USER'S MANUAL

LLM-2U-AM5

2U Edge AI Rackmount Server



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Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2026/7/03

Disclaimer

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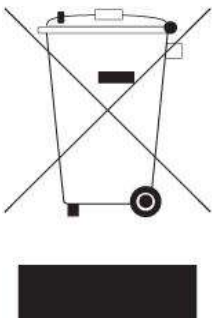
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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.



Safety Precautions

Before installing and using the equipment, please read the following precautions:

- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- The power outlet shall be installed near the equipment and shall be easily accessible.
- Turn off the system power and disconnect the power cord from its source before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge
- of power could ruin sensitive components. Make sure the equipment is properly grounded.
- When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- Avoid the dusty, humidity and temperature extremes.
- Do not place heavy objects on the equipment.
- If the equipment is not used for long time, disconnect it from the power to avoid being damaged by transient over-voltage.
- The storage temperature shall be above -20°C and below 80°C.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- If one of the following situation arises, get the equipment checked be service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well or it cannot work according the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.

Technical Support and Assistance

1. Visit the Premio Inc website at www.premioinc.com where you can find the latest information about the product.
2. Contact your distributor, our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:
   - Model name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Conventions Used in this Manual



WARNING This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.



CAUTION This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.



NOTE This indication provides additional information to complete a task easily.

Package Contents

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	LLM-2U-AM5 Edge AI Rackmount Server	1
2	FAN Coole	1
3	US Power Cord	1
4	20" Rail kit	1

Ordering Information

Model No.	Product Description
LLM-2U-AM5	2U Edge AI Rackmount Server with AMD Ryzen™ 9000/7000 Processors & EPYC 4004/4005, B650 Chipset

Optional Accessories

Model No.	Product Description
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00003	Power Cord, Japanese Type, 180cm
1-TPCD00005	Power Cord, 3-pin US Type, 180cm
1-TPCD00025	Power Cord, 3-pin AU Type, 180cm

Chapter 1

Product Introduction

1.1 Overview

Run Generative AI locally with the LLM Series — edge AI server designed for real-time large language model (LLM) inference. Powered by advanced GPUs, it supports models up to 40 billion parameters for low-latency, secure, and on-premise AI processing without cloud dependency. Deploy in industrial sites, field locations, or enterprise data centers to bring AI closer to your data.

LLM-2U-AM5



Key Features

- Support AMD Ryzen™ 9000 Series Desktop Processors & EPYC 4005/4004 (Max 170W)
- AMD B650 Chipset
- 4x DDR5 UDIMM, up to 5200 MT/s, Max. 192GB (Non-ECC)
- 2x Broadcom 10GbE LAN (SFP+), 2x GbE LAN
- Dual Display: 1x DP, 1x HDMI
- 2x PCIe x16 Gen 4, 1x PCIe x1
- 2x M.2 M-Key, 1x M.2 E-Key
- 2x 2.5" SATA SSD Drive Bays (Support RAID 0/1/5/10)
- 6x USB 3.2 Gen 2 (Rear), 2x USB 3.2 (Front)
- Optional Out-of-Band Management
- 850W Single Power Supply
- Support TPM 2.0
- UL 62368 Ed. 4, CE, FCC

1.2 Hardware Specification

System	
Support AMD Ryzen™ 9000 Series Desktop Processors & EPYC 4005/ 4004 (Max 170W TDP) Standard: • AMD EPYC™ 4565P Project Based: • AMD Ryzen™ 9 9950X • AMD EPYC™ 4564P	
System Chipset	AMD B650
LAN Chipset	GbE 1 & GbE 2: Intel I210AT LAN (Support Wake-on-LAN and PXE) 10GbE 3 & 10GbE 4: Broadcom BCM57412 LAN (Support PXE)
Audio Codec	Realtek ALC897-VA2-CG
System Memory	4x DDR5 5200 UDIMM, Max. up to 192GB (Non-ECC) • Up to 5600 MT/s (1DPC), 3600 MT/s (2DPC)
BIOS	AMI UEFI 256MB SPI Flash
Graphics	AMD Radeon Graphics
Watchdog	Software Programmable Supports 1~255 sec. System Reset
TPM	TPM 2.0

Display	
DisplayPort	1x DisplayPort 1.4a Max Resolution: 3840x2160 @60Hz
HDMI	1x HDMI 2.0 Max Resolution: 3840x2160 @60Hz
Multiple Display	2x Independent Displays

Storage	
M.2 M-Key	2x M.2 M-Key (2280, PCIe x4) Support NVMe Storage
SSD/HDD	4x 2.5" SATA SSD (7mm) or 2x 2.5" SATA SSD (15mm) SATA RAID 0/1/5/10 support

Expansion	
M.2 E-Key	1x M.2 E-Key Type: 2230 (Support PCIe x1 + USB 2.0)
PCIe	PCIe Slot from Left to right: Slot #1: PCIe x16 Physical Slot (Gen4, x16-lane or x8-lane) Slot #2: PCIe x16 Physical Slot (Gen4, x8-lane or No Signal) Slot #3: PCIe x16 Physical Slot (Gen3, x1-lane)
Card Dimension	N/A

*All specifications and photos are subject to change without notice.

I/O	
Audio	Line-out/Mic-in
LAN	2x GbE RJ45 2x Broadcom 10GbE SFP+
OOB	1x RJ45 (Optional)
USB	6x USB 3.2 Gen2 (10 Gbps, Rear) 2x USB 3.2 Gen1 (Front)
Others	1x Power Switch with Blue LED 1x Recovery Button 1x Reset Button 1x CMOS Battery 1x Buzzer

Internal I/O	
USB	4x USB 2.0

Operating System	
Windows	Windows 11 24H2 LTSC (64-Bit)
Linux	Linux Kernel 5.x Ubuntu 24.04 LTS

Power	
Power Mode	AT, ATX (Default ATX)
Power Supply	1x 850W Single Power Supply AC: 115 to 230 V
Power Connector	IEC 60320 C14

System Cooling	
Fan	4x System Fan 1x CPU Fan 1x PSU Fan

Environment	
Operating Temp.	0°C to 40°C with 0.6 m/s airflow
Storage Temp.	-20°C to 80°C
Relative Humidity	10% to 95% (non-condensing)
Certification	UL 62368 Ed. 4, CE, FCC
Vibration	With SSD: 1 Grms (5 - 500 Hz, 0.5 hr/axis)
Shock	With SSD: 0.21G half-sin 11ms

Physical	
Form Factor	2U
Construction	Heavy Duty Metal
Dimension	438 (W) x 361 (D) x 87 (H) mm
Mounting	Rackmount

*All specifications and photos are subject to change without notice.

1.3 System I/O

USB 3.2 Gen 2 port (10 Gbps)
Used to connect USB 3.2 device

USB 3.2 Gen 1 port (5 Gbps)
Used to connect USB 3.2 device

DisplayPort
Used to connect a DisplayPort monitor

HDMI port
Used to connect a HDMI monitor or connect optional split cable for dual display mode

RJ45 OOB port (Optional)
The OOB can be connected through RJ45 port

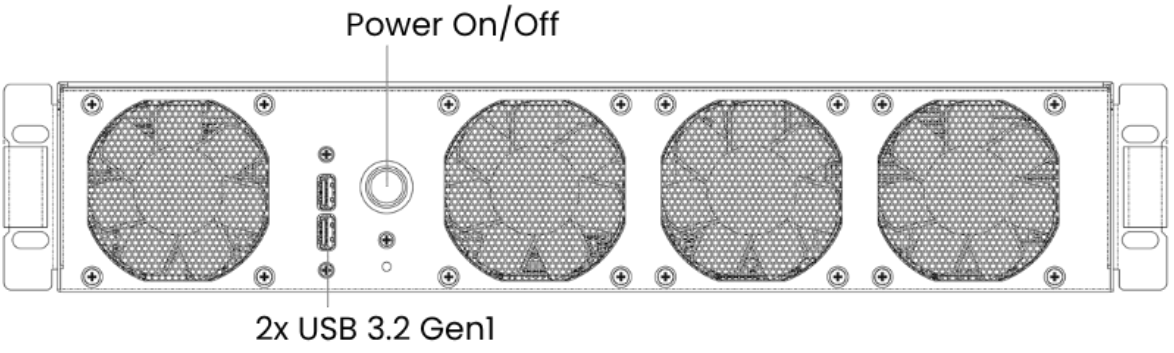
RJ45 LAN port
Used to connect the system to a local area network

Line-out/Mic-in
Used to connect a speaker / Used to connect a microphone

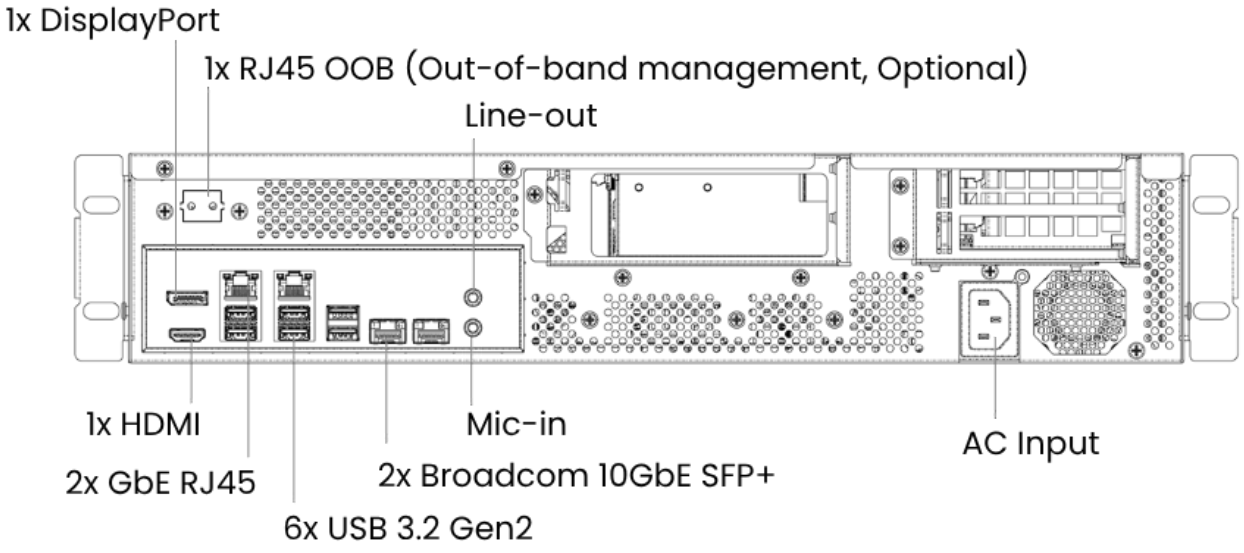
AC Input
Used to plug a AC power input with terminal block

Power on/off switch
Press to power-on or power-off the system

Front

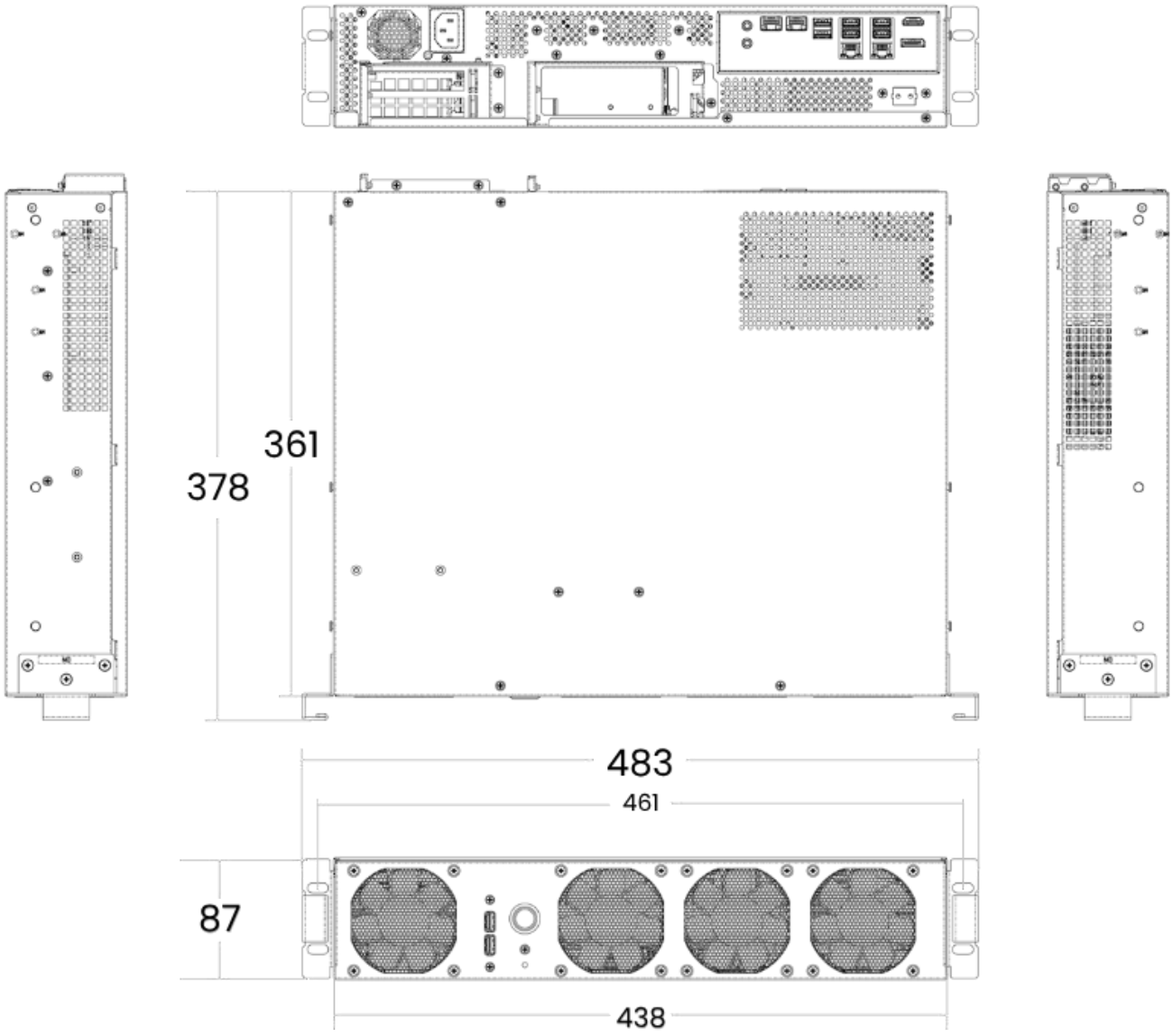


Rear



1.4 Mechanical Dimensions

Unit: mm

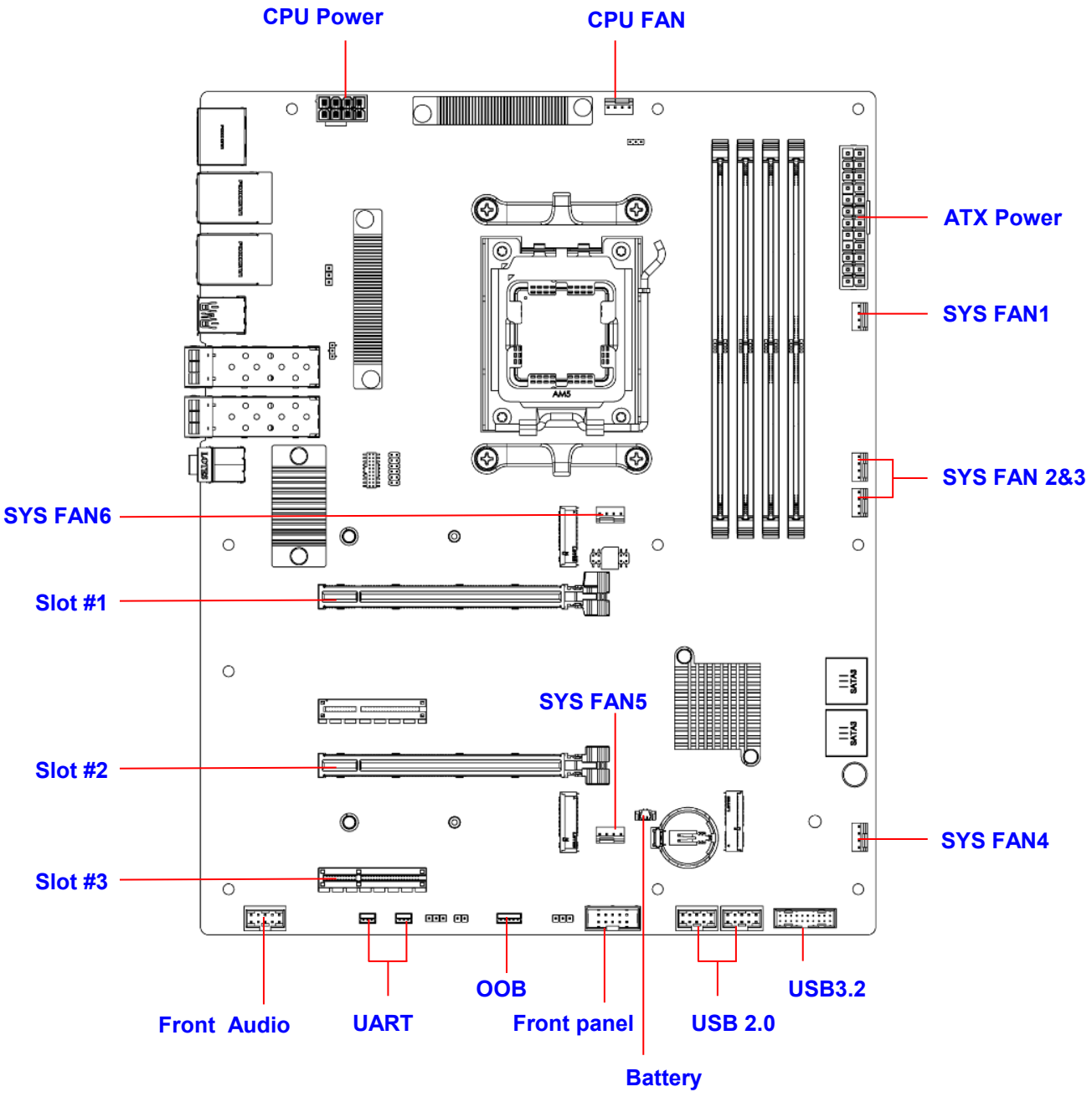


Chapter 2

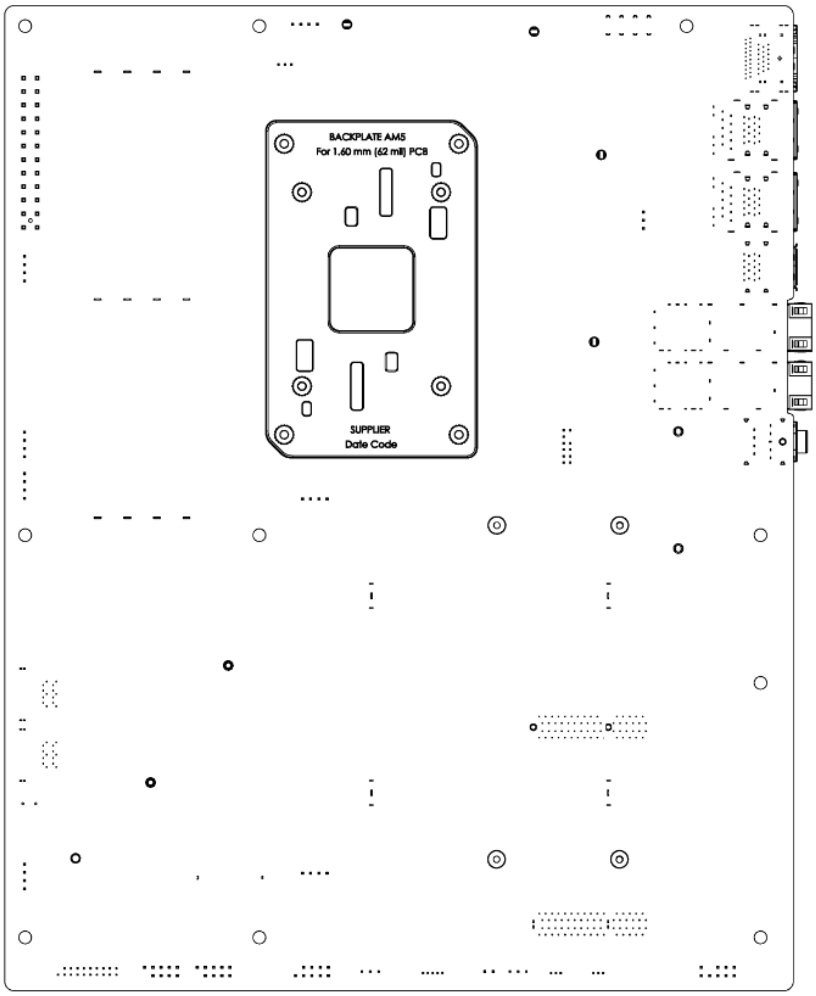
Mechanical Specifications

2.1 Switch and Connector Locations

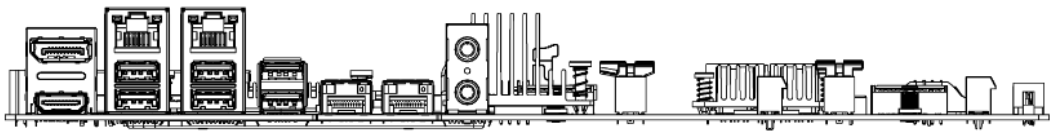
2.1.1 Top View



2.1.2 Bottom View



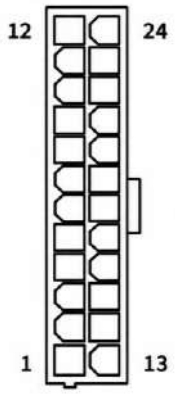
2.1.3 Rear I/O



2.2 I/O Interface Descriptions

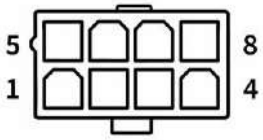
2.2.1 ATX Power

JPWR1



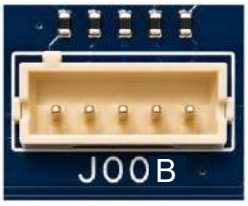
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWR OK	20	Res
9	SVSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

