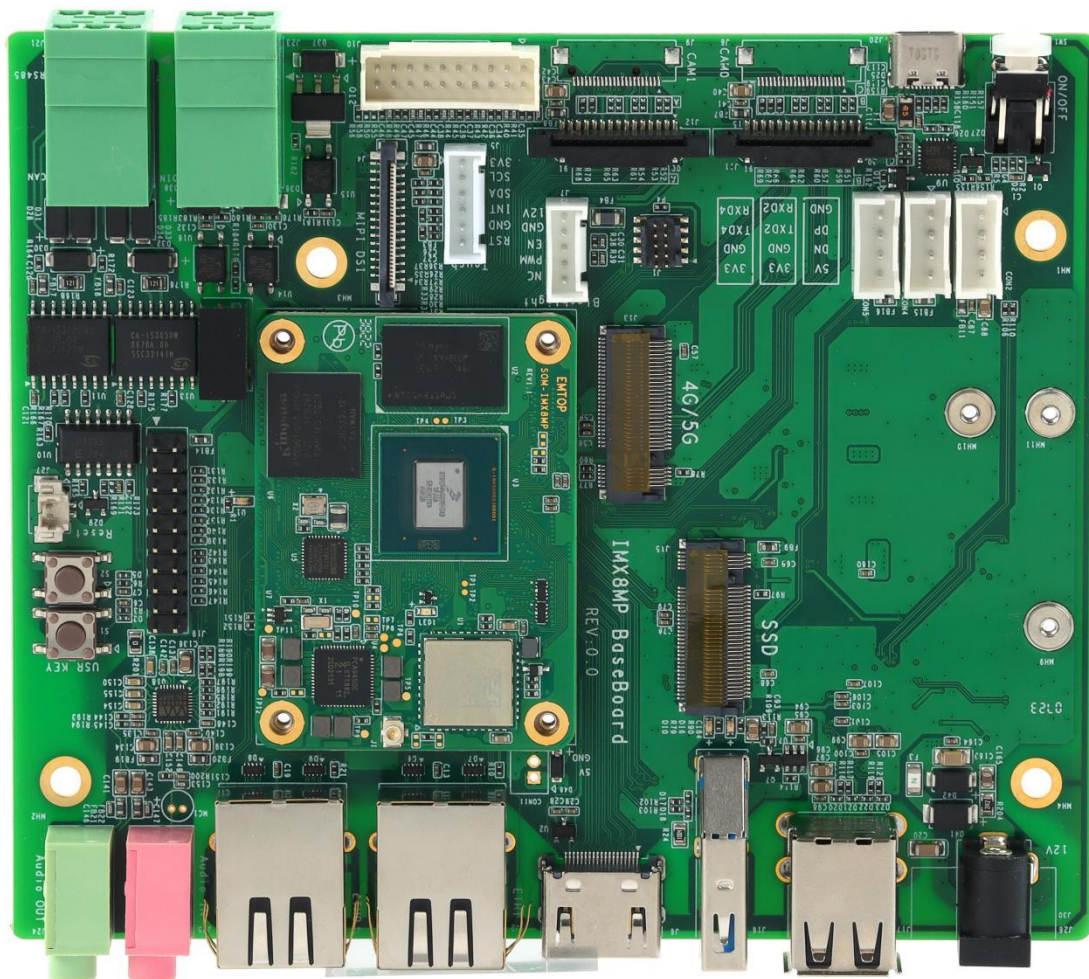


## SBC-IMX8MP Specification



## Revision History

Date	Revision	Change Details
2023/5/31	V1.0	First Released
2023/06/13	V1.1	Add Output device selecte method for Appendix

