



# PICO-ARU4

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PICO-ITX Single Board Computer

User's Manual 3<sup>rd</sup> Ed

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## Packing List

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

Item	Quantity
● PICO-ARU4	1

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

## About this Document

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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 on [AAEON.com](http://AAEON.com) for the latest version of this document.

## Safety Precautions

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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 WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60°C (140°F) TO PREVENT DAMAGE.**

### **Warning!**



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.*

产品中有毒有害物质或元素名称及含量

AAEON 主板/子板/背板

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	x	○	○	○	○	○
外部信号连接器及线材	x	○	○	○	○	○

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。

x：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：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。

## China RoHS Requirement (EN)

PICO-ITX Board

PICO-ARU4

### Name and content of hazardous substances in product

AAEON Main Board/ Daughter Board/ Backplane

QQ4-381 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	×	○	○	○	○	○
Connector and Cable	×	○	○	○	○	○

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

○: 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: This product defined period of use is under normal condition.

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# Chapter 1

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Product Specifications

## 1.1 Specifications

### System

Form Factor	PICO-ITX
CPU	Intel® Core™ Ultra Processors (Series 2): Intel® Core™ Ultra 7 Processor 255U (2PC+10EC/14T, P-core 2.00 GHz, E-core 1.70 GHz, 15W) Intel® Core™ Ultra 5 Processor 225U (2PC+10EC/14T, P-core 1.50 GHz, E-core 1.30 GHz, 15W)
Chipset	Integrated with Intel® SoC
Memory Type	Single-Channel LPDDR5 6400, up to 32GB
BIOS	UEFI
Wake on LAN	Yes
Watchdog Timer	255 Levels
Security	TPM 2.0
RTC Battery	Lithium Battery 3V/240mAh
Dimension	3.94" x 2.84" (100mm x 72mm)
Gross Weight	0.18 lb. (0.08Kg)
OS Support	Windows® 10/11 (64-bit) <b>Note:</b> NPU supported on Windows® 11 only Linux Ubuntu 22.04.2 kernel 5.19.0-32-generic

### Power

Power Requirement	12V
Power Supply Type	AT/ATX
Connector	Phoenix 2-pin Connector (Default) Lockable DC Jack Connector (coloy)

## Power

<b>Power Consumption</b>	Intel® Core™ Ultra 7 Processor 255U, DDR5 32GB x 1, 2.85A @+12V (Typical)
	Intel® Core™ Ultra 7 Processor 255U, DDR5 32GB x 1, 6.96A @+12V (Max)

## Display

<b>Controller</b>	Intel® Graphics
<b>LVDS/eDP</b>	eDP 1.4 x 1
<b>Display Interface</b>	HDMI 1.4 x 1, 3840 x 2160 @30Hz
<b>Multiple Display</b>	Up to 2 Simultaneous Displays

## Audio

<b>Codec</b>	—
<b>Audio Interface</b>	—
<b>Speaker</b>	—

## External I/O

<b>Ethernet</b>	Intel® Ethernet Controller I226, 2.5GbE, RJ-45 x 1 Intel® Ethernet Connection I219, 1GbE, RJ-45 x 1
<b>USB</b>	USB 3.2 Gen 2 x 2
<b>Serial Port</b>	—
<b>Video</b>	HDMI 1.4 x 1

## Internal I/O

<b>USB</b>	USB 2.0 x 2
<b>Serial Port</b>	COM 1~2 (RS-232/422/485, supports 5V/12V/RI, select by BOM)

## Internal I/O

Video	—
SATA	SATA 6Gb/s x 1 +5V SATA Power Connector x 1
Audio	—
DIO/GPIO	4-bit GPIO
SMBus/I2C	I2C/SMBus (Default: SMBus)
Touch	—
FAN	4-pin Smart Fan x 1
SIM	—
Front Panel	HDD LED, PWR LED, Power Button, Buzzer, Reset
Others	—

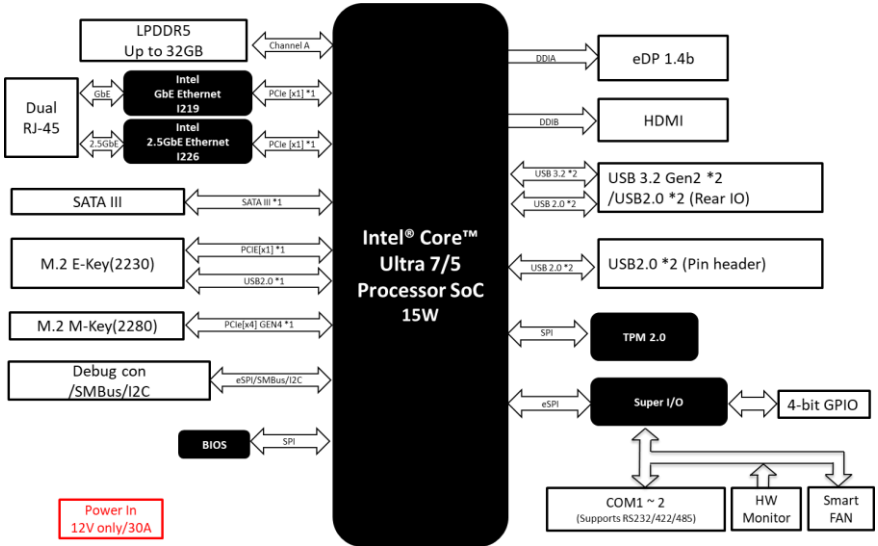
## Expansion

Mini PCIe/mSATA	—
M.2	M.2 2280 M-Key x 1 (PCIe 4.0 [x4]/SATA, Default: PCIe [x4], select by BOM) M.2 2230 E-Key x 1 (PCIe 4.0 [x1] + USB 2.0)
Others	—

## Environmental

Operating Temperature	-4°F ~ 158°F (-20°C ~ 70°C)
Storage Temperature	-40°F ~ 185°F (-40°C ~ 85°C)
Operating Humidity	0% ~ 90% relative humidity, non-condensing
MTBF (Hours)	1,063,716
EMC	CE/FCC Class A

## 1.2 Function Block Diagram



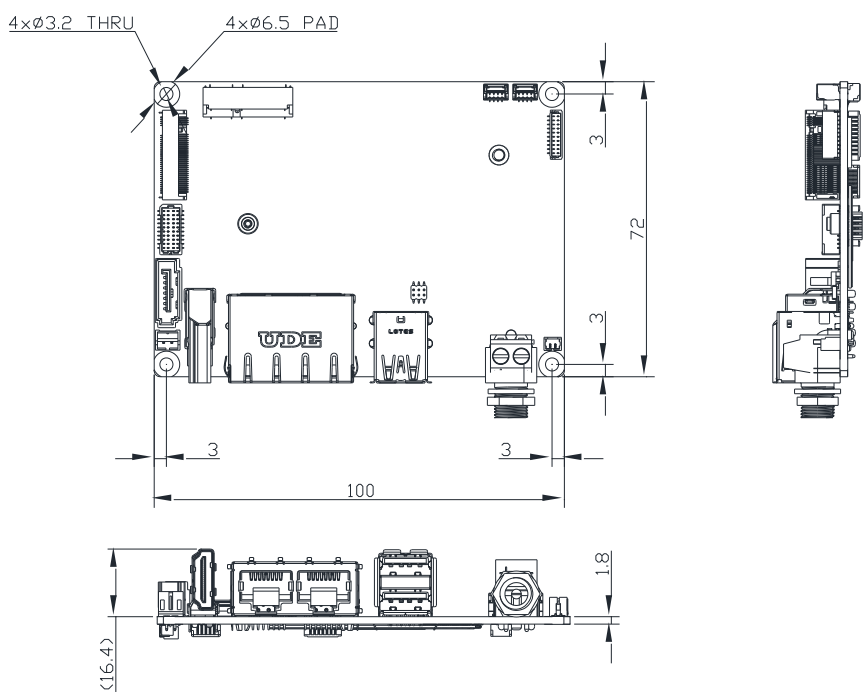
# Chapter 2

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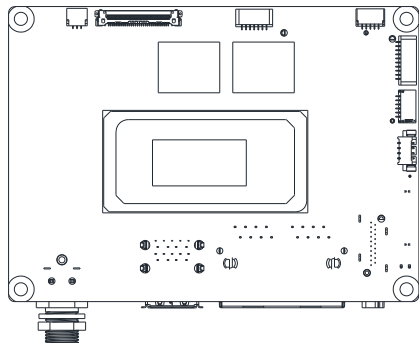
Hardware Information

## 2.1 Dimensions

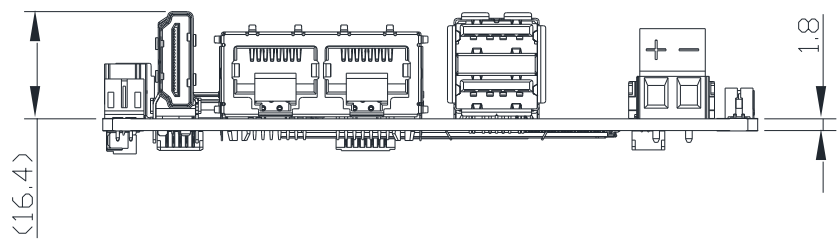
Top View:



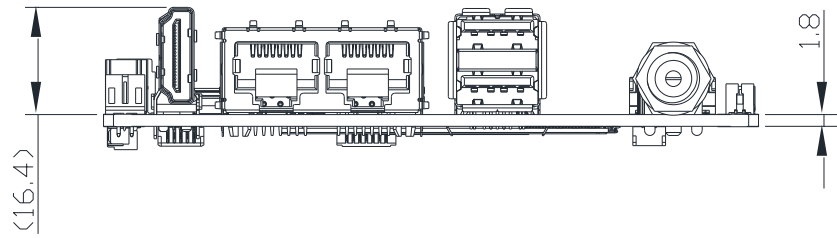
Bottom View:



With Phoenix 2-pin Connector (Default)

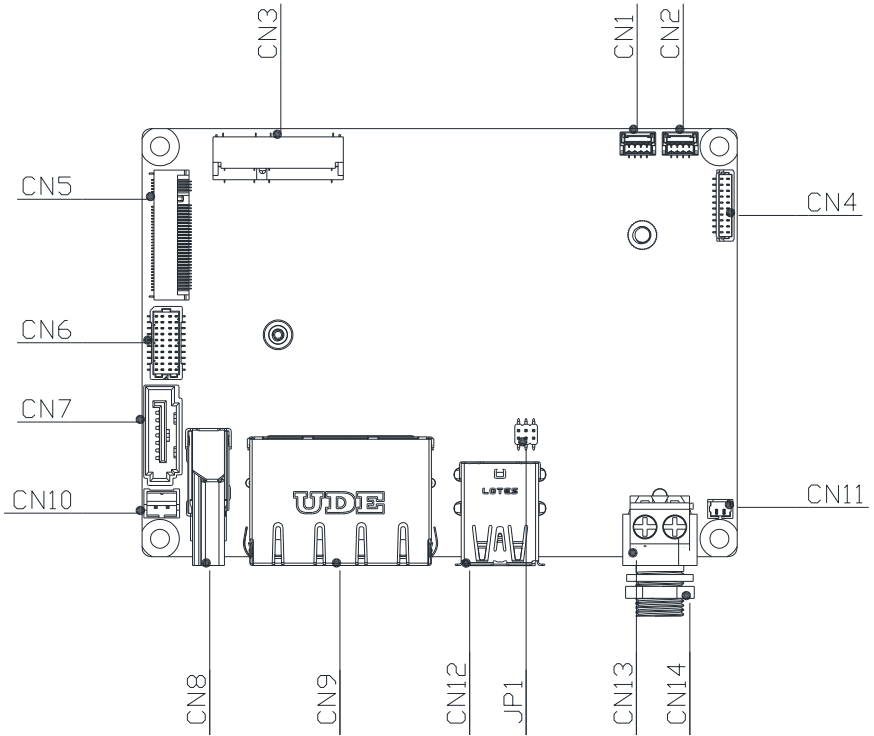


With Lockable DC Jack Connector (Colay)

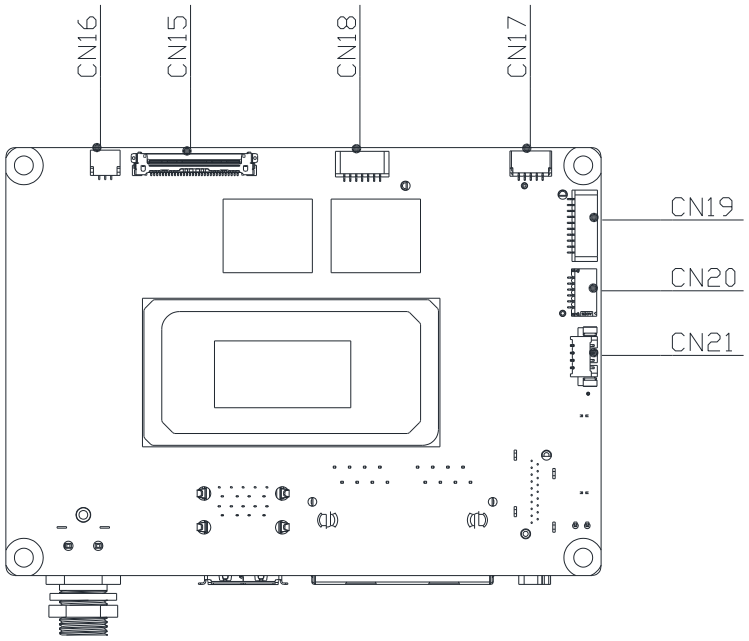


## 2.2 Jumpers and Connectors

Top View:



Bottom View:



## 2.3 List of Jumpers

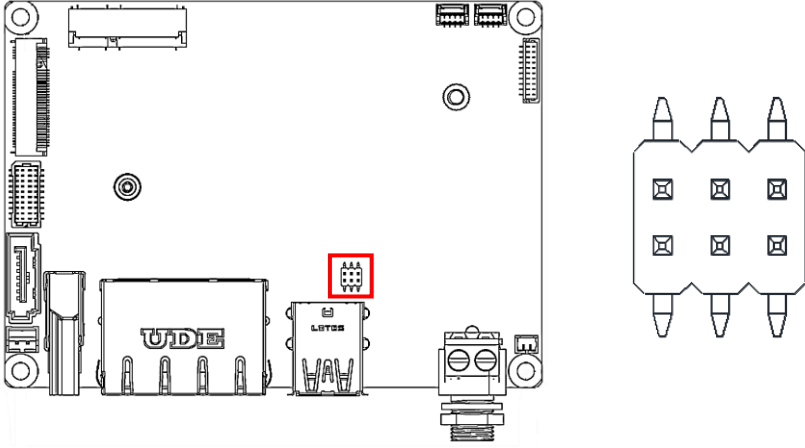
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Jumpers allow users to manually customize system configurations to their suitable application needs.

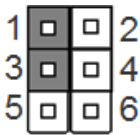
Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
JP1 (Pins 1,3,5)	Clear CMOS Jumper
JP1 (Pins 2,4,6)	Auto Power Button Enable/Disable Selection

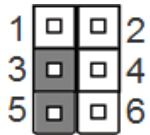
### 2.3.1 Clear CMOS Jumper & Auto Power Button Enable/Disable (JP1)



Clear CMOS Jumper:

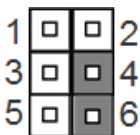


Normal (Default)

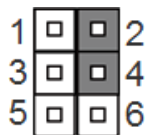


Clear CMOS

Auto Power Button Enable/Disable Selection:



Enable Auto Power Button (Default)



Disable Auto Power Button

**Note:** To avoid damage to the system, do not connect pins 1,3,5 with pins 2,4,6.

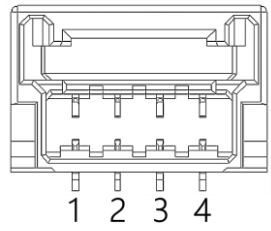
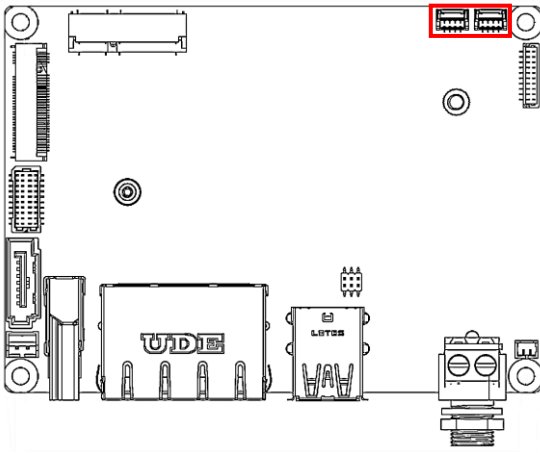
## 2.4 List of Connectors

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Please refer to the table below for all of the board's connectors that you can configure for your application

Label	Function
CN1	USB 2.0 Connector
CN2	USB 2.0 Connector
CN3	M.2 2230 E-Key
CN4	Front Panel
CN5	M.2 2280 M-Key
CN6	COM Connector
CN7	SATA Port
CN8	HDMI Port
CN9	RJ-45 LAN Port 1/Port 2
CN10	+5V Output for SATA HDD
CN11	RTC Battery Connector
CN12	USB 3.2/USB 2.0 Port 1/Port 2
CN13	Terminal Block DC Input Connector
CN14	DC Jack
CN15	eDP Connector
CN16	IMVP9 Programming Port
CN17	I2C/SMBus Connector
CN18	SPI Flash Programming Port
CN19	Port 80 Debug Port Connector
CN20	GPIO Connector
CN21	4-pin Fan Connector

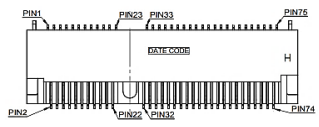
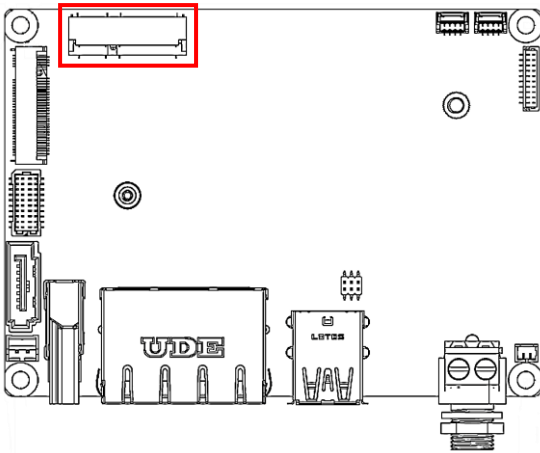
### 2.4.1 USB 2.0 Connector (CN1/CN2)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB2_6_DN	DIFF	-
3	USB2_6_DP	DIFF	-
4	GND	GND	GND

**Note:** The driving current of +5VSB supports up to 0.5A/Port.

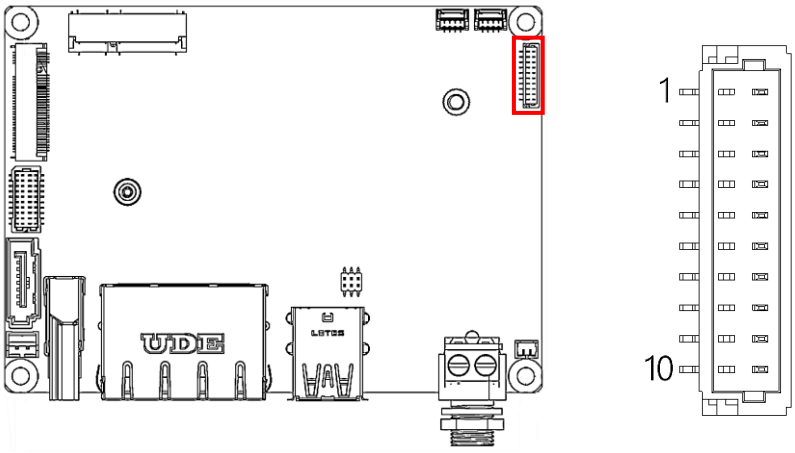
### 2.4.2 M.2 2230 E-Key (CN3)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+V3P3A	PWR	+3.3V
3	USB2_10_DP	DIFF	-
4	+V3P3A	PWR	+3.3V
5	USB2_10_DN	DIFF	-
6	NC	-	-
7	GND	GND	GND
8	NC	-	-
9	CNV_WR_D1_DN	DIFF	-
10	KEYE_CNV_RF_RST	IN	-
11	CNV_WR_D1_DP	DIFF	-
12	NC	-	-
13	GND	GND	GND
14	KEYE_CNV_CLKREQ	OUT	-
15	CNV_WR_D0_DN	DIFF	-
16	NC	-	-
17	CNV_WR_D0_DP	DIFF	-
18	GND	GND	GND
19	GND	GND	GND
20	KEYE_UART_WAKE_N	IN	-
21	CNV_WR_CLK_DN	DIFF	-
22	CNV_BRI_RSP	IN	-
23	CNV_WR_CLK_DP	DIFF	-
32	CNV_RGI_DT	IN	-
33	GND	GND	GND
34	CNV_RGI_RSP	OUT	-
35	PCIE_8_TXP	DIFF	-
36	CNV_BRI_DT	-	-
37	PCIE_8_TXN	DIFF	-
38	MLK_RST_N	IN	-
39	GND	GND	GND
40	MLK_DATA	IN/OUT	-
41	PCIE_8_RXP	DIFF	-
42	MLK_CLK	IN	-
43	PCIE_8_RXN	DIFF	-
44	NC	-	-
45	GND	GND	GND
46	NC	-	-
47	PCIE_3_CLK_DP	DIFF	-

