

# **GIGABYTE™**

## **R113-C10-AA01**

## **R113-C10-AA02**

Rack Server - AMD Ryzen™ 7000 - 1U UP 4-Bay SATA

Single 350W Bronze power supply (AA01)

Single 400W Gold power supply (AA02)

## **User Manual**

Rev. 1.0

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## **Documentation Classifications**

In order to assist in the use of this product, GIGABYTE provides the following types of documentation:

- User Manual: detailed information & steps about the installation, configuration and use of this product (e.g. motherboard, server barebones), covering hardware and BIOS.
- User Guide: detailed information about the installation & use of an add-on hardware or software component (e.g. BMC firmware, rail-kit) compatible with this product.
- Quick Installation Guide: a short guide with visual diagrams that you can reference easily for installation purposes of this product (e.g. motherboard, server barebones).

Please see the support section of the online product page to check the current availability of these documents.

## **For More Information**

For related product specifications, the latest firmware and software, and other information please visit our website at <http://www.gigabyte.com>




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## Conventions

The following conventions are used in this user's guide:

	<b>NOTE!</b> Pieces of additional information related to the current topic.
	<b>CAUTION!</b> Precautionary measures to avoid possible hardware or software problems.
	<b>WARNING!</b> Alerts to any damage that might result from doing or not doing specific actions.

## Server Warnings and Cautions

Before installing a server, be sure that you understand the following warnings and cautions.



### WARNING!

#### To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.



### WARNING!

To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



### WARNING!

This server is equipped with high speed fans. Keep away from hazardous moving fan blades during servicing.



### CAUTION!

- Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.
- Danger of explosion if battery is incorrectly replaced.
- Replace battery with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.



### CAUTION!

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



## Electrostatic Discharge (ESD)

### CAUTION!

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTI-STATIC WRIST STRAP ATTACHED TO CHASSIS GROUND -- ANY UNPAINTED METAL SURFACE -- ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully, they can be extremely sensitive to ESD. Hold boards only by their edges without touching any components or connectors. After removing a board from its protective ESD bag or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the ESD bag. Do not slide the board over any surface.

**System power on/off:** To service components within the server, please ensure the power has been disconnected.

e.g. Remove the node from the server chassis (to disconnect power) or disconnect the power from the server chassis.

Make sure the system is removed from the rack before opening the chassis, adding, or removing any non hot-plug components.

**Hazardous conditions, devices and cables:** Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system chassis and disconnect the cables attached to the system before servicing the chassis. Otherwise, personal injury or equipment damage can result.

**Electrostatic discharge (ESD) and ESD protection:** ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface on the server) when handling parts.

**ESD and handling boards:** Always handle boards carefully. They can be extremely sensitive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

**Installing or removing jumpers:** A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fingertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

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# Chapter 1 Hardware Installation

## 1-1 Installation Precautions

The motherboard/system contain numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the service guide and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

# 1-2 Product Specifications



**NOTE:**

We reserve the right to make any changes to the product specifications and product-related information without prior notice.

	System Dimension	<ul style="list-style-type: none"> <li>◆ 1U</li> <li>◆ 430 (W) x 43.5 (H) x 393.2(D) mm</li> </ul>
	CPU	<ul style="list-style-type: none"> <li>◆ AMD Ryzen™ 7000 Series processors</li> <li>◆ Single processor, 5nm technology</li> <li>◆ TDP up to 105W</li> </ul> <p>*Overclocking not supported due to thermal limitation.</p>
	Socket	◆ AM5
	Chipset	◆ AMD B650E
	Security	<ul style="list-style-type: none"> <li>◆ UEFI Secure Boot</li> <li>◆ SNMP Support: V3</li> </ul>
	Memory	<ul style="list-style-type: none"> <li>◆ 4 x DIMM slots</li> <li>◆ DDR5 memory supported only</li> <li>◆ Dual Channel memory architecture</li> <li>◆ DIMM modules up to 32GB supported</li> <li>◆ ECC Unbuffered DIMM 1Rx8/2Rx8 modules supported</li> <li>◆ Non-ECC Unbuffered DIMM 1Rx8/2Rx8/1Rx16 modules supported</li> <li>◆ Memory speed: up to 5200 MHz (1DPC), 3600 MHz (2DPC)</li> </ul>
	LAN	<p><b>Rear side:</b></p> <ul style="list-style-type: none"> <li>◆ 2 x 1Gb/s LAN ports (2 x Intel® I210-AT)</li> <li>◆ Support NCSI function</li> </ul> <p>1 x 10/100/1000 management LAN</p>
	Video	<ul style="list-style-type: none"> <li>◆ Integrated in Aspeed® AST2600</li> <li>◆ 2D Video Graphic Adapter with PCIe bus interface</li> <li>◆ 1920x1200@60Hz 32bpp, DDR4 SDRAM</li> </ul>
	Storage	<p><b>Front side:</b></p> <ul style="list-style-type: none"> <li>◆ 2 x 2.5" SATA hot-swappable bays</li> </ul> <p><b>Internal:</b></p> <ul style="list-style-type: none"> <li>◆ 2 x 2.5" SATA bays (optional)</li> <li>◆ <b>SATA supported only</b></li> </ul>
	RAID	◆ RAID 0/1/10

**Expansion Slot Riser Card CRS101R:**

- ◆ 1 x PCIe x16 (Gen5 x16) FHHL slot, from CPU

1 x M.2 slot:

- ◆ M-key
- ◆ PCIe Gen5 x4, from CPU
- ◆ Supports 2242/2280 cards

**Internal I/O**

- ◆ 1 x M.2 slot
- ◆ 1 x TPM header

**Front I/O**

- ◆ 2 x USB 3.2 Gen1
- ◆ 1 x Power button
- ◆ 1 x Reset button
- ◆ 1 x System status LED
- ◆ 1 x System power LED
- ◆ 2 x LAN activity LEDs
- ◆ 1 x HDD activity LED

**Rear I/O**

- ◆ 2 x USB 3.2 Gen1
- ◆ 1 x COM
- ◆ 1 x VGA
- ◆ 2 x RJ45
- ◆ 1 x MLAN
- ◆ 1 x ID button with LED

**TPM**

- ◆ 1 x TPM header with SPI interface
- ◆ Optional TPM2.0 kit: CTM010



## Power Supply

### **R113-C10-AA01**

- ◆ Single 350W 80 Plus Bronze power supply

#### AC Input:

- ◆ 100-240V~/ 6-3A, 50-60Hz

#### DC Output:

- ◆ Max 350W/ 100-240V~
- ◆ + 12V/ 29A
- ◆ + 5V/ 14A
- ◆ + 3.3V/ 12A
- ◆ + 5Vsb/ 2.5A

### **R113-C10-AA02**

- ◆ Single 400W 80 Plus Gold power supply

#### AC Input:

- ◆ 100-240V~, 6 - 3A, 60-50Hz

#### DC Output:

- ◆ Max 400W/ 100-240V~
- ◆ + 12V/ 33A
- ◆ + 5V/ 16A
- ◆ + 3.3V/ 14A
- ◆ + 5Vsb/ 3A



## System Management

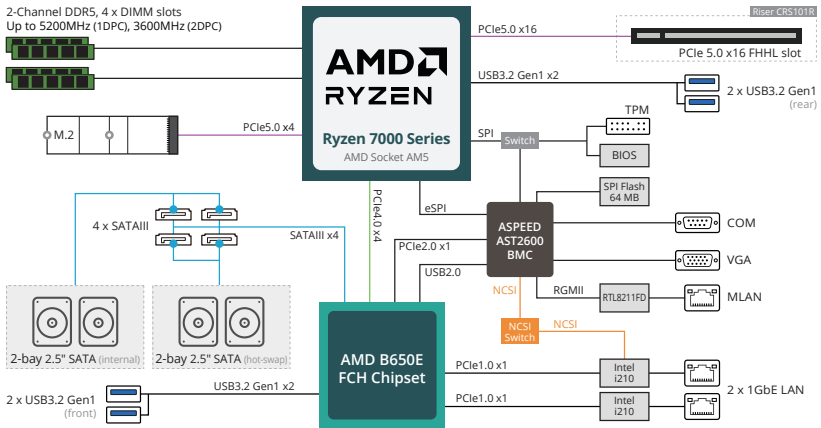
- ◆ Aspeed® AST2600 management controller
- ◆ GIGABYTE Management Console (AMI MegaRAC SP-X) web interface
  
- ◆ Dashboard
- ◆ HTML5 KVM
- ◆ Sensor Monitor (Voltage, RPM, Temperature, CPU Status ...etc.)
- ◆ Sensor Reading History Data
- ◆ FRU Information
- ◆ SEL Log in Linear Storage / Circular Storage Policy
- ◆ Hardware Inventory
- ◆ Fan Profile
- ◆ System Firewall
- ◆ Power Consumption
- ◆ Power Control
- ◆ LDAP / AD / RADIUS Support
- ◆ Backup & Restore Configuration
- ◆ Remote BIOS/BMC/CPLD Update
- ◆ Event Log Filter
- ◆ User Management
- ◆ Media Redirection Settings
- ◆ PAM Order Settings
- ◆ SSL Settings
- ◆ SMTP Settings



## Operating Properties

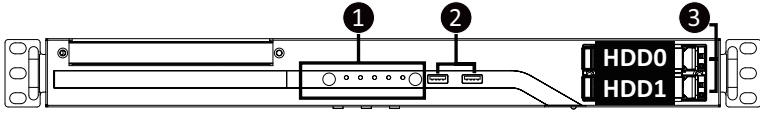
- ◆ Operating temperature: 10°C to 35°C
- ◆ Operating humidity: 8%-80% (non-condensing)
- ◆ Non-operating temperature: -40°C to 60°C
- ◆ Non-operating humidity: 20%-95% (non-condensing)

# 1-3 System Block Diagram



## Chapter 2 System Appearance

### 2-1 Front View



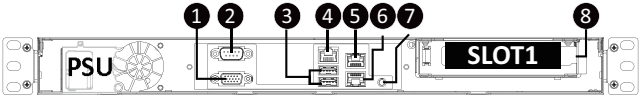
No.	Description
1.	Front Panel LEDs and Buttons
2.	USB 3.2 Gen1 Port x 2
3.	3.5" Drive Bays



- Refer to section **2-3 Front Panel LEDs and Buttons** for a detailed description of the function of the LEDs.

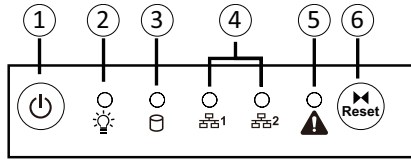


## 2-2 Rear View



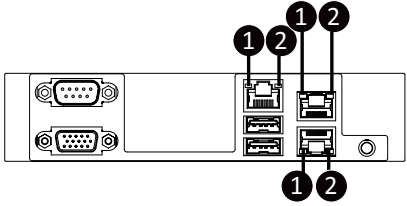
No.	Description
1.	VGA Port
2.	Serial Port
3.	USB 3.2 Gen1 Port x 2
4.	Server Management LAN Port
5.	1 GbE LAN Port #1
6.	1 GbE LAN Port #2
7.	ID Button with LED
8.	PCIe Card Slot

## 2-3 Front Panel LED and Buttons



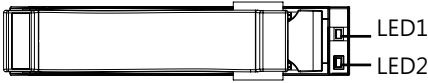
No.	Name	Color	Status	Description
1.	Power button with LED			Press the button to power on the system.
2.	Power LED	Green	On	System is powered on
		Green	Blink	System is in ACPI S1 state (sleep mode)
		N/A	Off	<ul style="list-style-type: none"> <li>System is not powered on or in ACPI S5 state (power off)</li> <li>System is in ACPI S4 state (hibernate mode)</li> </ul>
3.	HDD Status LED	Green	On	HDD locate
			Blink	HDD access
		Amber	On	HDD fault
		Green/Amber	Blink	HDD rebuilding
		N/A	Off	No HDD access or no HDD fault.
4.	LAN 1/2 Active/Link LEDs	Green	Solid On	Link between system and network or no access.
		Green	Blink	Data trasmission or receiving is occuring
		N/A	Off	No data transmission or receiving is occuring
5.	System Status LED	Green	On	Indicates system is operating normally.
			On	Indicates a critical condition, may include: <ul style="list-style-type: none"> <li>- System fan failure</li> <li>- System temperature</li> </ul>
		Amber	Blink	Indicates non-critical condition, may include: <ul style="list-style-type: none"> <li>- Redundant power module failure</li> <li>- Temperature and voltage issue</li> <li>- Chassis intrusion</li> </ul>
			Off	Indicates system is not ready, may include: <ul style="list-style-type: none"> <li>- POST error</li> <li>- NMI error</li> <li>- Processor or terminator is missing</li> </ul>
6.	Reset Button			Press the button to reset the system.

## 2-4 Rear System LAN LEDs



No.	Name	Color	Status	Description
1.	1GbE Speed LED	Yellow	On	1 Gbps data rate
		Green	On	100 Mbps data rate
		N/A	Off	10 Mbps data rate
2.	1GbE Link / Activity LED	Green	On	Link between system and network or no access
			Blink	Data transmission or reception is occurring.
		N/A	Off	No data transmission or reception is occurring.

## 2-5 Hard Disk Drive LEDs



RAID SKU		LED #1	Locate	HDD Fault	Rebuilding	HDD Access	HDD Present (No Access)
No RAID configuration (via HBA)	Disk LED (LED on Back Panel)	Green	ON(*1)	OFF		BLINK (*2)	OFF
		Amber	OFF	OFF		OFF	OFF
	Removed HDD Slot (LED on Back Panel)	Green	ON(*1)	OFF		--	--
		Amber	OFF	OFF		--	--
RAID configuration (via HW RAID Card or SW RAID Card)	Disk LED	Green	ON	OFF		BLINK (*2)	OFF
		Amber	OFF	ON	(Low Speed: 2 Hz)	OFF	OFF
	Removed HDD Slot	Green	ON(*1)	OFF	(*3)	--	--
		Amber	OFF	ON	(*3)	--	--

LED #2	HDD Present	No HDD
Green	ON	OFF

**NOTE:**

\*1: Depends on HBA/Utility Spec.

