

MOCHABIN PCBA V1-5 - Quick Start Guide

Rev 02- Nov 24, 2022

Revision History

Date	Revision	Board Rev	Description
Jan 29, 2020	Rev 01	V0-0-0	
Nov 24, 2022	Rev 02	V1-5	

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A. Appearance

A-1. Enclosure (Mochabin Box)



A-2. Mochabin PCBA




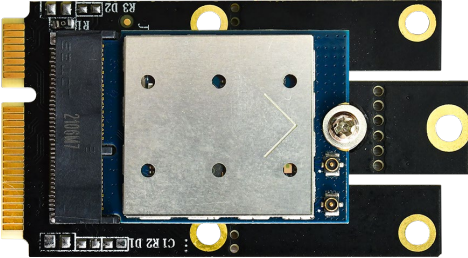




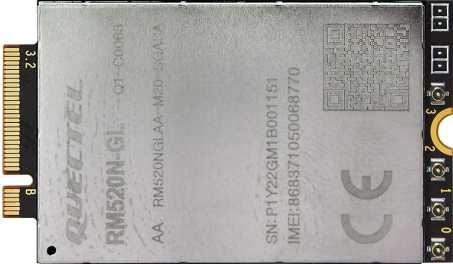
B. Package contents

	Content List	Qti	Std/ Opt	Remark
1	MOCHABIN BOX (MOCHABIN PCBA)	1 unit	standard	*1
2	AC to DC 12V Power Adapter	1 pc	standard	Input 90-240VAC / output 12V,3A DC (optional)
3	Micro USB to USB type-A cable	1 pc	optional	For debug console use
4	Warranty card	1 pc	standard	

Note *1: There are two SKUs, they are MOCHABIN BOX and MOCHABIN PCBA

C. Accessories (optional)

Item	Description	picture
1	SFP to 1000 base T	
2	SFP to 10G base T	
3	10G SFP+ optical cable	
4	8291M-PR Wi-Fi Dual-band 2x2 11ax + BT5.1	

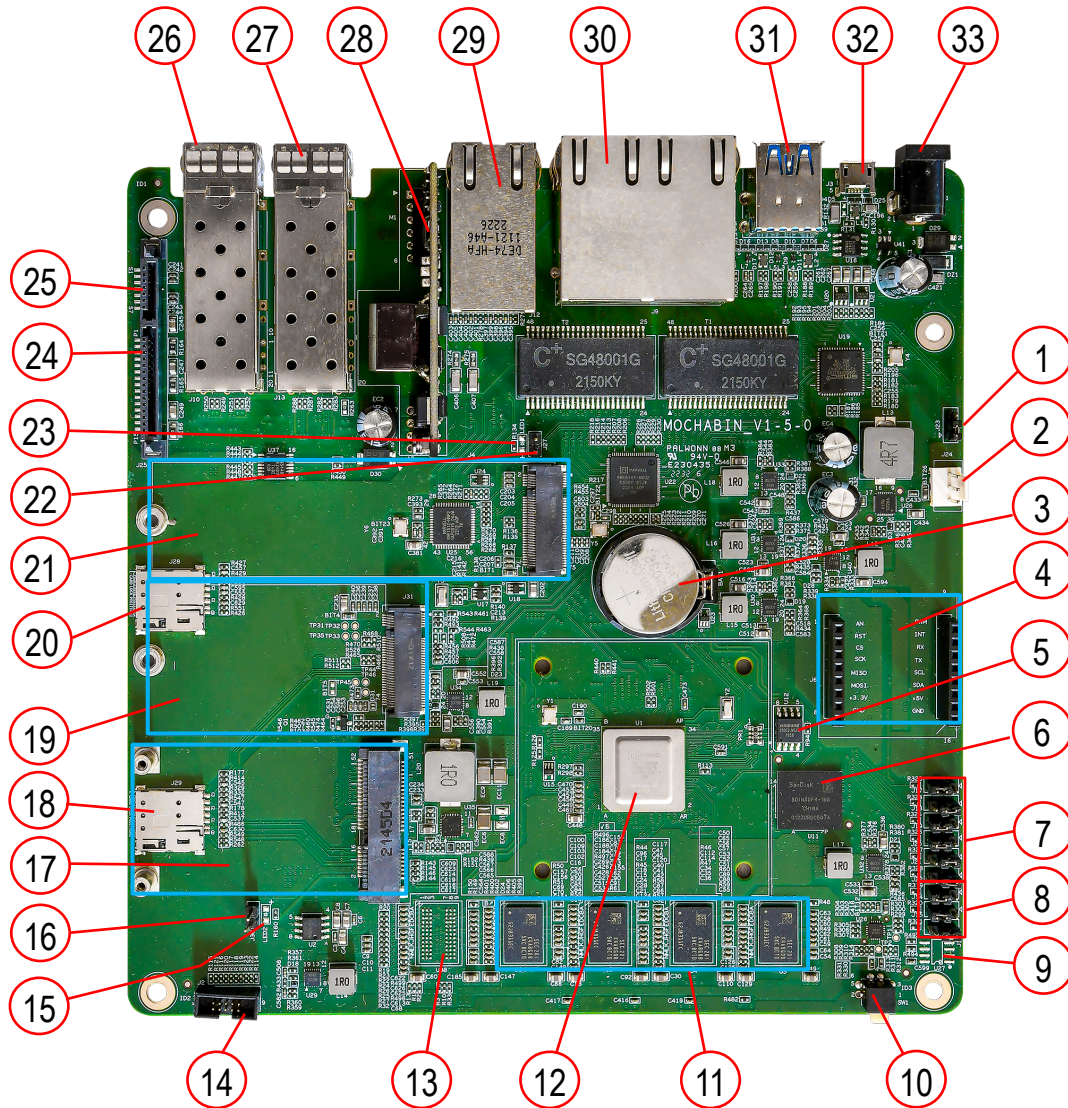
Item	Description	Picture
5	EG25-G LTE Cat4 Mini-PCle module	 <p>The image shows a Quetel EG25-G Mini-PCle module. The silver metal shield has the following text: QUETEL, EG25-G, Q1-A7611, EG25GB-256-SGNS, ANATEL:02528-13-07865, IFTEL:RTIQUEG19-0A27, TA-2019/495 APPROVED, A 201-190135, I.T.D. 19 0609 201, R-O-OUT-EG25-G, CCAM:022100703, GMIT-ID:2019CP1751101, FCC ID:2019R201SMEG25G, IC:10254A-R0187CEUS50, SIM:4F-G24-150-00758, IMI:885330059541432. The module is green with gold-plated Mini-PCle connectors.</p>
6	GTI-WiFi-9098 2x2 Wi-Fi 6 plus BT5.3 Mini-PCle module	 <p>The image shows a GTI-WiFi-9098 Mini-PCle module. The green PCB features a central silver chip with the following text: 82MXX-WA, 8808MX-K3-LT, LCC ID: 001919, 1705-10-16, 1301-03-16. The module is green with gold-plated Mini-PCle connectors and various surface components.</p>
7	RM520N-GL 5G Sub 6G NR module M.2 22x50	 <p>The image shows a Quetel RM520N-GL M.2 22x50 module. The silver metal shield has the following text: QUETEL, RM520N-GL, Q1-D0063, AA, RM520NGLAA-M20-561A, SN: P1Y22GMI B001151, IMEI: 868971050068770. The module is silver with gold-plated M.2 connectors.</p>