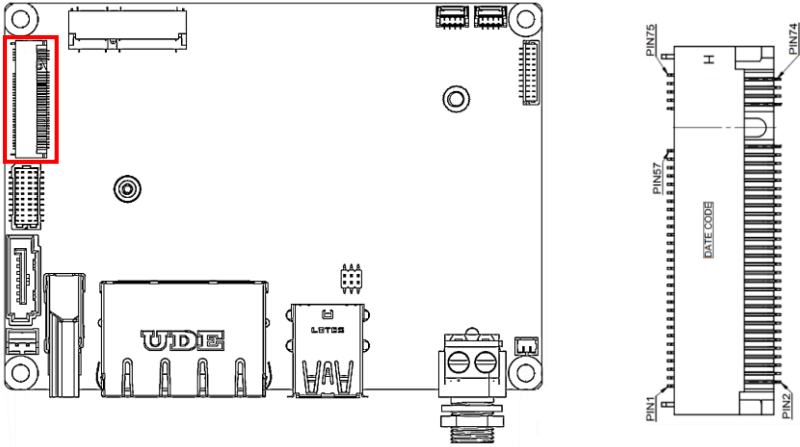
Pin	Pin Name	Signal Type	Signal Level
48	NC	-	-
49	PCIE_3_CLK_DN	DIFF	-
50	SUS_CLK	IN	-
51	GND	GND	GND
52	BUF_PLT_RST#	IN	-
53	PCIE_CLKREQ#3	OUT	-
54	NC	-	-
55	PCIE_WAKE#	IN/OUT	-
56	NC	-	-
57	GND	GND	GND
58	NC	-	-
59	CNV_WT_D1_DN	DIFF	-
60	NC	-	-
61	CNV_WT_D1_DP	DIFF	-
62	NC	-	-
63	GND	GND	GND
64	NC	-	-
65	CNV_WT_D0_DN	DIFF	-
66	NC	-	-
67	CNV_WT_D0_DP	DIFF	-
68	NC	-	-
69	GND	GND	GND
70	NC	-	-
71	CNV_WT_CLK_DN	DIFF	-
72	+V3P3A	PWR	+3.3V
73	CNV_WT_CLK_DP	DIFF	-
74	+V3P3A	PWR	+3.3V
75	GND	GND	GND

### 2.4.3 Front Panel (CN4)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	EXT_PWRBTN#	IN	-
3	SATA_LED-	OUT	-
4	SATA_LED+	OUT	-
5	BUZZER-	OUT	-
6	BUZZER+	OUT	-
7	GND	GND	GND
8	PWR_LED+	OUT	-
9	GND	GND	GND
10	HWRST#	IN	-

## 2.4.4 M.2 2280 M-Key (CN5)

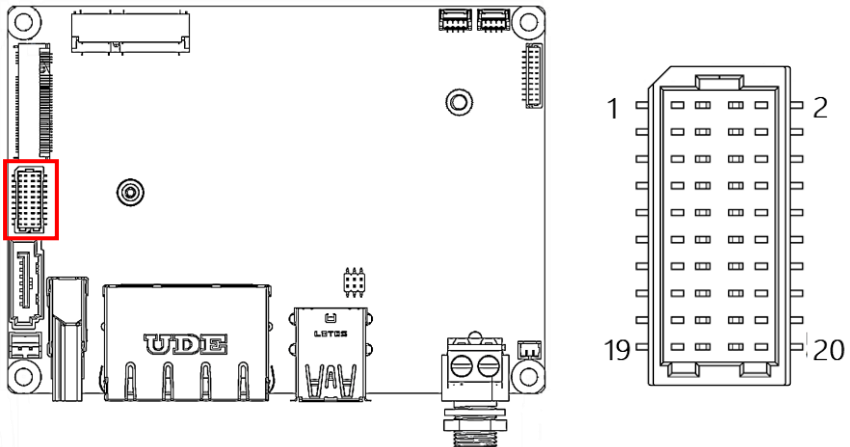


Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+V3P3S	PWR	+3.3V
3	GND	GND	GND
4	+V3P3S	PWR	+3.3V
5	PCIE_12_RXN	DIFF	-
6	CARD_PWR_OFF_N	IN	-
7	PCIE_12_RXP	DIFF	-
8	NC	-	-
9	GND	GND	GND
10	PCH_SATA_LED_N	OUT	+3.3V
11	PCIE_12_TXN	DIFF	-
12	+V3P3S	PWR	+3.3V
13	PCIE_12_TXP	DIFF	-
14	+V3P3S	PWR	+3.3V
15	GND	GND	GND
16	+V3P3S	PWR	+3.3V
17	PCIE_11_RXN	DIFF	-
18	+V3P3S	PWR	+3.3V
19	PCIE_11_RXP	DIFF	-
20	NC	-	-
21	GND	GND	GND
22	KEYM_SSD_VIO	IN	-
23	PCIE_11_TXN	DIFF	-

Pin	Pin Name	Signal Type	Signal Level
24	NC	-	-
25	PCIE_11_TXP	DIFF	-
26	NC	-	-
27	GND	GND	GND
28	NC	-	-
29	PCIE_10_RXN	DIFF	-
30	NC	-	-
31	PCIE_10_RXP	DIFF	-
32	NC	-	-
33	GND	GND	GND
34	NC	-	-
35	PCIE_10_TXN	DIFF	-
36	NC	-	-
37	PCIE_10_TXP	DIFF	-
38	NC	-	-
39	GND	GND	GND
40	NC	-	-
41	PCIE_9_RXN/ SATA_1_RXP	DIFF	-
42	NC	-	-
43	PCIE_9_RXP/ SATA_1_RXN	DIFF	-
44	NC	-	-
45	GND	GND	GND
46	NC	-	-
47	PCIE_9_TXN/ SATA_1_TXN	DIFF	-
48	NC	-	-
49	PCIE_9_TXP/SATA_1_TX P	DIFF	-
50	BUF_PLT_RST#	IN	-
51	GND	GND	GND
52	M2M_CLKREQ#	OUT	-
53	PCIE_5_CLK_DN	DIFF	-
54	PCIE_WAKE#	OUT	-
55	PCIE_5_CLK_DP	DIFF	-
56	NC	-	-
57	GND	GND	GND
58	NC	-	-

Pin	Pin Name	Signal Type	Signal Level
67	NC	-	-
68	SUS_CLK	IN	-
69	KEYM_DET	IN	-
70	+V3P3S	PWR	+3.3V
71	GND	GND	GND
72	+V3P3S	PWR	+3.3V
73	GND	GND	GND
74	+V3P3S	PWR	+3.3V
75	GND	GND	GND

### 2.4.5 COM Connector (CN6)



COM Port 1/Port 2 RS-232 (Default)

Pin	Pin Name	Signal Type	Signal Level
1	DCD1	IN	-
2	DCD2	IN	-
3	RX1	IN	-
4	RX2	IN	-
5	TX1	OUT	±9V
6	TX2	OUT	±9V
7	DTR1	OUT	±9V
8	DTR2	OUT	±9V
9	GND	GND	GND
10	GND	GND	GND
11	DSR1	IN	-

## COM Port 1/Port 2 RS-232 (Default)

Pin	Pin Name	Signal Type	Signal Level
12	DSR2	IN	-
13	RTS1	OUT	±9V
14	RTS2	OUT	±9V
15	CTS1	IN	-
16	CTS2	IN	-
17	RI1/ +5V/ +12V	IN/ PWR	+5V/+12V
18	RI2/ +5V/ +12V	IN/ PWR	+5V/+12V
19	NC	NC	NC
20	NC	NC	NC

## COM Port 1 RS-422

Pin	Pin Name	Signal Type	Signal Level
9	GND	GND	GND
1	RS422_TX-	OUT	±9V
3	RS422_TX+	OUT	±9V
5	RS422_RX+	IN	-
7	RS422_RX-	IN	-

## COM Port 1 RS-485

Pin	Pin Name	Signal Type	Signal Level
9	GND	GND	GND
1	RS485_D-	IN/OUT	±9V
3	RS485_D+	IN/OUT	±9V

**Note:** COM 1 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

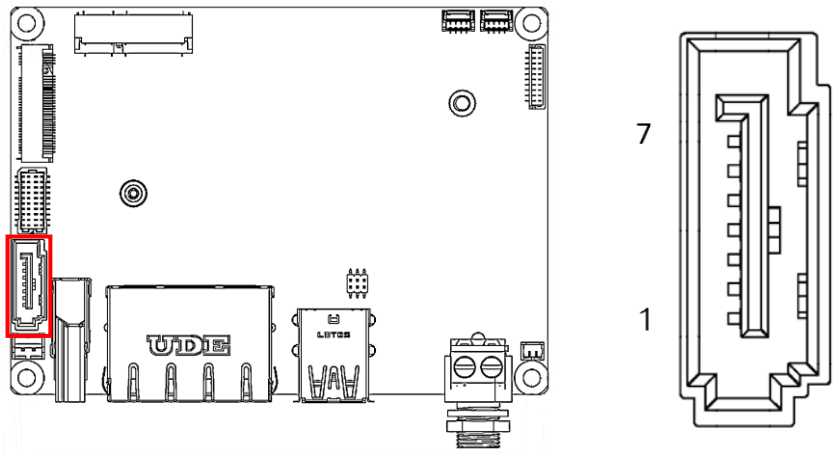
## COM Port 2 RS-422

Pin	Pin Name	Signal Type	Signal Level
10	GND	GND	GND
2	RS422_TX-	OUT	±9V
4	RS422_TX+	OUT	±9V
6	RS422_RX+	IN	-
8	RS422_RX-	IN	-

COM Port 2 RS-485			
Pin	Pin Name	Signal Type	Signal Level
10	GND	GND	GND
2	RS485_D-	IN/OUT	±9V
4	RS485_D+	IN/OUT	±9V

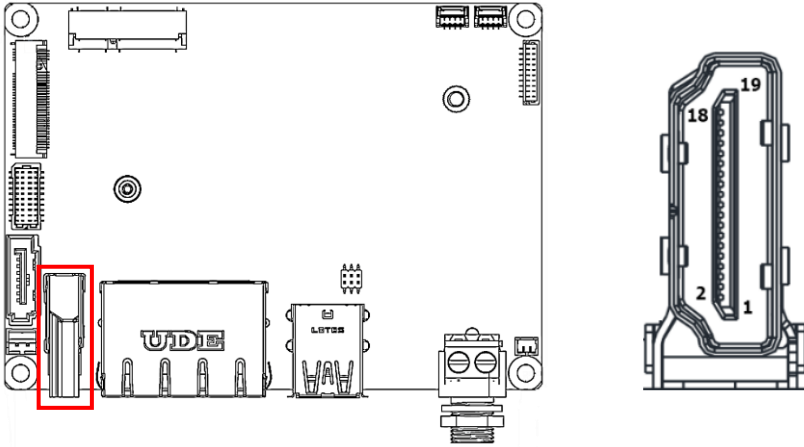
**Note:** COM 2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

### 2.4.6 SATA Port (CN7)



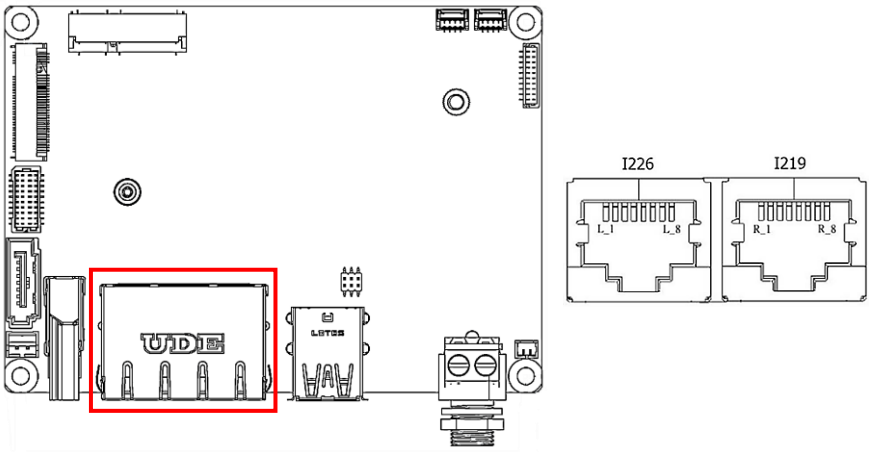
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	SATA_TXP	DIFF	-
3	SATA_TXN	DIFF	-
4	GND	GND	GND
5	SATA_RXN	DIFF	-
6	SATA_RXP	DIFF	-
7	GND	GND	GND

## 2.4.7 HDMI Port (CN8)



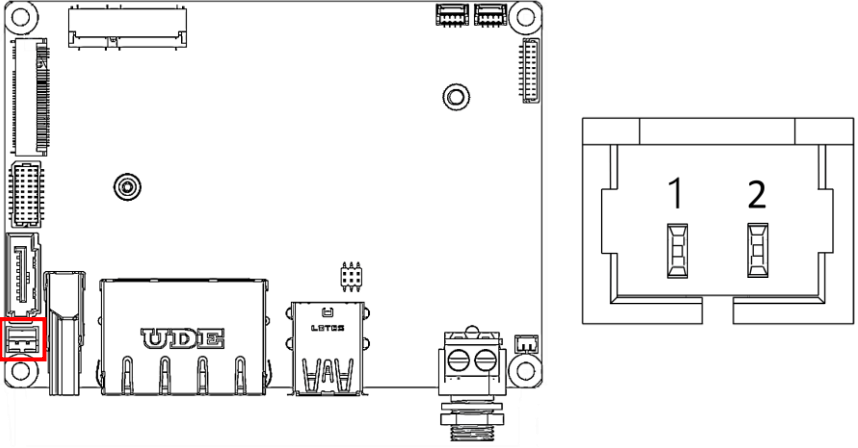
Pin	Pin Name	Signal Type	Signal Level
1	HDMI_TX2+	DIFF	-
2	GND	GND	GND
3	HDMI_TX2-	DIFF	-
4	HDMI_TX1+	DIFF	-
5	GND	GND	GND
6	HDMI_TX1-	DIFF	-
7	HDMI_TX0+	DIFF	-
8	GND	GND	GND
9	HDMI_TX0-	DIFF	-
10	HDMI_CLK+	DIFF	-
11	GND	GND	GND
12	HDMI_CLK-	DIFF	-
13	N/A	N/A	N/A
14	N/A	N/A	N/A
15	DDC_CLK	IN/OUT	-
16	DDC_DATA	IN/OUT	-
17	GND	GND	GND
18	+V5S	PWR	+5V
19	HDMI_HPD	IN	-

## 2.4.8 RJ-45 LAN Port 1/Port 2 (CN9)



Pin	Pin Name	Signal Type	Signal Level
L_1	LAN1_MDI0_P	DIFF	-
L_2	LAN1_MDI0_N	DIFF	-
L_3	LAN1_MDI1_P	DIFF	-
L_4	LAN1_MDI1_N	DIFF	-
L_5	LAN1_MDI2_P	DIFF	-
L_6	LAN1_MDI2_N	DIFF	-
L_7	LAN1_MDI3_P	DIFF	-
L_8	LAN1_MDI3_N	DIFF	-
R_1	LAN2_MDI0_P	DIFF	-
R_2	LAN2_MDI0_N	DIFF	-
R_3	LAN2_MDI1_P	DIFF	-
R_4	LAN2_MDI1_N	DIFF	-
R_5	LAN2_MDI2_P	DIFF	-
R_6	LAN2_MDI2_N	DIFF	-
R_7	LAN2_MDI3_P	DIFF	-
R_8	LAN2_MDI3_N	DIFF	-

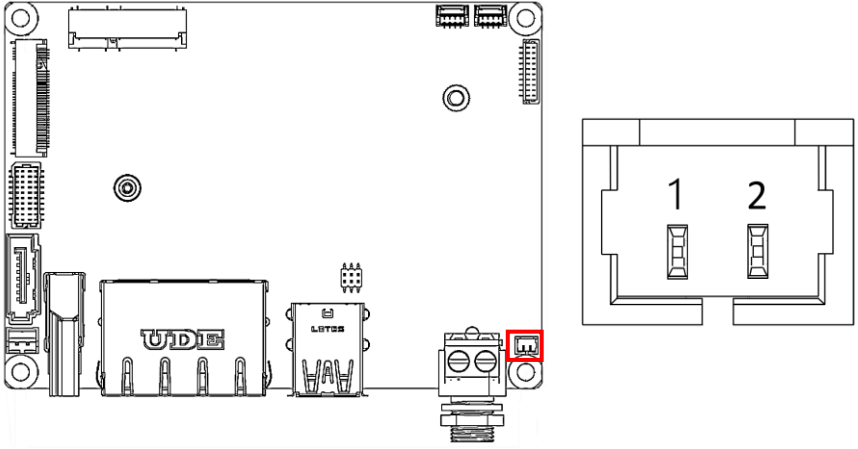
### 2.4.9 +5V Output for SATA HDD (CN10)



Pin	Pin Name	Signal Type	Signal Level
1	+V5S	PWR	+5V
2	GND	GND	GND

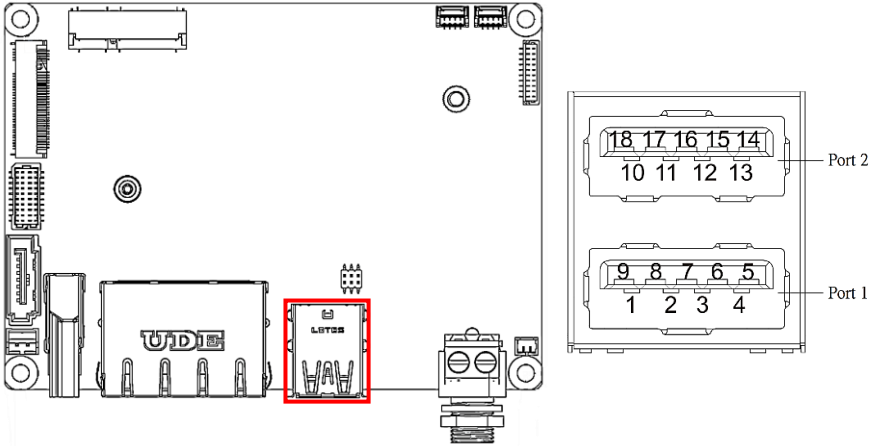
**Note:** The driving current of +V5S supports up to 2A.

### 2.4.10 RTC Battery Connector (CN11)



Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	+3.3V
2	GND	GND	GND

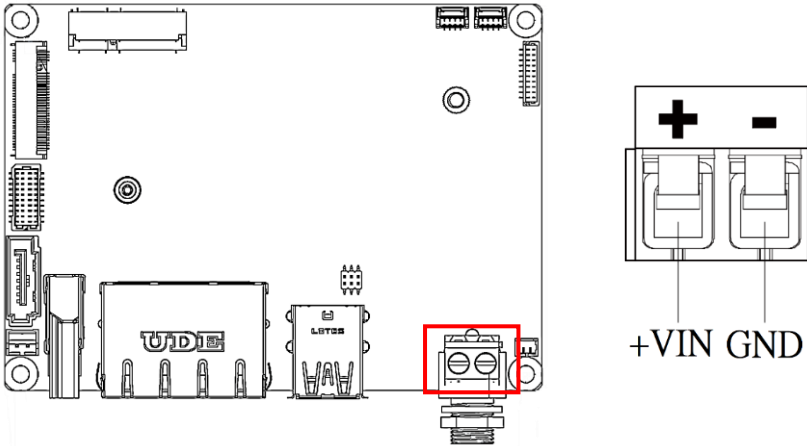
### 2.4.11 USB 3.2/USB 2.0 Port 1/Port 2 (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB2_1_DN	DIFF	-
3	USB2_1_DP	DIFF	-
4	GND	GND	GND
5	USB3_1_RXN	DIFF	-
6	USB3_1_RXP	DIFF	-
7	GND	GND	GND
8	USB3_1_TXN	DIFF	-
9	USB3_1_TXP	DIFF	-
10	+5VSB	PWR	+5V
11	USB2_8_DN	DIFF	-
12	USB2_8_DP	DIFF	-
13	GND	GND	GND
14	USB3_2_RXN	DIFF	-
15	USB3_2_RXP	DIFF	-
16	GND	GND	GND
17	USB3_2_TXN	DIFF	-
18	USB3_2_TXP	DIFF	-

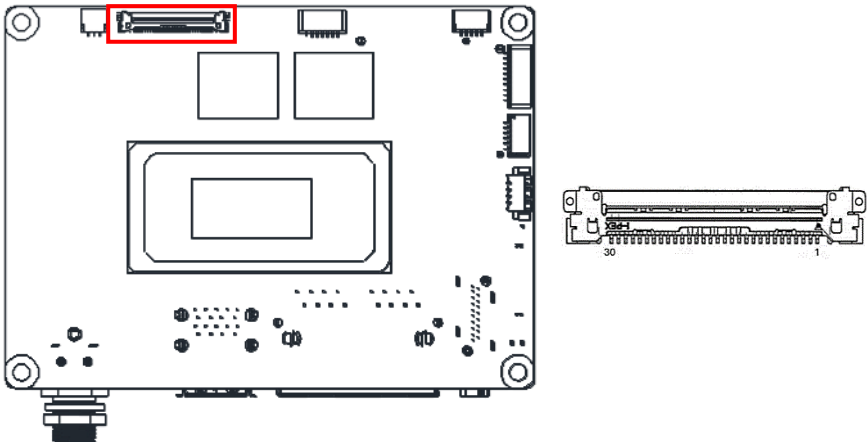
**Note:** The driving current of +5VSB supports up to 0.9A/Port.

