This guide is designed for ROCK Pi 4 enthusiast. The purpose is to learn about the ROCK Pi 4 board as well as how to prepare and set up for basic use. The ROCK Pi 4 has two models, one called ROCK Pi 4 Model A and the other called ROCK Pi 4 Model B. When you get a board, you need to know what Pi model it is and which hardware version it is. The information is printed in the top side of the board. We will introduce the board information as much as possible.

# What you need

## Necessary

- ROCK Pi 4 main board
  - ROCK Pi 4 Model A or Model B

- One of the Storage media below:
  - µSD card, larger than 8GB.
  - eMMC Module , larger than 8GB with eMMC to µSD converter board.

- Power supply
  - The ROCK Pi 4 is powered by USB Type C port and supports a wide range of input voltage, from 9V to 20V. The power adapter can be USB Type-C PD 2.0 with 9V/2A, 12V/2A, 15V/2A and 20V/2A protocol compatible, or Quick Charge 2.0 9V/2A, 12V/2A compatible. A dummy 9V or 12V power adapter with USB C tail will also work. Warning: **9V/12V USB C dummy power adapter is dangerous to other 5V only devices, don't mix them.**
  - If the power adapter is PD/QC compatible, the USB power cable must support USB data communication(USB 2.0 or 3.0) between the board and the power adapter, or the power adapter will not output desired voltage wanted by the board.
  - Note: **We don't suggest using a 5V only USB C power adapter.** The board may boot but it will cause stability issue once the system load rises.

- USB Keyboard and Mouse
  - With four USB-A connectors, ROCK Pi 4 can be equipped with a full sized keyboard and mouse.

- Monitor and HDMI Cable
  - ROCK Pi 4 is equipped with a full sized HDMI connector. HDMI capable monitor is recommended.
  - HDMI EDID display data is used to determine the best display resolution. On monitors and TVs that support 1080p (or 4K) this resolution will be selected. If 1080p is not supported the next available resolution reported by EDID will be used. This selected mode will work with MOST but not all monitors/TVs.

- USB to TTL serial cable
  - ROCK Pi 4 exports a dedicated serial console, which can access the low level debug message.

- USB Male A to Male A cable
  - If you want write image on ROCK Pi 4 from USB OTG port or use fastboot/adb commands you need an USB Male A to Male A cable to connect ROCK Pi 4 and PC.

# Optional

- µSD Card Reader
  - For flashing the image into µSD Card or eMMC Module.

- USB type A to type A cable
  - This is needed for fastboot/adb commands.

- USB to TTL serial cable
  - This is needed for serial console.

- Ethernet cable
  - ROCK Pi 4 supports Internet access via WIFI or Ethernet.
  - An Ethernet cable is used to connect your ROCK Pi 4 to a local network and the Internet.

- Camera Module
  - ROCK Pi 4 supports camera function.

- LCD Module
  - ROCK Pi 4 supports LCD display function.

- Audio cable
  - Audio can be played through speaker or headphones using a standard 3.5mm jack.
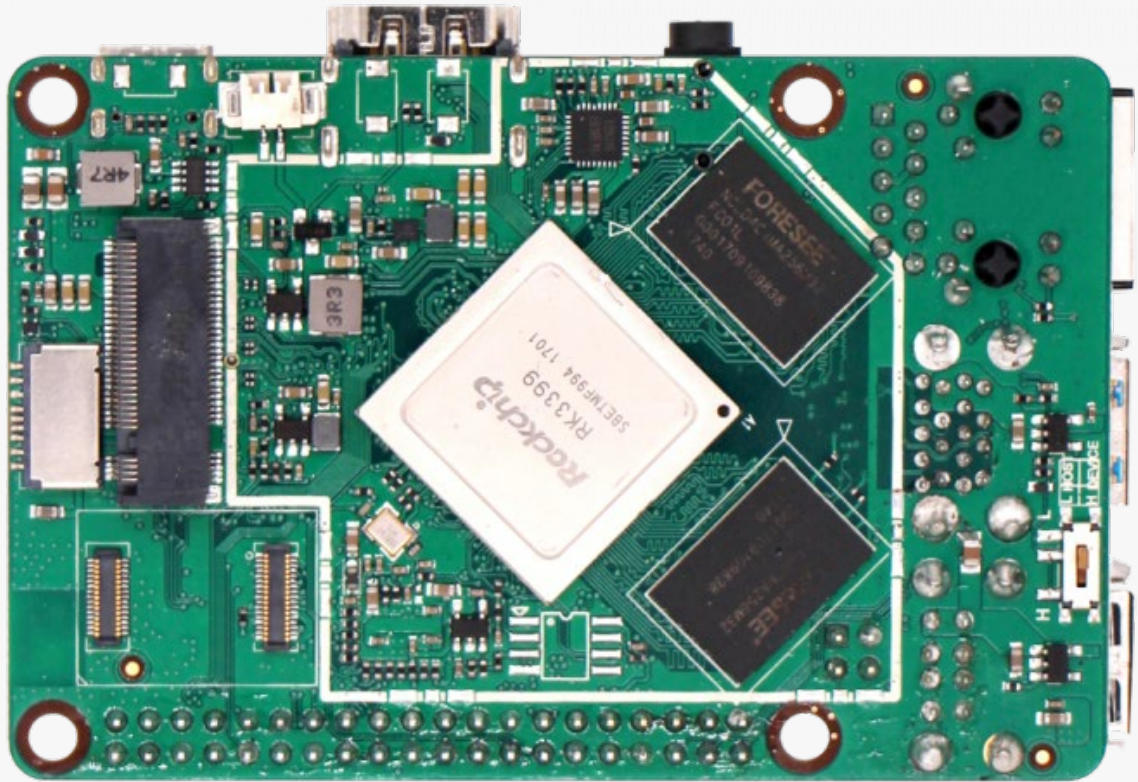
# Close look of ROCK Pi 4B