2.2.2 CPU Power

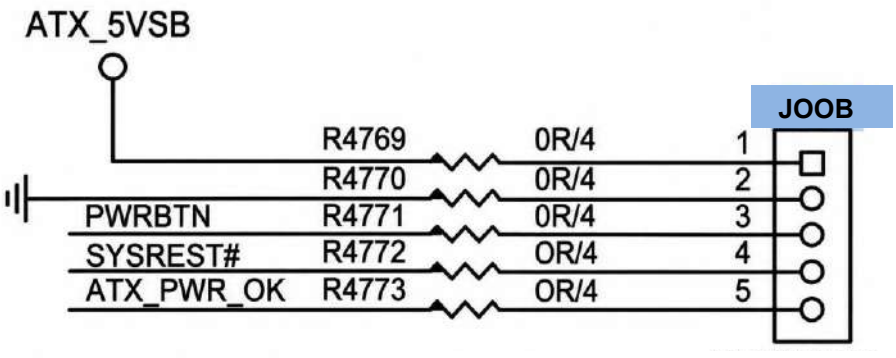


1	GND	5	P12V
2	GND	6	P12V
3	GND	7	P12V
4	GND	8	P12V

2.2.3 OOB

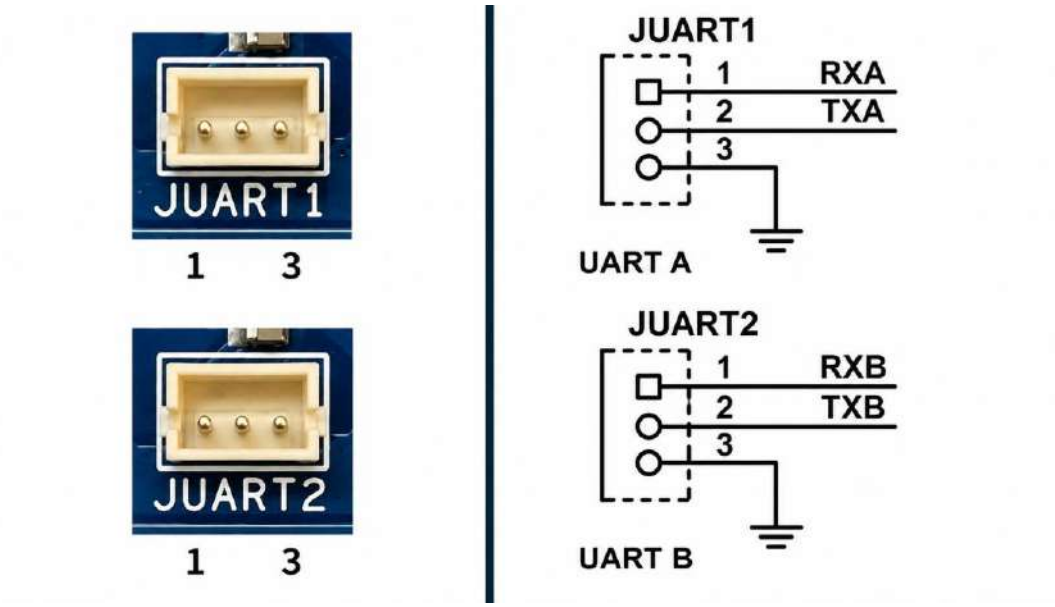


1 5

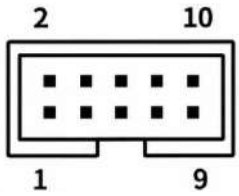


BH1X5-1.25PITCH-1.70MM_WHITE-RH

2.2.4 UART

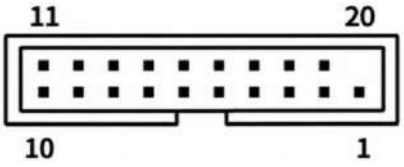


2.2.5 USB 2.0



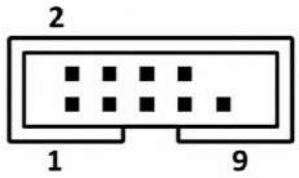
1	5V	2	5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND
9	NO Pin	10	NC

2.2.6 USB 3.2



1	5V	11	USB_D+
2	USB 3.2 RX-	12	USB_D-
3	USB 3.2 RX+	13	GND
4	GND	14	USB3_ESD_DN8
5	USB 3.2 TX-	15	USB 3.2 TX-
6	USB 3.2 TX+	16	GND
7	GND	17	USB 3.2 RX+
8	USB_D-	18	USB 3.2 RX-
9	USB_D+	19	5V
10	USB_VCC2	20	No Pin

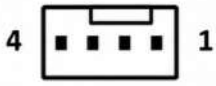
2.2.7 Front panel



1	HDD LED+	2	POWER LED
3	HDD LED-	4	POWER LED
5	RESET SWITCH-	6	RESET SWITCH+
7	RESET SWITCH+	8	RESET SWITCH-
9	NC	10	No pin

2.2.8 CPUFAN/SYSFAN1~6

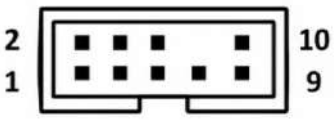
CAUFAN1
SYSFAN1~6



1	GND	2	FAN POWER
3	FAN SENSE	4	FAN_PWM

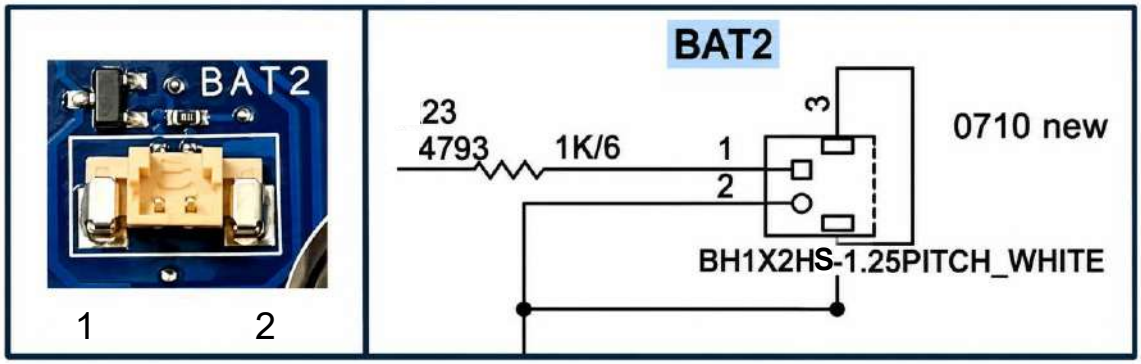
2.2.9 Front Audio

JAUD1



1	MIC_L	2	GND
3	MIC_R	4	NC
5	LINE_OUT_R	6	MIC_JD
7	HP_ON	8	No pin
9	LINE_OUT_L	10	LINE_OUT_JD

2.2.10 Battery



Chapter 3

System Setup

3.1 Set torque force to 3.5 kgf-cm to execute all the screwing and unscrewing.

3.2 Remove the chassis cover



WARNING

In order to prevent electric shock or system damage, before removing the chassis cover, must turn off power and disconnect the unit from power source.

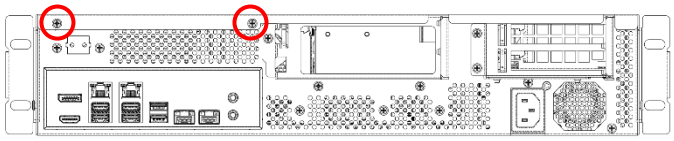


CAUTION

External metal parts close to GPU are hot!! Before touching it, special attention or protection is necessary

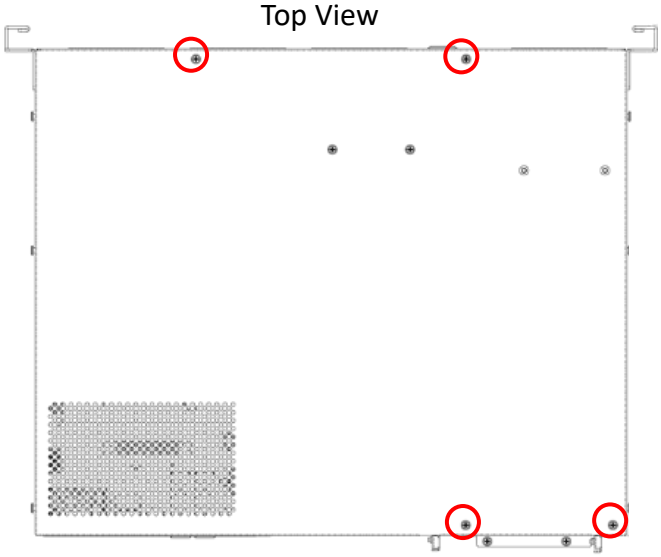
1. Unscrew the screws from the back and top of the top cover.

Back View



Unscrew the two screws from the back of the top cover.

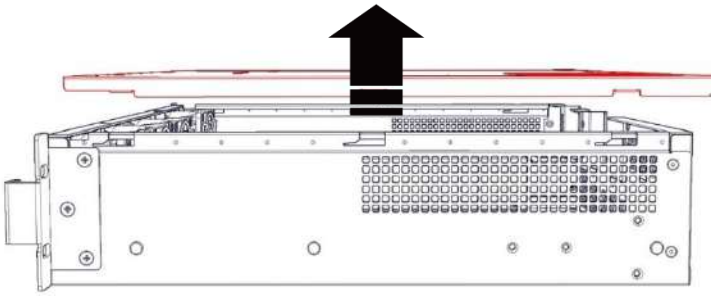
Top View



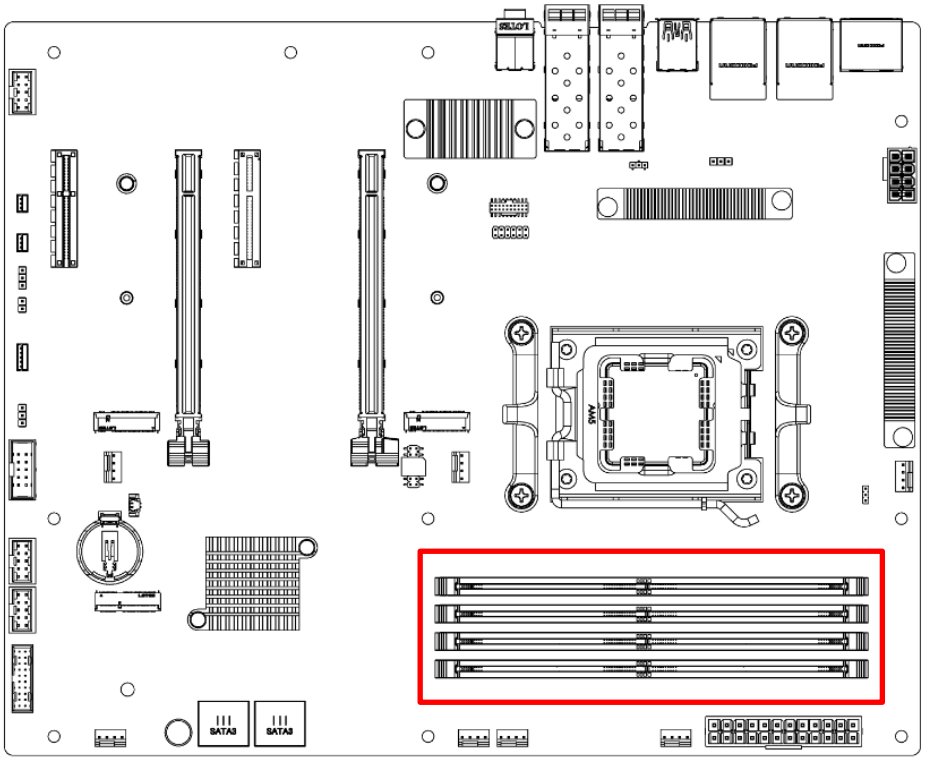
Unscrew the four screws from the top of the top cover.

2. Now you can remove the chassis cover.

Remove the top cover.

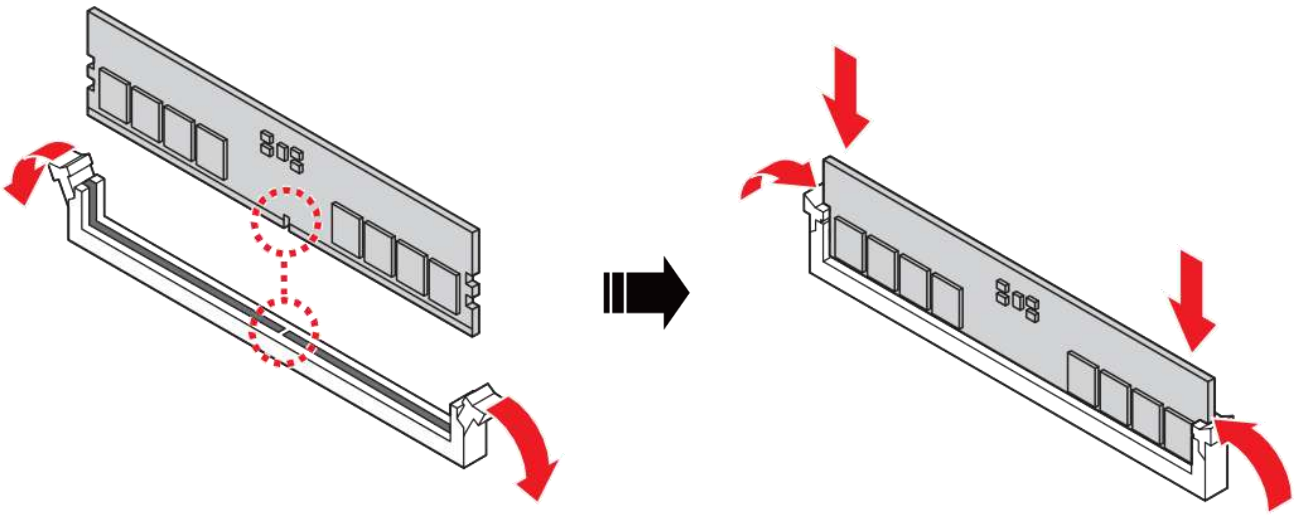


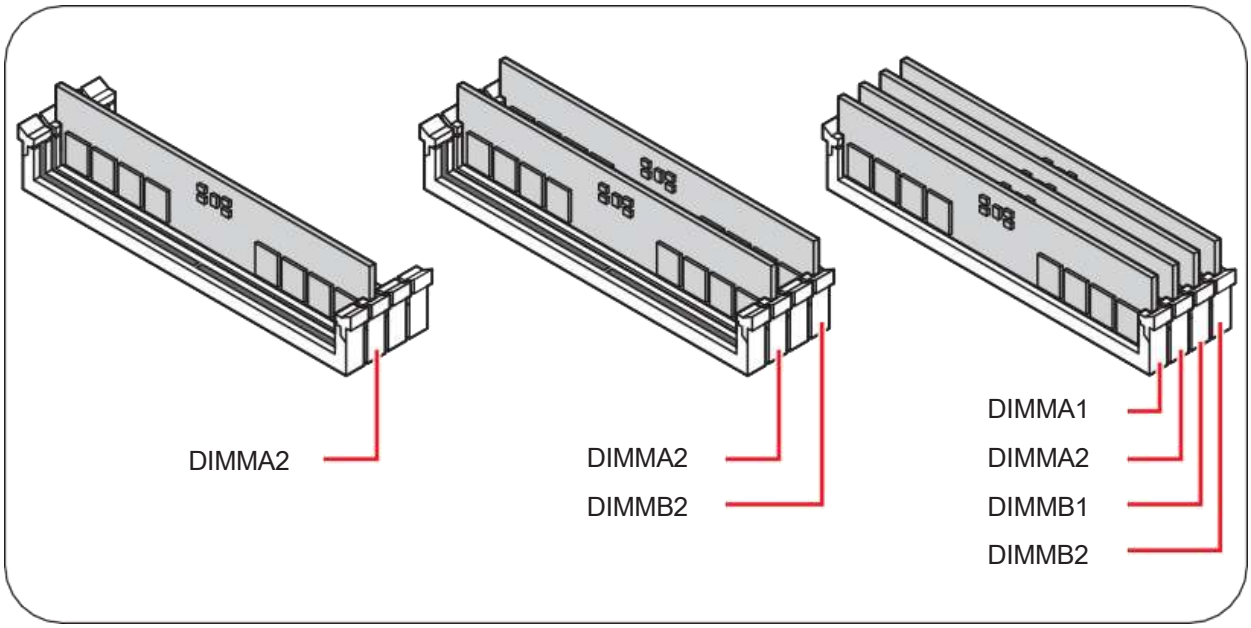
3.3 Installing DDR5 Memory



The SO-DIMM slots are intended for memory modules.

1. Open the side clips to unlock the DIMM slot.
2. Insert the DIMM vertically into the slot, ensuring that the off-center notch at the bottom aligns with the slot.
3. Push the DIMM firmly into the slot until it clicks and the side clips automatically close.a
4. Verify that the side clips have securely locked the DIMM in place.



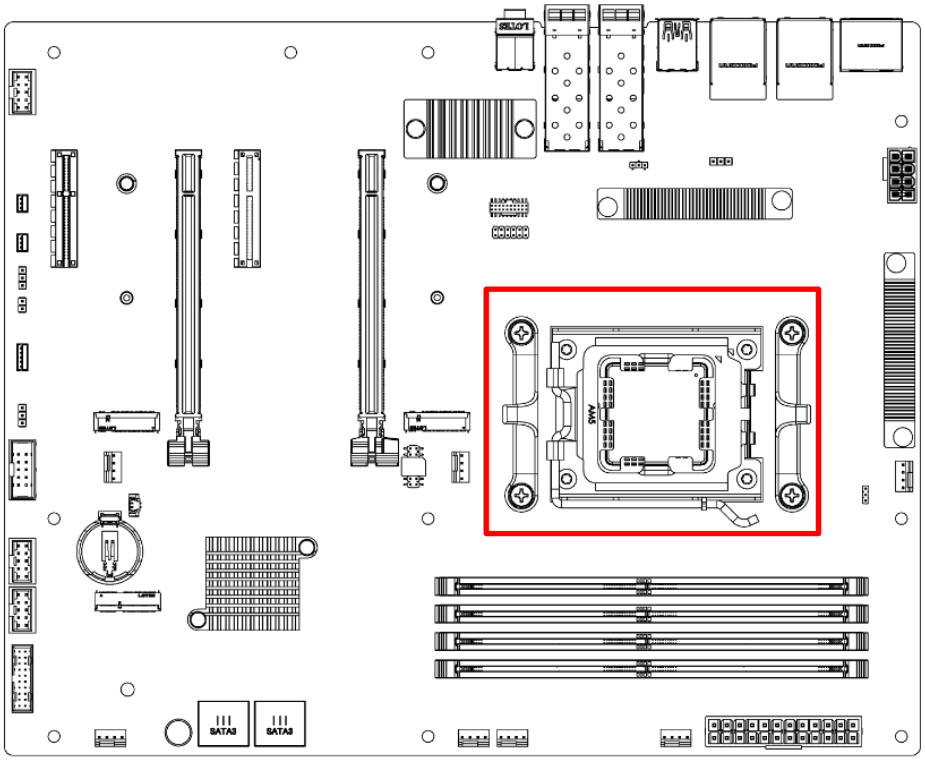


⚠ Important

- Always insert memory modules in the DIMM2 slot first.
- You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.
- To ensure system stability for Dual channel mode, memory modules must be of the same type, number and density.

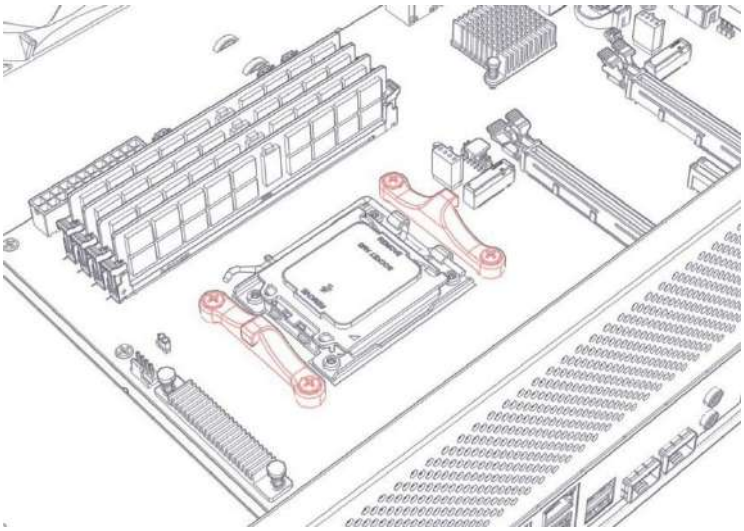
3.4 Installing CPU

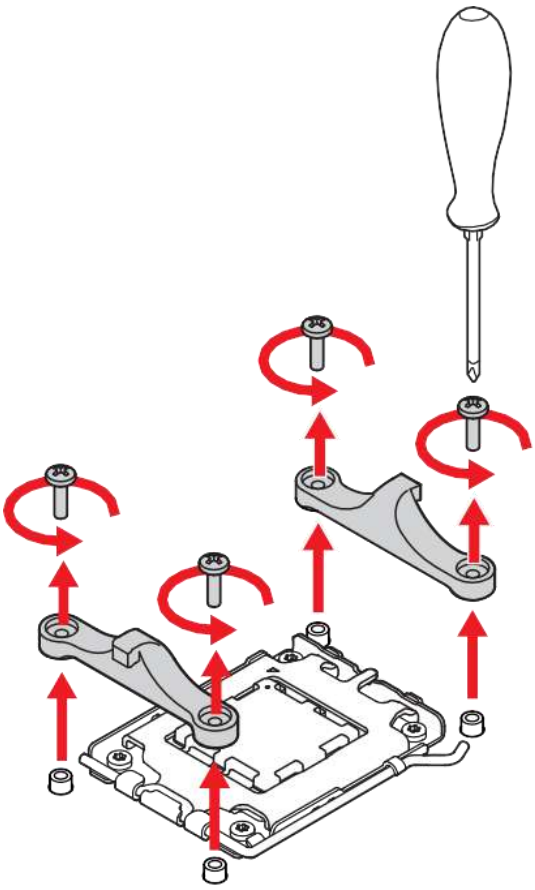
CPU socket is located at the top side, as highlighted below.



Remove Heatsink mounting bracket

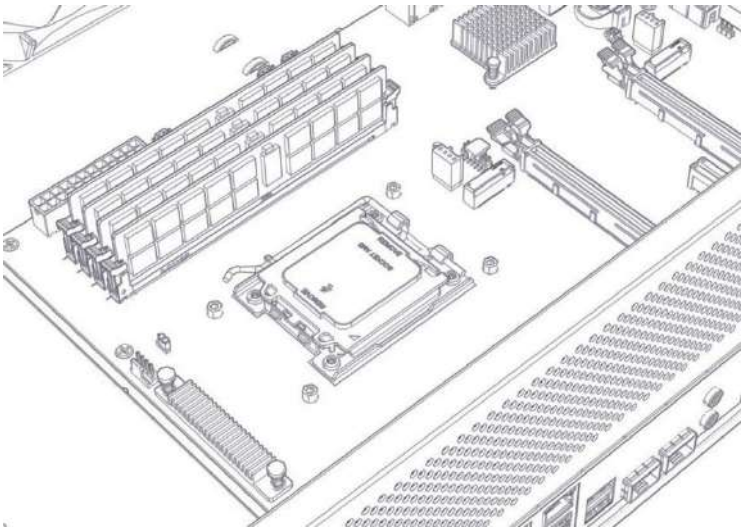
1. Inspect the Heatsink mounting bracket





2. Remove the four CPU heatsink brackets

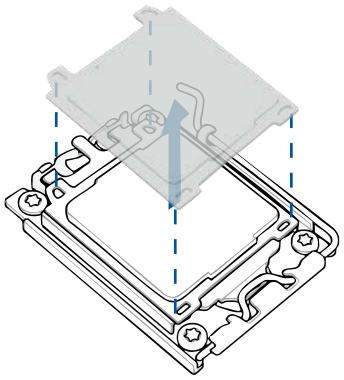
3. Removal of the fixing frame is complete.



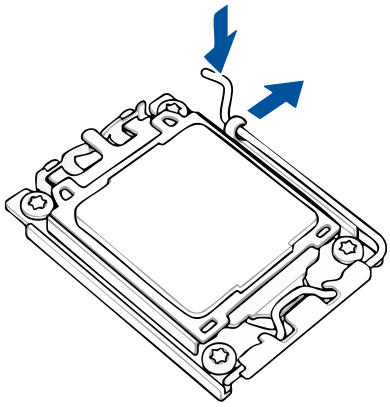
Installing CPU

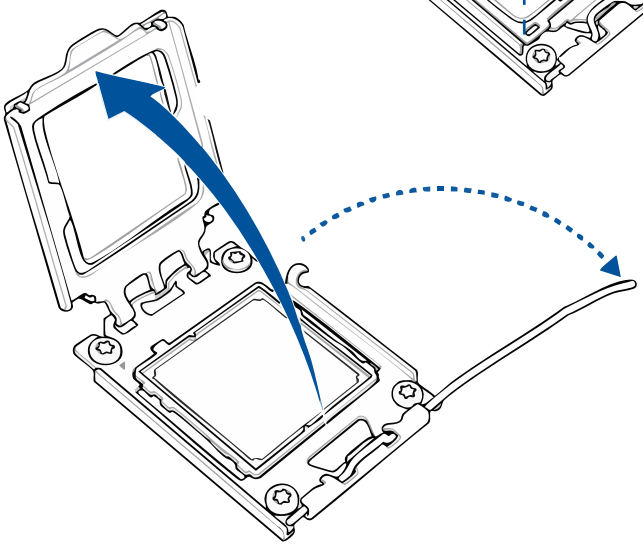
⚠ WARNING: To prevent damage to the CPU, try to avoid touching the chip during installation.

