



MiTAC ND108T Quick Installation Guide

V01

MB Placement

1 x Line-out/Mic-in

1 x USB2.0 ports header

1 x Power Switch

J1

12V internal 4-pin DC-in connector

J22

1 x UART header for debugging

J19

1 x USB 2.0 OTG port Header for programming

J3

1 x Raspberry Pi 40-pin header

J13



Pin Definition (1/3)

J1

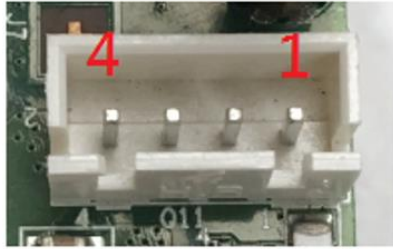


Figure 1: DC IN Connector (J1)

Pin	Signal
1	+12V
2	+12V
3	Ground
4	Ground

Table 1 : DC IN Connector pin-out reference

J19

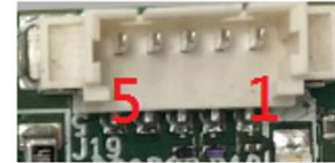


Figure 2: USB 2.0 Header for programming (J19)

Pin	Signal
1	5V_USB
2	Data (negative)
3	Data (positive)
4	Ground
5	NC

Table 2: 5-pin USB 2.0 header Pin out reference

Pin Definition (2/3)

J13

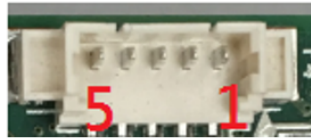


Figure 3: Single USB2.0 pin-out for normal use (J13)

Pin	Signal
1	5V_USB
2	Data (negative)
3	Data (positive)
4	Ground
5	NC

Table 3: Single USB 2.0 Header

J22

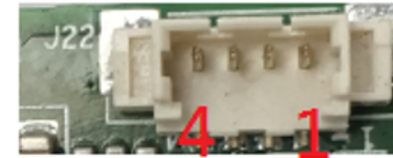


Figure 4: UART pin-out for Debug (J22)