### 2.4.12 External Power Input (CN13)



Pin	Pin Name	Signal Type	Signal Level
1	+VIN	PWR	+12V
2	GND	GND	GND

### 2.4.13 eDP Connector (CN15)

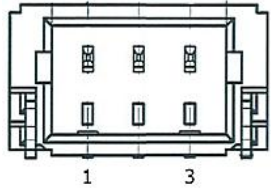
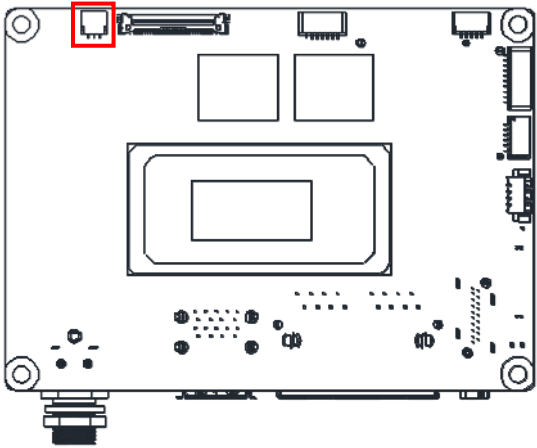


Pin	Pin Name	Signal Type	Signal Level
1	+VCC_EDP_BKLT	PWR	+12V
2	+VCC_EDP_BKLT	PWR	+12V
3	+VCC_EDP_BKLT	PWR	+12V
4	+VCC_EDP_BKLT	PWR	+12V
5	GND	GND	GND
6	GND	GND	GND
7	GND	GND	GND
8	EDP_HPD	-	-
9	EDP_BKLT_EN	-	-
10	NC		
11	EDP_BKLTCTL	-	-
12	GND	GND	GND
13	EDP_AUX_DP	DIFF	-
14	EDP_AUX_DN	DIFF	-
15	GND	GND	GND
16	EDP_LANE3_DP	DIFF	-
17	EDP_LANE3_DN	DIFF	-
18	GND	GND	GND
19	EDP_LANE0_DP	DIFF	-
20	EDP_LANE0_DN	DIFF	-
21	GND	GND	GND
22	EDP_LANE1_DP	DIFF	-
23	EDP_LANE1_DN	DIFF	-
24	GND	GND	GND
25	EDP_LANE2_DP	DIFF	-
26	EDP_LANE2_DN	DIFF	-
27	GND	GND	GND
28	+VDD	PWR	+3.3V
29	+VDD	PWR	+3.3V
30	+VDD	PWR	+3.3V

**Note:** The driving current of +VCC\_EDP\_BKLT supports up to 1.2A.

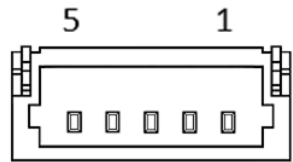
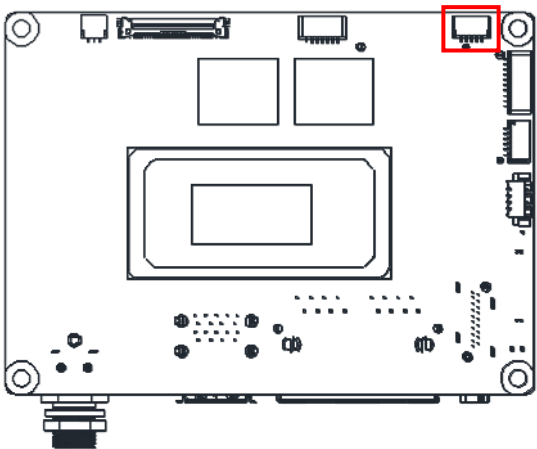
**Note:** The driving current of +VDD supports up to 1A.

### 2.4.14 IMVP9 Programming Port (CN16)



Pin	Pin Name	Signal Type	Signal Level
1	PM_SDA	IN/OUT	+3.3V
2	PM_SCL	IN	+3.3V
3	GND	GND	GND

### 2.4.15 I2C/SMBus Connector (CN17)

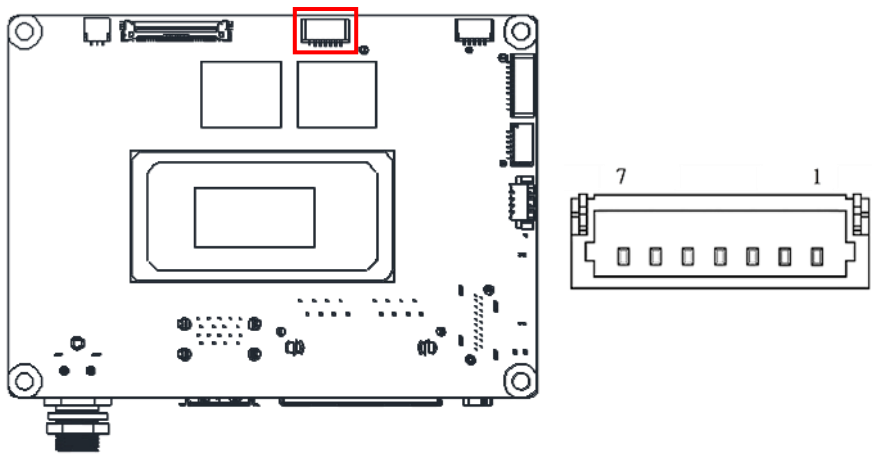


Pin	Pin Name	Signal Type	Signal Level
1	+V3P3S	PWR	+3.3V
2	SMB_CLK/	OUT	+3.3V

Pin	Pin Name	Signal Type	Signal Level
	I2C_CLK/TIME_SYNC0		
3	SMB_DAT/ I2C_DAT/TIME_SYNC1	IN/OUT	+3.3V
4	SMB_ALERT/ INT_SERIRQ/LAN_SDP	IN	+3.3V
5	GND	GND	GND

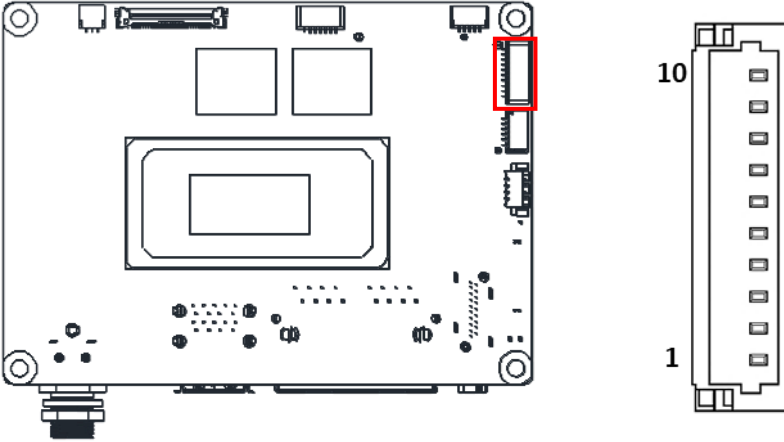
**Note:** Default function is SMBus.

### 2.4.16 SPI Flash Programming Port (CN18)



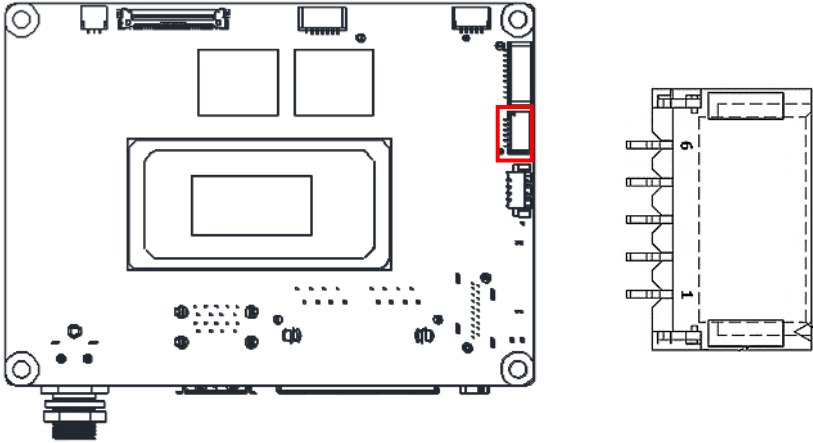
Pin	Pin Name	Signal Type	Signal Level
1	SPI_MISO	OUT	-
2	GND	GND	GND
3	SPI_CLK	IN	-
4	+V3P3A_SPI	PWR	+3.3V
5	SPI_MOSI	IN	-
6	SPI_CS	IN	-
7	NC	-	-

## 2.4.17 Port 80 Debug Port Connector (CN19)



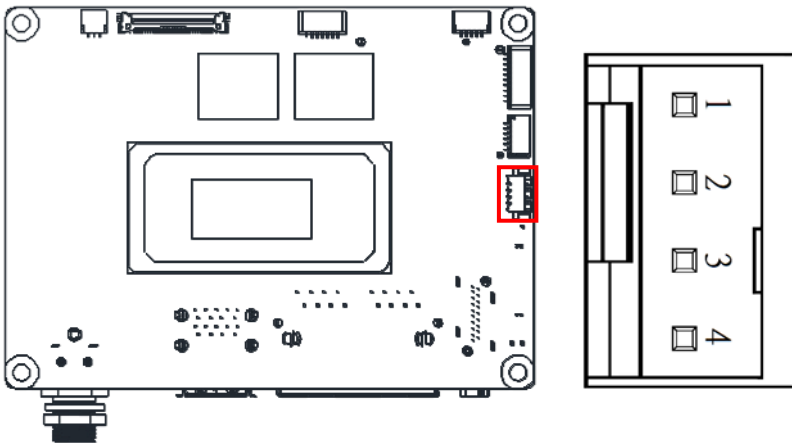
Pin	Pin Name	Signal Type	Signal Level
1	ESPI_IO0_EC_R	IN/OUT	+3.3V
2	ESPI_IO1_EC_R	IN/OUT	+1.8V
3	ESPI_IO2_EC_R	IN/OUT	+1.8V
4	ESPI_IO3_EC_R	IN/OUT	+1.8V
5	+V3P3S	PWR	+3.3V
6	ESPI_CS_EC_R_N	OUT	+3.3V
7	ESPI_RST_EC_R_N	OUT	+1.8V
8	GND	GND	GND
9	ESPI_CLK_EC_R	OUT	+1.8V
10	+V3P3A	PWR	+3.3V

### 2.4.18 GPIO Connector (CN20)



Pin	Pin Name	Signal Type	Signal Level
1	+V5S	PWR	+5V
2	GPIO_0	IN/OUT	-
3	GPIO_1	IN/OUT	-
4	GPIO_2	IN/OUT	-
5	GPIO_3	IN/OUT	-
6	GND	GND	GND

### 2.4.19 4-pin Fan Connector (CN21)



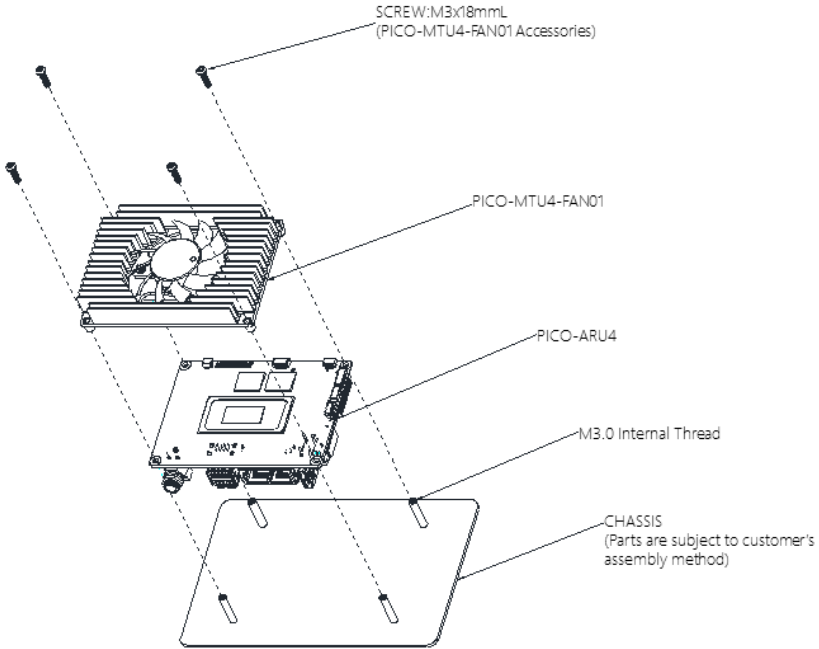
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	-
4	FAN_CTL	OUT	-

**Note:** The driving current of FAN\_POWER supports up to 1A.

## 2.5 Thermal Assembly Options

### 2.5.1 Fan Assembly

Fan Part Number: PICO-MTU4-FAN01.



# Chapter 3

---

AMI BIOS Setup

## 3.1 System Test and Initialization

---

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

### System configuration verification

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The PICO-ARU4 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the battery when it finally runs down.

## 3.2 AMI BIOS Setup

---

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

### Entering Setup

Power on the computer and press <Del> or <ESC> immediately. This will allow you to enter Setup.

#### **Main**

Set the date, use tab to switch between date elements.

#### **Advanced**

Enable/disable the feature configurations.

#### **System I/O**

Host bridge parameters.

#### **Security**

Set setup administrator password.

#### **Boot**

Enables/disable quiet boot option.

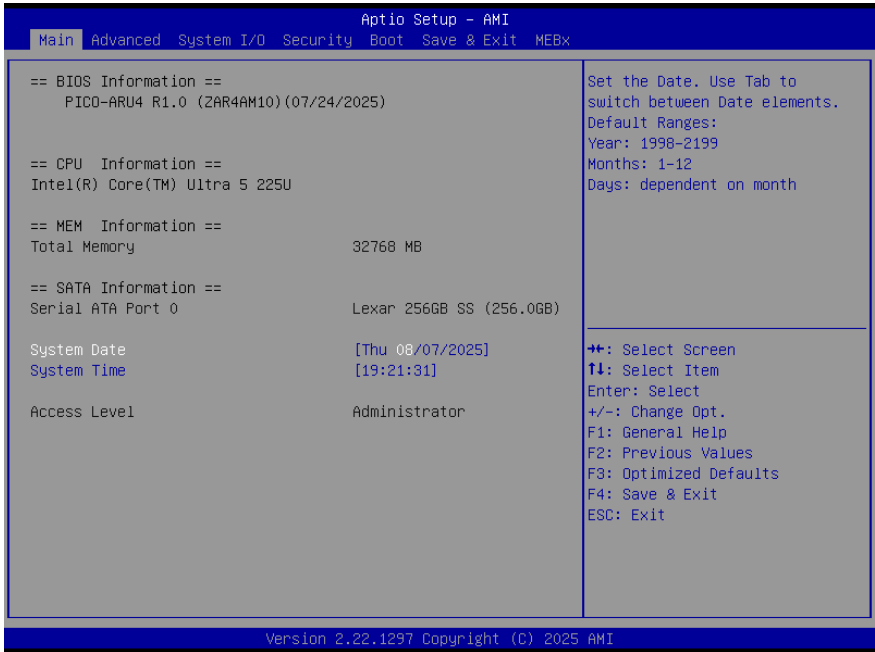
#### **Save & Exit**

Exit system setup after saving the changes.

#### **MEBx**

Enables/disable MEBx option.

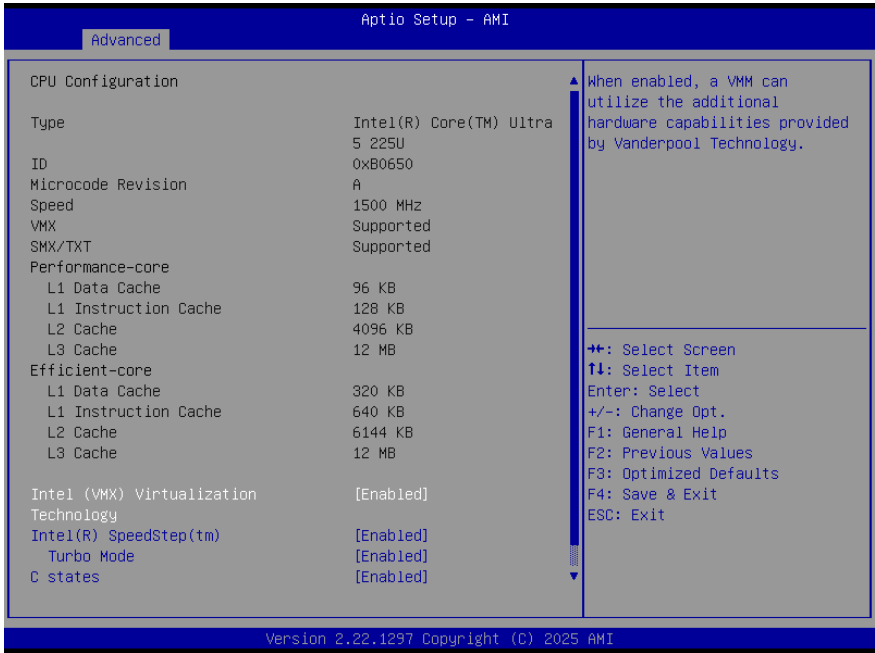
### 3.3 Setup Submenu: Main



### 3.4 Setup Submenu: Advanced



### 3.4.1 CPU Configuration



Options Summary		
Intel (VMX) Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
Intel® SpeedStep™	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported.		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or disable processor Turbo Mode (requires EMTTM to be enabled). Setting to AUTO means Turbo Mode is enabled.		
C states	Disabled	
	Enabled	Optimal Default, Failsafe Default

## Options Summary

NPU Device (B0:D11:F0)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable NPU (Neural Processing Unit) Device		

## 3.4.2 Memory Configuration

Aptio Setup - AMI

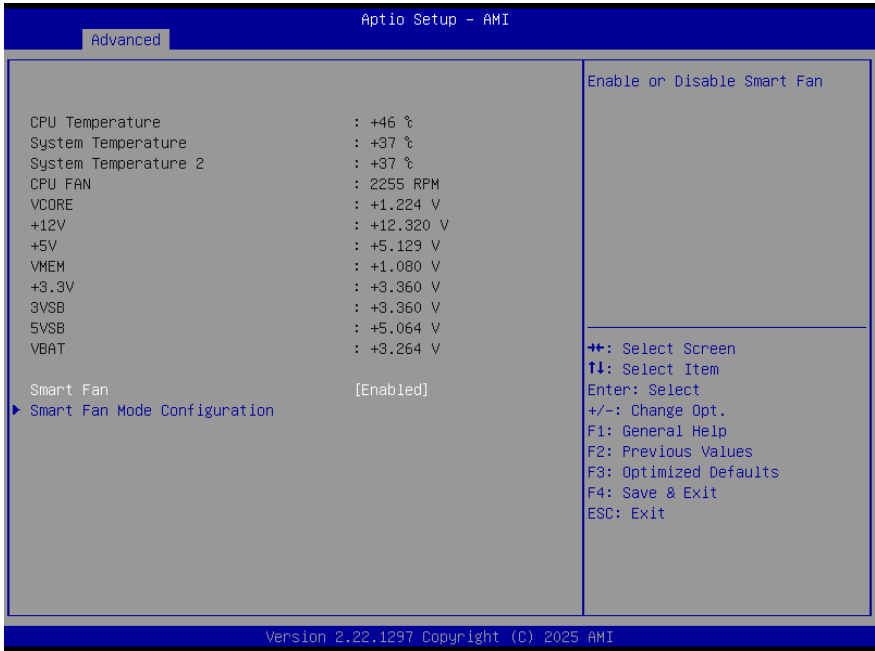
Advanced

Memory Configuration	
32768 MB	
Memory RC Version	1.5.4.0
Memory Frequency	6400 MHz
Total Memory	32768 MB

- ++: Select Screen
- ↑↓: Select Item
- Enter: Select
- +/-: Change Opt.
- F1: General Help
- F2: Previous Values
- F3: Optimized Defaults
- F4: Save & Exit
- ESC: Exit

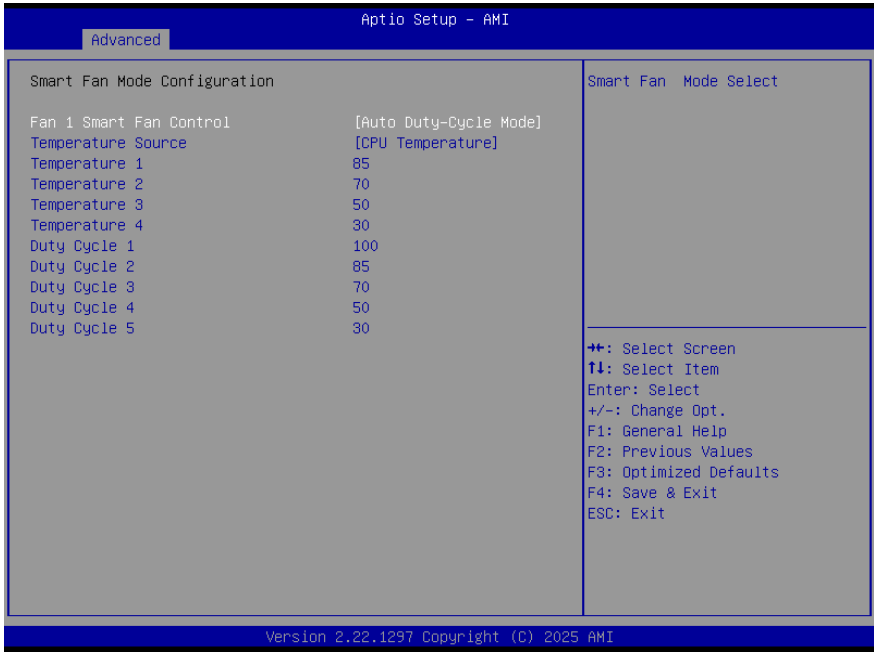
Version 2.22.1297 Copyright (C) 2025 AMI

### 3.4.3 Hardware Monitor



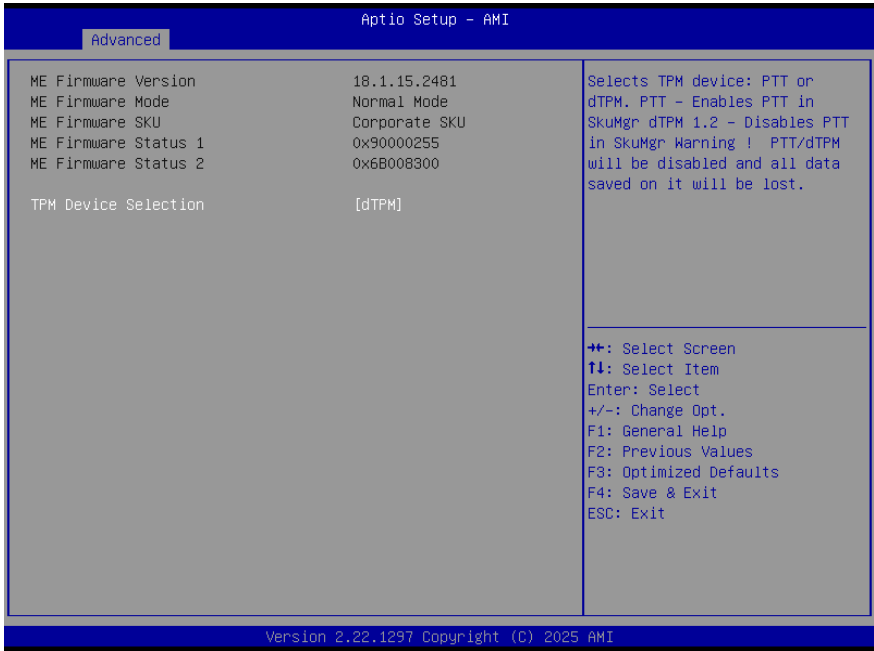
Options Summary		
Smart Fan	Disable	
	Enable	Optimal Default, Failsafe Default
Enables or Disables Smart Fan.		

