MTX-ASL1
User's Manual

Revision: 1.0
Release Date: March 04, 2025

Trademark:

*** Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.**

TABLE OF CONTENT

Environmental Protection and Safety Announcement

- Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

Main Board/ Daughter Board/ Backplane

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	X	O	O	O	O
外部信号连接器及线材	X	X	O	O	O	O

O: 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

SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出

SJ/T 11363-2006 标准规定的限量要求。

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 Requirements (EN)

Poisonous or Hazardous Substances or Elements in Products

Main Board/ Daughter Board/ Backplane

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	**Mercury (Hg)**	**Cadmium (Cd)**	**Hexavalent Chromium (Cr(VI))**	**Polybrominated Biphenyls (PBB)**	**Polybrominated Diphenyl Ethers (PBDE)**
PCB & Other Components	X	X	O	O	O	O
Wires & Connectors for External Connections	X	X	O	O	O	O

O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.

Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

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Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	March 04, 2025

Packing List

Part Number	Description	QTY per Board
MTX-ASL1	MTX-ASL1 MB	1
F04-MB-101-F	I/O Shield	1
F07-FNJMI24-F	Heatsink with Fan	1
G01-COM-H2M22-1F	COM Port Cable	2
G01-SATA3-BL-1F	SATA Cable	1
G01-PW4PS2S-322-1F	SATA Power Y Cable	1
F01-SP-A-BK-3F	Jumper	1

Optional Accessories

Part Number	Description	QTY per Board
L01AS059-F	Adapter 19V/3.42A/ 65W	1

Chapter 1 Introduction of the Motherboard

1-1 Specifications

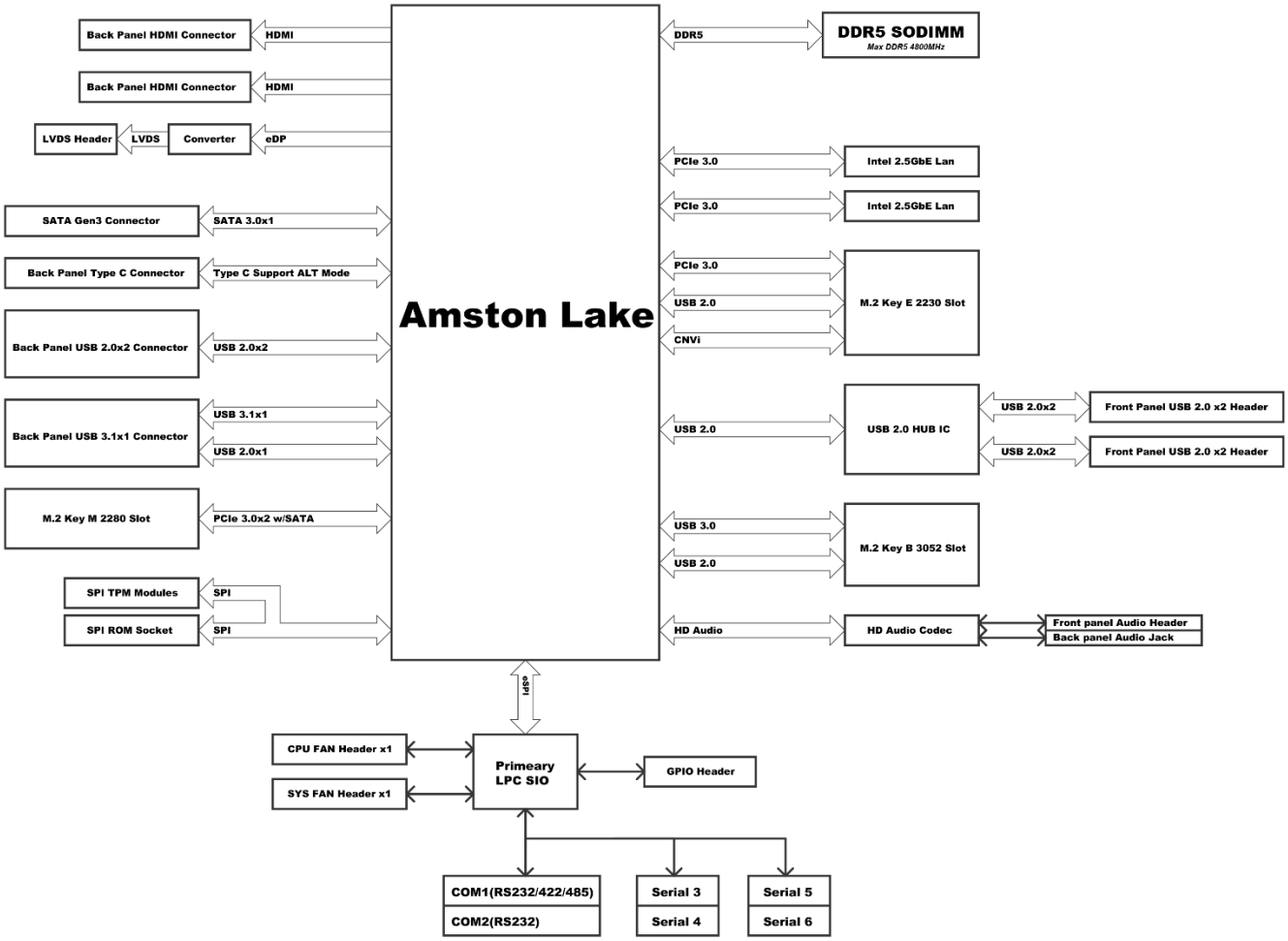
SYSTEM	
MB FORM FACTOR	Mini-ITX
CPU	Onboard Intel Atom® x7433RE Processor (Formerly Amston Lake, TDP 9W) Onboard Intel Atom® x7211RE Processor (Formerly Amston Lake, TDP 6W)
CHIPSET	Intel® SoC
MEMORY	1 x DDR5 4800MHz, Single Channel SO-DIMM, up to 32GB
BIOS	UEFI
WAKE ON LAN	Yes
WATCHDOG TIMER	255 Levels
SECURITY	TPM2.0
RTC BATTERY	Lithium Battery
DIMENSION (W X D)	170.0 (W) x 170.0 (D) mm (6.7″ x 6.7″)
OS SUPPORT	Windows® 11 (64bit) Windows® 10 (64bit) Linux
POWER	
POWER REQUIREMENT	DC-in 12~28V
POWER ON MODE	AT / ATX
CONNECTOR	DC Jack 4-pin Header
DISPLAY	
GPU	Intel® UHD Graphics
LVDS	1 x 24-bit Dual Channel LVDS (Max. Resolution: 1920 x 1080 @60Hz / Co-Lay eDP)
Type C DP	1 x Type C DP1.4 (Max Resolution: 4096 x 2160@60Hz)
HDMI	2 x HDMI 2.0b (Max Resolution: 4096 x 2160@60Hz)
MULTIPLE DISPLAY	Support 3 Displays
AUDIO	
CODEC	Realtek Audio Codec
COMBO	1 x Combo Audio Jack for Line-Out / Mic-In
AMPLIFIER	3W
LAN	

ETHERNET	2 x RJ45 for Intel® I226-V 2.5GbE
USB PORT	
USB	1 x USB 3.2 Gen 2x1 (10Gbps, Formerly USB 3.1 Gen 2) 1 x USB 3.2 Gen 2x1 Type-C (10Gbps) Support DP ALT Mode 2 x USB 2.0 Internal Header for 4 x USB 2.0
SERIAL PORT	
COM	1 x DB-9 for RS-232/422/485 with 5V/12V header Internal Header for 5 x RS-232 with 5V/12V header
INTERNAL I/O	
GPIO	8-Bit
SMBUS	Yes
FAN	1 x CPU Fan Header 1 x System Fan Header
FRONT PANEL	HDD Active LED Power On/Off Power LED Reset
ADDITIONAL	1 x PS/2
STORAGE	
SATA	1 x SATA III 1 x SATA Power Connector
eMMC	eMMC 64GB (optional)
EXPANSION	
M.2	1 x M-Key 2242/2280 (SATA/PCIe 3.0 x2) Support NVMe 1 x E-Key 2230 (USB 2.0/PCIe 3.0 x1) 1 x B-Key 3042/3052 (USB 3.2/USB 2.0) for 4G/5G Module
SIM	1 x Nano SIM Card Slot
ENVIRONMENT &CERTIFICATION	
SHOCK	15G, 11ms duration
VIBRATION	1 Grms/ 5~ 500Hz/ Operation
OPERATING TEMPERATURE	-20°C ~ 75°C (-4°F ~ 167°F)
STORAGE TEMPERATURE	-20°C ~ 85°C (-4°F ~ 185°F)
OPERATING HUMIDITY	10 ~ 90% Relative Humidity, Non-condensing
CERTIFICATION	CE/FCC Class A

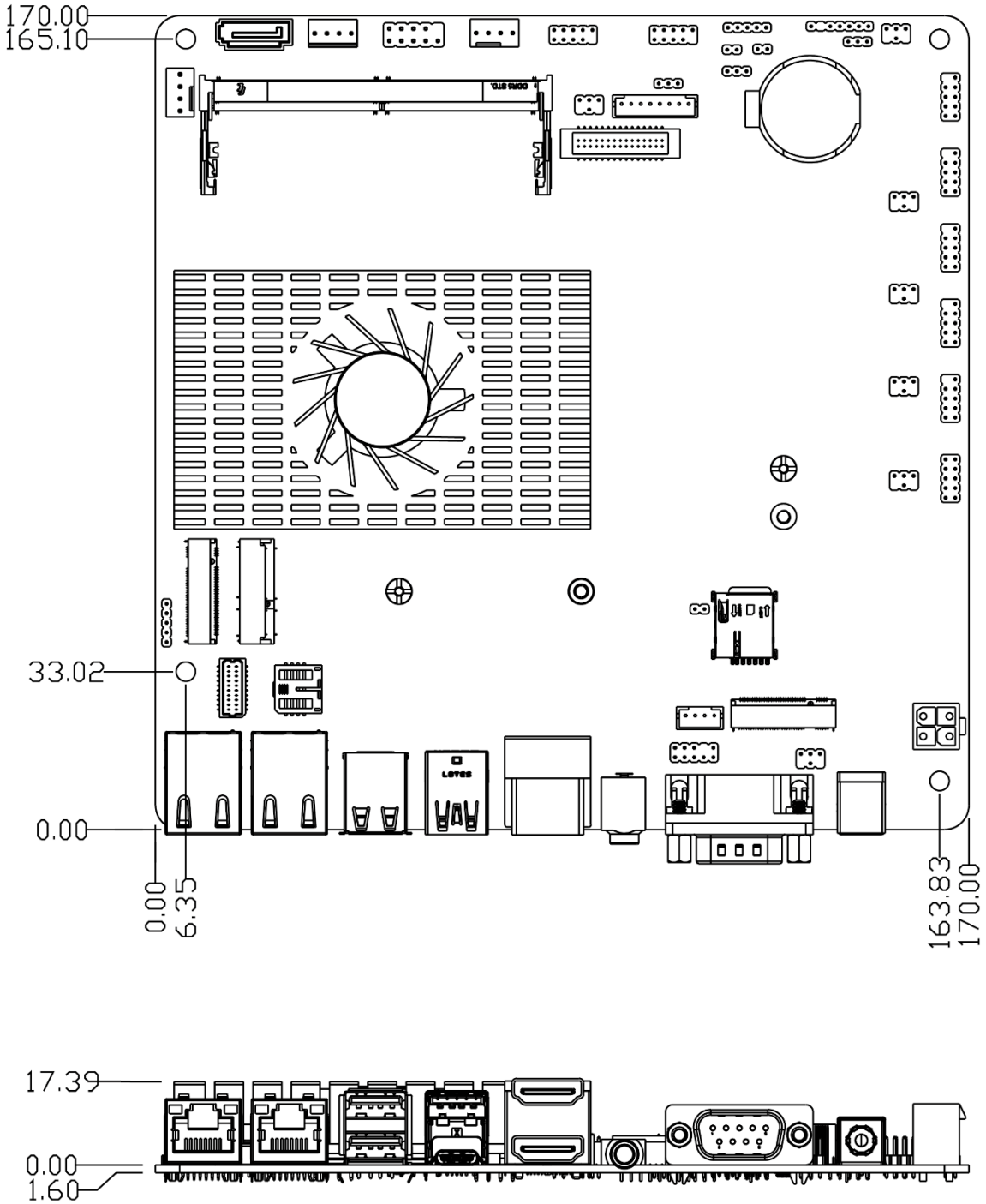
Ordering Information

PART NUMBER	MTX-ASL1-72110010	MTX-ASL1-72110210	MTX-ASL1-74330010	MTX-ASL1-74330210
CPU	Intel® Atom® x7211RE Processor	Intel® Atom® x7211RE Processor	Intel® Atom® x7433RE Processor	Intel® Atom® x7433RE Processor
SECURITY	Intel® PTT (fTPM)	TPM2.0	Intel® PTT (fTPM)	TPM2.0
POWER REQUIREMENT	DC-in 12~28V	DC-in 12~28V	DC-in 12~28V	DC-in 12~28V
GPU	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics	Intel® UHD Graphics
LVDS	1 x LVDS/eDP	1 x LVDS/eDP	1 x LVDS/eDP	1 x LVDS/eDP
Type C DP	1 x Type C DP	1 x Type C DP	1 x Type C DP	1 x Type C DP
HDMI	2 x HDMI	2 x HDMI	2 x HDMI	2 x HDMI
MULTIPLE DISPLAY	Support 3 Displays	Support 3 Displays	Support 3 Displays	Support 3 Displays
ETHERNET	2 x 2.5GbE	2 x 2.5GbE	2 x 2.5GbE	2 x 2.5GbE
USB	1 x USB 3.2 Gen 2	1 x USB 3.2 Gen 2	1 x USB 3.2 Gen 2	1 x USB 3.2 Gen 2
USB	1 x USB 3.2 Gen 2 Type C	1 x USB 3.2 Gen 2 Type C	1 x USB 3.2 Gen 2 Type C	1 x USB 3.2 Gen 2 Type C
USB	6 x USB 2.0	6 x USB 2.0	6 x USB 2.0	6 x USB 2.0
COM	5 x RS-232	5 x RS-232	5 x RS-232	5 x RS-232
COM	1 x RS-232/422/485	1 x RS-232/422/485	1 x RS-232/422/485	1 x RS-232/422/485
SATA	1 x SATA III	1 x SATA III	1 x SATA III	1 x SATA III
M.2	1 x M-Key 2242/2280	1 x M-Key 2242/2280	1 x M-Key 2242/2280	1 x M-Key 2242/2280
M.2	1 x B-Key 3042/3052	1 x B-Key 3042/3052	1 x B-Key 3042/3052	1 x B-Key 3042/3052
M.2	1 x E-Key 2230	1 x E-Key 2230	1 x E-Key 2230	1 x E-Key 2230
SIM	1 x Nano SIM Card Slot	1 x Nano SIM Card Slot	1 x Nano SIM Card Slot	1 x Nano SIM Card Slot
OPERATING TEMPERATURE	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)

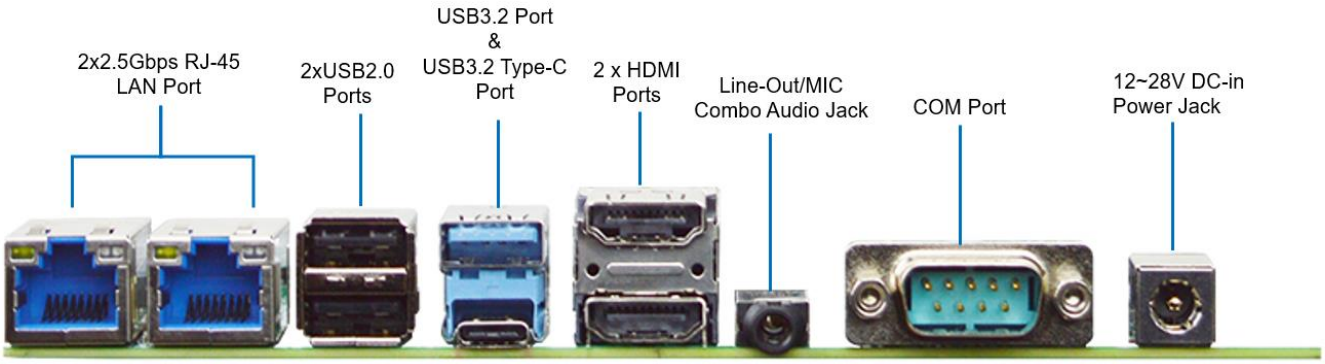
1-2 Block Diagram



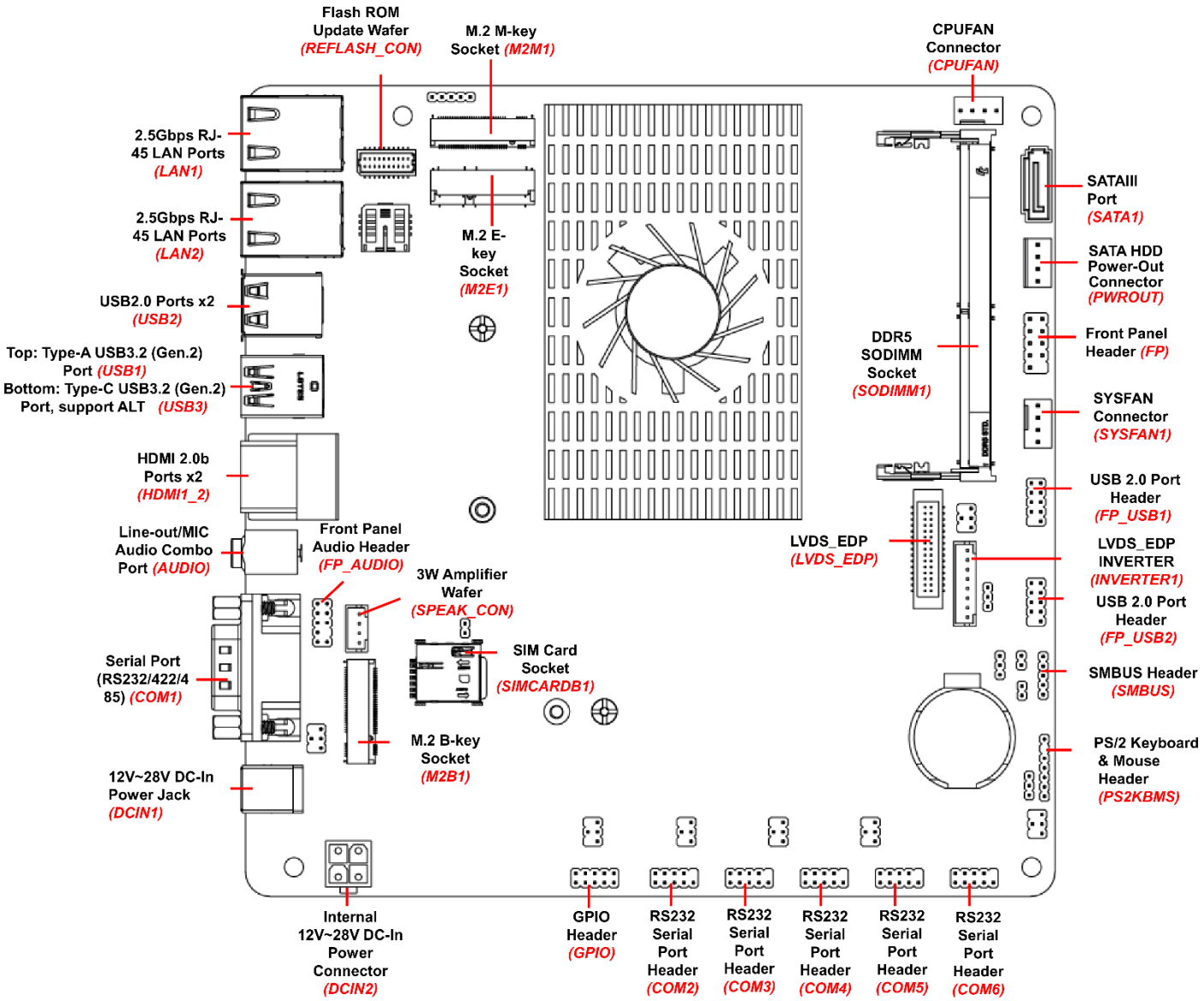
1-3 Dimension

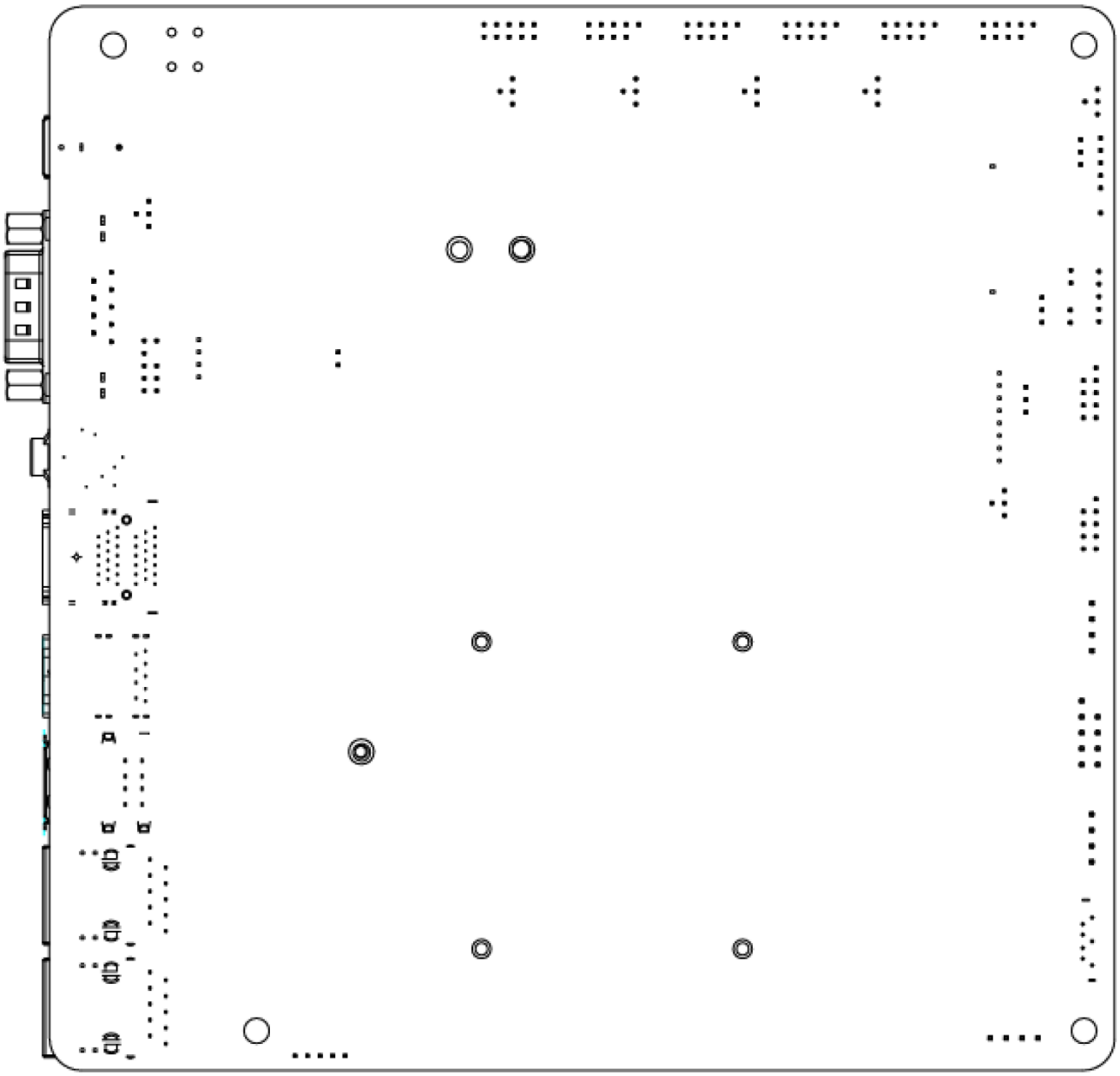


1-4 I/O Placement

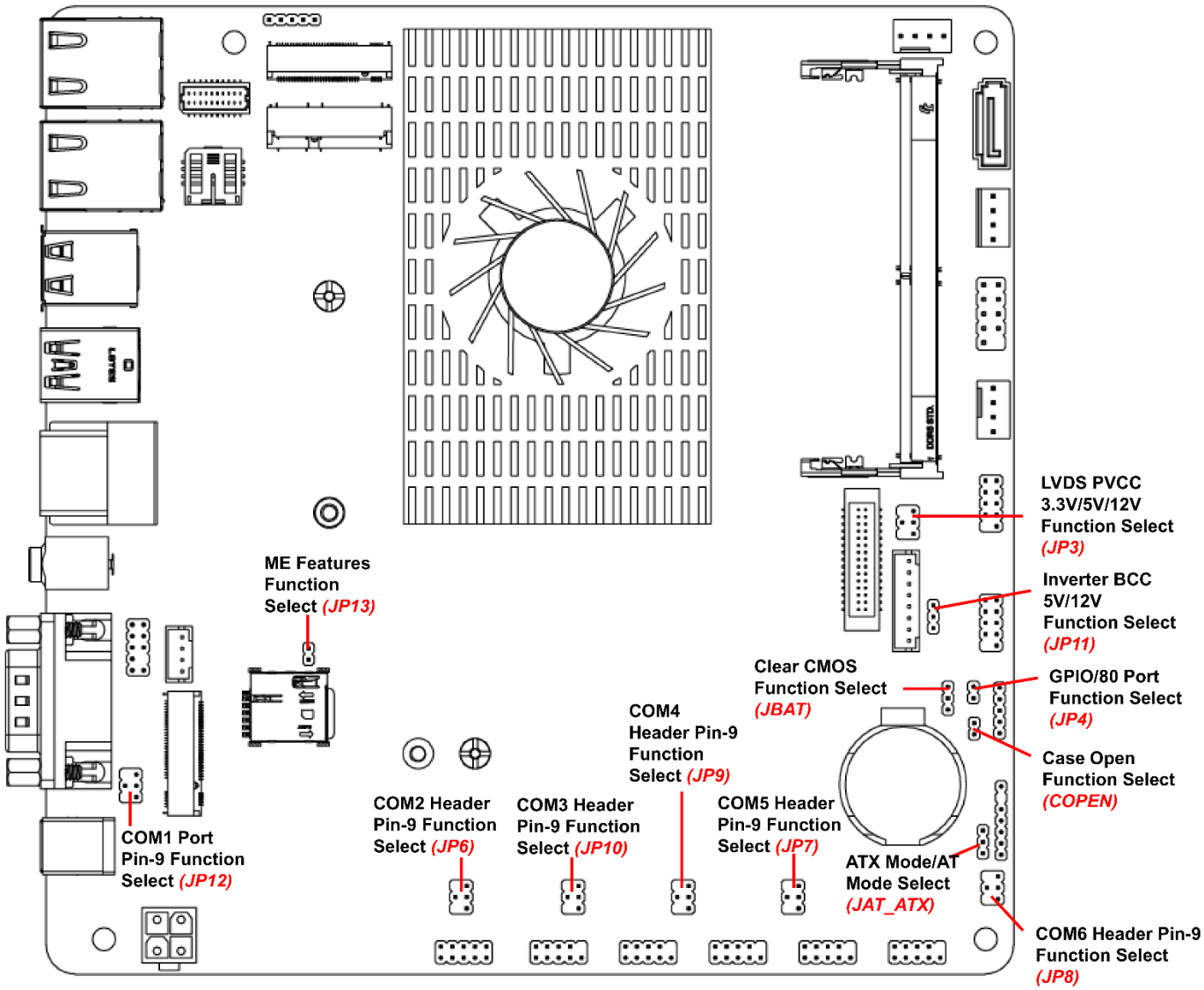


1-5 Motherboard Placement





1-6 Jumper Positions



Chapter 2 Hardware Information

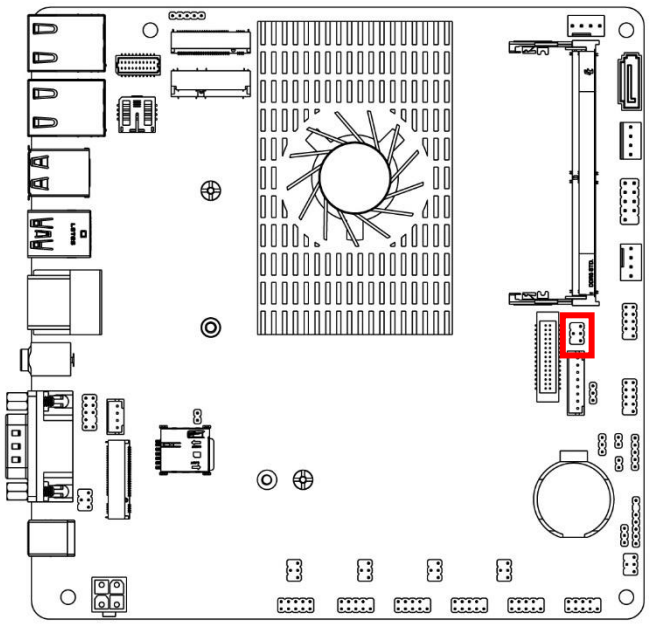
2-1 List of Jumpers

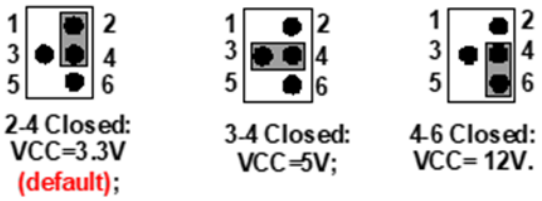
Please refer to the table below for all of the board's jumpers that you can configure for your application.