Pin	Signal
1	5V
2	UART Transmission
3	UART Receive
4	Ground

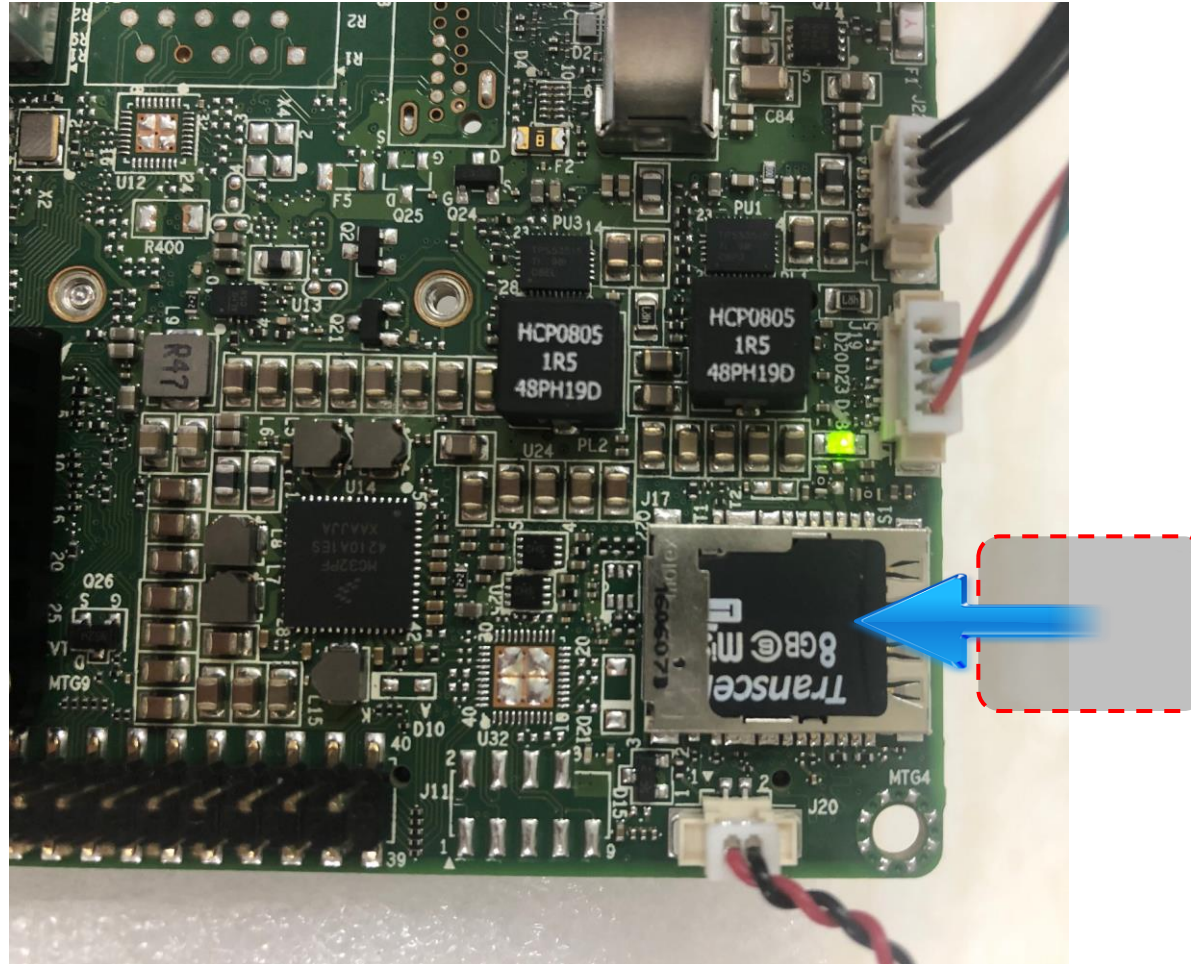
Table 4: UART Header Pin out reference

Pin Definition (3/3)

J3 Raspberry Pi 40-pin header

GPIO#	NAME		NAME	GPIO#
	3.3 VDC Power	1	2	5.0 VDC Power
8	GPIO 8 SDA1 (I2C)	3	4	5.0 VDC Power
9	GPIO 9 SCL1 (I2C)	5	6	Ground
7	GPIO 7 GPCLK0	7	8	GPIO 15 TxD (UART) 15
	Ground	9	10	GPIO 16 RxD (UART) 16
0	GPIO 0	11	12	GPIO 1 PCM_CLK/PWM0 1
2	GPIO 2	13	14	Ground
3	GPIO 3	15	16	GPIO 4 4
	3.3 VDC Power	17	18	GPIO 5 5
12	GPIO 12 MOSI (SPI)	19	20	Ground
13	GPIO 13 MISO (SPI)	21	22	GPIO 6 6
14	GPIO 14 SCLK (SPI)	23	24	GPIO 10 CE0 (SPI) 10
	Ground	25	26	GPIO 11 CE1 (SPI) 11
	SDA0 (I2C ID EEPROM)	27	28	SCL0 (I2C ID EEPROM)
21	GPIO 21 GPCLK1	29	30	Ground
22	GPIO 22 GPCLK2	31	32	GPIO 26 PWM0 26
23	GPIO 23 PWM1	33	34	Ground
24	GPIO 24 PCM_FS/PWM1	35	36	GPIO 27 27
25	GPIO 25	37	38	GPIO 28 PCM_DIN 28
	Ground	39	40	GPIO 29 PCM_DOUT 29

How to insert the Micro SD card



How to enter U-boot

The bring up sequences will count-down 3 seconds in u-boot.

Please use RS232 to connect ND108T's J22 (UART_TX and UART_RX), and press any key in 3 seconds to enter u-boot.

```
COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help
Trying to boot from MMC1

U-Boot 2018.03-imx_v2018.03_4.14.98_2.0.0_ga+g87a19df5e4 (May 08 2020 - 01:35:01 +0000)

CPU: Freescale i.MX8MD rev2.0 1300 MHz (running at 800 MHz)
CPU: Industrial temperature grade (-40C to 105C) at 26C
Reset cause: POR
Model: MitAC ND108T
DRAM: 1 GiB
MMC: FSL_SDHC: 0, FSL_SDHC: 1
Loading Environment from MMC... *** Warning - bad CRC, using default environment

Failed (-5)
No panel detected: default to HDMI
Display: HDMI (1280x720)
In: serial
Out: serial
Err: serial

BuildInfo:
- ATF 1cb68fa
- U-Boot 2018.03-imx_v2018.03_4.14.98_2.0.0_ga+g87a19df5e4

switch to partitions #0, OK
mmc0(part 0) is current device
flash target is MMC:0
Net:
Error: ethernet@30be0000 address not set.
No ethernet found.
Fastboot: Normal
Normal Boot
74 bytes read in 5 ms (13.7 KiB/s)
49521 bytes read in 10 ms (4.7 MiB/s)
Hit any key to stop autoboot: 1
```

```
COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help

U-Boot 2018.03-imx_v2018.03_4.14.98_2.0.0_ga+g87a19df5e4 (May 08 2020 - 01:35:01 +0000)

CPU: Freescale i.MX8MD rev2.0 1300 MHz (running at 800 MHz)
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BuildInfo:
- ATF 1cb68fa
- U-Boot 2018.03-imx_v2018.03_4.14.98_2.0.0_ga+g87a19df5e4

switch to partitions #0, OK
mmc0(part 0) is current device
flash target is MMC:0
Net:
Error: ethernet@30be0000 address not set.
No ethernet found.
Fastboot: Normal
Normal Boot
74 bytes read in 4 ms (17.6 KiB/s)
49521 bytes read in 10 ms (4.7 MiB/s)
Hit any key to stop autoboot: 0
u-boot=>
```