### 3.4.3.1 Smart Fan Mode Configuration



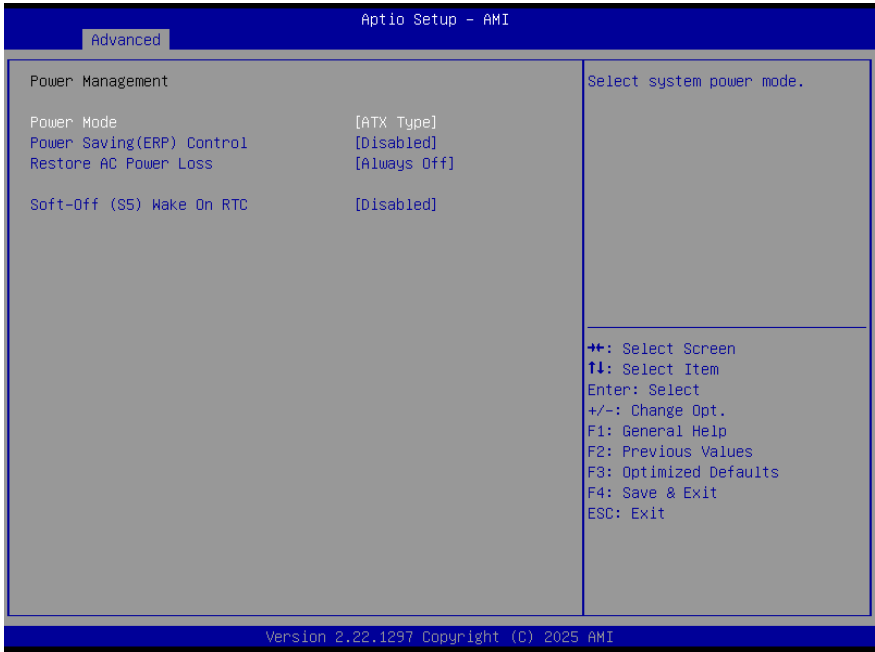
Options Summary		
Fan 1 Smart Fan Control	Manual Duty Mode	
	Auto Duty-Cycle Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select		
Temperature Source	CPU Temperature	Optimal Default, Failsafe Default
	System Temperature	
	System Temperature 2	
Select the monitored temperature source for this fan.		
Temperature 1	86	
Duty Cycle 1	100	
Automatic fan speed control adjusts the fan's duty cycle (1–100%) based on temperature changes.		

### 3.4.4 PCH-FW Configuration



Options Summary		
TPM Device Selection	dTPM	Optimal Default, Failsafe Default
	PTT	
Select TPM Device: PTT or discrete TPM (dTPM).  PTT: Enables PTT in SkuMgr.  dTPM: Disables PTT in SkuMgr.  Warning: Selecting PTT or dTPM will disable the other, and all data stored on the TPM will be lost.		

### 3.4.5 Power Management

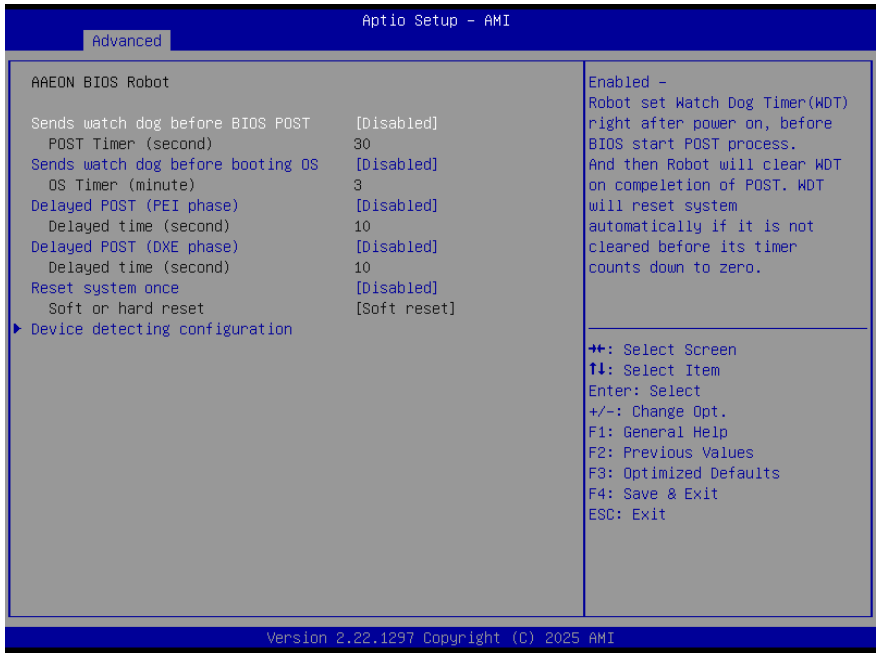


Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode.		
Power Saving(ERP) Control	Disabled	Optimal Default, Failsafe Default
	Enabled	
Select Power saving control.		
Restore AC Power Loss	Last State	Optimal Default, Failsafe Default
	Always On	
	Always Off	
Select power state when power is re-applied after a power failure.		
Soft-Off (S5) Wake On RTC	Disable	Optimal Default, Failsafe Default
	By Date	
	By Weekday	
	Bypass	

### Options Summary

By Date: The system will wake at the specified hour, minute, and second on the selected date.  
 By Weekday: The system will wake at the specified hour, minute, and second on the enabled weekdays.  
 Bypass: The BIOS will not control the RTC wake function.

### 3.4.6 AAEON BIOS Robot



### Options Summary

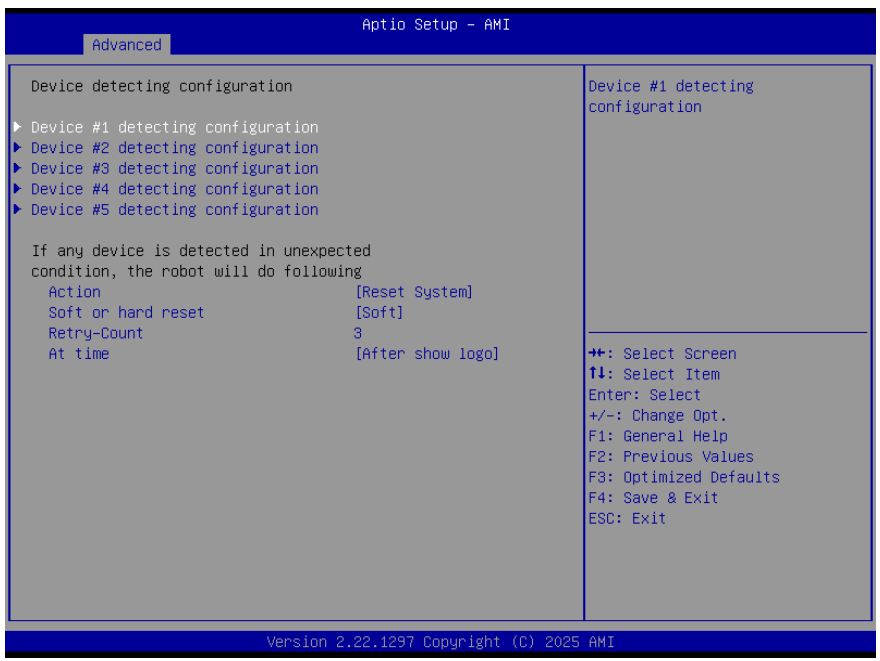
Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	

Enabled – The robot sets the Watchdog Timer (WDT) immediately after power-on, before the BIOS begins POST.  
  
 The WDT is cleared upon POST completion.

Options Summary		
If it is not cleared before the countdown reaches zero, the system will automatically reset.		
POST Timer (second)	30	Optimal Default, Failsafe Default
Timer Count – Sets the Watchdog Timer (WDT) duration for the POST process. Warning: Do not set this value equal to or shorter than the normal POST time, as the system may fail to complete POST unless BIOS settings are cleared. A value greater than twice the normal POST time is recommended.		
Sends watch dog before booting OS	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot sets the Watchdog Timer (WDT) after POST completion, before the BIOS transfers control to the operating system.  Warning: Before enabling this function, ensure that an application within the operating system is responsible for clearing the WDT. This function should be disabled if the operating system will be performing an update.		
OS Timer (minute)	3	Optimal Default, Failsafe Default
Timer count set to Watch Dog Timer for OS loading.		
Delayed POST (PEI phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot delays the BIOS from starting POST immediately after power-on. This allows POST to begin only after stable power is reached or the system has physically warmed up.  Note: This action occurs before the robot sends the Watchdog signal.		
Delayed time (second)	10	Optimal Default, Failsafe Default
Period of time for Robot to hold BIOS from POST.		
Delayed POST (DXE phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot holds the BIOS before POST completion, allowing POST to proceed only once stable power is achieved or the system has physically warmed up.  Note: This action occurs after the robot sends the Watchdog signal before BIOS POST.		
Delayed time (second)	10	Optimal Default, Failsafe Default
Period of time for Robot to hold BIOS from POST.		
Reset system once	Disabled	Optimal Default, Failsafe Default
	Enabled	

Options Summary		
Enabled – The robot resets the system once during each boot, sending a soft or hard reset to onboard devices to help place them in a more stable state.		
Soft or hard reset	Soft reset	Optimal Default, Failsafe Default
	Hard reset"	
Select reset type robot should send on each boot.		

### 3.4.7 Device Detecting Configuration



Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Soft or hard reset	Soft	Optimal Default, Failsafe Default
	Hard	
Select reset type robot should send on each boot.		
Retry-Count	30	Optimal Default, Failsafe Default

### Options Summary

Retry Counter – Specifies the number of times the robot will attempt to reset the system. After reaching this limit, the system will continue POST.

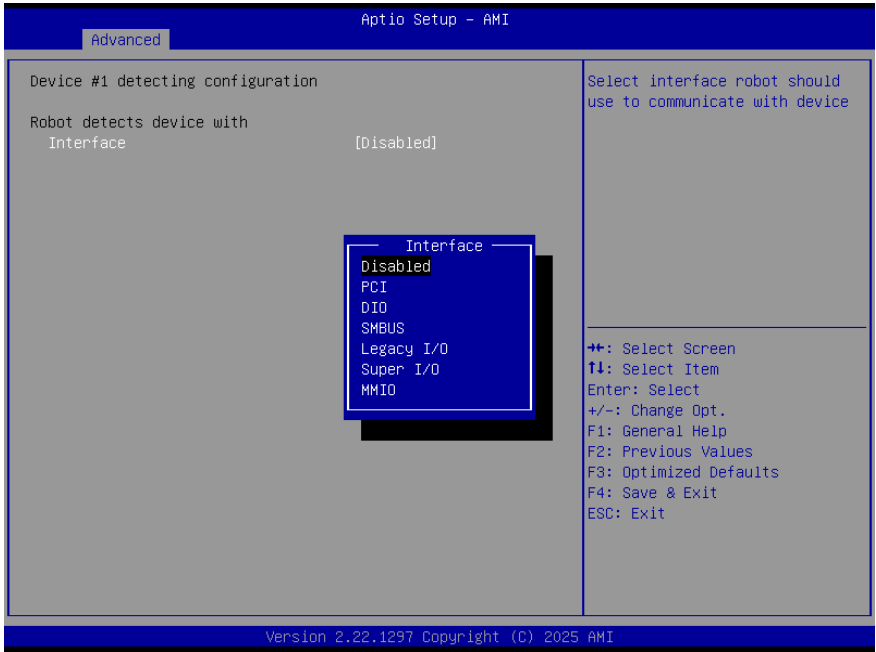
<b>At time</b>	After show logo	Optimal Default, Failsafe Default
	Before show logo	

Select Robot Action Time:

After Show Logo: The robot performs the action after the logo is displayed, when system devices are nearly ready.

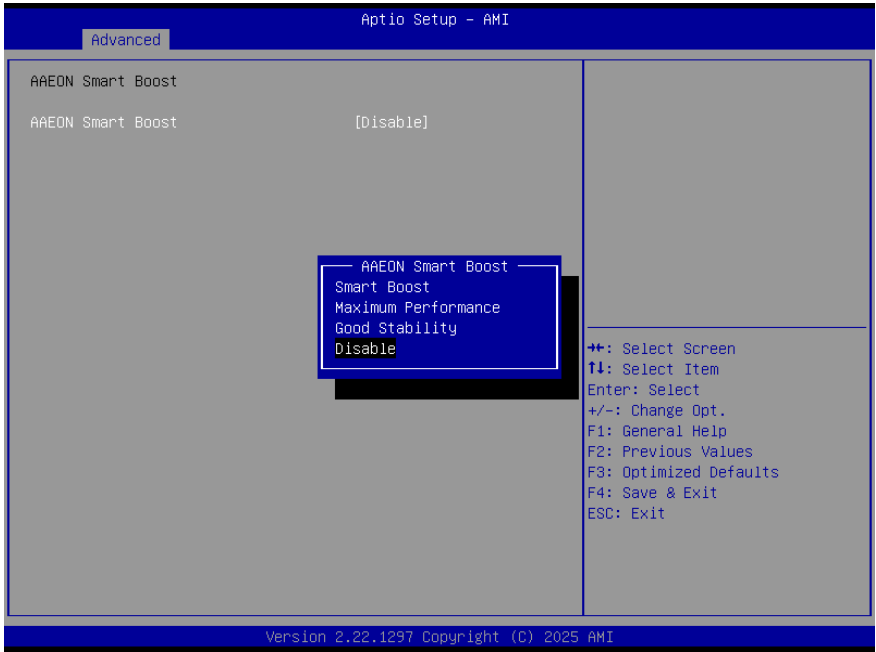
Before Show Logo: The robot performs the action earlier, before the logo appears; however, some devices may not be fully ready.

### 3.4.7.1 Device #1 ~ #5 Detecting Configuration



Options Summary		
Interface	Disable	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device.		

### 3.4.8 AAEON Smart Boost

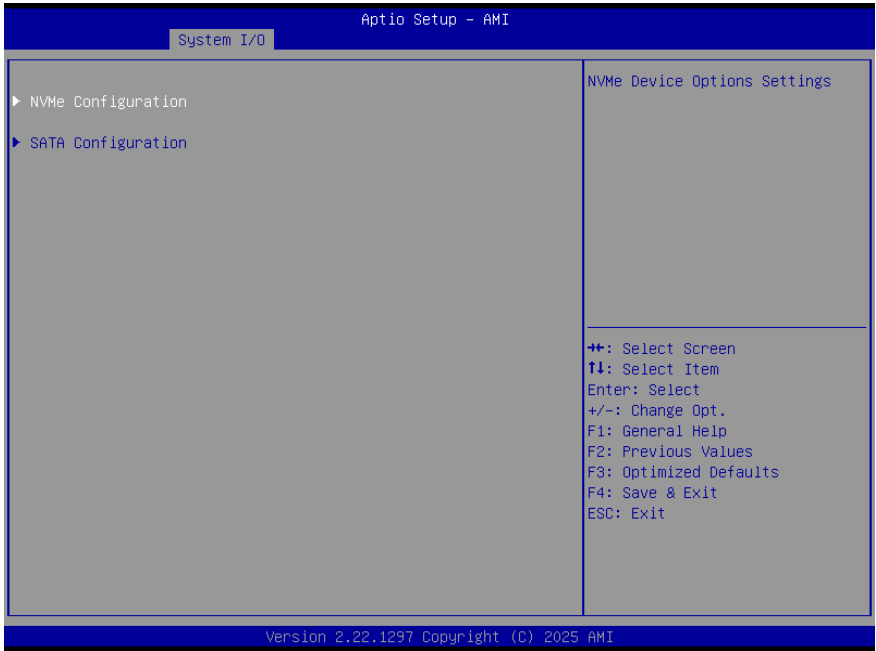


Options Summary		
AAEON Smart Boost	Disable	Optimal Default, Failsafe Default
	Smart Boost	
	Maximum Performance	
	Good Stability	

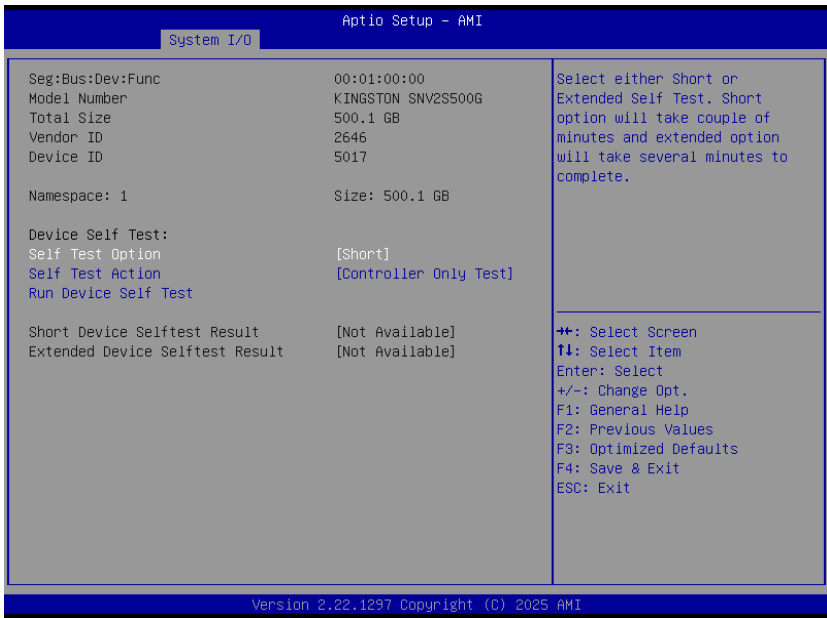
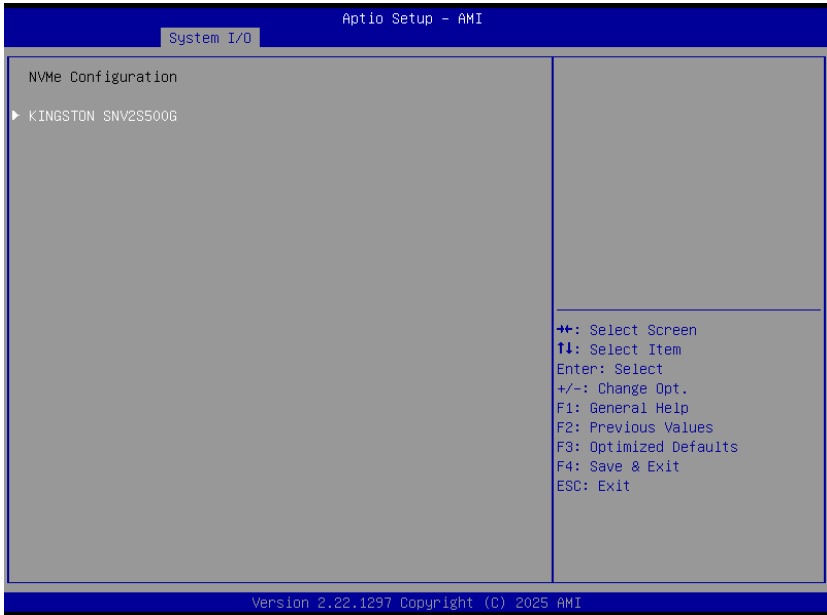
### 3.5 Setup Submenu: System I/O



