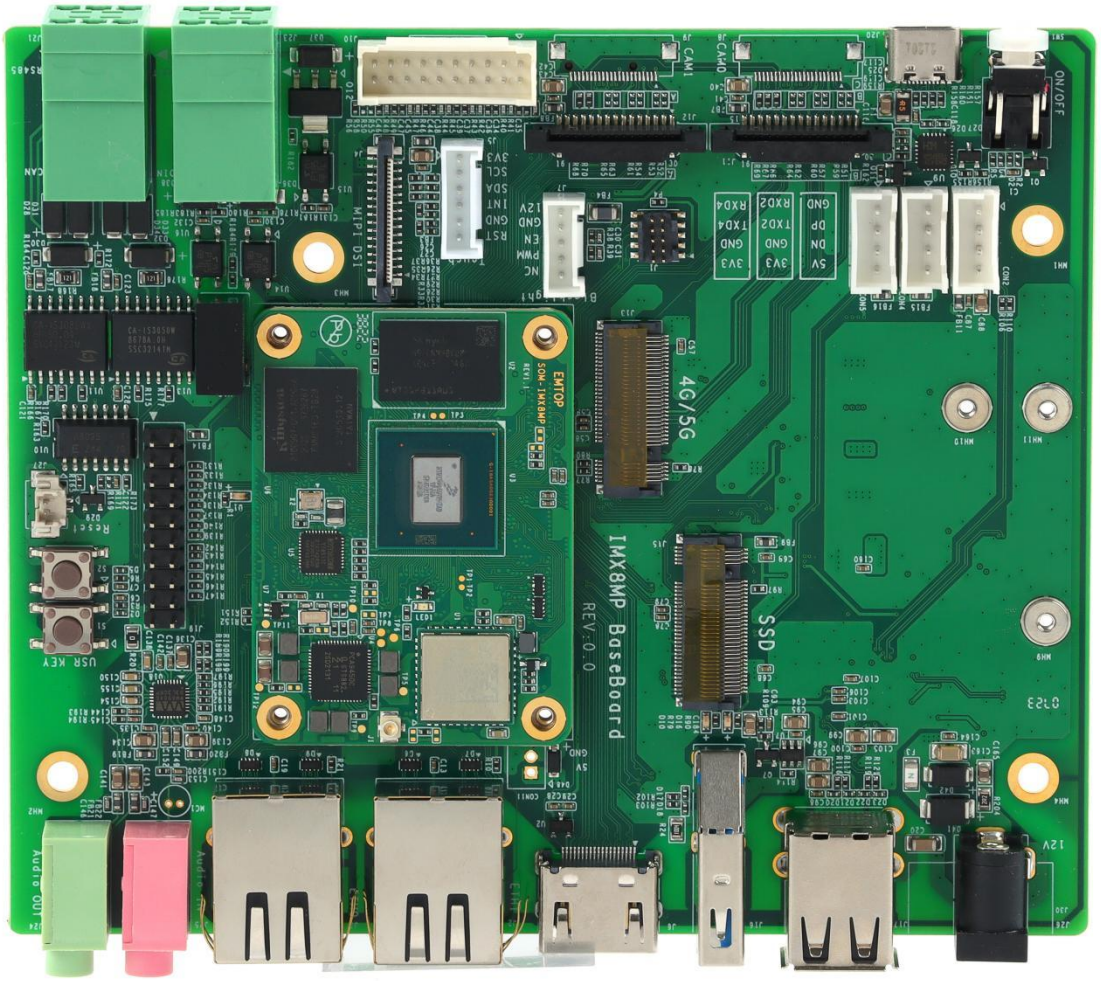
# SBC-IMX8MP Specification



# Revision History

| Date | Version | Description |
|---|---|---|
| 2023/5/31 | V1.0 | First Released |
| 2023/06/13 | V1.1 | Add Output device selecte method for Appendix |
| 2023/7/1 | V1.2 | Update Price |