1. Remove the CPU protective cover.



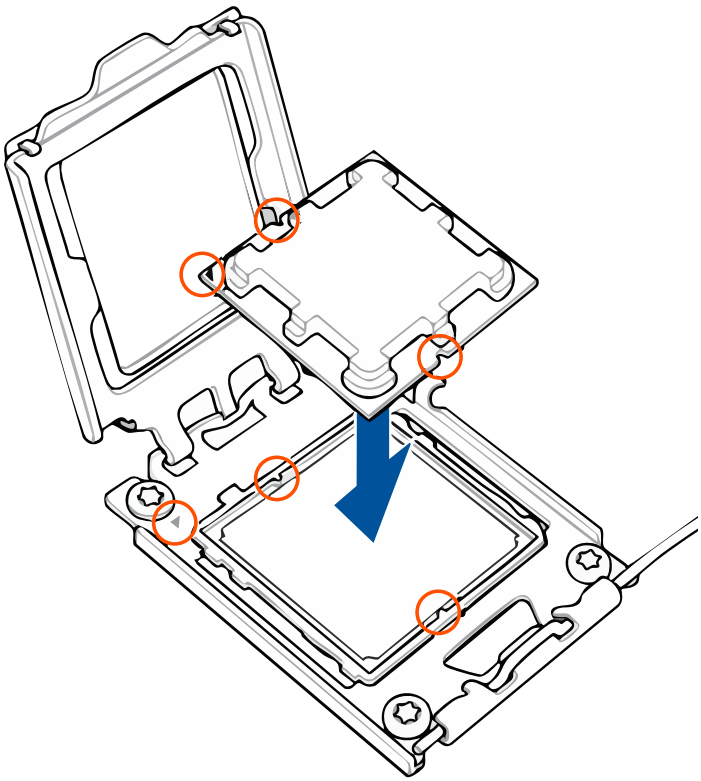
2. Open socket.



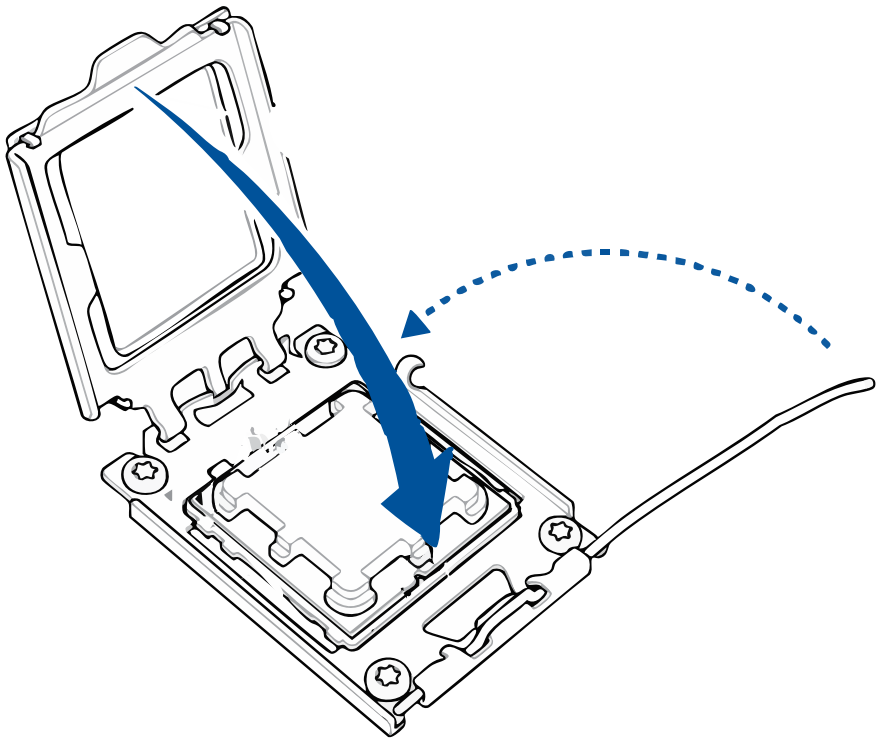


- Press down on the lever in order to release the socket, as shown above.
- Pull the lever open and lift up.

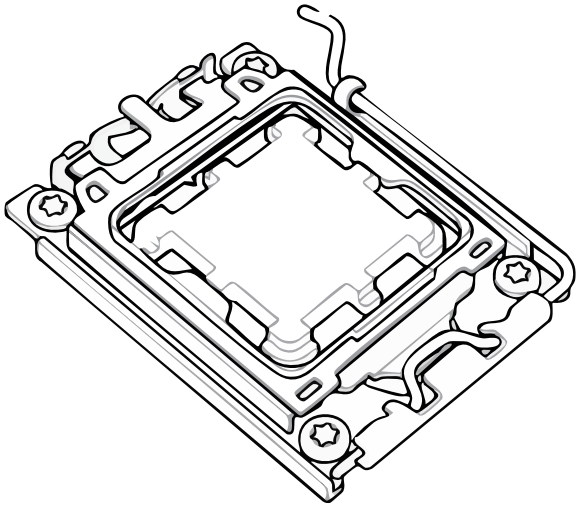
3. Hold the CPU by its edges, and carefully align the notches on the CPU with the notches onthe socket indicated by the circles in the pictures right. Gently lower the CPU into the socket without applying force.



4. Once the CPU has been placed, press down on the lever again to secure the socket. The outcome should look like the photo below.

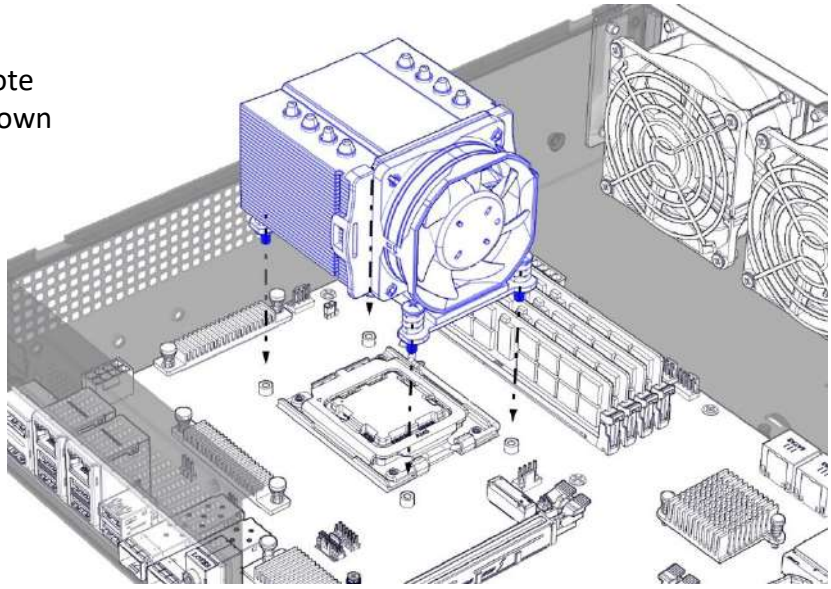


5. Installation Complete

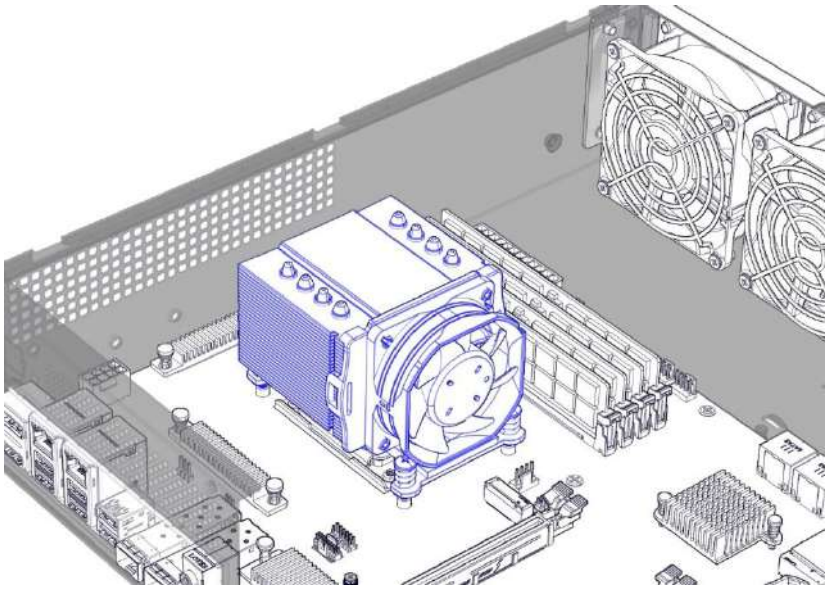


Install the heatsink (or cooler) on top of the CPU.

1. Prepare a set of Dynatron A47 Heatsink units for installation (note the installation orientation as shown in the diagram).

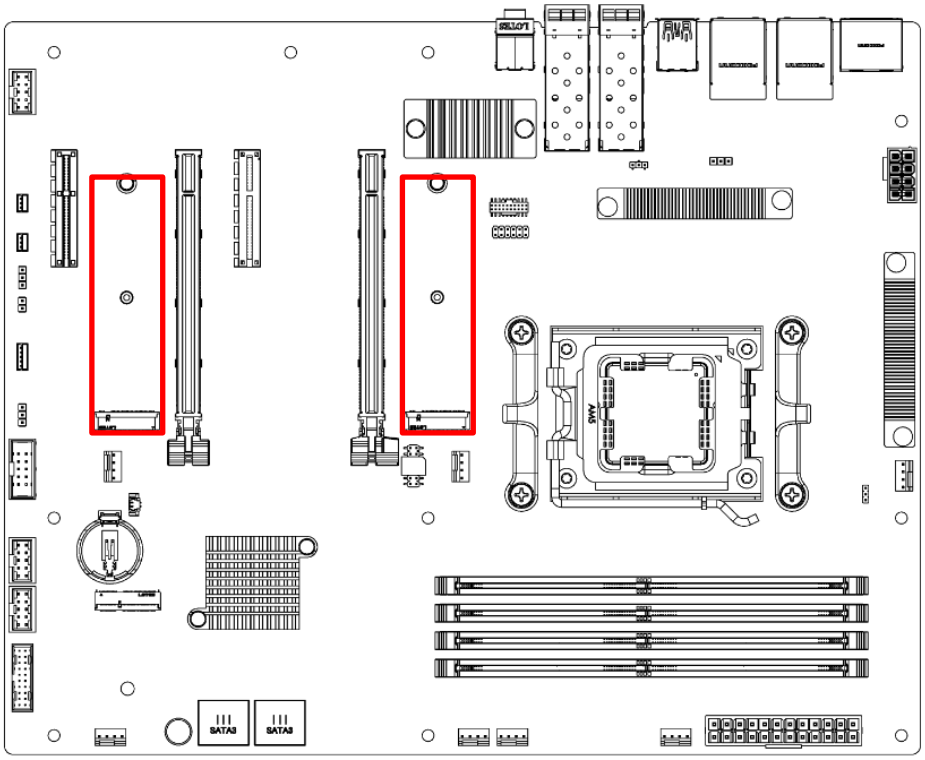


2. Tighten the four fixing screws diagonally evenly.

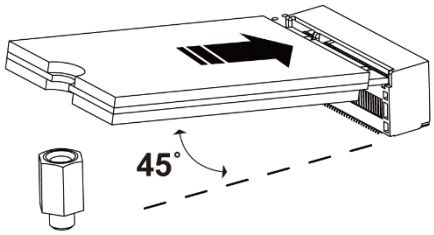


3.5 Installing M.2 SSD

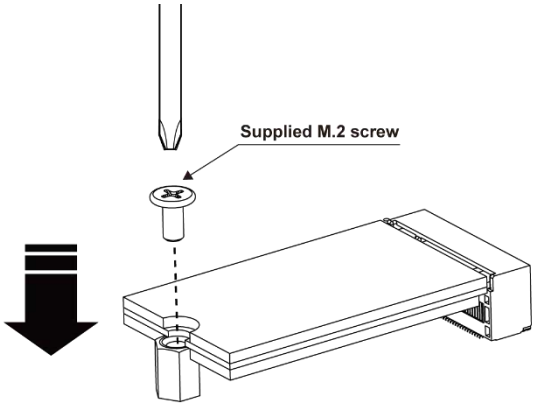
M.2 SSD socket is located at the top side, as highlighted below.



1. Insert the NVMe SSD at a 45-degree angle into the M.2 B-Key slot.

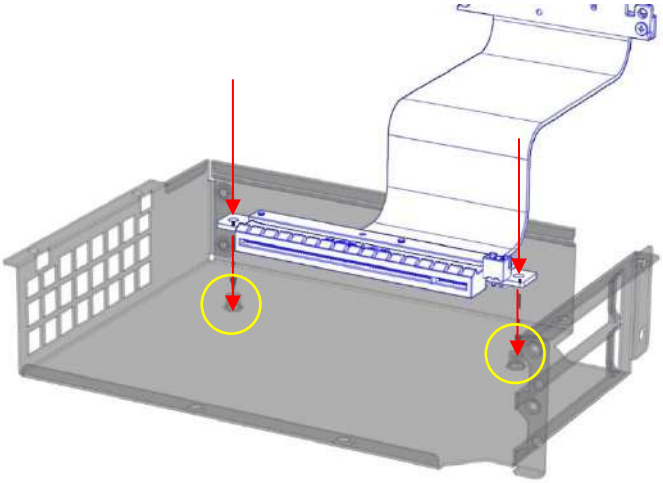


2. Press the NVMe SSD down and secure it with one screw.



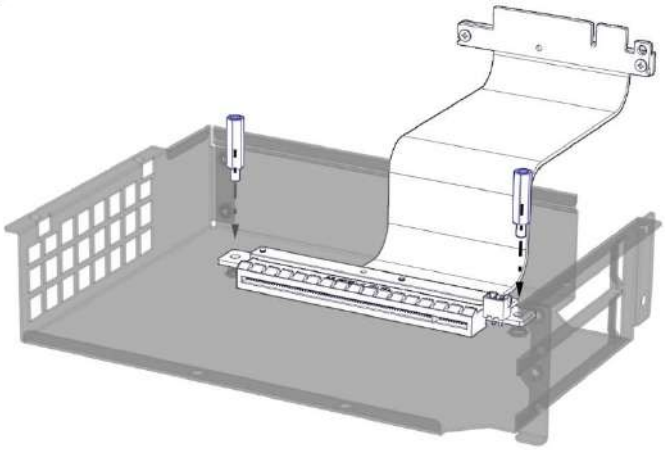
3.6 Installing Cage

3.6.1 Installing PCIe Cage

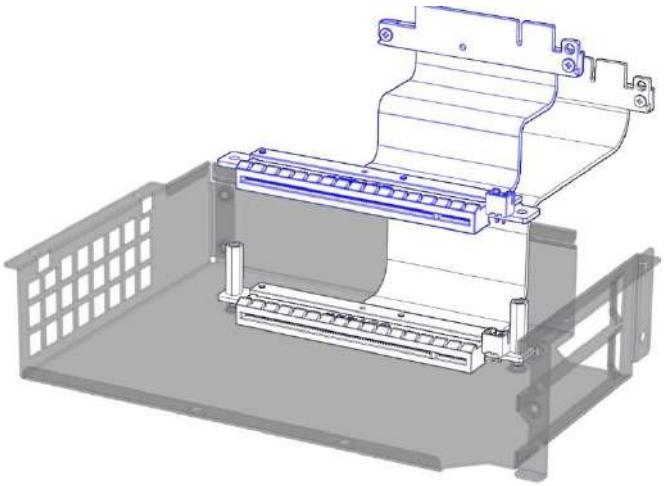


1. Prepare PCI Express Riser Cable

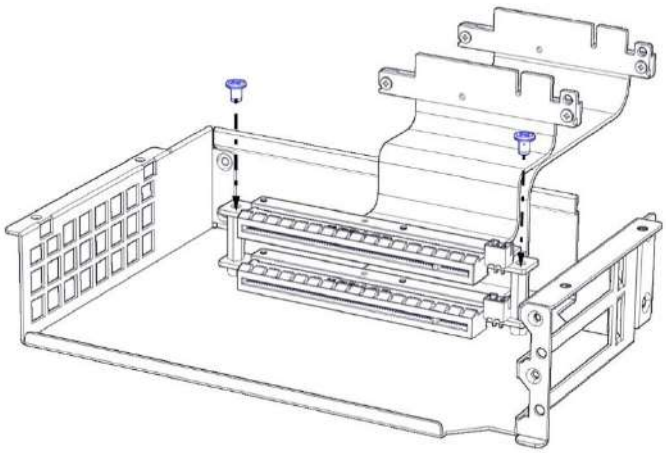
   *Mounting holes for PCIe slot



2. Secure the PCIe slot using two standoffs.

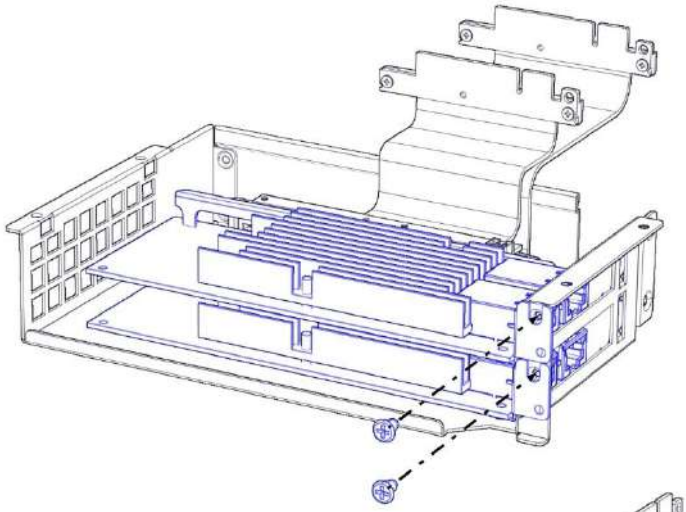


3. Install the Second PCIe Riser cable



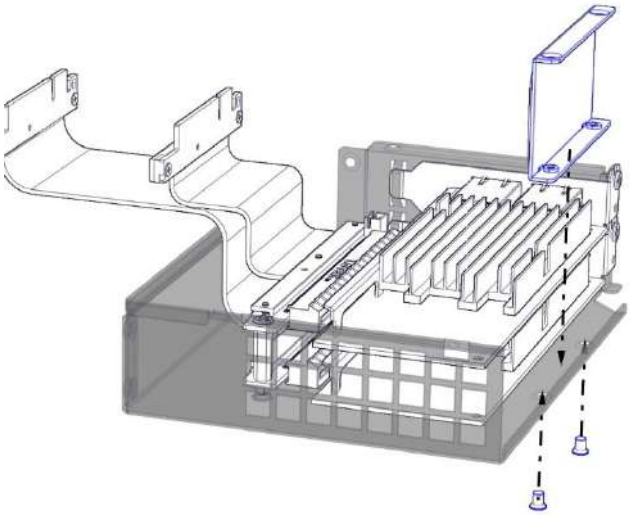
4. Tighten the two screws.

3.6.2 Install the network communication cards.



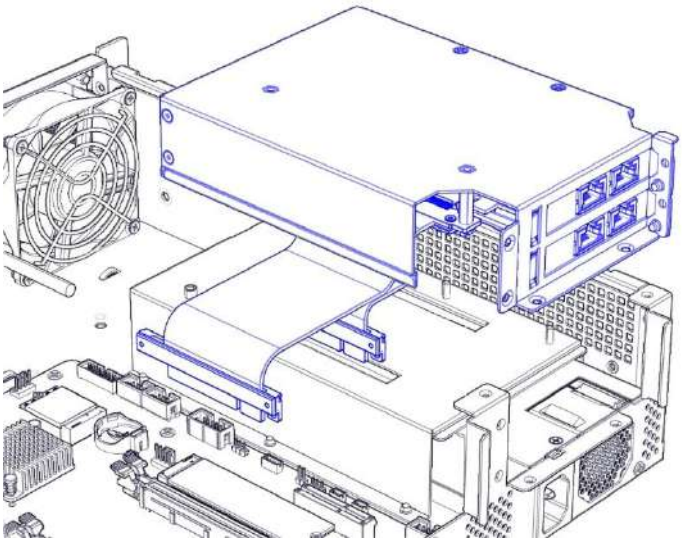
1. Install the upper and lower network communication cards.

   *Fasten the card-securing screw.

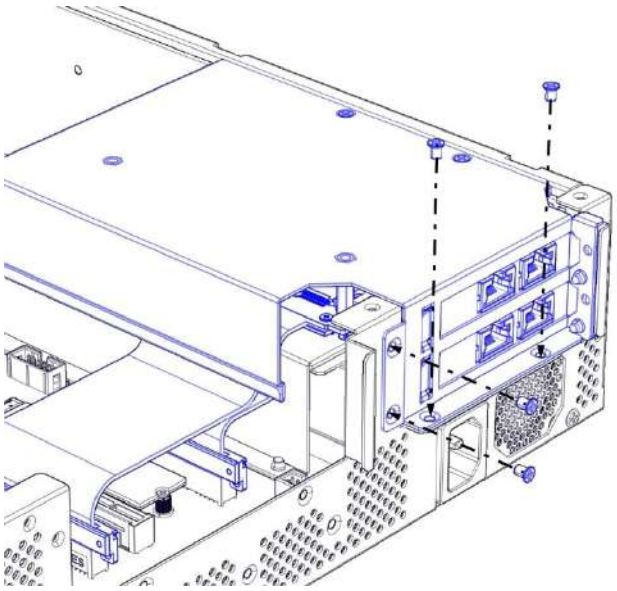


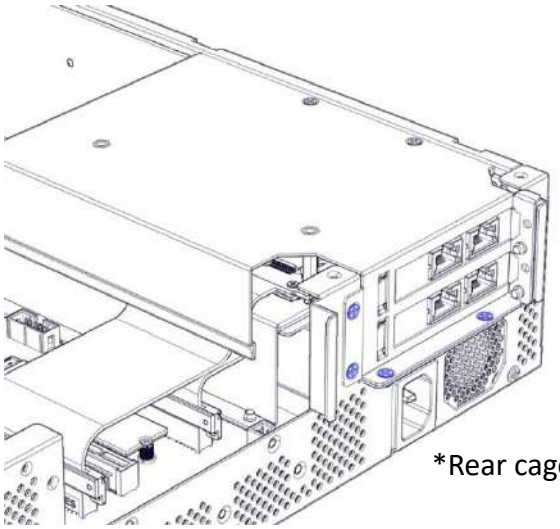
2. Install the matching mounting bracket.

3. Insert the PCIe riser golden fingers into the motherboard.
   (Default: Bottom Side card -> Slot 3 PCIe x4; Top Side card -> PCIe x16, or PCIe x4 for Intel Ethernet card.)



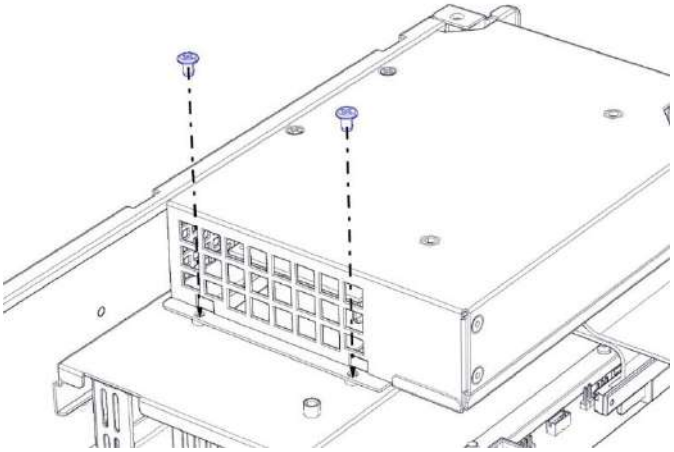
4. Check that the cage is properly seated in the chassis, and secure the PCIe cage using four screws.



