_sbc3566_mipi0_defconfig

- For MIPI DSI0 display (800x1280), select:

15. boardcon_sbc3566_mipi1_defconfig

Example: MIPI DSI0 display configuration

```
liuyuan@boardcon:~/opt/rk3566/rk3566_linux6.1_rkr7$ ./build.sh lunch
##### Rockchip Linux SDK #####
Manifest: rk3566_rk3568_linux6.1_release_v1.3.0_20251220.xml
GIT commit: "a6ba994 Release rk3566_rk3568 - 2025-12-30"
Log colors: message notice warning error fatal
Log saved at /home/liuyuan/opt/rk3566/rk3566_linux6.1_rkr7/output/sessions/2026-06-03_14-54-54
Pick a defconfig:
1. rockchip_defconfig
2. boardcon_compact3566_hdmi_defconfig
3. boardcon_compact3566_lvds_defconfig
4. boardcon_compact3566_mipi_defconfig
5. boardcon_em3566_hdmi_defconfig
6. boardcon_em3566_lvds_defconfig
7. boardcon_em3566_mipi_defconfig
8. boardcon_idea3566_hdmi_defconfig
9. boardcon_idea3566_lvds_defconfig
10. boardcon_idea3566_mipi_defconfig
11. boardcon_sbc3566_edp_defconfig
12. boardcon_sbc3566_hdmi_defconfig
13. boardcon_sbc3566_lvds_defconfig
14. boardcon_sbc3566_mipi0_defconfig
15. boardcon_sbc3566_mipi1_defconfig
16. rockchip_rk3566_evb2_lp4x_v10_32bit_defconfig
17. rockchip_rk3566_evb2_lp4x_v10_defconfig
18. rockchip_rk3568_evb1_ddr4_v10_32bit_defconfig
19. rockchip_rk3568_evb1_ddr4_v10_defconfig
20. rockchip_rk3568_pcie_ep_lp4x_v10_defconfig
Which would you like? [1]: 14
Switching to defconfig:
/home/liuyuan/opt/rk3566/rk3566_linux6.1_rkr7/device/rockchip/.chip/boardcon_sbc3566_mipi0_defconfig
```

Step 3: Compile U-Boot

To compile U-Boot, execute the following command:

```
$ ./build.sh uboot
```

Step 4: Compile the Kernel

To compile the kernel, execute the following command:

```
$ ./build.sh kernel
```

This command builds the kernel using the currently selected board configuration.

If the U-Boot display selection menu is required, use the following command instead:

```
$ ./build.sh kernel_dtb
```

This command builds the kernel and packages the eDP, HDMI, LVDS, MIPI DSI0, and MIPI DSI1 display DTBs for the currently selected board into the boot image. These DTBs are used for the display switching function in U-Boot.

Note:

- `./build.sh kernel`: For a normal single-display firmware build.
- `./build.sh kernel_dtb`: For firmware that supports EDP/HDMI/LVDS/MIPI display switching from the U-Boot menu.

Step 5: Compile Recovery

To compile recovery, execute the following command:

```
$ ./build.sh recovery
```

Step 6: Compile rootfs

(1) Compile Debian12

Root privileges are required to compile Debian12. Execute the following command:

```
$ sudo ./build.sh debian
```

After compilation is complete, [linaro-rootfs.img](#) will be generated in the debian directory.

Note:

The required dependencies must be installed before compiling Debian12.

```
$ cd debian
$ sudo apt-get install binfmt-support qemu-user-static live-build
$ sudo dpkg -i ubuntu-build-service/packages/*
$ sudo apt-get install -f
```

(2) Compile Buildroot

To compile buildroot, execute the following command:

```
$ ./build.sh buildroot
```

Step 7: Generate and Package Firmware Images

To generate and package the firmware images, execute the following command:

```
$ ./build.sh firmware
```

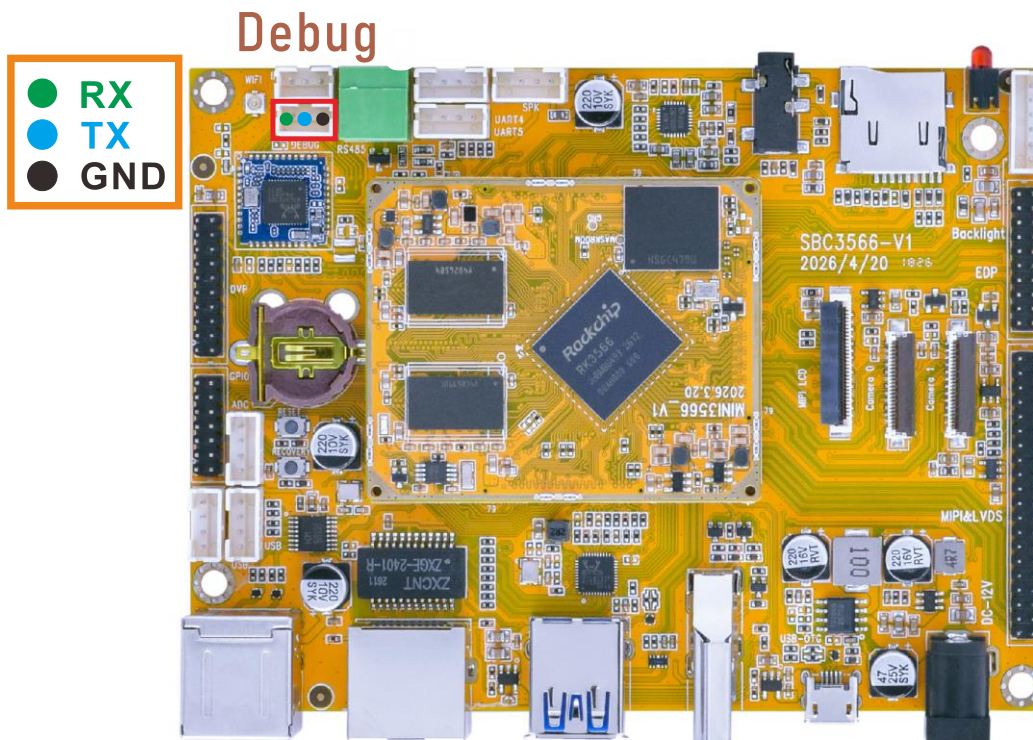
After the command is completed, the image files and **update.img** will be generated in the directory *rockdev/*

6. Debian12 Test

Account: `linaro`
Password: `linaro`

6.1 Serial Terminal

Step 1: Connect the USB-to-serial module to the PC and connect the other end to the Debug UART interface on the board.



Step 2: Open a serial terminal tool on the PC, select the corresponding serial port, and set the baud rate to 1500000.

Step 3: Power on the board and check whether the boot log is displayed in the serial terminal.

6.2.1 Display Output Switching Method

If no display mode is configured, the system uses HDMI as the default display output.

Step 1: During the U-Boot startup stage, press **Ctrl + C** when the following prompt appears to stop autoboot and enter the U-Boot command line:

```
Hit key to stop autoboot('CTRL+C'): 0
```

Step 2: Open the display output selection menu.

Execute the following command:

```
=> display menu
```

Step 3: Select the board type.

For example, enter **4** to select **SBC3566**:

```
Hit key to stop autoboot('CTRL+C'): 0
=> display menu

=====
Select board type:
 1. IDEA3566
 2. COMPACT3566
 3. EM3566
 4. SBC3566
=====
Please select board type: 4
```

Step 4: Select the display output mode.

For example, enter **2** to select **LVDS** display for SBC3566:

```
=====
Select display output for SBC3566:
 1. HDMI
 2. LVDS
 3. EDP
 4. MIPI0
 5. MIPI1

Note: SBC3566 supports HDMI, LVDS, EDP, MIPI0, and MIPI1.
=====
Please select display mode: 2

Selected board: SBC3566
Selected display mode: LVDS
```

Step 5: Enter **S** to save the configuration and reboot the board.

```
=====
Action:
 S. Save and reboot
 Q. Save and quit to U-Boot
 C. Cancel, do not save
=====
Please select action: S
vendor_storage_write display mode ret=12
Display mode saved: LVDS
Reset board to apply display mode...
```

The selected display output mode will take effect after the board reboots.

6.2.2 Display Effect Examples

eDP Display Effect



HDMI Display Effect



LVDS Display Effect



MIPI DSI0 Display Effect

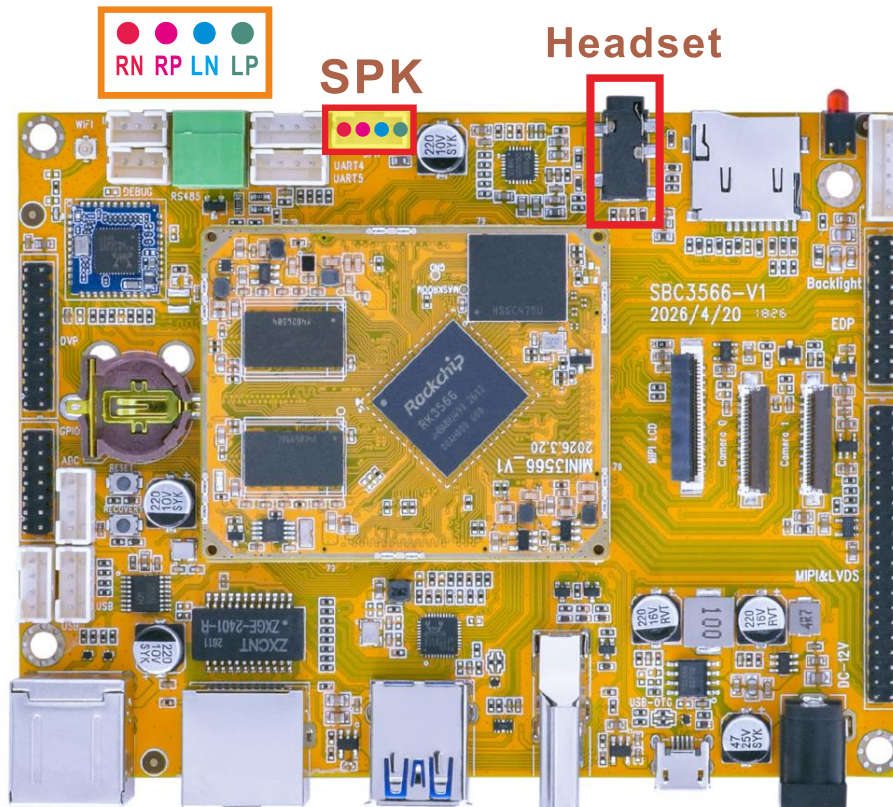


MIPI DSI1 Display Effect



6.3 Audio

Step 1: Connect the headset to the headset jack and connect the speaker.



Step 2: Check the sound card information.

Execute the following command:

```
# cat /proc/asound/cards
```

```
root@linaro-alip:/# cat /proc/asound/cards
0 [rockchiphdmi ]: rockchip-hdmi - rockchip-hdmi
  rockchip-hdmi
1 [rockchipes8388c]: simple-card - rockchip,es8388-codec
  rockchip,es8388-codec
```

Step 3: Record audio through the headset microphone.

- When using HDMI as the display:

```
# arecord -Dhw:1,0 -f cd record.wav
```

```
root@linaro-alip:/# arecord -Dhw:1,0 -f cd record.wav
Recording WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

- When using LVDS/MIPI as the display:

```
# arecord -Dhw:0,0 -f cd record.wav
```

```
root@linaro-alip:/# arecord -Dhw:0,0 -f cd record.wav
Recording WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

Step 4: Play audio through the headset or Speaker.

Audio output priority: Headset > Speaker.

By default, audio is routed to the headset when a headset is detected.

When no headset is detected, audio is routed to the speaker.

- When using HDMI as the display:

```
# aplay -Dhw:1,0 record.wav
```

```
root@linaro-alip:/# aplay -Dhw:1,0 record.wav
Playing WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

Note: Supplementary instructions on audio output.

- `aplay -Dhw:0,0 record.wav` : HDMI TX audio output
- `aplay -Dhw:1,0 record.wav` : Headset or Speaker audio output

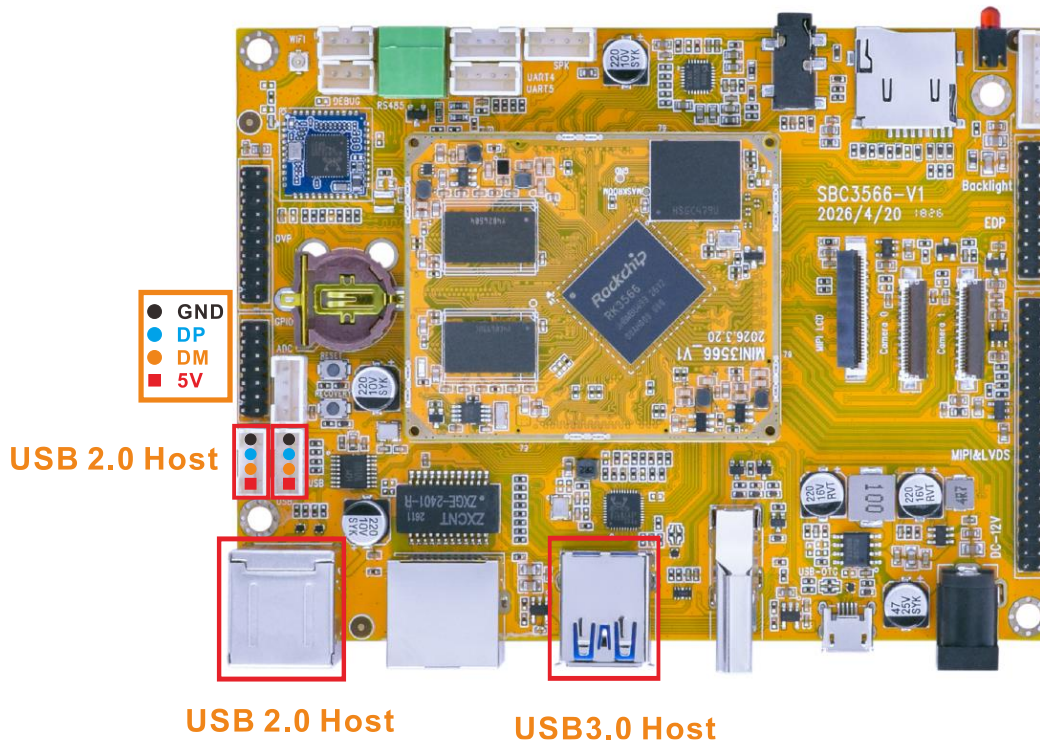
- When using LVDS/MIPI as the display:

```
# aplay -Dhw:0,0 record.wav
```

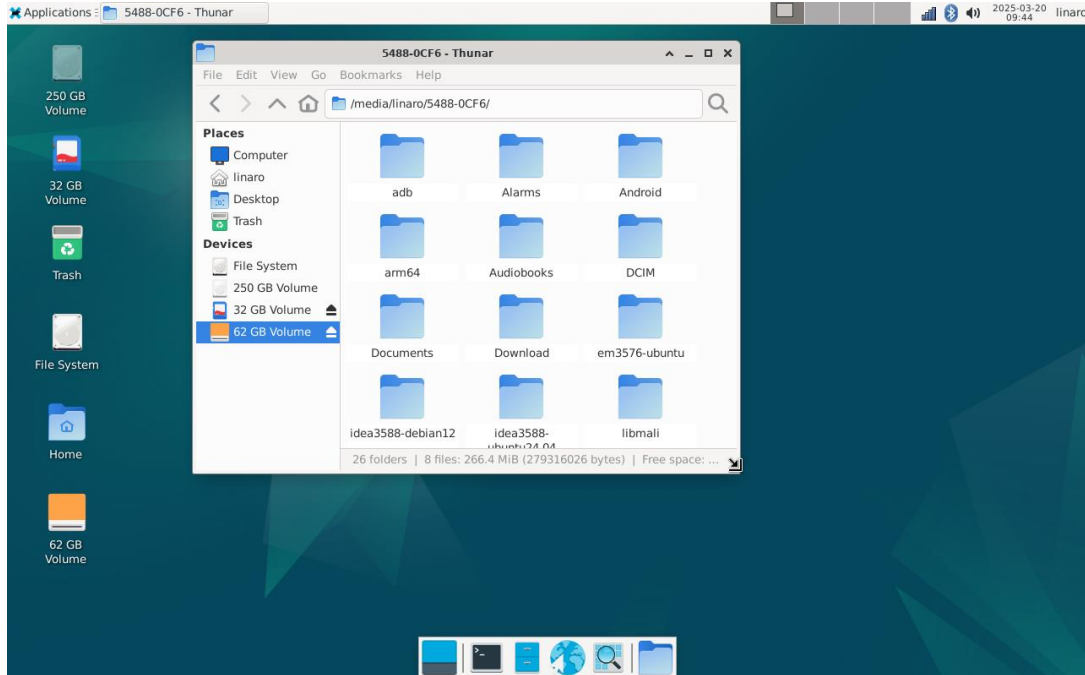
```
root@linaro-alip:/# aplay -Dhw:0,0 record.wav  
Playing WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

6.4 USB Host

The SBC3566 provides both USB 2.0 Host and USB 3.0 Host interfaces. The USB Host interfaces can be used to connect USB peripherals, such as a USB mouse, USB keyboard, USB flash drive, and other USB devices.



After a USB flash drive is connected and recognized successfully, a removable storage icon will appear on the desktop. Users can click the icon to access the files on the USB flash drive.



The current USB connection speed can be checked from the kernel log.

- When the device operates in USB 2.0 mode, the log usually shows “high-speed”:

```
root@linaro-alip:/# [ 100.401796] usb 5-1.1: new high-speed USB device number 5 using ehci-platform
[ 100.540580] usb 5-1.1: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 100.540631] usb 5-1.1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 100.540654] usb 5-1.1: Product: OnlyDisk
[ 100.540674] usb 5-1.1: Manufacturer: Netac
[ 100.540715] usb 5-1.1: SerialNumber: 0A6544CD10427AB2
[ 100.542566] usb-storage 5-1.1:1.0: USB Mass Storage device detected
[ 100.543718] scsi host1: usb-storage 5-1.1:1.0
[ 101.684785] scsi 1:0:0:0: Direct-Access Netac OnlyDisk 8.01 PQ: 0 ANSI: 6
[ 101.690705] sd 1:0:0:0: [sdb] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 101.691923] sd 1:0:0:0: [sdb] Write Protect is off
[ 101.692854] sd 1:0:0:0: [sdb] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[ 101.701334] sdb: sdb1
[ 101.701915] sd 1:0:0:0: [sdb] Attached SCSI removable disk
```

- When the device operates in USB 3.0 mode, the log usually shows “SuperSpeed”:

```
root@linaro-alip:/# [ 667.590292] usb 2-1: new SuperSpeed USB device number 2 using xhci-hcd
[ 667.621251] usb 2-1: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 667.621301] usb 2-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 667.621324] usb 2-1: Product: OnlyDisk
[ 667.621343] usb 2-1: Manufacturer: Netac
[ 667.621363] usb 2-1: SerialNumber: 0A6544CD10427AB2
[ 667.623814] usb-storage 2-1:1.0: USB Mass Storage device detected
[ 667.625045] scsi host1: usb-storage 2-1:1.0
[ 668.863371] scsi 1:0:0:0: Direct-Access Netac OnlyDisk 8.01 PQ: 0 ANSI: 6
[ 668.867339] sd 1:0:0:0: [sdb] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 668.868328] sd 1:0:0:0: [sdb] Write Protect is off
[ 668.869049] sd 1:0:0:0: [sdb] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[ 668.874950] sdb: sdb1
[ 668.875290] sd 1:0:0:0: [sdb] Attached SCSI removable disk
```

6.5 Ethernet

Step 1: Connect the network cable to the Ethernet port.



