UP Xtreme i14 Edge

UP System
UPX-EDGE-MTL01

User's Manual 2nd Ed

Last Updated: February 13, 2025

Copyright Notice

Acknowledgement

Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● UP Xtreme i14 Edge (UPX-EDGE-MTL01)	1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page at AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device
18. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.

FCC Statement

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur.
Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON System QO4-381 Rev.A2

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外部信号连接器及线材	×	○	○	○	○	○
外壳	○	○	○	○	○	○
中央处理器与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
液晶模块	×	○	○	○	○	○
光驱	×	○	○	○	○	○
触控模块	×	○	○	○	○	○
电源	×	○	○	○	○	○
电池	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。

×：表示该有害物质的某一均质材料超出了 GB/T 26572 的限量要求，然而该部件仍符合欧盟指令 2011/65/EU 的规范。

环保使用期限(EFUP (Environmental Friendly Use Period)) : 10 年

备注：

一、此产品所标示之环保使用期限，系指在一般正常使用状况下。

二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。

三、上述部件物质液晶模块、触控模块仅一体机产品适用。

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON System QO4-381 Rev.A2

Part Name	Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
PCB Assemblies	×	O	O	O	O	O
Connector and Cable	×	O	O	O	O	O
Chassis	O	O	O	O	O	O
CPU and Memory	×	O	O	O	O	O
Hard Disk	×	O	O	O	O	O
LCD Modules	×	O	O	O	O	O
CD-ROM/DVD-ROM	×	O	O	O	O	O
Touch Modules	×	O	O	O	O	O
Power	×	O	O	O	O	O
Battery	×	O	O	O	O	O

The table is prepared in accordance with the provisions of SJ/T 11364.

O：Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572.

×：Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1).

EFUP (Environment Friendly Use Period) value: 10 years.

Notes：

1. This product defined period of use is under normal condition.
2. In above part, CPU/Memory/ Hard Disk/CD-ROM/DVD-ROM/ Power are optional.
3. In above part, LCD Modules/ Touch Modules are for all-in-one product model.

Table of Contents

Chapter 1

Product Specifications

1.1 Specifications

System	
CPU	Intel® Core™ Ultra 5 Processor 125U
	(12M Cache, up to 4.30 GHz)
	Intel® Core™ Ultra 5 Processor 125H
	(18M Cache, up to 4.50 GHz)
	Intel® Core™ Ultra 7 Processor 155H
	(24M Cache, up to 4.80 GHz)
	Intel® Core™ Ultra 7 Processor 165H
	(24M Cache, up to 5.00 GHz)
Memory	Up to 64GB onboard LPDDR5 (Dual-Channel)
Graphics	Intel® Arc™ Graphics
Storage	M.2 2280 M-Key x 2
	SATA 6Gb/s x 1
Ethernet	2.5GbE x 1 (Intel® Ethernet Controller I226-IT)
	GbE x 1 (Intel® Ethernet Connection I219)
WIFI/BT	M.2 2230 E-Key x 1
Expansion Slot	40-pin GPIO x 1
	M.2 2230 E-Key x 1 (PCIe Gen 3 [x1], USB 2.0)
	M.2 2280 M-Key x 2 (PCIe Gen 4 [x4])
	M.2 3052 B-Key x 1 (PCIe Gen 3 [x1], USB 3.2 Gen 2) with Nano SIM slot (USB 3.0)
	SATA 6Gb/s x 1
Security	Onboard TPM 2.0
OS Support	Windows 10/11 (64-bit)
	Ubuntu 22.04/Kernel 6.5 and above

I/O

USB	USB 2.0 x 2 (via 10-pin Header x 1)
	USB 2.0 (Type-A) x 1
	USB 3.2 Gen 2 (Type-A) x 2
	USB 3.2 Gen 2 (Type-C) x 1
Display Port	HDMI 2.1 x 2
	DP 2.1 x 1
	DP 1.4 via USB Type-C x 1
Ethernet	2.5GbE x 1 (Intel® Ethernet Controller I226-IT),
	GbE x 1 (Intel® Ethernet Connection I219)
COM	RS-232/422/485 via 10-pin Header x 2
Audio	Audio Jack x 1 (Mic-in + Line-out)
GPIO	16-pin Terminal Block Connector x 1

Power Supply

Power requirement	9V ~ 36V DC-in (Lockable plug)
Power supply type	AT/ATX
Power Consumption (Typical)	67-80W

Mechanical

Mounting	VESA Mount/Wall Mount (optional)
Dimensions (W x H x D)	5.98" x 4.87" x 2.81" (152mm x 123.8mm x 71.5mm)
Net Weight	2.95 lb. (1.34Kg)
Gross Weight	3.88 lb. (1.76Kg)

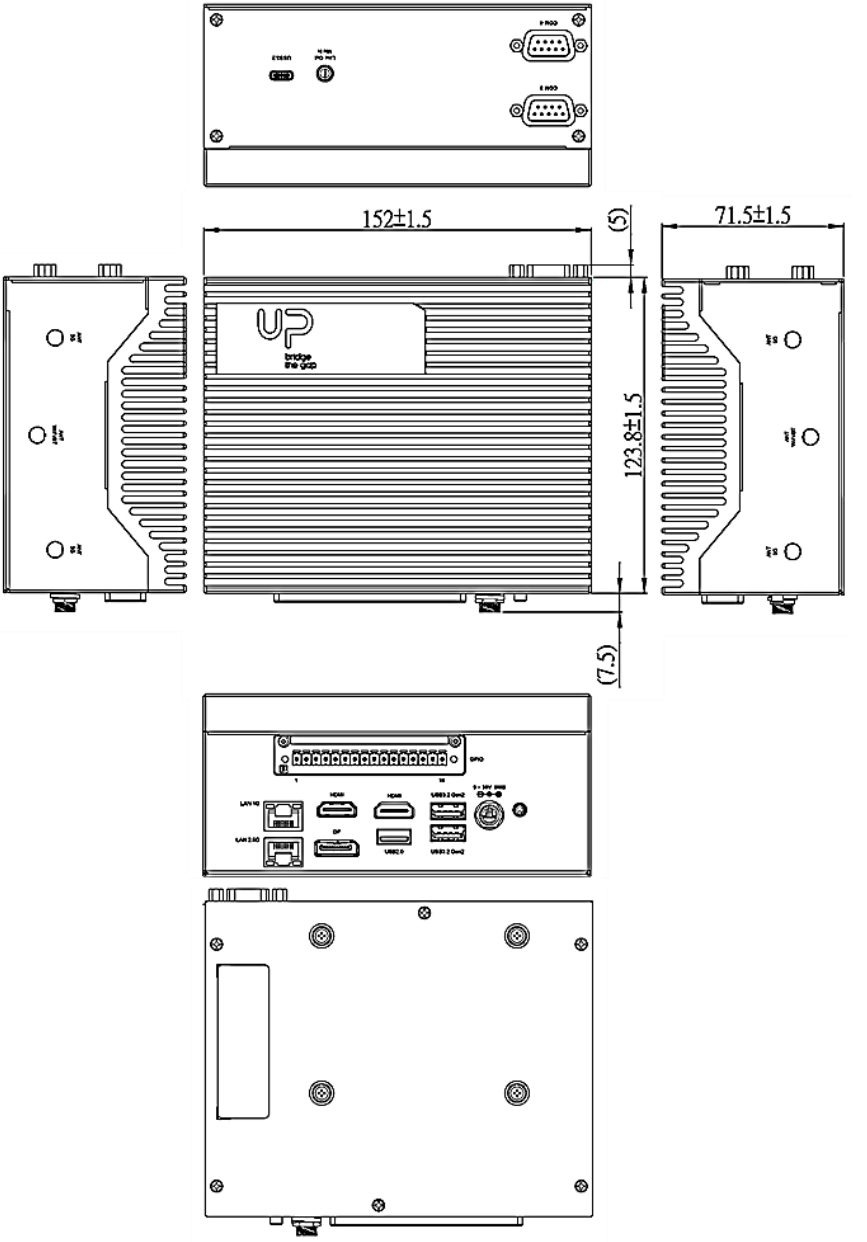
Environmental

Operating Temperature	32°F ~ 140°F (0°C ~ 60°C), 0.5m/s airflow
Operating Humidity	0% ~ 90% relative humidity, non-condensing
Storage Temperature	-40˚F ~ 176˚F (-40˚C ~ 80˚C)
MTBF	1,014,016
Certification	CE/FCC Class A, RoHS Compliant, REACH

Chapter 2

Hardware Information

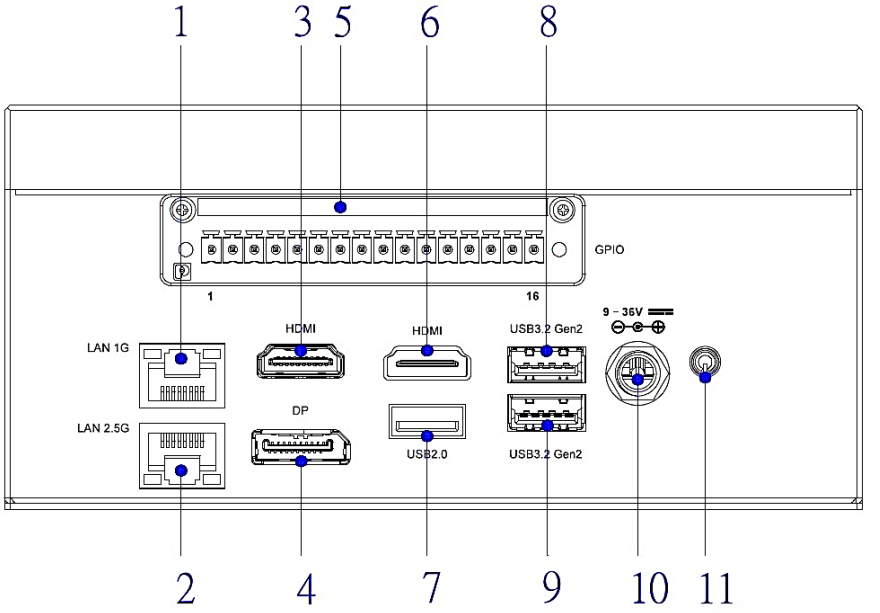
2.1 Dimensions



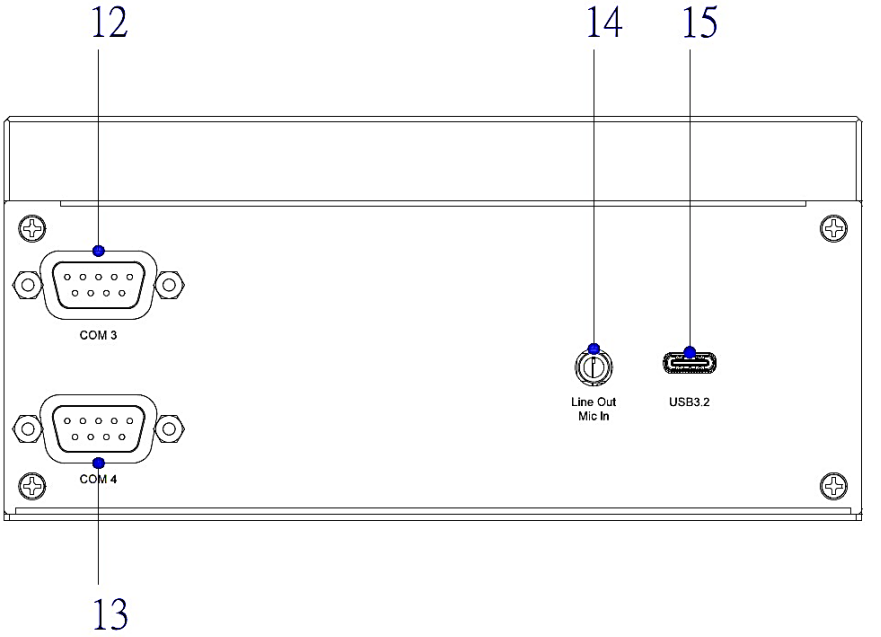
2.2 Jumpers and Connectors

System Level

Front I/O

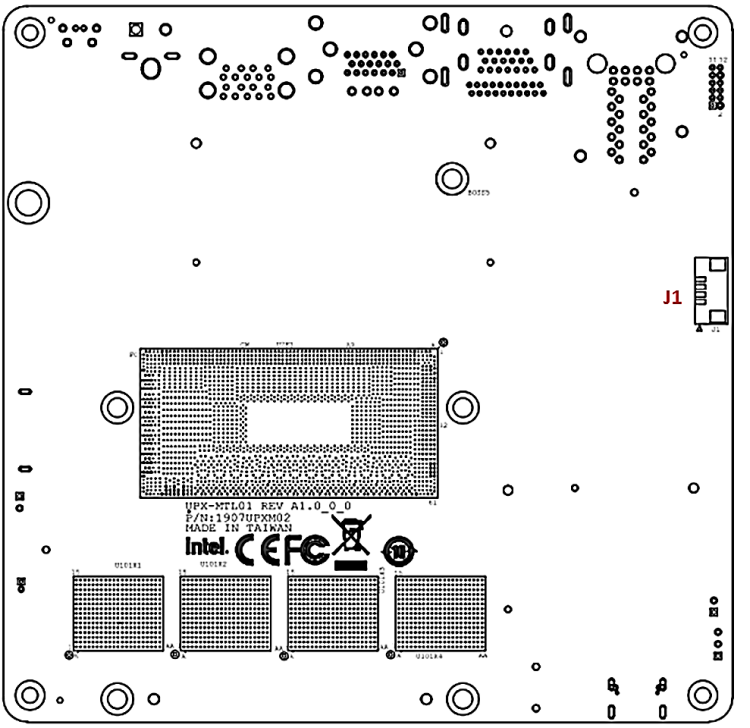


Rear I/O:

