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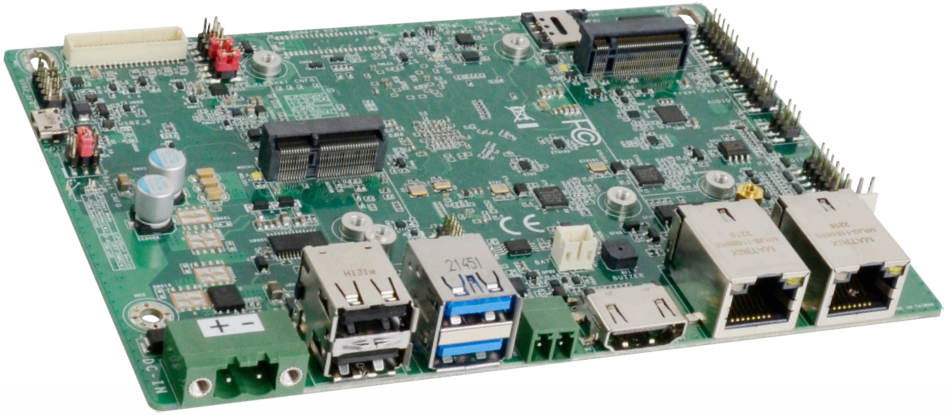

M8MP553

3.5" SBC Motherboard
User's Manual

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FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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About this Manual

This manual can be downloaded from the website.

The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

Warranty

1. Warranty does not cover damages or failures that arise from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

- To avoid damage to the system, use the correct AC input voltage range.
- To reduce the risk of electric shock, unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- 1 M8MP553 board
- 1 Terminal block for RS485 (COM3) 342-361021-000G
- 1 Heatsink (Height: 21mm) A71-008168-000G

Note: The items are subject to change in the developing stage.

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance with the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Before Using the System Board

When installing the system board in a new system, you will need at least the following internal components.

- Power adapter

External system peripherals may also be required for navigation and display, including at least a keyboard, a mouse and a video display monitor.

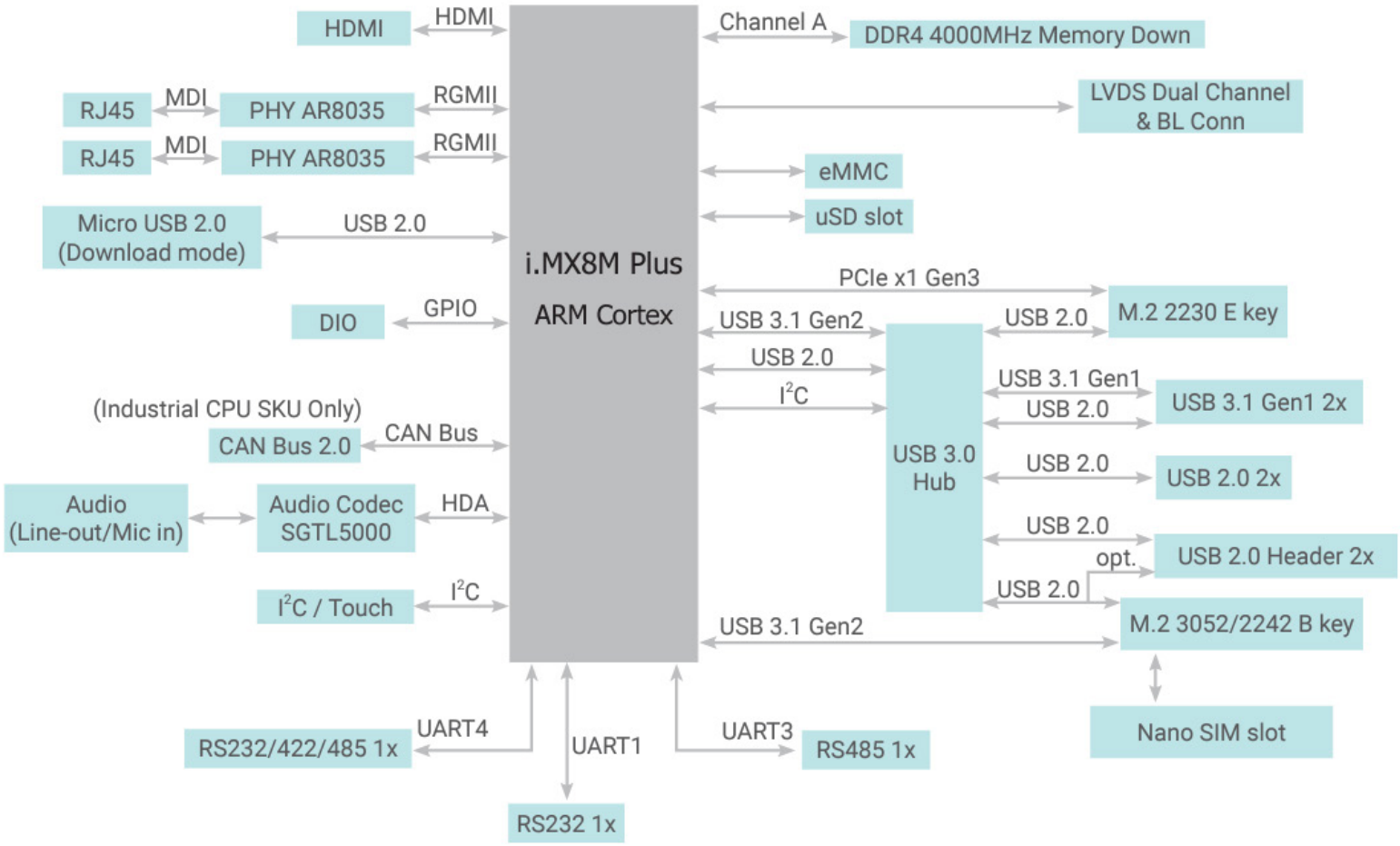
Chapter 1 - Introduction

▶ Specifications

System	**Processor**	i.MX 8M plus applications processors MIMX8ML6CVNKZAB (Industrial), Quad 1.6GHz, VPU/ISP/CAN FD, -40~105°C MIMX8ML3CVNKZAB (Industrial), Dual 1.6GHz, VPU/ML/ISP/CAN FD, -40~105°C	
	Memory	2GB/4GB/8GB LPDDR4 Memory Down	
Graphics	**Controller**	GC7000UL	
	Feature	HW Decode: 1080p60 H.265,H.264, VP9, VP8 HW Endcode: 1080p60 H.265,H.264	
	Display	1 x HDMI	HDMI: resolution up to 1920x1080@60Hz
		1 x LVDS	LVDS: resolution up to 1920x1200 @60Hz
	Dual Display	LVDS + HDMI	Android:support single output
Expension	**Interface**	1 x M.2 B key 3052/2242 (USB 3.1 Gen2/USB 2.0) 1 x M.2 E key 2230 (PCIe x1/USB 2.0) 1 x Nano SIM slot	
Audio	**Audio Codec**	Audio codec SGTL5000	
Ethernet	**Phy**	AR8035	
Rear I/O	**Ethernet**	2 x GbE (RJ-45)	
	Serial	1 x RS485 (2-wire)	
	USB	2 x USB 3.1 Gen1 2 x USB 2.0	
	Display	1 x HDMI	
Internal I/O	**Serial**	1 x RS232 1 x RS232/422/485 (2.0mm pitch)	
	USB	2 x USB 2.0 (2.00mm pitch, the 2nd USB is shared with M.2 B-key by default) 1 x Micro USB 2.0 (Download mode)	
	Display	1 x LVDS LCD Panel connector 1 x LCD/Inverter Power	
	Audio	1 x Audio (Line-out/Mic-in)	
	SD	1 x uSD card	
	DIO	1 x 8-bit DIO	
	I^2C	1 x I^2C / Touch	
	CANBus	2 x CAN bus 2.0b on Industrial CPU sku	
Storage	**eMMC**	1 x eMMC 5.1 with default 16GB (up to 64GB)	
Watchdog Timer	**Output & Interval**	System Reset, Programmable via Software from 1 to 255 Seconds	

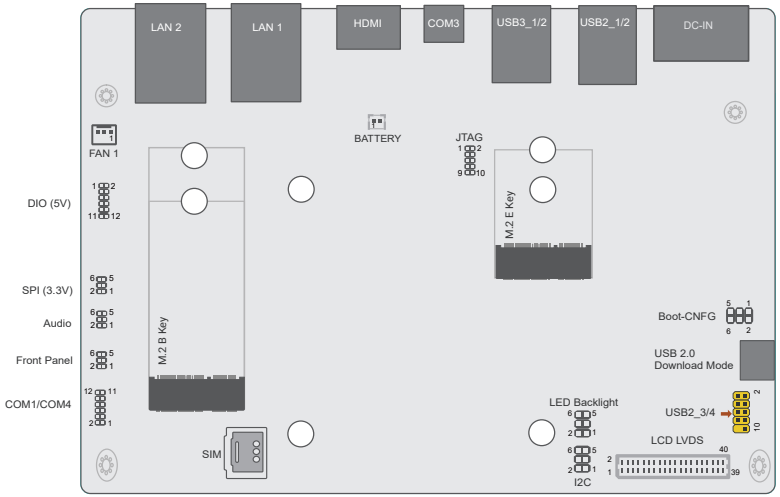
Power	**Type**	Wide Range 9~36VDC **Note1: Support 9V~24VDC in -30~80 °C operating temperature.** **Note2: Support 36VDC within 70 °C operating temperature.**	
	Connector	2-pole terminal block (default) Co-lay 4-pin vertical power connector	
	Consumption	Typical: i.MX 8M Plus Quad, 12V, 3.6Watt Max.: i.MX 8M Plus Quad, 12V, 5.28Watt	
	RTC Battery	CR2032 Coin Cell	
OS Support	**Linux**	Linux Yocto 3.0 (default): 770-8MP5532-300G Linux Yocto 5.0 (default, min. 4GB LPDDR4): 770-8MP5532-200G, 770-8MP5532-400G	
	Debian	Debian 12 (upon request, min. 8GB LPDDR4)	
	Android	Android 10 (upon request)	
	Note: Memory requirement is listed only for OS versions with a minimum capacity limit. **Unless otherwise specified, all LPDDR4 SKUs are supported.** **Please refer to the ordering information below for the memory capacity of each part number.**		
Environment	**Temperature**	Operating: -30 to 80 °C	Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH	Storage: 5 to 90% RH
	MTBF	i.MX 8M Plus Quad (Industrial): 632,710 hrs @ 25°C; 386,370 hrs @ 45°C ; 252,204 hrs @ 60°C; 138,544 hrs @ 80°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled	
Mechanism	**Dimensions**	3.5" SBC Form Factor	146mm (5.75") x 102mm (4.02")
	Height	PCB: 1.6mm	
		Top Side: 15mm	
		Bottom Side: 4mm	
Standards and Certifications	**Certifications**	CE, FCC, RoHS	

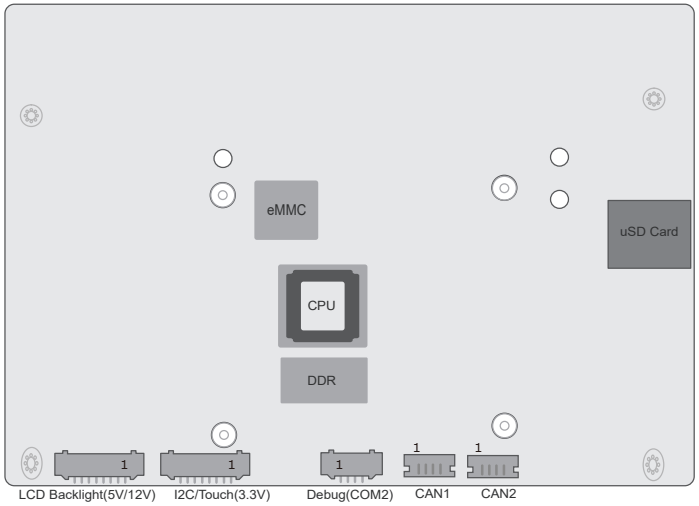
▶ Block Diagram



Chapter 2 - Hardware Installation

▶ Board Layout





Note:

Some components are optional and only available upon request.

Important:

Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

▶ **CPU**

Installing the Heat Sink

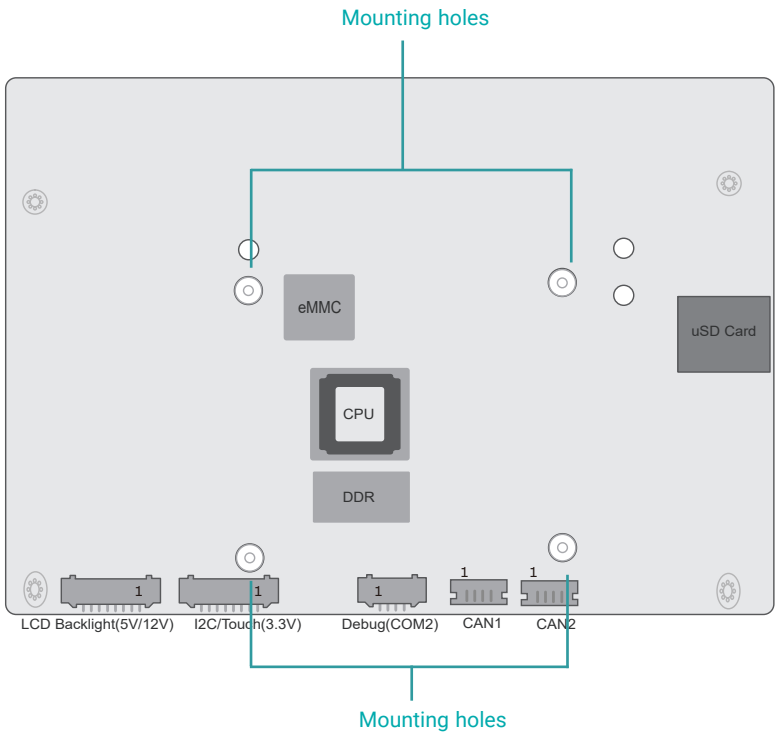
The CPU must be kept cool by using a heat sink, otherwise the CPU will overheat damaging both the CPU and system board.

1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

   Some heat sinks come with a patch of pre-applied thermal paste. Do not apply thermal paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

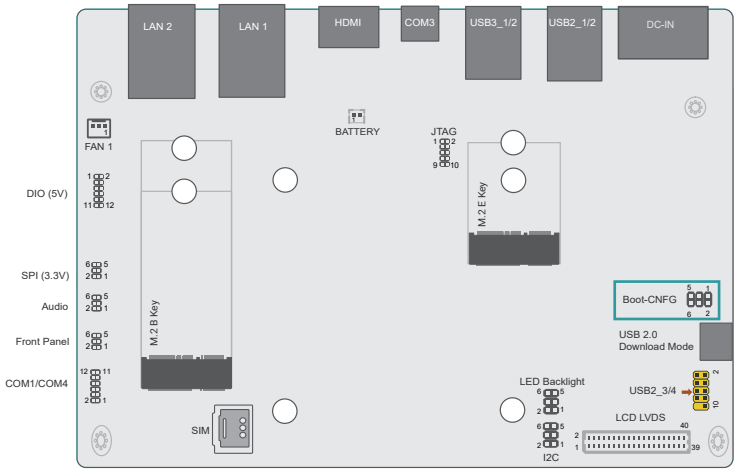
2. Place the heat sink on top of the CPU. The 4 spring screws around the heat sink, which are used to secure the heat sink onto the system board, must match the 4 mounting holes around the board.