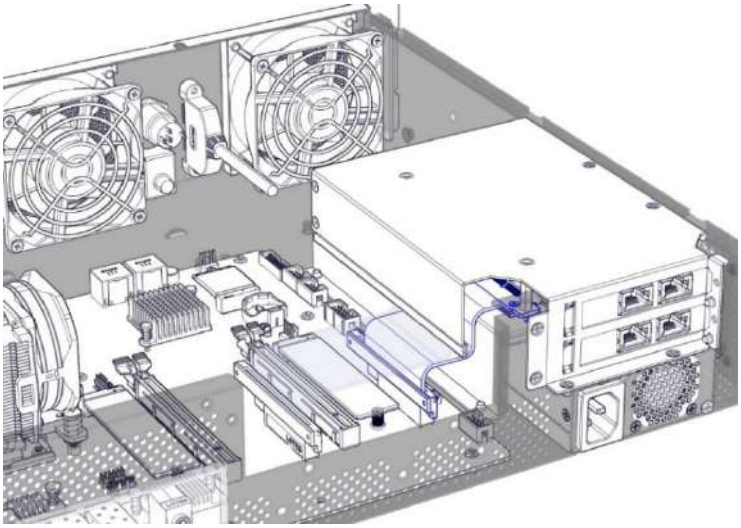


*Rear cage installation completed.

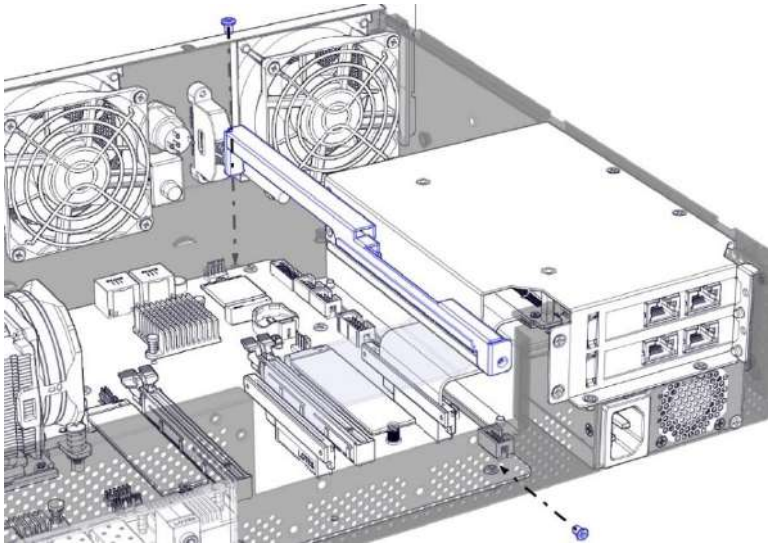
5. Check if the front screw hole positions align, and tighten the two screws.



6. Insert the golden fingers of the bottom-side riser cable into the Slot 3 PCIe x16 connector.

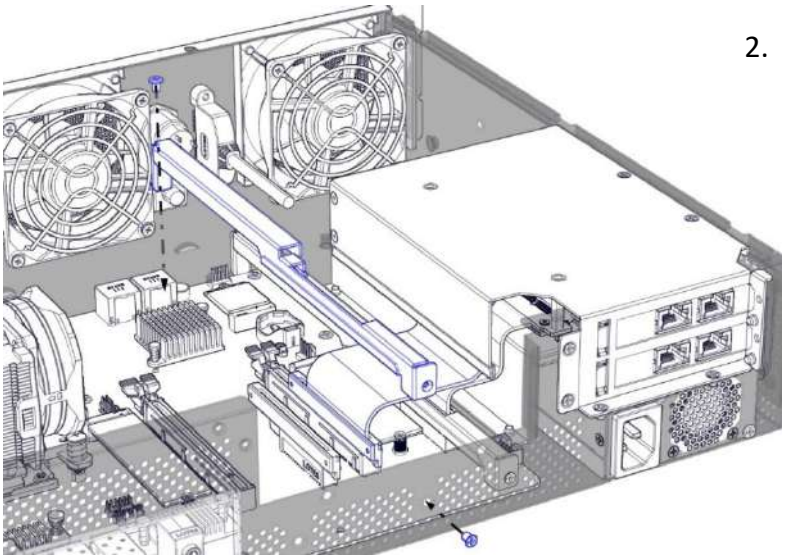


3.6.3 Install the Slot 4 (PCI_E5) PCIe golden finger bracket.



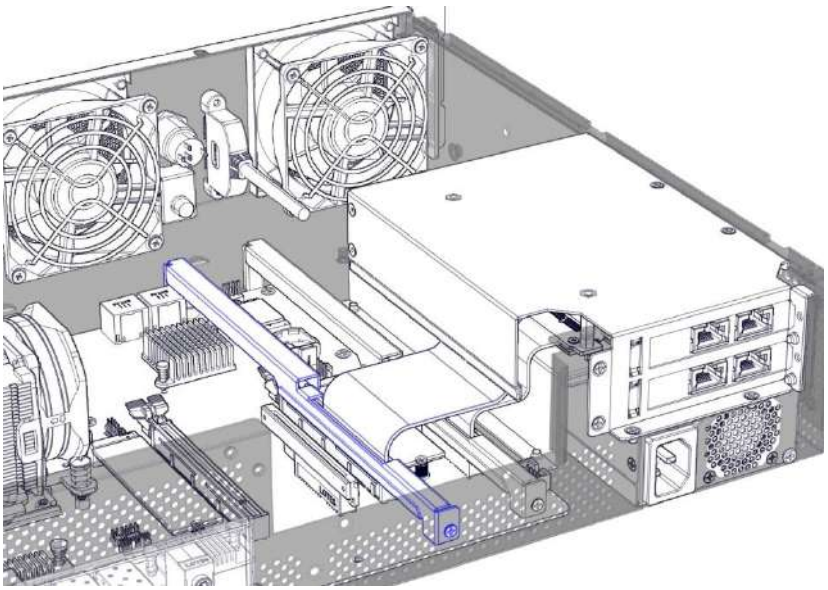
1. Secure the two screws at the front and rear.

*Check for proper installation.

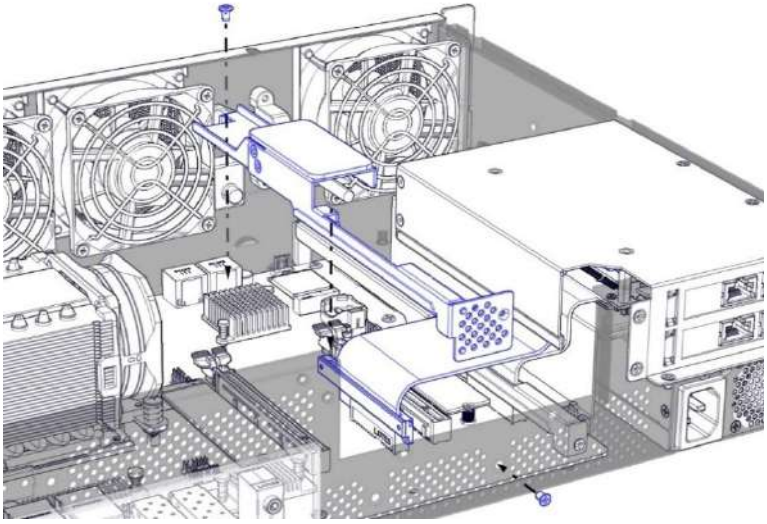


2. Insert the golden fingers of the top-side riser cable into the Slot 2 PCIe x16 connector (Default Option 1).

*Install the Slot 2 PCIe golden finger bracket (ARB2UA-1617-01) and tighten the front and rear screws.

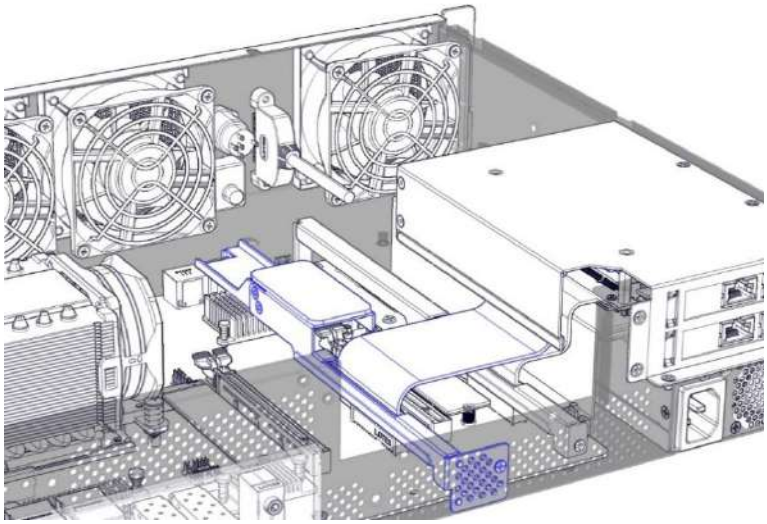


*Check for proper installation.



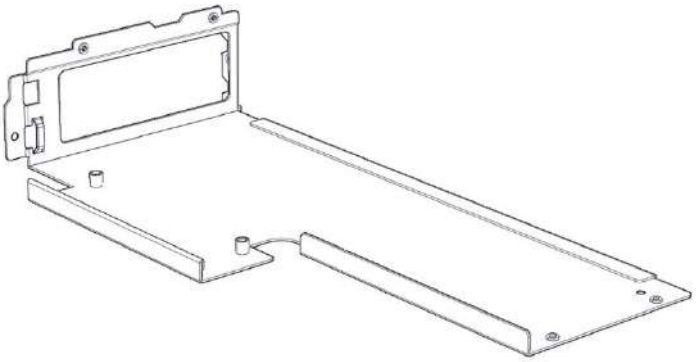
3. Insert the Top Side Riser cable golden fingers into the Slot2- PCI_E2 x4 slot (Option 2).

*Mount the Slot2 - PCI_E2 PCIe Gold Finger Slot bracket (ARB2UA-1618-01), then tighten the front and rear screws to secure it.



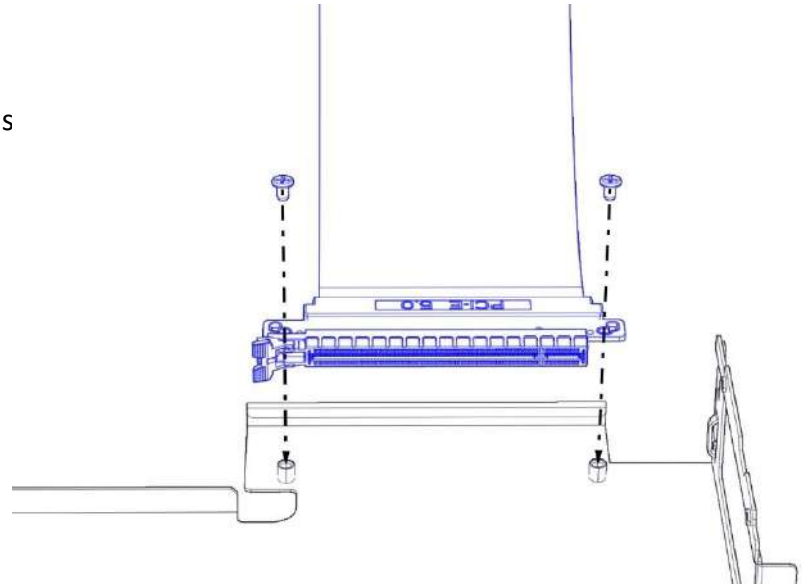
*Check for proper installation.

3.6.4 Install PCIe x16 Cage

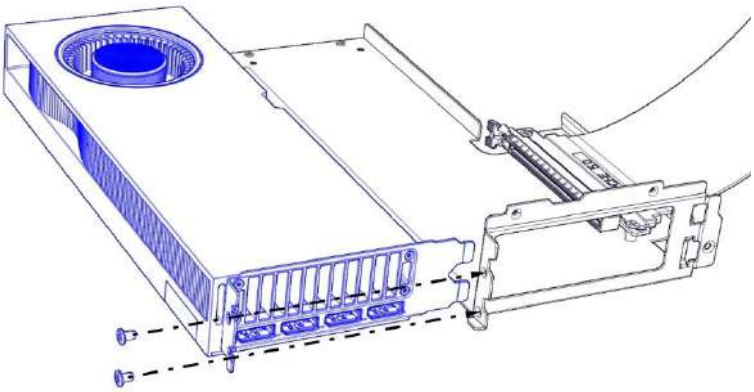


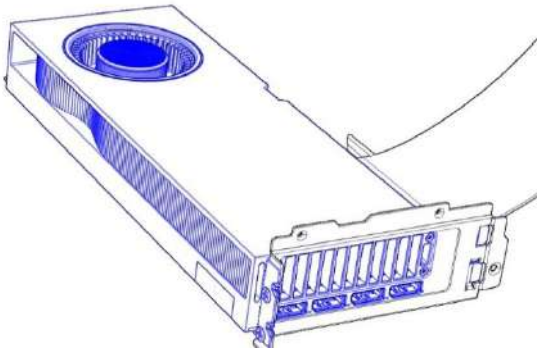
1. Prepare to install the PCIe x16 Ris and secure it with two screws.

   *Check for proper installation.



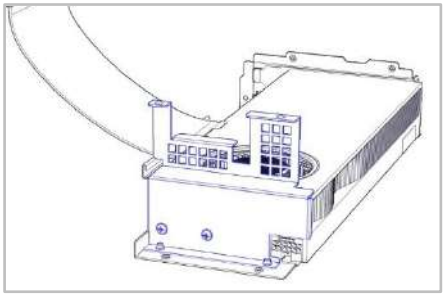
2. Insert the GPU card into the x16 slot and tighten the two screws (as shown).

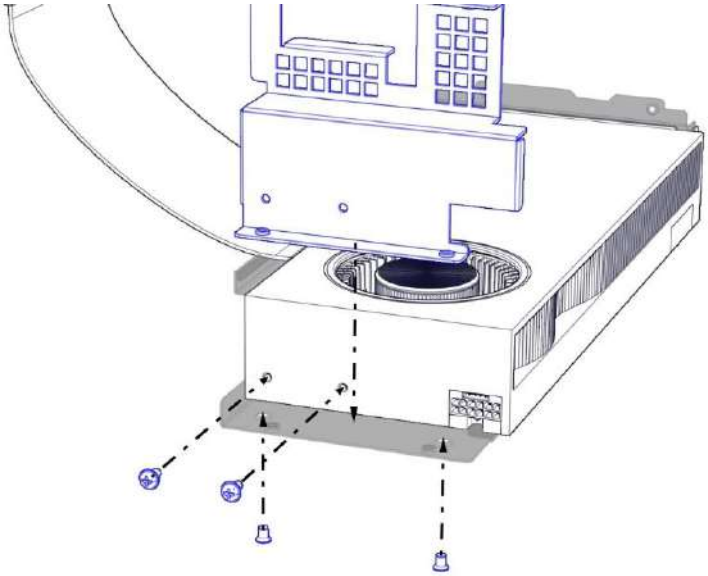


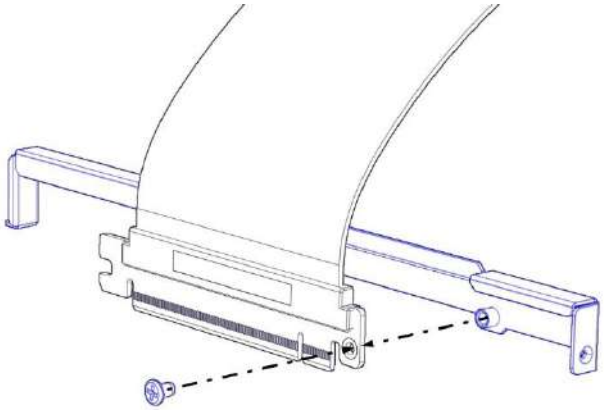


*Check if the GPU bracket is correctly inserted into the chassis cage.

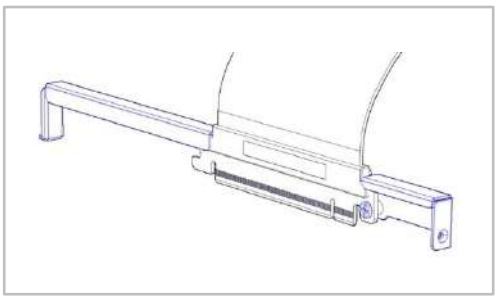
3. Prepare to install the GPU bracket (AR2UA-1607-04):
   ① Secure the bracket to the GPU using two screws.
   ② Secure the bracket to the chassis cage using the remaining screws.



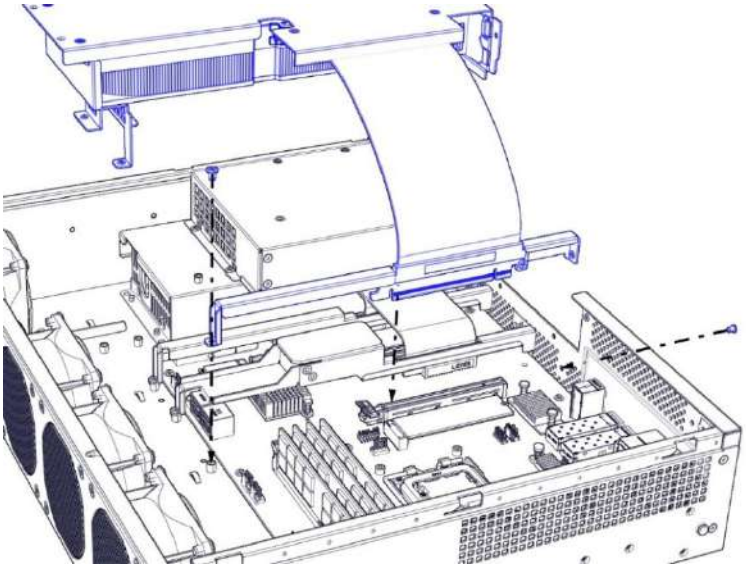




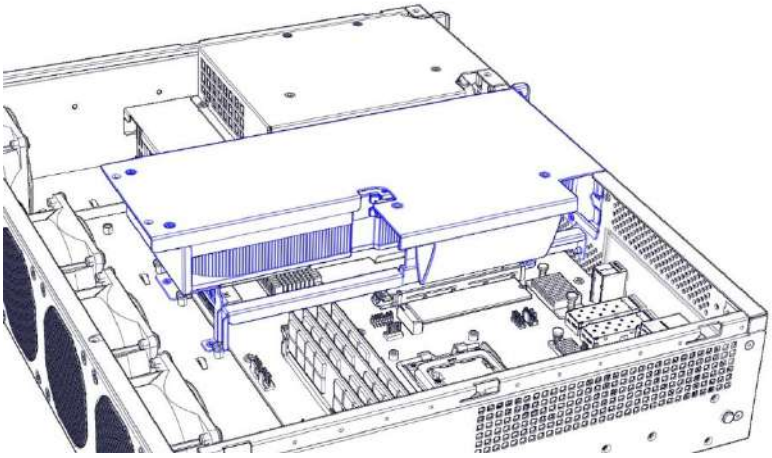
4. Mount the PCIe x16 Gold Finger Slot and the retaining bracket (ARB2UA-1603-02), then tighten the screws.

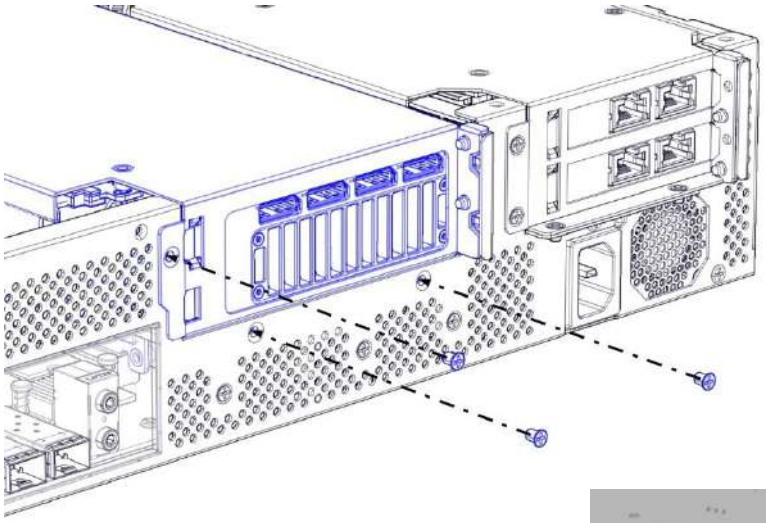


5. Assemble the Riser cable bracket and pre-install it into Slot1- PCI_E1 x16, then lock the front and rear screws.



6. Install the GPU cage by properly aligning it with the rear of the chassis. Verify that the screw holes on the front GPU bracket perfectly match the chassis bottom cover. Route and fold the Riser cable toward the GPU to ensure it does not interfere with the CPU cooling fan.

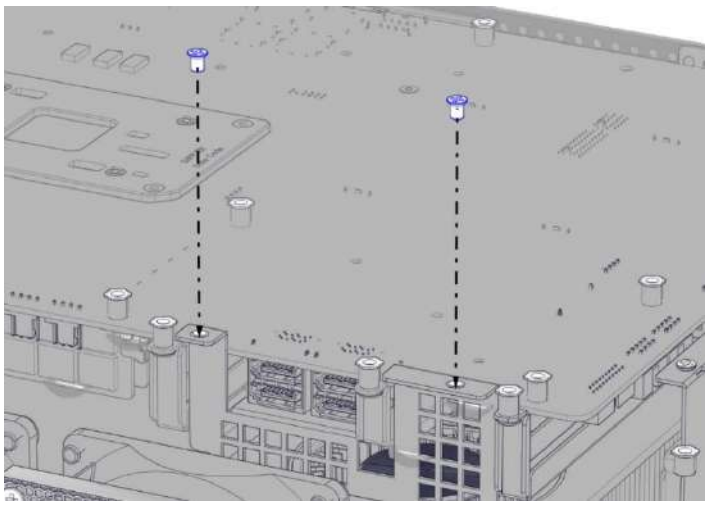


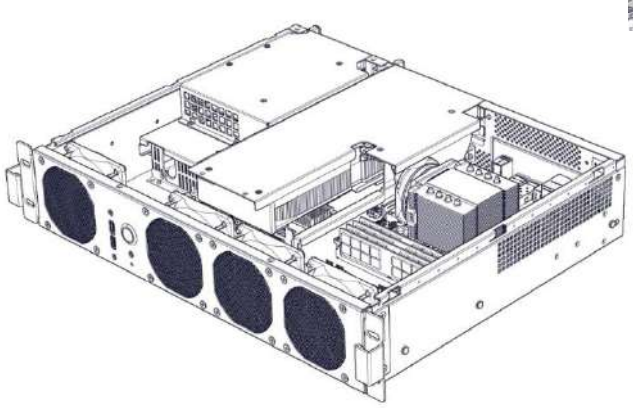


7. Secure the rear of the GPU cage with three screws.

*Check for proper installation.

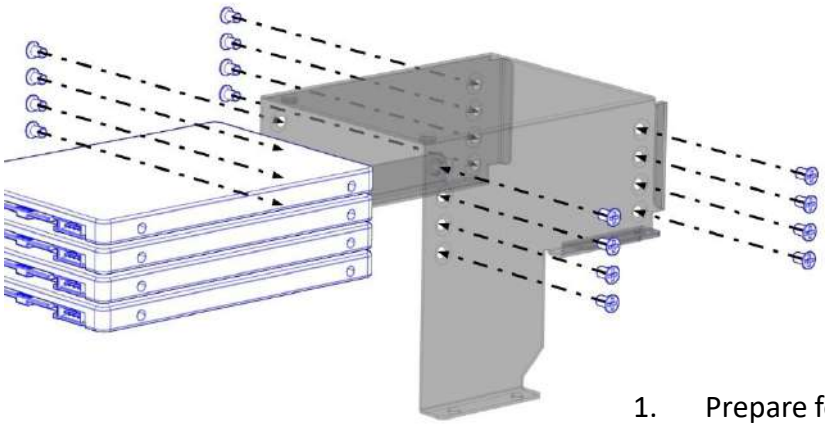
8. Flip the chassis over and secure the chassis base to the GPU bracket with two screws.