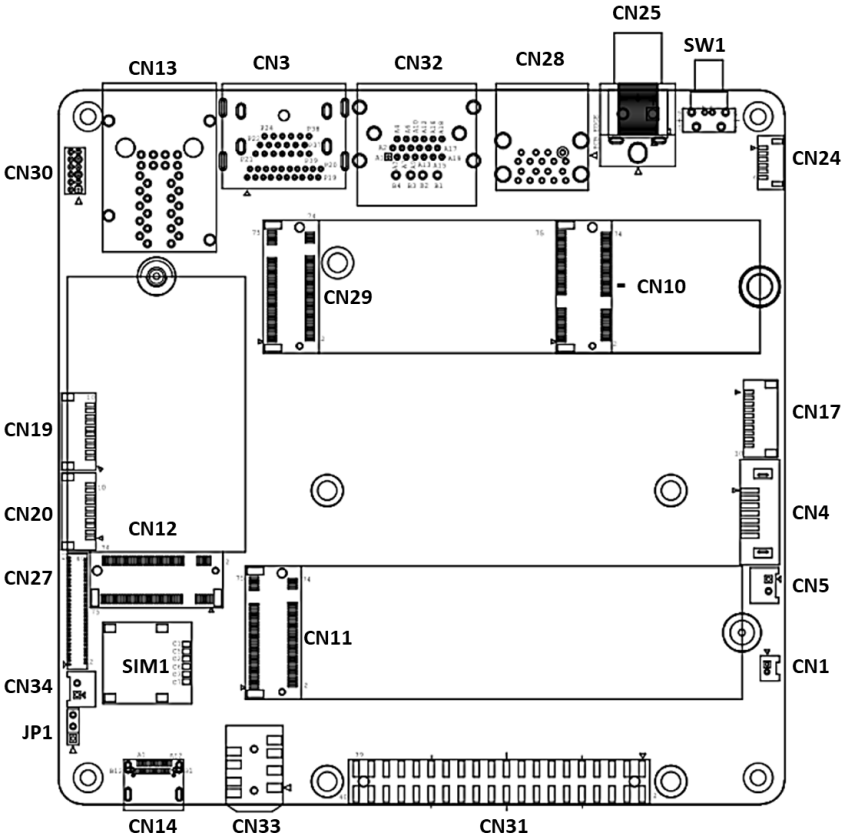


Board Level

Component Side



Solder Side


CN25
SW1
CN13
CN3
CN32
CN28
CN30
CN24
CN29
CN10
CN19
CN17
CN20
CN12
CN4
CN27
CN5
CN11
SIM1
CN1
CN34
JP1
CN14
CN33
CN31

2.3 List of Jumpers, Connectors, & Physical Interfaces

Please refer to the table below for all of the system's physical ports and interfaces.

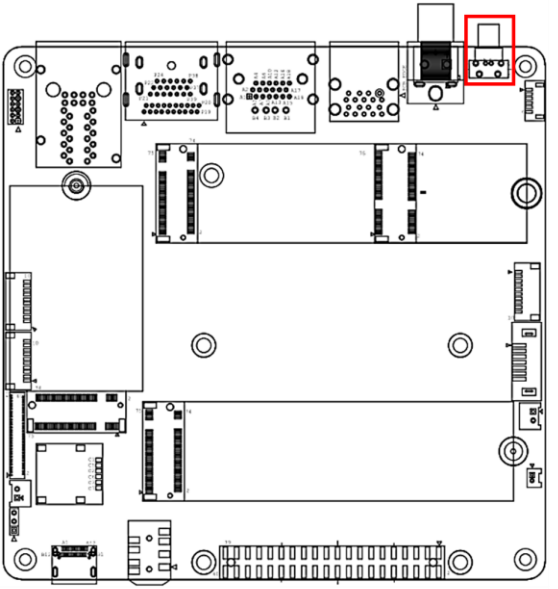
Label	Function
1	1GbE RJ-45 Port
2	2.5GbE RJ-45 Port
3	HDMI 2.1 Port
4	Display Port 2.1
5	16-pin Terminal Block GPIO
6	HDMI 2.1 Port
7	USB 2.0 (Type-A)
8/9	Dual USB 3.2 Gen 2 (Type-A) Port
10	9V ~ 36V DC-in
11	Power Button
12	COM 3
13	COM 4
14	Audio Jack (Line out + Mic in)
15	USB 3.2 Gen 2 (Type-C) Port

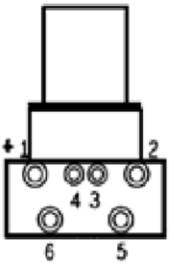
Please refer to the table below for all of the board's jumpers and connectors that you can configure for your application. Please note that not all board-level interfaces are configurable at system-level. For more information regarding the UP Xtreme i14 Edge's board level solution, please visit https://www.aaeon.com/en.

Label	Function
SW1	Power Button
CN1	RTC
CN3	HDMI/DP
CN4	SATA
CN5	SATA Power
CN10	M.2 2230 E-Key Slot
CN11	M.2 2280 M-Key Slot
CN12	M.2 3052 B-Key Slot
CN13	Dual LAN
CN14	USB Type-C
CN17	USB & UART
CN19	UART Wafer
CN20	UART Wafer
CN24	Front Panel

Label	Function
CN25	DC Power Jack
CN27	CSI FPC Connector
CN34	MIPI Power
CN28	Dual USB 3.0 Type-A
CN29	M.2 2280 M-Key Slot
CN30	BIOS & CPLD Update Connector
CN31	40 Pin HAT
CN32	USB 2.0 Type-A/HDMI
CN33	Audio Jack
J1	Fan Connector.
JP1	AT/ATX Mode Selection
SIM1	Nano SIM Card Slot

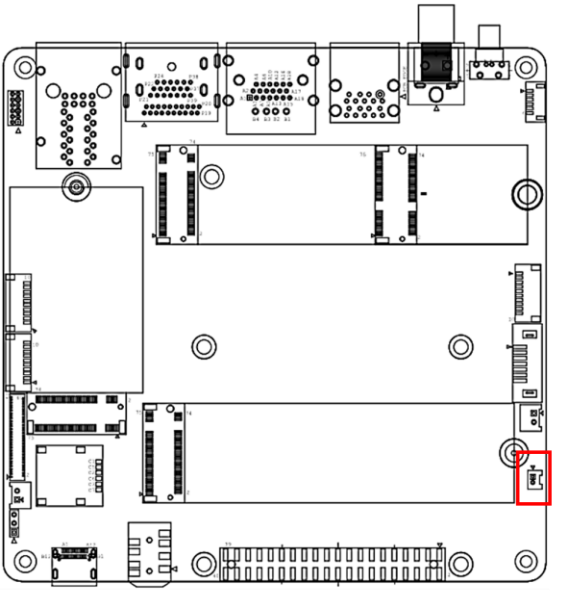
2.3.1 Power Button (SW1)

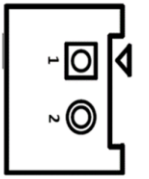




Pin	Signal	Pin	Signal
1	Power Button	2	GND
3	NC	4	NC
5	LED-	6	LED+

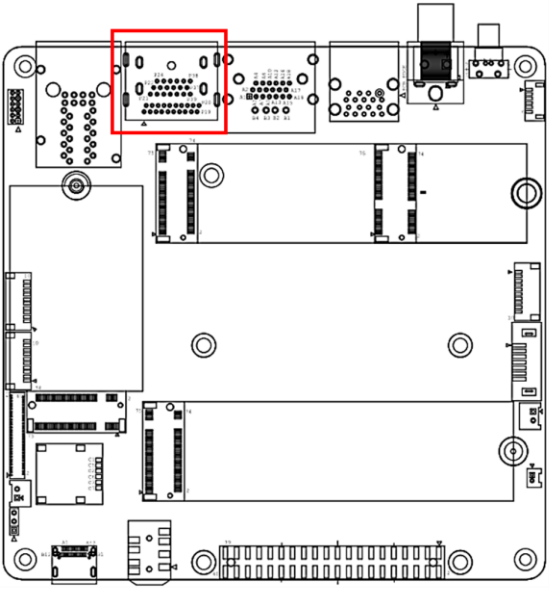
2.3.2 RTC (CN1)

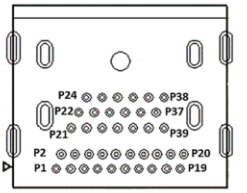




Pin	Signal	Pin	Signal
1	RTC_VCC	2	GND

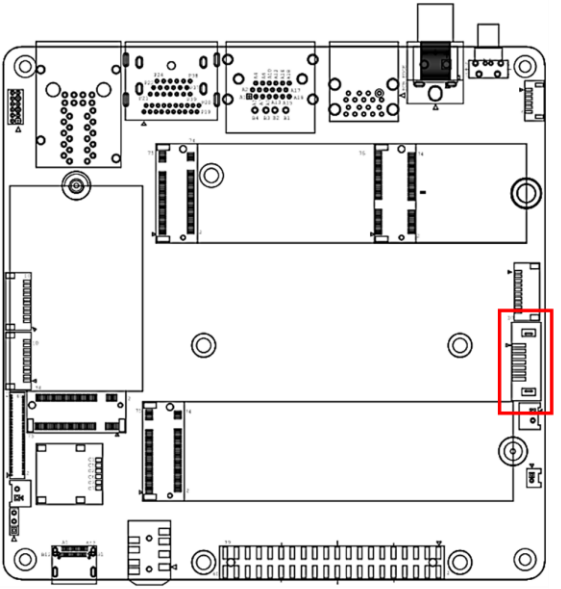
2.3.3 HDMI/DP Port (CN3)

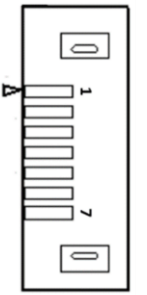




Pin	Signal	Pin	Signal	Pin	Signal
P1	DP_TX0+	P2	GND	P3	DP_TX0-
P4	DP_TX1+	P5	GND	P6	DP_TX1-
P7	DP_TX2+	P8	GND	P9	DP_TX2-
P10	DP_TX3+	P11	GND	P12	DP_TX3-
P13	Pull down 1M to GND	P14	Pull down 1M to GND	P15	DP_AUX+
P16	GND	P17	DP_AUX-	P18	DP_Hot Plug Detect
P19	GND	P20	+3.3V/1A	P21	HDMI_TX2+
P22	GND	P23	HDMI_TX2-	P24	HDMI_TX1+
P25	GND	P26	HDMI_TX1-	P27	HDMI_TX0+
P28	GND	P29	HDMI_TX0-	P30	HDMI_CLK+
P31	GND	P32	HDMI_CLK-	P33	NC
P34	NC	P35	HDMI_SCL	P36	HDMI_SDA
P37	GND	P38	+5V/0.5A	P39	HDMI_Hot Plug Detect

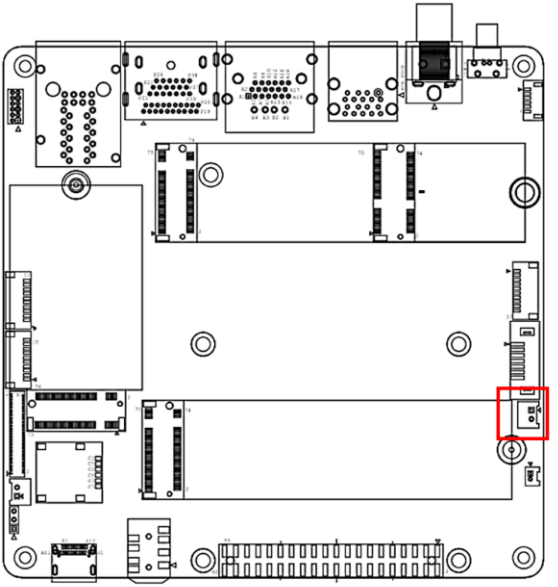
2.3.4 SATA (CN4)

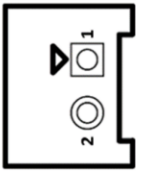




Pin	Signal	Pin	Signal
1	GND	2	SATA_TX+
3	SATA_TX-	4	GND
5	SATA_RX-	6	SATA_RX+
7	GND		

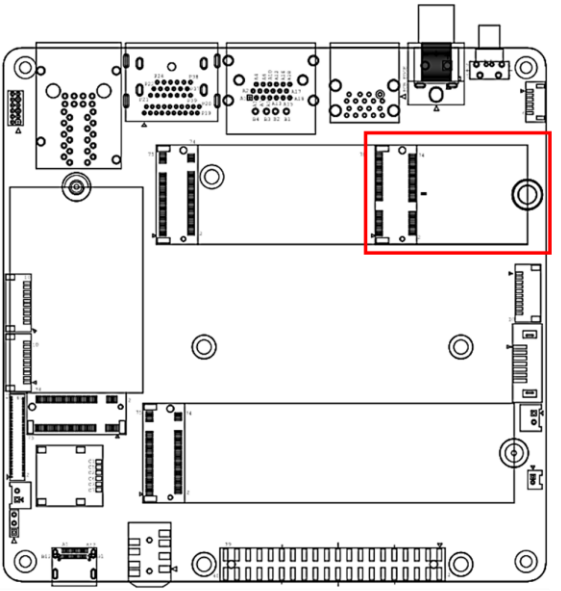
2.3.5 SATA Power (CN5)