3. Screw tight two of the spring screws at opposite corners into the mounting holes. And then proceed with the other two spring screws.



▶ Jumper Settings

Boot-CNFG (JP1)



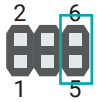
The JP1 is used to determine the boot configuration.

*** Pin #3, #4 is NC.**

Boot Mode

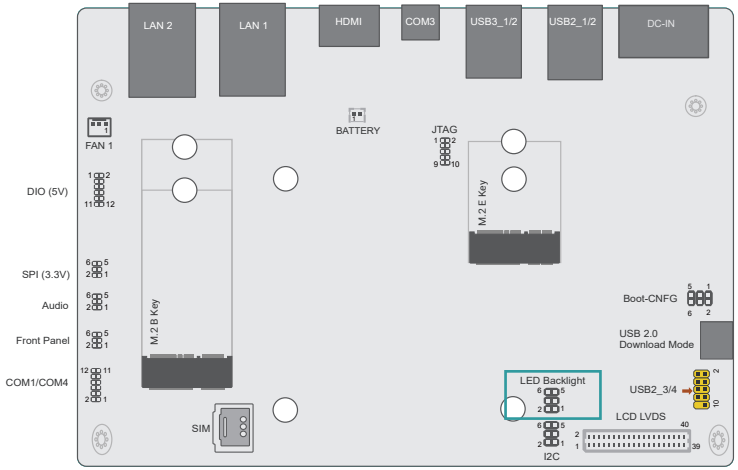
- 1-2 Off: Internal Boot (default)
- 1-2 On: Serial Downloader

Boot Device



- 5-6 Off: EMMC (default)
- 5-6 On: uSD

LED Backlight (BLJP1)

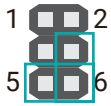


This jumper is used to select the voltage level and power level of LED Backlight: +5V or +3.3V for voltage and +12V or +5V for power.

Control Signal Voltage

- 1-2 On: 3.3V (Default)
- 1-3 On: 5V

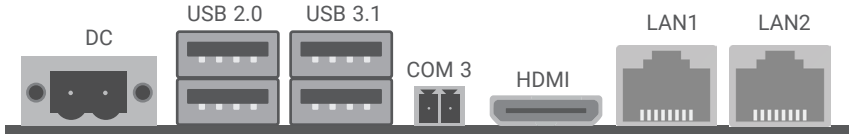
Backlight Power



- 5-6 On: Backlight Power 12V (default)
- 4-6 On: Backlight Power 5V

▶ External I/O Ports

Rear



Side

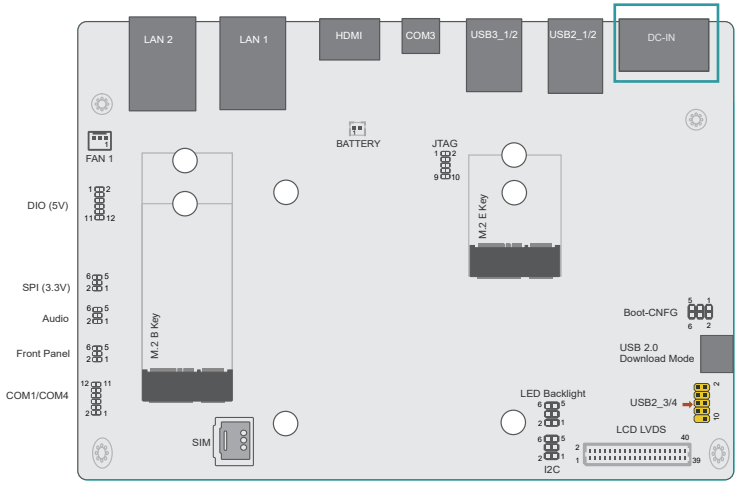
Side

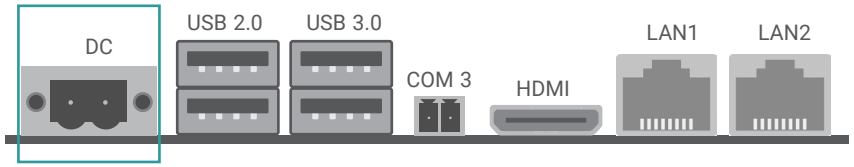
The external I/O ports consist of the following:

- 1 DC-in 2-poles Terminal Block
- 2 USB 3.1
- 2 USB 2.0
- 2 LAN
- 1 COM 3
- 1 HDMI
- Micro USB
- uSD

▶ **External I/O Ports**

9~36V DC-in (CN14)





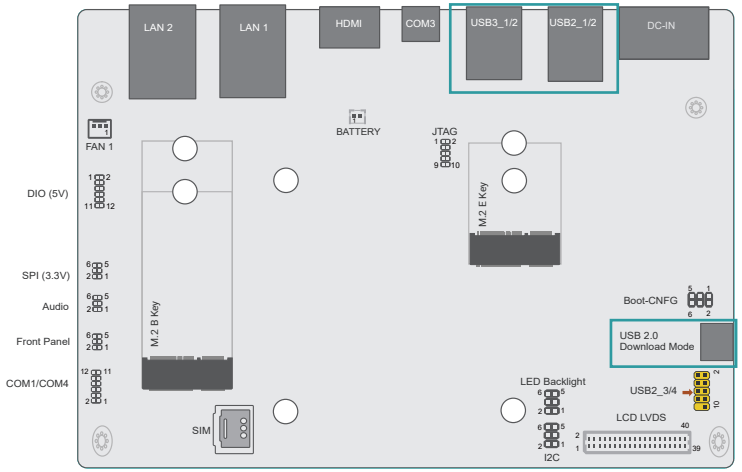
This 2-poles terminal block is considered a low power solution. Connect a DC power cord to this terminal block. Using a voltage more than the recommended range may fail to boot the system or cause damage to the system board.

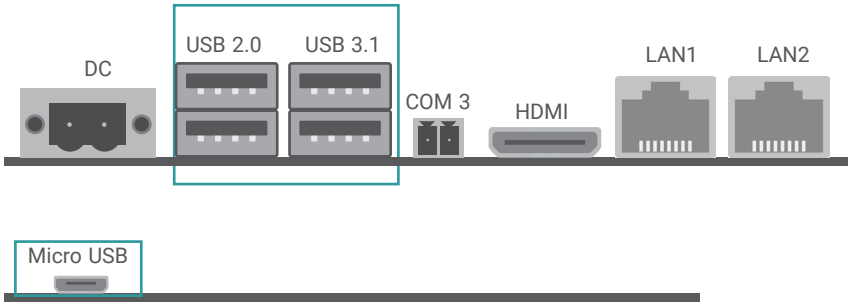
Important:

4 pin vertical power connector is available upon request.

▶ **External I/O Ports**

USB 2.0/3.1 & Micro USB (UBCN2 / UBCN1 & UBCN3)

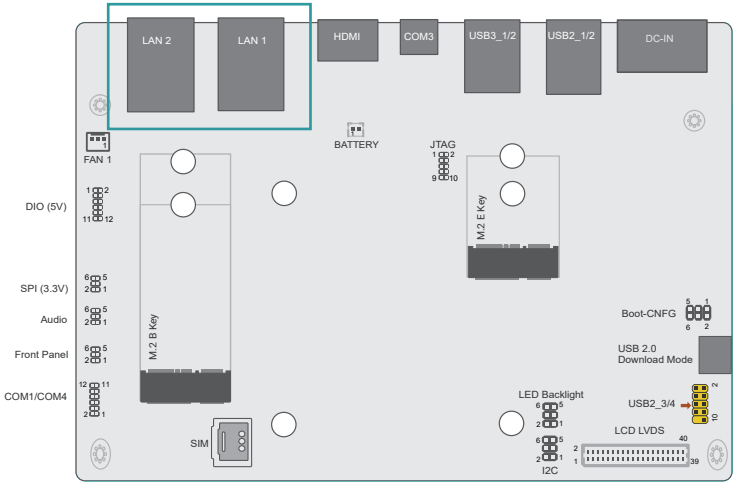


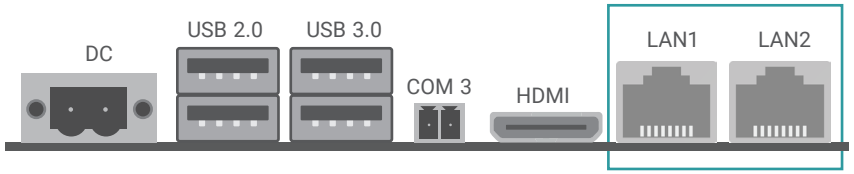


USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

▶ **External I/O Ports**

LAN1 / LAN2 (ETCN1 / ETCN2)

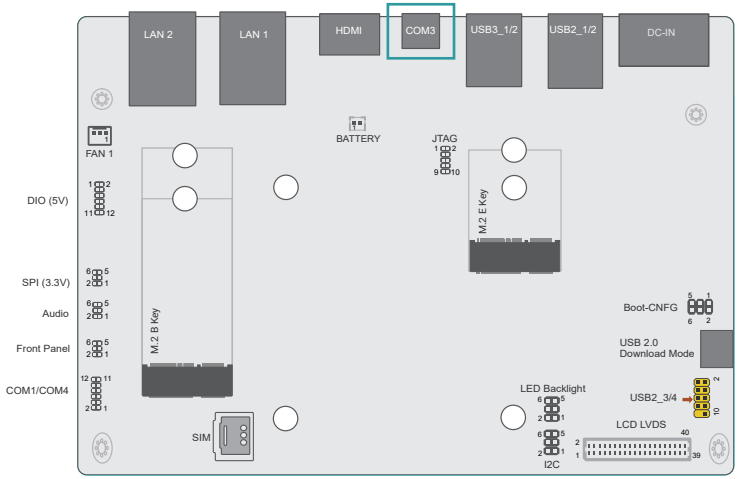


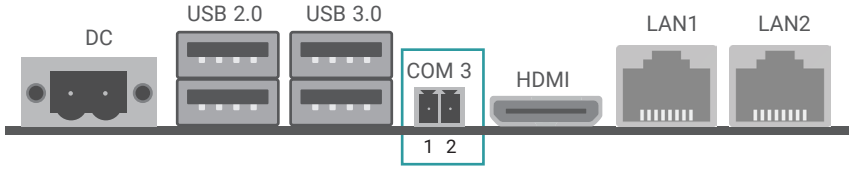


The onboard RJ45 LAN port allows the system board to connect to network by ethernet.

▶ **External I/O Ports**

COM 3 (TSCN1)



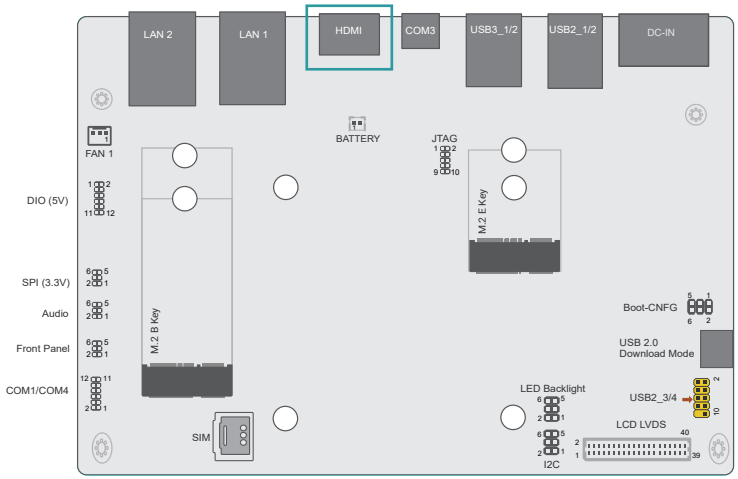


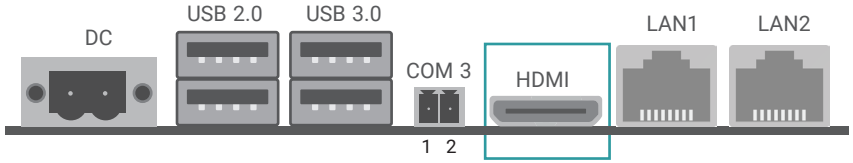
The COM 3 port provides 2-wire RS485 communication with support for auto flow control.

Pin	Assignment
1	DATA-_RS485
2	DATA+_RS485

▶ **External I/O Ports**

HDMI (DPCN1)

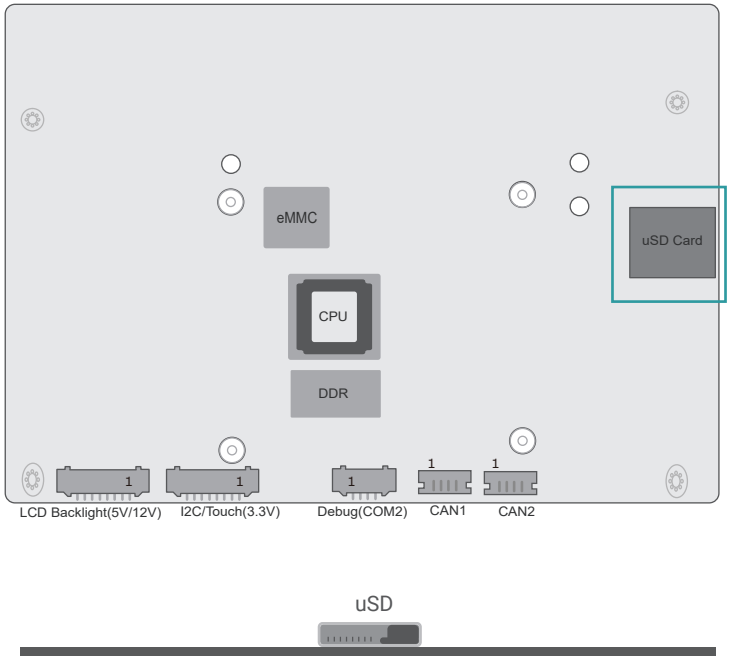




The HDMI port which carries both digital audio and video signals is used to connect a LCD monitor or digital TV.

▶ **External I/O Ports**

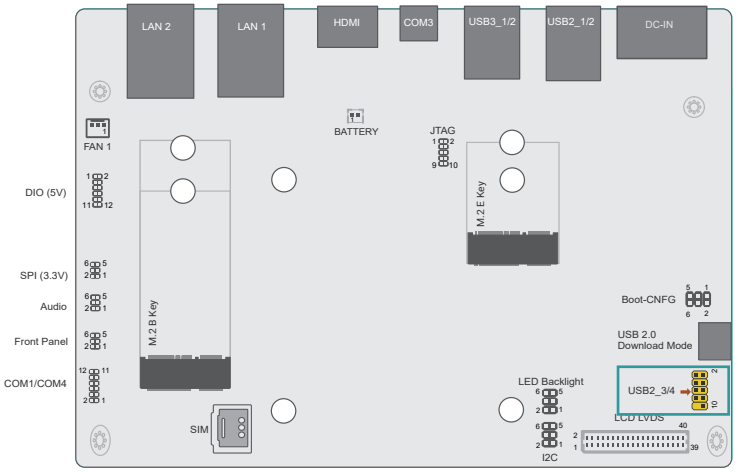
uSD Slot (SDCN1)



This slot is for a MicroSD card.