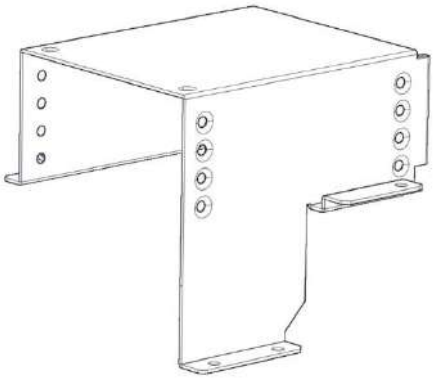




9. Flip the chassis back over and inspect the installation to ensure proper fit.

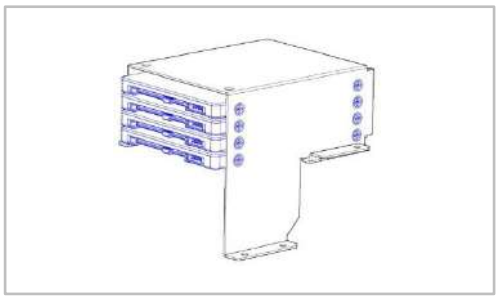
3.6.5 Install SSD Cage



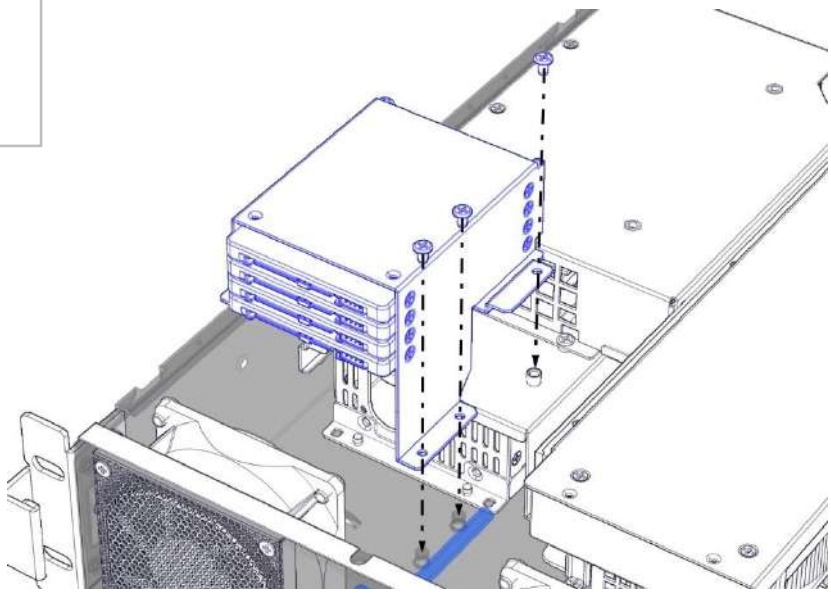


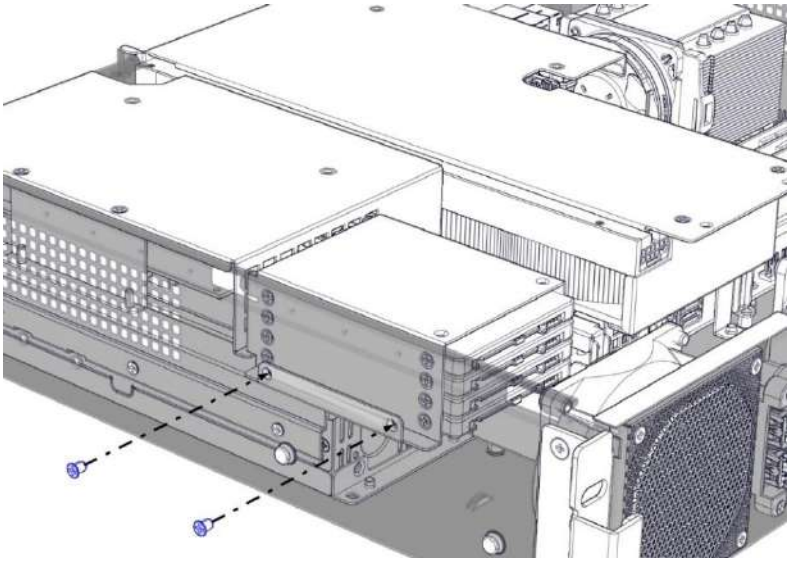
1. Prepare four 2.5" SSDs and secure them with 16 screws in sequence.

   *Check for proper installation.



2. Secure the right side of the SSD cage with three screws.



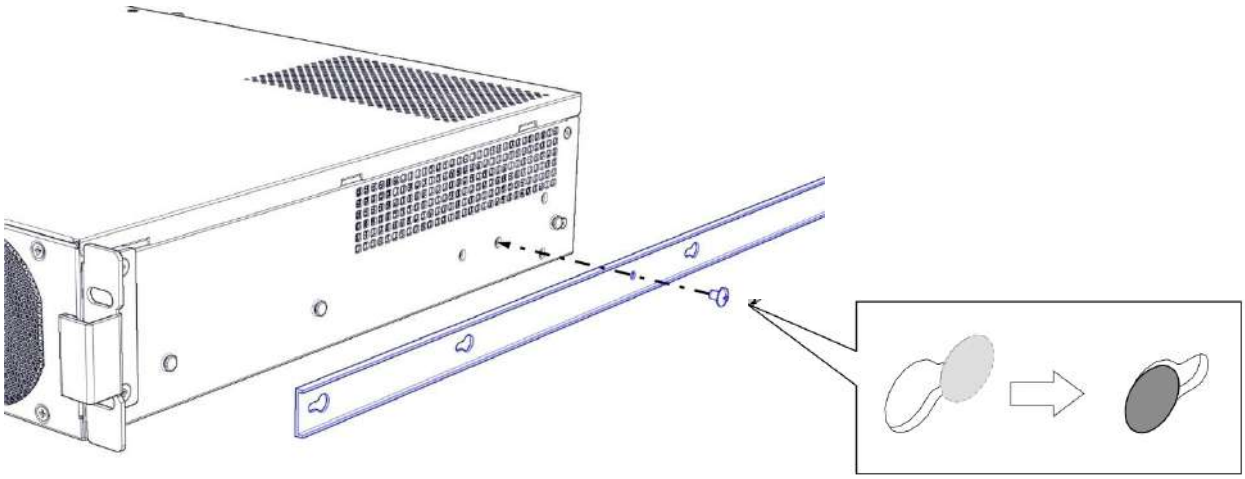


3. From the left side of the chassis, secure the left side of the SSD cage with two screws.

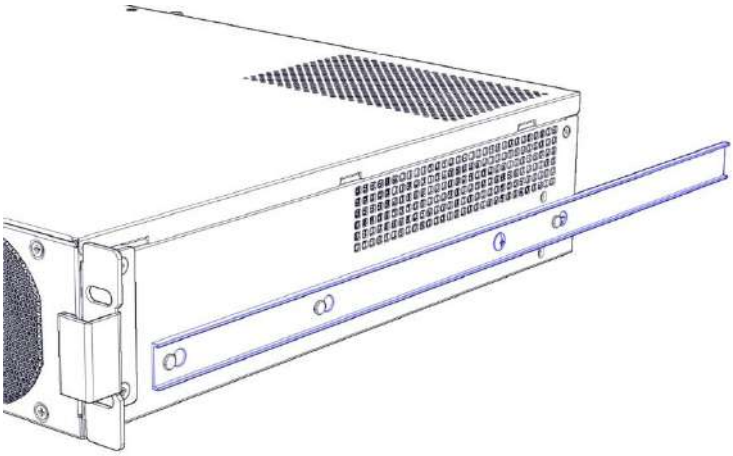
   *Check for proper installation.

3.7 Installing Sliding Rails

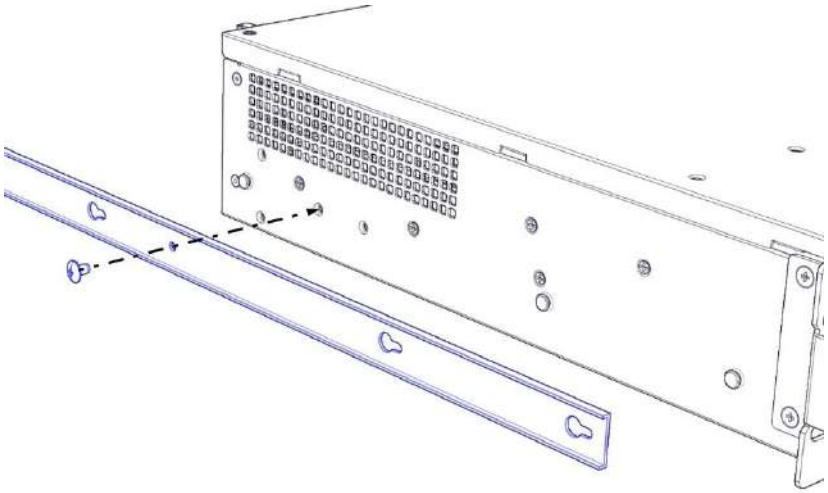
1. Prepare the inner slide rail and align the three teardrop-shaped guide grooves.



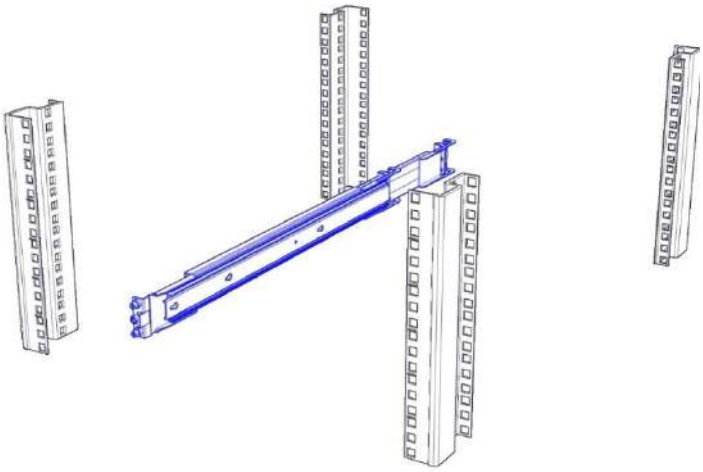
2. Tighten the slide rail screws.



3. Flip the case to the left side and install the internal slide rails as described above.



4. Confirm the required length of the external telescopic slide rails to be extended before installing it onto the rack.

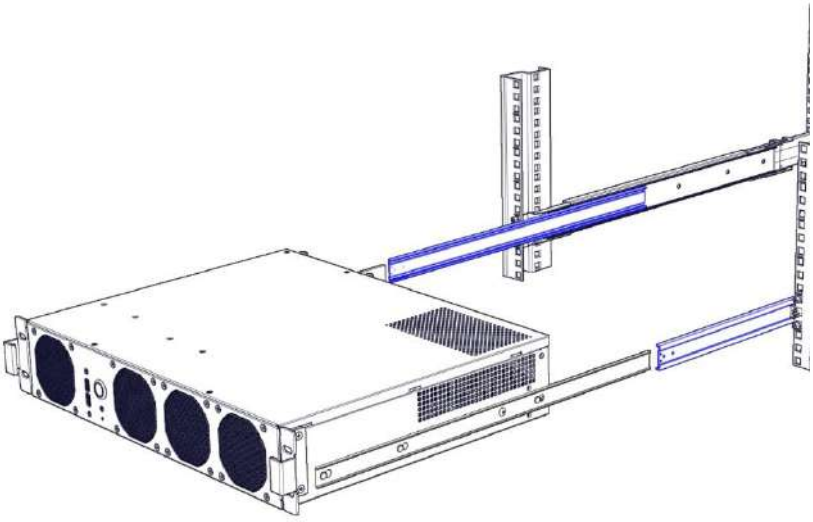


5. Check if they are level with the same slide rail height.

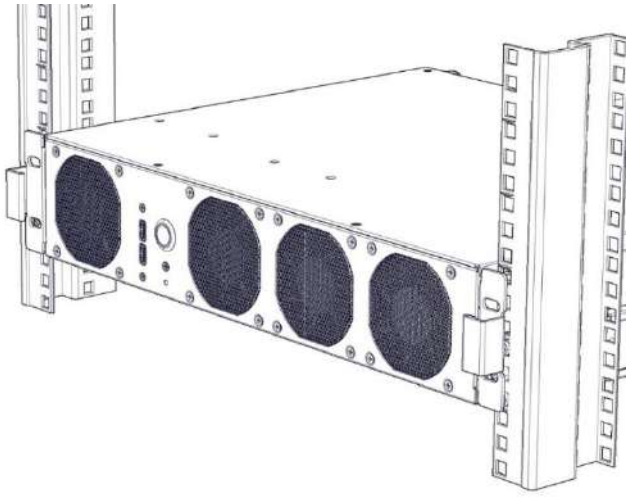


6. Connect and insert the inner slide rail of the chassis with the outer slide rail bracket.

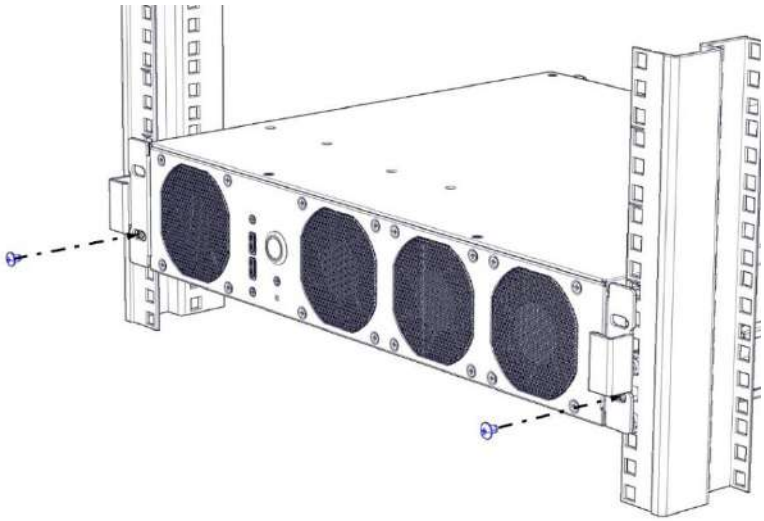
*Pull out the outer slide rail and the inner chassis slide.



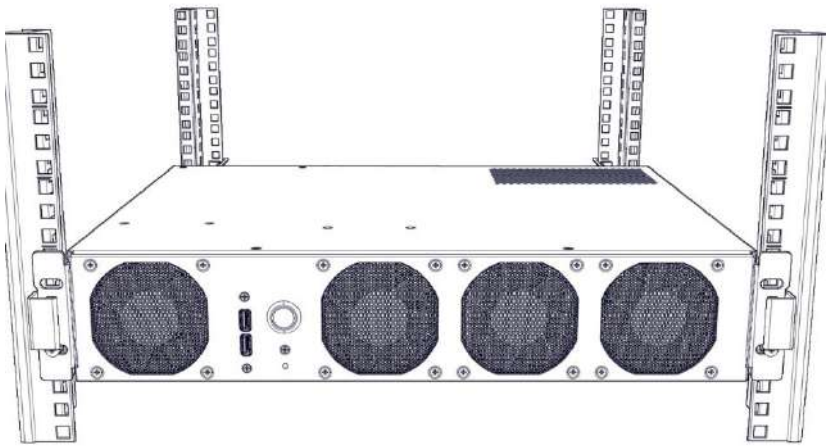
7. Check if the chassis is wobbly and level, and ensure it is properly inserted into the external slide rail.



8. Tighten the two front rack mounting screws.



9. Installation completed.



Chapter 4

System BIOS

4.1 BIOS Setup

This chapter provides information on the BIOS Setup program and allows users to configure the system for optimal use.

Users may need to run the Setup program when:

- An error message appears on the screen at system startup and requests users to run SETUP.
- Users want to change the default settings for customized features.

Important

- *Please note that BIOS update assumes technician-level experience.*
- *As the system BIOS is under continuous update for better system performance, the illustrations in this chapter should be held for reference only.*

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> or <F2> key to enter Setup, **<F11>** key to Boot Menu, **<F12>** key to PXE Boot .

Press <DEL> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it **OFF** and **On** or pressing the **RESET** button. You may also restart the system by simultaneously pressing **<Ctrl>, <Alt>, and <Delete>** keys.

Important

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

Control Keys

← →	Select Screen
↑ ↓	Select Item
Enter	Select
+ -	Change Value
Esc	Exit
F1	General Help
F7	Previous Values
F8	Search Setup Items
F9	Optimized Defaults
F10	Save & Reset*Setup
F12	Screenshot capture
<K>	Scroll help area upwards
<M>	Scroll help area downwards

* When you press **<F10>**, a confirmation window appears and it provides the modification information. Select between **Yes** or **No** to confirm your choice.

Getting Help

Upon entering setup, you will see the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the **arrow keys (↑ ↓)** to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

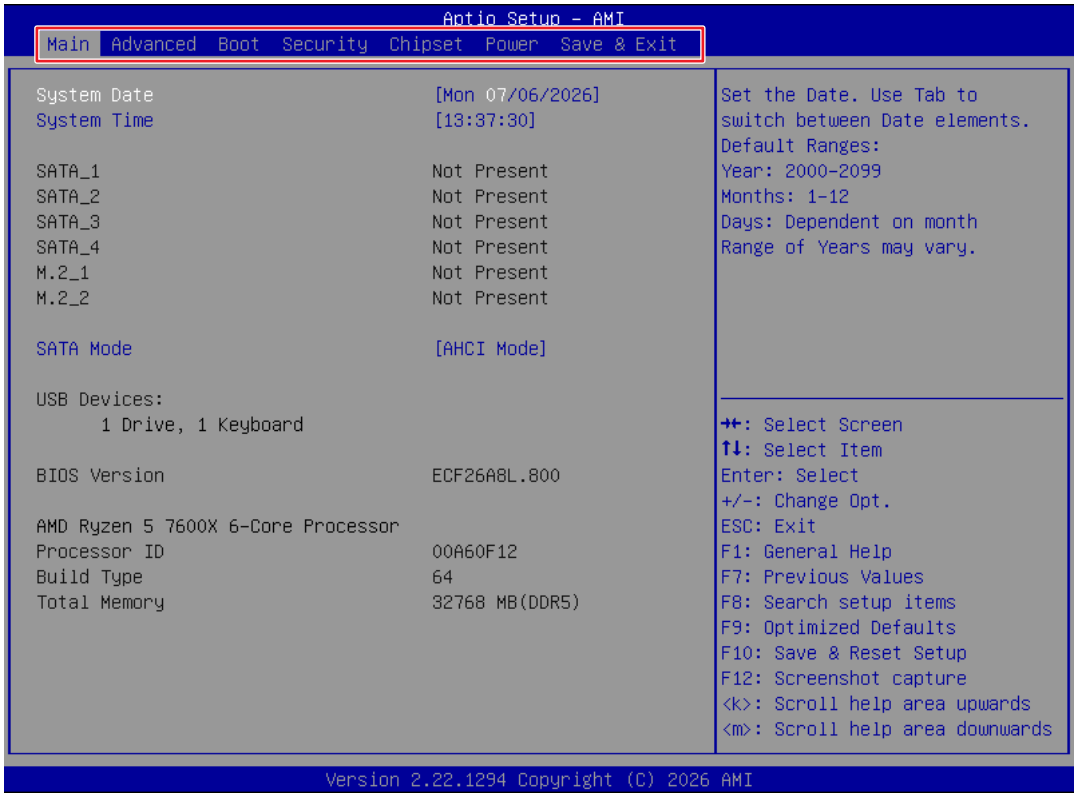
Sub-Menu

If you find a right pointer symbol appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use **arrow keys (↑ ↓)** to highlight the field and press **<Enter>** to call up the sub-menu. Then you can use the **control keys** to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the **<Esc>.**

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing **<F1>**. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press **<Esc>** to exit the Help screen.

4.2 The Menu Bar



► Main

Use this menu for basic system configurations, such as time, date, etc.

► Advanced

Use this menu to set up the items of special enhanced features.

► Boot

Use this menu to specify the priority of boot devices.

► Security

Use this menu to set supervisor and user passwords.

► Chipset

This menu controls the advanced features of the on-board chipsets.

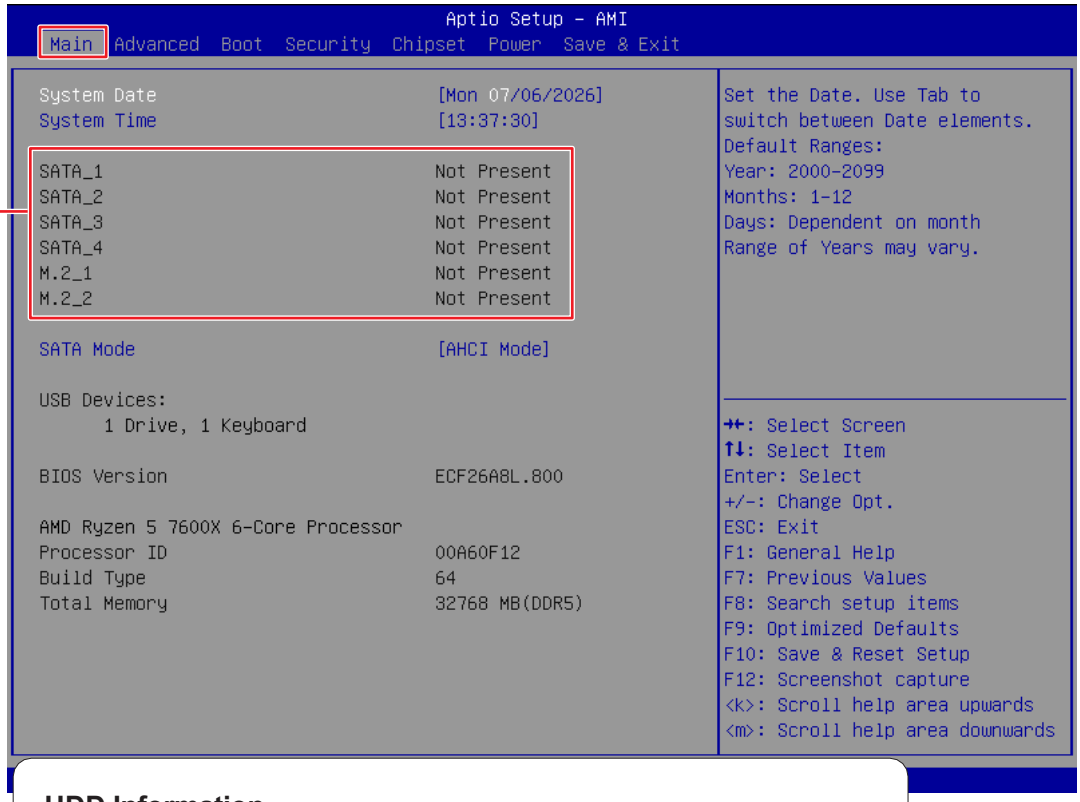
► Power

Use this menu to specify your settings for power management.

► Save & Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

4.3 Main



HDD Information

- **RAID (VMD) Disabled:** Display HDD information as plugging in status.
- **RAID (VMD) Enabled:** Display "Not Present" only.

► System Date

This setting allows you to set the system date.

Format: <Day> <Month> <Date> <Year>.

► System Time

This setting allows you to set the system time.

Format: <Hour> <Minute> <Second>.