Ethernet

After the network cable is connected, check the kernel log. The log shows that the Gigabit Ethernet link is detected successfully.

```
root@linaro-alip:/#
[ 95.287411] rk_gmac-dwmac fe010000.ethernet end1: Link is Up - 1Gbps/Full - flow control rx/tx
[ 95.287655] IPv6: ADDRCONF(NETDEV_CHANGE): end1: link becomes ready
```

Step 2: Check the network interface information.

Execute the following command:

```
# ifconfig end1
```

```
root@linaro-alip:/# ifconfig end1
end1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.100 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::e690:dbf8:7844:fddc prefixlen 64 scopeid 0x20<link>
    ether 92:bb:a5:1f:17:32 txqueuelen 1000 (Ethernet)
    RX packets 125 bytes 12766 (12.4 KiB)
    RX errors 0 dropped 12 overruns 0 frame 0
    TX packets 75 bytes 6627 (6.4 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 56
```

Step 3: Test the network connection.

Execute the following command:

```
# ping -I end1 www.armdesigner.com
```

```
root@linaro-alip:/# ping -I end1 www.armdesigner.com
PING www.armdesigner.com (67.222.54.196) from 192.168.0.226 end1: 56(84) bytes of data:
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=1 ttl=48 time=187 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 ttl=48 time=186 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=3 ttl=48 time=189 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=4 ttl=48 time=185 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=5 ttl=48 time=185 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=6 ttl=48 time=188 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=7 ttl=48 time=185 ms
^C
--- www.armdesigner.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6004ms
rtt min/avg/max/mdev = 185.119/186.494/189.162/1.532 ms
```

6.6 ADB

Step 1: Connect the board to the PC with a Micro USB cable.



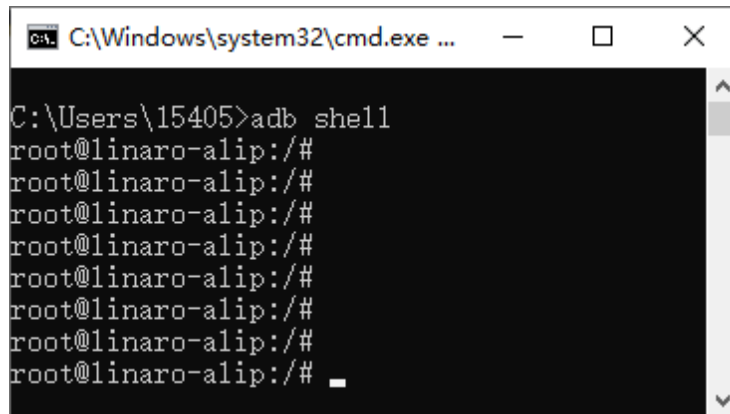
Micro USB

Step 2: Install the ADB driver on the Windows PC.

Step 3: Press **Windows + R** to open the Run dialog box. Type “cmd” and press Enter.

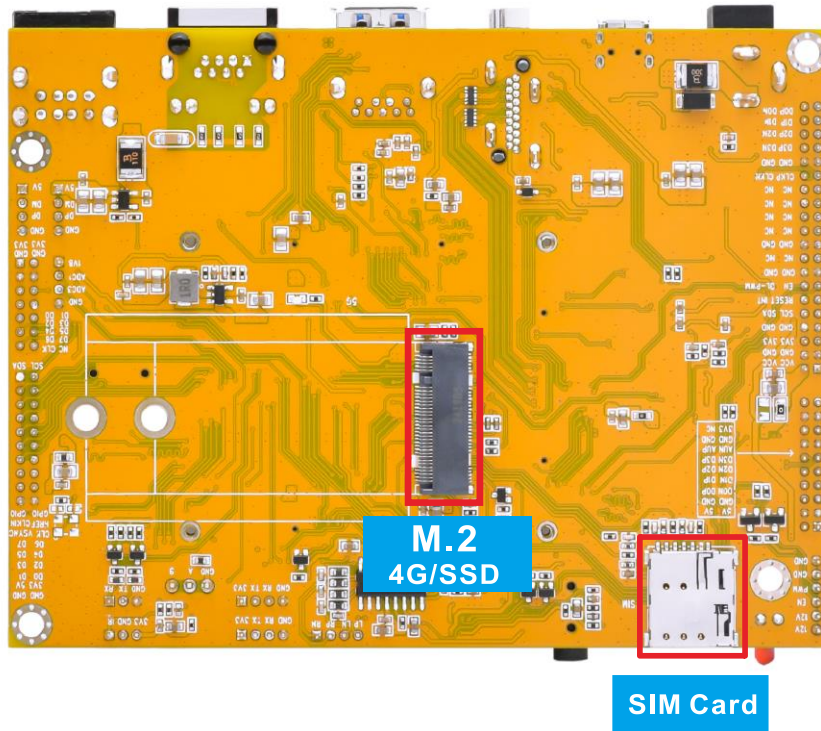
Step 4: Execute the following command to enable ADB:

```
# adb shell
```



6.7 M.2

The M.2 interface is compatible with both 4G and SSD modules, but they cannot be used at the same time.



6.7.1 4G Test

Step 1: Install the EM05 module into the M.2 socket and connect the 4G antenna.



Step 2: Insert the SIM card, and then power on the board.

Step 3: Check the 4G module device nodes.

After the 4G module is recognized successfully, the `/dev/ttyUSB*` device nodes will be generated.

Execute the following command:

```
# ls /dev/ttyUSB*
```

```
root@linaro-alip:/# ls /dev/ttyUSB*
/dev/ttyUSB0 /dev/ttyUSB1 /dev/ttyUSB2 /dev/ttyUSB3
```

Step 4: Initiate the PPP connection.

```
# pppd call quectel-ppp &
```

```
root@linaro-alip:/# pppd call quectel-ppp &
[1] 2691
root@linaro-alip:/# pppd options in effect:
debug          # (from /etc/ppp/peers/quectel-ppp)
nodetach       # (from /etc/ppp/peers/quectel-ppp)
dump          # (from /etc/ppp/peers/quectel-ppp)
noauth        # (from /etc/ppp/peers/quectel-ppp)
user test     # (from /etc/ppp/peers/quectel-ppp)
password ????? # (from /etc/ppp/peers/quectel-ppp)
remotename 3gppp # (from /etc/ppp/peers/quectel-ppp)
/dev/ttyUSB3 # (from /etc/ppp/peers/quectel-ppp)
115200      # (from /etc/ppp/peers/quectel-ppp)
lock        # (from /etc/ppp/peers/quectel-ppp)
connect chat -s -v -f /etc/ppp/peers/quectel-chat-connect # (from /etc/ppp/peers/quectel-ppp)
disconnect chat -s -v -f /etc/ppp/peers/quectel-chat-disconnect # (from /etc/ppp/peers/quectel-ppp)
nocrtscts   # (from /etc/ppp/peers/quectel-ppp)
modem       # (from /etc/ppp/peers/quectel-ppp)
asynctest   # (from /etc/ppp/options)
lcp-echo-failure 4 # (from /etc/ppp/options)
lcp-echo-interval 30 # (from /etc/ppp/options)
hide-password # (from /etc/ppp/peers/quectel-ppp)
novj        # (from /etc/ppp/peers/quectel-ppp)
novjccomp   # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-local # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-remote # (from /etc/ppp/peers/quectel-ppp)
ipparam 3gppp # (from /etc/ppp/peers/quectel-ppp)
noipdefault # (from /etc/ppp/peers/quectel-ppp)
ipcp-max-failure 30 # (from /etc/ppp/peers/quectel-ppp)
defaultroute # (from /etc/ppp/peers/quectel-ppp)
usepeerdns  # (from /etc/ppp/peers/quectel-ppp)
noccpx     # (from /etc/ppp/peers/quectel-ppp)
noipx      # (from /etc/ppp/options)
abort on (BUSY)
abort on (NO CARRIER)
abort on (NO DIALTONE)
abort on (ERROR)
abort on (NO ANSWER)
timeout set to 30 seconds
send (AT^M)
expect (OK)
AT^M^M
OK
-- got it

send (ATE0^M)
expect (OK)
^M
```

Step 5: Check the status of the network interfaces.

```
# ifconfig ppp0
```

```
root@linaro-alip:/# ifconfig ppp0
ppp0: flags=4305<UP,POINTOPOINT,RUNNING,NOARP,MULTICAST> mtu 1500
inet 10.72.180.212 netmask 255.255.255.255 destination 10.64.64.64
ppp txqueuelen 3 (Point-to-Point Protocol)
RX packets 137 bytes 10676 (10.4 KiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 158 bytes 11052 (10.7 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Step 6: Test the PPP connection.

```
# ping -I ppp0 www.armdesigner.com
```

```
root@linaro-alip:/# ping -I ppp0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (13.35.202.93) from 10.72.180.212 ppp0: 56(84) bytes of data.
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=1 ttl=244 time=93.0 ms
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=2 ttl=244 time=107 ms
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=3 ttl=244 time=104 ms
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=4 ttl=244 time=112 ms
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=5 ttl=244 time=83.3 ms
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=6 ttl=244 time=174 ms
64 bytes from server-13-35-202-93.sin2.r.cloudfront.net (13.35.202.93): icmp_seq=7 ttl=244 time=132 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6005ms
rtt min/avg/max/mdev = 83.349/114.948/173.676/27.838 ms
```

6.7.2 GPS Test

Step 1: Install the EM05 module into the M.2 socket and connect a passive GPS antenna.

Active GPS antennas are not supported.



Step 2: Enable the GPS function.

Execute the following command:

```
# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
```

Step 3: Read the GPS data.

Execute the following command:

```
# cat /dev/ttyUSB1
```

```

root@linaro-alip:/# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
root@linaro-alip:/# cat /dev/ttyUSB1
$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*1E

$GPGGA,,,,,0,,,,,,,,,*66

$GPRMC,,V,,,,,,,,,N,V*29

$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*1E

$GPGGA,,,,,0,,,,,,,,,*66

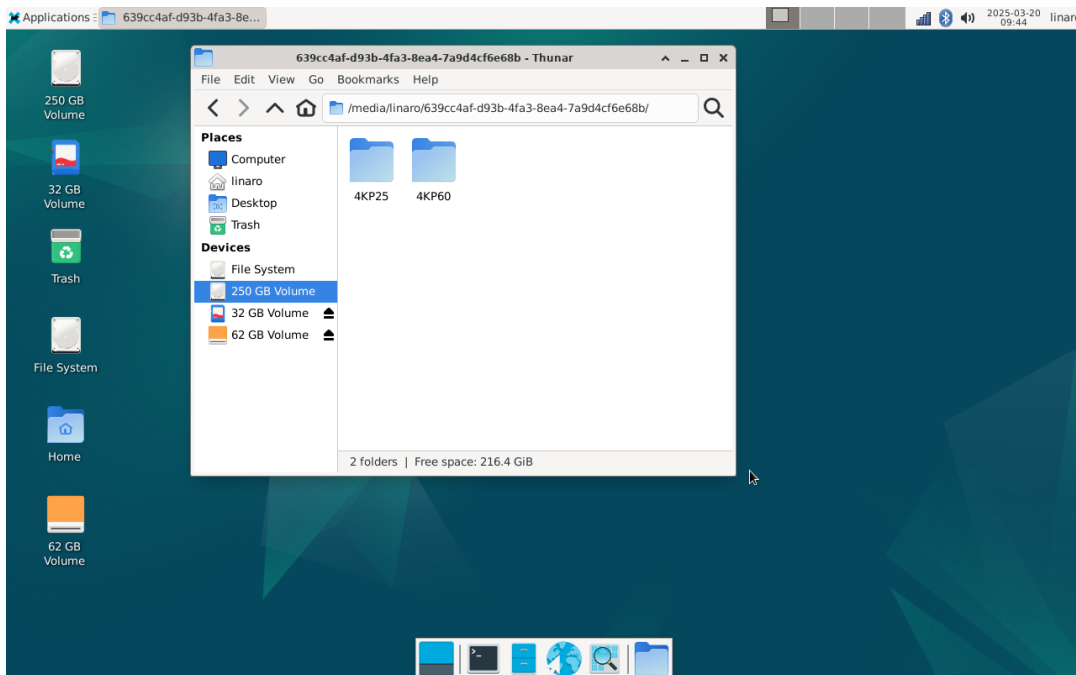
$GPRMC,,V,,,,,,,,,N,V*29
  
```

6.7.3 SSD Test

The onboard M.2 socket is a Key B interface. It supports an M.2 Key B SSD directly. To use an NVMe SSD with a Key M interface, connect it through a Key B-to-Key M adapter board.

Step 1: Connect the M.2 SSD, then power on.

Step 2: If the SSD is recognized successfully, a storage device icon will appear on the desktop. Users can click the icon to access the files on the SSD.

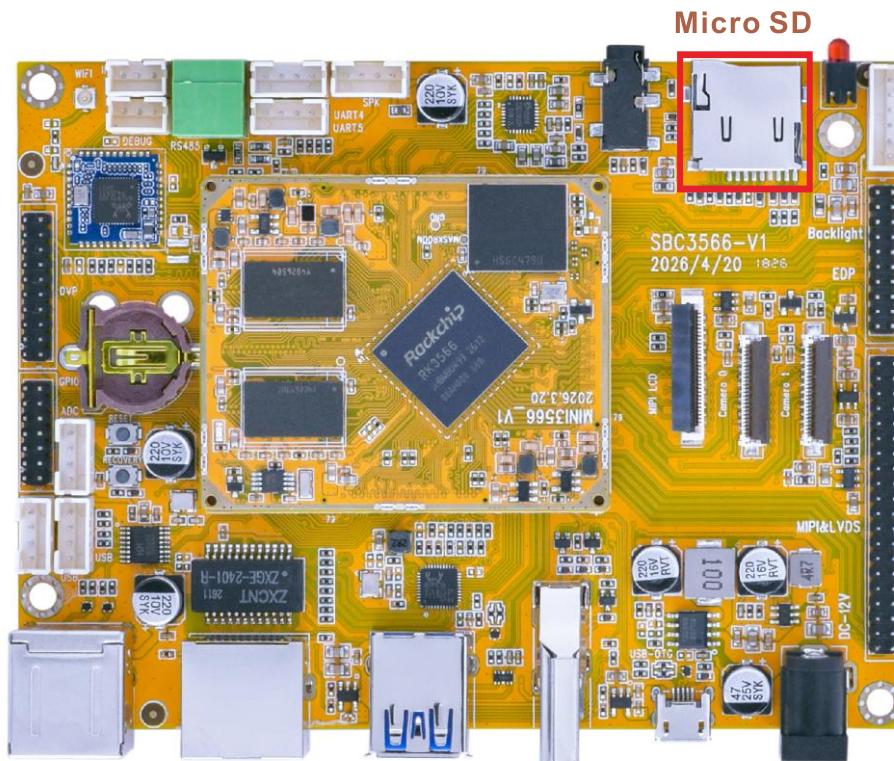


Note: If devices that are not in ext4 format, the user can choose to format them on the board. After formatting, **the files on the device will be permanently lost**, so please proceed with caution.

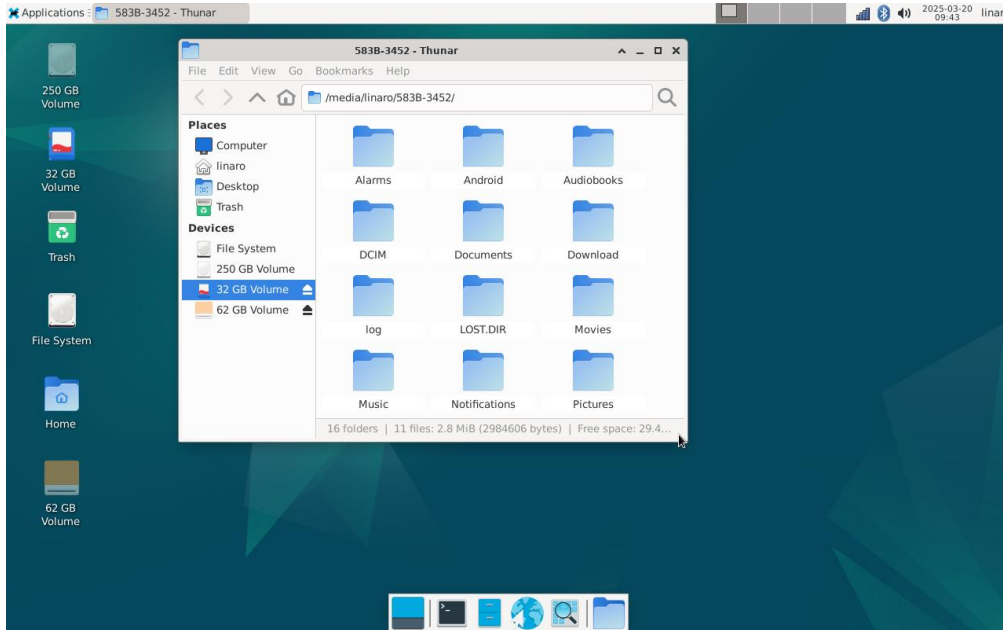
```
# mke2fs -t ext4 /dev/nvme0n1p1
```

6.8 SD Card

Step 1: Insert the micro SD card into the card slot.

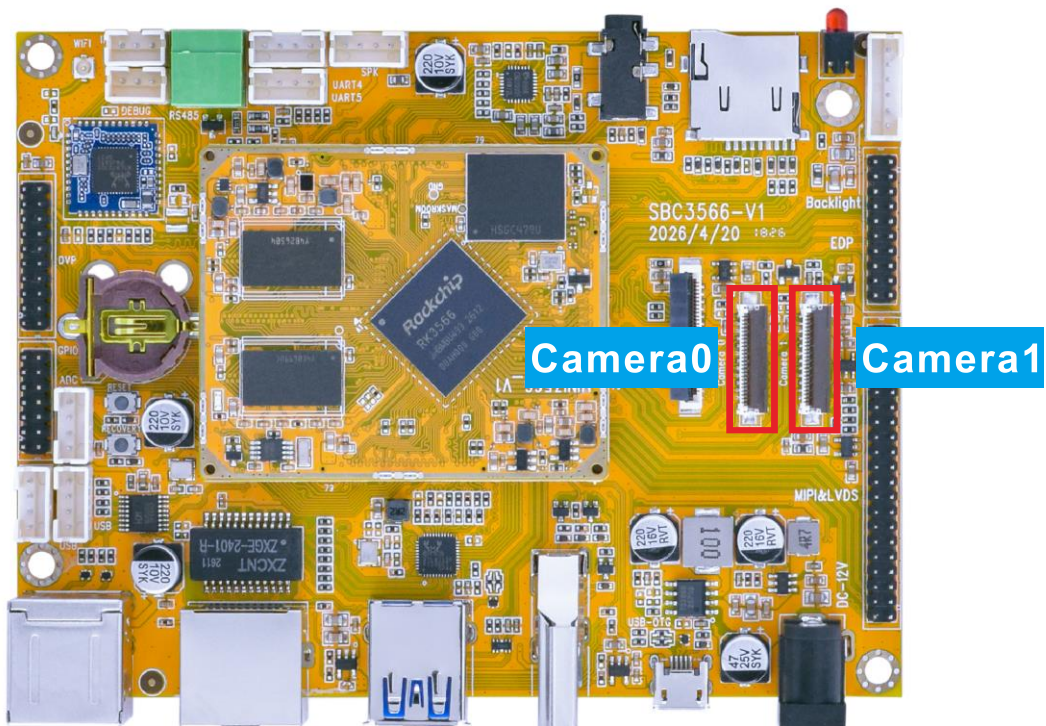


Step 2: After the micro SD card is inserted and recognized successfully, a removable storage icon will appear on the desktop. Users can click the icon to access the files on the micro SD card.



6.9 Camera

Step 1: Connect the OV13850 camera module, and then power on the board.



Step 2: Check the camera preview device nodes.

Execute the following command:

