GIGABYTE[™]

TO15-S41-IA01

ORv3 GPU Server 4th Gen Intel® Xeon® - 1OU DP 8 x PCIe Gen5 GPUs Immersion Cooling

User Manual

Rev. 1.0

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Documentation Classifications

In order to assist in the use of this product, Giga Computing 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.qiqabyte.com/Enterprise

For GIGABYTE distributors and resellers, additional sales & marketing materials are available from our reseller portal: http://reseller.b2b.gigabyte.com

For further technical assistance, please contact your GIGABYTE representative or visit https://esupport.gigabyte.com/ to create a new support ticket

For any general sales or marketing enquiries, you may also message GIGABYTE server directly by email: server.qrp@qiqabyte.com

Conventions

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

	NOTE! Pieces of additional information related to the current topic.					
	CAUTION! Precautionary measures to avoid possible hardware or software problems.					
A	WARNING! 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.



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 sensi-tive 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 fin-gertips 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 dam-age the contacts inside the jumper, causing intermittent problems with the function con-trolled 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.

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Socket Ath Generation Intel® Xeon® Scalable Processors Intel® Xeon® CPU Max Series Intel® Xeon® CPU Max Series Intel® Xeon® Platinum Processor, Intel® Xeon® Gold Processor, Intel® Xeon® Silver Processor Dual processor, CPU TDP up to 350W NOTE: If only 1 CPU is installed, some PCle or memory functions might be unavailable Socket 2 x LGA 4677 Socket E Chipset Intel® C741 Chipset UEFI Secure Boot Silicon root of trust SNMP Support: V3 ACHIPMENT SILICON SUMP Supported only Re-Channel memory per processor architecture RDIMM modules up to 96GB supported BORDIMM modules up to 256GB supported Memory Speed: Up to 4800 MHz Front side: 2 x 10GbE LAN ports (1 x Broadcom® BCM57416) Support NCSI function 1 x 10/100/1000 management LAN Integrated in Aspeed® AST2600 10 20 Video Graphic Adapter with PCle bus interface 1920x1200@60Hz 32bpp, DDR4 SDRAM		
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2D Video Graphic Adapter with PCIe bus interface 1920x1200@60Hz 32bpp, DDR4 SDRAM		• 1 x 10/100/1000 management LAN
2D Video Graphic Adapter with PCIe bus interface 1920x1200@60Hz 32bpp, DDR4 SDRAM	Video	Integrated in Aspeed® AST2600
• 1920x1200@60Hz 32bpp, DDR4 SDRAM		
		·
	Storage	3 111



Riser Card CORC208 x 2:

- 2 x PCle x16 (Gen5 x16) FHFL slots, from CPU 0, for GPUs
- 2 x PCle x16 (Gen5 x16) FHFL slots, from CPU_1, for GPUs

Riser Card CORC209 x 2:

- 2 x PCle x16 (Gen5 x16) FHFL slots, from CPU 0, for GPUs
- 2 x PCle x16 (Gen5 x16) FHFL slots, from CPU_1, for GPUs

Riser Card CRSG01F x 2:

• 2 x PCle x16 (Gen5 x8) low-profile slots on rear side

Optional 2 x M.2 slots (COMTP61):

- M-key
- PCle Gen5 x4, from CPU_1 (TBD)
- Support 22110 cards

Note: Supports GPUs TDP up to 350W with 8 GPUs configuration or 600W with 4 GPUs configuration.



- 2 x USB 3.2 Gen1
- 1 x VGA
- 1 x MLAN
- ◆ 1 x Power button with LED
- 1 x ID button with LED
- ◆ 1 x NMI button
- 1 x Reset button
- 1 x System status LED



1 x 48V Bus Bar



TPM

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

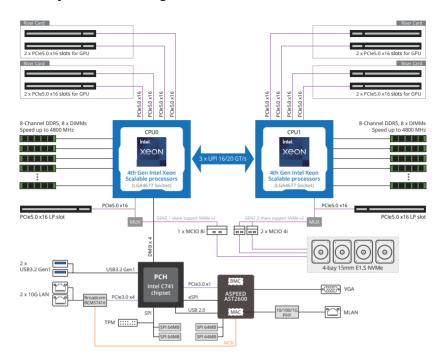


- Aspeed® AST2600 management controller
- GIGABYTE Management Console (AMI MegaRAC SP-X) web interface
- Dashboard
- HTML5 KVM
- Sensor Monitor (Voltage, RPM, Temperature, CPU Status ...etc.)
 - Sensor Reading History Data
- FRU Information
- SEL Log in Linear Storage / Circular Storage Policy
- Hardware 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



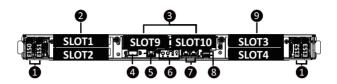
- Operating temperature: 10°C to 35°C
- Operating humidity: 8%-80% (non-condensing)
- Non-operating temperature: -40°C to 60°C
- Non-operating humidity: 20%-95% (non-condensing)

1-3 System Block Diagram



Chapter 2 System Appearance

2-1 Front View

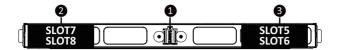


No.	Description
1.	EDSFF E1.S SSD Bay
2.	GPU Card Slot
3.	PCIe Card Slot
4.	VGA Port
5.	Server Management LAN Port
6.	Front Panel LEDs and Buttons
7.	10 GbE LAN Port
8.	USB 3.2 Gen1 Port
9.	GPU Card Slot



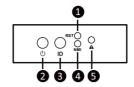
 Refer to section 2-3 Front Panel LEDs and Buttons for a detailed description of the function of the LEDs.

Rear View 2-2



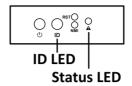
No.	Description
1.	Power Distribution Board to Bus Bar Connector
2.	GPU Card Slot
3.	GPU Card Slot

2-3 Front Panel LEDs and Buttons



No.	Name	Color	Status	Description		
1.	Reset Button			Press this button to reset the system.		
		Green	On	Indicates the system is powered on.		
2.	Power button	Green	Blink	System is in ACPI S1 state (sleep mode).		
	with LED	N/A	Off	- System is not powered on or in ACPI S5 state (power off) - System is in ACPI S4 state (hibernate mode)		
3.	ID Button with	Blue	On	Indicates the system identification is active.		
Э.	LED(Note)	N/A	Off	Indicates the system identification is disabled.		
4.	Press this button for the server to generate NMI button processor. If multiple-bit ECC errors occur, effectively be halted.					
	System Status LED ^(Note)	Green	Solid On	System is operating normally.		
			Solid On	Critical condition, may indicate: System fan failure System temperature		
5.		Amber	Blink	Non-critical condition, may indicate: Redundant power module failure Temperature and voltage issue Chassis intrusion		
		N/A	Off	System is not ready, may indicate: POST error NMI error Processor or terminator missing		

2-4 RoT LEDs



LED on Front panel(Note5)			
ID LED	Status LED		
OFF	OFF		
OFF	OFF		
Blinks Blue	Blinks Green		
Blinks Blue	Blinks Green		
4 times per second	4 times per second		
OFF	OFF		
OFF	OFF		
OFF	OFF		
OFF	OFF		
OI I	Orr		
	OFF OFF Blinks Blue 4 times per second Blinks Blue 4 times per second OFF OFF		

Active Flash Authentication (AUTH) Fail						
DMO - ALITH F - 11(Note2)	Blinks Blue	Blinks Green				
BMC : AUTH Fail ^(Note2)	1 time per second	1 time per second				
DIOC - ALITH 5-1/Note2)	Blinks Blue	Blinks Amber				
BIOS : AUTH fail ^(Note2)	1 time per second	1 time per second				
	Blinks Blue	Blinks Green				
BMC : AUTH fail after doing recovery(Note3)	2 times per second	2 times per second				
• •	[ON OFF OFF]	[ON OFF OFF]				
	Blinks Blue	Blinks Amber				
BIOS: AUTH fail after doing recovery(Note3)	2 times per second	2 times per second				
,	[ON OFF OFF]	[ON OFF OFF]				
Backup Flash Authentication Fail ^(Note4)						
	Blinks Blue	Blinks Green				
BMC : AUTH fail	2 times per second	2 times per second				
	[ON OFF ON OFF]	[ON OFF ON OFF]				
	Blinks Blue	Blinks Amber				
BIOS: AUTH fail	2 times per second	2 times per second				
	[ON OFF ON OFF]	[ON OFF ON OFF]				

NOTE!