### 3.5.1 Storage Configuration

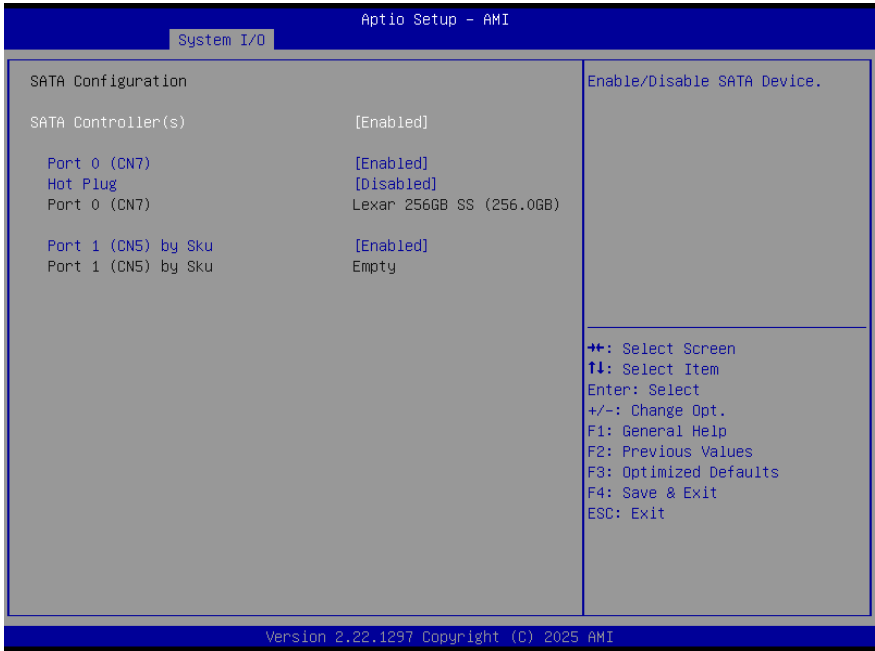


### 3.5.2 NVMe Configuration



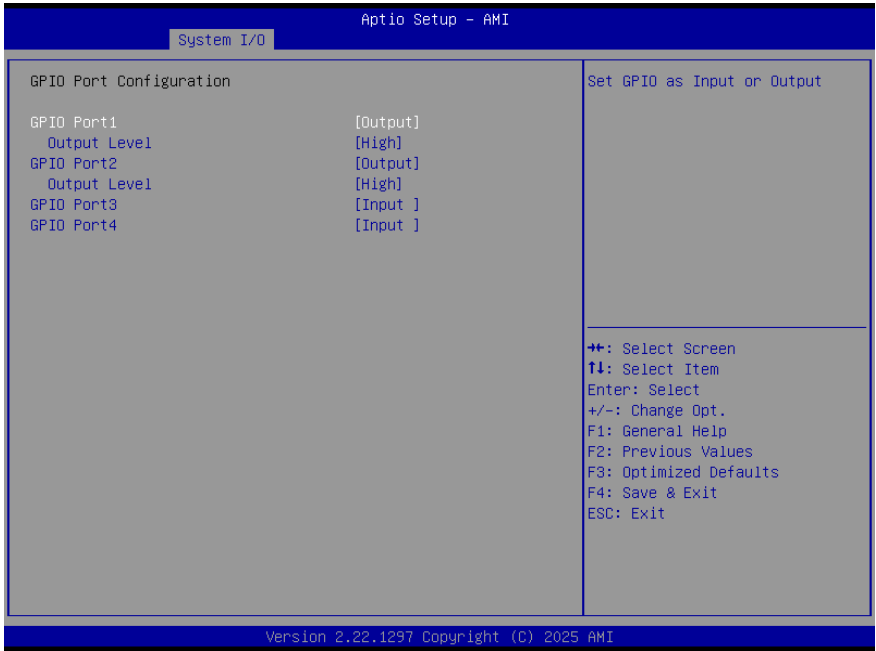
Options Summary		
<b>Self Test Option</b>	Short	Optimal Default, Failsafe Default
	Extended	
<p>Select Self Test Type:</p> <p>Short: Takes a couple of minutes to complete.</p> <p>Extended: Takes several minutes to complete.</p>		
<b>Self Test Action</b>	Controller Only Test	Optimal Default, Failsafe Default
	Controller and NameSpace Test	
<p>Select Test Scope:</p> <p>Controller Only: Tests the controller alone.</p> <p>Controller and Namespace: Tests both the controller and namespace; this option requires significantly more time to complete.</p>		
<b>Run Device Self Test</b>	N/A	N/A
<p>Perform the device self-test based on the user-selected options and actions. Pressing the 'Esc' key will abort the test. The result displayed below shows the most recent test outcome logged by the device.</p>		

### 3.5.3 SATA Configuration



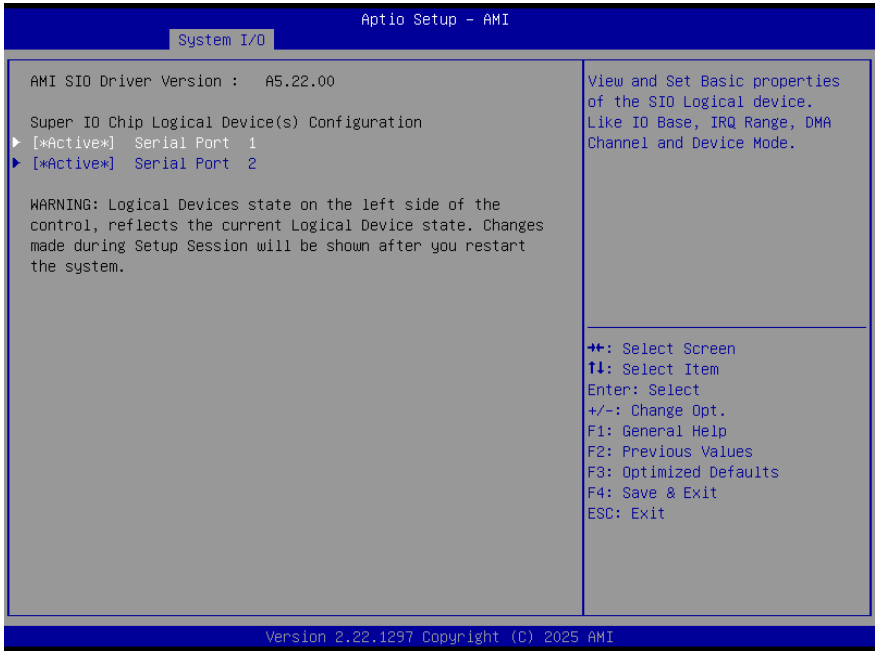
Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable SATA Device.		
Port 0 (CN10)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SATA Port.		
Port1(CN11)/mSATA (CN8)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SATA Port.		

### 3.5.4 GPIO Port Configuration

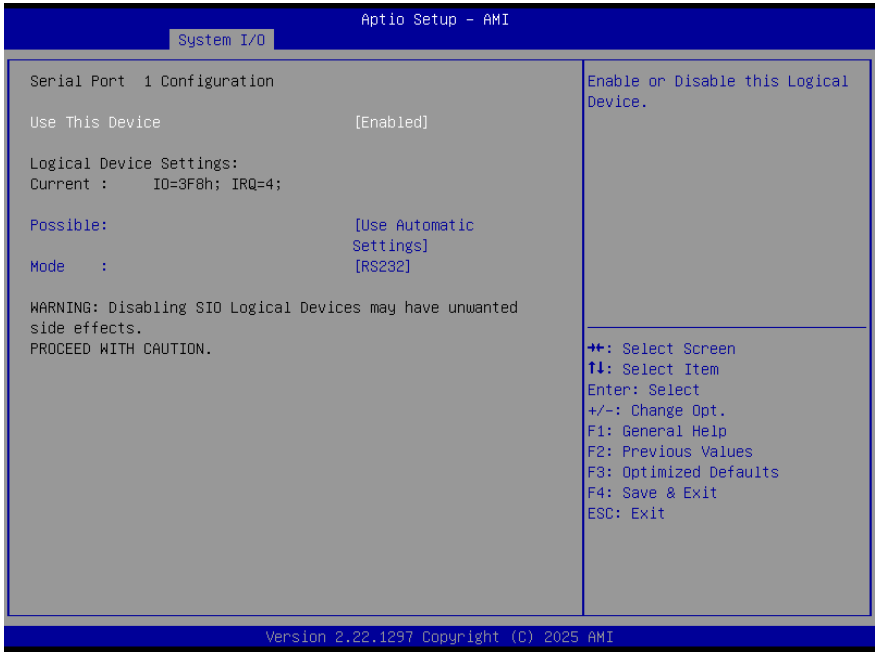


Options Summary		
GPIO Port*	Output	
	Input	
Set GPIO as Input or Output		
Output Level	High	
	Low	
Set output level when GPIO pin is output		

### 3.5.5 SIO Configuration

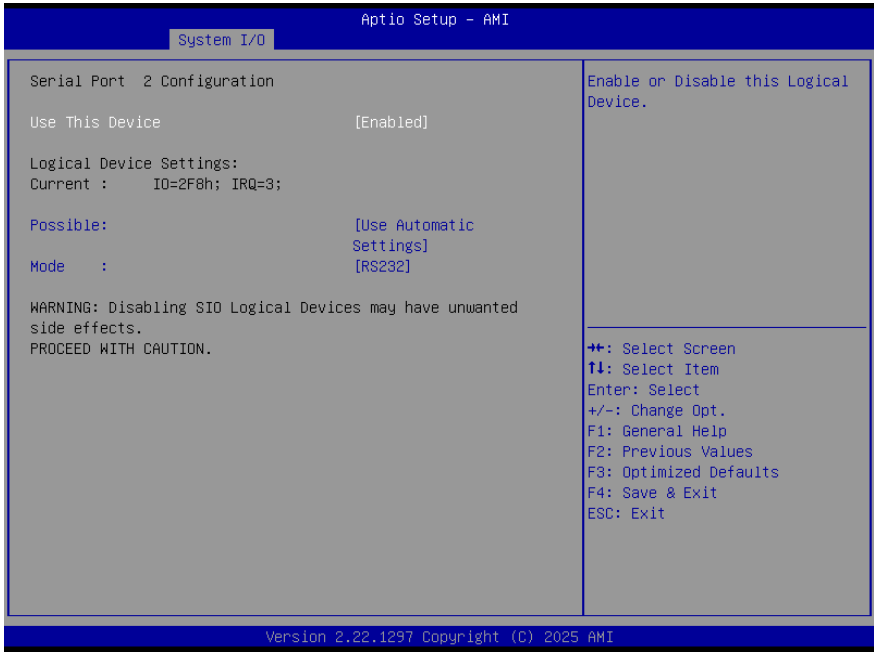


### 3.5.5.1 Serial Port 1 Configuration



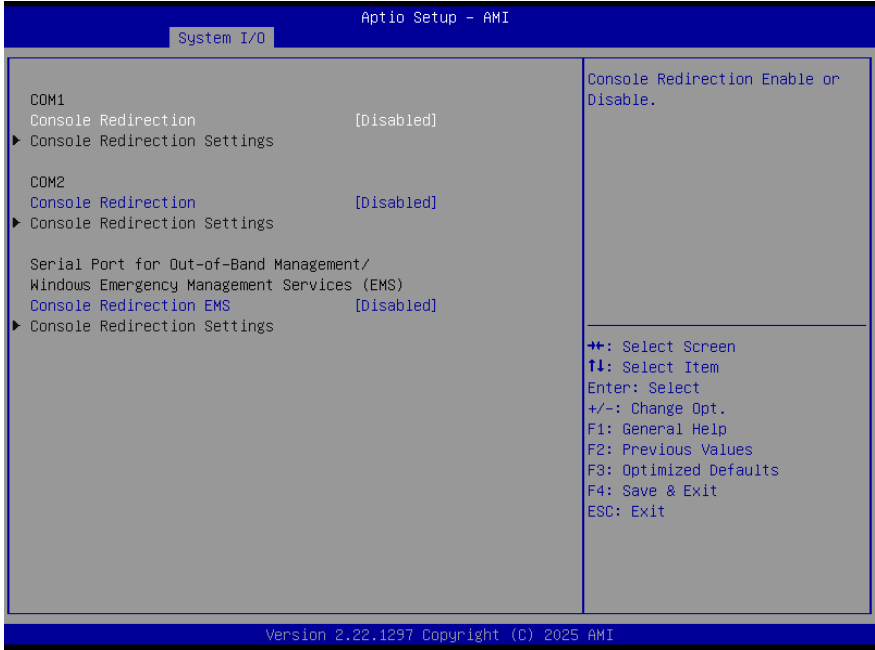
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8h; IRQ=4	
	IO=2F8h; IRQ=3	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		
Mode:	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection.		

### 3.5.5.2 Serial Port 2 Configuration



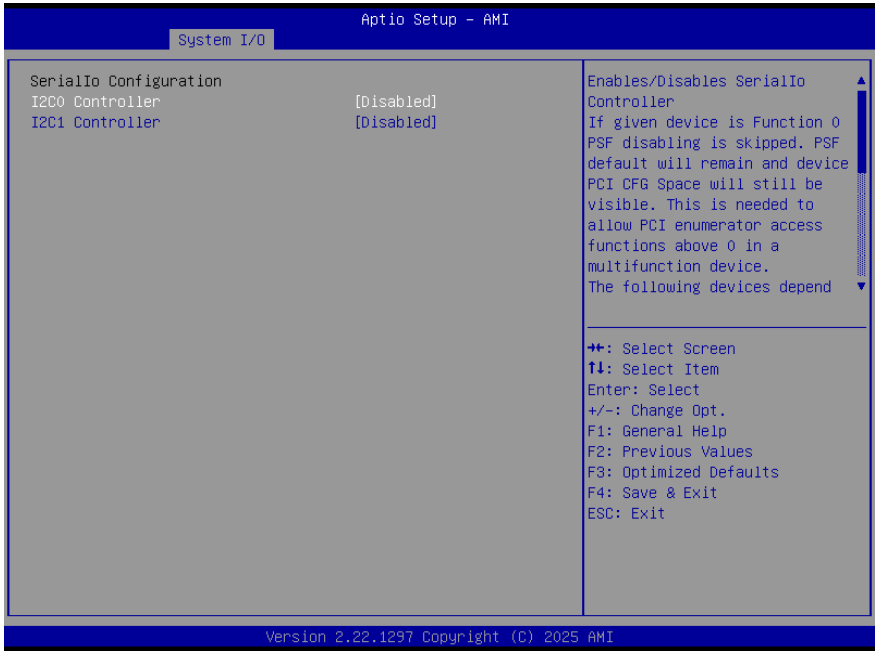
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		
Mode:	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection.		

### 3.5.6 Serial Port Console Redirection



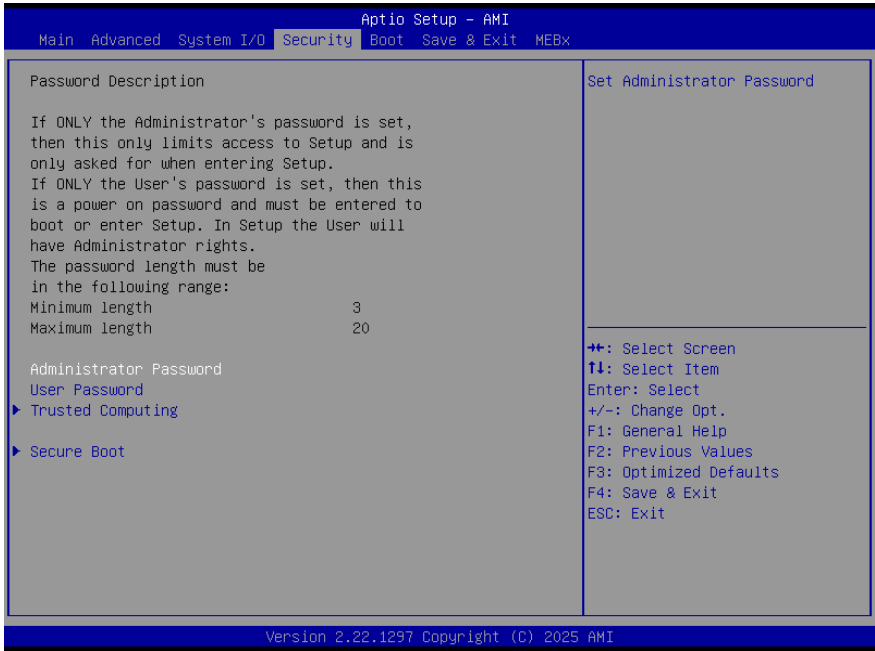
Options Summary		
Console Redirection	Disabled	Optimal Default, Failsafe Default
	Enabled	
Console Redirection Enable or Disable.		
Console Redirection EMS	Disabled	Optimal Default, Failsafe Default
	Enabled	
Console Redirection Enable or Disable.		

### 3.5.7 Serial IO Configuration



Options Summary		
I2C0 Controller	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable SerialIo Controller.		
I2C1 Controller	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable SerialIo Controller.		

## 3.6 Setup Submenu: Security



### Change User/Supervisor Password

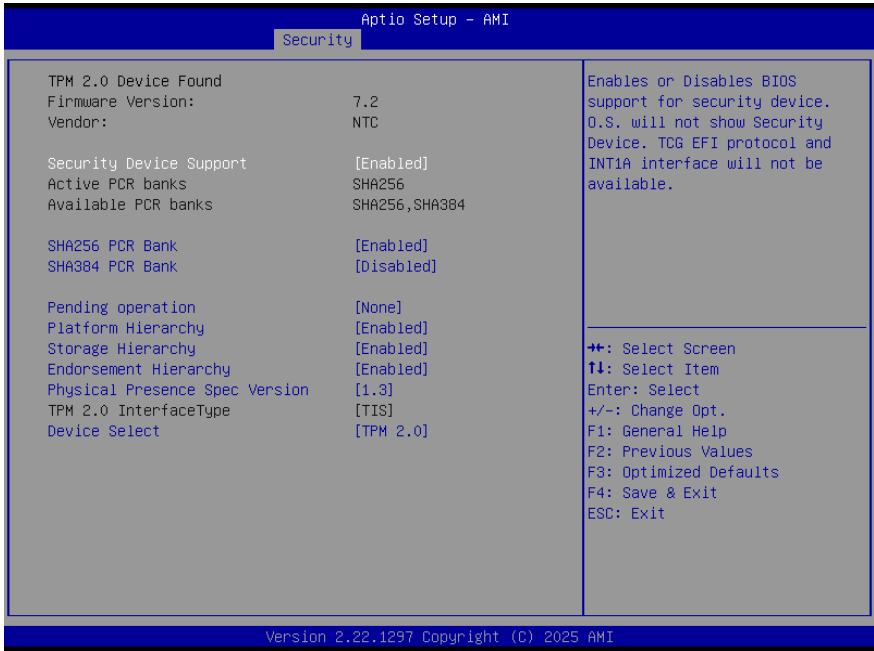
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

### Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

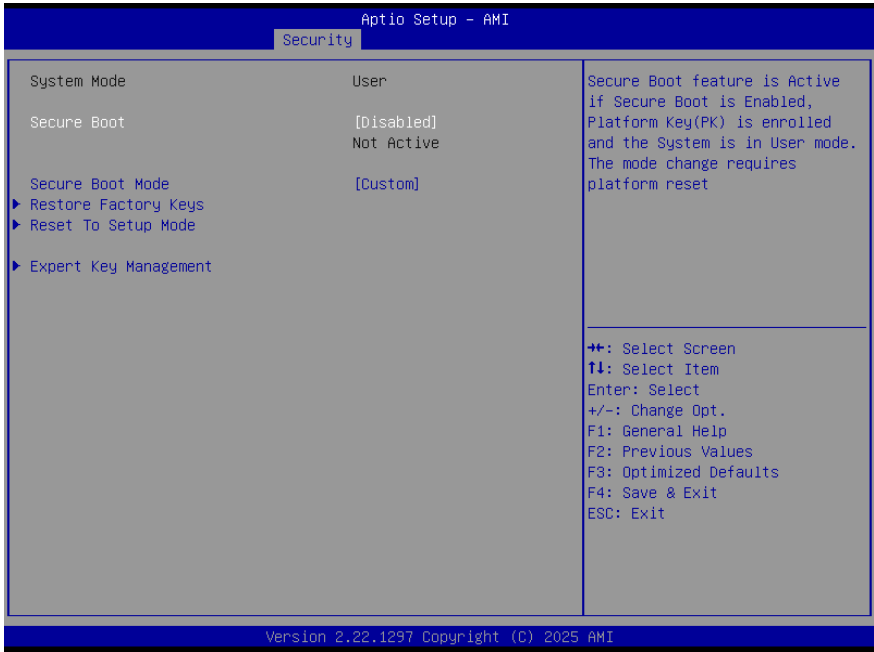
### 3.6.1 Trusted Computing



Options Summary		
Security Device Support	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or disables BIOS support for the security device. When disabled, the operating system will not detect the security device, and the TCG EFI protocol and INT1A interface will be unavailable.		
SHA256 PCR Bank	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SHA256 PCR Bank.		
SHA384 PCR Bank	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SHA384 PCR Bank.		
Pending operation	None	Optimal Default, Failsafe Default
	TPM Clear	
Schedule an operation for the security device. Note: Your computer will reboot during the process to apply the security device state change.		