▶ Internal I/O Connectors

USB2_3/4 (UBJ1)

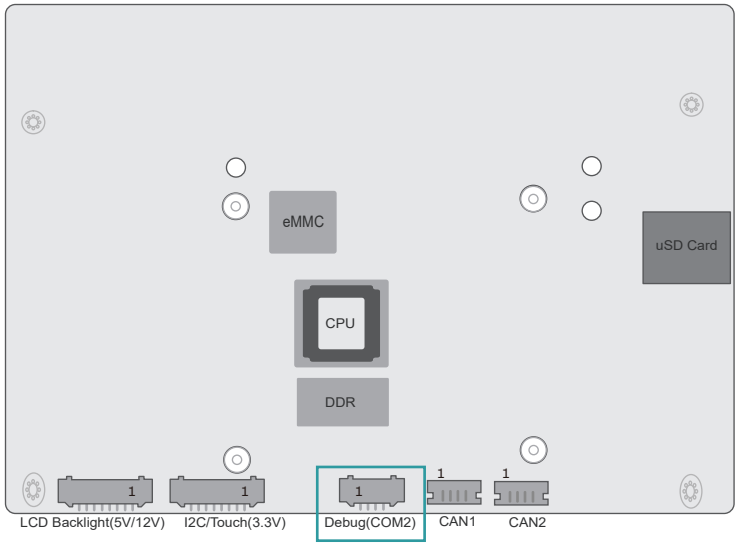


The USB device allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The internal USB pin headers may be connected to a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

Pin	Assignment	Pin	Assignment
1	VCC	2	VCC
3	DATA -	4	DATA -
5	DATA+	6	DATA+
7	GND	8	GND
9	---	10	---

Debug Port (COM2, J10)

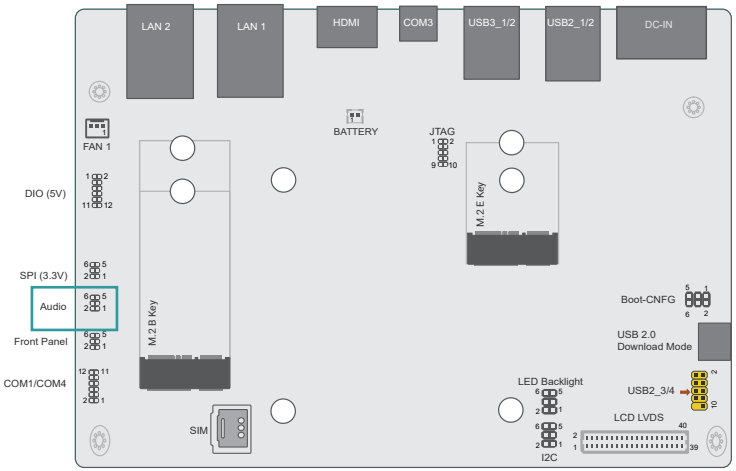


The debug port is used for debugging purposes.

Pin	Assignment
1	+3.3V
2	UART2_RX
3	UART2_TX
4	GND

▶ **Internal I/O Connectors**

Audio (AUJP1)

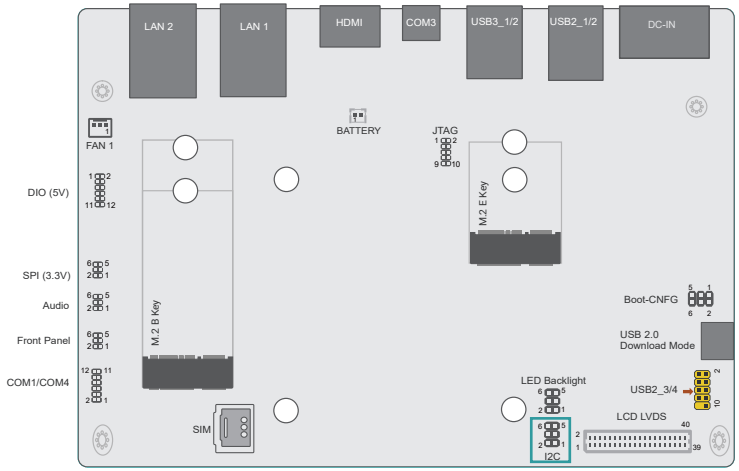


The AUJP1 is used for inputing / outputing Audio signal.

Pin	Assignment	Pin	Assignment
1	MIC_IN	2	GND
3	GND	4	R-CH
5	GND	6	L-CH

▶ **Internal I/O Connectors**

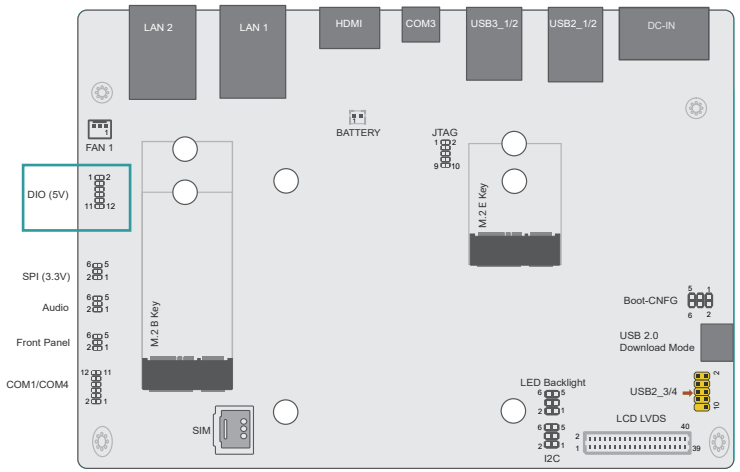
I2C (TPJP1)



The I2C connector is used to monitor or communicate with system components.

Pin	Assignment	Pin	Assignment
1	+3.3V_TP	2	GND
3	TP_SCL	4	TP_ALT#
5	TP_SDA	6	TP_RST#

DIO (IOJP1)

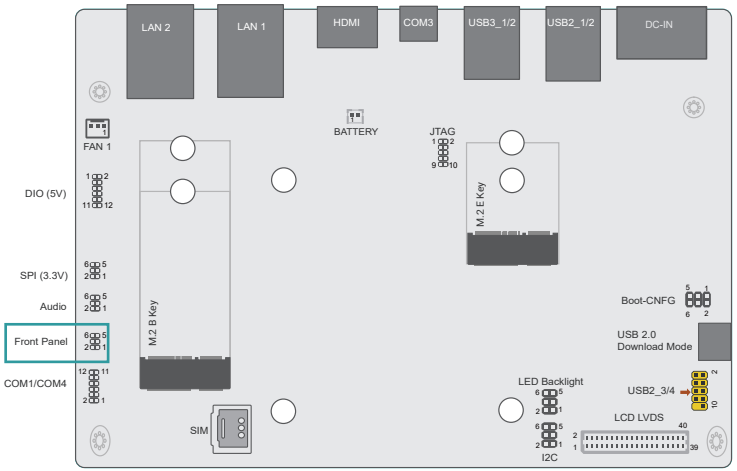


The Digital I/O connector supports 8-bit digital input/output signals to provide the signal control of the connected devices.

Pin	Assignment	Pin	Assignment
1	GND	2	PWM
3	GND	4	+5V_DIO
5	DIO0	6	DIO1
7	DIO2	8	DIO3
9	DIO4	10	DIO5
11	DIO6	12	DIO7

▶ Internal I/O Connectors

Front Panel (FPJP1)



The front panel pins link to these functions below:

Power Button

This switch is used for powering on or off the system.

Reset Button

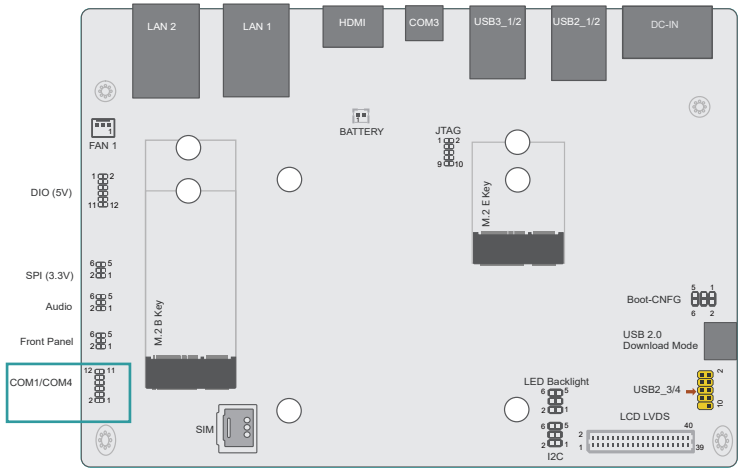
This switch allows you to reboot the system.

Power_LED

This LED indicates power status.

Pin	Assignment	Pin	Assignment
1	ONOFF_BTN#	2	FP_LED
3	GND	4	FP_PWM
5	RST#	6	RSV_BTN#

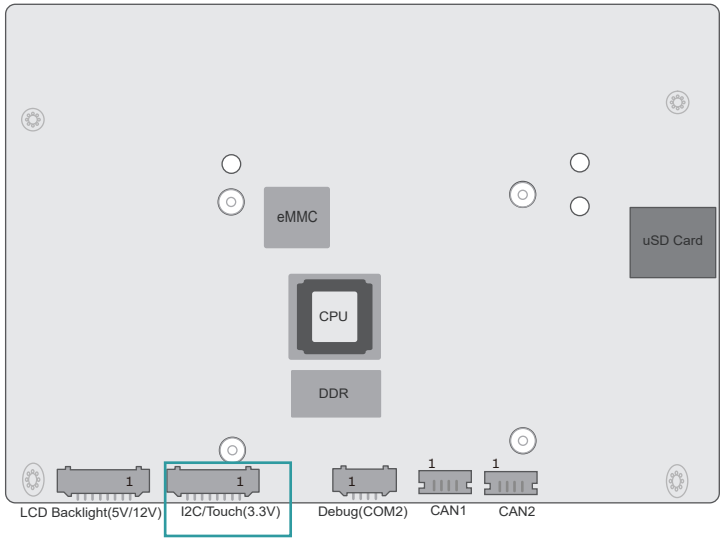
COM1 / COM4 (TSJP1)



Pin	Assignment	Pin	Assignment
1	SINN1	2	RTSN1
3	SOUTN1	4	CTSN1
5	GND	6	GND
7	DCDN4	8	SINN4
9	RTSN4	10	SOUTN4
11	CTSN4	12	DTRN4

▶ Internal I/O Connectors

I2C / Touch (TPJ1)

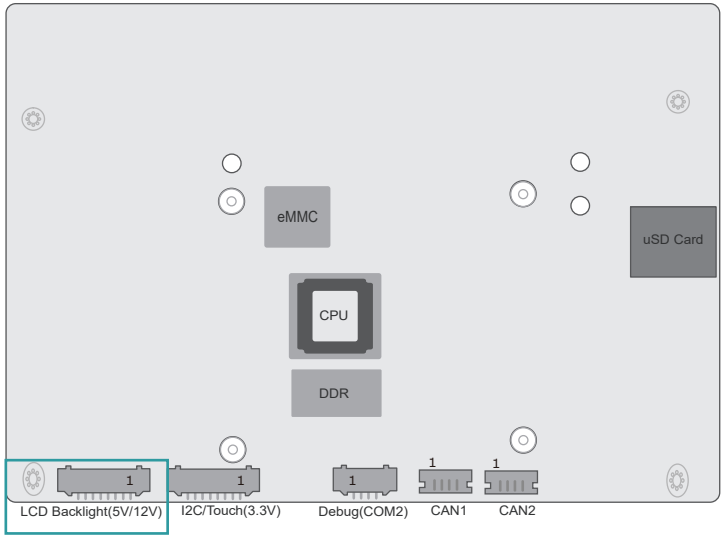


The I2C connector is used to monitor or communicate with system components.

Pin	Function
1	NC
2	NC
3	TP_RST#
4	TP_ALT#
5	+VTP_3V3
6	TP_SCL
7	TP_SDA
8	GND

▶ Internal I/O Connectors

LCD Backlight (BLJ1)

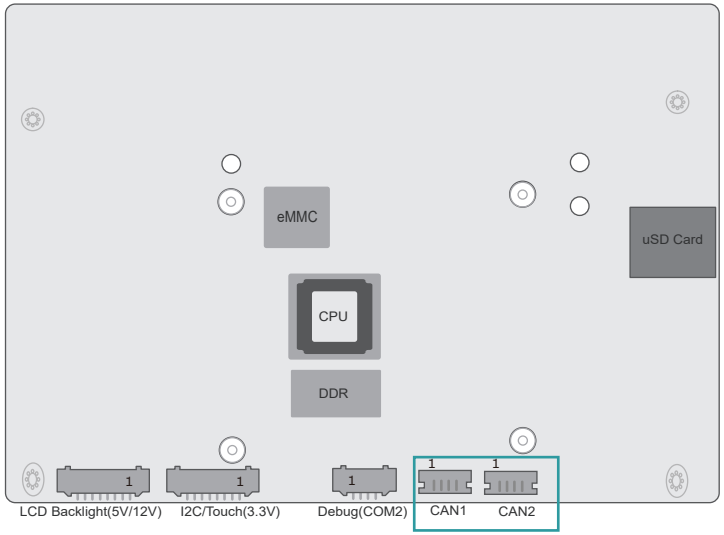


The LCD Backlight connector is to control the backlight of the LCD panel.

Pin	Function
1	VLED_12V / 5V
2	VLED_12V / 5V
3	VLED_12V / 5V
4	GND
5	GND
6	Backlight On / Off
7	GND
8	Backlight Dimming

▶ Internal I/O Connectors

CAN1 & CAN2 (CBCN1 & CBCN2)



The CAN bus (Controller Area Network) connector is used for interconnecting electronic control units (ECUs).