```
# grep "" /sys/class/video4linux/v*/name | grep mainpath
```

```
root@linaro-alip:/# grep "" /sys/class/video4linux/v*/name | grep mainpath
/sys/class/video4linux/video18/name:rkisp_mainpath
/sys/class/video4linux/video8/name:rkisp_mainpath
```

Step 3: Preview the camera.

Camera0:

```
# gst-launch-1.0 v4l2src device=/dev/video8 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! xvimagesink
```

```
root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video8 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! xvimagesink
Setting pipeline to PAUSED ...-1.0 v4l2src device=/dev/video8 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! xvimagesink
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 2076.568742] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
[ 2076.586138] rockchip-csi2-dphy1: dphy1, data_rate_mbps 600
[ 2076.586227] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 2076.642419] rkisp-vir0: tx stream:4 lose frame:0, isp state:0x20001 frame:0
Redistribute latency...
0:00:07.8 / 99:99:99.
```

Camera1:

```
# gst-launch-1.0 v4l2src device=/dev/video18 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! xvimagesink
```

```
root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video18 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! xvimagesink
Setting pipeline to PAUSED ...-1.0 v4l2src device=/dev/video18 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! xvimagesink
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 2165.507566] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
[ 2165.534175] rkisp rkisp-vir1: first params buf queue
[ 2165.534905] rkCIF_mipi_lvds: stream[0] start streaming
[ 2165.541556] rkCIF_mipi_lvds: Allocate dummy buffer, size: 0x01944000
[ 2165.541792] rockchip-mipi-csi2 mipi-csi2: stream on, src_sd: 0000000fec49675, sd_name:rockchip-csi2-dphy2
[ 2165.541816] rockchip-mipi-csi2 mipi-csi2: stream ON
[ 2165.541871] rockchip-csi2-dphy2: dphy2, data_rate_mbps 600
[ 2165.541916] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
Redistribute latency...
0:00:29.9 / 99:99:99.
```

Step 4: Record a video.

Camera0:

```
# gst-launch-1.0 v4l2src device=/dev/video8 num-buffers=100 ! \  
video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \  
videoconvert ! mpph264enc ! h264parse ! mp4mux ! \  
filesink location=/tmp/h264.mp4
```

```
root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video8 num-buffers=100 ! \  
video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \  
videoconvert ! mpph264enc ! h264parse ! mp4mux ! \merate=30/1 ! \  
filesink location=/tmp/h264.mp44parse ! mp4mux ! \  
mpp[3727]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder  
sys_cfg crash  
mpp[3727]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder  
sys_cfg crash  
mpp[3727]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder  
sys_cfg crash  
mpp[3727]: mpp: unable to create enc vp8 for soc rk3566 unsupported  
mpp[3727]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder  
sys_cfg crash  
Setting pipeline to PAUSED ...  
Using mplane plugin for capture  
mpp[3727]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder  
sys_cfg crash  
mpp[3727]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel  
Pipeline is live and does not need PREROLL ...  
Pipeline is PREROLLED ...  
Setting pipeline to PLAYING ...  
New clock: GstSystemClock  
mpp[3727]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0  
mpp[3727]: mpp_enc: set rc cbr bps [7776000:8262000:7290000] fps [30:1:fix] - [30:1:fix] gop 30  
mpp[3727]: mpp_enc: mode cbr bps [7290000:7776000:8262000] fps fix [30/1] -> fix [30/1] gop i [30] v [0]  
[ 2247.747883] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz  
[ 2247.773399] rkisp rkisp-vir0: first params buf queue  
[ 2247.773606] rockchip-csi2-dphy1: dphy1, data_rate_mbps 600  
[ 2247.773681] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0  
[ 2247.846058] rkisp-vir0: tx stream:4 lose frame:0, isp state:0x20001 frame:0  
Redistribute latency...  
Redistribute latency...
```

Camera1:

```
# gst-launch-1.0 v4l2src device=/dev/video18 num-buffers=100 ! \  
video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \  
videoconvert ! mpph264enc ! h264parse ! mp4mux ! \  
filesink location=/tmp/h264.mp4
```

```

root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video18 num-buffers=100 ! \
video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \m-buffers=100 ! \
videoconvert ! mpph264enc ! h264parse ! mp4mux ! \merate=30/1 ! \
filesink location=/tmp/h264.mp44parse ! mp4mux ! \
mpp[3773]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3773]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3773]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3773]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[3773]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[3773]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3773]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
mpp[3773]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[3773]: mpp_enc: set rc cbr bps [7776000:8262000:7290000] fps [30:1:fix] - [30:1:fix] gop 30
mpp[3773]: mpp_enc: mode cbr bps [7290000:7776000:8262000] fps fix [30/1] -> fix [30/1] gop i [30] v [0]
[ 2309.237388] rkisp_hw fdf00000.rkisp: set isp clk = 297000000Hz
[ 2309.252502] rkisp rkisp-vir1: first params buf queue
[ 2309.253330] rkcif_mipi_lvds: stream[0] start streaming
[ 2309.262262] rkcif_mipi_lvds: Allocate dummy buffer, size: 0x01944000
[ 2309.262361] rockchip-mipi-csi2 mipi-csi2: stream on, src_sd: 0000000fec49675, sd_name:rockchip-csi2-
dphy2
[ 2309.262376] rockchip-mipi-csi2 mipi-csi2: stream ON
[ 2309.262413] rockchip-csi2-dphy2: dphy2, data_rate_mbps 600
[ 2309.262450] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream on:1, dphy2, ret 0
Redistribute latency...
Redistribute latency...

```

Step 5: Capture JPEG images.

Camera0:

```

# gst-launch-1.0 -v v4l2src device=/dev/video8 num-buffers=10 ! \
video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \
multifilesink location=/tmp/test%05d.jpg

```

```

root@linaro-alip:/# gst-launch-1.0 -v v4l2src device=/dev/video8 num-buffers=10 ! \
video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \8 num-buffers=10 ! \
multifilesink location=/tmp/test%05d.jpgt=1080 ! mppjpegenc ! \
mpp[3879]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3879]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3879]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3879]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[3879]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[3879]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3879]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0: crop-bounds = < (int)0, (int)0, (int)2112, (int)1568 >
New clock: GstSystemClock
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, framerate=(fraction)120/1, interlace-mode=(string)progressive,
colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstCapsFilter:capsfilter0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, framerate=(fraction)120/1, interlace-mode=(string)progressive,
colorimetry=(string)1:3:5:1
mpp[3879]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[3879]: mpp_enc: set rc cbr bps [31104000:33048000:29160000] fps [120:1:fix] - [120:1:fix] gop 120
mpp[3879]: mpp_enc: set jpeg qfactor [80:1:99]

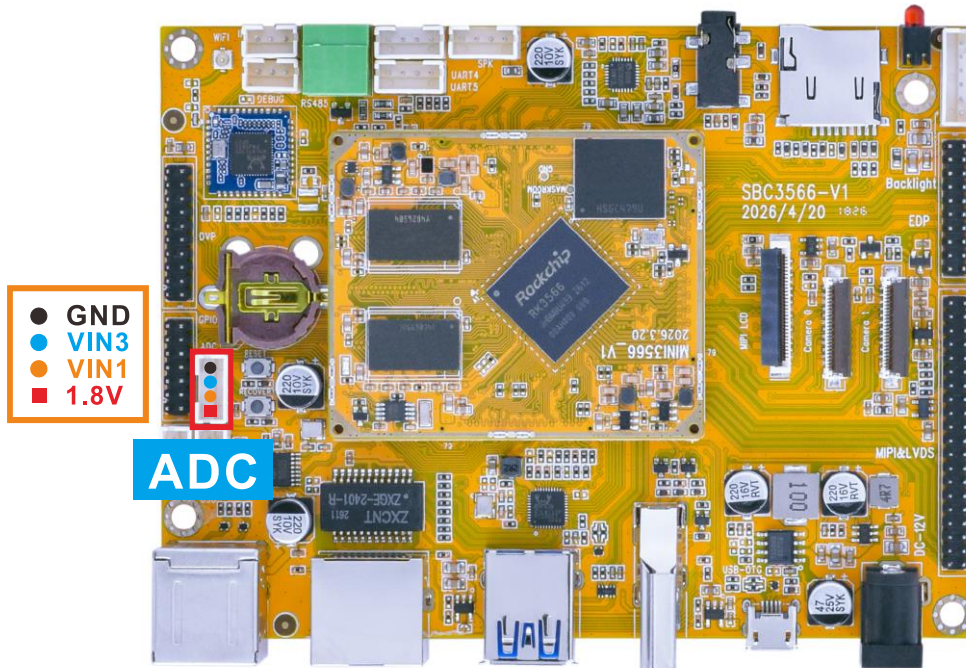
```

Camera1:

```
# gst-launch-1.0 -v v4l2src device=/dev/video18 num-buffers=10 ! \
video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \
multifilesink location=/tmp/test%05d.jpg
```

```
root@linaro-alip:/# gst-launch-1.0 -v v4l2src device=/dev/video18 num-buffers=10 ! \
video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \18 num-buffers=10 ! \
multifilesink location=/tmp/test%05d.jpgt=1080 ! mppjpegenc ! \
mpp[3915]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3915]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3915]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3915]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[3915]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[3915]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3915]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0: crop-bounds = < (int)0, (int)0, (int)2112, (int)1568 >
New clock: GstSystemClock
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, framerate=(fraction)120/1, interlace-mode=(string)progressive,
colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstCapsFilter:capsfilter0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, framerate=(fraction)120/1, interlace-mode=(string)progressive,
colorimetry=(string)1:3:5:1
mpp[3915]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[3915]: mpp_enc: set rc cbr bps [31104000:33048000:29160000] fps [120:1:fix] - [120:1:fix] gop 120
mpp[3915]: mpp_enc: set jpeg qfactor [80:1:99]
```

6.10 ADC



Connect the ADC_VIN pin to 1.8 V and GND respectively. The ADC raw value should change according to the input voltage level.

VIN1:

```
# cat /sys/bus/iio/devices/iio\:device0/in_voltage1_raw
```

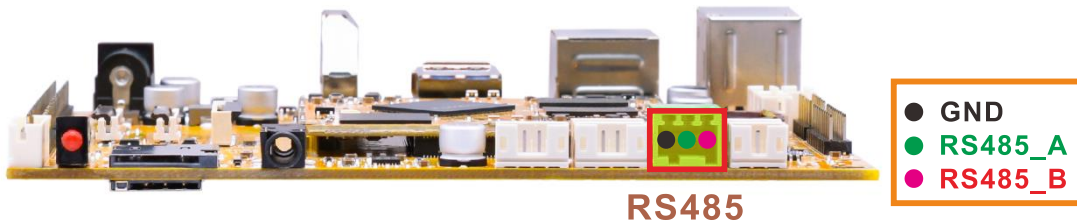
```
root@linaro-alip:/# cat /sys/bus/iio/devices/iio\:device0/in_voltage1_raw
1023
root@linaro-alip:/# cat /sys/bus/iio/devices/iio\:device0/in_voltage1_raw
11
```

VIN3:

```
# cat /sys/bus/iio/devices/iio\:device0/in_voltage3_raw
```

```
root@linaro-alip:/# cat /sys/bus/iio/devices/iio\:device0/in_voltage3_raw
1023
root@linaro-alip:/# cat /sys/bus/iio/devices/iio\:device0/in_voltage3_raw
11
```

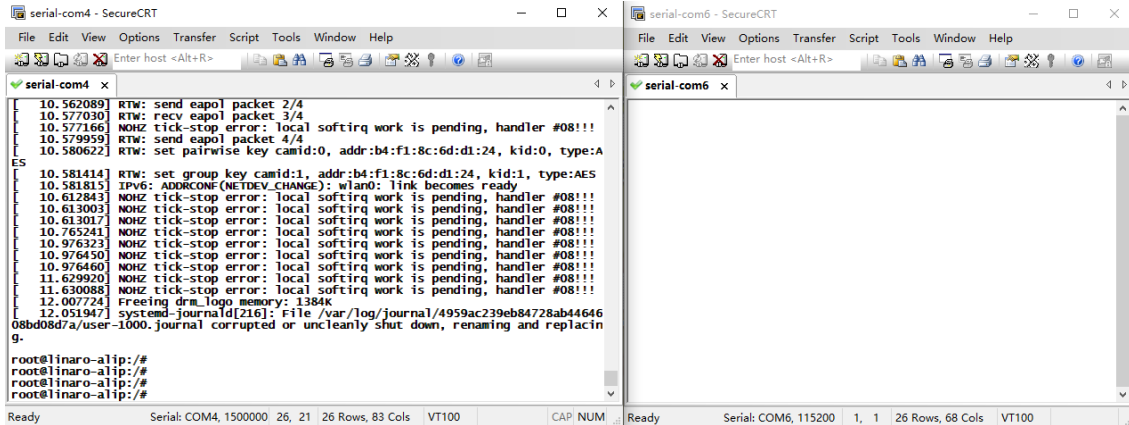
6.11 RS485



Step 1: Connect the RS485 test tool to the development board as shown in the diagram.



Step 2: Open two serial terminal windows. Set the debug serial port baud rate to 1500000, and set the RS485 serial port baud rate to 115200.



```

serial-com4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com4 x
10.562089] RTW: send eapol packet 2/4
10.577030] RTW: rcv eapol packet 3/4
10.577166] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.579959] RTW: send eapol packet 4/4
10.580622] RTW: set pairwise key camid:0, addr:b4:f1:8c:6d:d1:24, kid:0, type:A
ES
10.581414] RTW: set group key camid:1, addr:b4:f1:8c:6d:d1:24, kid:1, type:AES
10.581815] IPv6: ADDRCONF(NETDEV_CHANGE): wlan0: link becomes ready
10.612843] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.613003] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.613017] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.765241] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.976323] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.976450] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
10.976460] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
11.629920] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
11.630088] NOHZ tick-stop error: local softirq work is pending, handler #08!!!
12.007724] Freeing drw_logo memory: 1384k
12.051947] systemd-journald[216]: File /var/log/journal/4959ac239eb84728ab44646
08bd08d7a/user-1000.journal corrupted or uncleanly shut down, renaming and replacin
g.
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#

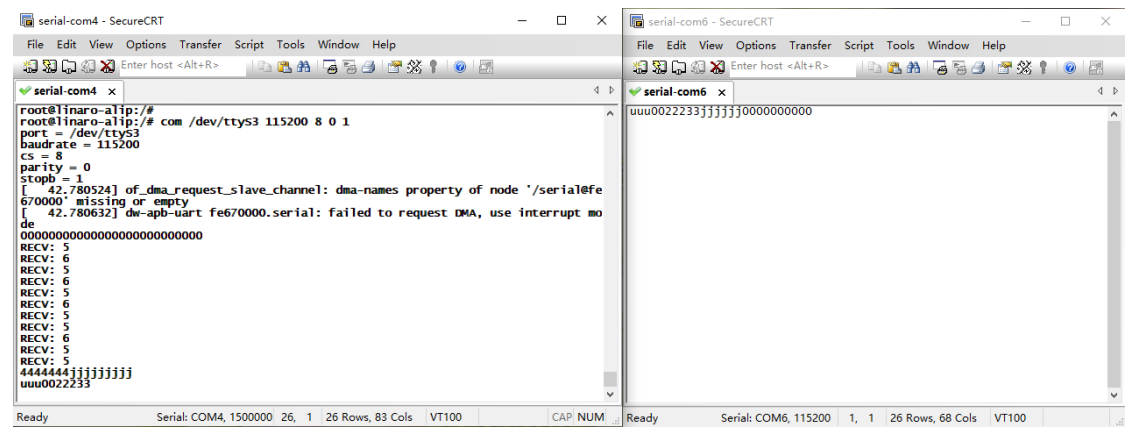
Ready Serial: COM4, 1500000 26, 21 26 Rows, 83 Cols VT100 CAP NUM

serial-com6 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com6 x

Ready Serial: COM6, 115200 1, 1 26 Rows, 68 Cols VT100
  
```

Step 3: Execute the following command on the board to test the RS485 data transmission and reception:

```
# com /dev/ttyS3 115200 8 0 1
```



```

serial-com4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com4 x
root@linaro-alip:/#
root@linaro-alip:/# com /dev/ttyS3 115200 8 0 1
port = /dev/ttyS3
baudrate = 115200
cs = 8
parity = 0
stopb = 1
[ 42.780524] of_dma_request_slave_channel: dma-names property of node '/serial@fe
670000' missing or empty
[ 42.780632] dw-apb-uart fe670000.serial: failed to request DMA, use interrupt mo
de
00000000000000000000000000000000
RECV: 5
RECV: 6
RECV: 5
RECV: 6
RECV: 5
RECV: 6
RECV: 5
RECV: 6
RECV: 5
RECV: 6
RECV: 5
RECV: 6
RECV: 5
uuu0022233
uuu0022233

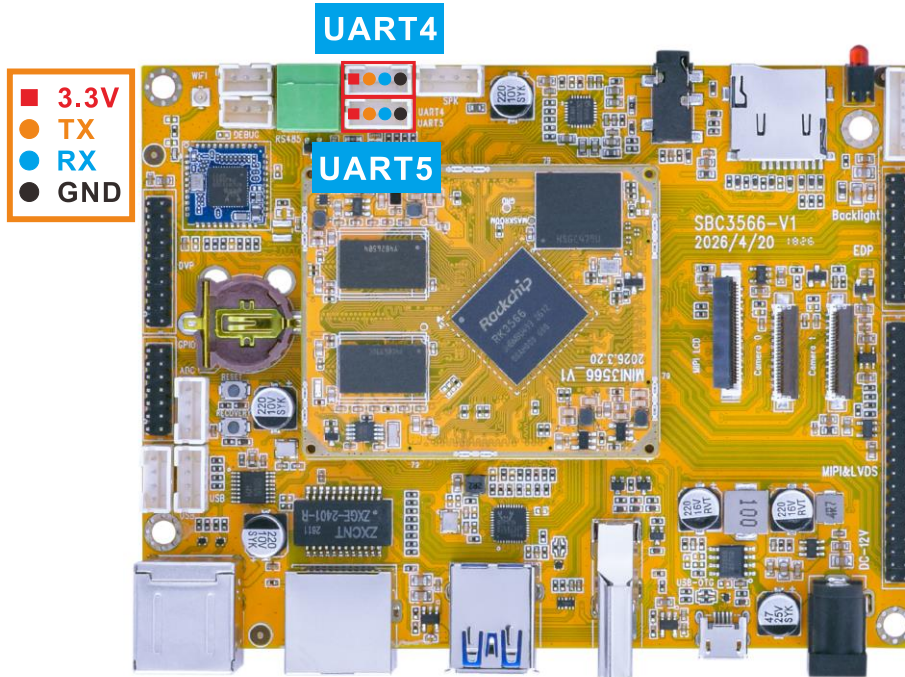
Ready Serial: COM4, 1500000 26, 1 26 Rows, 83 Cols VT100 CAP NUM

serial-com6 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com6 x
uuu0022233jjjjjjj000000000000