D. Key Features

SoC	<ul style="list-style-type: none"> • Marvell ARMADA 88F7040 • Quad Core ARMv8 Cortex-A72 • CPU frequency @1400MHz
Memory	<ul style="list-style-type: none"> • 1 GB / 2GB DDR4 -8bit (8bitx8)
Storage	<ul style="list-style-type: none"> • 4MB SPI NOR flash • 8GB eMMC flash • M.2 SSD socket
Ethernet	<ul style="list-style-type: none"> • 1x 10 Gb SFP+, fiber optic • 1x 1Gb SFP, fiber optic • 1x 1Gb RJ45 WAN • 4x 1Gb RJ45 LAN
Wireless	<ul style="list-style-type: none"> • 802.11 ac/ a/b/g/n 2x2 +BT5, mini-PCIe or USB module- optional
USB	<ul style="list-style-type: none"> • 2x USB 3.0 type-A ports
Expansion	<ul style="list-style-type: none"> • 16-pin (2x8) MikroBus connector • 1x Mini-PCIe 3.0 • 1x M.2 B-key 2250 • 1x M.2 B-key 2280
Debugging	<ul style="list-style-type: none"> • 1x JTAG port, 10-pin • 1x micro USB UART connector
Miscellaneous	<ul style="list-style-type: none"> • DC 12V Power Jack • Power on/off button • Reset button
LEDs	<ul style="list-style-type: none"> • 3x tri-color LEDs • 1 power-on LED • Red LED- M.2 SSD drive LED • Red LED- on mini-PCIe for WLAN

E. I/O ports on PCBA

E-1. Top side



No	Part location	Name	Description
1	J23	Reset selection (wire jumper)	*see section G-1
2	J24	Fan power	Supply +12V on pin2-3
3	BAT1	CR2032 /3.3V	RTC power
4	J6	Mikrobus socket	For Mikrobus expansion board *see section G-3
5	U12	SPI Serial Flash 32M bit	For uboot image
6	U11	eMMC	16GB eMMC for kernel and root-fs
7	J17,J18,J19,J29,J21,J22	Boot option selection	*See section H-2
8	J14,J15,J16	CPU speed selection	*See section H-1
9	U27	Secure chip	Not populated by default
10	SW1	switch	Power on/off switch
11	U3, U4, U5, U6	SDRAM 1 st bank	DDR4 8bit x4
12	U1	SoC-Marvell 88F7040	@1400MHz
13	U38	DDR4 8bit	ECC SDRAM, not populated by default
14	J2	JTAG Debugger	5x2 pins, *see section G-2
15	LED2	WiFi LED for J5	Not populated by default
16	J30	Header for external WiFi LED	Pin1-anode, pin2-cathode
17	J5	Mini-PCIe socket	Reserved for WiFi ax 2x2 + BT5 module
18	J29	SIM sleeve	Connects to J5 and J39
19	J31	M.2-2250 B-key	Reserved for 4G/LTE/5G module
20	J28	SIM sleeve	Connects to J31
21	J4	M.2-2280-B key socket	Reserved for SSD expansion
22	LED1	SSD LED for J4	Not populated by default
23	J27	Header for external SSD LED	Pin1-anode, pin2-cathode
24	J25(p1-p15)	SATA connector	SATA power
25	J25(S1-S7)	SATA connector	SATA signal

No	Part location	Name	Description
26	J10	SFP+ eth0	10Gb WAN Fiber connector (see note 1)
27	J13	SFP eth2	1Gb WAN Fiber connector (see note 1)
28	M1	PoE module	802.3at/af 30W PoE module, power from J12
29	J12	Gb RJ45 with PoE- eth2	WAN with PoE input (see note 1)
30	J9	J9A, J9B, J9C, J9D	1Gb RJ45 for WANx1 and LANx3
31	J26	Dual ports USB3.0	Dual ports USB3.0 type-A female
32	J3	Micro-USB for debug console	For debug console only
33	J1	+12V DC in	DC Jack 5.5x2.1mm

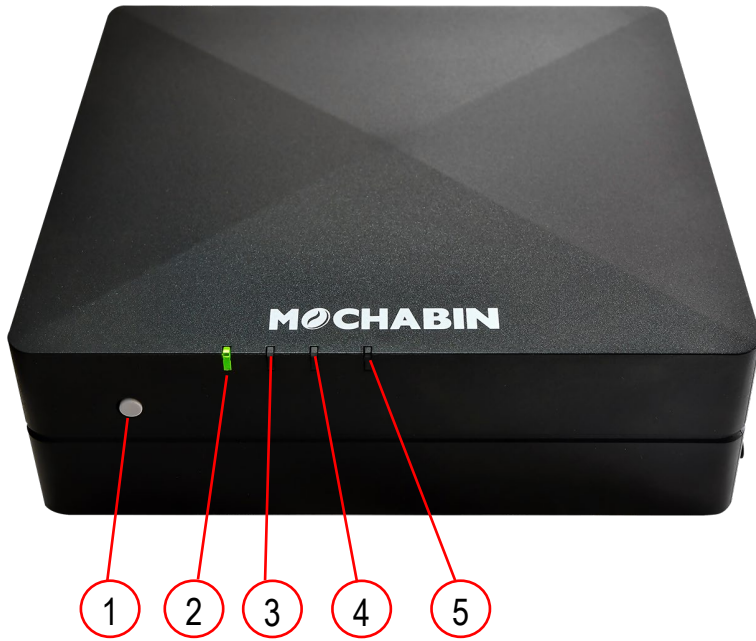
Note 1:

- 1) J12 and J13 are the same eth2 port with different form factor, either RJ45 or SFP
- 2) J10 is a 10Gb SFP+ eth0 port
- 3) Eth0 and eth2 are network bonded in mode-1(active backup) as the same WAN port with eth2 set to bond-primary. This means eth0 will be active only when eth2 doesn't exist or fails.