■ CAN1

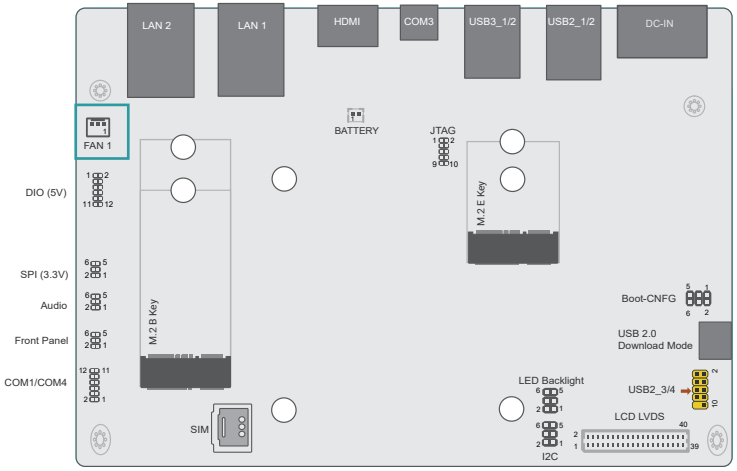
Pin	Function
1	+5V
2	CAN1H
3	CAN1L
4	GND

■ CAN2

Pin	Function
1	+5V
2	CAN2H
3	CAN2L
4	GND

▶ **Internal I/O Connectors**

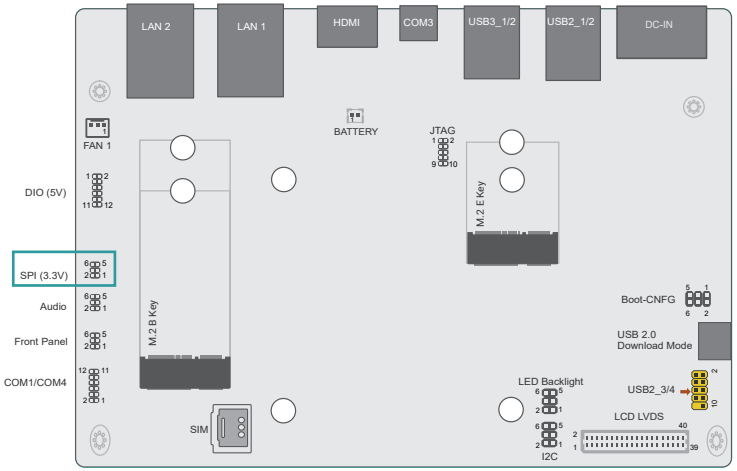
FAN (SFJ1)



Pin	Function
1	GND
2	PWM_FAN
3	TACH_FAN

▶ **Internal I/O Connectors**

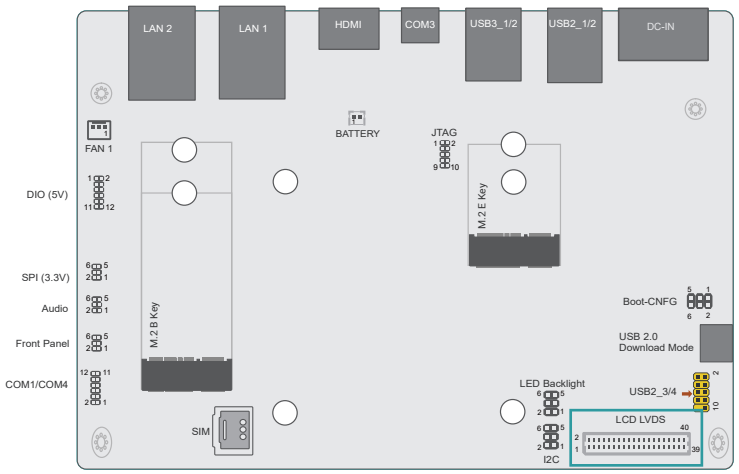
SPI (SPJP1)



Pin	Function	Pin	Function
1	SPI_CLK	2	+3.3V
3	SPI_MISO	4	SPI_SS0
5	SPI_MOSI	6	GND

▶ **Internal I/O Connectors**

LCD LVDS (DPJ1)



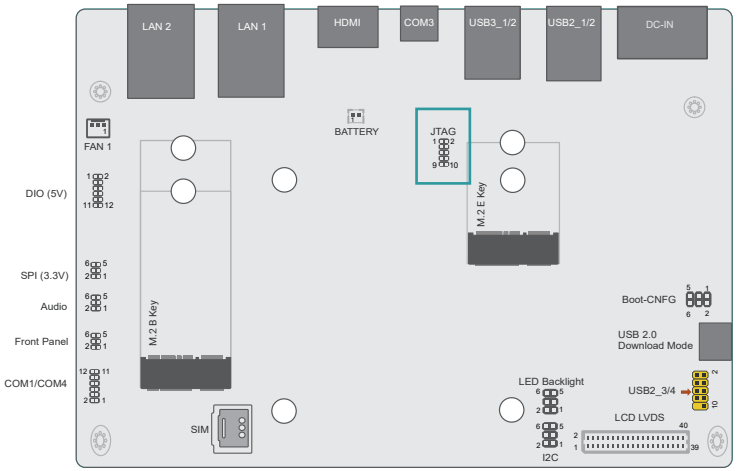
The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

Refer to the next page for the pin functions of these connectors.

Pin	Function	Pin	Function
1	GND	2	GND
3	LVDS_A2-	4	LVDS_B3+
5	LVDS_A2+	6	LVDS_B3-
7	GND	8	GND
9	LVDS_A3-	10	LVDS_B2+
11	LVDS_A3+	12	LVDS_B2-
13	GND	14	GND
15	LVDS_A0-	16	LVDS_B1+
17	LVDS_A0+	18	LVDS_B1-
19	GND	20	GND
21	LVDS_A1-	22	LVDS_B0+
23	LVDS_A1+	24	LVDS_B0-
25	GND	26	GND
27	LVDS_A_CLK-	28	LVDS_B_CLK-
29	LVDS_A_CLK+	30	LVDS_B_CLK+
31	GND	32	GND
33	GND	34	GND
35	+VDD_3.3V	36	+VDD_5V
37	+VDD_3.3V	38	+VDD_5V
39	+VDD_3.3V	40	+VDD_5V

▶ Internal I/O Connectors

JTAG (J1)

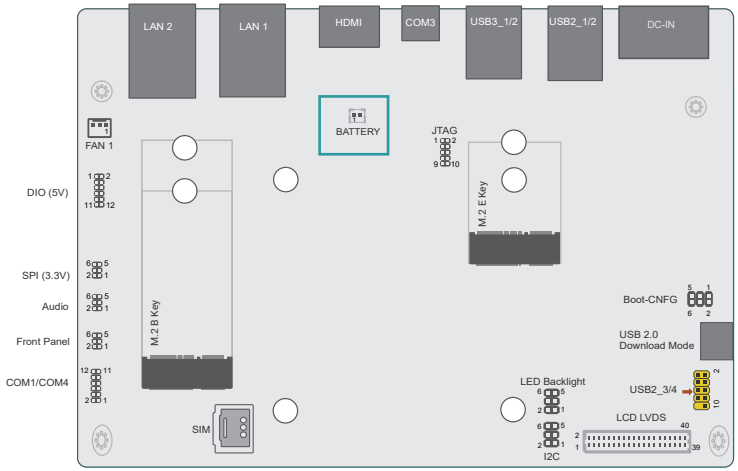


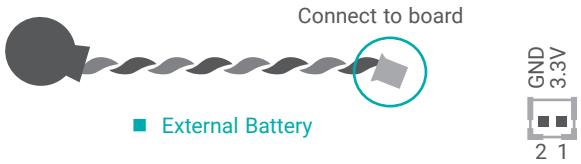
The JTAG port is used for debugging purpose.

Pin	Function	Pin	Function
1	MVDD_3V3	2	JTAG_TMS
3	GND	4	JTAG_TCK
5	GND	6	JTAG_TDO
7	GND	8	JTAG_TDI
9	GND	10	JTAG_RST#

▶ Internal I/O Connectors

Battery (BTJ1)





The external lithium ion battery supplies power to the real-time clock and CMOS memory as an auxiliary source of power when the main power is shut off.

Safety Measures

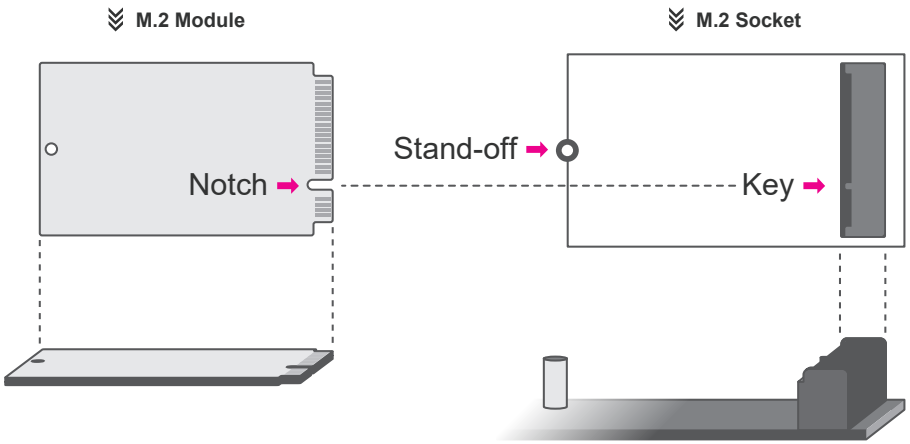
- There exists explosion hazard if the battery is incorrectly installed.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to local ordinances.

▶ Expansion Slots

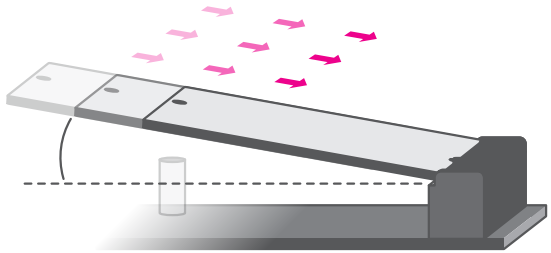
Installing the M.2 Module

Before installing the M.2 module into the M.2 socket, please make sure that the following safety cautions are well-attended.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the M.2 socket on the system board
4. Make sure the notch on card is aligned to the key on the socket.
5. Make sure the standoff screw is removed from the standoff.

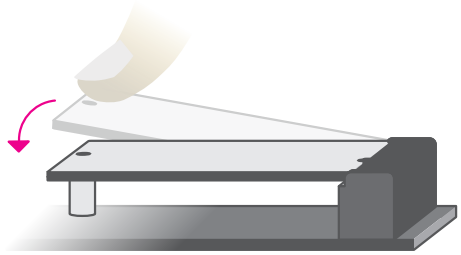


Please follow the steps below to install the card into the socket.



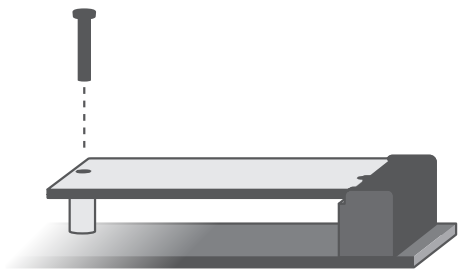
Step 1:

Insert the card into the socket at an angle while making sure the notch and key are perfectly aligned.



Step 2:

Press the end of the card far from the socket down until against the stand-off.



Step 3:

Screw tight the card onto the stand-off with a screw driver and a stand-off screw until the gap between the card and the stand-off closes up. The card should be lying parallel to the board when it's correctly mounted.

Chapter 3 - Software User Guide

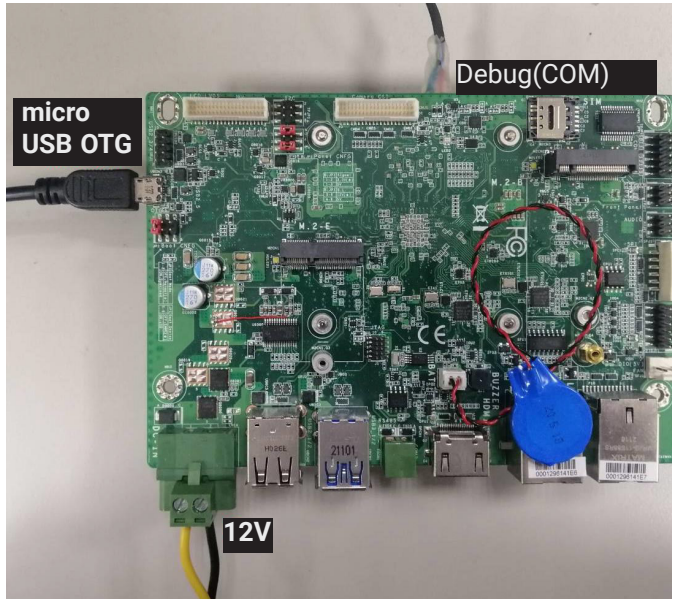
▶ Flash Yocto Images to eMMC using UUU tool - V1.1

How to flash images

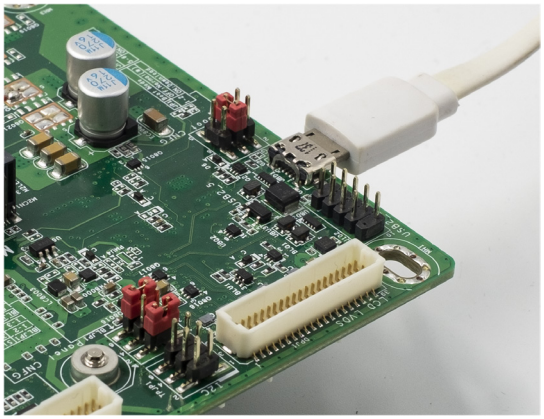
Files within the image folder are listed below:

```
M8MP553_YQ_0_0_0000_20210910_0003_YC30_4GB
├── HW_V011_Update_Script
│   ├── Linux
│   │   ├── update_all.sh
│   │   └── update_uboot_kernel.sh
│   └── Windows
│       ├── SD_update_all.bat
│       ├── SD_update_uboot_kernel.bat
│       ├── update_all.bat                    ← Windows batch for updating eMMC
│       └── update_uboot_kernel.bat           ← Windows batch for updating bootloader and kernel
└── uuu_script
    ├── emmc_all.uuu                          ← For eMMC to update ALL images
    ├── emmc_uboot_kernel.uuu                 ← For eMMC to update bootloader and kernel image only
    ├── fsl-image-mfgtool-initramfs-imx_mfgtools.cpio.gz.u-boot
    ├── m8mp553_files
    │   ├── Image                             ← Linux kernel Image
    │   ├── imx8mp-m8mp553.dtb                ← DeviceTree blob
    │   ├── imx-boot                          ← bootloader
    │   ├── rootfs.tar.bz2                    ← RootFS file
    │   └── update_process.sh                 ← Linux update script
    ├── sd_all.uuu
    ├── sd_uboot_kernel.uuu
    ├── uuu                                   ← Linux update tool
    └── uuu.exe                               ← Windows update tool

5 directories, 18 files
```

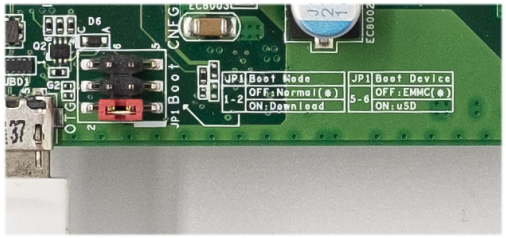
Connect M8MP553 to PC via UART-USB debug board and USB cable for showing debug log at the terminal (option).



Please ensure that usb cable is connected to the microUSB slot.



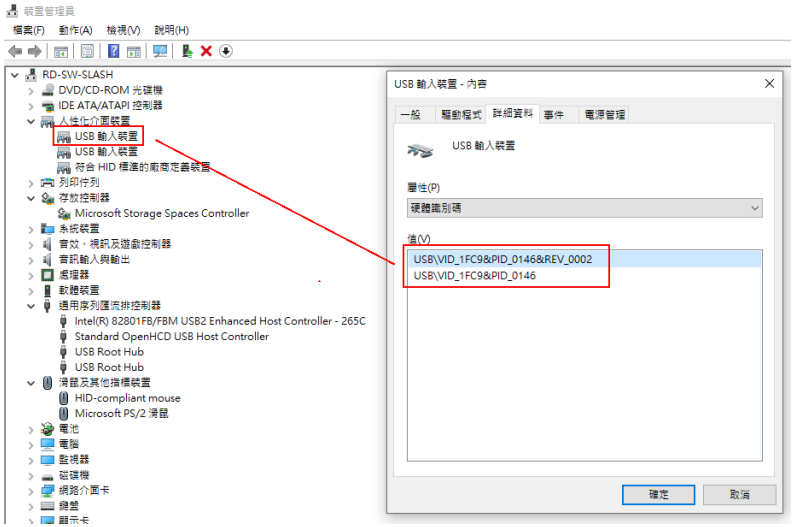
Please ensure that JP1 Boot jumper is switched to 1-2 ON for Download mode.