## Overview:

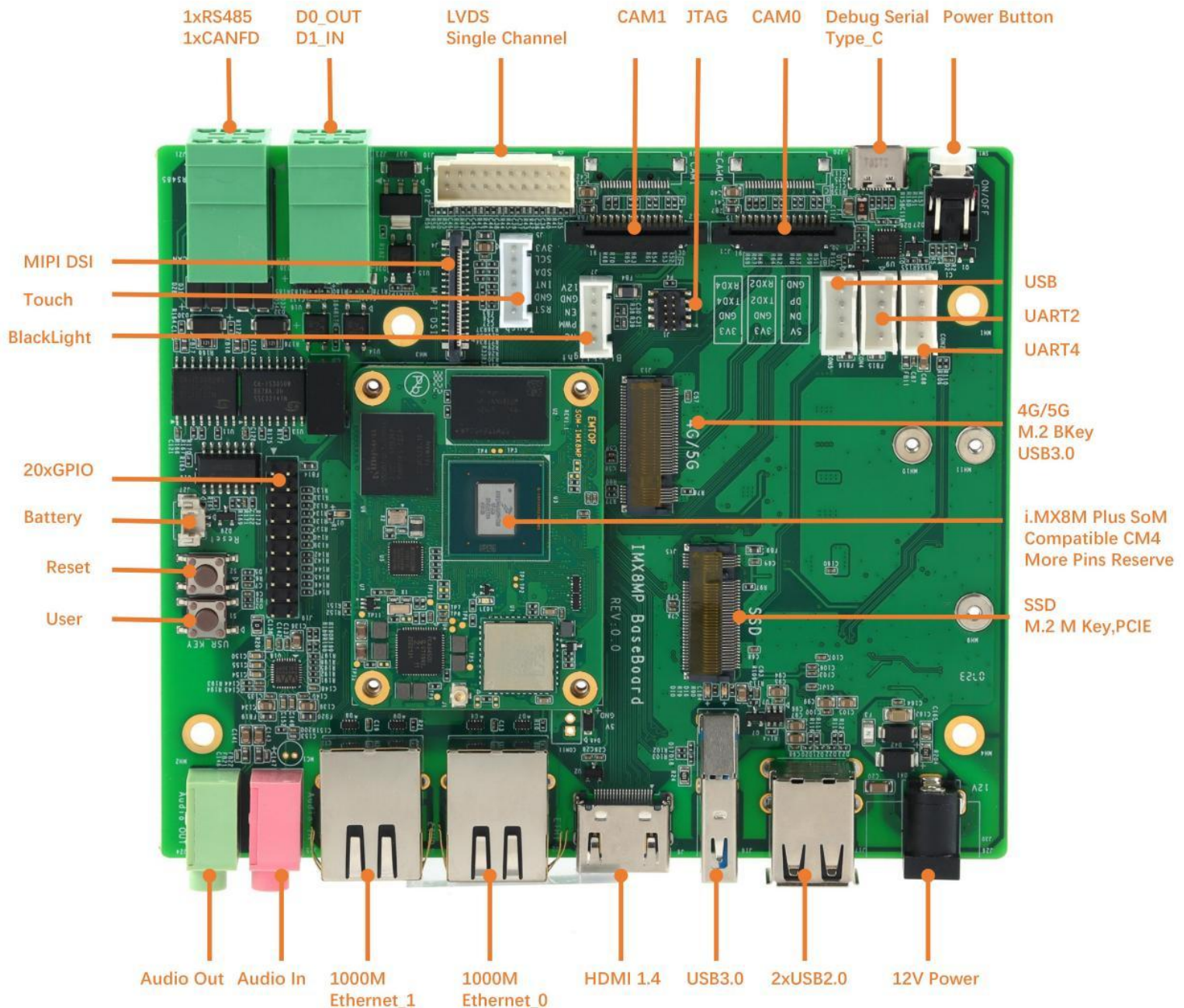
- The SBC-IMX8MP is Optimized for SOM-IMX8MP evaluation and software development, Including 1xSOM-IMX8MP And 1xCARRIER Board, Implements industry standard interfaces and peripherals, Designed as reference for customer's carrier-boards bring products to market faster, built to meet the needs of industry 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