- ROCK Pi 4B front view
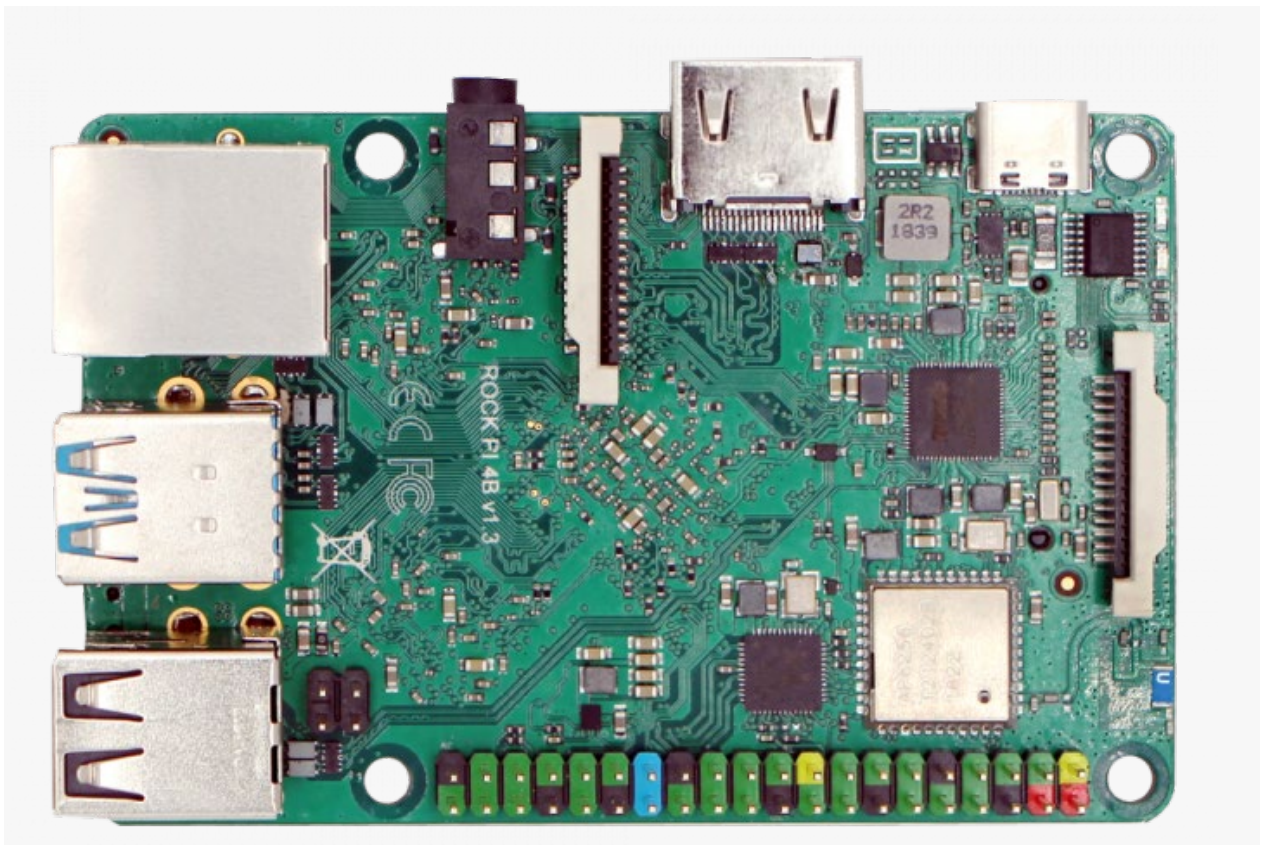
- ROCK Pi 4B front with an angle view