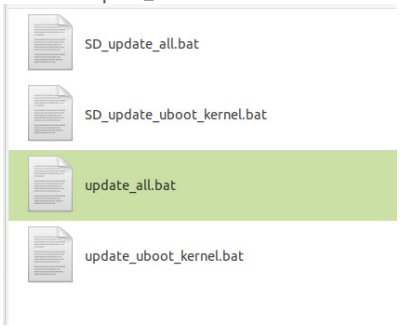
Power on M8MP553 (The adaptor output voltage is 12V).

Option 1: Start to flash images on Windows

After plugging the USB cable, ensure that it appears in the device manager.

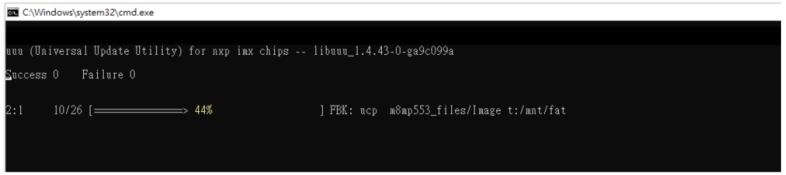


Execute "upate_all.bat" with administrator privileges.

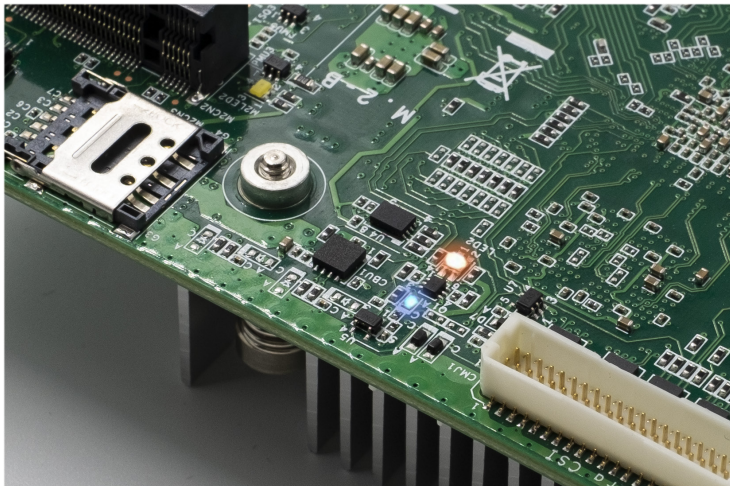


Then the update process will be starting, please wait it to be finished.

The command line windows appears while flashing:



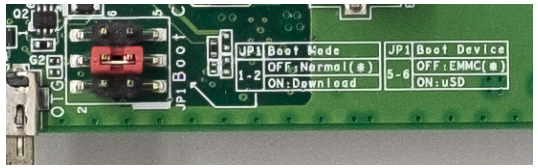
During the flashing process, the red light and blue light are active.



If the text in green "Done" appears, the process is finished.

```
C:\Windows\system32\cmd.exe

uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.43-0-ga9c099a

Success 1    Failure 0

2:1     40/40 [Done                                  ] FBK: DONE


C:\Users\slash.huang\Documents\M8MP553\M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP\M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP>pause
請按任意鍵繼續 . . .
```

After the process is done, please switch JP1 back to 1-2/5-6 OFF to boot from eMMC.

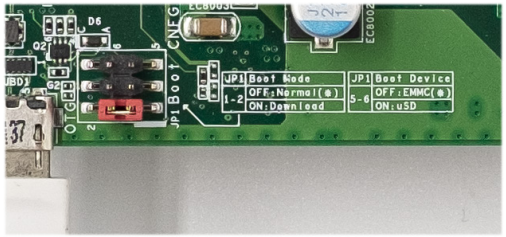


Option 2: Start to flash images on Linux

After plugging the USB cable, ensure that it appears in the list after typing "lsusb" in terminal.

```
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$ lsusb
Bus 002 Device 002: ID 8087:8000 Intel Corp.
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 002: ID 8087:8008 Intel Corp.
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 118: ID 0461:4e84 Primax Electronics, Ltd
Bus 003 Device 117: ID 1ddd:1130
Bus 003 Device 116: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 003 Device 030: ID 1fc9:0146 NXP Semiconductors
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$
```

Switch JP1 Boot jumper to 1-2 ON for Download mode.



Enter the "Linux" directory and type "./update_all.sh" in terminal.

```
/home/slash/work/for_DFI/imx8/M8MP553/M8MP553_YQ_0_0_0000_20210910_0003_YC30_4GB/HW_V011_Update_Script/Linux
slash@slash-ThinkPad-E14-Gen-2:Linux$ ./update_all.sh
```

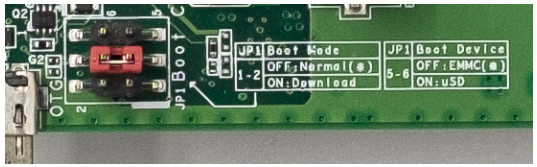
Then the update process will begin with information in the terminal that indicates progress.

```
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$ sudo ./uuu ./emmc_all.uuu
[sudo] password for slash:
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.43-0-ga9c099a

Success 0    Failure 0


3:1     27/40 [                  2%                  ] FBK: ucp  m8mp553_files/rootfs.tar.bz2 t:-
```

If the text in green "Done" appears, the process is finished.

```
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$ sudo ./uuu ./emmc_all.uuu
[sudo] password for slash:
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.43-0-ga9c099a

Success 1    Failure 0


3:1     40/40 [Done                                  ] FBK: DONE
```

Remember to switch JP1 back to 1-2 / 5-6 OFF to boot from eMMC.



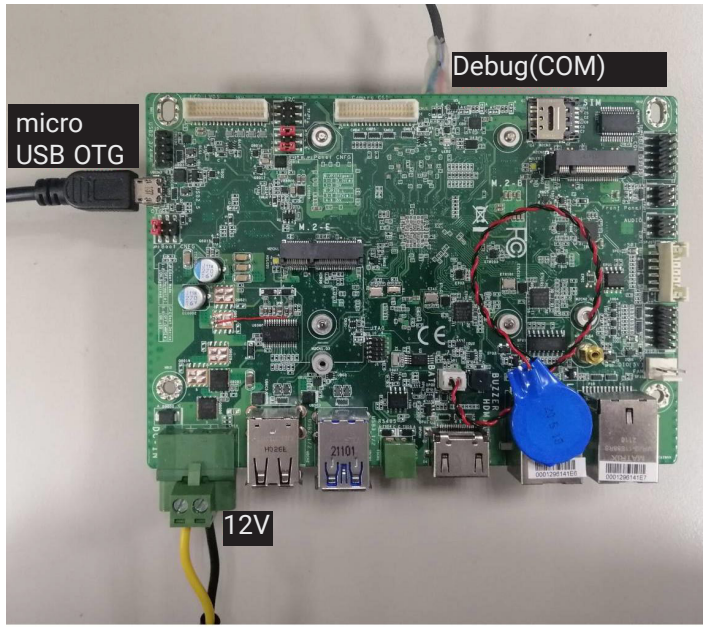
▶ Flash Yocto Images to SD using UUU tool - V1.1

How to flash images

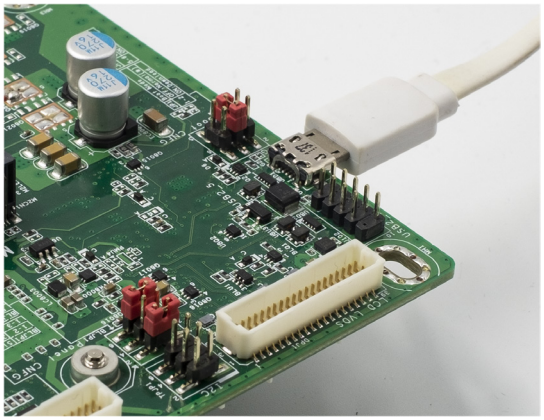
Files within the image folder are listed below:

```
M8MP553_YQ_0_0_0001_20220127_0013_Y30
├── m8mp553_yc30_update_folder
│   ├── HW_V020_Update_Script
│   │   ├── Linux
│   │   │   ├── sd_update_all.sh
│   │   │   ├── sd_update_uboot_kernel.sh
│   │   │   ├── update_all.sh
│   │   │   └── update_uboot_kernel.sh
│   │   └── Windows
│   │       ├── SD_update_all.bat                    → Windows batch for updating SD
│   │       ├── SD_update_uboot_kernel.bat           → Windows batch for updating bootloader and kernel to SD
│   │       ├── update_all.bat
│   │       └── update_uboot_kernel.bat
│   └── .uuu_script
│       ├── emmc_all.uuu
│       ├── emmc_uboot_kernel.uuu
│       ├── fsl-image-mfgtool-initramfs-imx_mfgtools.cpio.gz.u-boot
│       ├── lvds_panel_type
│       ├── m8mp553_files
│       │   ├── dfi-image-qt-m8mp553.tar.bz2         → Yocto 3.0 Root File System
│       │   ├── Image                                → Linux kernel Image
│       │   ├── imx8mp-m8mp553-lvdsam1024.dtb        → Linux kernel Device-tree blob
│       │   ├── imx8mp-m8mp553-lvdsg215hv.dtb        → Linux kernel Device-tree blob
│       │   ├── imx-boot                             → Boot-load
│       │   ├── update_process.sh                    → Linux update script
│       │   └── uuu
│       ├── sd_all.uuu                               → For SD to update ALL images
│       ├── sd_uboot_kernel.uuu                      → For SD to update bootloader and kernel image only
│       ├── uuu                                      → Linux update tool
│       └── uuu.exe                                  → Windows update tool
```

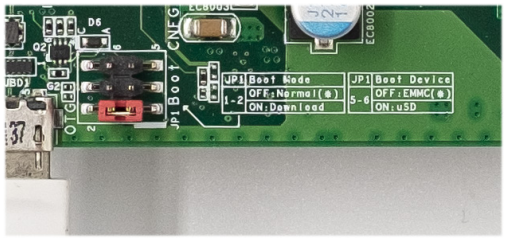
Put uSD card to M8MP553 board.
Connect M8MP553 to PC via UART-USB debug board and USB cable for showing debug log at the terminal (option).



Please ensure that usb cable is connected to the microUSB slot.



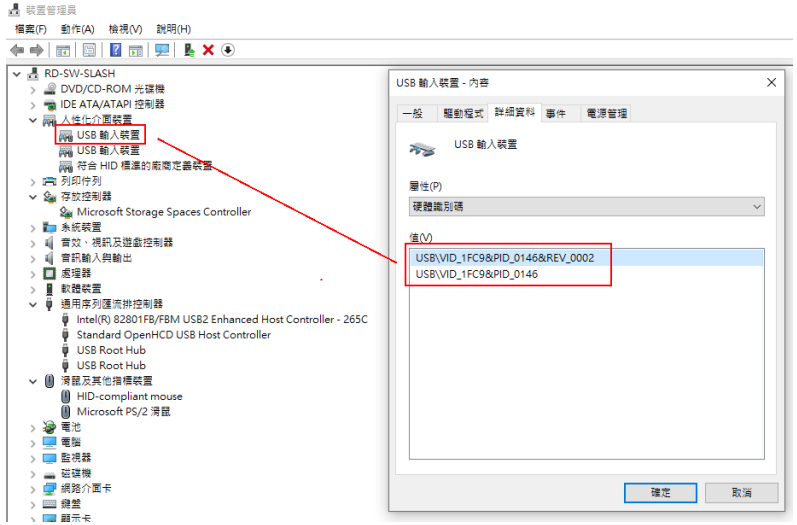
Please ensure that JP1 Boot jumper is switched to 1-2 ON for Download mode.



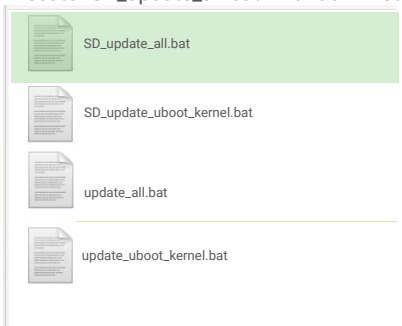
Power on M8MP553 (The adaptor output voltage is 12V).

Option 1: Start to flash images on Windows

After plugging the USB cable, ensure that it appears in the device manager.

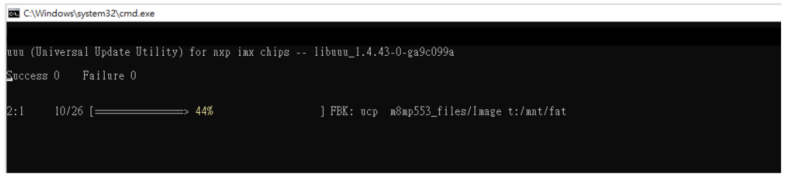


Execute "SD_update_all.bat" with administrator privileges.

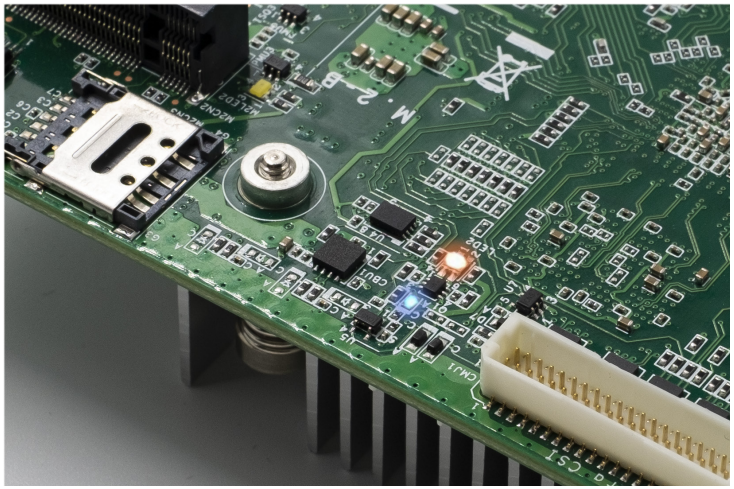


Then the update process will be starting, please wait it to be finished.

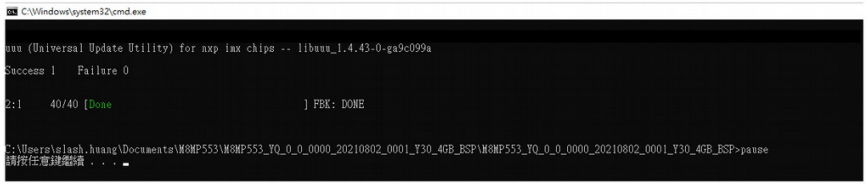
The command line windows appears while flashing:



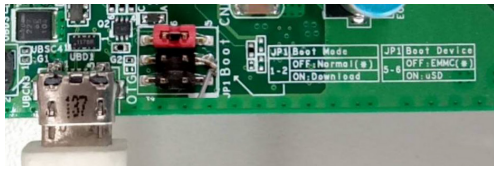
During the flashing process, the red light and blue light are active.



If the text in green "Done" appears, the process is finished.



After the process is done, please switch JP1 back to 1-2/3-4 OFF to boot from SD.