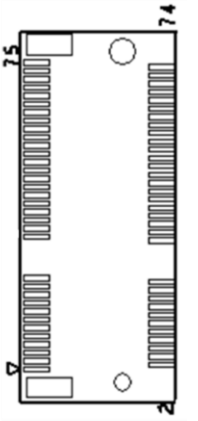




Pin	Signal	Pin	Signal
1	+5V/1A	2	GND

2.3.6 M.2 2230 E-Key Slot (CN10)



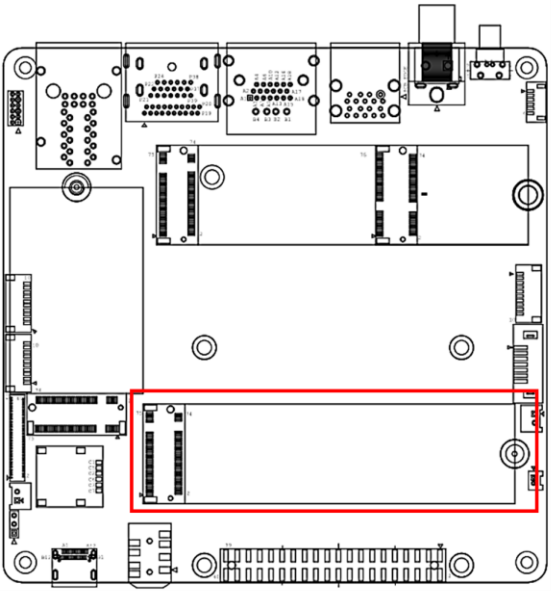


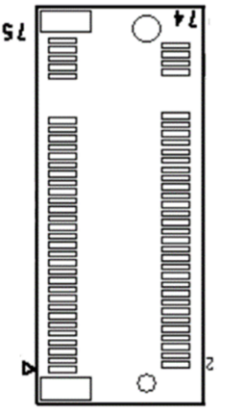
Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V/2.5A	3	USB2_D+
4	+3.3V/2.5A	5	USB2_D-	6	NC
7	GND	8	NC	9	CNV_WR_LANE1_D-
10	CNV_RF_RESET	11	CNV_WR_LANE1_D+	12	NC
13	GND	14	CNV_MODEM_CLKREQ	15	CNV_WR_LANE0_D-
16	NC	17	CNV_WR_LANE0_D+	18	GND
19	GND	20	CNV_UART_WAKE	21	CNV_WR_CLK_D-
22	CNV_BRI_RSP	23	CNV_WR_CLK_D+	24	Key-E
25	Key-E	26	Key-E	27	Key-E
28	Key-E	29	Key-E	30	Key-E
31	Key-E	32	CNV_RGI_DT	33	GND
34	CNV_RGI _RSP	35	PCIE9_TX+	36	CNV_BRI_DT
37	PCIE9_TX-	38	NC	39	GND
40	NC	41	PCIE9_RX+	42	NC

Pin	Signal	Pin	Signal	Pin	Signal
43	PCIE9_RX-	44	CNV_PA_BLANKING	45	GND
46	NC	47	PCIE5_CLK_D+	48	NC
49	PCIE5_CLK_D-	50	SUS_CLK	51	GND
52	Platform Reset	53	PCIE_CLKREQ#5	54	BT_EN
55	PCIE_WAKE#	56	WIFI_EN	57	GND
58	NC	59	CNV_WT_LANE1_D-	60	NC
61	CNV_WT_LANE1_D+	62	NC	63	GND
64	NC	65	CNV_WT_LANE0_D-	66	NC
67	CNV_WT_LANE0_D+	68	NC	69	GND
70	NC	71	CNV_WT_CLK_D-	72	+3.3V/2.5A
73	CNV_WT_CLK_D+	74	+3.3V/2.5A	75	GND

Note: Total 2.5A for M.2 E-Key Slot.

2.3.7 M.2 2280 M-Key Slot (CN11)

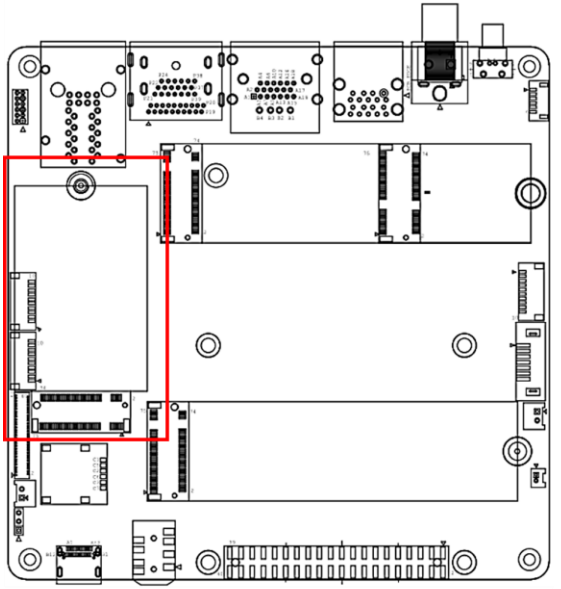


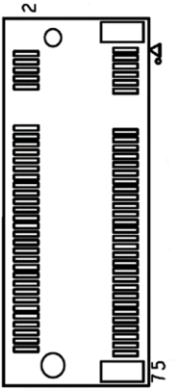


Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V/2.5A	3	NC
4	+3.3V/2.5A	5	PCIE16_RX3-	6	NC
7	PCIE16_RX3+	8	NC	9	GND
10	NC	11	PCIE16_TX3-	12	+3.3V/2.5A
13	PCIE16_TX3+	14	+3.3V/2.5A	15	GND
16	+3.3V/2.5A	17	PCIE15_RX2-	18	+3.3V/2.5A
19	PCIE15_RX2+	20	NC	21	GND
22	NC	23	PCIE15_TX2-	24	NC
25	PCIE15_TX2+	26	NC	27	GND
28	NC	29	PCIE14_RX1-	30	NC
31	PCIE14_RX1+	32	NC	33	GND
34	NC	35	PCIE14_TX1-	36	NC
37	PCIE14_TX1+	38	NC	39	GND
40	NC	41	PCIE13_RX0-	42	NC
43	PCIE13_RX0+	44	NC	45	GND
46	NC	47	PCIE13_TX0-	48	NC
49	PCIE13_TX0+	50	Platform Reset	51	GND
52	NC	53	PCIE_P3_CLK_D-	54	PCIE_WAKE#
55	PCIE_P3_CLK_D+	56	NC	57	GND
58	NC	59	Key-M	60	Key-M
61	Key-M	62	Key-M	63	Key-M
64	Key-M	65	Key-M	66	Key-M
67	NC	68	NC	69	NC
70	+3.3V/2.5A	71	GND	72	+3.3V/2.5A
73	GND	74	+3.3V/2.5A	75	GND

Note: Total 2.5A for M.2 M-Key Slot.

2.3.8 M.2 3052 B-Key Slot (CN12)



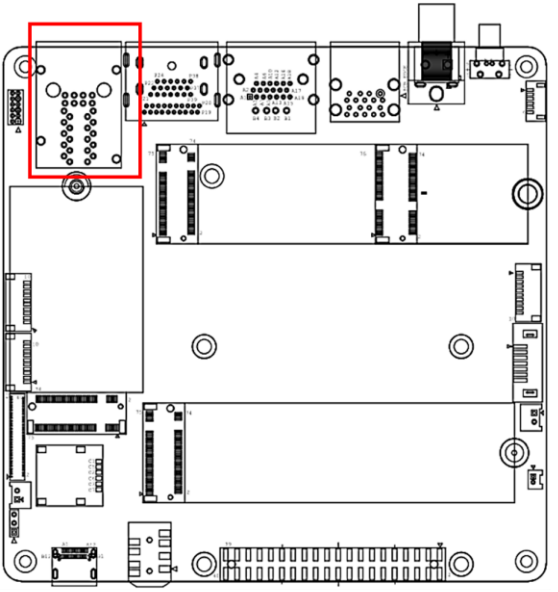


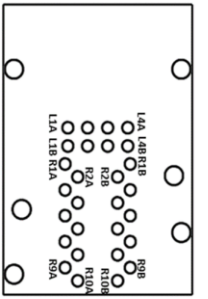
Pin	Signal	Pin	Signal	Pin	Signal
1	NC	2	+3.3V/2.5A	3	GND
4	+3.3V/2.5A	5	GND	6	NC
7	USB2_P8_D+	8	3GPW_EN	9	USB2_P8_D-
10	NC	11	GND	12	Key-B
13	Key-B	14	Key-B	15	Key-B
16	Key-B	17	Key-B	18	Key-B
19	Key-B	20	NC	21	NC
22	NC	23	NC	24	NC
25	NC	26	NC	27	GND
28	NC	29	USB32_1_RX-	30	UIM_RST
31	USB32_1_RX+	32	UIM_CLK	33	GND
34	UIM_DAT	35	USB32_1_TX-	36	UIM_PWR
37	USB32_1_TX+	38	NC	39	GND
40	NC	41	PCIE10_RX-	42	NC
43	PCIE10_RX+	44	NC	45	GND
46	NC	47	PCIE10_TX-	48	NC
49	PCIE10_TX+	50	5G_WWAN_PERST	51	GND
52	PCIE_CLKREQ#4	53	PCIE_P4_CLK_D-	54	PCIE_WAKE#
55	PCIE_P4_CLK_D+	56	NC	57	GND

Pin	Signal	Pin	Signal	Pin	Signal
58	NC	59	NC	60	NC
61	NC	62	NC	63	NC
64	NC	65	NC	66	NC
67	Platform Reset	68	NC	69	NC
70	+3.3V/2.5A	71	GND	72	+3.3V/2.5A
73	GND	74	+3.3V/2.5A	75	GND

Note: Total 2.5A for M.2 B-Key Slot.

2.3.9 Dual LAN (CN13)

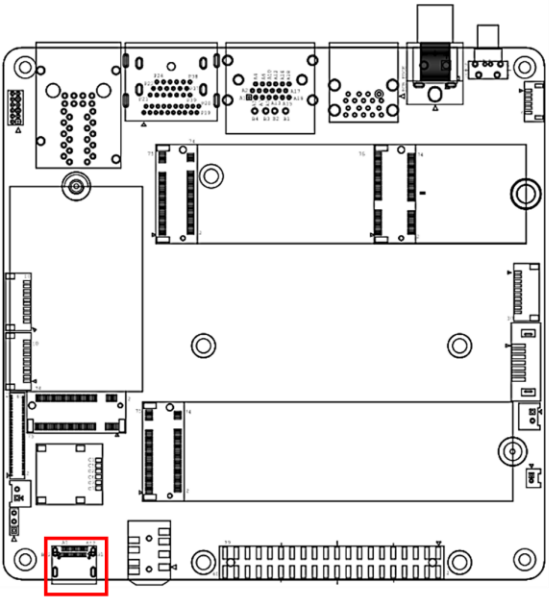


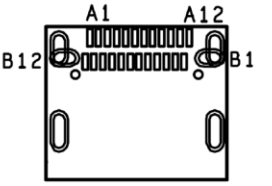


Pin	Signal	Pin	Signal	Pin	Signal
R1A	LAN1_MDI0+	R1B	LAN2_MDI0+	L1A	LAN1_ACTLED-
R2A	LAN1_MDI0-	R2B	LAN2_MDI0-	L2A	LAN1_ACTLED+
R3A	LAN1_MDI1+	R3B	LAN2_MDI1+	L3A	LAN1_LINK1000#
R4A	LAN1_MDI1-	R4B	LAN2_MDI1-	L4A	LAN1_LINK100#
R5A	LAN1_MDI2+	R5B	LAN2_MDI2+	L1B	LAN2_ACTLED-
R6A	LAN1_MDI2-	R6B	LAN2_MDI2-	L2B	LAN2_ACTLED+
R7A	LAN1_MDI3+	R7B	LAN2_MDI3+	L3B	LAN2_LINK1000#
R8A	LAN1_MDI3-	R8B	LAN2_MDI3-	L4B	LAN2_LINK100#

Pin	Signal	Pin	Signal	Pin	Signal
R9A	GND	R9B	GND		
R10A	GND	R10B	GND		

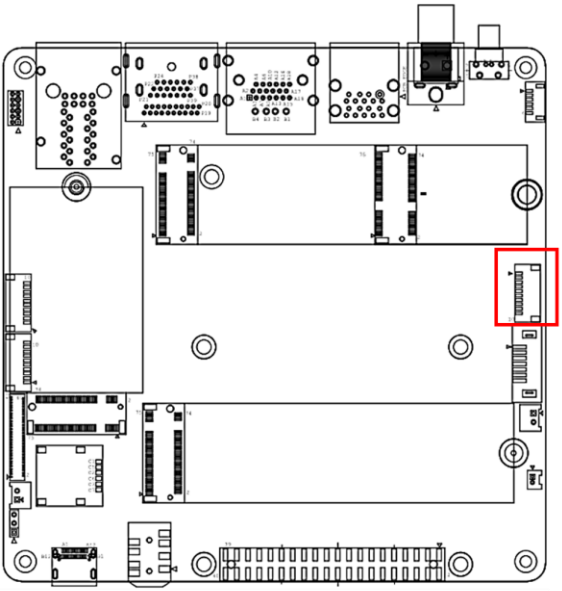
2.3.10 USB Type-C (CN14)





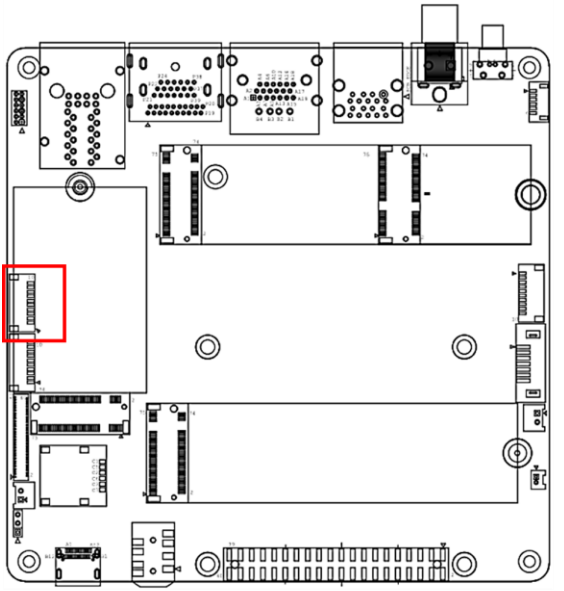
Pin	Signal	Pin	Signal	Pin	Signal
A1	GND	A2	Type C Port_TX0+	A3	Type C Port_TX0-
A4	+5V/3A	A5	Type C Port_CC1	A6	USB2_D3+
A7	USB2_D3-	A8	Type C Port_SBU1	A9	+5V/3A
A10	Type C Port_RX1-	A11	Type C Port_RX1+	A12	GND
B1	GND	B2	TCP0_ TX1_D+	B3	TCP0_ TX1_ D-
B4	+5V/3A	B5	Type C Port_CC2	B6	USB2_D3+
B7	USB2_D3-	B8	Type C Port_SBU2	B9	+5V/3A
B10	Type C Port_RX0-	B11	Type C Port_RX0+	B12	GND