- ROCK Pi 4B back view

# Features

| Model | ROCK PI 4 Model A | ROCK PI 4 Model B | ROCK PI 4 Model C |
|---|---|---|---|
| Processor | 64bits hexa core processor<br>Rockchip RK3399<br>Dual Cortex-72, frequency 1.8GHz with qual Cortex-A53, frequency 1.4GHz<br>Mali T860MP4 gpu, support OpenGL ES 1.1/2.0/3.0/3.1/3.2, Vulkan 1.0, Open CL 1.1 1.2, DX11. | | |
| Memory | LPDDR4<br>64bit dual channel LPDDR4@3200Mb/s, 1GB/2GB/4GB optioal | | |
| Storage | eMMC module (Optional industrial compatible high performance eMMC module, 8GB/16GB/32GB/64GB/128GB available)<br>µSD card (µSD slot supports up to 128 GB µSD card)<br>M.2 SSD (M.2 connector supports up to 2T M2 NVME SSD) | | |
| Display | HDMI 2.0 up to 4k@60<br>MIPI DSI 2 lanes via FPC connector | | DP up to 1440P@60<br>HDMI 2.0 up to 4k@60 |

| | | |
|---|---|---|
| | HDMI and MIPI DSI can work at the same time, support mirror mode or extend mode. | MIPI DSI 2 lanes via FPC connector<br>HDMI and DP can work at the same time. |
| **Audio** | 3.5mm jack with mic<br>HD codec that supports up to 24-bit/96KHz audio. | |
| **Camera** | MIPI CSI 2 lanes via FPC connector, support up to 800 MP camera. | |
| **Wireless** | None | 802.11 ac wifi<br>Bluetooth 5.0<br>with on board antenna |
| **USB** | USB 3.0 OTG X1, hardware switch for host/device switch, upper one<br>USB 3.0 HOST X1, dedicated USB 3.0 channel, lower one<br>USB 2.0 HOST X2 | |
| **Ethernet** | GbE LAN | GbE LAN with Power over Ethernet (PoE) support<br>additional HAT is required for powering from PoE |
| **IO** | 40-pin expansion header<br>2 x UART<br>2 x SPI bus<br>3 x I2C bus<br>1 x PCM/I2S<br>1 x SPDIF<br>2 x PWM<br>1 x ADC<br>6 x GPIO<br>2 x 5V DC power in<br>2 x 3.3V DC power in | |
| **Others** | RTC<br>RTC battery connector for time backup(optional) | |
| **Power** | USB PD, support USB Type C PD 2.0, 9V/2A, 12V/2A, 15V/2A, 20V/2A.<br>Qualcomm® Quick ChargeTM: Supports QC 3.0/2.0 adapter, 9V/2A, 12V/1.5A | |

| | |
|---|---|
| **Size** | 85mm x 54mm |

# Starting the board for the first time

ROCK Pi 4 can be started with eMMC or µSD Card. Now, you are presented with two options when installing your new operating system onto your ROCK Pi 4.

## Prepare

- When start system with eMMC

Insert eMMC Module into eMMC to µSD card converter board. Insert the converter board into µSD Card Reader, which connects to host computer. The picture below shows.
(add eMMC, eMMC to µSD Module and µSD Card Reader picture)

If you do not have an eMMC to µSD card converter board, you can also first install a linux system to a µSD Card and then use the running µSD System to install the desired system to the eMMC card with the eMMC card already inserted into the Rock PI 4. See Rockpi4/install/eMMC.

- When start system with µSD Card

Insert the µSD Card into µSD Card Reader, which connects to host computer. The picture below shows.
(add µSD Card and µSD Card Reader picture)

## Write Image

- Download the flash tool, etcher, from Downloads. Choose the right version for your host operation system. Here we operate on host Ubuntu 16.04.