\*2: Blink cycle depends on HDD's activity signal.

\*3: If HDD is pulled out during rebuilding, the disk status of this HDD is regarded as faulty.

## Chapter 3 System Hardware Installation



### Pre-installation Instructions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damage to your computer or injury to yourself.

- Always disconnect the computer from the power outlet whenever you are working inside the computer case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal system of the computer case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging until you are ready to use the component for the installation.

### 3-1 Removing and Installing the Chassis Cover

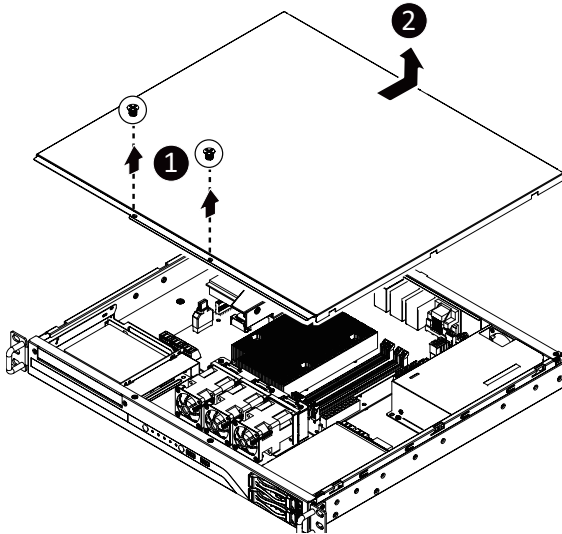


Before you remove or install the system cover

- Make sure the system is not turned on or connected to AC power.

**Follow these instructions to remove the chassis cover:**

1. Remove the two screws securing the top cover.
2. Slide the cover to the rear of the system and then remove the cover in the direction indicated by the arrow.
3. To reinstall the chassis cover follow steps 1-4 in reverse order.



## 3-2 Removing and Installing the Hard Disk Drive

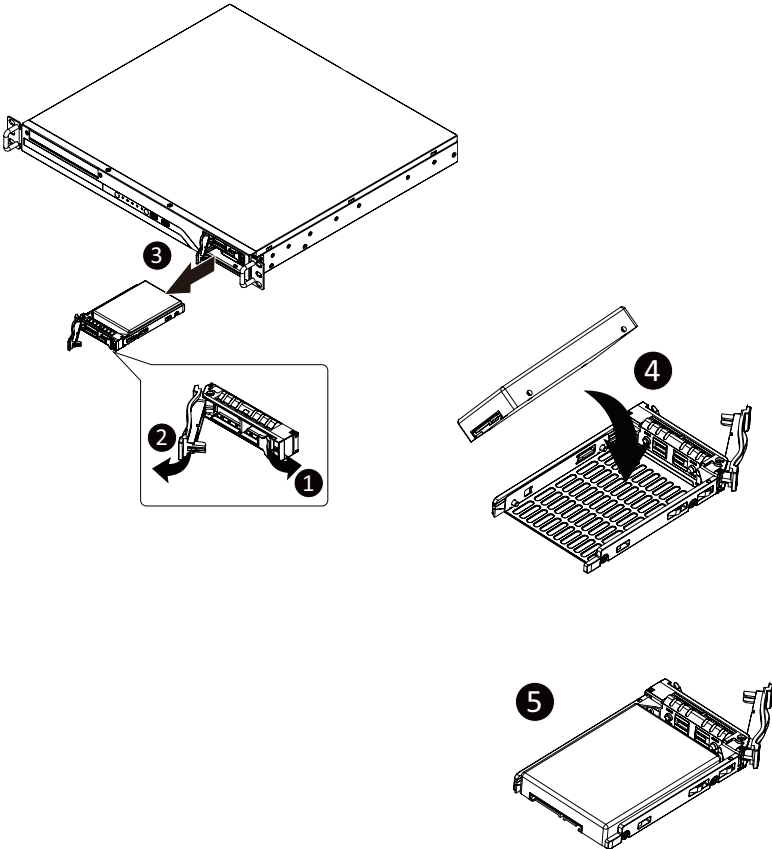


Read the following guidelines before you begin to install the hard disk drive:

- Take note of the HDD tray orientation before sliding it out.
- The tray will not fit back into the bay if it is inserted incorrectly.
- Make sure that the hard disk drive is connected to the connector on the backplane.

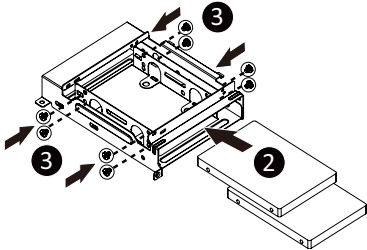
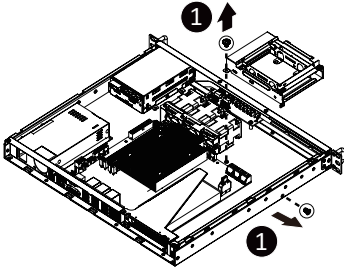
Follow these instructions to install a 2.5" hard disk drive:

1. Press the release button.
2. Extend the locking lever.
3. Pull the locking lever in the direction indicated to remove the HDD tray.
4. Align the hard disk drive with the positioning stud on the HDD tray.
5. Slide the hard disk drive into the HDD tray.
6. Reinsert the HDD tray into the slot and close the locking lever.



**Follow these instructions to install one Hard disk drive:**

- 1. Loosen and remove the screws securing the HDD cage.
- 2. Slide the HDD into the HDD cage.
- 3. Replace the HDD cage to system and secure it with screw.
- 4. Connect necessary cables.





### 3-3 Removing and Installing the CPU and Heat Sink



Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system unit on a flat and stable surface.
- Open the system according to the instructions.

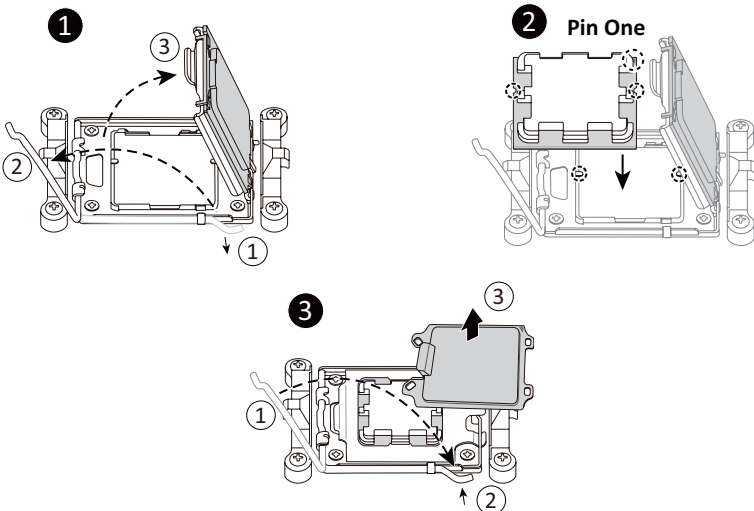


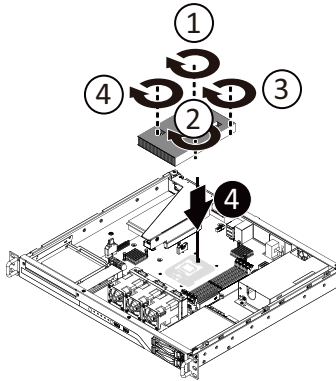
#### **WARNING!**

Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

#### **Follow these instructions to install the CPU:**

1. Gently press the CPU socket lever handle down and away from the socket. Lift up the CPU socket locking lever and then open the CPU cover.
2. Align the CPU pin one (triangle marking) with the pin one corner of the CPU socket. Install the CPU onto the socket.
3. Ensure the CPU is positioned into its socket and then close the CPU cover. Secure the CPU socket lever under its retention tab. The plastic protective cover will pop off by itself and can be removed  
**NOTE:** Always replace the plastic protective cover when the CPU is not installed to protect the CPU socket.
4. Align and place the heatsink onto the top of the CPU socket.
5. To secure the heatsink, tighten the four screws to the CPU socket.
6. To remove the heatsinks and CPUs, follow steps 1-5 in reverse order.





- Lock the CPU by using a Torx T20 screwdriver to tighten screw.
- When installing the heatsink to CPU, use a Torx T20 screwdriver to tighten 4 captive nuts in sequence as 1-4.
- The screw tightening torque:  $13.5 \pm 0.5$  kgf-cm.
- To ensure the system operates properly, make sure the heatsink is seated on the processor firmly.

## 3-4 Removing and Installing Memory

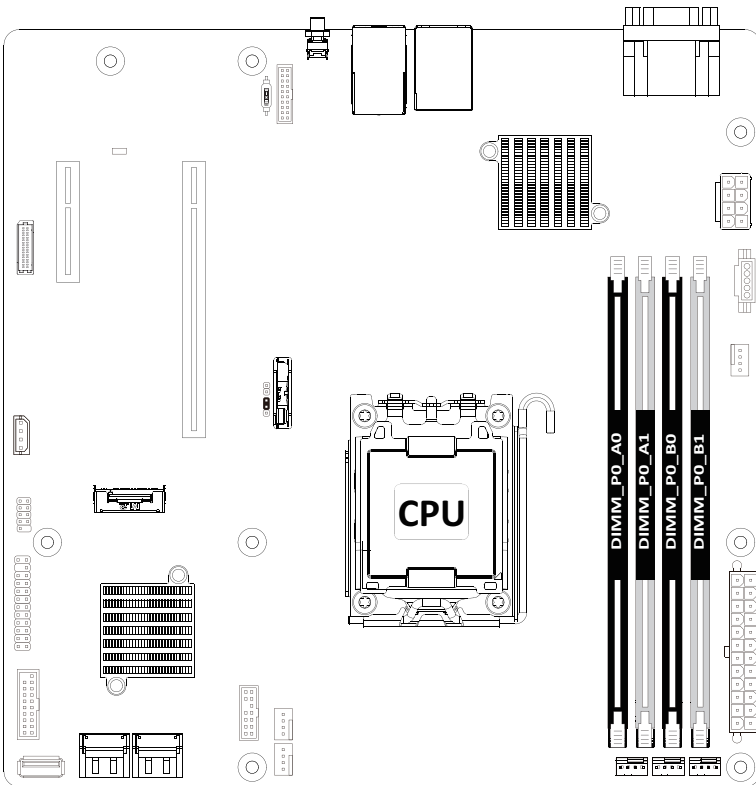


Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

### 3-4-1 Dual Channel Memory Configuration

This motherboard provides 4 DDR5 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



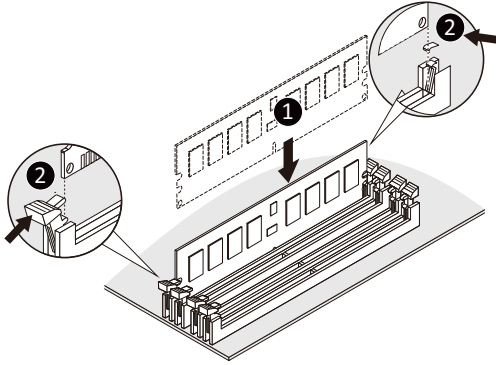
### 3-4-2 Removing and Installing a Memory Module



Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. Be sure to install DDR5 DIMMs on to this motherboard.

**Follow these instructions to install a DIMM module:**

1. Insert the DIMM memory module vertically into the DIMM slot and push it down.
2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.
3. Reverse the installation steps when you want to remove the DIMM module.



### 3-4-3 Memory Module Population Table

Memory Type	DDR5	
Voltage (V)	5V	
Connector	UDIMM ECC/Non-ECC	
Speed (MT/s)	5200	3600
Channels	1,2	
DIMM Per Channel	1,2	
DIMM Capacity (GB)	2,4,8,16,32	



**Note:**

- When only one DIMM is used, it must be populated in memory slot A1.

## 3-5 Removing and Installing the PCIe Card



- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered off and all power sources have been disconnected from the server prior to installing a PCIe card.
- Failure to observe these warnings could result in personal injury or damage to equipment.



- The PCIe riser assembly does not include a riser card or any cabling as standard. To install a PCIe card, a riser card must be installed.

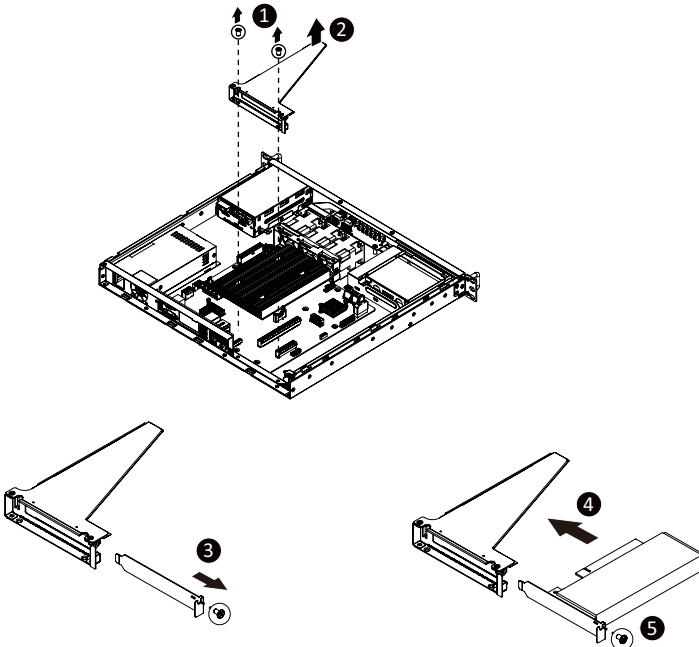
### Follow these instructions to install a PCIe card:

1. Remove the two screws securing the riser bracket
2. Lift up the riser bracket out of system.
3. Remove the screw securing the slot cover from riser bracket.
4. Orient the PCIe card with the riser guide slot and push in the direction of the arrow until the PCIe card sits in the PCIe card connector.