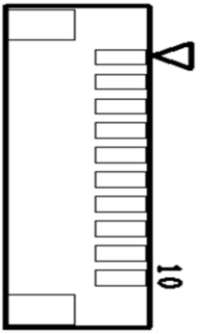
2.3.11 USB & UART (CN17)



Pin	Signal	Pin	Signal	Pin	Signal
1	+5V/2A	2	USB2_D5-	3	USB2_D5+
4	GND	5	+5V/2A	6	USB2_D6-
7	USB2_D6+	8	GND	9	UART_RX
10	UART_TX				

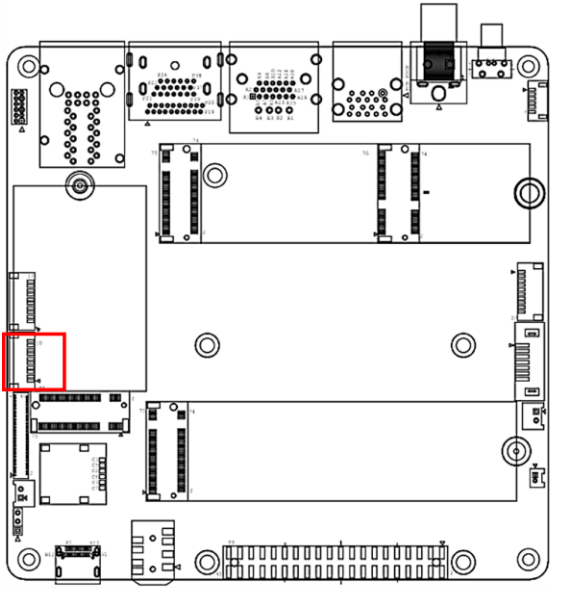
2.3.12 UART Wafer (CN19)

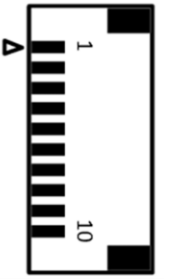




Pin	Signal	Pin	Signal
1	DCD	2	RX
3	TX	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	NC	10	NC

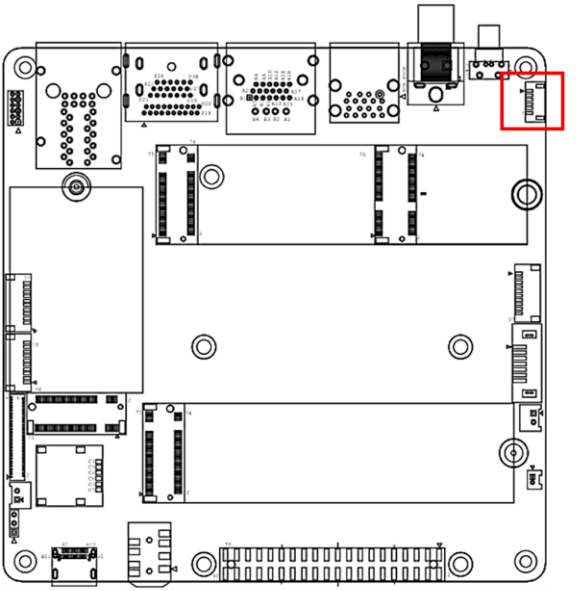
2.3.13 UART Wafer (CN20)

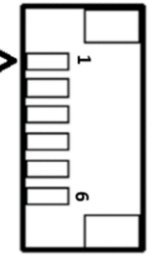




Pin	Signal	Pin	Signal
1	DCD	2	RX
3	TX	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	NC	10	NC

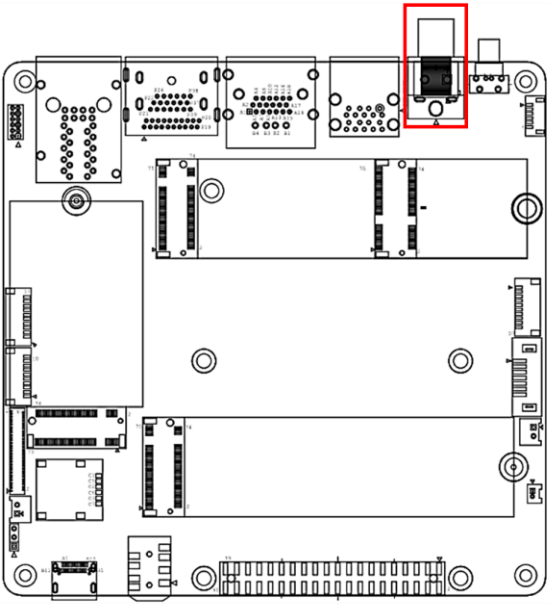
2.3.14 Front Panel (CN24)

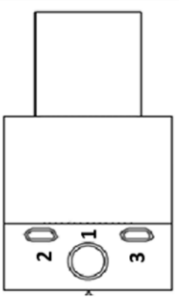




Pin	Signal	Pin	Signal
1	GND	2	RESET
3	GND	4	Power Button
5	GND	6	LED Power

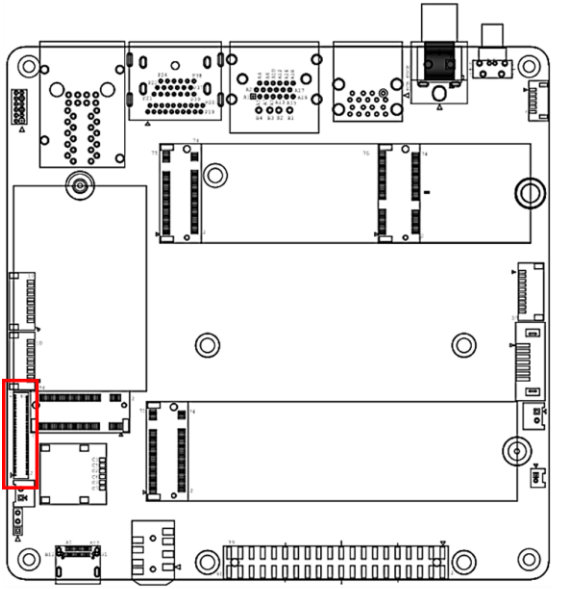
2.3.15 DC Power Jack (CN25)

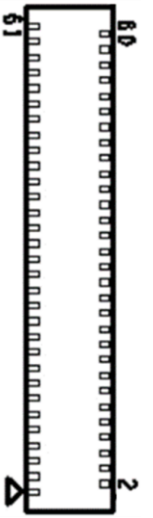




Pin	Signal	Pin	Signal
1	DC_IN	2	GND
3	GND		

2.3.16 CSI FPC Connector (CN27)

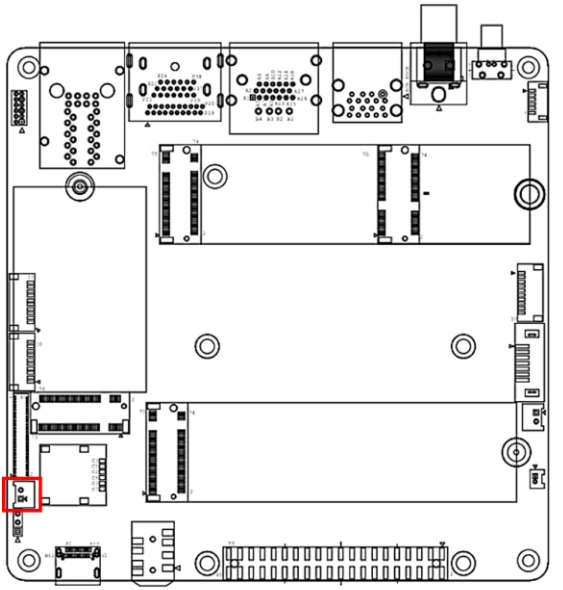


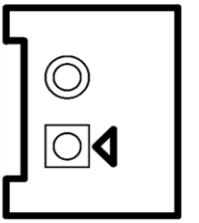


Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	CSI_B1_A3_DN	3	CSI_B1_A3_DP
4	GND	5	CSI_B0_A2_DP	6	CSI_B0_A2_DN
7	GND	8	CSI_B_CLK_DN	9	CSI_B_CLK_DP
10	GND	11	CSI_A0_DP	12	CSI_A0_DN
13	GND	14	CSI_A1_DN	15	CSI_A1_DP
16	GND	17	CSI_A_CLK_DP	18	CSI_A_CLK_DN
19	GND	20	CSI_E0_DN	21	CSI_E0_DP
22	GND	23	CSI_E1_DP	24	CSI_E1_DN
25	GND	26	CSI_E_CLK_DN	27	CSI_E_CLK_DP
28	GND	29	CSI_F1_E3_DP	30	CSI_F1_E3_DN
31	GND	32	CSI_F0_E2_DN	33	CSI_F0_E2_DP
34	GND	35	CSI_F_CLK_DP	36	CSI_F_CLK_DN
37	GND	38	GND	39	CSI_I2S_BCLK_MG CLKOUT1
40	CSI_I2S_SDO_MG CLKOUT0	41	CSI_I2S_FRM_MGC LKOUT3	42	CSI_I2S_SDI_MGC LKOUT2
43	CRD1_PWREN	44	STROBE_CAM	45	CRD1_PWREN
46	CAM1_RST#	47	HDMI_IN_DET_CA M_CLK	48	CAM2_RST#

Pin	Signal	Pin	Signal	Pin	Signal
49	GPPC_PRIVACY_CAM2	50	I2C0_SCL	51	ISH_INT_GP_CRD_GSB
52	I2C0_SDA	53	GPPC_CAM_SYNC	54	I2C5_SCL
55	GPPC_PRIVACY_CAM1	56	I2C5_SDA	57	SUSCLK
58	PM_SLP_S3#	59	INTIO_GPIO5	60	Platform Reset
61	HDMI_IN_RST				

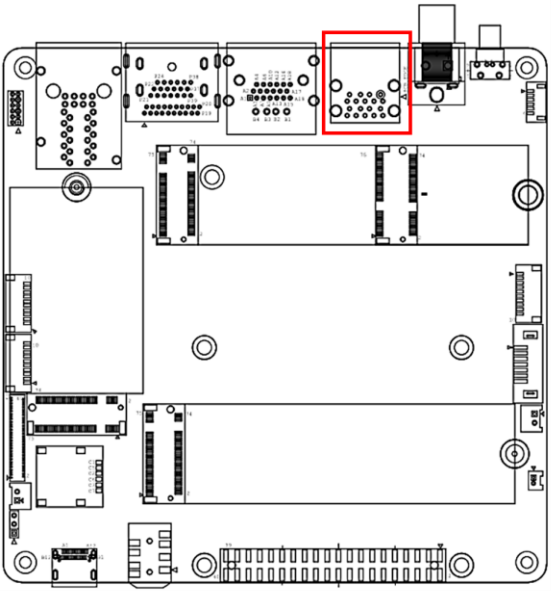
2.3.17 MIPI Power (CN34)

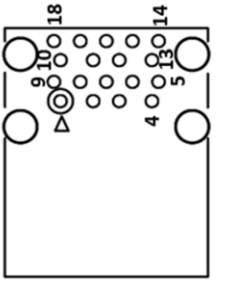




Pin	Signal	Pin	Signal
1	+12V/1A	2	GND

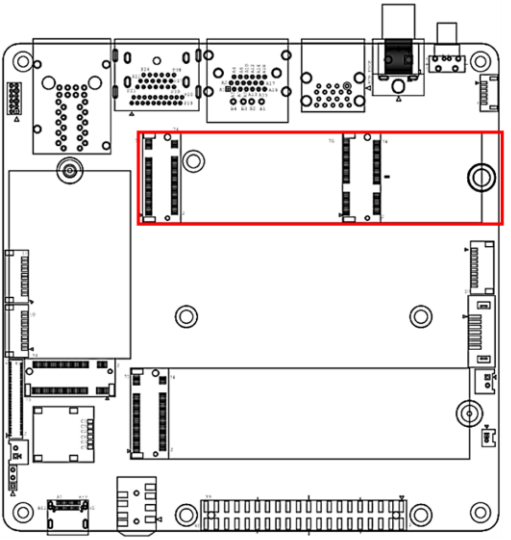
2.3.18 Dual USB 3.0 Type-A (CN28)

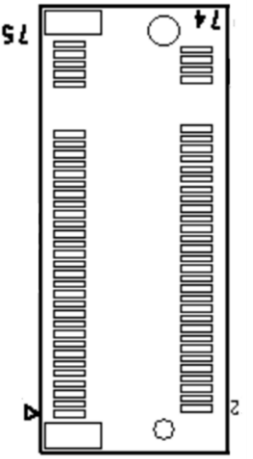




Pin	Signal	Pin	Signal	Pin	Signal
1	+5V/2A	2	USB2_D2-	3	USB2_D2+
4	GND	5	USB3_RX2-	6	USB3_RX2+
7	GND	8	USB3_TX2-	9	USB3_TX2+
10	+5V/2A	11	USB2_D1-	12	USB2_D1+
13	GND	14	USB3_RX1-	15	USB3_RX1+
16	GND	17	USB3_TX1-	18	USB3_TX1+

2.3.19 M.2 2280 M-Key Slot (CN29)



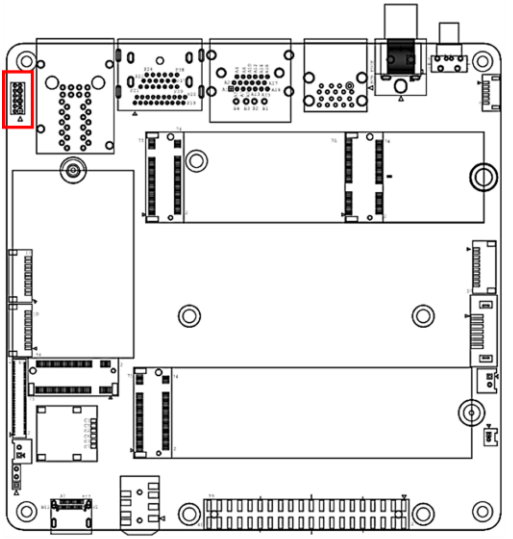


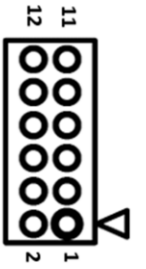
Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V/2.5A	3	NC
4	+3.3V/2.5A	5	PCIE20_RX3-	6	NC
7	PCIE20_RX3+	8	NC	9	GND
10	NC	11	PCIE20_TX3-	12	+3.3V/2.5A
13	PCIE20_TX3-	14	+3.3V/2.5A	15	GND
16	+3.3V/2.5A	17	PCIE19_RX2-	18	+3.3V/2.5A
19	PCIE19_RX2+	20	NC	21	GND
22	NC	23	PCIE19_TX2-	24	NC
25	PCIE19_TX2+	26	NC	27	GND
28	NC	29	PCIE18_RX1-	30	NC
31	PCIE18_RX1+	32	NC	33	GND
34	NC	35	PCIE18_TX1-	36	NC
37	PCIE18_TX1+	38	NC	39	GND
40	NC	41	PCIE17_RX0-	42	NC
43	PCIE17_RX0+	44	NC	45	GND
46	NC	47	PCIE17_TX0-	48	NC
49	PCIE17_TX0+	50	Platform Reset	51	GND
52	NC	53	PCIE_P0_CLK_D-	54	PCIE_WAKE#
55	PCIE_P0_CLK_D+	56	NC	57	GND
58	Key-M	59	Key-M	60	Key-M

Pin	Signal	Pin	Signal	Pin	Signal
61	Key-M	62	Key-M	63	Key-M
64	Key-M	65	Key-M	66	Key-M
67	NC	68	NC	69	NC
70	+3.3V/2.5A	71	GND	72	+3.3V/2.5A
73	GND	74	+3.3V/2.5A	75	GND

Note: Total 2.5A for M.2 M-Key Slot.