Location Printing	Function
JP3	LVDS PVCC 3.3V/5V/12V Function Select
JP4	GPIO/80 Port Function Select
JP6	**COM2** Header Pin-9 Function Select
JP7	**COM5** Header Pin-9 Function Select
JP8	**COM6** Header Pin-9 Function Select
JP9	**COM4** Header Pin-9 Function Select
JP10	**COM3** Header Pin-9 Function Select
JP11	Inverter VCC 5V/12V Function Select
JP12	**COM1 Port** Pin-9 Function Select
JP13	ME Features Function Select
JAT_ATX	ATX Mode/AT Mode Select
COPEN	Case Open Function Select
JBAT	Clear CMOS Function Select

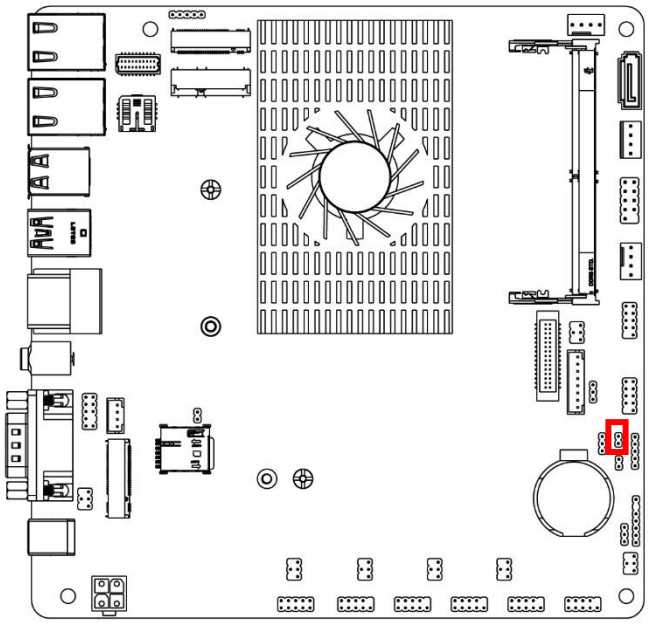
2-2 Jumper Settings

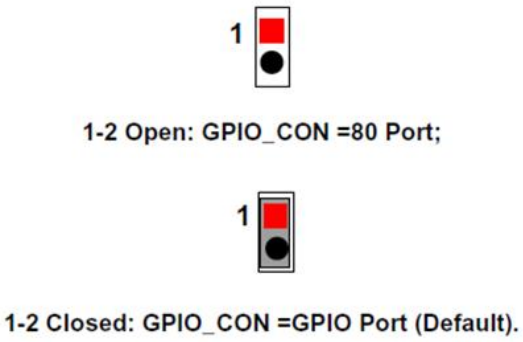
(1) LVDS PVCC 3.3V/5V/12V Function Select (JP3)



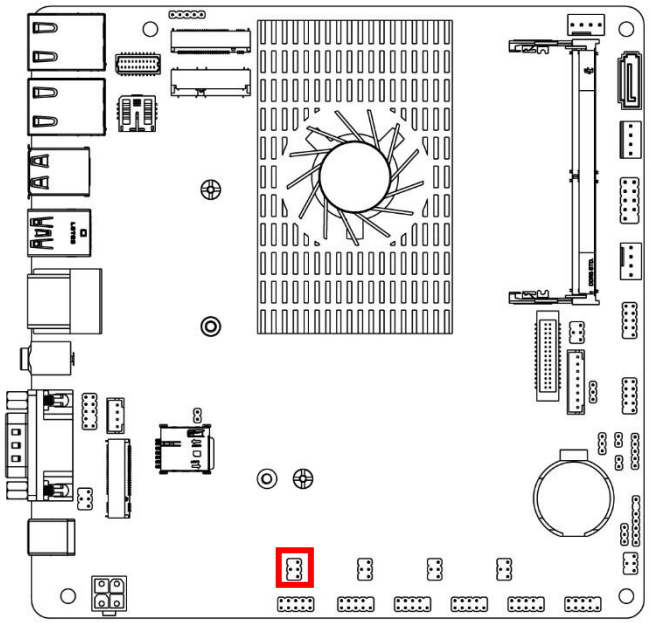


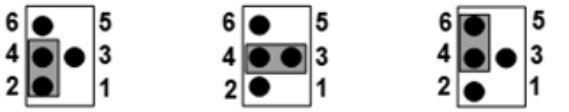
(2) GPIO/80 Port Function Select (JP4)





(3) COM2 Header Pin-9 Function Select (JP6)



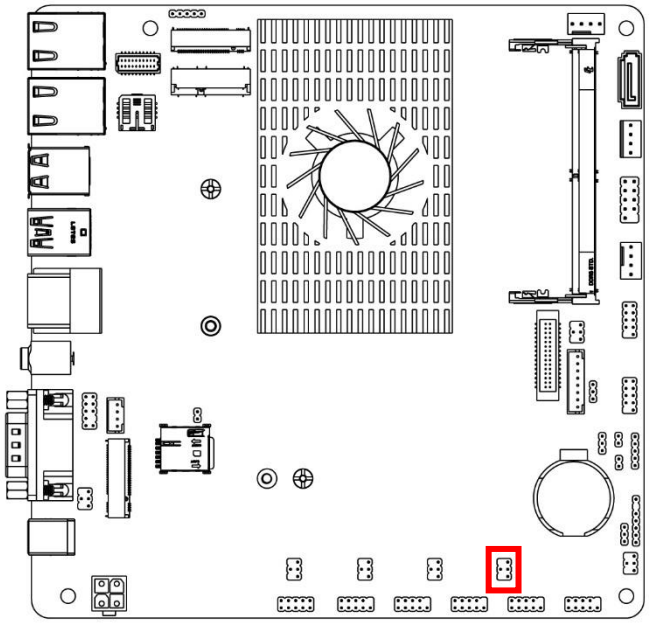


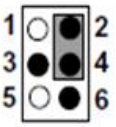
2-4 Closed:
RI=RS232

3-4 Closed:
RI=5V

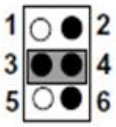
4-6 Closed:
RI=12V

(4) COM5 Header Pin-9 Function Select (JP7)

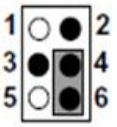




2-4 Closed:
RI=RS232;

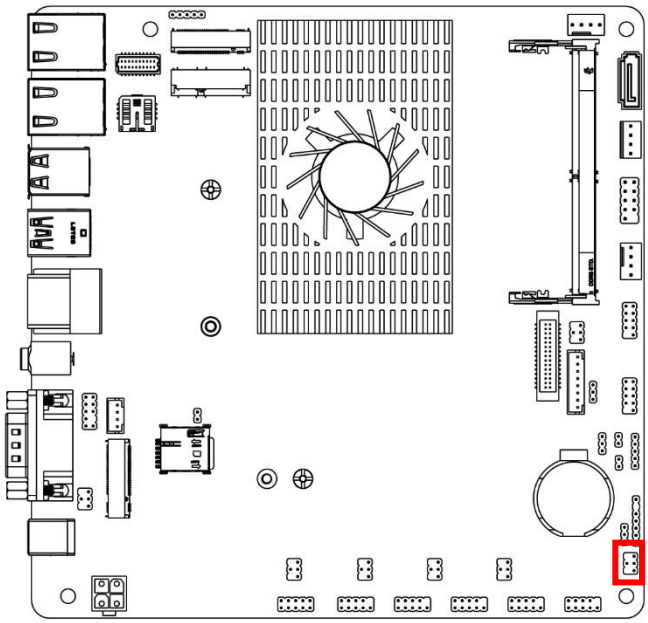


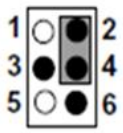
3-4 Closed:
RI= +5V;



4-6 Closed:
RI= +12V.

(5) COM6 Header Pin-9 Function Select (JP8)





2-4 Closed:
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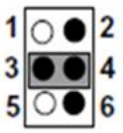
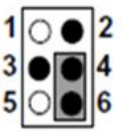
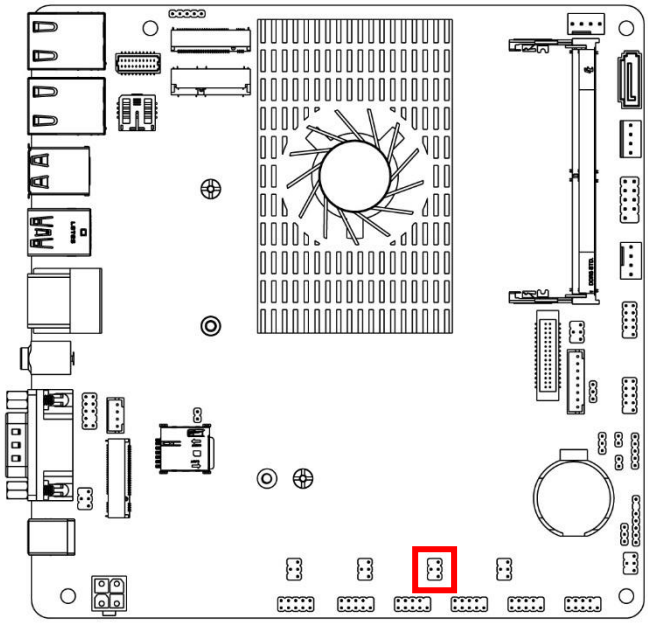


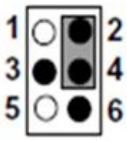
3-4 Closed:
RI= +5V;



4-6 Closed:
RI= +12V.

(6) COM4 Header Pin-9 Function Select (JP9)





2-4 Closed:
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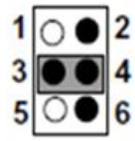
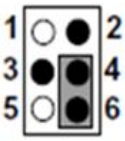
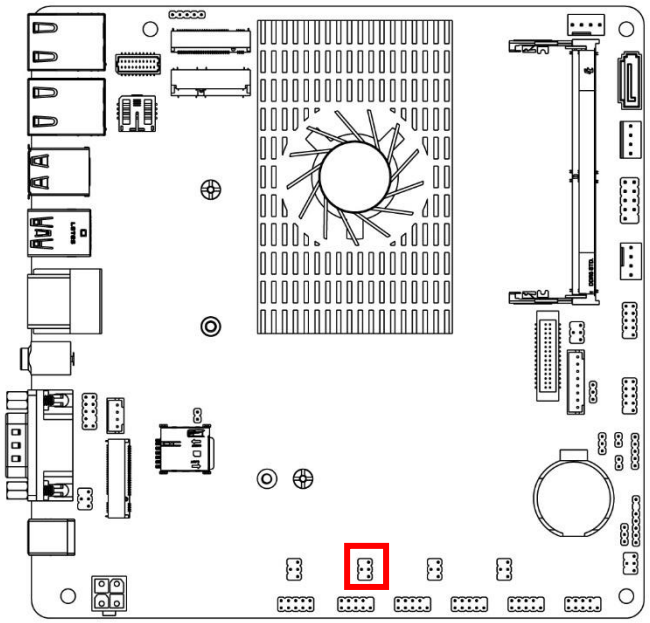


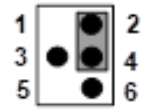
3-4 Closed:
RI= +5V;



4-6 Closed:
RI= +12V.

(7) COM3 Header Pin-9 Function Select (JP10)





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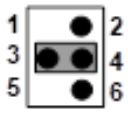
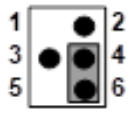
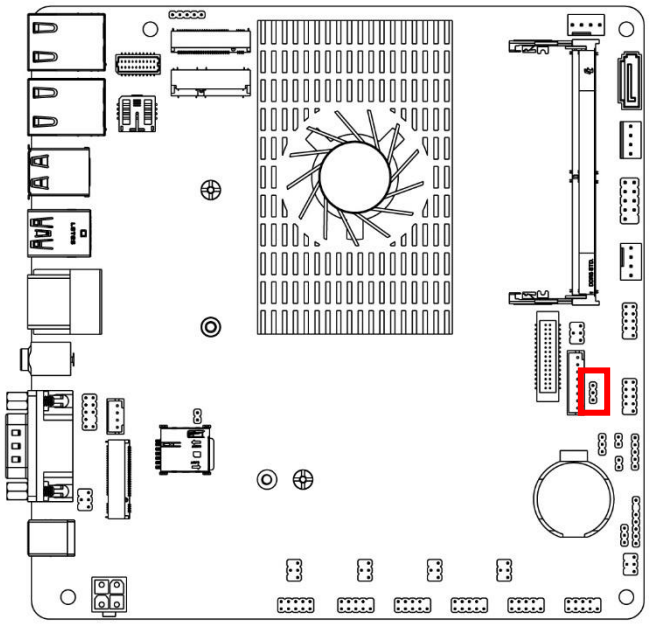


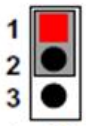
3-4 Closed:
RI=5V;



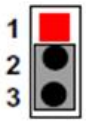
4-6 Closed:
RI=12V.

(8) Inverter VCC 5V/12V Function Select (JP11)



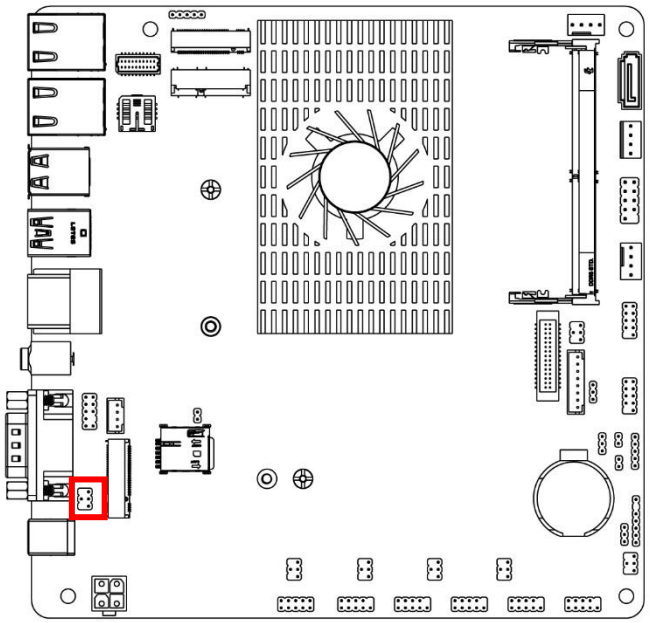


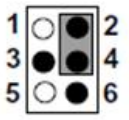
1-2 Closed: Inverter VCC=5V (Default);



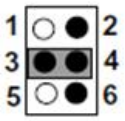
2-3 Closed: Inverter VCC=12V.

(9) COM1 Port Pin-9 Function Select (JP12)

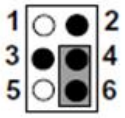




2-4 Closed:
RI=RS232;

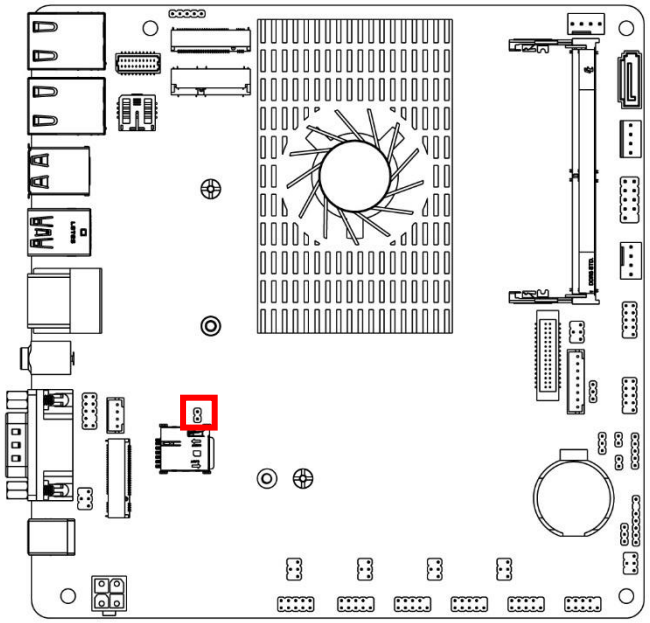


3-4 Closed:
RI= +5V;

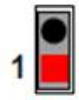


4-6 Closed:
RI= +12V.

(10) ME Features Function Select (JP13)

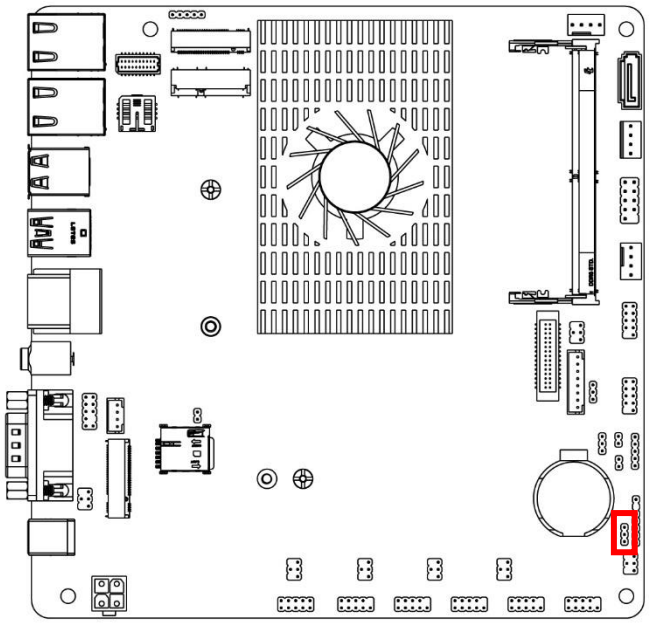


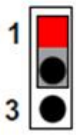
1-2 Open: Enable ME Features (Default);



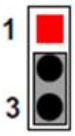
1-2 Closed: Disable ME Features.

(11) ATX Mode/AT Mode Select (JAT_ATX)



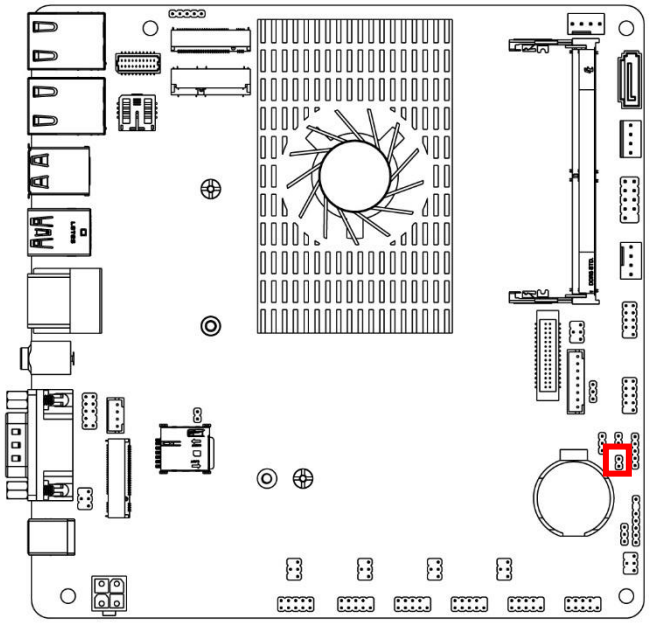


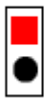
1-2 Closed: ATX Mode Selected (Default);



2-3 Closed: AT Mode Selected.

(12) Case Open Function Select (COPEN)

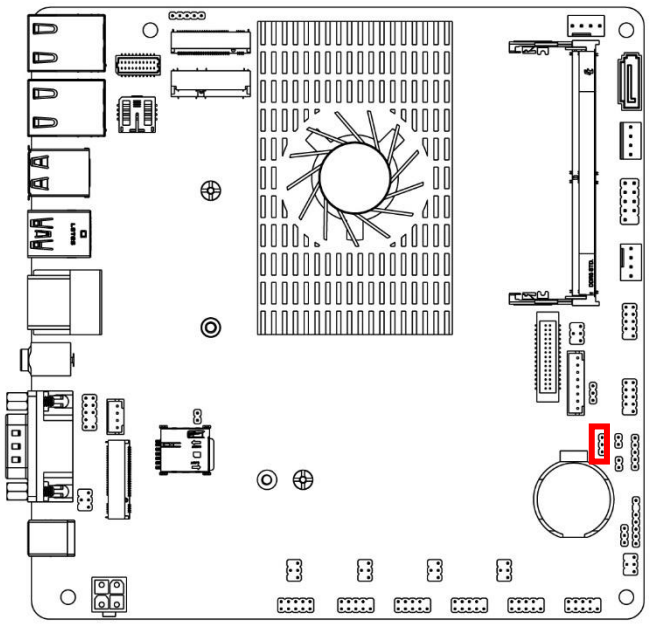


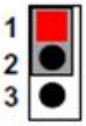


1-2 Open: Enable ME Features (Default);

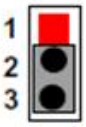
1-2 Closed: Disable ME Features.

(13) Clear CMOS Function Select (JBAT)





1-2 Closed: Normal (Default);



2-3 Closed: Clear CMOS.

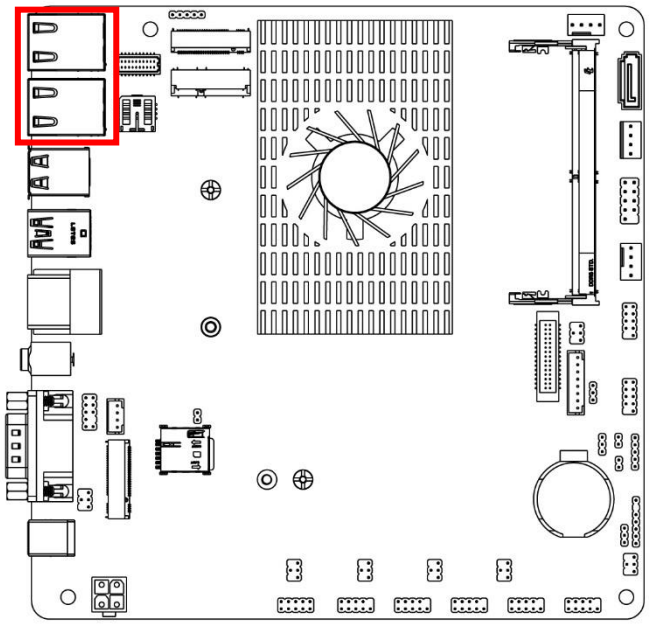
2-3 List of Connectors

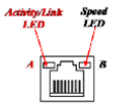
Please refer to the table below for all of the board's jumpers that you can configure for your application.

Location Printing	Function
LAN1/LAN2	RJ-45 LAN Port Connector X2
USB2	USB2.0 Port Connector X2
USB3	USB3.2 (Gen.2) Port Connector
USB1	USB3.2 (Gen.2) Type-C Port Connector *Support ALT Mode
HDMI1_2	HDMI2.0b Port Connector X2
AUDIO	Audio Line Out/MIC Combo Connector
COM1	Serial Port (RS232/422/485) Connector *Support 5V/12V
DCIN3	12~28V DC-in Power Connector
DCIN2	Internal 4-Pin 12~28V DC-in Power Connector
CPUFAN	CPU FAN Connector
SATA1	SATAIII Port Connector
PWROUT	SATA HDD Power-out Connector
SYSFAN1	System FAN Connector
REFLASH_CON	BIOS Flash ROM Update Wafer
FP_AUDIO	Front Panel Audio Header
SPEAK_CON	3W Amplifier Wafer
GPIO	GPIO Port Header
COM2/3/4/5/6	RS232 Serial Port Header
PS2KBMS	PS/2 Keyboard and Mouse Header
SMBUS	SMBUS Header
FP_USB1/2	USB2.0 Port Header
LVDS_EDP	LVDS/EDP Header
INVERTER1	LVDS_EDP Inverter Wafer
FP	Front Panel Header(PWR LED/HDD LED/Power Button/Reset)
SODIMM1	DDR5 SODIMM Socket
M2M1	M.2 2242/2280 Key M Socket
M2E1	M.2 2230 Key E Socket
M2B1	M.2 2242/3052 Key B Socket
SIMCARDB1	Nano-SIM Card Socket

2-4 Connector Settings

(1) *(1)* RJ-45 LAN Port Connector X2(LAN1/LAN2)



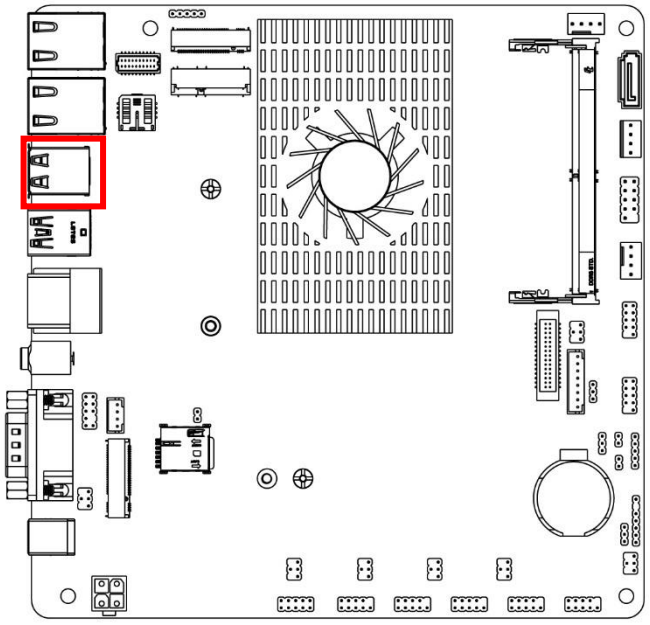


A: Activity/Link LED		B: Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10/100Mbps connection
Blinking	Data Activity	Orange	1000Mbps connection
On	Link	Green	2.5Gbps connection

Note: **2.5Gbps high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*

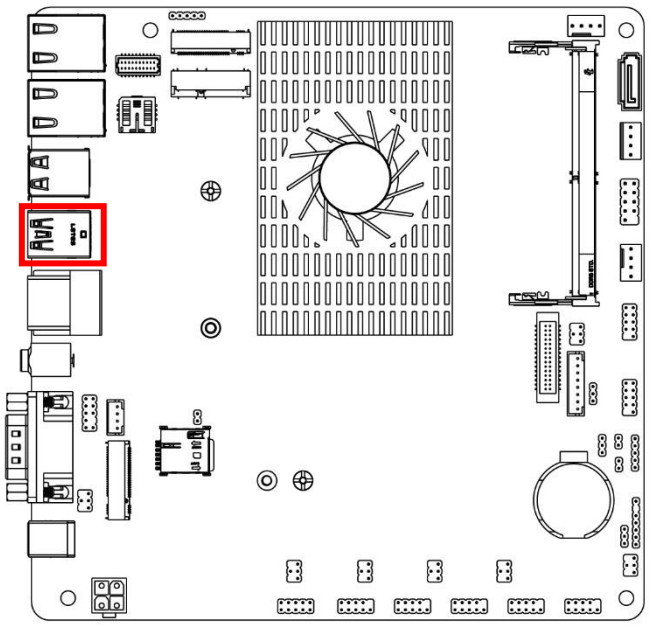
Note: Standard specifications.

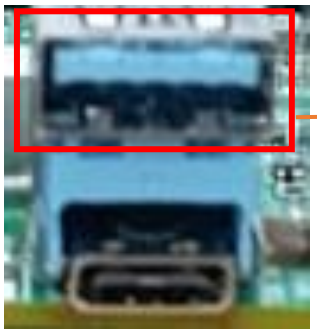
(2) USB2.0 Port Connector X2 (USB2)



Note: Standard specifications.

(3) USB3.2 (Gen.2) Port Connector (USB3)

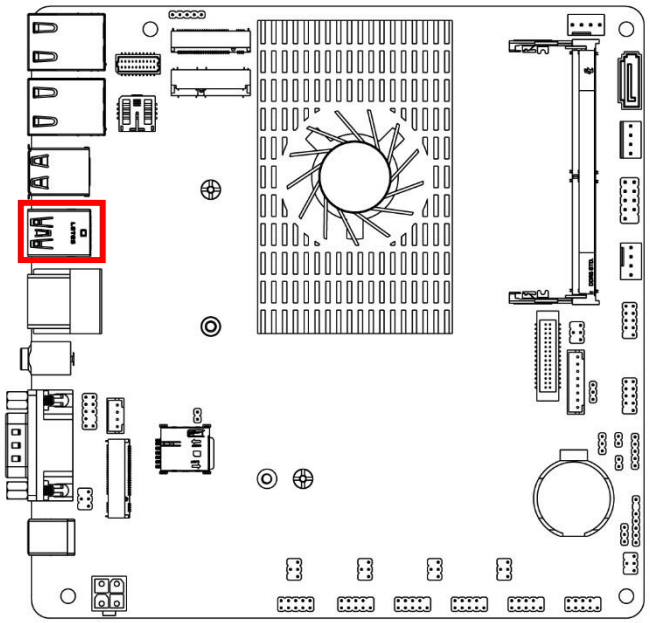


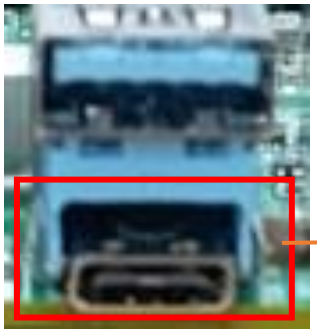


USB3

Note: Standard specifications.