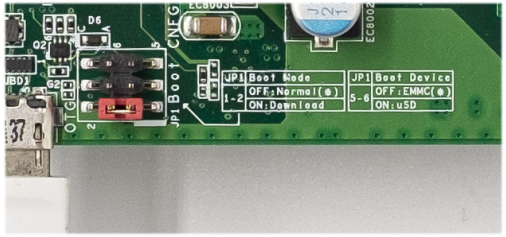


Option 2: Start to flash images on Linux

After plugging the USB cable, ensure that it appears in the list after typing "lsusb" in terminal.

```
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$ lsusb
Bus 002 Device 002: ID 8087:8000 Intel Corp.
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 002: ID 8087:8008 Intel Corp.
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 118: ID 0461:4e84 Primax Electronics, Ltd
Bus 003 Device 117: ID 1ddd:1130
Bus 003 Device 116: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 003 Device 030: ID 1fc9:0146 NXP Semiconductors
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$
```

Switch JP1 Boot jumper to 1-2 ON for Download mode.



Enter the "Linux" directory and type "./sd_update_all.sh" in terminal.

```
HW_V011_Update_Script/
├── Linux
│   ├── sd_update_all.sh
│   ├── sd_update_uboot_kernel.sh
│   ├── update_all.sh
│   └── update_uboot_kernel.sh
└── Windows
    ├── SD_update_all.bat
    ├── SD_update_uboot_kernel.bat
    ├── update_all.bat
    └── update_uboot_kernel.bat
```

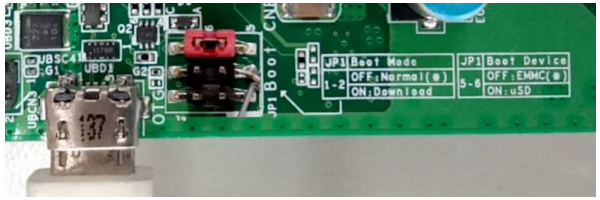
Then the update process will begin with information in the terminal that indicates progress.

```
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$ sudo ./uuu ./emmc_all.uuu
[sudo] password for slash:
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.43-0-ga9c099a

Success 0    Failure 0

3:1     27/40 [                    2%                    ] FBK: ucp  m8mp553_files/rootfs.tar.bz2 t:-
```

If the text in green "Done" appears, the process is finished.

```
slash@slash-HD631-Q87CRM:M8MP553_YQ_0_0_0000_20210802_0001_Y30_4GB_BSP$ sudo ./uuu ./emmc_all.uuu
[sudo] password for slash:
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.43-0-ga9c099a

Success 1    Failure 0

3:1     40/40 [Done                                      ] FBK: DONE
```

Remember to switch JP1 back to 1-2 / 3-4 OFF to boot from SD.

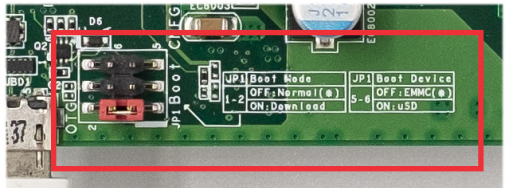


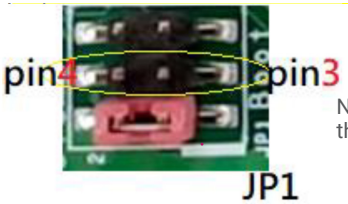
▶ Flash Images into eMMC/SD using UUU tool

1.Must install Windows drivers first if user would like to flash images, using UUU tool in Windows7.
•Unzip M8MP553_DB12_x_y_nnn_yymmdd_0000_LPDDR_2_4_8GB.zip image package.

2.Before flashing images into M8MP553 device via UUU tool, user must configure BOOTCNFG to BOOT Type, also alleged Serial Download mode, by plugging one jumper into JP1 shorting pin1 and pin2.

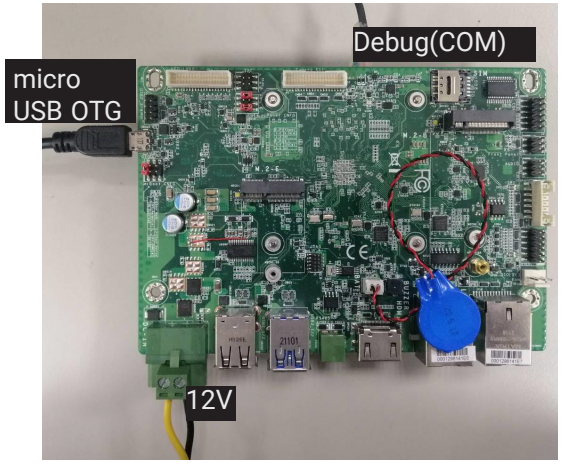
3.See the pictures shown as below.





Note:
the use of REV.2 board at the JP1 of pin3 pin4 must be open.

4.• Connect M8MP553 with PC via UART-USB debug board and USB cable for showing debug log at terminal.
• Connect M8MP553 with PC via USB TypeC cable for flashing image.
• Power on M8MP553 (The adapter output voltage is 12V).



5. • Open the Command Prompt in Windows7, or open the Terminal in Ubuntu after the preparations are done.
• Enter image release folder
• Execute the following command, then wait for process complete

For Windows:

Flash all images into eMMC : **>uuu.exe debian12_emmc_all_hdmi.uuu**

Flashing tool logs in Windows:

```
X:\M8MP553_Debian12_80_UUU_TOOL_250331>
X:\M8MP553_Debian12_80_UUU_TOOL_250331>uuu.exe debian12_emmc_all_hdmi.uuu
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.5.182-0-gda3cd53

Success 0    Failure 0


1:2-092CB800 1/ 1 [==================100%==================] SDPS: boot -f m8mp553_files/flash.bin
```

```
X:\M8MP553_Debian12_80_UUU_TOOL_250331>uuu.exe debian12_emmc_all_hdmi.uuu
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.5.182-0-gda3cd53

Success 1    Failure 0


1:2-         15/15 [                                  ] FB: acmd ${kboot} ${loadaddr} ${initrd_addr} ${fdt_addr}
1:2-0000000029/29 [Done                               ] FBK: DONE
1:2-092CB800 1/ 1 [==================100%==================] SDPS: boot -f m8mp553_files/flash.bin

X:\M8MP553_Debian12_80_UUU_TOOL_250331>
```

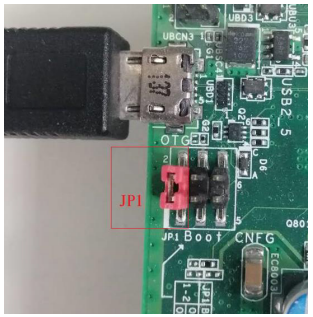
Sometimes, UUU flashing process might FAIL, because Windows are runtime installing necessary drivers. User can see the following processes be executed when flashing images into M8MP553 device. User must make sure necessary Windows drivers are installed, then the processes can complete automatically, or user can't flash images via UUU tool successfully.

• Execute UUU flashing process again after each following driver installation process completes.

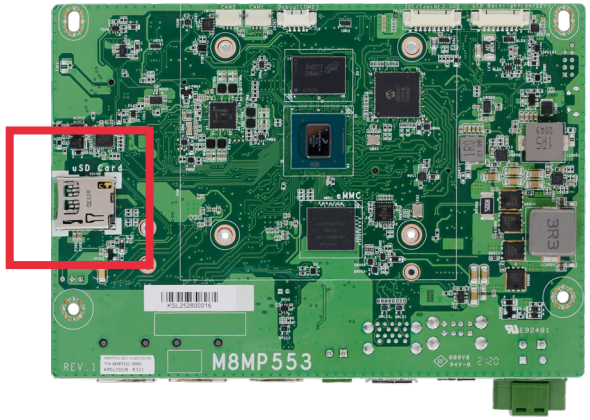
For Ubuntu:

$ sudo ./uuu debian12_emmc_all_hdmi.uuu

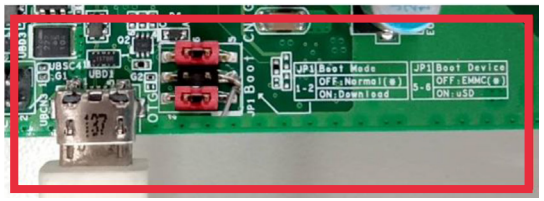
6. • Turn off the device after flashing process completes.
   • Switch BOOTCNFG to BOOT Device, also alleged Normal mode, by removing all jumpers from JP1.



7. **Flash image into SD card** (Can only be update in Linux environment).
   7.1 **Insert SD card to device.**



7.2 Connect JP1 as below picture and power on device to force device enter SD card download mode.



7.3 SD card flash commands in Ubuntu

Flash u-boot/kernel/rootfs images:

To find the device name of your SD card in Linux (e.g. /dev/sda, /dev/sdb, etc.)

$ sudo ./flex-installer -i pf -d /dev/sdX (e.g. /dev/sda, /dev/sdb, etc.)

**$ sudo ./flex-installer -d /dev/sdX -m imx8mpevk **

**f ./debian_files/firmware_imx8mpevk_sdboot.img **

**b ./debian_files/boot_IMX_arm64_lts_6.6.36.tar.zst **

r ./debian_files/rootfs_lsdk2412_debian_desktop_arm64.tar.zst

```
pedro@pedro-veriton-m4715g:~$ sudo ./flex-installer -i pf -d /dev/sdc
[sudo] password for pedro:
/dev/sdc: 15 GB
The capacity of /dev/sdc is only 15 GB, using partitions: 3P=512M:64M:-1
Partitioning /dev/sdc ...
Formatting partitions ...
Model: Generic- SD/MMC (scsi)
Disk /dev/sdc: 15.9GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start  End     Size    Type     File system  Flags
 1      273MB  810MB   537MB   primary  ext4
 2      811MB  878MB   67.1MB  primary  ext4
 3      879MB  15.9GB  15.1GB  primary  ext4

partition and format /dev/sdc     [Done]
pedro@pedro-veriton-m4715g:~$ sudo ./flex-installer -d /dev/sdc -m imx8mpevk -f firmware_imx8mpevk_sdboot.img -b boot_IMX_arm64_lts_6.6.36.tar.zst \
            -r rootfs_lsdk2412_debian_desktop_arm64.tar.zst
46176+1 records in
46176+1 records out
47285179 bytes (47 MB, 45 MiB) copied, 6.87256 s, 6.9 MB/s
Program firmware_imx8mpevk_sdboot.img to /dev/sdc with offset 32K     [Done]
Installing boot_IMX_arm64_lts_6.6.36.tar.zst to /dev/sdc1 ...
boot_IMX_arm64_lts_6.6.36.tar.zst: 333639680 bytes
Install boot_IMX_arm64_lts_6.6.36.tar.zst in /dev/sdc1     [Done]
Installing rootfs_lsdk2412_debian_desktop_arm64.tar.zst to /dev/sdc3 ...
rootfs_lsdk2412_debian_desktop_arm64.tar.zst: 5784995840 bytes
Install rootfs_lsdk2412_debian_desktop_arm64.tar.zst in /dev/sdc3     [Done]
setting UUID 0b9ee7d6-f449-46d1-8fc7-9175bde48518 for boot partition /dev/sdc1 ...
syncing data ...
installation completed successfully
```

The above steps may take up to 30 minutes depending on the speed of the SD card.

There are 3 partitions on the SD card: boot, data2, and data3.

After completing the process, switch to the boot partition.

Then, mount the boot partition of the SD card and configure the required file.

The command is as follows:

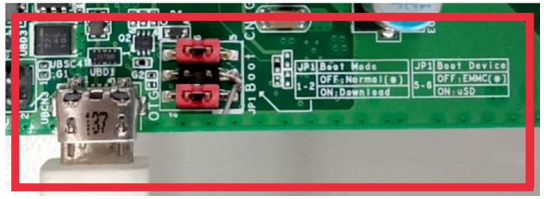
$cd /media/XXX/boot
$cp imx8mp-m8mp553-hdmi.dtb imx8mp-m8mp553.dtb
$sync
$cd -

```
pedro@pedro-veriton-m4715g:~$ df
Filesystem      1K-blocks       Used Available Use% Mounted on
/dev/sdd2           57316         24     52708   1% /media/pedro/data2
/dev/sdd1          499284     328628    133960  72% /media/pedro/boot
/dev/sdd3        14367564    6012076   7604104  45% /media/pedro/data3
pedro@pedro-veriton-m4715g:~$ cd /media/pedro/boot
pedro@pedro-veriton-m4715g:/media/pedro/boot$ sudo cp imx8mp-m8mp553-hdmi.dtb imx8mp-m8mp553.dtb
[sudo] password for pedro:
pedro@pedro-veriton-m4715g:/media/pedro/boot$ sync
pedro@pedro-veriton-m4715g:/media/pedro/boot$ cd -
/home/pedro
pedro@pedro-veriton-m4715g:~$
```

Once completed you can remove the SD card from your PC.

7.4 SD boot mode configuration

Connect JP1 as below picture and power on device to force device enter SD card boot mode.



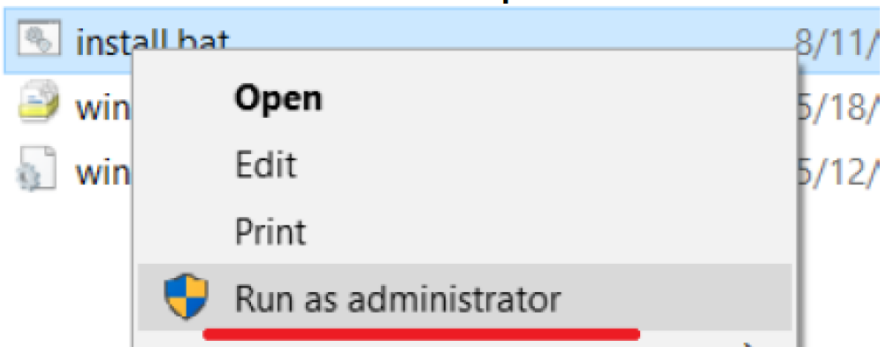
8. Turn on the device.

[Quick Note]

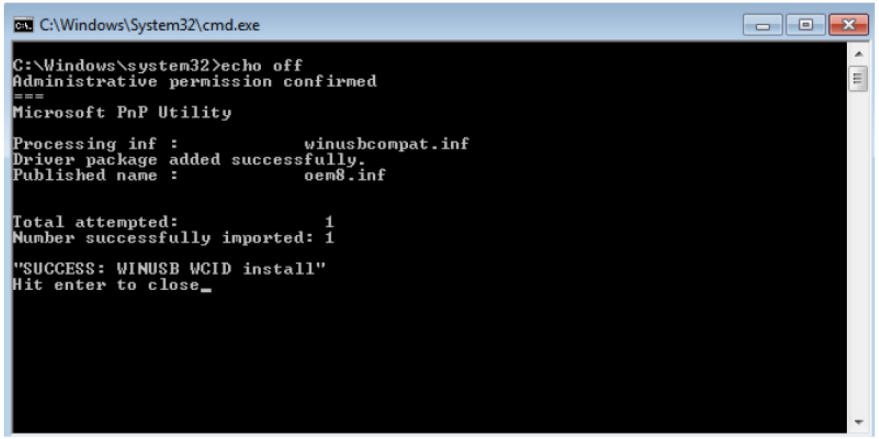
* Win 7 User Guide
a. Back Ground (must do it, or you can't flash image in Windows)
b. Install updated winusb inf file (must do it, or you can't flash image in Windows)

winusb.zip

- Unzip
- Run install.bat as **administrator permission**

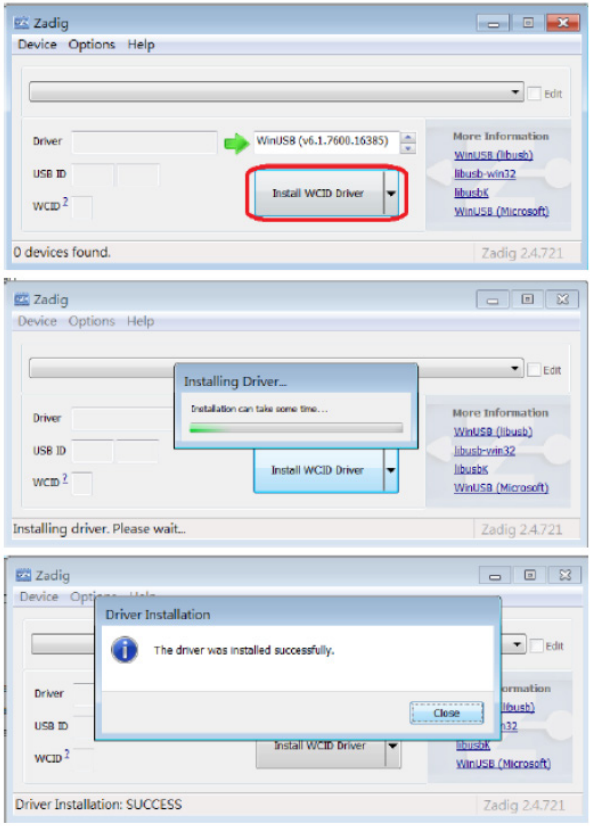


The below screen show install success



c. Use zadig to install winusb driver (must do it, or you can't flash image in Windows)
If still fail to install winusb driver, you can try the following method.

