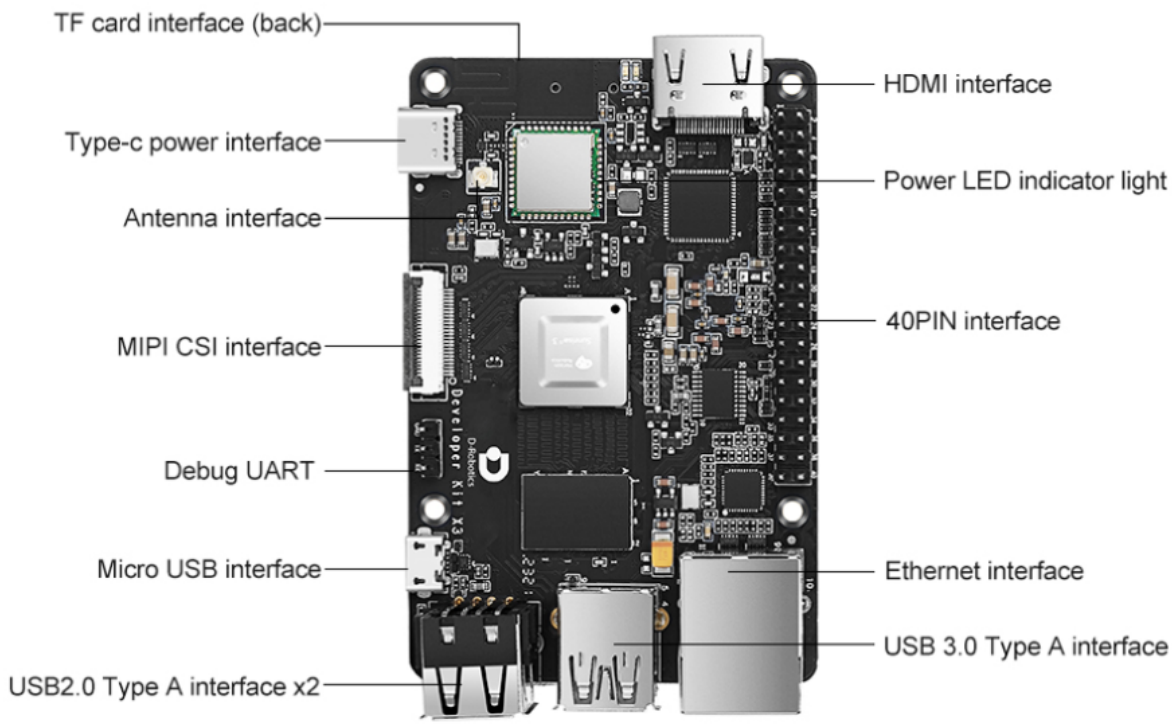
Hardware interface

1.Interface distribution



2.Supply power interface

The development board provides a USB Type C power interface as a power supply interface, which requires the use of a power adapter that supports *5V/3A* to power the development board. After connecting the power adapter to the development board, the red power indicator light on the development board lights up, indicating that the power supply to the development board is normal.

Note: Please do not use the computer USB interface to power the development board, otherwise it may cause abnormal power outages, repeated restarts, and other situations due to insufficient power supply.