*(4) USB3.2 (Gen.2) Type-C Port Connector *Support ALT Mode (USB1)*

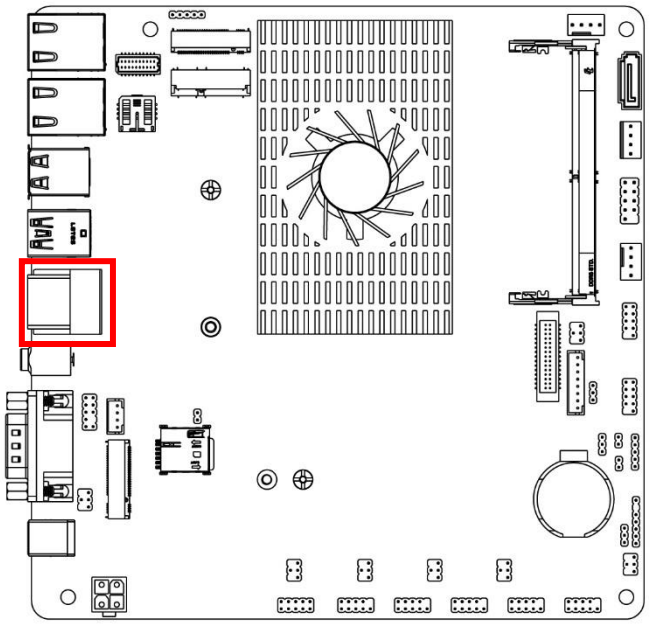




USB1

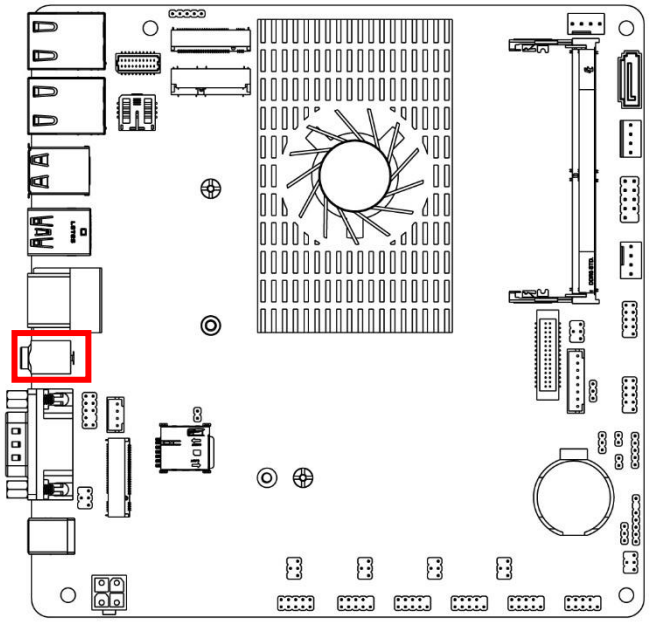
Note: Standard specifications.

(5) HDMI2.0b Port Connector X2 (HDMI1_2)



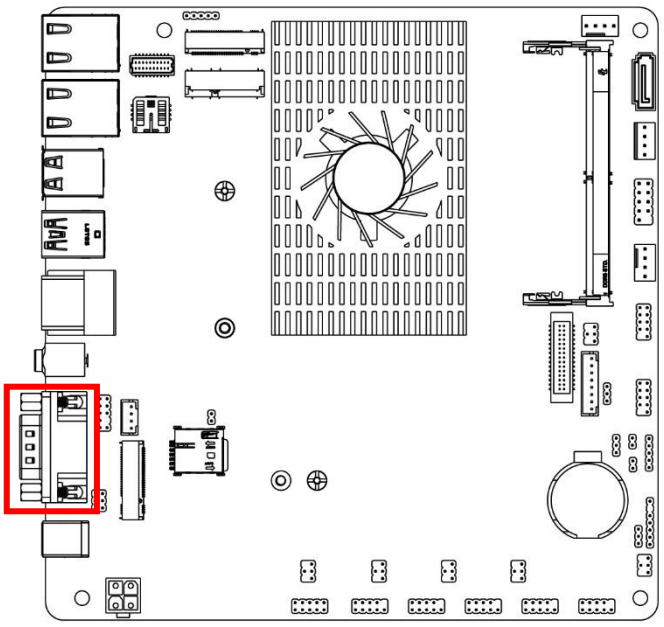
Note: Standard specifications.

(6) Audio Line Out/MIC Combo Connector (AUDIO)



Note: Standard specifications.

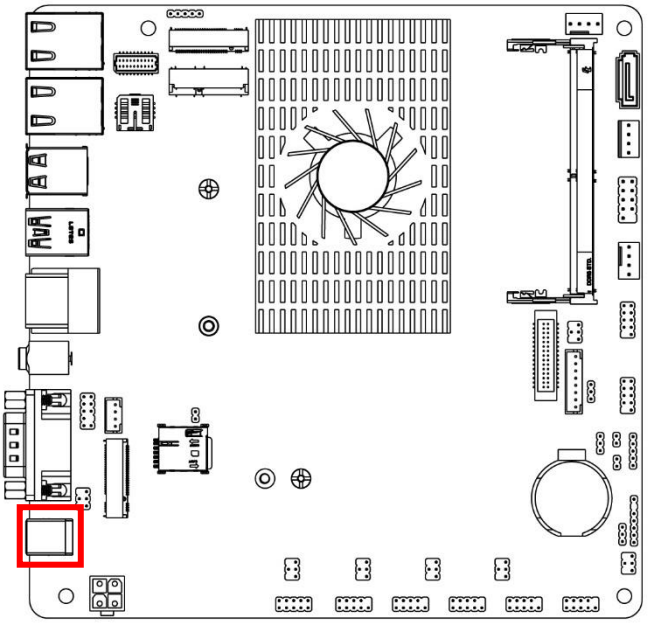
*(7) Serial Port (RS232/422/485) Connector *Support 5V/12V (COM1)*



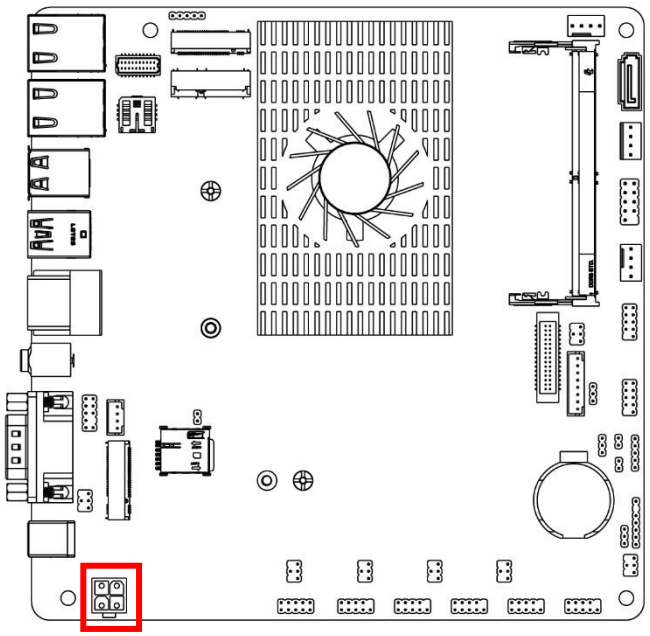
Pin NO.	RS232	*RS422 (optional)	*RS485 (optional)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

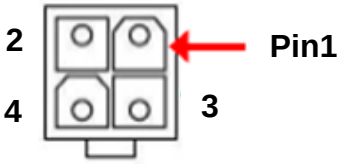
Note: Standard specifications.

(8) 12~28V DC-in Socket Connector (DCIN3)



(9) Internal 4-Pin 12~28V DC-in Power Connector (DCIN2)

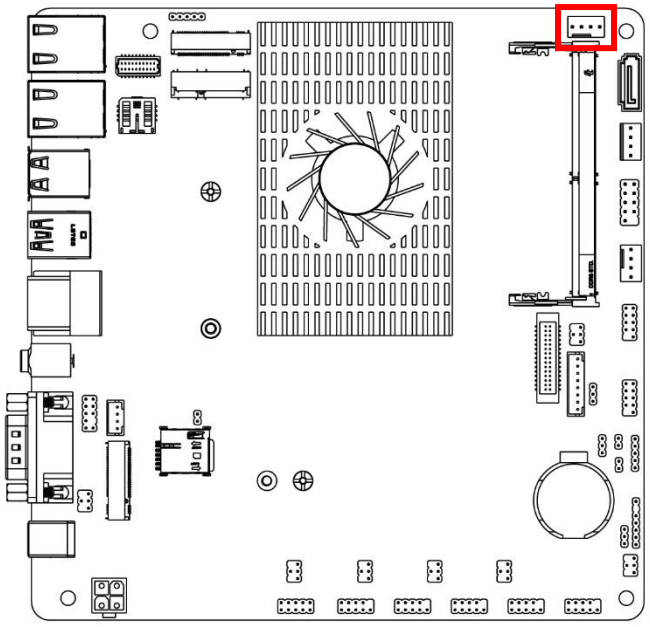


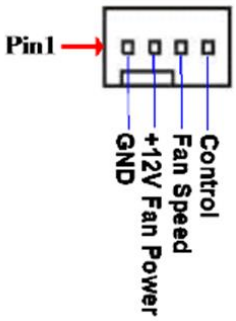


Pin No.	Definition
1	GND
2	GND
3	+12V~28V
4	+12V~28V

Warning! The board has a 12V~28V DC-in power connector **(DCIN1)** on I/O back panel and an internal 12V~28V power connector **(DCIN2)**. User can only connect one type of compatible power supply to one of them to power the system.

(10) CPU FAN Connector (CPUFAN)

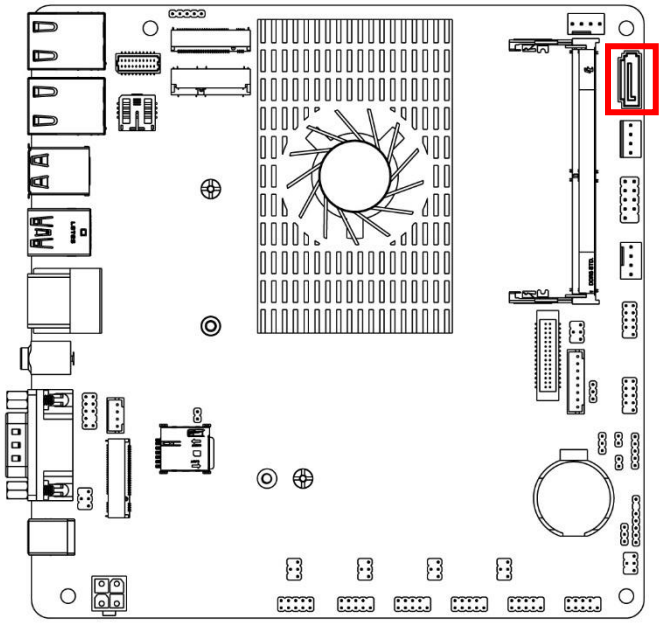




***Note**: **Maximum current limit is 1.5A while using 12V working voltage**

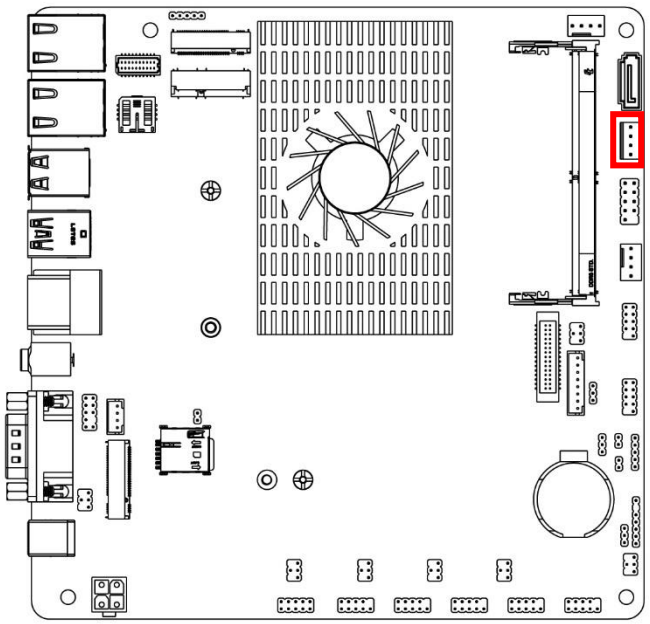
(11) SATAIII Port Connector (SATA1)

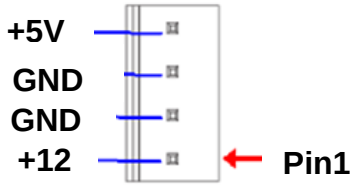
This is a high-speed SATAIII port that supports 6GB/s transfer rate



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

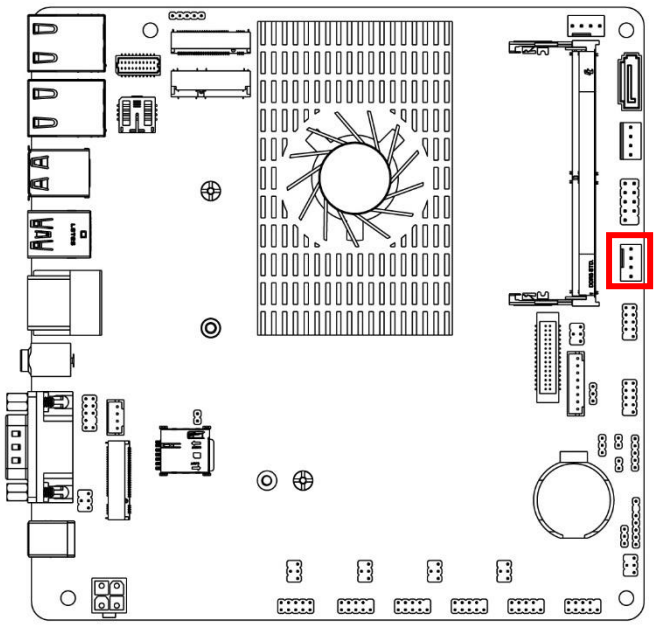
(12) SATA HDD Power-Out Connector (PWROUT)

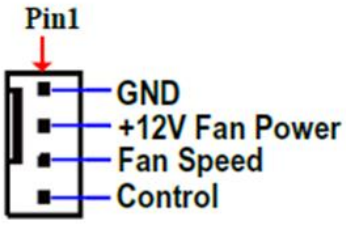




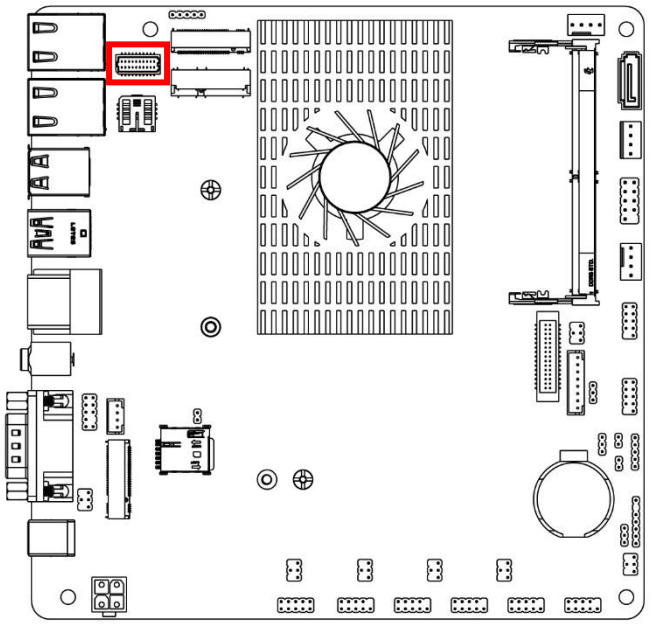
Warning: *Make sure that Pin-1 of compatible SATA Power out connector is inserted into corresponding Pin-1 of* ***SATAPWR*** *connector to avoid possible damage to the board and hard disk driver!*

(13) System FAN Connector (SYSFAN1)

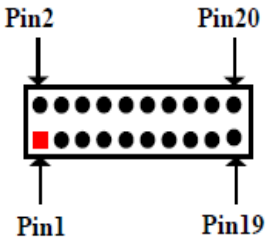




(14) BIOS Flash ROM Update Wafer (REFLASH_CON)

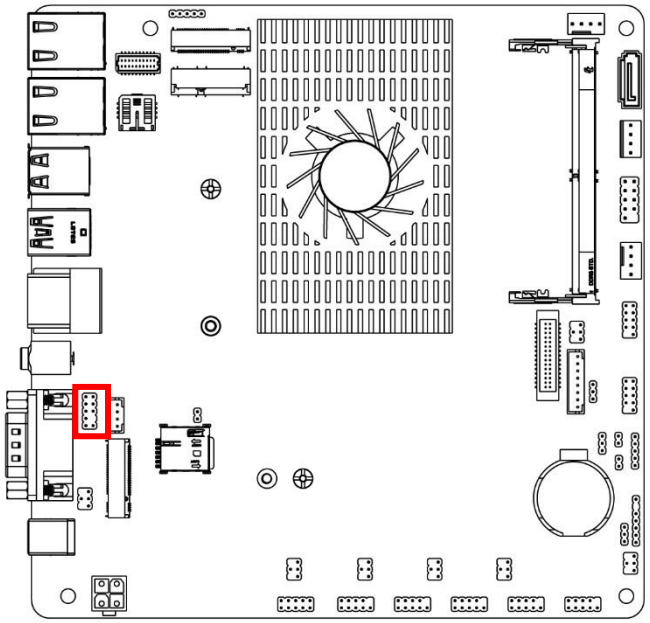


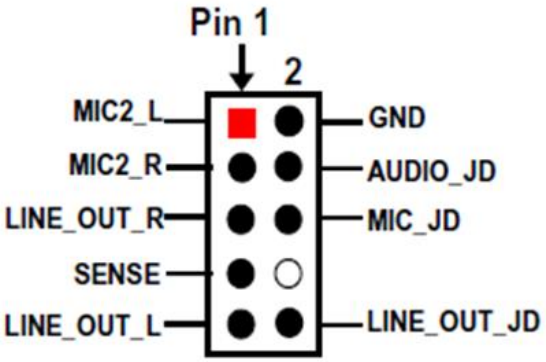
Pin Define	Pin NO.	Pin NO.	Pin Define
GND	Pin 20	Pin 19	SPSW
PCTL-	Pin 18	Pin 17	PCH_SYS_RESRT-
PCH_RSMRST-	Pin 16	Pin 15	GND
SPI_MISO_F	Pin 14	Pin 13	SMBCLK
SPI_MOST_F	Pin 12	Pin 11	SMBDATA
SPI_CLK_F	Pin 10	Pin 9	SPI_CS1-
SPI_CS0-	Pin 8	Pin 7	GND
3VSB	Pin 6	Pin 5	GND
VCC3	Pin 4	Pin 3	GND
ATX_5VSB	Pin 2	Pin 1	5VSB



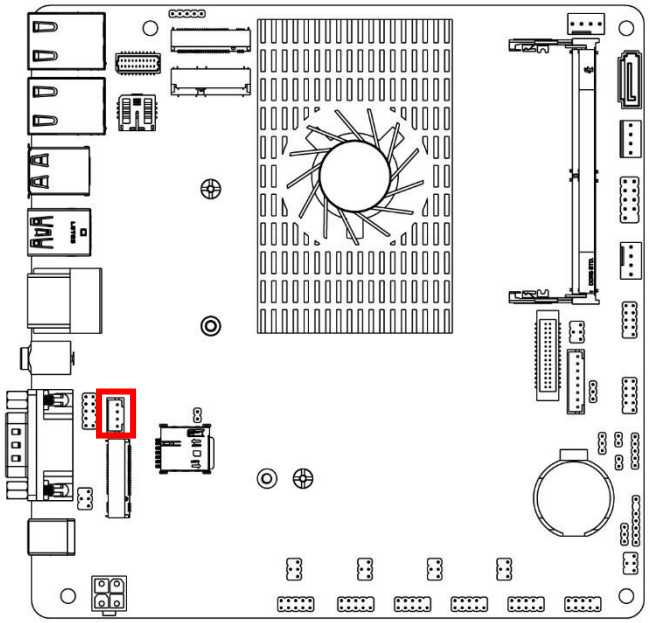
(15) Front Panel Audio Header (FP_AUDIO)

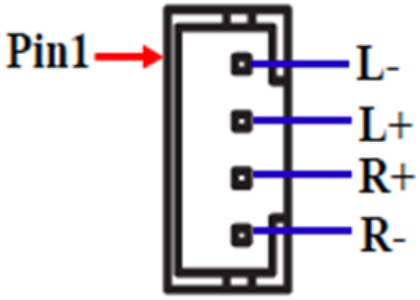
This header connects to Front Panel Line-Out, MIC-In connector with cable



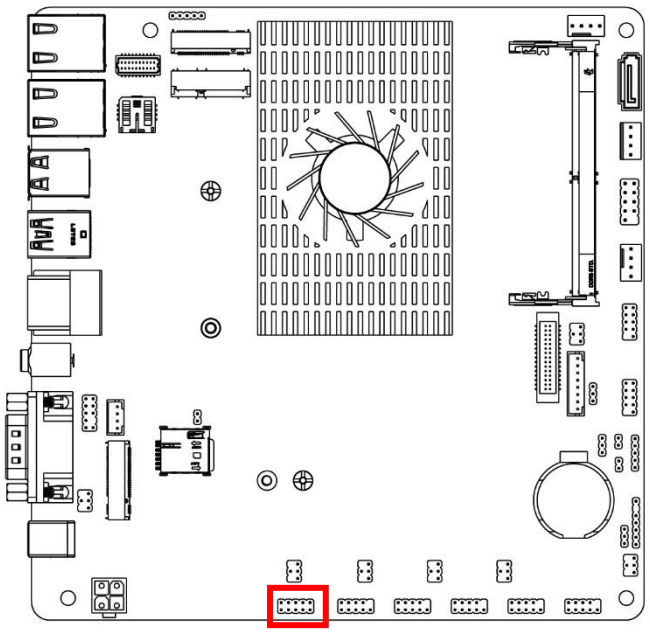


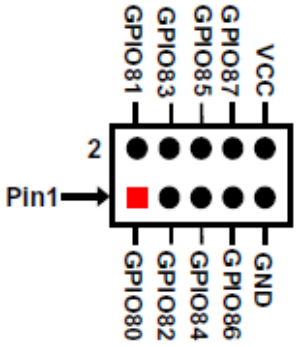
(16) 3W Amplifier Wafer (SPEAK_CON)





(17) GPIO Port Header (GPIO)

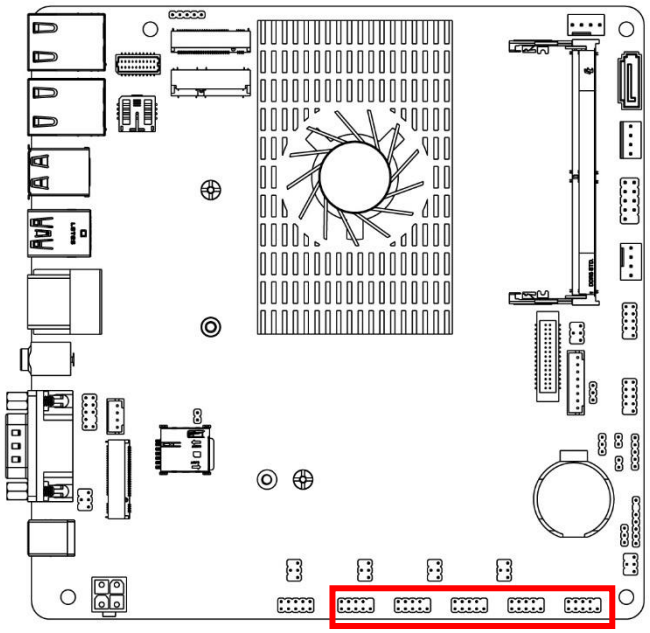


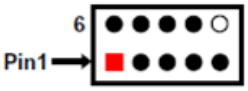


JP80P Open: For 80Port Function;
JP80P Closed: Normal 8-bit GPIO.

***Note**: Maximum current limit is 1A while using 5V working voltage.*

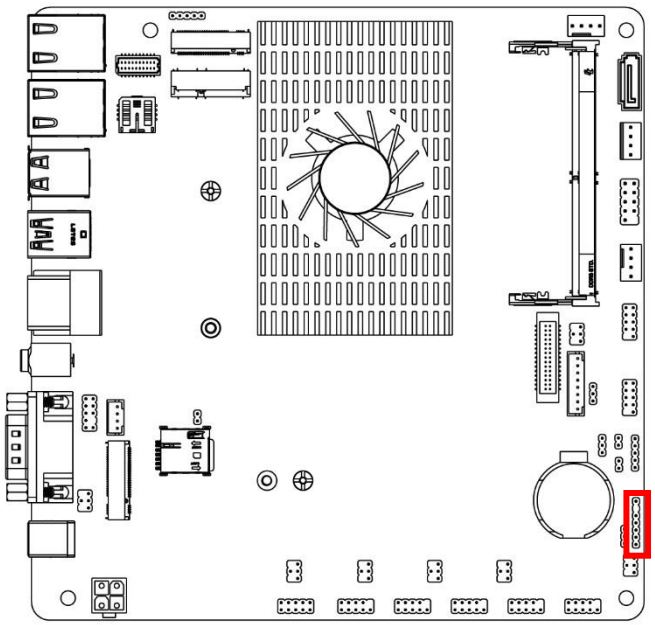
(18) RS232 Serial Port Header (COM2/3/4/5/6)

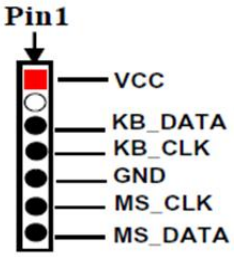




Pin NO.	Pin 6	Pin 7	Pin 8	Pin 9	
RS232	DSR	RTS	CTS	RI	
Pin NO.	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
RS232	DCD	RXD	TXD	DTR	GND

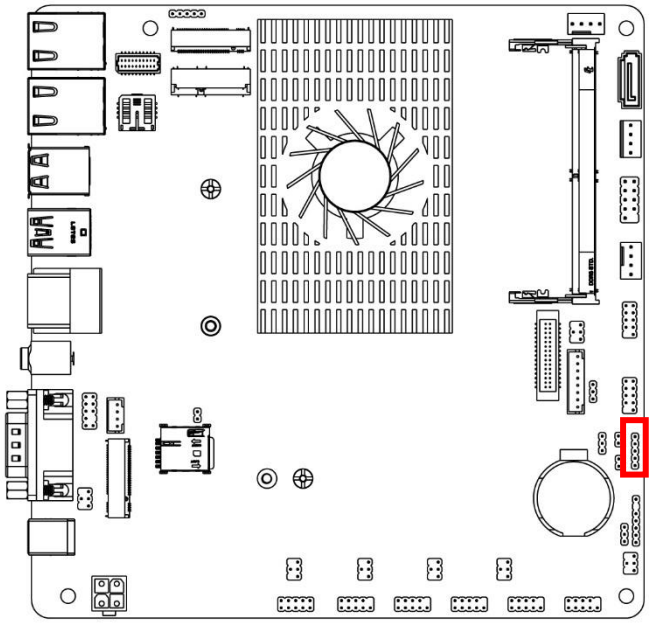
(19) PS/2 Keyboard and Mouse Header (PS2KBMS)

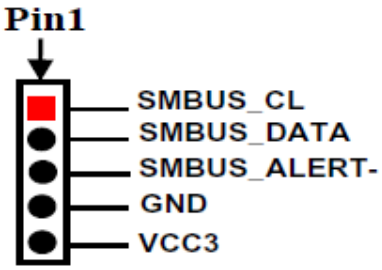




***Note: Maximum current limit is 0.5A while using 5V working voltage.**

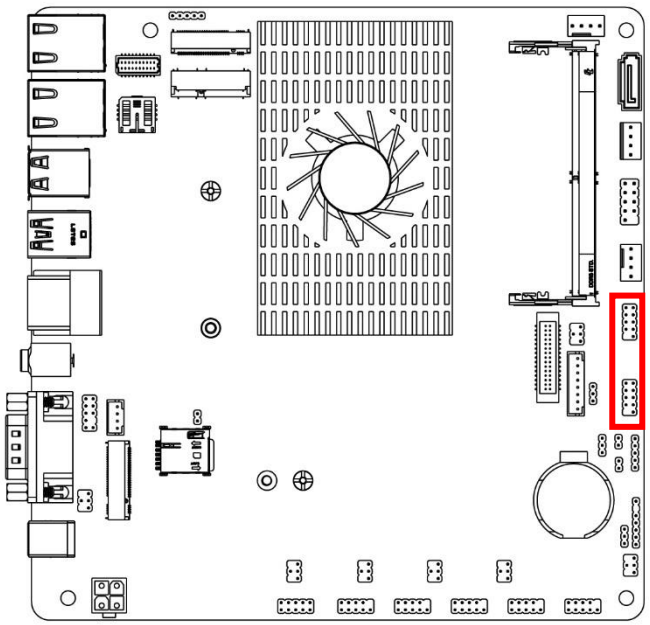
(20) SMBUS Header (SMBUS)