E-2. Back side

No	Part location	Name	Description
34	SW2	Reset switch	
35	LED7	12VDC Power on LED	Green
36	LED6	I2C controlled LED	Tri-color
37	LED5	I2C controlled LED	Tri-color
38	LED4	I2C controlled LED	Tri-color
39	U7, U8, U9, U10	SDRAM 2 nd bank	DDR4 8bit x4
40	U13	DDR4 8bit	ECC SDRAM, not populated by default

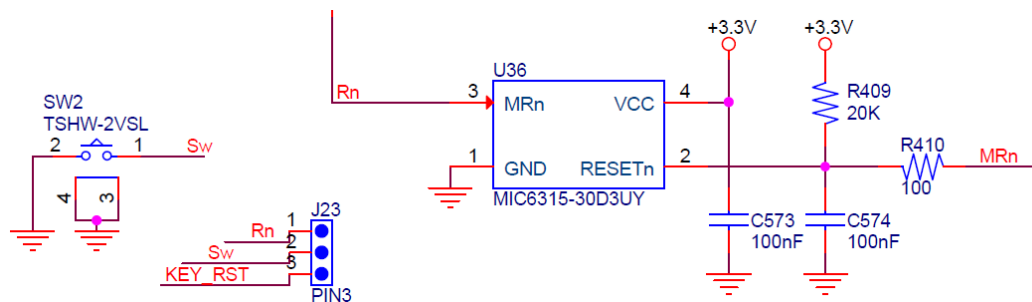
F. I/O ports on Enclosure



No	Part location	Name	Description
1	SW1	switch	Power on/off switch
2	LED7	12VDC Power on LED	Green
3	LED6	I2C controlled LED	Tri-color
4	LED5	I2C controlled LED	Tri-color
5	LED4	I2C controlled LED	Tri-color
6	J10	SFP+ eth0	10Gb WAN Fiber connector (see note 1)
7	J13	SFP eth2	1Gb WAN Fiber connector (see note 1)
8	J12	Gb RJ45 with PoE- eth2	WAN with PoE input (see note 1)
9	J9	J9A, J9B, J9C, J9D	1Gb RJ45 for WANx1 and LANx3
10	J26	Dual ports USB3.0	Dual ports USB3.0 type-A female
11	J3	Micro-USB for debug console	For debug console only
12	J1	+12V DC in	DC Jack 5.5x2.1mm

G. User interfaces

G-1. Reset selection J23

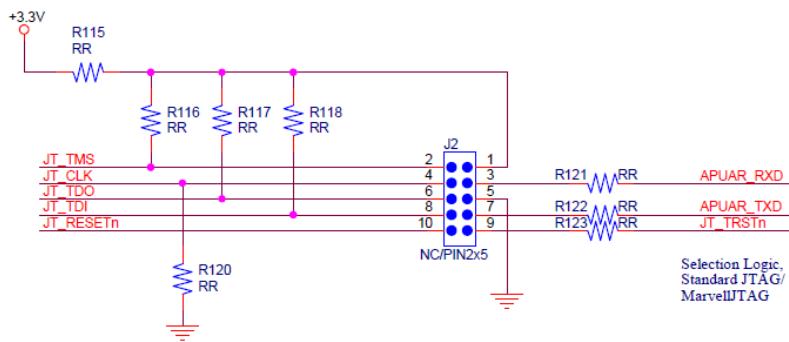


1. J23 is preset to 1-2 by default. When reset switch SW2 is pressed, the MRn low signal will be asserted and sent to SoC to start the system reset process.
2. When J23 is set to 2-3, the KEY_RST will be low when SW2 is pressed and then sent to SOC through GPIO pin, code must be pre-programmed by the user for responding.

G-2. J2- JTAG debugger Pin definition

Pin#	Signal	Remark	Pin#	Signal	Remark
1	+3.3V	Not applied with R115 not populated	2	JT_TMS	
3	APUART_RXD	NC with R121 not populated	4	JT_CLK	
5	GND		6	JT_TDO	
7	APUART_TXD	NC with R122 not populated	8	JT_TDI	
9	JT_TRSTn	NC with R123 not populated	10	JT_RESETn	

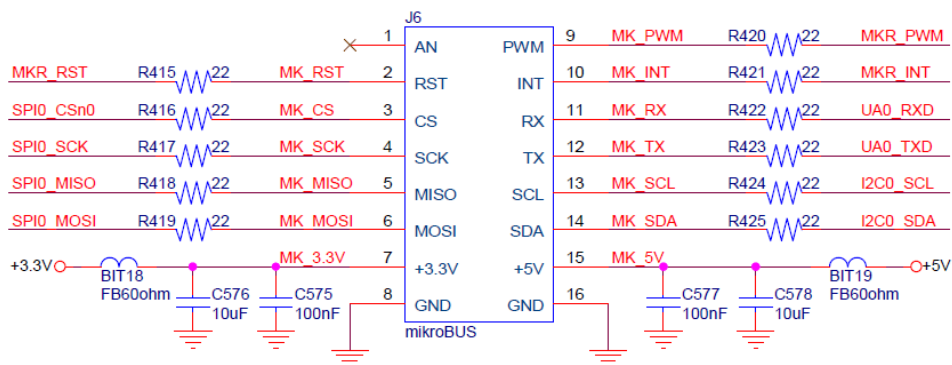
G-2-1. J2- JTAG debugger schematic



G-3. J6- Mikrobus- Pin definition

Pin#	Signal	Remark	Pin#	Signal	Remark
1	NC	AN	9	MKR_PWM	MK_PWM
2	MKR_RST	MK_RST	10	MKR_INT	MK_INT
3	SPI0_CS _{n0}	MK_CS	11	UA0_RXD	MK_RX
4	SPI0_SCK	MK_SCK	12	UA0_TXD	MK_TX
5	SPI0_MISO	MK_MISO	13	I2C0_SCL	MK_SCL
6	SPI0_MOSI	MK_MOSI	14	I2C0_SDA	MK_SDA
7	+3.3V	MK_3.3V	15	+5V	MK_5V
8	GND		16	GND	