- After unpacking the package, we run the tool by executing the command
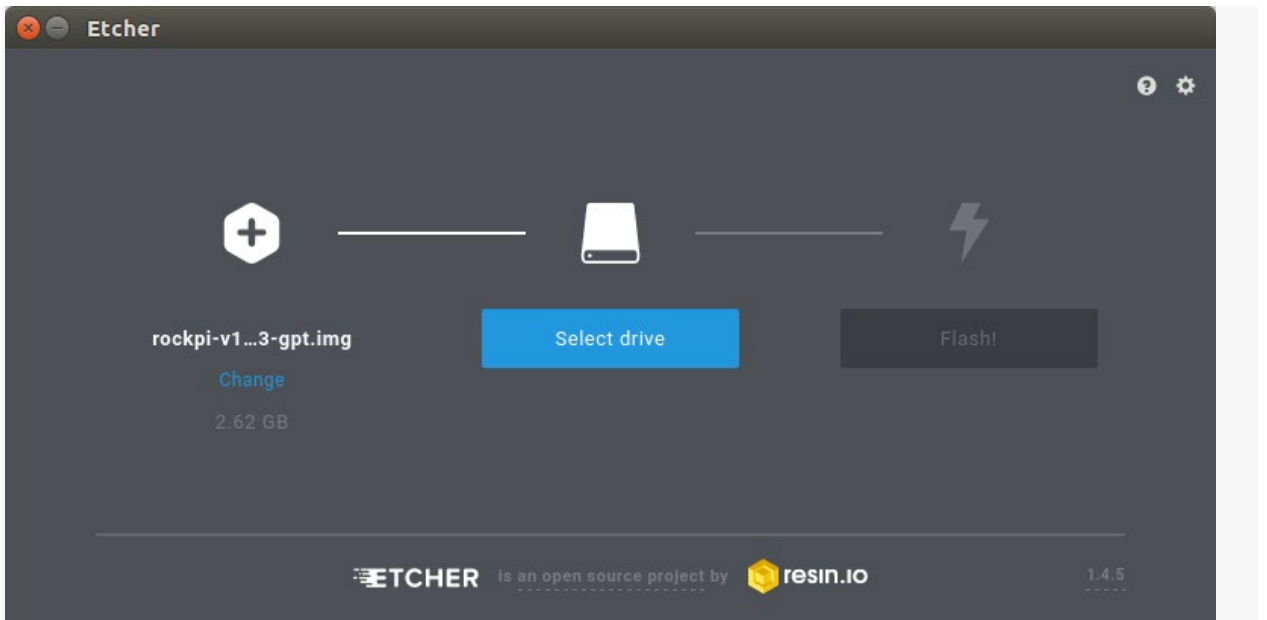
```
$ ./etcher-etcher-electron-1.4.5-x86_64.AppImage
```