ND108T Yocto & Android Image Update Standard Operation Procedure

Title:	ND108T Yocto & Android Image Update Standard Operation Procedure		
Project:	ND108T	Revision:	1.1
Author:		Revision Date:	2020/06/29

Rev.	Date	Name	Comment
1.0	2020/04/22	Mark Chang	Draft (skeleton)
1.1	2020/06/29	Mark Chang	Add Android image support

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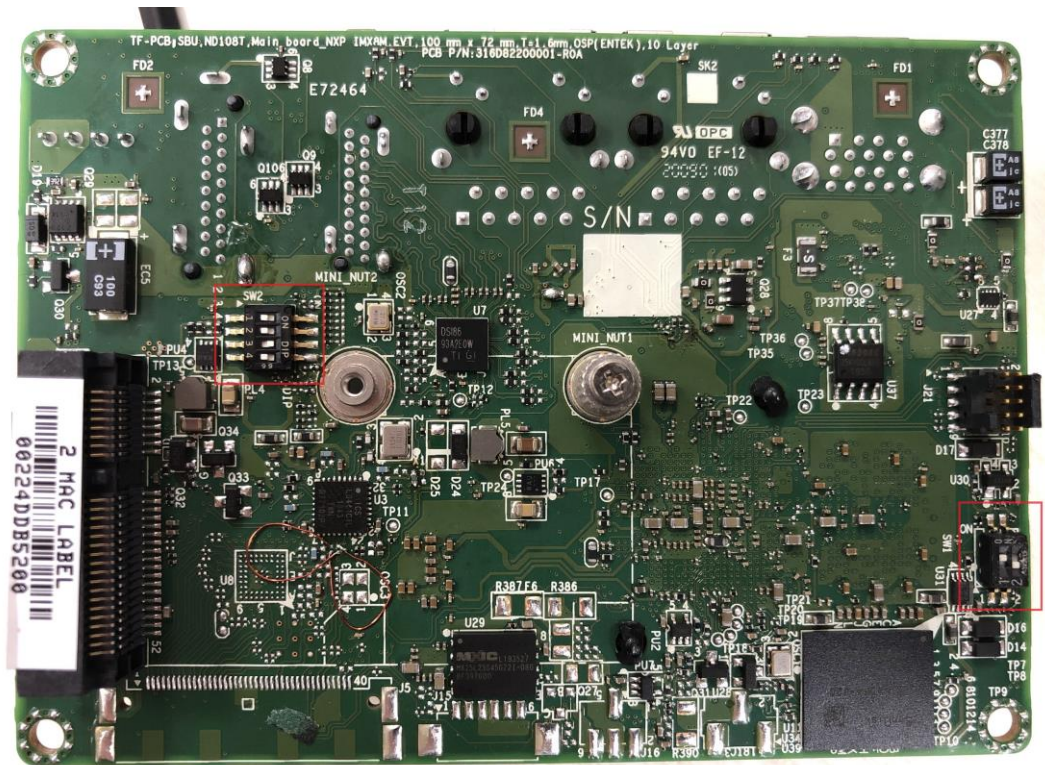
<i>Table of Contents</i>	<i>2</i>
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<i>2 Yocto Image Update</i>	<i>3</i>
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1 Purpose

This Standard Operation Procedure (SOP) describes the usage of Yocto & Android image update method for ND108T project.

2 Yocto Image Update

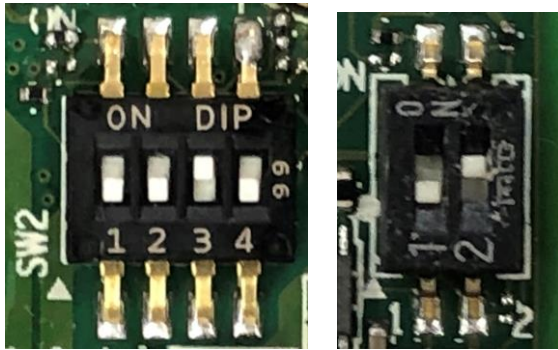
- 1) Configure DIP switches SW1 [1 2] to [OFF ON] and SW2 [1 2 3 4] to [OFF OFF ON OFF].