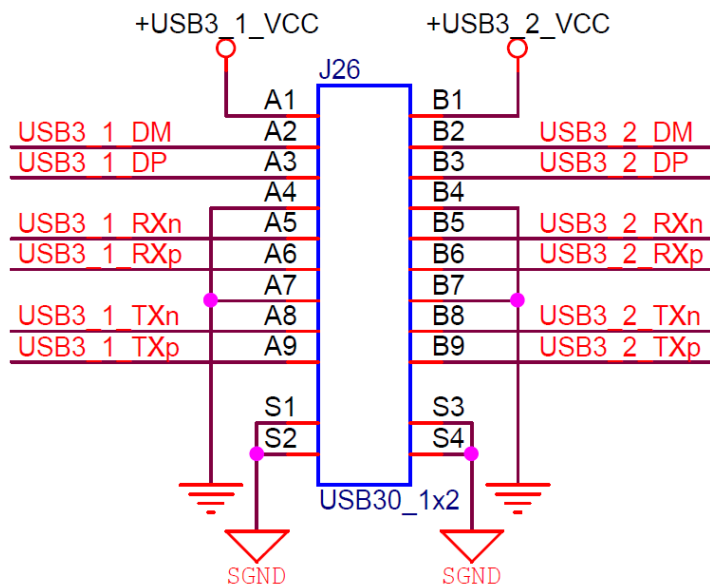
G-3-1. J6- Mikrobus- Schematic



G-4. J26 Dual USB3.0 cable connector

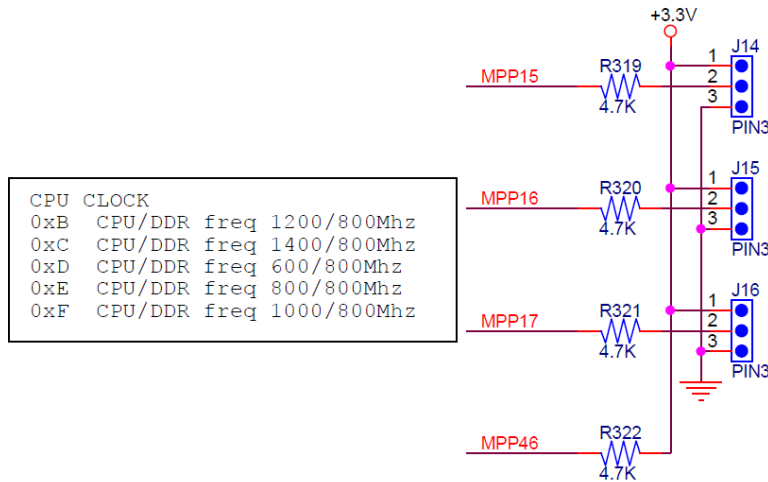
Pin#	Signal	Remark	Pin#	Signal	Remark
A1	+USB3_1_VCC	+5V	B1	+USB3_2_VCC	+5V
A2	USB3_1_DM		B2	USB3_2_DM	
A3	USB3_1_DP		B3	USB3_2_DP	
A4	GND		B4	GND	
A5	USB3_1_RXn		B5	USB3_2_RXn	
A6	USB3_1_RXp		B6	USB3_2_RXp	
A7	GND		B7	GND	
A8	USB3_1_TXn		B8	USB3_2_TXn	
A9	USB3_1_TXp		B9	USB3_2_TXp	
S1/S2	SGNC		S3/S4	SGNC	

G-4-1. J26- Schematic



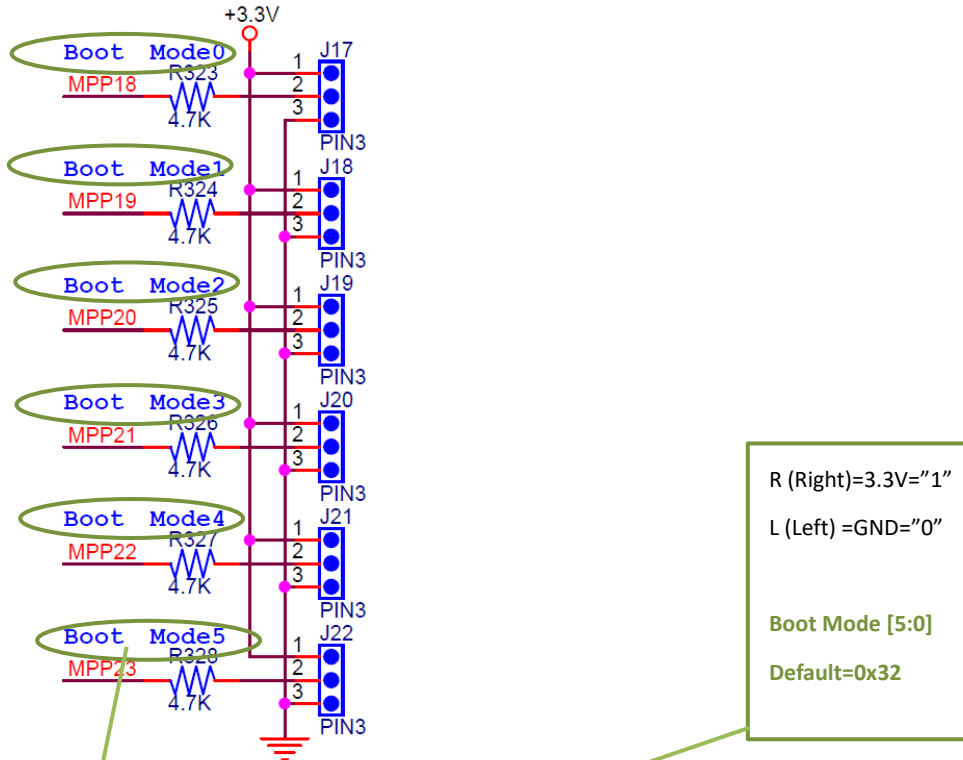
H. Bootstrap wire jumpers

H-1. CPU Clock – J14, J15, J16



MPP46	MPP17 J16	MPP16 J15	MPP15 J14	HEX value	CPU clock MHz	DDR clock MHz	Remark
H	L(2-3)	H(1-2)	H(1-2)	0xB	1200	800	
H	H(1-2)	L(2-3)	L(2-3)	0xC	1400	800	Default value
H	H(1-2)	L(2-3)	H(1-2)	0xD	600	800	
H	H(1-2)	H(1-2)	L(2-3)	0xE	800	800	
H	H(1-2)	H(1-2)	H(1-2)	0xF	1000	800	