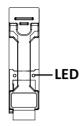
- 1. EC FW is broken or not exited result in Microchip CEC1702 cannot load EC FW for authentication.
- (1) Authentication fail include below scenarios Configuration table is missing or modified Public key is missing or modified Protected area or signature is modified Flash empty
- 3. if active flash is still authentication failed after recovery sequence, Microchip CEC1702 stop the process and showing LED behavior.
- 4. If backup flash authentication is failed cause by configuration table, public key or protected area is broken. Microchip CEC1702 stop the process and showing LED behavior.
- 5. Front panel LED is controlled by BMC or Microchip CEC1702. Once Microchip CEC1702 is working(Auth or recovery), the front panel LED is controlled by Microchip CEC1702 and vice versa.

2-5 Front System LAN LEDs



No.	Name	Color	Status	Description		
		Yellow	On	1 Gbps data rate		
1.	1 GbE Speed LED	' Green On 100 Minns data rate		100 Mbps data rate		
	-	N/A	Off	10 Mbps data rate		
		Croon	On	Link between system and network or no access		
2.	1 GbE Link / Activity LED _	Green	Blink	Data transmission or reception is occurring.		
		N/A	Off	No data transmission or reception is occurring.		
	10 GbE Speed LED	Yellow	On	10 Gbps data rate		
3.		Green	On	1 Gbps data rate		
			N/A	Off	100 Mbps data rate	
		Green	On	Link between system and network or no access		
4.	10 GbE Link / Activity LED	Green	Blink	Data transmission or reception is occurring.		
		N/A	Off	No data transmission or reception is occurring.		

2-6 Storage LED



RAIL	Color	Locate	NVMe Fault	Rebuilding	HDD Access	HDD Present (No Access)	
No RAID configuration (via HBA, ICH)	NVMe LED (On NVMe Module)	Amber	OFF	ON (*1)			
RAID configuration (via HW RAID Card or SW RAID Card)	NVMe LED	Amber	BLINK	ON	Alternately		

NOTE:

(*1) Depends on HBA/Utility Spec

Chapter 3 System Hardware Installation



Pre-installation Instructions

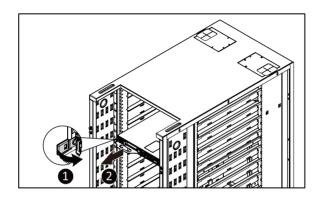
Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damage to your computer or injury to yourself.

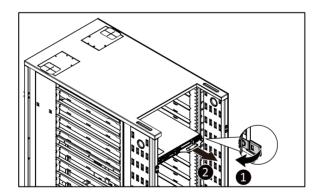
- Always disconnect the computer from the power outlet whenever you are working inside the computer case.
- If possible, wear a grounded wrist strap when you are working inside the computer case.
 Alternatively, discharge any static electricity by touching the bare metal system of the computer case, 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 Compute Node from the Rack

Follow these instructions to remove the compute node from the rack:

- 1. Press the release latches inward while simultaneously pulling the handle for the compute node.
- 2. Pull the compute node out of the cabinet.
- 3. To install the compute node, push the shelf back into the cabinet.

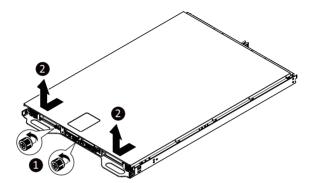




3-2 Removing and Installing the Chassis Cover

Follow these instructions to remove the chassis cover:

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



3-3 Installing the EDSFF SSD

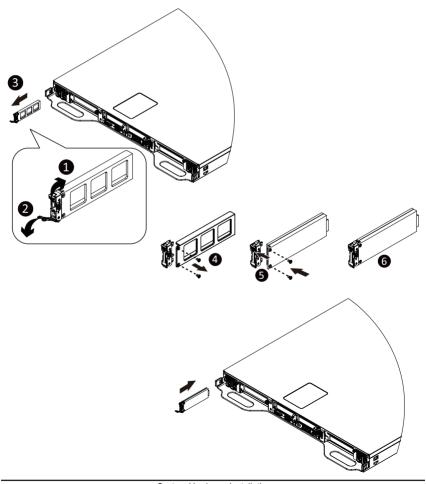


Read the following guidelines before you begin to install the EDSFF SSD:

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

Follow these instructions to install the SSD:

- 1. Press the release latch of the storage tray.
- 2. Pull out the locking lever.
- 3. Use the locking lever to slide out the storage tray.
- 4. Remove two screws on the storage tray.
- 5. Install the SSD into the storage tray, secure the SSD with two screws.
- 6. Re-install the storage tray with SSD into the system until it clicks.



3-4 Removing and Installing the Heat Sink



Read the following guidelines before you begin to install the heat sink:

- Always turn off the computer and unplug the power cord from the power outlet before installing the heat sink 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.

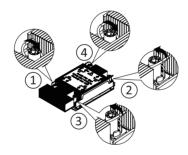


WARNING!

Failure to 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 heat sink:

- 1. Loosen the screws securing the heat sink in place in reverse order $(4 \rightarrow 3 \rightarrow 2 \rightarrow 1)$.
- 2. Lift and remove the heat sink from the system.
- 3. To install the heat sink, reverse steps 1-2 while ensuring that you tighten the captive screws in sequential order (1→2→3→4) as seen in the image below.



3-5 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.

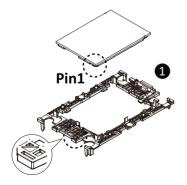


WARNING!

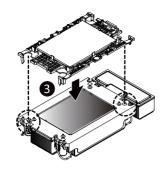
Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

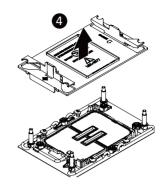
Follow these instructions to install the CPU:

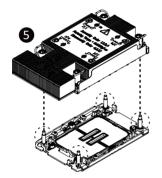
- Align the processor to the carrier so that the gold triangle on the processor aligns with the triangle on the carrier, and then install the processor into the carrier.
- 2. Place the thermal pad at the bottom of the CPU heatsink.
- Carefully flip the heatsink over. Align the carrier assembly so that the triangle on the carrier aligns with the triangle on the heatsink, and then install the carrier assembly onto the bottom of the heatsink.
- 4. Remove the CPU socket cover.
 - NOTE: Save and replace the CPU socket cover if the processor is removed from its socket.
- Align the heatsink to the CPU socket using the guide pins and make sure the gold triangle is in the correct orientation. Then place the heatsink onto the top of the CPU socket.
- Secure the heatsink by tightening the screws in sequential order (1→2→3→4).
 NOTE: When removing the heatsink, loosen the screws in reverse order (4→3→2→1).

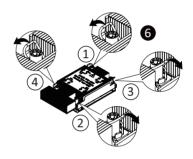












Carrier Types used for Package Types

Package Type	Xeon® SP XCC	Xeon® SP MCC	Xeon® SP+HBM
Carrier Code	E1A	E1B	E1C

NOTE!

- The carrier code is marked on each carrier and matches a code laser marked on to the IHS(Integrated Heat Spreader) to ensure the right parts are used together.
- When installing the heatsink to CPU,use T30-Lobe driver to tighten 4 captive nuts in sequence as 1-4.
- The screw tightening torque: 8 ± 0.5 kgf-cm.

3-6 Removing and Installing Memory

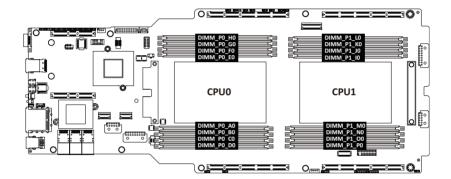


Read the following guidelines before you begin to install the memory:

- 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.

3-6-1 Eight Channel Memory Configuration

This motherboard provides 16 DDR5 memory sockets and supports Eight Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



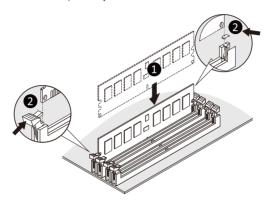
3-6-2 Removing and Installing a Memory Module



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.



3-6-3 Memory Population Table

Туре	Ranks Per DIMM	DIMM Cap	acity (GB)	Speed (MT/s); Voltage (V); DIMM per Channel (DPC) 1DPCN ¹ 2DPC				
		16Gb	24Gb ²	1.1V				
RDIMM -	SRx8 (RC D)	16GB	24GB					
	SRx4 (RC C)	32GB	48GB					
	SRx4 (RC F) 9x4	32GB	NA					
	DRx8 (RC E)	32GB	48GB					
	DRx4 (RC A)	64GB	96GB	4800	4400			
	DRx4 (RC B) 9x4	64GB	NA					
RDIMM 3DS	(4R/8R)x4	2H-128GB	NA					
	(RC A)	4H-256GB						

NOTE:

- 1.1DPC applies to 1SPC or 2SPC implementations (SPC Sockets Per Channel)
- 2. 24Gb XCC only w/ limited configs: 1DPC all DIMM types, 2DPC 96GB only. Only 8 and 16 DIMM configs, no fallbacks.

