CMB108

MicroATX Standard Systems for Intel® LGA1700 Core™ 200E & 14th Gen Core™ i9/i7/i5/i3 DT processors

User's Manual

Version 1.0
January 2026

iBASE

Compliance

CE

This product has passed CE tests for environmental specifications and limits. This product is in accordance with the directives of the European Union (EU). If users modify and/or install other devices in this equipment, the CE declaration of conformity may no longer apply.

FC

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 installed 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.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive for waste electrical and electronic equipment (WEEE-2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. For proper disposal, please follow local regulations regarding electronic waste.

Green IBASE

This product complies with RoHS 2 restrictions, which prohibit the use of certain hazardous substances in electrical and electronic equipment. The following substances must not exceed the specified concentrations:

- Hexavalent chromium: 1,000 ppm
- Poly-brominated biphenyls (PBBs): 1,000 ppm
- Poly-brominated diphenyl ethers (PBDEs): 1,000 ppm
- Cadmium: 100 ppm
- Mercury: 1,000 ppm
- Lead: 1,000 ppm
- Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
- Butyl benzyl phthalate (BBP): 1,000 ppm
- Dibutyl phthalate (DBP): 1,000 ppm
- Diisobutyl phthalate (DIBP): 1,000 ppm

Important Safety Information

Carefully read the precautions before using the device.

Environmental conditions:

- Place the device horizontally on a stable and solid surface in case the device may fall, causing serious damage.
- Leave plenty of space around the device and do not block the openings for ventilation. *Never drop objects into, or insert any foreign objects into, the system.*

Care for Your IBASE products:

- Before cleaning the device, turn it off and unplug all cables such as power in case a small amount of electrical current may still flow.
- Use neutral cleaning agents or diluted alcohol to clean the device chassis with a cloth. Then wipe the chassis with a dry cloth.
- Vacuum the dust with a computer vacuum cleaner to prevent the air vent or slots from being clogged.

WARNING

Attention during use:

- Do not place heavy objects on the top of the device.
- Operate this device from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your distributor or local power company.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure that the total ampere rating of the product plugged into the extension cord does not exceed its limits.

Avoid Disassembly

Do not disassemble, repair or make any modification to the device. Disassembly, modification, or any attempt at repair could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

CAUTION

Danger of explosion if the internal lithium-ion battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warranty Policy

- **IBASE standard products:**

  IBASE offers a 2-year warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **Third-party parts:**

  1-year warranty from delivery for the third-party parts that are not manufactured by IBASE, such as CPU, memory, HDD, power adapter, panel and touchscreen.

* Products that fail due to misuse, accident, improper installation, or unauthorized repair are **not covered by warranty**. Customers will be responsible for repair and shipping costs.

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest product information.
2. If you need any further assistance from your distributor or sales representative, prepare the following information about your product and provide details about the problem.
   - Product model name
   - Product serial number
   - Detailed description of the problem
   - The error messages in text or in screenshots if there is any
   - The arrangement of the peripherals
   - Software in use (such as OS and application software, including the version numbers)
3. If repair service is required, log in to the RMA system on the website or and contact your distributor or sales representative for assistance.

iBASE

Table of Contents

Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Optional Accessories
- Specifications
- Product View
- Dimensions

1.1 Introduction

The CMB108 High Performance Expandable Industrial Computer is built on the latest Core™ 200E & 14/13th/12th Gen Intel® Core™ i9/i7/i5/i3 DT processors (65W TDP), delivering reliable performance for industrial and embedded applications. It supports discrete GPU cards and offers rich expansion with PCI-E Gen.5/Gen.4/Gen.3 slots, dual M-Key NVMe, E-Key WiFi/BT, and B-Key 5G.

Designed for flexibility, the system provides multi-display outputs (HDMI, DisplayPort, optional DVI-D), 2.5GbE LAN, USB 3.2, and up to four 2.5-inch storage devices with RAID support, powered by a 500W 1U Flex ATX PSU. With features like fTPM, iAMT 16.1, and a watchdog timer, the CMB108 delivers a secure and scalable platform for industrial computing.

1.2 Features

- Supports Core™ 200E & 14/13th/12th Gen Intel® Core™ DT processors (TDP 65W)
- Supports discrete GPU cards with reserved expansion slots
- Multiple expansion slots:
  1x PCI-E(x16) [PCI-E Gen.5],
  1x PCI-E(x4) [PCI-E Gen. 4],
  1x PCI-E(x4) [PCI-E Gen.3]
- 500W 1U Flex ATX power supply [default]
- 2-pin remote boot extension design
- Supports multi-display interfaces [HDMI, DisplayPort, optional DVI-D] and 2.5GbE ports, USB 3.2 ports
- 4 sets of 2.5" storage devices (supports RAID 0/1)
- 2x M-Key (2280) for NVMe, 1x E-Key (2230) for WiFi/BT, supports CNVi, 1x B-Key (3052) for 5G
- fTPM, DIO, iAMT(16.1), Watchdog timer

1.3 Packing List

Your product package should include the items listed below. If any of the items below is missing, contact the distributor or the dealer from whom you purchased the product.

- CMB108 x 1
- Wall mount kit (2 brackets) x 1
- Screws for wall mount kit x 8
- Power cord x 1

1.4 Optional Accessories

IBASE provides optional accessories as follows. Please contact us or your dealer if you need any.

- WiFi cable kit (KIT-16)
- VESA mounting kit
- 60CM D-SUB9M cable (PK1-184, P/N C501PK11840602000P)
- 95CM D-SUB9M cable (PK1-56E, P/N C501PK15609202E00P)
- SATA cable (SATA-64A, P/N C501SATA640203A00P)

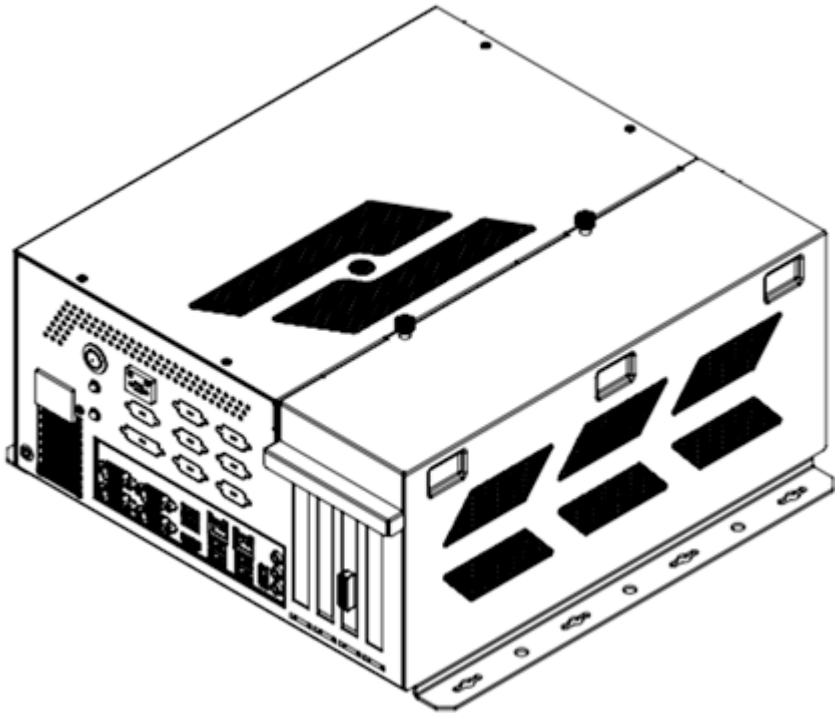
1.5 Specifications

Product Name	CMB108
System Mainboard	CMB108 with MB998 Series MicroATX motherboard
CPU Type	Core™ 200E & 14th/13th/12th Gen Intel® Core™ DT processors (TDP 65W)
System Speed	Up to 5.60 GHz (W680R supports ECC by CPU SKUs)
Memory	2x DDR5 UDIMM, Max. 64GB
Front Panel I/O	1 x Power button 1 x 2-pin remote boot extension design 4 x slots (Detachable cover for GFX Card) 1 x Audio jacks 2 x DisplayPort 1 x HDMI 1 x DVI-D [optional] 6 x USB 3.2 ports 2 x RJ45 for 2.5GbE 2 x RS232/422/485 / 4x RS232[optional]
Rear Panel I/O	Two antenna holes (reserved); System fan
Expansion Slots	1x PCI-E(x16) [Gen.5], 1x PCI-E(x4) [Gen.4], 1x PCI-E(x4) [Gen.3]
Storage	4x 2.5” SATA (RAID 0/1) + 2x M.2 M-Key (2280) storage
Construction	SECC
Chassis Color	Black
Mounting Type	Desktop & wall mount
Dimensions	325mm (W) x 350.0mm (D) x 156.0mm (H)
Weight	Depends on PSU and motherboard configuration
Operating Temp.	0°C ~ 45°C (32°F ~ 113°F) for 65W CPU
Storage Temp.	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	10~95%, non-condensing @60°C
Vibration	With SSD: 1Grms, IEC 60068-2-64, random, 5Hz~500Hz
Shock	With SSD: Operating 20G (IEC 60068-2-27, 11 ms half-sine); Non-Operating 40G (IEC 60068-2-27, 11 ms half-sine)
Certification	CE / FCC Class A / LVD

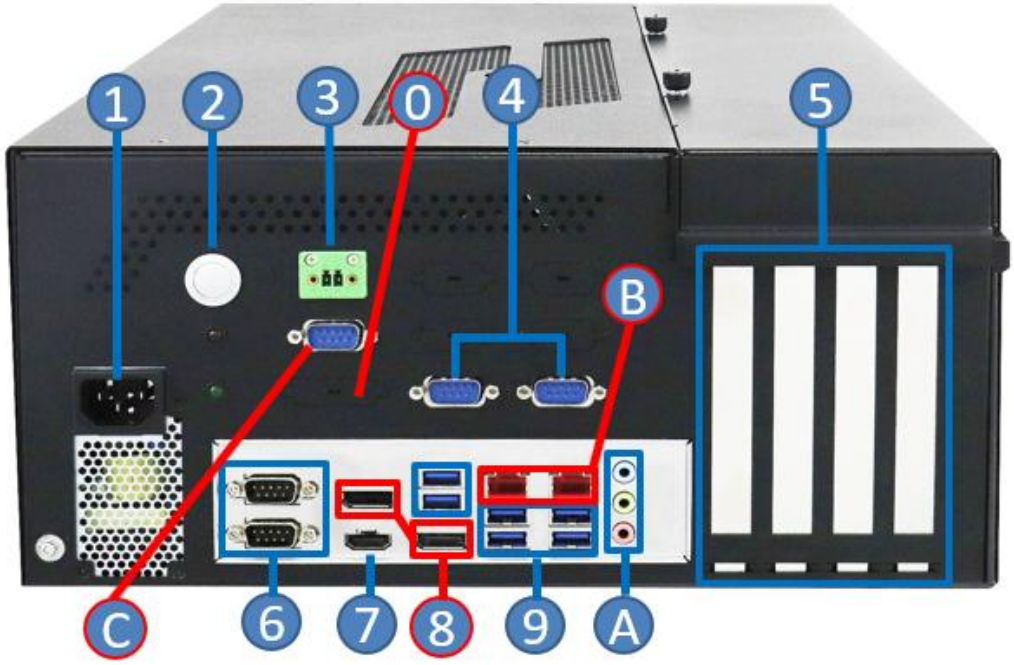
All specifications are subject to change without prior notice.

1.6 Product View

Oblique View

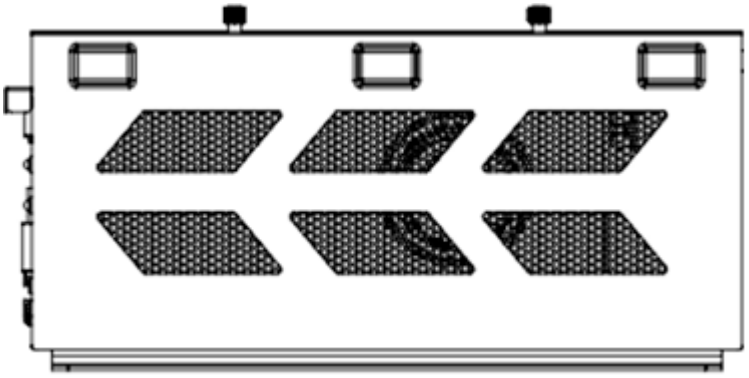


Rear View

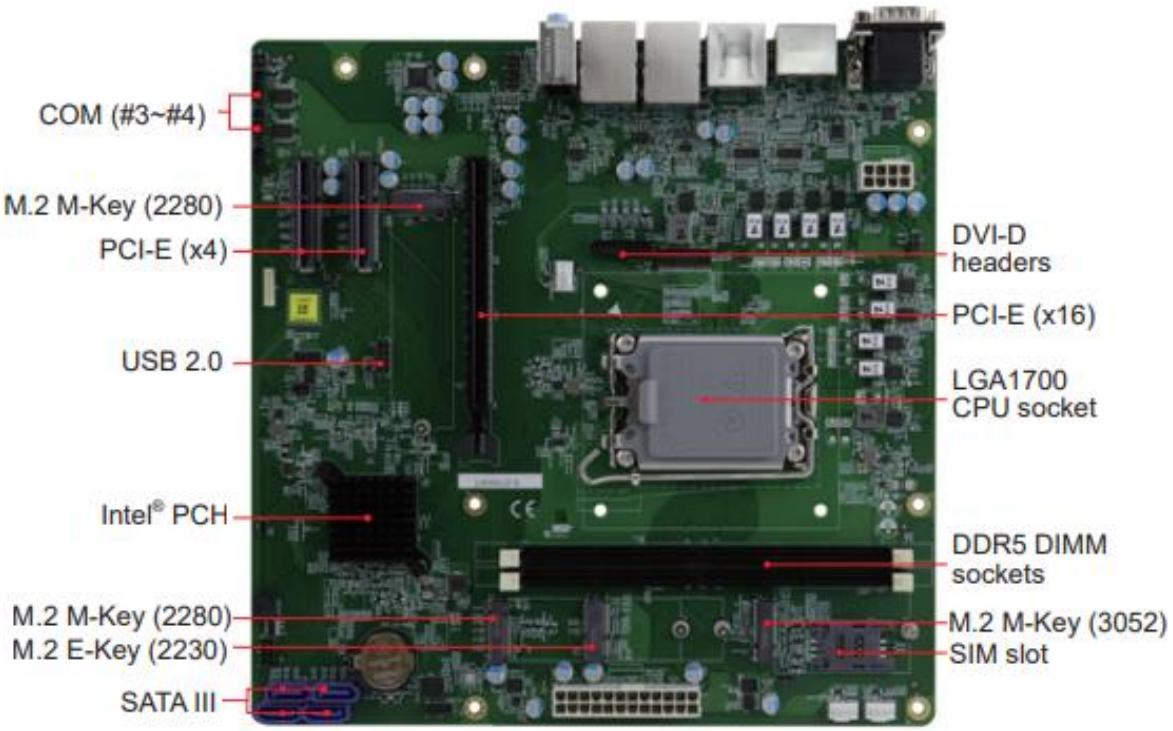


No.	Name	No.	Name
1	AC-in	7	HDMI Port
2	Power Button	8	DisplayPort (x2)
3	2-pin remote boot extension design	9	USB 3.2 Ports (x6)
4	Configurable Serial Ports	0	DVI-D port (option)
5	Four Expansion Slots	A	Audio Jacks
6	RS-232 Serial Ports	B	LAN Ports
		C	Digital I/O

Side View

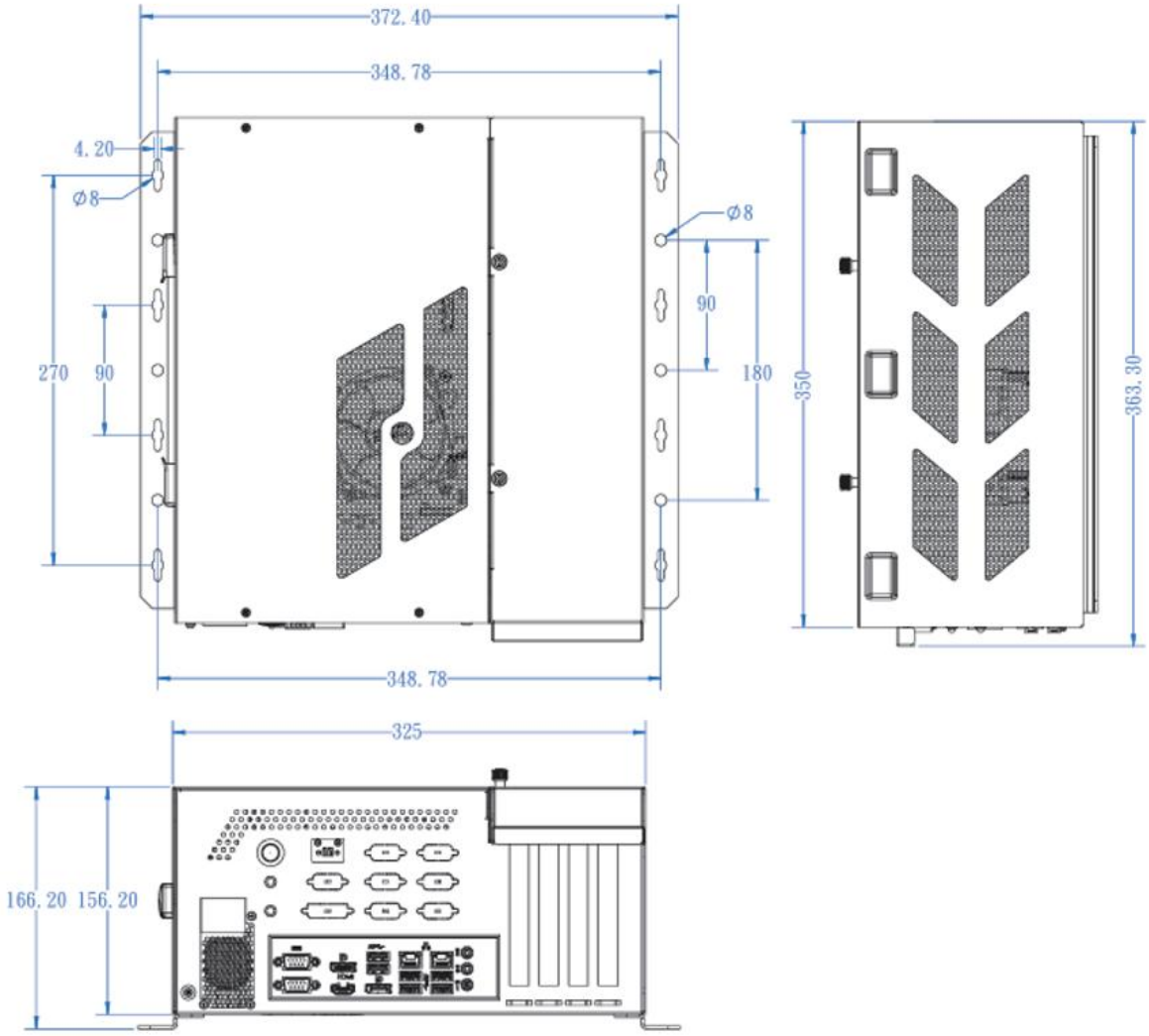


Motherboard (MB998)



1.7 Dimensions

Unit: mm



Chapter 2
Hardware Configuration

The information provided in this chapter includes:

- Installations
- Information and locations of connectors

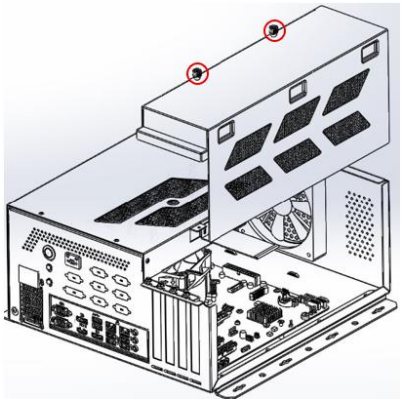
2.1 Installation Procedure

This section describes how to access the internal components of the system and install optional modules, such as memory modules, M.2 cards and SSD storage. Please follow the steps carefully to avoid damage to components. Before starting, make sure the system is powered off, all cables are disconnected, and proper ESD precautions are observed.