## Highlight Features

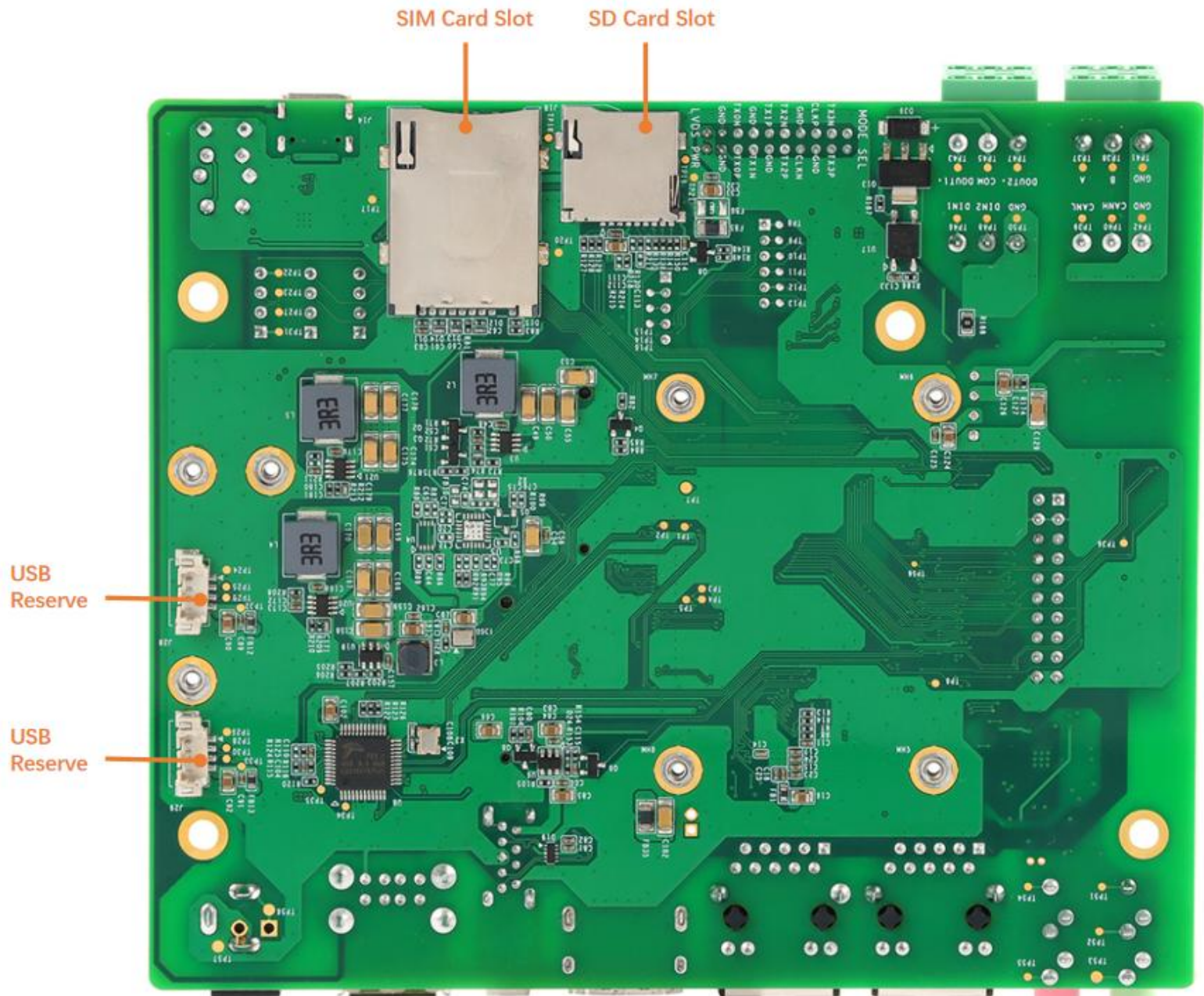
- NXP i.MX8M Plus with 4 core 1.8 GHz or 1.6GHz Cortex-A53 processors
  - One 800MHz Cortex-M7 for real time requirements
  - Integrated 2.3 Tops AI/ML Neural Processing Unit accelerating ML inferencing
  - Advanced multimedia capabilities include 1080p60 video encode and decode (including H.265, H.264), 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/