Run zadig-2.4.exe and click Install WCID Driver



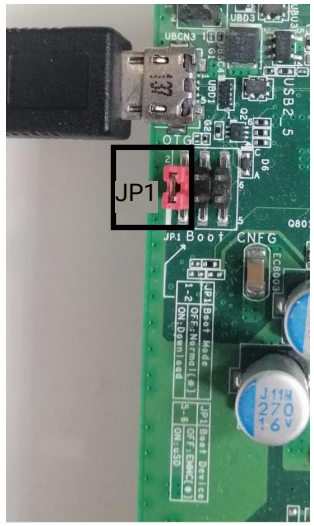
Reboot Windows after drivers are installed, windows will install necessary USB download gadget driver.

▶ Flash Android Images to eMMC/SD using UUU tool - V1.1

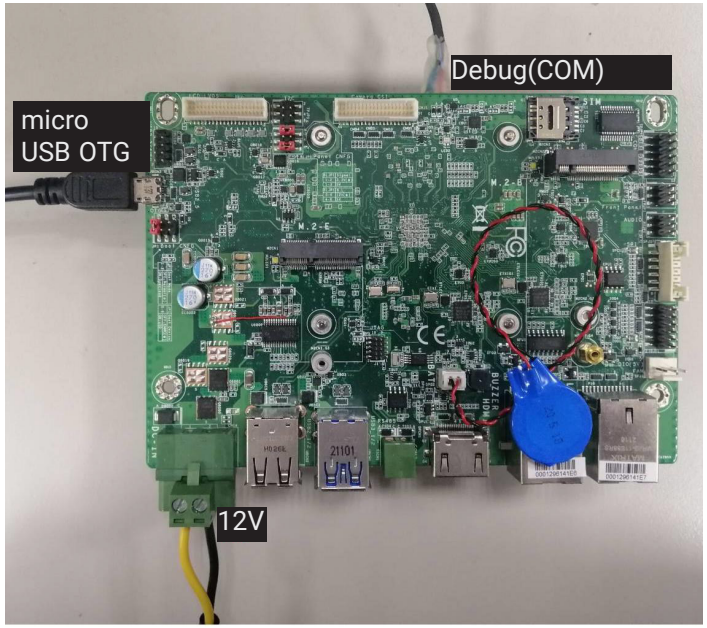
How to flash images

1. Before flashing images into M8MP553 device via UUU tool, user must configure BOOTCNFG to BOOT Type, also alleged Serial Download mode by plugging one jumper into JP1 shorting pin1 and pin2 (eMMC boot, pin5 & pin6 off).

2. See the pictures showed as below :



3.
- Connect M8MP553 to PC via UART-USB debug board and USB cable for showing debug log at terminal (option)
- Connect M8MP553 to PC via Micro USB cable for flashing image.
- Power on M8MP553 (The adapter output voltage is 12V).



4.
- Open the Terminal in Ubuntu after necessary preparations are done.
- Enter image release folder.
- Execute the following command then wait for process complete.

For Ubuntu:

$ chmod 777 uuu_imx_android_flash.sh

$ chmod 777 uuu_imx_android_flash_hdmi.sh

$ chmod 777 uuu

$ sudo ./uuu_imx_android_flash.sh -f imx8mp -a –e (Update image LVDS dual display)

$ sudo ./uuu_imx_android_flash_hdmi.sh -f imx8mp -a –e (Update image HDMI output only)

For Windows 10:

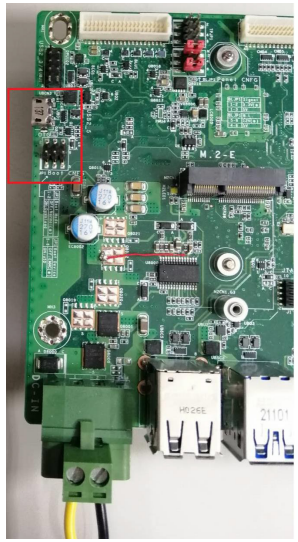
>uuu_imx_android_flash.bat -f imx8mp -a –e (Update image LVDS dual display)

>uuu_imx_android_flash_hdmi.bat -f imx8mp -a –e (Update image HDMI output only)

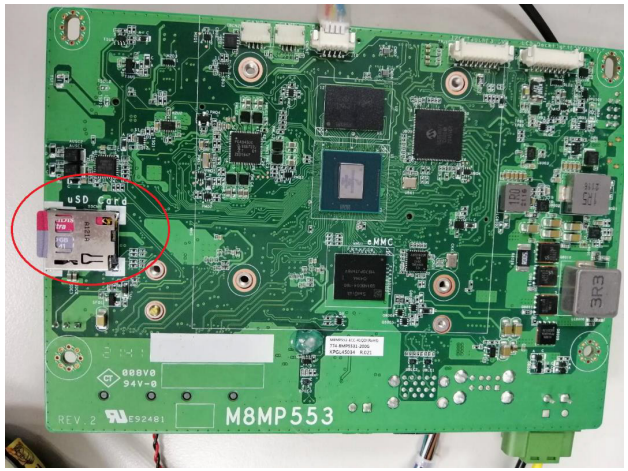
```
C:\tmp\M8MP553_UUU_MFGTOOL_220114_15>uuu_imx_android_flash.bat -f imx8mp -a -e
This script is validated with uuu 1.3.124 version, it is recommended to align with this version.
dtbo is supported
dual slot is supported
dynamic partition is supported
generate lines to flash u-boot-imx8mp.imx to the partition of bootloader0
generate lines to flash partition-table.img to the partition of gpt
generate lines to flash dtbo-imx8mp.img to the partition of dtbo_a
generate lines to flash boot.img to the partition of boot_a
generate lines to flash vbmeta-imx8mp.img to the partition of vbmeta_a
lpmake.exe I 01-14 15:29:36 15676   840 builder.cpp:937] [liblp]Partition system_a will resize from 0 bytes to 909824000 bytes
lpmake.exe I 01-14 15:29:36 15676   840 builder.cpp:937] [liblp]Partition vendor_a will resize from 0 bytes to 564174848 bytes
lpmake.exe I 01-14 15:29:36 15676   840 builder.cpp:937] [liblp]Partition product_a will resize from 0 bytes to 332734464 bytes
generate lines to flash super.img to the partition of super
uuu script generated, start to invoke uuu with the generated uuu script
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.43-0-ga9c099a

Success 1    Failure 0


2:1     21/21 [Done                                   ] FB: done
```

P.S. M8MP553 UUU MFGTool must be put on local disk not network disk.

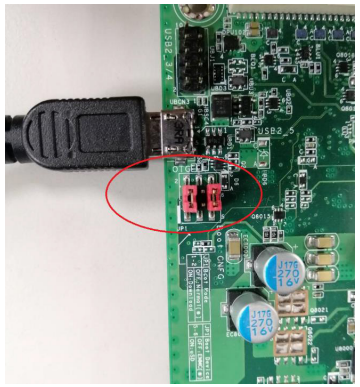
5.
• Turn off the device after flashing process complete.
• Switch BOOTCNFG to BOOT Device, also alleged Normal mode (eMMC boot), by removing all jumpers from JP1.



6. Turn on the device (eMMC boot)
7. **Flash image into SD card**
   • Insert SD card to device.



• Connect JP1 as below picture and power on device to force device enter SD card download mode.

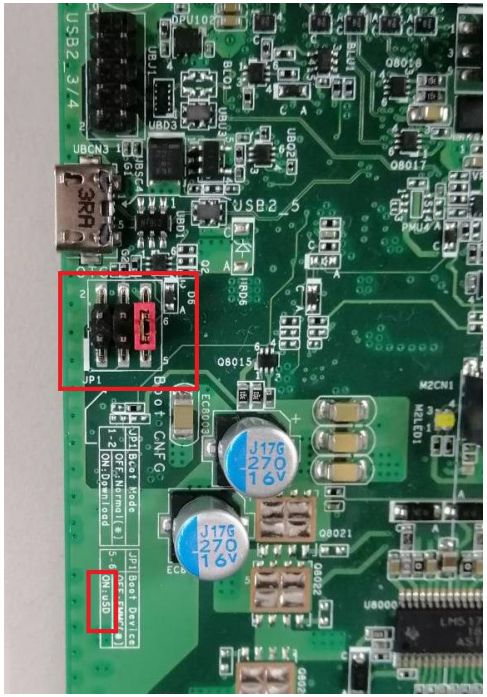


• SD card flash commands

For Ubuntu:
$ sudo ./uuu_imx_android_flash.sh -f imx8mp -a –e -t sd (Update image LVDS dual display)
$ sudo ./uuu_imx_android_flash_hdmi.sh -f imx8mp -a –e -t sd (Update image HDMI output only)

For Windows 10:
>uuu_imx_android_flash.bat -f imx8mp -a –e -t sd (Update image LVDS dual display)
>uuu_imx_android_flash_hdmi.bat -f imx8mp -a –e -t sd (Update image HDMI output only)

• Turn off the device after flashing process complete. Switch BOOTCNFG to BOOT Device. See the pictures showed as below (SD Normal mode).



• Turn on the device (SD boot)

▶ Software Feature

General Support List

(*) is depended on the NXP support.

Component	Name	Base-Line Feature
General	OS Support	Yocto 3.0, Kernel 5.4.70-2.3.0 Yocto 5.0, Kernel 6.6.23-2.0.0 Debian 12, Kernel 6.6.36 Android 10.0, Kernel 5.4.70
Misc	Firmware Upgrade (*)	UUU firmware update tool
	Utilities (*)	Hardware diagnostic utilities

Linux AP/API Support List

(*) is depended on the NXP support.

Component	Description	Detail	Release Schedule
Linux	Yocto 3.0 - Kernel 5.4.70-2.3.0	It's an open-source project that delivers a set of tools that create operating system images for embedded Linux systems. Support wayland weston graphics Demo Image Only (*).	2022, Q1
	Yocto 5.0 - Kernel 6.6.23-2.0.0	It's an open-source project that delivers a set of tools that create operating system images for embedded Linux systems. Support wayland weston graphics Demo Image Only (*).	2024 Q4
Linux AP/API	NXP iMX8MPlus Yocto 3.0 BSP Support Wayland Window Support BitBake build tool	All library and utility should support (*). Source code package (support by request).	2022, Q1
	NXP iMX8MPlus Yocto 5.0 BSP Support Wayland Window Support BitBake build tool	All library and utility should support (*). Source code package (support by request).	2024 Q4
	Support I2C, Watchdog, GPIO, LVDS brightness control	Provide support console for i.MX8MPlus platform.	2024 Q4
Linux Debian	Debian 12.0 - Kernel 6.6.36	It's an open-source project that delivers a set of tools that create operating system images for embedded Linux systems. Support GNOME GUI desktop Demo Image Only (*).	2025 Q1
Linux Debian AP/API	NXP iMX8MPlus Debian12 BSP Support GNOME GUI desktop Support flexbuild build tool	All library and utility should support (*). Source code package (support by request).	2025 Q1
Linux Debian AP/API	NXP iMX8MPlus Debian12 BSP Support GNOME GUI desktop Support flexbuild build tool	All library and utility should support (*). Source code package (support by request).	2025 Q1
Android	Android 10.0.0 - Kernel 5.4.70	Support Demo image.	2022, Q2
Android AP/API	NXP iMX8MPlus Android 10.0 NXP BSP Support Android AOSP launcher Support Android ADB shell Support Android APK install	1. All library, utility and Android apk should support (*). 2. Source code package (support by request).	2022, Q2
	Support GPIO, LVDS brightness control	Provide support console for i.MX8M platform.	2022, Q2

Yocto 3.0 Support List

(*) is depended on the NXP support.

Component	Support Status
Yocto Version	3.0
Kernel Version	5.4.70-2.3.0
Window System	Wayland without QT5 build
eMMC	Support eMMC boot by default, eMMC v5.1, Linux EXT4 file system
Ethernet LAN1/2	Support "ping", "ifconfig" console commands verify, static IP/DHCP Dynamic IP, writable MAC address store in eMMC.
USB	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT filesystem.
USB OTG	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT filesystem. 3. Support connect to PC to update image by NXP i.MX uuu update firmware tool .
HDMI Video	Support HDMI+LVDS dual display with extend mode. Support max display resolution of 1080p60.
LVDS Panel	Support Panel: 1920x1080 dual channel (G215HVN01.0) Support Panel: 1024x600 (AM-1024600DTZQW) Support HDMI+LVDS dual display with extend mode.
LVDS Backlight	Support PWM backlight control by Linux device node, level value 0~100.

Component	Support Status
Touch	1. Support Touch: ILI2301S+ILIM2V 2. Support single touch function.
Micro SD Card (uSD card slot)	1. Support SD card boot, support SD storage by "mount" console command, FAT filesystem. 2. Support SD boot (select by boot switch). 3. Not support SDIO module.
M.2 B key	Support "lspci" console command for check PCIe card status. LTE module : Quectel EM06.
M.2 2230 E key	Support "lspci" console command for check PCIe card status. WiFi module : AW-CB375NF (AZUREWAVE, CHIPSET: RTL8822CE)
COM Port (RS232/RS485/ RS422)	Support Loopback test, (need DFI Linux user space utility).
I2C	Support "i2cdetect" console command for detect I2C device.
SPI	Support read/write data by NXP utility spidev_test. (Winbond 25Q128JV)
PWM-DIO	Support control by Linux device node.
FAN	Support control by Linux device node.
Buzzer	Support Buzzer control by Linux device node.
Debug serial port	Support read Linux kernel debug message by serial port, use PC serial terminal tool (ex. PuTTY), BR 115200.
Play Video	Support play MPEG4, H.264 file (play by NXP gstreamer tool).
Watch Dog	Support NXP utility "wdt_driver_test.out"(*) to test Watch Dog reboot function.
CAN Bus	CAN Bus Support "cansend", "candump" console commands for test send/ read data.
RTC	Support Linux "date -s"and "hwclock -w" console commands to set system time.
Audio	1. Support system sound output to LINE OUT Connector. 2. Support Music app for test play MP3/WAV file (16 bit, 44.1 kHz sample rate, CD quality. 3. Support sound recorder for test recording PCM file with Mono MIC_IN audio, file store to eMMC.
Camera	Not support.
Power saving feature (suspend/resume)*	Not support.