2.1.1 System Cover Removal

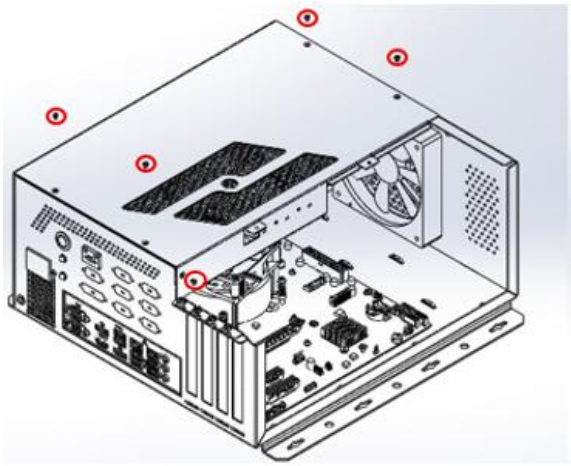
Step 1 – Remove the Finger Screws

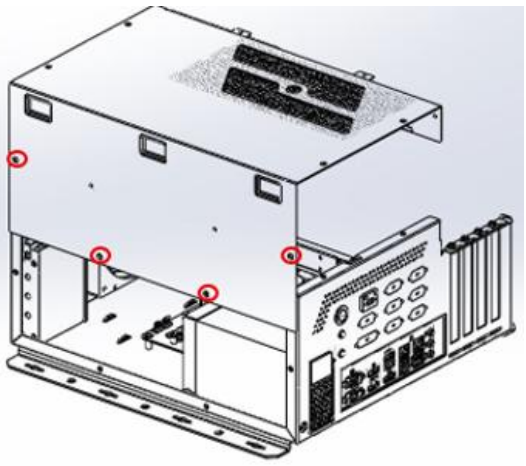
- At the rear of the system you will see two large, knurled thumb screws (also called finger screws or thumbscrews).
- These can be loosened and removed by hand, without tools.
- Once removed, the right-side L-shaped cover can be lifted upward from the chassis.



Step 2 – Remove the Left-Side Cover

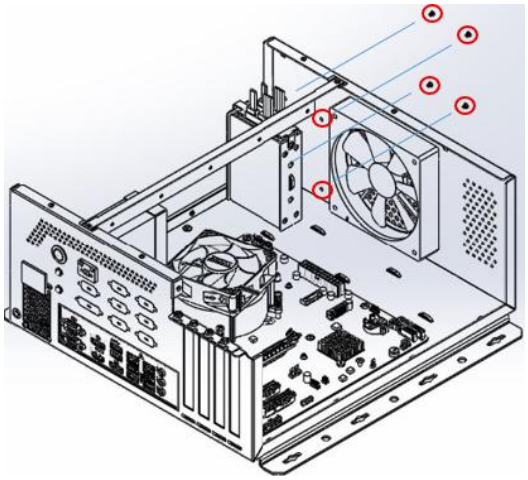
- With the right-side cover removed, proceed to the left-side L-shaped cover.
- Remove five screws on the top panel and four screws on the left side panel (total of 9). Lift away the left-side cover.
- At this stage, the internal components (M.2 slots, memory slots and SSD bay) are visible.



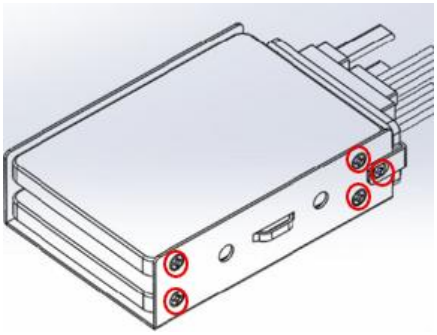


2.1.2 Component Installation

SSD Drive Installation



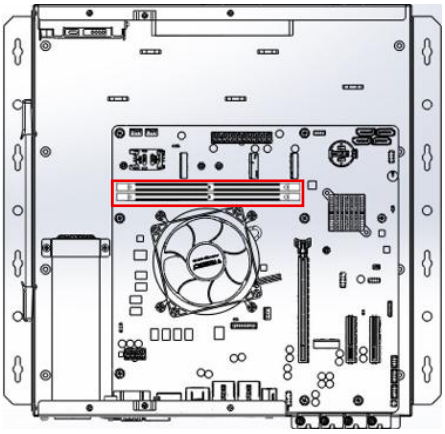
1. Locate the SSD drive bay inside the chassis.
2. From the outside of the chassis, remove the four screws that lock the SSD bay to the chassis.
3. Slide out the SSD bay carefully.
4. To release the U-shaped metal bracket holding the cables, remove one screw on each side of the bracket.
5. Disconnect the SATA data cable and SATA power cable from the drive(s).
6. For each drive installed:
   - Remove the two screws on each side that are securing the drive.
   - Lift out the drive.

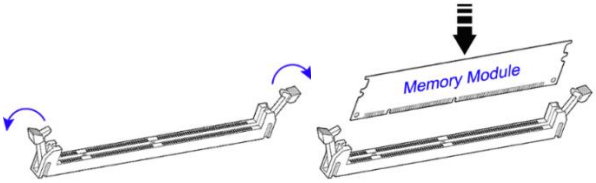


7. To install a drive:
   - Replace the drive into position. Secure it with four screws.
   - Reconnect the SATA data cable to an available SATA port on the motherboard (CN8–CN11).
   - Reconnect the SATA power cable from the PSU harness.
8. Re-attach the U-shaped bracket to the bay using the two side screws.
9. Slide the SSD bay back into the chassis and re-secure it with the four external screws removed in Step 2.

Memory Module Installation (J11/J12)

1. Locate the DDR5 UDIMM slots.
2. Press the ejector tabs outward.
3. Align the memory module notch with the slot key.
4. Insert the module firmly until both ejector tabs snap into place.
5. For dual-channel operation, install modules in both J11 and J12.



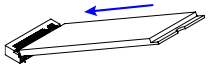


M.2 Card Installation

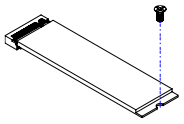
- **J6 – M.2 M-Key NVMe (CPU lanes, 2280)**
- **J14 – M.2 M-Key (2280)**
- **J13 – M.2 E-Key (Wi-Fi/BT, 2230)**
- **J15 – M.2 B-Key (WWAN, 3052)**

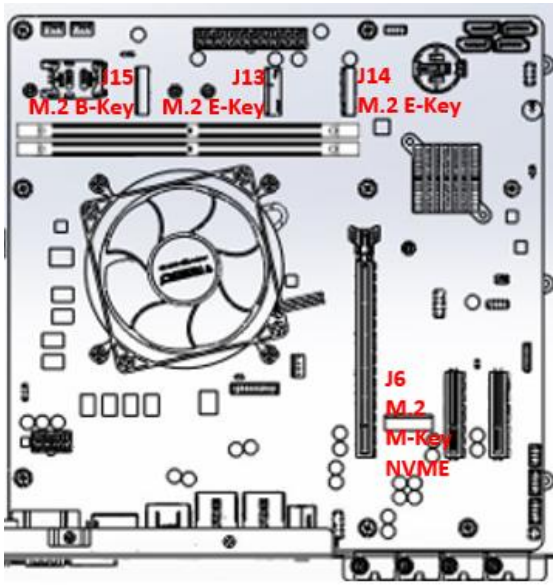
Procedure (common):

1. Locate the desired M.2 slot on the board.
2. Insert the module into the connector at about a 30° angle.



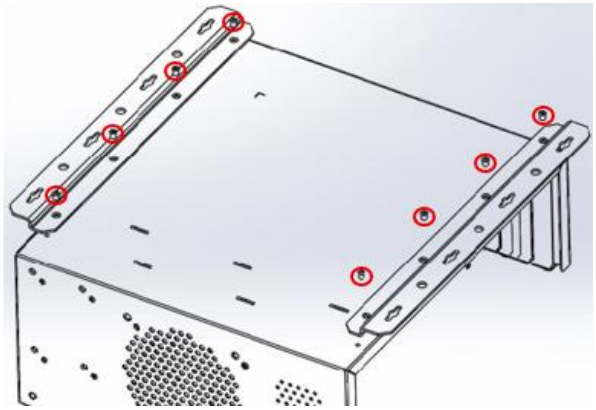
3. Push the card down gently until it lies flat.
4. Secure it with a single M.2 screw at the standoff.





Wall Mount Bracket Installation / Removal

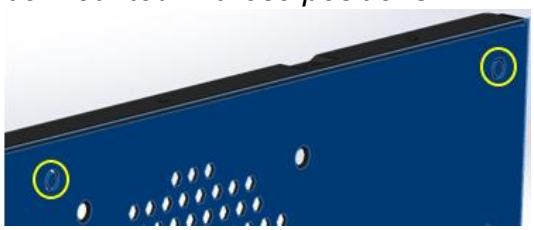
1. **Prepare the system**
   - Power off the system, disconnect all cables, and place it on a clean, stable surface.
   - Turn the chassis **upside down** so that the bottom panel is facing upward.
2. **Remove the screws**
   - Locate the two wall-mount brackets secured to the bottom panel.
   - Remove the **eight screws** (four per bracket) that hold the brackets in place.
   - Keep the screws for re-installation if needed.



3. **Bracket removal or installation**
   - To remove: Lift the brackets away from the chassis after the screws are removed.
   - To install: Align each bracket with the screw holes on the bottom panel, then secure it with **four screws per bracket (eight total)**. Tighten the screws firmly.

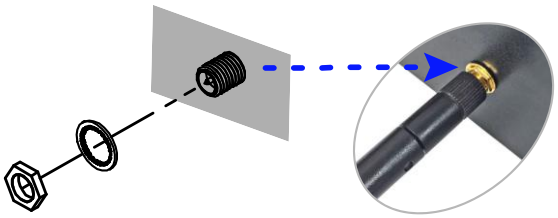
2.1.3 Antenna Installation

Remark: *Reserved antenna holes (see picture below) are available on the chassis. If an optional M.2 wireless module is installed, external antennas can be mounted in these positions.*

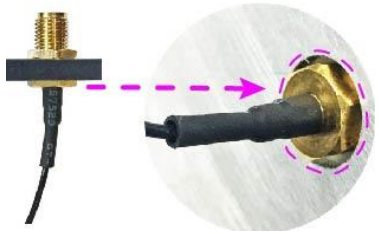


Installation:
Thread the antenna extension cable through an antenna hole of the front I/O cover and fasten the antenna as shown below. Then apply adhesive to the edge of the hex nut behind the front I/O cover to prevent the extension cable from falling if the cable becomes loose.

1. Thread and fasten the hex nut and the washer. Then install the antenna.



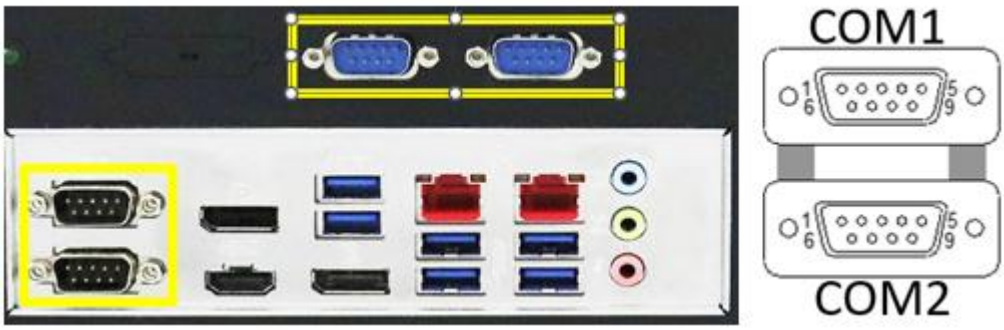
2. Apply adhesive around here.



Info: The diameter of the nut is around 6.35 mm (0.25”-36UNC).

2.1.4 COM Ports & Power Input Connector

- **COM Ports**



Note:

- COM1 (top) / COM2 (bottom) are RS-232/422/485 ports.
- Other ports (optional) - COM3 ~ COM6 are fixed RS-232.

Pin	Signal Name	Pin	Signal Name
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	RI, Ring indicator
5	Ground		

Pin	Signal Name		
	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

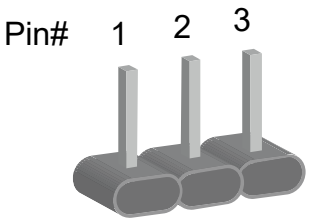
- **Power Input**

Note:
This system is equipped with an internal power supply. Connect the supplied AC power cord to the AC inlet on the rear panel, and plug the other end into a grounded AC outlet.
No external DC power wiring or pin assignment is required.

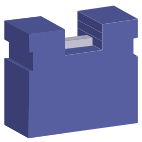
2.2 Setting the Jumpers

Set up and configure your product by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

Jumpers are short-length conductors consisting of several metal pins with a non-conductive base mounted on the circuit board. Jumper caps are used to have the functions and features enabled or disabled. If a jumper has 3 pins, you can connect either PIN1 to PIN2 or PIN2 to PIN3 by shorting.

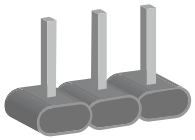
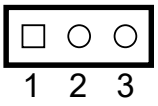
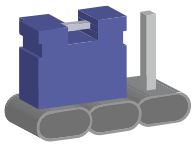
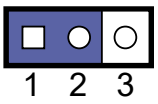
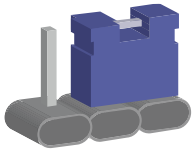
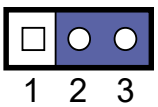


A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

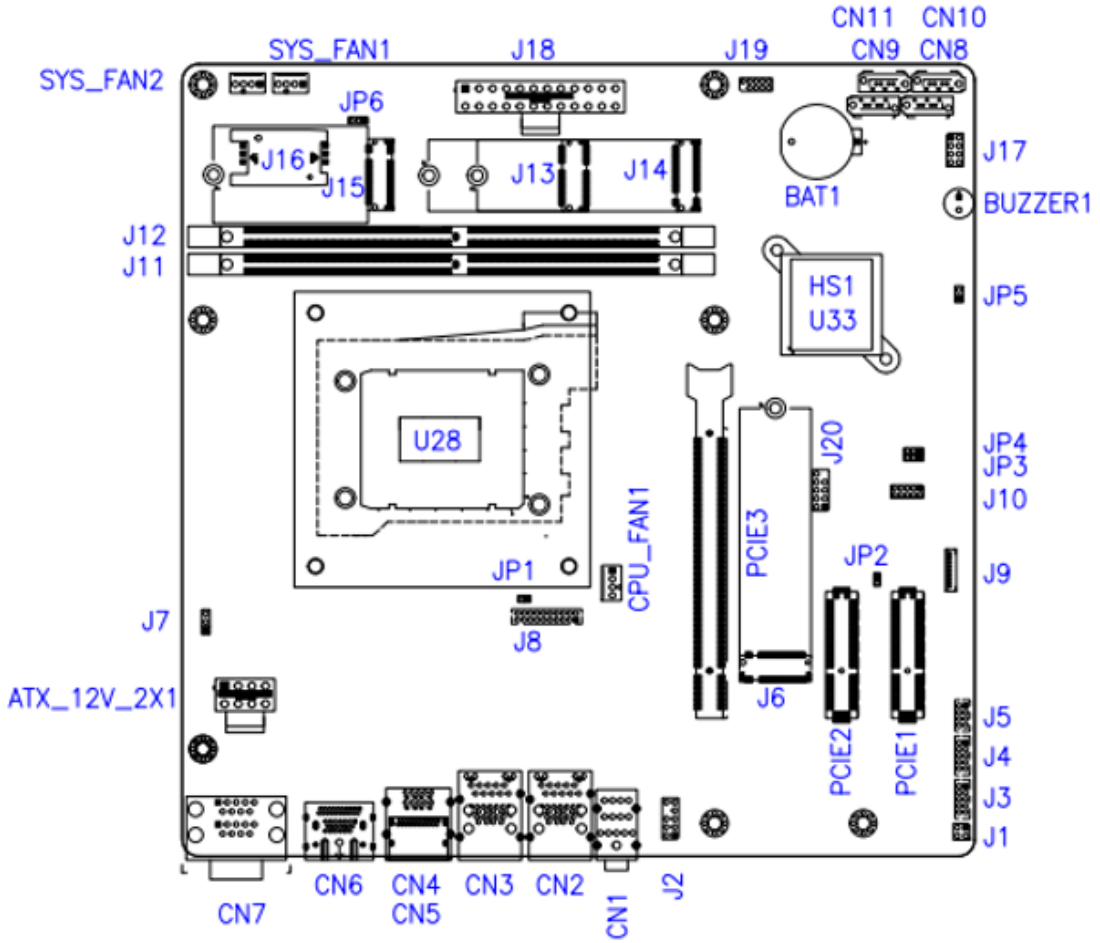
Pin	Jumper	Illustration
Open		
1-2 Closed		
2-3 Closed		

