EPS-ADS

Intel® 12th Fanless Rugged Embedded System

Quick Reference Guide

1ˢᵗ Ed –03 July 2023

Part No. E2017DAR0A0R

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

A Message to the Customer

Avalue Customer Services

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

To receive the latest version of the user's manual; please visit our Web site at:

http://www.avalue.com.tw/

Content

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

- 1 x EPS-ADS Intel® 12th Fanless Rugged Embedded System
- Other major components include the following:
  - Din Rail Kit
  - Component Kits (Screws for M.2 & Din Rail, 4x Rubber Foots)

If any of the above items is damaged or missing, contact your retailer.

1.3 System Specifications

System	
Processor	Default: Intel® Core™ i9-12900TE (35W) Intel® Core™ i7-12700TE (35W) Intel® Core™ i5-12500TE (35W) Intel® Core™ i3-12100TE (35W) Intel® Pentium G7400TE(35W) Intel® Celeron G6900TE(35W) Optional: Intel® Core™ i5-12500E (65W)
Platform Controller Hub	Intel®H610E Intel®Q670E
System Memory	2 DIMM Up to 64GB Dual Channel DDR5 4800MHz
BIOS Information	AMI uEFI BIOS 256 Mbit SPI Flash ROM
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec.
H/W Status Monitor	CPU & system temperature monitoring and Voltage monitoring
TPM	Support HW TPM 2.0
SBC	EBM-ADS (5.25'')
Expansion	
mPCIe (Size, Signal)	1 x mPCIe support PCIe III x 1/USB2.0 expansion
M.2 (Key-X, Size, Signal)	1 x M.2 Key-B 2242/3042/3052 support SATA3/PCIeIII x1/ USB 2.0/USB3.2 Gen. 1 and internal nano SIM slot1(support 5G Module 3.3V & 3.8V) 1 x M.2 Key-E 2230 PCIeIII x 1/USB2.0 for Wi-Fi & BT Modules
Storage	
M.2 (Key-X, Size, Signal)	1 x M.2 Key-M 2242/2280, support PCIe Gen IV x 4 (NVMe SSD) RAID 0/1 (Q670E sku only) 1 x M.2 Key-B 2242, support SATA (share with expansion slot)
2.5" Drive Bay (Height)	1 x 2.5" Drive Bay (Internal)
Edge I/O (Front)	
USB Port	4 x USB 3.2 Gen.1 (5Gbp/s) (front) (4 x USB 3.2 Gen.1 from Hub)
COM Port	6 x COM (front) (4 x RS232/422/485 + 2 x RS232) (Select via BIOS, auto flow control via HW)

EPS-ADS

	(2 onboard with 5V/12V/RI Supported, 4 via cable)
Audio	1 x Mic-In, 1 x Line-Out(front)
Power Button	1 x Push Button for Power on/off
Reset Button	1 x Push Button for Reset
Wire-Control Power On/Off	2-Pin Terminal Block
LED Indicator	1 x Storage LED (Yellow)- M.2 B-key SATA/ M.2 M-key PCIe Storage/ 2.5'' SATA
	1 x LTE LED (Green)- M.2 B-key PCIe/USB3
	1 x Wifi LED (Green)- M.2 E key
SIM Slot	1 x nano SIM slot (Internal)
Antenna	6 x Antenna with dust cover (4 x LTE / 2 x Wifi)

Edge I/O (Rear)

USB Port	2 x USB 3.2 Gen.2 (10Gbp/s)
	2 x USB 2.0
HDMI	2 x HDMI 2.0b
DP	2 x DP++ 1.4
RJ-45	2 x RJ-45
System Fan	1 x Smart Fan connector for 65 W CPU SKU
Power Connector	5-pin Phoenix type (default onboard)

Display

Graphic Chipset	Intel® 12th Generation CPU integrated
	(H610E support 3-display, Q670E support 4-display)
Resolution	HDMI 2.0b: Max. resolution 4096x2304 @ 60Hz
	DP++ 1.4: 4096x2304 @ 60Hz

Audio

Audio Codec	Realtek ALC888s co-lay ALC897 HD codec (Default as ALC888s)
Audio Interface	Mic-In, Line-Out

Ethernet

LAN Chipset	1 x Intel I226-LM
	1 x Intel I219-LM, iAMT support for Q670E sku w/i9,i7,i5 CPU
Specification	1 x 10/100/1000/2.5G Base-Tx GbE compatible
	1 x 10/100/1000Base-Tx GbE compatible

LED Indicator

2.5G LAN Port (i226-LM)

ACT/LINK		SPEED	
LED	Definition	LED	Definition
Light Off	No Link	Solid Orange	2.5G
Solid Yellow	Connection	Solid Green	1G/100M
Flashing	Activity	Light Off	10M

1G LAN Port (i219-LM)

ACT/LINK		SPEED	
LED	Definition	LED	Definition
Light Off	No Link	Solid Orange	1G
Solid Yellow	Connection	Solid Green	100M
Flashing	Activity	Light Off	10M

Power Requirement

DC Input	DC in +12V~24V, wide voltage single power input Reverse current/voltage protection
DC Input Connector	5-Pin Terminal Block (V+. V-, GND)
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 5.0 Compliant
Power Mode	ATX/AT (ATX is default setting)
Adapter	AC to DC 150W/240W adapter ACC-ADP-150N-02R (For i7/i5/i3) 240W (For i9/65W)

Mechanical & Environment

Operating Temp.	Fanless Mode (35W) -10°C ~ 55°C (14°F ~ 131°F) with 0.5m/s air flow/with 12V adapter Fan Kit Mode (65W) -10°C ~ 50°C (14°F ~ 122°F) with 0.5m/s air flow/with 12V adapter (with 24V adapter for 35/65W should go with fan kit 0.5/s air flow)
Storage Temp.	-30°C ~70°C (-22°F ~ 158°F)
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Dimension (W*L*H)	215.8 × 202.5 × 75mm
Weight	3.2kg
Vibration Test Random (operation)	1. PSD: 0.0505G²/Hz, 5 Grms 2. Operation mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test: Fh Storage: SSD
Vibration Test Sine (non-operation)	1. Test Acceleration: 2G 2. Test frequency: 5~500 Hz 3. Sweep：1 Oct/ per one minute. (logarithmic) 4. Test Axis: X, Y and Z axis Test time :30 min. each axis

	5. System condition: non-Operating mode Reference IEC 60068-2-6 Testing procedures
Package vibration test	1. PSD: 0.026G²/Hz, 2.16 Grms 2. Non-operation mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis 5. 30 min. per each axis IEC 60068-2-64 Test: Fh
Shock Test	1. Wave form：Half Sine wave 2. Acceleration Rate：50g for operation mode 3. Duration Time：11ms 4. No. of Shock：+/- XYZ axis 18 times 5. Operation mode Reference IEC 60068-2-27 Testing procedures Test Eb: Shock Test
Drop Test	1. One corner, three edges, six faces 2. ISTA 2A, IEC-60068-2-32 Test: Ed
IP Rating	IP 50
Mounting Kit	Wall mount kit DIN RAIL
Software Support	
OS Information	Win 10/Win 11 64bit / Linux
Certification	
Certification Information	CE, FCC Class B LVD 62368-1

Note: Specifications are subject to change without notice.

1.4 System Overview

1.4.1   Front View
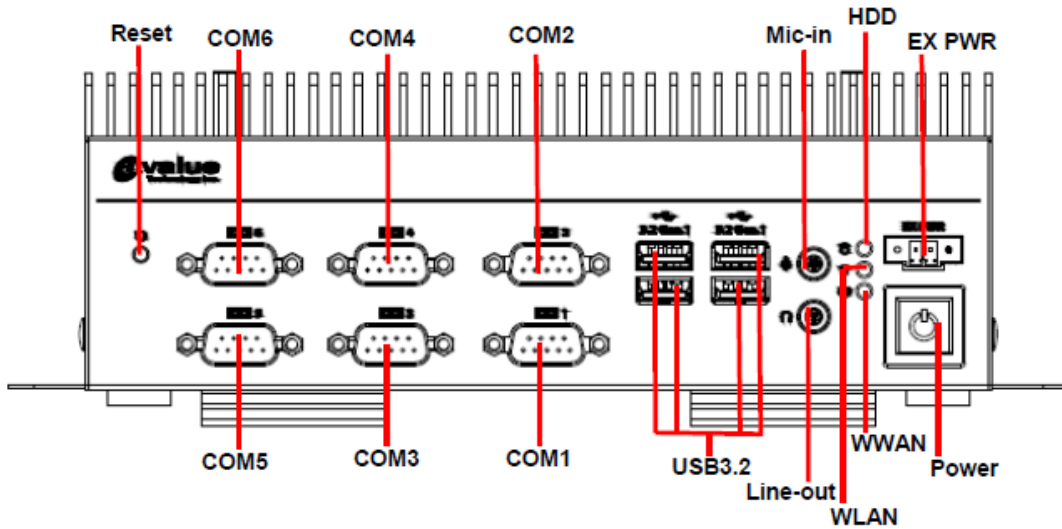
1.4.2   Rear View
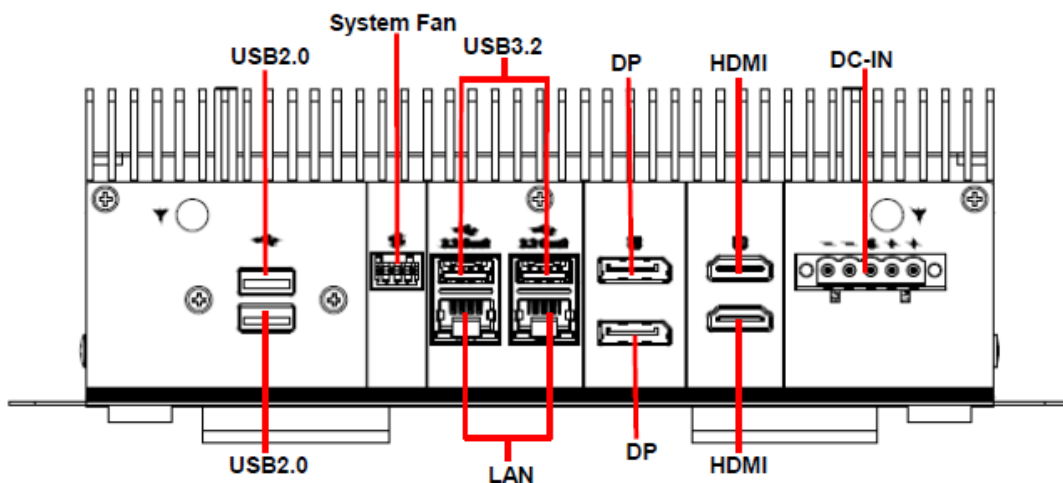
Connectors

Label	Function	Note
Power	Power on button	
EX PWR	Power button	2-Pin Terminal Block
Reset	Reset button	
HDD	HDD indicator	
WWAN	WWAN Indicator	
WLAN	WLAN Indicator	
Mic-in	Mic-in audio jack	
Line-out	Line-out audio jack	
USB3.2	USB 3.2 connector x 4	
COM1~6	Serial Port 1~6 connector	

DC-IN	DC Input connector	5-pin Phoenix type (default onboard)
HDMI	HDMI connector x 2	
DP	DP connector x 2	
LAN	RJ-45 Ethernet x 2	
USB3.2	USB 3.2 connector x 2	
USB2.0	USB 2.0 connector x 2	
System Fan	Smart Fan connector	

1.5 System Dimensions
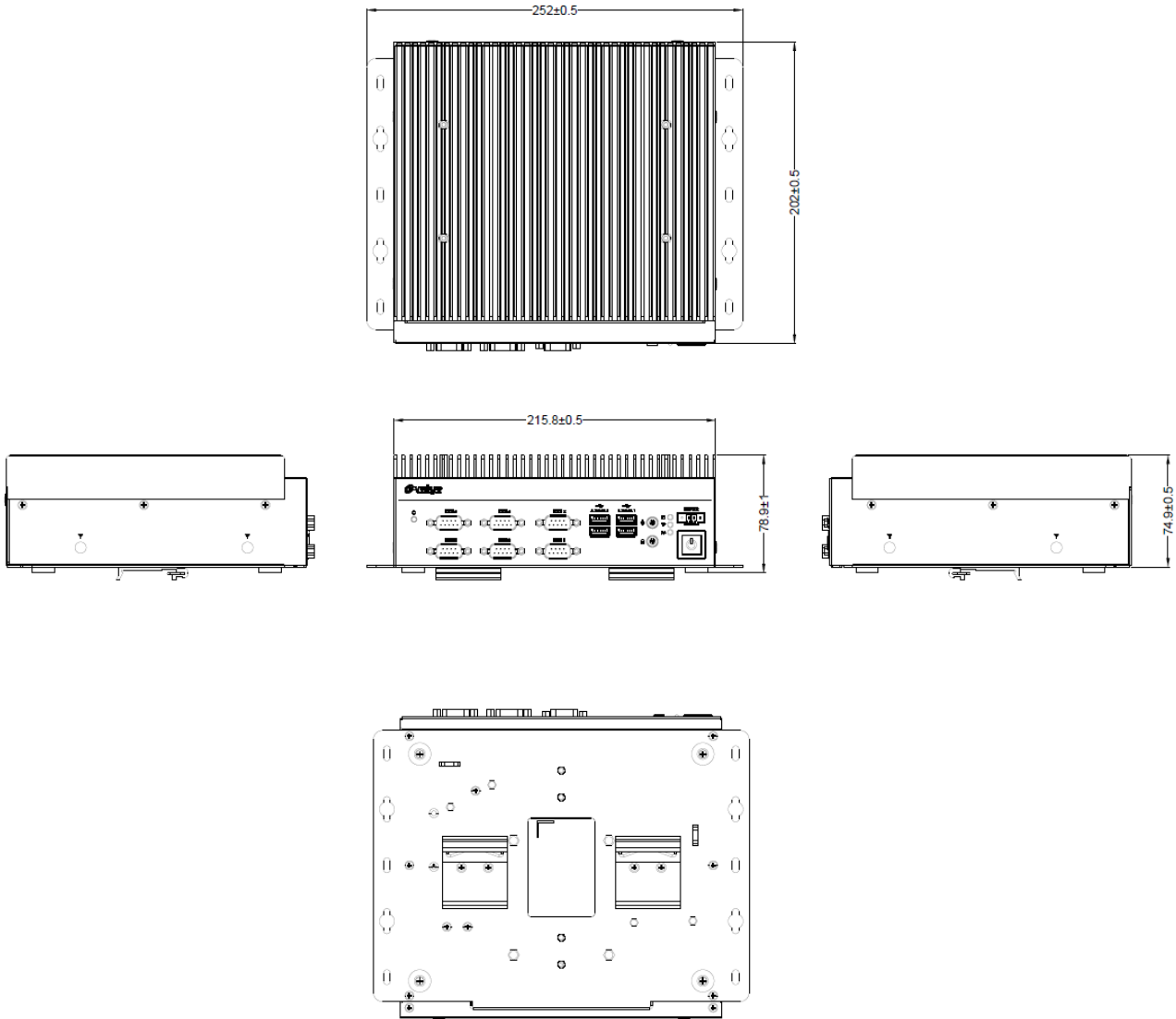
(Unit: mm)

2. Hardware Configuration

For advanced information, please refer to:

1- EBM-ADS included in this manual.

Note: If you need more information, please visit our website:

http://www.avalue.com.tw

2.1 EPS-ADS connector mapping

2.1.1   Serial Port 1~4 connector (COM1~4)

In RS-232 Mode

Signal	PIN	PIN	Signal
NDCD#	1	6	NDSR#
NRXD	2	7	NRTS#
NTXD	3	8	NCTS#
NDTR#	4	9	NRI#
GND	5		

In RS-422 Mode

Signal	PIN	PIN	Signal
TxD1-	1	6	NC
TxD1+	2	7	NC
RxD1+	3	8	NC
RxD1-	4	9	NC
GND	5		

In RS-485 Mode

Signal	PIN	PIN	Signal
DATA1-	1	6	NC
DATA1+	2	7	NC
NC	3	8	NC
NC	4	9	NC
GND	5		

EPS-ADS

2.1.2 Serial Port 5~6 connector (COM5~6)
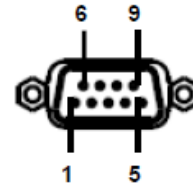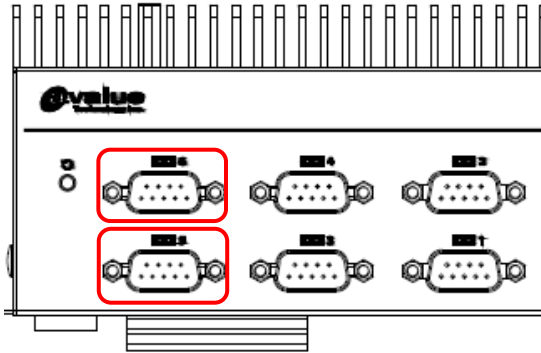
Signal	PIN	PIN	Signal
DCD#	1	6	DSR#
RXD	2	7	RTS#
TXD	3	8	CTS#
DTR#	4	9	RI#
GND	5		

2.1.3 Power button (EX PWR)
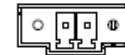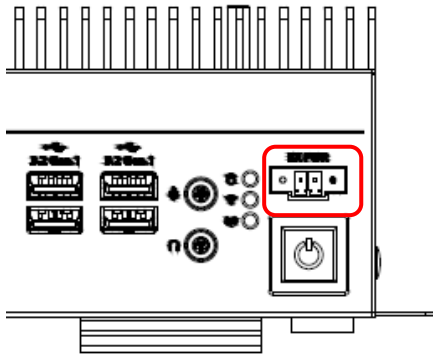
Signal	PIN
PWR_BTN_IN	1
GND	2

2.1.4 DC Input connector (DC-IN)
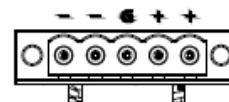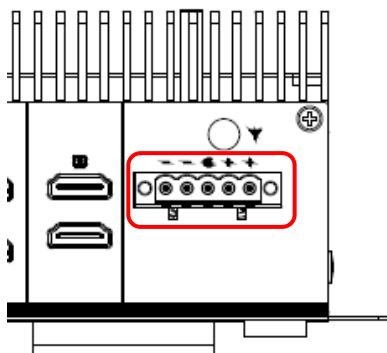
Signal	PIN
VIN+	1
VIN+	2
CHASSIS_GND	3
VIN-	4
VIN-	5