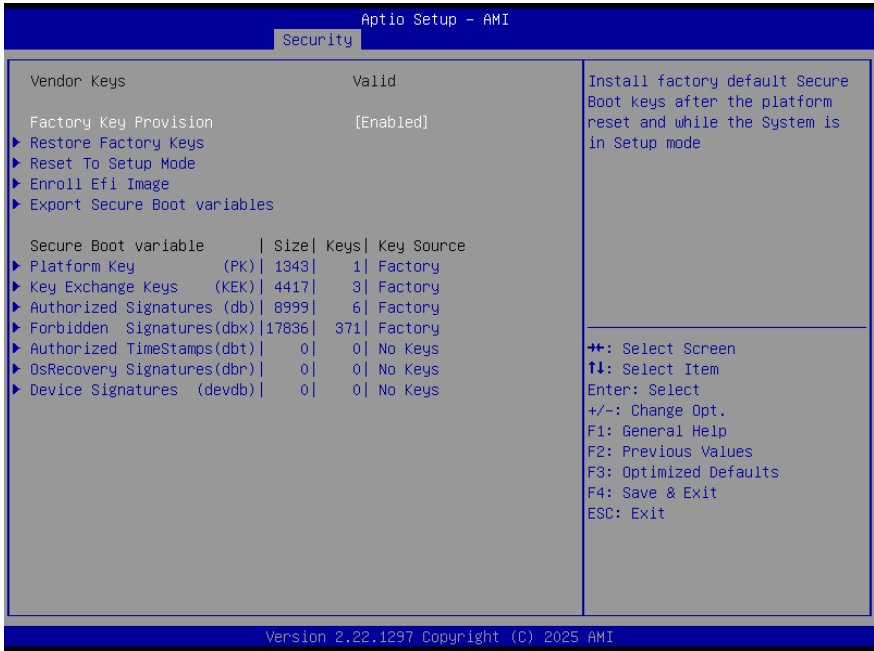
Options Summary		
Platform Hierarchy	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable Platform Hierarchy		
Storage Hierarchy	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable Storage Hierarchy		
Endorsement Hierarchy	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable Endorsement Hierarchy		
Physical Presence Spec Version	1.3	Optimal Default, Failsafe Default
	1.2	
Select the PPI Specification version for OS support: 1.2 or 1.3. Note: Some HCK tests may not support version 1.3.		
Device Select	Auto	
	TPM 1.2	
	TPM 2.0	Optimal Default, Failsafe Default
TPM 1.2: Supports only TPM 1.2 devices. TPM 2.0: Supports only TPM 2.0 devices. Auto: Supports both TPM 1.2 and TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated by default.		

### 3.6.2 Secure Boot



Options Summary		
Secure Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
Secure Boot is active when Secure Boot is enabled, the Platform Key (PK) is enrolled, and the system is in User mode. Changing the mode requires a platform reset.		
Secure Boot Mode	Custom	Optimal Default, Failsafe Default
	Standard	
Secure Boot Mode Options: Standard or Custom. In Custom mode, Secure Boot policy variables can be configured by a physically present user without requiring full authentication.		
Restore Factory Keys		
Force the system into User Mode and install the factory default Secure Boot key databases.		
Reset To Setup Mode		
Delete all Secure Boot key databases from NVRAM		

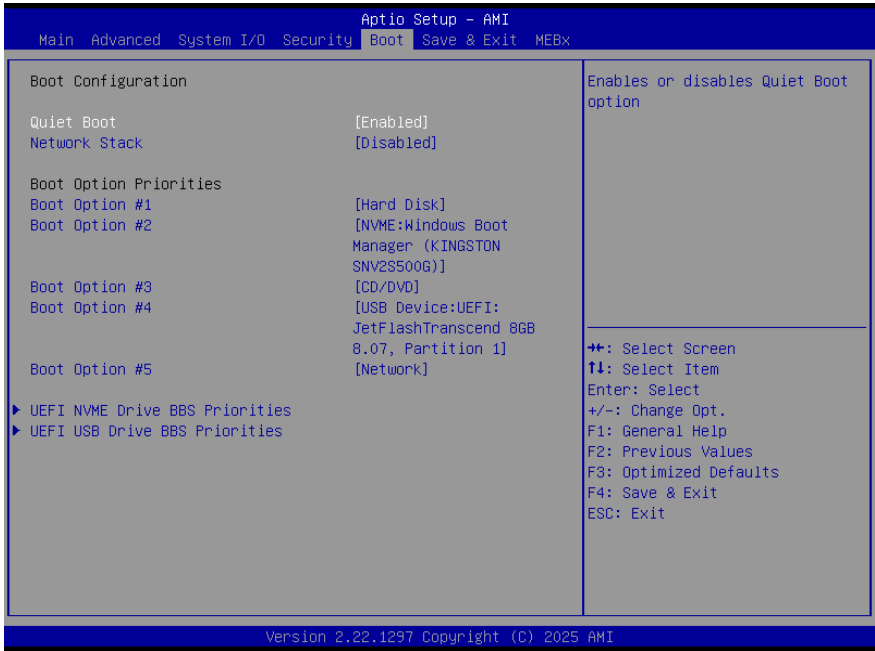
### 3.6.3 Expert Key Management



Options Summary		
Factory Key Provision	Disabled	Optimal Default, Failsafe Default
	Enabled	
Secure Boot is active when Secure Boot is enabled, the Platform Key (PK) is enrolled, and the system is in User mode. Changing the mode requires a platform reset.		
Restore Factory Keys		
Forces the system into User Mode and installs the factory default Secure Boot key databases.		
Reset To Setup Mode		
Delete all Secure Boot key databases from NVRAM.		
Export Secure Boot variables		
Copy the NVRAM contents of Secure Boot variables to files in a root folder on the file system device.		
Enroll Efi Image		

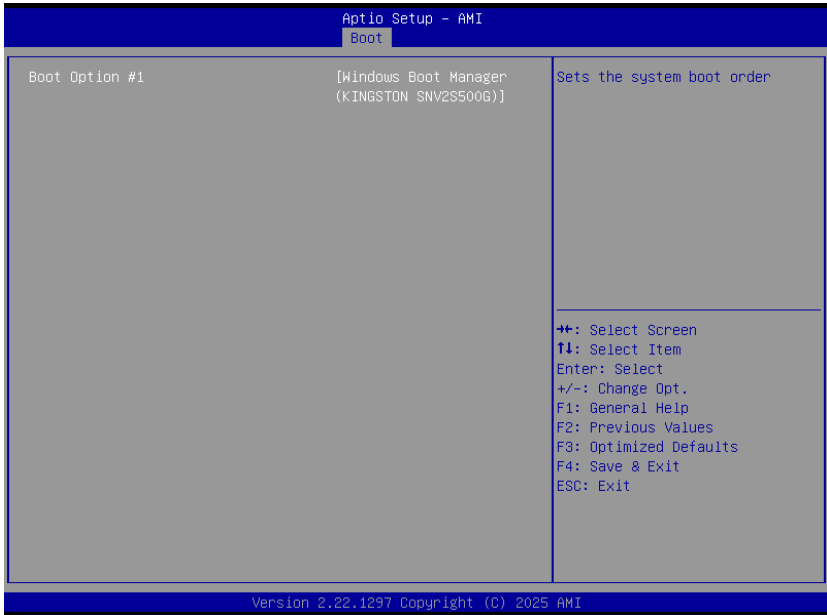
Options Summary	
Allow the image to run in Secure Boot mode by enrolling the SHA256 hash certificate of a PE image into the Authorized Signature Database (db).	
<b>Remove 'UEFI CA' from DB</b>	
A Device Guard-ready system must not include the 'Microsoft UEFI CA' certificate in the Authorized Signature Database (db).	
<b>Restore DB defaults</b>	
Restore DB variable to factory defaults.	
<b>Platform Key(PK)</b>	Details
	Export
	Update
	Delete
<b>Key Exchange Keys</b>	Details
	Export
	Update
	Append
	Delete
<b>Authorized Signatures</b>	Details
	Export
	Update
	Append
	Delete
<b>Forbidden Signatures</b>	Details
	Export
	Update
	Append
	Delete
<b>Authorized TimeStamps</b>	Update
	Append
<b>OsRecovery Signatures</b>	Update
	Append
Enroll Factory Defaults or Load Certificates from a File: Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAxxx Authenticated UEFI Variable EFI PE/COFF Image (SHA256) Key Source Options: Factory, External, or Mixed	

### 3.7 Setup Submenu: Boot



Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Quiet Boot option.		
Network Stack	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable UEFI Network Stack.		
<b>BOOT Option Priorities</b>		
Sets the system boot order.		

### 3.7.1 BBS Priorities



### 3.8 Setup Submenu: Save & Exit



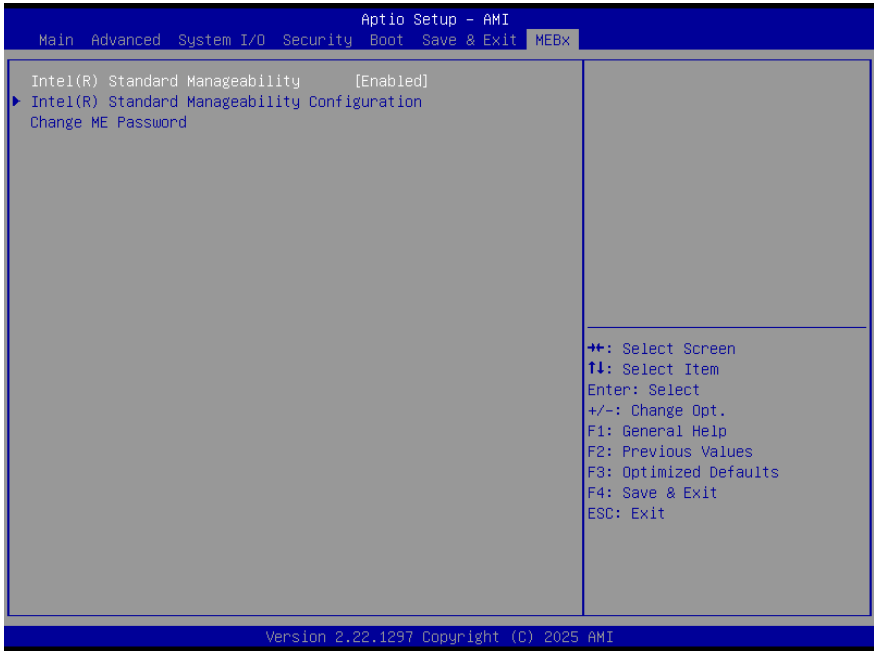
Options Summary	
Save Changes and Reset	Reset the system after saving the changes.
Discard Changes and Exit	Exit system setup without saving any changes.
Restore Defaults	Restore/Load Default values for all the setup options.

### 3.9 Setup Submenu: MEBx

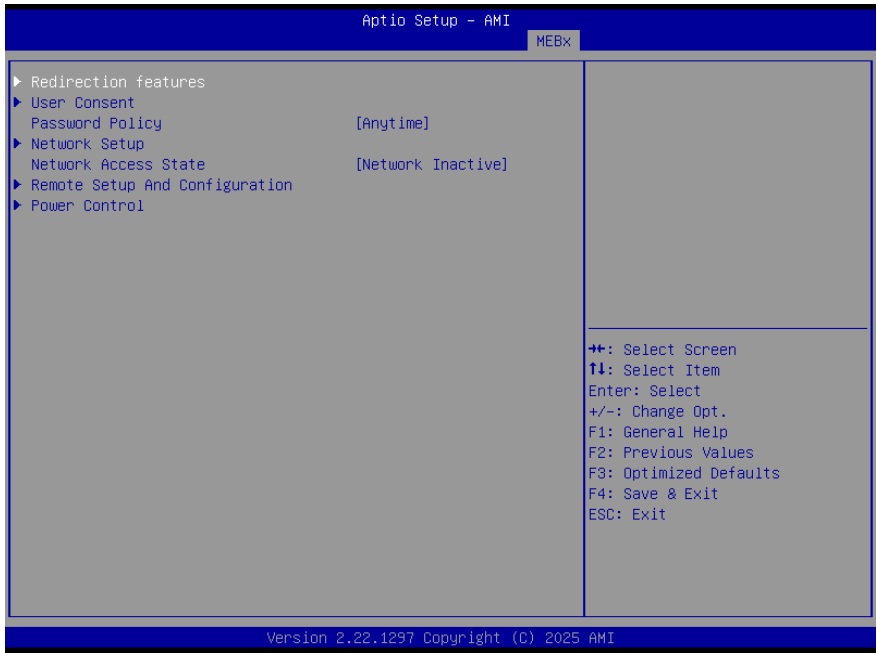


Options Summary		
Intel (R) AMT	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Intel® AMT option.		

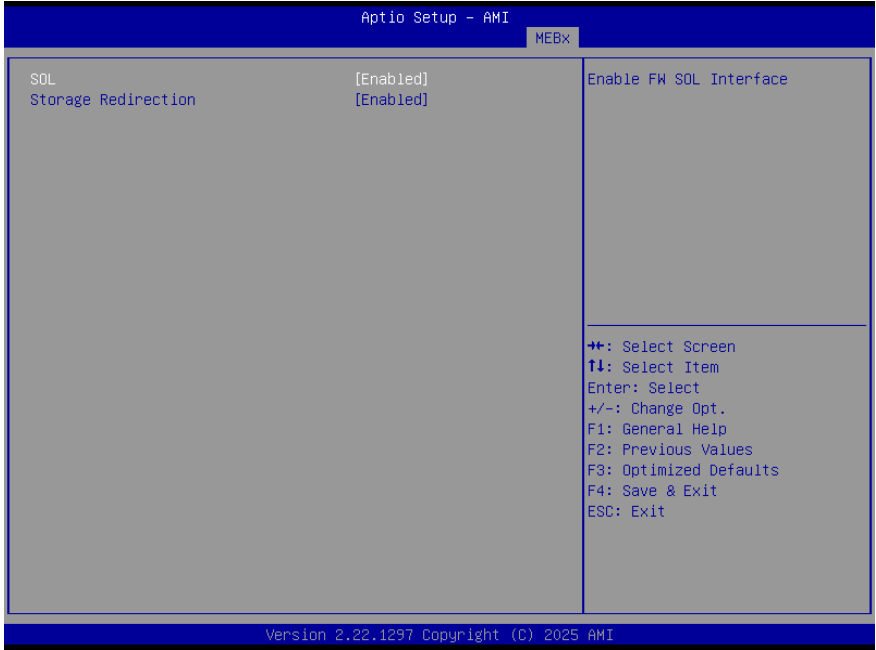
### 3.9.1 Intel(R) Standard Manageability



Options Summary		
Intel(R) Standard Manageability	Disable	
	Partially Disabled	
	Enabled	Optimal Default, Failsafe Default
Intel(R) Standard Manageability Configuration		
Change ME Password	Change Password for entering MEBx	

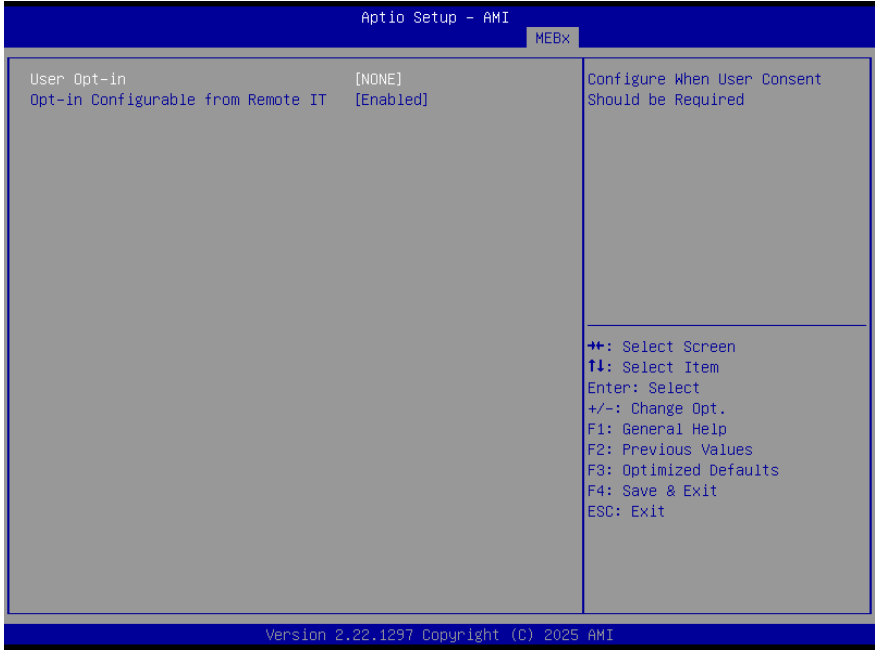


### 3.9.2 Redirection Features



Options Summary		
SOL	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable FW SOL Interface		
Storage Redirection	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable FW Remote – Storage Redirection.		

### 3.9.3 User Consent

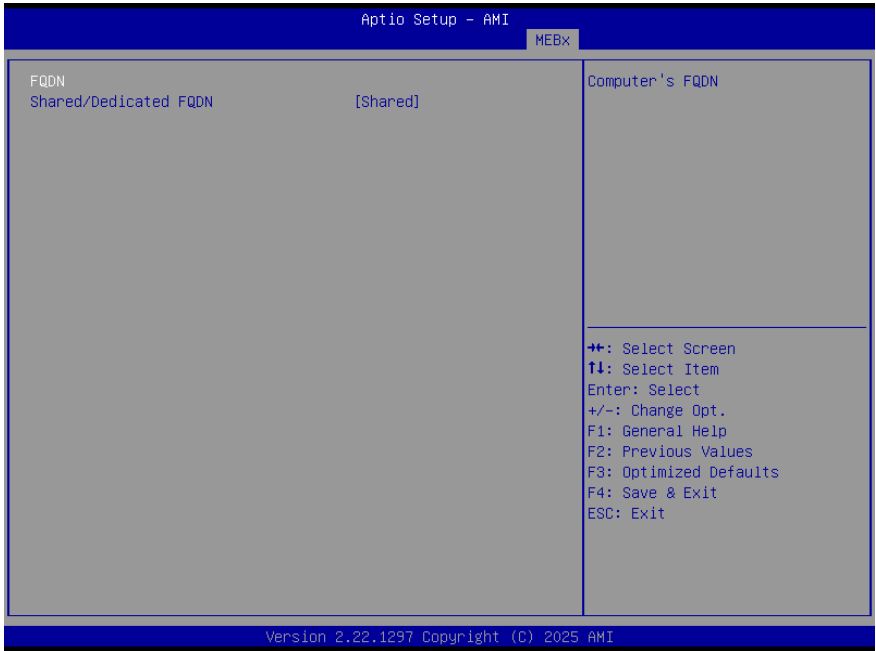


Options Summary		
User Opt-in	None	Optimal Default, Failsafe Default
	ALL	
Configure When User Consent Should be Required.		
Opt-in Configurable from Remote IT	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable Remote Change Capability of User Consent Feature.		

### 3.9.4 Network Setup

Pico-ITX Board

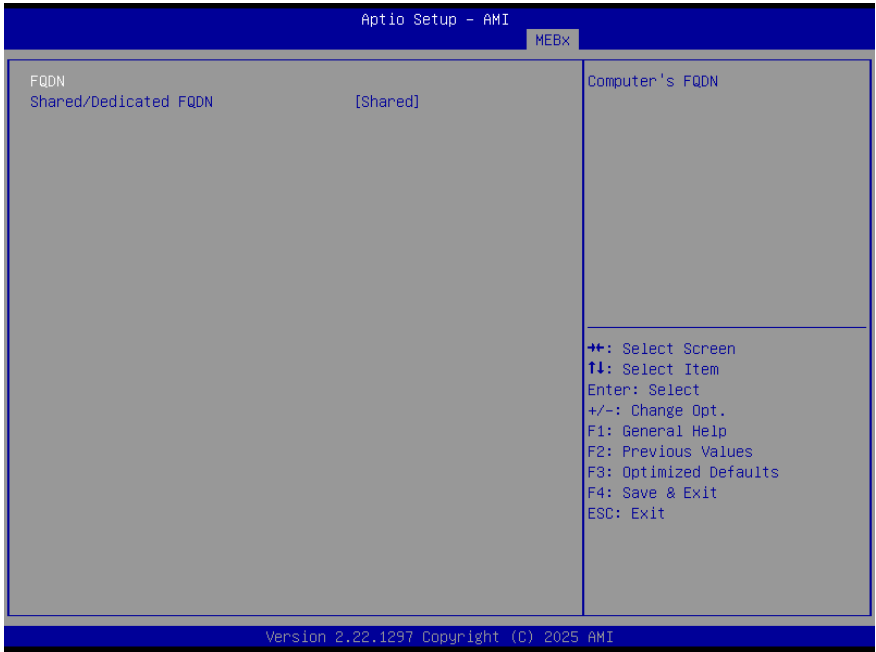
PICO-ARU4



### 3.9.5 Intel® ME Network Name Settings

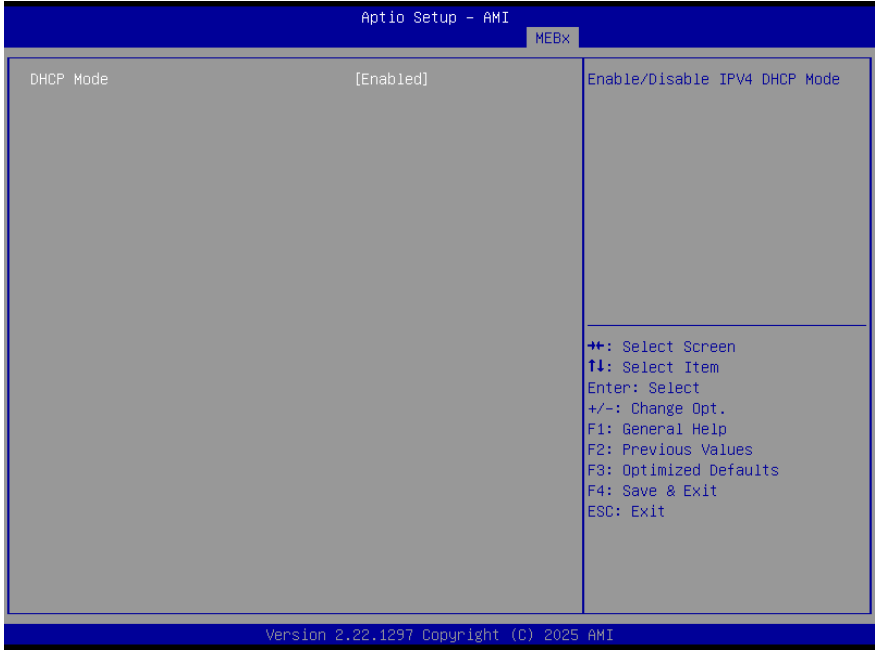
Pico-ITX Board

PICO-ARU4



Options Summary		
FQDN		
Computer's FQDN		
Shared/Dedicated FQDN	Dedicated	
	Shared	Optimal Default, Failsafe Default

### 3.9.6 TCP/IP Settings



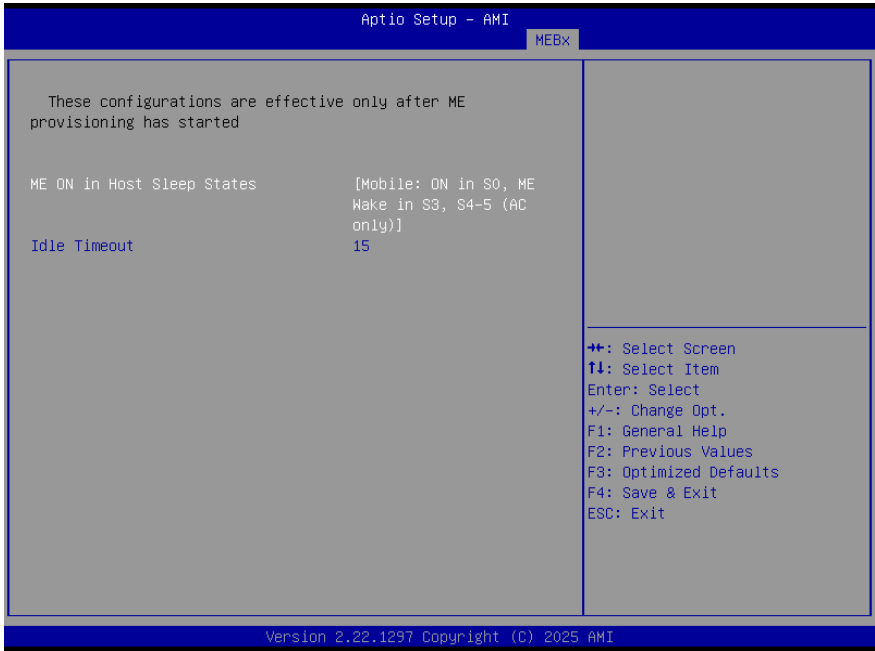
Options Summary		
DHCP Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable IPV4 DHCP Mode.		