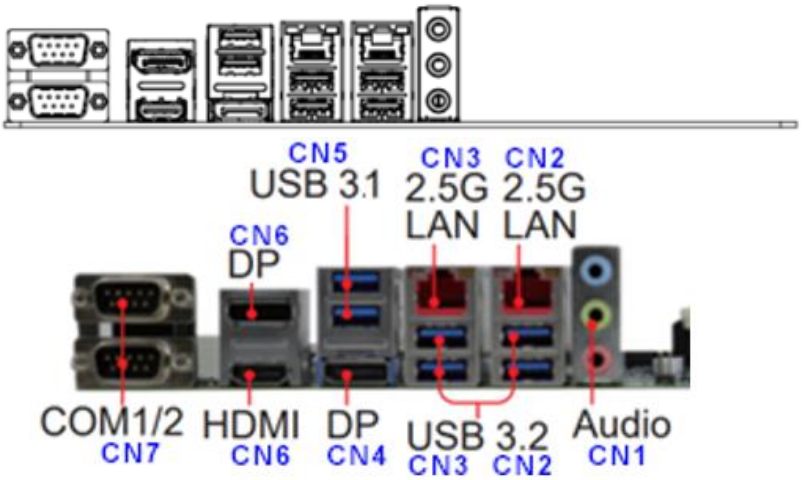
When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.3 Jumper & Connector Locations on Motherboard

Motherboard: MB998

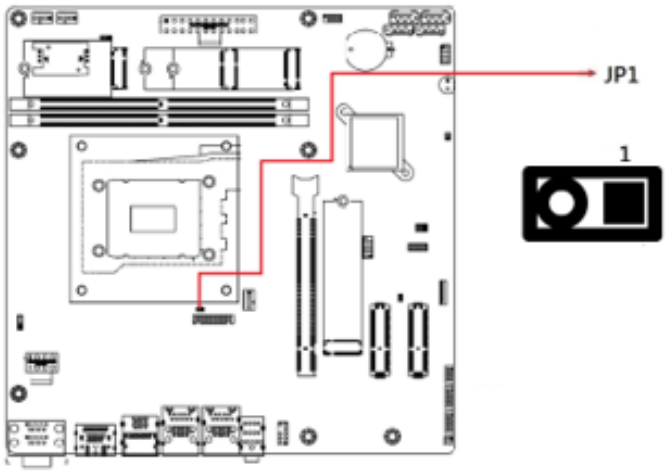


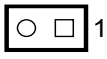


2.4 Jumpers Quick Reference

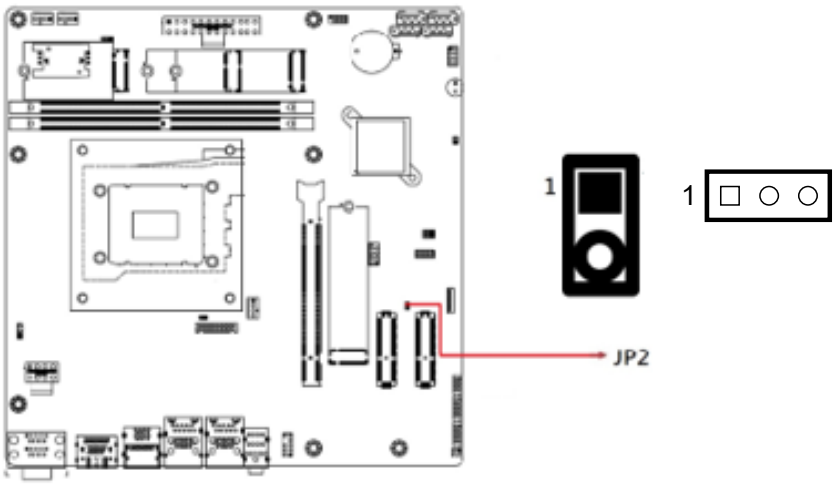
Jumper	Function
JP1	PCIe (x16) Bifurcation Selection
JP2	AT/ATX Select
JP3	Clear RTC
JP4	Clear CMOS Data
JP5	Flash Descriptor Security Override (Factory use only)
JP6	Sierra EM919x 5G card USB/PCIe Select

2.4.1 JP1: PCI Express Bifurcation



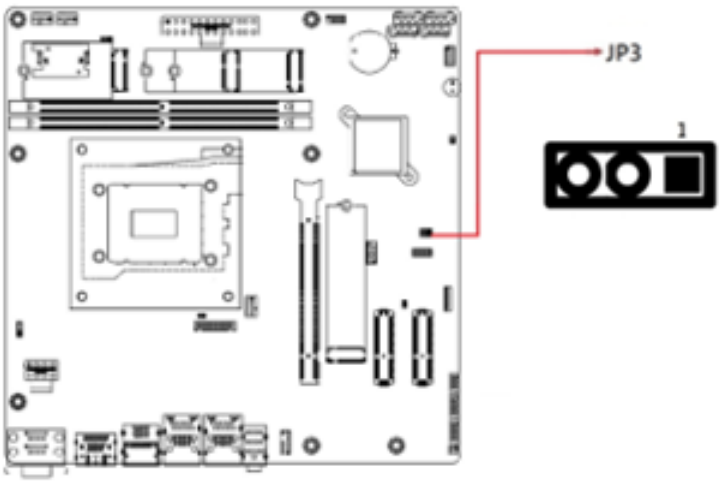
Function	Pin closed	Illustration
1 x PCIe (x16) (default)	Open	 1
2 x PCIe (x8)	Close	 1

2.4.2 JP2: AT/ATX Select



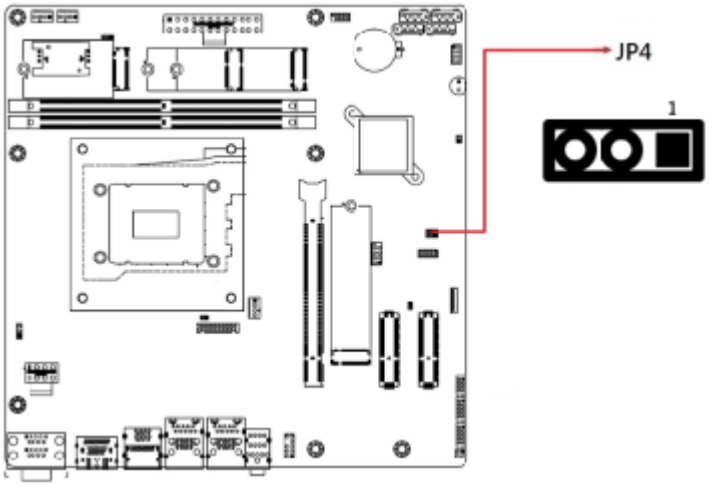
Function	Pin closed	Illustration
ATX (Default)	Open	1
AT	Close	1

2.4.3 JP3: Clear RTC



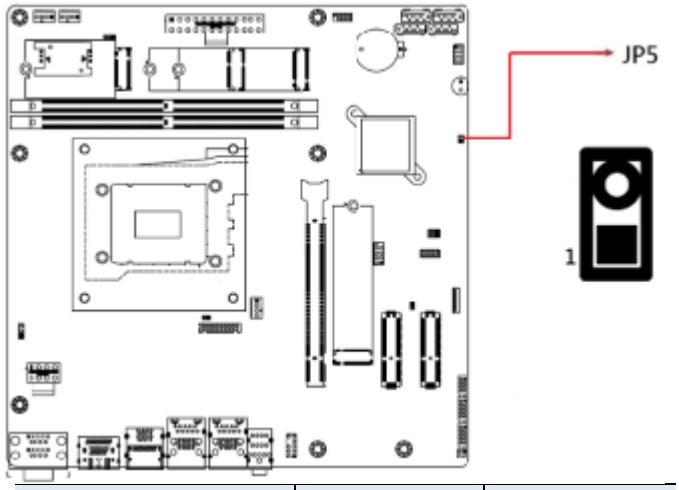
Function	Pin closed	Illustration
Normal (default)	1-2	1
Clear RTC	2-3	1

2.4.4 JP4: Clear CMOS



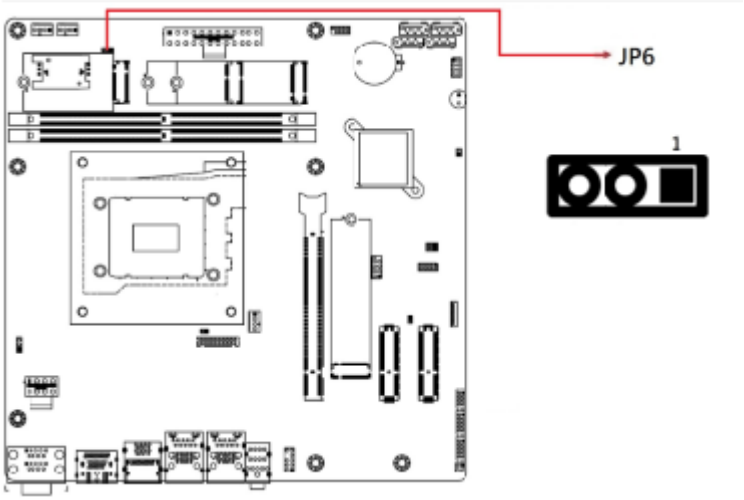
Function	Pin closed	Illustration
Normal (default)	1-2	1
Clear CMOS	2-3	1

2.4.5 JP5: Flash Descriptor Security Override (Factory use only)



Function	Pin closed	Illustration
Disabled (default)	Open	1
Enabled	Close	1

2.4.6 JP6: Sierra EM919x 5G card USB/PCIe Select

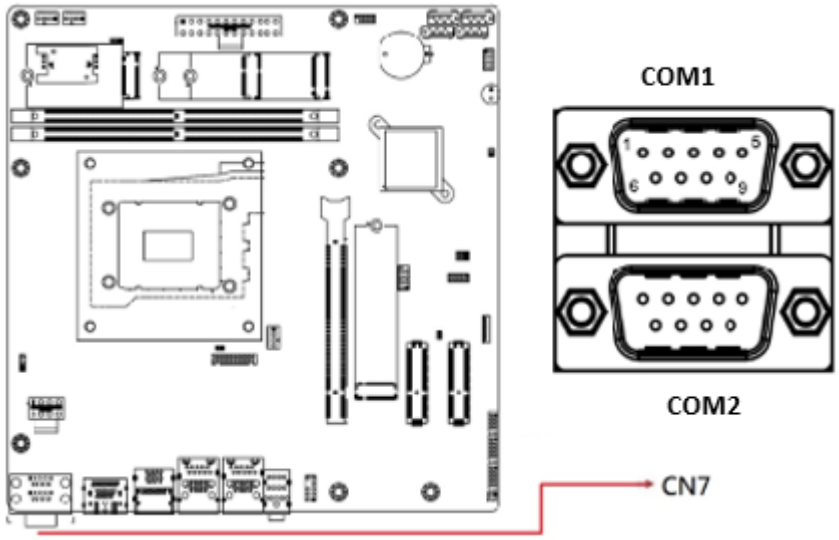


Function	Pin closed	Illustration
USB	1-2	1
PCIe (default)	2-3	1

2.5 Connectors Quick Reference

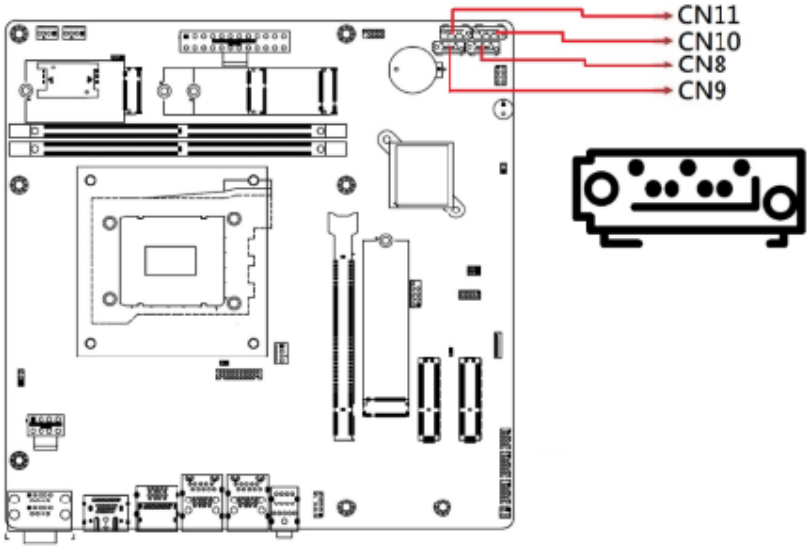
Connector	Function
CN1	Audio Jack
CN2	2.5G LAN (I226V)+ USB 3.2 GEN2 #3/#4
CN3	2.5G LAN (I226LM) + USB 3.2 GEN2 #1/#2
CN4	DisplayPort (DP++)
CN5	USB 3.2 #5/#6 (w/ power control)
CN6	DisplayPort (upper) and HDMI (bottom)
CN7	COM1 (upper) and COM2 (bottom)
CN8, CN9, CN10, CN11	SATA #4, SATA #5, SATA #6, SATA #7
J1	S3 Status Connector
J2	Audio Front Panel
J3	COM4
J4	COM3
J5	PS2 Keyboard/Mouse
J6	M.2 M-Key NVME (CPU lanes)
J7	PWM programming (Factory use only)
J8	DVI-D (HK_DF11-20S-PA66H)
J9	eSPI Debug (Factory use only)
J10	Digital I/O (4in, 4out)
J11	DDR5 UDIMM CHA 0
J12	DDR5 UDIMM CHB 0
J13	M.2 E-Key
J14	M.2 M-Key
J15	M.2 B-Key
J16	SIM card slot
J17	Front Panel
J18	24-pin ATX power connector
J19	SPI Flash Connector (Factory use only)
CPU_FAN1	CPU Fan Power Connector (PWM Only)
SYS_FAN1	System Fan Power Connector (PWM Only)
SYS_FAN2	System Fan Power Connector (PWM Only)

2.5.1 CN7: COM1 & COM2 RS-232/422/485 Ports



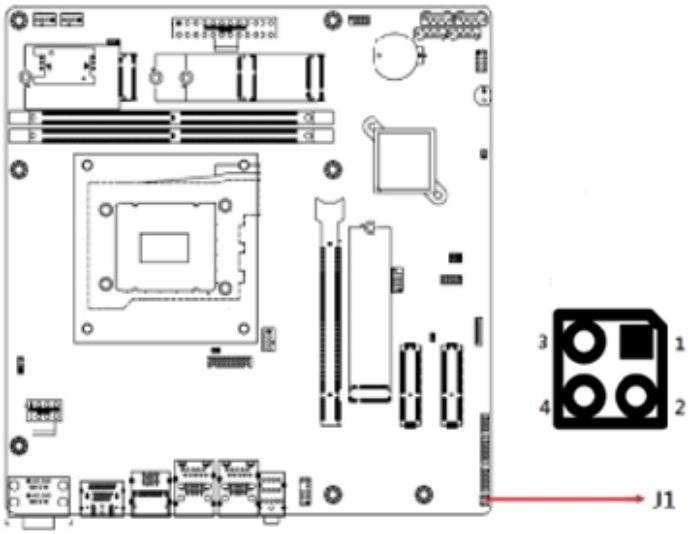
Pin	Signal Name		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

2.5.2 CN8, CN9, CN10, CN11: SATA Connectors



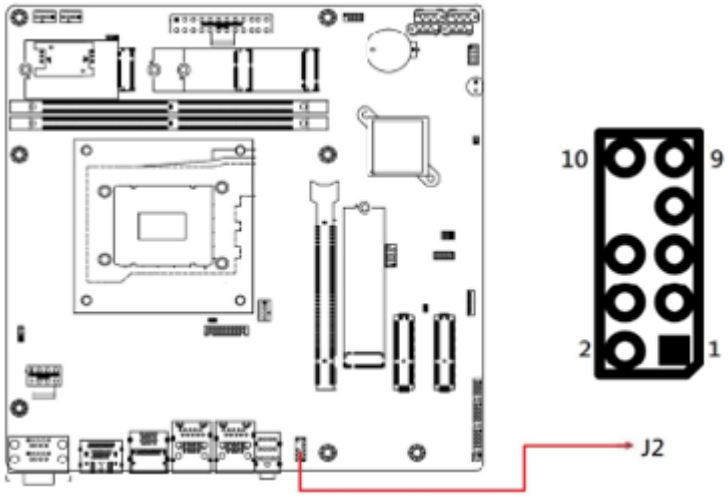
Pin	Signal Name
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

2.5.3 J1: S3 Status Connector



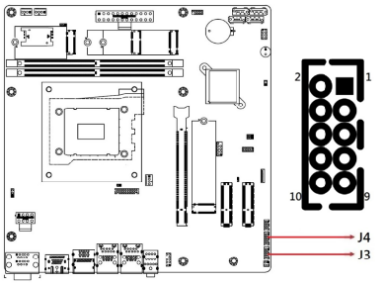
Pin	Signal Name	Pin	Signal Name
1	3VDUAL	2	Ground
3	VCC3	4	Ground

2.5.4 J2: Front Panel Audio Connector



Pin	Signal Name	Pin	Signal Name
1	MIC IN_L	2	Ground
3	MIC IN_R	4	DET
5	LINE_R	6	Ground
7	Sense	8	Key
9	LINE_L	10	Ground

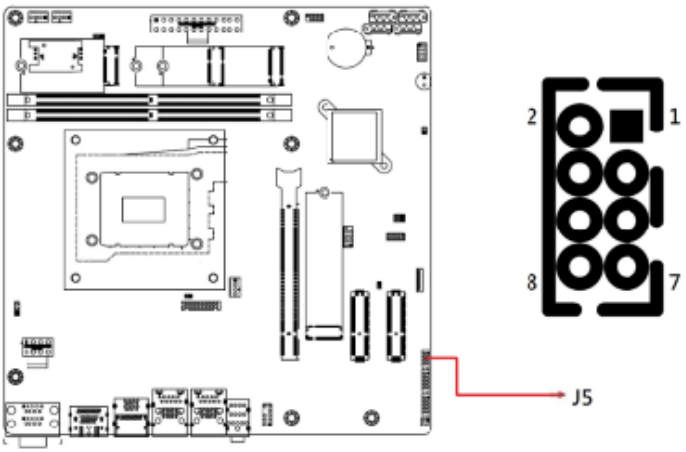
2.5.5 J3, J4: COM3, COM4 RS232 Serial Port