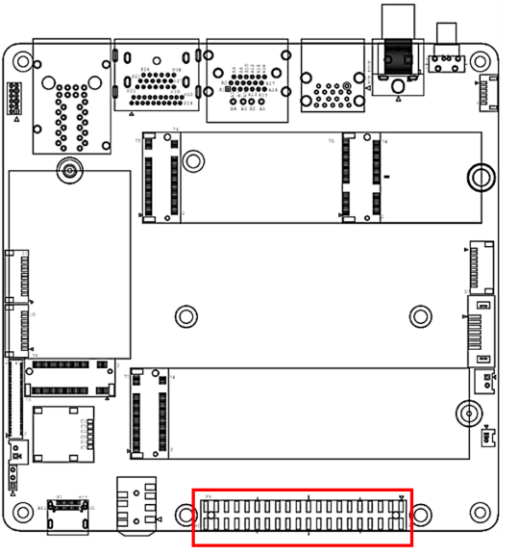
2.3.20 CPLD and BIOS Update (CN30)

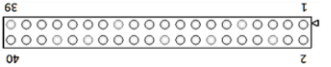




Pin	Signal	Pin	Signal	Pin	Signal
1	CPLD_TCK	2	GND	3	CPLD_TDO
4	+1.8V	5	CPLD_TMS	6	SPI_CS
7	SPI_CLK	8	SPI_MISO	9	CPLD_TDI
10	GND	11	SPI_MOSI	12	SPI_HOLD

2.3.21 40 Pin HAT (CN31)

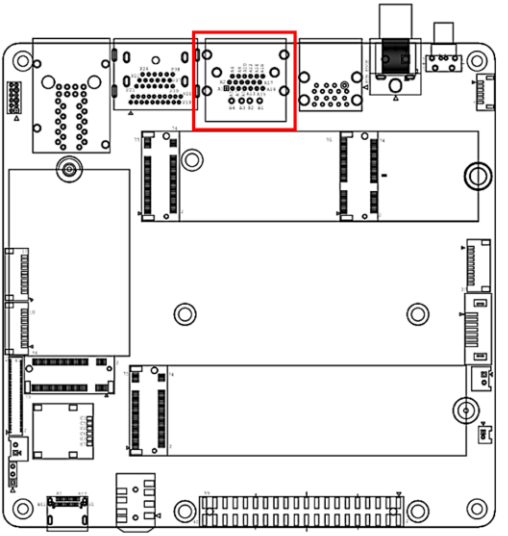


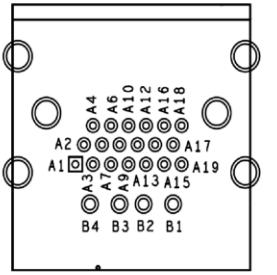


Pin	Signal	Pin	Signal
1	+3.3V/2A	2	+5V/2A
3	I2C1_SDA	4	+5V/2A
5	I2C1_SCL	6	GND
7	GPIO3_ADC	8	UART_TX
9	GND	10	UART_RX
11	RTS	12	I2S_CLK
13	TIME_SYNC0	14	GND
15	TIME_SYNC1	16	GPIO19
17	+3.3V/2A	18	GPIO20
19	SPI_MOSI	20	GND
21	SPI_MISO	22	GPIO21
23	SPI_CLK	24	SPI_CS0
25	GND	26	SPI_CS1
27	I2C0_SDA	28	I2C0_SCL
29	GPIO11	30	GND
31	GPIO12	32	PWM0
33	PWM1	34	GND
35	I2S_FRM	36	CTS
37	GPIO15	38	I2S_RX
39	GND	40	I2S_TX

Note: Total 2A(5V) and 2A(3.3V) for HAT 40 pin.

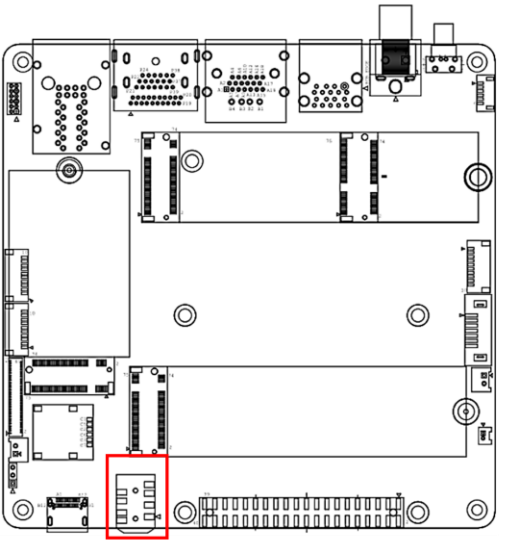
2.3.22 USB 2.0 Type-A/HDMI (CN32)

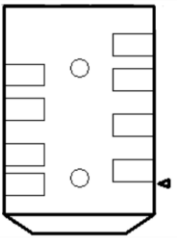




Pin	Signal	Pin	Signal	Pin	Signal
A1	HDMI_TX2+	A2	GND	A3	HDMI_TX2-
A4	HDMI_TX1+	A5	GND	A6	HDMI_TX1-
A7	HDMI_TX0+	A8	GND	A9	HDMI_TX0-
A10	HDMI_CLK+	A11	GND	A12	HDMI_CLK-
A13	NC	A14	GND	A15	HDMI_SCL
A16	HDMI_SDA	A17	GND	A18	+5V/0.5A
A19	HDMI_Hot plug detect	B1	+5V/2A	B2	USB2_D-
B3	USB2_D+	B4	GND		

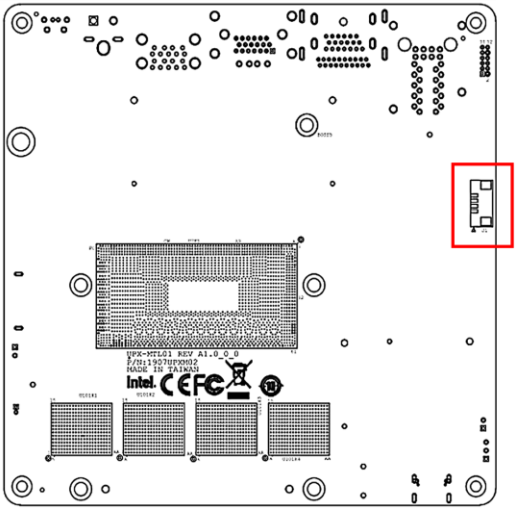
2.3.23 Audio Jack (CN33)

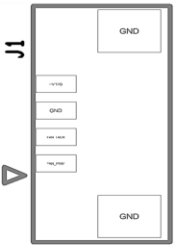




Pin	Signal	Pin	Signal
1	MIC In	2	AUD_GND
3	Line Out - Right	4	NC
5	NC	6	NC
7	NC	8	Line Out - Left

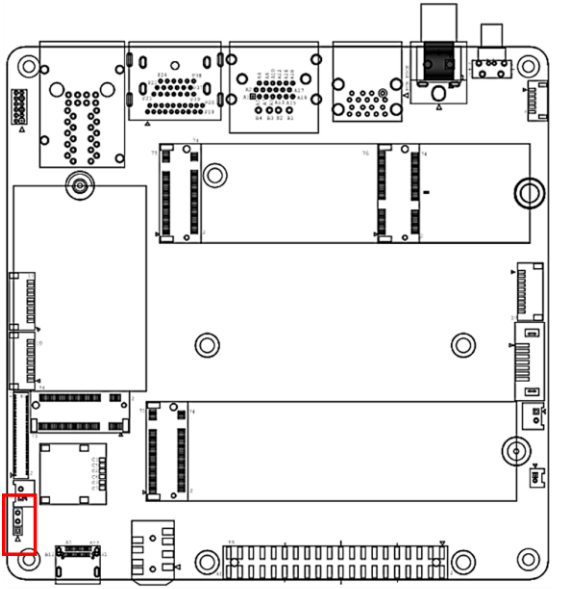
2.3.24 Fan Connector. (J1)

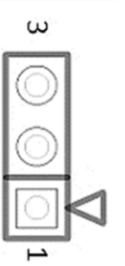




Pin	Signal	Pin	Signal
1	PWM	2	TACH
3	GND	4	12V/1.5A

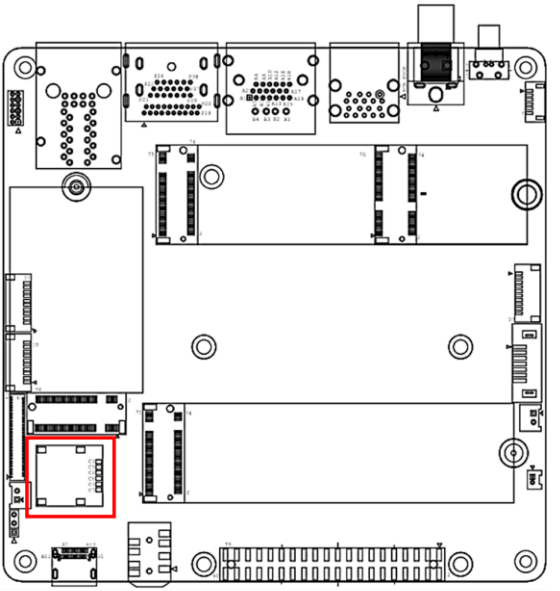
2.3.25 AT/ATX Mode Selection (JP1)

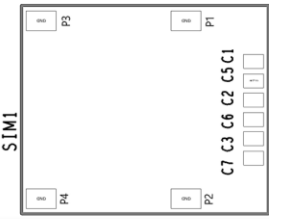




Pin	Signal	Pin	Signal
1	ATX_MODE (default)	2	AT/ATX select
3	AT_MODE		

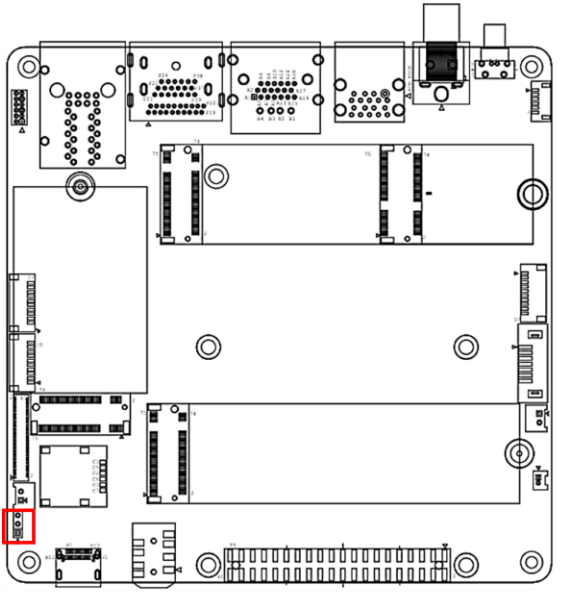
2.3.26 Nano SIM Card Slot (SIM1)

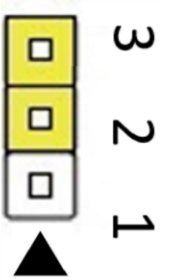




Pin	Signal	Pin	Signal
C1	UIM_PWR	C2	UIM_RST
C3	UIM_CLK	C5	UIM_GND
C6	NC	C7	UIM_DAT
P1	GND	P2	GND
P3	GND	P4	GND

2.3.27 Auto-Power Button Selection (JP1)





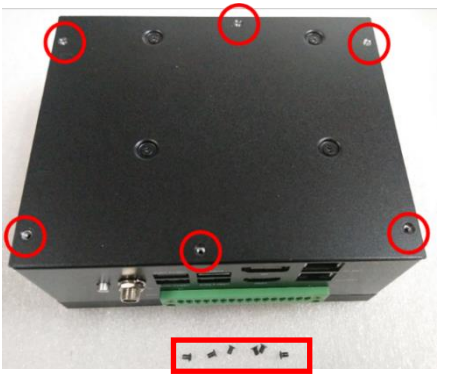
Pin	Signal
1-2*	ATX MODE
2-3	AT MODE

2.4 Hardware Installation

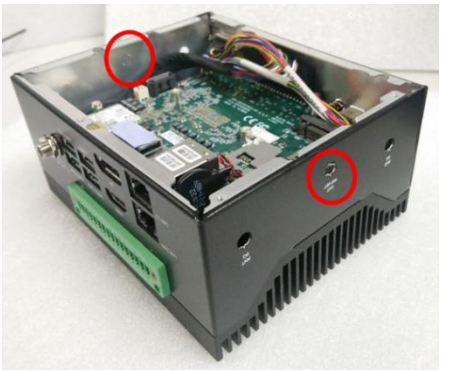
This section details the steps needed to install various hardware components for the UP Xtreme i14 Edge. It is recommended that you read through each step before beginning installation and to make sure you have all necessary tools and components.