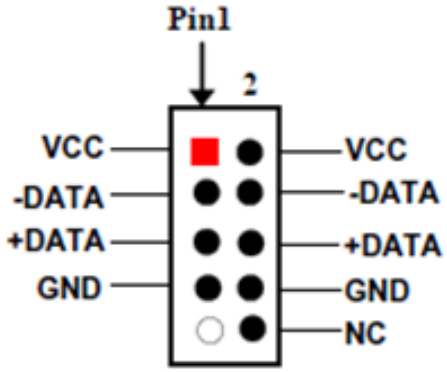




***Note: Maximum current limit is 0.3A while using 5V working voltage.**

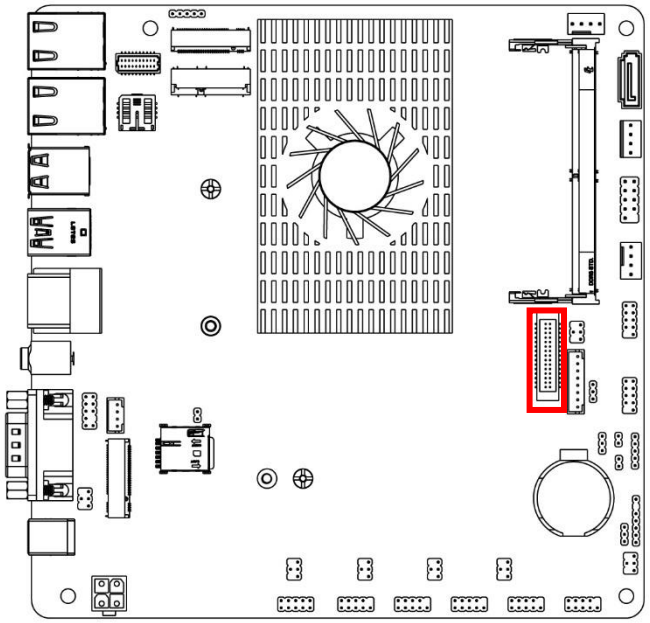
(21) USB2.0 Port Header (FP_USB1/2)



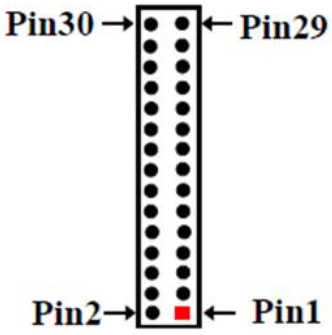


***Note**: Maximum current limit is 1.5A while using 5V working voltage.*

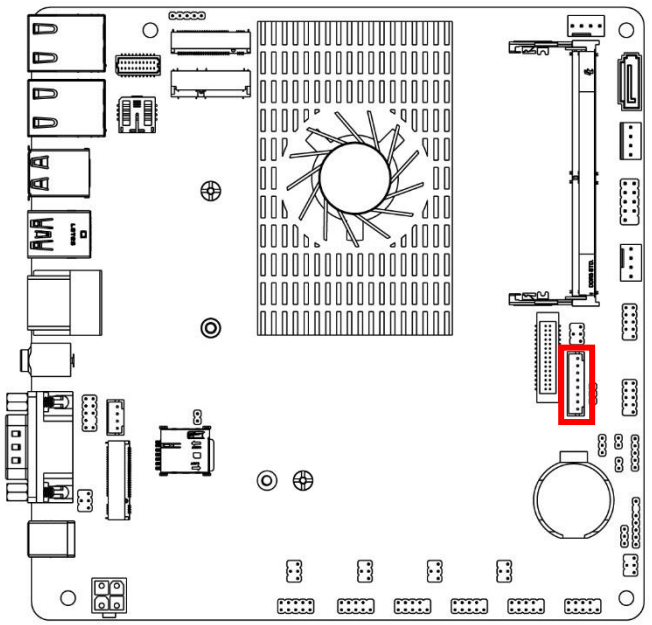
(22) LVDS/EDP Header (LVDS_EDP)

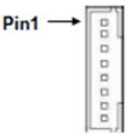


Pin Define	Pin NO.	Pin NO.	Pin Define
LCD_VCC	Pin 30	Pin 29	LCD_VCC
LCD_VCC	Pin 28	Pin 27	LCD_VCC
LVDSA_DATAN0	Pin 26	Pin 25	LVDSA_DATAP0
LVDSA_DATAN1	Pin 24	Pin 23	LVDSA_DATAP1
LVDSA_DATAN2	Pin 22	Pin 21	LVDSA_DATAP2
LVDS_CLKAN	Pin 20	Pin 19	LVDS_CLKAP
LVDSA_DATAN3	Pin 18	Pin 17	LVDSA_DATAP3
GND	Pin 16	Pin 15	GND
GND	Pin 14	Pin 13	GND
LVDS_DDC_SCL	Pin 12	Pin 11	LVDS_DDC_SDA
LVDSB_DATAP0	Pin 10	Pin 9	LVDSB_DATAN0
LVDSB_DATAP1	Pin 8	Pin 7	LVDSB_DATAN1
LVDSB_DATAP2	Pin 6	Pin 5	LVDSB_DATAN2
LVDSB_CLKP	Pin 4	Pin 3	LVDS_CLKBN
LVDSB_DATAP3	Pin 2	Pin 1	LVDSB_DATAN3



(23) LVDS_EDP Inverter Wafer (INVERTER1)

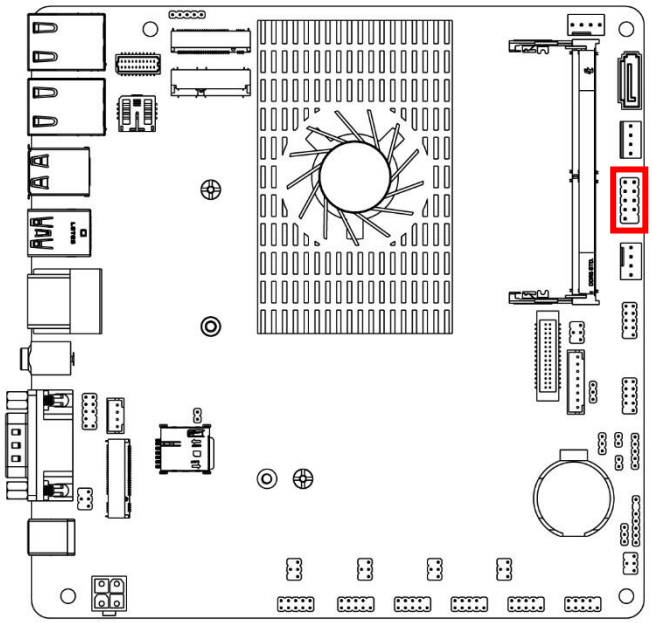


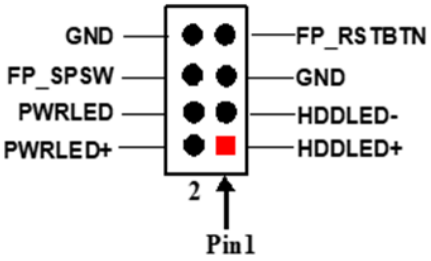


Pin No.	Definition
1	LCD_BKLT_EN
2	LCD_BKLT_PWM
3	Backlight VCC
4	Backlight VCC
5	GND
6	GND
7	BRTNSS_UP
8	BRTNSS_DOWN

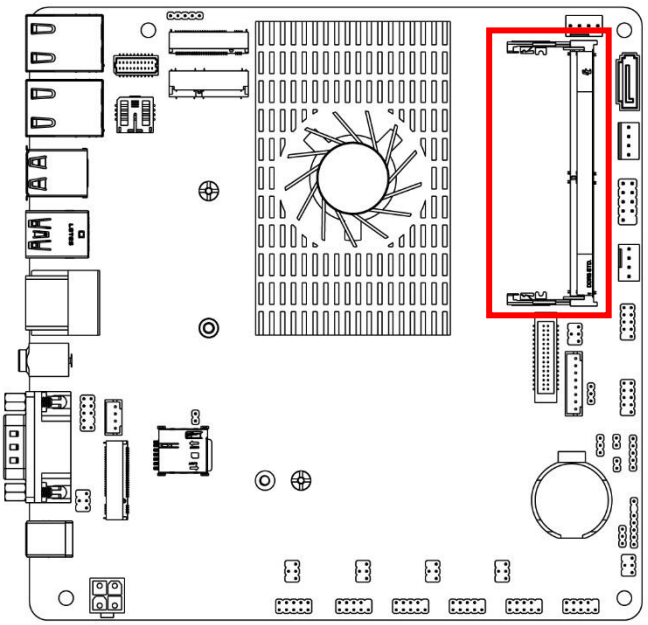
Warning! *Find* ***Pin-1*** *location of the inverter and make sure that the installation direction is correct! Otherwise serious harm will occur to the board/display panel!!*

(24) Front Panel Header(PWR LED/HDD LED/Power Button/Reset)(FP)



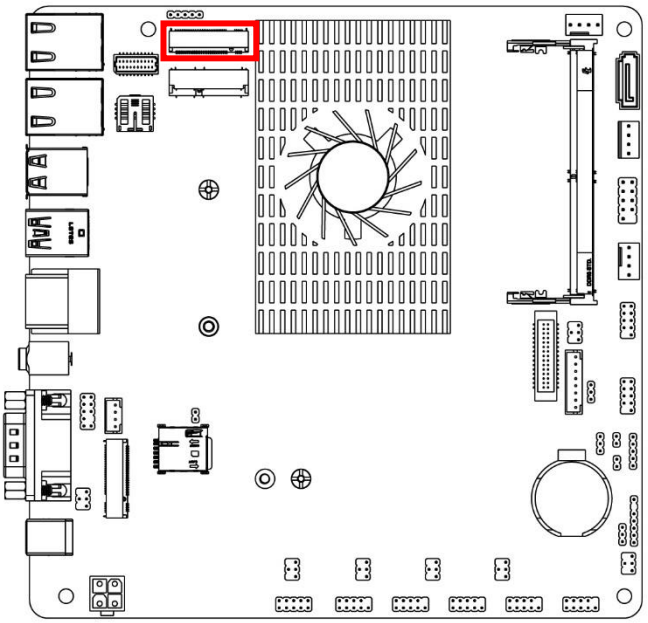


(25) DDR5 SODIMM Socket (SODIMM1)



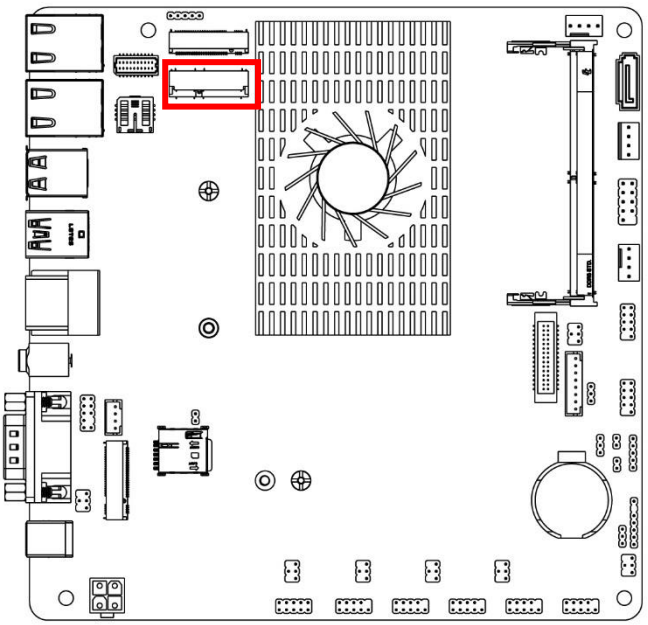
Note: Standard specifications.

(26) M.2 2242/2280 Key M Socket (M2M1)



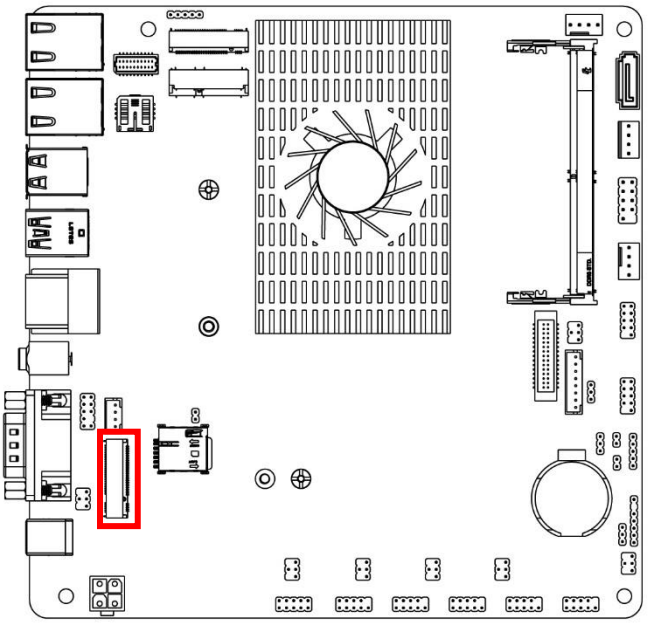
Note: Standard specifications.

(27) M.2 2230 Key E Socket (M2E1)



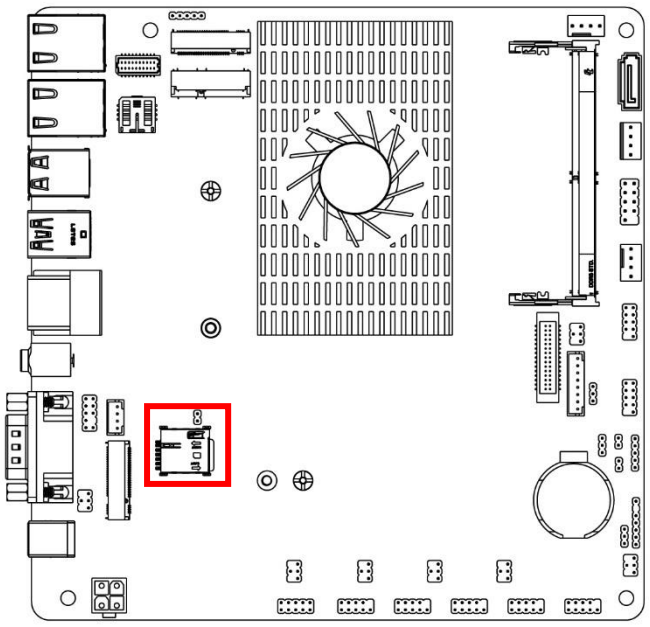
Note: Standard specifications.

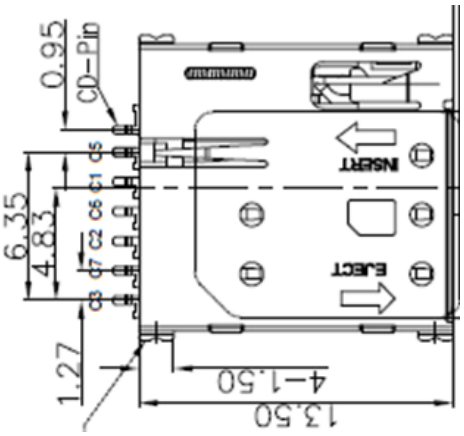
(28) M.2 2242/3052 Key B Socket (M2B1)



Note: Standard specifications.

(29) DDR5 SODIMM Socket Up (SODIMM1)





Note: Standard specifications.

2-5 Maximum Voltage & Current Limit

Below is a list of maximum voltage & Current Limit specification for motherboard interface (including but not limited to slots, connectors and headers) for setup reference:

Parts		Working Voltage	Current Support
USB Port From	USB1	5V	900mA
	USB2	5V/12V	500mA x2
	USB3(Type-C ALT)	5V	3A
	FP_USB1	5V	1.5A
	FP_USB2	5V	1.5A
FP		5V	1A
LVDS/EDP		3.3V/5V/12V (via jumper setting)	2A
INVERTER1		5V/12V/Adapter VCC (via jumper setting)	2A
LVDS/EDP1		5V/12V/Adapter VCC (via jumper setting)	2A
CPUFAN1		12V	1.5A
SATAPWR		5V	1A
GPIO		5V	1A
PS2KBMS		5V	0.5A
SMBUS		5V	0.3A

Chapter 3 Introducing BIOS

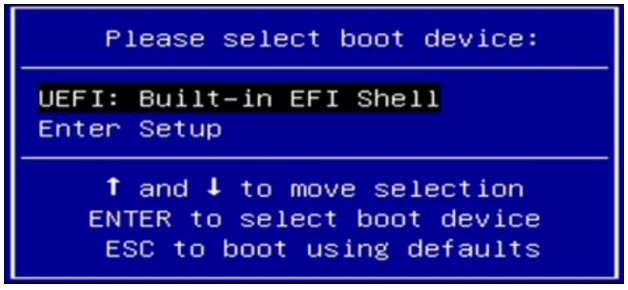
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup.
If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

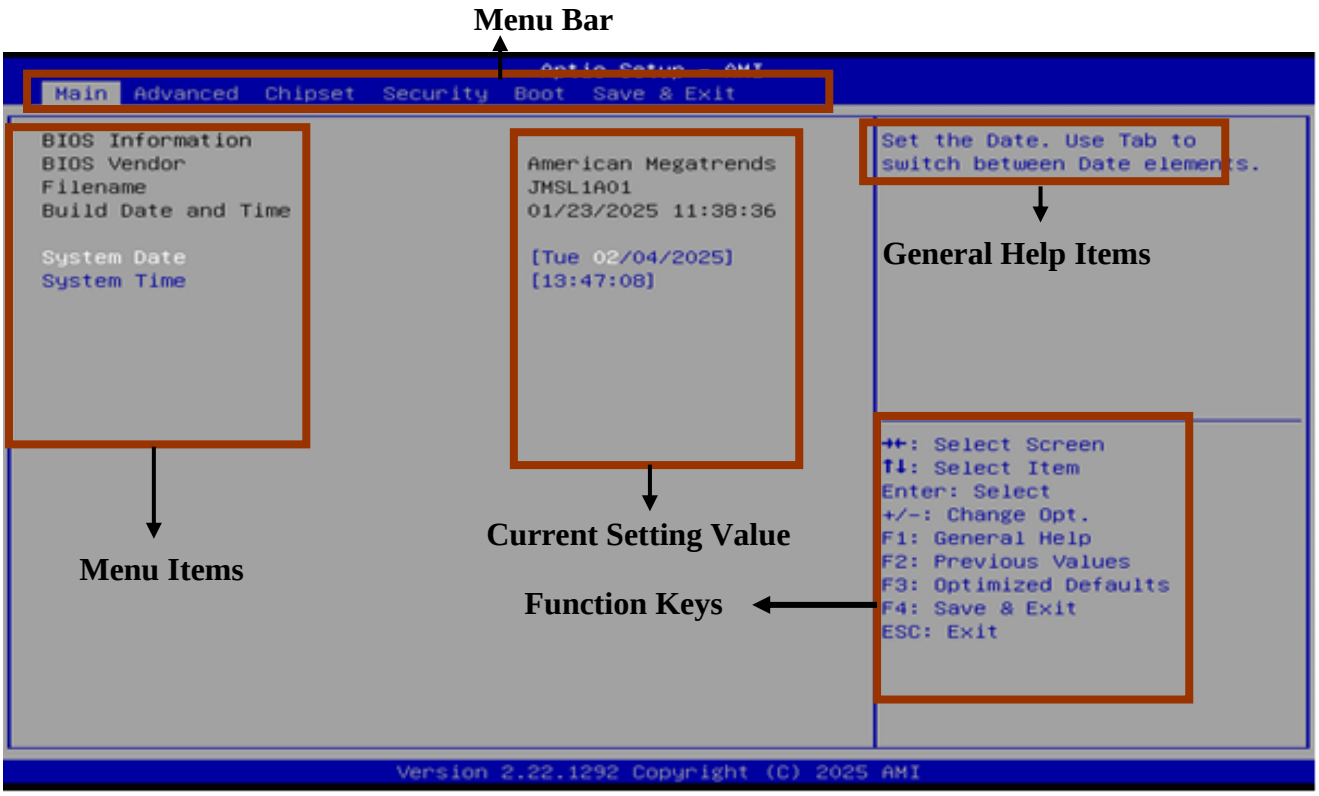
Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.



BIOS Boot Menu Screen (boot device options please refer to actual configuration)

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen.
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press 【F1】 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

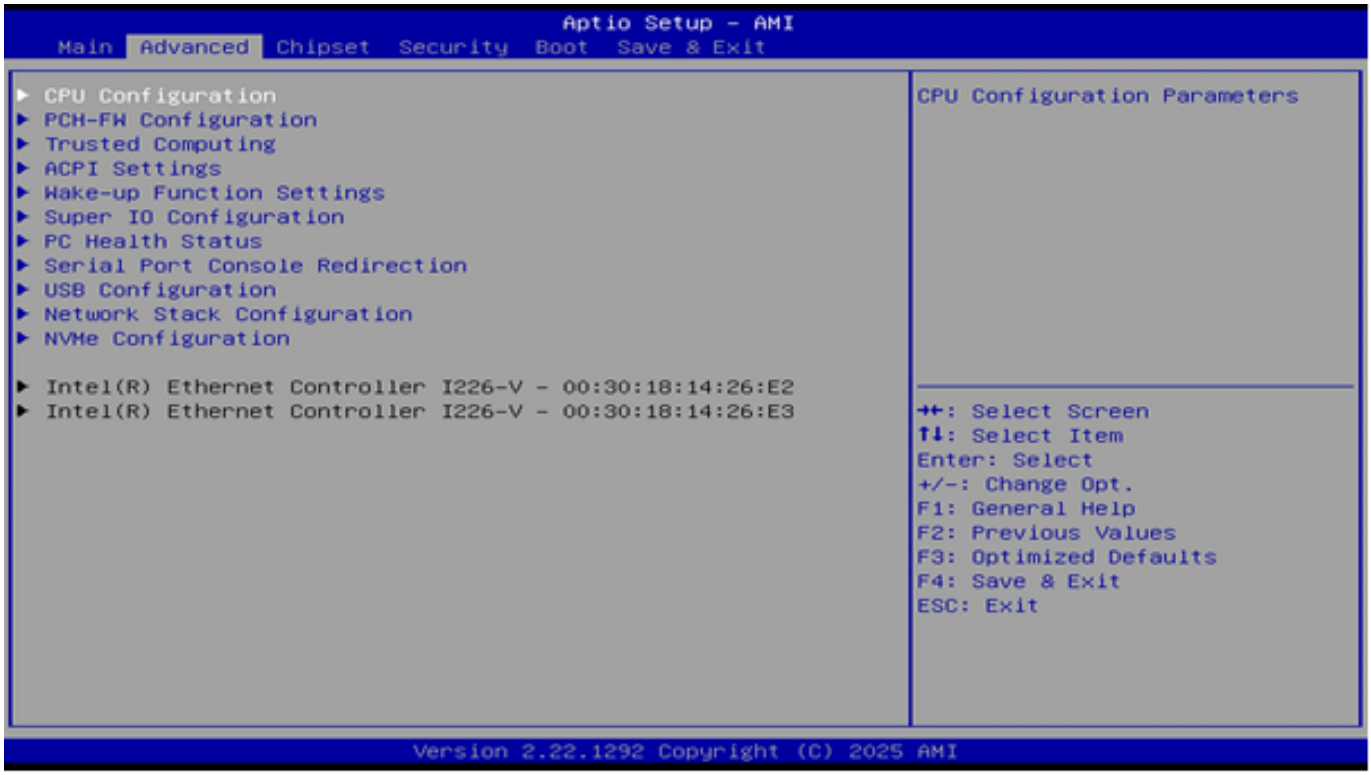
System Date

Set the date. Please use [Tab] to switch between date elements.

System Time

Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



► **CPU Configuration**

Press [Enter] to view current CPU configuration and make settings for the following sub-items:

Intel(R) SpeedStep(tm)

Use this item to allows more than two frequency ranges to be supported

The optional settings: [Disabled]; [Enabled]
Intel(R) SpeedStep(tm) Set the default value to: [Enabled]

Turbo Mode

Use this item to enable/disable processor turbo mode (requires EMTTM enabled too). AUTO means enabled.

The optional settings: [Disabled]; [Enabled]
Turbo Mode Set the default value to: [Enabled]

C-States

Use this item to enable or disable C-State.

The optional settings: [Disabled]; [Enabled].
C states Set the default value to: [Enabled]

► **PCH-FW Configuration**

Use this item to configure management engine technology parameters

Press [Enter] to make settings for the following sub-items:

TPM Device Selection

Use this item to selects TPM device: PTT or dTPM. PTT-Enables PTT in SKuMgr dTPM 1.2-Disables PTT in SKuMgr Warning! PTT/dTPM will be disabled and all date saved on it will be

lost.

The optional settings: [dTPM]; [PTT].

TPM Device Selection Set the default value to: [PTT]

- **Firmware Update Configuration**

  Use this item to enable/disable Me FW Image Re-Flash function.

  The optional settings: [Disabled]; [Enabled].

  Me FW Image Re-Flash Selection Set the default value to: [Disabled]

► **Trusted Computing**

Press [Enter] to enable or disable '**Security Device Support**'.

Security Device Support

Use this item to enable or disable BIOS support for security device.o.s. will not show security device. TCG EFI protocol and INT1A interface will not be available

The optional settings: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

Active PCR Banks

Available PCR Banks

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank

The optional settings are: [Disabled]; [Enabled]

SHA256 PCR Bank Set the default value to: [Enabled]

SHA384 PCR Bank

Use this item to enable or disable SHA384 PCR Bank

The optional settings are: [Disabled]; [Enabled]

SHA384 PCR Bank Set the default value to: [Disabled]

SM3_256 PCR Bank

Use this item to enable or disable SM3_256 PCR Bank

The optional settings are: [Disabled]; [Enabled]

SM3_256 PCR Bank Set the default value to: [Disabled]

Pending Operation

Use this item to schedule an operation for the security device.

NOTE: Your computer will reboot during restart in order to change state of security device

The optional settings are: [None]; [TPM Clear]

Pending Operation Set the default value to: [None]

► **ACPI Settings**

Press [Enter] to make settings for the following sub-items:

ACPI Settings

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.

The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].
ACPI Sleep State Set the default value to: [S3 (Suspend to RAM)]

- **Wake-up Function Settings**

Wake-up System With Fixed Time

This item will only show when* *'Wake-up System with Dynamic Time'*** *is set as [Disabled].*

Use this item to enable or disable system wake-up by RTC alarm. When this function is enabled, system will wake on the time (hr::min::sec) specified.

The optional settings: [Disabled]; [Enabled].
Wake-up System With Fixed Time Set the default value to: [Disabled]
When set as [Enabled], user can make settings in the following items that appear:

Wake-up Hour

Use this item to select 0-23 for example enter 3 for 3am and 15 for 3pm.

Wake-up Hour Set the default value to: [0]

Wake-up Minute

Use this item to select 0-59.

Wake-up Minute Set the default value to: [0]

Wake-up Second

Use this item to select 0-59.

Wake-up Second Set the default value to: [0]

Wake-up System with Dynamic Time

This item will only show when* *'Wake-up System with Fixed Time'*** *is set as [Disabled].*

Use this item to enable or disable system wake-up by RTC alarm. When enabled, system will wake on the current time + Increase minute(s).

Wake-up System with Dynamic Time Set the default value to: [Disabled]
When set as [Enabled], user can make settings in the following items that appear:

Wake-up Minute Increase

Use this item to select 1-60 minute(s).

Wake-up Minute Increase Set the default value to: [1]

PS2 KB/MS Wake-Up

Use this item to enable or disable PS2 KB/MS Wake-Up from (S3/S4/S5) support only disable ERP function.