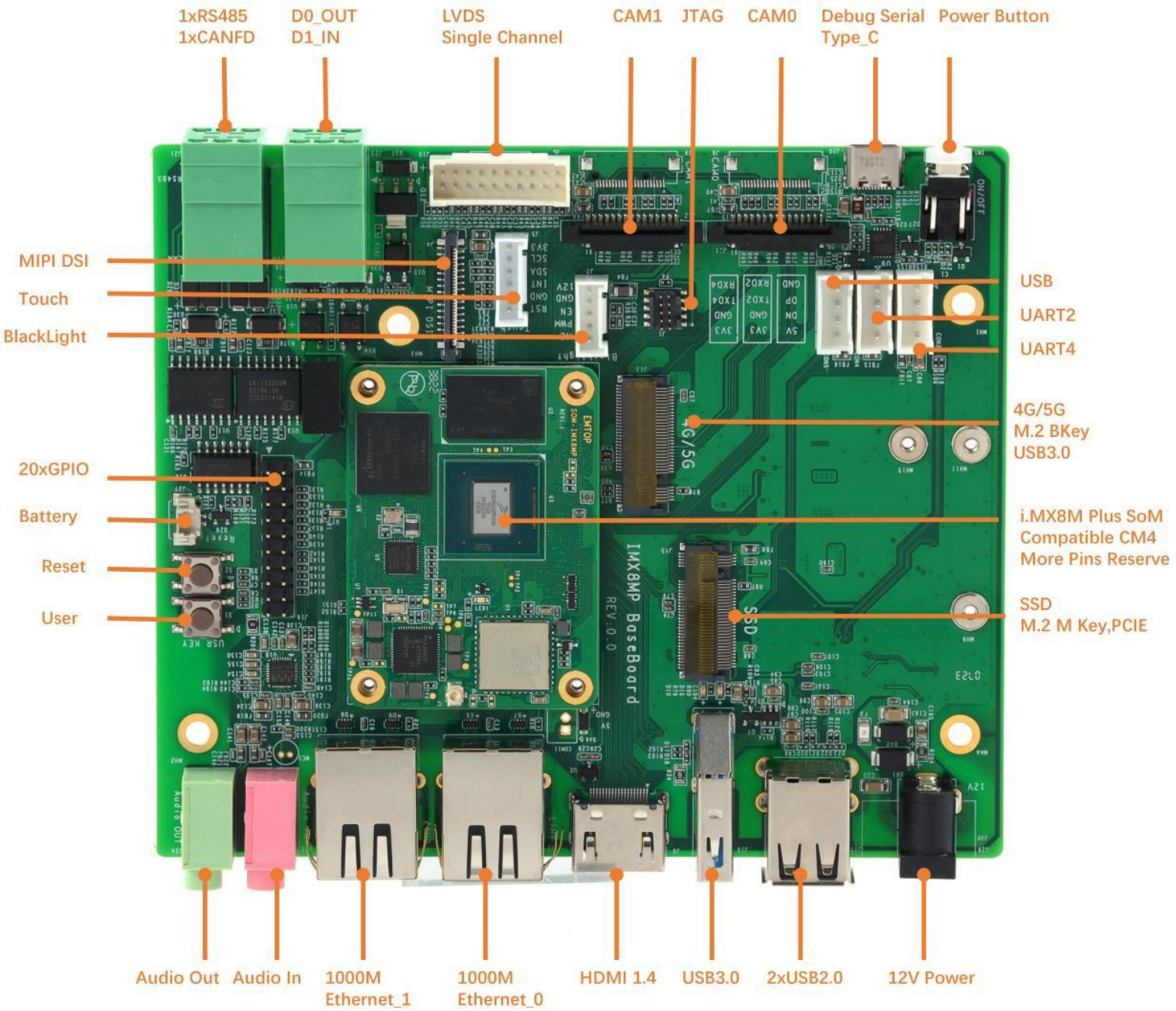
# 1 Overview:

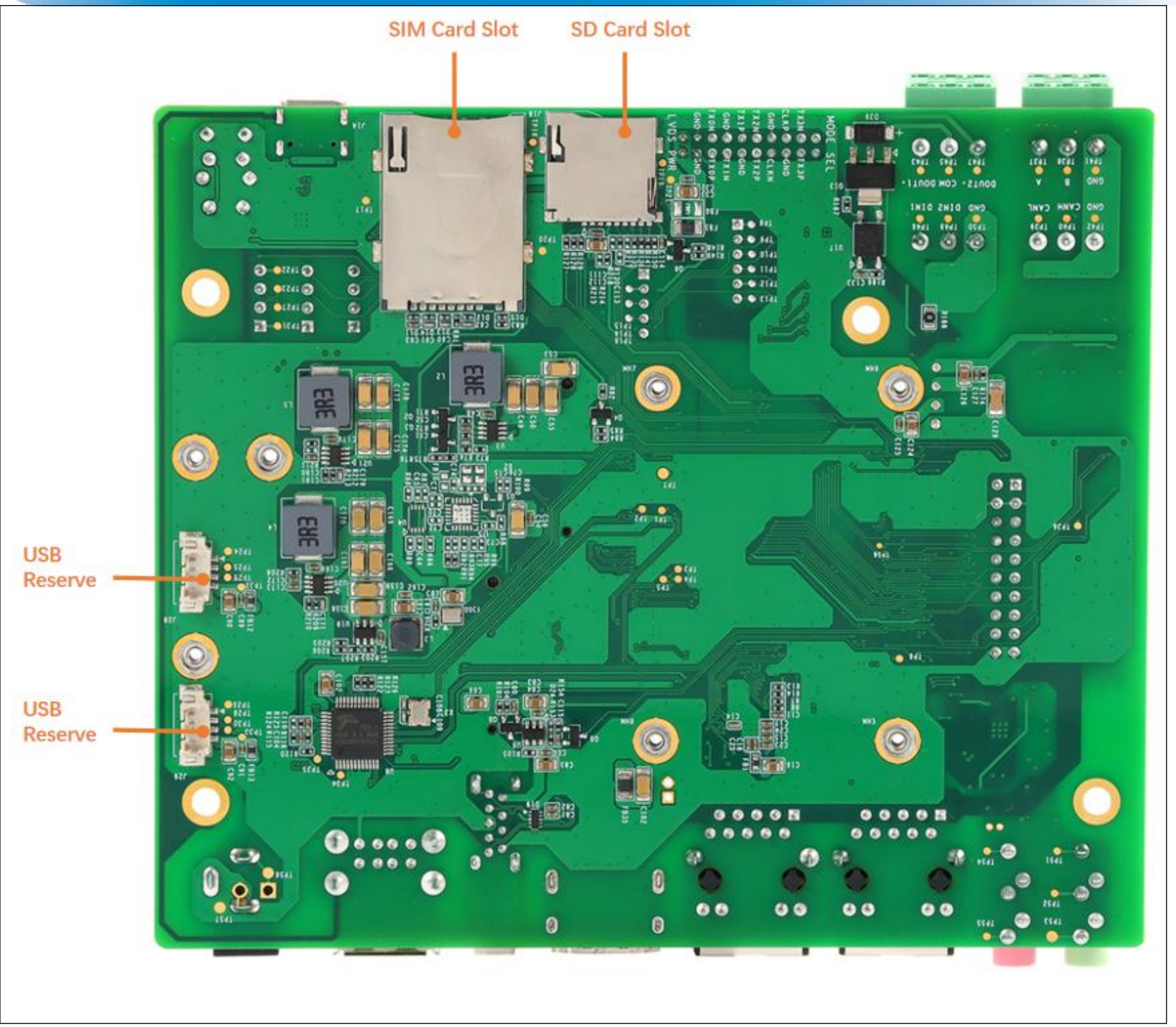
- The SBC-IMX8MP is Optimized for SOM-IMX8MP evaluation and software development, Including 1xSoM-IMX8MP And 1xCarrier Board, Implements industry standard interfaces and peripherals,Designed as reference for customer's carrier-boards bring products to market faster, built to meet the needs of industry 4.0, IoTs, smart cities and multimedia.
- Based on quad core i.MX 8M Plus up to 1.8GHz with 2.3 TOPS NPU,support 2GB/4GB/8GB LPDDR4,4-64GB EMMC.
- With complete software development including Yocto-L5.10.72_2.2.0 Wayland with Qt 6.3.1 and rich I/O ports is ready and capable for direct applications.Support 5G/SSD/LVDS/MIPI-Display With Touch/MIPI-CAMERA/Gigabit network With TSN

# 2 Highlight Features

- NXP i.MX8M Plus with 4 core 1.8 GHz or 1.6GHz Cortex-A53 processors
  - One 800MHz Cortex-M7 for real time requirements
  - Integrated 2.3 Tops AI/ML Neural Processing Unit accelerating ML inferencing
  - Advanced multimedia capabilities include 1080p60 video encode and decode (including H.265, H.264), 3D/2D graphic acceleration, and multiple audio and voice functionalities
- 2xGigabit network(1XTSN), 2.4GHz & 5GHz Wifi and Bluetooth 5.2,
- 2xMIPI CSI,1xMIPI-DSI,1xHDMI1.4,1xLVDS Single LANE
- 1xPCIE3.0,2xUSB 3.0 Host,2xUSB2.0Host
- 1xRS485/1XCANFD/14XGPIOS/2xDI/2XDO/2xTTL/1XDebug(USB To TTL)/1xIIC/1xBlackLight
- 1xRTC/1XUSER KEY/1XReset Key/1xON/OFF Key
- Support 5G M.2 Module
- Rich Add On Module
  - 4G/5G/7 INCH MIPI Display/OV5640 MIPI Camera/USB Camera/LVDS Display/