### 3.9.7 Remote Setup and Configuration



Options Summary		
Provisioning Server Address		
Provisioning server address. Either host name or IPv4 or IPv6 address.		
Provisioning Server Port number		
Provisioning server port number (0-65535)		
Remote Configuration **	Enabled	Optimal Default, Failsafe Default
	Disabled	

### 3.9.8 Power Control



Options Summary		
ME ON in Host Sleep States	Mobile: ON in S0	
	Mobile: ON in S0, ME Wake in S3, S4-5 (AC only)	Optimal Default, Failsafe Default
Idle Timeout	15	Optimal Default, Failsafe Default
Timeout Value (1-65535)		

# Chapter 4

---

Driver Installation

## 4.1 Driver Download/Installation

---

Drivers for the PICO-MTU4 can be downloaded from the product page on the AAEON website by following this link:

[https://www.aaeon.com/en/product/detail/pico-itx\\_boards\\_pico-aru4/download](https://www.aaeon.com/en/product/detail/pico-itx_boards_pico-aru4/download)

Download the driver(s) you need and follow the steps below to install them.

### Chipset Driver (Windows 10/11)

1. Open the folder where you unzipped the **Chipset Drivers**.
2. Run the **SetupChipset.exe** file in the folder.
3. Follow the instructions.
4. Drivers will be installed automatically.

### Graphics Driver (Windows 10/11)

1. Open the folder where you unzipped the **Graphics Drivers**.
2. Run the **Installer.exe** file in the folder.
3. Follow the instructions.
4. Drivers will be installed automatically.

### LAN Drivers (Windows 11)

#### a) Install Intel I225/I226 Driver:

1. Open the folder where you unzipped the **LAN Drivers**.
2. Open the Device Manager by pressing Win + X and selecting "Device Manager."
3. Find the network adapter that corresponds to Intel I225/I226. It may be listed under "Network adapters."
4. Right-click on the network adapter and select "Update driver."
5. Choose "Browse my computer for drivers."
6. Navigate to the location where you extracted the driver files.
7. Follow the instructions.
8. Drivers will be installed automatically.

**b) Install Intel I219 Driver:**

1. Open the folder where you unzipped the **LAN Drivers**.
2. Open the Device Manager by pressing Win + X and selecting "Device Manager."
3. Find the network adapter that corresponds to Intel I219. It may be listed under "Network adapters."
4. Right-click on the network adapter and select "Update driver."
5. Choose "Browse my computer for drivers."
6. Navigate to the location where you extracted the driver files.
7. Follow the instructions.
8. Drivers will be installed automatically.

**LAN Drivers (Windows 10)****a) Install Intel I225/I226 Driver:**

1. Open the folder where you unzipped the **LAN Drivers**.
2. Open the Device Manager by pressing Win + X and selecting "Device Manager."
3. Find the network adapter that corresponds to Intel I225/I226. It may be listed under "Network adapters."
4. Right-click on the network adapter and select "Update driver."
5. Choose "Browse my computer for drivers."
6. Navigate to the location where you extracted the driver files.
7. Follow the instructions.
8. Drivers will be installed automatically.

**b) Install Intel I219 Driver:**

1. Open the folder where you unzipped the **LAN Drivers**.
2. Open the Device Manager by pressing Win + X and selecting "Device Manager."
3. Find the network adapter that corresponds to Intel I219. It may be listed under "Network adapters."
4. Right-click on the network adapter and select "Update driver."
5. Choose "Browse my computer for drivers."
6. Navigate to the location where you extracted the driver files.
7. Follow the instructions.
8. Drivers will be installed automatically.

## Intel Platform Monitoring Technology Driver (Windows 10/11)

1. Open the folder where you unzipped the **Intel Platform Monitoring Technology Driver**.
2. Open the Device Manager by pressing Win + X and selecting "Device Manager."
3. Find the device that corresponds to Intel Platform Monitoring Technology. It may be listed under "System devices" or "Other devices."
4. Right-click on the device and select "Update driver."
5. Choose "Browse my computer for drivers."
6. Navigate to the location where you extracted the driver files.
7. Select the folder containing the files **intcpmt.cat**, **intcpmt.inf**, and **IntcPMT.sys**, then click "Next."
8. Follow the on-screen instructions to complete the driver installation.

## ME & TXE Drivers (Windows 10/11)

1. Open the folder where you unzipped the **ME & TXE Drivers**.
2. Run the **SetupME.exe** file in the folder.
3. Follow the instructions.
4. Drivers will be installed automatically.

## Intel NPU Driver (Windows 11)

1. Open the Device Manager by pressing Win + X and selecting "Device Manager."
2. Find the device that corresponds to the Intel NPU. It may be listed under "Processors," "System devices," or "Other devices."
3. Right-click on the device and select "Update driver."
4. Choose "Browse my computer for drivers."
5. Navigate to the location where you extracted the driver files.
6. Select the folder containing all the extracted files and click "Next."
7. Follow the on-screen instructions to complete the driver installation.

## Peripheral Drivers (Windows 11)

1. Open Device Manager by pressing Win + X and selecting Device Manager.
2. Locate the devices related to iaLPSS2 components. They might appear under categories such as System devices or Other devices.
3. Right-click on the specific device (e.g., GPIO2, I2C, I3C, SPI, UART2) that you want to install or update the driver for, then select Update driver.
4. Select Browse my computer for drivers.

5. Navigate to the folder where you have the extracted iaLPSS2 driver files.
6. Select the folder containing the driver files including:
  - iaLPSS2\_GPIO2\_MTL.sys
  - iaLPSS2\_I2C\_MTL.sys
  - iaLPSS2\_13C\_MTL.sys
  - iaLPSS2\_SPI\_MTL.sys
  - iaLPSS2\_UART2\_MTL.sys
7. Click Next and follow the on-screen prompts to complete the installation for each component driver.
8. Repeat steps 3 to 7 for each iaLPSS2 device if needed.
9. After installation, restart your computer to apply changes.

## 4.2 Ubuntu OpenVINO Installation

Prior to installation, please reference the below Ubuntu version and kernel support list:

Intel Platform	Ubuntu	22.04 LTS		24.04 LTS		25.10
	Kernel	6.5	6.8	6.8	6.11	6.14
	OpenVINO	2024/2025				
Panther Lake		X	X	X	△ (X: GPU)	●
Arrow Lake (U/H)		△ (X: GPU/NPU)	△ (X: GPU/NPU)	△ (X: GPU)	●	
Meteor Lake (U/H)		●		●		
Raptor Lake		●		●		

Key: ● FULL SUPPORT, △ PARTIAL SUPPORT, ✕ NOT SUPPORTED

Reference link: <https://github.com/intel/linux-npu-driver/releases>

### Step 1: Install OS

- Install a compatible **Ubuntu version for x86 platforms** as specified in the **Verified List**.
- Ensure the system is connected to the internet.
- Verify the installed Ubuntu version by running the following command:

```
cat /etc/os-release
```

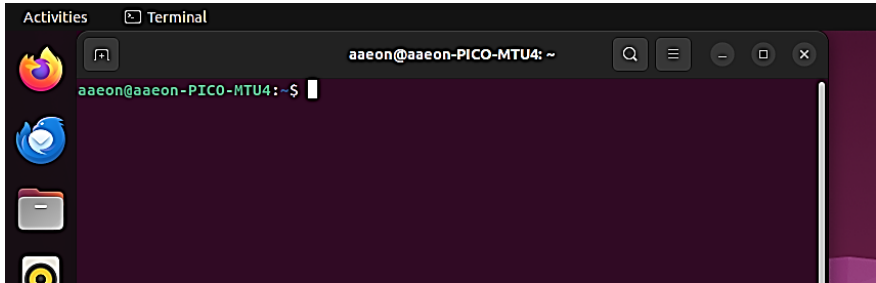
```

aaeon@ubuntu:~$ cat /etc/os-release
PRETTY_NAME="Ubuntu 25.10"
NAME="Ubuntu"
VERSION_ID="25.10"
VERSION="25.10 (Questing Quokka)"

```

## Step 2: Install the ECBU AI Tool Package

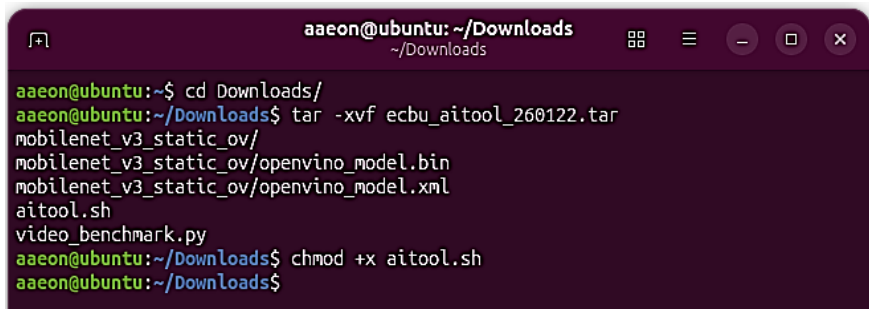
- Copy the file `ecbu_aitool_260122.tar` to the **Downloads** folder on the target device.
- Use the keyboard shortcut **Ctrl + Alt + T** to open a terminal window:



- Extract the installation package using the following script:

```
cd ~/Downloads
tar -xvf ecbu_aitool_xxx.tar
chmod +x aitool.sh
```

**Note:** `xxx` represents the version number of the package.



- Install the driver and toolkit by running the following installation script:

`./aitool.sh`

```

aaeon@ubuntu: ~/Downloads
aaeon@ubuntu:~$ cd Downloads/
aaeon@ubuntu:~/Downloads$ tar -xvf ecbu_aitool_260122.tar
mobilenet_v3_static_ov/
mobilenet_v3_static_ov/openvino_model.bin
mobilenet_v3_static_ov/openvino_model.xml
aitool.sh
video_benchmark.py
aaeon@ubuntu:~/Downloads$ chmod +x aitool.sh
aaeon@ubuntu:~/Downloads$ ./aitool.sh
[sudo: authenticate] Password:

```

- When you see the `[sudo] password for <username>`: prompt, input the user password to continue.
- To install the AAEON ECBU AI Tool, type 1 and press **Enter**.

```

Terminal
AAEON ECBU
AI TOOL

[sudo: authenticate] Password:
Model      : EPIC-PTH9      | BIOS      : PPL9AM03
OS         : Ubuntu 25.10   | Kernel    : 6.17.0-5-generic
Hostname   : ubuntu
CPU        : Genuine Intel(R) 0000
Memory     : 14.67 GB

GPU        : Intel Corporation Panther Lake [Intel Graphics]
           : [0006:b0b0]
NPU        : Intel Corporation Panther Lake NPU
Network    :  Connectivity

Please enter your options and press Enter to execute:
1. Start install driver/ai resources
2. Run AI demo
0. Exit tool

```

- The script will automatically download and install the required components based on the detected operating system version. When the message **"Reboot system now?"** appears, type **y** and press **Enter** to restart the system.

```
(Reading database ... 160790 files and directories currently installed.)
Preparing to unpack level-zero_1.24.2+u24.04_and64.deb ...
Unpacking level-zero (1.24.2) over (1.24.2) ...
Setting up level-zero (1.24.2) ...
Processing triggers for libc-bin (2.42-0ubuntu3) ...
openvino_venv directory exists.

openvino exists.
Detected openvino exist.
videos exists.

Reboot system now? █
```

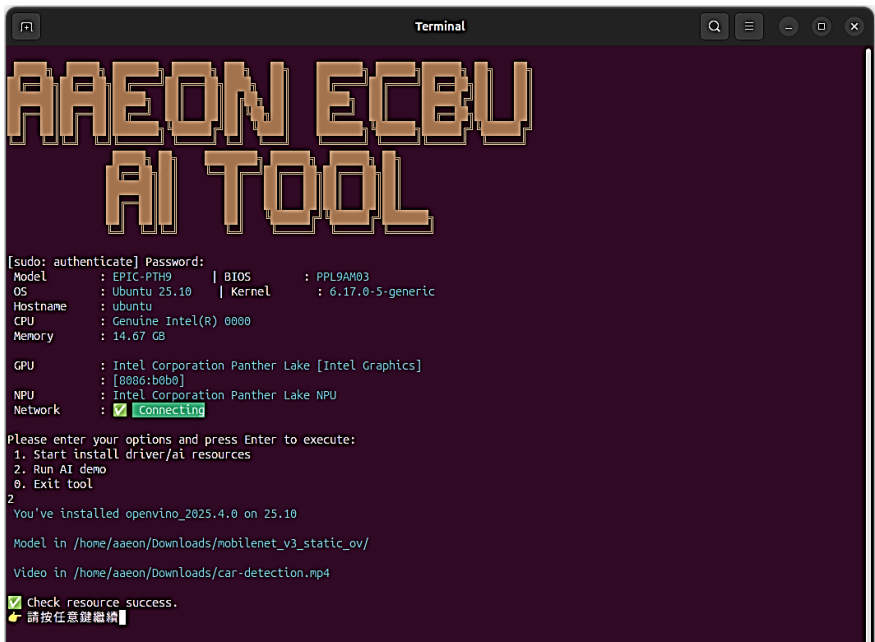
### Step 3: Run AI Demo

- Launch the AI tool using the following command:

```
cd ~/Downloads/
```

```
./aitool.sh
```

- To run the **AAEON Demo**, type **2** and press **Enter**.
- The tool will verify the installation of the following components:
  - OpenVINO
  - AI models
  - Test video files



- Press any key to continue when prompted. The program will check for supported hardware devices (CPU, GPU, NPU)

```

Terminal
[✓] Check resource success.
[👉] 請按任意鍵繼續
[setupvars.sh] OpenVINO environment initialized
[ INFO ] Build ..... 2025.4.0-20398-7a975177ff4-releases/2025/4
[ INFO ]
[ INFO ] Available devices:
[ INFO ] CPU
[ INFO ] SUPPORTED_PROPERTIES:
[ INFO ]   Immutable: AVAILABLE_DEVICES : ""
[ INFO ]   Immutable: RANGE_FOR_ASYNC_INFER_REQUESTS : 1 1 1
[ INFO ]   Immutable: RANGE_FOR_STREAMS : 1 10
[ INFO ]   Immutable: EXECUTION_DEVICES : CPU
[ INFO ]   Immutable: FULL_DEVICE_NAME : Genuine Intel(R) 0000
[ INFO ]   Immutable: OPTIMIZATION_CAPABILITIES : BF16 FP32 FP16 INT8 BIN EXPORT_IMPORT

```

```

Terminal
[ INFO ] Mutable: ENABLE_WEIGHTLESS : NO
[ INFO ] Mutable: WEIGHTS_PATH : ""
[ INFO ]
[ INFO ] GPU
[ INFO ] SUPPORTED_PROPERTIES:
[ INFO ]   Immutable: AVAILABLE_DEVICES : 0
[ INFO ]   Immutable: RANGE_FOR_ASYNC_INFER_REQUESTS : 1 2 1
[ INFO ]   Immutable: RANGE_FOR_STREAMS : 1 2
[ INFO ]   Immutable: OPTIMAL_BATCH_SIZE : 1
[ INFO ]   Immutable: MAX_BATCH_SIZE : 1
[ INFO ]   Immutable: DEVICE_ARCHITECTURE : GPU: vendor=0x8086 arch=v30.0.0
[ INFO ]   Immutable: FULL_DEVICE_NAME : Intel(R) Graphics [0xb0b0] (iGPU)
[ INFO ]   Immutable: DEVICE_UUID : 8680b0b000000000000000200000000000

```

```

Terminal
[ INFO ] Mutable: CONFIG_FILE : ""
[ INFO ]
[ INFO ] NPU
[ INFO ] SUPPORTED_PROPERTIES:
[ INFO ]   Immutable: AVAILABLE_DEVICES : AUTO_DETECT
[ INFO ]   Mutable: CACHE_DIR : ""
[ INFO ]   Mutable: COMPIATION_NUM_THREADS : 10
[ INFO ]   Immutable: DEVICE_ARCHITECTURE : AUTO_DETECT
[ INFO ]   Immutable: DEVICE_COPS : {bf16:0,f16:21504,f32:0,i8:43000,u8:43000}
[ INFO ]   Mutable: DEVICE_ID : ""
[ INFO ]   Immutable: DEVICE_PCI_INFO : {domain: 0 bus: 0 device: 0xb function: 0}
[ INFO ]   Immutable: DEVICE_TYPE : integrated
[ INFO ]   Immutable: DEVICE_UUID : 80d1d11eb73811eab3de024ac130004

```

- After the device check is complete, press any key to continue.

```

aaaon@ubuntu: ~/Downloads
[ INFO ] Immutable: NPU_DEVICE_TOTAL_MEM_SIZE : 15750049792
[ INFO ] Immutable: NPU_DRIVER_VERSION : 1766082426
[ INFO ] Mutable: NPU_MAX_TILES : 3
[ INFO ] Mutable: NPU_QOQ_OPTIMIZATION : NO
[ INFO ] Mutable: NPU_QOQ_OPTIMIZATION_AGGRESSIVE : NO
[ INFO ] Mutable: NPU_RUN_INFERENCES_SEQUENTIALLY : NO
[ INFO ] Mutable: NPU_TILES : -1
[ INFO ] Mutable: NPU_TURBO : NO
[ INFO ] Immutable: NUM_STREAMS : 1
[ INFO ] Immutable: OPTIMAL_NUMBER_OF_INFER_REQUESTS : 1
[ INFO ] Immutable: OPTIMIZATION_CAPABILITIES : FP16 INT8 EXPORT_IMPORT
[ INFO ] Mutable: PERFORMANCE_HINT : LATENCY
[ INFO ] Mutable: PERFORMANCE_HINT_NUM_REQUESTS : 1
[ INFO ] Mutable: PERF_COUNT : NO
[ INFO ] Immutable: RANGE_FOR_ASYNC_INFER_REQUESTS : 1 10 1
[ INFO ] Immutable: RANGE_FOR_STREAMS : 1 4
[ INFO ] Mutable: WEIGHTS_PATH : ""
[ INFO ] Mutable: WORKLOAD_TYPE : DEFAULT
[👉] 請按任意鍵繼續

```

- The system will begin AI benchmark testing on each available device.
- The tool first detects which devices are available and then runs the benchmark tests accordingly.

```

系統偵測到設備: ['CPU', 'GPU', 'NPU']

正在測試設備: CPU
模型輸入形狀: [1, 3, 224, 224]
測試影片: car-detection.mp4
> 正在預熱 (處理 30 幀)...
> 開始正式 Benchmark (處理 300 幀)...

正在測試設備: GPU
模型輸入形狀: [1, 3, 224, 224]
測試影片: car-detection.mp4
> 正在預熱 (處理 30 幀)...
> 開始正式 Benchmark (處理 300 幀)...

正在測試設備: NPU
模型輸入形狀: [1, 3, 224, 224]
測試影片: car-detection.mp4
> 正在預熱 (處理 30 幀)...
> 開始正式 Benchmark (處理 300 幀)...

```

- When the tests are complete, an AI benchmark report will be generated for each detected device.

```

AAEON ECEBU
REPORT

Model      : EPIC-PTH9   | BIOS      : PPL9AM03
OS         : Ubuntu 25.10 | Kernel    : 6.17.0-5-generic

=====
OpenVINO 影片辨識效能報告 - 2026-01-22 17:51:14
=====
Device FPS (Throughput) Avg Latency (ms) P95 Latency (ms) P99 Latency (ms) Min Latency (ms) Max Latency (ms) Total Frames
CPU      889.17           3.66           3.27           4.96           2.03           131.71          300
GPU      259.92           994.73         1011.98        1012.89        969.60        1013.45         300
NPU      1703.25           0.82           0.95           0.99           0.64           1.11           300
aaeon@ubuntu:~/Downloads$

```

# Appendix A

---

Mating Connectors

## A.1 List of Mating Connectors and Cables

The following table lists mating connectors and available cables.