H-2. Boot Mode – J17, J18, J19, J20, J21, J22



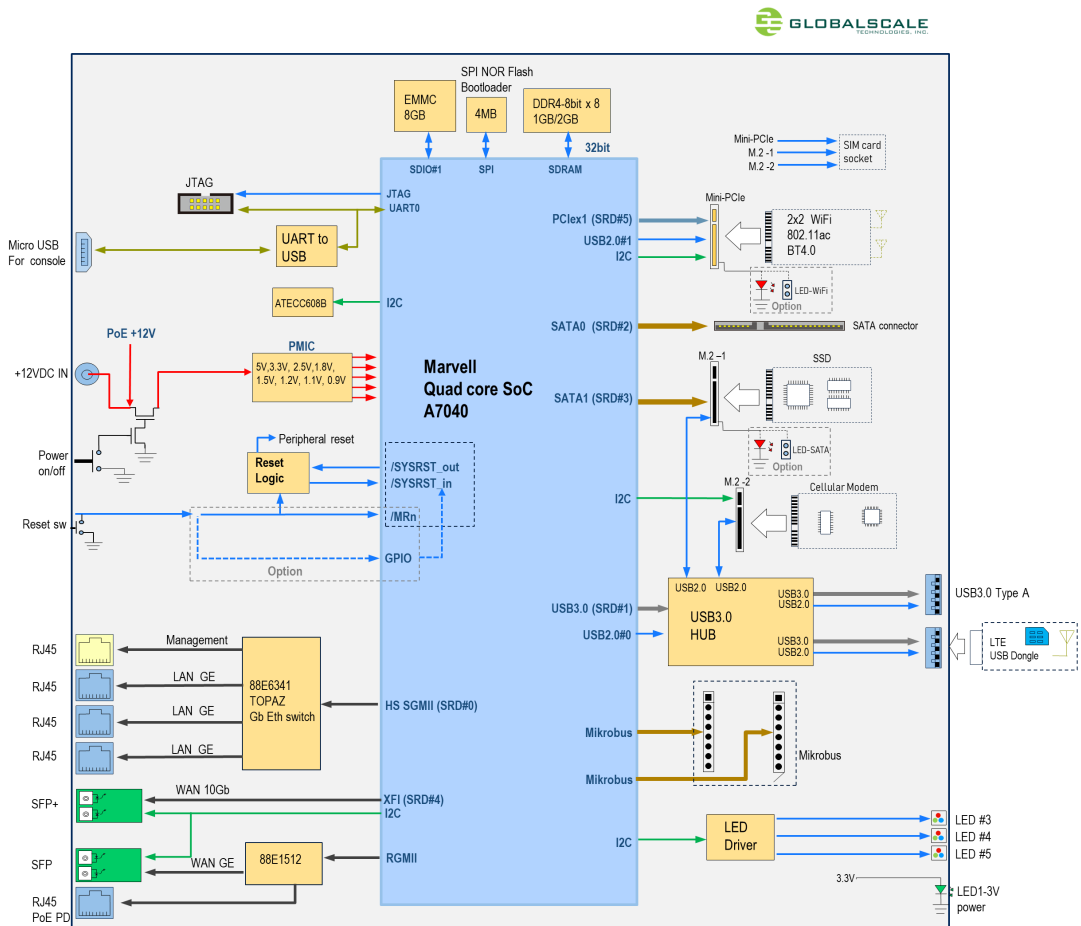
BootROM Enabled	
Boot Mode [5:0]	Details
0x0	BootROM Enabled, Boot from NOR: 8 bits width, DEV_Wen, and DEV_OEn are not muxed with DEV_A[16:15], using MPP multiplexing option of NOR 8 bits
0x1	BootROM Enabled, Boot from NOR: 8 bits width, DEV_Wen, and DEV_OEn are muxed with DEV_A[16:15], using MPP multiplexing option of NOR 8 bits
0x4	BootROM Enabled, Boot from NOR: 16 bits width, DEV_Wen, and DEV_OEn are not muxed with DEV_A[16:15], using MPP multiplexing option of NOR 16 bits
0x5	BootROM Enabled, Boot from NOR: 16 bits width, DEV_Wen, and DEV_OEn are muxed with DEV_A[16:15], using MPP multiplexing option of NOR 16 bits
0x8	BootROM Enabled, Boot from NAND: 8 bits width, using MPP multiplexing option of NAND 8 bits

0x9	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 1 bit ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0A	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0B	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0C	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0D	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 2KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0E	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x0F	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x10	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x11	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 4KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x12	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x13	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x14	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x15	BootROM Enabled, Boot from NAND: 8 bits width, with a page size of 8KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 8 bits
0x18	BootROM Enabled, Boot from NAND: 16 bits width, using MPP multiplexing option of NAND 16 bits
0x19	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 1 bit ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1A	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1B	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1C	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 16 bits

0x1D	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 2KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1E	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x1F	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x20	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x21	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 4KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x22	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 4 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x23	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 8 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x24	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 12 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x25	BootROM Enabled, Boot from NAND: 16 bits width, with a page size of 8KB, 16 bits ECC support per page, using MPP multiplexing option of NAND 16 bits
0x28	BootROM Enabled, Boot from SD: AP_SD, using MPP multiplexing option of SD on AP_MPP[5:0]
0x29	BootROM Enabled, Boot from SD: CP_SD, using MPP multiplexing option of SD on MPP[61:56]
0x2A	BootROM Enabled, Boot from eMMC: AP_eMMC, using MPP multiplexing option of eMMC on AP_MPP[5:0] sel SDIO PHY.
0x2B	BootROM Enabled, Boot from eMMC: CP_eMMC, using MPP multiplexing option of eMMC on CP MPP[61:56] sel SDIO PHY and CP MPP[34:33] sel 0x2
0x2E	BootROM Enabled, Boot from SPI: CP_SPI1, NAND Flash type, using MPP multiplexing option of SPI on MPP[13:16]
0x2F	BootROM Enabled, Boot from SPI: CP_SPI0, NAND Flash type, using MPP multiplexing option of SPI on MPP[56:59]
0x30	BootROM Enabled, Boot from SPI: AP_SPI, 24 address bits, NOR Flash type, using MPP multiplexing option of SPI on AP_MPP[3:0]
0x32	BootROM Enabled, Boot from SPI: CP_SPI1, 24 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[13:16]
0x33	BootROM Enabled, Boot from SPI: CP_SPI1, 32 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[13:16]
0x34	BootROM Enabled, Boot from SPI: CP_SPI0, 24 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[56:59]

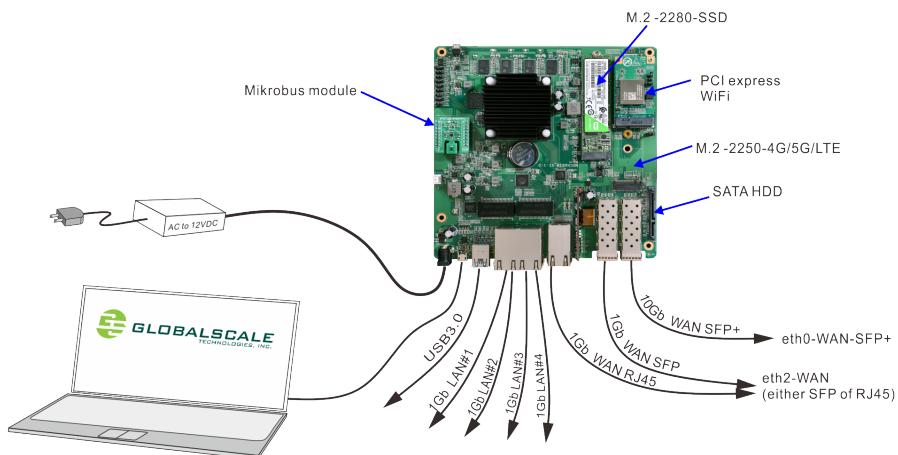
0x35	BootROM Enabled, Boot from SPI: CP_SPI0, 32 address bits, NOR Flash type, using MPP multiplexing option of SPI on MPP[56:59]
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I. Block Diagram