# 3 Hardware Specification




SIM Card Slot
SD Card Slot
USB
Reserve
USB
Reserve

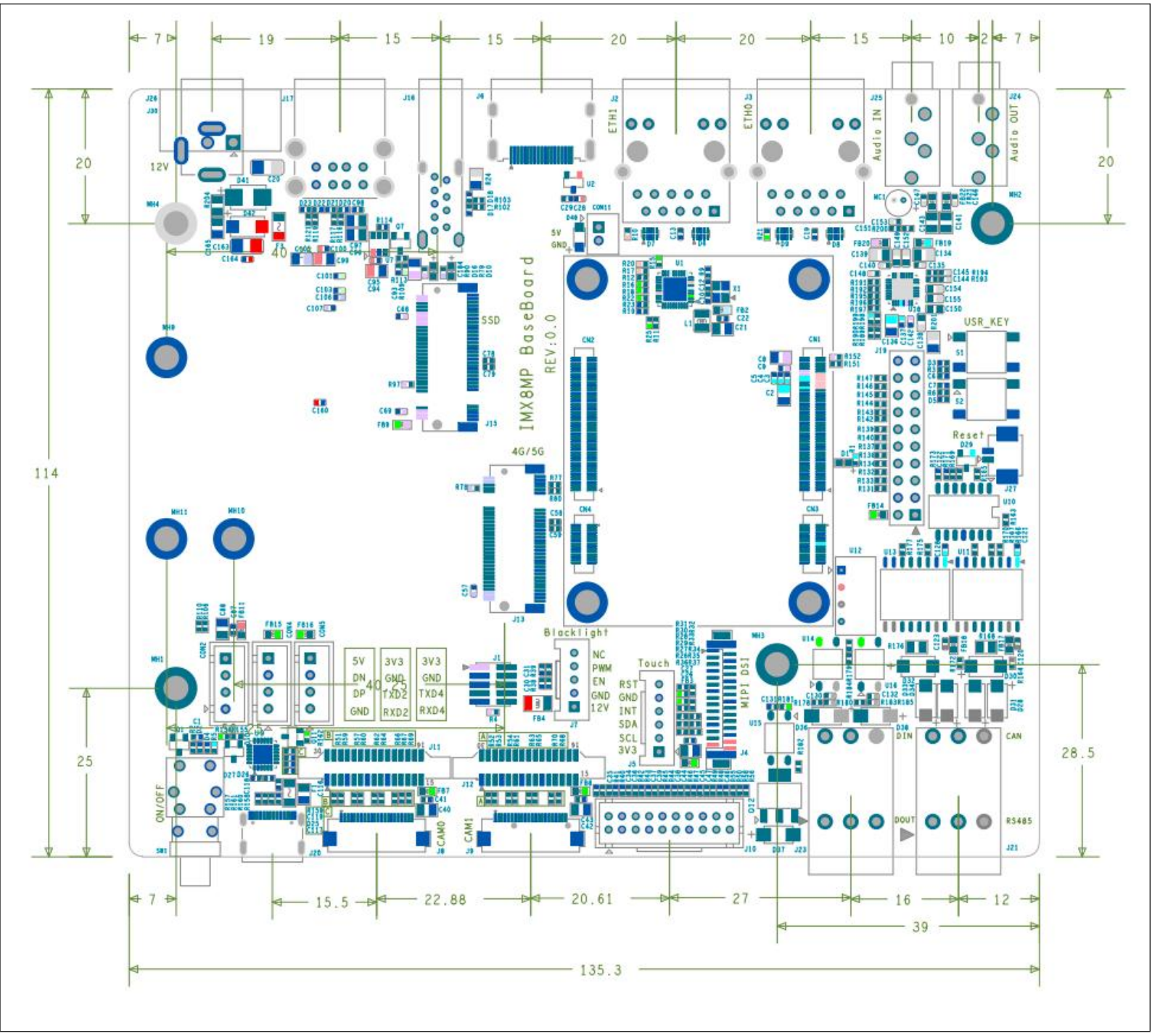
# Specification listed for the SBC-IMX8MP Starter Kit:

| | | |
|---|---|---|
| SoM Unit | CPU(IMX8M Plus): | ● 2x or 4x Cortex A53 up to 1.8GHz<br>● 1x Cortec M7 up to 800MHz<br>● 375 Mpixel/s HDR ISP<br>● GC7000UL with OpenCL and Vulkan support<br>● Video Decode and Encode<br>● Optional 2.3 TOP/s NPU |
| | Memory: | ● Up to 8GB LPDDR4 RAM (2GB default) |
| | Storage: | ● 4~64GB eMMC(16GB default) |
| | Connectivity: | ● WiFi/BT Combo<br>● 2x30Pin Double Row 0.4mm Pitch BTB<br>● 2x100Pin Double Row 0.4mm Pitch BTB |
| | Power supply: | 5V/2A typical |
| | Mechanical: | 55*40mm |
| Carrier Board Unit | Connectivity: | ● WiFi/BT Combo(on SOM)<br>● 2x GbE LAN port<br>● 1x RS485<br>● 1x CANFD<br>● 2xTTL<br>● 1xDubug<br>● 1x PCIe(M2 Key M) |
| | I/O Interfaces: | ● 14x GPIOs<br>● 2x DIN<br>● 2x DO |
| | USB: | ● 2x USB2.0 host<br>● 1x USB3.0 host<br>● 1x M2 Key B(USB3.0) |
| | Display: | ● 1x HDMI2.0a(1920 x 1080p60)<br>● 1x MIPI DSI<br>● 1x LVDS(single channel) |
| | Media: | ● 2x MIPI CSI<br>● Audio IN/Out |
| | Power supply: | ● 12V/2A typical |
| | Mechanical: | ● 135.3x113mm |

# 4 Software Specification

| Names | | Note | Formats |
|---|---|---|---|
| BOOTLOADER | U-BOOT | MMC/SD | Source Code |
| | | FAT | Source Code |
| | | NET | Source Code |
| KERNEL | LINUX-5.15.32 | Support JFFS2/EXT4/FAT/ NFS various of file syste m | Source Code |
| DEVICE DRIVER | PMIC | PCA9450CHN driver | Source Code |
| | SERIAL | Serials driver | Source Code |
| | RTC | Hardware RTC driver | Source Code |
| | NET | 10/100M/1Gbps Ethernet driver | Source Code |
| | CAN | CAN bus driver | Source Code |
| | SPI | SPI driver | Source Code |
| | MIPI-DSI | MIPI-DSI driver | Source Code |
| | HDMI | HDMI driver | Source Code |
| | I2C | I2C driver | Source Code |
| | LVDS | LCD driver | Source Code |
| | TOUCH SCREEN | I2C and TSC touch panel driver | Source Code |
| | MMC/SD | MMC/SD controller driver | Source Code |
| | USB HOST | USB HOST driver | Source Code |
| | AUDIO | WM8904 Audio driver(sup ports recording & playbac k) | Source Code |
| | BUTTON | GPIO button driver | Source Code |
| | LED | LED driver | Source Code |
| | BUZZER | Buzzer driver | Source Code |
| | CAMERA | CSI Camera driver | Source Code |
| | PCIe | PCIe interface driver | Source Code |
| ROOTFS | YOCTO | Wayland with Qt 6.3.1 | Image |

# 5 Mechanical Information



# 6 ADD On Module

| Item | Picture | Description |
|---|---|---|
| LCD-MIPI7C |  | 7 INCH MIPI Dislay Support Resolution 1024*600, Capacity Touch. |
| LCD-LVDS104 |  | 10.4 INCH LVDS Display |
| 5G Module |  | M.2 M Key 5G Module |
| 4G Module |  | M.2 M Key 4G Module |

| | | |
|---|---|---|
| **CAM-MIPI5640** |  | **500MP MIPI Camera With Sensor OV5640** |
| **CAM-MIPI219** |  | **800MP MIPI Camera With Sensor IMX219** |
| **CAM-OV5647** |  | **500MP MIPI Camera With Sensor OV5647** |

| | | |
|---|---|---|
| **512GB SSD** |  | 512GB SLC Cache 3D NAND TLC NVMe M.2 2280 PCIe Gen 3x4 Internal SSD Solid State Hard Drive Memory Card Read/Write Speed up to 3500/2200MB/s for Laptop PC Desktop ARM SBC Boards |
| **1TGB SSD** |  | 1T555555GB SLC Cache 3D NAND TLC NVMe M.2 2280 PCIe Gen 3x4 Internal SSD Solid State Hard Drive Memory Card Read/Write Speed up to 3500/2200MB/s for Laptop PC Desktop ARM SBC Boards |