2.2 EBM-ADS Overviews
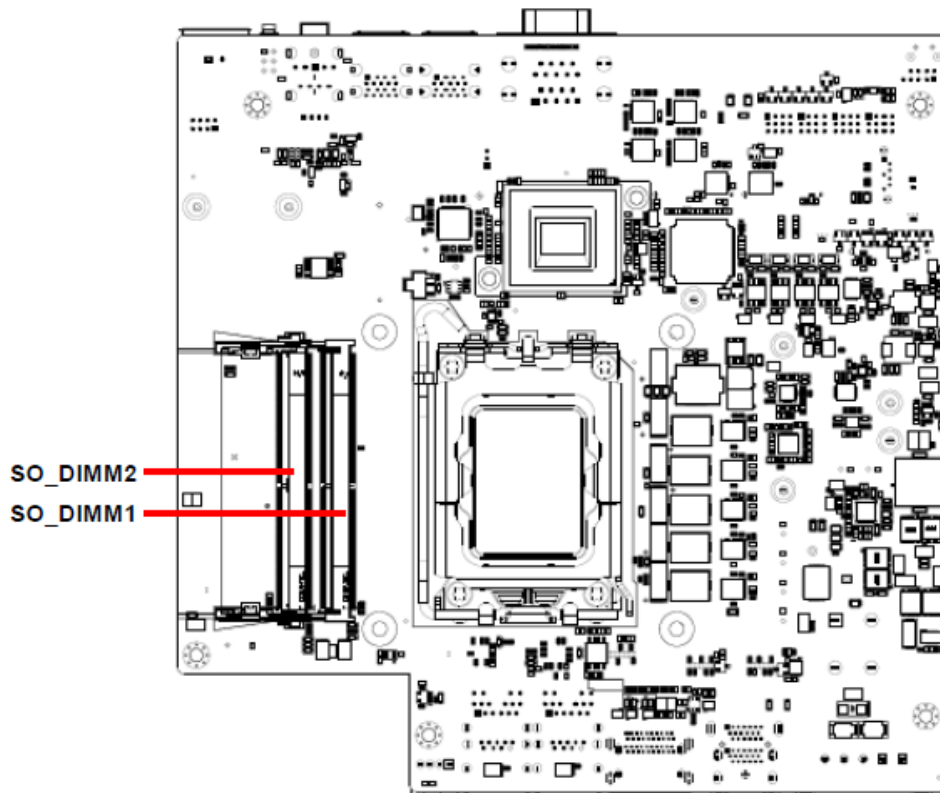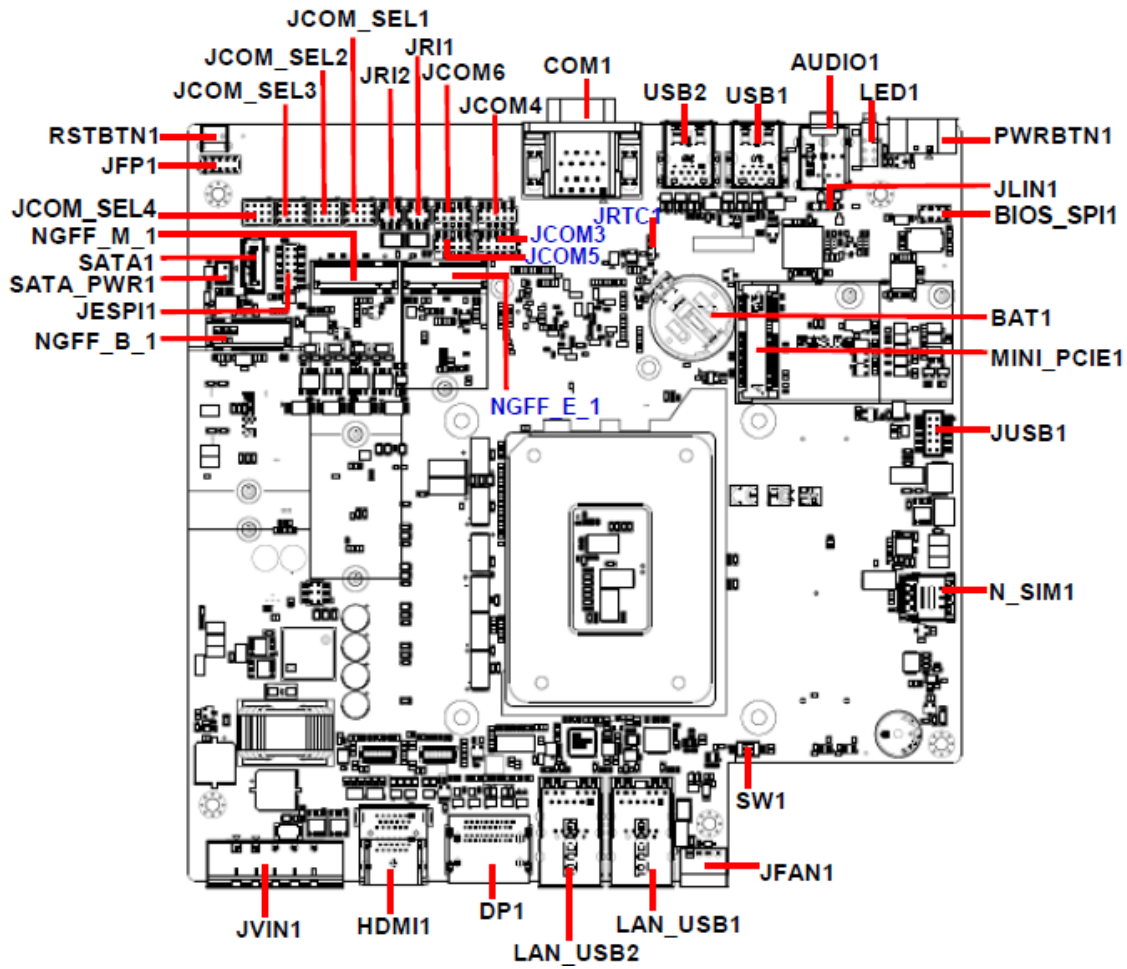
2.3 EBM-ADS Jumper & Connector list

Jumpers

Label	Function	Note
JRTC1	Clear CMOS	3 x 1 header, pitch 2.00 mm
SW1	Multi-function select	
JRI1/2	Serial port 1/2 pin9 signal select	3 x 2 header, pitch 2.00 mm
JCOM_SEL1~4	Serial port 1~4 – RS232/422/485 mode select	4 x 3 header, pitch 2.00 mm

Connectors

Label	Function	Note
BAT1	Battery connector	2 x 1 wafer, pitch 1.25 mm
JFAN1	Fan connector	4 x 1 wafer, pitch 2.50 mm
AUDIO1	Audio connector	
JLIN1	Audio connector	4 x 1 header, pitch 2.00 mm
COM1	Serial port 1 connector	D-sub 9-pin, male
JCOM3/4/5/6	Serial port 3/4/5/6 connector	5 x 2 header, pitch 2.00 mm
N_SIM1	nano SIM slot	
JFP1	Front Panel connector	5 x 2 header, pitch 2.00 mm
JESPI1	ESPI connector	6 x 2 header, pitch 2.00 mm
BIOS_SPI1	BIOS SPI connector	4 x 2 header, pitch 2.00 mm
USB1/2	USB 3.2 connector x 4	
JUSB1	On-board header for USB2.0	5 x 2 wafer, pitch 2.00 mm
HDMI1	HDMI connector x 2	
LAN_USB1/2	RJ-45 Ethernet x 2 USB 3.2 connector x 2	
LED1	HDD/WLAN/WWAN indicator	
PWRBTN1	Power button	1 x 3 terminal block, pitch 3.50 mm
RSTBTN1	Reset button	
JVIN1	DC Input connector	1 x 5 terminal block, pitch 5.08 mm
SATA_PWR1	SATA power connector	2 x 1 wafer, pitch 2.00 mm
DP1	DP connector	
SATA1	Serial ATA connector 1	
NGFF_B_1	M.2 KEY-B connector	

NGFF_E_1	M.2 KEY-E connector
NGFF_M_1	M.2 KEY-M connector
MINI_PCIE1	Full size Mini-PCI-e connector
SO_DIMM1/2	DDR5 SODIMM socket 1/2

2.4 Setting Jumpers & Connectors

2.4.1 Multi-function select (SW1)
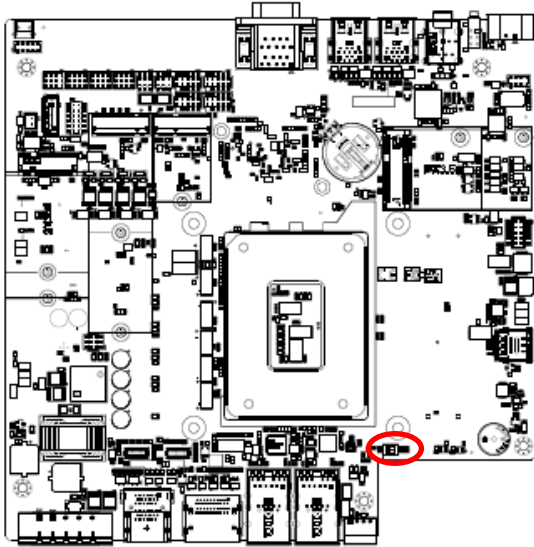
*Default

SW1.1

AT mode

OFF	1		⇨	ON
	2			

ATX mode*

OFF	1	⇦		ON
	2			

SW1.2

M.2 keyB 3.8V

OFF	1		⇨	ON
	2			

M.2 keyB 3.3V*

OFF	1	⇦		ON
	2			

2.4.2   Clear CMOS (JRTC1)
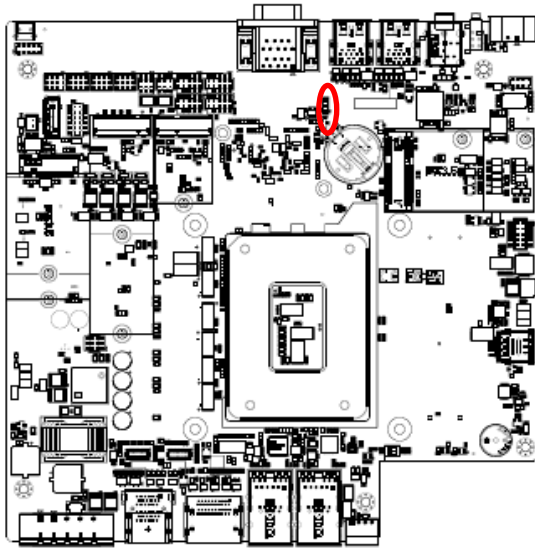
Normal*
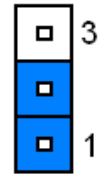
Clear CMOS
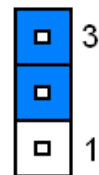
* **Default**

2.4.3   Serial port 1/2 pin9 signal select (JRI1/2)

* **Default**

Ring*

+5V

+12V
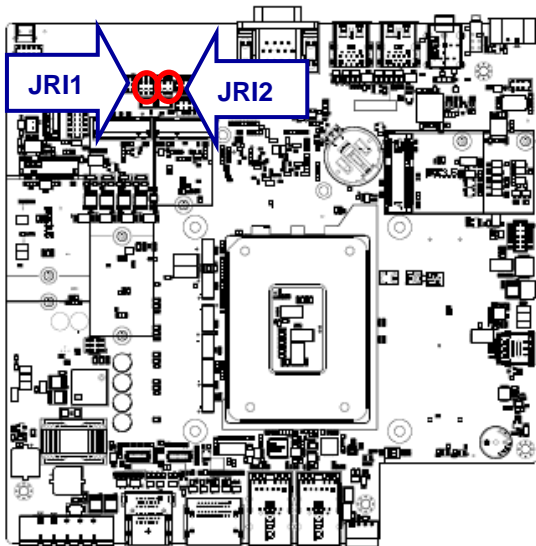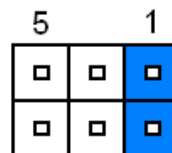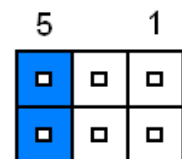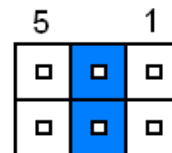
2.4.4   Serial port 1~4 – RS232/422/485 mode select (JCOM_SEL1~4)

JCOM_SEL3

JCOM_SEL4

JCOM_SEL1

JCOM_SEL2

* Default

RS232*

```
10          1
```

```
12          3
```

RS422, RS485

```
10          1
```

```
12          3
```
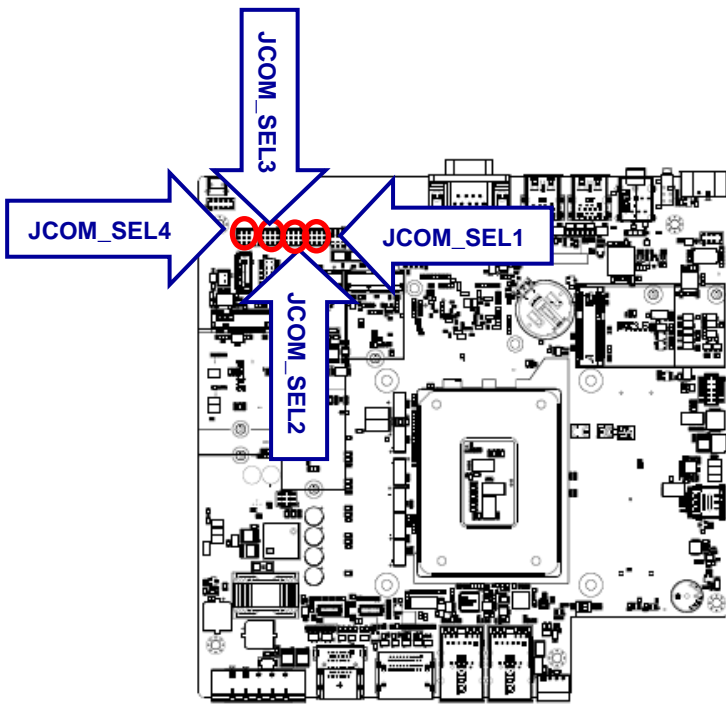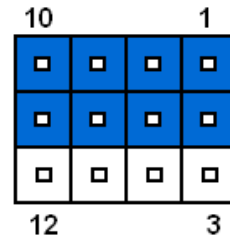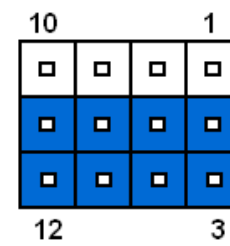
2.4.5   Fan connector (JFAN1)

1
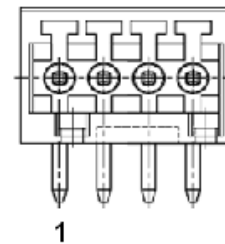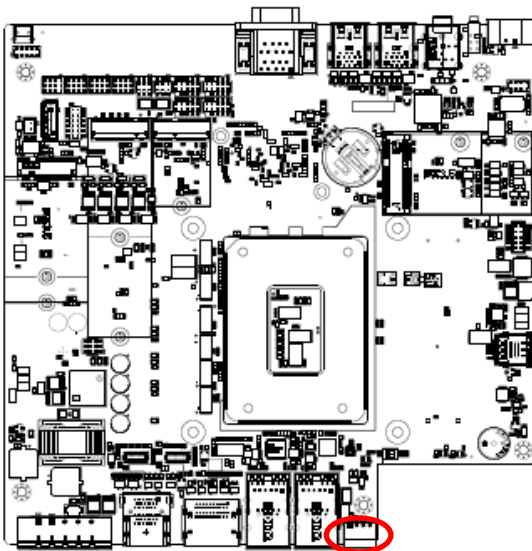
Signal	PIN
GND	1
+12V	2
TACH_FAN0	3
PWM_FAN0	4

2.4.6　　Serial port 3/4/5/6 connector (JCOM3/4)

In RS-232 Mode

Signal	PIN	PIN	Signal
NDCD#	1	6	NDSR#
NRXD	2	7	NRTS#
NTXD	3	8	NCTS#
NDTR#	4	9	NRI#
GND	5		

In RS-422 Mode

Signal	PIN	PIN	Signal
TxD1-	1	6	NC
TxD1+	2	7	NC
RxD1+	3	8	NC
RxD1-	4	9	NC
GND	5		

In RS-485 Mode

Signal	PIN	PIN	Signal
DATA1-	1	6	NC
DATA1+	2	7	NC
NC	3	8	NC
NC	4	9	NC
GND	5		

2.4.7 Serial port 3/4/5/6 connector (JCOM5/6)

Signal	PIN	PIN	Signal
COM_DCD#	1	2	COM_RXD
COM_TXD	3	4	COM_DTR#
GND	5	6	COM_DSR#
COM_RTS#	7	8	COM_CTS#
COM_RI#	9		

2.4.8 SATA power connector (SATA_PWR1)
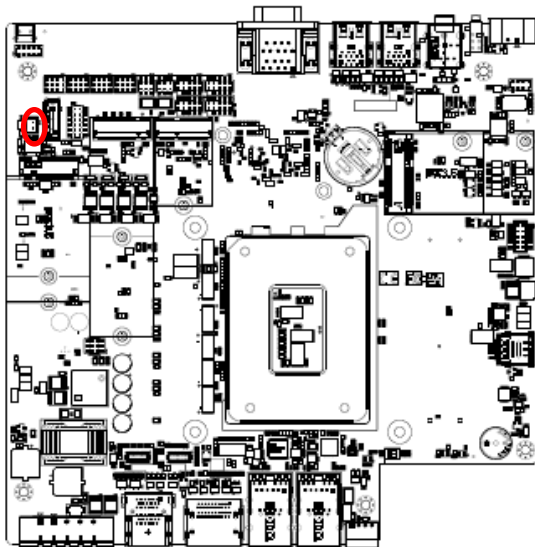
Signal	PIN
GND	1
+5V	2

2.4.9   On-board header for USB2.0 (JUSB1)
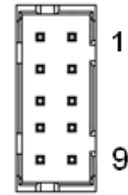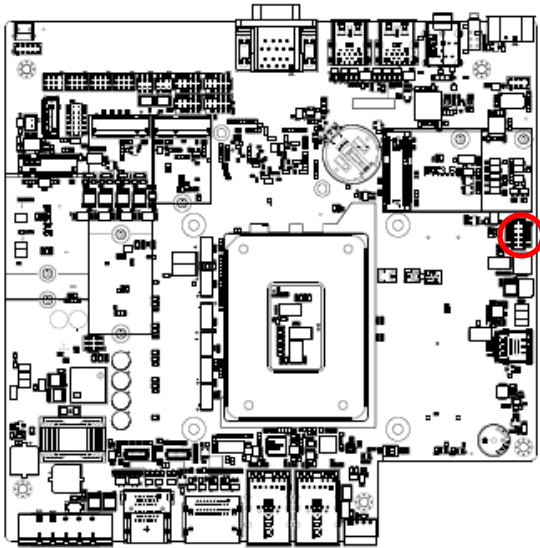
Signal	PIN	PIN	Signal
+5VSB	2	1	+5VSB
USB_R_DN5	4	3	USB_R_DN4
USB_R_DP5	6	5	USB_R_DP4
GND	8	7	GND
GND	10	9	GND