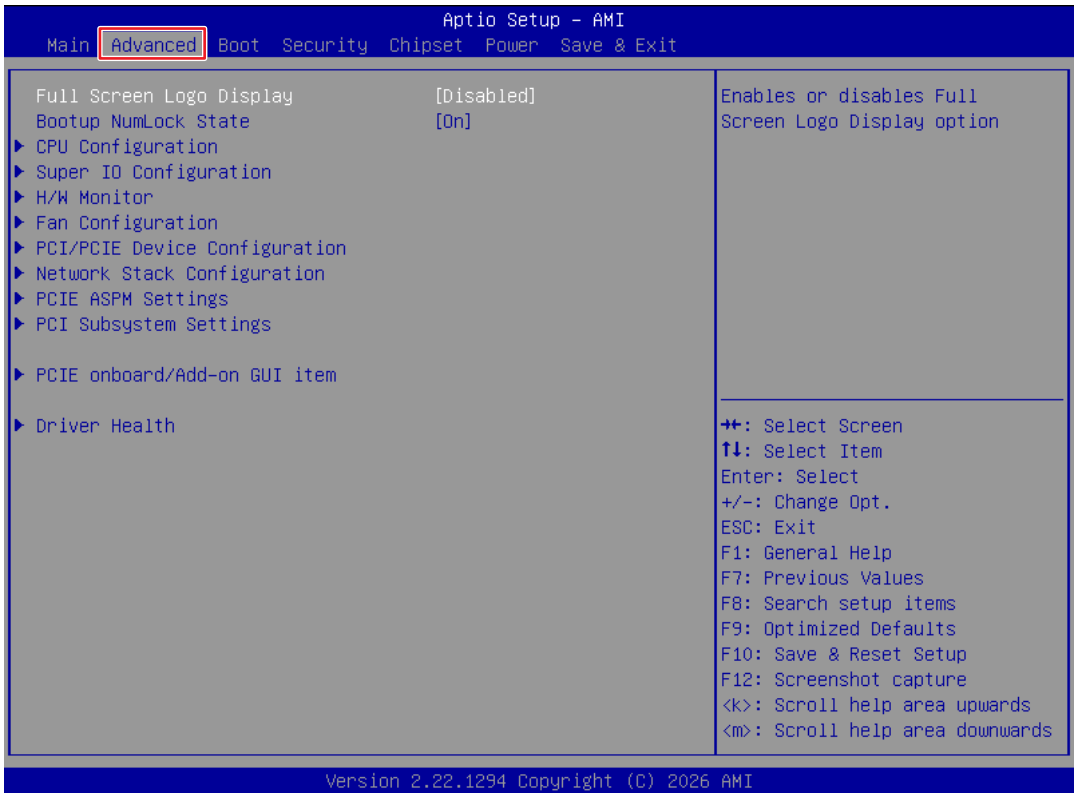
► SATA Mode Selection

This setting specifies SATA controller mode.

[AHCI] AHCI (Advanced Host Controller Interface), is a technical standard for an interface that allows the software to communicate with Serial ATA (SATA) devices. It offers advanced SATA features such as Native Command Queuing (NCQ) and hot-plugging.

[RAID] RAID (Redundant Array of Independent Disks) is a virtual disk storage technology that combines multiple physical disks into one unit for data redundancy, performance improvement, or both.

4.4 Advanced



► Full Screen Logo Display

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.

[Enabled] BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

[Disabled] BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, **it is recommended to disable this BIOS feature for faster boot-up.**

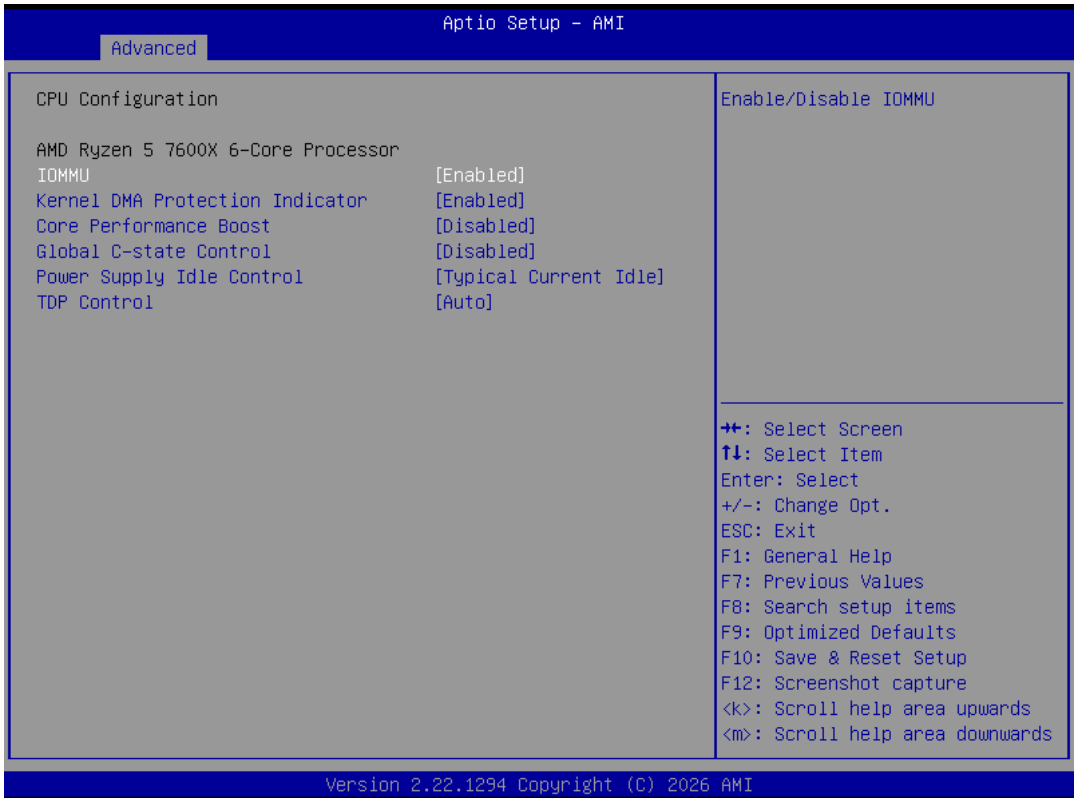
► Bootup NumLock State

This setting is to set the state of the Num Lock key on the keyboard when the system is powered on.

[On] Turn on the Num Lock key when the system is powered on.

[Off] Allow users to use the arrow keys on the numeric keypad.

► CPU Configuration



▶ IOMMU

Enables or disables AMD IOMMU (Input-Output Memory Management Unit) virtualization support.

[Enabled] Enables IOMMU, allowing direct physical device assignment to virtual machines for optimized I/O performance.

[Disabled] Disables IOMMU, restricting virtual machines from direct hardware access.

▶ Kernel DMA Protection Indicator

Enables or disables the signaling for Kernel Direct Memory Access (DMA) Protection to the OS.

[Enabled] Enables the indicator signal, allowing the OS to utilize IOMMU to isolate and protect the system against malicious DMA attacks via PCIe devices or hot-plug peripherals.

[Disabled] Disables this function.

▶ Core Performance Boost

Enables or disables AMD Core Performance Boost (CPB) technology.

[Enabled] Enables the processor to automatically scales CPU clock speeds above base frequency based on load, thermals, and power limits.

[Disabled] Disables CPB functionality, locking the CPU to its base clock speed to lower temperatures and power consumption.

▶ **Global C-state Control**

Enables or disables the processor's automated low-power idle states (C-states).

[Enabled] Enables global C-states, allowing the CPU to reduce core voltage and frequency when idle to save energy.

[Disabled] Disables automated C-states, keeping the CPU cores to stay active to reduce wake-up latency, often used for manual overclocking stability.

▶ **Power Supply Idle Control**

Configures CPU's power loading behavior during low-power idle states. Available options **depend on the supported CPU installed** in the system.

[Auto] Automatically applies the system default power management settings based on the processor and motherboard specifications.

[Typical Current Idle] Forces a typical current load when idle, which resolves instability or random reboots caused by power supplies that cannot handle ultra-low current standby states.

[Low Current Idle] Allows the CPU to drop to lower current levels when idle to maximize power saving.

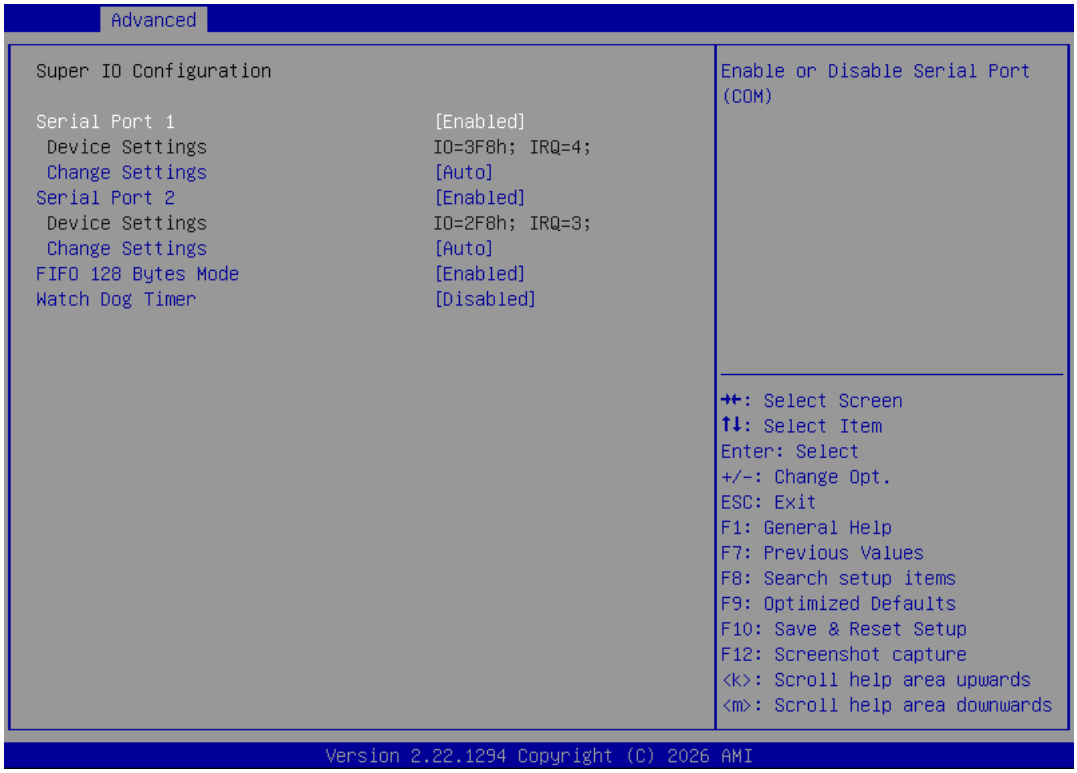
▶ **TDP Control**

Configures the Thermal Design Power (TDP) limits for the processor.

[Auto] Automatically manages power delivery targets based on the default specifications of the AMD processor.

[Manual] Allows users to manually define the TDP wattage limit.

► Super IO Configuration



▶ Serial Port 1/ 2

Enables or disables the specified serial port (COM).

[Enabled] Activates the serial port and allows hardware resource allocation.

[Disabled] Deactivates the serial port, freeing up system IRQ and IO resources.

» Change Settings

Selects the IO address and IRQ (Interrupt Request) settings for the specified serial port.

[Auto] Allows the BIOS to automatically assign resources.

[Manual Options] Manually configures the serial port to specific I/O base addresses (**3F8h, 2F8h, 3E8h, 2E8h**) and assigns a dedicated hardware IRQ line from the available resource matrix.

▶ FIFO 128 Bytes Mode

Enables or disables the 128-byte First-In, First-Out (FIFO) buffer mode for serial data processing.

[Enabled] Activates a deeper 128-byte data buffer to reduce CPU overhead during continuous, high-speed serial transmissions.

[Disabled] Disables this function.

▶ Watch Dog Timer

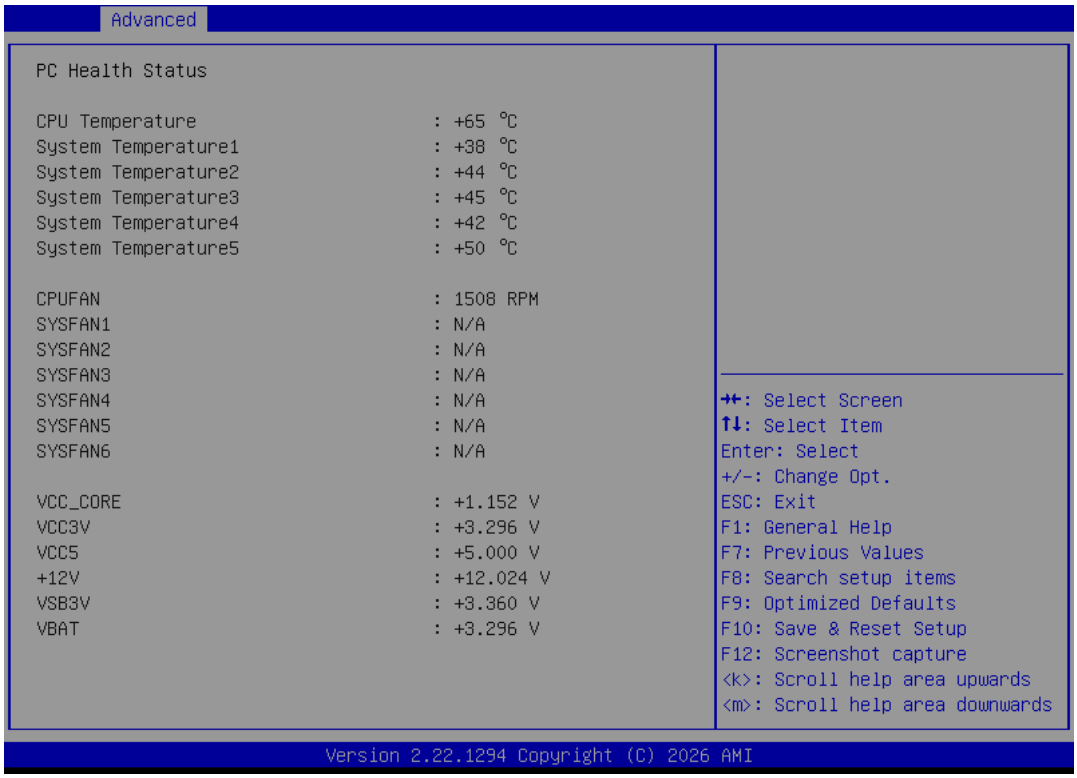
Enables or disables the system Watch Dog Timer, which automatically reboots the system if it hangs or freezes.

[Enabled] Enables the timer mechanism to monitor system responsiveness and trigger a reset upon failure.

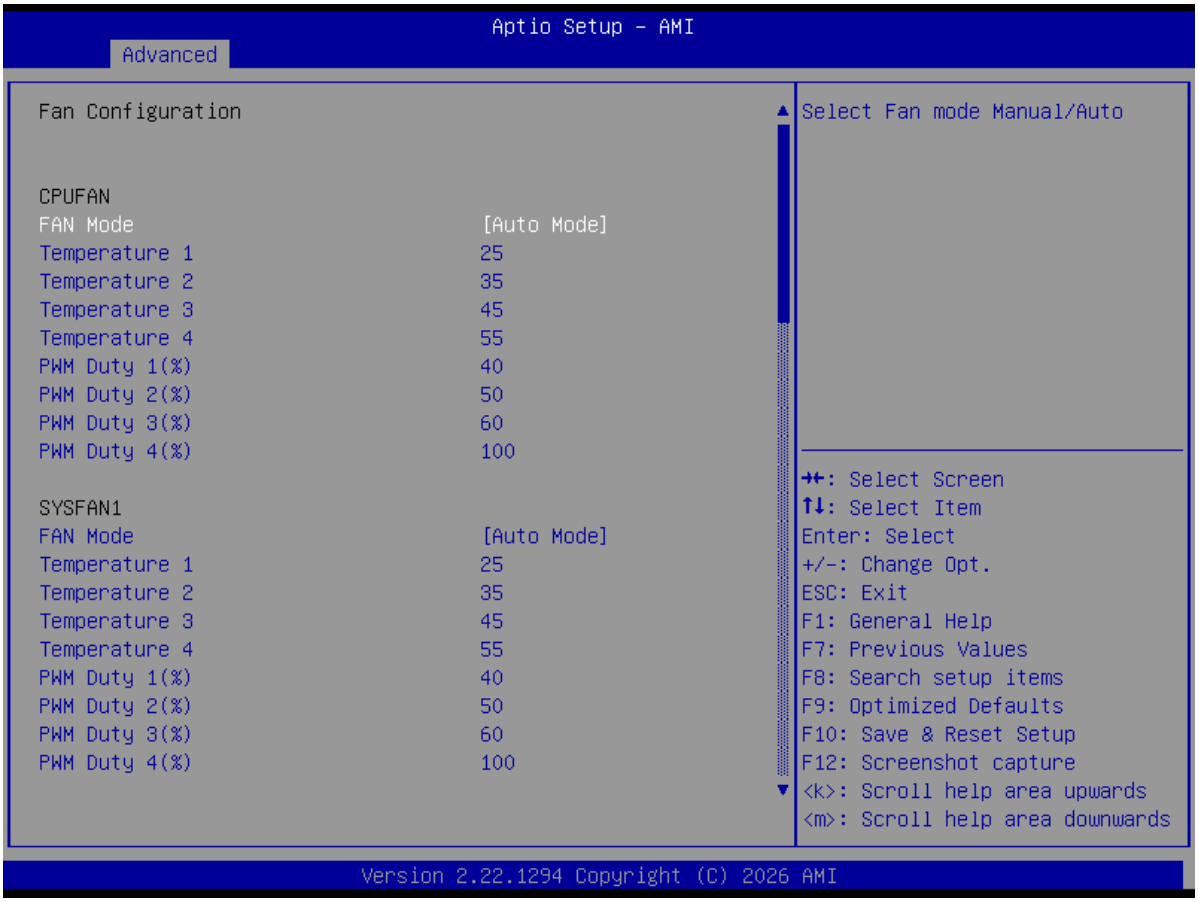
[Disabled] Disables this function.

► H/W Monitor (PC Health Status)

These items display the current status of all monitored hardware devices/ components such as voltages, temperatures and fan speeds.



► Fan Configuration



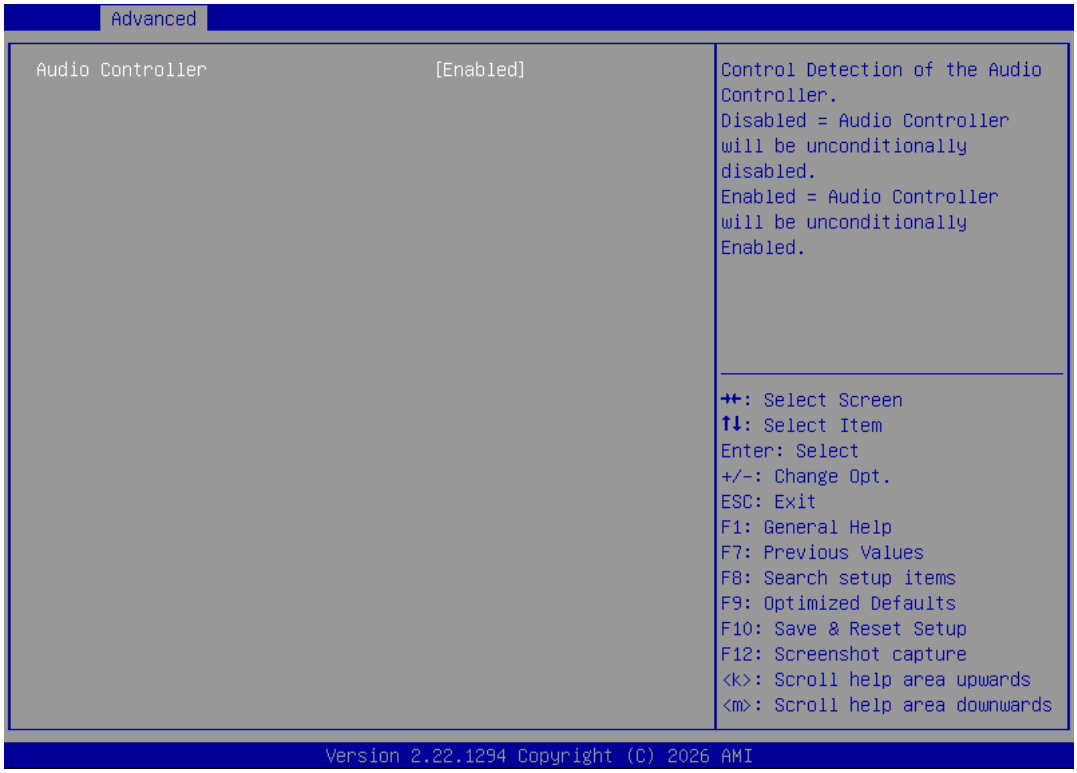
[Auto Mode]	Automatically adjusts the fan speed dynamically based on real-time temperature sensor data.
[Manual Mode]	Locks the fan to run at a user-defined fixed speed percentage regardless of temperature changes.

» **Duty (%) (CPUFAN / SYSFAN1~6)**

Configures the fixed operational speed for the fan when **[Manual Mode]** is active.

[User Defined Value]	Enter a percentage value (from 0 to 100) to set the PWM pulse-width duty cycle or DC voltage output line.

► PCI/PCIE Device Configuration

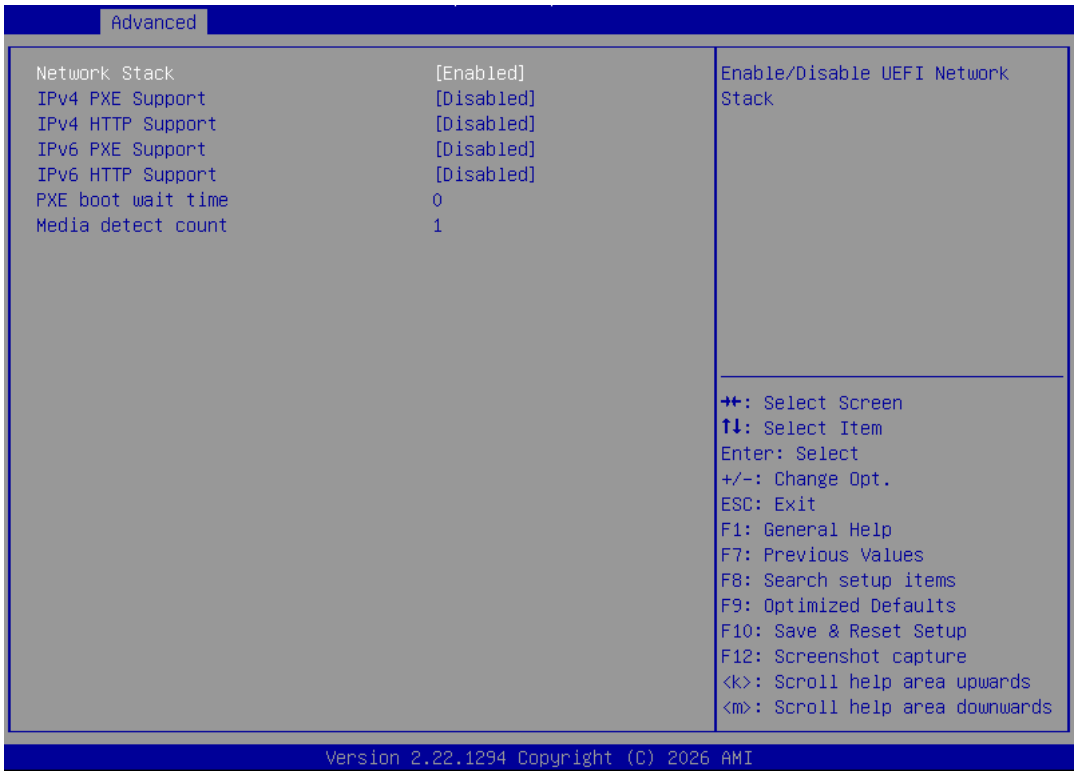


▶ Audio Controller

Enables or disables the detection of the onboard audio controller.

► Network Stack Configuration

This menu provides Network Stack settings for users to enable network boot (PXE) from BIOS.



▶ Network Stack

This menu provides Network Stack settings for users to enable network boot (PXE) from BIOS. The following items will display when **Network Stak** is enabled.

» **IPV4 PXE Support**

Enables or disables IPv4 PXE boot support.