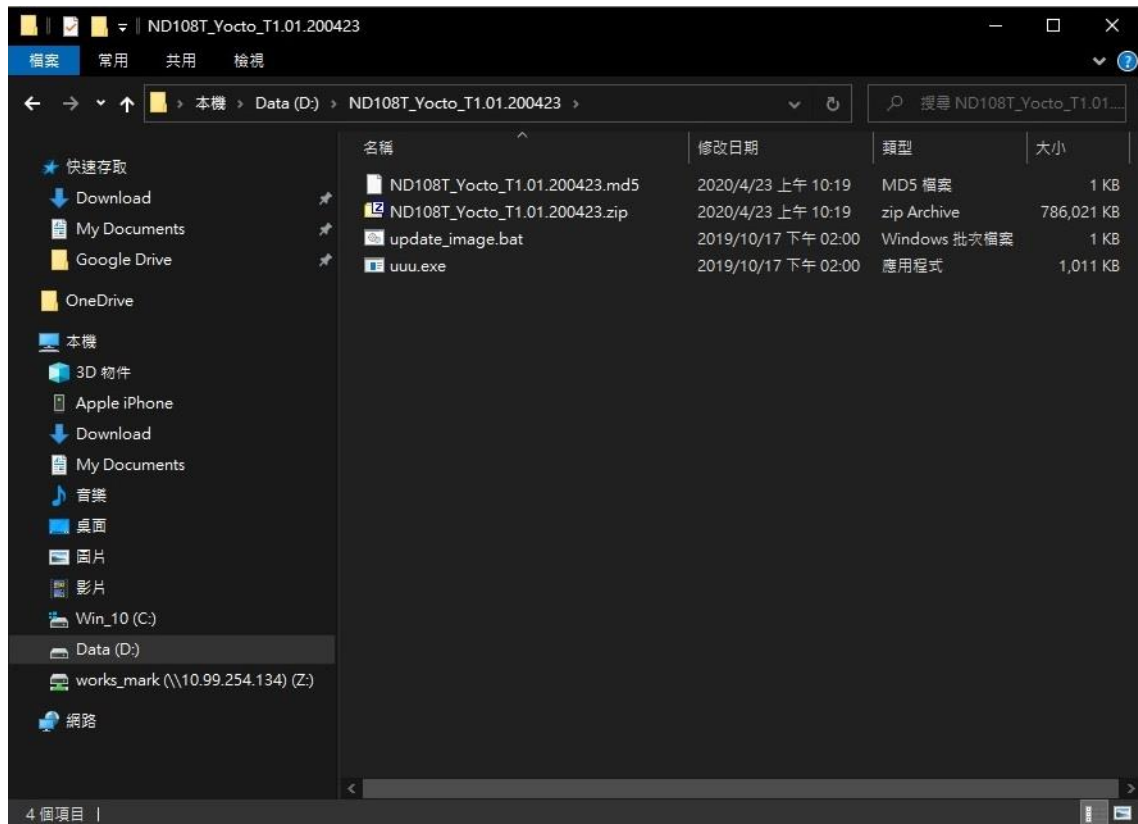
SW1 (Boot Mode DIP)		
DIP1	DIP2	Boot Source
OFF	ON	Serial Download Mode
ON	OFF	Internal Boot Mode

SW2 (Boot Media DIP)				
DIP1	DIP2	DIP3	DIP4	Boot Media Configuration
OFF	OFF	ON	OFF	eMMC
ON	ON	OFF	OFF	microSD

- 2) Connect USB cable between your J19 connector of ND108T device and desktop PC, then plug-in power source to J1 connector.



- 3) Unzip Yocto image (ND108T_Yocto_xx.xx.xxxxxx.zip) in your Windows 10 desktop-PC.