2.4.10   Front Panel connector (JFP1)
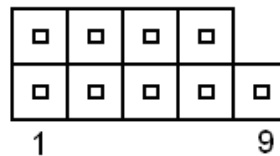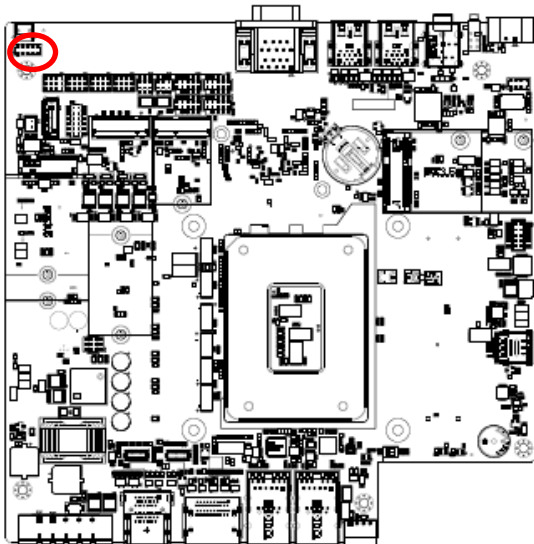
Signal	PIN	PIN	Signal
+5V	1	2	FP_PWR_LED+
HDD_LED#	3	4	PWR_LED#
PM_SYSRST#	5	6	PWRBTN_TO_EC#
GND	7	8	GND
NC	9		

2.4.11   BIOS SPI connector (BIOS_SPI1)
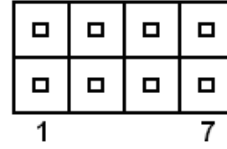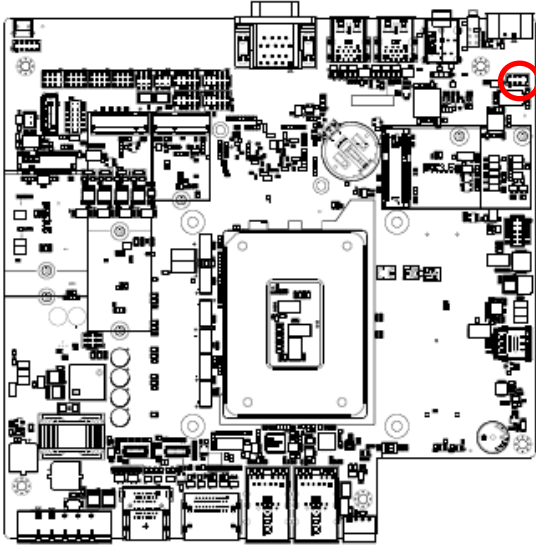
Signal	PIN	PIN	Signal
+3.3VSB	1	2	GND
SPI_CS0#	3	4	SPI_CLK
SPI_MISO	5	6	SPI_MOSI
BIOS_HOLD#	7	8	BIOS_WP#

2.4.12   Audio connector (JLIN1)
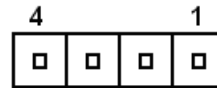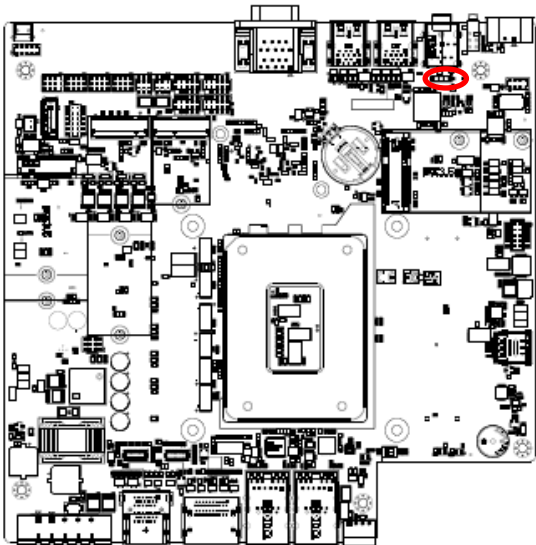
Signal	PIN
LINE1-R-IN	1
LINE1-L-IN	2
HD_AGND	3
LINE1-JD	4

2.4.13 ESPI connector (JESPI1)
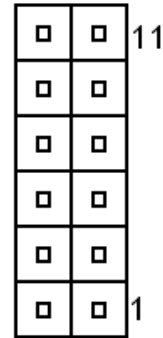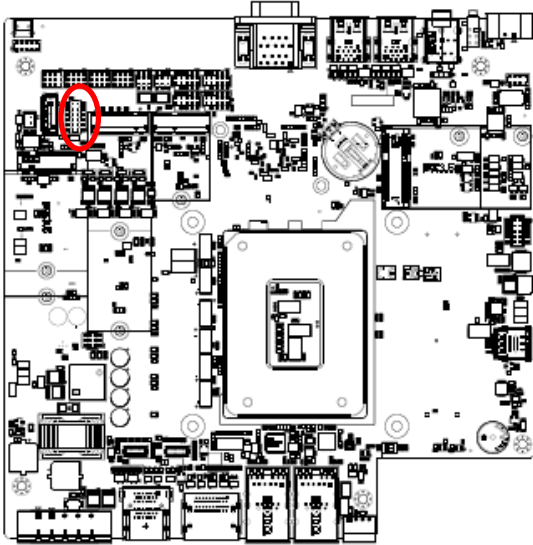
Signal	PIN	PIN	Signal
+3.3VSB	2	1	ESPI_IO0
PLT_RST#	4	3	ESPI_IO1
ESPI_CS0#	6	5	ESPI_IO2
ESPI_CLK	8	7	ESPI_IO3
GND	10	9	NC
ESPI_ALEAT#	12	3	ESPI_RST

2.4.14 Power button (PWRBTN1)
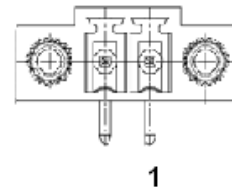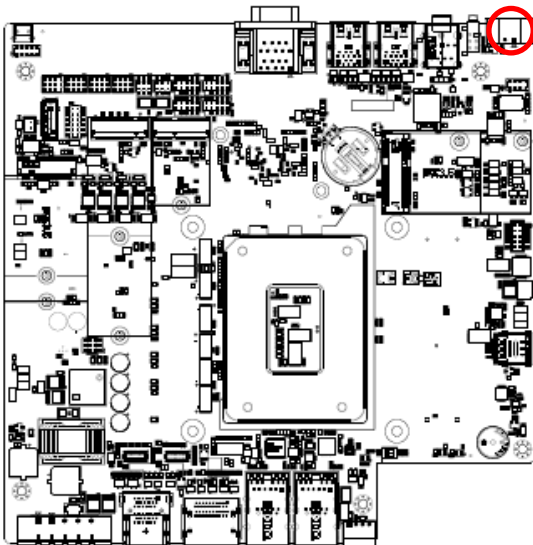
Signal	PIN
PWR_BTN_IN	1
GND	2

2.4.15 DC Input connector (JVIN1)
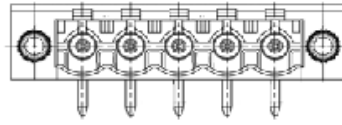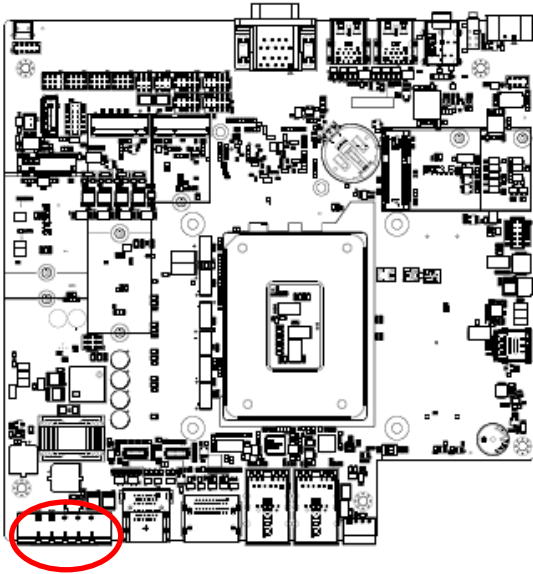
Signal	PIN
+VIN	1
+VIN	2
GND_CHASSIS	3
GND	4
GND	5

2.5 Installing Hard Disk (EPS-ADS)
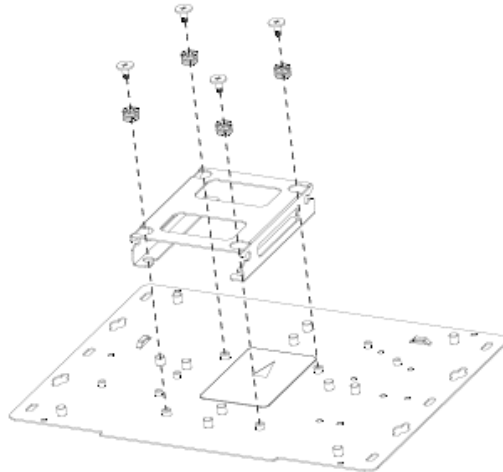
Step1. Insert and fasten 4 screws on each side of the system to secure brackets.
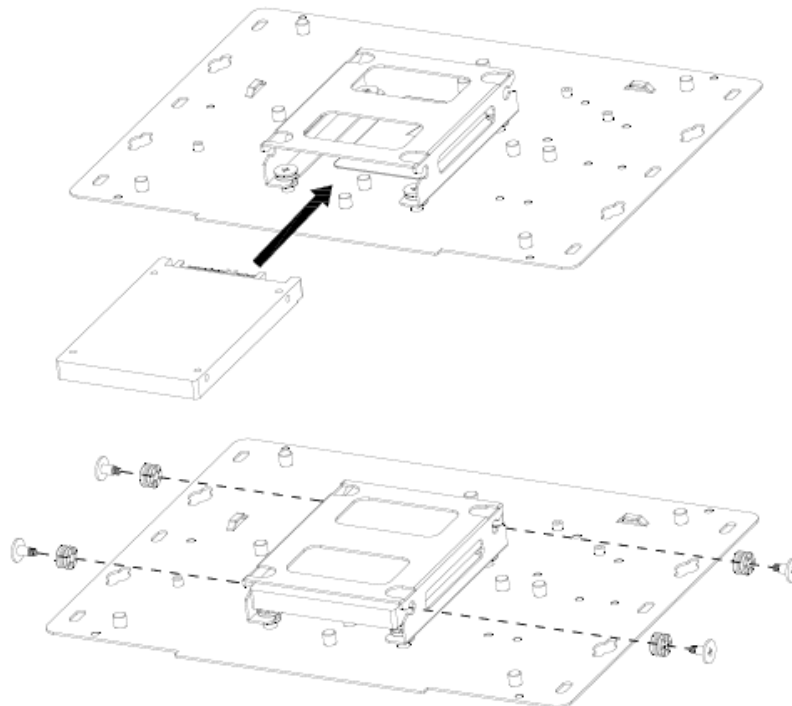
Step2. Fix HDD using the 4 screws in the Accessory Kit.
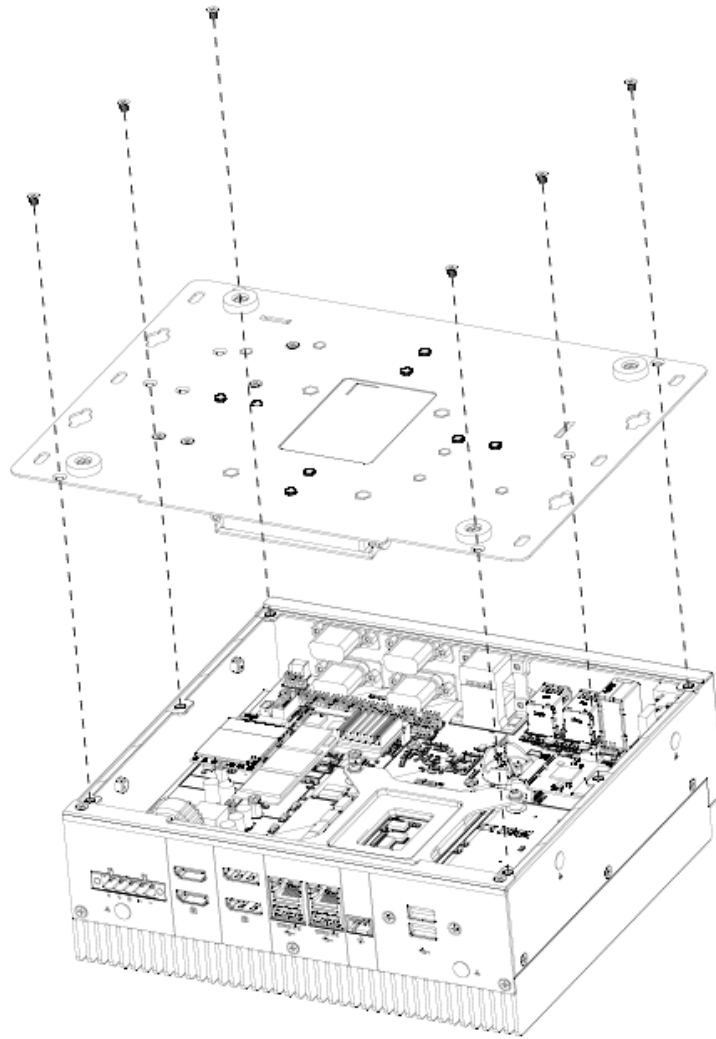
Step3. Place back the cover and fasten 6 screws back to complete.

2.6 Installing PCIE card (EPS-ADS)
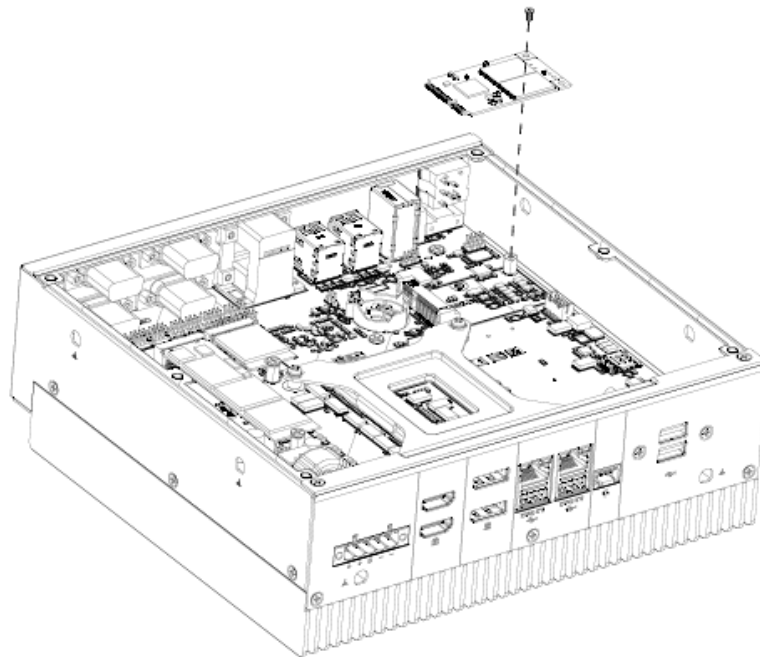
Step1. Fasten screw to secure PCIE card.
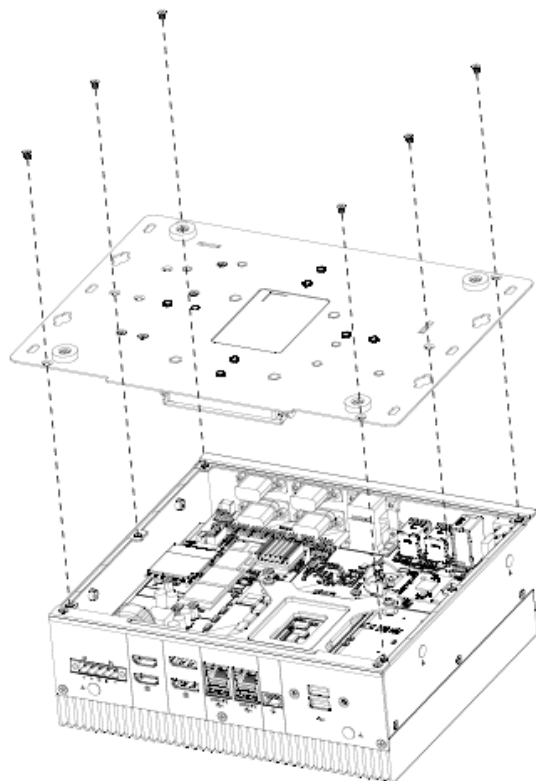
Step2. Place back the cover and fasten 6 screws back to complete.

2.7 Installing M.2 Key-B card (EPS-ADS)
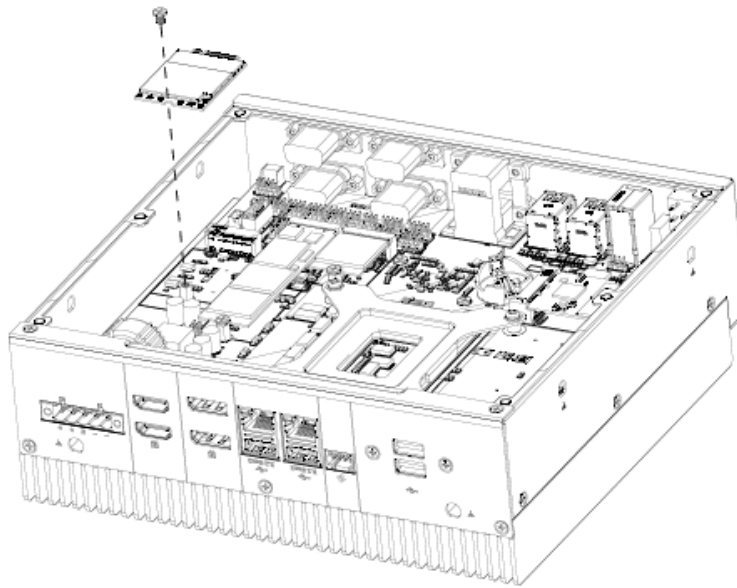
Step1. Insert M.2 Key-B card into designated locations and fasten with the screw to complete installation.