3-6-4 Processor and Memory Module Matrix Table

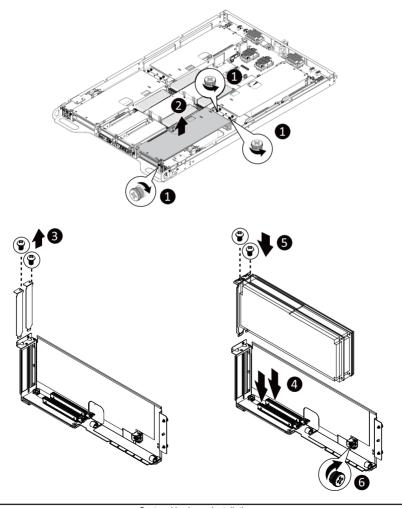
Memory Q'ty		CPU0							CPU1							
for each CPU	H0	G0	F0	E0	A0	В0	C0	D0	LO	K0	J0	10	M0	N0	00	P0
1 DIMM					v							v				
2 DIMM		v			v							v			v	
4 DIMM		v		v	v		v			v		v	v		v	
6 DIMM		v	v	v	v		v	v	v	v		v	v	v	v	
8 DIMM	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v

3-7 Installing the GPU Card

Follow these instructions to install the GPU card:

For Slot3/Slot4

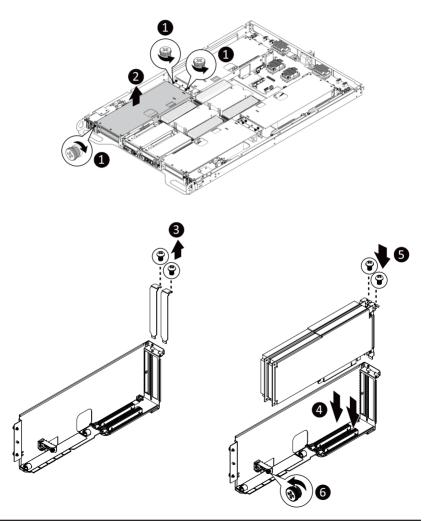
- 1. Loosen the thumbnail screws securing the GPU card bracket.
- 2. Slightly lift the GPU card bracket up in the direction indicated as shown in the image below.
- 3. Remove the two screws securing the GPU card slot covers and remove the GPU slot covers.
- 4. Insert the GPU card into the selected slot. Make sure the GPU card is properly seated.
- 5. Install the two screws to secure the GPU card in place.
- 6. Use a driver to tighten the thumbnail screw of the GPU card.
 - NOTE! The screw tightening torque: 5 ± 0.5 kgf-cm.
- 7. Reverse step 1-7 to install the GPU card with bracket into the system.



Follow these instructions to install the GPU card:

For Slot1/Slot2

- 1. Loosen the thumbnail screws securing the GPU card bracket.
- 2. Slightly lift the GPU card bracket up in the direction indicated as shown in the image below.
- 3. Remove the two screws securing the GPU card slot covers and remove the GPU slot covers.
- 4. Insert the GPU card into the selected slot. Make sure the GPU card is properly seated.
- 5. Install the two screws to secure the GPU card in place.
- 6. Use a driver to tighten the thumbnail screw of the GPU card.
 - NOTE! The screw tightening torque: 5 ± 0.5 kgf-cm.
- 7. Reverse step 1-7 to install the GPU card with bracket into the system.



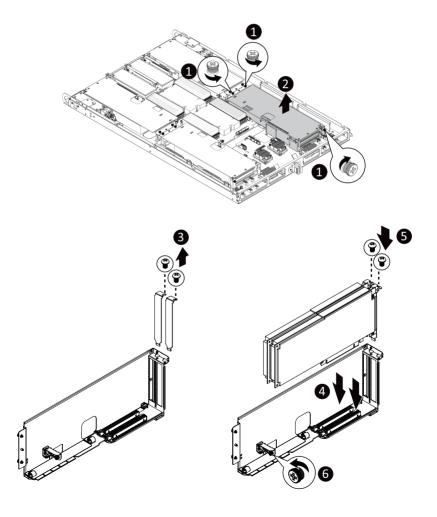
Follow these instructions to install the GPU card:

For Slot5/Slot6

- 1. Loosen the thumbnail screws securing the GPU card bracket.
- 2. Slightly lift the GPU card bracket up in the direction indicated as shown in the image below.
- 3. Remove the two screws securing the GPU card slot covers and remove the GPU slot covers.
- 4. Insert the GPU card into the selected slot. Make sure the GPU card is properly seated.
- 5. Install the two screws to secure the GPU card in place.
- 6. Use a driver to tighten the thumbnail screw of the GPU card.

NOTE! The screw tightening torque: 5 ± 0.5 kgf-cm.

7. Reverse step 1-7 to install the GPU card with bracket into the system.



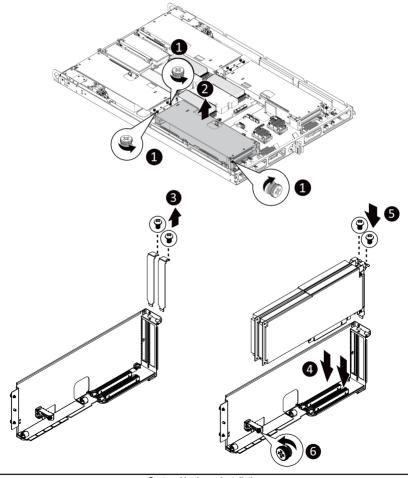
Follow these instructions to install the GPU card:

For Slot7/Slot8

- 1. Remove the two screws securing the GPU card bracket and remove the bracket.
- 2. Remove the screw securing the GPU card bracket from the side of system.
- 3. Loosen the thumbnail screw securing the GPU card bracket.
- 4. Slightly lift the GPU card bracket up in the direction indicated as shown in the image below.
- 5. Remove the two screws securing the GPU card slot covers and remove the GPU slot covers.
- 6. Insert the GPU card into the selected slot. Make sure the GPU card is properly seated.
- 7. Install the two screws to secure the GPU card in place.
- 8. Use a driver to tighten the thumbnail screw of the GPU card.

NOTE! The screw tightening torque: 5 ± 0.5 kgf-cm.

9. Reverse step 1-7 to install the GPU card with bracket into the system.



3-8 Removing and Installing the PCIe Card



• 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.

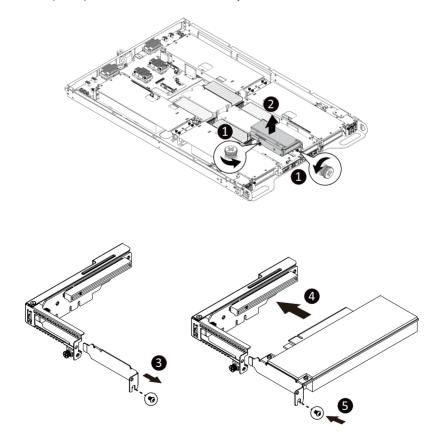
Follow these instructions to install the left PCI Expansion card:

- Loosen the two thumbnail 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.
- Orient the PCle card with the riser guide slot and push in the direction of the arrow until the PCle card sits in the PCle card connector.

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

Repeat steps 3-4 as necessary.

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



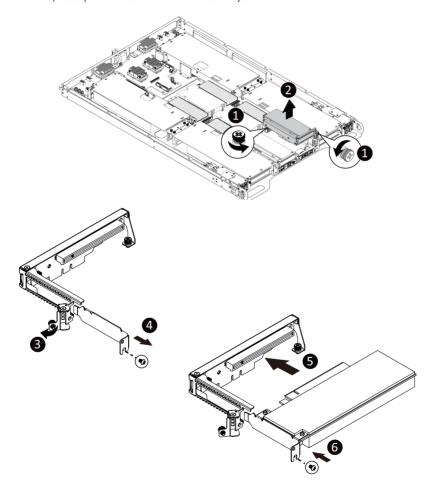
Follow these instructions to install the right PCI Expansion card:

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

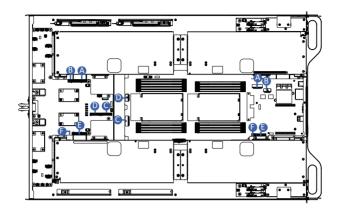
NOTE: Some riser brackets allow for single or multiple PCle cards.