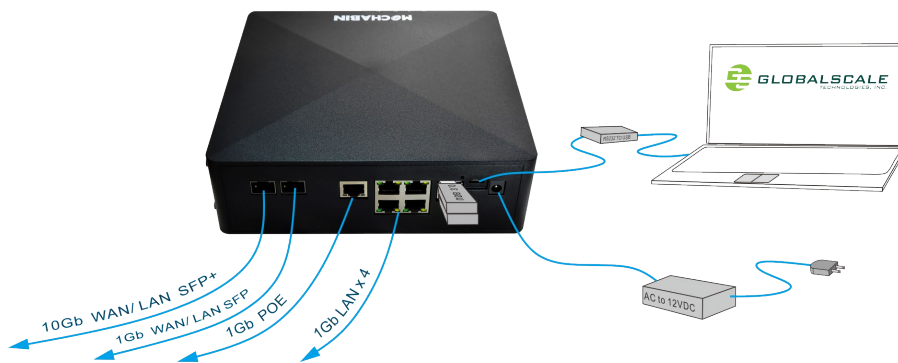


J. Cable connection for testing

J-1. Mochabin PCBA connection



J-2. Mochabin BOX connection



K. Preparation for power on

K-1. Hardware:

- a. Linux PC installed with minicom, putty or Windows PC installed with putty
- b. MOCHABIN unit PCBA or BOX
- c. Ethernet cable from IP router or IP switch (optional)
- d. USB3.0 Flash disks (optional)
- e. Mini-USB to USB cable

K-2. Software:

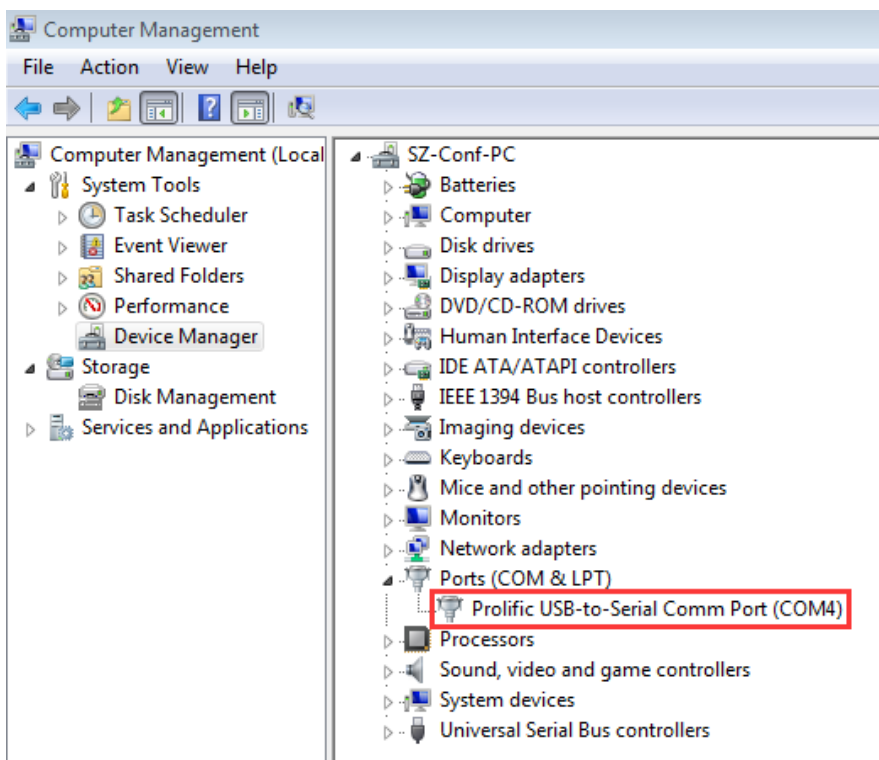
- a. Putty for Linux or Windows PC
Please go on web and download putty.exe

Visit the following web site for more information

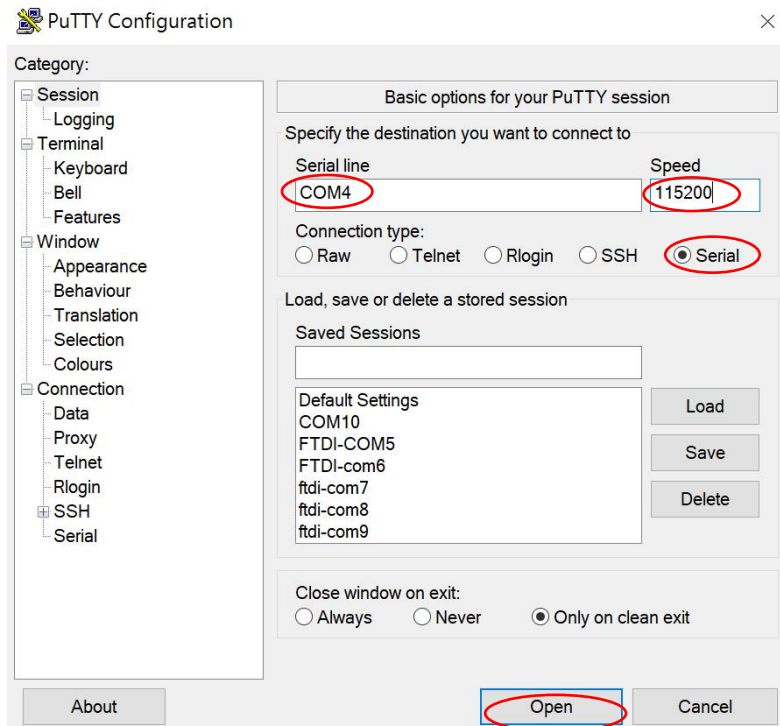
<http://www.globalscaletechnologies.com/t-downloads.aspx>

L. Find com port and connect with putty

1. Connect MOCHABIN's RS-232 port to PC's USB port by using the dedicated cable
2. Go to [my computer] [device manager] and you will see a new COM port after plugging in the USB cable, here is COM4 for example



- Run putty, select serial connection then enter the COM port you've found in the previous step, The baud rate speed is 115200 then press "open"