Pin	Signal Name	Pin	Signal Name
1	DCD#	2	SIN#
3	SOUT	4	RTS#
5	GND	6	DSR#
7	DTR#	8	CTS#
9	RI#	10	Key

Connector type: HK_DF11-10S-PA66H

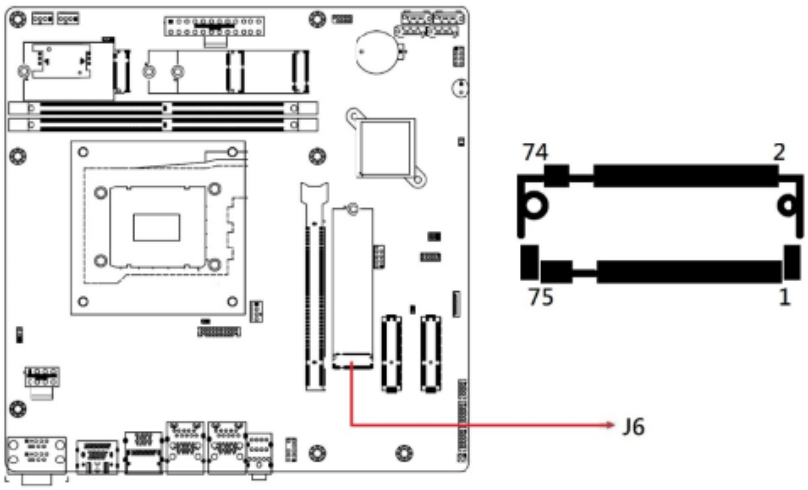
2.5.6 J5: PS2 Keyboard/Mouse Connector



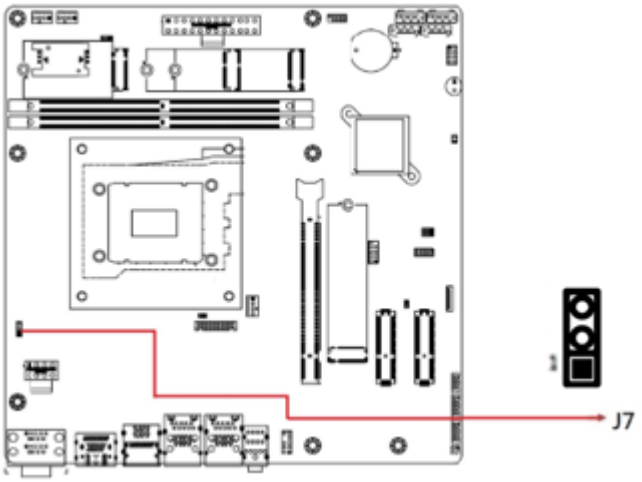
Pin	Signal Name	Pin	Signal Name
1	VCC	2	VCC
3	MDA	4	KBDA
5	MCL	6	KBCL#
7	GND	8	GND

Connector type: HK_DF11-8S-PA66H

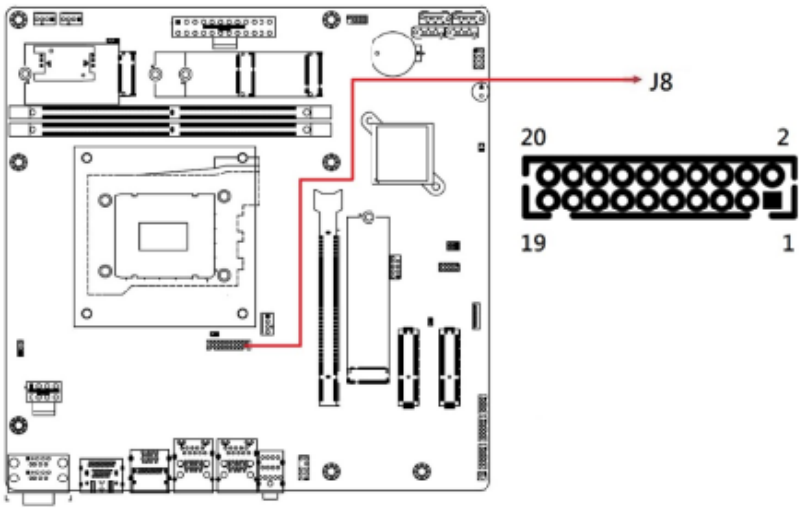
2.5.7 J6: M.2 M-Key NVME (CPU lanes)



2.5.8 J7: PWM Programming (Factory use only)



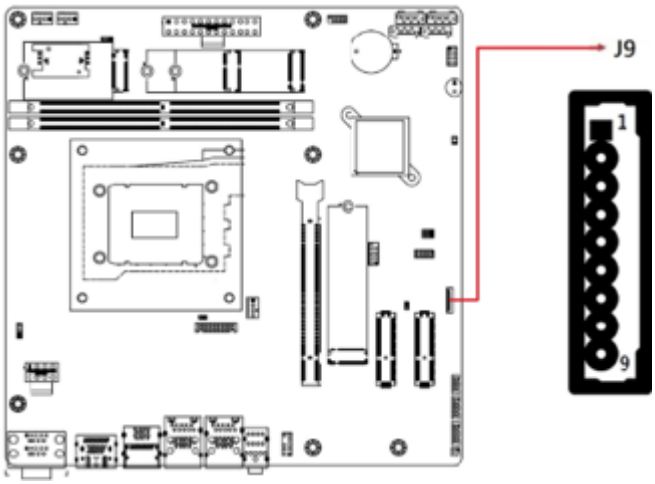
2.5.9 J8: DVI-D Connector



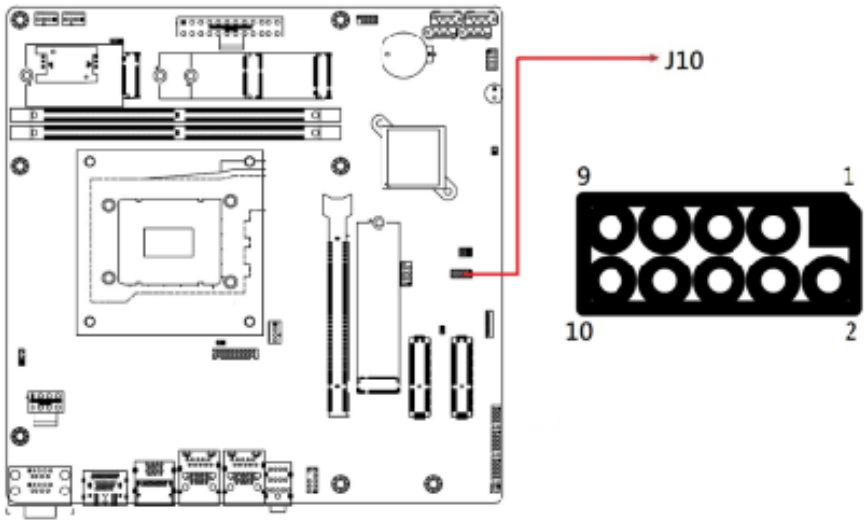
Pin	Signal Name	Pin	Signal Name
1	DATA1_P	2	DATA1_N
3	Ground	4	Ground
5	CLK_P	6	CLK_N
7	Ground	8	VCC
9	HPD	10	NC
11	DATA2_P	12	DATA2_N
13	Ground	14	Ground
15	DATA0_P	16	DATA0_N
17	NC	18	NC
19	SDA	20	SCL

Connector type: HK_DF11-20S-PA66H

2.5.10 J9: eSPI Debug (Factory use only)

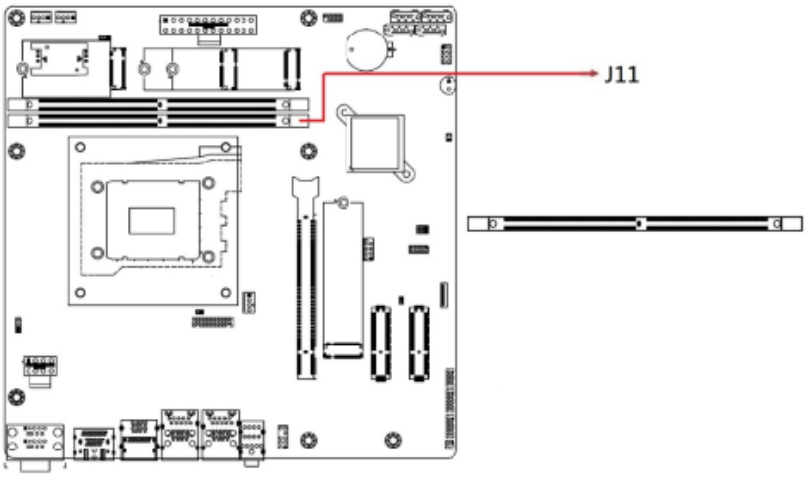


2.5.11 J10: Digital I/O Connector (4 in, 4 out)

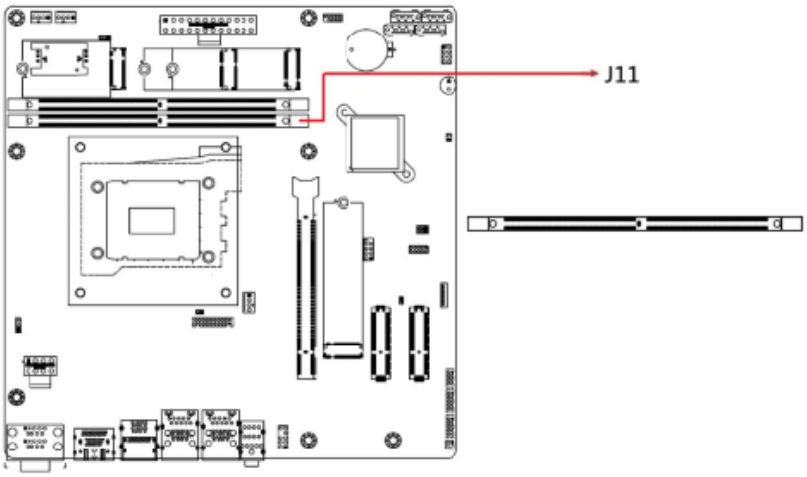


Pin	Signal Name	Pin	Signal Name
1	Ground	2	+5V
3	Out3	4	Out1
5	Out2	6	Out0
7	IN3	8	IN1
9	IN2	10	IN0

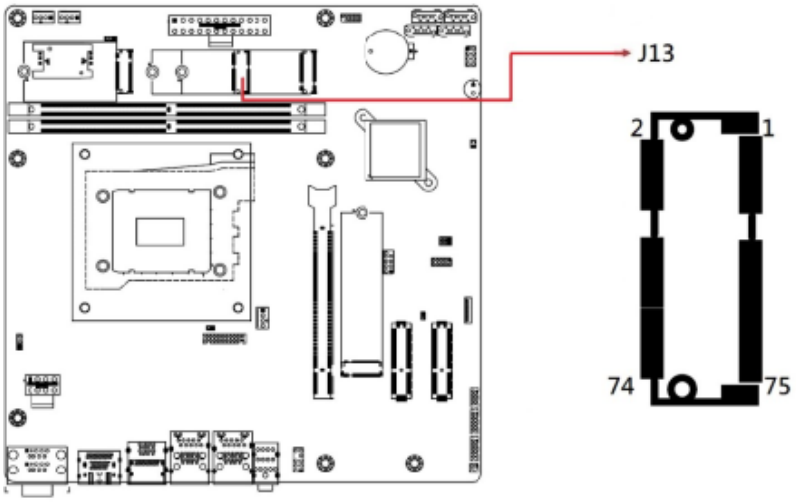
2.5.12 J11: DDR5 UDIMM CHA 0



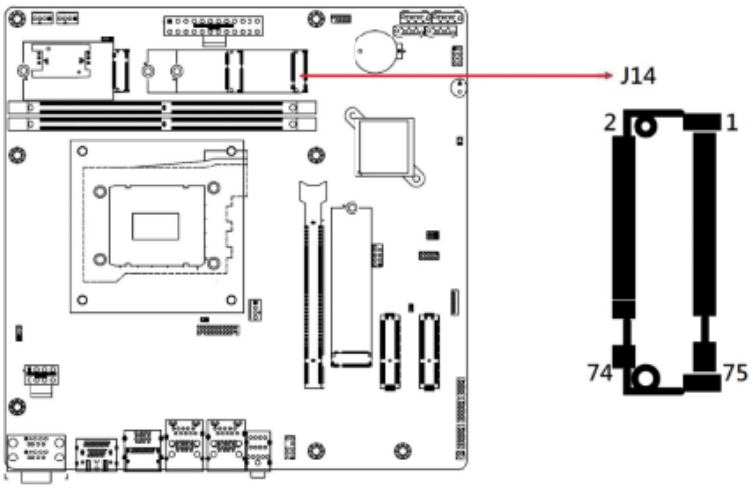
2.5.13 J12: DDR5 UDIMM CHB 0



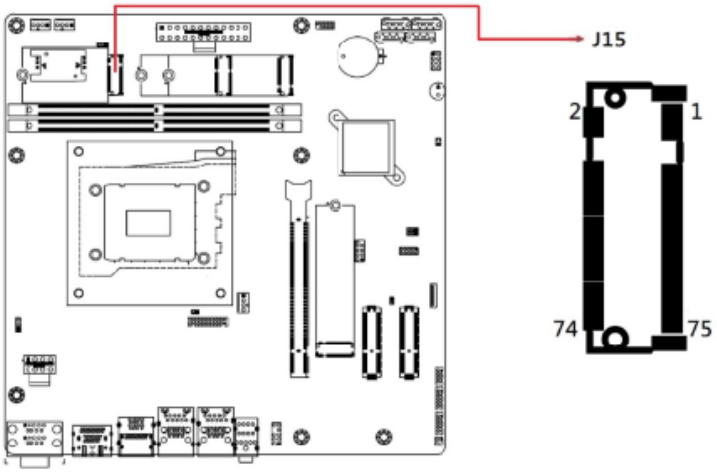
2.5.14 J13: M.2 E-key Socket



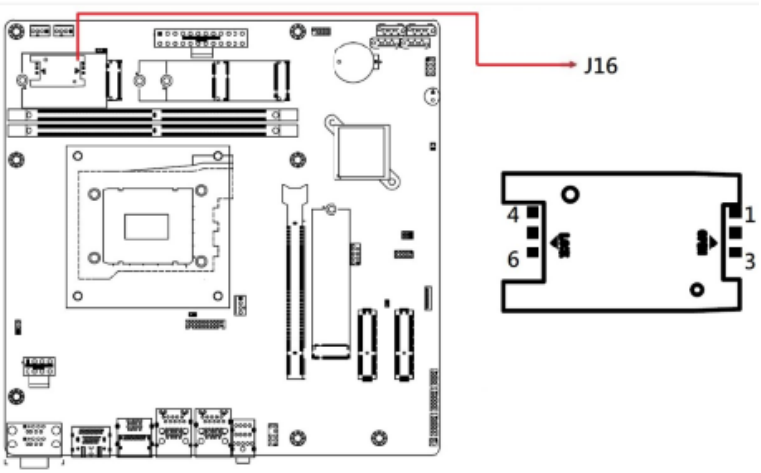
2.5.15 J14: M.2 M-key Socket



2.5.16 J15: M.2 B-key Socket

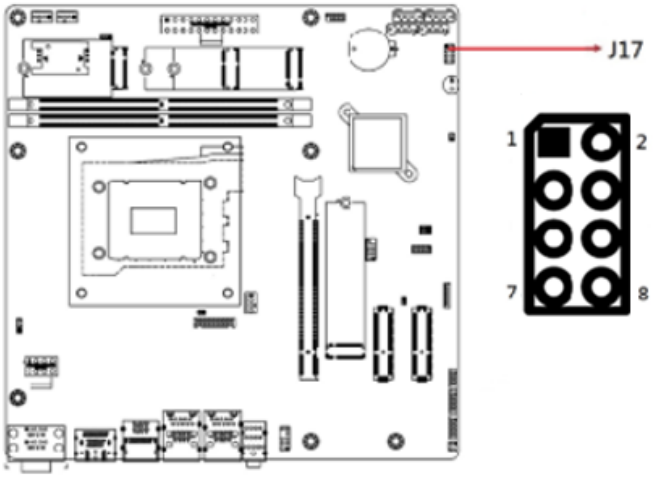


2.5.17 J16: SIM Card Slot



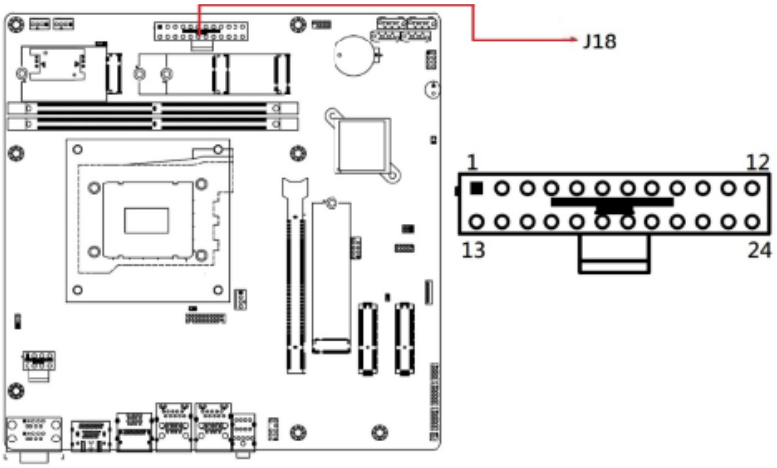
Remarks: This is used for M.2 B-key device (5G module).