Please disable ERP before activating this function in S4-S5
The optional settings: [Disabled]; [Enabled].
PS2 KB/MS Wake-Up Set the default value to: [Disabled]

PCIE Wake-up from S3-S5

The optional settings: [Disabled]; [Enabled].
PCIE Wake-up from S3-S5 Set the default value to: [Disabled]

USB S3/S4 Wake-up

Use this item to enable or disable USB S3/S4 Wake-up support only disable ERP function.
The optional settings: [Disabled]; [Enabled].
USB S3/S4 Wake-up Set the default value to: [Disabled]

USB S5 Power

Use this item to USB power after system shutdown support only disable ERP function.
The optional settings: [Disabled]; [Enabled]
USB S5 Power Set the default value to: [Enabled]

► **Super I/O Configuration**

Press [Enter] to make settings for the following sub-items:

Super IO Configuration

ERP Support

Use this item to energy-related products function. Disable ERP to active all wake-up functions.
The optional settings are: [Disabled]; [Enabled].
ERP Support Set the default value to: [Disabled]

► **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).
The optional settings are: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.
The optional settings are: [IO=3F8h; IRQ=4]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]
Change Settings Set the default value to: [IO=3F8h; IRQ=4]

Transmission Mode Select

The optional settings are: [RS422]; [RS232]; [RS485].
Transmission Mode Select Set the default value to: [RS232]

Mode Speed Select

The optional settings are: [RS232/RS422/RS485=250kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].
Mode Speed Select Set the default value to: [RS232=1Mbps, RS422/RS485=10Mbps]

► **Serial Port 2 Configuration**

Press [Enter] to make settings for the following sub-items:

Serial Port

Use this item to enable or disable serial port (COM).
The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [IO=2F8h; IRQ=3]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]

Change Settings Set the default value to: [IO=2F8h; IRQ=3]

- **Serial Port 3 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [IO=3E8h; IRQ=10]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]; [IO=3E0h; IRQ=3,4,5,7,10,11]; [IO=2E0h; IRQ=3,4,5,7,10,11]

Change Settings Set the default value to: [IO=3E8h; IRQ=10]

- **Serial Port 4 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [IO=2E8h; IRQ=10]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]; [IO=3E0h; IRQ=3,4,5,7,10,11]; [IO=2E0h; IRQ=3,4,5,7,10,11]

Change Settings Set the default value to: [IO=2E8h; IRQ=10]

- **Serial Port 5 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [IO=3F0h; IRQ=11]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]; [IO=3E0h; IRQ=3,4,5,7,10,11]; [IO=2E0h; IRQ=3,4,5,7,10,11]

Change Settings Set the default value to: [IO=3E0h; IRQ=11]

- **Serial Port 6 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [IO=2F0h; IRQ=11]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]; [IO=3E0h; IRQ=3,4,5,7,10,11]; [IO=2E0h; IRQ=3,4,5,7,10,11]

Change Settings Set the default value to: [IO=2E0h; IRQ=11]

WatchDog Reset Timer

Use this item to enable or disable WDT reset function. When set as [Enabled], the following sub-items shall appear:

WatchDog Reset Timer Value

User can select a value in the range of [10] to [255] seconds when '**WatchDog Reset Timer Unit**' set as [Sec]; or in the range of [1] to [255] minutes when '**WatchDog Reset Timer Unit**' set as [Min].

WatchDog Reset Timer Value Set the default value to: [10]

WatchDog Reset Timer Unit

The optional settings are: [Sec.]; [Min.].

WatchDog Reset Timer Unit Set the default value to: [Sec.]

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (refer to JAT_ATX jumper setting Pin 1&2 of for ATX Mode & Pin 2&3 of AT Mode Select).

Case Open Detect

Use this item to detect case has already open or not, show message in POST.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], system will detect if COPEN has been short or not (refer to COPEN

jumper setting for Case Open Detection); if Pin 1&2 of COPEN are short, system will show Case Open Message during POST

Case Open Detect Set the default value to: [Disabled]

► **PC Health Status**

Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**'.

► **SmartFAN Configuration**

Press [Enter] to make settings for SmartFan Configuration:

SmartFAN Configuration

CPUFAN1 Smart Mode

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

CPUFAN1 Full-Speed Temperature

Use this item to set CPUFAN1 full speed temperature. Fan will run at full speed when above this pre-set temperature.

CPUFAN1 Full-Speed Temperature Set the default value to: [75]

CPUFAN1 Full-Speed Duty

Use this item to set CPUFAN1 full-speed duty. Fan will run at full speed when above this pre-set duty.

CPUFAN1 Full-Speed Duty Set the default value to: [100]

CPUFAN1 Idle-Speed Temperature

Use this item to set CPUFAN1 idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

CPUFAN1 Idle-Speed Temperature Set the default value to: [40]

CPUFAN1 Idle-Speed Duty

Use this item to set CPUFAN1 idle speed duty. Fan will run at idle speed when below this pre-set duty

CPUFAN1 Idle-Speed Duty Set the default value to: [60]

SYSFAN1 Smart Mode

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

SYSFAN1 Full-Speed Temperature

Use this item to set SYSFAN1 full speed temperature. Fan will run at full speed when above this pre-set temperature.

SYSFAN1 Full-Speed Temperature Set the default value to: [60]

SYSFAN1 Full-Speed Duty

Use this item to set SYSFAN1 full-speed duty. Fan will run at full speed when above this pre-set

duty.

SYSFAN1 Full-Speed Duty Set the default value to: [100]

SYSFAN1 Idle-Speed Temperature

Use this item to set SYSFAN1 idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

SYSFAN1 Idle-Speed Temperature Set the default value to:[30]

SYSFAN1 Idle-Speed Duty

Use this item to set SYSFAN1 idle speed duty. Fan will run at idle speed when below this pre-set duty

SYSFAN1 Idle-Speed Duty Set the default value to:[60]

- **Serial Port Console Redirection**

COM1

Console Redirection

The optional settings: [Disabled]; [Enabled].

Console Redirection Set the default value to: [Disabled]

When set as [Enabled], the following sub-items shall appear:

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following items:

COM1

Console Redirection Settings

Terminal Type

The optional settings: [VT100]; [VT100Plus]; [VT-UTF8]; [ANSI].

[ANSI]: Extended ASCII char set;

[VT100]: ASCII char set;

[VT100Plus]: Extends VT100 to support color, function keys, etc.

[VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

Terminal Type Set the default value to: [ANSI]

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].

Bits per second Set the default value to: [115200]

Data Bits

The optional settings: [7]; [8].

Data Bits Set the default value to: [8]

Parity

A parity bit can be sent with the data bits to detect some transmission errors.

The optional settings: [None]; [Even]; [Odd]; [Mark]; [Space].

Even: parity bit is 0 if the data bits is odd; Odd: parity bit is 0 if num of 1's in the data bits is odd; Mark: parity bit is always 1; Space: Parity bit is always 0; Mark and Space Parity do not allow for error detection.

Parity Set the default value to: [Space]

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

The optional settings: [1]; [2].

Stop Bits Set the default value to: [1]

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings: [None]; [Hardware RTS/CTS].

Flow Control Set the default value to: [None]

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

The optional settings: [Disabled]; [Enabled].

VT-UTF8 Combo Key Support Set the default value to: [Enabled]

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.

The optional settings: [Disabled]; [Enabled].

Recorder Mode Set the default value to: [Disabled]

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

The optional settings: [Disabled]; [Enabled].

Resolution 100x31 Set the default value to: [Disabled]

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [Linux]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Putty KeyPad Set the default value to: [VT100]

Serial Port for Out-of-Band Management/

Windows Emergency Management Services (EMS)

Console Redirection

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following items:

Out-of-Band Mgmt Port

The optional setting is: [COM1].

Terminal Type

The optional settings: [VT100]; [VT100Plus]; [VT-UTF8]; [ANSI].

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in console redirection settings page, for more help with terminal type/emulation.

Terminal Type EMS Set the default value to: [VT-UTF8]

Bits per second EMS

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [57600]; [115200].

Bits per second EMS Set the default value to: [115200]

Flow Control EMS

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Flow Control EMS Set the default value to: [None]

Data Bits EMS

The default setting is: [8].

**This item may or may not show up, depending on different configuration.*

Parity EMS

The default setting is: [None].

**This item may or may not show up, depending on different configuration.*

Stop Bits EMS

The default setting is: [1].

**This item may or may not show up, depending on different configuration.*

- **USB Configuration**

Press [Enter] to make settings for the following sub-items:

USB Configuration

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

The optional settings are: [Enabled]; [Disabled].

XHCI Hand-off Set the default value to: [Disabled].

USB Mass Storage Driver Support

The optional settings are: [Disabled]; [Enabled].

USB Mass Storage Driver Support Set the default value to: [Enabled].

USB Hardware Delays and Time-outs:

USB Transfer Time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

USB Transfer time-out Set the default value to: [20 sec]

Device Reset Time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device reset time-out Set the default value to: [20 sec]

Device Power-up Delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

The optional settings: [Auto]; [Manual].

Device power-up delay Set the default value to: [Auto]

Select **[Manual]** you can set value for the following sub-item: '**Device power-up delay in seconds**'**,** the delay range is 1 .. 40 seconds, in one second increments.

- **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.

Network Stack

The optional settings are: [Enabled]; [Disabled].

Network Stack Set the default value to: [Disabled]

When set as [Enabled], the following sub-items shall appear:

Ipv4 PXE Support

The optional settings are: [Disabled]; [Enabled].

IPv4 PXE Support Set the default value to: [Enabled]

Ipv6 PXE Support

The optional settings are: [Disabled]; [Enabled].

IPv6 PXE Support Set the default value to: [Disabled]

PXE Boot Wait Time

Wait time in seconds to press [ESC] key to abort the PXE boot.

Use either [+]/[-] or numeric keys to set the value.

PXE boot wait time Set the default value to: [5]

Media Detect Count

Use this item to set number of times presence of media will be checked.
Use either [+]/[-] or numeric keys to set the value.
Media detect count Set the default value to: [5]

- **NVMe Configuration**

  Use this item to set NVMe Device options settings.

  NVMe Configuration

- **Intel(R) Ethernet Controller I226-V-XX:XX:XX:XX:XX:XX**
- **Intel(R) Ethernet Controller I226-V -XX:XX:XX:XX:XX:XX**

3-8 Chipset Menu

- **System Agent (SA) Configuration**

  Press [Enter] to make settings for the following sub-items:

  - **Maximum Memory Frequency**

  Use this item to Maximum Memory Frequency selections in Mhz
  The optional settings are: [Auto];[4000]; [4200]; [4400]; [4600]; [4800].
  Maximum Memory Frequency Set the default value to: [Auto].

  Memory Frequency

  Total Memory

  GTT Size

  Use this item to select the GTT size
  The optional settings are: [2MB]; [4MB]; [8MB].
  GTT Size Set the default value to: [8MB]

  DVMT Pre-Allocated

  Use this item to select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.
  The optional settings are: [32M]; [64M]; [96M]; [128M]; [160M]
  DVMT Pre-Allocated Set the default value to: [128M]

  Active LVDS/eDP

  Use this item to select the active configuration
  The optional settings are: [Disabled]; [Enabled]
  Active LFP Set the default value to: [Disabled]

  Panel Type

  The optional settings are: [800x480 1ch 18-bit]; [800x600 1ch 18-bit]; [800x600 1ch 24-bit]; [1024x600 1ch 18-bit]; [1024x768 1ch 18-bit]; [1024x768 1ch 24-bit]; [1280x800 1ch 18-bit]; [1280x800 1ch 24-bit]; [1366x768 1ch 18-bit]; [1366x768 1ch 24-bit]; [1440x900 2ch 18-bit];

[1440x900 2ch 24-bit]; [1280x1024 2ch 24-bit]; [1680x1050 2ch 24-bit]; [1920x1080 2ch 24-bit]; [eDP].

Panel Type Set the default value to: [eDP]

Backlight Control

Use this item to make back light control setting.

The optional settings are: [PWM Inverted]; [PWM Normal].

Backlight Control Set the default value to: [PWM Normal]

► **PCH-IO Configuration**

Press [Enter] to make settings for the following sub-items:

SATA Controller(s)

Use this item to enable or disable SATA device.

The optional settings: [Disabled]; [Enabled].

SATA Controller(s) Set the default value to: [Enabled]

When set as **[Enabled]**, the following sub-items shall appear:

SATA Mode Selection

This item determines how SATA controller(s) operate.

The optional settings: [AHCI].

SATA Mode Selection Set the default value to: [AHCI].

M.2

Port

The optional settings: [Disabled]; [Enabled].

M.2 Set the default value to: [Enabled].

SATA1

Port

The optional settings: [Disabled]; [Enabled].

SATA1 Set the default value to: [Enabled].

HD Audio

This item controls detection of the HD-Audio device.

The optional settings are: [Disabled]; [Enabled].

[**Disabled**]: HDA will be unconditionally disabled.

[**Enabled**]: HAD will be unconditionally enabled.

HD Audio Set the default value to: [Enabled].

eMMC Controller(Option)

Use this item to enable or disable eMMC controller

The optional settings are: [Disabled]; [Enabled].

eMMC Controller(Option) Set the default value to: [Enabled].

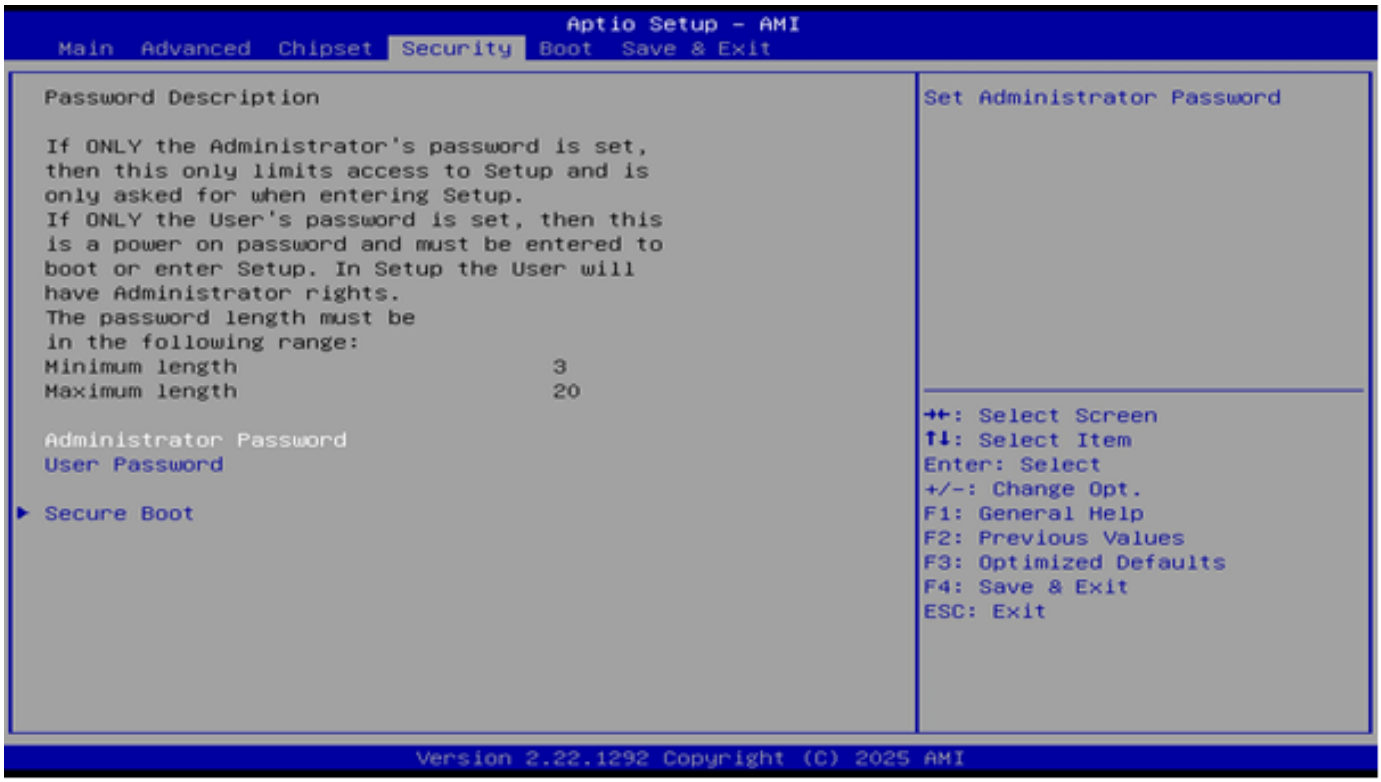
System State After Power Failure

Use this item to specify what state to go to when power is re-applied after a power failure (G3 state)

The optional settings are: [Always On]; [Always Off]; [Former State].

System State After Power Failure Set the default value to: [Always Off]

3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new user password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new user password.

- **Secure Boot**

  Press [Enter] to make customized secure settings:

  Secure Boot

  Secure Boot feature is active if Secure Boot is enabled, Platform Key (PK) is enrolled and the system is in User mode. The mode change requires platform reset.

  The optional settings are: [Disabled]; [Enabled]

  Secure Boot Mode

  The optional settings are: [Standard]; [Custom].

  Set UEFI Secure Boot Mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.

  **When set as [Custom], user can make further settings in 'Key Management'.*

  - **Restore Factory Keys**

    Use this item to force system to User Mode, to install factory default Secure Boot key databases.

  - **Reset To Setup Mode**

    Use this item to delete all Secure Boot Key databases from NVRAM.

- **Key Management**

This item enables expert users to modify Secure Boot Policy variables without full authentication.
Press [Enter] to make settings for the following sub-items:

Factory Key Provision

This item is for user to install factory default secure boot keys after the platform reset and while the system is in Setup mode.
The optional settings are: [Disabled]; [Enabled].

- **Restore Factory Keys**

Use this item to force system into User Mode. Install factory default Secure Boot Key databases.

- **Reset to Setup Mode**

Use this item to delete all Secure Boot key databases from NVRAM.

- **Enroll Efi Image**

Use this item to allow efi image to run in secure boot mode. Enroll SHA256 Hash certificate of a PE image into authorized signature database (db)
The optional settings are: [<EFI>]; [<System Volume Information>]; [date.txt]; [Time.txt]; [Counter.txt]

- **Export Secure Boot variables**

Use this item to copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

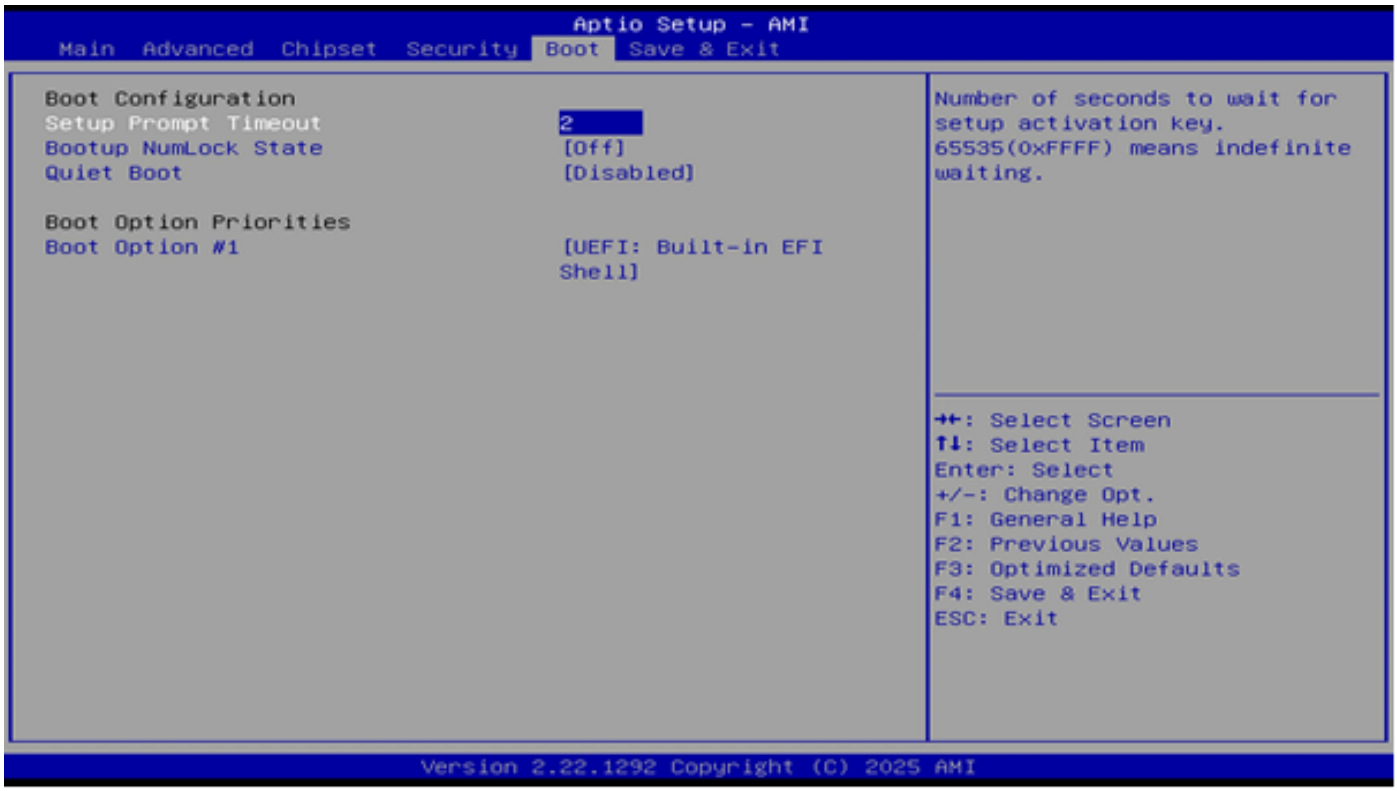
Secure Boot Variable/Size/Keys/Key Source

- **Platform Key (PK)/Key Exchange Keys/Authorized Signature/Forbidden Signature/ Authorized TimeStamps/OS Recovery Signatures**

Use this item to enroll Factory Defaults or load the keys from a file with:
1. Public Key Certificate in:
   a) EFI_SIGNATURE_LIST
   b) EFI_ CERT_X509 (DER)
   c) EFI_ CERT_RSA2048 (bin)
   d) EFI_ CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, External, Mixed.

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Setup Prompt Timeout Set the default value to: [2]

Bootup NumLock State

Use this item to select keyboard NumLock state.

The optional settings: [On]; [Off].

Bootup NumLock State Set the default value to: [Off]

Quiet Boot

The optional settings: [Disabled]; [Enabled].

Quiet Boot Set the default value to: [Disabled]

Boot Option Priorities

3-11 Save & Exit Menu

Save Changes and Reset
This item allows user to reset the system after saving the changes.
Discard Changes and Reset
This item allows user to reset the system without saving any changes.

Restore Defaults
Use this item to restore /load default values for all the setup options.
Save as User Defaults
Use this item to save the changes done so far as user defaults.
Restore User Defaults
Use this item to restore defaults to all the setup options.

Boot Override

The available options here are dynamically updated and make system boot to any boot option selected.

UEFI: Built-in EFI Shell

Use this item to launch EFI shell application (shell.efi) from one of the available filesystem device.