M. Running MOCHABIN

M-1. Check U-boot version and some system information

Power on the board then press enter to terminate uboot running, you can see messages on screen like the followings

```

U-Boot 2018.03-devel-18.12.3-gb794de0054 (Sep 05 2022 - 14:38:22 +0800)

Model: Marvell Armada 7040 Mochabin development board
SoC: Armada7040-B0; AP806-B0; CP115-A0
Clock: CPU      1400 [MHz]
       DDR      800  [MHz]
       FABRIC   800  [MHz]
       MSS      200  [MHz]
LLC Enabled (Exclusive Mode)
DRAM: 4 GiB
Bus spi@700680 CS0 configured for direct access 00000000f9000000:0x1000000
SF: Detected w25q32bv with page size 256 Bytes, erase size 4 KiB, total 4 MiB
Comphy chip #0:
Comphy-0: SGMII1          3.125 Gbps
Comphy-1: USB3_HOST0
Comphy-2: SATA0
Comphy-3: SATA1
Comphy-4: SF10           10.3125 Gbps
Comphy-5: PEX2
UTMI PHY 0 initialized to USB Host0
UTMI PHY 1 initialized to USB Host1
SATA link 0 timeout.
SATA link 1 timeout.
AHCI 0001.0000 32 slots 2 ports 6 Gbps 0x3 impl SATA mode
flags: 64bit ncq led only pmp fbss pio slum part sxs
PCIE-0: Link down
MMC: sdhci@6e0000: 0
Loading Environment from SPI Flash... OK
Model: Marvell Armada 7040 Mochabin development board
Net: eth0: mvpp2-0 [PRIME], eth1: mvpp2-1, eth2: mvpp2-2
Hit any key to stop autoboot: 0
Marvell>>

```

Enter “boot” to continue boot up if interrupted.

```

Marvell>>
Marvell>> boot

```

M-2. login “root” with password “admin”

```
moca289bf1 login: root
Password:
Last login: Wed Nov 23 13:11:33 UTC 2022 on ttyS0
Welcome to Ubuntu 18.04 LTS (GNU/Linux 5.4.163-00034-ga7e9e3c22288 aarch64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage
root@moca289bf1:~#
```

```
root@moca289bf1:~# whoami
root
root@moca289bf1:~# pwd
/root
root@moca289bf1:~#
```

M-3. Check the kernel version

Enter command : `uname -a`

```
Linux moca289bf1 5.4.163-00034-ga7e9e3c22288 #2 SMP PREEMPT Fri Aug 5 14:25:28 CST 2022 aarch64
aarch64 aarch64 GNU/Linux
root@moca289bf1:~# ^C
root@moca289bf1:~#
```

M-4. Check the CPU information

M-4.1 check with command “cat /proc/cpuinfo”

You may see there are 4 processors

```
root@moca289bf1:~# cat /proc/cpuinfo
processor       : 0
BogoMIPS      : 50.00
Features       : fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

processor       : 1
BogoMIPS      : 50.00
Features       : fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

processor       : 2
BogoMIPS      : 50.00
Features       : fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

processor       : 3
BogoMIPS      : 50.00
Features       : fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
CPU implementer : 0x41
CPU architecture: 8
CPU variant    : 0x0
CPU part      : 0xd08
CPU revision   : 1

root@moca289bf1:~#
```

M-4.2 check with lscpu command

```

root@moca289bf1:~# lscpu
Architecture:      aarch64
Byte Order:        Little Endian
CPU(s):            4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s):         1
NUMA node(s):     1
Vendor ID:         ARM
Model:             1
Model name:        Cortex-A72
Stepping:          r0p1
CPU max MHz:       1400.0000
CPU min MHz:       350.0000
BogoMIPS:          50.00
NUMA node0 CPU(s): 0-3
Flags:              fp asimd evtstrm aes pmull sha1 sha2 crc32 cpuid
root@moca289bf1:~#
    
```

M-5. Check the memory information

```

root@moca289bf1:~# cat /proc/meminfo
MemTotal:          4031096 kB
MemFree:           3843280 kB
MemAvailable:     3821368 kB
Buffers:           5972 kB
Cached:            83540 kB
SwapCached:        0 kB
Active:            50816 kB
Inactive:          56704 kB
Active(anon):      18520 kB
Inactive(anon):    2556 kB
Active(file):      32296 kB
Inactive(file):    54148 kB
Unevictable:       0 kB
Mlocked:           0 kB
SwapTotal:         0 kB
SwapFree:          0 kB
Dirty:             4 kB
Writeback:         0 kB
AnonPages:         18016 kB
Mapped:            24328 kB
Shmem:             3060 kB
KReclaimable:     12432 kB
Slab:              35864 kB
SReclaimable:     12432 kB
SUnreclaim:       23432 kB
KernelStack:      1952 kB
PageTables:        764 kB
NFS_Unstable:     0 kB
Bounce:           0 kB
    
```

M-6. Check the network information

Connect RJ45 cable from the WAN port to the ethernet router or switch
type in “dhclient” then ifconfig”

M-6.1 check with ifconfig command

```

root@moca289bf1:~# ifconfig
bond0: flags=5187<UP, BROADCAST, RUNNING, MASTER, MULTICAST> mtu 1500
    inet 192.168.3.21 netmask 255.255.255.0 broadcast 192.168.3.255
    inet6 fe80::f2ad:4eff:fe28:9bf1 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:28:9b:f1 txqueuelen 1000 (Ethernet)
    RX packets 417 bytes 44263 (44.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 389 bytes 34702 (34.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

br0: flags=4099<UP, BROADCAST, MULTICAST> mtu 1500
    inet 192.168.84.1 netmask 255.255.255.0 broadcast 192.168.84.255
    ether f0:ad:4e:28:9b:f0 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth0: flags=6147<UP, BROADCAST, SLAVE, MULTICAST> mtu 1500
    ether f0:ad:4e:28:9b:f1 txqueuelen 2048 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4419<UP, BROADCAST, RUNNING, PROMISC, MULTICAST> mtu 1508
    inet6 fe80::f2ad:4eff:fe28:9bf0 prefixlen 64 scopeid 0x20<link>
    ether f0:ad:4e:28:9b:f0 txqueuelen 2048 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 18 bytes 1838 (1.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth2: flags=6211<UP, BROADCAST, RUNNING, SLAVE, MULTICAST> mtu 1500
    ether f0:ad:4e:28:9b:f1 txqueuelen 2048 (Ethernet)
    RX packets 417 bytes 44263 (44.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 389 bytes 34702 (34.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

```

```
lan0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether f0:ad:4e:28:9b:f0 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lan1: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether f0:ad:4e:28:9b:f0 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lan2: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether f0:ad:4e:28:9b:f0 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lan3: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether f0:ad:4e:28:9b:f0 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
     inet 127.0.0.1 netmask 255.0.0.0
     inet6 ::1 prefixlen 128 scopeid 0x10<host>
     loop txqueuelen 1000 (Local Loopback)
     RX packets 51 bytes 4889 (4.8 KB)
     RX errors 0 dropped 0 overruns 0 frame 0
     TX packets 51 bytes 4889 (4.8 KB)
     TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@moca289bf1:~# ^C
root@moca289bf1:~#
```