» **IPV4 HTTP Support**

Enables or disables Ipv4 HTTP Support.

» **IPV6 PXE Support**

Enables or disables Ipv6 PXE Support.

» **IPV6 HTTP Support**

Enables or disables Ipv6 HTTP Support.

» **PXE boot wait time**

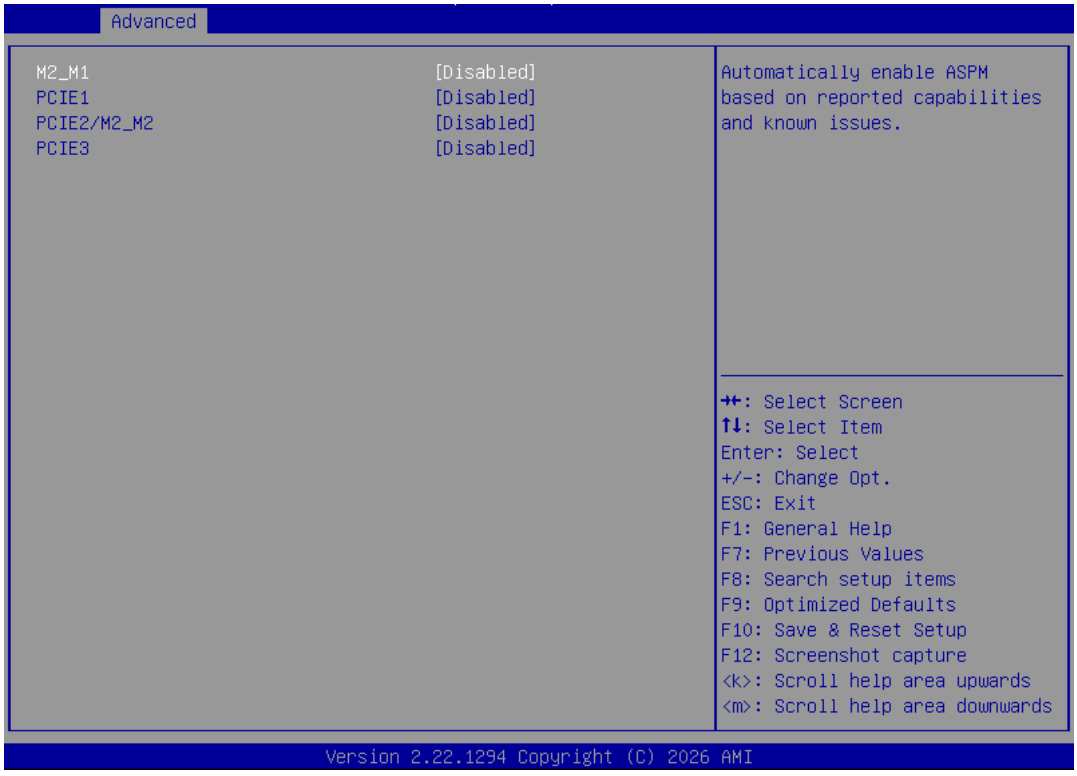
Use this option to specify the wait time to press the ESC key to abort the PXE boot. Press "+" or "-" on your keyboard to change the value. The default setting is 0.

» **Media detect count**

Use this option to specify the number of times media will be checked. Press"+"or"-"on your keyboard to change the value. The default setting is 1.

► PCIE ASPM settings

This menu provide settings for PCIe ASPM (Active State Power Management) level for different installed devices.



▶ M2_M1/ PCIE1/ PCIE2/ M2_M2/ PCIE3

Sets PCI Express ASPM (Active State Power Management) state for power saving.

[L0s]	Initiate an automatic shutdown of the system to protect from potential damage due to overheating.
[L1]	Higher latency, lower power"standby"state **(optional)**.
[L0sL1]	Activate both L0s and L1 support.
[Disabled]	Disable this function.

► PCIE Subsystem Settings



▶ Above 4G Decoding

Enables or disables 64-bit capable devices to be decoded in above 4GB address space.

[Enabled] Enables 64-bit decoding space above 4GB boundary for compatible graphics cards and compute devices. This is a **prerequisite for Resizable BAR functionality**.

[Disabled] Restricts device memory resource mapping to the legacy 32-bit address space below 4GB.

▶ Re-Size BAR Support

Enables or disables Resizable Base Address Register (BAR) support for compatible graphics cards and PCIe expansion devices.

[Enabled] Allows the CPU to negotiate and access the entire frame buffer of supported PCIe controllers at once, reducing system overhead and latency.

[Disabled] Forces the CPU to communicate with the device frame buffer through fixed, legacy 256MB allocation blocks.

▶ SR-IOV Support

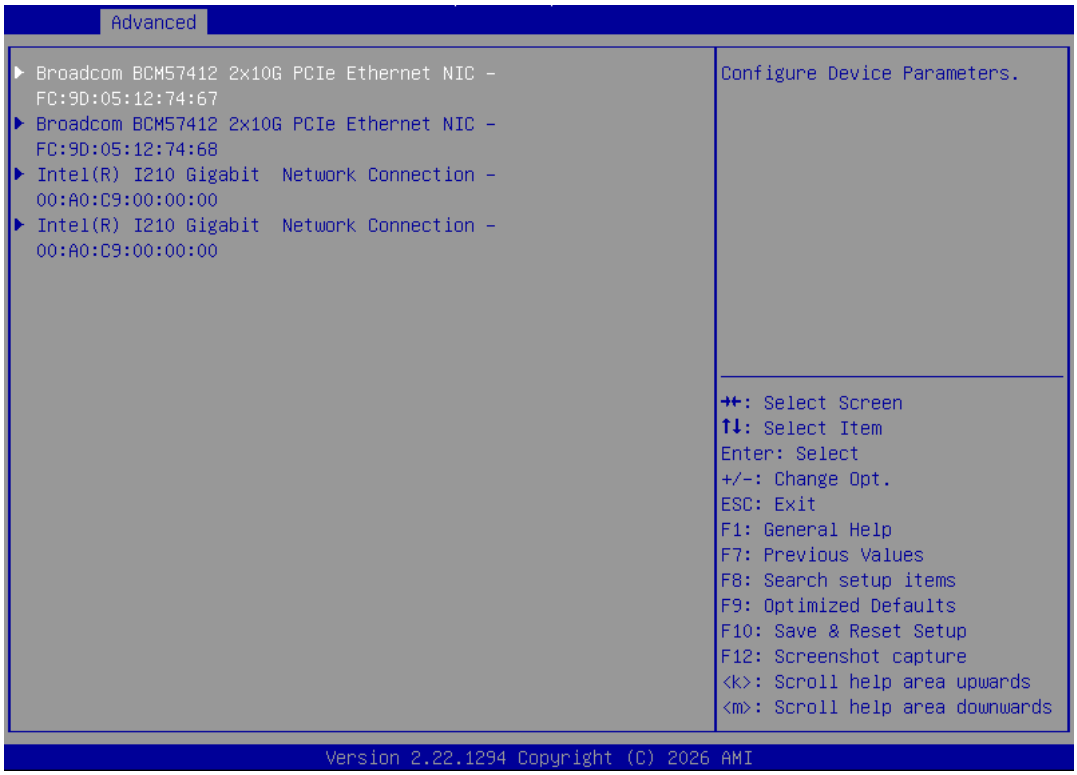
Enables or disables Single Root I/O Virtualization (SR-IOV) Support.

[Enabled] Allows a single physical PCIe device to create and expose multiple virtual functions (VFs), passing native hardware performance directly to virtual machines.

[Disabled] Disables virtualization extensions, ensuring standard single-host operation.

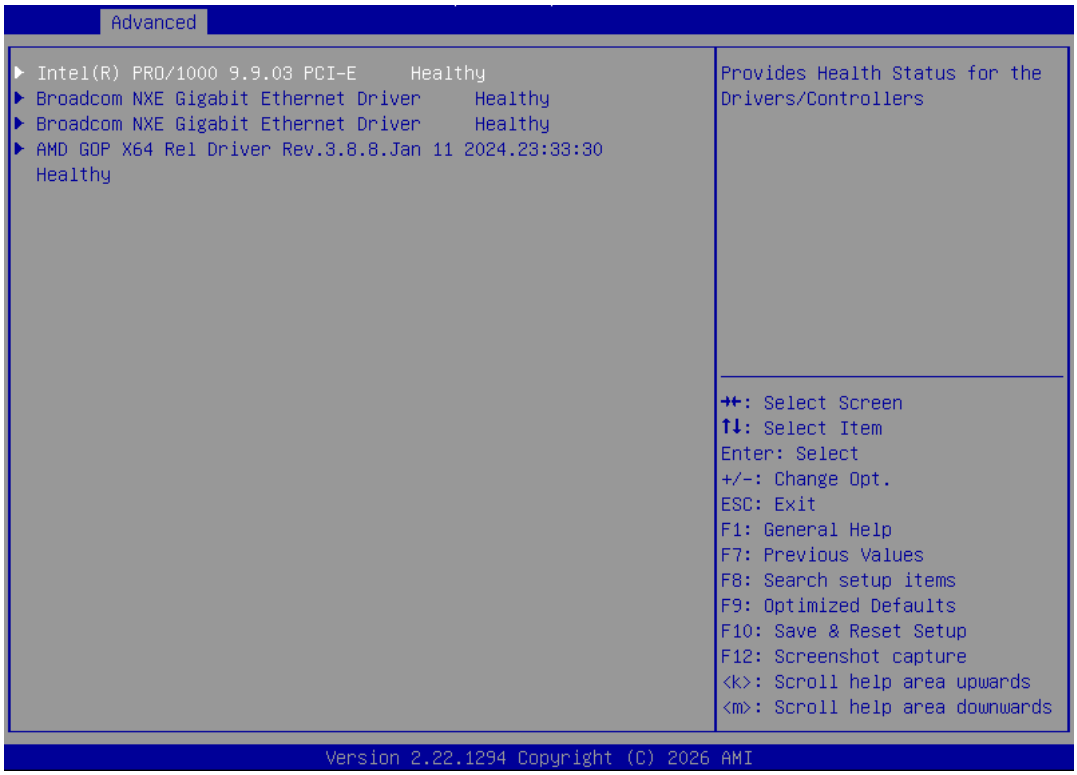
► PCIE onboard/ Add-on GUI item

Use this menu to view and manage graphical user interface (GUI) items for add-on expansion cards connected via the PCIe expansion slots.



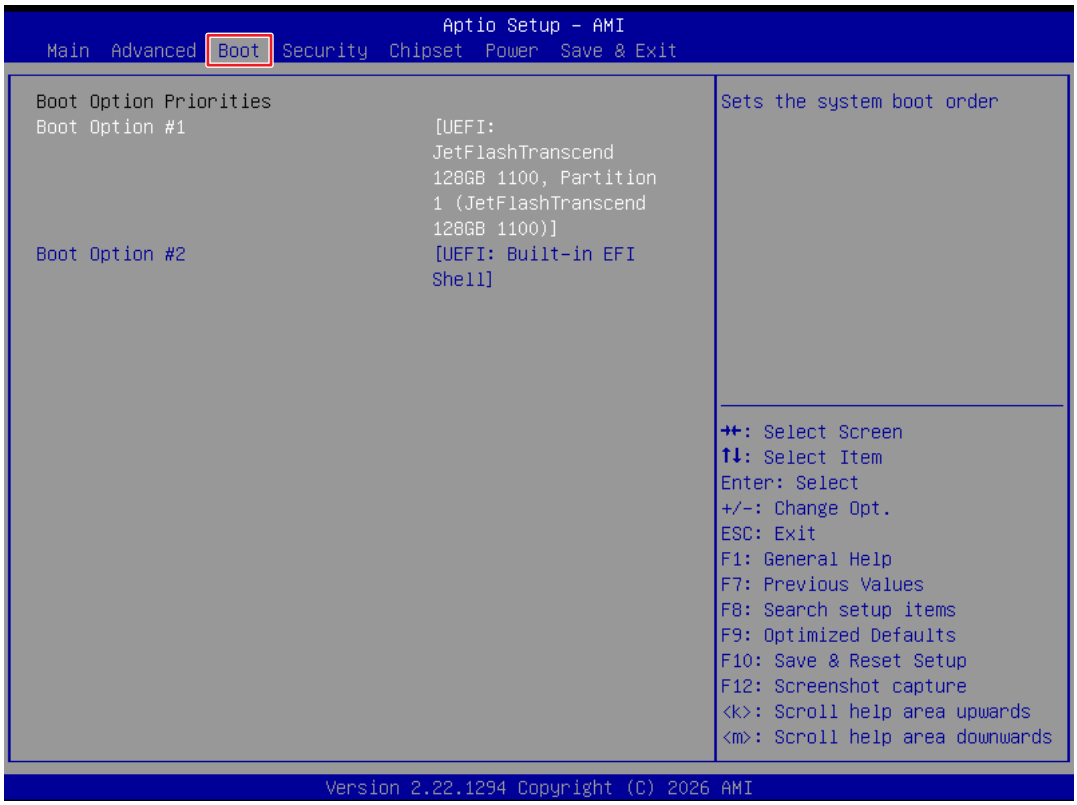
► Driver Health

This menu provides status reports and diagnostic information regarding the operational integrity and health of installed device drivers.



4.5 Boot

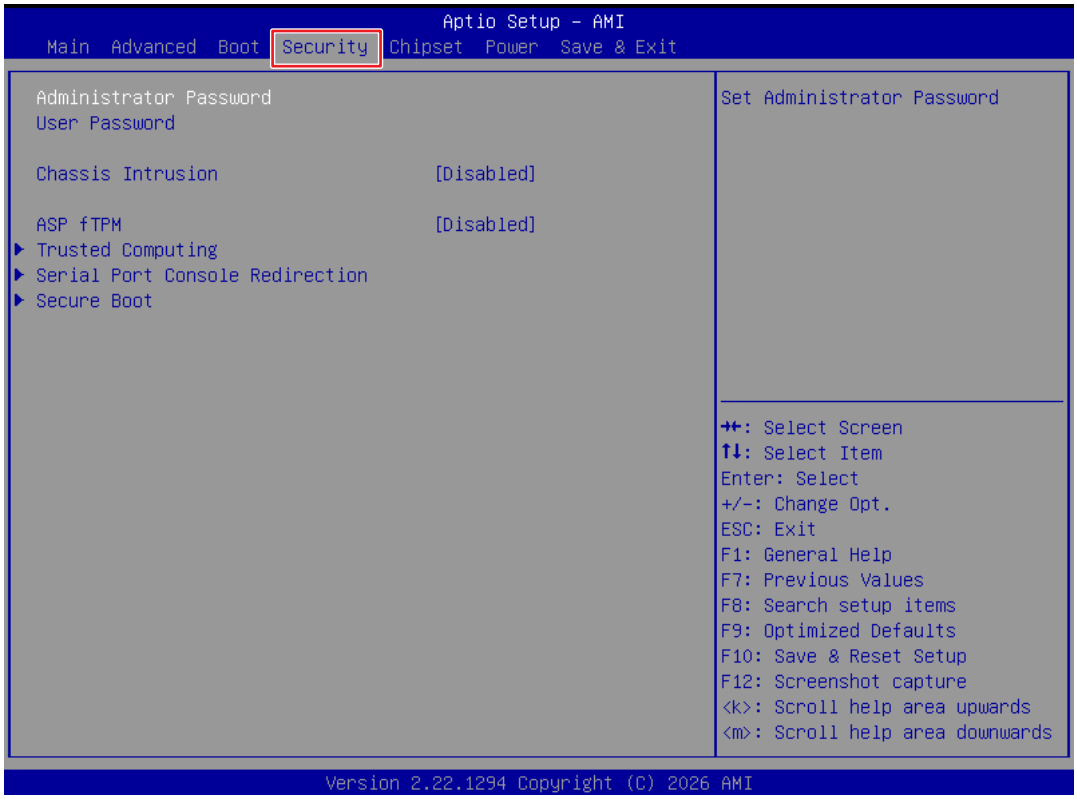
Use this menu to configure device boot priorities and system behavior when loading your operating system.



► Boot Option #1-2

This setting allows users to set the sequence of boot devices where BIOS attempts to load the disk operating system.

4.6 Security



► Administrator Password

Administrator Password controls access to the BIOS Setup utility.

► User Password

User Password controls access to the system at boot and to the BIOS Setup utility.

► Chassis Intrusion

Enables or disables alert while the chassis is opened. This function is ready for the chassis equips a chassis intrusion jumper (switch).

[Enabled] **Open Alert.** Once the chassis is **opened**, the system will record and issue a warning message. A beep sound will be emitted before this function is reset.

[Disabled] **Close the alert**, no matter if there is a case open record.

[Reset] Clears the historical chassis intrusion status log and resets the alert mechanism for the next boot cycle.

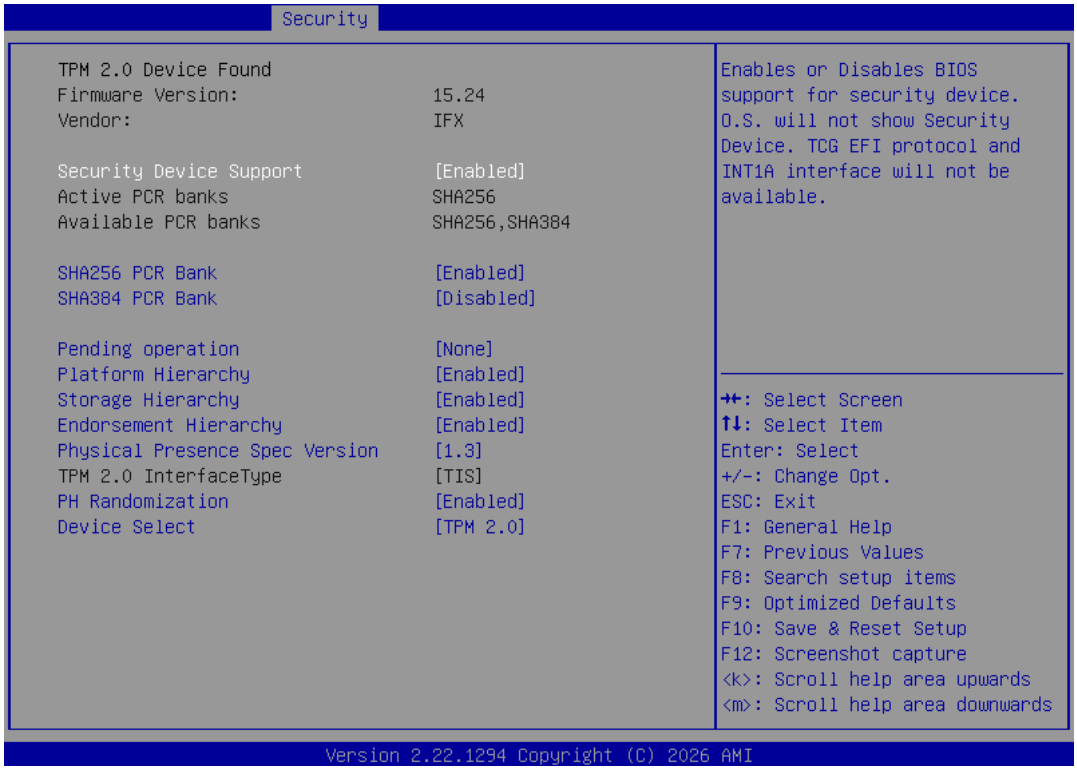
► ASP fTPM

Enables or disables the AMD Secure Processor (ASP) firmware-based Trusted Platform Module (fTPM).

[Enabled] Activates the firmware-based TPM via the CPU security processor, enabling secure storage, encryption keys, and operating system security features.

[Disabled] Disables the firmware TPM function.

► Trusted Computing



▶ Security Device Support

This item enables or disables BIOS support for security device. When set to [Disable], the OS will not show security device.

▶ SHA256/ 384 PCR Bank

These settings enables or disables the SHA256 PCR Bank and SHA384 PCR Bank.

▶ Pending Operation

When **Security Device Support** is set to [Enable], **Pending Operation** will appear. It is advised that users should routinely back up their TPM secured data.

[TPM Clear] Clear all data secured by TPM.

[None] Discard the se lection.

▶ Platform Hierarchy, Storage Hierarchy, Endorsement Hierarchy

These settings enables or disables the Platform Hierarchy, Storage Hierarchy and Endorsement Hierarchy.

▶ Physical Presence Spec Version

This settings show the Physical Presence Spec Version.

▶ TPM 2.0 Interface Type

This setting shows the TPM 2.0 Interface Type.

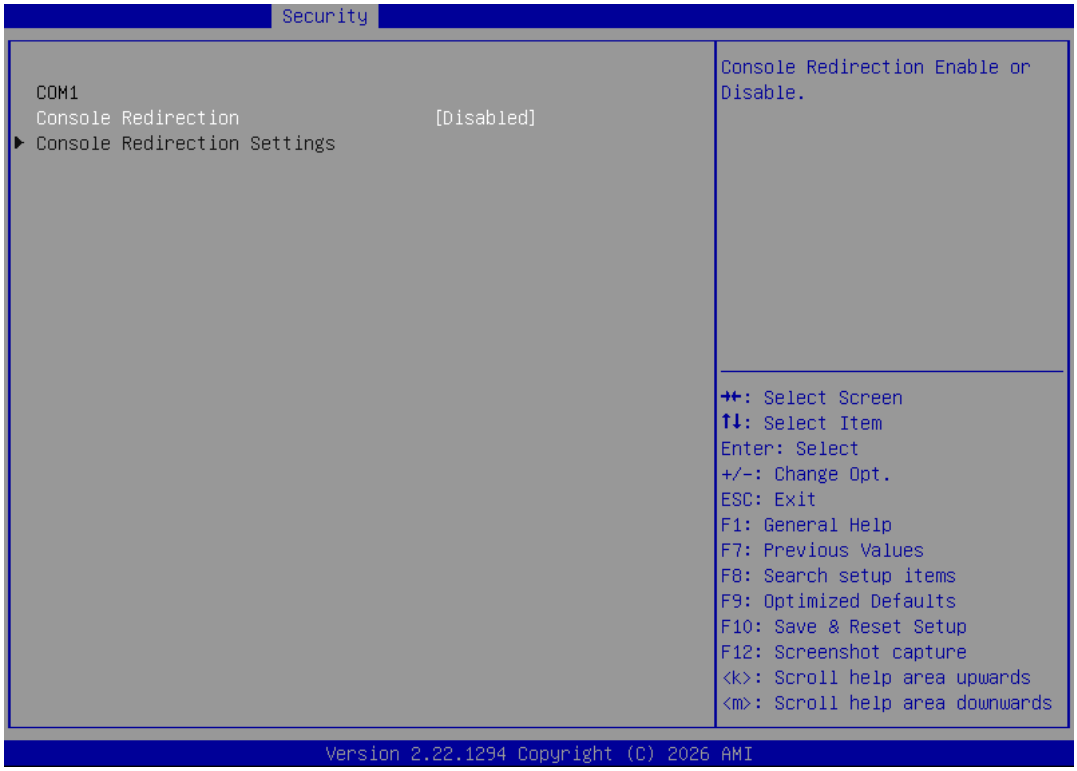
▶ PH Randomization

Enables or disables Platform Hierarchy (PH) Randomization.

▶ Device Select

Select your TPM device through this setting.