**NOTE:** Some riser brackets allow for single or multiple PCIe cards.

Repeat steps 3-4 as necessary.

5. Secure the PCIe card with the screw.
6. Repeat steps 1-2 to install the PCIe card into the system.



## 3-6 Installing the M.2 Device

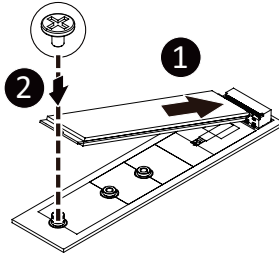


### CAUTION

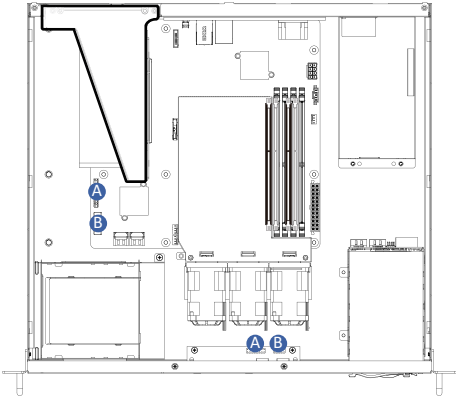
The position of the stand-off screw will depend on the size of the M.2 device. The stand-off screw is pre-installed for 2280 cards as standard. Refer to the size of the M.2 device and change the position of the stand-off screw accordingly.

### Follow these instructions to install the M.2 device:

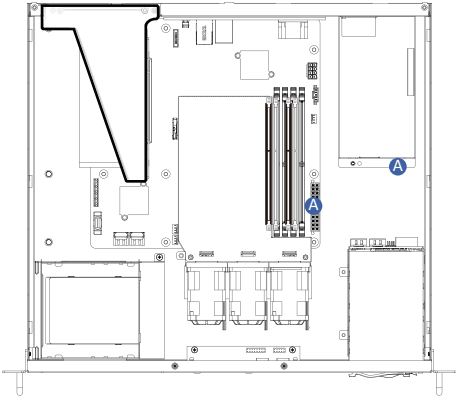
1. Insert the M.2 SSD module into the slot.
2. Secure it with the screw, tightening as necessary to fasten the M.2 SSD module in place.



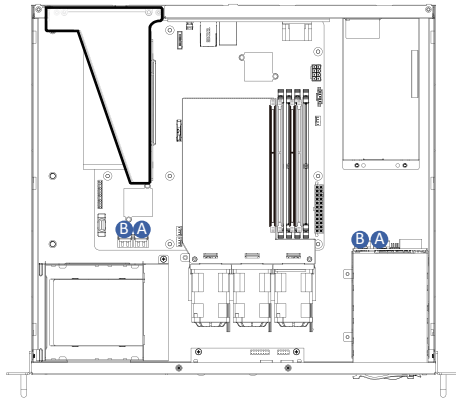
### 3-7 Cable Routing



A	Front Panel LEDs and Buttons Cable	Motherboard: FP_1
		Front IO Board: J2
B	Front USB Cable	Motherboard: F_U32
		Front IO Board: J1

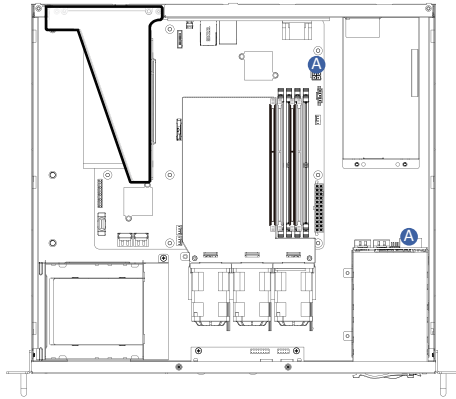


A	System Power Cable	Motherboard: ATX
		Power Supply Cable



A	SATA Cable	Motherboard: SATA1
B		Front HDD Backplane Board: SATA1
		Motherboard: SATA3
		Front HDD Backplane Board: SATA2

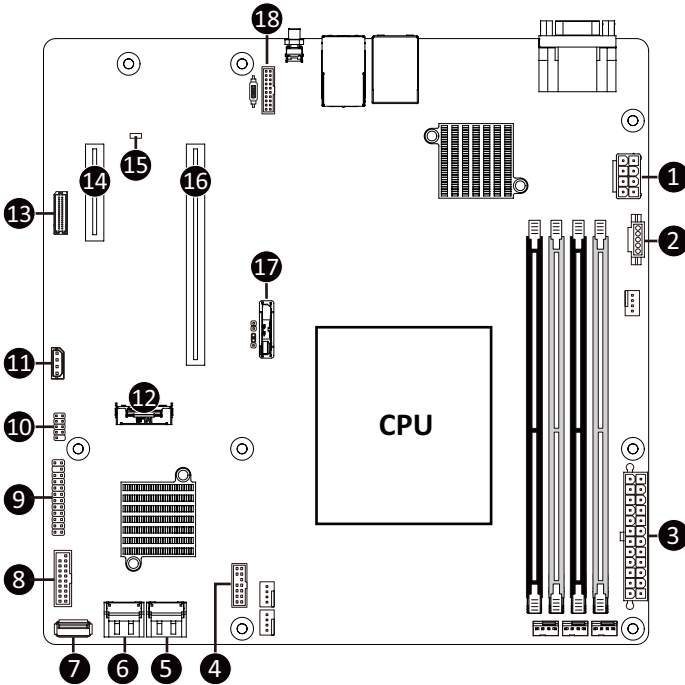




<b>B</b>	HDD Backplane Power Cable	Motherboard: ATX12V_2X4
		Front HDD Backplane Board: --

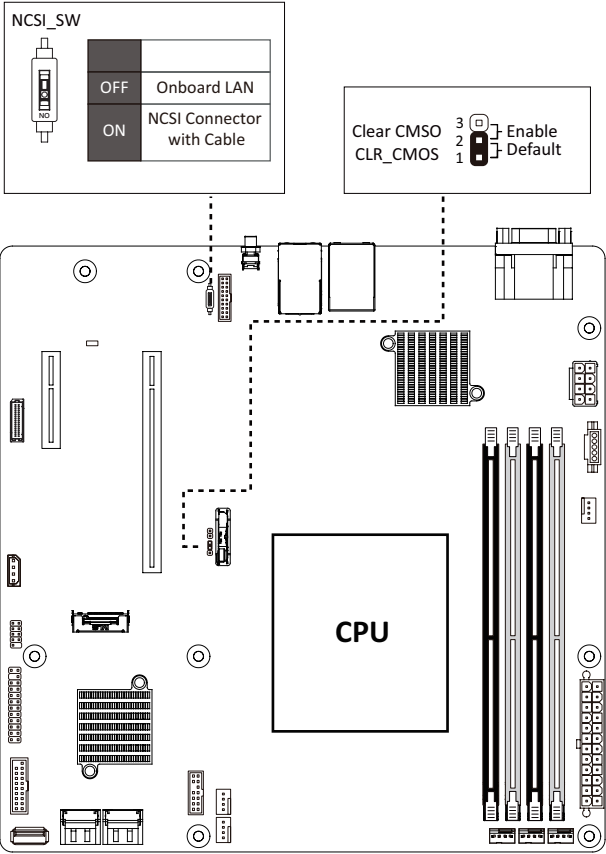
# Chapter 4 Motherboard Components

## 4-1 Motherboard Components



Item	Description
1	2x4 Pin 12V Power Connector
2	PMBus Connector
3	2x12 Pin Main Power Connector
4	TPM Connector
5	SATAIII 6Gb/s Connector #0/#1 (SATA_0_1)
6	SATAIII 6Gb/s Connector #2/#3 (SATA_2_3)
7	USB 2.0 Type-A Connector
8	Front Panel USB 3.2 Gen1 Connector
9	Front Panel Header
10	Front Panel USB 2.0 Header
11	IPMB Connector
12	M.2 Slot (PCIe Gen5 x4, Support NGFF-2280)
13	HDD Backplane Board Connector
14	PCIe x4 Slot (Gen4 x4)
15	BMC Firmware Readiness LED
16	PCIe x16 Slot (Gen5 x16)
17	System Battery
18	NCSI Connector for add-on LAN Card (CN_NSCI)

# 4-2 Jumper Settings



## Chapter 5 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters, loading the operating system etc. The BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <DEL> key during the POST when the power is turned on.



- BIOS flashing is potentially risky, if you do not encounter any problems when using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the **Exit** section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 4 for how to clear the CMOS values.)

### BIOS Setup Program Function Keys

<<-><->>	Move the selection bar to select the screen
<↑><↓>	Move the selection bar to select an item
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<Enter>	Execute command or enter the submenu
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<F1>	Show descriptions of general help
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program

■ **Main**

This setup page includes all the items of the standard compatible BIOS.

■ **Advanced**

This setup page includes all the items of AMI BIOS special enhanced features.

(ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)

■ **Chipset**

This setup page includes all the submenu options for configuring the functions of the North Bridge.

■ **Server Management**

Server additional features enabled/disabled setup menus.

■ **Security**

Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.

A supervisor password allows you to make changes in BIOS Setup.

A user password only allows you to view the BIOS settings but not to make changes.

■ **Boot**

This setup page provides items for configuration of the boot sequence.

■ **Save & Exit**

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)

Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

# 5-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

## Main Menu Help

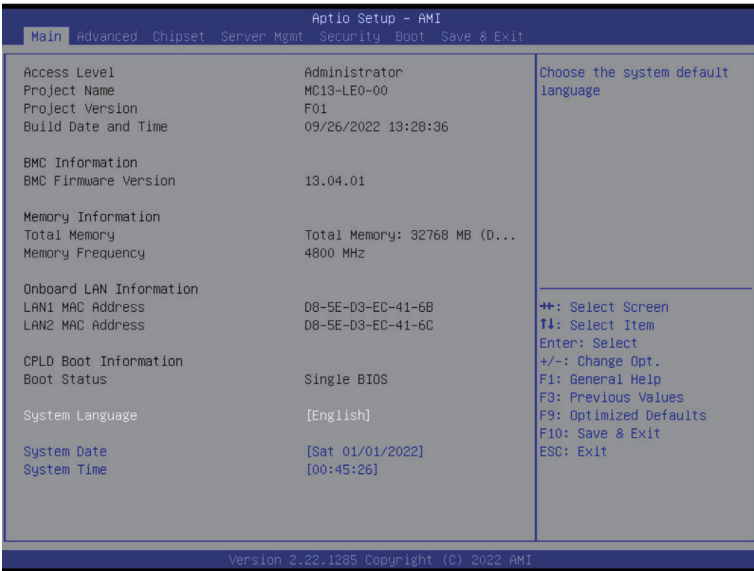
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

## Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.



- When the system is not stable as usual, select the **Restore Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.



(Note) The model name will vary depends on the product you purchased

Parameter	Description
Access Level	Displays the privileges level information.
Project Name	Displays the project name information.
Project Version	Displays version number of the BIOS setup utility.
Build Date and Time	Displays the date and time when the BIOS setup utility was created.
BMC Information <sup>(Note1)</sup>	
BMC Firmware Version <sup>(Note1)</sup>	Displays BMC firmware version information.
Memory Information	
Total Memory <sup>(Note2)</sup>	Displays the total memory size of the installed memory.
Memory Frequency <sup>(Note2)</sup>	Displays the frequency information of the installed memory.
Onboard LAN Information	
LAN# MAC Address <sup>(Note3)</sup>	Displays LAN MAC address information.
CPLD Boot Information	
Boot Status	Displays CPLD boot information.
System Language	Default setting is English.
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

(Note1) Functions available on selected models.

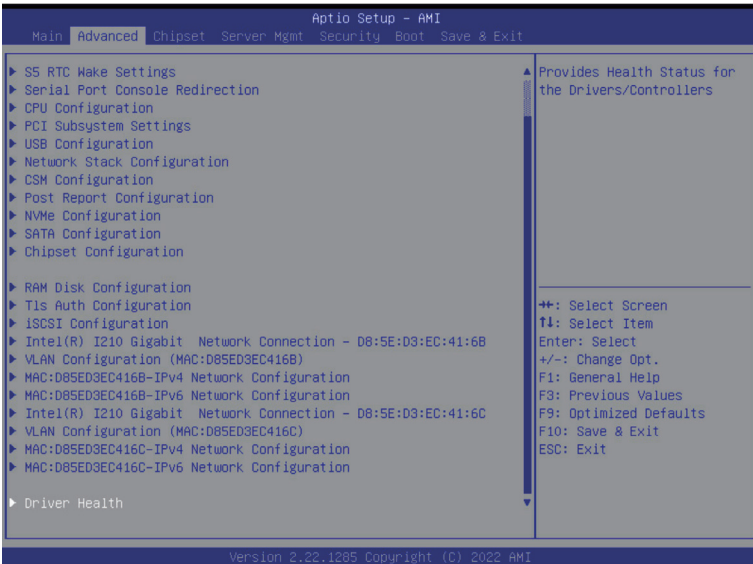
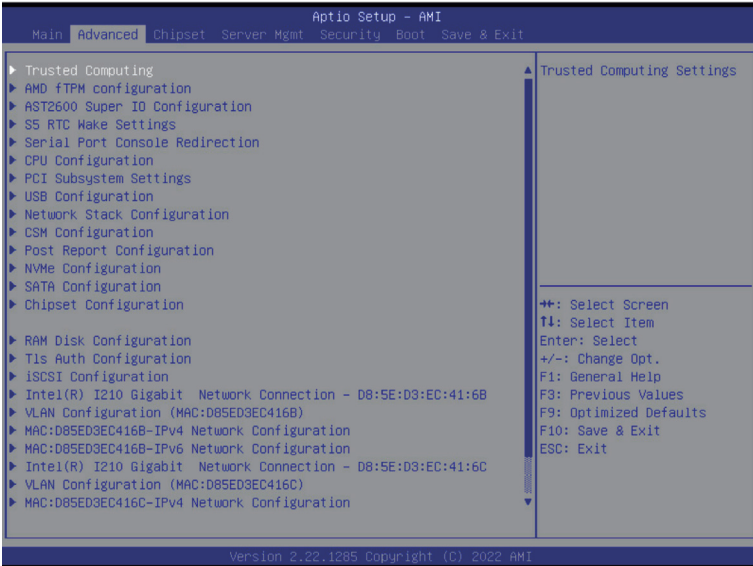
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

(Note3) The number of LAN ports listed will depend on the motherboard / system model.