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# Hardware Specification







**Specification listed for the SBC-IMX8MP Starter Kit:**

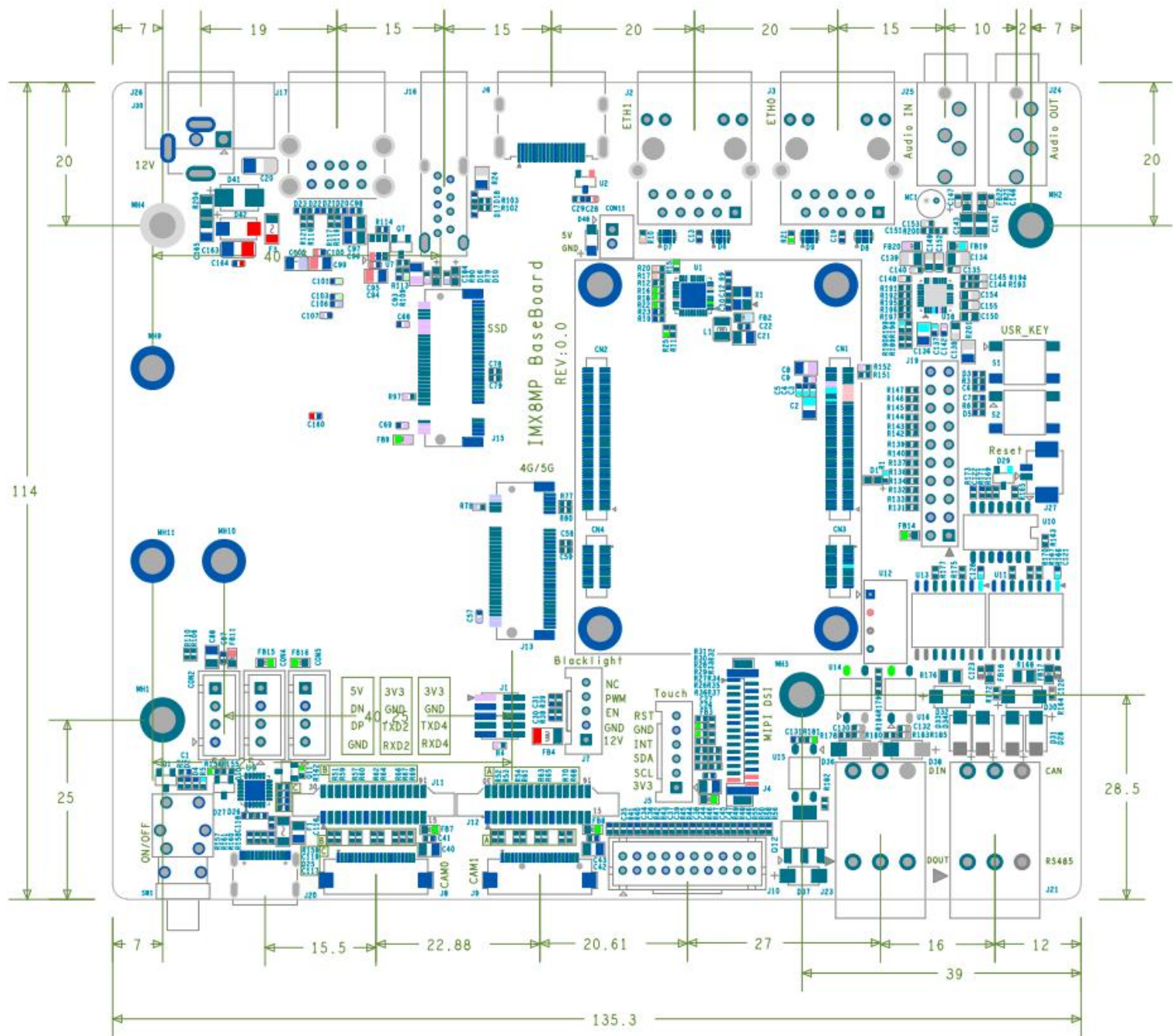
SoM Unit	CPU(IMX8M Plus):	<ul style="list-style-type: none"> <li>● 2x or 4x Cortex A53 up to 1.8GHz</li> <li>● 1x Cortec M7 up to 800MHz</li> <li>● 375 Mpixel/s HDR ISP</li> <li>● GC7000UL with OpenCL and Vulkan support</li> <li>● Video Decode and Encode</li> <li>● Optional 2.3 TOP/s NPU</li> </ul>
	Memory:	● Up to 8GB LPDDR4 RAM (2GB default)
	Storage:	● 4~64GB eMMC(16GB default)
	Connectivity:	<ul style="list-style-type: none"> <li>● WiFi/BT Combo</li> <li>● 2x30Pin Double Row 0.4mm Pitch BTB</li> <li>● 2x100Pin Double Row 0.4mm Pitch BTB</li> </ul>
	Power supply:	5V/2A typical
	Mechanical:	55*40mm
Carrier Board Unit	Connectivity:	<ul style="list-style-type: none"> <li>● WiFi/BT Combo(on SOM)</li> <li>● 2x GbE LAN port</li> <li>● 1x RS485</li> <li>● 1x CANFD</li> <li>● 2xTTL</li> <li>● 1xDubug</li> <li>● 1x PCIe(M2 Key M)</li> </ul>
	I/O Interfaces:	<ul style="list-style-type: none"> <li>● 14x GPIOs</li> <li>● 2x DIN</li> <li>● 2x DO</li> </ul>
	USB:	<ul style="list-style-type: none"> <li>● 2x USB2.0 host</li> <li>● 1x USB3.0 host</li> <li>● 1x M2 Key B(USB3.0)</li> </ul>
	Display:	<ul style="list-style-type: none"> <li>● 1x HDMI2.0a(1920 x 1080p60)</li> <li>● 1x MIPI DSI</li> <li>● 1x LVDS(single channel)</li> </ul>
	Media:	<ul style="list-style-type: none"> <li>● 2x MIPI CSI</li> <li>● Audio IN/Out</li> </ul>
	Power supply:	● 12V/2A typical
	Mechanical:	● 135.3x113mm