# 7 Order Information

| Item Name | LPDDR4 | EMMC | WIFI/BT | Price@1k | Temp |
|---|---|---|---|---|---|
| SBC-IMX8MP-L216CW | 2GB | 16GB | Yes | USD139 | 0°C-70°C |
| SBC-IMX8MP-L216CW-I | 2GB | 16GB | Yes | USD169 | -45°C-85°C |

| | | |
|---|---|---|
| LCD-MIPI7C | ADD On Boards | USD59 |
| LCD-LVDS13 | ADD On Boards | USD99 |
| 5G Module | ADD On Boards | USD199 |
| 4G Module | ADD On Boards | USD59 |
| CAM-MIPI5640 | ADD On Boards | USD49 |
| CAM-MIPI219 | ADD On Boards | USD9.9 |
| CAM-OV5647 | ADD On Boards | USD9.9 |
| 512GB SSD | ADD On Boards | USD22 |
| 1TGB SSD | ADD On Boards | USD45 |

# 8 Packing List

- 1xSOM-IMX8MP---System On Module
- 1xCarrier Board---Carrier board of SBC-IMX8MP Fixed with SoM
- 1x12V@2A Power Adapter
- 1xUSB Type-C Cable--For serial Debug
- 1xethernet Cable--For SSH Debug
- 1xQuick Start Guide

# 9 Contact Information

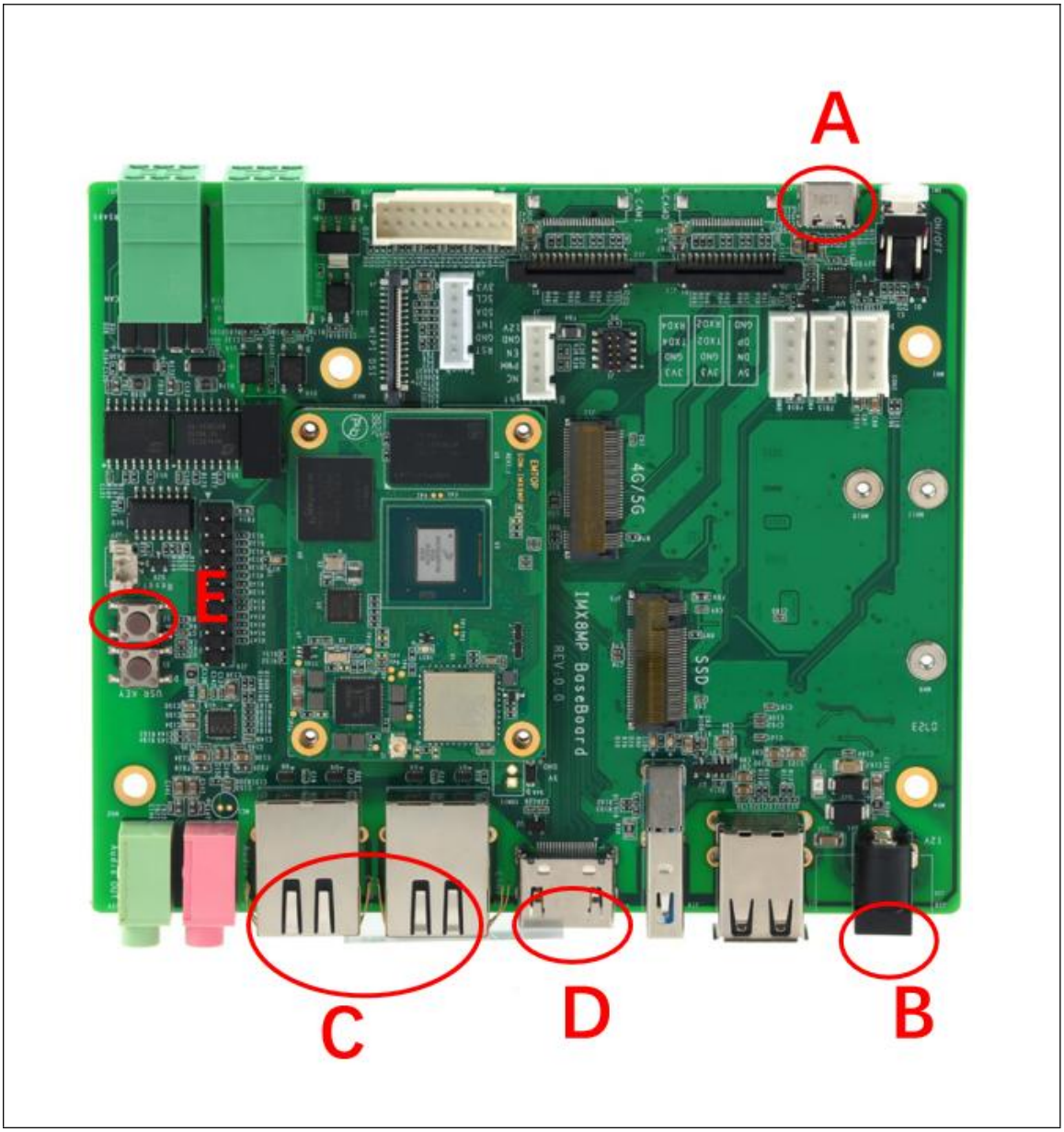
**sales@emtop-tech.com**
**support@emtop-tech.com**