## 5-2 Advanced Menu

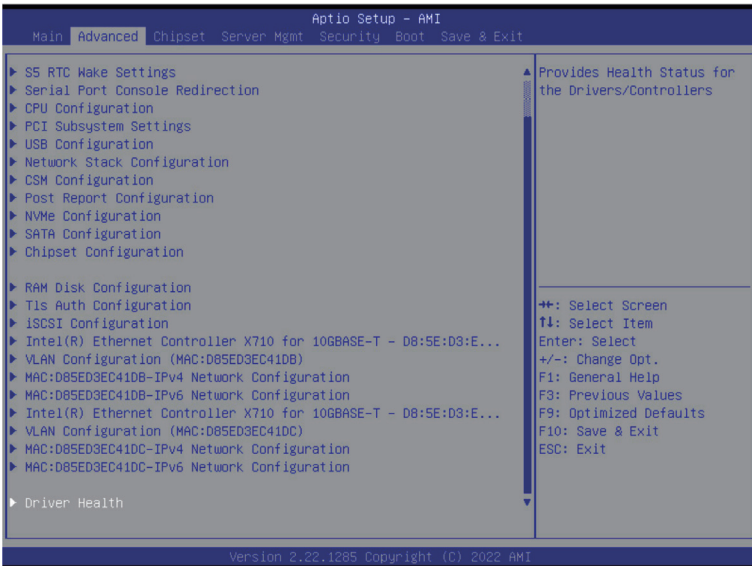
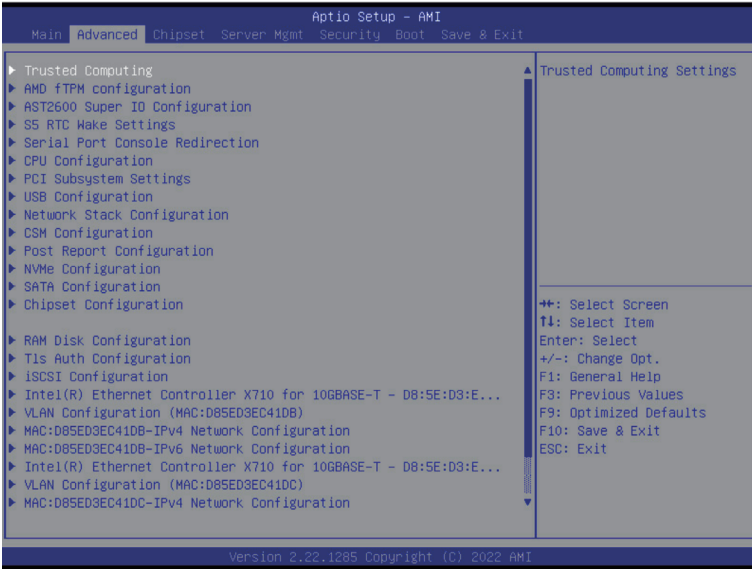
The Advanced Menu displays submenu options for configuring the function of various hardware components. Select a submenu item, then press <Enter> to access the related submenu screen.

### MC13-LE0

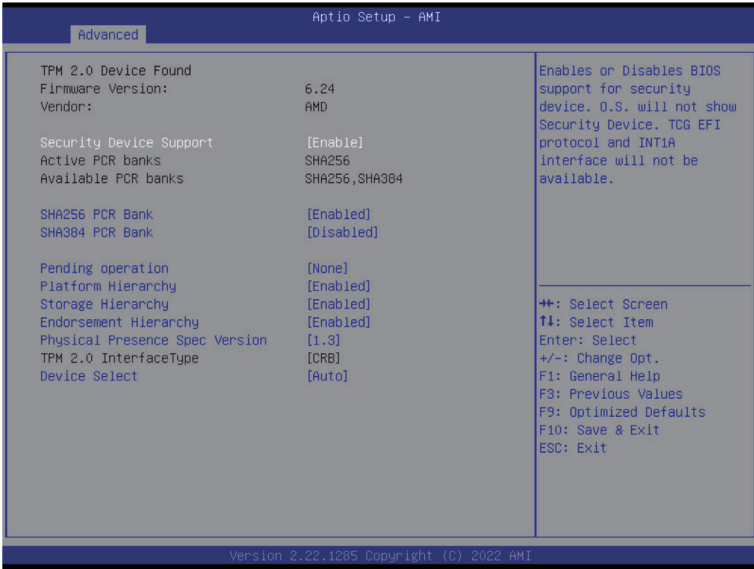




MC13-LE1



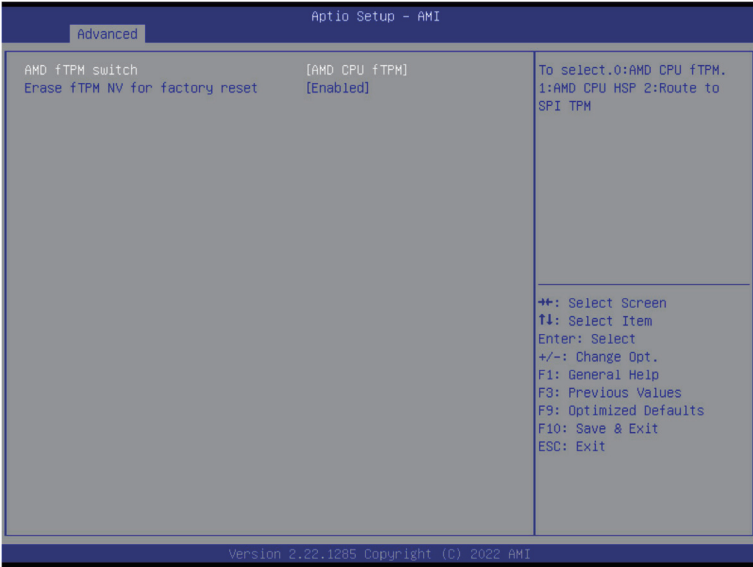
## 5-2-1 Trusted Computing



Parameter	Description
TPM20 Device Found	
Firmware Version	Displays the firmware version information.
Vendor	Displays the vendor information.
Security Device Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Disable, Enable. Default setting is <b>Enable</b> .
Active PCR banks	Displays active Platform Configuration Register (PCR) banks.
Available PCR banks	Displays available PCR banks.
SHA256 PCR Bank	Enable/Disable SHA256 PCR bank. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
SHA-384 PCR Bank	Enable/Disable SHA-384 PCR bank. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .
Pending operation	Schedule an operation for the security device. NOTE: Your computer will reboot during restart in order to change the state of a security device. Options available: None, TPM Clear. Default setting is <b>None</b> .

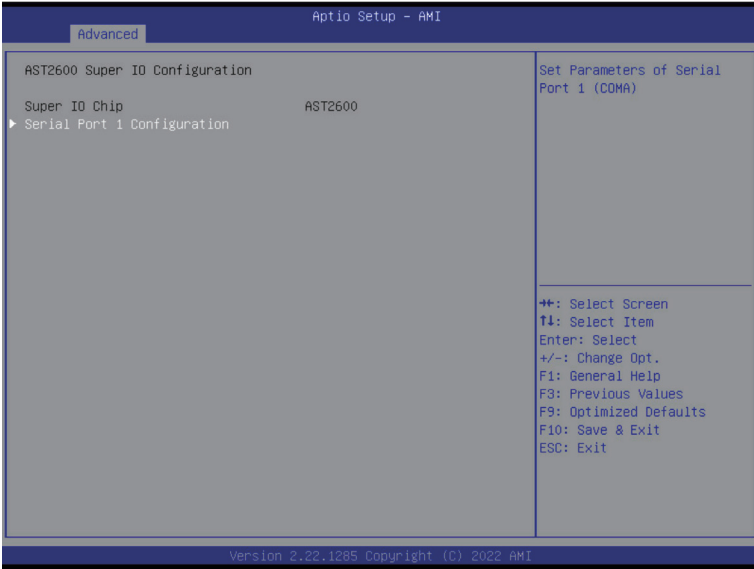
Parameter	Description
Platform Hierarchy	Enable/Disable platform hierarchy. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Storage Hierarchy	Enable/Disable storage hierarchy. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Endorsement Hierarchy	Enable/Disable endorsement hierarchy. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Physical Presence Spec Version	Selects the physical presence spec version. Options available: 1.2, 1.3. Default setting is <b>1.3</b> .
TPM 20 InterfaceType	Displays the TPM 2.0 interface type.
Device Select	Options available: TPM 1.2, TPM 2.0, Auto. Default setting is <b>Auto</b> .

## 5-2-2 AMD fTPM Configuration



Parameter	Description
AMD fTPM switch	Options available: AMD CPU fTPM, AMD CPU HSP, Route to SPI TPM. Default setting is <b>AMD CPU fTPM</b> .
Erase fTPM NV for factory reset	Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .

### 5-2-3 AST2600 Super IO Configuration



Parameter	Description
AST2600 Super IO Configuration	
Super IO Chip	Displays the super IO chip information
Serial Port 1 Configuration	Press [Enter] for configuration of advanced items.

## 5-2-3-1 Serial Port 1 Configuration



Parameter	Description
Serial Port 1 Configuration	
Serial Port <sup>(Note)</sup>	Enable/Disable the Serial Port (COM). When set to Enabled allows you to configure the Serial port 1 settings. When set to Disabled, displays no configuration for the serial port. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Devices Settings	Displays the Serial Port 1 device settings.
Change Settings	Select an optimal settings for Super IO Device. Options available for Serial Port 1: 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; Default setting is <b>Auto</b> .

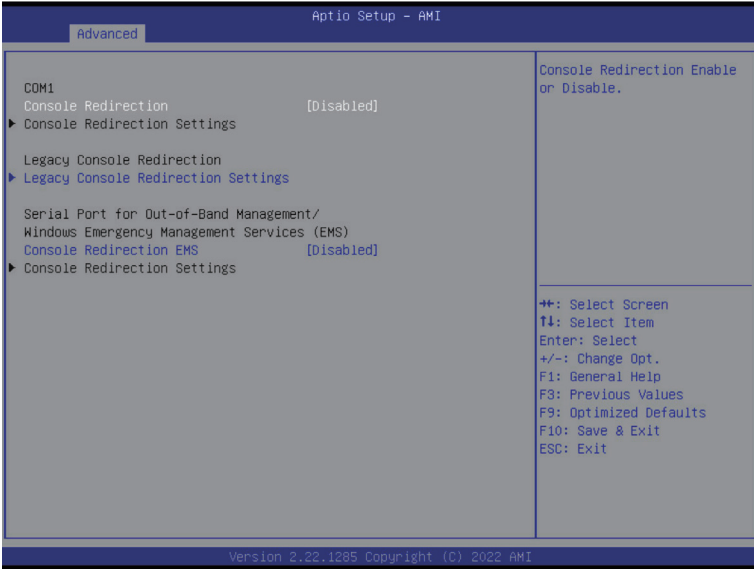
(Note) Advanced items prompt when this item is defined.

## 5-2-4 S5 RTC Wake Settings



Parameter	Description
Wake System from S5	<p>Enable/Disable system wake on alarm event.</p> <p>Options available: Disabled, Fixed Time. When Fixed Time is selected, system will wake on the hr::min::sec specified.</p> <p>Default setting is <b>Disabled</b>.</p>

## 5-2-5 Serial Port Console Redirection



Parameter	Description
COM Console Redirection <sup>(Note)</sup>	<p>Select whether to enable console redirection for specified device. Console redirection enables the users to manage the system from a remote location.</p> <p>Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</p>
COM Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <p><b>Please note that this item is configurable when COM Console Redirection is set to Enabled.</b></p> <ul style="list-style-type: none"> <li>◆ Terminal Type <ul style="list-style-type: none"> <li>– Selects a terminal type to be used for console redirection.</li> <li>– Options available: VT100, VT100Plus, VT-UTF8, ANSI. Default setting is <b>ANSI</b>.</li> </ul> </li> <li>◆ Bits per second <ul style="list-style-type: none"> <li>– Selects the transfer rate for console redirection.</li> <li>– Options available: 9600, 19200, 38400, 57600, 115200. Default setting is <b>115200</b>.</li> </ul> </li> <li>◆ Data Bits <ul style="list-style-type: none"> <li>– Selects the number of data bits used for console redirection.</li> <li>– Options available: 7, 8. Default setting is <b>8</b>.</li> </ul> </li> </ul>

(Note) Advanced items prompt when this item is defined.