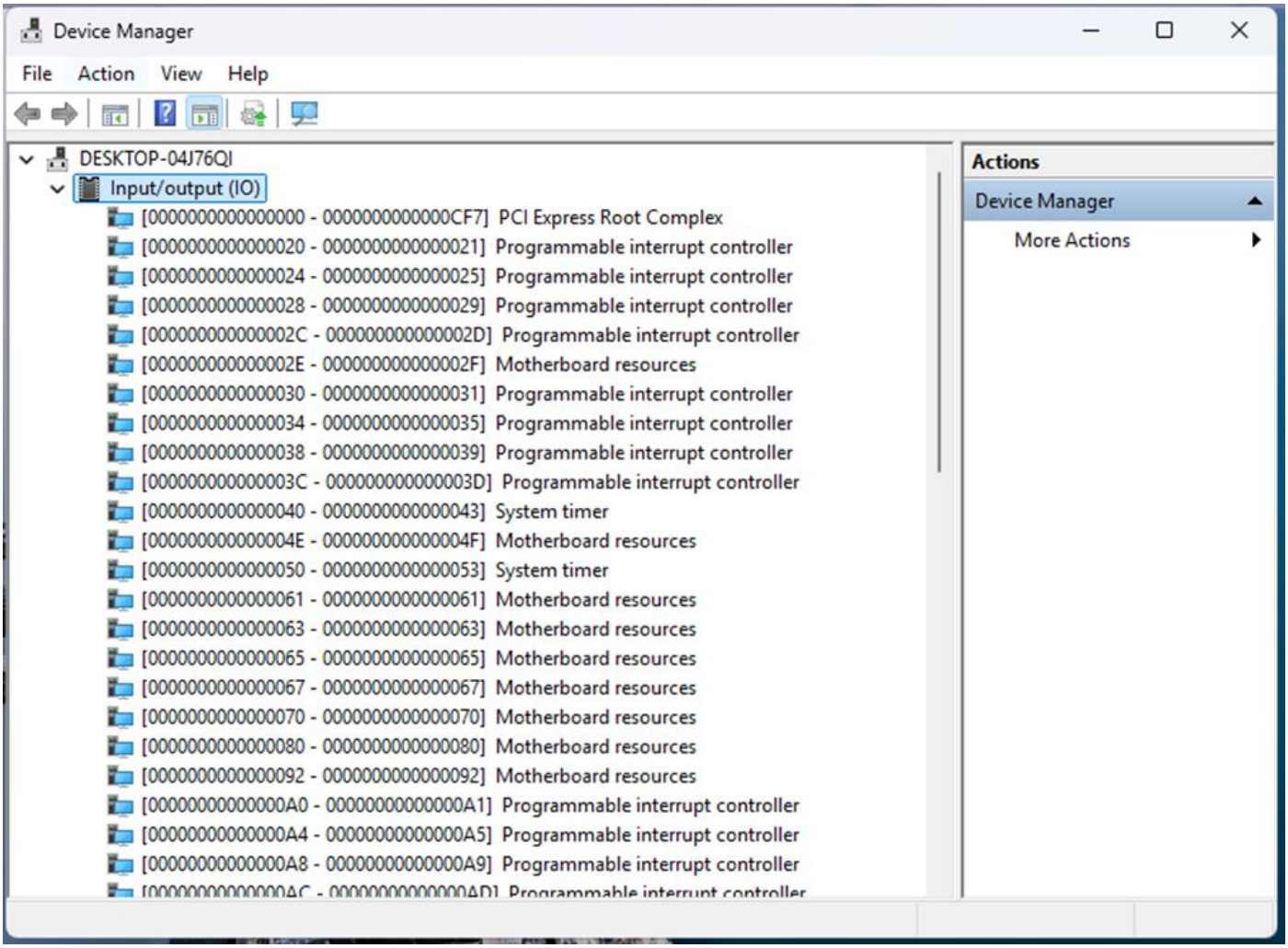
Appendix A

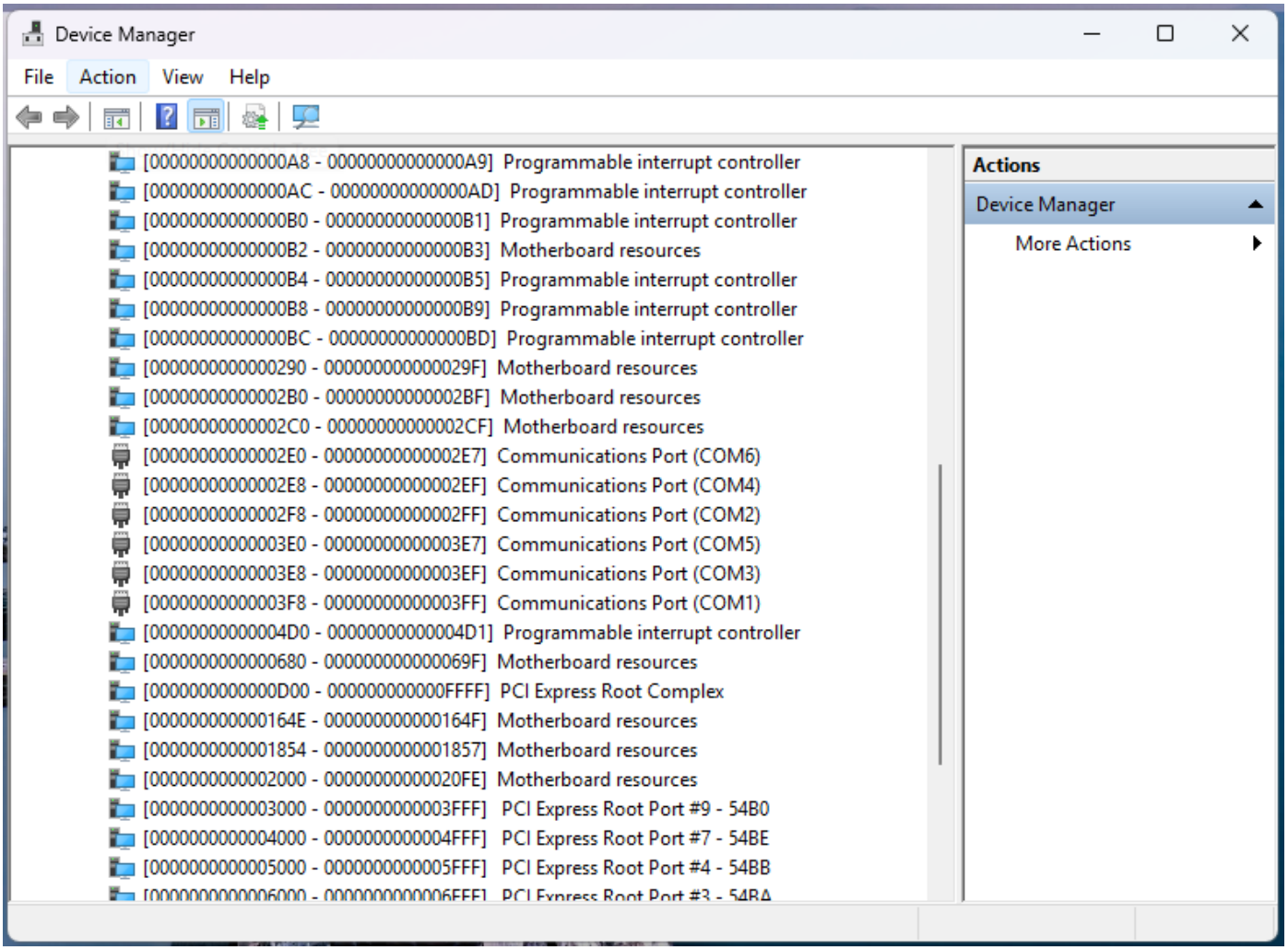
Mating Connectors

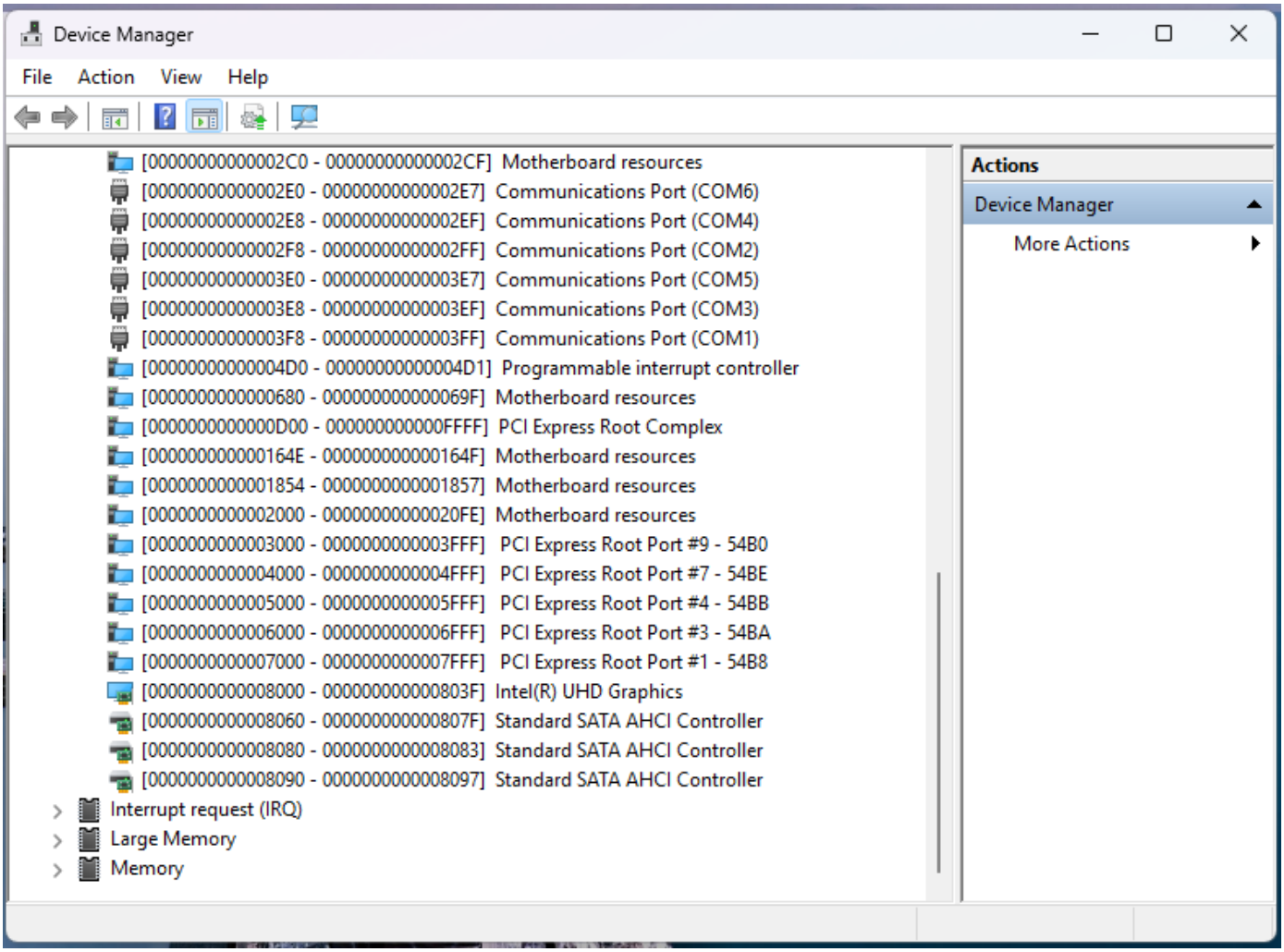
Location Printing	Function	Vendor	Vendor P/N
DCIN2	Internal 4-Pin 12~28V DC-in Power Connector	TOPT	ATX2-0201-S6T-B0
DCIN3	12~28V DC-in Power Connector	SHENG CONG	DJ-D020AE
CPUFAN	CPU FAN Connector	TOPT	WF1-1104—B-S4N—B2
SATA1	SATAIII Port Connector	LOTES	ABA-SAT-056-K01
PWROUT	SATA HDD Power-out Connector	TOPT	WF5-11XX-Q-S6W-B0
SYSFAN1	System FAN Connector	TOPT	WF1-1104-B-S4N—B2
REFLASH_CON	BIOS Flash ROM Update Wafer	DENENTECH	W10M-XXDSM38G0XX
FP_AUDIO	Front Panel Audio Header	Deneng Hardware Electronic	P420-05DG01RA402
SPEAK_CON	3W Amplifier Wafer	TOPT	WF2-1104-S6W-B0
GPIO	GPIO Port Header	Deneng Hardware Electronic	P420-XXDG01ST4XX
COM2/3/4/5/6	RS232 Serial Port Header	TOPT	PH200-205S-GBB0010A
PS2KBMS	PS/2 Keyboard and Mouse Header	TOPT	PH2-C107-N2-S9B-G0
SMBUS	SMBUS Header	TOPT	PH200-A105-SGCB-RN
FP_USB1/2	USB2.0 Port Header	TOPT	PH200-205S-GBB0009A
LVDS_EDP	LVDS/EDP Header	CHUFON	C151900-160
INVERTER1	LVDS_EDP Inverter Wafer	TOPT	WF2-1108-K-S6R-B0
FP	Front Panel Header(PWR LED/HDD LED/Power Button/Reset	Denentch	P525-05DG01ST408

Appendix B

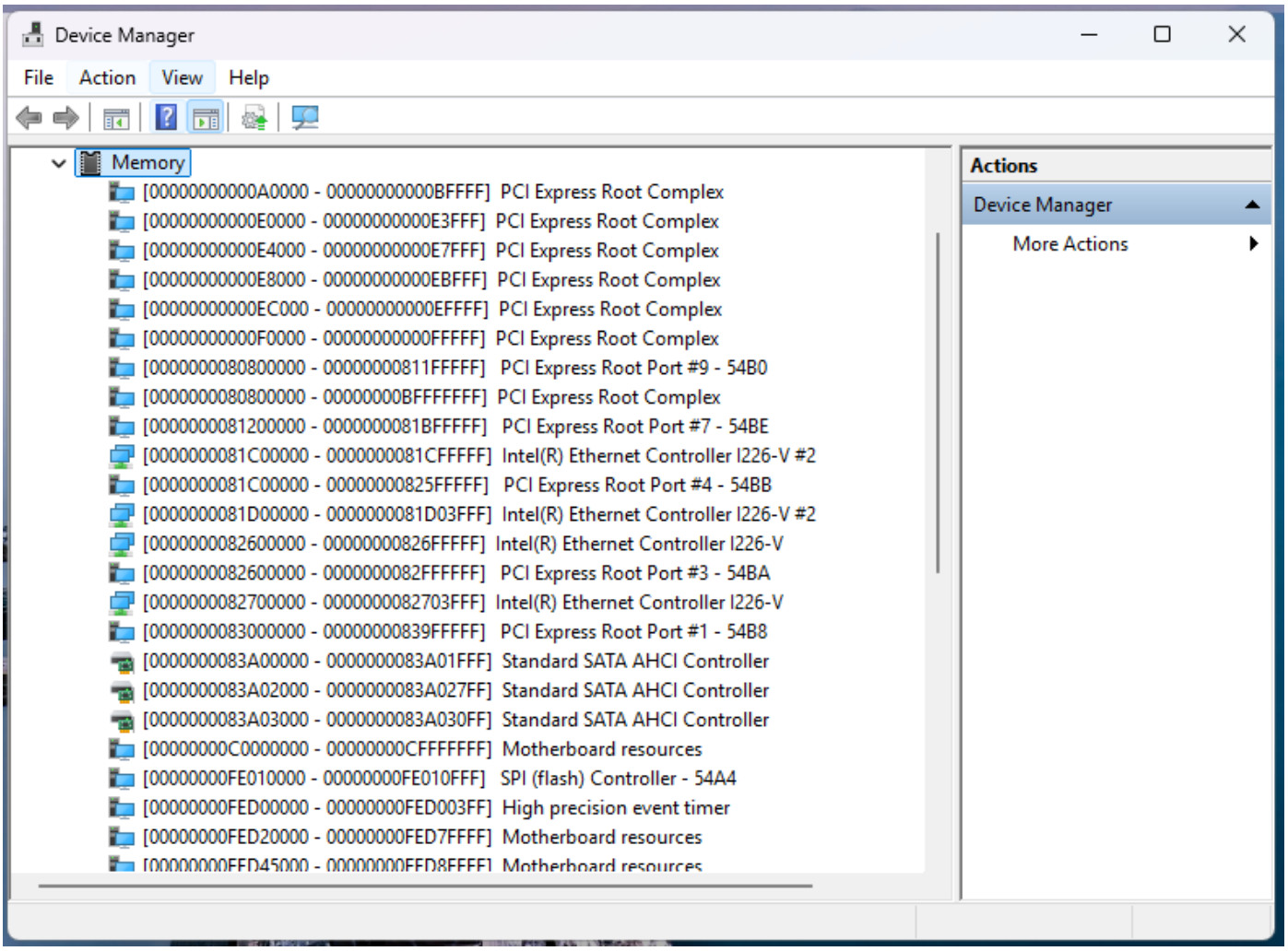
I/O Address Map

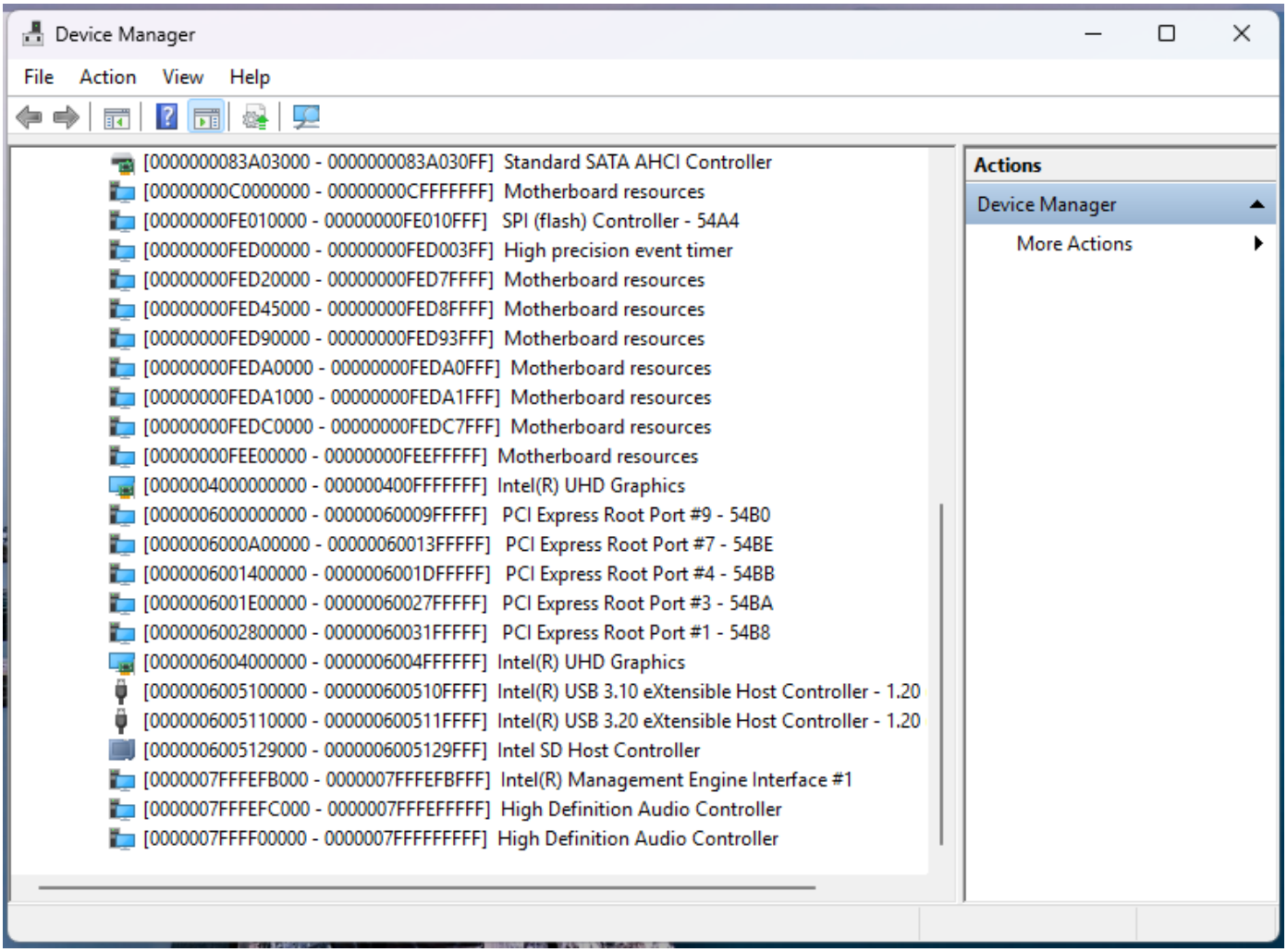



Device Manager
File
Action
View
Help
[00000000000000A8 - 00000000000000A9] Programmable interrupt controller
[00000000000000AC - 00000000000000AD] Programmable interrupt controller
[00000000000000B0 - 00000000000000B1] Programmable interrupt controller
[00000000000000B2 - 00000000000000B3] Motherboard resources
[00000000000000B4 - 00000000000000B5] Programmable interrupt controller
[00000000000000B8 - 00000000000000B9] Programmable interrupt controller
[00000000000000BC - 00000000000000BD] Programmable interrupt controller
[0000000000000290 - 000000000000029F] Motherboard resources
[00000000000002B0 - 00000000000002BF] Motherboard resources
[00000000000002C0 - 00000000000002CF] Motherboard resources
[00000000000002E0 - 00000000000002E7] Communications Port (COM6)
[00000000000002E8 - 00000000000002EF] Communications Port (COM4)
[00000000000002F8 - 00000000000002FF] Communications Port (COM2)
[00000000000003E0 - 00000000000003E7] Communications Port (COM5)
[00000000000003E8 - 00000000000003EF] Communications Port (COM3)
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[0000000000000680 - 000000000000069F] Motherboard resources
[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
[000000000000164E - 000000000000164F] Motherboard resources
[0000000000001854 - 0000000000001857] Motherboard resources
[0000000000002000 - 00000000000020FE] Motherboard resources
[0000000000003000 - 0000000000003FFF] PCI Express Root Port #9 - 54B0
[0000000000004000 - 0000000000004FFF] PCI Express Root Port #7 - 54BE
[0000000000005000 - 0000000000005FFF] PCI Express Root Port #4 - 54BB
Actions
Device Manager
More Actions

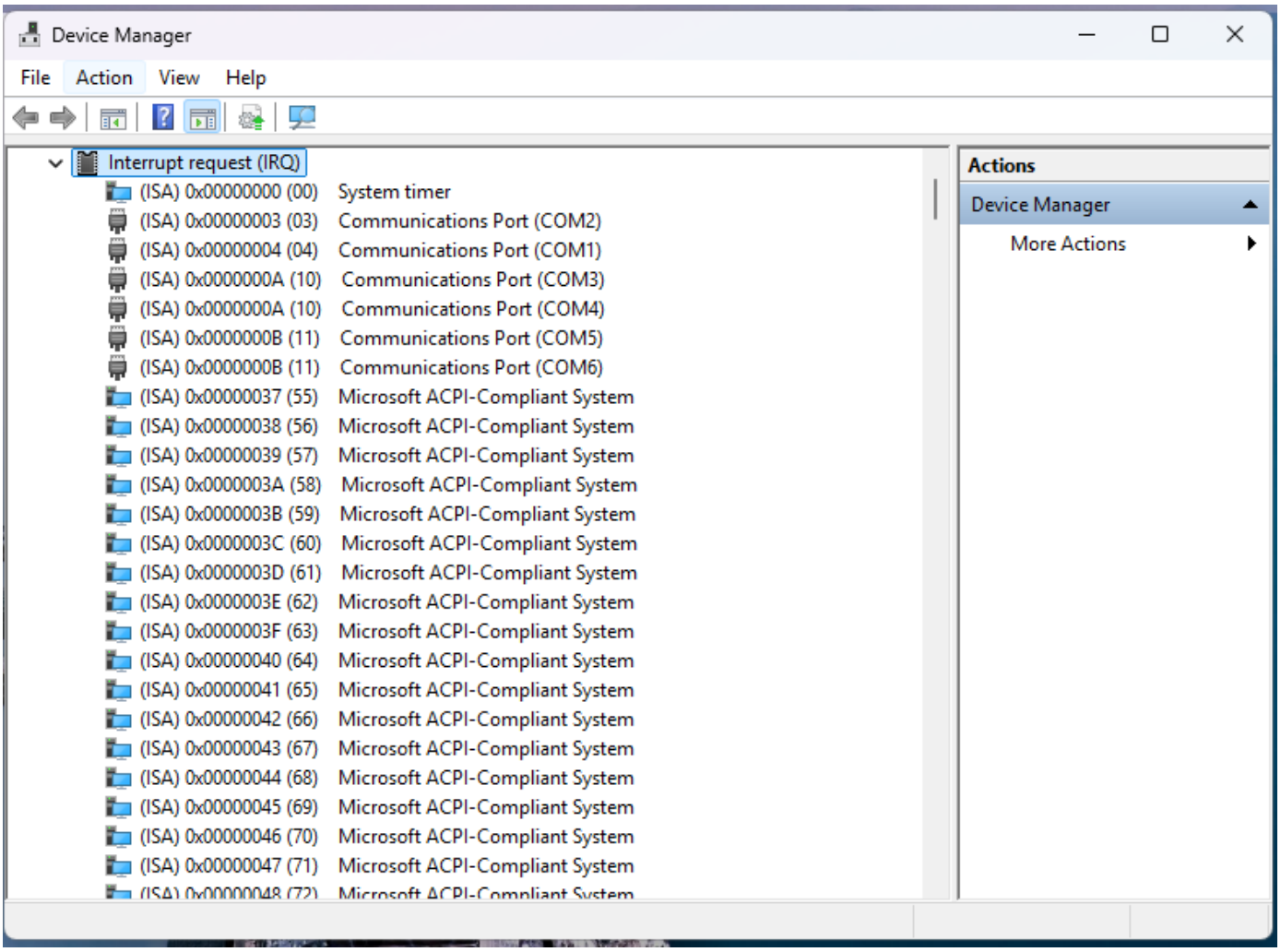

Device Manager
File Action View Help
[00000000000002C0 - 00000000000002CF] Motherboard resources
[00000000000002E0 - 00000000000002E7] Communications Port (COM6)
[00000000000002E8 - 00000000000002EF] Communications Port (COM4)
[00000000000002F8 - 00000000000002FF] Communications Port (COM2)
[00000000000003E0 - 00000000000003E7] Communications Port (COM5)
[00000000000003E8 - 00000000000003EF] Communications Port (COM3)
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[0000000000000680 - 000000000000069F] Motherboard resources
[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
[000000000000164E - 000000000000164F] Motherboard resources
[0000000000001854 - 0000000000001857] Motherboard resources
[0000000000002000 - 00000000000020FE] Motherboard resources
[0000000000003000 - 0000000000003FFF] PCI Express Root Port #9 - 54B0
[0000000000004000 - 0000000000004FFF] PCI Express Root Port #7 - 54BE
[0000000000005000 - 0000000000005FFF] PCI Express Root Port #4 - 54BB
[0000000000006000 - 0000000000006FFF] PCI Express Root Port #3 - 54BA
[0000000000007000 - 0000000000007FFF] PCI Express Root Port #1 - 54B8
[0000000000008000 - 000000000000803F] Intel(R) UHD Graphics
[0000000000008060 - 000000000000807F] Standard SATA AHCI Controller
[0000000000008080 - 0000000000008083] Standard SATA AHCI Controller
[0000000000008090 - 0000000000008097] Standard SATA AHCI Controller
Interrupt request (IRQ)
Large Memory
Memory
Actions
Device Manager
More Actions

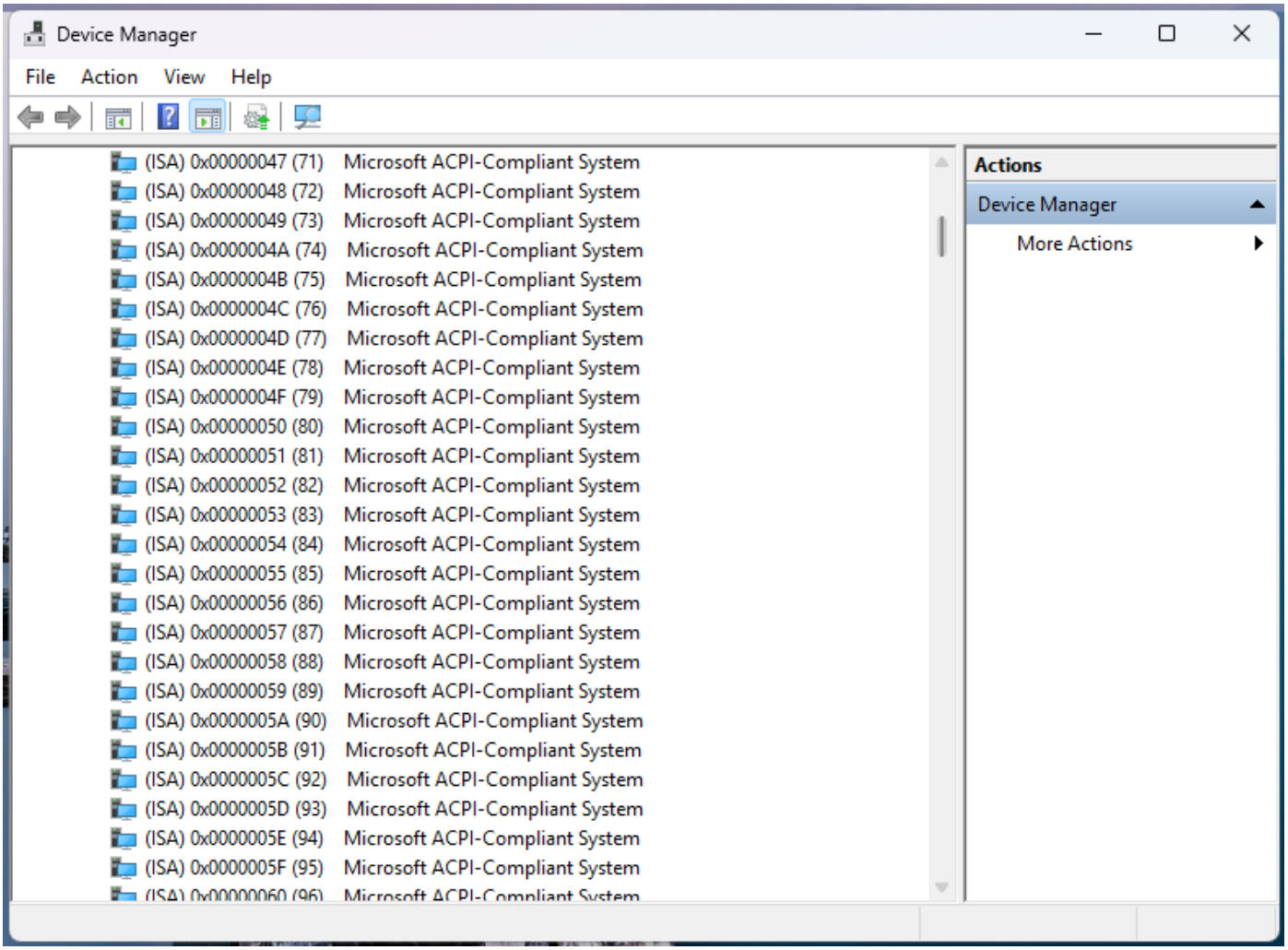
A2 Memory Address Map

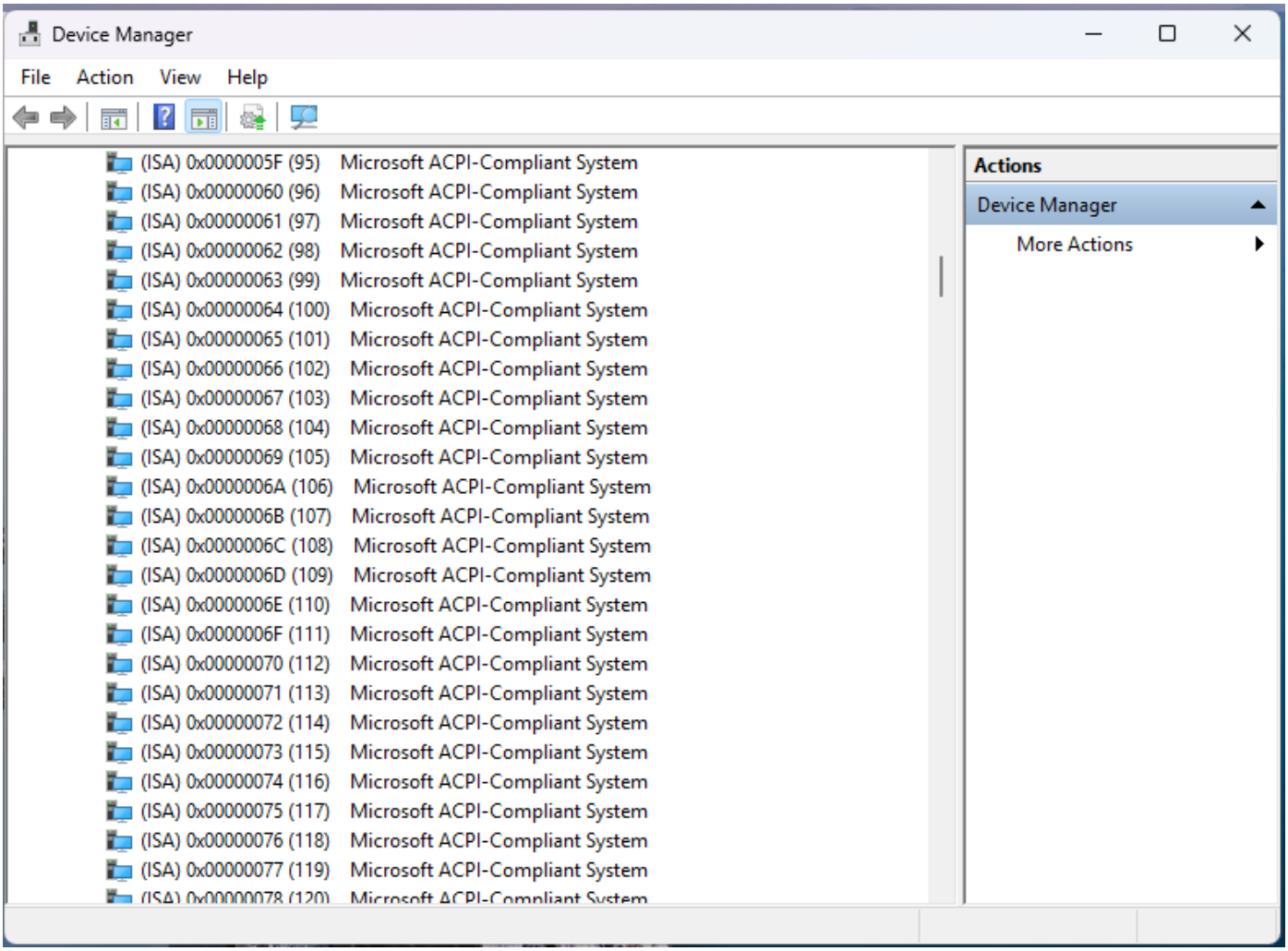



Device Manager
File Action View Help
[0000000083A03000 - 0000000083A030FF] Standard SATA AHCI Controller
[00000000C0000000 - 00000000CFFFFFFF] Motherboard resources
[00000000FE010000 - 00000000FE010FFF] SPI (flash) Controller - 54A4
[00000000FED00000 - 00000000FED003FF] High precision event timer
[00000000FED20000 - 00000000FED7FFFF] Motherboard resources
[00000000FED45000 - 00000000FED8FFFF] Motherboard resources
[00000000FED90000 - 00000000FED93FFF] Motherboard resources
[00000000FEDA0000 - 00000000FEDA0FFF] Motherboard resources
[00000000FEDA1000 - 00000000FEDA1FFF] Motherboard resources
[00000000FEDC0000 - 00000000FEDC7FFF] Motherboard resources
[00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
[0000004000000000 - 000000400FFFFFFF] Intel(R) UHD Graphics
[0000006000000000 - 00000060009FFFFF] PCI Express Root Port #9 - 54B0
[0000006000A00000 - 00000060013FFFFF] PCI Express Root Port #7 - 54BE
[0000006001400000 - 0000006001DFFFFF] PCI Express Root Port #4 - 54BB
[0000006001E00000 - 00000060027FFFFF] PCI Express Root Port #3 - 54BA
[0000006002800000 - 00000060031FFFFF] PCI Express Root Port #1 - 54B8
[0000006004000000 - 0000006004FFFFFF] Intel(R) UHD Graphics
[0000006005100000 - 000000600510FFFF] Intel(R) USB 3.10 eXtensible Host Controller - 1.20
[0000006005110000 - 000000600511FFFF] Intel(R) USB 3.20 eXtensible Host Controller - 1.20
[0000006005129000 - 0000006005129FFF] Intel SD Host Controller
[0000007FFFEFB000 - 0000007FFFEFBFFF] Intel(R) Management Engine Interface #1
[0000007FFFEFC000 - 0000007FFFEFFFFF] High Definition Audio Controller
[0000007FFFF00000 - 0000007FFFFFFFFF] High Definition Audio Controller
Actions
Device Manager
More Actions