2.8 Installing M.2 Key-E card (EPS-ADS)
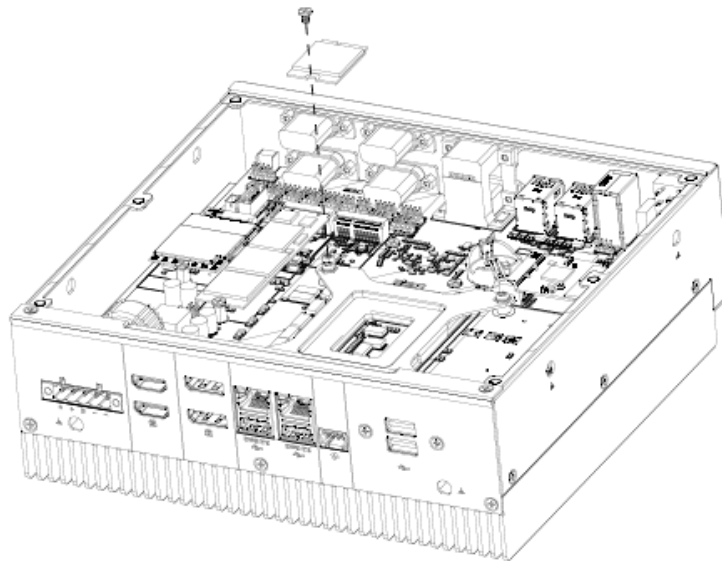
Step1. Insert M.2 Key-E card into designated locations and fasten with the screw to complete installation.
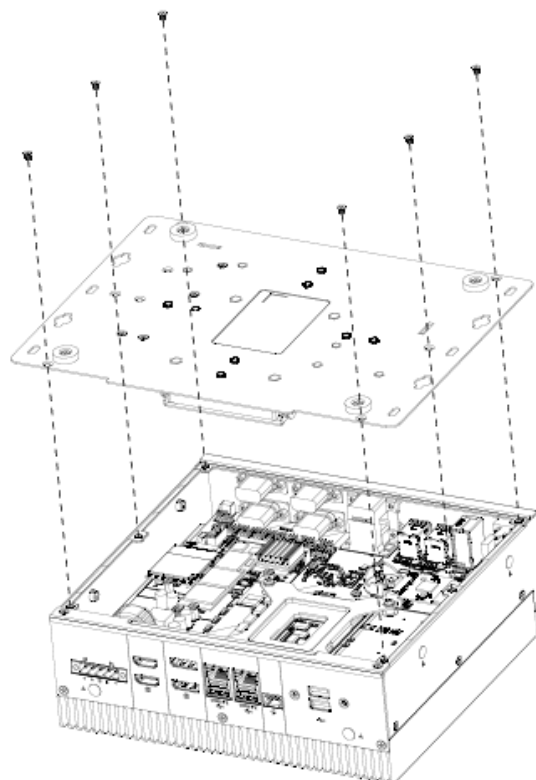
Step2. Place back the cover and fasten 6 screws back to complete.

2.9 Installing M.2 Key-M card (EPS-ADS)
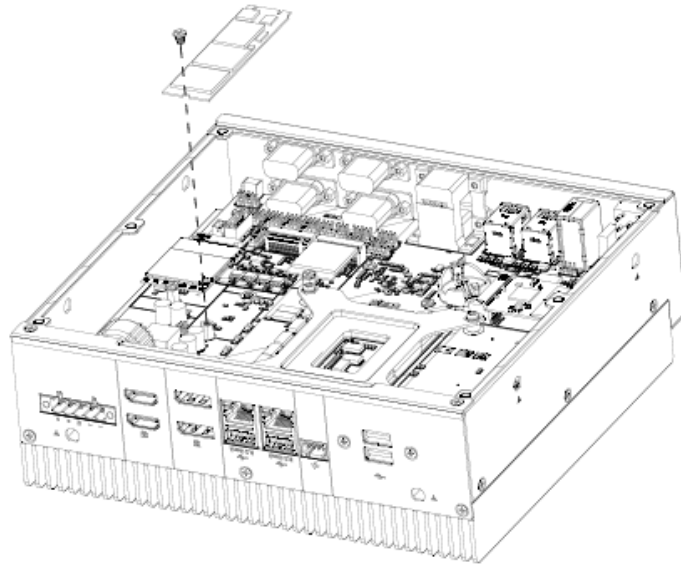
Step1. Insert M.2 Key-M card into designated locations and fasten with the screw to complete installation.
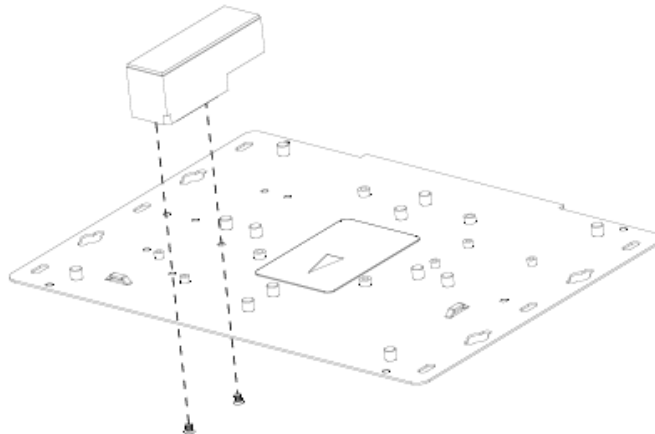
Step2. Fix M.2 M-Key card using the 2 screws in the Accessory Kit.
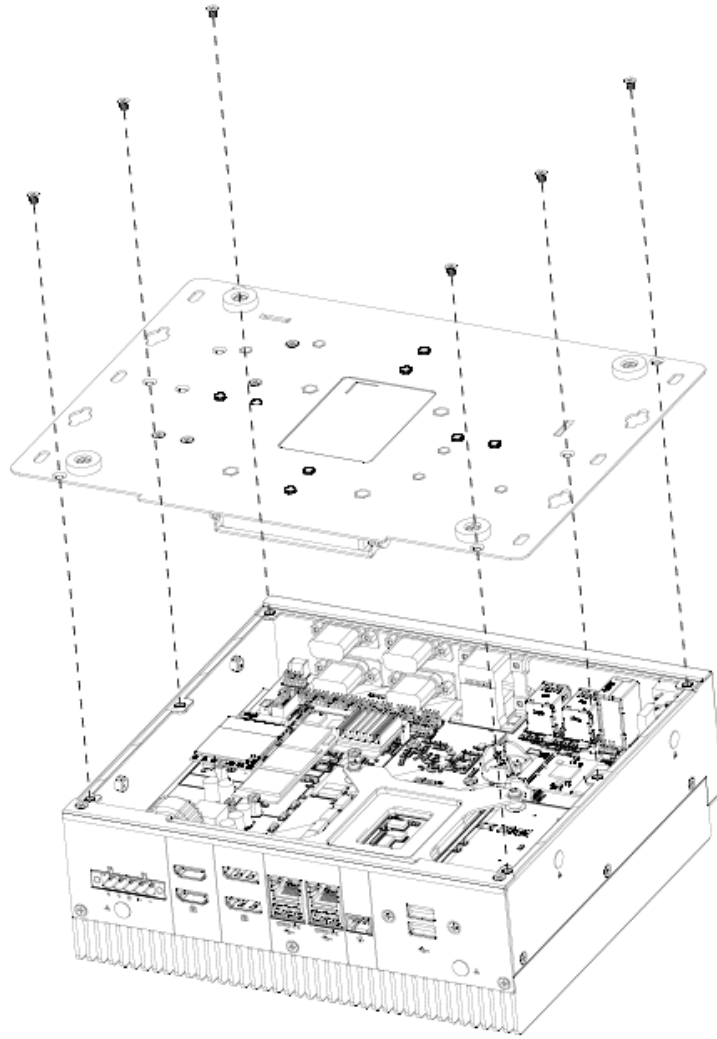
Step3. Place back the cover and fasten 6 screws back to complete.

2.10   Installing Din Rail Mounting (EPS-ADS)
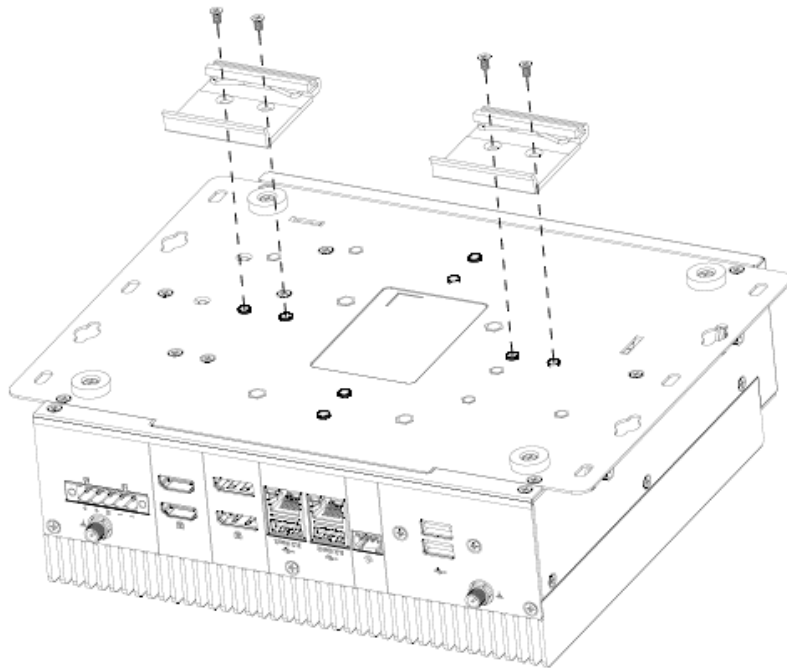
(Horizontal Din Rail)
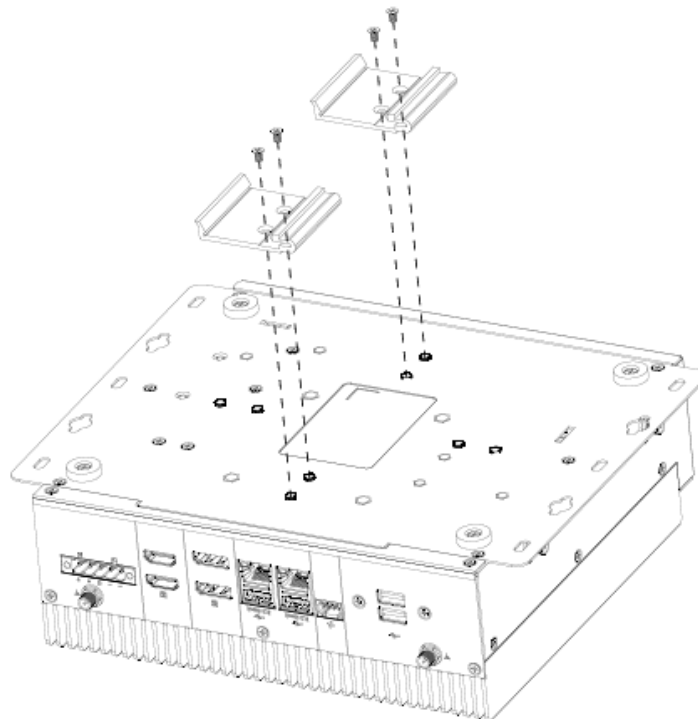
(Vertical Din Rail)

Step1. Insert Din Rail into designated locations and fasten with the 4 screws to complete installation.

3.BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:
By pressing <F2> or <Del> immediately after switching the system on, or
By pressing the <F2> or <Del> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

<p align="center">**Press <F2> or <Del> to enter SETUP**</p>

If the message disappears before you 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.

3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**

  Use the left and right arrow keys to choose the menu you want to be in.

  Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.4 Getting Help

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> or the F1 key again.

3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the BIOS supports an override to the NVRAM settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.

```
                              Aptio Setup - AMI
     Main  Advanced  Chipset  Security  Boot  Save & Exit
 ┌─────────────────────────────────────────────┬───────────────────────────┐
 │ BIOS Information                             │ Choose the system default │
 │ BIOS Vendor             American Megatrends  │ language                  │
 │ Core Version            5.27                 │                           │
 │ Compliancy              UEFI 2.8; PI 1.7     │                           │
 │ Project Version         1AZJN 0.04 x64       │                           │
 │ Build Date and Time     06/13/2023 13:15:40  │                           │
 │ Access Level            Administrator        │                           │
 │ BIOS Name               EMADS00I             │                           │
 │                                              │                           │
 │ System Language         [English]            │                           │
 │ ▶ Intel RC Version                           │                           │
 │                                              │                           │
 │ System Date             [Thu 06/29/2023]     │                           │
 │ System Time             [11:04:42]           │───────────────────────────│
 │                                              │ →←: Select Screen         │
 │                                              │ ↑↓: Select Item           │
 │                                              │ Enter: Select             │
 │                                              │ +/-: Change Opt.          │
 │                                              │ F1: General Help          │
 │                                              │ F2: Previous Values       │
 │                                              │ F3: Optimized Defaults    │
 │                                              │ F4: Save & Exit           │
 │                                              │ ESC: Exit                 │
 │                                              │                           │
 └─────────────────────────────────────────────┴───────────────────────────┘
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```

```
                              Aptio Setup - AMI
     Main
 ┌─────────────────────────────────────────────┬───────────────────────────┐
 │ Intel RC Version                         ▲   │                           │
 │                                              │                           │
 │ FSP Information                              │                           │
 │ FSP version             0C.00.8D.10          │                           │
 │ RC version              0C.E0.8D.10          │                           │
 │ Build Date                                   │                           │
 │ FSP Mode                Dispatch Mode        │                           │
 │                                              │                           │
 │ Board Information                            │                           │
 │ Board Name              EPS-ADS(EMADS00I)    │                           │
 │ Board ID                N/A                  │                           │
 │ Fab ID                  Default string       │                           │
 │ LAN PHY Revision        A6 (B2 Stepping)     │                           │
 │                                              │ →←: Select Screen         │
 │ Processor Information                        │ ↑↓: Select Item           │
 │ Name                    AlderLake DT         │ Enter: Select             │
 │ Type                    12th Gen Intel(R)    │ +/-: Change Opt.          │
 │                         Core(TM) i5-12500TE  │ F1: General Help          │
 │ Speed                   1900 MHz             │ F2: Previous Values       │
 │ ID                      0x90675              │ F3: Optimized Defaults    │
 │ Stepping                H0                   │ F4: Save & Exit           │
 │ Package                 Not Implemented Yet  │ ESC: Exit                 │
 │ Number of Efficient-cores  0Core(s) / 0Thread(s)                         │
 │ Number of Performance-cores  6Core(s) / 12Thread(s)                      │
 │ Microcode Revision      26                   │                           │
 └─────────────────────────────────────────────┴───────────────────────────┘
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```

3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

3.6.1.3 System Time

Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

```
                              Aptio Setup - AMI
        Main  Advanced  Chipset  Security  Boot  Save & Exit

  ▶ CPU Configuration                         CPU Configuration Parameters
  ▶ PCH-FW Configuration
  ▶ Trusted Computing
  ▶ ACPI Settings
  ▶ Super IO Configuration
  ▶ NCT6126D HW Monitor
  ▶ S5 RTC Wake Settings
  ▶ Serial Port Console Redirection
  ▶ USB Configuration
  ▶ Network Stack Configuration
  ▶ NVMe Configuration

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

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```

3.6.2.1 CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.

```
                          Aptio Setup – AMI
        Advanced

    CPU Configuration                                  Displays the P-core Information

    ▶ Performance-core Information

      ID                          0x90675
      Brand String                12th Gen Intel(R)
                                  Core(TM) i5-12500TE
      Frequency                   1900 MHz
      VMX                         Supported
      SMX/TXT                     Supported

      CPU Flex Ratio Settings     19
      Intel (VMX) Virtualization  [Enabled]
      Technology                                       ↔: Select Screen
      Active Performance-cores    [All]                ↑↓: Select Item
      Hyper-Threading             [Enabled]            Enter: Select
    ▶ CPU – Power Management Control                    +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



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```

Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled**[Default]**	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores	All**[Default]** 7 6 5 4 3 2 1	Number of cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Hyper-Threading	Disabled Enabled**[Default]**	Enable or Disable Hyper-Threading Technology.

3.6.2.1.1 Performance-core Information

```
                                Aptio Setup - AMI
        Advanced

Performance-core Information

L1 Data Cache                       48 KB x 6
L1 Instruction Cache                32 KB x 6
L2 Cache                            1280 KB x 6
L3 Cache                            18 MB




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


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```

3.6.2.1.2 CPU – Power Management Control

```
                                Aptio Setup - AMI
        Advanced

CPU - Power Management Control                      Allows more than two frequency
                                                    ranges to be supported.
Intel(R) SpeedStep(tm)              [Enabled]
Intel(R) Speed Shift Technology     [Enabled]
  Turbo Mode                        [Enabled]
C states                            [Enabled]




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


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```

Item	Option	Description
Intel® SpeedStep™	Disabled Enabled**[Default]**	Allows more than two frequency ranges to be supported.
Intel® Speed Shift Technology	Disabled Enabled**[Default]**	Enable/Disable intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

Turbo Mode	Enabled**[Default]**, Disabled	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.
C States	Enabled**[Default]**, Disabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized

3.6.2.2 PCH-FW Configuration

```
                            Aptio Setup - AMI
         Advanced

    ME Firmware Version          16.1.25.1865        Configure Management Engine
    ME Firmware Mode             Normal Mode         Technology Parameters
    ME Firmware SKU              Consumer SKU
    ME Firmware Status 1         0x90000255
    ME Firmware Status 2         0x8B100106
    ME Firmware Status 3         0x00000020
    ME Firmware Status 4         0x00004000
    ME Firmware Status 5         0x00000000
    ME Firmware Status 6         0x00400002


  ▶ Firmware Update Configuration
  ▶ PTT Configuration
                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit



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```

3.6.2.2.1 Firmware Update Configuration

```
                            Aptio Setup - AMI
         Advanced

    Me FW Image Re-Flash          [Disabled]          Enable/Disable Me FW Image
                                                      Re-Flash function.










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



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```

Item	Option	Description
Me FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

3.6.2.2.2 PTT Configuration
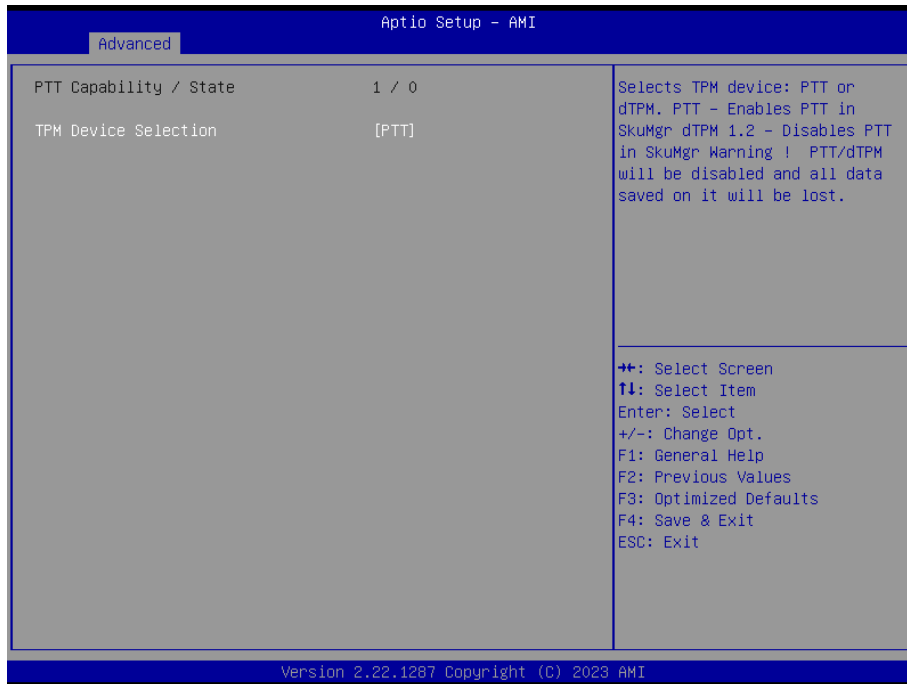
Item	Option	Description
TPM Device Selection	dTPM PTT**[Default]**,	Selects TPM device: PTT or dTPM. PTT-Enables PTT in SKuMgr dTPM 1.2-Disables PTT in SkuMgr Warning! PTT/dTPM will be disabled and all data saved on it will be lost.