2.4.1 Wi-Fi Module (M.2 2230 E-Key Slot) Installation

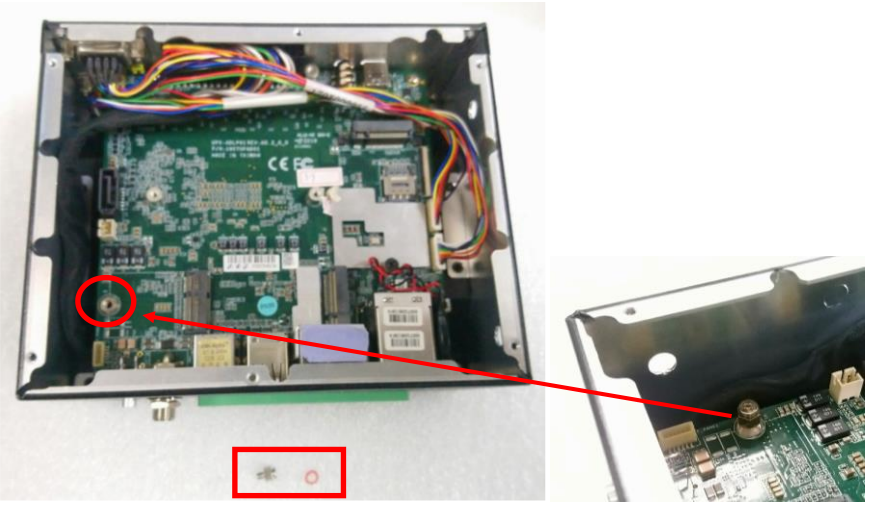
Step 1: Remove the six (6) screws on the bottom plate.



Step 2: Remove the metal cover on the ANT Wi-Fi/BT antenna holes (2 holes on the left and right sides of the system).

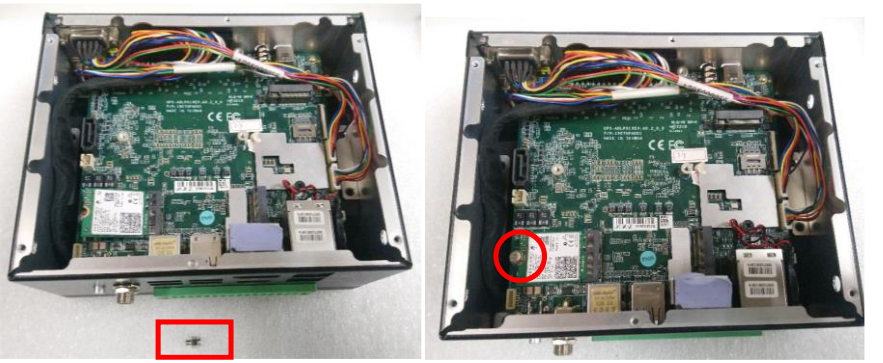


Step 3: Remove the M.2 nut and orange washer.

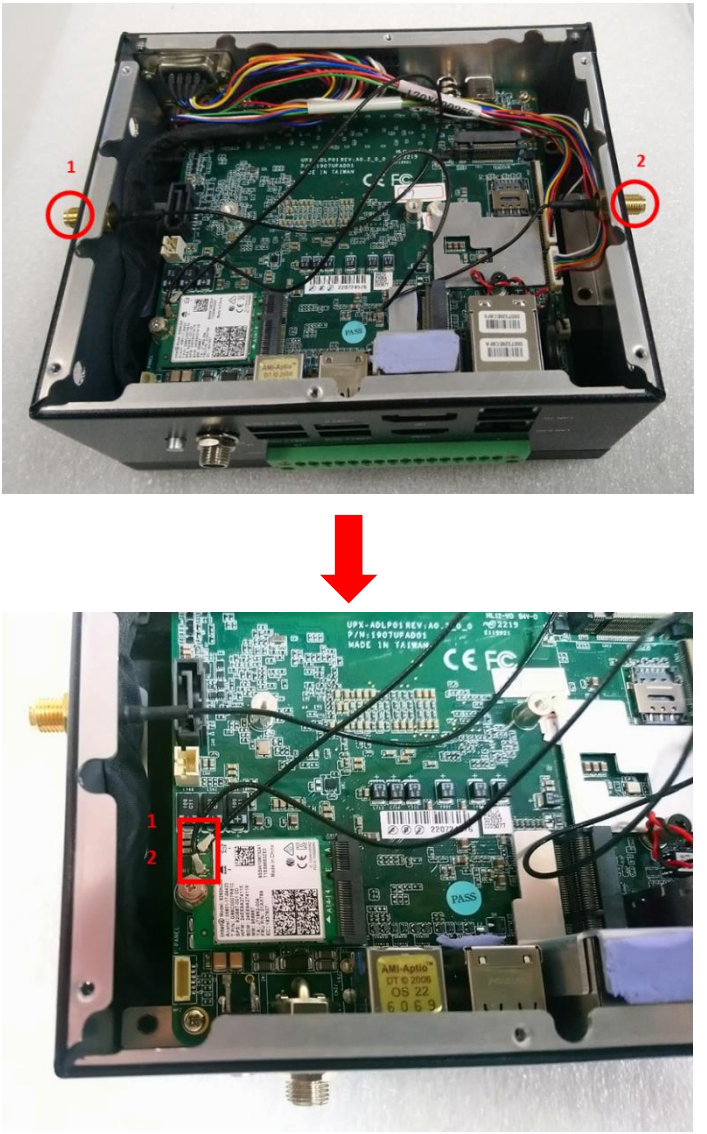


Step 4: Install the M.2 2230 Wi-Fi module and secure with the M.2 nut.

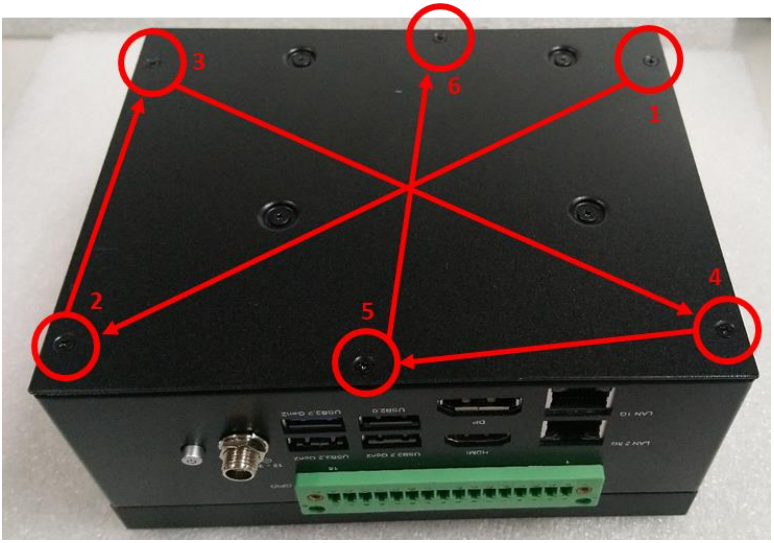
Note: The orange washer does not need to be used when securing the M.2 nut.



Step 5: Install the two antenna cables, then lock them in place with the external nut and washer. Install the antenna IPEX connector onto the Wi-Fi card in the sequence shown and affix with glue. Please use hot-melt adhesive with UL94 V-0 certification.



Step 6: Reaffix the screws that were removed during step 1 to the bottom of the plate, in the order shown.

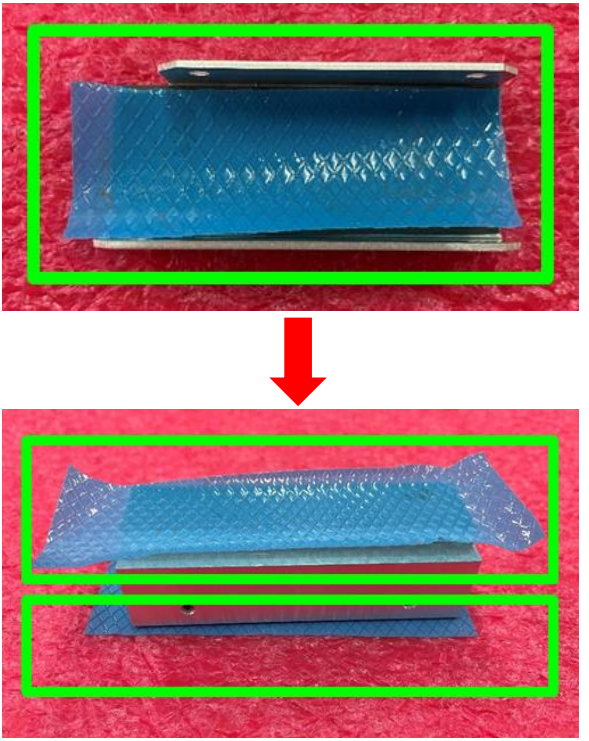


Step 7: Lock the external antennas, as shown.

2.4.2 PCIe Module 1 (M.2 2280 M-Key Slot) Installation

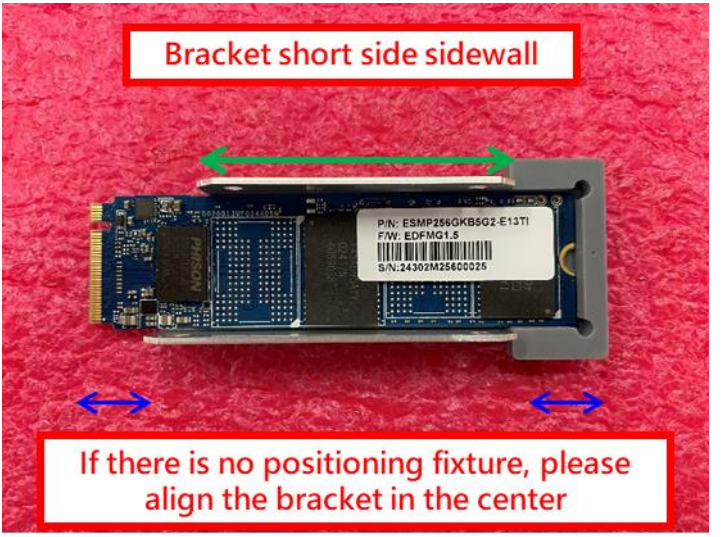
Note: Use an electric screwdriver with a torque setting of 5 kgf-cm ± 5% (4.75–5.25 kgf-cm) for all screw-tightening steps unless stated otherwise.

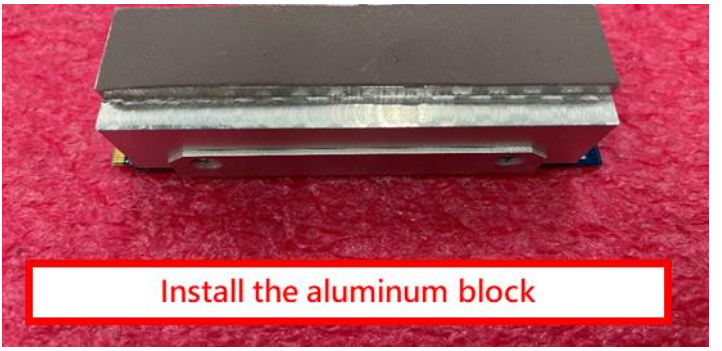
Step 1: Carefully peel off the protective film from the thermal pad of the M.2 module.



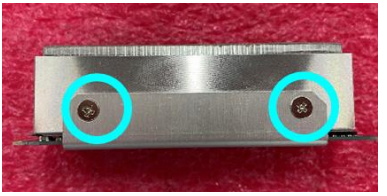
Step 2: Assemble Bracket and Aluminum Block.

- Locate the bracket and aluminum block.
- Ensure the bracket is centered if there is no positioning fixture.
- Install the aluminum block by aligning the short edges of the bracket with the aluminum block walls.

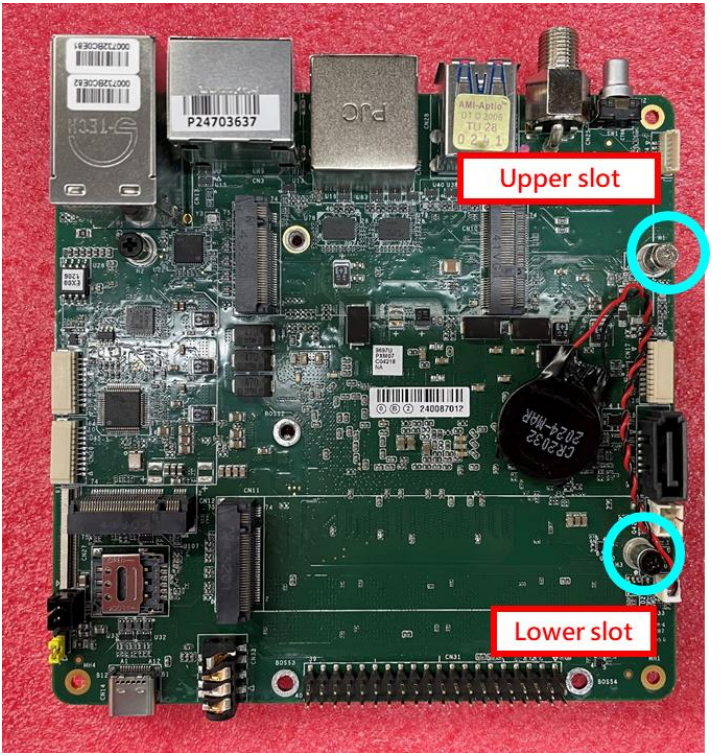




- Secure the assembly using screws.