Connector Label	Function	Mating Connector		Cable P/N
		Vendor	Model no	
CN1	USB 2.0 Port	HIROSE	KW30-4P-1C(800)	170X000880
CN2	USB 2.0 Port	HIROSE	KW30-4P-1C(800)	170X000880
CN4	Front Panel	JST	SHR-10V-S-B	170X000603
CN6	COM Header	JST	SHDR-20V-S-B	170X000231
CN7	SATA Port	Molex	887505318	1709070500
CN10	SATA PWR	JST	PHR-2	1702150155
CN11	RTC Battery	Molex	51021-0200	175011301K
CN13	Power Input	Molex	19211-0003	170204010R
CN15	eDP	I-PEX	20453-030T-01S	N/A
CN16	IMVP9 Programming Port	JST	SHR-03V-S-B	N/A
CN17	I2C/SMBUS Header	JST	SHR-05V-S-B	170X000743
CN18	SPI Flash Programming Port	JST	SHR-07V-S-B	N/A
CN19	eSPI debug Header	JST	SHR-10V-S-B	1703100133
CN20	GPIO Port	JST	SHR-06V-S-B	N/A
CN21	4-pin Smart FAN	Molex	51021-0400	N/A

# Appendix B












































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I/O Information




















































## B.1 I/O Address Map

Input/output (IO)	
[0000000000000000 - 000000000000CF7]	PCI Express Root Complex
[0000000000000020 - 0000000000000021]	Programmable interrupt controller
[0000000000000024 - 0000000000000025]	Programmable interrupt controller
[0000000000000028 - 0000000000000029]	Programmable interrupt controller
[000000000000002C - 000000000000002D]	Programmable interrupt controller
[000000000000002E - 000000000000002F]	Motherboard resources
[0000000000000030 - 0000000000000031]	Programmable interrupt controller
[0000000000000034 - 0000000000000035]	Programmable interrupt controller
[0000000000000038 - 0000000000000039]	Programmable interrupt controller
[000000000000003C - 000000000000003D]	Programmable interrupt controller
[0000000000000040 - 0000000000000043]	System timer
[000000000000004E - 000000000000004F]	Motherboard resources
[0000000000000050 - 0000000000000053]	System timer
[0000000000000061 - 0000000000000061]	Motherboard resources
[0000000000000063 - 0000000000000063]	Motherboard resources
[0000000000000065 - 0000000000000065]	Motherboard resources
[0000000000000067 - 0000000000000067]	Motherboard resources
[0000000000000070 - 0000000000000070]	Motherboard resources
[0000000000000080 - 0000000000000080]	Motherboard resources
[0000000000000092 - 0000000000000092]	Motherboard resources
[00000000000000A0 - 00000000000000A1]	Programmable interrupt controller
[00000000000000A4 - 00000000000000A5]	Programmable interrupt controller
[00000000000000A8 - 00000000000000A9]	Programmable interrupt controller
[00000000000000AC - 00000000000000AD]	Programmable interrupt controller
[00000000000000B0 - 00000000000000B1]	Programmable interrupt controller
[00000000000000B2 - 00000000000000B3]	Motherboard resources
[00000000000000B4 - 00000000000000B5]	Programmable interrupt controller
[00000000000000B8 - 00000000000000B9]	Programmable interrupt controller
[00000000000000BC - 00000000000000BD]	Programmable interrupt controller
[0000000000002F8 - 0000000000002FF]	Communications Port (COM2)
[0000000000003F8 - 0000000000003FF]	Communications Port (COM1)
[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
[0000000000000680 - 000000000000069F]	Motherboard resources
[0000000000000A00 - 0000000000000A0F]	Motherboard resources
[0000000000000A10 - 0000000000000A1F]	Motherboard resources
[0000000000000A20 - 0000000000000A2F]	Motherboard resources
[0000000000000D00 - 000000000000FFFF]	PCI Express Root Complex
[000000000000164E - 000000000000164F]	Motherboard resources
[0000000000001854 - 0000000000001857]	Motherboard resources
[0000000000002000 - 00000000000020FE]	Motherboard resources
[0000000000003020 - 000000000000303F]	Standard SATA AHCI Controller
[0000000000003040 - 0000000000003043]	Standard SATA AHCI Controller
[0000000000003050 - 0000000000003057]	Standard SATA AHCI Controller
[000000000000EFA0 - 000000000000EFBF]	Intel (R) SMBus - 772
















































## B.2 IRQ Mapping Chart
















































Interrupt request (IRQ)	
 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000003 (03)	Communications Port (COM2)
 (ISA) 0x00000004 (04)	Communications Port (COM1)
 (ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INTC105E
 (ISA) 0x00000037 (55)	Microsoft ACPI-Compliant System
 (ISA) 0x00000038 (56)	Microsoft ACPI-Compliant System
 (ISA) 0x00000039 (57)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003A (58)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003B (59)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003C (60)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003D (61)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003E (62)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003F (63)	Microsoft ACPI-Compliant System
 (ISA) 0x00000040 (64)	Microsoft ACPI-Compliant System
 (ISA) 0x00000041 (65)	Microsoft ACPI-Compliant System
 (ISA) 0x00000042 (66)	Microsoft ACPI-Compliant System
 (ISA) 0x00000043 (67)	Microsoft ACPI-Compliant System
 (ISA) 0x00000044 (68)	Microsoft ACPI-Compliant System
 (ISA) 0x00000045 (69)	Microsoft ACPI-Compliant System
 (ISA) 0x00000046 (70)	Microsoft ACPI-Compliant System
 (ISA) 0x00000047 (71)	Microsoft ACPI-Compliant System
 (ISA) 0x00000048 (72)	Microsoft ACPI-Compliant System
 (ISA) 0x00000049 (73)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004A (74)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004B (75)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004C (76)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004D (77)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004E (78)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004F (79)	Microsoft ACPI-Compliant System
 (ISA) 0x00000050 (80)	Microsoft ACPI-Compliant System
 (ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
 (ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
 (ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
 (ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
 (ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
 (ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
 (ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
 (ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
 (ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Trusted Platform Module 2.0
















































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 (ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
 (ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
 (ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
 (ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
 (ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
 (ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
 (ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
 (ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
 (ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
 (ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
 (ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
 (ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
 (ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
 (ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
 (ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
 (ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
 (ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
 (ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
 (ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
 (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
 (ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
 (ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
 (ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
 (ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
 (ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
 (ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
 (ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
 (ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
 (ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
 (ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
 (ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
 (ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System
 (ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System
















































---
















































 (ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
 (ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
 (ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BF (191)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C0 (192)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C1 (193)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C2 (194)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C3 (195)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C4 (196)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C5 (197)	Microsoft ACPI-Compliant System
(ISA) 0x000000C6 (198)	Microsoft ACPI-Compliant System
(ISA) 0x000000C7 (199)	Microsoft ACPI-Compliant System
(ISA) 0x000000C8 (200)	Microsoft ACPI-Compliant System
(ISA) 0x000000C9 (201)	Microsoft ACPI-Compliant System



































 (ISA) 0x000000CA (202)	Microsoft ACPI-Compliant System
 (ISA) 0x000000CB (203)	Microsoft ACPI-Compliant System
 (ISA) 0x000000CC (204)	Microsoft ACPI-Compliant System
 (ISA) 0x00000100 (256)	Microsoft ACPI-Compliant System
 (ISA) 0x00000101 (257)	Microsoft ACPI-Compliant System
 (ISA) 0x00000102 (258)	Microsoft ACPI-Compliant System
 (ISA) 0x00000103 (259)	Microsoft ACPI-Compliant System
 (ISA) 0x00000104 (260)	Microsoft ACPI-Compliant System
 (ISA) 0x00000105 (261)	Microsoft ACPI-Compliant System
 (ISA) 0x00000106 (262)	Microsoft ACPI-Compliant System
 (ISA) 0x00000107 (263)	Microsoft ACPI-Compliant System
 (ISA) 0x00000108 (264)	Microsoft ACPI-Compliant System
 (ISA) 0x00000109 (265)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010A (266)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010B (267)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010C (268)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010D (269)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010E (270)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010F (271)	Microsoft ACPI-Compliant System
 (ISA) 0x00000110 (272)	Microsoft ACPI-Compliant System
 (ISA) 0x00000111 (273)	Microsoft ACPI-Compliant System
 (ISA) 0x00000112 (274)	Microsoft ACPI-Compliant System
 (ISA) 0x00000113 (275)	Microsoft ACPI-Compliant System
 (ISA) 0x00000114 (276)	Microsoft ACPI-Compliant System
 (ISA) 0x00000115 (277)	Microsoft ACPI-Compliant System
 (ISA) 0x00000116 (278)	Microsoft ACPI-Compliant System
 (ISA) 0x00000117 (279)	Microsoft ACPI-Compliant System
 (ISA) 0x00000118 (280)	Microsoft ACPI-Compliant System
 (ISA) 0x00000119 (281)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011A (282)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011B (283)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011C (284)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011D (285)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011E (286)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011F (287)	Microsoft ACPI-Compliant System
 (ISA) 0x00000120 (288)	Microsoft ACPI-Compliant System
 (ISA) 0x00000121 (289)	Microsoft ACPI-Compliant System
 (ISA) 0x00000122 (290)	Microsoft ACPI-Compliant System
 (ISA) 0x00000123 (291)	Microsoft ACPI-Compliant System
 (ISA) 0x00000124 (292)	Microsoft ACPI-Compliant System
 (ISA) 0x00000125 (293)	Microsoft ACPI-Compliant System
 (ISA) 0x00000126 (294)	Microsoft ACPI-Compliant System
 (ISA) 0x00000127 (295)	Microsoft ACPI-Compliant System
 (ISA) 0x00000128 (296)	Microsoft ACPI-Compliant System
 (ISA) 0x00000129 (297)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012A (298)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012B (299)	Microsoft ACPI-Compliant System
(ISA) 0x0000012C (300)	Microsoft ACPI-Compliant System
(ISA) 0x0000012D (301)	Microsoft ACPI-Compliant System
(ISA) 0x0000012E (302)	Microsoft ACPI-Compliant System
(ISA) 0x0000012F (303)	Microsoft ACPI-Compliant System

 (ISA) 0x00000130 (304)	Microsoft ACPI-Compliant System
 (ISA) 0x00000131 (305)	Microsoft ACPI-Compliant System
 (ISA) 0x00000132 (306)	Microsoft ACPI-Compliant System
 (ISA) 0x00000133 (307)	Microsoft ACPI-Compliant System
 (ISA) 0x00000134 (308)	Microsoft ACPI-Compliant System
 (ISA) 0x00000135 (309)	Microsoft ACPI-Compliant System
 (ISA) 0x00000136 (310)	Microsoft ACPI-Compliant System
 (ISA) 0x00000137 (311)	Microsoft ACPI-Compliant System
 (ISA) 0x00000138 (312)	Microsoft ACPI-Compliant System
 (ISA) 0x00000139 (313)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013A (314)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013C (316)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013D (317)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System
 (ISA) 0x00000140 (320)	Microsoft ACPI-Compliant System
 (ISA) 0x00000141 (321)	Microsoft ACPI-Compliant System
 (ISA) 0x00000142 (322)	Microsoft ACPI-Compliant System
 (ISA) 0x00000143 (323)	Microsoft ACPI-Compliant System
 (ISA) 0x00000144 (324)	Microsoft ACPI-Compliant System
 (ISA) 0x00000145 (325)	Microsoft ACPI-Compliant System
 (ISA) 0x00000146 (326)	Microsoft ACPI-Compliant System
 (ISA) 0x00000147 (327)	Microsoft ACPI-Compliant System
 (ISA) 0x00000148 (328)	Microsoft ACPI-Compliant System
 (ISA) 0x00000149 (329)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014B (331)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014D (333)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
 (ISA) 0x00000150 (336)	Microsoft ACPI-Compliant System
 (ISA) 0x00000151 (337)	Microsoft ACPI-Compliant System
 (ISA) 0x00000152 (338)	Microsoft ACPI-Compliant System
 (ISA) 0x00000153 (339)	Microsoft ACPI-Compliant System
 (ISA) 0x00000154 (340)	Microsoft ACPI-Compliant System
 (ISA) 0x00000155 (341)	Microsoft ACPI-Compliant System
 (ISA) 0x00000156 (342)	Microsoft ACPI-Compliant System
 (ISA) 0x00000157 (343)	Microsoft ACPI-Compliant System
 (ISA) 0x00000158 (344)	Microsoft ACPI-Compliant System
 (ISA) 0x00000159 (345)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015A (346)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015B (347)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015C (348)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System
 (ISA) 0x0000015E (350)	Microsoft ACPI-Compliant System
(ISA) 0x0000015F (351)	Microsoft ACPI-Compliant System
(ISA) 0x00000160 (352)	Microsoft ACPI-Compliant System
(ISA) 0x00000161 (353)	Microsoft ACPI-Compliant System
(ISA) 0x00000162 (354)	Microsoft ACPI-Compliant System










































 (ISA) 0x00000163 (355)	Microsoft ACPI-Compliant System
 (ISA) 0x00000164 (356)	Microsoft ACPI-Compliant System
 (ISA) 0x00000165 (357)	Microsoft ACPI-Compliant System
 (ISA) 0x00000166 (358)	Microsoft ACPI-Compliant System
 (ISA) 0x00000167 (359)	Microsoft ACPI-Compliant System
 (ISA) 0x00000168 (360)	Microsoft ACPI-Compliant System
 (ISA) 0x00000169 (361)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016A (362)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016B (363)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016C (364)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016D (365)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016E (366)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
 (ISA) 0x00000170 (368)	Microsoft ACPI-Compliant System
 (ISA) 0x00000171 (369)	Microsoft ACPI-Compliant System
 (ISA) 0x00000172 (370)	Microsoft ACPI-Compliant System
 (ISA) 0x00000173 (371)	Microsoft ACPI-Compliant System
 (ISA) 0x00000174 (372)	Microsoft ACPI-Compliant System
 (ISA) 0x00000175 (373)	Microsoft ACPI-Compliant System
 (ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
 (ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
 (ISA) 0x00000178 (376)	Microsoft ACPI-Compliant System
 (ISA) 0x00000179 (377)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017A (378)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017B (379)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
 (ISA) 0x00000180 (384)	Microsoft ACPI-Compliant System
 (ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
 (ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
 (ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
 (ISA) 0x00000184 (388)	Microsoft ACPI-Compliant System
 (ISA) 0x00000185 (389)	Microsoft ACPI-Compliant System
 (ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
 (ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
 (ISA) 0x00000188 (392)	Microsoft ACPI-Compliant System
 (ISA) 0x00000189 (393)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018A (394)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018B (395)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018C (396)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018D (397)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
 (ISA) 0x00000190 (400)	Microsoft ACPI-Compliant System
 (ISA) 0x00000191 (401)	Microsoft ACPI-Compliant System
 (ISA) 0x00000192 (402)	Microsoft ACPI-Compliant System
 (ISA) 0x00000193 (403)	Microsoft ACPI-Compliant System
 (ISA) 0x00000194 (404)	Microsoft ACPI-Compliant System
 (ISA) 0x00000195 (405)	Microsoft ACPI-Compliant System

 (ISA) 0x00000196 (406)	Microsoft ACPI-Compliant System
 (ISA) 0x00000197 (407)	Microsoft ACPI-Compliant System
 (ISA) 0x00000198 (408)	Microsoft ACPI-Compliant System
 (ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019A (410)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019B (411)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019C (412)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A0 (416)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A1 (417)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A2 (418)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A3 (419)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A4 (420)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A7 (423)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System
 (ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System
 (ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B1 (433)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B2 (434)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B3 (435)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B4 (436)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B5 (437)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B6 (438)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B7 (439)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B8 (440)	Microsoft ACPI-Compliant System
 (ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BB (443)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BC (444)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BD (445)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BF (447)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C0 (448)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C1 (449)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C2 (450)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C3 (451)	Microsoft ACPI-Compliant System
 (ISA) 0x000001C4 (452)	Microsoft ACPI-Compliant System
(ISA) 0x000001C5 (453)	Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454)	Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455)	Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456)	Microsoft ACPI-Compliant System

 (ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CA (458)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CB (459)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CC (460)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CD (461)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CE (462)	Microsoft ACPI-Compliant System
 (ISA) 0x000001CF (463)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D0 (464)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D1 (465)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D2 (466)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D3 (467)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D4 (468)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D5 (469)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D6 (470)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D7 (471)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DB (475)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DD (477)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DF (479)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E0 (480)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E1 (481)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
 (ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
 (ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
 (ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
 (ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System

	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x00000010 (16)	High Definition Audio Controller
	(PCI) 0xFFFFFEE2 (-30)	Intel(R) Ethernet Connection (24) I219-LM
	(PCI) 0xFFFFFEE3 (-29)	Intel(R) AI Boost
	(PCI) 0xFFFFFEE4 (-28)	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
	(PCI) 0xFFFFFEE5 (-27)	Intel(R) Graphics
	(PCI) 0xFFFFFEE6 (-26)	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
	(PCI) 0xFFFFFEE7 (-25)	Intel(R) Management Engine Interface #1
	(PCI) 0xFFFFFEE8 (-24)	Intel(R) Ethernet Controller I226-IT
	(PCI) 0xFFFFFEE9 (-23)	Intel(R) Ethernet Controller I226-IT
	(PCI) 0xFFFFFEEA (-22)	Intel(R) Ethernet Controller I226-IT
	(PCI) 0xFFFFFEEB (-21)	Intel(R) Ethernet Controller I226-IT
	(PCI) 0xFFFFFEEC (-20)	Intel(R) Ethernet Controller I226-IT
	(PCI) 0xFFFFFEED (-19)	Standard NVM Express Controller
	(PCI) 0xFFFFFEEE (-18)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-17)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-16)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-15)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-14)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-13)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-12)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-11)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-10)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-9)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-8)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-7)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-6)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-5)	Standard NVM Express Controller
	(PCI) 0xFFFFFEED (-4)	Standard SATA AHCI Controller
	(PCI) 0xFFFFFEED (-3)	PCI Express Root Port
	(PCI) 0xFFFFFEED (-2)	PCI Express Root Port

## B.3 Memory Address Map

	Large Memory	
	[0000004000000000 - 000003FFBFFFFFFF]	PCI Express Root Complex
	Memory	
	[0000000000000000 - 000000000000FFFF]	Motherboard resources
	[0000000000000000 - 000000000000FFFF]	Motherboard resources
	[0000000000A0000 - 0000000000BFFFFFFF]	PCI Express Root Complex
	[0000000080000000 - 00000000800FFFFFFF]	Intel(R) Ethernet Controller I226-IT
	[0000000080000000 - 00000000801FFFFFFF]	PCI Express Root Port
	[0000000080000000 - 00000000BFFFFFFF]	PCI Express Root Complex
	[0000000080100000 - 0000000080103FFF]	Intel(R) Ethernet Controller I226-IT
	[0000000080200000 - 0000000080203FFF]	Standard NVM Express Controller
	[0000000080200000 - 00000000802FFFFFFF]	PCI Express Root Port
	[0000000080320000 - 0000000080321FFF]	Standard SATA AHCI Controller
	[0000000080322000 - 00000000803227FF]	Standard SATA AHCI Controller
	[0000000080323000 - 00000000803230FF]	Standard SATA AHCI Controller
	[00000000BFFE0000 - 00000000BFFFFFFF]	Intel(R) Ethernet Connection (24) I219-LM
	[00000000C0000000 - 00000000CFFFFFFF]	Motherboard resources
	[00000000E0D10000 - 00000000E0D1FFFF]	Intel(R) Serial IO GPIO Host Controller - INTC105E
	[00000000E0D20000 - 00000000E0D2FFFF]	Intel(R) Serial IO GPIO Host Controller - INTC105E
	[00000000E0D30000 - 00000000E0D3FFFF]	Intel(R) Serial IO GPIO Host Controller - INTC105E
	[00000000E0D40000 - 00000000E0D4FFFF]	Intel(R) Serial IO GPIO Host Controller - INTC105E
	[00000000E0D50000 - 00000000E0D5FFFF]	Intel(R) Serial IO GPIO Host Controller - INTC105E
	[00000000FC800000 - 00000000FC81FFFF]	Motherboard resources
	[00000000FE010000 - 00000000FE010FFF]	Intel (R) SPI (flash) controller - 7723
	[00000000FED00000 - 00000000FED003FF]	High precision event timer
	[00000000FED20000 - 00000000FED27FFF]	Motherboard resources
	[00000000FED40000 - 00000000FED44FFF]	Trusted Platform Module 2.0
	[00000000FED45000 - 00000000FED48FFF]	Motherboard resources
	[00000000FEDC0000 - 00000000FEDC7FFF]	Motherboard resources
	[00000000FEE00000 - 00000000FEEFFFFFFF]	Motherboard resources
	[0000004000000000 - 000000400FFFFFFF]	Intel(R) Graphics
	[0000004017000000 - 0000004017FFFFFFF]	Intel(R) Graphics
	[0000004020240000 - 000000402024FFFF]	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
	[0000004020250000 - 000000402025FFFF]	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
	[0000004020268000 - 00000040202680FF]	Intel (R) SMBus - 7722
	[0000004020269000 - 0000004020269FFF]	Intel(R) Management Engine Interface #1
	[000003FFB0000000 - 000003FFB7FFFFFFF]	Intel(R) AI Boost
	[000003FFBFC00000 - 000003FFBFDFFFFFFF]	High Definition Audio Controller
	[000003FFBFB00000 - 000003FFBFBFFFFFFF]	Intel(R) AI Boost
	[000003FFBFB00000 - 000003FFBFBFFFFFFF]	High Definition Audio Controller
	[000003FFBFC00000 - 000003FFBFFFFFFF]	Intel(R) Platform Monitoring Technology (PMT) Driver