3.6.2.3 Trusted Computing

Item	Options	Description
Security Device Support	Disable, Enable**[Default]**	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

3.6.2.4 APCI Settings

```
                                      Aptio Setup – AMI
        Advanced

    ACPI Settings                                              Enables or Disables BIOS ACPI
                                                               Auto Configuration.
    Enable ACPI Auto Configuration        [Disabled]

    Enable Hibernation                    [Enabled]
    ACPI Sleep State                      [S3 (Suspend to RAM)]




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




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```
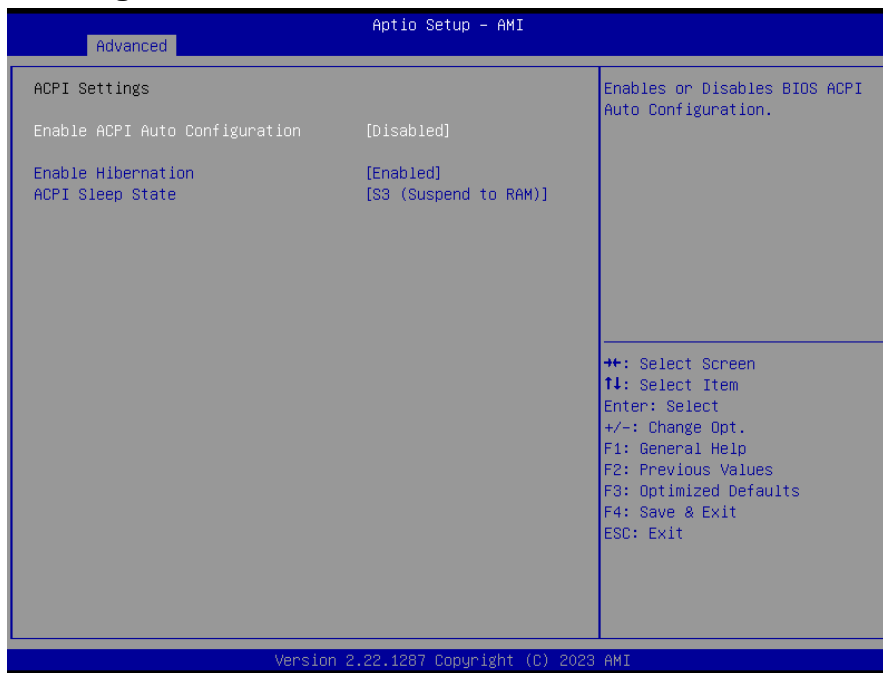
Item	Options	Description
Enable ACPI Auto Configuration	Disabled**[Default]**, Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM)**[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

3.6.2.5   Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.2 for more information.
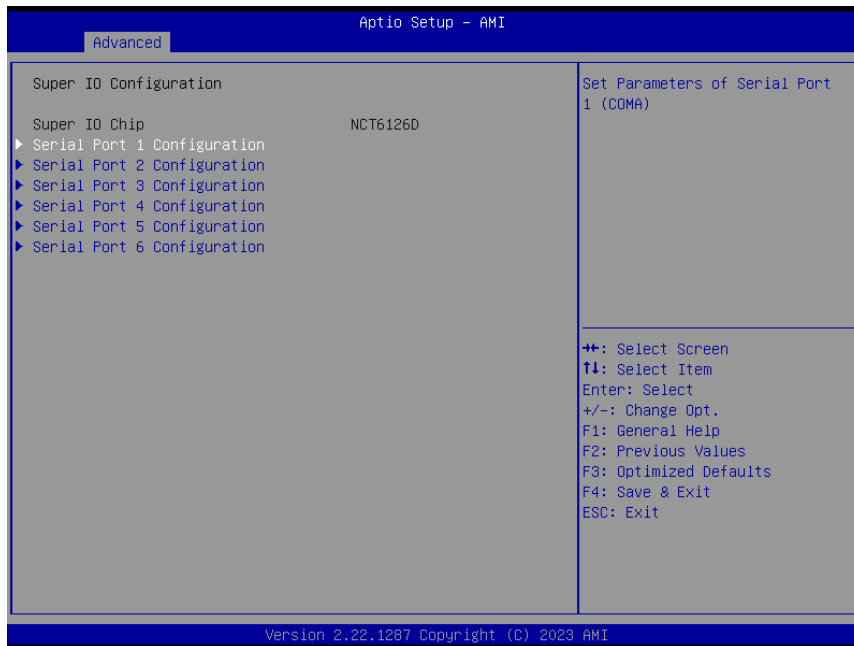
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).

3.6.2.5.1 Serial Port 1 Configuration
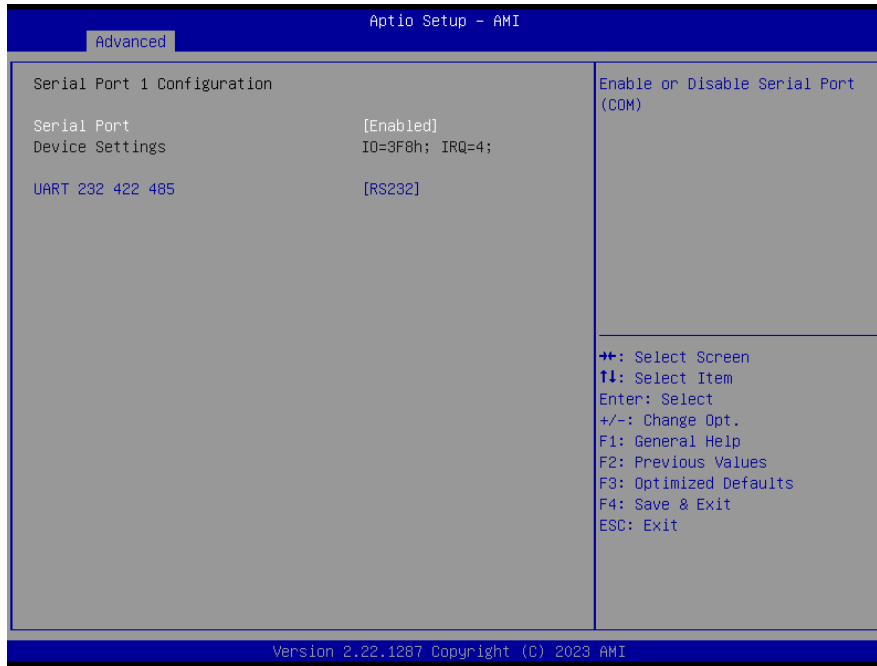
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	RS232**[Default]**, RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.2 Serial Port 2 Configuration

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

	RS232**[Default]**, RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.
UART 232 422 485		

3.6.2.5.3 Serial Port 3 Configuration

```
                              Aptio Setup - AMI
         Advanced

     Serial Port 3 Configuration                        Enable or Disable Serial Port
                                                        (COM)
     Serial Port                    [Enabled]
     Device Settings                IO=3E8h; IRQ=4;

     UART 232 422 485               [RS232]




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




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```

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	RS232**[Default]**, RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.4 Serial Port 4 Configuration
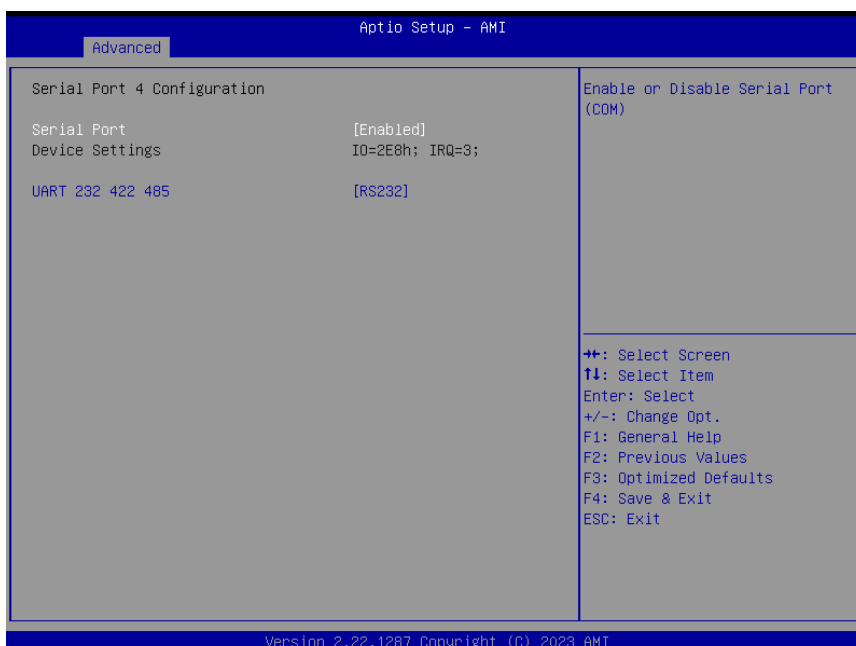
```
                              Aptio Setup - AMI
         Advanced

     Serial Port 4 Configuration                        Enable or Disable Serial Port
                                                        (COM)
     Serial Port                    [Enabled]
     Device Settings                IO=2E8h; IRQ=3;

     UART 232 422 485               [RS232]




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




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```

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	RS232**[Default]**, RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.5 Serial Port 5 Configuration
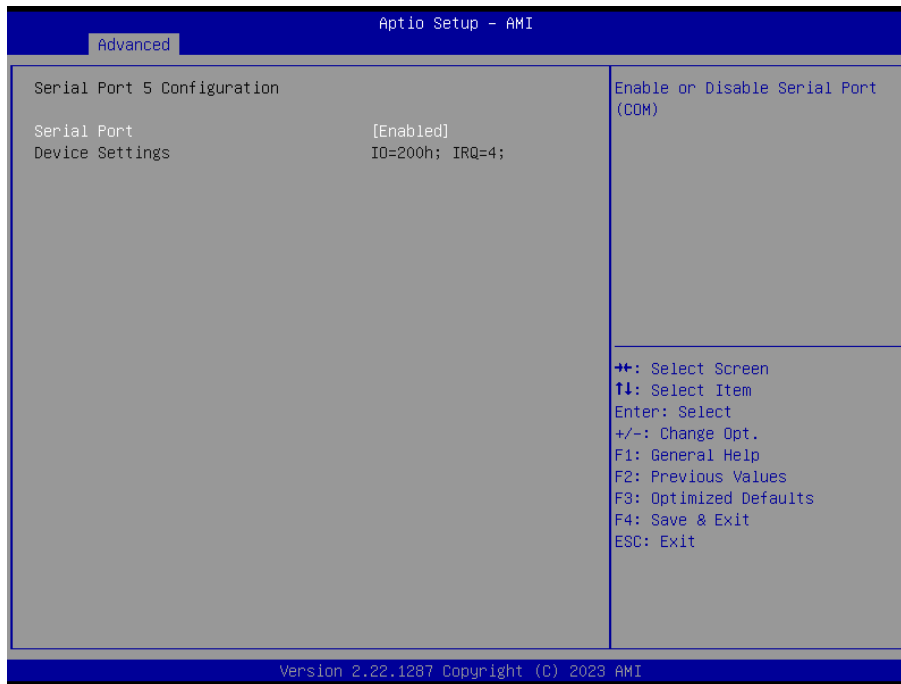
```
                              Aptio Setup - AMI
          Advanced

    Serial Port 5 Configuration                         Enable or Disable Serial Port
                                                        (COM)
    Serial Port                       [Enabled]
    Device Settings                   IO=200h; IRQ=4;




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




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```

Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.5.6 Serial Port 6 Configuration
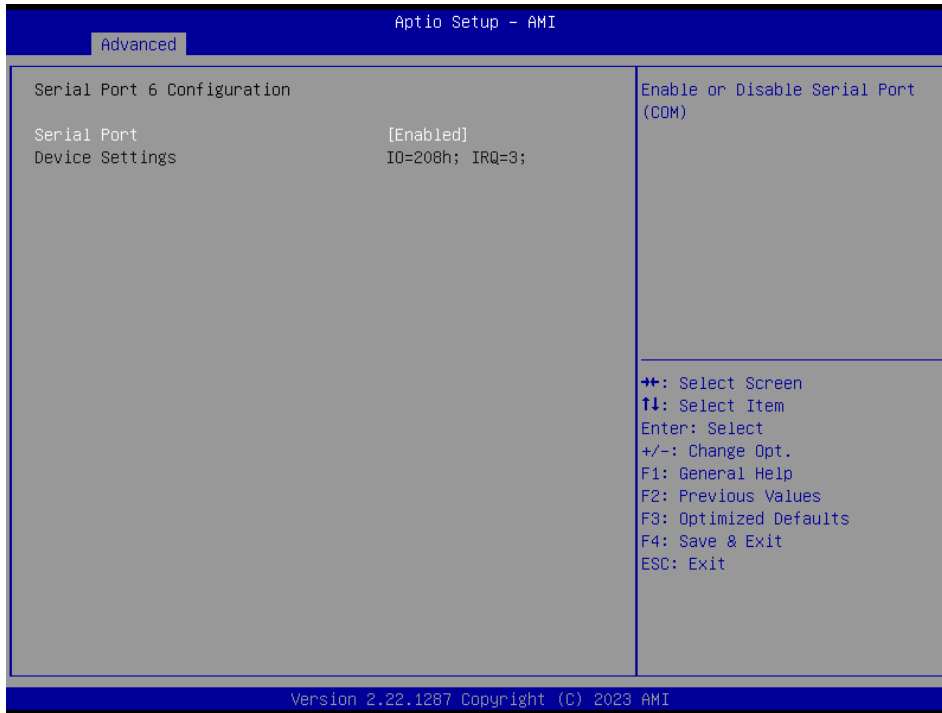
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).

3.6.2.6 NCT6126D HW Monitor
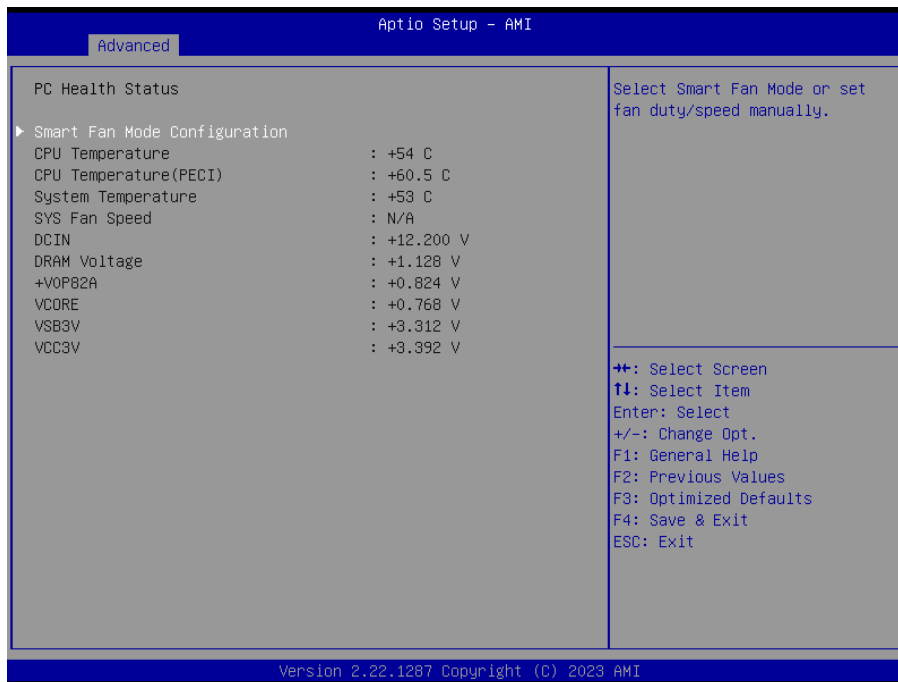
3.6.2.6.1 Smart Fan Mode Configuration

Item	Option	Description
SYS Fan Mode	Manual Mode**[Default]**/Mode 01/Mode 02/Mode 03/Mode 04/Mode 05/Mode 06/Mode 07/Mode 08/Mode 09/Mode 10/Mode 11/Mode 12/Mode 13/Mode 14/Mode 15/Mode 16/Mode 17/Mode 18/Mode 19/Mode 20	Avalue Smart Fan Mode Select: Mode 01 to Mode 20 Or Manual(No Smart Fan).
SYS Fan Manual Mode Duty	255	Set Fan Duty Manually(1~255).