A3 IRQ Mapping Chart




Device Manager
File Action View Help
(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
Actions
Device Manager
More Actions


Device Manager
File Action View Help
(ISA) 0x0000005F (95) Microsoft ACPI-Compliant System
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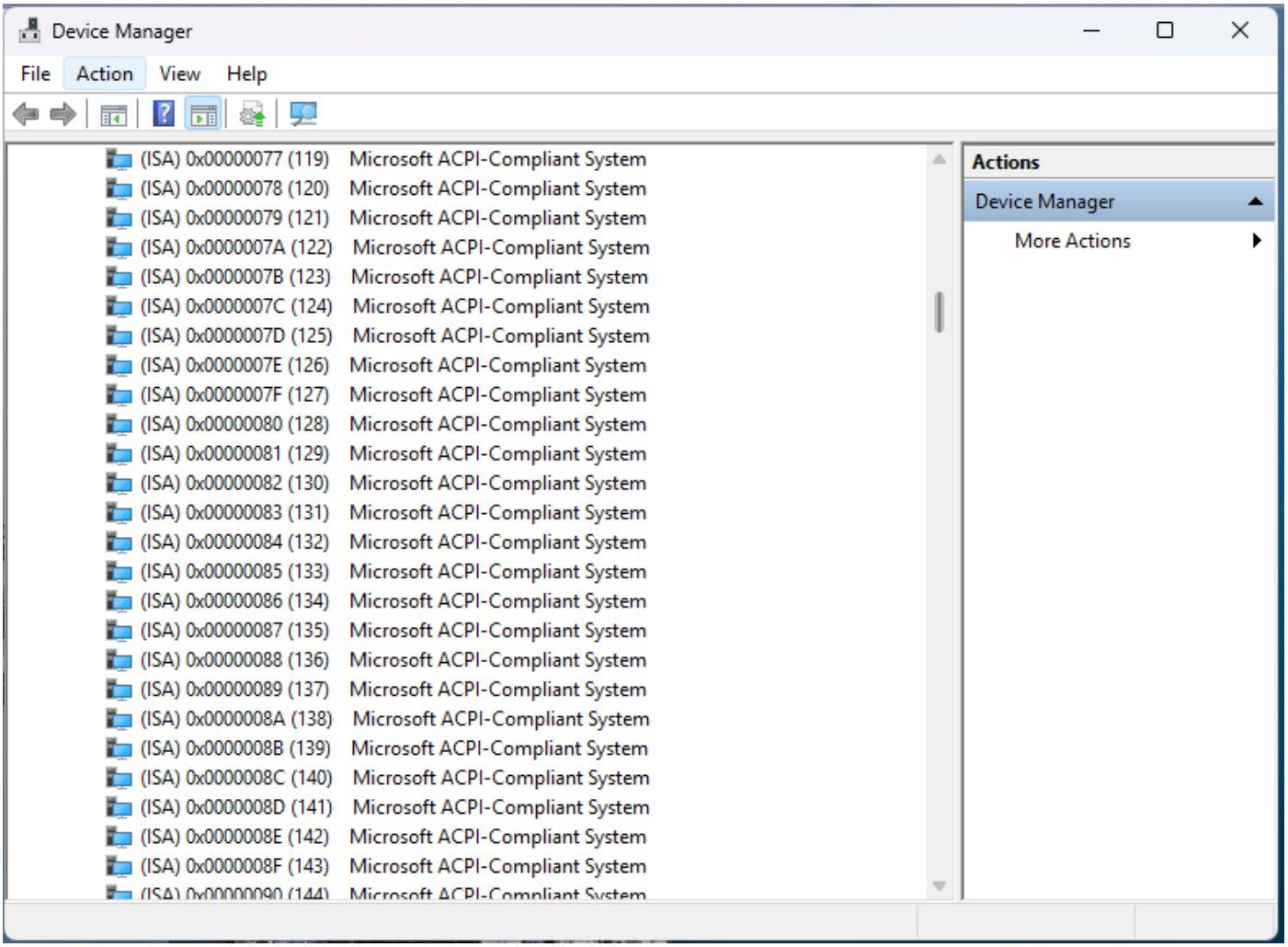
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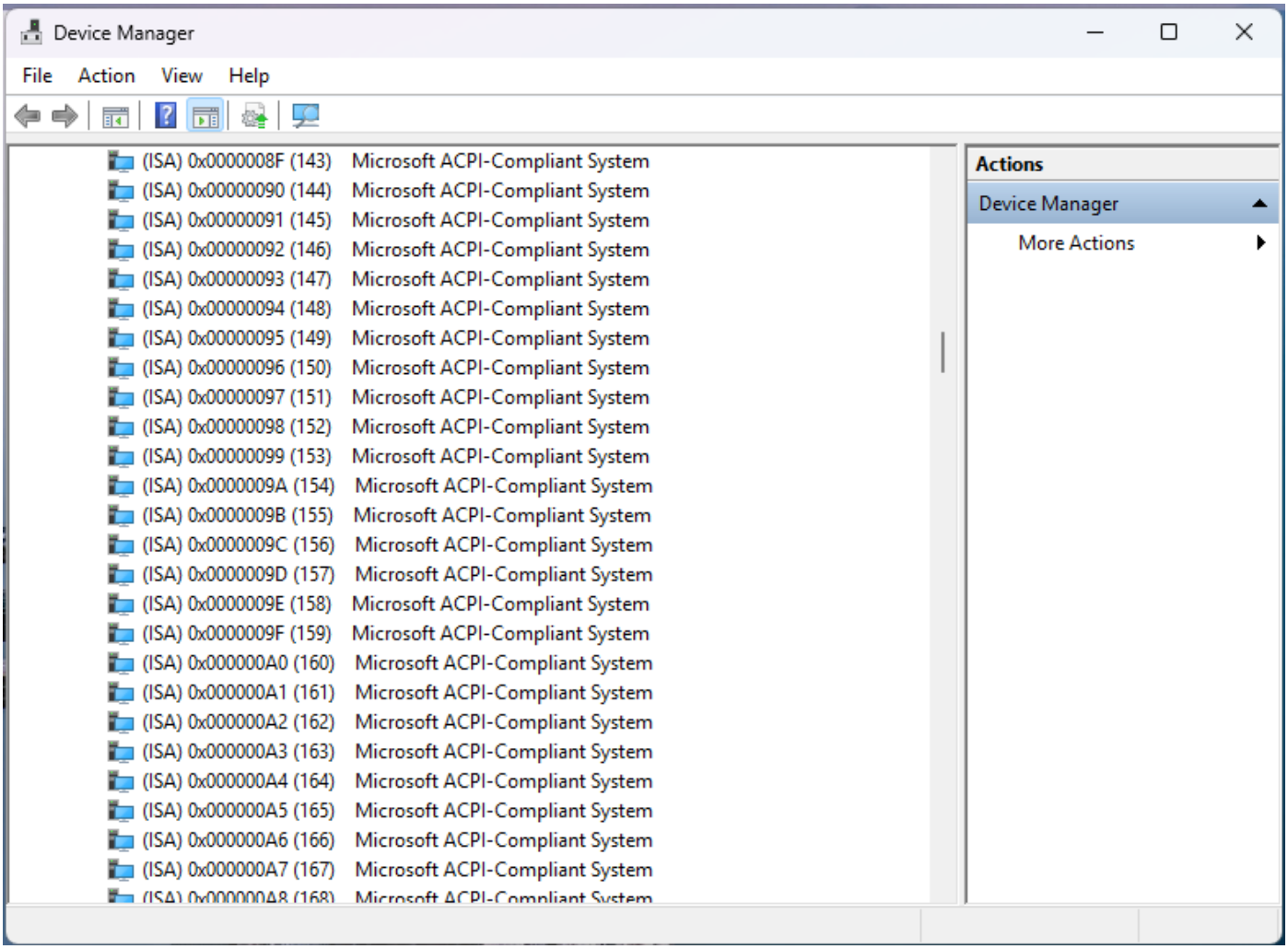
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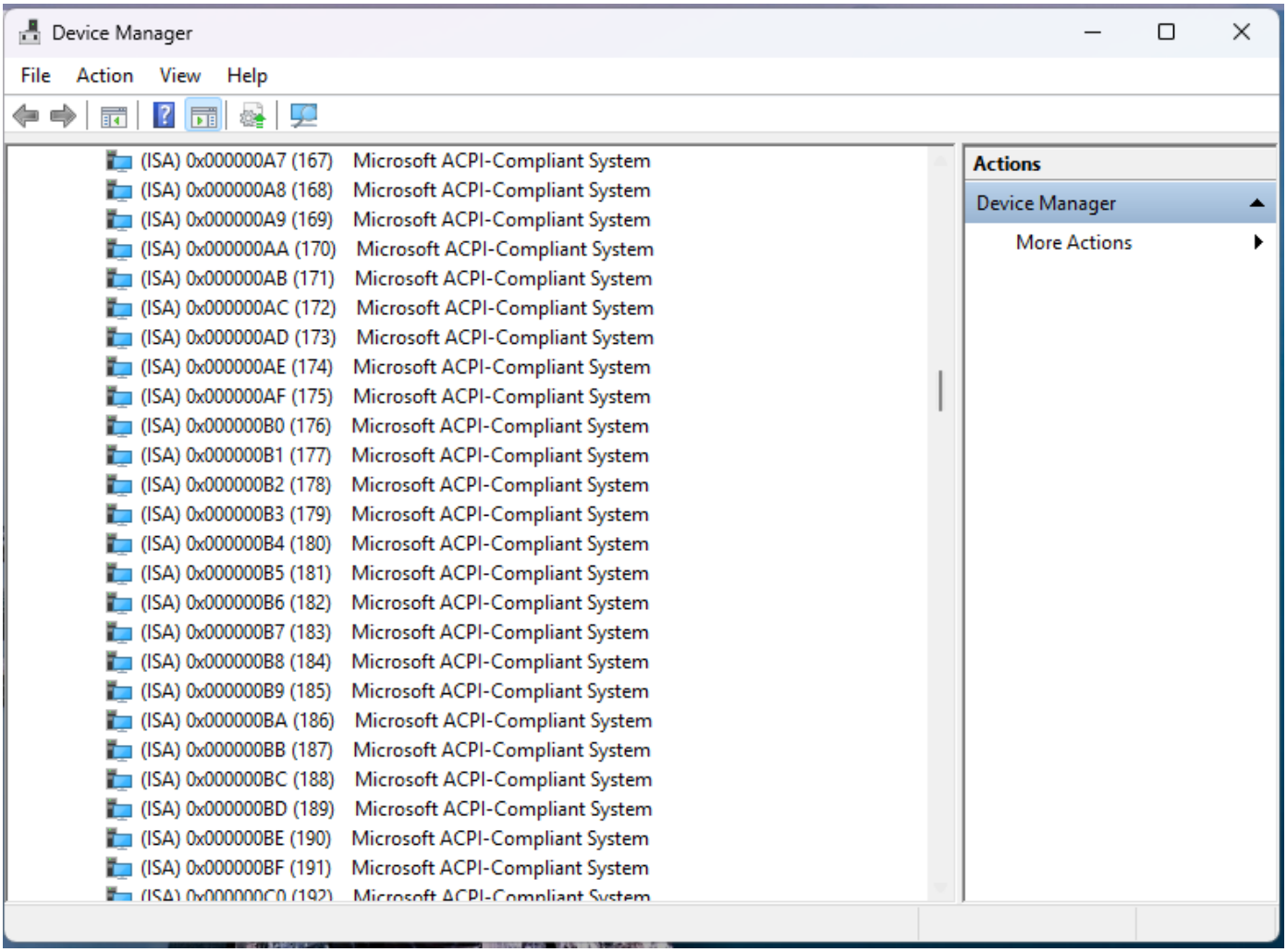
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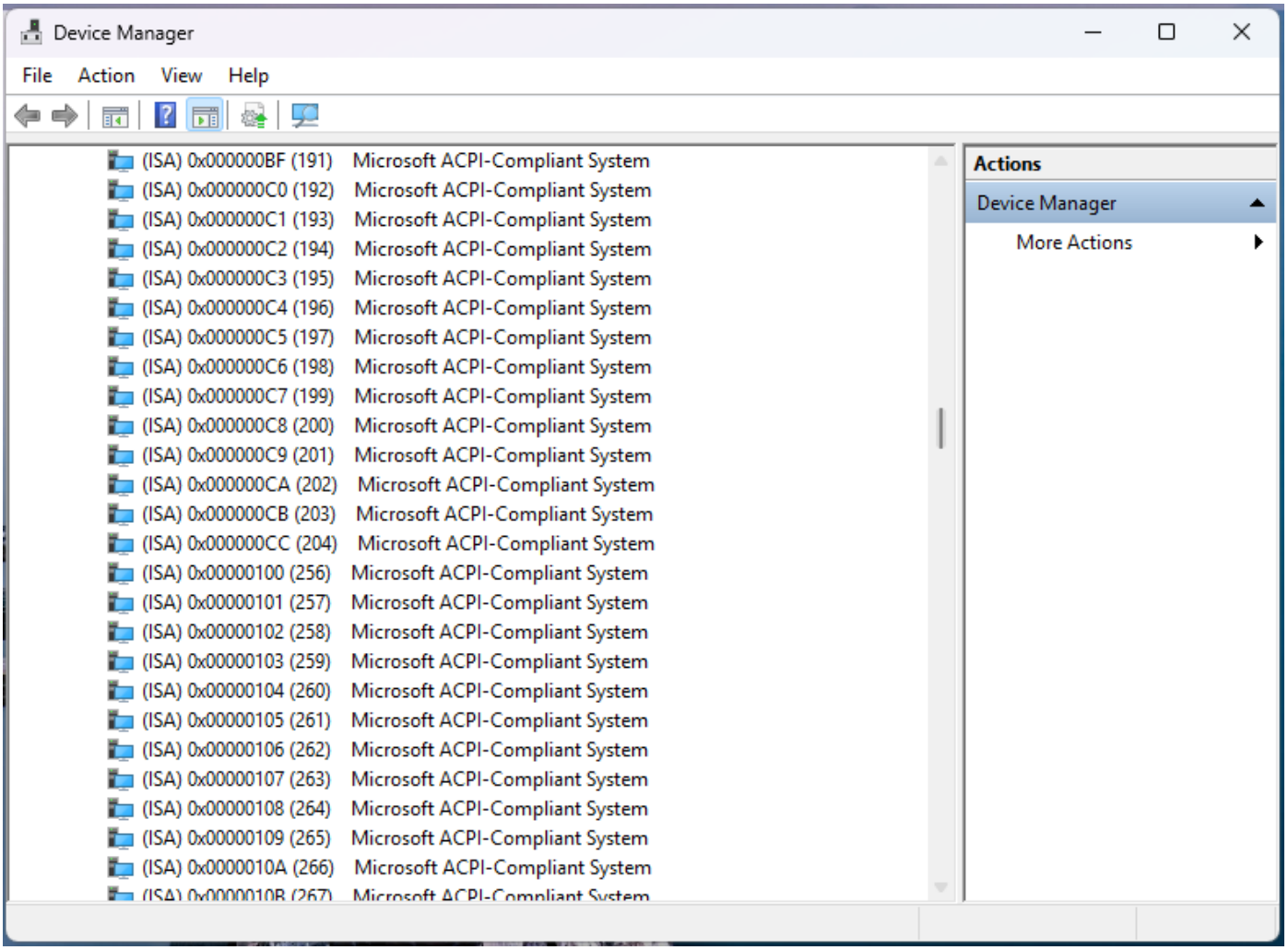
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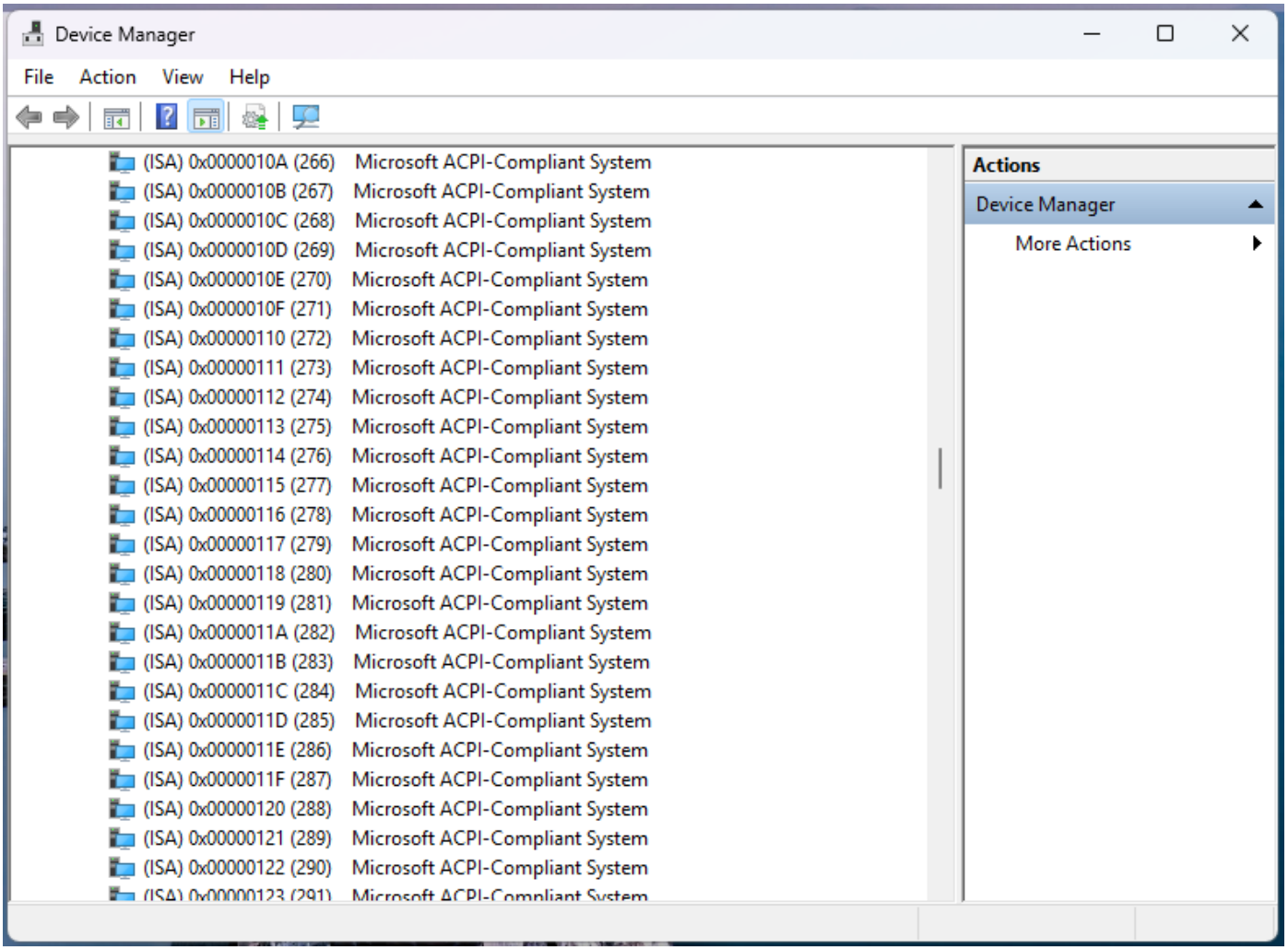
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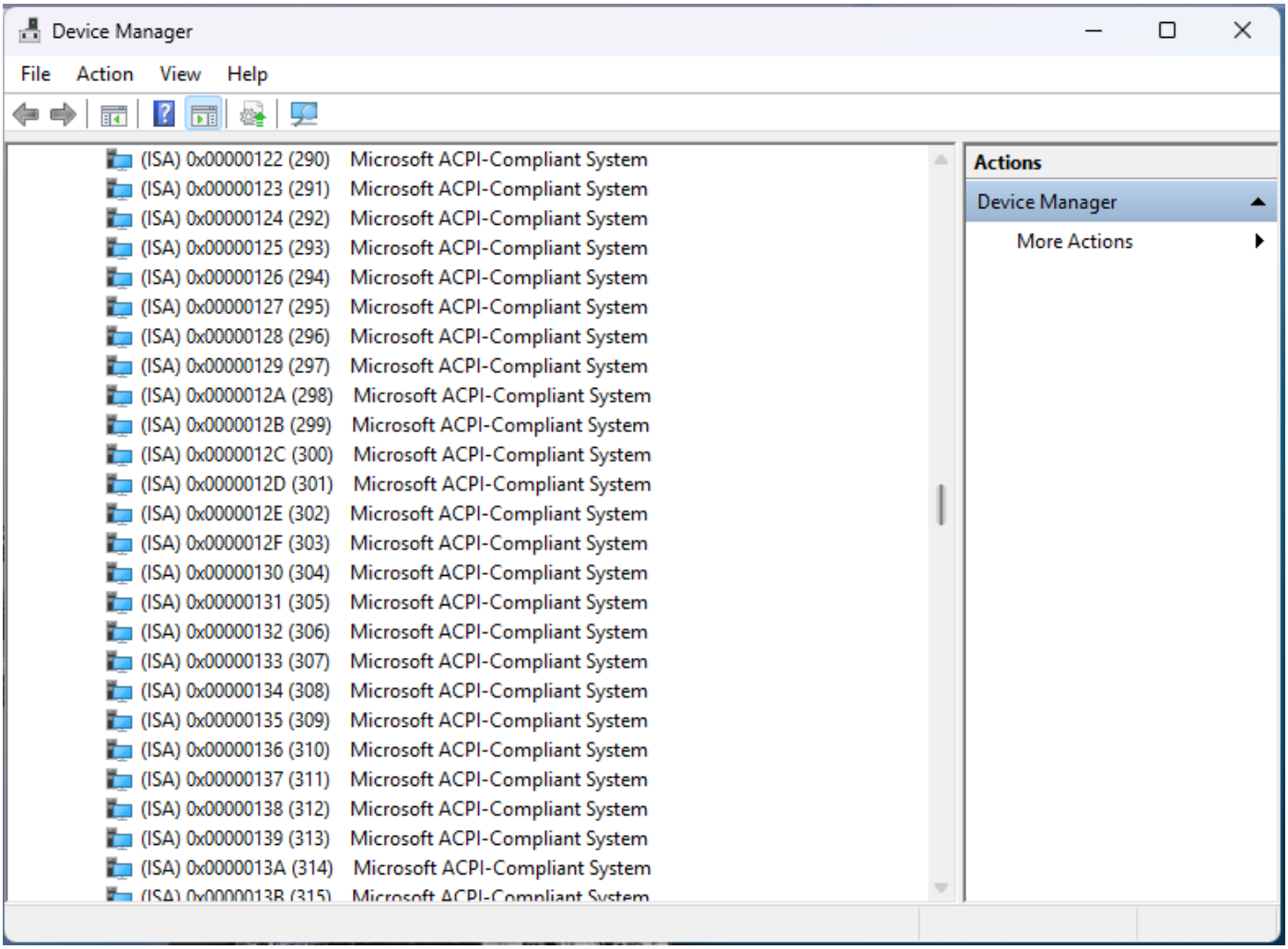
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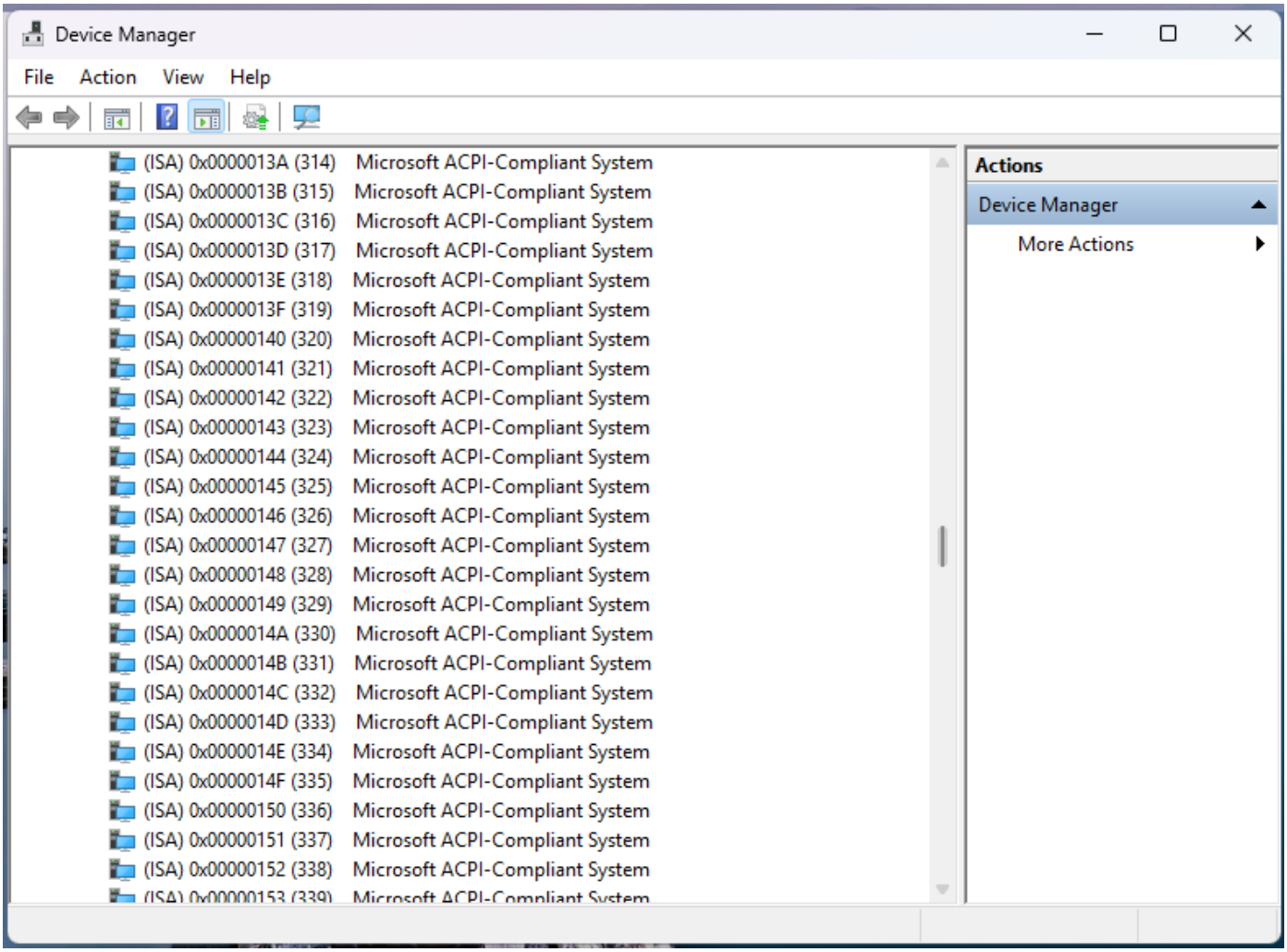
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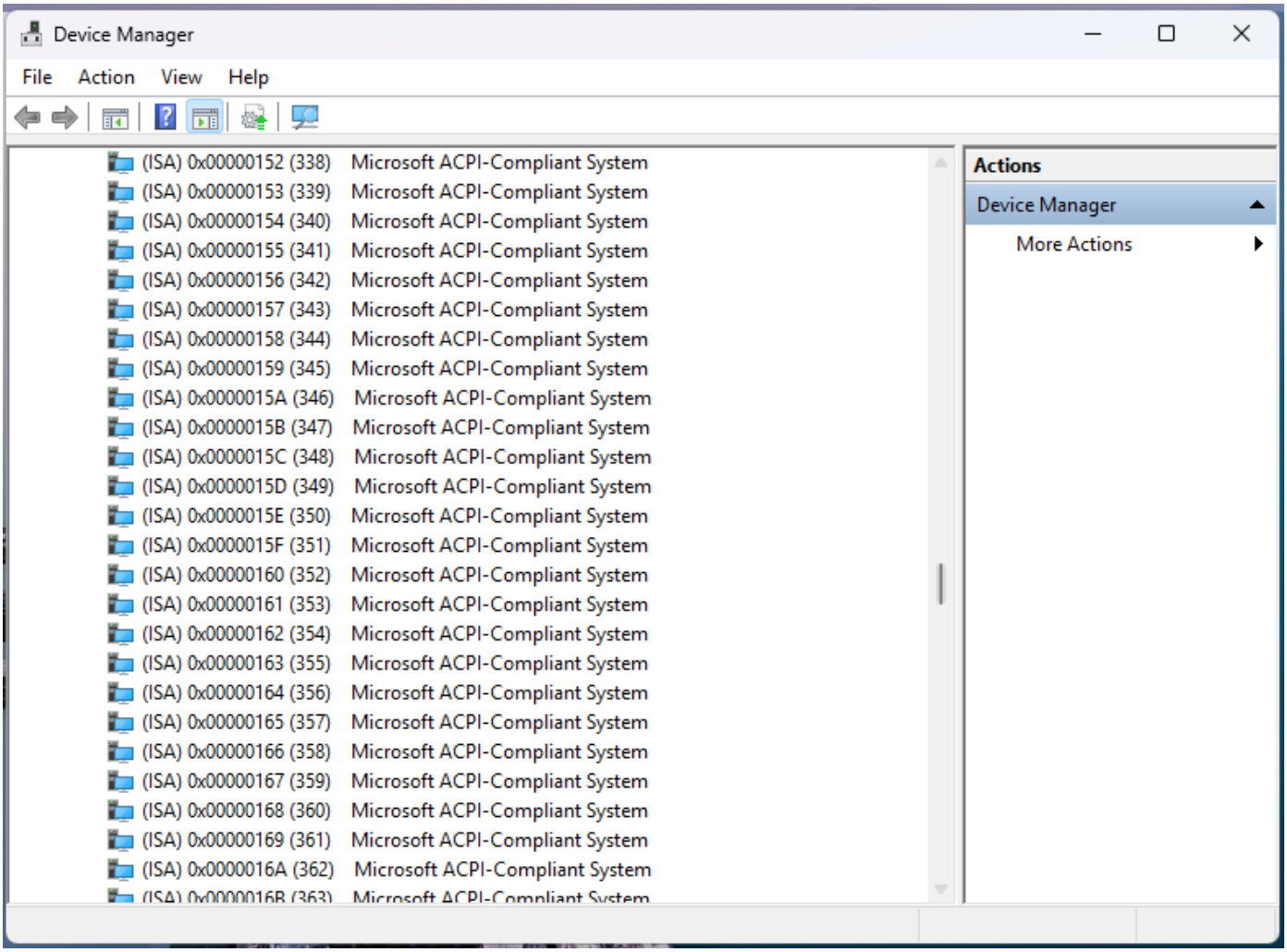
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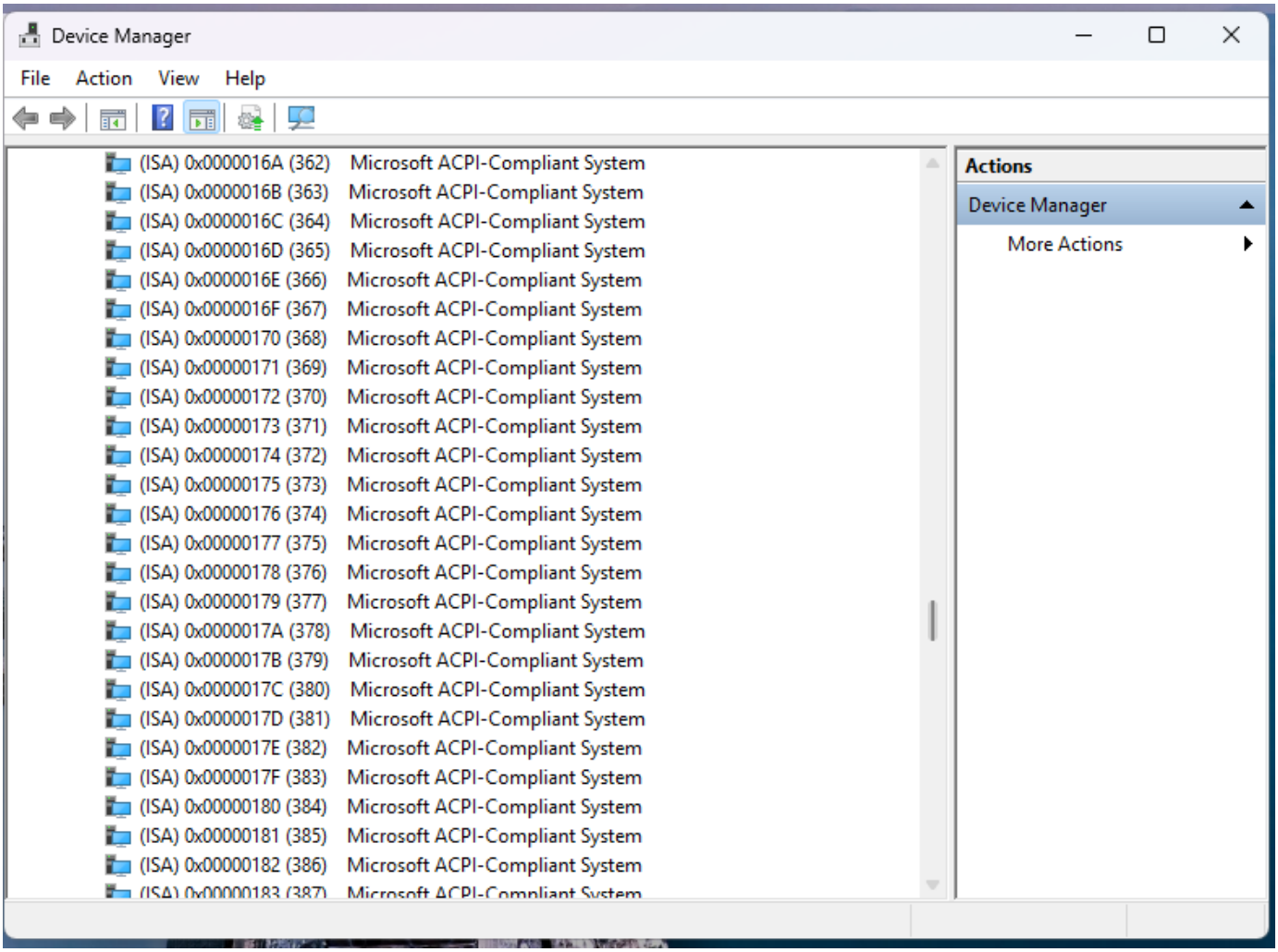
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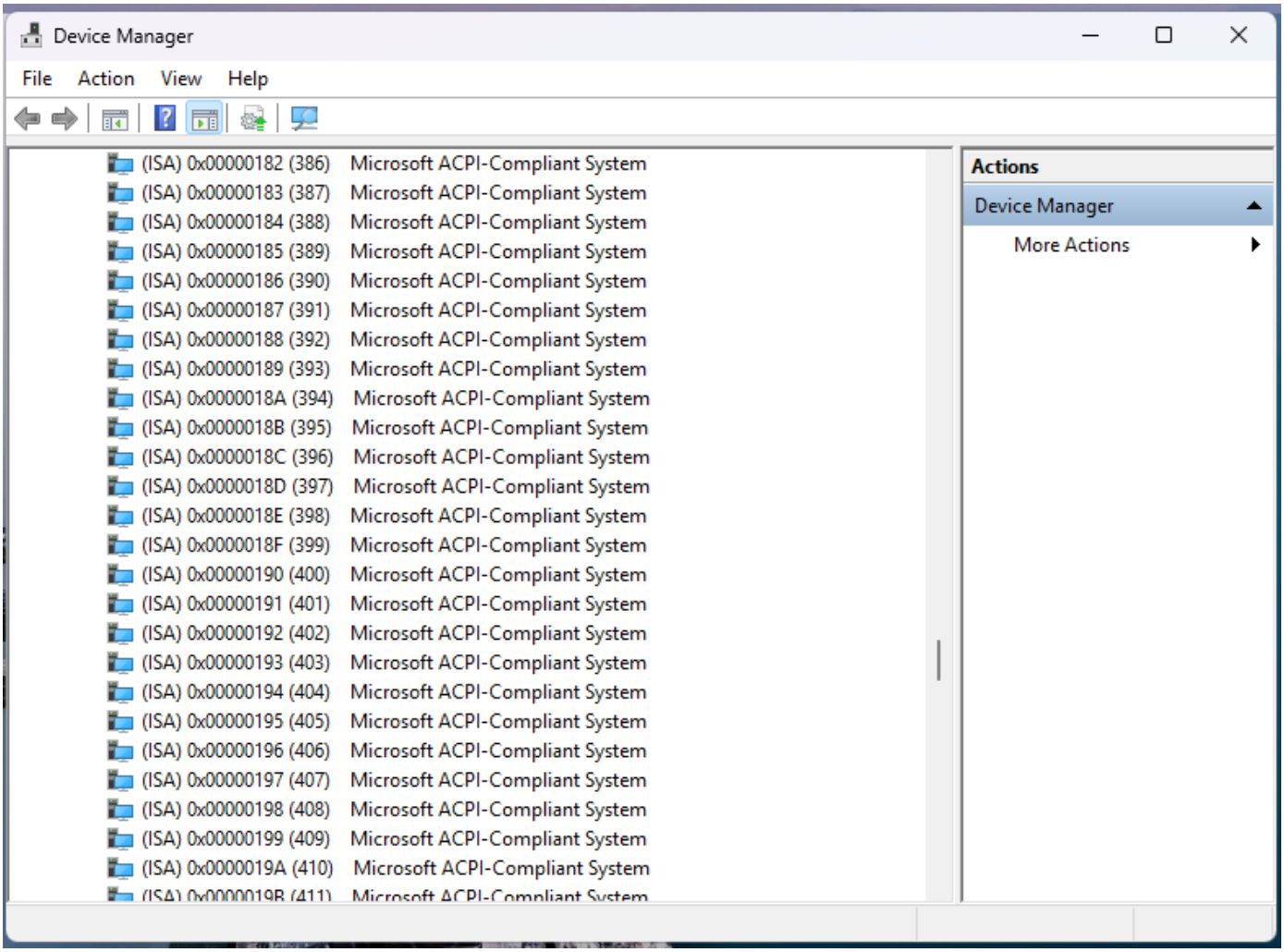
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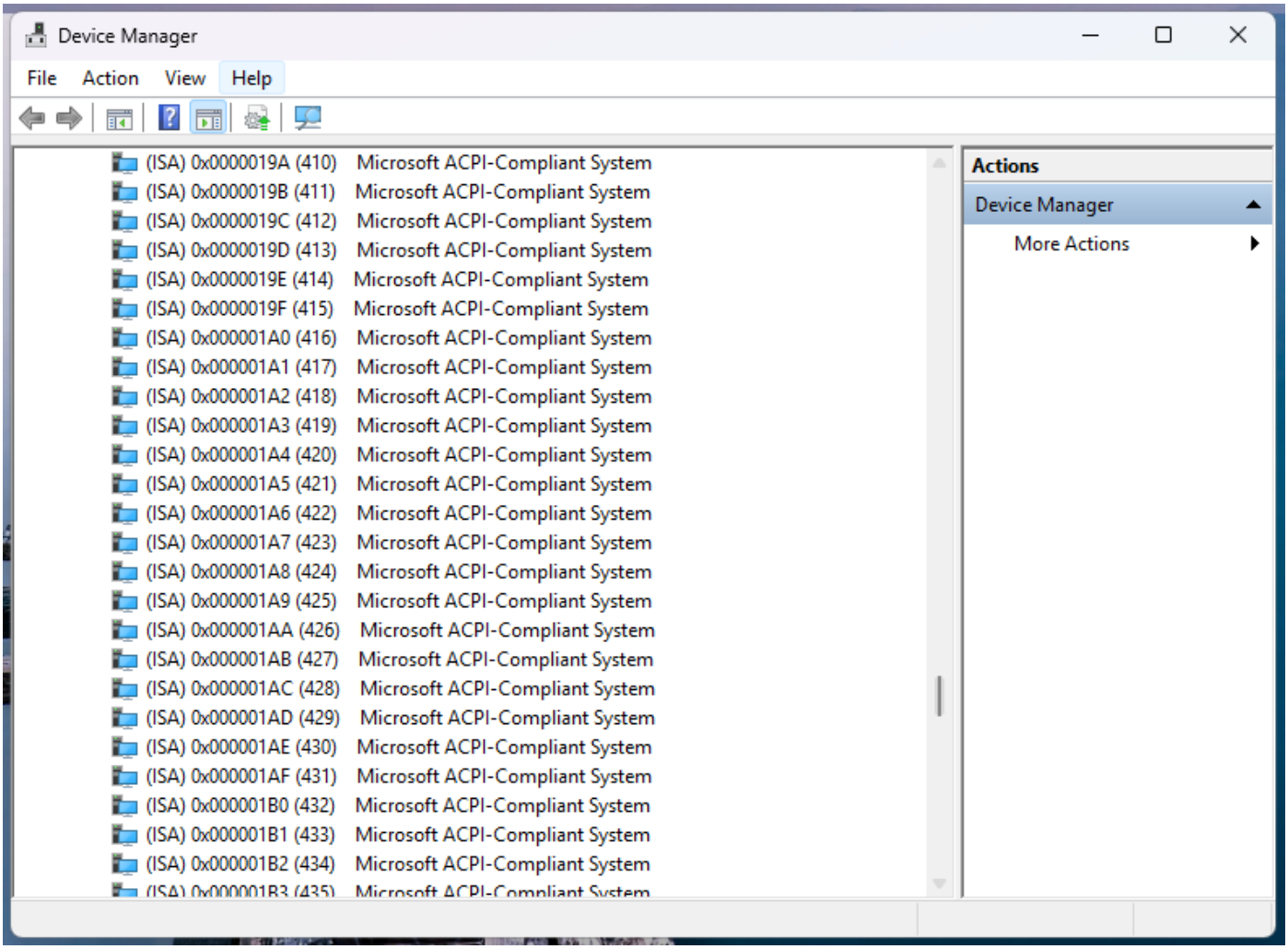
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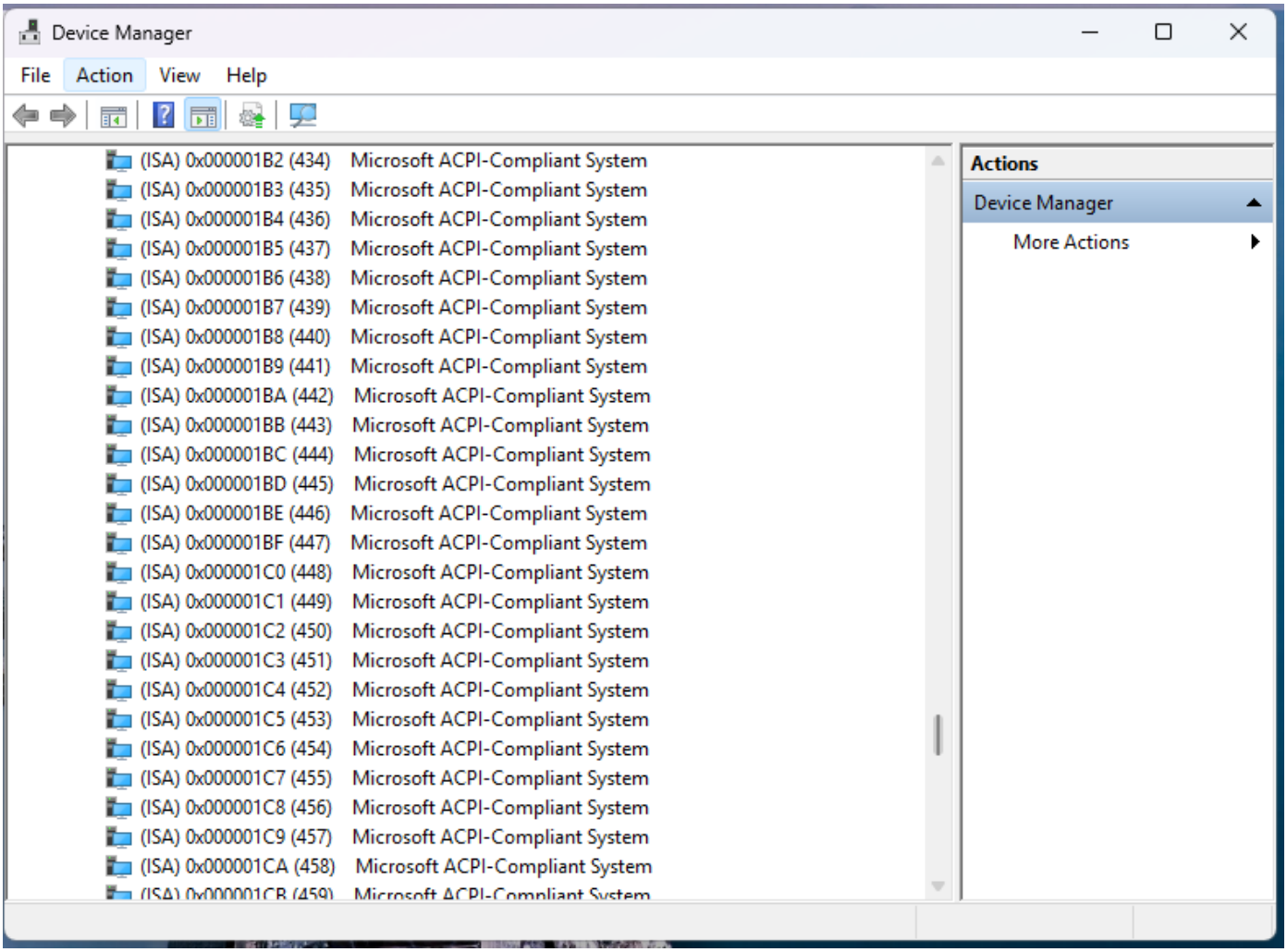
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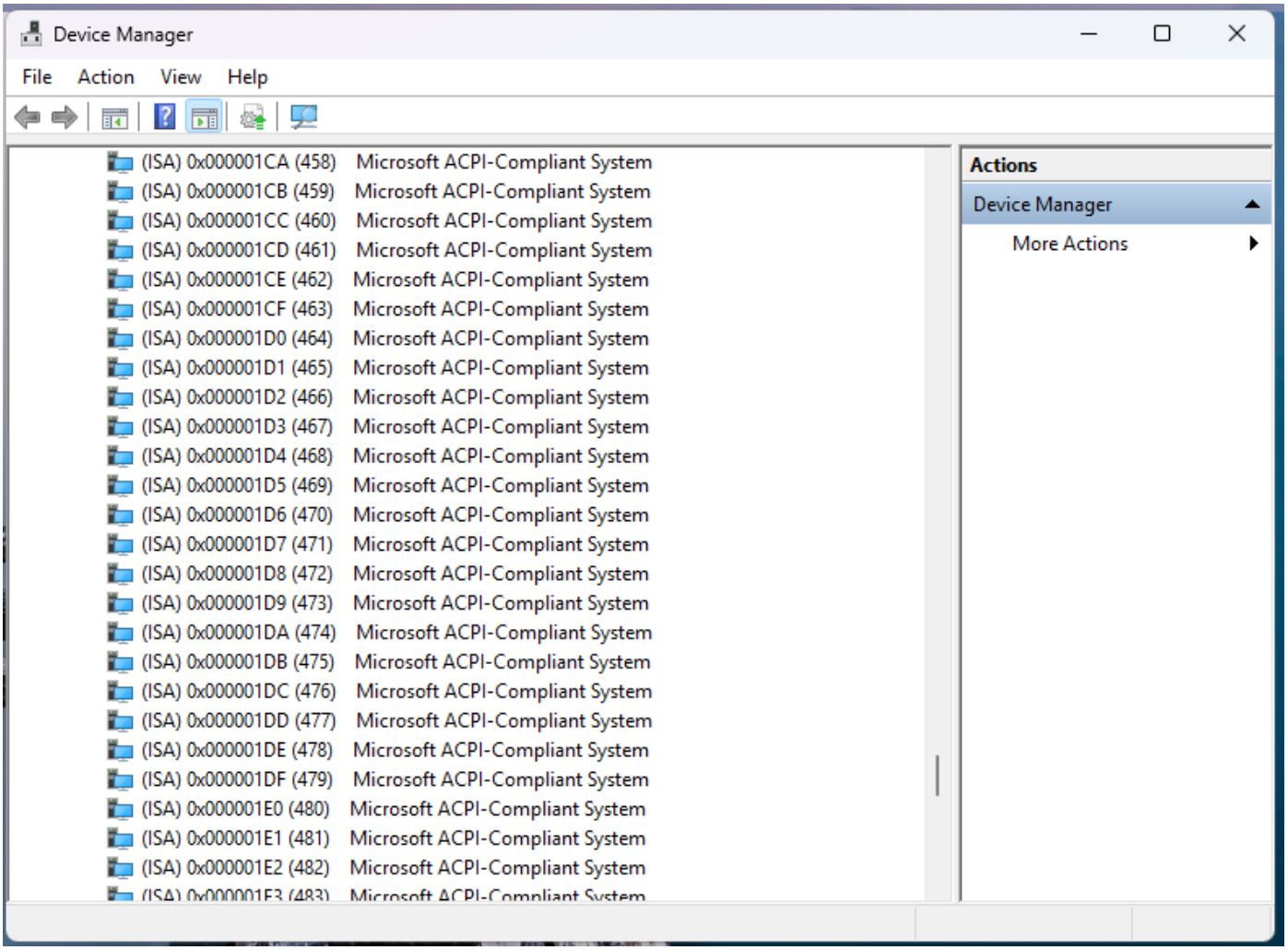
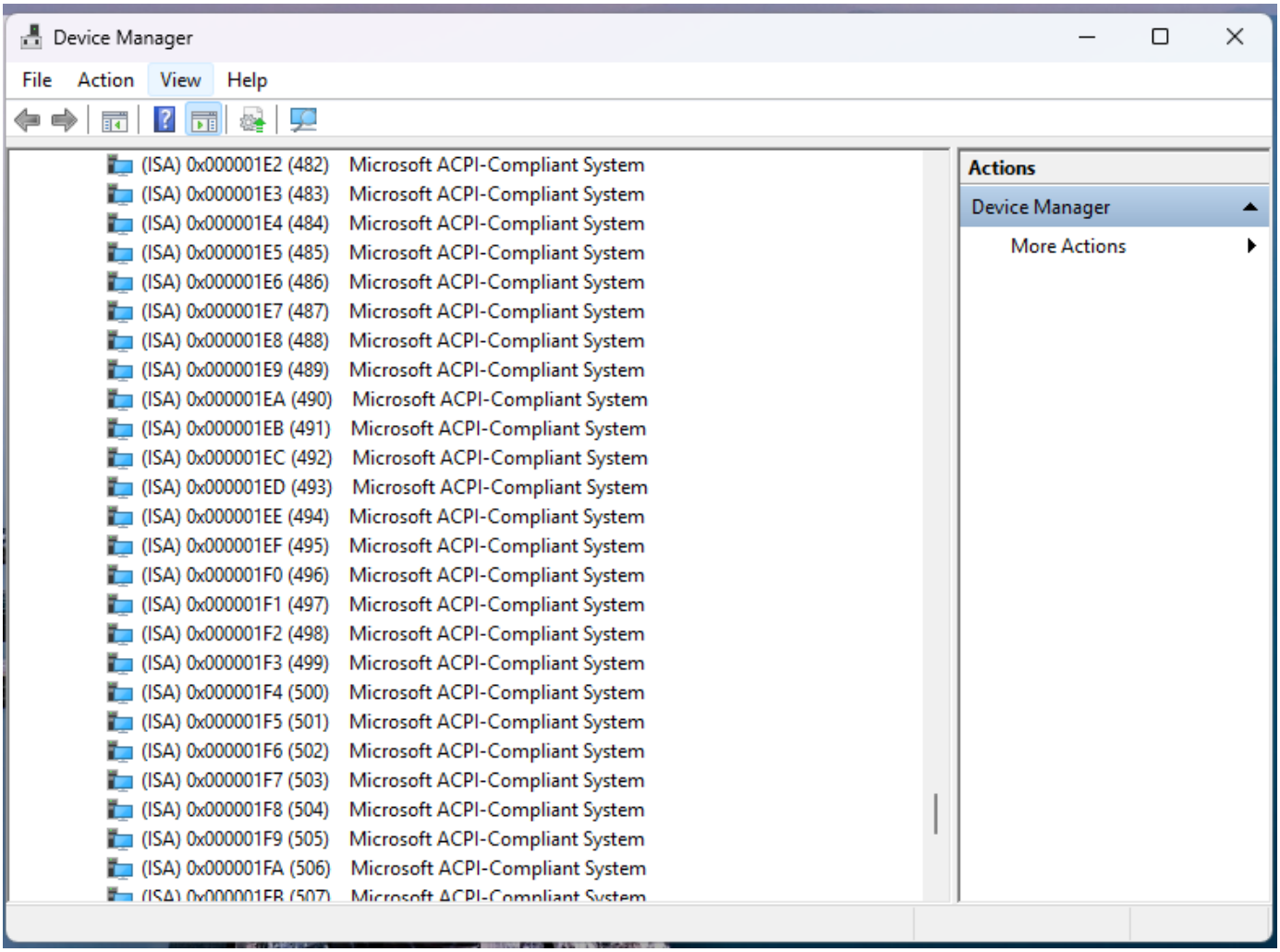