# Appendix-Quick Start Guide

SBC-IMX8MP Support SSH or Serial to get debug information

- 1xSBC-IMX8MP Must
- 1x12V@2A Power Adapter Must
- 1xUSB Type C Cable (Connect to Serial Interface ) Must
- PC(Windows with Putty or other serial /SSH Tool)
- (Option) 1xHDMI Display, 1xEthernet Cable,1xMIPI-DSI Display

## Hardware Connection



| | |
|---|---|
| **A** | Debug Serial, Type-C Interface,Connector To your PC, Drivers will auto install. |
| **B** | 12V@2A Power Adapter |
| **C** | Option,Connect Ethernet cable to your router if you use SSH |
| **D** | Option,Connect to your hdmi display |
| **E** | If you wish to boot from tf card, Press S2 Reset before Power up |

# Make A Bootable TF Card

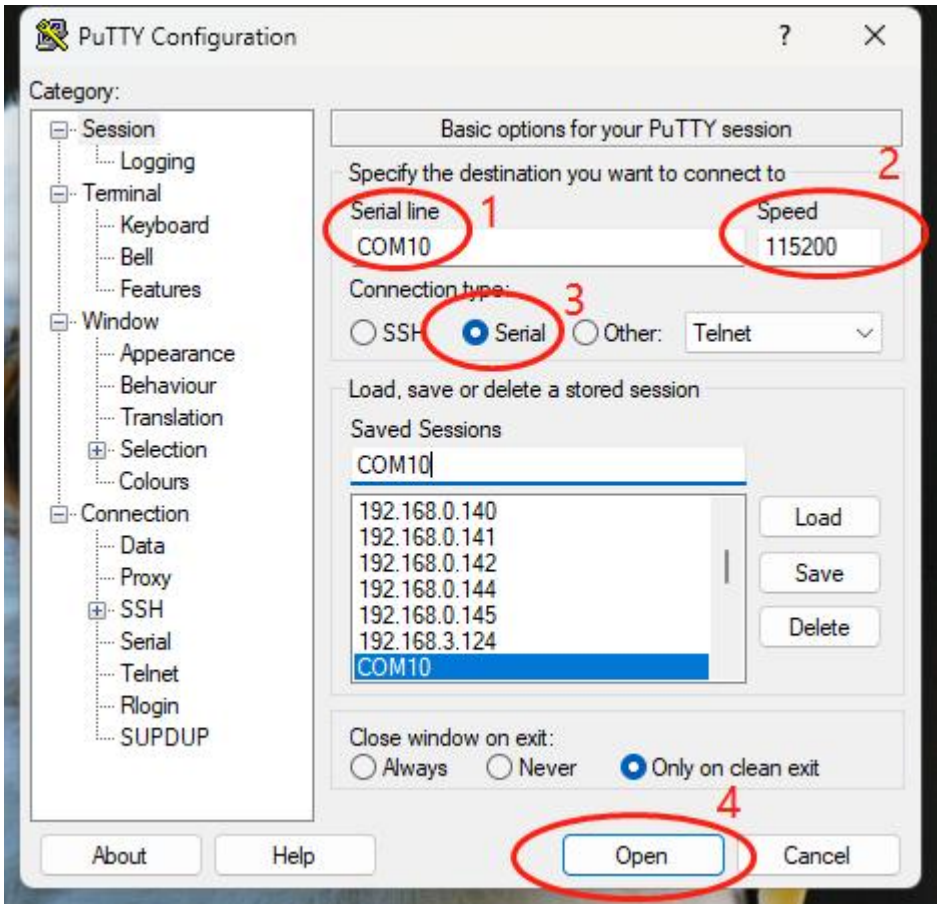
https://www.jianguoyun.com/p/DRcrVQYQ7L_aCRiR7ocFIAA
(Password : 4x4fhu)