3.6.2.7 S5 RTC Wake Settings

Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.8 Serial Port Console Redirection
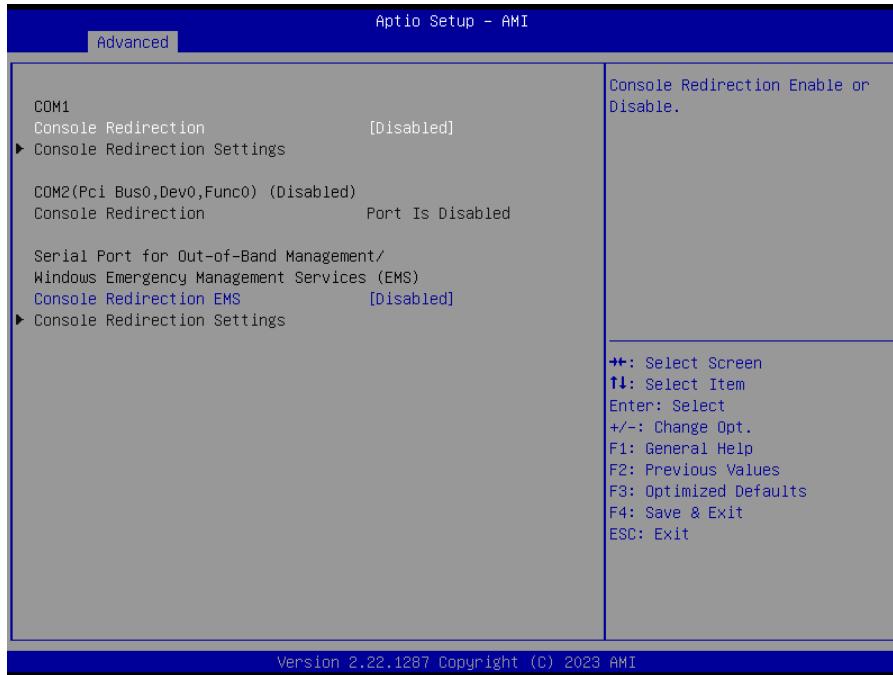
Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

3.6.2.9 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.

```
                              Aptio Setup - AMI
        Advanced

     USB Configuration                                  The time-out value for
                                                        Control, Bulk, and Interrupt
     USB Module Version              30                 transfers.

     USB Controllers:
          1 XHCI
     USB Devices:
          1 Drive, 1 Keyboard, 2 Hubs


     USB hardware delays and time-outs:
     USB transfer time-out           [20 sec]
     Device reset time-out           [20 sec]
     Device power-up delay           [Auto]            ↔: Select Screen
                                                        ↑↓: Select Item
     Mass Storage Devices:                              Enter: Select
     JetFlashTranscend 8GB 1100      [Auto]            +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit


                        Version 2.22.1287 Copyright (C) 2023 AMI
```

Item	Options	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	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 100ms, for a Hub port the delay is taken form Hub descriptor.
Mass Storage Devices	Auto**[Default]** Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

3.6.2.10 Network Stack Configuration

```
                            Aptio Setup – AMI
        Advanced

  Network Stack                  [Disabled]              Enable/Disable UEFI Network
                                                         Stack




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



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```

Item	Options	Description
Network Stack	Enabled Disabled**[Default]**	Enable/Disable UEFI Network Stack.

3.6.2.11 NVMe Configuration

```
                            Aptio Setup – AMI
        Advanced

  NVMe Configuration

  No NVME Device Found




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



                     Version 2.22.1287 Copyright (C) 2023 AMI
```
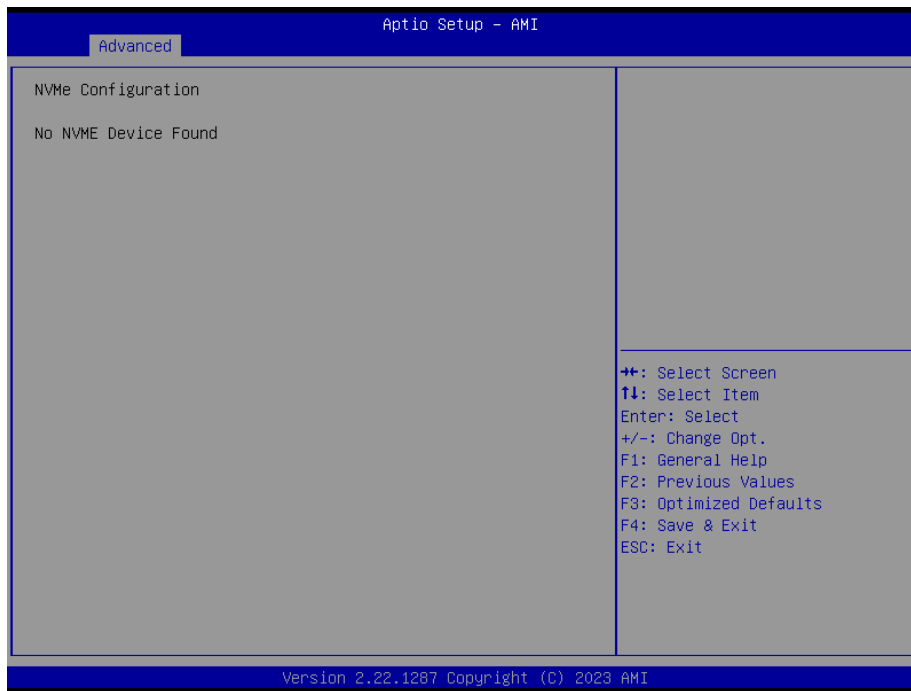
3.6.3 Chipset
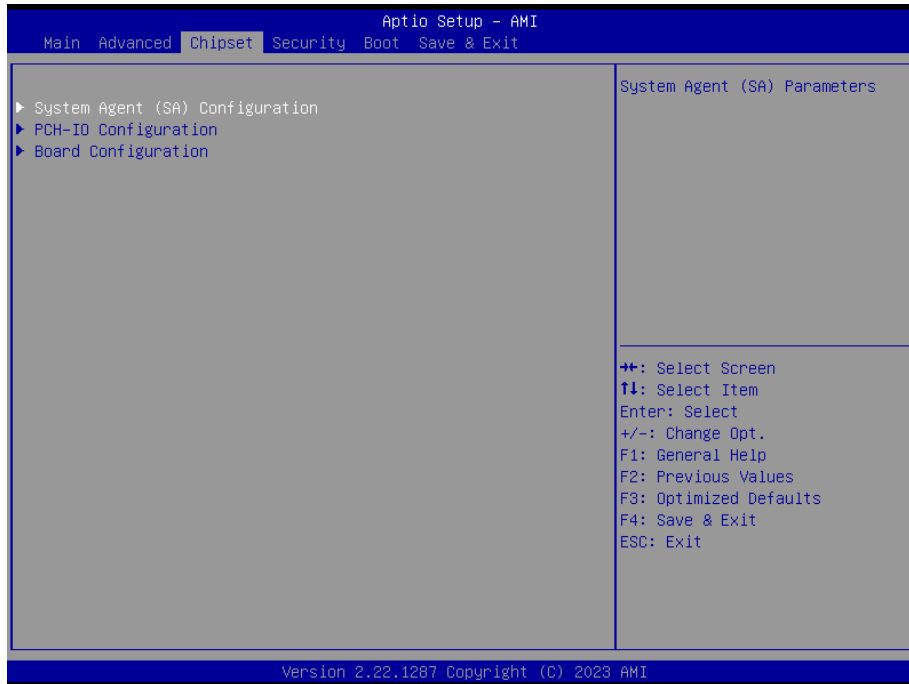
3.6.3.1 System Agent (SA) Configuration
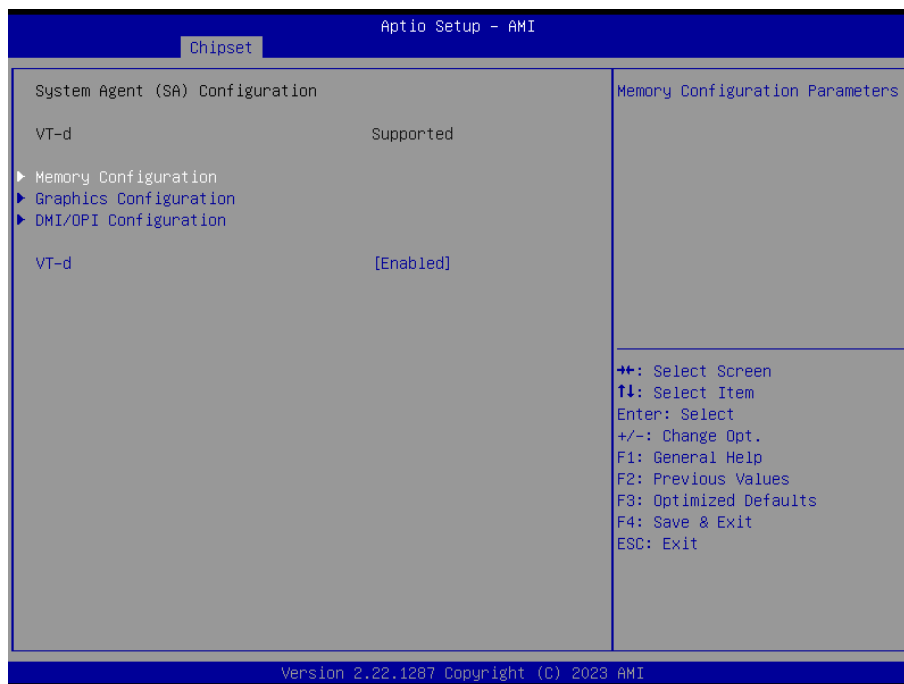
Item	Option	Description
VT-d	Enabled**[Default]** Disabled	VT-d capability.

3.6.3.1.1 Memory Configuration

```
                          Aptio Setup - AMI
         Chipset

Memory Configuration

Memory RC Version              0.0.4.89
Memory Frequency                4800 MHz
tCL-tRCD-tRP-tRAS              40-39-39-77
MC 0 Ch 0 DIMM 0              Populated & Enabled
    Size                     16384 MB (DDR5)
    Number of Ranks          1
    Manufacturer             UnKnown
MC 0 Ch 0 DIMM 1             Not Populated / Disabled
MC 1 Ch 0 DIMM 0             Not Populated / Disabled
MC 1 Ch 0 DIMM 1             Not Populated / Disabled

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

                 Version 2.22.1287 Copyright (C) 2023 AMI
```

3.6.3.1.2 Graphics Configuration

```
                          Aptio Setup - AMI
         Chipset

Graphics Configuration                        Select which of IGFX/PCIE
                                              Graphics device should be
                                              Primary Display.
Primary Display              [Auto]
GTT Size                     [8MB]




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

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```

Item	Option	Description
Primary Display	Auto**[Default]** IGFX	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
GTT Size	2MB 4MB 8MB**[Default]**	Select the GTT Size.

3.6.3.1.3 DMI/OPI Configuration

```
                              Aptio Setup - AMI
              Chipset

  DMI/OPI Configuration

  DMI                              X4  Gen4




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



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```

3.6.3.2   PCH-IO Configuration

```
                              Aptio Setup - AMI
              Chipset

  PCH-IO Configuration                              PCI Express Configuration
                                                    settings
▶ PCI Express Configuration
▶ SATA Configuration
▶ HD Audio Configuration

  PCH LAN Controller               [Enabled]




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



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```

Item	Option	Description
PCH LAN Controller	Disabled Enabled**[Default]**	Enable/Disable onboard NIC.

3.6.3.2.1 PCI Express Configuration

```
                           Aptio Setup - AMI
          Chipset

 PCI Express Configuration                              PCI Express Root Port Settings.

 PCIE Port assigned to LAN          3

 ▶ M.2 KeyE (PCI-E Port 1)
 ▶ Mini Card (PCI-E Port 2)
 ▶ Intel I225/I226 LAN Chip (PCI-E Port 4)
 ▶ M.2 KeyB (PCI-E Port 5~6)

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

                   Version 2.22.1287 Copyright (C) 2023 AMI
```
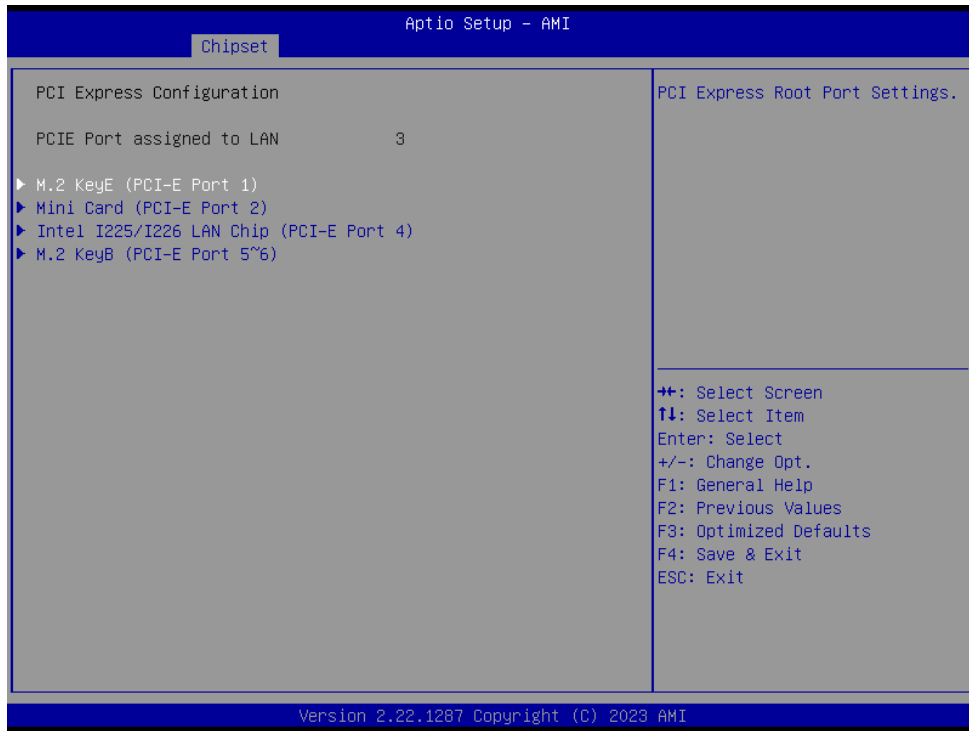
3.6.3.2.1.1 M.2 KeyE (PCI-E Port 1)

```
                           Aptio Setup - AMI
          Chipset

 M.2 KeyE (PCI-E Port 1)         [Enabled]             Control the PCI Express Root
 ASPM                            [Disabled]            Port.
 L1 Substates                    [L1.1 & L1.2]
 PTM                             [Enabled]
 PCIe Speed                      [Auto]
 Detect Timeout                  0

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

                   Version 2.22.1287 Copyright (C) 2023 AMI
```
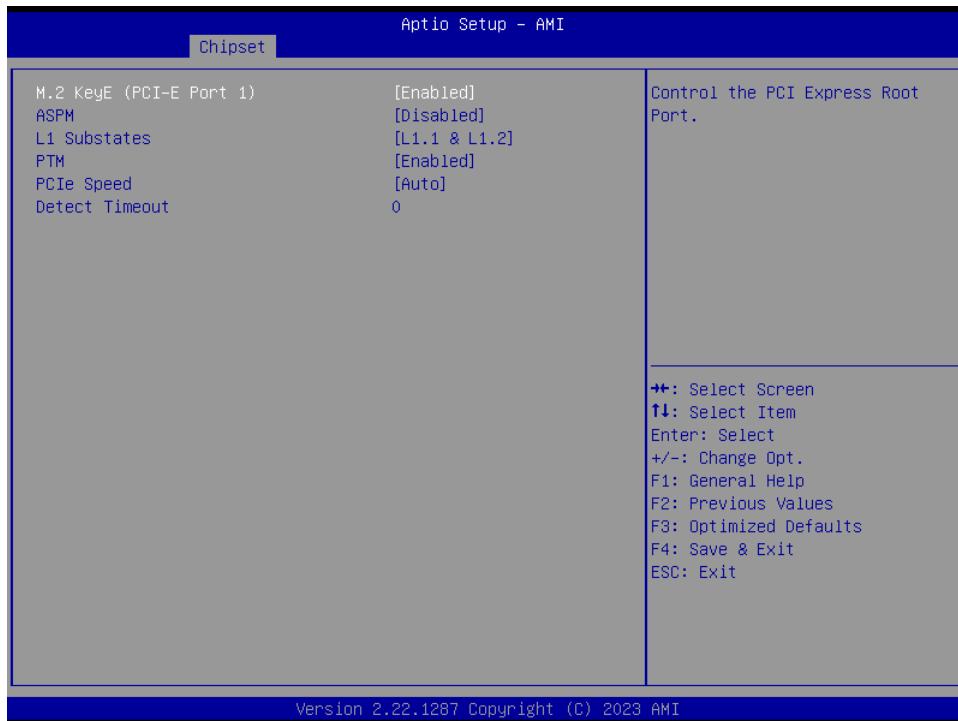
Item	Option	Description
M.2 KeyE (PCI-E Port 1)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.

ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PTM	Disabled Enabled**[Default]**	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

3.6.3.2.1.2 Mini Card (PCI-E Port 2)

Item	Option	Description
Mini Card (PEI-E Port 2)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PTM	Disabled Enabled**[Default]**	Enable/Disable Precision Time Measurement.

PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

3.6.3.2.1.3 Intel I225/I226 LAN Chip (PCI-E Port 4)

```
                           Aptio Setup – AMI
          Chipset

 Intel I225/I226 LAN Chip (PCI-E      [Enabled]        Control the PCI Express Root
 Port 4)                                               Port.
 ASPM                                 [Disabled]
 L1 Substates                         [L1.1 & L1.2]
 PTM                                  [Enabled]
 PCIe Speed                           [Auto]
 Detect Timeout                       0




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




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```

Item	Option	Description
Intel I225/I226 LAN Chip (PEI-E Port 4)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PTM	Disabled Enabled**[Default]**	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

3.6.3.2.1.4 M.2 KeyB (PCI-E Port 5~6)
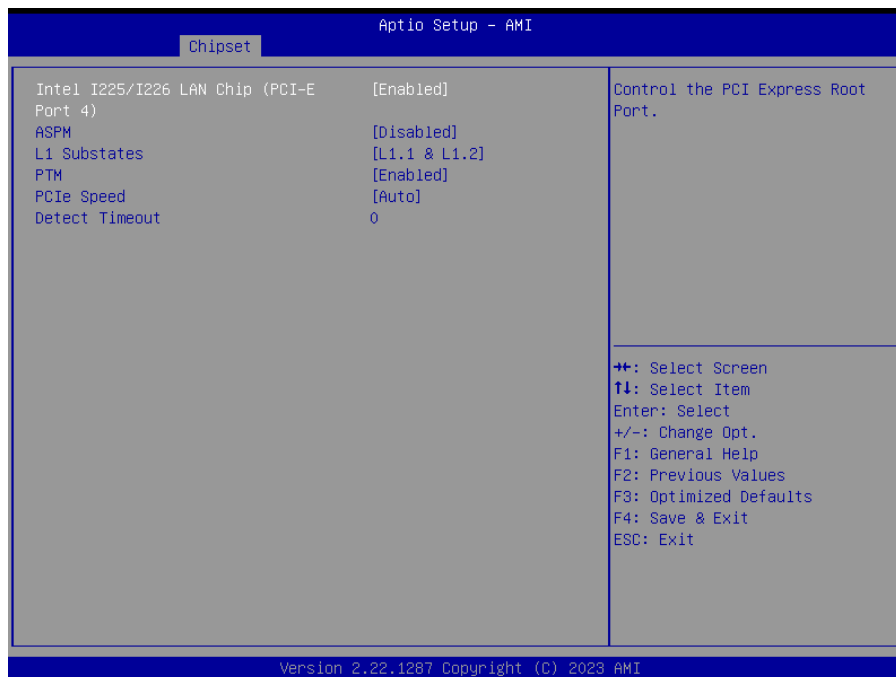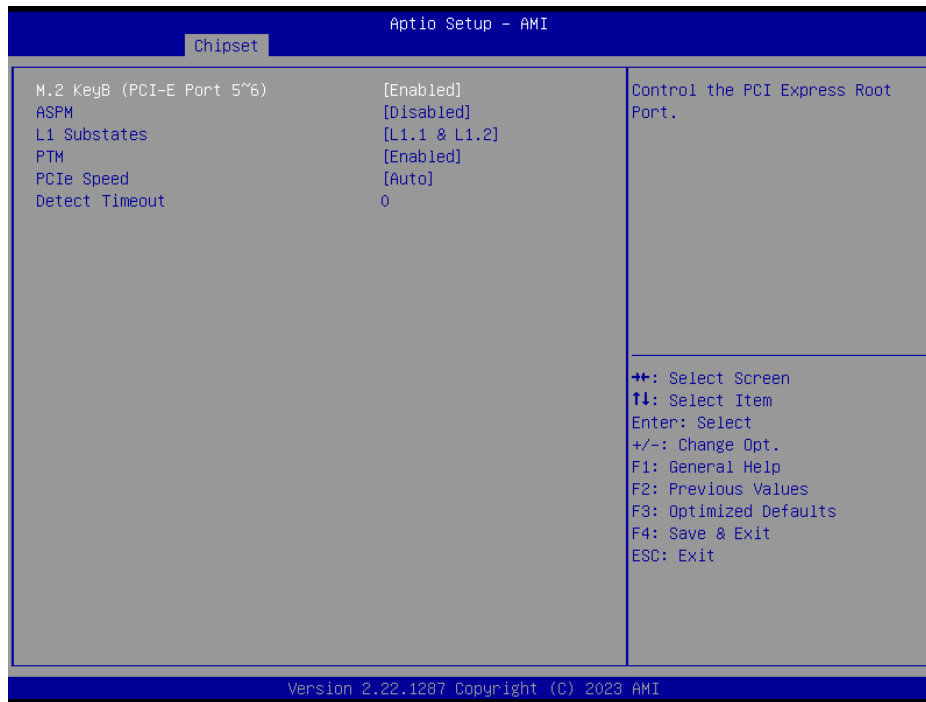
```
                                    Aptio Setup - AMI
          Chipset