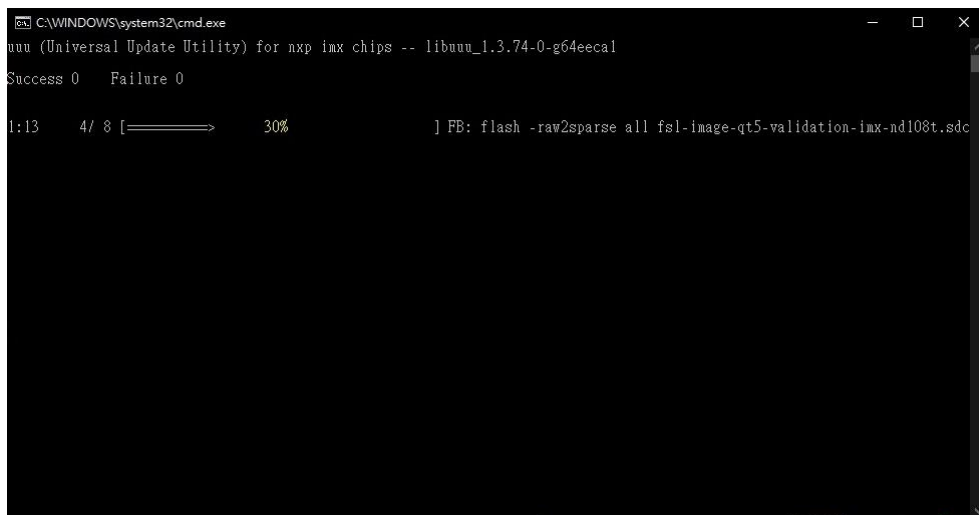


- 4) Launch the batch file “update_image.bat” to update image.



```
C:\WINDOWS\system32\cmd.exe
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.3.74-0-g64eeca1
Success 0 Failure 0

1:13 1/ 1 [=====100%=====] SDP: boot -f imx-boot-nd108t-sd.bin-flash_nd108t
```



```
C:\WINDOWS\system32\cmd.exe
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.3.74-0-g64eeca1
Success 0 Failure 0

1:13 4/ 8 [=====> 30% ] FB: flash -raw2sparse all fsl-image-qt5-validation-imx-nd108t.sdc
```

- 5) Wait for the upgrade progress is done.



```
C:\WINDOWS\system32\cmd.exe
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.3.74-0-g64eeca1
Success 1 Failure 0

請按任意鍵繼續 . . . - ] FB: done
```


- 6) Unplug USB cable and power source, and configure DIP switch SW1 [1 2] to [ON OFF] to Internal Boot Mode.



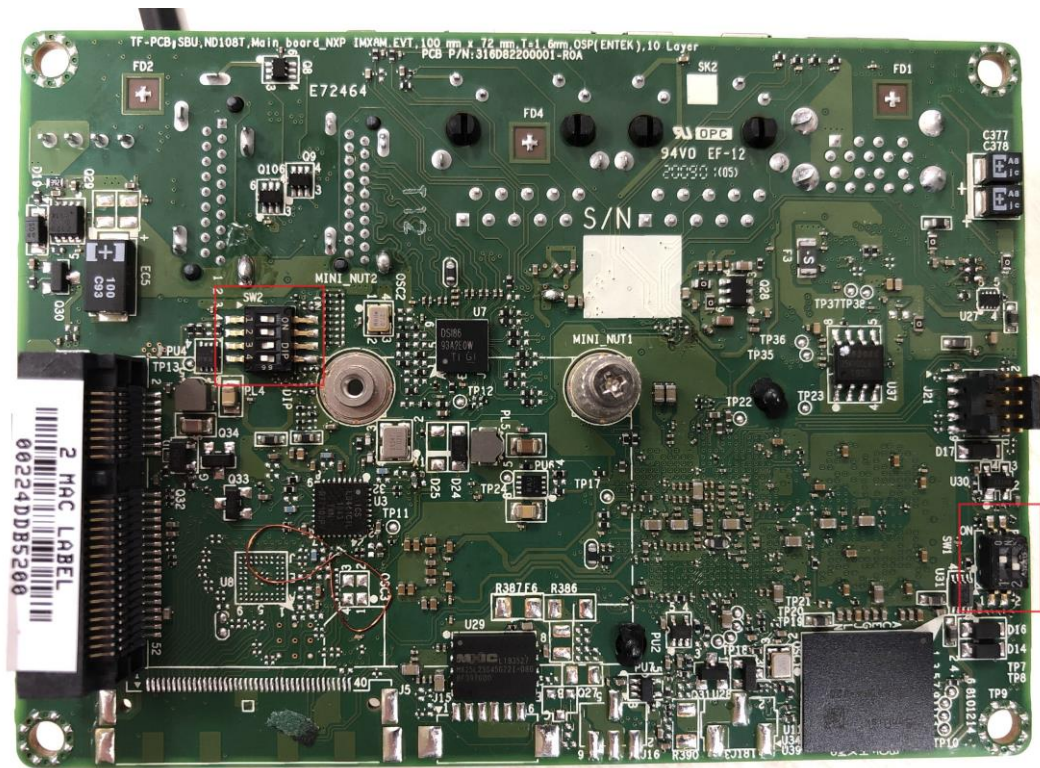
- 7) Plug in power source to boot up device; if you have the debug board and connect to desktop-PC, then you could get logs.

```
COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help

U-Boot SPL 2018.03-imx v2018.03_4.14.98_2.0.0_ga+g87a19df5e4 (Apr 16 2020 - 07:14:53 +0000)
PMIC: PFUZE100 ID=0x10
MITAC ND108T SKUID: SKUD
DRAM: Samsung LPDDR4 4GB (K4FBE3D4HM-MGCI)
DDRINFO: start lpddr4 ddr_init
DRAM PHY training for 3200MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DRAM PHY training for 400MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DRAM PHY training for 100MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DRAM PHY training for 3200MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DDRINFO:ddrphy calibration done
DDRINFO:ddrmix config done
Normal Boot
Trying to boot from USB SDP
```