Repeat steps 4-5 as necessary.

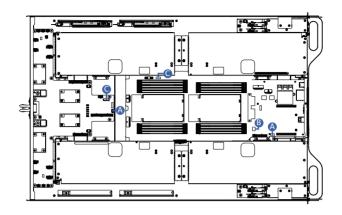
- 6. Secure the PCle card with the screw.
- 7. Repeat steps 1-3 to install the PCle card into the system.



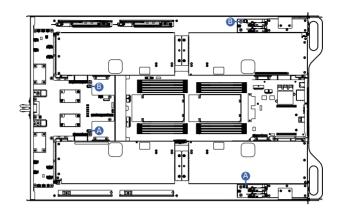
3-9 Cable Routing



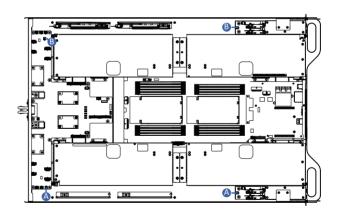
	System Power Cable	Motherboard: ATX1_1
A		Power Distribution Board: ATX1_1
В	0 1 5 011	Motherboard: ATX1_2
В	System Power Cable	Power Distribution Board: ATX1_2
С	System Power Cable	Motherboard: ATX2_1
		Power Distribution Board: ATX2_1
D	System Power Cable	Motherboard: ATX2_2
		Power Distribution Board: ATX2_2
E	System Power Cable	Motherboard: SSI_2X9P
		Power Distribution Board: SSI_MB_1
F	System Power Cable	Motherboard: SSI_2X2P_2
		Power Distribution Board: SSI_MB_2



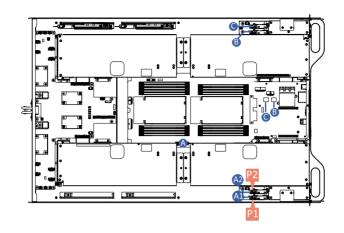
	System Signal Cable	Motherboard: JP12V_STBY
A		Power Distribution Board : JP12V_STBY1
_	System Signal Cable	Motherboard: FP_2
В		Power Distribution Board : F_PANEL1
_		Motherboard: BP_1
С	System Signal Cable	Power Distribution Board : BP_1



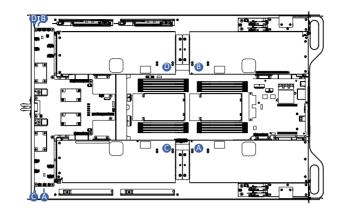
	Storage Backplane Board Signal Cable	Front Storage Board: BP_1
A		Power Distribution Board : BP_R1
ь		Front Storage Board: BP_1
P P		Power Distribution Board : BP_L1



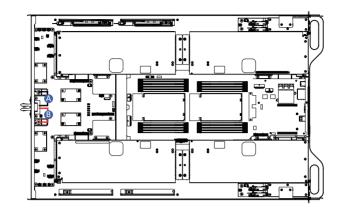
Δ.	Storage Backplane Board Power Cable	Front Storage Board: PWR_IN
A		Power Distribution Board : P_E1_L1
D		Front Storage Board: PWR_IN
		Power Distribution Board : P_E1_R1



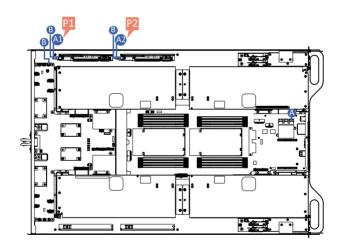
	A1	NVMe 0-1 Cable	Motherboard: U2_PO_PE3
A			Storage Board: U2_0
	A2		Motherboard: U2_PO_PE3
			Storage Board: U2_0
В		NVMe 2 Cable	Motherboard: U2_P1_PE1C
			Storage Board: U2_0
С		NVMe C Cable	Motherboard: U2_P1_PE1D
			Storage Board: U2_0



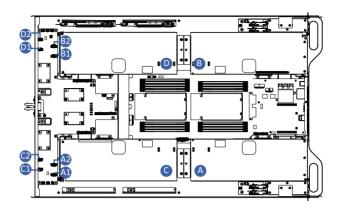
	Front System Riser Power Cable	Front System Left Riser:
A		Power Distribution Board: RIS_PWR_L1
В	Front System Riser Power Cable	Front System Right Riser:
		Power Distribution Board: RIS_PWR_R1
С	Rear System Riser Power Cable	Rear System Left Riser:
		Power Distribution Board: RIS_PWR_L
D	Rear System Riser Power Cable	Rear System Left Riser:
		Power Distribution Board: RIS_PWR_R



Α	Bus Bar Cable	Power Distribution Board: BUS_GND1
В	Dus Dai Cable	Power Distribution Board: BUS_PWR1



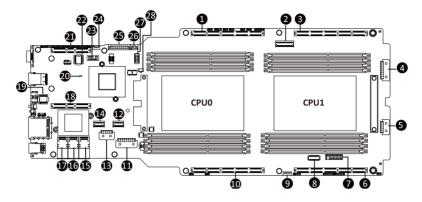
	M.2 Riser Sinal Cable (Option)	Motherboard: P1_S
A		A1: U2_M2
		A2: U2_M2
В	M.2 Riser Power Cable (Option)	M.2 Riser: M2_PWR
		Power Distribution Board: M2_PWR



		Front System Left GPU:
А		Power Distribution Board: A1: P12V_GPU3 A2: P12V_GPU4
		Front System Right GPU:
В	GPU Card Power Cable (Reserved)	Power Distribution Board: B1: P12V_GPU7 B2: P12V_GPU8
		Front System Right GPU:
С		Power Distribution Board: C1:P12V_GPU1 C2:P12V_GPU2
		Rear System Right GPU:
D		Power Distribution Board: D1: P12V_GPU5 D2: P12V_GPU6

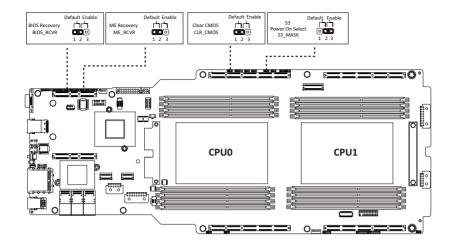
Chapter 4 Motherboard Components 4-1 Motherboard Components

Motherboard Components



Item	Description
1	PCIe x32 Slot #1
2	MCIO Connector (U2_P0_PE3/PCIe Gen5)
3	PCIe x32 Slot #3
4	2 x 9 Pin ATX Power Connector
5	2 x 6 Pin ATX Power Connector
6	PCIe x32 Slot #4
7	Front Panel Header (Primary)
8	HDD Back Plane Board Connector
9	IPMB Connector
10	PCIe x32 Slot #2
11	2 x 9 Pin ATX Power Connector
12	MCIO Connector (U2_P1_PE1D/PCIe Gen5)
13	2 x 6 Pin ATX Power Connector
14	MCIO Connector (U2_P1_PE1C/PCIe Gen5)
15	Slimline SAS Connector (sSATA #0 - #3)
16	Slimline SAS Connector (SATA #4 - #7)
17	Slimline SAS Connector (SATA #0 - #3)
18	Proprietaey PCIe Slot(Gen5 x16)
19	BMC_FLH1(BMC_FLH2/at the back)
20	BMC Readiness LED
21	Proprietaey PCIe Slot(Gen5 x16)
22	BIOS_1(BIOS_2/at the back)
23	TPM Module Connector
24	12V Standby Power Connector
25	2 x 9 Pin ATX Power Connector
26	2 x 2 Pin ATX Power Connector
27	Front Panel Header (Secondary)
28	System Battery Cable Connector

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 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></enter>	Execute command or enter the submenu
<esc></esc>	Main Menu: Exit the BIOS Setup program
	Submenus: Exit current submenu
<f1></f1>	Show descriptions of general help
<f3></f3>	Restore the previous BIOS settings for the current submenus
<f9></f9>	Load the Optimized BIOS default settings for the current submenus
<f10></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 Platform Controller Hub.