Step 3: Remove the screw from the M.2 2280 slot on the PCB. If using the upper slot, remove the silver screws, do not remove the standoff for the lower slot. If using the lower slot, remove the black screws.



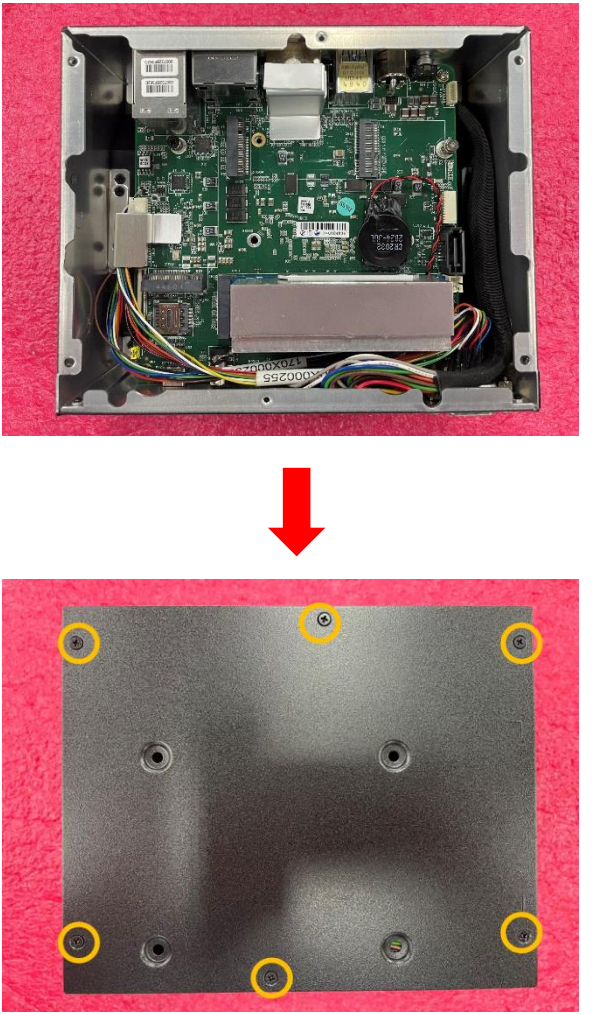
Step 4: For upper slot installation, align the module with the slot, ensuring the notch faces the correct direction (see illustration), then secure the M.2 SSD with screws using a torque of 3 kgf-cm ± 5% (2.85–3.15 kgf-cm).

Note the orientation of the module, as illustrated:

Step 5: Align the module as shown in the diagram, then tighten the screws with a torque of 5 kgf-cm ± 5% (4.75–5.25 kgf-cm).

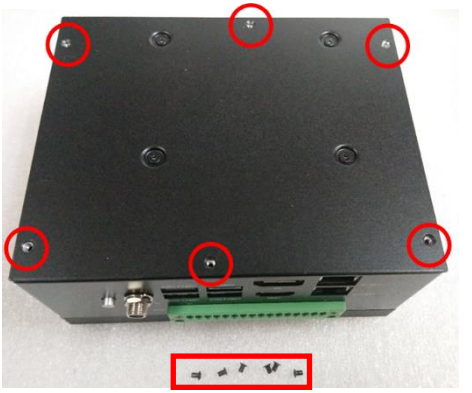
Note the orientation of the module, as illustrated:

Step 6: Reattach the bottom cover and secure it with screws, using a torque setting of 2.5 kgf-cm ± 5% (2.4–2.6 kgf-cm).

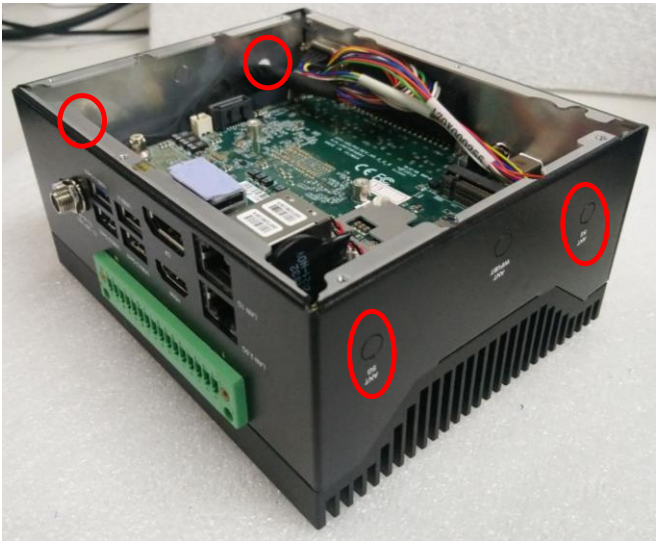


2.4.3 5G Module (M.2 3052 B-Key Slot) Installation

Step 1: Remove the six (6) screws on the bottom plate.

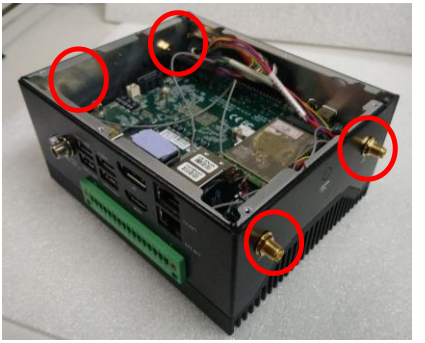


Step 2: Remove the metal cover on the 5G ANT antenna holes (4 holes on the left and right sides of the system).

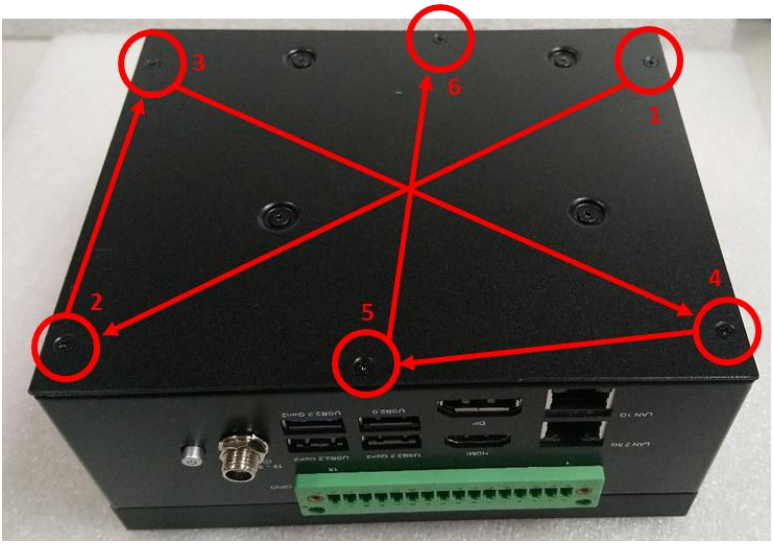


Step 3: Remove the M.2 screw.

Step 4: Install the M.2 3052 5G module and secure with the M.2 nut. Then, install the four (4) antenna cables, and lock the outer nut and washer. Install the antenna IPEX connector on the 5G card in sequence and affix it with glue.



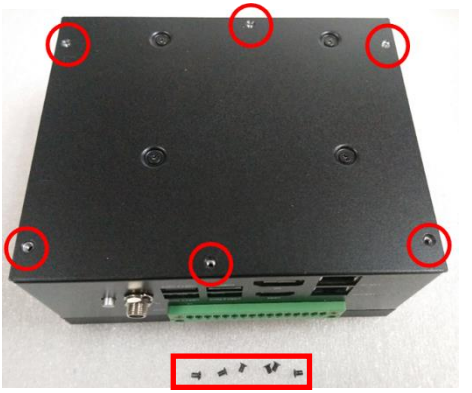
Step 5: Reaffix the screws that were removed during step 1 to the bottom of the plate, in the order shown.



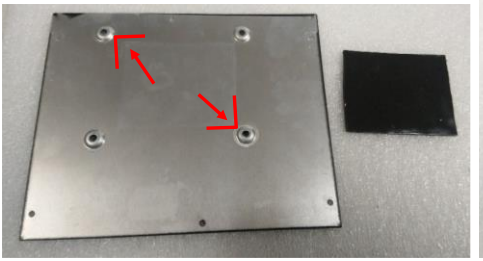
Step 6: Lock the external antennas, as shown.

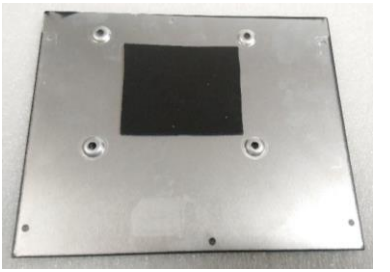
2.4.6 2.5" SATA Drive Installation

Step 1: Remove the six (6) screws on the bottom plate.

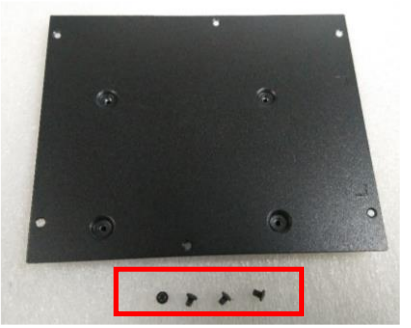


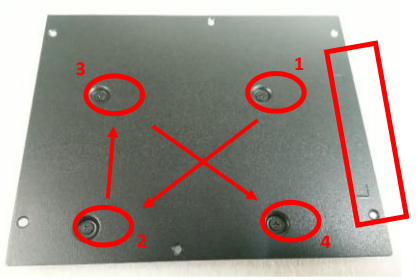
Step 2: Paste the HDD Pad according to the positioning marked below.



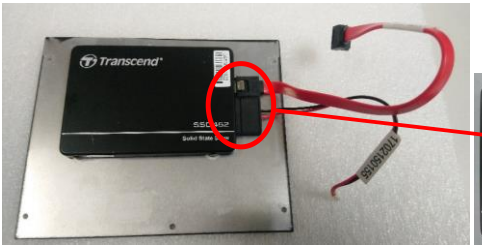


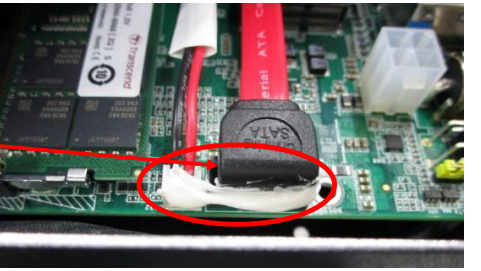
Step 3: Assemble the HDD, ensuring it is aligned with the screw holes on the back cover (the cable end should face the direction of the mark), then lock the HDD screws in the sequence shown.



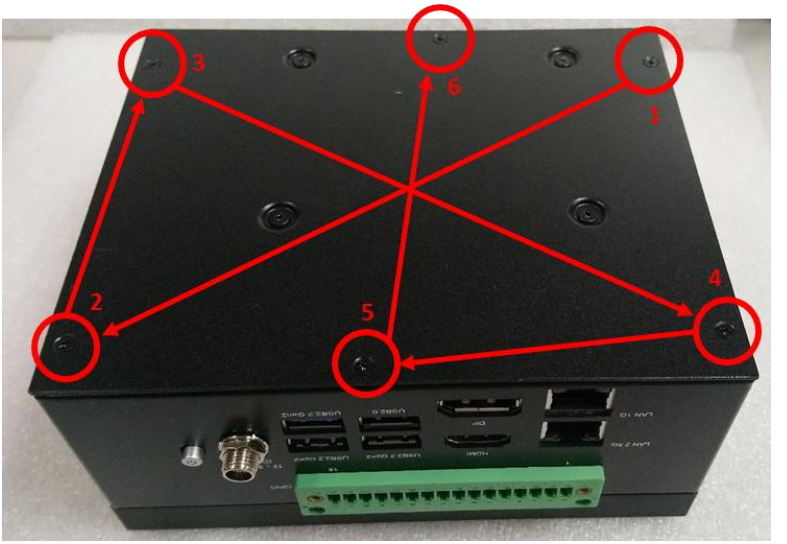


Step 4: Lock the screws in the order shown, then plug the 2.5" HDD/SSD cable and affix it with glue. Please use hot-melt adhesive with UL94 V-0 certification.



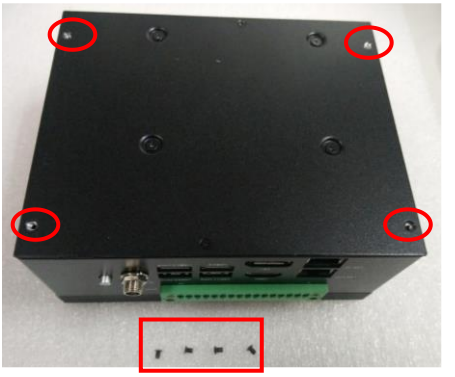


Step 5: Reaffix the screws that were removed during step 1 to the bottom of the plate, in the order shown.



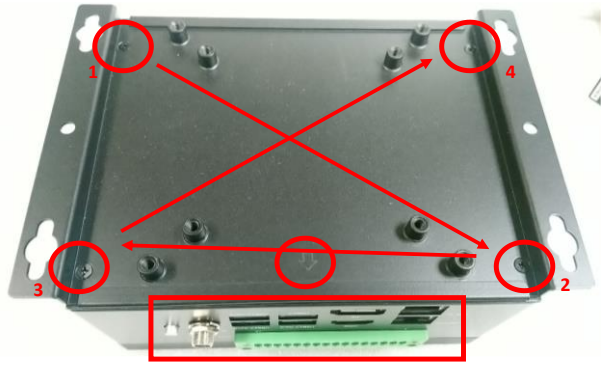
2.4.7 VESA Mount Installation

Step 1: Remove the four (4) screws on the bottom plate.



Step 2: Prepare the VESA Wall mount bracket screw accessories.