   M.2 KeyB (PCI-E Port 5~6)            [Enabled]            Control the PCI Express Root
   ASPM                                 [Disabled]           Port.
   L1 Substates                         [L1.1 & L1.2]
   PTM                                  [Enabled]
   PCIe Speed                           [Auto]
   Detect Timeout                       0




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



                              Version 2.22.1287 Copyright (C) 2023 AMI
```
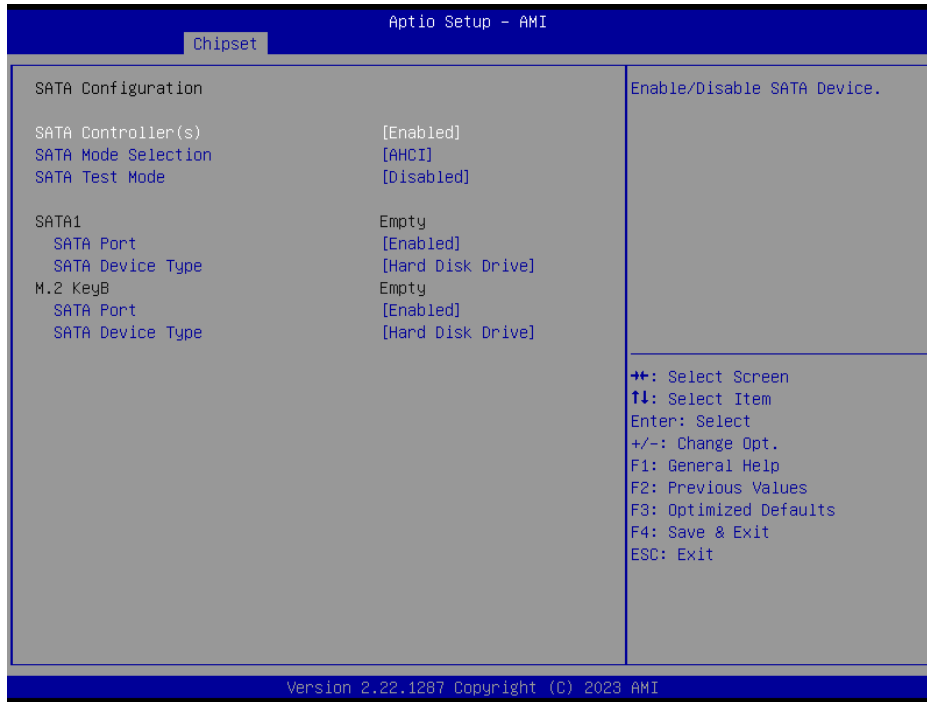
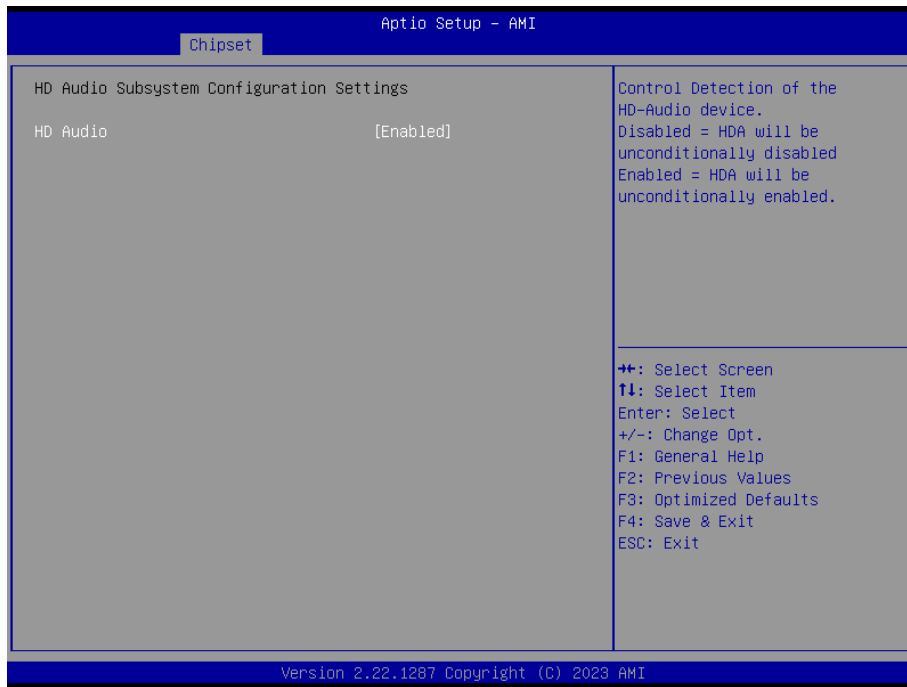| Item	Option	Description
M.2 KeyB (PEI-E Port 5~6)	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM	Disabled**[Default]** L1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled, L1.1 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PTM	Disabled Enabled**[Default]**	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PCIe Speed.
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

3.6.3.2.2 SATA Configuration

```
                        Aptio Setup - AMI
            Chipset

SATA Configuration                                  Enable/Disable SATA Device.

SATA Controller(s)           [Enabled]
SATA Mode Selection          [AHCI]
SATA Test Mode               [Disabled]

SATA1                        Empty
  SATA Port                  [Enabled]
  SATA Device Type           [Hard Disk Drive]
M.2 KeyB                     Empty
  SATA Port                  [Enabled]
  SATA Device Type           [Hard Disk Drive]


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




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```

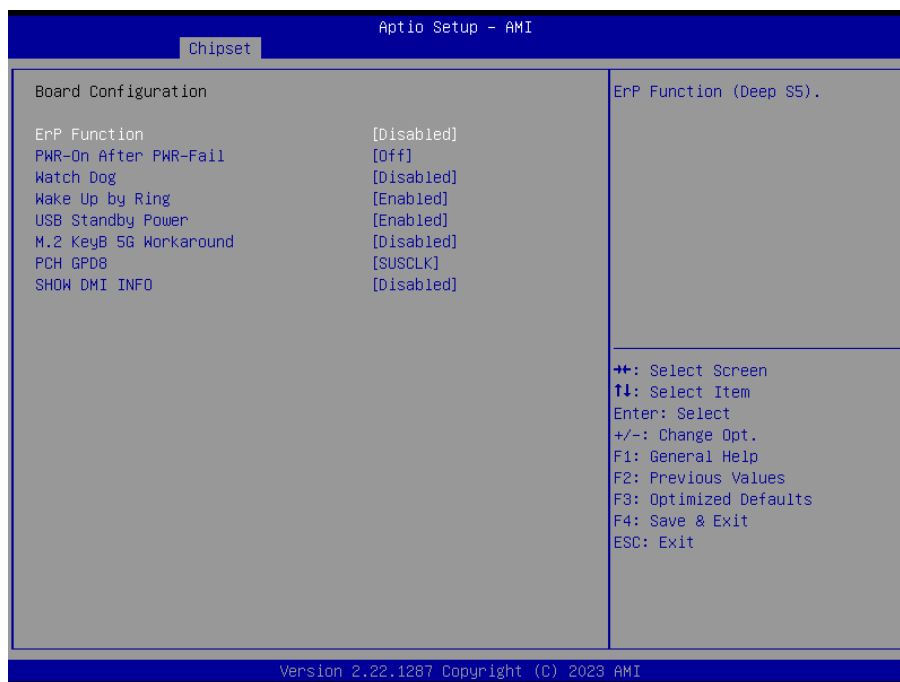| Item	Options	Description
SATA Controller(s)	Enabled**[Default]** Disabled,	Enable/Disable SATA Device.
SATA Mode Selection	AHCI**[Default]**, RAID	Determines how SATA controller(s) operate.
SATA Test Mode	Enabled Disabled**[Default]**	The Mode Enable/Disable (Loop Back).
SATA Port	Enabled**[Default]** Disabled	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

3.6.3.2.3 HD Audio Configuration

```
                              Aptio Setup – AMI
             Chipset

    HD Audio Subsystem Configuration Settings          Control Detection of the
                                                       HD-Audio device.
    HD Audio                          [Enabled]        Disabled = HDA will be
                                                       unconditionally disabled
                                                       Enabled = HDA will be
                                                       unconditionally enabled.



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



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```

Item	Option	Description
HD Audio	Disabled Enabled**[Default]**	Control Detection of the HD-Audio device. Disable = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled

3.6.3.3   Board & Panel Configuration

```
                              Aptio Setup – AMI
             Chipset

    Board Configuration                                ErP Function (Deep S5).

    ErP Function                      [Disabled]
    PWR-On After PWR-Fail             [Off]
    Watch Dog                         [Disabled]
    Wake Up by Ring                   [Enabled]
    USB Standby Power                 [Enabled]
    M.2 KeyB 5G Workaround            [Disabled]
    PCH GPD8                          [SUSCLK]
    SHOW DMI INFO                     [Disabled]



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



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```

Item	Option	Description
ErP Function	Disabled**[Default]** Enabled	ErP Function (Deep S5).
PWR-On After PWR-Fail	Off**[Default]** On Last state	AC loss resume.
Watch Dog	Disabled**[Default]** 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select WatchDog.
Wake Up by Ring	Disabled Enabled**[Default]**	Wake Up by Ring from S3/S4/S5.
USB Standby Power	Disabled Enabled**[Default]**	Enable/Disabled USB Standby Power during S3/S4/S5.
M.2 KeyB 5G Workaround	Disabled**[Default]** Enabled	Enabled/Disabled M.2 KeyB 5G Card Workaround.
PCH GPD8	SUSCLK**[Default]** Output low	Set PCH GPD8 funciton for some 5G card.
SHOW DMI INFO	Disabled**[Default]** Enabled	SHOW DMI INFO.

3.6.4   Security

```
                            Aptio Setup - AMI
      Main  Advanced  Chipset  Security  Boot  Save & Exit

                                                    Set Administrator Password
      Password Description

      If ONLY the Administrator's password is set,
      then this only limits access to Setup and is
      only asked for when entering Setup.
      If ONLY the User's password is set, then this
      is a power on password and must be entered to
      boot or enter Setup. In Setup the User will
      have Administrator rights.
      The password length must be
      in the following range:
      Minimum length              3
      Maximum length              20            →←: Select Screen
                                                ↑↓: Select Item
      Administrator Password                    Enter: Select
      User Password                             +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
    ▶ Secure Boot                               ESC: Exit



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```

● **Administrator Password**

Set setup Administrator Password

● **User Password**

Set User Password

3.6.4.1 Secure Boot

```
                           Aptio Setup - AMI
                 Security

    System Mode                    Setup

    Secure Boot                    [Enabled]
                                   Not Active

    Secure Boot Mode               [Standard]
  ▶ Restore Factory Keys
  ▶ Reset To Setup Mode

  ▶ Key Management

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

                 Version 2.22.1287 Copyright (C) 2023 AMI
```

3.6.5 Boot

```
                           Aptio Setup - AMI
        Main  Advanced  Chipset  Security  Boot  Save & Exit

    Boot Configuration                            Number of seconds to wait for
    Setup Prompt Timeout          1               setup activation key.
    Bootup NumLock State          [On]            65535(0xFFFF) means indefinite
    Quiet Boot                    [Disabled]      waiting.

    Boot Option Priorities
    Boot Option #1                [UEFI:
                                  JetFlashTranscend 8GB
                                  1100, Partition 1
                                  (JetFlashTranscend 8GB
                                  1100)]
    Boot Option #2                [UEFI:
                                  JetFlashTranscend 8GB
                                  1100, Partition 2
                                  (JetFlashTranscend 8GB    ↔: Select Screen
                                  1100)]                    ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit

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```

Item	Option	Description
Setup Prompt Timeout	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the Keyboard NumLock state
Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
Boot Option #1/2	Set the system boot order.	

3.6.6 Save and exit
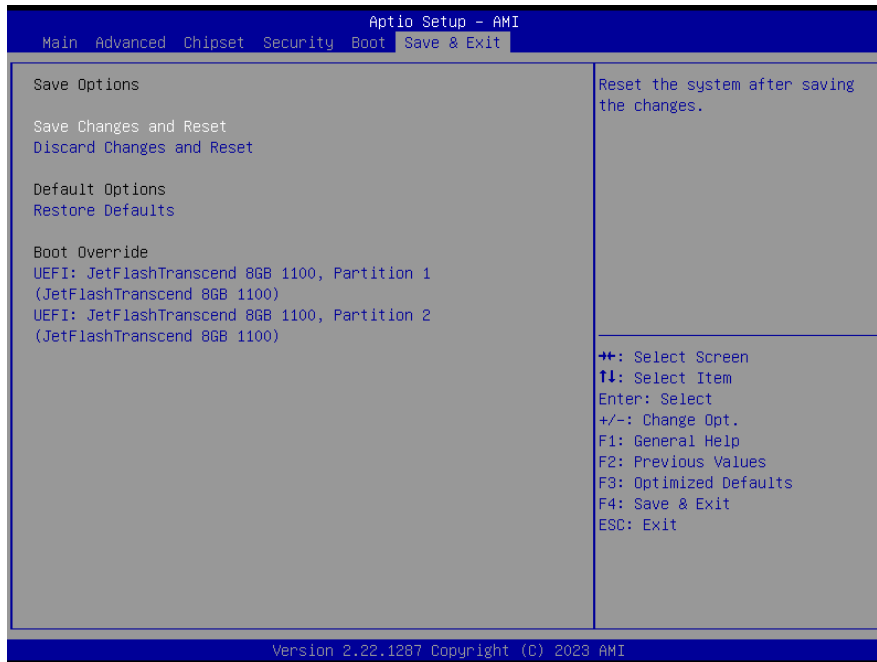
3.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

3.6.6.3 Restore Defaults

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

3.6.6.4 Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

4. Drivers Installation

Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

4.1 Install Chipset Driver

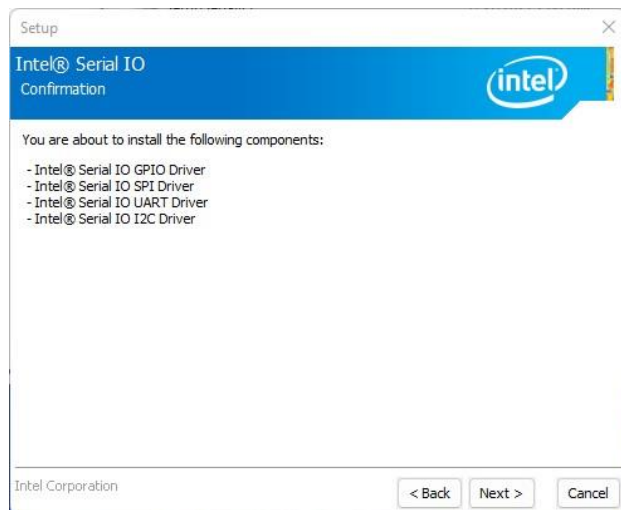All drivers can be found on the Avalue
Official Website:
http://www.avalue.com.tw.

Note: The installation procedures and
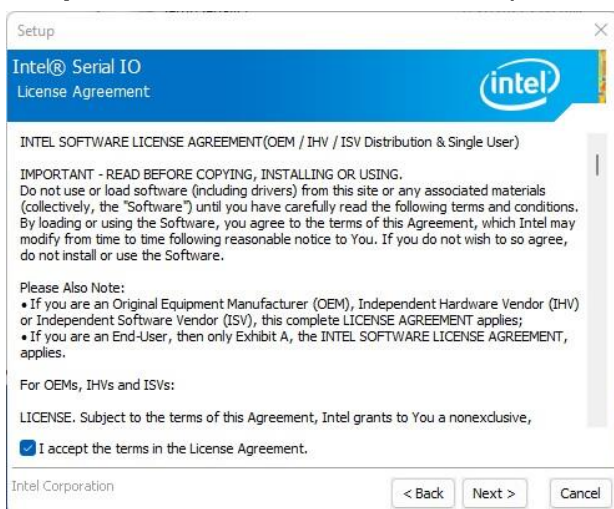screen shots in this section are
based on Windows 11 operation
system. If the warning message
appears while the installation
process, click Continue to go on.

Step 3. Click **Install**.

Step1. Click **Next**.

Step 4. Click **Finish** to complete setup.

Step 2. Click **Accept**.

4.2 Install VGA Driver

All drivers can be found on the Avalue
Official Website:
http://www.avalue.com.tw.

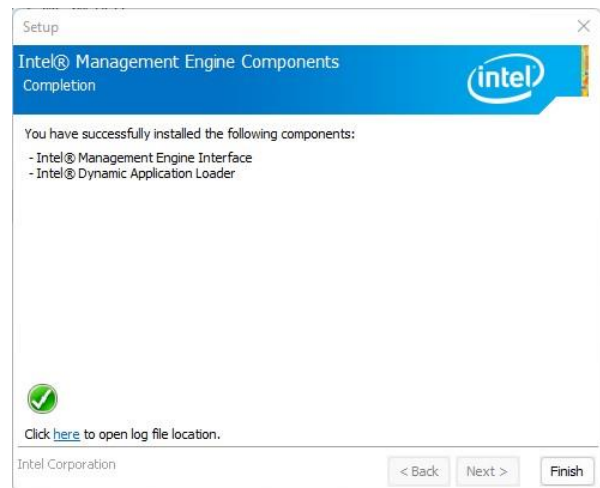> **Note:** The installation procedures and
> screen shots in this section are
> based on Windows 11 operation
> system.
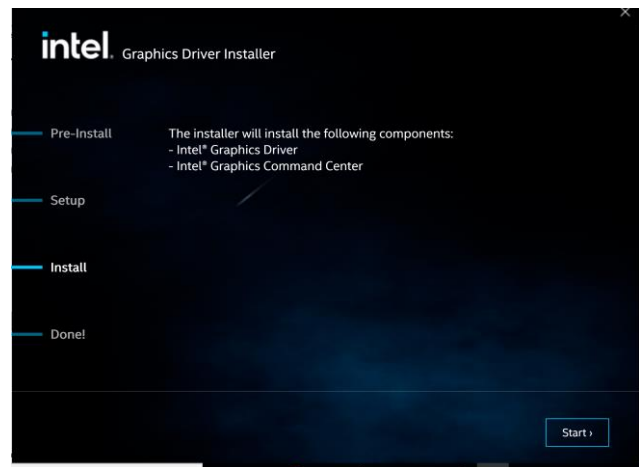
Step 3. Click **Start**.