Get the system image from Image directory, named as **IMX8MP-BASEBOARD-Yocto-SD-REVXX.img.xz**, unxz it and get the raw image **IMX8MP-BASEBOARD-Yocto-SD-REVXX.img**.
If you work under Windows system, please run Tools/win32diskimager to write the **IMX8MP-BASEBOARD-Yocto-SD-REVXX.img** into TF Card. If you work under Linux system, please use dd command to write it into TF Card.

Default output device is hdmi.

| Image Name | Display Supported |
|---|---|
| IMX8MP-BASEBOARD-Yocto-SD-REVXX.img | HDMI |

# Debug From Serial

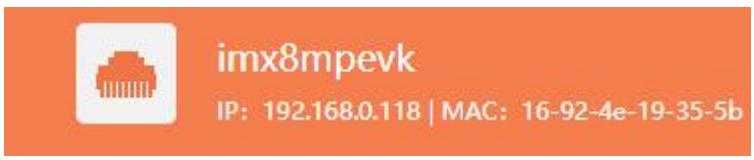



| | |
|---|---|
| 1 | After connect the type-c to your pc, check your device manager COM Number |
| 2 | Baud rate Choose as 115200 |
| 3 | Choose Serial |
| 4 | Open |

You can download drivers or serial/ssh Tools from our github link:
https://github.com/EMTOP-TECH/SOM-IMX8MP

# Debug From SSH

The Board default enable SSH,




**Password is:root**

# Output Device Select

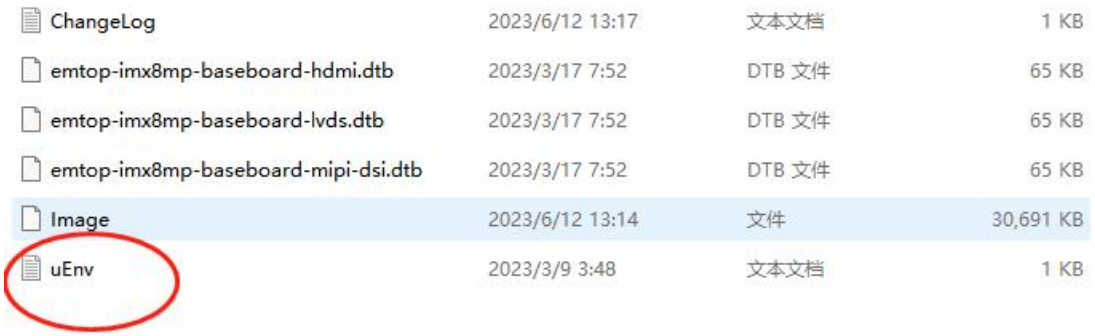
The board support **lvds/hdmi/mipi-dsi** 3 kinds of output device.

You can find below dtb file under TF/EMMC boot Partition

| | |
|---|---|
| emtop-imx8mp-baseboard-hdmi.dtb | Support HDMI Output |
| emtop-imx8mp-baseboard-mipi-dsi.dtb | Support MIPI-DSI Output |
| emtop-imx8mp-baseboard-lvds.dtb | Support LVDS Output |

## Select device Under Windows:

You can check the file u.Env.txt from the TF card boot Partition





Remove the #. means MIPI-DSI Output method enable.

## Selete Output device from board

System Boot up from EMMC

```
$sudo nano /run/media//mmcblk2p1//u.Env.txt
```

System Boot up from TF Card

```
$sudo nano /run/media/mmcblk1p1/uEnv.txt
```

Remark:

- Boot from emmc, the device is **/mmcblk2p1/**
- Boot from TF card, the device is **/mmcblk1p1/**