■ 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

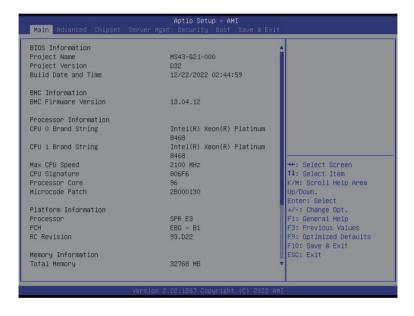
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

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.





Parameter	Description
BIOS 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 ^(Note1)	
BMC Firmware Version ^(Note1)	Displays BMC firmware version information.
Processor Information	
CPU Brand String/ Max CPU Speed / CPU Signature / Processor Core / Microcode Patch	Displays the technical information for the installed processor(s).
Platform Information	
Processor/ PCH/ RC Revision	Displays the platform information of the installed processor(s) and PCH.
Memory Information	
Total Memory ^(Note2)	Displays the total memory size of the installed memory.
Usable Memory ^(Note2)	Displays the usable memory size of the installed memory.

(Note1) Functions available on selected models..

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

Parameter	Description
Memory Frequency ^(Note2)	Displays the frequency information of the installed memory.
Onboard LAN Information	
LAN# MAC Address ^(Note3)	Displays LAN MAC address information.
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

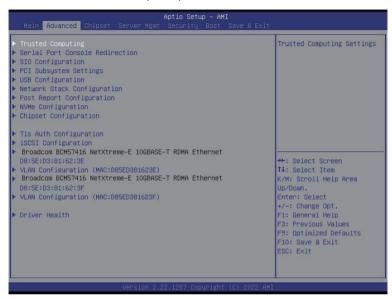
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

(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.

When Boot Mode Select is set to UEFI (Default)



When "Boot Mode Select" is set to Legacy in the Boot > Boot Mode Select section

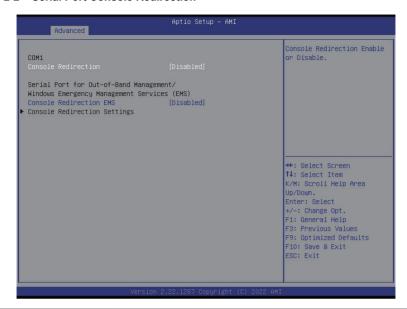


5-2-1 Trusted Computing



Parameter	Description
Configuration	
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: Enable, Disable. Default setting is Enable .

5-2-2 Serial Port Console Redirection



Parameter	Description
COM1 Console Redirection ^(Note)	Console redirection enables the users to manage the system from a remote location. Options available: Enabled, Disabled. Default setting is Disabled .
COM1 Console Redirection Settings	Press [Enter] to configure advanced items. Please note that this item is configurable when COM1 Console Redirection is set to Enabled. Terminal Type Selects a terminal type to be used for console redirection. Options available: VT100, VT100+, VT-UTF8, ANSI. Default setting is VT100+. Bits per second Selects the transfer rate for console redirection. Options available: 9600, 19200, 38400, 57600, 115200. Default setting is 115200. Data Bits Selects the number of data bits used for console redirection. Options available: 7, 8. Default setting is 8.

Parameter

Description

Parity

- A parity bit can be sent with the data bits to detect some transmission errors
- Even: parity bit is 0 if the num of 1's in the data bits is even.
- Odd: parity bit is 0 if num of 1's in the data bits is odd.
- Mark: parity bit is always 1. Space: Parity bit is always 0.
- Mark and Space Parity do not allow for error detection.
- Options available: None, Even, Odd, Mark, Space. Default setting is None

Stop Bits

- Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit.
 Communication with slow devices may require more than 1 stop bit
- Options available: 1, 2. Default setting is 1.

Flow Control

- Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
- Options available: None, Hardware RTS/CTS. Default setting is None.
- VT-UTF8 Combo Key Support
 - Enable/Disable the VT-UTF8 Combo Key Support.
 - Options available: Enabled, Disabled. Default setting is **Enabled**.
- Recorder Mode^(Note)
 - When this mode enabled, only texts will be send. This is to capture Terminal data.
 - Options available: Enabled, Disabled. Default setting is **Disabled**.
- Resolution 100x31^(Note)
 - Enable/Disable extended terminal resolution.
 - Options available: Enabled, Disabled. Default setting is Enabled.
- Putty KeyPad^(Note)
 - Selects Function Key and KeyPad on Putty.
 - Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400.
 Default setting is VT100.

COM1 Console Redirection Settings (continued)

(Note)

Parameter	Description
Legacy Console Redirection	Description
Legacy Console Redirection	
Legacy Console Redirection Settings	Press [Enter] to configure advanced items. ◆ Redirection COM Port - Selects a COM port for Legacy serial redirection. - Default setting is COM1. ◆ Resolution - Selects the number of rows and columns used in Console Redirection for legacy OS support. - Options available: 80x24, 80x25. Default setting is 80x24. ◆ Redirect After POST - 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. - Options available: Always Enable, BootLoader. Default setting is Always Enable.
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection ^(Note)	EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management. Options available: Enabled, Disabled. Default setting is Disabled .
Serial Port for Out-of-Band EMS Console Redirection Settings	Press [Enter] to configure advanced items. Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled. Out-of-Band Mgmt Port Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port. Default setting is COM1. Terminal Type EMS Selects a terminal type to be used for console redirection. Options available: VT100, VT100+, VT-UTF8, ANSI. Default setting is VT100+. Bits per second EMS Selects the transfer rate for console redirection. Options available: 9600, 19200, 57600, 115200. Default setting is 115200.

(Note)

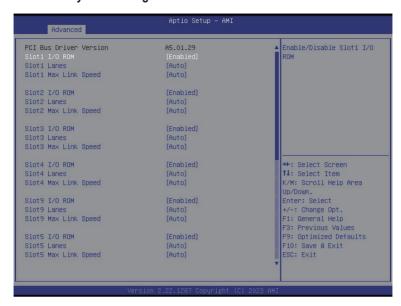
Parameter	Description
Serial Port for Out-of-Band EMS Console Redirection Settings(continued)	 Flow Control EMS Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty,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

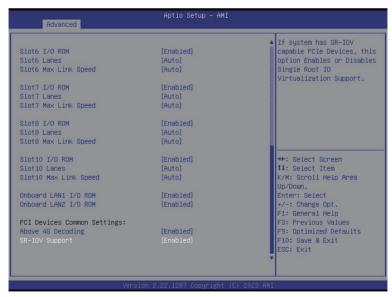
5-2-3 SIO Configuration



Parameter	Description
AMI SIO Driver Version	Displays the AMI SIO driver version information.
AMI SIO Driver Version Super IO Chip Logical Device(s) Configuration	Displays the AMI SIO driver version information. Press [Enter] to configure advanced items. Use This Device When set to Enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial port. Options available: Enabled, Disabled. Default setting is Enabled. Current: Displays the serial port base I/O address and IRQ.
[*Active*] Serial Port	- Configures the serial port base I/O address and IRQ. Use Automatic Settings IO=3F8h; IRQ=4; DMA; IO=3F8h; IRQ=4; DMA; IO=2F8h; IRQ=4; DMA; IO=3E8h; IRQ=4; DMA; IO=2E8h; IRQ=4; DMA; Default setting is Use Automatic Settings.

5-2-4 PCI Subsystem Settings





Parameter	Description
PCI Bus Driver Version	Displays the PCI Bus Driver version information.
PCI Express Slot # I/O ROM ^(Note1)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is Enabled .
Onboard LAN1/ LAN2 I/O ROM(Note2)	Enable/Disable the onboard LAN1/ LAN2 devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled .
PCI Devices Common Settings	
Above 4G Decoding	Enable/Disable memory mapped I/O to 4GB or greater address space (Above 4G Decoding). Options available: Enabled, Disabled. Default setting is Enabled .
SR-IOV Support	If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support. Options available: Enabled, Disabled. Default setting is Enabled .

(Note1) This section is dependent on the available PCle Slot.

(Note2) This section is dependent on the available LAN controller.

5-2-5 USB Configuration



Parameter	Description
USB Configuration	
USB Devices:	Displays the USB devices connected to the system.
XHCI Hand-off	Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Enabled, Disabled. Default setting is Enabled .
USB Mass Storage Driver Support ^(Note)	Enable/Disable the USB Mass Storage Driver Support. Options available: Enabled, Disabled. Default setting is Enabled .
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: Enabled, Disabled. Default setting is Enabled .