Step 1. Click **Begin installation** to
continue installation.
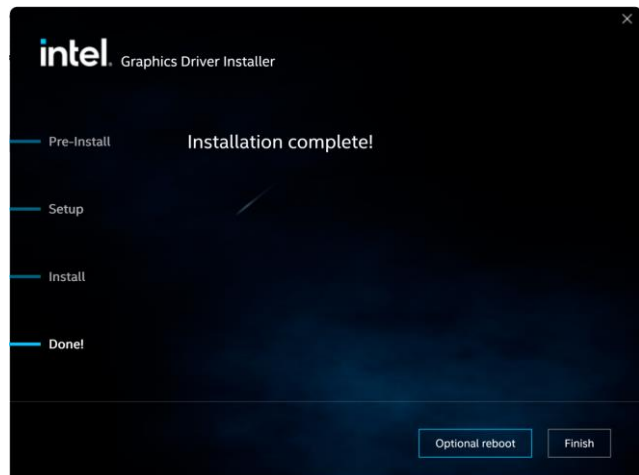
Step 4. Click **Finish** to complete setup.
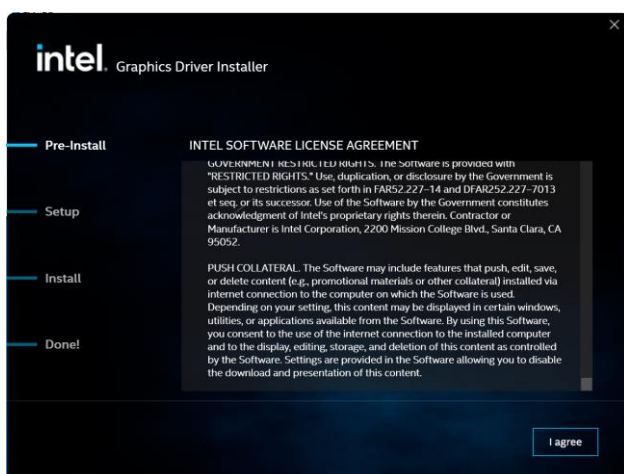
Step 2. Click **I agree**.

4.3 Install Audio Driver (For Realtek ALC888S HD Audio)

All drivers can be found on the Avalue
Official Website:
http://www.avalue.com.tw.

Note: The installation procedures and
screen shots in this section are
based on Windows 11 operation
system. If the warning message
appears while the installation
process, click Continue to go on.
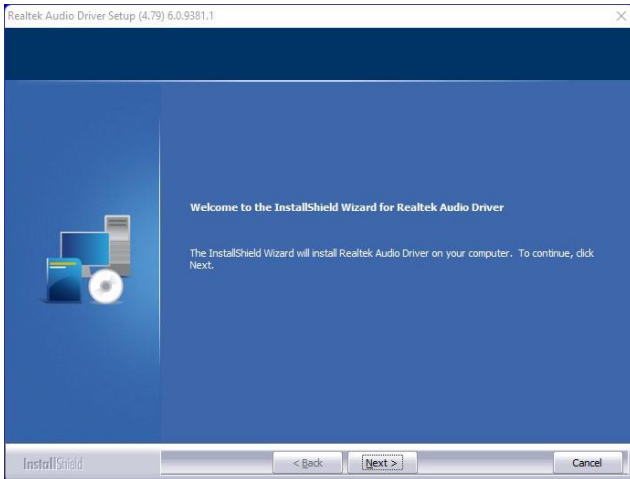
Step1. Click **Next** to Install.
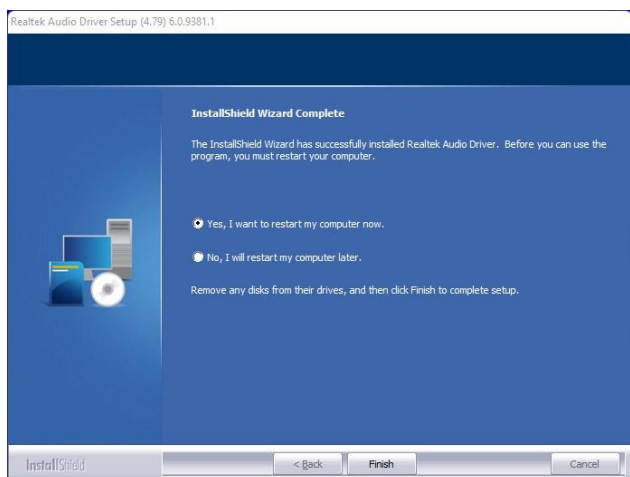
Step 2. Select **Finish** to complete
Installation.

4.4 Install LAN Driver

All drivers can be found on the Avalue
Official Website:
http://www.avalue.com.tw.

Note: The installation procedures and
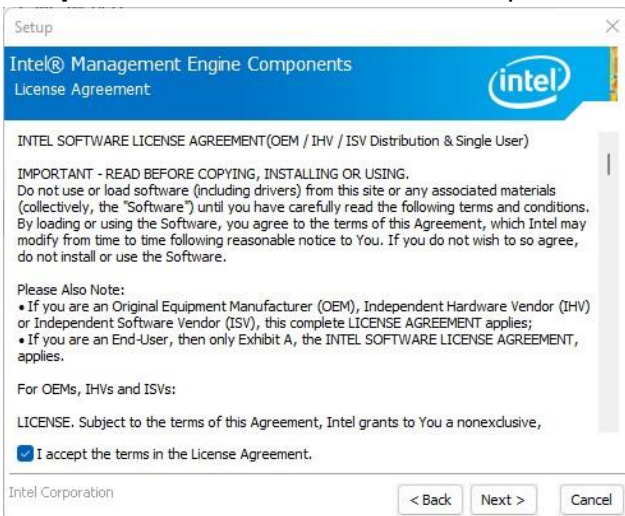screen shots in this section are
based on Windows 11 operation
system.
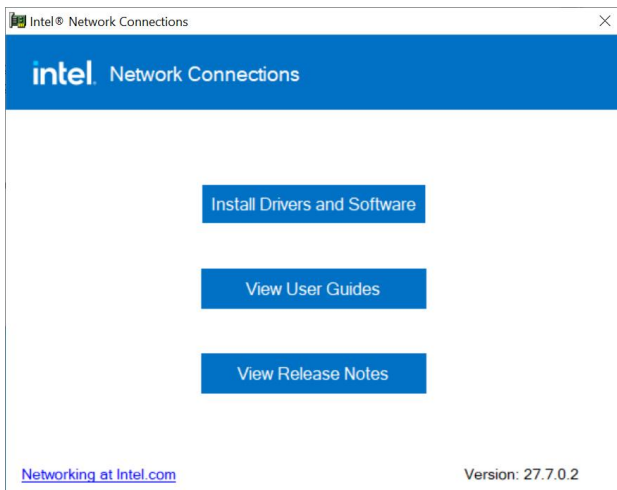
Step 1. Click **Install Drivers and
Software** to continue installation.
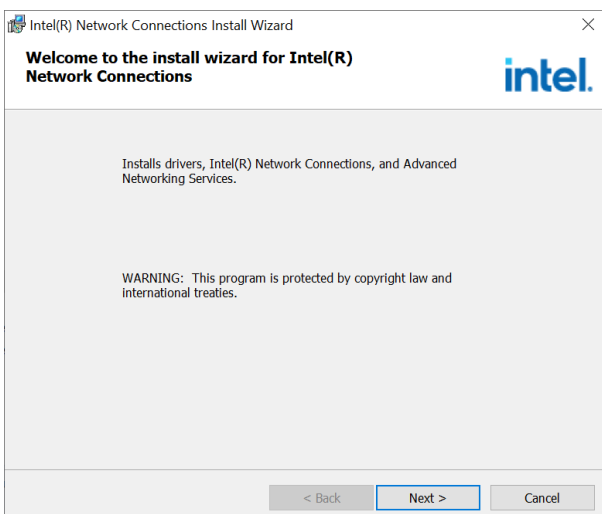
Step 2. Click **Next**.
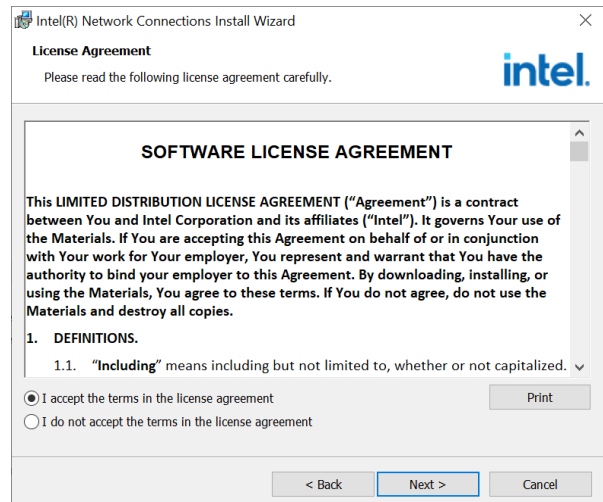
Step 3. Click **Next**.
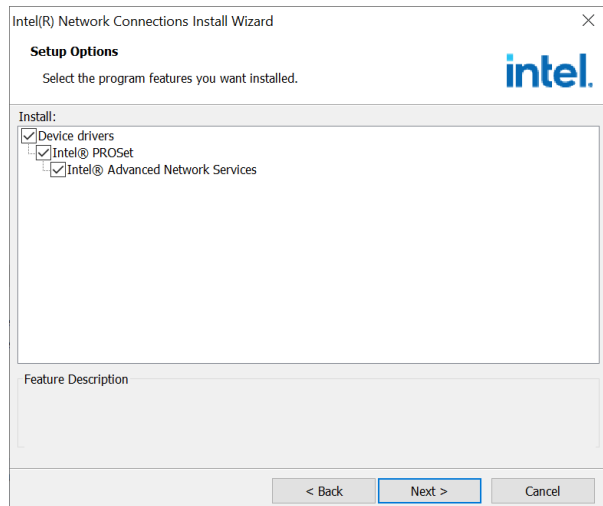
Step 4. Click **Next**.
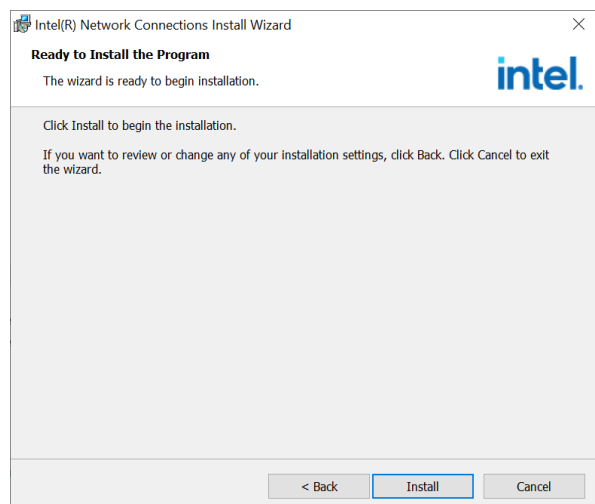
Step 5. Click **Install**.
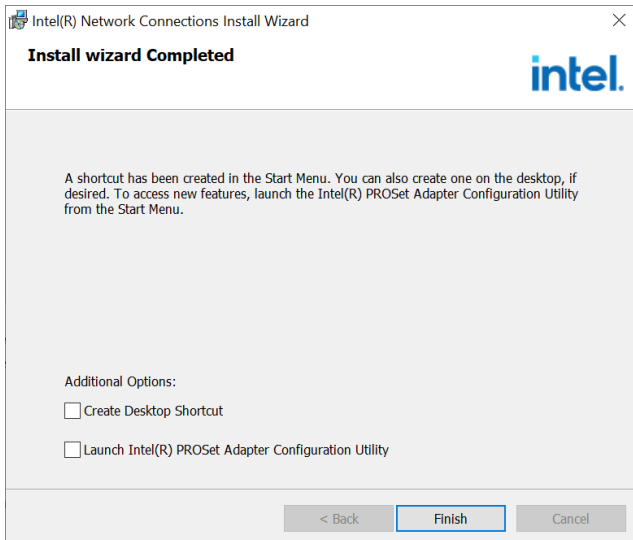
Step 6. Click **Finish** to complete setup.

4.5 Install Serial IO Driver

All drivers can be found on the Avalue
Official Website:
http://www.avalue.com.tw.

> **Note:** The installation procedures and
> screen shots in this section are
> based on Windows 11 operation
> system.
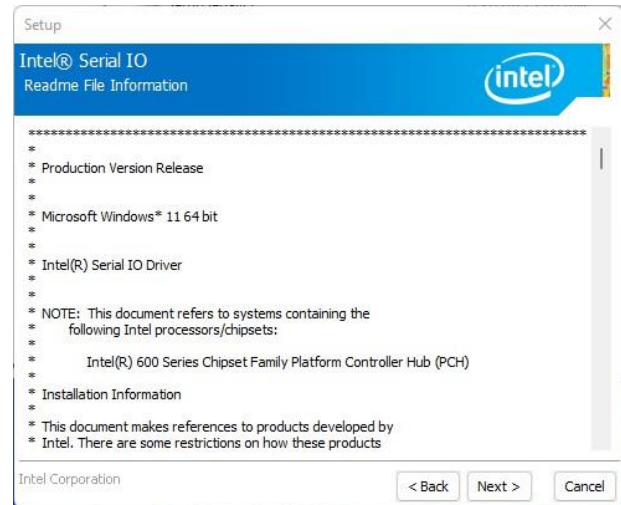
Step 3. Click **Next**.

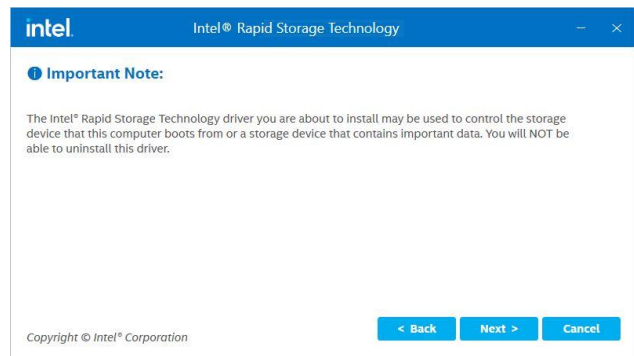**Step 1.** Click **Next** to continue setup.

Step 4. Click **Next**.

Step 2. Click **Next**.
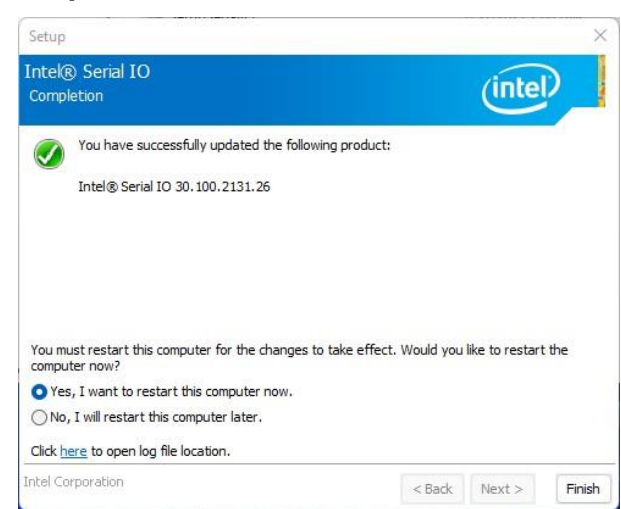
Step 5. Click **Finish** to complete the setup.

4.6 Install ME Driver

All drivers can be found on the Avalue Official Website:
http://www.avalue.com.tw.

Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.
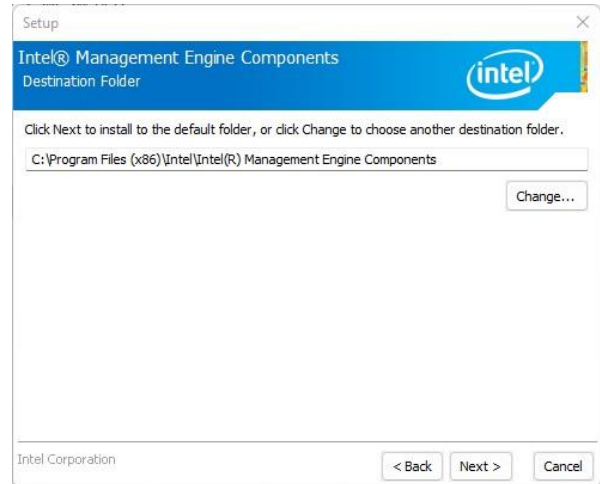
Step 3. Click **Next**

Step 1. Click **Next** to continue setup.

Step 4. Click **Finish** to complete the setup

Step 2. Click **Next**.
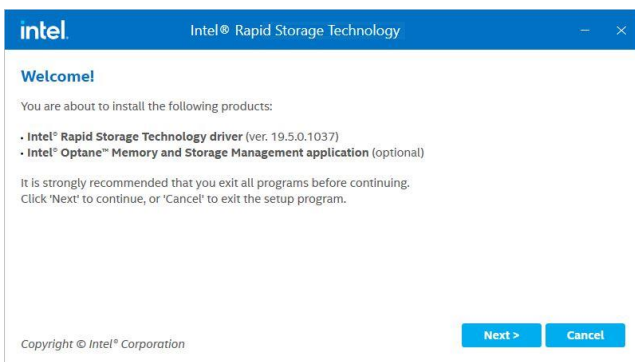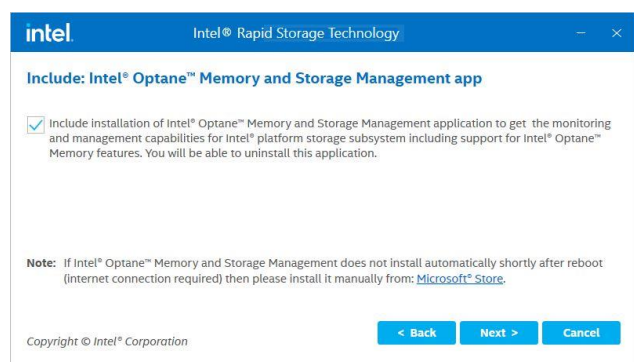
4.7 Install IRST Driver

All drivers can be found on the Avalue Official Website:
http://www.avalue.com.tw.

Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.
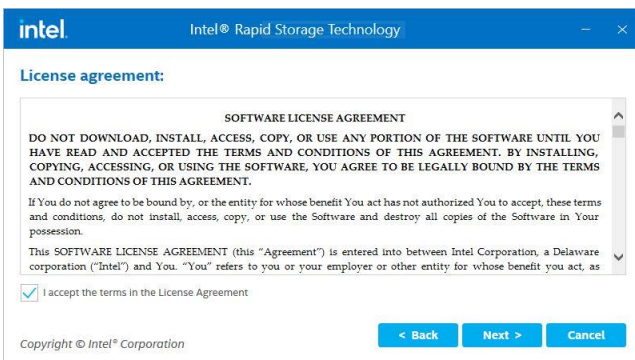
Step 3. Click **Next**.

Step 1. Click **Next** to continue installation.

Step 4. Click **Next**.

Step 2. Click **Next**.

Step 5. Complete setup.