# 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 system	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(supports recording & playback)	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









## Mechanical Information






## ADD On Module

Item	Picture	Description
LCD-MIPI7C		7 INCH MIPI Dislay Support Resolution 1024*600, Capacity Touch.
LCD-LVDS13		13.1 INCH LVDS Display
5G Module		M.2 M Key 5G Module
4G Module		M.2 M Key 4G Module

<b>CAM-MIPi5640</b>		<b>500MP MIPI Camera With Sensor OV5640</b>
<b>CAM-MIPi219</b>		<b>800MP MIPI Camera With Sensor IMX219</b>
<b>CAM-OV5647</b>		<b>500MP MIPI Camera With Sensor OV5647</b>

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

## 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-MIP17C	ADD On Boards	USD59
LCD-LVDS13	ADD On Boards	USD49
5G Module	ADD On Boards	USD199
4G Module	ADD On Boards	USD59
CAM-MIP15640	ADD On Boards	USD49
CAM-MIP1219	ADD On Boards	USD9.9
CAM-OV5647	ADD On Boards	USD9.9
512GB SSD	ADD On Boards	USD22
1TGB SSD	ADD On Boards	USD45

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## 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

## Contact Information

**[sales@emtop-tech.com](mailto:sales@emtop-tech.com)**

**[support@emtop-tech.com](mailto:support@emtop-tech.com)**

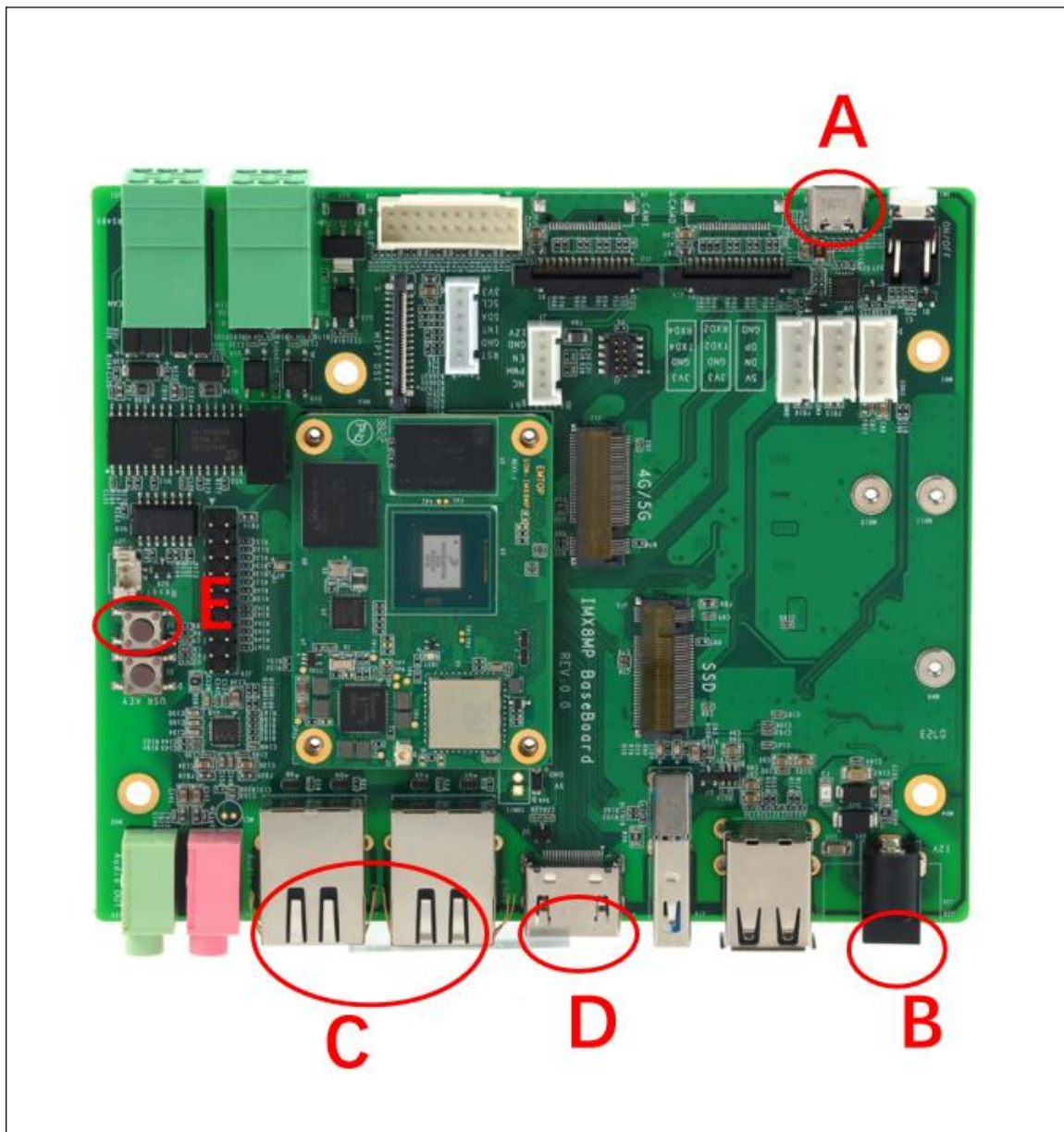
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## Appendix-Quick Start Guide

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



<b>A</b>	Debug Serial, Type-C Interface,Connector To your PC, Drivers will auto install.
<b>B</b>	12V@2A Power Adapter
<b>C</b>	Option,Connect Ethernet cable to your router if you use SSH
<b>D</b>	Option,Connect to your hdmi display
<b>E</b>	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](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.