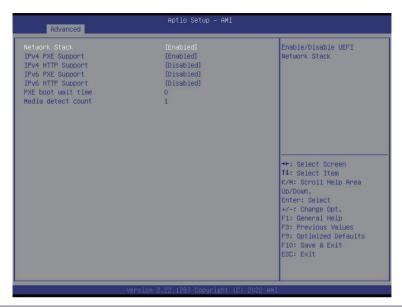
(Note) This item is present only if you attach USB devices.

5-2-6 Network Stack Configuration



Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 PXE Support	Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is Enabled .
Ipv4 HTTP Support	Enable/Disable the Ipv4 HTTP feature. Options available: Enabled, Disabled. Default setting is Disabled .
Ipv6 PXE Support	Enable/Disable the Ipv6 PXE feature. Options available: Enabled, Disabled. Default setting is Disabled .
Ipv6 HTTP Support	Enable/Disable the Ipv6 HTTP feature. Options available: Enabled, Disabled. Default setting is Disabled .
PXE boot wait time	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	Number of times the presence of media will be checked. Press the <+> / <-> keys to increase or decrease the desired values.

5-2-7 Post Report Configuration



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

5-2-8 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 BIOS Build-In.

5-2-9 Chipset Configuration



Parameter	Description
Restore on AC Power Loss ^(Note)	Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, Unspecified. The default setting depends on the BMC setting.
Skip Above 4G Decoding for VGA	Enable/Disable 64bit capable devices to be decoded in Skip Above 4G Address VGA Space. Options available: Enabled, Disabled. Default setting is Disabled .
P2P Bridge IO Size	Specifies P2P Bridge IO aligned to the size. Options available: 0x100, 0x150, 0x1000. Default setting is 0x1000 .
P2P Performance for GPU	Options available: Enabled, Disabled. Default setting is Enabled .
SATA HDD Security Frozen	Enable/Disable this item to send freeze lock command to SATA HHD. Options available: Enabled, Disabled. Default setting is Enabled .
Chassis Opened Warning	Enable/Disable the chassis intrusion alert function. Options available: Enabled, Disabled, Clear. Default setting is Disabled.

(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

5-2-10 Tls Auth Configuration



Parameter	Description
Server CA Configuration	Press [Enter] for configuration of advanced items.
	Enroll Cert
	- Press [Enter] to enroll a certificate
	Enroll Cert Using File
	Cert GUID
	Input digit character in 1111111-2222-3333-4444-1234567890ab
	format.
	 Commit Changes and Exit
	 Discard Changes and Exit
	Delete Cert
Client Cert Configuration	Press [Enter] for configuration of advanced items.

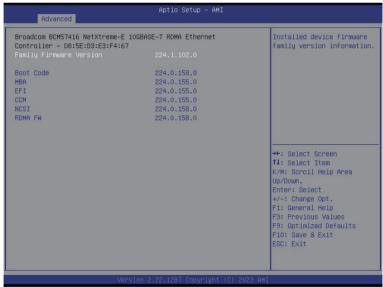
5-2-11 iSCSI Configuration

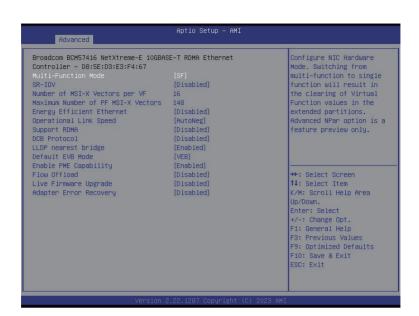


Parameter	Description
Attempt Priority	Press [Enter] configure advanced items. Attempt Priority Options available: Host Attempt, Redfish Attempt. Default setting is Host Attempt. Commit Changes and Exit
Host iSCSI Configuration	Press [Enter] to configure advanced items. • iSCSI Initiator Name - Only IQN format is accepted. Range: from 4 to 223 • Add an Attempt • Delete Attempts • Change Attempt Order

5-2-12 Broadcom BCM57416 Ethernet Network Connection



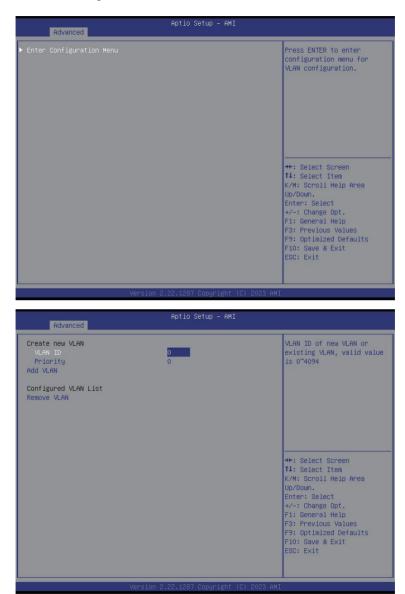




Advanced Broadcom BCM57416 NetXtreme-E 10GBASE-T RDMA Ethernet Controls the enablement of legacy Boot Protocols in Controller - D8:5E:D3:E3:F4:67 Option ROM Legacy Boot Protocol the Option ROM. [PXE] Boot Strap Type [Auto Detect] Hide Setup Prompt [Disabled] Setup Key Stroke Banner Message Timeout Pre-boot Wake On LAN [Enabled] VLAN Mode [Disabled] VLAN ID (1-4094) Boot Retry Count [No Retry] →+: Select Screen ↑↓: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit

Parameter	Description
Firmware Image Properties	Press [Enter] to view the firmware version information of the device.
NIC Configuration	Press [Enter] to configure advanced items. ◆ Link Speed − Default setting is Auto Negotiated. ◆ Wake On LAN − 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. − Options available: Enabled, Disabled. Default setting is Enabled. ◆ LLDP Agent − Enable/Disable firmware's LLDP Agent. − Options available: Enabled, Disabled. Default setting is Enabled
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).
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.

5-2-13 VLAN Configuration



Parameter	Description
Enter Configuration Menu	Press [Enter] to configure advanced items. Create new VLAN 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. 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. Add VLAN Press [Enter] to create a new VLAN or update an existing VLAN. Configured VLAN List Remove VLAN Press [Enter] to remove an existing VLAN.

5-2-14 Driver Health



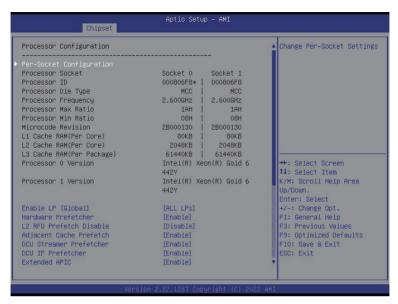
Parameter	Description
Driver Health	Displays driver health status of the devices/controllers if installed

5-3 Chipset Menu

Chipset Setup menu displays submenu options for configuring the function of Platform Controller Hub(PCH). Select a submenu item, then press <Enter> to access the related submenu screen.



5-3-1 Processor Configuration



Common RefCode Configuration		Enable or Disable Non
Numa Virtual Numa	(Enable)	uniform Memory Access (NUMA).
		++: Select Screen †1: Select Item K/M: Scroll Help Area Up/Down. Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Parameter	Description
Processor Configuration	
Pre-Socket Configuration	Press [Enter] to configure advanced items. CPU Socket 0/1 Configuration Core Disable Bitmap(Hex) Number of Cores to enable. 0 means all cores. FFFFFFF means to disable all cores. The maximum value depends on the number of CPUs available. Press the numeric keys to adjust desired values.
Processor Socket / Processor ID / Processor Frequency / Processor Max Ratio / Processor Min Ratio / Microcode Revision / L1 Cache RAM(Per Core) / L2 Cache RAM(Per Core) / L3 Cache RAM(Per Package) / Processor # Version	Displays the technical specifications for the installed processor(s).
Hyper-Threading [All]	The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance. Options available: Enable, Disable. Default setting is Enable .
Hardware Prefetcher	Select whether to enable the speculative prefetch unit of the processor. Options available: Enable, Disable. Default setting is Disable .
L2 RF0 Prefetch Disable	Options available: Enable, Disable. Default setting is Disable .
Adjacent Cache Prefetch	When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched. Options available: Enable, Disable. Default setting is Enable .
DCU Streamer Prefetcher	Enable/Disable DCU streamer prefetcher. Options available: Enable, Disable. Default setting is Enable .
DCU IP Prefetcher	Enable/Disable DCU IP Prefetcher. Options available: Enable, Disable. Default setting is Enable .
Extended APIC	Enable/Disable extended APIC support. Note: The VT-d will be enabled automatically when x2APIC is enabled. Options available: Enable, Disable. Default setting is Disable.
Enable Intel(R) TXT	Enable/Disable the Intel Trusted Execution Technology support function. Options available: Enable, Disable. Default setting is Disable .
VMX (Vanderpool Technology)	Enable/Disable the Vanderpool Technology. This will take effect after rebooting the system. Options available: Enable, Disable. Default setting is Enable .
Enable SMX	Enable/Disable the Safer Mode Extensions (SMX) support function. Options available: Enable, Disable. Default setting is Disable .
AES-NI	Enable/Disable the AES-NI support. Options available: Enable, Disable. Default setting is Enable .