M-6.2 Using ping command to verify internet connection

```
root@moca289bf1:~# ping -c 10 www.google.com
PING www.google.com (142.251.43.4) 56(84) bytes of data.
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=1 ttl=52 time=42.9 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=2 ttl=52 time=89.1 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=3 ttl=52 time=227 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=4 ttl=52 time=156 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=5 ttl=52 time=60.4 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=6 ttl=52 time=41.4 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=7 ttl=52 time=278 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=8 ttl=52 time=206 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=9 ttl=52 time=157 ms
64 bytes from tsa03s08-in-f4.1e100.net (142.251.43.4): icmp_seq=10 ttl=52 time=49.2 ms

--- www.google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 41.464/130.929/278.034/81.949 ms
root@moca289bf1:~#
```

M-7. Check the USB3.0 ports

M-7.1 check USB device without USB disk plugged

Enter command: lsusb

```
root@moca289bf1:~# lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 002: ID 0424:5534 Standard Microsystems Corp. Hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 002: ID 0424:2134 Standard Microsystems Corp. Hub
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@moca289bf1:~#
```


M-7.2 check USB device with 2 USB disks plugged

Enter command: lsusb

```
root@moca289bf1:~# lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 003: ID 13fe:6300 Kingston Technology Company Inc.
Bus 004 Device 002: ID 0424:5534 Standard Microsystems Corp. Hub
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 003: ID 0951:1624 Kingston Technology DataTraveler G2
Bus 003 Device 002: ID 0424:2134 Standard Microsystems Corp. Hub
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@moca289bf1:~#
```

M-7.3 check disk partitions

Enter command: cat /proc/partitions

```
root@moca289bf1:~# cat /proc/partitions
major minor #blocks name
1        0      65536 ram0
31       0       3968 mtblock0
31       1         64 mtblock1
31       2         64 mtblock2
179      0    15388672 mmcblk0
179      1    15387648 mmcblk0p1
8        0    15474688 sda
8        1    15466048 sda1
8       16     3915776 sdb
8       17     3915744 sdb1
root@moca289bf1:~#
```

M-7.4 check disk partitions with “df” command

```

root@moca289bf1:~# df
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/root        15014832 1046040 13183028   8% /
devtmpfs         1981884     0    1981884   0% /dev
tmpfs            2015548     0    2015548   0% /dev/shm
tmpfs            2015548    3156    2012392   1% /run
tmpfs             5120       0         5120   0% /run/lock
tmpfs            2015548     0    2015548   0% /sys/fs/cgroup
tmpfs            403108     0     403108   0% /run/user/0
/dev/sda1        15458400 9288768  6169632  61% /media/disk0
/dev/sdb1         3907552     288    3907264   1% /media/disk1
root@moca289bf1:~#
    
```

M-7.5 check disk partitions with “fdisk -l” command

```
root@moca289bf1:~# fdisk -l
Disk /dev/ram0: 64 MiB, 67108864 bytes, 131072 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes

Disk /dev/mtdblock0: 3.9 MiB, 4063232 bytes, 7936 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mtdblock1: 64 KiB, 65536 bytes, 128 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mtdblock2: 64 KiB, 65536 bytes, 128 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mmcblk0: 14.7 GiB, 15758000128 bytes, 30777344 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x89708921
```

check disk partitions with “fdisk -l” command (continued)

```
Device      Boot Start      End  Sectors  Size Id Type
/dev/mmcblk0p1 *    2048 30777343 30775296 14.7G 83 Linux

Disk /dev/sda: 14.8 GiB, 15846080512 bytes, 30949376 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xb9fc2146

Device      Boot Start      End  Sectors  Size Id Type
/dev/sda1    17280 30949375 30932096 14.8G  c W95 FAT32 (LBA)

Disk /dev/sdb: 3.8 GiB, 4009754624 bytes, 7831552 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x000087dd

Device      Boot Start      End  Sectors  Size Id Type
/dev/sdb1 *    63 7831551 7831489 3.8G  c W95 FAT32 (LBA)
root@moca289bf1:~#
```

M-8. top command

```

root@moca289bf1:~# top
top - 14:06:16 up 53 min, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 121 total, 1 running, 68 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.1 sy, 0.0 ni, 99.8 id, 0.0 wa, 0.1 hi, 0.0 si, 0.0 st
KiB Mem : 4031096 total, 3829240 free, 87092 used, 114764 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 3813692 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 2697 root        20   0   5628   2776  2224  R   0.7   0.1   0:00.31 top
  153 root        20   0     0     0     0   S   0.3   0.0   0:04.57 f212a200.m+
    1 root        20   0  95492   8152  5764  S   0.0   0.2   0:01.85 systemd
    2 root        20   0     0     0     0   S   0.0   0.0   0:00.00 kthreadd
    3 root         0 -20     0     0     0   I   0.0   0.0   0:00.00 rcu_gp
    4 root         0 -20     0     0     0   I   0.0   0.0   0:00.00 rcu_par_gp
    8 root         0 -20     0     0     0   I   0.0   0.0   0:00.00 mm_percpu_+
    9 root        20   0     0     0     0   S   0.0   0.0   0:00.04 ksoftirqd/0
   10 root        20   0     0     0     0   I   0.0   0.0   0:00.06 rcu_preempt
   11 root        rt    0     0     0     0   S   0.0   0.0   0:00.00 migration/0
   12 root        20   0     0     0     0   S   0.0   0.0   0:00.00 cpuhp/0
   13 root        20   0     0     0     0   S   0.0   0.0   0:00.00 cpuhp/1
   14 root        rt    0     0     0     0   S   0.0   0.0   0:00.00 migration/1
   15 root        20   0     0     0     0   S   0.0   0.0   0:00.02 ksoftirqd/1
   18 root        20   0     0     0     0   S   0.0   0.0   0:00.00 cpuhp/2
   19 root        rt    0     0     0     0   S   0.0   0.0   0:00.00 migration/2
   20 root        20   0     0     0     0   S   0.0   0.0   0:00.02 ksoftirqd/2
    
```

M-9. Other useful commands like “lspci” and “lsmod”

```

root@moca289bf1:~# lspci
00:00.0 PCI bridge: Marvell Technology Group Ltd. Device 0110
root@moca289bf1:~#
    
```

```
root@moca289bf1:~# lsmod
Module                Size Used by
xt_MASQUERADE         16384 1
iptables_nat         16384 1
nf_nat                45056 2 iptable_nat,xt_MASQUERADE
nf_contrack           118784 2 nf_nat,xt_MASQUERADE
nf_defrag_ipv6        24576 1 nf_contrack
nf_defrag_ipv4        16384 1 nf_contrack
libcrc32c             16384 2 nf_contrack,nf_nat
bonding               135168 0
omap_rng              20480 0
crct10dif_ce          16384 1
rng_core              16384 1 omap_rng
cfg80211              368640 0
rfkill                32768 2 cfg80211
ip_tables             32768 1 iptable_nat
x_tables              36864 2 ip_tables,xt_MASQUERADE
root@moca289bf1:~#
```

=== End of File ===