2.5.18 J17: Front Panel Connector



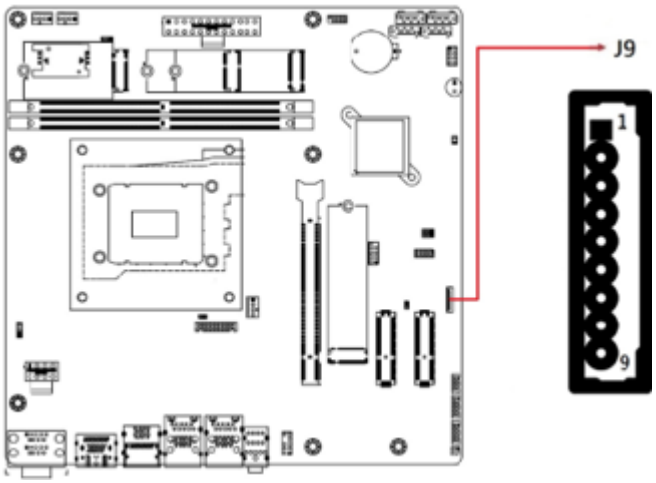
Pin	Signal Name	Pin	Signal Name
1	Power BTN	2	Power BTN
3	HDD LED+	4	HDD LED-
5	Reset BTN	6	Reset BTN
7	Power LED+	8	Power LED-

2.5.19 J18: 24-pin ATX Power Connector

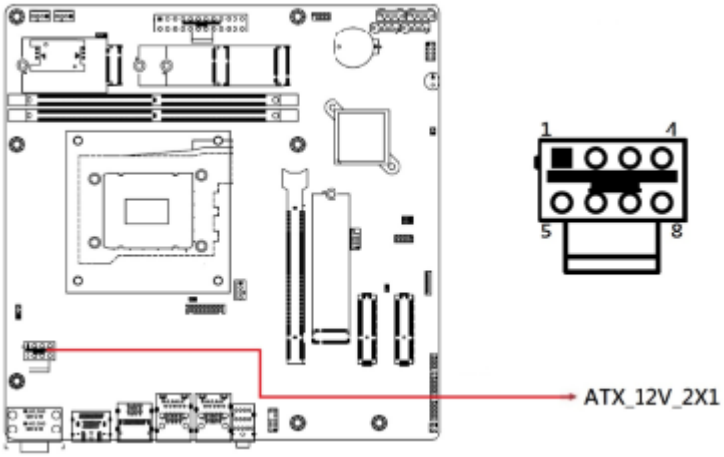


Pin	Signal Name	Pin	Signal Name
13	3.3V	1	3.3V
14	-12V	2	3.3V
15	Ground	3	Ground
16	PS-ON	4	+5V
17	Ground	5	Ground
18	Ground	6	+5V
19	Ground	7	Ground
20	-5V	8	Power good
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	Ground	12	3.3V

2.5.20 J19: SPI Flash Connector (Factory use only)

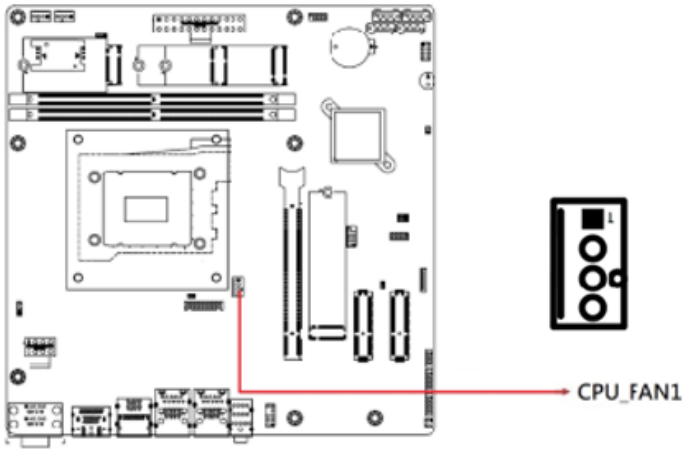


2.5.21 ATX_12V_2X1: AT 12V Power Connector



Pin	Signal Name	Pin	Signal Name
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V

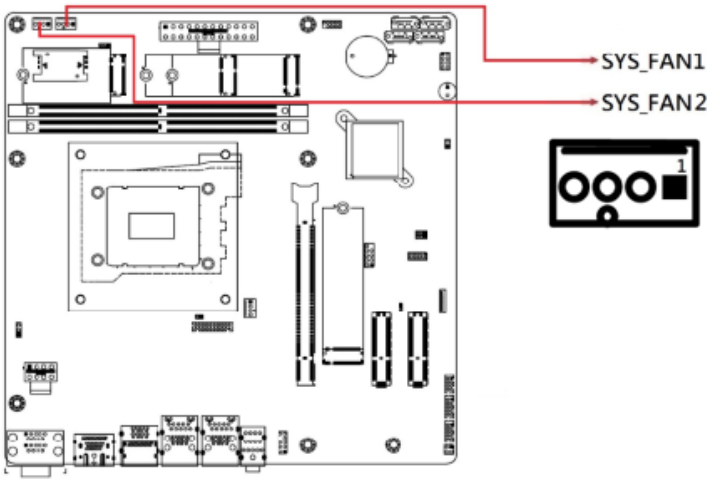
2.5.22 CPU_FAN1: CPU Fan Power Connector



Pin	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

Note: PWM Only

2.5.23 SYS_FAN1, SYS_FAN2: System Fan Power Connectors



Pin	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

Note: PWM Only

Chapter 3
Driver Installation

The information provided in this chapter includes:

- Intel® Chipset Software Installation Utility
- VGA Driver
- HD Audio Driver
- Intel® Trusted Execution Engine Drivers
- Intel® Serial I/O Drivers
- LAN Drivers

3.1 Introduction

This section describes the installation procedures for software drivers. The software drivers are available in the IBASE's website.

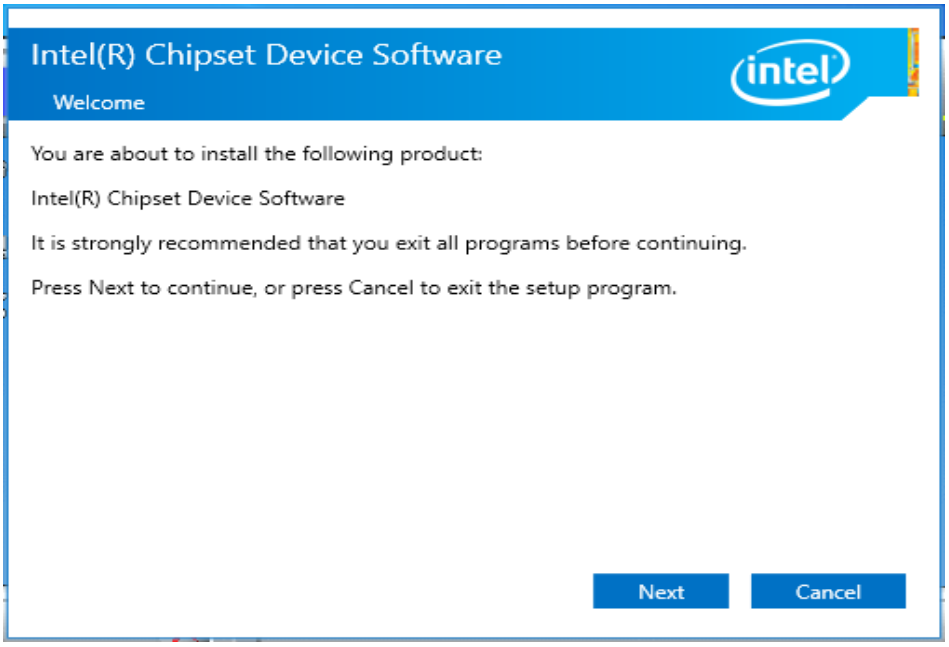
Note: After installing your Windows operating system, you must install the Intel® Chipset Software Installation Utility first before proceeding with the drivers installation.

3.2 Intel® Chipset Software Installation Utility

The Intel® Chipset drivers should be installed first before the software drivers to install INF files for Plug & Play function for Intel chipset components. Follow the instructions below to complete the installation.

1. Open the downloaded driver package. Run the chipset driver installer first. Click **Intel** on the left pane and then **Intel(R) AlderLake-S/RaptorLake-S Chipset Drivers**, and **Intel(R) Chipset Software Installation Utility** on the right pane.

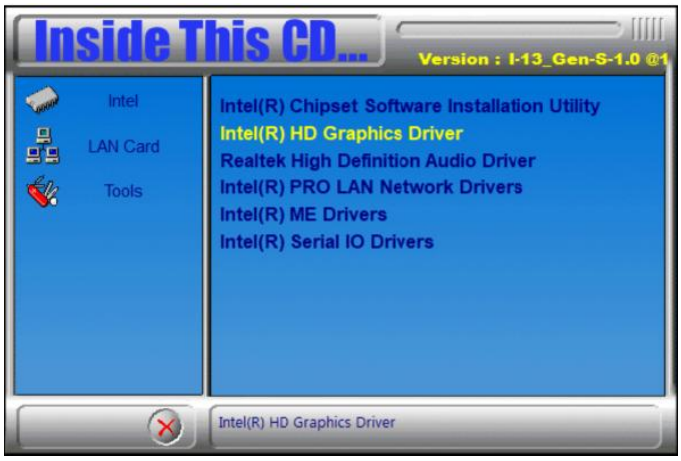
2. When the *Welcome* screen to the Intel® Chipset Device Software appears, click **Next** to continue.



3. Accept the *License Agreement* and click **Accept**.
4. On the *Readme File Information* screen, click **Install**.
5. When the driver has been completely installed, click **Finish** to complete the setup process.

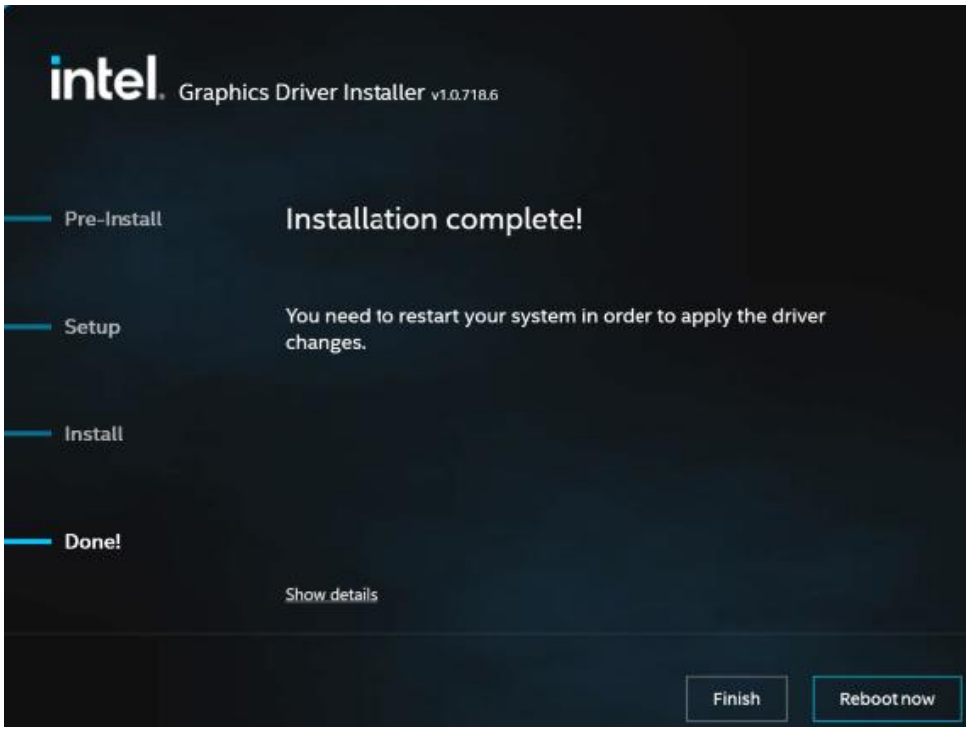
3.3 VGA Driver Installation

1. Click **Intel** on the left pane and then **Intel(R) AlderLake-S/RaptorLake-S Chipset Drivers**, and **Intel(R) HD Graphics Driver** on the right pane.



2. When the ***Intel Graphics Driver Installer*** screen appears, click **Begin installation**.

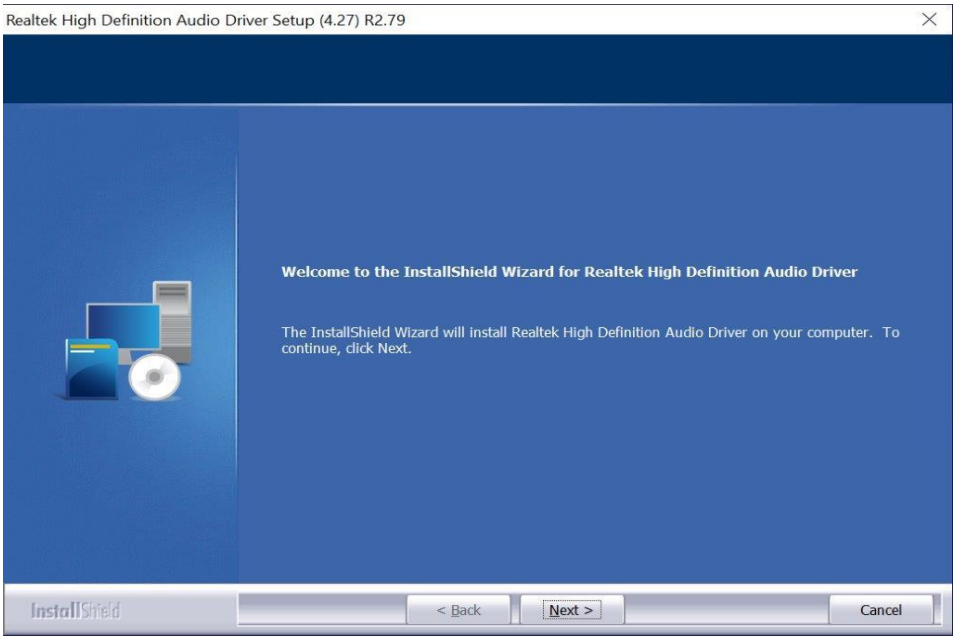
3. Click **I agree** to accept the INTEL SOFTWARE LICENSE AGREEMENT.
4. In the Pre-Install stage, “The installer will install the following components:
   - Intel® Graphics Driver
   - Intel® Graphics Command Center
   Click **Start** to start installing the new graphics driver.
5. The next screen will indicate that the new graphics driver is being installed. When the message “**Installation complete!**” appears, restart your system in order to apply the driver changes.



3.4 Realtek HD Audio Driver Installation

1. Click **Intel** on the left pane and then **Intel(R) AlderLake-S/RaptorLake-S Chipset Drivers**, and **Realtek High Definition Audio Driver** on the right pane.

2. On the *Welcome* screen of the InstallShield Wizard, click **Next** to install the drivers.

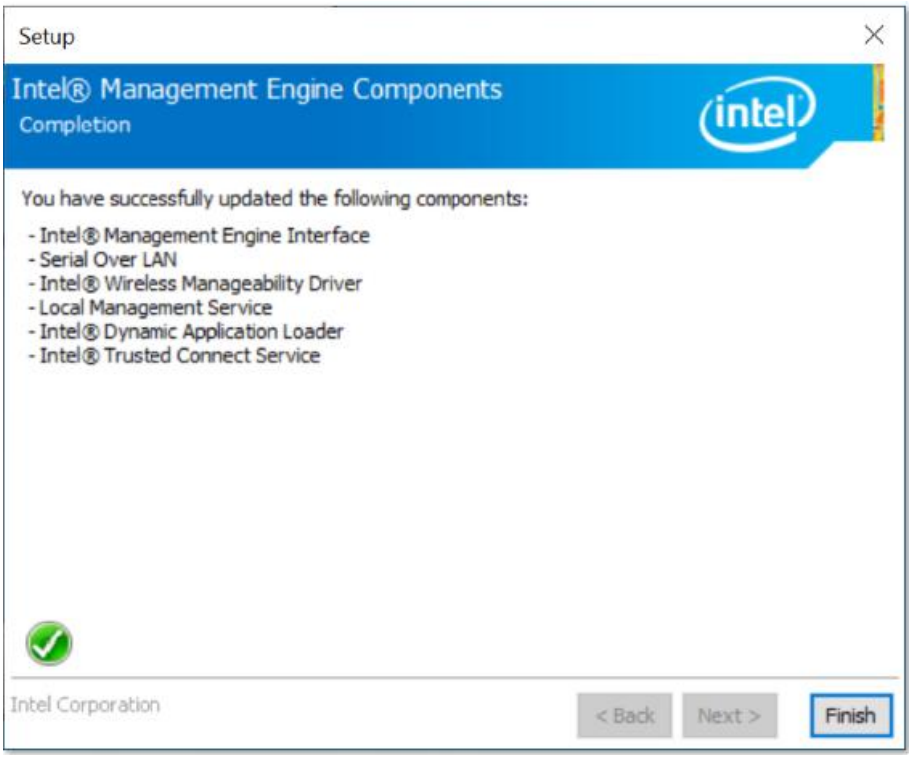


3. When the audio driver has been successfully installed, click **Finish** to restart the computer.

3.5 Intel® ME Drivers Installation

1. Click **Intel** on the left pane and then **Intel(R) AlderLake-S/RaptorLake-S Chipset Drivers,** and **Intel(R) ME Drivers** on the right pane.

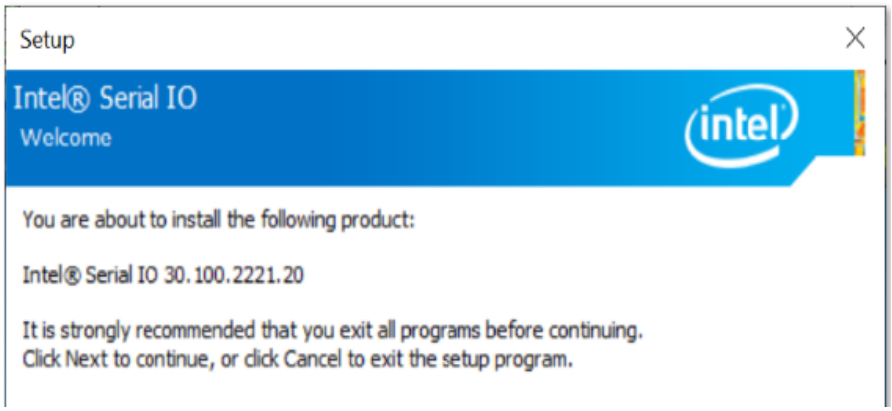
2. When the *Welcome* screen to the **Intel® Management Engine Components** appears, click **Next**.
3. Accept the terms in the License Agreement and click **Next**.
4. On the next screen, click **Next** to install to the default folder.
5. Click **Finish** when the necessary components have been successfully installed.



3.6 Intel® Serial IO Drivers Installation

1. Click **Intel** on the left pane and then **Intel(R) AlderLake-S/RaptorLake-S Chipset Drivers,** and **Intel(R) Serial IO Drivers** on the right pane.