Parameter	Description
Debug Consent	Options available: Enable, Disable. Default setting is Disable .
Total Memory Encryption (TME)	Enable/Disable total memory encryption (TME).
	Options available: Enabled, Disabled. Default setting is Disabled.

5-3-2 Common RefCode Configuration



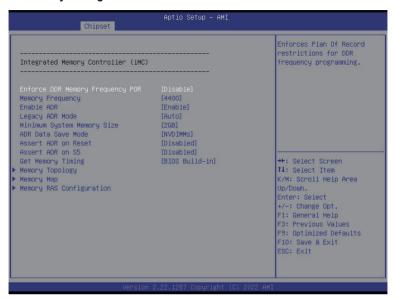
Parameter	Description
Common RefCode Configuration	
MMIO High Base	Selects the MMIO High Base setting. Options available: 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T. Default setting is 56T .
MMIO High Granularity Size	Selects the allocation size used to assign memory-mapped I/O (MMIO) resources. Total mmio space can be up to 32x granularity. Per stack mmio resource assignments are multiples of the granularity where 1 unit per stack is the default allocation. Options available: 1G, 4G, 16G, 64G, 256G, 1024G. Default setting is 256G .
Isoc Mode	Enable/Disable the Isochronous support in order to meet the QoS requirements (Quality of Service). Options available: Auto, Enable, Disable. Default setting is Auto .
Numa (Non-Uniform Memory Access)	Enable/Disable Non-uniform Memory Access (NUMA) support to improve the system performance. Options available: Enable, Disable. Default setting is Enable .
Virtual Numa	Divide physical NUMA nodes into evenly sized virtual NUMA nodes in ACPI table. This may improve Windows performance on CPUs with more than 64 logical processors. Options available: Enable, Disable. Default setting is Disable .

5-3-3 UPI Configuration



Parameter	Description
UnCore General Configuration	Press [Enter] to configure advanced items. Uncore Status Press [Enter] to view the Uncore status. Link Frequency Select Selects the UPI link frequency. Options available: 9.6GT/s, 10.4GT/s, 11.2GT/s, Auto. Default setting is Auto. SNC (Sub NUMA) Enable/Disable Sub NUMA Cluster function. Options available: Disable, Enable SNC2 (2-clusters). Default setting is Disable. Stale AtoS Enable/Disable Stale A to S directory optimization. Options available: Disable, Enable, Auto. Default setting is Auto. LLC dead line alloc Enable/Disable fill dead lines in LLC. Options available: Disable, Enable, Auto. Default setting is Enable.

5-3-4 Memory Configuration



Parameter	Description
Integrated Memory Controller (iMC)	
	When set to Enable, the system enforces Plan Of Record restrictions
Enforce POR	for DDR4 frequency and voltage programming.
	Options available: POR, Disable. Default setting is Disable .
	Configures the maximum memory frequency. If Enforce POR is
Memory Frequency	disabled, user will be able to run at higher frequencies than the
Memory r requericy	memory support (limited by processor support).
	Default setting is Auto .
	Enables the detecting and enabling of ADR (Asynchronous DRAM
Enable ADR	Refresh) function.
	Options available: Enable, Disable. Default setting is Enable .
Lancou ADD Mada	Enable/Disable the Legacy ADR Mode.
Legacy ADR Mode	Options available: Enable, Disable. Default setting is Disable .
Minimum Custom Manage Cine	Configures the minimum memory size.
Minimum System Memory Size	Options available: 2GB, 4GB, 6GB, 8GB. Default setting is 2GB .
	Specifies the Data Save Mode for ADR. Batterybacked or Type 01
ADR Data Save Mode	NVDIMM.
ADR Data Save Mode	Options available: Disable, Batterybacked DIMMs, NVDIMMs.
	Default setting is NVDIMMs .
Frase-Arm NVDIMMs	Enable/Disable Erasing and Arming NVDIMMs.
ETASE-ATTI INV DIIVIIVIS	Options available: Enable, Disable. Default setting is Enable .

Parameter	Description
Deeters NV/DIMMe	Enable/Disable Automatic restoring of NVDIMMs.
Restore NVDIMMs	Options available: Enable, Disable. Default setting is Enable .
Interior and NIV/DIMMe	Controls if NVDIMMs are interleaved together or not.
Interleave NVDIMMs	Options available: Enable, Disable. Default setting is Enable .
Assert ADD on Doort	Enable/Disable Assert ADR on Reset.
Assert ADR on Reset	Options available: Enabled, Disabled. Default setting is Disabled .
Assert ADR on S5	Enable/Disable Assert ADR on S5.
ASSERTADIR OII 55	Options available: Enabled, Disabled. Default setting is Disabled .
Cot Momony Timing	Auto is the detected SPD value and use it, otherwise use BIOS Build-in.
Get Memory Timing	Options available: Auto, BIOS Build-in. Default setting is BIOS Build-in .
Momony Topology	Press [Enter] to view memory topology with DIMM population
Memory Topology	information.
	Press [Enter] to configure advanced items.
	◆ RAS Type
	 Displays the RAS type.
	◆ New SDDC Mode
	 Enable/Disable 48B SDDC ECC from ICX C0 Onwards.
	 Options available: Disabled, Enabled. Default setting is
	Enabled.
	◆ Mirror Mode
	 Mirror Mode will set entire 1LM memory in system to be
	mirrored, consequently reducing the memory capacity by half.
	Enables the Mirror Mode will disable the XPT Prefetch.
	Options available: Disabled, Full Mirror Mode, Partial Mirror
	Mode. Default setting is Disabled .
	Correctable Error Threshold
Memory RAS Configuration	 Correctable Error Threshold (0x01-0x7fff) used for sparing, and leaky bucket.
,	 Press the <+> / <-> keys to increase or decrease the desired
	values.
	Trigger SW Error Threshold
	 Enable/Disable Sparing trigger SW Error Match Threshold.
	 Options available: Disabled, Enabled. Default setting is
	Disabled.
	 Sparing SW Error Match Threshold
	 Correctable Error Threshold (1-32767) used for bank level
	information.
	 Press the <+> / <-> keys to increase or decrease the desired
	values.
	Correctable Error Time Window
	 Correctable Error time window based interface in hour (0-24).
	 Press the <+> / <-> keys to increase or decrease the desired
	values.

Parameter	Description
Memory RAS Configuration (continued)	 Leaky bucket time window based interface Enable/Disable leaky bucket time window based interface. Options available: Disabled, Enabled. Default setting is Disabled. Leaky bucket low bit Configures leaky bucket low bit (1-63). Press the <+> / <-> keys to increase or decrease the desired values. Leaky bucket high bit Configures leaky bucket high bit (1-63). Press the <+> / <-> keys to increase or decrease the desired values. ADDDC Sparing^(Note) Enable/Disable ADDDC Sparing. Options available: Disabled, Enabled. Default setting is Disabled. Enable ADDDC Error Injection Options available: Disabled, Enabled. Default setting is Enabled. Column Correction Disable Options available: Disable, Enable. Default setting is Disable. Set PMem Die Sparing Options available: Disabled, Enabled. Default setting is Disabled. Patrol Scrub Options available: Disabled, Enabled, Enable at End of POST. Default setting is Disabled.

5-3-5 IIO Configuration



Parameter	Description
IIO Configuration	
Intel® VT for Directed I/O (VT-d)	Press [Enter] to configure advanced items. Intel® VT for Directed I/O Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables. Options available: Enable, Disable. Default setting is Enable. ACS Control Enable: Programs ACS only to Chipset PCle Root Ports Bridges. Disable: Programs ACS to all PCle bridges. Default setting is Enable. DMA Control Opt-In Flag Enable/Disable DMA_CTRL_PLATFORM_OPT_IN_FLAG in DMAR table in ACPI. Not compatible with Direct Device Assignment (DDA). Options available: Enable, Disable. Default setting is Disable. Interrupt Remapping Enable/Disable the interrupt remapping support function. Options available: Auto, Enable, Disable. Default setting is Auto. x2APIC Opt Out Options available: Enable, Disable. Default setting is Disable. Pre-boot DMA Protection Options available: Enable, Disable. Default setting is Disable.
	DIOC Catain

Parameter	Description
	Press [Enter] to configure advanced items.
	 Intel® VMD Configuration
Intel® VMD technology	 Enable/Disable Intel® VMD technology.
	 Options available: Enable, Disable. Default setting is Disable.
	 Intel® VMD for Non-Hotplug NVMe^(Note)
	 Enable/Disable Intel® VMD for Non-Hotplug NVMe.
	 Options available: Enable, Disable. Default setting is Disable.