► Serial Port Console Redirection

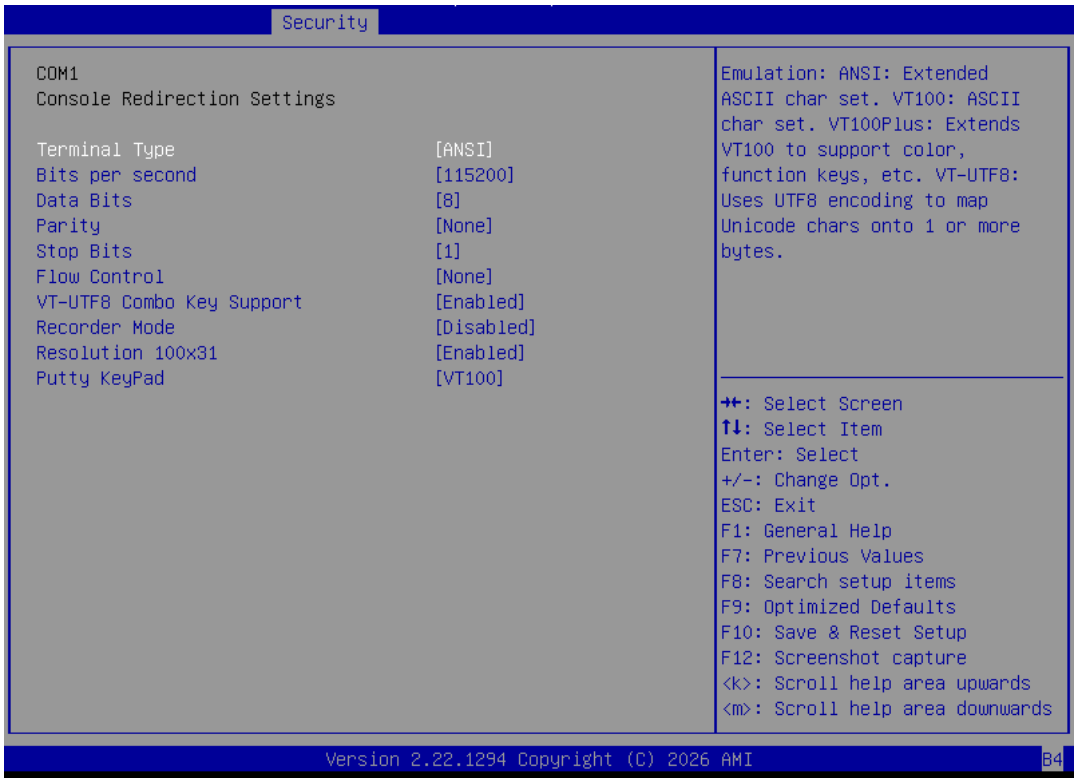


▶ Console Redirection

Console Redirection operates in host systems that do not have a monitor and keyboard attached. This setting enables or disables the operation of console redirection. When set to [Enabled], BIOS redirects and sends all contents that should be displayed on the screen to the serial COM port for display on the terminal screen. Besides, all data received from the serial port is interpreted as keystrokes from a local keyboard.

▶ Console Redirection Settings (COM1)

This option appears when Console Redirection is **enabled**.



» Terminal Type

To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal(s). You can select emulation for the terminal from this setting.

[ANSI]	Extended ASCII character set.
[VT100]	ASCII character set.
[VT100Plus]	Extends VT100 to support color, function keys, etc.
[VT-UTF8]	Uses UTF8 encoding to map Unicode characters onto one or more bytes.

» Bits per second, Data Bits, Parity, Stop Bits

These setting specifies the transfer rate (bits per second, data bits, parity, stop bits) of Console Redirection.

» Flow Control

Flow control is the process of managing the rate of data transmission between two nodes. It's the process of adjusting the flow of data from one device to another to ensure that the receiving device can handle all of the incoming data. This is particularly important where the sending device is capable of sending data much faster than the receiving device can receive it.

» VT-UTF8 Combo Key Support

This setting enables or disables the VT-UTF8 combination key support for ANSI/VT100 terminals.

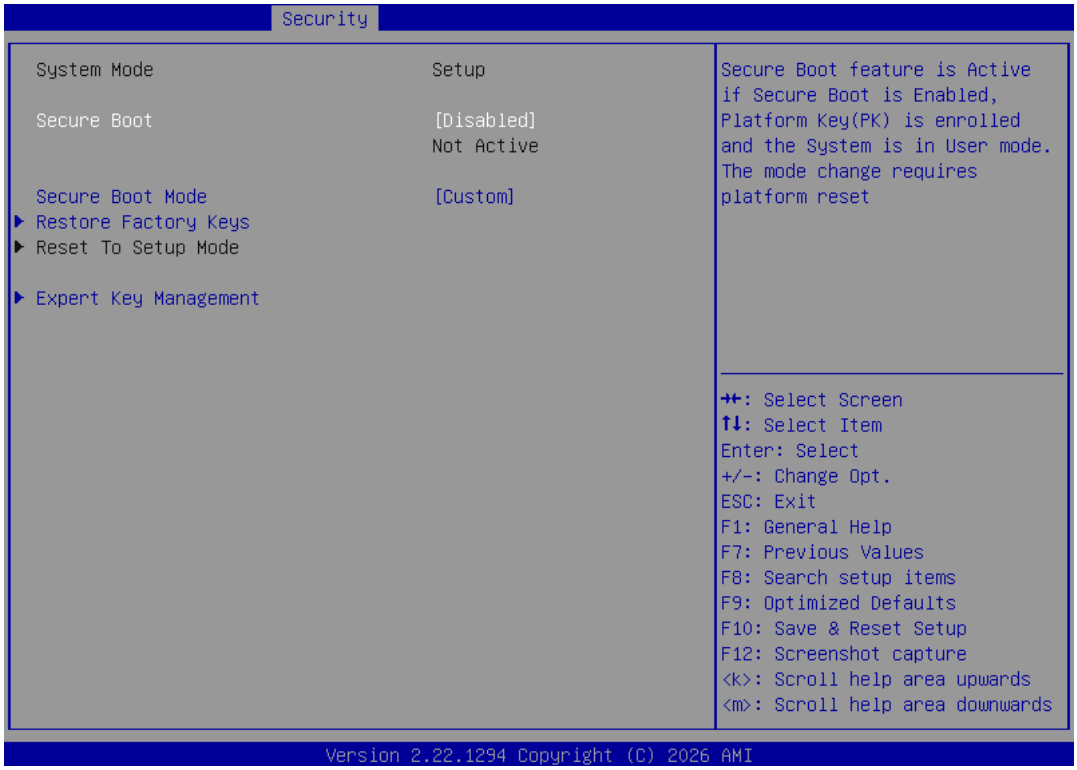
» **Recorder Mode, Resolution 100x31**

These settings enables or disables the recorder mode and the resolution 100x31.

» **Putty KeyPad**

PuTTY is a terminal emulator for Windows. This setting controls the numeric keypad for use in PuTTY.

► Secure Boot



▶ Secure Boot

Secure Boot function can be enabled only when the **Platform Key (PK)** is enrolled and running accordingly.

▶ Secure Boot Mode

Selects the secure boot mode. This item appears when **Secure Boot** is enabled.

[Standard] The system will automatically load the secure keys from BIOS.

[Custom] Allows user to configure the secure boot settings and manually load the secure keys.

▶ Restore Factory Keys

Allows you to restore all factory default keys. The settings will be applied after reboot or at the next reboot. This item appears when **"Secure Boot Mode"** sets to **[Custom]**.

▶ Reset to setup Mode

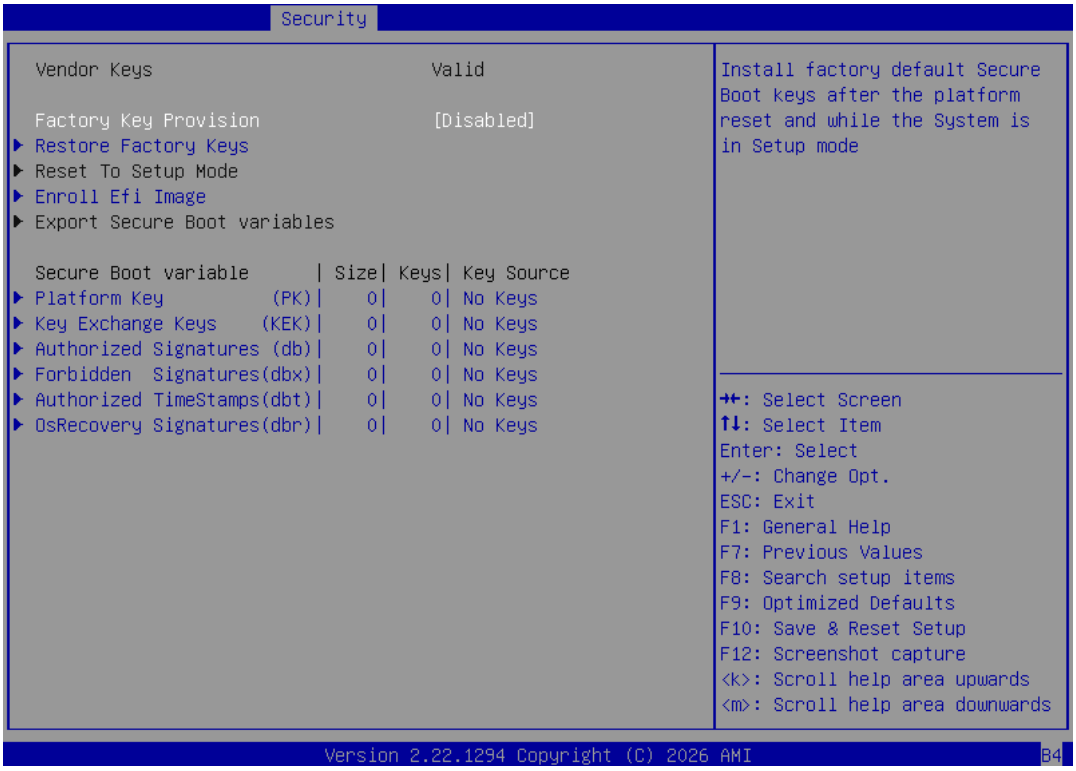
Allows you to delete all the Secure Boot keys (PK,KEK,db,dbt,dbx). The settings will be applied after reboot or at the next reboot. This item appears when**"Secure Boot Mode"**sets to **[Custom]**.

▶ Expert Key Management

Press **Enter** key to enter the sub-menu. Manage the secure boot keys. This item appears when**"Secure Boot Mode"**sets to **[Custom]**.

▶ Expert Key Management

Press **Enter** key to enter the sub-menu. Manage the secure boot keys. This item appears when**"Secure Boot Mode"**sets to **[Custom]**.



» **Platform Key (PK):**

The Platform Key (PK) can protect the firmware from any un-authenticated changes. The system will verify the PK before your system enters the OS. Platform Key (PK) is used for updating KEK.

» **Set New Key**

Sets a new PK to your system.

» **Delete Key**

Deletes the PK from your system.

» **Key Exchange Keys (KEK):**

Key Exchange Key (KEK) is used for updating DB or DBX.

» **Set New Key**

Sets a new KEK to your system.

» **Append Key**

Loads an additional KEK from storage devices to your system.

» **Delete Key**

Deletes the KEK from your system.

» **Authorized Signatures (db) :**

Authorized Signatures (db) lists the signatures that can be loaded.

» **Set New Key**

Sets a new db to your system.

» **Append Key**

Loads an additional db from storage devices to your system.

» **Delete Key**

Deletes the db from your system.

» **Forbidden Signatures (dbx):**

Forbidden Signatures (dbx) lists the forbidden signatures that are not trusted and cannot be loaded.

» **Set New Key**

Sets a new dbx to your system.

» **Append Key**

Loads an additional dbx from storage devices to your system.

» **Delete Key**

Deletes the dbx from your system.

» **Authorized TimeStamps (dbt):**

Authorized TimeStamps (dbt) lists the authentication signatures with authorization time stamps.

» **Set New Key**

Sets a new DBT to your system.

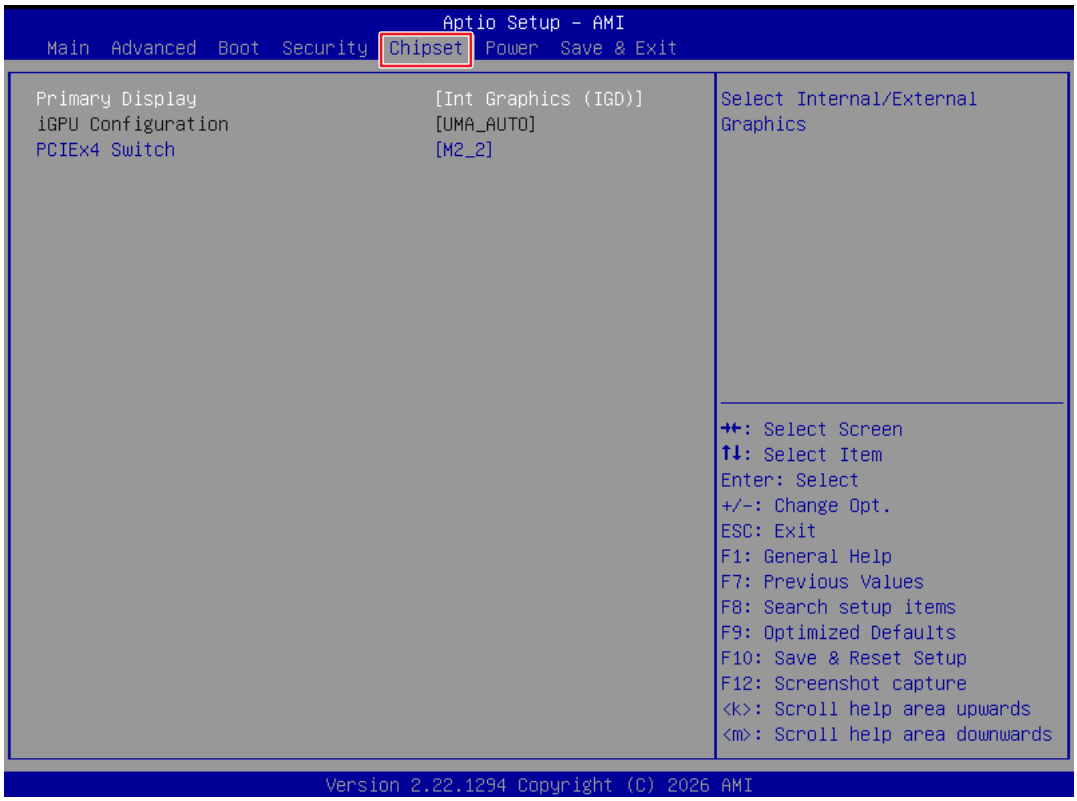
» **Append Key**

Loads an additional DBT from storage devices to your system.

» **OsRecovery Singnatures (dbr):**

Lists the available signatures for OS recovery.

4.7 Chipset



► Primary Display

Selects the primary graphics controller for initial display output during system boot.

[Int Graphics (IGD)]	Prioritizes the Integrated Graphics Device (IGD) built into the CPU.
[Ext Graphics (PEG)]	Prioritizes an external, discrete graphics card installed via the PCI Express Graphics (PEG) slot.

► iGPU Configuration

Configures system memory allocations for the integrated graphics unit (iGPU) or disables it entirely.

This item will **gray out** when the Primary Display is set to **[Int Graphics (IGD)]**.

[UMA_AUTO]	Automatically allocates system memory dynamically for the integrated graphics engine based on runtime demand.
[UMA_SPECIFIED]	Allows manual configuration of the dedicated integrated graphics frame buffer allocation.
[UMA_GAME_OPTIMIZED]	Automatically applies high-performance, pre-allocated frame buffer configurations optimized for heavier compute loads.
[iGPU Disabled]	Turns off the CPU's integrated graphics unit completely.

► UMA Frame buffer Size

Determines the exact amount of main system RAM permanently allocated as dedicated Video RAM (VRAM) for the integrated graphics unit.

This option will only display when iGPU Configuration is set to **[UMA_SPECIFIED]**.

[AS CRB] Uses the standard AMD Customer Reference Board (CRB) default memory allocation profile.

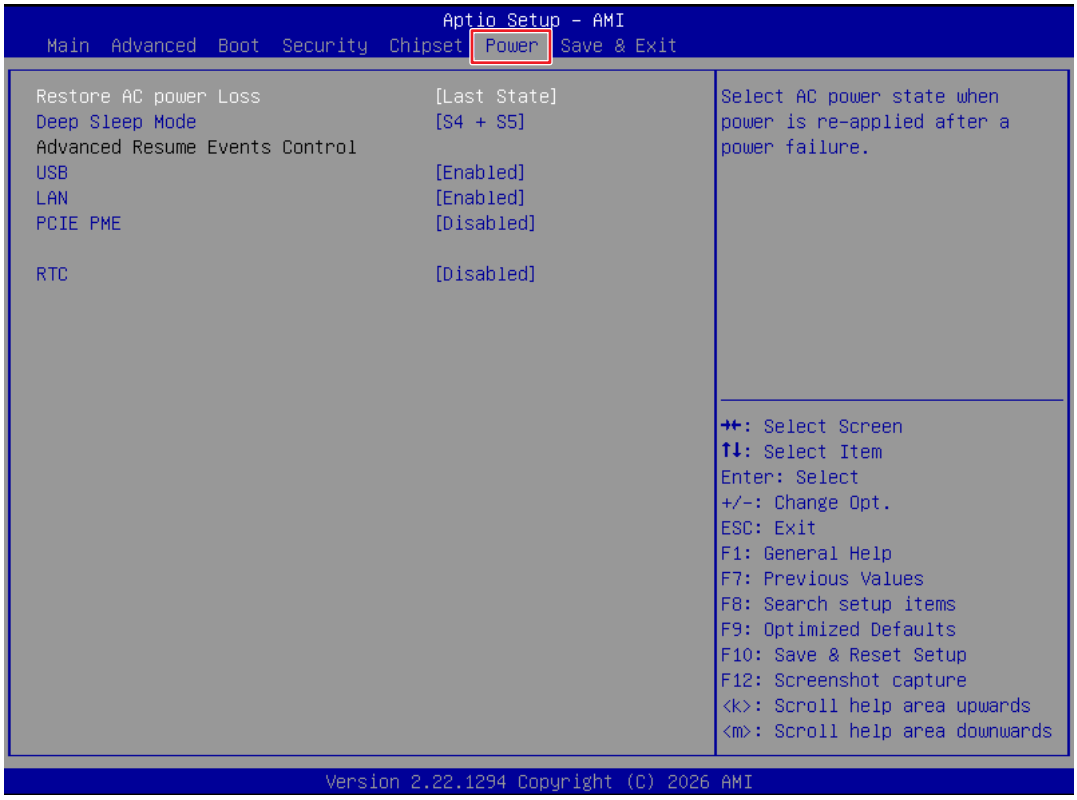
► PCIEx4 Switch

Manages hardware lane routing for the shared motherboard PCIe x4 resource interface.

[M2_2] Routes the x4 bandwidth to an M.2 NVMe interface (M2_2).

[PCI_E2] Diverts the x4 bandwidth lines to power the physical PCIe expansion slot (PCI_E2).

4.8 Power



► Restore AC Power Loss

Configures the system behavior and power state when AC power is restored after an unexpected power outage.

This menu automatically grays out when the motherboard hardware or jumper is configured to **AT Mode**.

[Last State] Restores the system to the power state prior to the power failure.

[Power On] Powers on the system immediately upon AC power recovery.

[Power Off] Keeps the system in a powered-off state until the power button is physically pressed.

► Deep Sleep Mode

Controls the sub-system power reduction intensity during deep sleep phases to comply with power saving standards.

[S4+S5] Forces the system to enter a deep power-saving state during Suspend-to-Disk (S4) and Soft-Off (S5) by cutting off standby power rails (e.g., +5VSB). This will disable USB wake capability.

[Disabled] Disables deep sleep mode function.

► USB

Enables or disables the USB device to wake up the system from S4/ S5 sleep state.

► LAN

Enables or disables the system to be awakened from the power saving modes when activity or input signal of Intel LAN device is detected.

► PCIE PME

Enables or disables the system to be awakened from power saving modes when a PCIe Power Management Event (PME) signal is asserted by an installed PCIe card.

► RTC

Configures the Real-Time Clock (RTC) alarm behavior for automated scheduled hardware power-on events.

[Disabled]	Disables scheduled time-based automatic power-on sequences.
[Daily]	Sets the system to power-on at a designated time every day.
[Dynamic]	Sets a moving interval wake schedule based on user-defined dynamic incremental timers.
[Weekly]	Sets a weekly recurrence schedule to wake up the system on specific selected days of the week.

The following sub-items only display when RTC is set to **[Daily]**.

» **wake up hour / wake up minute / wake up second**

Sets the precise daily execution timestamp using a 24-hour clock formatting model.

Adjustable range: Hour: 0-23, Minute: 0-59, Second: 0-59.

The following sub-items only display when RTC is set to **[Dynamic]**.

» **wake up minute increase**

Specifies the duration in minutes to wait before re-initiating a boot after the computer shuts down.

Adjustable range: 1-5.

The following sub-items only display when RTC is set to **[Weekly]**.

» **Monday ~ Sunday**

Toggles individual weekday selections to define exactly which days the system should actively trigger the weekly alarm.

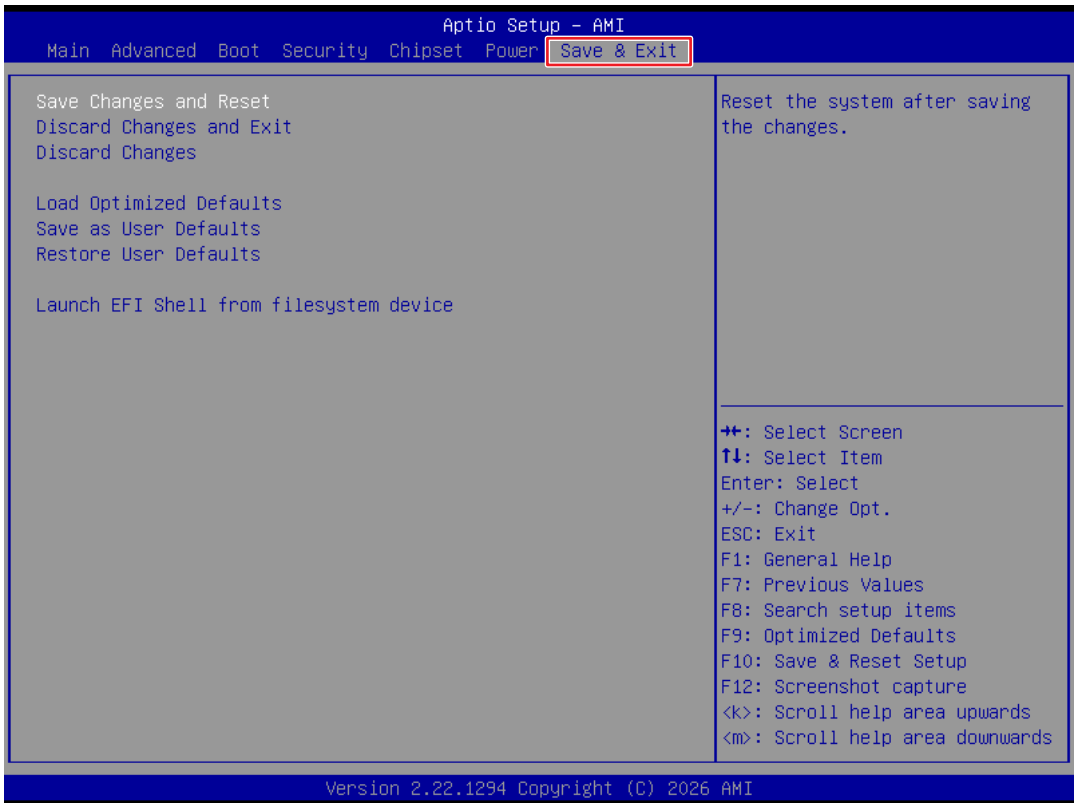
Options: [Disabled] / [Enabled].

» **Wake up hour / Wake up minute / Wake up second**

Sets the execution time parameters on the specific weekdays configured to [Enabled].

Adjustable range: Hour: 0-23, Minute: 0-59, Second: 0-59.

4.9 Save & Exit



► Save Changes and Reset

Save changes to CMOS and reset the system.

► Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

► Discard Changes

Abandon all changes.

► Load Optimized Defaults

Use this menu to load the default values set by the motherboard manufacturer specifically for optimal performance of the motherboard.

► Save as User Defaults

Save changes as the user's default profile.

► Restore User Defaults

Restore the user's default profile.

► Launch EFI Shell from filesystem device

This setting helps to launch the EFI Shell application from one of the available file system devices.

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