3.Debugging UART

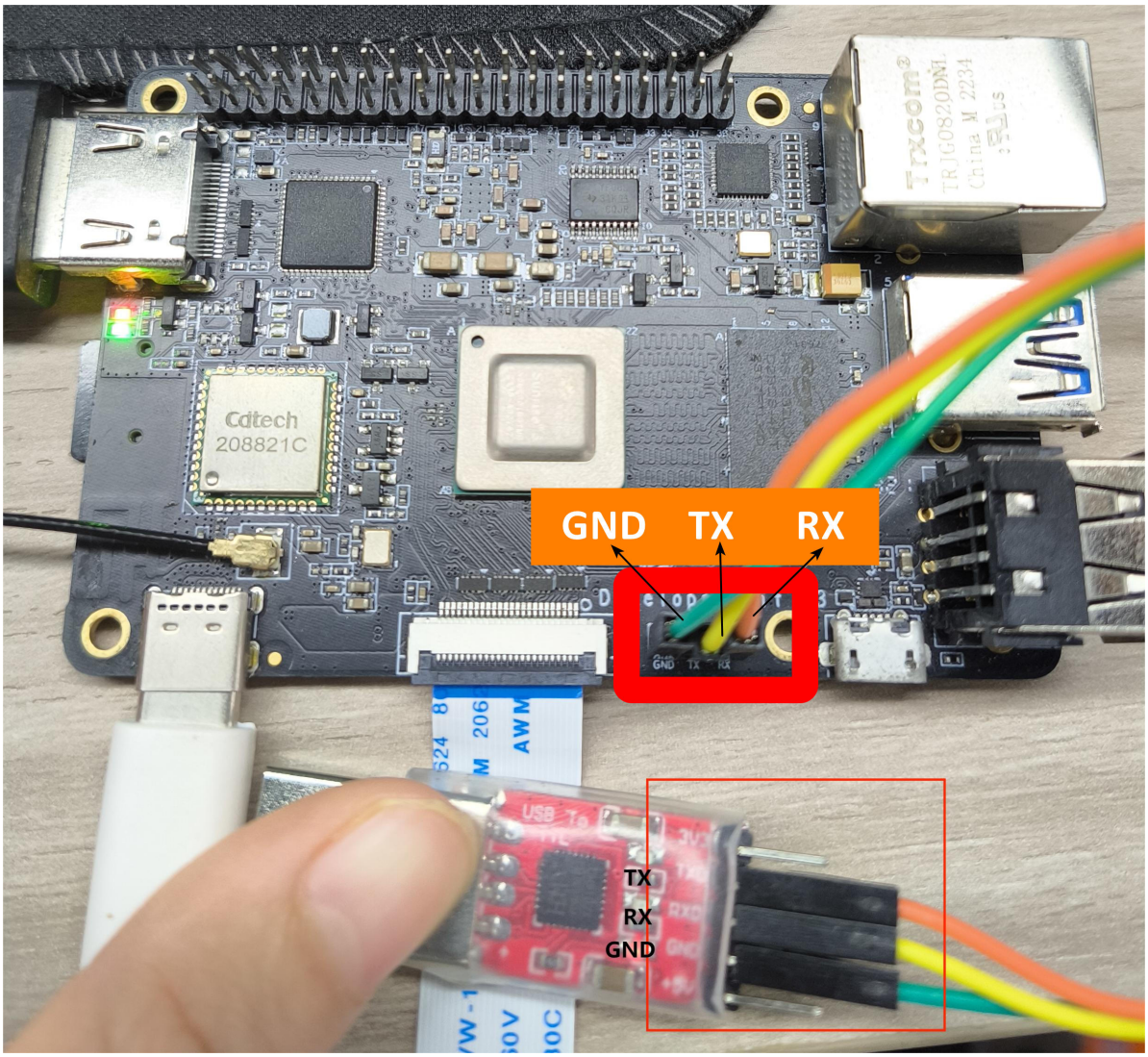
The development board provides a debugging serial port to achieve serial port login and debugging functions.

The parameter configuration of the computer serial port tool is as follows.

- Baud rate: 921600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None

When connecting the serial port, it is necessary to connect the DuPont cable to the development board to debug the serial port, and connect the serial port USB adapter board to the computer.

After the connection is completed, as shown below.



4.Wired network port

The development board provides a Gigabit Ethernet interface that supports 1000BASE-T and 100BASE-T standards. It defaults to static IP mode with an IP address of 192.168.1.10.

To confirm the IP address of the development board, you can log in to the device through the serial port and use the `ifconfig` command to view the configuration of the `eth0` network port.

5.HDMI interface

The development board provides one HDMI interface and supports up to 1080P resolution.

The development board outputs the Ubuntu system desktop (Ubuntu Server version displays the logo icon) on the monitor through the HDMI interface.

In addition, the HDMI interface also supports real-time display of cameras and network streaming functions.

The current display resolutions supported by HDMI interfaces are as follows.