3 Android Image Update

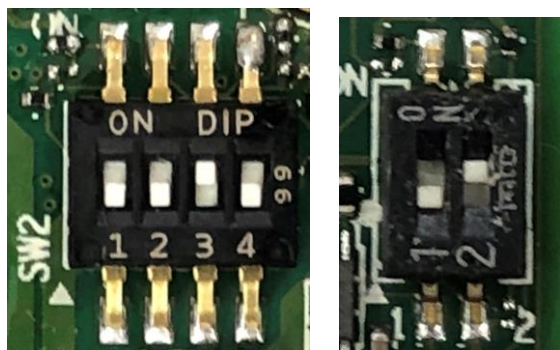
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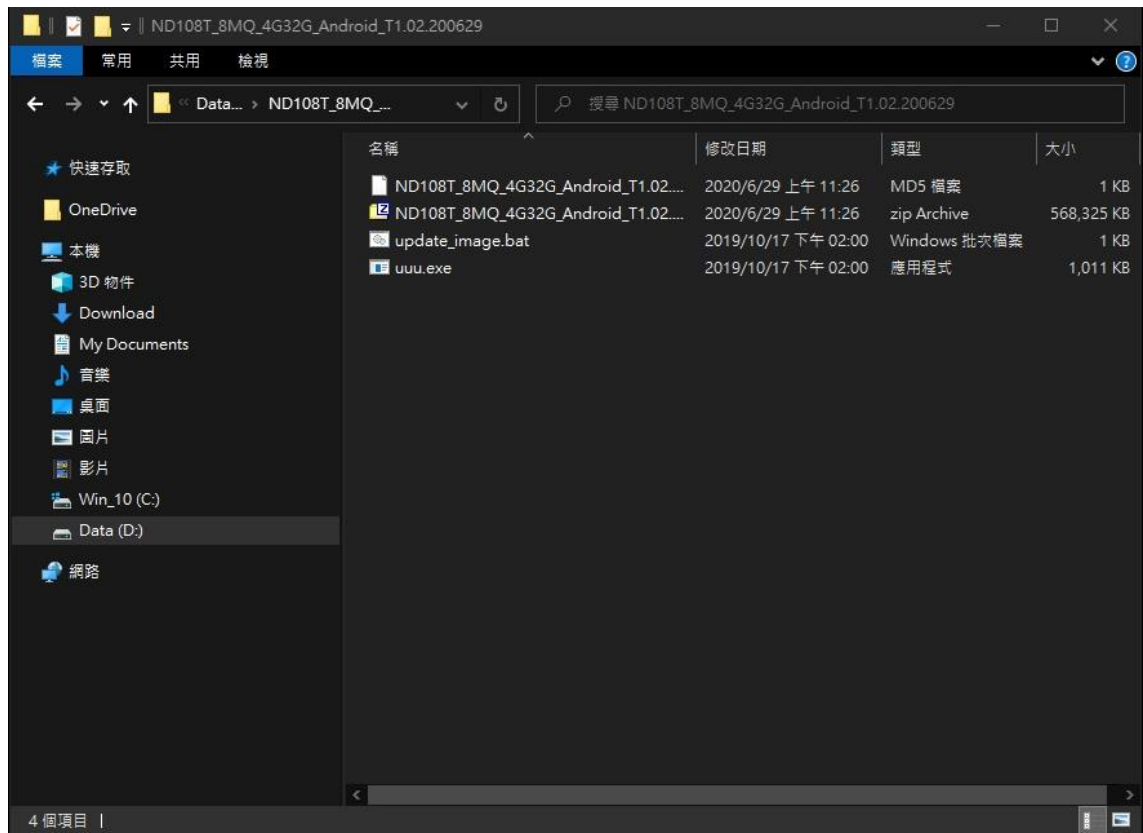
SW1 (Boot Mode DIP)		
DIP1	DIP2	Boot Source
OFF	ON	Serial Download Mode
ON	OFF	Internal Boot Mode