Parameter	Description
COM Console Redirection Settings (continued)	<ul style="list-style-type: none"> <li>◆ Parity <ul style="list-style-type: none"> <li>– A parity bit can be sent with the data bits to detect some transmission errors.</li> <li>– Even: parity bit is 0 if the num of 1's in the data bits is even.</li> <li>– Odd: parity bit is 0 if num of 1's in the data bits is odd.</li> <li>– Mark: parity bit is always 1. Space: Parity bit is always 0.</li> <li>– Mark and Space Parity do not allow for error detection.</li> <li>– Options available: None, Even, Odd, Mark, Space. Default setting is <b>None</b>.</li> </ul> </li> <li>◆ Stop Bits <ul style="list-style-type: none"> <li>– Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.</li> <li>– Options available: 1, 2. Default setting is <b>1</b>.</li> </ul> </li> <li>◆ Flow Control <ul style="list-style-type: none"> <li>– Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.</li> <li>– Options available: None, Hardware RTS/CTS. Default setting is <b>None</b>.</li> </ul> </li> <li>◆ VT-UTF8 Combo Key Support <ul style="list-style-type: none"> <li>– Enable/Disable the VT-UTF8 Combo Key Support.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ Recorder Mode <ul style="list-style-type: none"> <li>– When this mode enabled, only texts will be send. This is to capture Terminal data.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Resolution 100x31 <ul style="list-style-type: none"> <li>– Enable/Disable extended terminal resolution.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li>◆ Putty Keypad <ul style="list-style-type: none"> <li>– Selects FunctionKey and Keypad on Putty.</li> <li>– Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is <b>VT100</b>.</li> </ul> </li> </ul>

Parameter	Description
Legacy Console Redirection	
Legacy Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Redirection COM Port <ul style="list-style-type: none"> <li>– Selects a COM port for Legacy serial redirection.</li> <li>– Default setting is <b>COM1</b>.</li> </ul> </li> <li>◆ Resolution <ul style="list-style-type: none"> <li>– Selects the number of rows and columns used in Console Redirection for legacy OS support.</li> <li>– Options available: 80x24, 80x25. Default setting is <b>80x24</b>.</li> </ul> </li> <li>◆ Redirect After POST <ul style="list-style-type: none"> <li>– When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS.</li> <li>– Options available: Always Enable, BootLoader. Default setting is <b>Always Enable</b>.</li> </ul> </li> </ul>
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection <sup>(Note)</sup>	<p>EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management.</p> <p>Options available: Disabled, Enabled. Default setting is <b>Disabled</b>.</p>
Serial Port for Out-of-Band EMS Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <p><b>Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.</b></p> <ul style="list-style-type: none"> <li>◆ Out-of-Band Mgmt Port <ul style="list-style-type: none"> <li>– Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port.</li> <li>– Default setting is <b>COM1</b>.</li> </ul> </li> <li>◆ Terminal Type EMS <ul style="list-style-type: none"> <li>– Selects a terminal type to be used for console redirection.</li> <li>– Options available: VT100, VT100Plus, VT-UTF8, ANSI. Default setting is <b>ANSI</b>.</li> </ul> </li> <li>◆ Bits per second EMS <ul style="list-style-type: none"> <li>– Selects the transfer rate for console redirection.</li> <li>– Options available: 9600, 19200, 38400, 57600, 115200. Default setting is <b>115200</b>.</li> </ul> </li> </ul>

(Note) Advanced items prompt when this item is defined.

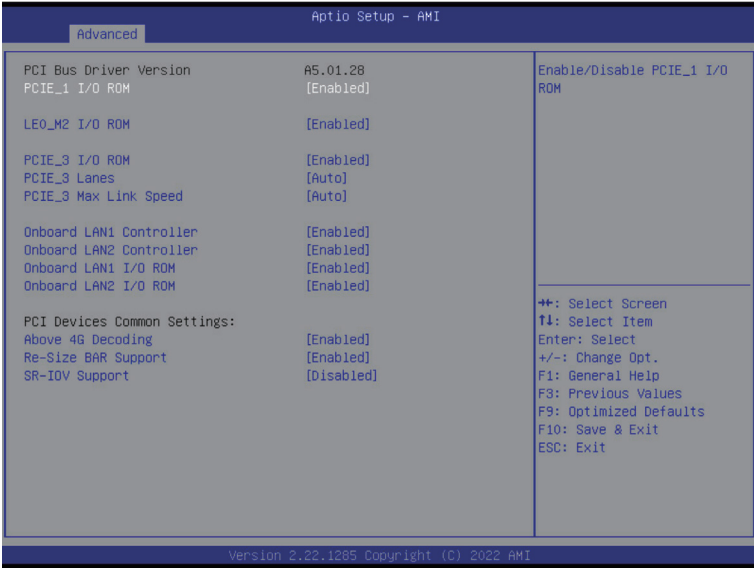
Parameter	Description
Serial Port for Out-of-Band EMS Console Redirection Settings(continued)	<ul style="list-style-type: none"><li>◆ Flow Control EMS<ul style="list-style-type: none"><li>– Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.</li><li>– Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is <b>None</b>.</li></ul></li></ul>

## 5-2-6 CPU Configuration



Parameter	Description
CPU Configuration	
Module Version	Displays the module version information.
PSS Support	Enable/Disable the generation of ACPI_PPC, _PSS, and _PCT objects. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
PPC Adjustment	Options available: PState 0, PState 1, PState 2, PState 3. Default setting is <b>PState 0</b> .
NX Mode	Enable/Disable No-execute page protection Function. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
SVM Mode	Enable/Disable the CPU Virtualization. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Node 0 Information	Press [Enter] to view the information related to Node 0.

## 5-2-7 PCI Subsystem Settings

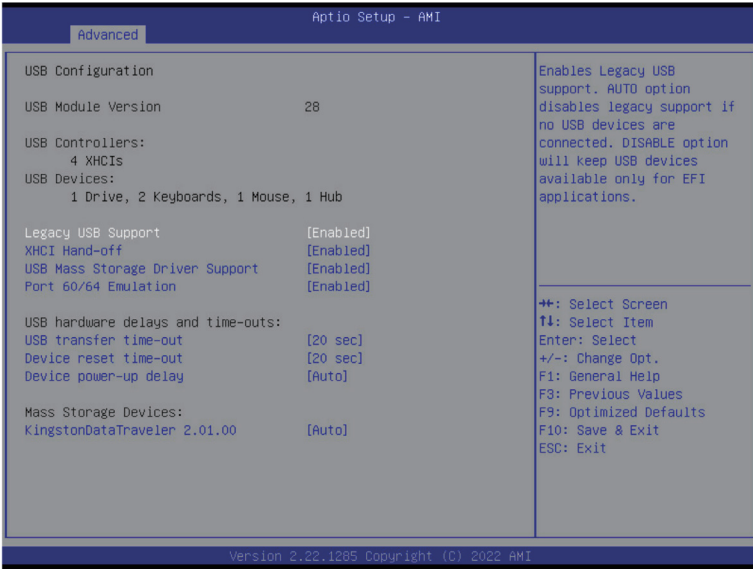


Parameter	Description
PCI BUS Driver Version	Displays PCI BUS driver version information.
PCI_E_1 I/O ROM	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
LE0_M2 I/O ROM	Enable/Disable LE0_M2 device and initialize the device expansion ROM. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
PCIE_3 I/O ROM	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
PCIE_3 Lanes	Change the PCIe lanes. Options available: Auto, x16, x8x8, x8x4x4, x4x4x8, x4x4x4x4. Default setting is <b>Auto</b> .
PCIE_3 Max Link Speed	Change the PCIe max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is <b>Auto</b> .
Onboard LAN# Controller <sup>(Note)</sup>	Enable/Disable the onboard LAN controller. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Onboard LAN# I/O ROM <sup>(Note)</sup>	Enable/Disable the onboard LAN devices, and initializes device expansion ROM. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .

(Note) This section is dependent on the available LAN controller.

<b>Parameter</b>	<b>Description</b>
Above 4G Decoding	Enable/Disable memory mapped I/O to 4GB or greater address space (Above 4G Decoding). Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Re-Size BAR Support	Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
SR-IOV Support	If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .

## 5-2-8 USB Configuration



Parameter	Description
USB Configuration	
USB Module Version	Displays the USB module version information.
USB Controllers	Displays the supported USB controllers.
USB Devices:	Displays the USB devices connected to the system.
Legacy USB Support	Enable/Disable the Legacy USB support function. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications. Options available: Enabled, Disabled, Auto. Default setting is <b>Enabled</b> .
XHCI Hand-off	Enable/Disable the XHCI Hand-off support. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
USB Mass Storage Driver Support <sup>(Note)</sup>	Enable/Disable the USB Mass Storage Driver Support. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .

(Note) This item is present only if you attach USB devices.

Parameter	Description
Port 60/64 Emulation	Enables the I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OS. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
USB hardware delays and time-outs	
USB transfer time-out	Selects the time-out value for USB Control/Bulk/Interrupt transfers. Options available: 1 sec, 5 sec, 10 sec, 20 sec. Default setting is <b>20 sec</b> .
Device reset time-out	Selects the time-out value during a USB mass storage device reset. Options available: 10 sec, 20 sec, 30 sec, 40 sec. Default setting is <b>20 sec</b> .
Device power-up delay	Maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor. Options available: Auto, Manual. Default setting is <b>Auto</b> .
Mass Storage Devices	Displays the mass storage devices available on the system.



## 5-2-9 Network Stack Configuration



Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Ipv4 PXE Support <sup>(Note)</sup>	Enable/Disable the Ipv4 PXE feature. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Ipv4 HTTP Support <sup>(Note)</sup>	Enable/Disable the Ipv4 HTTP feature. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .
Ipv6 PXE Support <sup>(Note)</sup>	Enable/Disable the Ipv6 PXE feature. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .
Ipv6 HTTP Support <sup>(Note)</sup>	Enable/Disable the Ipv6 HTTP feature. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .
PXE boot wait time <sup>(Note)</sup>	Wait time in seconds to press ESC key to abort the PXE boot. Press the <+> / <-> keys to increase or decrease the desired values.
Media detect count <sup>(Note)</sup>	Number of times the presence of media will be checked. Press the <+> / <-> keys to increase or decrease the desired values.

(Note) This item appears when **Network Stack** is set to **Enabled**.

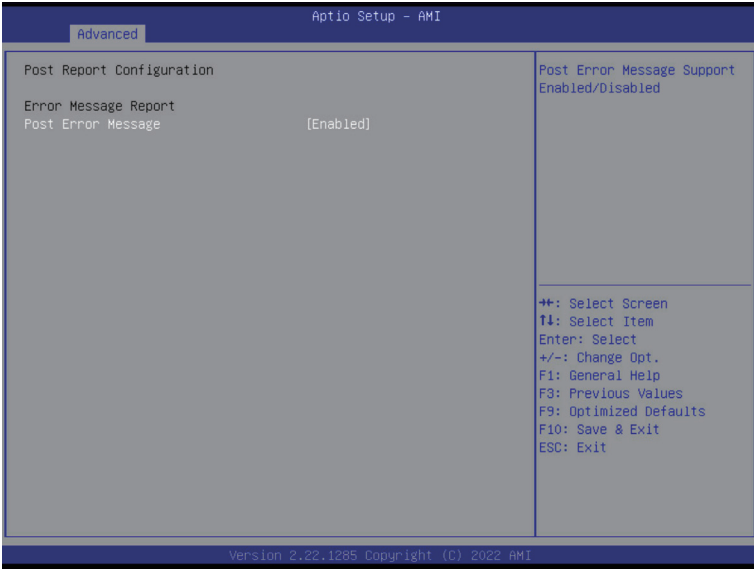
## 5-2-10 CSM Configuration



Parameter	Description
Compatibility Support Module Configuration	
CSM Support <sup>(Note)</sup>	Enable/Disable CSM support. Options available: Disabled, Enabled. Default setting is <b>Disabled</b> .
CSM16 Module Version	Displays the CSM module version information.
GateA20 Active	Options available: Upon Request, Always. Default setting is <b>Upon Request</b> .
INT19 Trap Response	Options available: Immediate, Postponed. Default setting is <b>Immediate</b> .
HDD Connection Order	Options available: Adjust, Keep. Default setting is <b>Adjust</b> .
Boot option filter	Options available: UEFI and Legacy, Legacy only, UEFI only. Default setting is <b>UEFI and Legacy</b> .
Option ROM execution	
Network/Storage/Video/ Other PCI devices	Options available: UEFI, Legacy. Default setting is <b>UEFI</b> .

(Note) Advanced items prompt when this item is defined.

## 5-2-11 Post Report Configuration



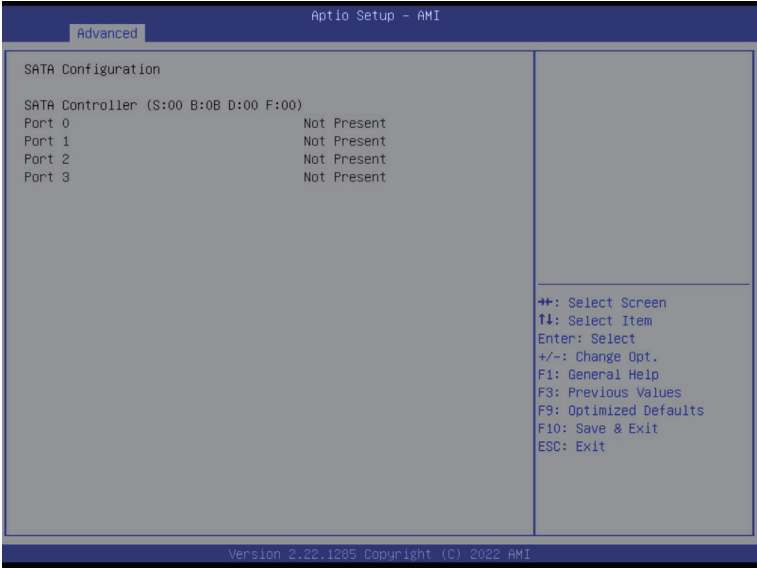
Parameter	Description
Post Report Configuration	
Error Message Report	
Post Error Message	Enable/Disable Post Error Message support. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .

## 5-2-12 NVMe Configuration



Parameter	Description
NVMe Configuration	Displays the NVMe devices connected to the system.
NVMe OPRoM Select	Options available: BIOS Build-In, NVMe Device. Default setting is <b>BIOS Build-In</b> .

### 5-2-13 SATA Configuration



Parameter	Description
SATA Configuration	Displays the installed HDD devices information. System will automatically detect HDD type.

## 5-2-14 Chipset Configuration



Parameter	Description
Restore AC Power Loss	This option provides user to set the mode of operation if an AC / power loss occurs. Options available: Power Off, Power On, Last State, Unspecified. Default setting is <b>Last State</b> .