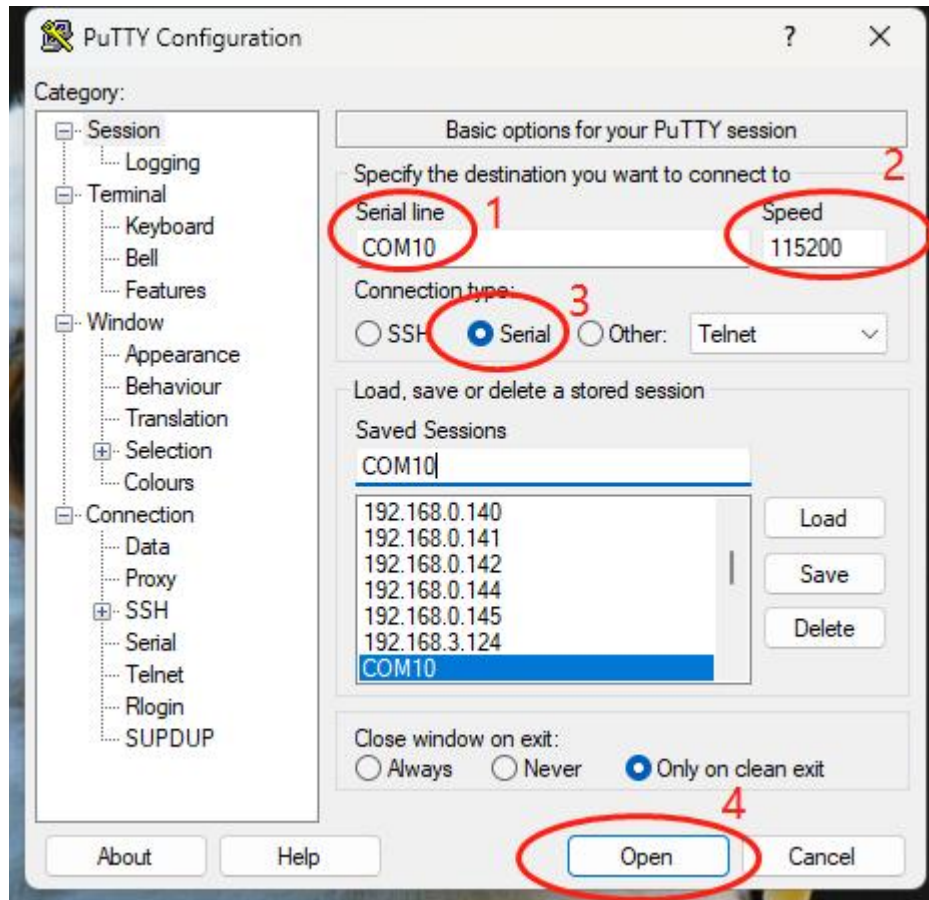
Default output device is hdmi.

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

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## Debug From Serial



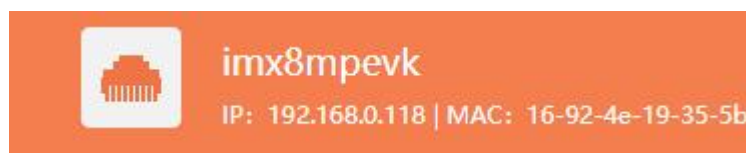
1	After connect the type-c to your pc, check your device manager COM Number
2	Baud rate Choose as 115200
3	Choose Serial
4	Open

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**

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## 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

ChangeLog	2023/6/12 13:17	文本文档	1 KB
emtop-imx8mp-baseboard-hdmi.dtb	2023/3/17 7:52	DTB 文件	65 KB
emtop-imx8mp-baseboard-lvds.dtb	2023/3/17 7:52	DTB 文件	65 KB
emtop-imx8mp-baseboard-mipi-dsi.dtb	2023/3/17 7:52	DTB 文件	65 KB
Image	2023/6/12 13:14	文件	30,691 KB
uEnv	2023/3/9 3:48	文本文档	1 KB

```
# fdtfile=emtop-imx8mp-baseboard-hdmi.dtb  
fdtfile=emtop-imx8mp-baseboard-mipi-dsi.dtb  
# fdtfile=emtop-imx8mp-baseboard-lvds.dtb  
|
```



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

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## 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/**

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