Ready Serial: COM6, 115200 1, 1 26 Rows, 68 Cols VT100
  
```

6.12 UART

Step 1: Connect the RX and TX pins of the UART interface together to create a loopback connection.



Step 2: Test UART4 loopback communication.

Execute the following command:

```
# com /dev/ttyS4 115200 8 0 1
```

```
root@linaro-alip:/# com /dev/ttyS4 115200 8 0 1
port = /dev/ttyS4
baudrate = 115200
cs = 8
parity = 0
stopb = 1
00000000
RECV: 00000000
11111111
RECV: 11111111
ggggg
RECV: ggggg
uuu
RECV: uuu
```

Step 3: Test UART5 loopback communication.

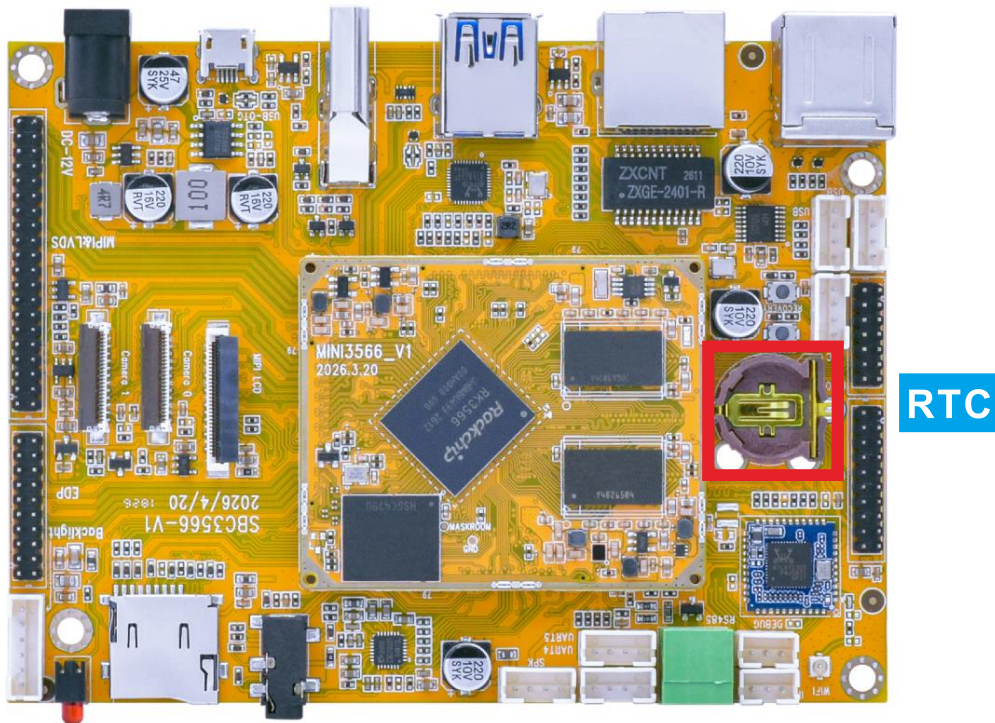
Execute the following command:

```
# com /dev/ttyS5 115200 8 0 1
```

```
root@linaro-alip:~# com /dev/ttyS5 115200 8 0 1
port = /dev/ttyS5
baudrate = 115200
cs = 8
parity = 0
stopb = 1
88888888
RECV: 88888888
yyyyyy
RECV: yyyyyy
rrrrr
RECV: rrrrr
k
RECV: k
```

6.13 RTC

Step 1: Install the coin cell battery.



Step 2: Set the system time manually, for example:

```
# date -s "2026-06-04 16:00:00"
```

Note: If the network is connected, the system time may be synchronized automatically to the current UTC time.

Step 3: Write the system time to the hardware clock:

```
# hwclock -w
```

Step 4: Read the current hardware clock time:

```
# hwclock
```

```
root@linaro-alip:/# date -s "2026-06-04 16:00:00"
Thu Jun 4 16:00:00 UTC 2026
root@linaro-alip:/# hwclock -w
root@linaro-alip:/# hwclock
2026-06-04 16:00:13.187467+00:00
root@linaro-alip:/# hwclock
2026-06-04 16:00:33.938108+00:00
```

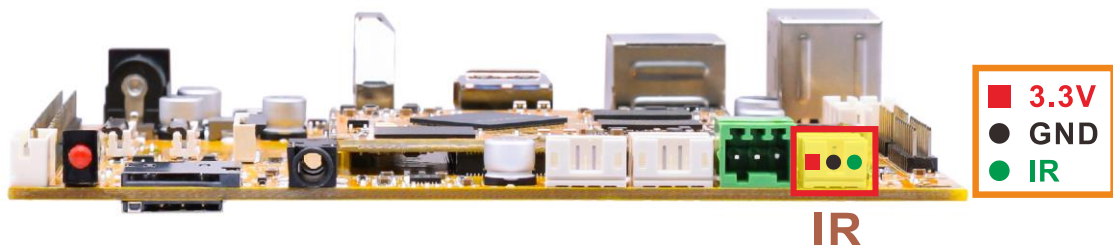
Step 5: Power off the board and disconnect the main power supply. Wait for a period of time, then power on the board again.

Step 6: Read the hardware clock time again:

```
root@linaro-alip:/# hwclock
2026-06-04 16:07:43.586529+00:00
root@linaro-alip:/# hwclock
2026-06-04 16:07:57.487042+00:00
root@linaro-alip:/# hwclock
2026-06-04 16:08:19.758763+00:00
```

If the RTC is working properly, the hardware clock time should be retained and continue running after power-off.

6.14 IR



Step 1: Enable IR debug logs.

Execute the following command:

```
# echo 1 > /sys/module/rockchip_pwm_remotectl/parameters/code_print
```

Step 2: Point the remote control at the IR receiver and press a button. The corresponding key value will be printed in the log.

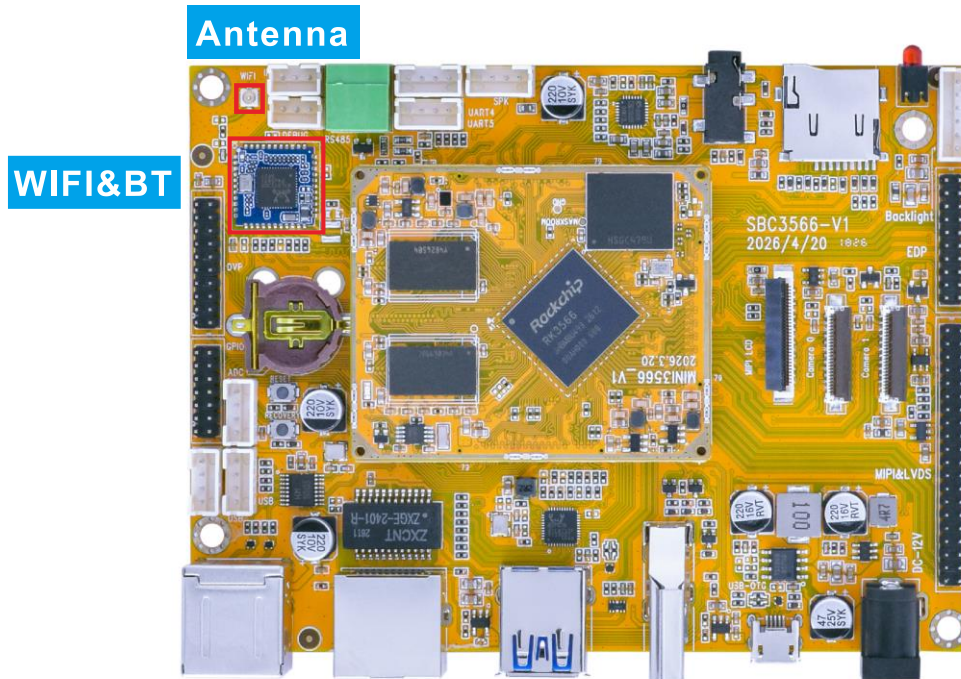
```

root@linaro-alip:/# echo 1 >
/sys/module/rockchip_pwm_remotectl/parameters/code_printip_pwm_remotectl/parameters/code_print
root@linaro-alip:/# [ 464.078416] USERCODE=0x1818
[ 464.105422] RMC_GETDATA=9b
[ 464.842401] USERCODE=0x1818
[ 464.869507] RMC_GETDATA=98
[ 466.198537] USERCODE=0x1818
[ 466.225687] RMC_GETDATA=99
[ 466.862289] USERCODE=0x1818
[ 466.889468] RMC_GETDATA=9a
[ 467.578254] USERCODE=0x1818
[ 467.605320] RMC_GETDATA=97
[ 468.358371] USERCODE=0x1818
[ 468.385553] RMC_GETDATA=e6
[ 468.954431] USERCODE=0x1818
[ 468.981577] RMC_GETDATA=e4

```

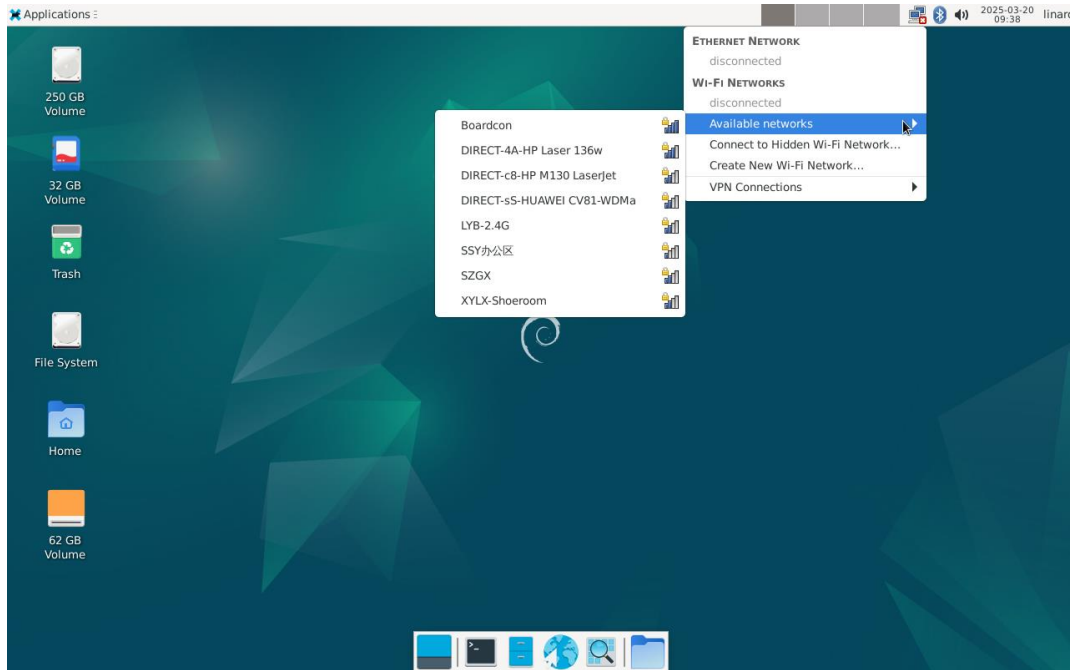
6.15 WiFi & Bluetooth

To use the WiFi and Bluetooth functions properly, make sure the antenna is connected.

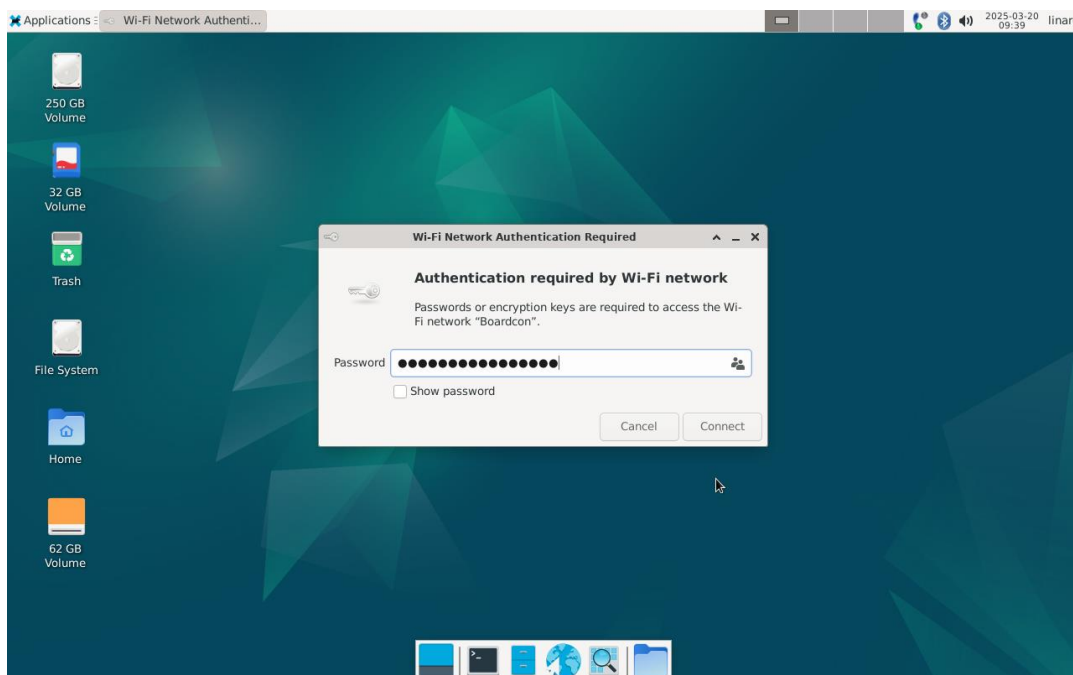


6.15.1 WiFi

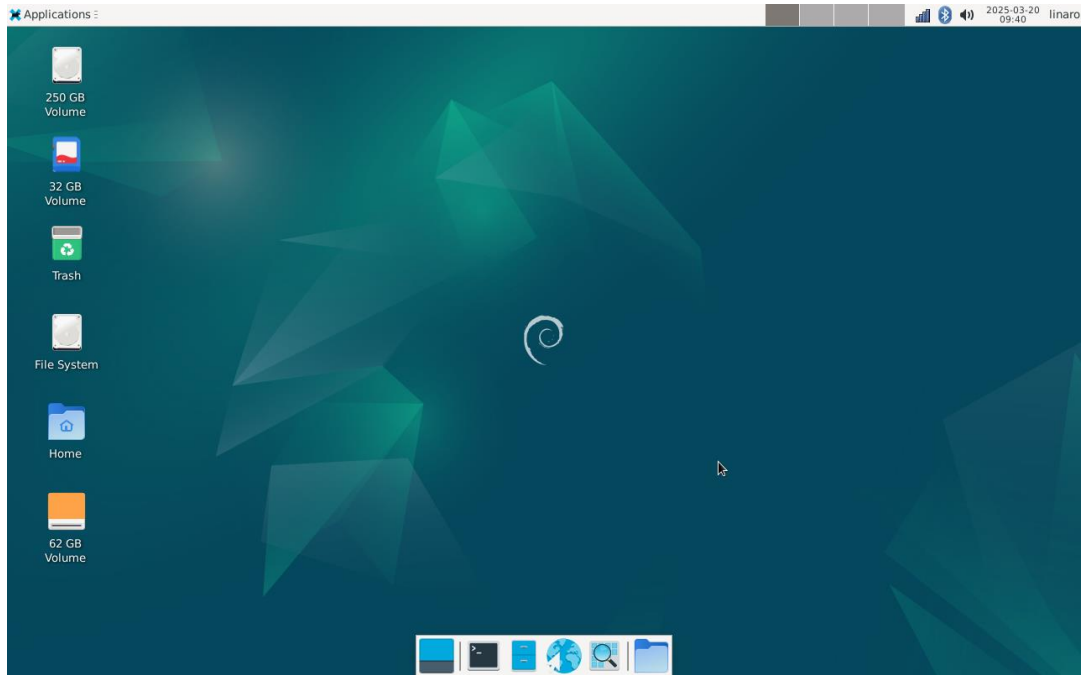
Step 1: Click the network icon in the upper-right corner of the desktop, then select **"Available Networks"** to view the list of available WiFi hotspots.



Step 2: Select the target SSID from the available network list and enter the password.



Step 3: After the WiFi connection is established successfully, the corresponding network status icon will be displayed in the upper-right corner of the desktop.



Step 4: Users can test the network connection using the built-in browser, or verify it with the following commands.

(1) Check the wlan0 network interface status.

Execute the following command:

```
# ifconfig wlan0
```

```
root@linaro-alip:/# ifconfig wlan0
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.169 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::9ba2:8ab4:a077:beca prefixlen 64 scopeid 0x20<link>
    ether 84:fc:14:f9:69:1c txqueuelen 1000 (Ethernet)
    RX packets 77 bytes 10717 (10.4 KiB)
    RX errors 0 dropped 12 overruns 0 frame 0
    TX packets 62 bytes 7282 (7.1 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

(2) Test network connectivity.