If you get an error message: "No polkit authentication agent found" you can try and start it with sudo, but do know that this is running the tool as **root**.
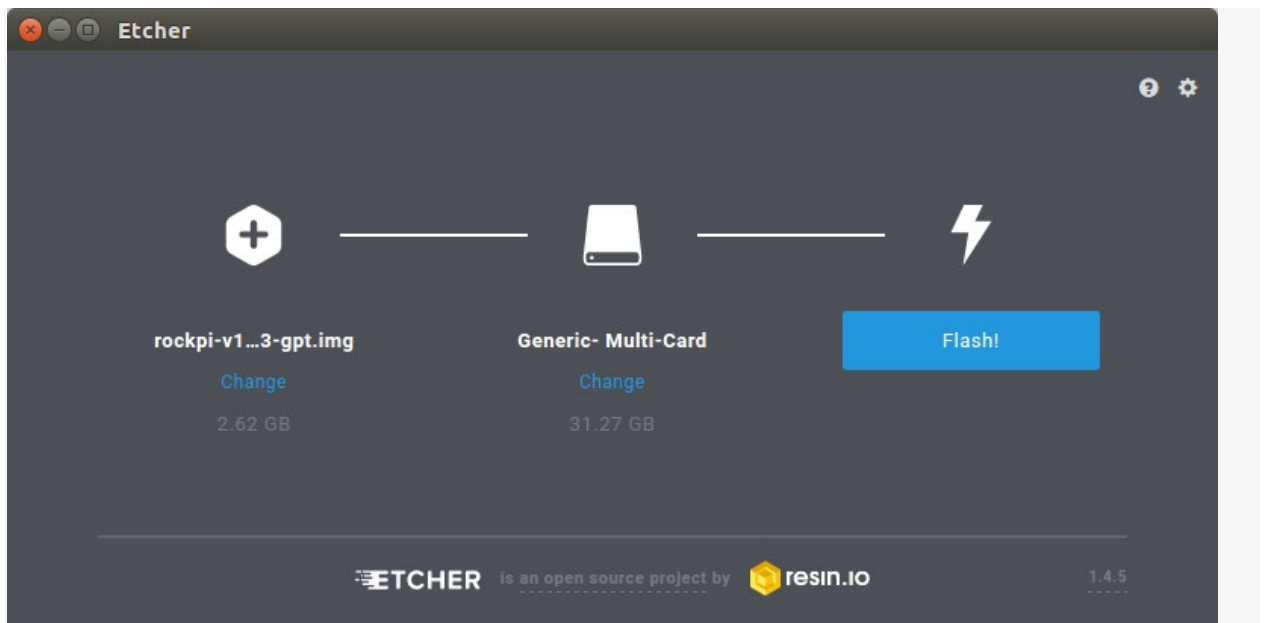
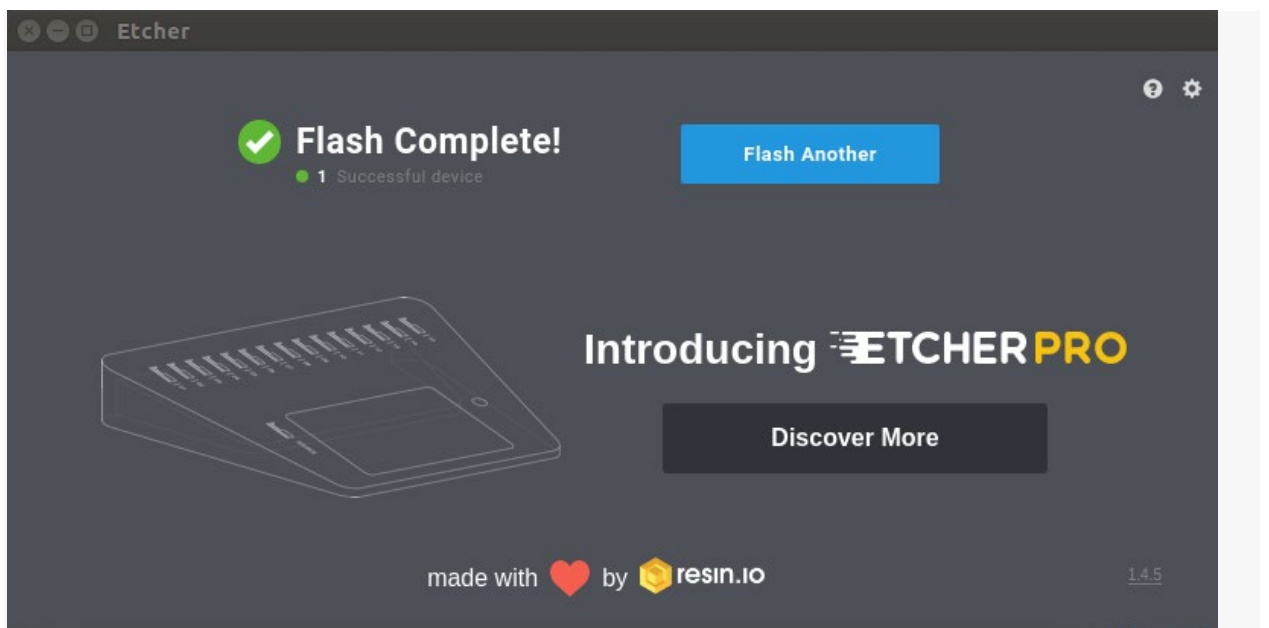- In the etcher window, click **Select image**.
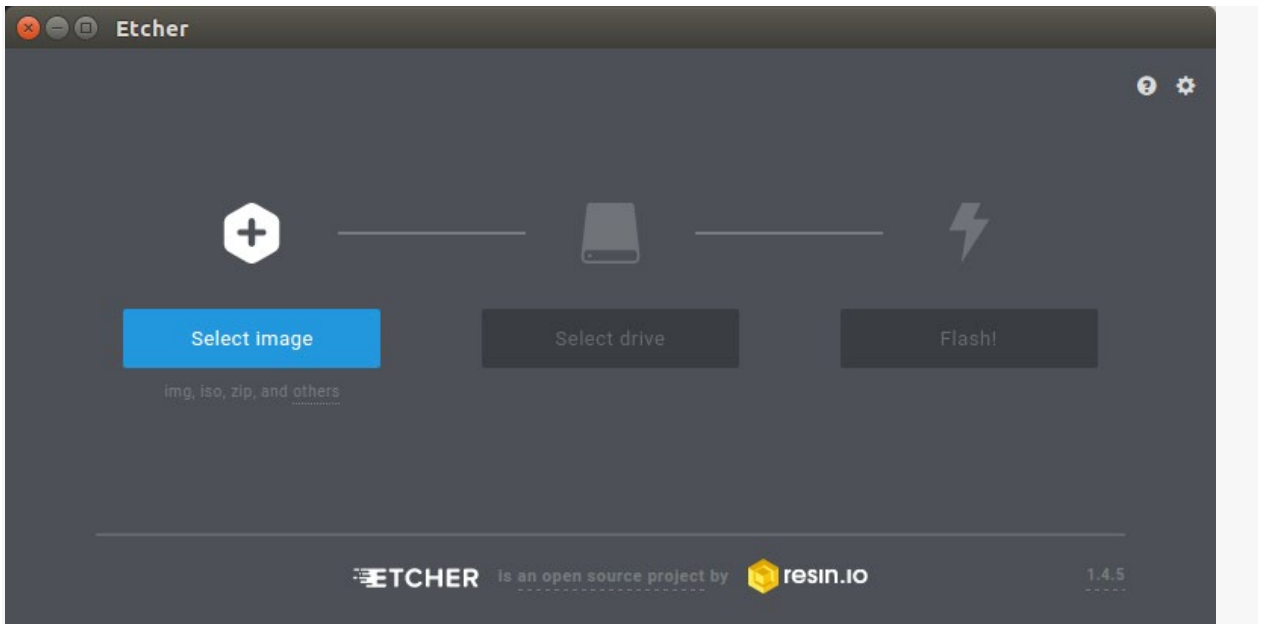
- In the etcher window, click **Select Drive**.