SW2 (Boot Media DIP)				
DIP1	DIP2	DIP3	DIP4	Boot Media Configuration
OFF	OFF	ON	OFF	eMMC
ON	ON	OFF	OFF	microSD

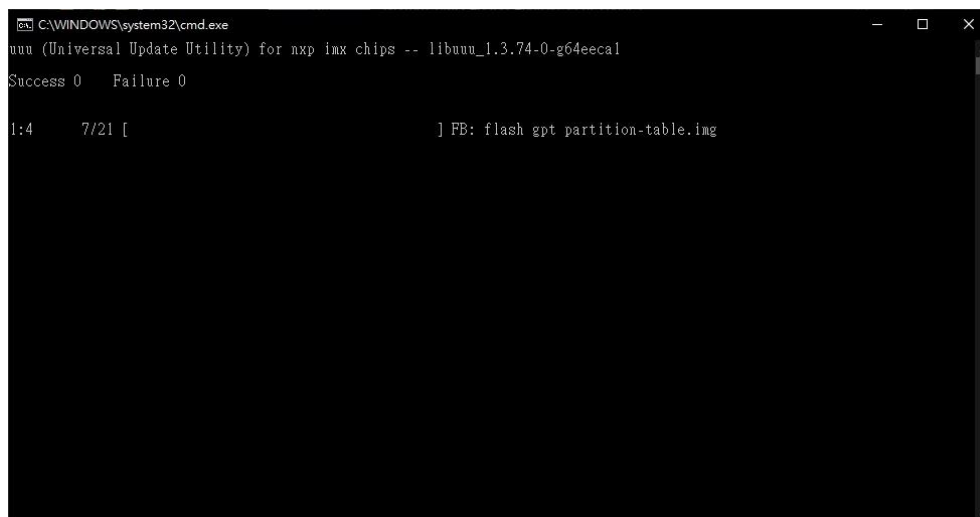
- 2) Connect USB cable between your J19 connector of ND108T device and desktop PC, then plug-in power source to J1 connector.



- 3) Unzip Android image (ND108T_8MQ_4G32G_Android_xx.xx.xxxxxx.zip) in your Windows 10 desktop-PC.



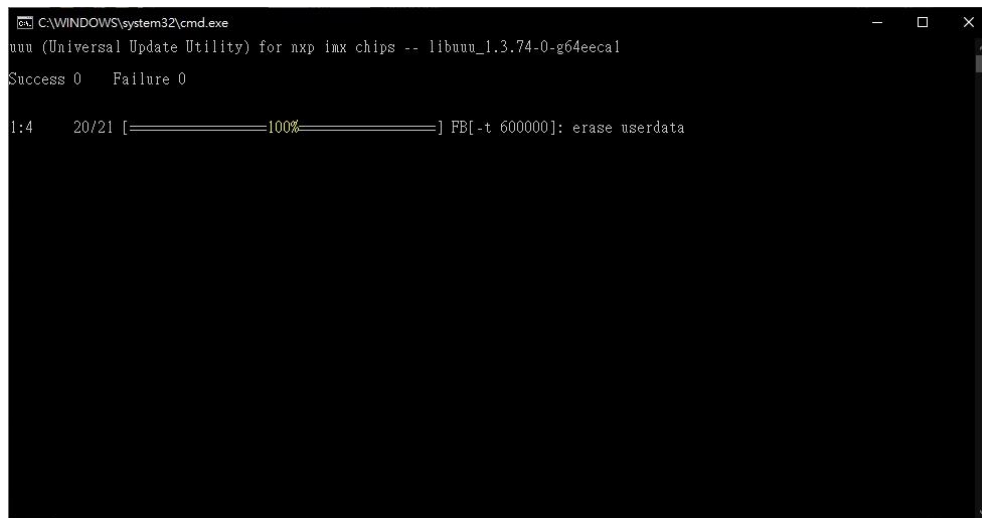
- 4) Launch the batch file “update_image.bat” to update image.





```
C:\WINDOWS\system32\cmd.exe
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.3.74-0-g64eeca1
Success 0   Failure 0

1:4   12/21 [==>          9%          ] FB[-t 100000]: flash system_a system.img
```



```
C:\WINDOWS\system32\cmd.exe
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.3.74-0-g64eeca1
Success 0   Failure 0

1:4   20/21 [=====100%=====] FB[-t 600000]: erase userdata
```

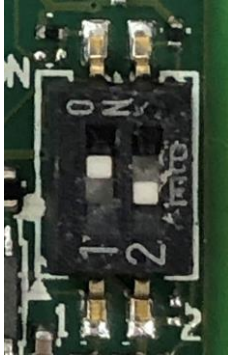
5) Wait for the upgrade progress is done.



```
C:\WINDOWS\system32\cmd.exe
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.3.74-0-g64eeca1
Success 1   Failure 0

請按任意鍵繼續 . . .          ] FB: done
```


- 6) Unplug USB cable and power source, and configure DIP switch SW1 [1 2] to [ON OFF] to Internal Boot Mode.