Execute the following command:

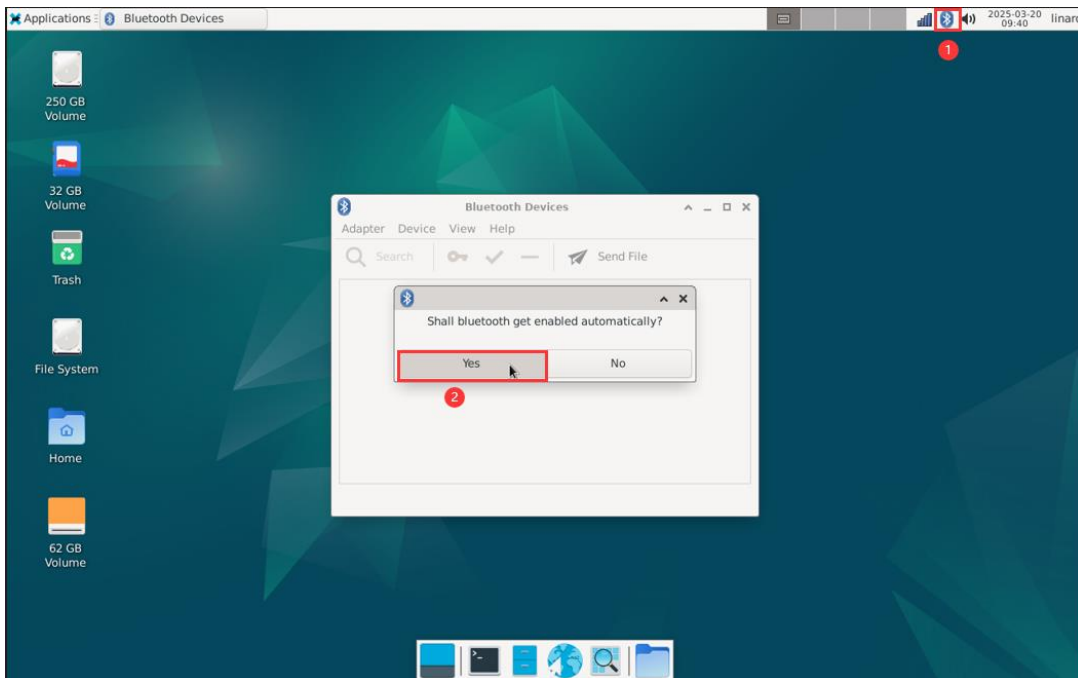
```
# ping -I wlan0 www.armdesigner.com
```

```
root@linaro-alip:/# ping -I wlan0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (3.174.46.103) from 192.168.0.169 wlan0: 56(84) bytes of data.
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=1 ttl=246 time=294 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=2 ttl=246 time=215 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=3 ttl=246 time=229 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=4 ttl=246 time=206 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=5 ttl=246 time=286 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=6 ttl=246 time=313 ms
^C64 bytes from 3.174.46.103: icmp_seq=7 ttl=246 time=210 ms

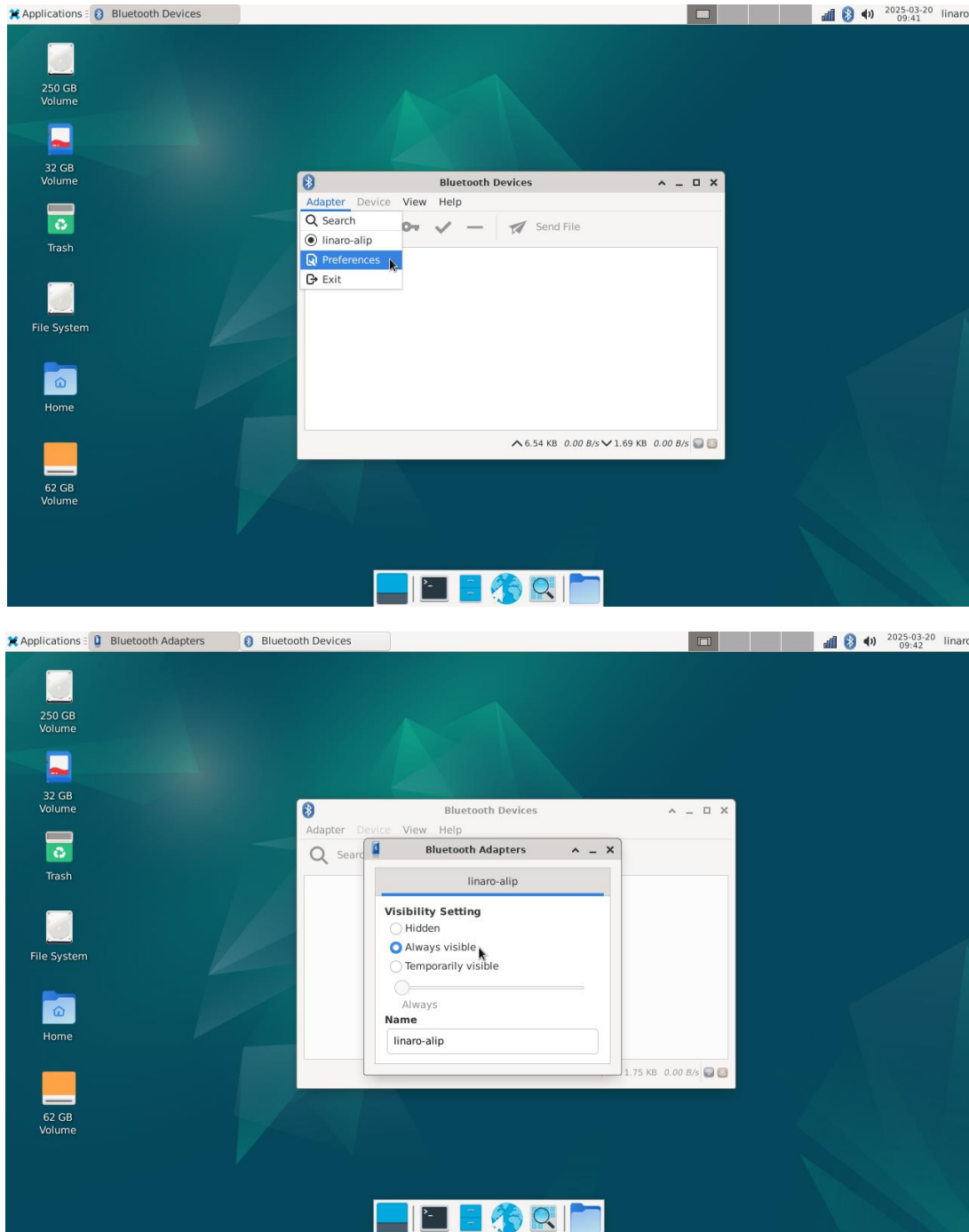
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 10526ms
rtt min/avg/max/mdev = 206.057/250.541/313.323/42.013 ms
```

6.15.2 Bluetooth

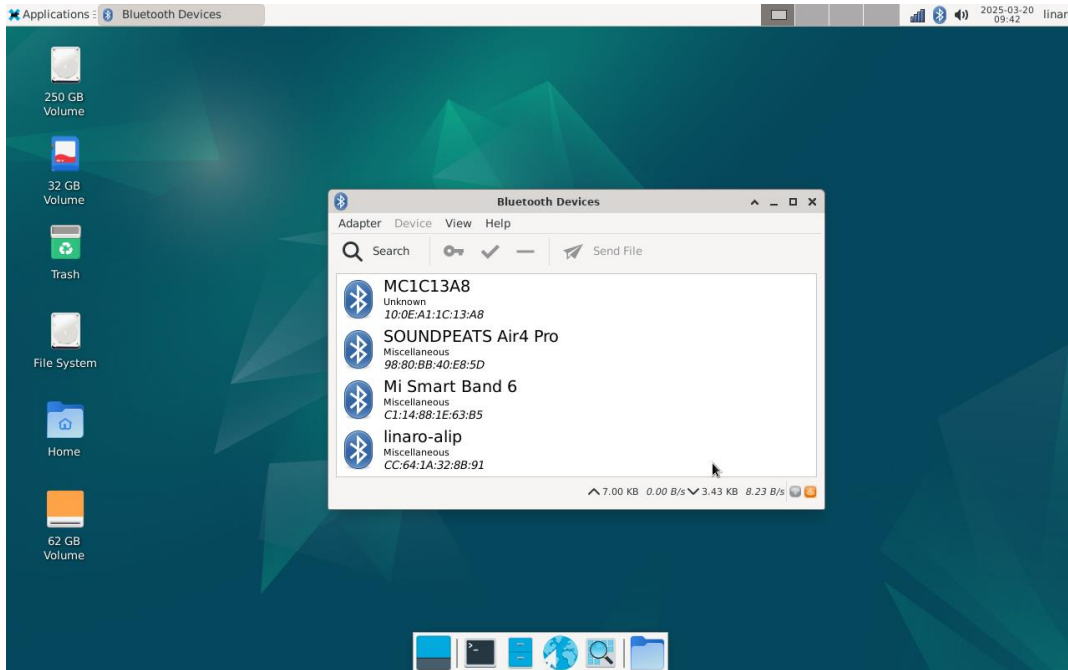
Step 1: Click the Bluetooth icon in the upper-right corner of the desktop.



Step 2: The Bluetooth device name is hidden by default. To make it visible to other Bluetooth devices, select **Adapter -> Preferences -> Always visible**.



Step 3: Click "Search" to scan for nearby Bluetooth devices, then select the target device from the list and start pairing.



After the pairing is completed successfully, the Bluetooth device can be used normally.

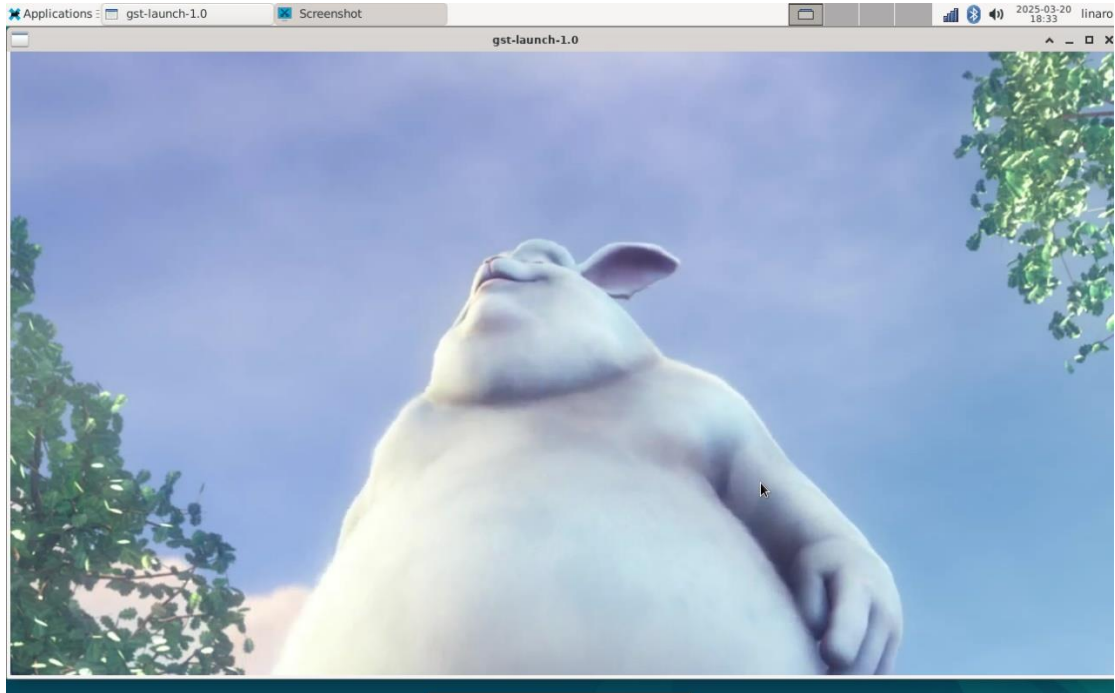
6.16 Video Playback

(1) Use the built-in video test scripts.

Execute the following command:

```
# /rockchip-test/video/test_gst_video.sh
```

```
root@linaro-alip:/# /rockchip-test/video/test_gst_video.sh
Setting pipeline to PAUSED ...
Pipeline is PREROLLING ...
Redistribute latency...
mpp[3272]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3272]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3272]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3272]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[3272]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3272]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Redistribute latency...
mpp[3272]: h264d_api: is_avcC=1
Pipeline is PREROLLED ...0 %
Prerolled, waiting for async message to finish...
Setting pipeline to PLAYING ...
Redistribute latency...
New clock: GstSystemClock
0:00:02.3 / 0:00:29.5 (7.8 %)
```

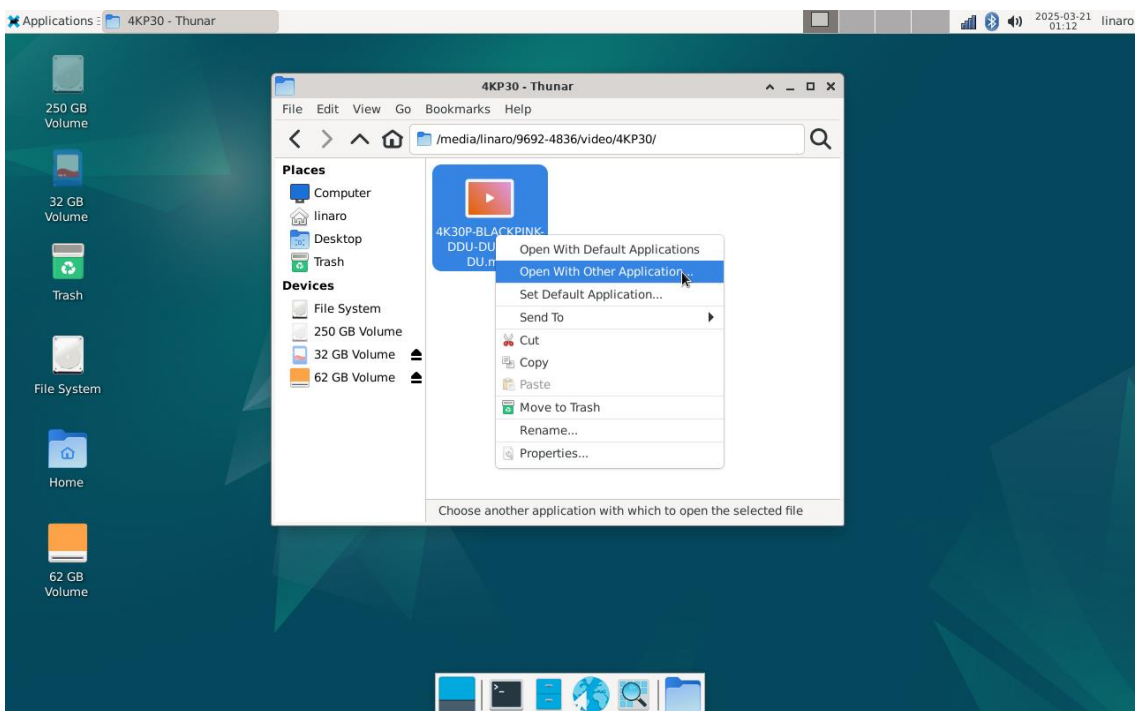


(2) Play videos using Chromium Browser.

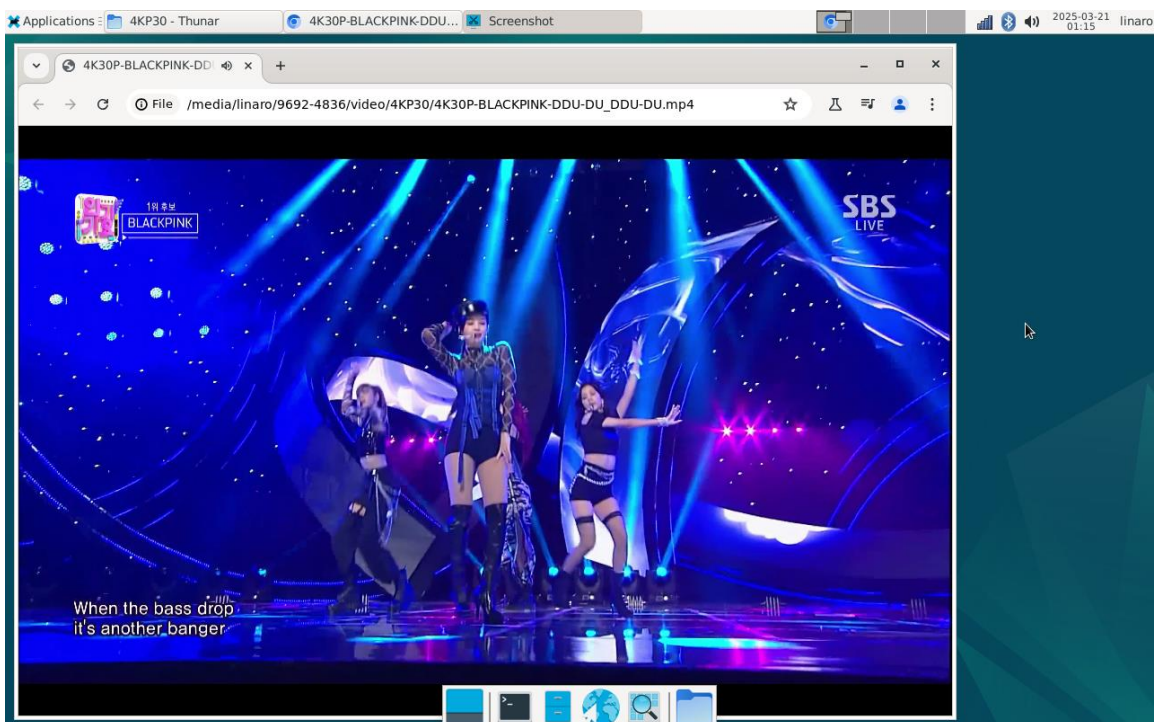
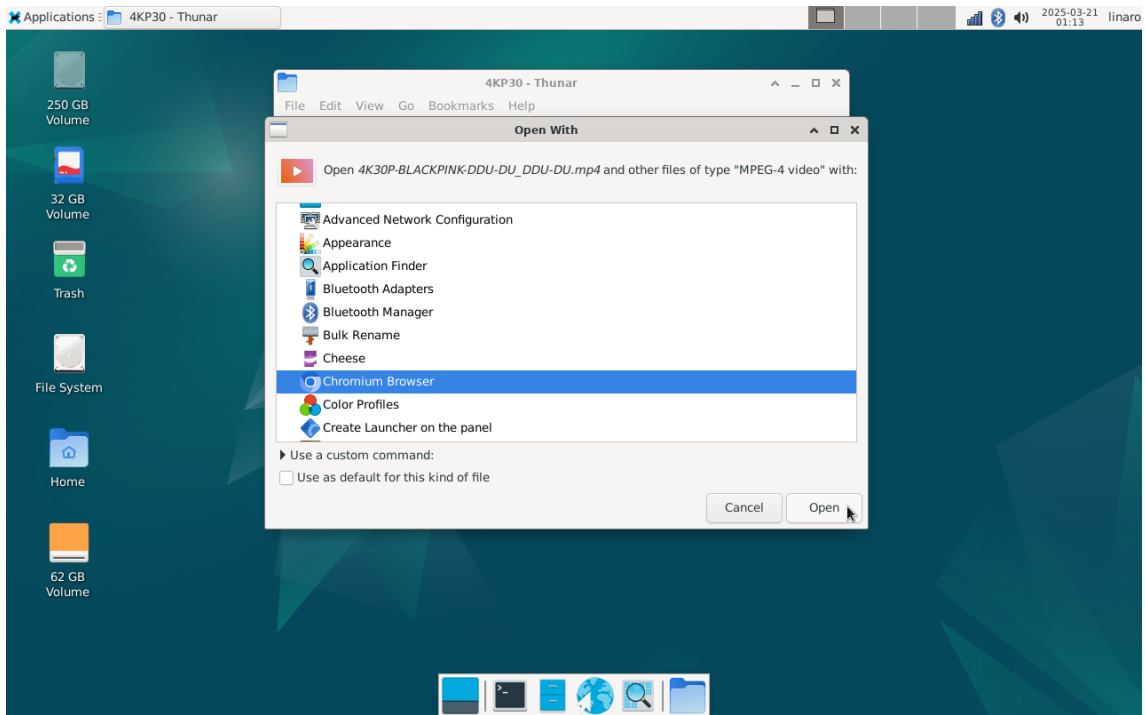
Chromium Browser supports video playback up to 4K resolution. The supported video decoding formats include VP8, H.264, H.265, VP9, and AV1.

Note: Chromium Browser may not be compatible with all H.265 video files.

Step 1: Select the video file, right-click it, and choose **“Open With Other Application...”**.



Step 2: Find Chromium Browser in the application list, select it, and click “Open” to play the video file.



(3) Play videos using the `gst-play-1.0` command.