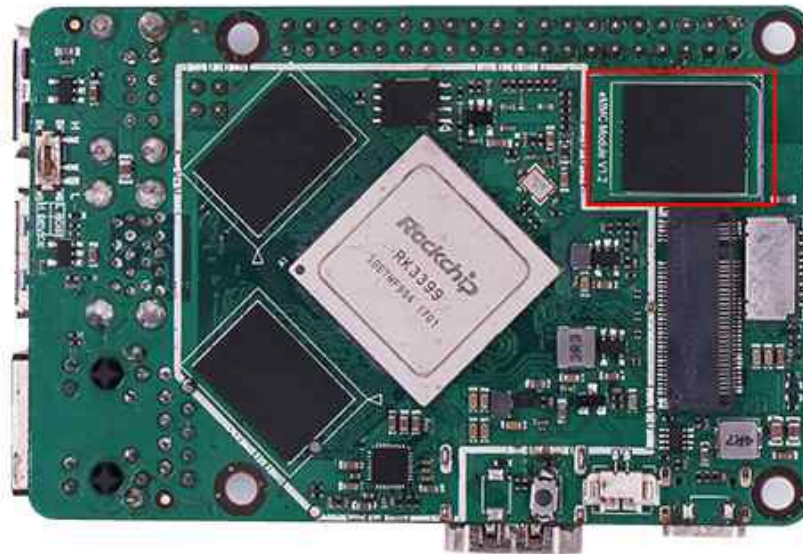- In the etcher window, click **Flash**.

- In the etcher window, once it shows us Flash Complete! It is done and can be put into the RockPi.



# Boot

- Now insert system storage media into the socket on board.
    - o Method of starting system with eMMC. The picture below shows.

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  - Methods of starting system with μSD Card. The picture below shows.

- Connect the ROCK Pi 4 to your display with the HDMI cable. Ensure that the source for the display is switched to the HDMI port you are using.
- Connect the USB keyboard and mouse.
- Connect the power supply to the ROCK Pi 4. The board will begin to immediately. (You might not see the boot sequence, on Ubuntu Server you will see the login prompt)

Wish you good luck!

# Troubleshooting

- Refer Troubleshooting page
- Post your issue on the forum: https://forum.radxa.com/c/rockpi4/Troubleshooting