## 5-2-15 RAM Disk Configuration



Parameter	Description
Disk Memory Type	Specifies the type of memory to use from available memory pool in system to create a disk. Options available: Boot Service Data, Reserved. Default setting is <b>Boot Service Data</b> .
Create Raw	Creates a raw RAM disk. <ul style="list-style-type: none"> <li>◆ Size (Hex) <ul style="list-style-type: none"> <li>– Input a valid RAM disk size that should be multiple of the RAM disk block size.</li> </ul> </li> <li>◆ Create &amp; Exit</li> <li>◆ Discard &amp; Exit</li> </ul>
Create from file	Creates a RAM disk from a given file.
Created RAM disk list	
Remove selected RAM disk(s)	Selects the RAM disk(s) to remove.

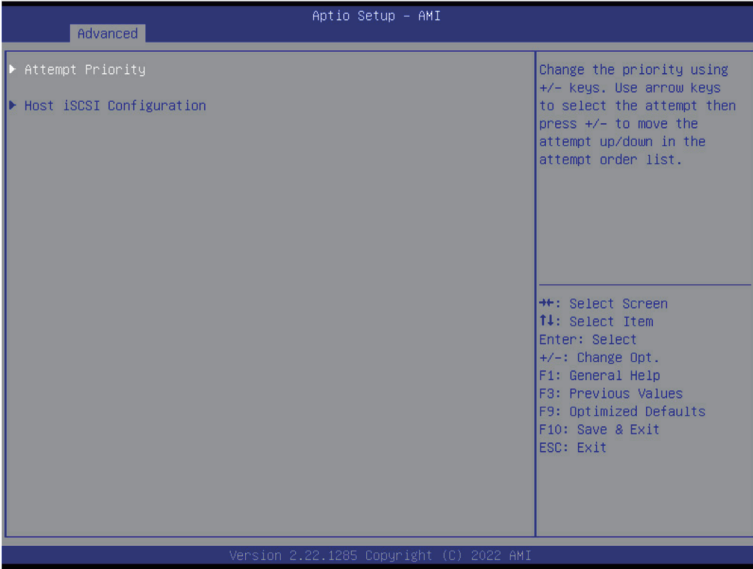
## 5-2-16 Tls Auth Configuration



Parameter	Description
Server CA Configuration	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> <li>◆ Enroll Cert                             <ul style="list-style-type: none"> <li>– Press [Enter] to enroll a certificate                                     <ul style="list-style-type: none"> <li>• Enroll Cert Using File</li> <li>• Cert GUID</li> </ul> </li> <li>Input digit character in 1111111-2222-3333-4444-1234567890ab format.</li> <li>– Commit Changes and Exit</li> <li>– Discard Changes and Exit</li> </ul> </li> <li>◆ Delete Cert</li> </ul>
Client Cert Configuration	<p>Press [Enter] for configuration of advanced items.</p>



## 5-2-17 iSCSI Configuration



Parameter	Description
Attempt Priority	<ul style="list-style-type: none"> <li>◆ Attempt Priority                             <ul style="list-style-type: none"> <li>– Change the attempt priority.</li> <li>– Options available: Host Attempt, Redfish Attempt. Default setting is <b>Host Attempt</b>.</li> </ul> </li> <li>◆ Commit Change and Exit</li> </ul>
Host iSCSI Configuration	<ul style="list-style-type: none"> <li>◆ iSCSI Initiator Name                             <ul style="list-style-type: none"> <li>– Press [Enter] and name iSCSI Initiator. Only IQN format is accepted. Range: from 4 to 223.</li> </ul> </li> <li>◆ Add an Attempt</li> <li>◆ Delete Attempts</li> <li>◆ Change Attempt Order</li> </ul>

## 5-2-18 Intel(R) I210 Gigabit Network Connection

Aptio Setup - AMI

Advanced

► NIC Configuration

Blink LEDs	0	Click to configure the network device port.
UEFI Driver	Intel(R) PRO/1000 7.5.11 ...	
Adapter PBA	000300-000	**+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Device Name	Intel(R) I210 Gigabit Ne...	
Chip Type	Intel i210	
PCI Device ID	1533	
PCI Address	05:00:00	
Link Status	[Disconnected]	
MAC Address	D8:5E:D3:ED:41:6B	
Virtual MAC Address	00:00:00:00:00:00	

Version 2.22.1285 Copyright (C) 2022 AMI

Aptio Setup - AMI

Advanced

Link Speed	[Auto Negotiated]	Specifies the port speed used for the selected boot protocol.
Wake On LAN	[Enabled]	

\*\*+: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F3: Previous Values  
F9: Optimized Defaults  
F10: Save & Exit  
ESC: Exit

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Parameter	Description
NIC Configuration	<ul style="list-style-type: none"> <li>◆ Link Speed <ul style="list-style-type: none"> <li>– Allows for automatic link speed adjustment.</li> <li>– Options available: Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full. Default setting is <b>Auto Negotiated</b>.</li> </ul> </li> <li>◆ Wake On LAN <ul style="list-style-type: none"> <li>– Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Enabled</b>.</li> </ul> </li> </ul>
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values.
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Specifies the link status of the port.
MAC Address	Displays the MAC address of the Ethernet controller.
Virtual MAC Address	Displays the virtual MAC address of the Ethernet controller.

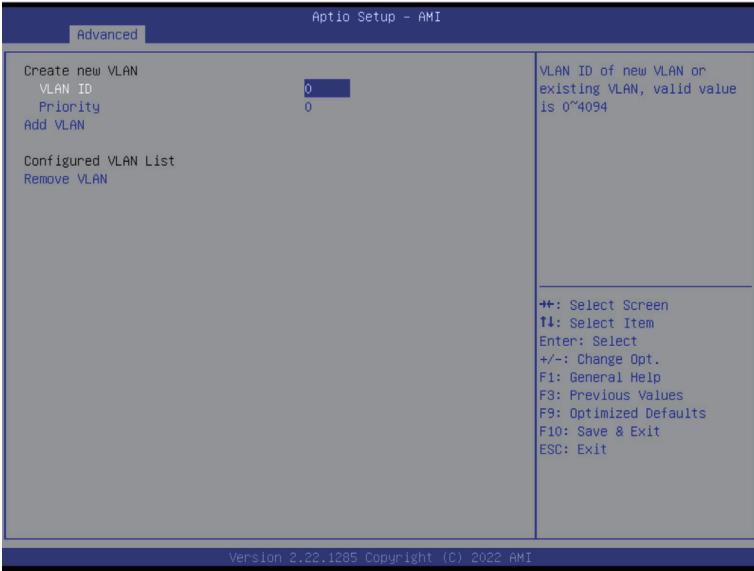
## 5-2-19 Intel(R) X710 Ethernet Network Connection

Advanced		Aptio Setup - AMI	
<p>▶ NIC Configuration</p> <p>Blink LEDs 0</p> <p>UEFI Driver Intel(R) 40GbE 3.5.23            Adapter PBA H64862-000            Device Name Intel(R) Ethernet Control...            Chip Type Intel X710            PCI Device ID 15FF            PCI Address 01:00:00</p> <p>Link Status [Disconnected]</p> <p>MAC Address D8:5E:D3:EC:41:DB            Virtual MAC Address 00:00:00:00:00:00</p>		<p>Click to configure the network device port.</p>	
		<p>++: Select Screen            ↑↓: Select Item            Enter: Select            +/-: Change Opt.            F1: General Help            F3: Previous Values            F9: Optimized Defaults            F10: Save &amp; Exit            ESC: Exit</p>	
Version 2.22.1285 Copyright (C) 2022 AMI			

Advanced		Aptio Setup - AMI	
<p>Link Speed [Auto Negotiated]            Wake On LAN [Enabled]            LLDP Agent [Enabled]</p>		<p>Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states.</p>	
		<p>++: Select Screen            ↑↓: Select Item            Enter: Select            +/-: Change Opt.            F1: General Help            F3: Previous Values            F9: Optimized Defaults            F10: Save &amp; Exit            ESC: Exit</p>	
Version 2.22.1285 Copyright (C) 2022 AMI			

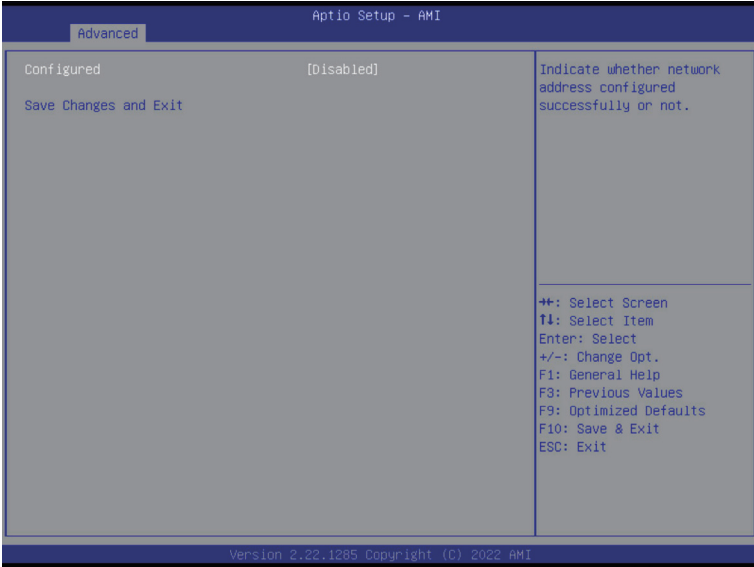
Parameter	Description
NIC Configuration	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Link Speed <ul style="list-style-type: none"> <li>– Default setting is <b>Auto Negotiated</b>.</li> </ul> </li> <li>◆ Wake On LAN <ul style="list-style-type: none"> <li>– Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Enabled</b>.</li> </ul> </li> <li>◆ LLDP Agent <ul style="list-style-type: none"> <li>– Enable/Disable firmware's LLDP Agent.</li> <li>– Options available: Disabled, Enabled. Default setting is <b>Enabled</b></li> </ul> </li> </ul>
Blink LEDs	<p>Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).</p>
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
MAC Address	Displays the technical specifications for the Network Interface Controller.
Virtual MAC Address	Displays the technical specifications for the Network Interface Controller.

## 5-2-20 VLAN Configuration



Parameter	Description
Enter Configuration Menu	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Create new VLAN</li> <li>◆ VLAN ID <ul style="list-style-type: none"> <li>– Sets VLAN ID for a new VLAN or an existing VLAN.</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> <li>– The valid range is from 0 to 4094.</li> </ul> </li> <li>◆ Priority <ul style="list-style-type: none"> <li>– Sets 802.1Q Priority for a new VLAN or an existing VLAN.</li> <li>– Press the &lt;+&gt; / &lt;-&gt; keys to increase or decrease the desired values.</li> <li>– The valid range is from 0 to 7.</li> </ul> </li> <li>◆ Add VLAN <ul style="list-style-type: none"> <li>– Press [Enter] to create a new VLAN or update an existing VLAN.</li> </ul> </li> <li>◆ Configured VLAN List</li> <li>◆ Remove VLAN <ul style="list-style-type: none"> <li>– Press [Enter] to remove an existing VLAN.</li> </ul> </li> </ul>

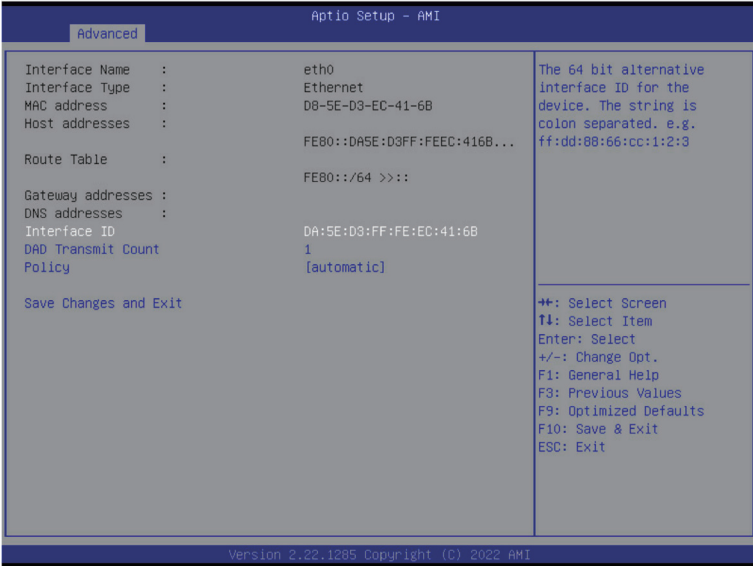
## 5-2-21 MAC IPv4 Network Configuration



Parameter	Description
Configured	Indicates whether network address is configured successfully or not. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Enable DHCP <sup>(Note)</sup>	Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Local IP Address <sup>(Note)</sup>	Press [Enter] to configure local IP address.
Local NetMask <sup>(Note)</sup>	Press [Enter] to configure local NetMask.
Local Gateway <sup>(Note)</sup>	Press [Enter] to configure local Gateway
Local DNS Servers <sup>(Note)</sup>	Press [Enter] to configure local DNS servers
Save Changes and Exit	Press [Enter] to save all configurations.

(Note) This item appears when **Configured** is set to **Enabled**.