Execute the following command:

```
# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
# gst-play-1.0 --flags=3 --videosink="kmssink plane-id=98" /media/linaro/F3AB-0FF3/video/4KP60/4KP60-exist.mp4 --audiosink="alsasink device=hw:0,0"
```

```
root@linaro-alip:/#
cat /proc/asound/cards # export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/# gst-play-1.0 --flags=3 --videosink="kmssink plane-id=98" /media/linaro/F3AB-0FF3/video/4KP60/4KP60-exist.mp4 --audiosink="alsasink device=hw:0,0"
Press 'k' to see a list of keyboard shortcuts.
Now playing /media/linaro/F3AB-0FF3/video/4KP60/4KP60-exist.mp4
Redistribute latency...
mpp[9609]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[9609]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[9609]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[9609]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[9609]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[9609]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Redistribute latency...
mpp[9609]: h264d_api: is_avcC=1
WARNING No volume control found
WARNING debug information: ../gst/playback/gstplaysink.c(2908): gen_audio_chain ():
/GstPlayBin:playbin/GstPlaySink:playsink:
Volume/mute is not available
[ 7151.416179] dwhdmi-rockchip fe0a0000.hdmi: Rate 533250000 missing; compute N dynamically
[ 7151.417041] dwhdmi-rockchip fe0a0000.hdmi: Rate 533250000 missing; compute N dynamically
Redistribute latency...
Redistribute latency...
Redistribute latency...
0:01:04.0 / 0:04:01.9
```

Command explanation:

- `export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1`: [Open AFBC](#).
- `--videosink="kmssink plane-id=98"`: [Specifies the plane](#). Which can be viewed using the command: `cat /sys/kernel/debug/dri/0/state | grep "plane\[\"`.
- `/media/linaro/F3AB-0FF3/video/4KP60/4KP60-exist.mp4`: [The media file path to be played](#).
- `--audiosink="alsasink device=hw:0,0"`: [Specifies the audio output device as hw:0,0](#).

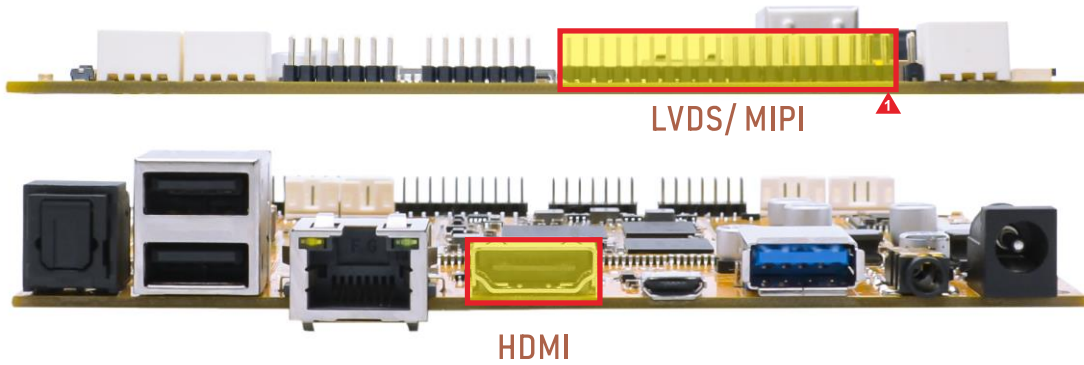
7. Buildroot Test

7.1 Serial Terminal

Step 1: Connect the USB-to-serial module to the PC and connect the other end to the Debug UART interface on the board.

7.2 Display

Only one display output is supported at a time. The display output can be selected from eDP, HDMI, LVDS, or MIPI. Multiple display outputs cannot be used simultaneously.



7.2.1 Display Output Switching Method

The display output switching method is the same as that described in Section [6.2.1 Display Output Switching Method](#).

7.2.2 Display Effect Examples

eDP Display Effect



HDMI Display Effect



LVDS Display Effect



MIPI DSI0 Display Effect

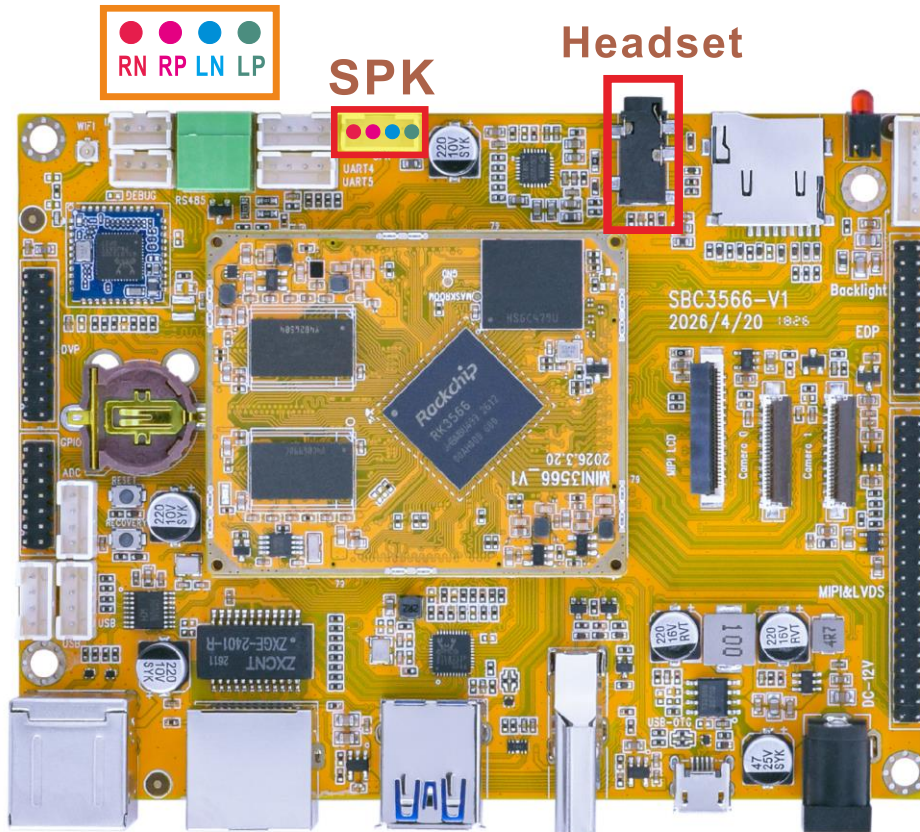


MIPI DSI1 Display Effect



7.3 Audio

Step 1: Connect the headset to the headset jack and connect the speaker.



Step 2: Check the sound card information.

Execute the following command:

```
# cat /proc/asound/cards
```

```
root@sbc3566-buildroot:/# cat /proc/asound/cards
0 [rockchiphdmi ]: rockchip-hdmi - rockchip-hdmi
rockchip-hdmi
1 [rockchipes8388c]: simple-card - rockchip,es8388-codec
rockchip,es8388-codec
```

Step 3: Record audio through the headset microphone.

- When using HDMI as the display:

```
# arecord -Dhw:1,0 -f cd record.wav
```

```
root@sbc3566-buildroot:/# arecord -Dhw:1,0 -f cd record.wav
Recording WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

- When using LVDS/MIPI as the display:

```
# arecord -Dhw:0,0 -f cd record.wav
```

```
root@sb3566-buildroot:/# arecord -Dhw:0,0 -f cd record.wav
Recording WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

Step 4: Play audio through the headset or Speaker.

Audio output priority: Headset > Speaker.

By default, audio is routed to the headset when a headset is detected.

When no headset is detected, audio is routed to the speaker.

- When using HDMI as the display:

```
# aplay -Dhw:1,0 record.wav
```

```
root@sb3566-buildroot:/# aplay -Dhw:1,0 record.wav
Playing WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

Note: Supplementary instructions on audio output.

- `aplay -Dhw:0,0 record.wav` : [HDMI TX audio output](#)
- `aplay -Dhw:1,0 record.wav` : [Headset or Speaker audio output](#)

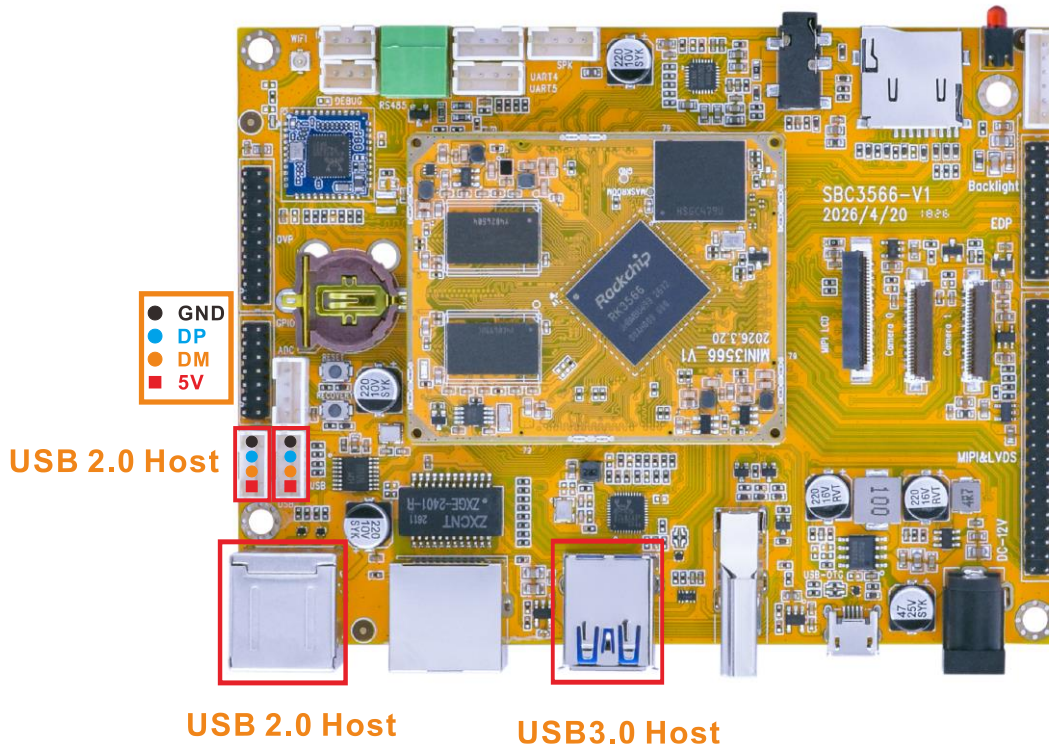
- When using LVDS/MIPI as the display:

```
# aplay -Dhw:0,0 record.wav
```

```
root@sb3566-buildroot:/# aplay -Dhw:0,0 record.wav
Playing WAVE 'record.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

7.4 USB Host

The SBC3566 provides both USB 2.0 Host and USB 3.0 Host interfaces. The USB Host interfaces can be used to connect USB peripherals, such as a USB mouse, USB keyboard, USB flash drive, and other USB devices.



The current USB connection speed can be checked from the debug log.

- When the USB device operates in USB 2.0 mode, the log usually shows “high-speed”:

```

root@sbc3566-buildroot:/# [ 248.262712] usb 2-1: new SuperSpeed USB device number 2 using xhci-hcd
[ 248.293742] usb 2-1: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 248.293841] usb 2-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 248.293981] usb 2-1: Product: OnlyDisk
[ 248.294020] usb 2-1: Manufacturer: Netac
[ 248.294052] usb 2-1: SerialNumber: C0E8BFA3EC38F796
[ 248.297547] usb-storage 2-1:1.0: USB Mass Storage device detected
[ 248.300032] scsi host0: usb-storage 2-1:1.0
[ 250.046377] scsi 0:0:0:0: Direct-Access Netac OnlyDisk 8.01 PQ: 0 ANSI: 6
[ 250.053167] sd 0:0:0:0: [sda] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 250.053442] sd 0:0:0:0: [sda] Write Protect is off
[ 250.053677] sd 0:0:0:0: [sda] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[ 250.059130] sda: sda1
[ 250.060317] sd 0:0:0:0: [sda] Attached SCSI removable disk
[ 250.347858] FAT-fs (sda1): utf8 is not a recommended IO charset for FAT filesystems, filesystem will be
case sensitive!
[ 250.352240] FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please run
fsck.
    
```

- When the USB device operates in USB 3.0 mode, the log usually shows “SuperSpeed”:

```

root@sbc3566-buildroot:/# [ 275.718087] usb 5-1.4: new high-speed USB device number 3 using ehci-platform
[ 275.832676] usb 5-1.4: New USB device found, idVendor=21c4, idProduct=0cc7, bcdDevice= 1.00
[ 275.832781] usb 5-1.4: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 275.832822] usb 5-1.4: Product: USB Flash Drive
[ 275.832854] usb 5-1.4: Manufacturer: Lexar
[ 275.832884] usb 5-1.4: SerialNumber: 04102800000031D7
[ 275.835238] usb-storage 5-1.4:1.0: USB Mass Storage device detected
[ 275.837693] scsi host1: usb-storage 5-1.4:1.0
[ 276.848257] scsi 1:0:0:0: Direct-Access Lexar USB Flash Drive 1.00 PQ: 0 ANSI: 4
[ 276.852541] sd 1:0:0:0: [sdb] 120861886 512-byte logical blocks: (61.9 GB/57.6 GiB)
[ 276.853405] sd 1:0:0:0: [sdb] Write Protect is off
[ 276.854247] sd 1:0:0:0: [sdb] No Caching mode page found
[ 276.854284] sd 1:0:0:0: [sdb] Assuming drive cache: write through
[ 276.862753] sdb: sdb1
[ 276.864002] sd 1:0:0:0: [sdb] Attached SCSI removable disk
[ 277.530888] FAT-fs (sdb1): utf8 is not a recommended IO charset for FAT filesystems, filesystem will be
case sensitive!
[ 277.536946] FAT-fs (sdb1): Volume was not properly unmounted. Some data may be corrupt. Please run
fsck.
  
```

After a USB flash drive is connected, it will be mounted automatically. Run the following command to check the mount path of the USB flash drive:

```
# df -h
```

```

root@sbc3566-buildroot:/# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        5.9G  727M  5.0G   13% /
devtmpfs        951M   8.0K  951M    1% /dev
tmpfs           978M   480K  978M    1% /run
tmpfs           978M   204K  978M    1% /var/log
tmpfs           978M    0  978M    0% /dev/shm
tmpfs           978M   140K  978M    1% /tmp
/dev/mmcb1k0p7  124M   5.3M  115M    5% /oem
/dev/mmcb1k0p8  936M   396K  920M    1% /userdata
/dev/sda1       58G   57G   1.5G   98% /mnt/udisk
/dev/sdb1       32G   5.5G   27G   17% /media/udisk1
  
```

7.5 Ethernet

Step 1: Connect the network cable to the Ethernet port.



Ethernet

After the network cable is connected, check the kernel log to confirm that the Gigabit Ethernet link is detected successfully.

```

root@sbc3566-buildroot:/# [ 2116.530691] rk_gmac-dwmac fe010000.ethernet eth0: Link is Up - 1Gbps/Full -
flow control rx/tx
[ 2116.530894] IPv6: ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
  
```

Step 2: Check the network interface information.

Execute the following command:

```
# ifconfig eth0
```

```
root@em3566-buildroot:/# ifconfig
eth0      Link encap:Ethernet  HWaddr D6:D5:7F:4F:15:C9
          inet addr:192.168.0.78  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::fc76:2c88:6db3:d377/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:216 errors:0 dropped:22 overruns:0 frame:0
          TX packets:11 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:19583 (19.1 KiB)  TX bytes:1410 (1.3 KiB)
          Interrupt:56
```

Step 3: Test the network connection.

Execute the following command:

```
# ping -I eth0 www.armdesigner.com
```

```
root@em3566-buildroot:/# ping -I eth0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (13.32.99.40) from 192.168.0.78 eth0: 56(84) bytes of data.
64 bytes from server-13-32-99-40.fra60.r.cloudfront.net (13.32.99.40): icmp_seq=1 ttl=246 time=197 ms
64 bytes from server-13-32-99-40.fra60.r.cloudfront.net (13.32.99.40): icmp_seq=2 ttl=246 time=197 ms
64 bytes from server-13-32-99-40.fra60.r.cloudfront.net (13.32.99.40): icmp_seq=3 ttl=246 time=198 ms
64 bytes from server-13-32-99-40.fra60.r.cloudfront.net (13.32.99.40): icmp_seq=4 ttl=246 time=197 ms
64 bytes from server-13-32-99-40.fra60.r.cloudfront.net (13.32.99.40): icmp_seq=5 ttl=246 time=197 ms
64 bytes from server-13-32-99-40.fra60.r.cloudfront.net (13.32.99.40): icmp_seq=6 ttl=246 time=197 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5007ms
rtt min/avg/max/mdev = 196.640/197.012/197.588/0.340 ms
```

7.6 ADB

Step 1: Connect the board to the PC with a Micro USB cable.



Micro USB

Step 2: Install the ADB driver on the Windows PC.

Step 3: Press **Windows + R** to open the Run dialog box. Type “cmd” and press Enter.

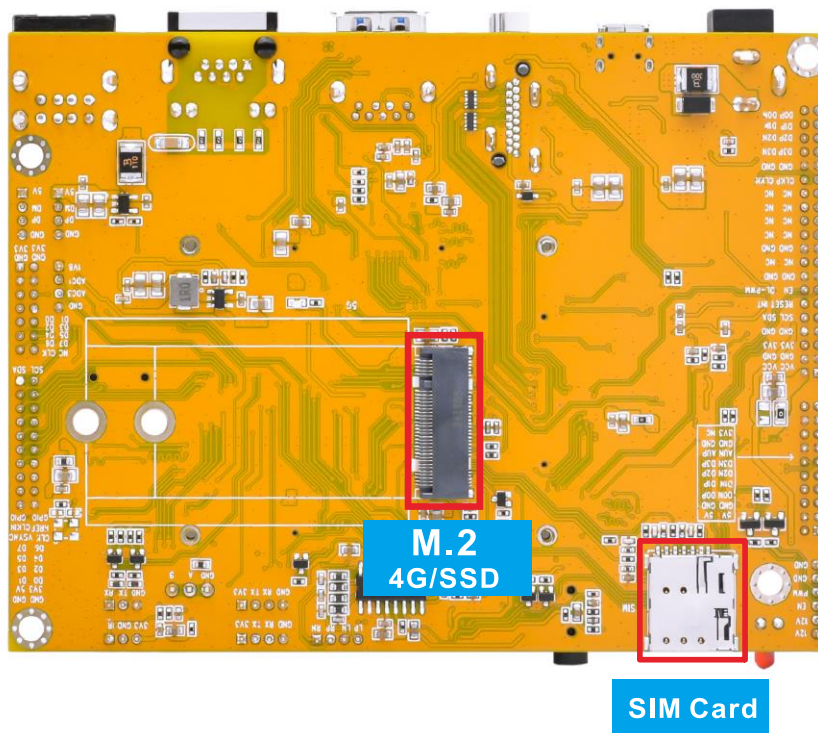
Step 4: Execute the following command to enable ADB:

```
# adb shell
```

```
C:\Windows\system32\cmd.exe - adb shell
C:\Users\15405>
C:\Users\15405>adb shell
* daemon not running. starting it now on port 5037 *
* daemon started successfully *
root@sbc3566-buildroot:/#
root@sbc3566-buildroot:/#
root@sbc3566-buildroot:/#
root@sbc3566-buildroot:/#
root@sbc3566-buildroot:/#
root@sbc3566-buildroot:/#
```

7.7 M.2

The M.2 interface is compatible with both 4G modules and SSD modules, but they cannot be used at the same time.



7.7.1 4G Test

Step 1: Install the EM05 module into the M.2 socket and connect the 4G antenna.



Step 2: Insert the SIM card, and then power on the board.

Step 3: Check the 4G module device nodes.

After the 4G module is recognized successfully, the `/dev/ttyUSB*` device nodes will be generated.