- 1920x1080
- 1280x720
- 1024x600
- 800x480

6.USB interface

Due to the fact that the RDK X3 chip only provides one USB interface, the development board has implemented multiple USB interface extensions through hardware circuits to meet users needs for accessing multiple USB devices.

The interface description is as follows.

Interface type	Number of interfaces	Interface description
Micro USB 2.0	1	USB Device mode, used to connect the host to achieve functions such as ADB, Fastboot, UVC, etc
USB 2.0 Type A	2	USB Host mode, used to connect USB 2.0 peripherals
USB 3.0 Type A	1	USB Host mode, used to connect USB 3.0 peripherals

7.MIPI CSI interface

The development board provides one MIPI CSI interface (interface 2), which can realize the access of MIPI cameras.

At present, the development board is compatible with various specifications of camera modules.

The module models and specifications are as follows.

Serial Number	Sensor	Resolution ratio	FOV	I2C device address
1	GC4663	400W	H:104 V:70 D:113	0x29
2	JXF37	200W	H:62 V:37 D:68	0x40
3	IMX219	800W	H:62 V:37 D:68	0x10
4	IMX477	1200W	H:62 V:37 D:68	0x1a

4	IMX477	1200W	H:62 V:37 D:68	0x1a
Serial Number	**Sensor**	**Resolution**	**FOV**	**I2C device address**
5	OV5647	500W	H:62 V:37 D:68	0x36
Number		**ratio**		

The camera module is connected to the development board through an FPC cable, and attention should be paid to inserting the connector with the blue side facing upwards at both ends of the cable.

Note: It is strictly prohibited to plug in or unplug the camera without powering off the development board, otherwise it may damage the camera module.

8.Micro SD interface

The development board provides one Micro SD memory card interface.

It is recommended to use a storage card with at least 8GB capacity to meet the installation requirements of the Ubuntu operating system and related feature packs.

9.Wi Fi antenna interface

The wireless network of the development board supports two configurations: onboard and external antennas.

In normally , on board antennas can meet usage requirements.

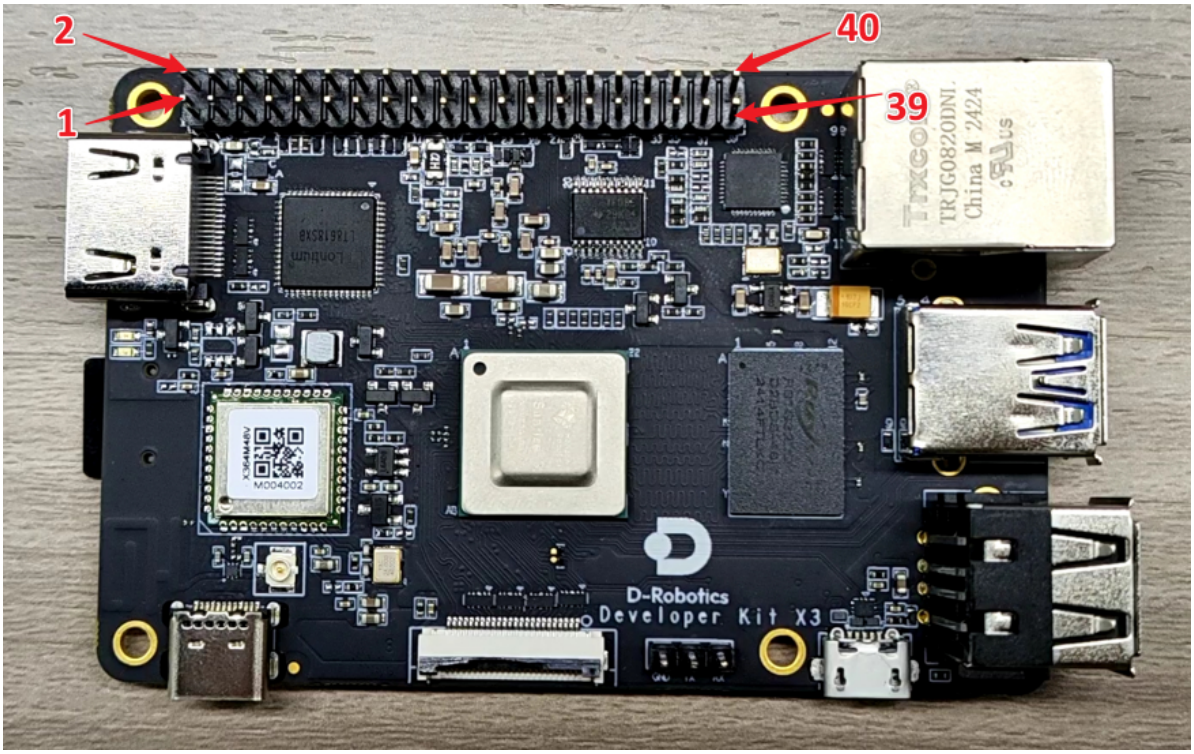
After installing the metal casing on the development board, it is necessary to connect an external antenna to the antenna interface to enhance signal strength.