Step 3: With the arrow mark facing the front I/O, use the screws to lock the VESA bracket in the following sequence.



Chapter 3

Software Installation

3.1 Linux Setup

The UP Xtreme i14 Edge supports Linux operating systems (see Chapter 1 for specifications). For instructions on how to install a Linux OS onto your UP Xtreme i14 Edge, you can find several guides and tutorials in the wiki section of the UP website at https://up-board.org for both installing supported distributions as well as porting your own Linux build.

3.2 Windows Drivers Installation

Drivers for the UP Xtreme i14 Edge can be downloaded from the UP website by following the link https://www.aaeon.com/tw/product/detail/up-system-intel-core-ultra-meteor-lake-up-xtreme-i14-edge/download and navigating to the Downloads section, then clicking on the UP Xtreme i14 Edge to find all relevant drivers.

3.3 OpenVINO Environment for Linux

3.3.1 Install OS & Update Kernel

Step 1: Install Ubuntu 22.04 LTS

Step 2: Install 6.5 OEM Kernel to enable VPU.

Command:

```
sudo apt update
sudo apt-get install linux-image-6.5.0-1009-oem
```

Step 3: Reboot your board to apply the changes.

After rebooting, check that you have booted into the correct kernel version - *uname -a*

Output should show: `linux-image-6.5.0-1009-oem`

3.3.2 Install GPU Driver

Source: https://dgpu-docs.intel.com/driver/client/overview.html

Add gpupackage repository:

```
wget -qO- https://repositories.intel.com/gpu/intel-graphics.key | \
sudo gpg –dearmor --output /usr/share/keyrings/intel-graphics.gpg
echo "deb [arch=amd64,i386 signed-by=/usr/share/keyrings/intel-graphics.gpg]
https://repositories.intel.com/gpu/ubuntu jammy client" | \
sudo tee /etc/apt/sources.list.d/intel-gpu-jammy.list
sudo apt update
```

Add gpupackage repository:

```
sudo apt install -y \
intel-opencl-icd intel-level-zero-gpu level-zero \
intel-media-va-driver-non-free libmfx1 libmfxgen1 libvpl2 \
```

```
libegl-mesa0 libegl1-mesa libegl1-mesa-dev libgbm1 libgl1-mesa-dev
libgl1-mesa-dri \
libglapi-mesa libgles2-mesa-dev libglx-mesa0 libigdgmm12 libxatracker2
mesa-va-drivers \
mesa-vdpau-drivers mesa-vulkan-drivers va-driver-all vainfo hwinfo clinfo
```

Install linux-firmware to have GPU firmware

```
sudo apt-get install –y linux-firmware
```

Set user to the group (optional)

```
usermod -a -G video user
usermod -a -G render user
```

Add GPU ID into Grub file

```
sudo vim /etc/default/grub
GRUB_CMDLINE_LINUX="i915.force_probe=7d55"
```

Update Grub

```
sudo update-grub
```

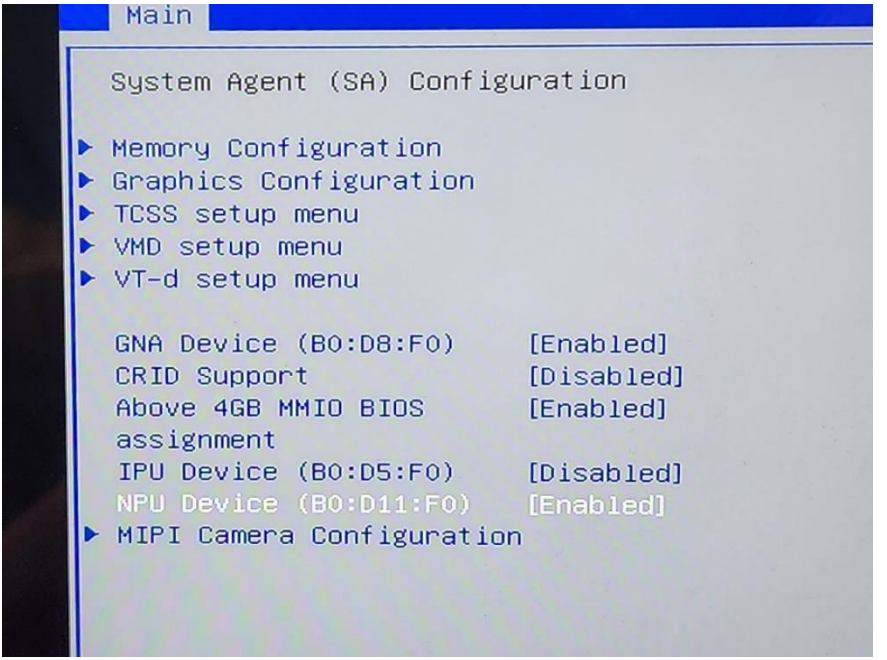
Verify by running clinfo

```
Sudo reboot
```

3.3.3 Install NPU Driver

Enable NPU device in BIOS:

CRB Setup->CRB advanced -> System Agent (SA) Configuration-> NPU Device [Enabled]



Go to https://github.com/intel/linux-npu-driver/releases/tag/v1.1.0

Download and install all packages *.deb packages

Verify by `dmesg | grep vpu`

Set `/dev/accel/accel0` as your user group (optional if you are not accessing NPU in root)

```
chown user:user /dev/accel/accel0
```

3.3.4 Install OpenVINO

Step 1: Download OpenVINO:

You must use the OpenVINO archives as they include the NPU plugin.

Download the appropriate package from OpenVINO 2023.2 Linux Packages.

Step 2: Proceed with OpenVINO Installation:

Follow the installation instructions provided in the downloaded package to install OpenVINO on your system.

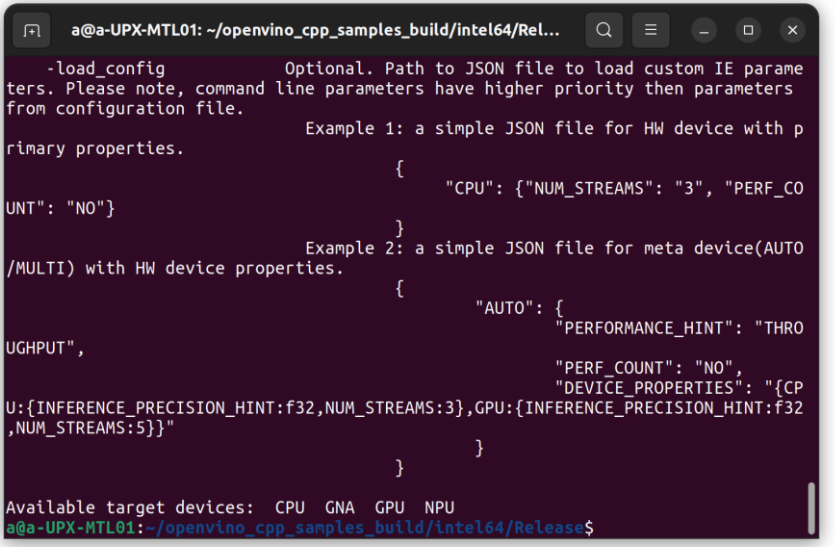
Step 3: Accessing NPU Device:

If you have an NPU device and need access in the user group, run the following command to change the ownership of the device:

```
chown $USER:$USER /dev/accel/accel0
```

Step 4: Run Benchmark Application:

To see the available devices and options, run the benchmark application with the help option:



3.3.5 Install IPU Driver (Optional)

IPU driver can be found at https://github.com/intel/ipu6-drivers

3.4 OpenVINO Environment for Windows

3.4.1 OpenVINO Installation

Source:

https://docs.openvino.ai/2024/get-started/install-openvino.html?PACKAGE=OPENVINO_BASE&VERSION=v_2024_2_0&OP_SYSTEM=WINDOWS&DISTRIBUTION=ARCHIVE

3.4.2 Additional Configurations for GPU and NPU

Source: https://docs.openvino.ai/2024/get-started/configurations.html

3.4.3 NPU Installation Guide

Operating System Support

Operating System	Version	Details
Microsoft Windows® 11 64-bit	September Update (22H2)	
	October Update (22H2)	
	October Update (23H2)	

Note: NPU will not support workloads on Windows* 10. Disable the NPU device from BIOS for Windows 10.

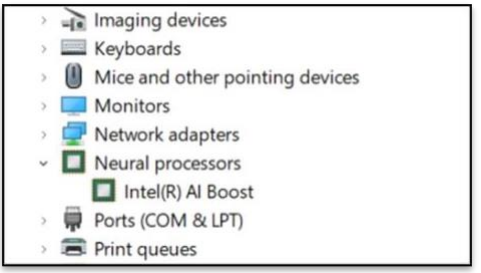
API Frameworks Support

Framework	Version
OpenVino	OpenVino 2024.1
DirectML	Preview

How to Install/Update the NPU Driver

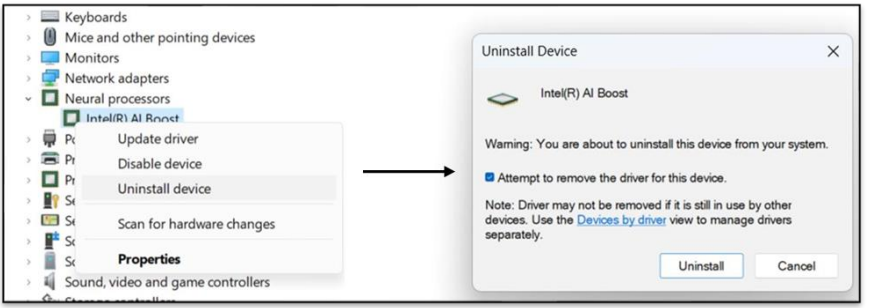
1. Check if an NPU driver is already installed on your device.

   Right click on Windows start button and select Device Manager. Check if Intel(R) AI Boost is visible under Neural processors.



2. If an NPU driver is installed, you need to uninstall it. In Device Manager window: Right click on the Intel(R) AI Boost and select Uninstall Device.

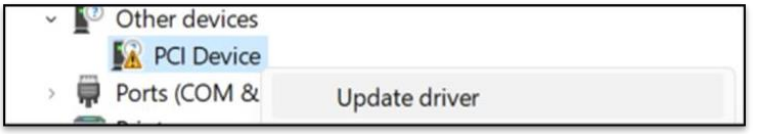
When the Uninstall Device window appears, select the Attempt to remove the driver for this device checkbox and click on the Uninstall button.



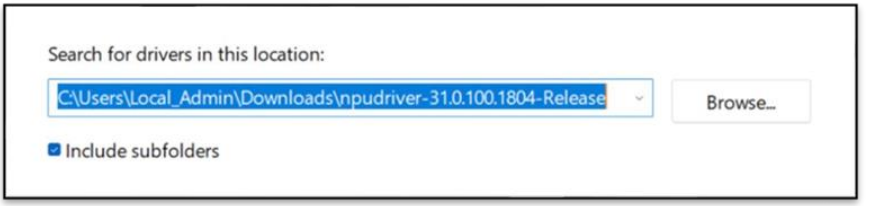
3. Once the device is uninstalled, it's time to install the new driver version. Download latest NPU driver from Intel Download Center.
4. Unpack the zip driver package downloaded from Intel Download Center. To unpack the .zip driver file, right click the file and Extract All -> Extract.
5. Go to Device Manager and Scan for Hardware Changes, by clicking on  icon located at the top menu. This will reveal "Other devices".

Note: If you click more than once on icon the other devices may disappear andrevert to show Intel(R) AI Boost.

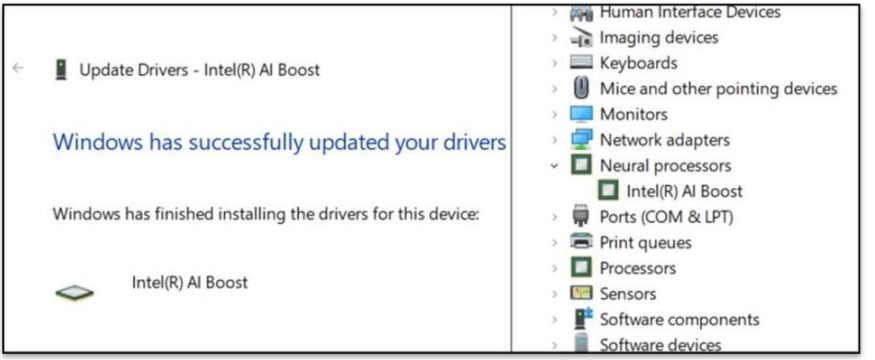
6. Install the new NPU driver. Find PCI Device under Other devices. Right click it and select Update Driver.



7. In the new Window that appears, click Browse my computer for drivers. Click on Browse button and navigate to the location where the unpacked driver was saved.



8. After setting the correct location tick the Include Subfolders checkbox and clickNext. The driver will now install.
9. If the driver installed correctly, you should see the following window saying, "*Windows has successfully updated your drivers*" and the Device Manager should display your Intel(R) AI Boost driver under Neural processors.



Appendix A

Cables and Connectors

A.1 Cables and Connectors

This table provides detailed information about the cables and connectors used by the UP Xtreme i14 Edge. If you have any questions about the configuration of your system, please contact your AAEON sales representative.

Label	Function	Mating Connector		AAEON P/N
		Vendor	Model No.	
CN4	SATA	TechBest	007-01-00757	1709070500
CN5	SATA Power	PINREX	721-81-02TW00	1702150155
CN17	USB & UART	PINREX	710-74-10TWRG.NY9T	170010015G
CN19	UART wafer	PINREX	710-74-10TWRG.NY9T	1701100180
CN20	UART wafer	PINREX	710-74-10TWRG.NY9T	1701100180
CN24	Front Panel	CATCH	1204-700-06SMR	170X000306
CN27	CSI FPC Connector	SHENG-DA	BL309P-61S31-TAH0	170X000600
CN30	BIOS & CPLD Update Conn	Astron	27-4121-206-1G-R	170X000132
CN33	Audio Jack	Astron	E35S16AA-8S-R	170X000382