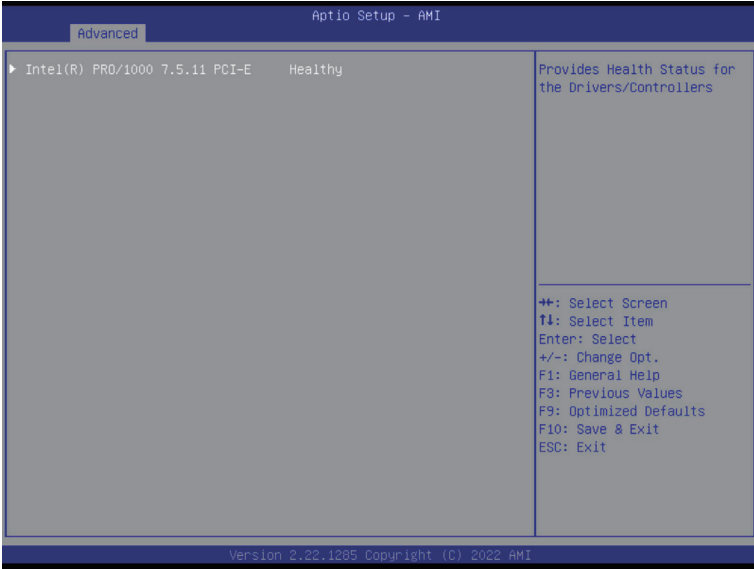
## 5-2-22 MAC IPv6 Network Configuration



Parameter	Description
Enter Configuration Menu	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li>◆ Displays the MAC Address information.</li> <li>◆ Interface ID <ul style="list-style-type: none"> <li>– The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3.</li> </ul> </li> <li>◆ DAD Transmit Count <ul style="list-style-type: none"> <li>– The number of consecutive Neighbor solicitation messages sent while performing Duplicate Address Detection on a tentative address. A value of zero indicates that Duplicate Address Detection is not performed.</li> </ul> </li> <li>◆ Policy <ul style="list-style-type: none"> <li>– Options available: automatic, manual. Default setting is <b>automatic</b>.</li> </ul> </li> <li>◆ Save Changes and Exit <ul style="list-style-type: none"> <li>– Press [Enter] to save all configurations.</li> </ul> </li> </ul>



## 5-2-23 Driver Health



Parameter	Description
Driver Health	Displays driver health status of the devices/controllers if installed.

### 5-3 Chipset Setup Menu

Chipset Setup menu displays submenu options for configuring the function of the North Bridge. Select a submenu item, then press <Enter> to access the related submenu screen.



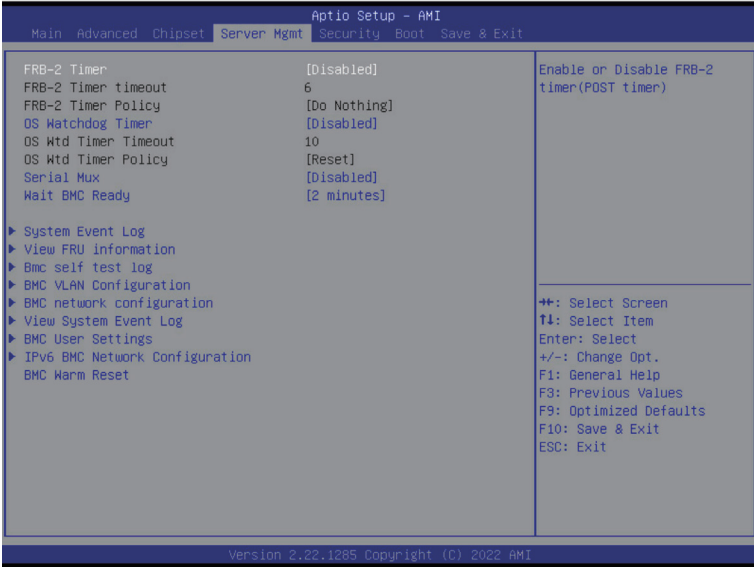
Parameter	Description
North Bridge	Press [Enter] for configuration of advanced items.

### 5-3-1 North Bridge



Parameter	Description
North Bridge Configuration	
Above 4GB MMIO Limit	Selects Above 4GB MMIO Limit to 38–43 bits limit. This option works only when "Above 4G decoding" is enabled. Options available: 40bit (1TB), 41bit (2TB), 42bit (4TB), 43bit (8TB). Default setting is <b>40bit (1TB)</b> .
Memory Information	
Total Memory	Displays the total memory information.
Socket 0 Information	Press [Enter] to view information related to socket 0.

# 5-4 Server Management Menu



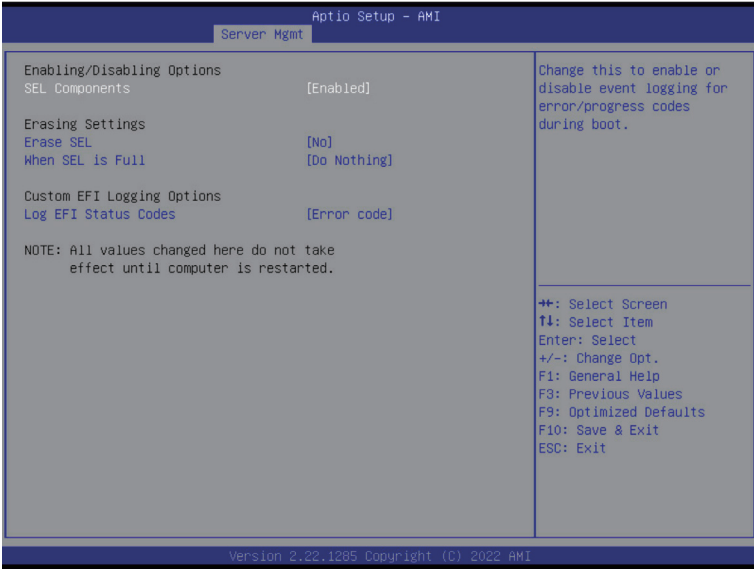
Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
FRB-2 Timer timeout <sup>(Note1)</sup>	Configures the FRB2 Timer timeout. Options available: 3 minutes, 4 minutes, 5 minutes, 6 minutes. Default setting is <b>6 minutes</b> .
FRB-2 Timer Policy <sup>(Note1)</sup>	Configures the FRB2 Timer policy. Options available: Do Nothing, Reset, Power Down. Default setting is <b>Do Nothing</b> .
OS Watchdog Timer	Enable/Disable OS Watchdog Timer function. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
OS Wtd Timer Timeout <sup>(Note2)</sup>	Configures OS Watchdog Timer. Options available: 5 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is <b>10 minutes</b> .
OS Wtd Timer Policy <sup>(Note2)</sup>	Configure OS Watchdog Timer Policy. Options available: Reset, Do Nothing, Power Down. Default setting is <b>Reset</b> .
Serial Mux	Enable/Disable Serial Mux configuration. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .

(Note1) This item is configurable when **FRB-2 Timer** is set to **Enabled**.

(Note2) This item is configurable when **OS Watchdog Timer** is set to **Enabled**.

<b>Parameter</b>	<b>Description</b>
Wait BMC Ready	Post wait BMC ready and reboot system. Options available: Disabled, 2 minutes, 4 minutes, 6 minutes. Default setting is <b>2 minutes</b> .
System Event Log	Press [Enter] to configure advanced items.
View FRU Information	Press [Enter] to view the FRU information.
Bmc self test log	Press [Enter] to configure advanced items.
BMC VLAN Configuration	Press [Enter] to configure advanced items.
BMC network configuration	Press [Enter] to configure advanced items.
View System Event Log	Press [Enter] to view the system event log records.
BMC User Settings	Press [Enter] to add, delete and set privilege level for users.
IPv6 BMC Network Configuration	Press [Enter] to configure advanced items.
BMC Warm Reset	Press [Enter] to do warm reset BMC.

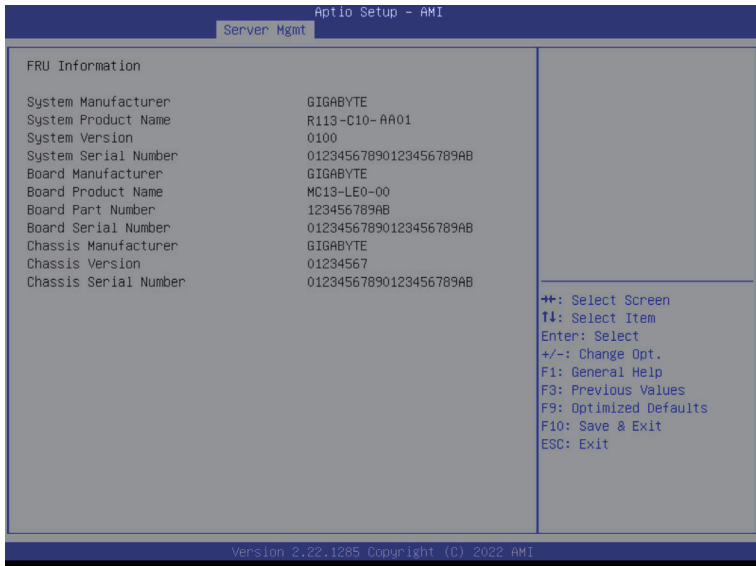
## 5-4-1 System Event Log



Parameter	Description
Enabling / Disabling Options	
SEL Components	Change this item to enable or disable all features of System Event Logging during boot. Options available: Disabled, Enabled. Default setting is <b>Enabled</b> .
Erasing Settings	
Erase SEL	Choose options for erasing SEL. Options available: No/Yes, On next reset/Yes, On every reset. Default setting is <b>No</b> .
When SEL is Full	Choose options for reactions to a full SEL. Options available: Do Nothing, Erase Immediately, Delete Oldest Record. Default setting is <b>Do Nothing</b> .
Custom EFI Logging Options	
Log EFI Status Codes	Enable/Disable the logging of EFI Status Codes (if not already converted to legacy). Options available: Disabled, Both, Error code, Progress code. Default setting is <b>Error code</b> .

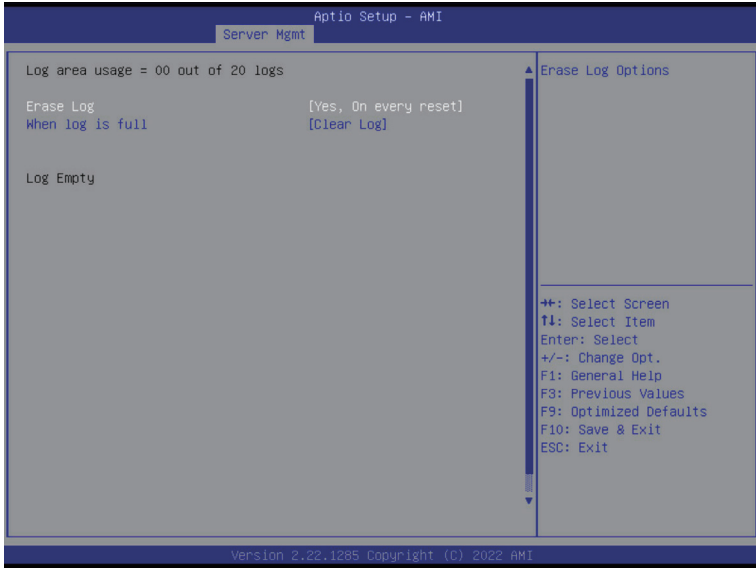
## 5-4-2 View FRU Information

The FRU page is a simple display page for basic system ID information, as well as System product information. Items on this window are non-configurable.



(Note) The model name will vary depends on the product you purchased

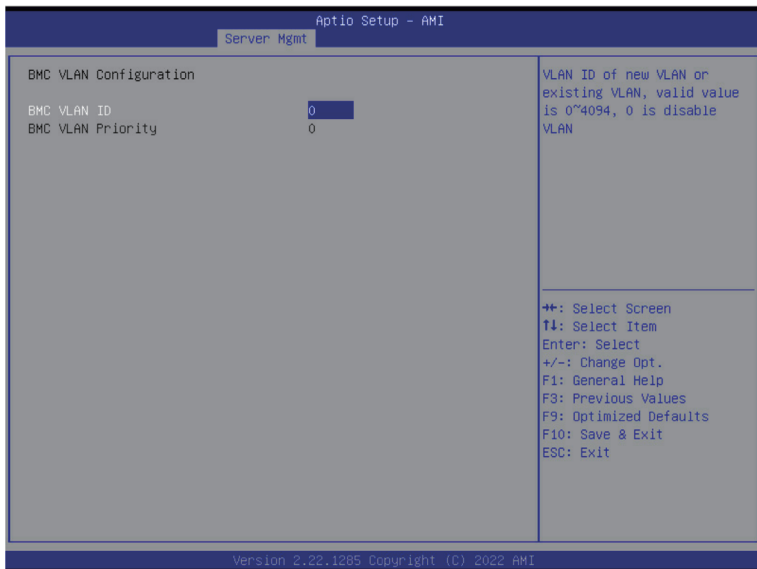
### 5-4-3 Bmc self test log



Parameter	Description
Log area usage = 00 out of 20 logs	
Erase Log	Choose options for erasing SEL. Options available: Yes, On every reset/ No. Default setting is <b>Yes, On every reset</b> .
When log is Full	Choose options for reactions to a full SEL. Options available: Clear Log, Do not log any more. Default setting is <b>Clear Log</b> .