10.40pin header interface

RDX X3 Board 40Pin Table

Reuse function 2	Reuse function 1	Reuse function 0	Function Description	X3 Pin Number	BCM Encoding	CVM Function	Physical Pin Board Encoding		CVM Function	BCM Encoding	X3 Pin Number	Function Description	Reuse function 0	Reuse function 1	Reuse function 2
			3.3V power signal			VDD_3V3	1	2	VDD_5V			5V power signal			
		I2C0_SDA	I2C0 data signal	9	2	I2C0_SDA	3	4	VDD_5V			5V power signal			
		I2C0_CLK	I2C0 clock signal	8	3	I2C0_SDC	5	6	GND			GND signal			
		I2S0_MCLK	I2S0 MCLK clock signal	101	4	I2S0_MCLK	7	8	UART_TXD	14	111	UART3 send signal		UART3_TXD	
			GND signal			GND	9	10	UART_RXD	15	112	UART3 receive signal		UART3_RXD	
PWM7	SPI2_MOSI	I2C2_CLK	GPIO17 signal	12	17	GPIO17	11	12	I2S0_BCLK	18	102	I2S0 BCLK clock signal	I2S0_BCLK		
PWM8	SPI2_MISO	I2C2_SDA	GPIO27 signal	13	27	GPIO27	13	14	GND			GND signal			
			GPIO22 signal	30	22	GPIO22	15	16	GPIO23	23	27	GPIO23 signal			
			3.3V power signal			VDD_3V3	17	18	GPIO24	24	22	GPIO24 signal		PWM1	
	SPI1_MOSI		SPI1 MOSI signal	6	10	SPI1_MOSI	19	20	GND			GND signal			
	SPI1_MISO		SPI1 MISO signal	7	9	SPI1_MOSO	21	22	GPIO25	25	29	GPIO25 signal			
	SPI1_SCLK		SPI1 CLK signal	3	11	SPI1_SCLK	23	24	SPI1_CSN	8	5	SPI1 CS signal		SPI1_CSN	
			GND signal			GND	25	26	GPIO7	7	28	GPIO7 signal			
	SPI2_CSN	I2C3_SDA	I2C3 clock signal	15	0	I2C3_SDA	27	28	I2C3_SCL	1	14	I2C3 signal	I2C3_SCL	SPI2_SCLK	
	LPWM3		GPIO5 signal	119	5	GPIO5	29	30	GND			GND signal			
	LPWM2		GPIO6 signal	118	6	GPIO6	31	32	PWM4	12	25	PWM4 signal		PWM4	
PWM0			PWM0 signal	4	13	PWM0	33	34	GND			GND signal			
		I2S0_LRCK	I2S0 LRCK signal	103	19	I2S0_LRCK	35	36	GPIO16	16	20	GPIO16 signal			
	LPWM1		GPIO26 signal	117	26	GPIO26	37	38	I2S1_SDIO	20	108	I2S1_SDIO signal	I2S1_SDIO		
			GND signal			GND	39	40	I2S0_SDIO	21	104	I2S0_SDIO signal	I2S0_SDIO		

The PIN1 and PIN40 positions on the RDK X3 development board are as follows.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