- 7) Plug in power source to boot up device; if you have the debug board and connect to desktop-PC, then you could get logs.

```
COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help

U-Boot SPL 2018.03-imx_v2018.03_4.14.98_2.0.0_ga+g87a19df5e4 (Apr 16 2020 - 07:14:53 +0000)
PMIC: PFUZE100 ID=0x10
MITAC ND108T SKUID: SKUD
DRAM: Samsung LPDDR4 4GB (K4FBE3D4HM-MGCJ)
DDRINFO: start lpddr4 ddr init
DRAM PHY training for 3200MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DRAM PHY training for 400MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DRAM PHY training for 100MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DRAM PHY training for 3200MTS
check ddr4_pmu_train_imem code
check ddr4_pmu_train_imem code pass
check ddr4_pmu_train_dmem code
check ddr4_pmu_train_dmem code pass
Training PASS
DDRINFO:ddrphy calibration done
DDRINFO: ddrmix config done
Normal Boot
Trying to boot from USB SDP
```



MiTAC I.MX8M Product Series

ME1-108T / ND108T

Linux BSP User Guide



For MiTAC I.MX8M series product (Box PC: ME1-108T, MB: ND108T), MiTAC provides the following Linux BSP (Board support Package) software for developer to develop your targeting Linux OS. These BSPs with source code are customizable, allowing the developers to specify which drivers and routines should be included in the build based on your targeting Linux version and software options.

Moreover, the BSP also contain a pre-compiled binaries image for Yocto and Android which can let developer to have quick try or install for demo purpose. The source code of these pre-compiled images are also provided and developers can base on it to further develop your preferred UI, new device drivers and field applications to build up your final Yocto and Android OS.

1. Hardware Quick Installation Guide

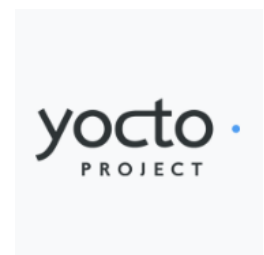
In this file, you will know how to quick install the board for your following Linux development, including:

- Know all the board related headers and pin definition
- How to install the Micro SD card
- How to enter the U-boot

★Please download the installation guide [Here](#)

2. BSP for Yocto Sumo

Yocto project is a framework for creating a Linux distributions for embedded devices. It's layering mechanism makes it easy to add Linux to new target devices highly customized for a particular platform; it can include custom start-up scripts, software packages built with a high degree of optimization for a particular architecture, and different user interfaces from full Gnome desktop to a simple a serial console. This release is based on NXP BSP layer for Yocto framework and MiTAC extends this layer to support our I.MX8M product related functions.



**Yocto Sumo (Kernel version 4.14.98) BSP,**

including source code and files for:

- Bootloader
- Libraries and header files
- All board function device drivers
- Detailed manual describing installation, all APIs and functions, files and utilities
- Sample Source code with pre-compiled binaries image for testing and demo purpose

★Please download the BSP source code [Here](#)

3. BSP for Android 9

This release is based on NXP BSP layer for Android 9 framework and MiTAC extends this layer to support our I.MX8M product related functions.

**Android 9 (Pie, Kernel version 4.14.98) BSP,**

including source code and files for:

- Bootloader
- Libraries and header files
- All board function device drivers
- Detailed manual describing installation, all APIs and functions, files and utilities
- Sample Source code with pre-compiled binaries image for testing and demo purpose

*Note: due to Google CTS (Compatibility Test Suite), the sample image cannot support Google Play for Marketplace function. For this function enabling, developers you may need to contact Google and apply it based on your final developed Android image.

★Please download the BSP source code [Here](#)

.



4. Customization Support

For other customization items beyond our standard BSP coverage above, please contact our sales window for more business discussion and it will only support by requested. The customization items could be:

- **Yocto and Android sample image customization**
ex: UI customization, new Android option enable/disable, new App pre-install
- **Other Linux shell support**
ex: Ubuntu, Debian, RTOS
- **Other Linux kernel version support**
ex: Android 10, Yocto Legacy version
- **Other peripheral device driver support**
ex: WiFi card, LTE card, CAN bus card

Remark:

In the BSP documents, there are several Linux Reference Manuals released from NXP. Based on the NXP document using rule, **please help to register on their website below to sign in and get the authority**. You will also be available get more technical related documents or support through your account on their website.

<https://www.nxp.com/webapp-signup/register>