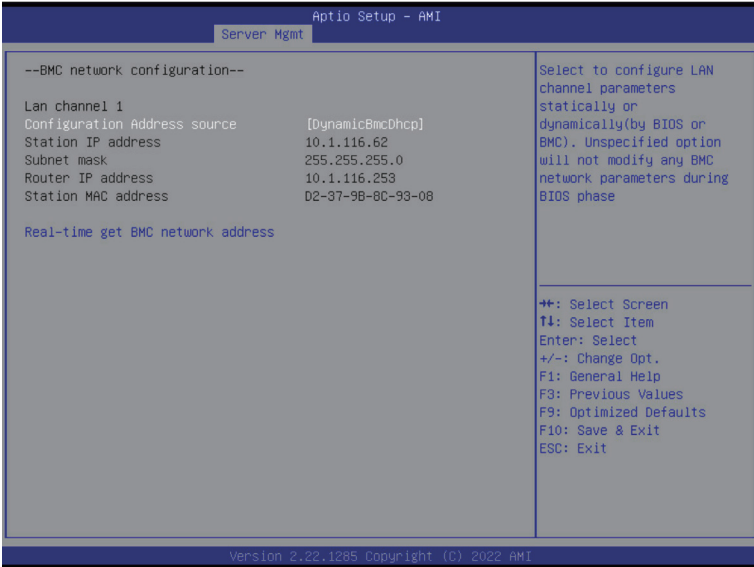


## 5-4-4 BMC VLAN Configuration



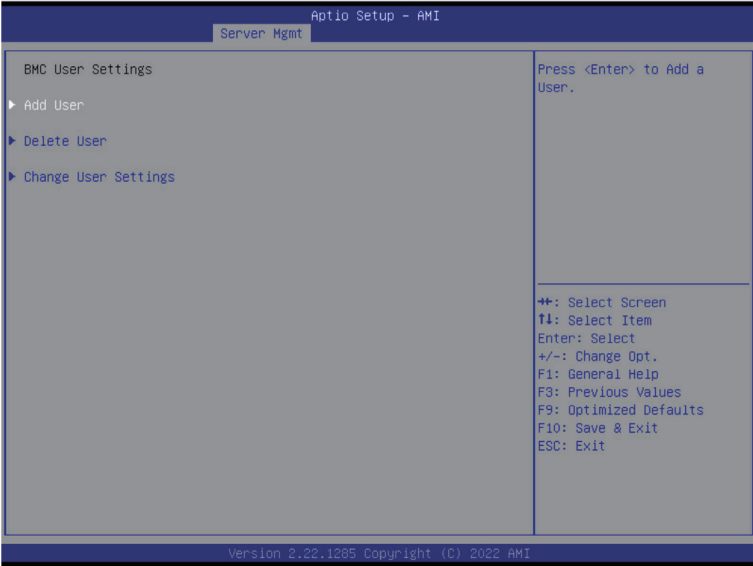
Parameter	Description
BMC VLAN Configuration	
BMC VLAN ID	Sets VLAN ID for a new VLAN or an existing VLAN. Press the <+> / <-> keys to increase or decrease the desired values. The valid range is from 0 to 4094.
BMC VLAN Priority	Sets 802.1Q Priority for a new VLAN or an existing VLAN. Press the <+> / <-> keys to increase or decrease the desired values. The valid range is from 0 to 7.

## 5-4-5 BMC Network Configuration



Parameter	Description
BMC network configuration	
Lan Channel 1	
Configuration Address source	Selects to configure LAN channel parameters statically or dynamically (DHCP). Do nothing option will not modify any BMC network parameters during BIOS phase. Options available: Unspecified, Static, DynamicBmcDhcp. Default setting is <b>DynamicBmcDhcp</b> .
Station IP address	Displays IP Address information.
Subnet mask	Displays Subnet Mask information. Please note that the IP address must be in three digitals, for example, 192.168.000.001.
Router IP address	Displays the Router IP Address information.
Station MAC address	Displays the MAC Address information.
Real-time get BMC network address	Press [Enter] will set LAN mode and Address source and then get IP, Subnet, Gateway and MAC address.

## 5-4-6 BMC User Settings



Parameter	Description
BMC User Settings	
Add User	Press [Enter] to add a user.
Delete User	Press [Enter] to delete a user.
Change User Settings	Press [Enter] to change the settings.

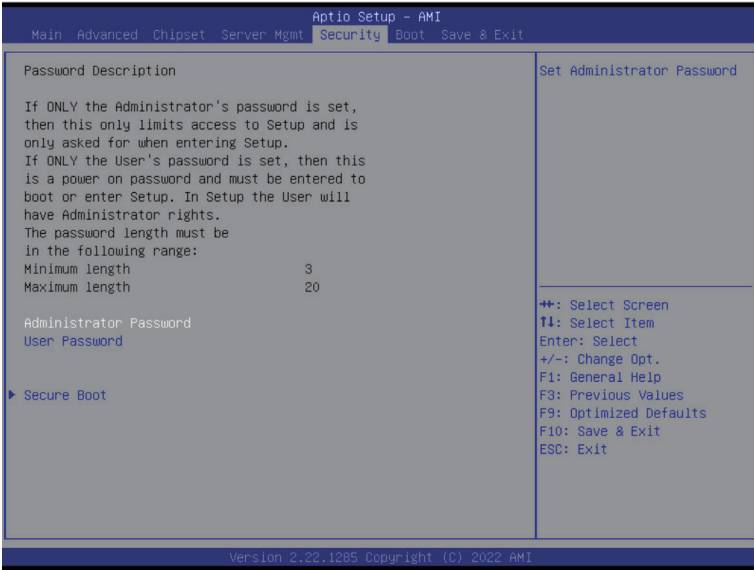
## 5-4-7 IPv6 BMC Network Configuration



Parameter	Description
IPv6 BMC network configuration	
IPv6 BMC Lan Channel 1	
IPv6 BMC Lan Option	Enable/Disable IPv6 BMC LAN channel function. When this item is disabled, the system will not modify any BMC network during BIOS phase. Options available: Unspecified, Disable, Enable. Default setting is <b>Enable</b> .
IPv6 BMC Lan IP Address Source	Selects to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Options available: Unspecified, Static, Dynamic-Obtained by BMC running DHCP. Default setting is <b>Enable Dynamic-Obtained by BMC running DHCP</b> .
IPv6 BMC Lan IP Address/Prefix Length	Check if the IPv6 BMC LAN IP address matches those displayed on the screen.

# 5-5 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.



There are two types of passwords that you can set:

- Administrator Password  
Entering this password will allow the user to access and change all settings in the Setup Utility.
- User Password  
Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

Parameter	Description
Administrator Password	Press [Enter] to configure the administrator password.
User Password	Press [Enter] to configure the user password.
Secure Boot	Press [Enter] to configure advanced items.

## 5-5-1 Secure Boot

The Secure Boot submenu is applicable when your device is installed the Windows® 8 (or above) operating system.



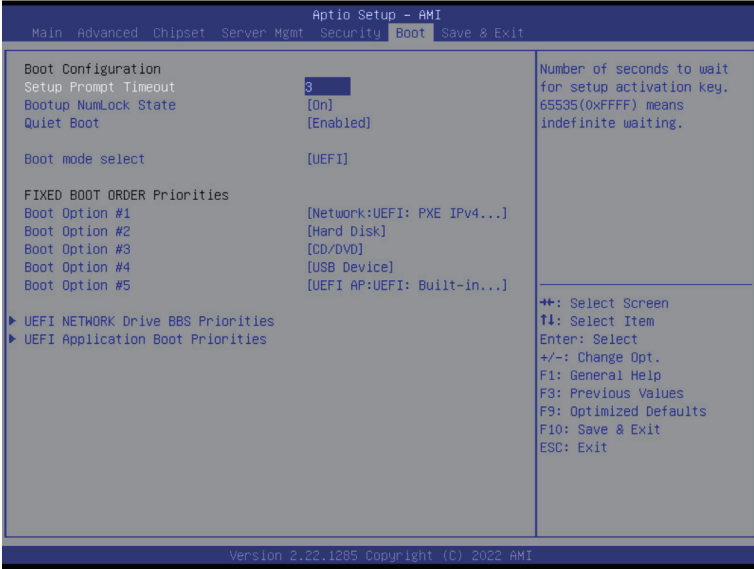
Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. Options available: Enabled, Disabled. Default setting is <b>Disabled</b> .
Secure Boot Mode <sup>(Note)</sup>	Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all files being loaded before Windows loads to the login screen have not been tampered with. When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases. When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database. Options available: Standard, Custom. Default setting is <b>Standard</b> .
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.
Reset to Setup Mode	Press [Enter] to reset the system to Setup mode.

(Note) Advanced items prompt when this item is set to **Custom**.

Parameter	Description
Key Management	<p data-bbox="335 156 665 180">Press [Enter] to configure advanced items.</p> <p data-bbox="335 185 936 235"><b>Please note that this item is configurable when Secure Boot Mode is set to Custom.</b></p> <ul style="list-style-type: none"> <li data-bbox="335 243 941 352">◆ Factory Key Provision <ul style="list-style-type: none"> <li data-bbox="367 266 941 321">– Allows to provision factory default Secure Boot keys when system is in Setup Mode.</li> <li data-bbox="367 326 904 352">– Options available: Enabled, Disabled. Default setting is <b>Disabled</b>.</li> </ul> </li> <li data-bbox="335 357 925 431">◆ Restore Factory Keys <ul style="list-style-type: none"> <li data-bbox="367 381 925 404">– Installs all factory default keys. It will force the system in User Mode.</li> <li data-bbox="367 409 606 431">– Options available: Yes, No.</li> </ul> </li> <li data-bbox="335 435 899 517">◆ Enroll Efi Image <ul style="list-style-type: none"> <li data-bbox="367 459 899 517">– Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).</li> </ul> </li> <li data-bbox="335 522 893 572">◆ Secure Boot variable <ul style="list-style-type: none"> <li data-bbox="367 545 893 572">– Displays the current status of the variables used for secure boot.</li> </ul> </li> <li data-bbox="335 577 798 682">◆ Platform Key (PK) <ul style="list-style-type: none"> <li data-bbox="367 600 798 627">– Displays the current status of the Platform Key (PK).</li> <li data-bbox="367 631 675 655">– Press [Enter] to configure a new PK.</li> <li data-bbox="367 660 601 682">– Options available: Update.</li> </ul> </li> <li data-bbox="335 686 941 823">◆ Key Exchange Keys (KEK) <ul style="list-style-type: none"> <li data-bbox="367 710 941 736">– Displays the current status of the Key Exchange Key Database (KEK).</li> <li data-bbox="367 741 904 796">– Press [Enter] to configure a new KEK or load additional KEK from storage devices.</li> <li data-bbox="367 801 670 823">– Options available: Update, Append.</li> </ul> </li> <li data-bbox="335 827 941 964">◆ Authorized Signatures (DB) <ul style="list-style-type: none"> <li data-bbox="367 851 904 878">– Displays the current status of the Authorized Signature Database.</li> <li data-bbox="367 882 941 937">– Press [Enter] to configure a new DB or load additional DB from storage devices.</li> <li data-bbox="367 942 670 964">– Options available: Update, Append.</li> </ul> </li> <li data-bbox="335 969 899 1105">◆ Forbidden Signatures (DBX) <ul style="list-style-type: none"> <li data-bbox="367 992 899 1019">– Displays the current status of the Forbidden Signature Database.</li> <li data-bbox="367 1023 888 1078">– Press [Enter] to configure a new dbx or load additional dbx from storage devices.</li> <li data-bbox="367 1083 670 1105">– Options available: Update, Append.</li> </ul> </li> <li data-bbox="335 1110 925 1246">◆ Authorized TimeStamps (DBT) <ul style="list-style-type: none"> <li data-bbox="367 1133 925 1160">– Displays the current status of the Authorized TimeStamps Database.</li> <li data-bbox="367 1165 904 1219">– Press [Enter] to configure a new DBT or load additional DBT from storage devices.</li> <li data-bbox="367 1224 670 1246">– Options available: Update, Append.</li> </ul> </li> <li data-bbox="335 1251 920 1387">◆ OsRecovery Signatures <ul style="list-style-type: none"> <li data-bbox="367 1274 920 1301">– Displays the current status of the OsRecovery Signature Database.</li> <li data-bbox="367 1306 888 1361">– Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices.</li> <li data-bbox="367 1365 670 1387">– Options available: Update, Append.</li> </ul> </li> </ul>

## 5-6 Boot Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is <b>On</b> .
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is <b>Enabled</b> .
Boot mode select	Selects the boot mode. Options available: LEGACY, UEFI. Default setting is <b>UEFI</b> .
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot order priority. By default, the server searches for boot devices in the following sequence: <ol style="list-style-type: none"> <li>1. Hard drive.</li> <li>2. CD-COM/DVD drive.</li> <li>3. USB device.</li> <li>4. Network.</li> <li>5. UEFI.</li> </ol>



# 5-7 Save & Exit Menu

The Save & Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press <Enter>.



Parameter	Description
Save Options	
Save Changes and Exit	Saves changes made and closes the BIOS setup. Options available: Yes, No.
Discard Changes and Exit	Discards changes made and exits the BIOS setup. Options available: Yes, No.
Save Changes and Reset	Restarts the system after saving the changes made. Options available: Yes, No.
Discard Changes and Reset	Restarts the system without saving any changes. Options available: Yes, No.
Save Changes	Saves changes done so far to any of the setup options. Options available: Yes, No.
Discard Changes	Discards changes made and closes the BIOS setup. Options available: Yes, No.
Default Options	

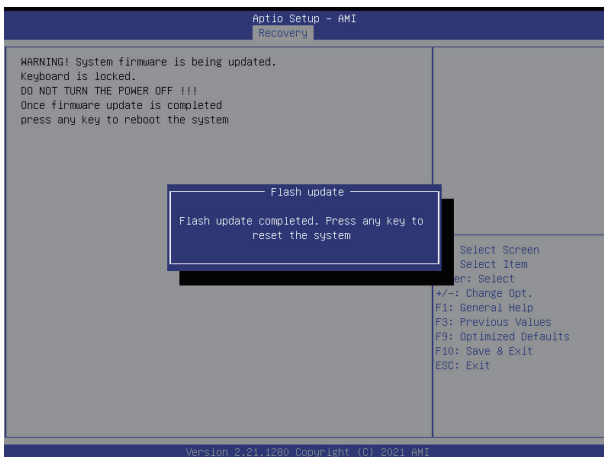
<b>Parameter</b>	<b>Description</b>
Restore Defaults	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly. Options available: Yes, No.
Save as User Defaults	Saves the changes made as the user default settings. Options available: Yes, No.
Restore User Defaults	Loads the user default settings for all BIOS setup parameters. Options available: Yes, No.
Boot Override	Press [Enter] to configure the device as the boot-up drive.
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.

## 5-8 BIOS Recovery

The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

1. Copy the XXX.rom to USB diskette.
2. Setting BIOS Recovery jump to enabled status.
3. Boot into BIOS recovery.
4. Run Proceed with flash update.
5. BIOS updated.



## 5-9 BIOS POST Beep code (AMI standard)

### 5-9-1 PEI Beep Codes

# of Beeps	Description
1	Memory not Installed.
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

### 5-9-2 DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met