M8MP553 Yotco3.0 BSP base on https://github.com/nxp-imx/imx-manifest/ ,
imx_5.4.70_2.3.0 branch,
fsl-image-full build (Builds Wayland weston graphics with Qt5 image).
Refer from imx-yocto-L5.4.70_2.3.0 i.MX_Yocto_Project_User's_Guide.pdf.

Yocto 5.0 Support List

(*) is depended on the NXP support.

Component	Support Status
Yocto Version	5.0
Kernel Version	6.6.23-2.0.0
Window System	Wayland without QT5 build
eMMC	Support eMMC boot by default, eMMC v5.1, Linux EXT4 file system
Ethernet LAN1/2	Support "ping", "ifconfig" console commands verify, static IP/DHCP Dynamic IP, writable MAC address store in eMMC.
USB	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT filesystem.
USB OTG	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT filesystem. 3. Support connect to PC to update image by NXP i.MX uuu update firmware tool .
HDMI Video	Support HDMI+LVDS dual display with extend mode. Support max display resolution of 1080p60. Support pure HDMI max display resolution of 3840*2160p30. (Option by requirement)
LVDS Panel	Support Panel: 1920x1080 dual channel (G215HVN01.0) Support Panel: 1024x600 (AM-1024600DTZQW) Support HDMI+LVDS dual display with extend mode.
LVDS Backlight	Support PWM backlight control by Linux device node, level value 0~100.
Touch	1. Support Touch: ILI2301S+ILIM2V 2. Support single touch function.
Micro SD Card (uSD card slot)	1. Support SD card boot, support SD storage by "mount" console command, FAT filesystem. 2. Support SD boot (select by boot switch). 3. Not support SDIO module.
M.2 B key	Support "lspci" console command for check PCIe card status. LTE module : Quectel, EM060K .
M.2 2230 E key	Support "lspci" console command for check PCIe card status. WiFi module : ENLI, RTL8822CE
Wifi /BT	1. Support RTL8822CE WiFi/BT module 2. RTL8822CE WiFi: (1) Support Wifi STA Mode (connect Wifi AP) by console command to enable/disable it. (2) Not support other WiFi modes, ex: Wi-Fi Direct, Miracast, Wi-Fi TimeSync ...etc. 3.RTL8822CE BT: (1) Support BT connected and enable/disable by console mode. (2) Support BT files transfer by OPP profile using "Bluetooth File Transfer" tool. (3) Support OPP profile only. (4) Not support other BT profiles which are not listed on above.

Component	Support Status
COM Port (RS232/ RS485/ RS422)	Support Loopback test, (need DFI Linux user space utility).
GPIO	Support read input high/low status, set output voltage high/low status, control by Linux device node, 8 pins.
I2C	Support "i2cdetect" console command for detect I2C device.
SPI	Support read/write data by NXP utility spidev_test. (Winbond 25Q128JV)
PWM-DIO	Support control by Linux device node.
FAN	Support control by Linux device node.
Buzzer	Support Buzzer control by Linux device node.
Debug serial port	Support read Linux kernel debug message by serial port, use PC serial terminal tool (ex. PuTTY), BR 115200.
Play Video	Support play MPEG4, H.264 file (play by NXP gstreamer tool).
Watch Dog	Support NXP utility "wdt_driver_test.out"(*) to test Watch Dog reboot function.
CAN Bus	CAN Bus Support "cansend", "candump" console commands for test send/read data.
RTC	Support Linux "date -s"and "hwclock -w" console commands to set system time.
Audio	1. Support system sound output to LINE OUT Connector. 2. Support Music app for test play MP3/WAV file (16 bit, 44.1 kHz sample rate, CD quality. 3. Support sound recorder for test recording PCM file with Mono MIC_IN audio, file store to eMMC.
Power saving feature (suspend/ resume)*	Not support.
Image Size	1. u-boot image: Around 2110 KB 2. kernel image: Around 36 MB 3. rootfs image: Around 910MB
Free storage size	Take 16GB eMMC as an example: 1. Boot partition: Around 465MB free space 2. rootfs partition: Around 9.6GB free space

M8MP553 Yotco5.0 BSP base on https://github.com/nxp-imx/imx-manifest/ , imx_6.6.23_2.0.0 branch, imx- image-multimedia build (Builds Wayland weston graphics without Qt6 image). Refer from imx-yocto-L6.6.23_2.0.0 i.MX_Yocto_Project_User's_Guide.pdf.

Debian Support List

(*) is depended on the NXP support.

Component	Support Status
Debian Version	12
Kernel version	6.6.36
Window System	GNOME GUI desktop (8Gb RAM recommended)
eMMC	Support eMMC boot by default, eMMC v5.1, Linux EXT4 file system
Ethernet LAN1/2	Support "ping", "ifconfig" console commands verify, static IP/DHCP Dynamic IP, writable MAC address store in eMMC.
USB	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT filesystem.
USB OTG	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT filesystem. 3. Support connect to PC to update image by NXP i.MX uuu update firmware tool .
HDMI Video	Support HDMI+LVDS dual display with extend mode. Support max display resolution of 1080p60.
LVDS Panel	Support Panel: 1024x600 (AM-1024600DTZQW) Support HDMI+LVDS dual display with extend mode.
LVDS Backlight	Support PWM backlight control by Linux device node, level value 0~100.
Touch	1. Support Touch: ILI2301S+ILIM2V 2. Support single touch function.
Micro SD Card (uSD card slot)	1. Support SD card boot, support SD storage by "mount" console command, FAT filesystem. 2. Support SD boot (select by boot switch). 3. Not support SDIO module.
M.2 B key	Support "lspci" console command for check PCIe card status. LTE module : Quectel, EM060K.
M.2 2230 E key	Support "lspci" console command for check PCIe card status. WiFi module : ENLI, RTL8822CE.
Wifi /BT	1. Support RTL8822CE WiFi/BT module 2. RTL8822CE WiFi: (1) Support Wifi STA Mode (connect Wifi AP) by GNOME UI to enable/disable it. (2) Not support other WiFi modes, ex: Wi-Fi Direct, Miracast, Wi-Fi TimeSync ...etc. 3.RTL8822CE BT: (1) Support BT connected and enable/disable by console mode. (2) Support BT files transfer by OPP profile using "Bluetooth File Transfer" tool. (3) Support OPP profile only. (4) Not support other BT profiles which are not listed on above.

Component	Support Status
COM Port (RS232/RS485/RS422)	Support Loopback test, (need DFI Linux user space utility).
I2C	Support "i2cdetect" console command for detect I2C device.
GPIO	Support read input high/low status, set output voltage high/low status, control by Linux device node, 8 pins.
SPI	Support read/write data by NXP utility spidev_test.(Winbond 25Q128JV).
PWM-DIO	Support control by Linux device node.
FAN	Support control by Linux device node.
Buzzer	Support Buzzer control by Linux device node.
Debug serial port	Support read Linux kernel debug message by serial port, use PC serial terminal tool (ex. PuTTY), BR 115200.
Play Video	Support play MPEG4, H.264 file.
Watch Dog	Support NXP utility "wdt_driver_test.out"(*) to test Watch Dog reboot function.
CAN Bus	CAN Bus Support "cansend", "candump" console commands for test send/read data.
RTC	Support Linux "date -s"and "hwclock -w" console commands to set system time.
Audio	1. Support system sound output to LINE OUT Connector. 2. Support Music app for test play MP3/WAV file (16 bit, 44.1 kHz sample rate, CD quality. 3. Support sound recorder for test recording PCM file with Mono MIC_IN audio, file store to eMMC.
Power saving feature (suspend/resume)*	Not support.
Image Size	1. u-boot image: Around 1527 KB 2. boot image: Around 136 MB 3. system image: Around 1.7GB
Free storage size	Take 16GB eMMC as an example: 1. Boot partition: Around 131MB free space 2. Data2 partition: Around 512MB free space 3. Data3 partition: Around 7.0 GB free space

M8MP553 Debian BSP base on https://github.com/NXP/flexbuild, LSDK-24.12_DEBIAN-12_LF-6.6.36 branch. Refer from https://www.nxp.com/docs/en/user-guide/UG10155.pdf.

Android Support List

(*) is depended on the NXP support.

Component	Support Status
Android Version	10.0.0
Kernel version	5.4.70
eMMC	Support eMMC boot , eMMC v5.1, Linux ext4 file system.
Ethernet LAN1/2	Support "ping", "ifconfig" console commands verify, static IP/DHCP Dynamic IP Support fixed MAC address (In eMMC).
USB	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT file system.
USB OTG	1. Support USB HID Keyboard and Mouse Device. 2. Support USB Mass Storage by "mount" console command, EXT3/EXT4/FAT file system. 3. Support connect to PC to update image by NXP i.MX uuu update firmware tool.
HDMI Video	1. Default support LVDS+HDMI dual display function, HDMI is slave output, resolution 1024x600 (base on LVDS resolution). 2. For Android standard product, We enable dual display function by default. 3.Support pure HDMI max display resolution of 3840*2160p30. (Option by requirement)
LVDS Panel	1. Support LVDS+HDMI dual display function, LVDS is main output, resolution 1024x600, (Support Panel: AM-1024600DTZQW). 2. For Android standard product, We enable dual display function by default.
LVDS Backlight	Support control by Linux device node, level value 0~100.
Touch	1. Support Touch: ILI2301S+ILIM2V. 2. Support single touch function.
Micro SD Card (uSD card slot)	1. Support SD card boot, support SD storage by "mount" console command, FAT file system. 2. Support SD boot (select by boot switch). 3. Not support SDIO module.
I2S-Audio	1. Support system sound output to LINE OUT Connector. 2. Support adjusts sound volume by OS setting UI. 3. Support Music app for test play MP3/WAV file (16 bit, 44.1 kHz sample rate, CD quality. 4. Support sound recorder for test recording PCM file with Mono MIC_IN audio, file store to eMMC.
M.2 2242/3042/3052 B key	Support "lspci" console command for check PCIe card status. Support "lsusb" console command for check PCIe card status. 4GLTE module: Quectel, EM060K
M.2 2230 E key	Support "lspci" console command for check PCIe card status. Support "lsusb" console command for check PCIe card status. WiFi module: ENLI, RTL8822CE

Component	Support Status
UART1 - RS232 (Debug serial port)	Support output Linux kernel debug log, use PC serial terminal tool read log (ex. PuTTY), BR 115200.
COM Port(RS232/ RS485/ RS422)	Support DTE mode, BR 115200 loopback test (need DFI Android test utility).
I2C	Support "i2cdetect" console command for detect I2C device.
GPIO	Support read input high/low status, set output voltage high/low status, control by Linux device node, 8 pins.
DIO-PWM	Support control by Linux device node.
FAN	Support control by Linux device node.
Buzzer	Support Buzzer control by Linux device node.
CAN Bus	Support "cansend", "candump" console commands for test send/read data.
Reset / Power on Key	HW control.
I2C-RTC	Support Linux "date -s"and "hwclock -w" console commands to set system time.
I2C-Thermal sensor	Support read device temperature (degrees C) by Linux device node.
Play Video	Support play MPEG4 H.264 file.
Wifi /BT	1. Support RTL8822CE WiFi/BT module(Option by requirement) 2. RTL8822CE WiFi: (1) Support Wifi STA Mode (connect Wifi AP) by Android UI to enable/disable it. (2) Support Soft AP Mode (enable DHCP/IPv4 routing) by Android UI to enable/ disable it. (3) Support Android UI to set up Soft AP information. (4) Support Android Airplane mode to disable Wi-Fi function. (5) Not support STA mode and Soft AP mode enable at same time. (6) Not support other WiFi modes, ex: Wi-Fi Direct, Miracast, Wi-Fi TimeSync …etc. (7) STA mode limitation: When plug-in wired LAN, STA mode will disconnect automatically by Android network framework limitation. 3. RTL8822CE BT: (1) Support BT connected and enable/disable by Android UI. (2) Support BT files transfer by OPP profile using "Bluetooth File Transfer" tool. (3) Support OPP profile only. (4) Not support other BT profiles which are not listed on above.
LTE and SIM slot	1. Support Quectel EM06 module. 2. Support data-link only.
Android Build Type	ENG Build without SELinux.

Component	Support Status
Android ADB	Support
Android Factory Reset	Support
Android Fastboot	Support
Android OTA	No support
Android CTS	No support
Android GMS/ GTS	No support
Android Suspend	No support suspend, set never to suspend by default.
Image Size	1. u-boot image: Around 1308 KB 2. boot image: Around 67 MB 3. super image: Around 3.6 GB 4. system image: Around 906 MB
Free storage size	1. Data partition: Around 5.6 GB free space 2. System partition: Around 2.4GB free space

M8MP553 Android BSP base on https://github.com/nxp-imx/imx-manifest, Android 10.0.0_2.6.0 branch, Please refer Android Q10.0.0_2.6.0, Android_User's_Guide.pdf from NXP website.

U-BOOT Function Available

a. Booting: eMMC/SD Card
b. eMMC& SDCARD Function
c. UART Console Debug
d. Save U-BOOT environment in eMMC or SD Card

Appendix A- Mating Connectors

▶ The Mating Connectors List

Please refer to the following list of the mating connectors.

Function	Location	Connector information
USB2.0	UBJ1	PINREX, 220-97-05GB19, 2*5-1(K9)/2.0mm, PIN PLUG
Debug Port (COM2)	J10	YIMTEX, 501MW1*04MTR-2R, 1*4P, 1.25mm, BOX HEADER
Audio	AUJP1	PINREX, 222-97-03GBE1(R), 2*3, 2.0mm, PIN PLUG
I2C	TPJP1	PINREX, 222-97-03GBE1(R), 2*3, 2.0mm, PIN PLUG
DIO	IOJP1	PINREX, 222-97-06GBE1(R), 2*6, 2.0mm, PIN PLUG
Front Panel	FPJP1	PINREX, 222-97-03GBE1(R), 2*3, 2.0mm, PIN PLUG
COM1 / COM4	TSJP1	PINREX, 222-97-06GBE1(R), 2*6, 2.0mm, PIN PLUG
I2C / Touch	TPJ1	JOINT TECH, A1250WR-S-08P, 1*8P/1.25mm, BOX HEADER
LCD Backlight	BLJ1	JOINT TECH, A1250WR-S-08P, 1*8P/1.25mm, BOX HEADER
CAN1, CAN2	CBCN1, CBCN2	TOKUTSU, 1W1003WOR0-04, 1*4/1.0mm, BOX HEADER
FAN	SFJ1	PINREX, 744-81-03TW00, 1*3, 2.54mm, BOX HEADER
SPI	SPJP1	PINREX, 222-97-03GBE1(R), 2*3, 2.0mm, PIN PLUG
LCD LVDS	DPJ1	V-STAR, W100V40TP2, 2*20, 1.00mm, BOX HEADER
JTAG	J1	PINREX, 232-92-05GBE7, 2*5P/1.27mm, PIN PLUG
Battery	BTJ1	PINREX, 721-81-02TW00, 1*2, 2.0mm, WAFER