Execute the following command:

```
# ls /dev/ttyUSB*
```

```
root@sbc3566-buildroot:/# ls /dev/ttyUSB*  
/dev/ttyUSB0 /dev/ttyUSB1 /dev/ttyUSB2 /dev/ttyUSB3
```

Step 4: Initiate the PPP connection.

```
# mkdir -p var/run/pppd/lock  
# pppd call quectel-ppp &
```

```

root@sbc3566-buildroot:/# mkdir -p var/run/pppd/lock
root@sbc3566-buildroot:/# pppd call quectel-ppp &
[1] 1900
root@sbc3566-buildroot:/# pppd options in effect:
debug          # (from /etc/ppp/peers/quectel-ppp)
nodetach       # (from /etc/ppp/peers/quectel-ppp)
dump           # (from /etc/ppp/peers/quectel-ppp)
noauth         # (from /etc/ppp/peers/quectel-ppp)
user test      # (from /etc/ppp/peers/quectel-ppp)
password ????? # (from /etc/ppp/peers/quectel-ppp)
remotename 3gpp # (from /etc/ppp/peers/quectel-ppp)
/dev/ttyUSB3 # (from /etc/ppp/peers/quectel-ppp)
115200       # (from /etc/ppp/peers/quectel-ppp)
lock         # (from /etc/ppp/peers/quectel-ppp)
connect chat -s -v -f /etc/ppp/peers/quectel-chat-connect # (from /etc/ppp/peers/quectel-ppp)
disconnect chat -s -v -f /etc/ppp/peers/quectel-chat-disconnect # (from /etc/ppp/peers/quectel-ppp)
noctrlscts   # (from /etc/ppp/peers/quectel-ppp)
modem        # (from /etc/ppp/peers/quectel-ppp)
hide-password # (from /etc/ppp/peers/quectel-ppp)
novj         # (from /etc/ppp/peers/quectel-ppp)
novjccomp    # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-local # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-remote # (from /etc/ppp/peers/quectel-ppp)
ipparam 3gpp # (from /etc/ppp/peers/quectel-ppp)
noipdefault  # (from /etc/ppp/peers/quectel-ppp)
ipcp-max-failure 30 # (from /etc/ppp/peers/quectel-ppp)
defaultroute # (from /etc/ppp/peers/quectel-ppp)
usepeerdns   # (from /etc/ppp/peers/quectel-ppp)
noccps       # (from /etc/ppp/peers/quectel-ppp)
abort on (BUSY)
abort on (NO CARRIER)
abort on (NO DIALTONE)
abort on (ERROR)
abort on (NO ANSWER)
timeout set to 30 seconds
send (AT^M)
expect (OK)
AT^M^M
OK
-- got it

send (ATE0^M)
expect (OK)
^M
ATE0^M^M
OK
-- got it
  
```

Step 5: Check the status of the network interfaces.

```
# ifconfig ppp0
```

```

root@sbc3566-buildroot:/# ifconfig ppp0
ppp0      Link encap:Point-to-Point Protocol
          inet addr:10.79.47.239 P-t-P:10.64.64.64 Mask:255.255.255.255
          UP POINTOPOINT RUNNING NOARP MULTICAST MTU:1500 Metric:1
          RX packets:4 errors:0 dropped:0 overruns:0 frame:0
          TX packets:14 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:3
          RX bytes:52 (52.0 B) TX bytes:198 (198.0 B)
  
```

Step 6: Test the PPP connection.

```
# ping -I ppp0 www.armdesigner.com
```

```

root@sbc3566-buildroot:/# ping -I ppp0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (13.35.202.122) from 10.79.47.239 ppp0: 56(84) bytes of data.
64 bytes from server-13-35-202-122.sin2.r.cloudfront.net (13.35.202.122): icmp_seq=1 ttl=244 time=71.3 ms
64 bytes from server-13-35-202-122.sin2.r.cloudfront.net (13.35.202.122): icmp_seq=2 ttl=244 time=103 ms
64 bytes from server-13-35-202-122.sin2.r.cloudfront.net (13.35.202.122): icmp_seq=3 ttl=244 time=101 ms
64 bytes from server-13-35-202-122.sin2.r.cloudfront.net (13.35.202.122): icmp_seq=4 ttl=244 time=108 ms
64 bytes from server-13-35-202-122.sin2.r.cloudfront.net (13.35.202.122): icmp_seq=5 ttl=244 time=105 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 71.307/97.827/108.372/13.471 ms
  
```

7.7.2 GPS Test

Step 1: Install the EM05 module into the M.2 socket and connect a passive GPS antenna.

Active GPS antennas are not supported.



Step 2: Enable the GPS function.

Execute the following command:

```
# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
```

Step 3: Read the GPS data.

Execute the following command:

```
# cat /dev/ttyUSB1
```

```

root@sbc3566-buildroot:/# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
root@sbc3566-buildroot:/# cat /dev/ttyUSB1
$GPRMTC,,V,,,,,,,,,N,V*29
$GPGTGA,,T,,M,,N,,K,N*2C
$GPGSA,A,1,,,,,,,,,,,,,*1E
$GPGGA,,,,,0,,,,,,*66
$GPRMTC,,V,,,,,,,,,N,V*29
$GPGTGA,,T,,M,,N,,K,N*2C
$GPGSA,A,1,,,,,,,,,,,,,*1E
$GPGGA,,,,,0,,,,,,*66
$GPRMTC,,V,,,,,,,,,N,V*29
  
```

7.7.3 SSD Test

The onboard M.2 socket is a Key B interface. It supports an M.2 Key B SSD directly. To use an NVMe SSD with a Key M interface, connect it through a Key B-to-Key M adapter board.

Step 1: Connect the M.2 SSD, then power on.

Step 2: Check the SSD device node.

After the SSD is recognized, the corresponding NVMe device node will be generated.

Execute the following command:

```
# ls /dev/nvme0*
```

```
root@sbc3566-buildroot:/# ls /dev/nvme0*  
/dev/nvme0 /dev/nvme0n1 /dev/nvme0n1p1
```

Step 3: Check the SSD mount path.

After the SSD is recognized, it will be mounted automatically.

Execute the following command to check the mount path:

```
# df -h
```

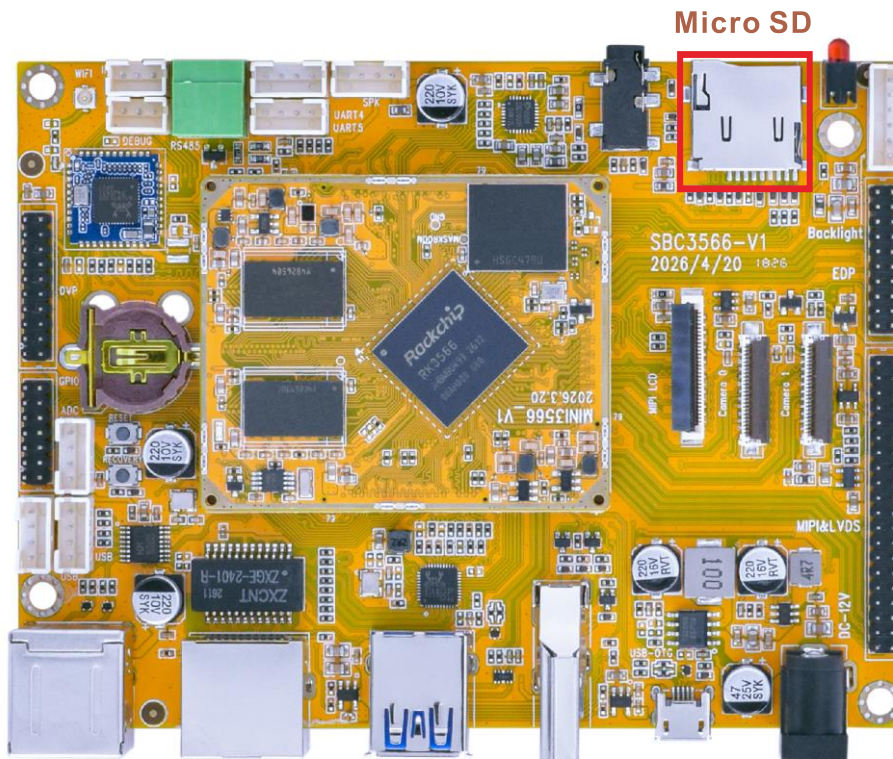
```
root@sbc3566-buildroot:/# df -h  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/root        5.9G  723M  5.0G  13% /  
devtmpfs        951M   8.0K  951M   1% /dev  
tmpfs           978M  496K  978M   1% /run  
tmpfs           978M  204K  978M   1% /var/log  
tmpfs           978M    0  978M   0% /dev/shm  
tmpfs           978M  140K  978M   1% /tmp  
/dev/mmcblk0p7  124M   5.3M  115M   5% /oem  
/dev/mmcblk0p8  936M  340K  920M   1% /userdata  
/dev/nvme0n1p1  120G  864K  120G   1% /mnt/storage
```

Note: If devices that are not in ext4 format, the user can choose to format them on the board. After formatting, **the files on the device will be permanently lost**, so please proceed with caution.

```
# mke2fs -t ext4 /dev/nvme0n1p1
```

7.8 SD Card

Step 1: Insert the micro SD card into the card slot.



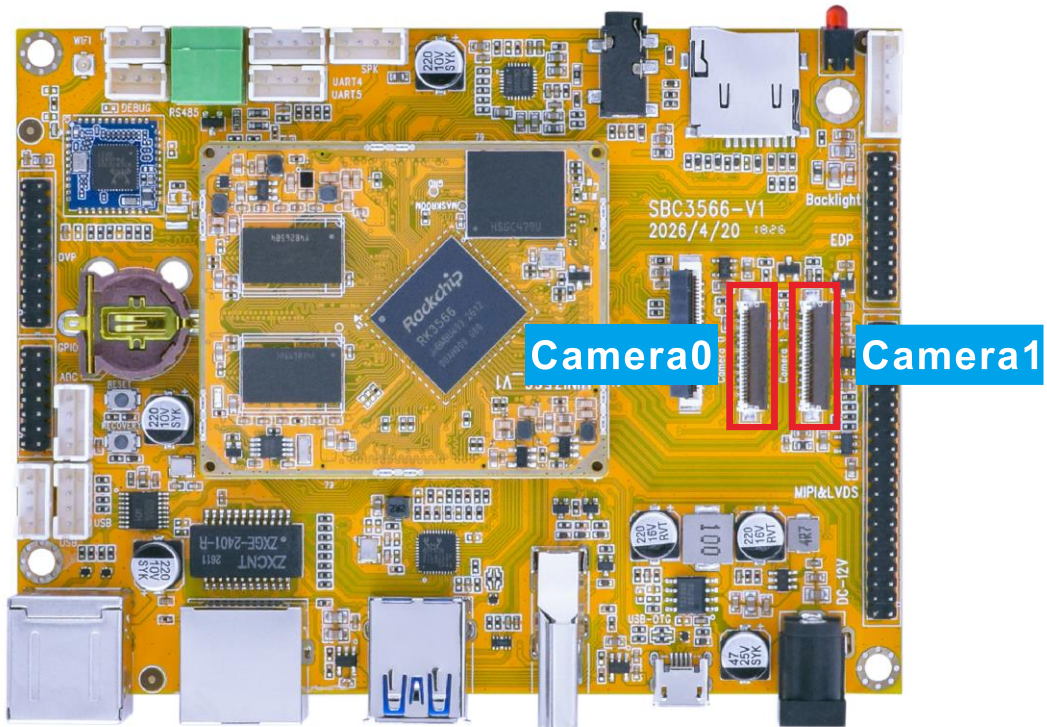
Step 2: After the SD card is recognized, it will be mounted automatically. Run the following command to check the mount path of the SD card.

```
# df -h
```

```
root@sbc3566-buildroot:/# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root       5.9G  727M  5.0G  13% /
devtmpfs        951M   8.0K  951M   1% /dev
tmpfs           978M  448K  978M   1% /run
tmpfs           978M  200K  978M   1% /var/log
tmpfs           978M    0  978M   0% /dev/shm
tmpfs           978M  140K  978M   1% /tmp
/dev/mmcblk0p7  124M   5.3M  115M   5% /oem
/dev/mmcblk0p8  936M  516K  919M   1% /userdata
/dev/mmcblk1p1  60G   18G   42G  30% /mnt/sdcard
```

7.9 Camera

Step 1: Connect the OV13850 camera module, and then power on the board.



Step 2: Check the camera preview device nodes.

Execute the following command:

```
# grep "" /sys/class/video4linux/v*/name | grep mainpath
```

```
root@sbc3566-buildroot:/# grep "" /sys/class/video4linux/v*/name | grep mainpath
/sys/class/video4linux/video18/name:rkisp_mainpath4linux/v*/name | grep mainpath
/sys/class/video4linux/video8/name:rkisp_mainpath
```

Step 3: Preview the camera.

Camera0:

```
# gst-launch-1.0 v4l2src device=/dev/video8 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! waylandsink
```

```

root@sbc3566-buildroot:/#
w,format=NV12,width=1920,height=1080, framerate=30/1 ! waylandsink8 ! video/x-raw
mpp[1889]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1889]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1889]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1889]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[1889]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 62.206797] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
[ 62.210861] rockchip-csi2-dphy1: dphy1, data_rate_mbps 600
[ 62.210934] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 62.265407] rkisp-vir0: tx stream:4 lose frame:0, isp state:0x20001 frame:0
Redistribute latency...
[17:06:02.583] seeing the first app
0:00:08.4 / 99:99:99.
  
```

Camera1:

```
# gst-launch-1.0 v4l2src device=/dev/video18 ! video/x-raw,format=NV12,width=1920,height=1080, framerate=30/1 ! waylandsink
```

```

root@sbc3566-buildroot:/#
aw,format=NV12,width=1920,height=1080, framerate=30/1 ! waylandsink8 ! video/x-raw
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 99.443935] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
[ 99.450258] rkCIF_mipi_lvds: stream[0] start streaming
[ 99.458460] rkCIF_mipi_lvds: Allocate dummy buffer, size: 0x01944000
[ 99.458562] rockchip-mipi-csi2 mipi-csi2: stream on, src_sd: 000000001dbf5e08, sd_name:rockchip-csi2-dphy2
[ 99.458577] rockchip-mipi-csi2 mipi-csi2: stream ON
[ 99.458624] rockchip-csi2-dphy2: dphy2, data_rate_mbps 600
[ 99.458663] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
Redistribute latency...
0:00:09.1 / 99:99:99.
  
```

Step 4: Record a video.

Camera0:

```
# gst-launch-1.0 v4l2src device=/dev/video8 num-buffers=100 ! \
video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \
videoconvert ! mpph264enc ! h264parse ! mp4mux ! \
filesink location=/tmp/h264.mp4
```

```
root@sbc3566-buildroot:/#
100 ! \c3566-buildroot:/# gst-launch-1.0 v4l2src device=/dev/video8 num-buffers=1
> video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \
> videoconvert ! mpph264enc ! h264parse ! mp4mux ! \
> filesink location=/tmp/h264.mp4
mpp[1919]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1919]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1919]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1919]: mpp: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
mpp[1919]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[1919]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1919]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
mpp[1919]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[1919]: mpp_enc: set rc cbr bps [7776000:8262000:7290000] fps [30:1:fix] - [30:1:fix] gop 30
mpp[1919]: mpp_enc: mode cbr bps [7290000:7776000:8262000] fps fix [30/1] -> fix [30/1] gop i [30] v [0]
[ 149.018783] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
[ 149.028827] rkisp_rkisp-vir0: first params buf queue
[ 149.028972] rockchip-csi2-dphy1: dphy1, data_rate_mbps 600
[ 149.029021] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 149.090568] rkisp-vir0: tx stream:4 lose frame:0, isp state:0x20001 frame:0
Redistribute latency...
```

Camera1:

```
# gst-launch-1.0 v4l2src device=/dev/video18 num-buffers=100 ! \
video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \
videoconvert ! mpph264enc ! h264parse ! mp4mux ! \
filesink location=/tmp/h264.mp4
```



```
root@sbc3566-buildroot:/#
=100 ! \3566-buildroot:/# gst-launch-1.0 v4l2src device=/dev/video18 num-buffers=
> video/x-raw,format=NV12,width=1920,height=1080,framerate=30/1 ! \
> videoconvert ! mpph264enc ! h264parse ! mp4mux ! \
> filesink location=/tmp/h264.mp4
mpp[1937]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1937]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1937]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1937]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[1937]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[1937]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1937]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
mpp[1937]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[1937]: mpp_enc: set rc cbr bps [7776000:8262000:7290000] fps [30:1:fix] - [30:1:fix] gop 30
mpp[1937]: mpp_enc: mode cbr bps [7290000:7776000:8262000] fps fix [30/1] -> fix [30/1] gop i [30] v [0]
[ 214.866435] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
[ 214.889707] rkisp_rkisp-vir1: first params buf queue
[ 214.890323] rkCIF_mipi_lvds: stream[0] start streaming
[ 214.896113] rkCIF_mipi_lvds: Allocate dummy buffer, size: 0x01944000
[ 214.896217] rockchip-mipi-csi2 mipi-csi2: stream on, src_sd: 00000001dbf5e08, sd_name:rockchip-csi2-
dphy2
[ 214.896233] rockchip-mipi-csi2 mipi-csi2: stream ON
[ 214.896275] rockchip-csi2-dphy2: dphy2, data_rate_mbps 600
[ 214.896379] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
Redistribute latency...
Redistribute latency...
Got EOS from element "pipeline0".
Execution ended after 0:00:03.459324543
Setting pipeline to NULL ...
[ 218.338047] rkCIF_mipi_lvds: stream[0] start stopping, total mode 0x1, cur 0x1
[ 218.339318] rockchip-mipi-csi2 mipi-csi2: stream off, src_sd: 00000001dbf5e08, sd_name:rockchip-csi2-
dphy2
[ 218.339389] rockchip-mipi-csi2 mipi-csi2: stream OFF
[ 218.339437] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream_stop stream stop, dphy2
[ 218.339483] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:0, dphy2, ret 0
Freeing pipeline ...
[ 218.346893] rkCIF_mipi_lvds: stream[0] stopping finished, dma_en 0x0
```

Step 5: Capture JPEG images.

Camera0:

```
# gst-launch-1.0 -v v4l2src device=/dev/video8 num-buffers=10 ! \
video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \
multifilesink location=/tmp/test%05d.jpg
```

```

root@sbc3566-buildroot:/#
rs=10 ! \566-buildroot:/# gst-launch-1.0 -v v4l2src device=/dev/video8 num-buffer
> video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \
> multifilesink location=/tmp/test%05d.jpg
mpp[1958]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1958]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1958]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1958]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[1958]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[1958]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1958]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0: crop-bounds = < (int)0, (int)0, (int)2112, (int)1568 >
New clock: GstSystemClock
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstCapsFilter:capsfilter0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
mpp[1958]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[1958]: mpp_enc: set rc cbr bps [31104000:33048000:29160000] fps [120:1:fix] - [120:1:fix] gop 120
mpp[1958]: mpp_enc: set jpeg qfactor [80:1:99]
/GstPipeline:pipeline0/GstMppJpegEnc:mppjpegenc0.GstPad:src: caps = image/jpeg, width=(int)1920,
height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstMultiFileSink:multifilesink0.GstPad:sink: caps = image/jpeg, width=(int)1920,
height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
[ 419.966372] rkisp_hw fdff0000.rkisp: set isp clk = 297000000Hz
/GstPipeline:pipeline0/GstMppJpegEnc:mppjpegenc0.GstPad:sink: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstCapsFilter:capsfilter0.GstPad:sink: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
[ 419.991832] rkisp rkisp-vir0: first params buf queue
[ 419.992047] rockchip-csi2-dphy1: dphy1, data_rate_mbps 600
[ 419.992115] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 420.053742] rkisp-vir0: tx stream:4 lose frame:0, isp state:0x20001 frame:0
Redistribute latency...
Got EOS from element "pipeline0".
Execution ended after 0:00:00.506643333
Setting pipeline to NULL ...
[ 420.701140] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream_stop stream stop, dphy1
[ 420.701236] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:0, dphy1, ret 0
Freeing pipeline ...