2. When the *Welcome* screen to the Intel® Serial IO appears, click **Next**.

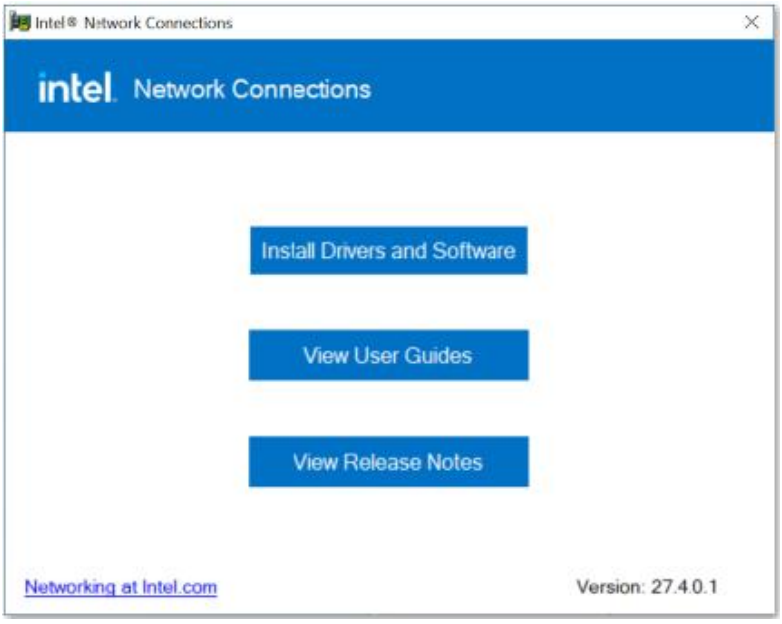


3. Accept the terms in the license agreement and click **Next**.
4. On the **Readme File Information** and **Confirmation** screens, click **Next**.
5. Click **Finish** when the **Completion** screen appears.

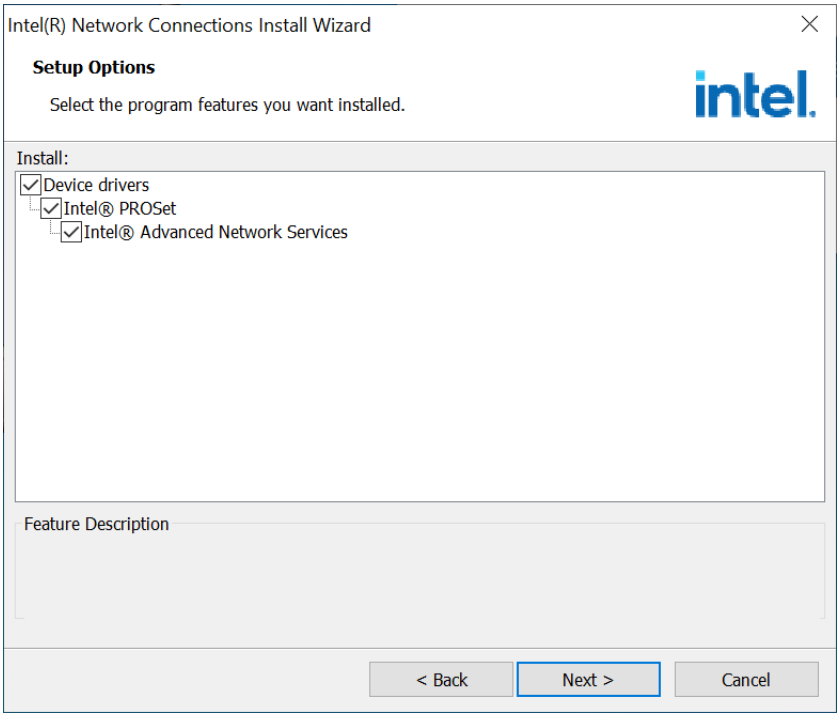
3.7 LAN Drivers Installation

1. Click **LAN Card** on the left pane and then **Intel PRO LAN Network Drivers** on the right pane.

2. Click **Intel Drivers and Software**.



3. When the *Welcome to the install wizard for Intel(R) Network Connection* screen appears, click **Next**. On the next screen, accept the terms in the License Agreement and click **Next**.
4. On the *Setup Options* screen, select the program features you want installed. Then click **Next** to continue.



5. On the *Ready to Install the Program* screen, click **Install** to begin the installation.
6. When the *Install wizard Completed* screen appears, click **Finish**.

Chapter 4
BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

- Main Settings
- Advanced Settings
- Chipset Settings
- Security Settings
- Boot Settings
- Save & Exit

4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system supports Intel® processors. The BIOS provides critical low-level support for standard devices such as disk drives and serial ports. It also provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

4.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. You can also press <F7> to call the pop-up Boot menu immediately.

If you still need to enter Setup, restart the system by pressing the ”Reset” button or by pressing <Ctrl> + <Alt> + <Delete> simultaneously.
You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

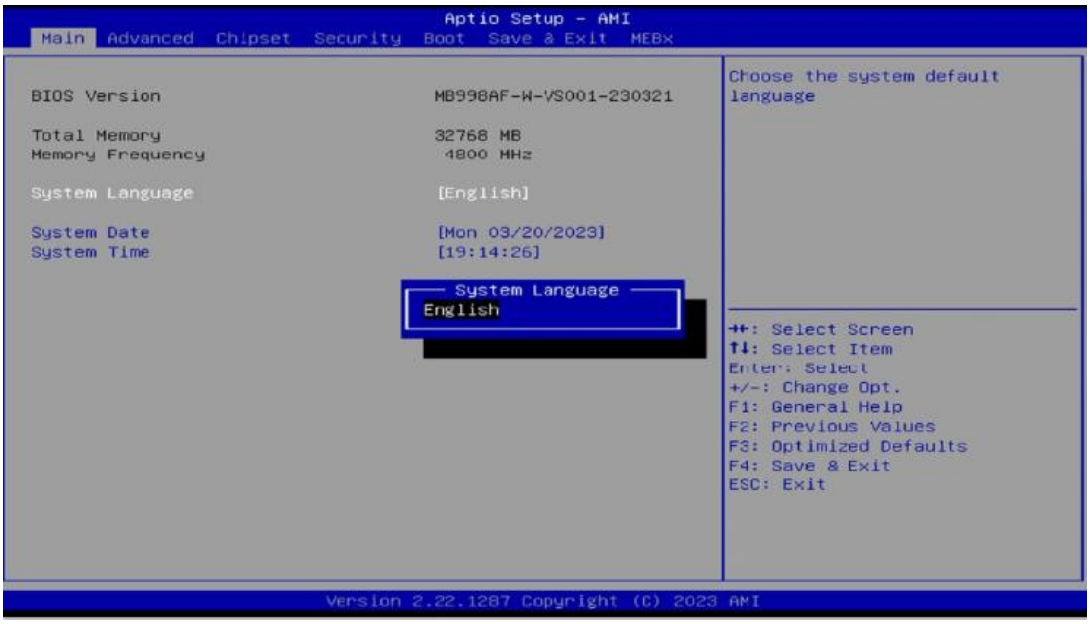
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS Setup utility, the *Main Menu* screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: It is strongly recommended that you avoid making any changes to the chipset defaults.

These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could make the system unstable and crash in some cases.

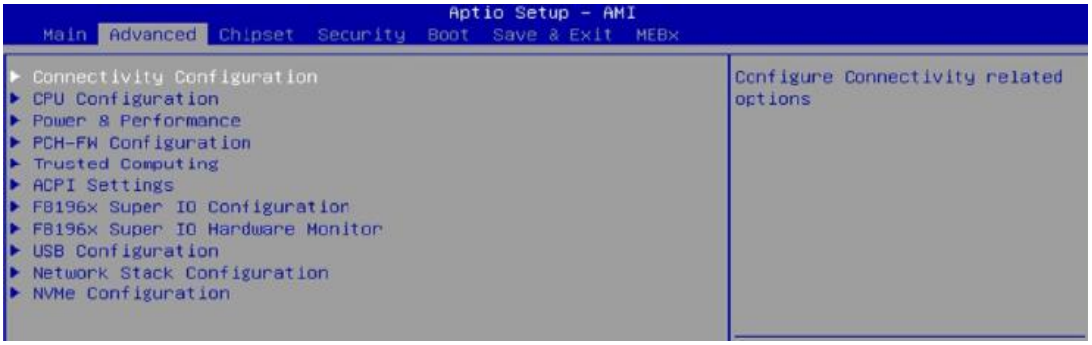
4.3 Main Settings



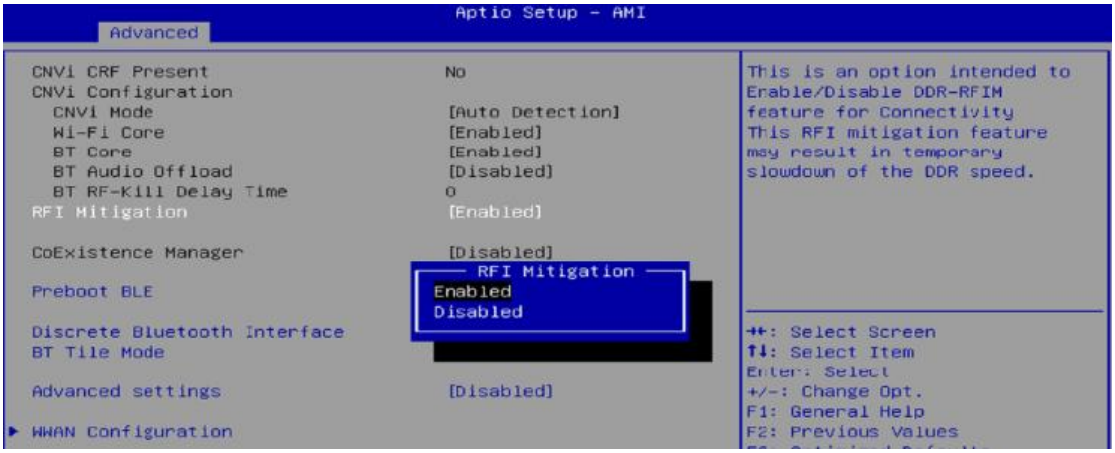
BIOS Setting	Description
System Language	Choose the system default language.
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

4.4 Advanced Settings

This section allows you to configure, improve your system and allows you to set up some system features according to your preference.

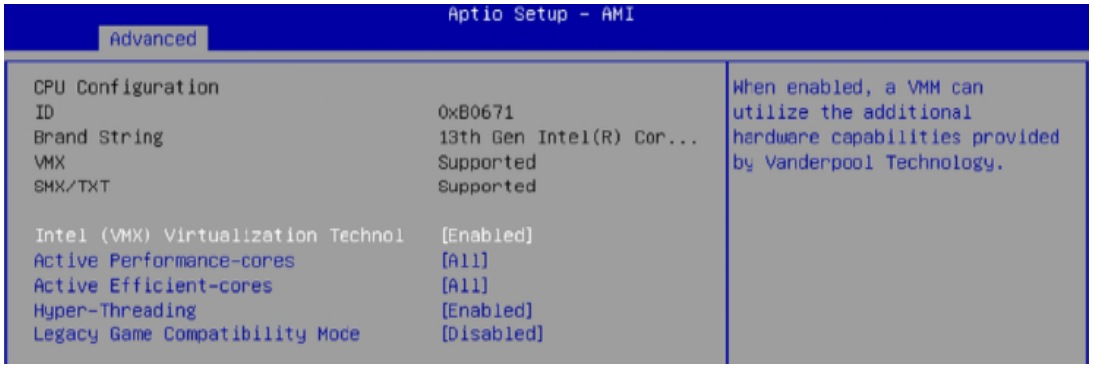


4.4.1 Connectivity Configuration

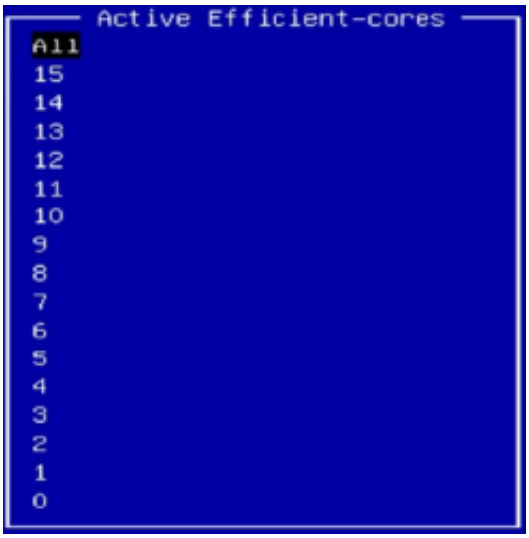


BIOS Setting	Description
RFI Mitigation	This is an option intended to enable/disable DDR-RFIM feature for Connectivity
Preboot BLE	This will be used to enable Preboot Bluetooth function.
Discrete Bluetooth Interface	SeriaIIo UARTO needs to be enabled to select BT interface.
BT Tile Mode	Enable/Disable Tile.
Advanced Settings	Configure ACPI objects for wireless devices.
WWAN Configuration	Configure WWAN related options.
WWAN Device	Select the M.2 WWAN Device options to enable 4G – 7360/7560 (Intel), 5G- M80 (MediaTek) Modems

4.4.2 CPU Configuration



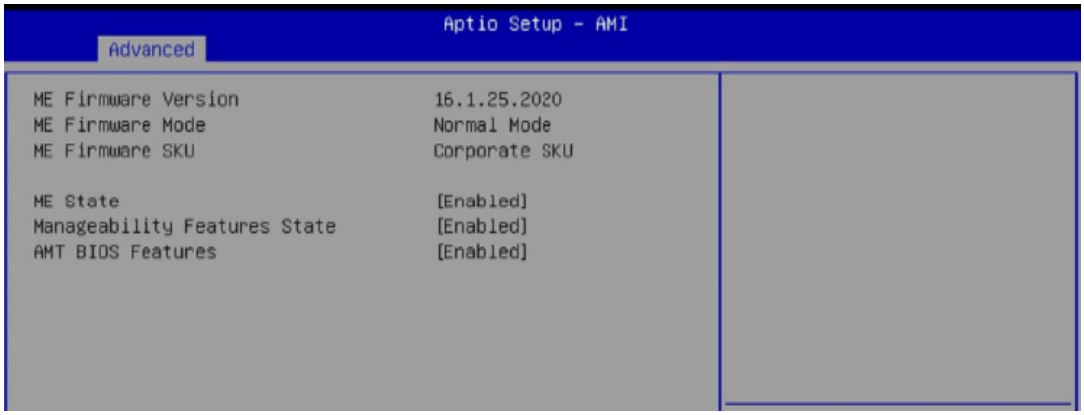
BIOS Setting	Description
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores Active Efficient-cores	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are (0,0), Pcode will enable all cores
Hyper-Threading	Enable or disable Hyper-Threading Technology.
Legacy Game Compatibility Mode	When enable, pressing the scroll lock key will toggle the Efficient-cores between being parked when Scroll Lock LED is on and un-parked when LED is off.



4.4.3 Power & Performance

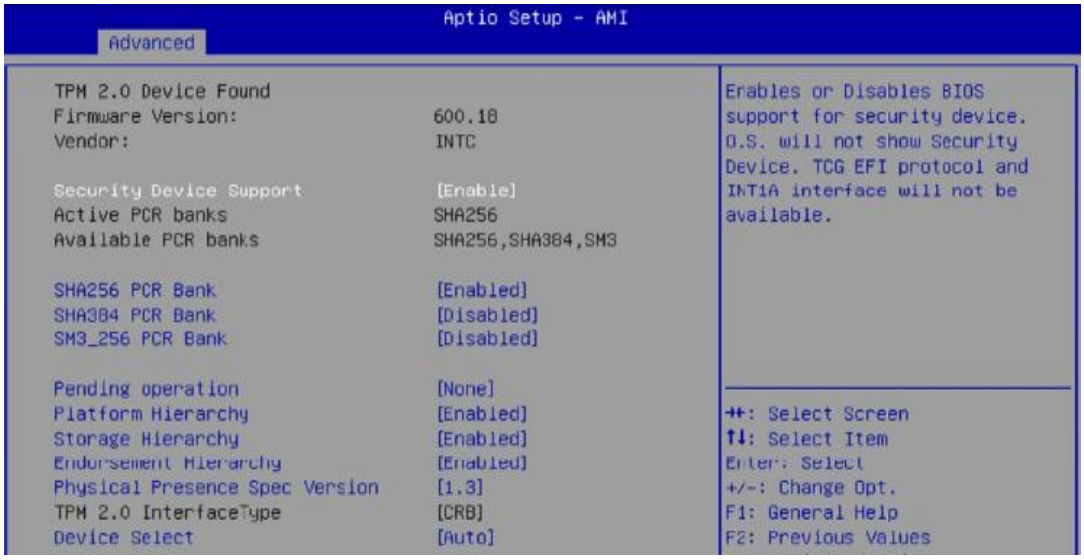
BIOS Setting	Description
Intel(R) SpeedStep(tm)	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.

4.4.4 PCH-FW Configuration



BIOS Setting	Description
ME State	When Disabled ME will be put into ME Temporarily Disabled Mode.
Manageability Features State	Enable/Disable Intel(R) Manageability features. **Note:** This option disables/enables Manageability Features support in FW. To disable support platform must be in an unprovisioned state first.
AMT BIOS Features	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. **Note:** This option does not disable Manageability Features in FW.

4.4.5 Trusted Computing



BIOS Setting	Description
Security Device Support	Enables / Disables BIOS support for security device. OS will not show security device. TCG EFI protocol and INTIA interface will not be available.
SHA256 / SHA384 / SH3_256 PCR Bank	Option: Enabled / Disabled
Pending operation	Schedule an operation for the security device. Note: Your computer will reboot during restart in order to change state of security device.
Platform Hierarchy	Enables / Disables platform hierarchy.
Storage Hierarchy	Enables / Disables storage hierarchy.
Endorsement Hierarchy	Enables / Disables endorsement hierarchy.
Physical Presence Spec Version	Selects to show the PPI Spec Version (1.2 or 1.3) that the OS supports. **Note:** Some HCK tests might not support 1.3.
Device Select	• **TPM 1.2** will restrict support to TPM 1.2 devices only. • **TPM 2.0** will restrict support to TPM 2.0 devices only. • **Auto** will support both with the default being set to TPM 2.0 devices if not found, and TPM 1.2 device will be enumerated.