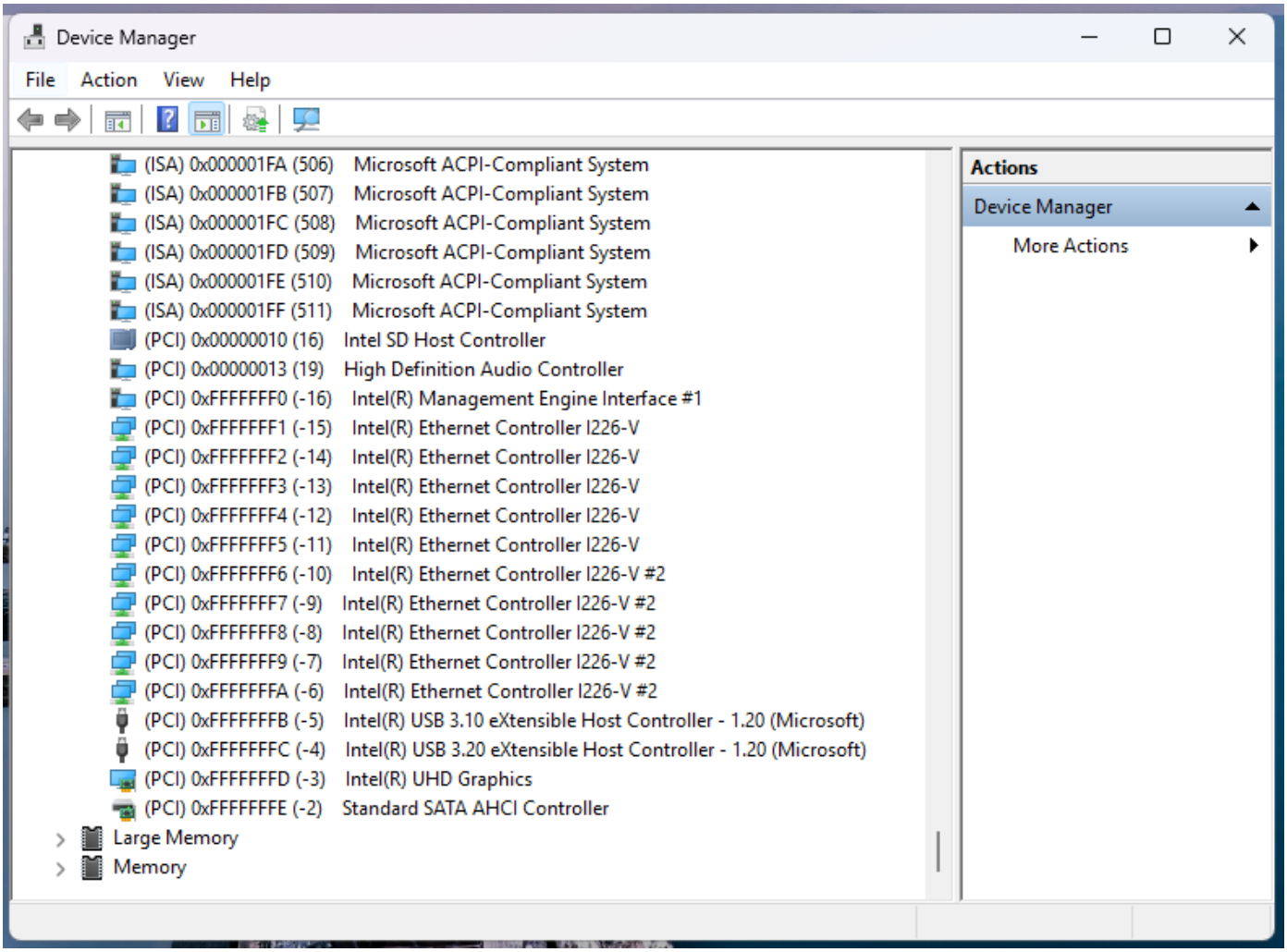
Device Manager
More Actions


Device Manager
File Action View Help
(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
Actions
Device Manager
More Actions


Device Manager
File
Action
View
Help
(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
Actions
Device Manager
More Actions


Device Manager
File Action View Help
(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) Intel SD Host Controller
(PCI) 0x00000013 (19) High Definition Audio Controller
(PCI) 0xFFFFFFF0 (-16) Intel(R) Management Engine Interface #1
(PCI) 0xFFFFFFF1 (-15) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF2 (-14) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF3 (-13) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF4 (-12) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF5 (-11) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF6 (-10) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFF7 (-9) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFF8 (-8) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFF9 (-7) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFFA (-6) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFFB (-5) Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
(PCI) 0xFFFFFFFC (-4) Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
(PCI) 0xFFFFFFFD (-3) Intel(R) UHD Graphics
(PCI) 0xFFFFFFFE (-2) Standard SATA AHCI Controller
Large Memory
Memory
Actions
Device Manager
More Actions