```

Camera1:

```

# gst-launch-1.0 -v v4l2src device=/dev/video18 num-buffers=10 ! \
video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \
multifilesink location=/tmp/test%05d.jpg

```

```

root@sbc3566-buildroot:/#
ers=10 ! \66-buildroot:/# gst-launch-1.0 -v v4l2src device=/dev/video18 num-buffe
> video/x-raw,format=NV12,width=1920,height=1080 ! mppjpegenc ! \
> multifilesink location=/tmp/test%05d.jpg
mpp[1979]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1979]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1979]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1979]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[1979]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
Setting pipeline to PAUSED ...
Using mplane plugin for capture
mpp[1979]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[1979]: mpp: Only rk3588's h264/265/jpeg and rk3576's h264/265 encoder can use frame parallel
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0: crop-bounds = < (int)0, (int)0, (int)2112, (int)1568 >
New clock: GstSystemClock
/GstPipeline:pipeline0/GstV4l2Src:v4l2src0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstCapsFilter:capsfilter0.GstPad:src: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
mpp[1979]: mpp_enc: set prep cfg w:h [1920:1080] stride [1920:1088] fmt 0 rotate 0 mirror 0
mpp[1979]: mpp_enc: set rc cbr bps [31104000:33048000:29160000] fps [120:1:fix] - [120:1:fix] gop 120
mpp[1979]: mpp_enc: set jpeg qfactor [80:1:99]
/GstPipeline:pipeline0/GstMppJpegEnc:mppjpegenc0.GstPad:src: caps = image/jpeg, width=(int)1920,
height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstMultiFileSink:multifilesink0.GstPad:sink: caps = image/jpeg, width=(int)1920,
height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
[ 497.618274] rkisp_hw fdf00000.rkisp: set isp clk = 297000000Hz
/GstPipeline:pipeline0/GstMppJpegEnc:mppjpegenc0.GstPad:sink: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
/GstPipeline:pipeline0/GstCapsFilter:capsfilter0.GstPad:sink: caps = video/x-raw, format=(string)NV12,
width=(int)1920, height=(int)1080, pixel-aspect-ratio=(fraction)1/1, framerate=(fraction)120/1, interlace-
mode=(string)progressive, colorimetry=(string)1:3:5:1
[ 497.626945] rkisp rkisp-vir1: first params buf queue
[ 497.627521] rkCIF_mipi_lvds: stream[0] start streaming
[ 497.633251] rkCIF_mipi_lvds: Allocate dummy buffer, size: 0x01944000
[ 497.633354] rockchip-mipi-csi2 mipi-csi2: stream on, src_sd: 000000001dbf5e08, sd_name:rockchip-csi2-
dphy2
[ 497.633368] rockchip-mipi-csi2 mipi-csi2: stream ON
[ 497.633409] rockchip-csi2-dphy2: dphy2, data_rate_mbps 600
[ 497.633447] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
Redistribute latency...
Got EOS from element "pipeline0".
Execution ended after 0:00:00.450455000
Setting pipeline to NULL ...
[ 498.105102] rkCIF_mipi_lvds: stream[0] start stopping, total mode 0x1, cur 0x1
Freeing pipeline ...
[ 498.114305] rockchip-mipi-csi2 mipi-csi2: stream off, src_sd: 000000001dbf5e08, sd_name:rockchip-csi2-
dphy2
[ 498.114401] rockchip-mipi-csi2 mipi-csi2: stream OFF
[ 498.114451] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream_stop stream stop, dphy2
[ 498.114497] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:0, dphy2, ret 0
root@sbc3566-buildroot:/# [ 498.127794] rkCIF_mipi_lvds: stream[0] stopping finished, dma_en 0x0

```

7.10 ADC

ADC test method is the same as Debian12. Please refer to section [6.10 ADC](#).

7.11 RS485

RS485 test method is the same as Debian12. Please refer to section [6.11 RS485](#).

7.12 UART

UART test method is the same as Debian12. Please refer to section [6.12 UART](#).

7.13 RTC

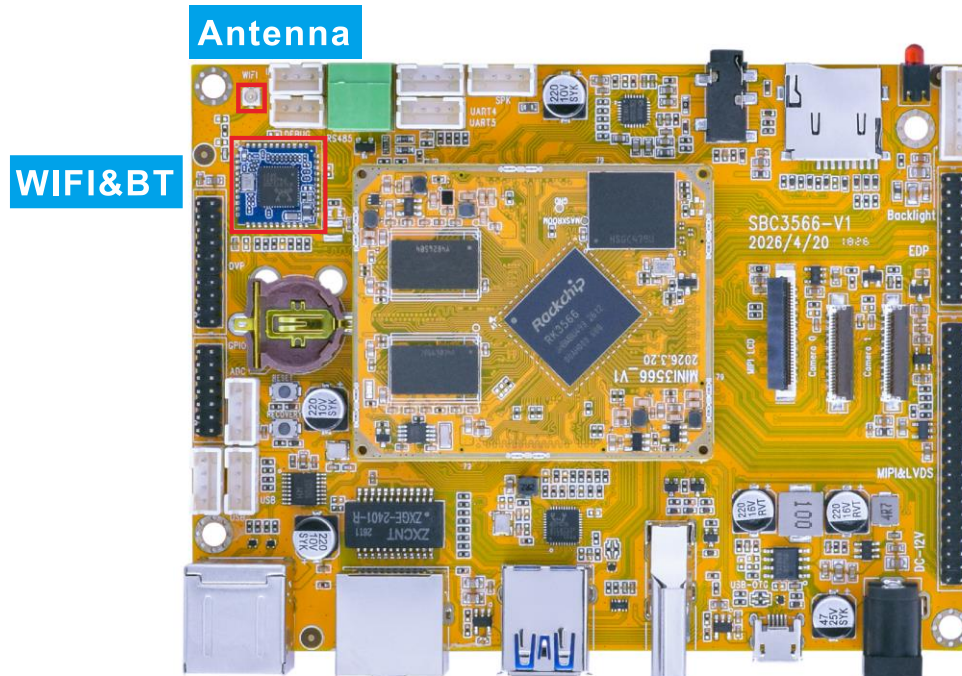
RTC test method is the same as Debian12. Please refer to section [6.13 RTC](#).

7.14 IR

IR test method is the same as Debian12. Please refer to section [6.14 IR](#).

7.15 WiFi & Bluetooth

To use the WiFi and Bluetooth functions properly, make sure the antenna is connected.



7.15.1 WiFi

Step 1: Check the Wi-Fi device information.

Execute the following command:

```
# ifconfig wlan0
```

```
root@sbc3566-buildroot:/# ifconfig wlan0
wlan0   Link encap:Ethernet HWaddr 84:FC:14:F9:69:1C
        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)
```

Step 2: Scan for available WiFi hotspots.

Execute the following command:

```
# iwlist wlan0 scan
```

```
root@sbc3566-buildroot:/# iwlist wlan0 scan
wlan0   Scan completed :
        Cell 01 - Address: B2:22:7A:5A:B6:4A
                ESSID:"DIRECT-4A-HP Laser 136w"
                Protocol:IEEE 802.11gn
                Mode:Master
                Frequency:2.462 GHz (Channel 11)
                Encryption key:on
                Bit Rates:72 Mb/s
                Extra:rsn_ie=30140100000fac040100000fac040100000fac020c00
                IE: IEEE 802.11i/WPA2 Version 1
                   Group Cipher : CCMP
                   Pairwise Ciphers (1) : CCMP
                   Authentication Suites (1) : PSK
                Quality=87/100 Signal level=44/100
                Extra:fm=0003
        Cell 02 - Address: B4:F1:8C:6D:D1:29
                ESSID:""
                Protocol:IEEE 802.11bgn
                Mode:Master
                Frequency:2.462 GHz (Channel 11)
                Encryption key:on
                Bit Rates:300 Mb/s
                Extra:rsn_ie=30140100000fac040100000fac040100000fac020c00
```

Step 3: Connect to the WiFi hotspot.

Execute the following command:

```
# wifi-connect.sh SSID PSK
```

```
root@sbc3566-buildroot:/# wifi-connect.sh Boardcon Boardcon43435656
connect to WiFi ssid: Boardcon, Passwd: Boardcon43435656
Successfully initialized wpa_supplicant
rfkill: Cannot open RFKILL control device
root@sbc3566-buildroot:/# [ 833.569237] RTW: rtw_set_802_11_connect(wlan0) fw_state=0x00000008
[ 833.784126] RTW: start auth
```

Step 4: Check the network interface status.

Execute the following command:

```
# ifconfig wlan0
```

```
root@sbc3566-buildroot:/# ifconfig wlan0
wlan0      Link encap:Ethernet HWaddr 84:FC:14:F9:69:1C
           inet addr:192.168.0.39 Bcast:192.168.0.255 Mask:255.255.0
           inet6 addr: fe80::b08e:b8d9:f383:8261/64 Scope:Link
           UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
           RX packets:275 errors:0 dropped:41 overruns:0 frame:0
           TX packets:32 errors:0 dropped:0 overruns:0 carrier:0
           collisions:0 txqueuelen:1000
           RX bytes:30653 (29.9 KiB) TX bytes:4368 (4.2 KiB)
```

Step 5: Test the WiFi network connection.

Execute the following command:

```
# ping -I wlan0 www.armdesigner.com
```

```
root@sbc3566-buildroot:/# ping -I wlan0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (3.174.46.103) from 192.168.0.39 wlan0: 56(84) bytes of data.
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=1 ttl=246 time=385 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=2 ttl=246 time=196 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=3 ttl=246 time=202 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=4 ttl=246 time=200 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=5 ttl=246 time=248 ms
64 bytes from server-3-174-46-103.fra60.r.cloudfront.net (3.174.46.103): icmp_seq=6 ttl=246 time=237 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5005ms
rtt min/avg/max/mdev = 195.962/244.659/384.786/65.662 ms
```

7.15.2 Bluetooth

In the Buildroot system, Bluetooth is configured to work as a Bluetooth speaker by default.

Step 1: Enter the Bluetooth control tool.

Execute the following command:

```
# bluetoothctl
```

```
root@sbc3566-buildroot:/# bluetoothctl
hci0 new_settings: powered bondable ssp br/edr le secure-conn
Agent registered
[CHG] Controller 84:FC:14:F9:69:1D Pairable: yes
[bluetooth]#
```

Step 2: Enable Bluetooth and set it to discoverable mode.

Execute the following commands in bluetoothctl:

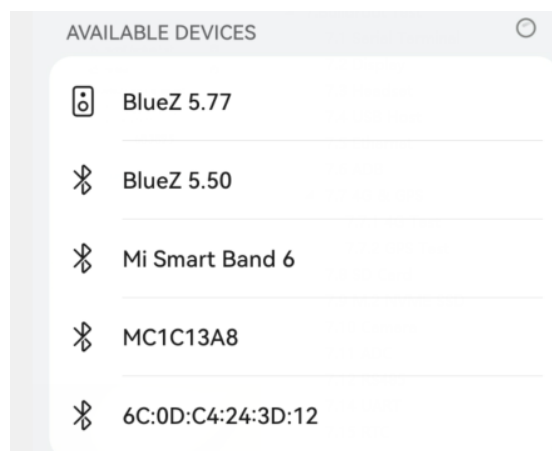
```
[bluetooth]# power on
[bluetooth]# discoverable on
```

```
[bluetooth]# power on
Changing power on succeeded
[bluetooth]# discoverable on
[bluetooth]# [ 1178.612287] Bluetooth: hu 0000000093a3dace retransmitting 1 pkts
hci0 new_settings: powered connectable bondable ssp br/edr le secure-conn
hci0 new_settings: powered connectable discoverable bondable ssp br/edr le secure-conn
Changing discoverable on succeeded
[CHG] Controller 84:FC:14:F9:69:1D Discoverable: yes
[bluetooth]#
```

After this step, the Bluetooth device can be discovered by the phone.

Step 3: Pair and connect the Bluetooth device.

On the phone, find the Bluetooth device named “**BlueZ 5.77**” in the Bluetooth device list, then tap it to pair and connect.



If a pairing confirmation message appears, confirm it on both the phone and the board.

```
[bluetooth]# [ 1264.094859] rtk_btcoex: hci accept conn req
[ 1264.287389] rtk_btcoex: connected, handle 0002, status 0x00
[ 1264.287495] rtk_btcoex: Page success
hci0 A8:35:12:9A:EB:4D type BR/EDR connected eir_len 11
[NEW] Device A8:35:12:9A:EB:4D liuy
[liuy]# [ 1264.349987] rtk_btcoex: io capability request
Request confirmation
[agent] Confirm passkey 756300 (yes/no): yes
[liuy]# [ 1269.105503] rtk_btcoex: link key notify
hci0 new_link_key A8:35:12:9A:EB:4D type 0x05 pin_len 0 store_hint 1
hci0 device_flags_changed: A8:35:12:9A:EB:4D (BR/EDR)
  supp: 0x00000000 curr: 0x00000000
[CHG] Device A8:35:12:9A:EB:4D INFO: 0x0007 (7)
[CHG] Device A8:35:12:9A:EB:4D Bonded: yes
Authorize service
[agent] Authorize service 0000110d-0000-1000-8000-00805f9b34fb (yes/no): yes
[liuy]# [ 1271.850305] rtk_btcoex: l2cap op 3, len 20, out 1
[NEW] Transport /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/fd0
[liuy]# [ 1272.378707] rtk_btcoex: l2cap op 6, len 16, out 1
[NEW] Endpoint /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/sep1
[NEW] Endpoint /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/sep2
[NEW] Endpoint /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/sep3
[NEW] Endpoint /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/sep5
Authorize service
[agent] Authorize service 00001108-0000-1000-8000-00805f9b34fb (yes/no): yes
hci0 new_settings: powered connectable bondable ssp br/edr le secure-conn
[CHG] Controller 84:FC:14:F9:69:1D Discoverable: no
[liuy]#
```

Step 4: Check the connected Bluetooth device address and exit bluetoothctl.

Run the following command in bluetoothctl:

```
# devices Connected
```

Example output:

```
[liuy]# devices Connected  
Device A8:35:12:9A:EB:4D liuy
```

The address A8:35:12:9A:EB:4D is the MAC address of the currently connected Bluetooth device.

Then exit bluetoothctl:

```
# exit
```

```
[liuy]# exit  
root@sbc3566-buildroot:/#
```

Step 5: Start Bluetooth audio playback.

Execute the following command:

```
bluealsa-play A8:35:12:9A:EB:4D &
```

```
root@sbc3566-buildroot:/# bluealsa-play A8:35:12:9A:EB:4D &  
[1] 2005  
root@sbc3566-buildroot:/# bluealsa-play: [2005] W: aplay.c:1185: Couldn't get BlueALSA PCM list: The name  
org.bluealsa was not provided by any .service files  
bluealsa-play: [2005] D: aplay.c:1194: Starting main loop
```

After the Bluetooth connection is established, play audio on the phone. The audio should be output from the board.

7.16 Video Playback

(1) Use the built-in video test scripts.

Execute the following command:

```
# /rockchip-test/video/test_gst_video.sh
```

```

root@sbc3566-buildroot:/# /rockchip-test/video/test_gst_video.sh
Setting pipeline to PAUSED ...
Pipeline is PREROLLING ...
Redistribute latency...
mpp[1934]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[1934]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[1934]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[1934]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[1934]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[1934]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
Redistribute latency...
mpp[1934]: h264d_api: is_avcC=1
Pipeline is PREROLLED ...
Prerolled, waiting for async message to finish...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
Redistribute latency...
[10:18:10.279] seeing the first app
0:00:06.1 / 0:00:29.5 (20.9 %)
  
```

(2) Video Playback Using Chromium Browser.

Chromium Browser supports video playback up to 4K resolution. The supported video decoding formats include VP8, H.264, H.265, VP9, and AV1.

Note: Chromium Browser may not be compatible with all H.265 video files.

Execute the following command to play the video using Google Chrome:

```
# chromium /mnt/udisk/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4
```

```

root@sbc3566-buildroot:/#
DDU-DU.mp46-buildroot:/# chromium /mnt/udisk/video/4KP30/4K30P-BLACKPINK-DDU-DU_
[2082:2101:0605/101901.206813:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2101:0605/101901.207168:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2101:0605/101901.207370:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2101:0605/101901.207504:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2101:0605/101901.207592:ERROR:object_proxy.cc(576)] Failed to call method:
org.freedesktop.DBus.NameHasOwner: object_path= /org/freedesktop/DBus: unknown error type:
[2082:2101:0605/101901.246520:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2101:0605/101901.326313:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2101:0605/101901.326410:ERROR:object_proxy.cc(576)] Failed to call method:
org.freedesktop.DBus.NameHasOwner: object_path= /org/freedesktop/DBus: unknown error type:

(process:2082): GLib-GIO-CRITICAL **: 10:19:01.392: g_settings_schema_source_lookup: assertion 'source !=
NULL' failed
[2082:2097:0605/101901.393133:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2097:0605/101901.393307:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2082:0605/101901.629617:ERROR:object_proxy.cc(576)] Failed to call method:
org.freedesktop.DBus.NameHasOwner: object_path= /org/freedesktop/DBus: unknown error type:
[2082:2082:0605/101901.653877:ERROR:object_proxy.cc(576)] Failed to call method:
org.freedesktop.DBus.NameHasOwner: object_path= /org/freedesktop/DBus: unknown error type:
[2082:2082:0605/101901.654157:ERROR:object_proxy.cc(576)] Failed to call method:
org.freedesktop.DBus.NameHasOwner: object_path= /org/freedesktop/DBus: unknown error type:
[2082:2098:0605/101901.654549:ERROR:bus.cc(407)] Failed to connect to the bus: Could not parse server
address: Unknown address type (examples of valid types are "tcp" and on UNIX "unix")
[2082:2082:0605/101901.725581:ERROR:object_proxy.cc(576)] Failed to call method:
org.freedesktop.DBus.NameHasOwner: object_path= /org/freedesktop/DBus: unknown error type:
  
```

Command explanation:

- chromium: [Launches the Chromium browser.](#)
- /mnt/udisk/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4: [The media file path to be played.](#)

(3) Use the `gst-play-1.0` command to play the video.

Execute the following command:

```
# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
# gst-play-1.0 --videosink="waylandsink fullscreen=true"
/mnt/udisk/video/4KP60/4KP60-exist.mp4 --audiosink="alsasink device=hw:0,0"
```

```
root@sbc3566-buildroot:/# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
root@sbc3566-buildroot:/#
/mnt/udisk/video/4KP60/4KP60-exist.mp4 --audiosink="alsasink device=hw:0,0"rue"
Press 'k' to see a list of keyboard shortcuts.
Now playing /mnt/udisk/video/4KP60/4KP60-exist.mp4
Redistribute latency...
Redistribute latency...
mpp[2204]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2204]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2204]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2204]: mpp: unable to create enc vp8 for soc rk3566 unsupported
mpp[2204]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2204]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
Redistribute latency...
Redistribute latency...
mpp[2204]: h264d_api: is_avcC=1
Redistribute latency...
0:00:15.3 / 0:04:01.9
```

Command explanation:

- `export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1`: [Open AFBC](#).
- `/mnt/udisk/video/4KP60/4KP60-exist.mp4`: [The media file path to be played](#).
- `--audiosink="alsasink device=hw:0,0"`: [Specifies the audio output device as hw:0,0](#).