4.4.6 ACPI Settings

BIOS Setting	Description
Enable ACPI Auto Configuration	Enables or Disables BIOS ACPI Auto Configuration
Enable Hibernation	Enables / Disables the system ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Selects an ACPI sleep state where the system will enter when the Suspend button is pressed. Options: Suspend Disabled, S3 (Suspend to RAM)

4.4.7 F8196x Super IO Configuration

BIOS Setting	Description
Power Failure	Options: Always on, Always off
Serial Port Configuration	Sets parameters of Serial Ports. Enables / Disables the serial port and select an optimal setting for the Super IO device.

4.4.7.1. Serial Port 1 Configuration

BIOS Setting	Description
Serial Port	Enables / Disables the serial port.
Change Settings	Selects an optimal settings for Super I/O device. • Auto • IO = 3F8h; IRQ = 4 • IO = 3F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12
Device Mode	Changes the serial port mode. • RS232 • RS485 TX Low Active • RS485 with Termination TX Low Active • RS422 • RS422 with Termination

4.4.7.2. Serial Port 2 Configuration

BIOS Setting	Description
Serial Port	Enables / Disables the serial port.
Change Settings	Selects an optimal settings for Super I/O device. Options: • Auto • IO = 2F8h; IRQ = 3 • IO = 3F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12
Device Mode	Changes the serial port mode. Options: • RS232 • RS485 TX Low Active • RS485 with Termination TX Low Active • RS422 • RS422 with Termination

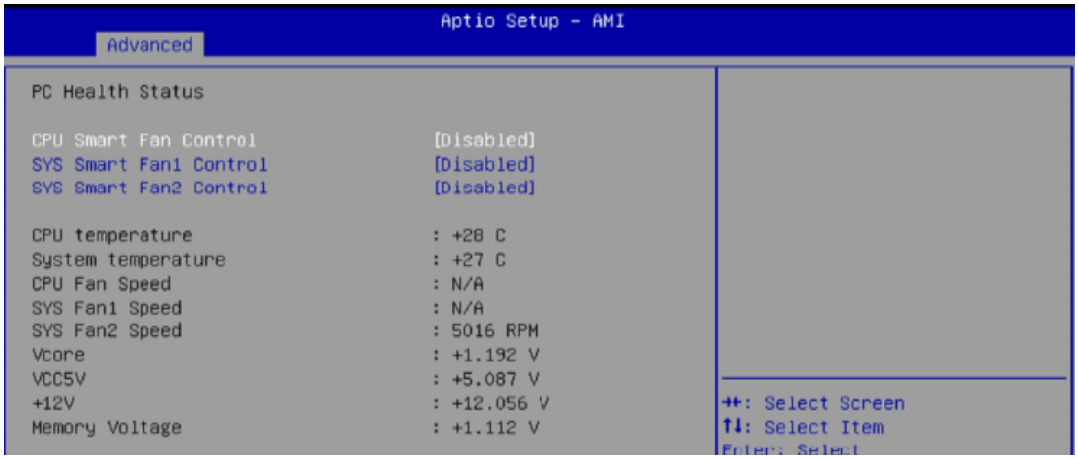
4.4.7.3. Serial Port 3 Configuration

BIOS Setting	Description
Serial Port	Enables / Disables the serial port.
Change Settings	Selects an optimal settings for Super I/O device. • Auto • IO = 3E8h; IRQ = 7 • IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2F0h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E0h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12

4.4.7.4. Serial Port 4 Configuration

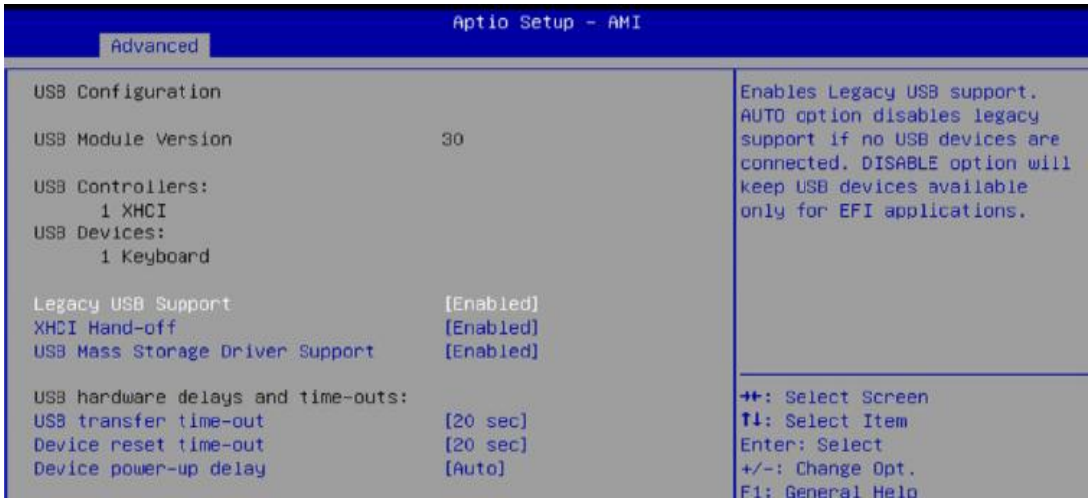
BIOS Setting	Description
Serial Port	Enables / Disables the serial port.
Change Settings	Selects an optimal settings for Super I/O device. • Auto • IO = 2E8h; IRQ = 7 • IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2F0h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E0h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12

4.4.8 F8196x Super IO Hardware Monitor



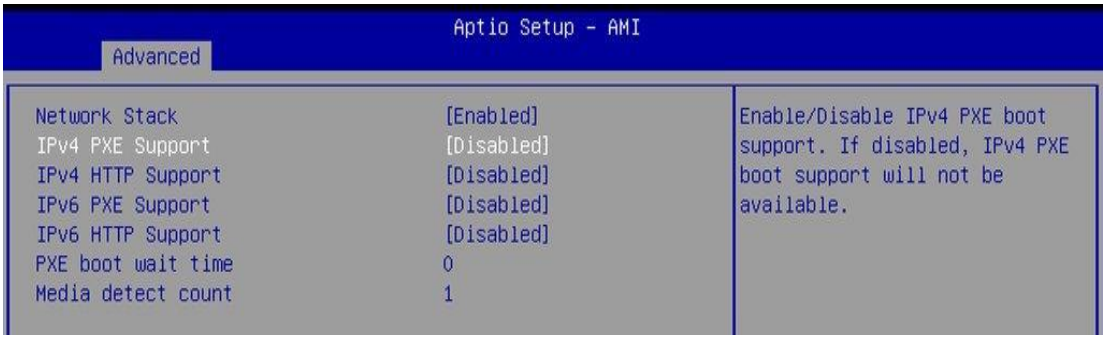
BIOS Setting	Description
CPU Smart Fan Control	Enables / Disables the CPU smart fan feature. Options: Disabled / 50 °C / 60 °C / 70 °C / 80 °C
System Smart Fan Control	Enables / Disables the system smart fan feature. Options: Disabled / 50 °C / 60 °C / 70 °C / 80 °C
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

4.4.9 USB Configuration



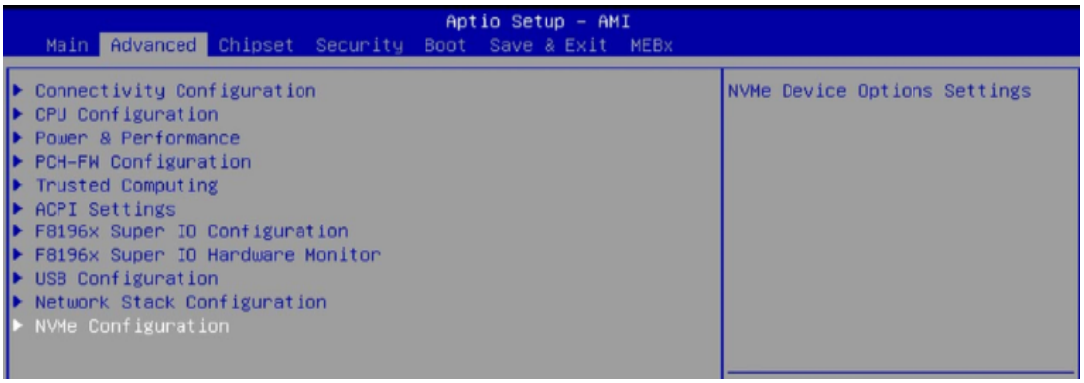
BIOS Setting	Description
Legacy USB Support	• **Enabled** enables Legacy USB support. • **Auto** disables legacy support if there is no USB device connected. • **Disabled** keeps USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
USB Transfer time-out	The time-out value (1 / 5 /10 / 20 secs) for Control, Bulk, and Interrupt transfers.
Device reset time-out	Gives seconds (10 / 20 / 30 / 40 secs) to delay execution of Start Unit command to USB mass storage device.
Device power-up delay	The 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. But for a Hub port, the delay is taken from Hub descriptor.

4.4.10 Network Stack Configuration

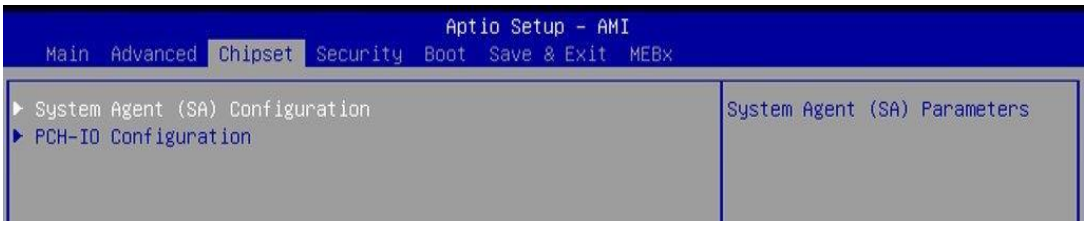


BIOS Setting	Description
Network Stack	Enables / Disables UEFI Network Stack.
IPv4 PXE Support	Enables / Disables IPv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
IPv4 HTTP Support	Enables / Disables IPv4 HTTP Boot Support. If disabled, Ipv4 HTTP boot option will not be created.
IPv6 PXE Support	Enables / Disables IPv6 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
IPv6 HTTP Support	Enables / Disables IPv6 HTTP Boot Support. If disabled, Ipv4 HTTP boot option will not be created.
PXE boot wait time	Assigns a period of time to press ESC key to abort the PXE boot.
Media detect count	Assigns a number of times to check the presence of media.

4.4.11 NVMe Configuration

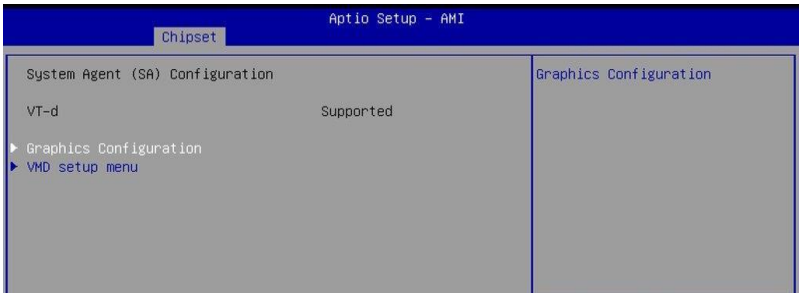


4.5 Chipset Settings



BIOS Setting	Description
System Agent (SA) Configuration	System Agent (SA) parameters
PCH-IO Configuration	PCH parameters

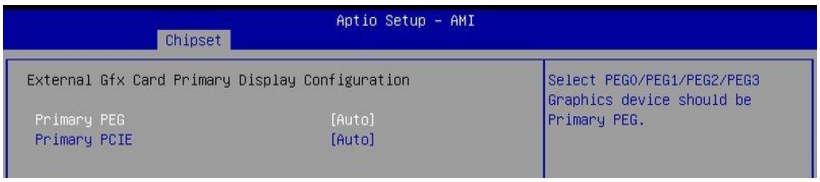
4.5.1 System Agent (SA) Configuration

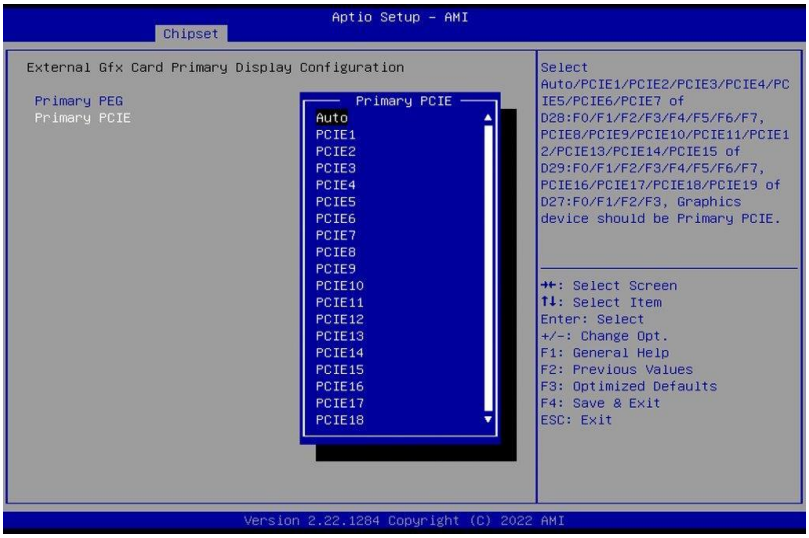


BIOS Setting	Description
Graphics Configuration	Configures the graphics settings.
VMD setup menu	VMD configuration settings.

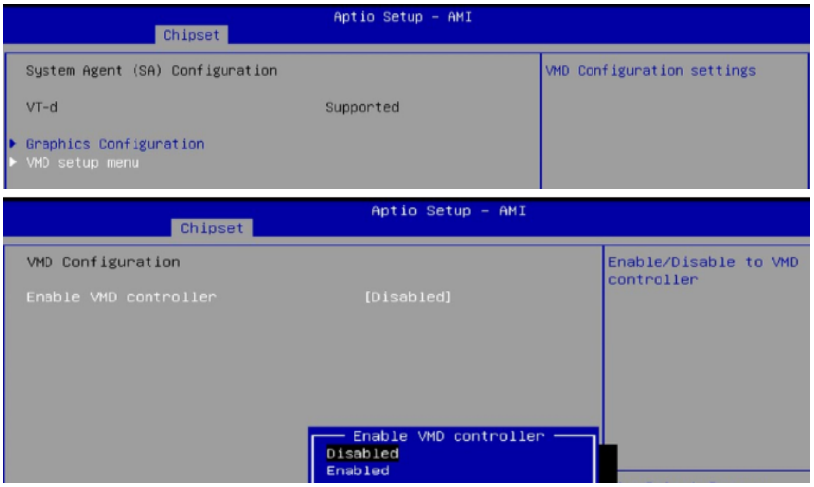
4.5.1.1.Graphics Configuration

BIOS Setting	Description
Primary Display	Select which of IGFX/PEG/PCI Graphics device should be primary display or select HG for Hybrid Gfx. Options: Auto, IGFX, PEG Slot, PCH PCI, HG
External Gfx Card Primary Display Configuration	External Gfx Card Primary Display Configuration
Primary PEG	Select PEG0/PEG1/PEG3 Graphics device should be Primary PEG.
Primary PCIE	Select the graphics device as Primary PCIE.
Internal Graphics	Keep IGFX enabled based on the setup options. Options: Auto, Disabled, Enabled
GTT Size	Sets the GTT size as 2 MB, 4 MB, or 8 MB.
Aperture Size	Sets the aperture size. **Note:** Above 4 GB MMIO BIOS assignment is automatically enabled when selecting 2048 MB aperture. To use this feature, disable CSM support.

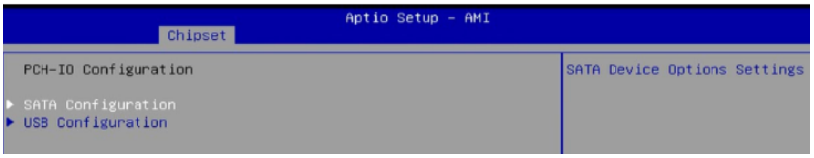




4.5.1.2. VMD Setup Menu

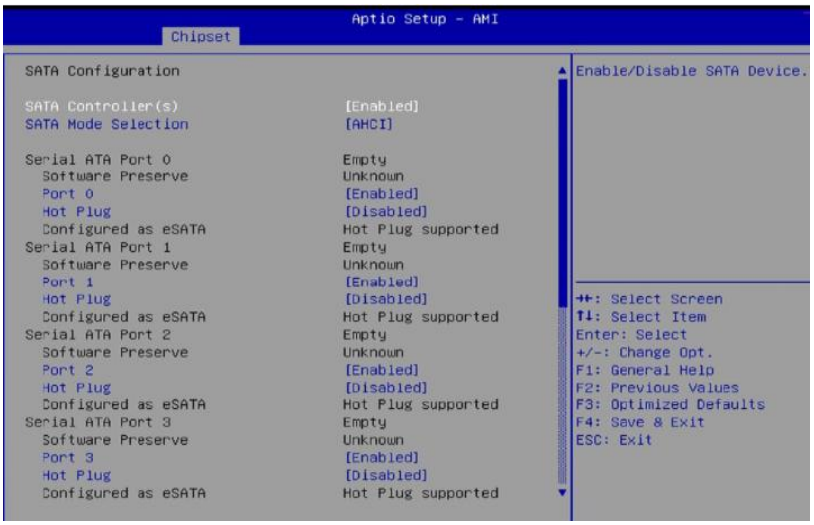


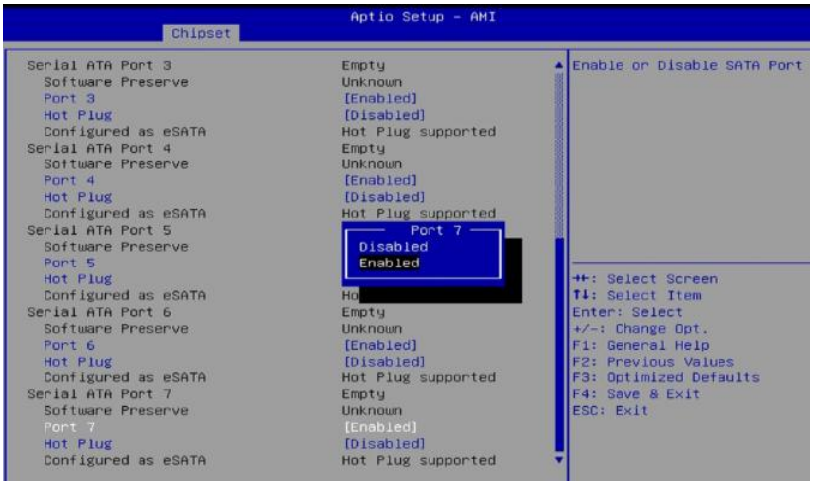
4.5.2 PCH-IO Configuration



BIOS Setting	Description
PCH-IO Configuration	PCH Parameters
SATA Configuration	SATA Devices Options Settings
USB Configuration	USB Configuration Settings

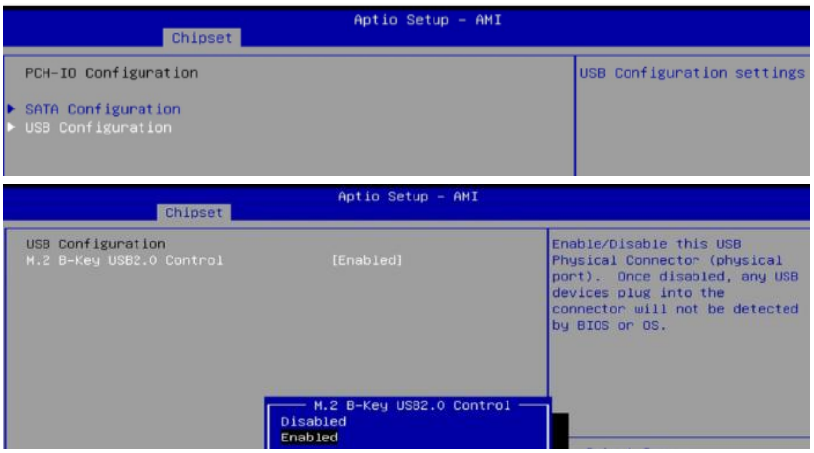
4.5.2.1. SATA Configuration:



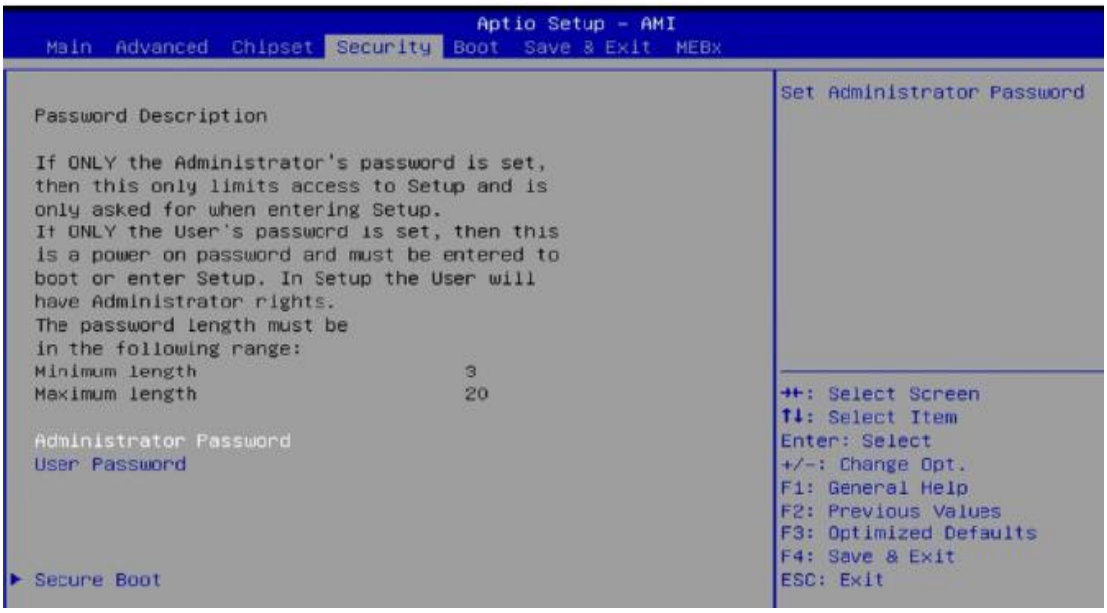


BIOS Setting	Description
SATA Controller(s)	Enables / Disables the SATA device.
SATA Mode Selection	Determines how SATA controller(s) operate.
Serial ATA Ports	Enables / Disables SATA ports.
Hot Plug	Designates the port as Hot Pluggable.

4.5.2.2. USB Configuration:

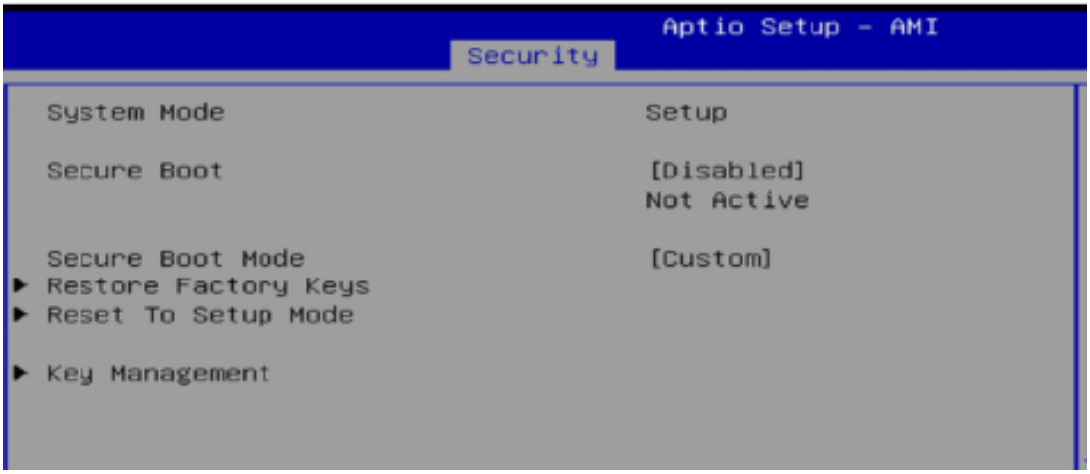


4.6 Security Settings



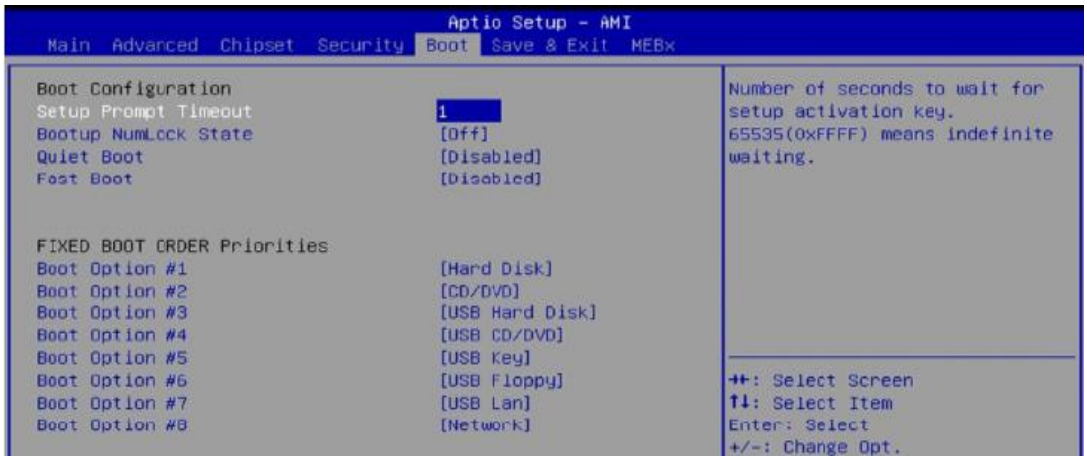
BIOS Setting	Description
Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.
Secure Boot	Configures Secure Boot.

4.6.1 Secure Boot



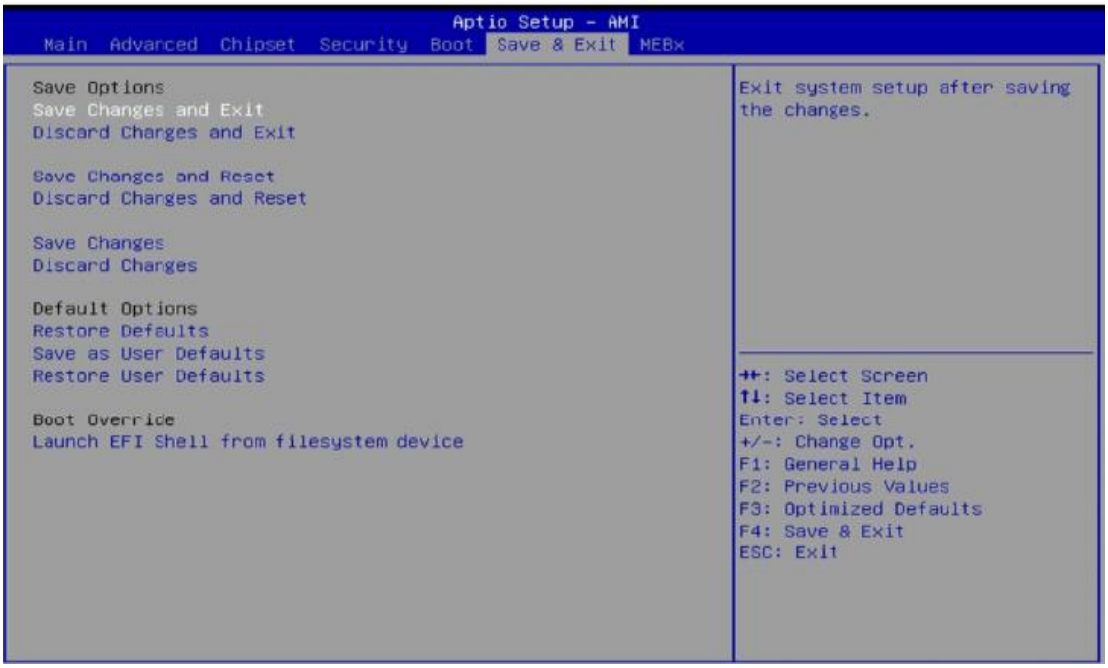
BIOS Setting	Description
Secure Boot	Secure Boot feature is Active if Secure Boot is enabled. Platform Key (PK) Is enrolled and the system is in User mode. The mode change requires platform reset.
Secure Boot Mode	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot policy variables can be configured by a physically present user without full authentication.
Restore Factory Keys	Forces system to user mode. Install factory default Secure Boot key databases.
Key Management	Enables expert users to modify Secure Boot Policy variables without full authentication.

4.7 Boot Settings



BIOS Setting	Description
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
Fast Boot	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Boot Option Priorities	Sets the system boot order.

4.8 Save & Exit Settings



BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
Save Changes	Saves changes done so far to any of the setup options.
Discard Changes	Discards changes done so far to any of the setup options.
Restore Defaults	Restores / Loads defaults values for all the setup options.
Save as User Defaults	Saves the changes done so far as User Defaults.
Restore User Defaults	Restores the user defaults to all the setup options.
Launch EFI Shell from filesystem device	Attempts to launch EFI Shell application (Shell.efi) from one of the available filesystem devices.

4.9 MEBx


Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit MEBx
Configuration locked after EndOfPo
→←: 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

Appendix

This section provides the mapping addresses of peripheral devices and the sample code of watchdog timer configuration.

- I/O Port Address Map
- Interrupt Request Lines (IRQ)
- Watchdog Timer Configuration

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x00003000-0x0000303F	Intel(R) UHD Graphics 770
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
0x0000EFA0-0x0000EFBF	Intel(R) SMBus - 7AA3
0x00003090-0x00003097	Standard SATA AHCI Controller

Address	Device Description
0x00003080-0x00003083	Standard SATA AHCI Controller
0x00003060-0x0000307F	Standard SATA AHCI Controller
0x0000FFF8-0x0000FFFF	Intel(R) Active Management Technology - SOL (COM13)
0x00000000-0x00000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x00002000-0x000020FE	Motherboard resources
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	Communications Port (COM3)
IRQ 7	Communications Port (COM4)
IRQ 12	Microsoft PS/2 Mouse
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INTC1056
IRQ 16	Intel(R) Serial IO UART Host Controller - 7AA8
IRQ 17	High Definition Audio Controller
IRQ 19	Intel(R) Active Management Technology - SOL (COM13)
IRQ 27	Intel(R) Serial IO I2C Host Controller - 7ACC
IRQ 29	Intel(R) Serial IO I2C Host Controller - 7ACE
IRQ 31	Intel(R) Serial IO I2C Host Controller - 7AFC
IRQ 32	Intel(R) Serial IO I2C Host Controller - 7AFD
IRQ 37	Intel(R) Serial IO SPI Host Controller - 7AAB
IRQ 43	Intel(R) Serial IO I2C Host Controller - 7ACF
IRQ 55~IRQ 204	Microsoft ACPI-Compliant System
IRQ 256~IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967239	Intel(R) Management Engine Interface #1
IRQ 4294967240~64	Intel(R) Ethernet Controller I226-LM
IRQ 4294967265~89	Intel(R) Ethernet Controller I226-V
IRQ 4294967290	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
IRQ 4294967291	Intel(R) UHD Graphics 770
IRQ 4294967292	Standard SATA AHCI Controller
IRQ 4294967293	Intel(R) PCI Express Root Port #4 - 7ABB
IRQ 4294967294	Intel(R) PCI Express Root Port #3 - 7ABA

C. Watchdog Timer Configuration

The Watchdog Timer (WDT) is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, you will need to restart the WDT at regular intervals before the timer counts to zero.

Sample Code:

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A
PARTICULAR // PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81964.H"
//---------------------------------------------------------------------------
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//---------------------------------------------------------------------------
int main (int argc, char *argv[])
{
unsigned char bBuf;
unsigned char bTime;
char **endptr;

char SIO;

printf("Fintek 81964 watch dog program\n");
SIO = Init_F81964();
if (SIO == 0)
{
printf("Can not detect Fintek 81964, program abort.\n");
return(1);
}//if (SIO == 0)

if (argc != 2)
{
printf(" Parameter incorrect!!\n");
return (1);
}

bTime = strtol (argv[1], endptr, 10);
printf("System will reset after %d seconds\n", bTime);
```

```
if (bTime)
{       EnableWDT(bTime); }
else
{       DisableWDT();  }
return 0;
}
//-------------------------------------------------------------------------
void EnableWDT(int interval)
{
unsigned char bBuf;

bBuf = Get_F81964_Reg(0x2B);
bBuf &= (~0x20);
Set_F81964_Reg(0x2B,     bBuf);       //Enable WDTO

Set_F81964_LD(0x07);              //switch to logic device 7
Set_F81964_Reg(0x30,     0x01);       //enable timer

bBuf = Get_F81964_Reg(0xF5);
bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81964_Reg(0xF5,     bBuf);       //count mode is second

Set_F81964_Reg(0xF6,     interval);   //set timer

bBuf = Get_F81964_Reg(0xFA);
bBuf |= 0x01;
Set_F81964_Reg(0xFA,     bBuf);       //enable WDTO output

bBuf = Get_F81964_Reg(0xF5);
bBuf |= 0x20;
Set_F81964_Reg(0xF5,     bBuf);       //start counting
}
//-------------------------------------------------------------------------
void DisableWDT(void)
{
unsigned char bBuf;

Set_F81964_LD(0x07);              //switch to logic device 7

bBuf = Get_F81964_Reg(0xFA);
bBuf &= ~0x01;
Set_F81964_Reg(0xFA,     bBuf);       //disable WDTO output

bBuf = Get_F81964_Reg(0xF5);
bBuf &= ~0x20;
bBuf |= 0x40;
Set_F81964_Reg(0xF5,     bBuf);       //disable WDT
}
//-------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A
PARTICULAR PURPOSE.
//
//---------------------------------------------------------------------------
#include "F81964.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81964_BASE;
void Unlock_F81964 (void);
void Lock_F81964 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81964(void)
{
unsigned int result;
unsigned char ucDid;

F81964_BASE = 0x4E;
result = F81964_BASE;

ucDid = Get_F81964_Reg(0x20);
if   (ucDid  ==  0x07)          //Fintek 81964
{      goto      Init_Finish;    }

F81964_BASE = 0x2E;
result = F81964_BASE;

ucDid = Get_F81964_Reg(0x20);
if   (ucDid  ==  0x07)          //Fintek 81964
{      goto      Init_Finish;    }

F81964_BASE = 0x00;
result = F81964_BASE;

Init_Finish:
return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81964 (void)
{
outportb(F81964_INDEX_PORT, F81964_UNLOCK);
outportb(F81964_INDEX_PORT, F81964_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81964 (void)
{
outportb(F81964_INDEX_PORT, F81964_LOCK);
}
//---------------------------------------------------------------------------
void Set_F81964_LD( unsigned char LD)
{
```

```
Unlock_F81964();
outportb(F81964_INDEX_PORT, F81964_REG_LD);
outportb(F81964_DATA_PORT, LD);
Lock_F81964();
}
//----------------------------------------------------------------------
void Set_F81964_Reg( unsigned char REG, unsigned char DATA)
{
Unlock_F81964();
outportb(F81964_INDEX_PORT, REG);
outportb(F81964_DATA_PORT, DATA);
Lock_F81964();
}
//----------------------------------------------------------------------
unsigned char Get_F81964_Reg(unsigned char REG)
{
unsigned char Result;
Unlock_F81964();
outportb(F81964_INDEX_PORT, REG);
Result = inportb(F81964_DATA_PORT);
Lock_F81964();
return Result;
}
//----------------------------------------------------------------------

//----------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A
PARTICULAR PURPOSE.
//
//----------------------------------------------------------------------
#ifndef       F81964_H
#define       F81964_H              1
//----------------------------------------------------------------------
#define     F81964_INDEX_PORT      (F81964_BASE)
#define     F81964_DATA_PORT       (F81964_BASE+1)
//----------------------------------------------------------------------
#define     F81964_REG_LD      0x07
//----------------------------------------------------------------------
#define     F81964_UNLOCK      0x87
#define     F81964_LOCK  0xAA
//----------------------------------------------------------------------
unsigned int Init_F81964(void);
void Set_F81964_LD( unsigned char);
void Set_F81964_Reg( unsigned char,
unsigned char); unsigned char
Get_F81964_Reg( unsigned char);
//----------------------------------------------------------------------
#endif   //     F81964_H
```