5-3-6 Advanced Power Management Configuration



Parameter	Description
Advanced Power Management Configuration	
CPU P State Control	 Press [Enter] to configure advanced items. SpeedStep (Pstates) Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. Options available: Enable, Disable. Default setting is Enable. Activate SST-BF Enable/Disable SST-BF. Options available: Enable, Disable. Default setting is Disable. Configure SST-BF(Note) Enable/Disable BIOS to configure SST-BF High Priority Cores Options available: Enable, Disable. Default setting is Enable. Turbo Mode When this item is enabled, the processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance. When this item is disabled, the processor will not overclock any of its core. Options available: Enable, Disable. Default setting is Enable.

(Note) This item is configurable when Activate SST-BF is set to Enable.

Parameter	Description
Hardware PM State Control	Press [Enter] to configure advanced items. ◆ Hardware P-States − When this item is disabled, the processor hardware chooses a P-state based on OS Request (Legacy P-States). − In Native mode, the processor hardware chooses a P-state based on OS guidance. − In Out of Band mode, the processor hardware autonomously chooses a P-state (with no OS guidance). − Options available: Disable, Native Mode, Out of Band Mode, Native Mode with No Legacy Support. Default setting is Native Mode.
CPU C State Control	Press [Enter] to configure advanced items. ◆ Enable Monitor MWAIT - Allows Monitor and MWAIT instructions. - Options available: Enable, Disable. Default setting is Disable . ◆ CPU C6 Report - Enable/Disable CPU C6(ACPI C3) report to OS. - Options available: Disable, Enable, Auto. Default setting is Disable . ◆ Enhanced Halt State (C1E) - Core C1E auto promotion control. Takes effect after reboot. - Options available: Enable, Disable. Default setting is Disable .
Package C State Control	Press [Enter] to configure advanced items. Package C State Configures the state for the C-State package limit. Options available: C0/C1 state, C2 state, C6(non Retention) state, Auto. Default setting is Auto.
CPU - Advanced PM Tuning	Press [Enter] to configure advanced items. ◆ Energy Perf BIAS − Enters the Energy Perf BIAS submenu. » Power Performance Tuning • Options available: OS Controls EPB, BIOS Controls EPB, PECI Controls EPB. Default setting is OS Controls EPB . » Energy_PERF_BIAS_CFG mode ^(Note) • Options available: Performance, Balanced Performance, Balanced Power, Power. Default setting is Performance .

5-3-7 PCH Configuration





Parameter	Description
PCH Configuration	
PCH SATA Configuration	Press [Enter] to configure advanced items. ◆ SATA Controller - Enable/Disable SATA controller. - Options available: Enable, Disable. Default setting is Enable. ◆ Configure SATA as - Configures on chip SATA type. - AHCI Mode: When set to AHCI, the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time. - RAID Mode: When set to RAID, the SATA controller enables both its RAID and AHCI functions. You will be allowed to access the RAID setup utility at boot time. - Options available: AHCI, RAID. Default setting is AHCI. ◆ Alternate Device ID on RAID ^(Note 1) - Enable/Disable Alternate Device ID on RAID mode. - Options available: Enable, Disable. Default setting is Disable. ◆ SATA Port 0/1/2/3/4/5/6/7 - The category identifies SATA hard drives that are installed in the computer. System will automatically detect HDD type.

(Note 1) Only appears when HDD sets to RAID Mode.

Parameter	Description
PCH SATA Configuration (continued)	 Port 0/1/2/3/4/5/6/7 Enable/Disable Port 0/1/2/3/4/5/6/7 device. Options available: Enable, Disable. Default setting is Enable. Hot Plug (for Port 0/1/2/3/4/5/6/7)^(Note 2) Enable/Disable HDD Hot-Plug function. Options available: Enable, Disable. Default setting is Enable. Spin Up Device (for Port 0/1/2/3/4/5/6/7)^(Note 2) On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device. Options available: Enable, Disable. Default setting is Disable.
PCH sSATA Configuration	 sSATA Controller Enable/Disable sSATA controller. Options available: Enable, Disable. Default setting is Enable. Configure sSATA as Configures on chip SATA type. AHCI Mode: When set to AHCI, the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time. RAID Mode: When set to RAID, the SATA controller enables both its RAID and AHCI functions. You will be allowed to access the RAID setup utility at boot time. Options available: AHCI, RAID. Default setting is AHCI. Alternate Device ID on RAID^(Note 1) Enable/Disable Alternate Device ID on RAID mode. Options available: Enable, Disable. Default setting is Disabled. SSATA Port 0/1/2/3/4/5 The category identifies sSATA hard drives that are installed in the computer. System will automatically detect HDD type. Port 0/1/2/3/4/5 Enable/Disable Port 0/1/2/3/4/5 device. Options available: Enable, Disable. Default setting is Enable. Hot Plug (for Port 0/1/2/3/4/5)^(Note 2) Enable/Disable HDD Hot-Plug function. Options available: Enable, Disable. Default setting is Disable. Spin Up Device (for Port 0/1/2/3/4/5)^(Note 2) On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device. Options available: Enable, Disable. Default setting is Disabled.

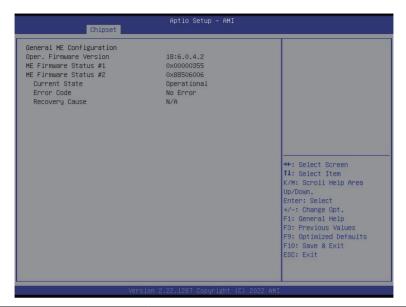
- (Note 1) Only appears when HDD sets to RAID Mode.
- (Note 2) Only Supported when HDD is in AHCI or RAID Mode.

5-3-8 Miscellaneous Configuration



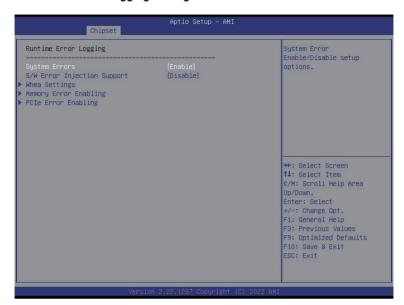
Parameter	Description
Miscellaneous Configuration	
	Selects the active video type.
Active Video	Options available: Auto, Onboard Device, PCIE Device, Specific PCIE
	Device. Default setting is Auto .

5-3-9 Server ME Configuration



Parameter	Description
General ME Configuration	
Oper. Firmware Version	Displays the operational firmware version.
ME Firmware Status #1/#2	Displays ME Firmware status information.
Current State	Displays ME Firmware current status information.
Error Code	Displays ME Firmware status error code.
Recovery Cause	Displays ME Firmware recovery cause.
PTT Support	Displays if the system supports the Intel® Platform Trust Technology.
Suppress PTT Commands	Displays if the system supports to Bypass TPM2 commands submitting to PTT Firmware.

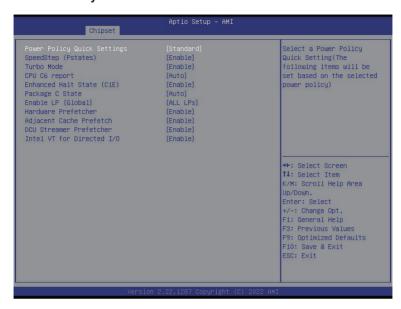
5-3-10 Runtime Error Logging Settings



Parameter	Description	
Runtime Error Logging		
System Errors	Enable/Disable system error logging function. Options available: Enable, Disable. Default setting is Enable .	
S/W Error Injection Support	Enable/Disable software injection error logging function. Options available: Enable, Disable. Default setting is Disable .	
Whea Settings	Press [Enter] to configure advanced items. • WHEA (Windows Hardware Error Architecture) Support - Enable/Disable WHEA Support. - Options available: Enable, Disable. Default setting is Enable .	
Memory Error Enabling	Press [Enter] to configure advanced items. ◆ Memory Error - Enable/Disable Memory Error. - Options available: Enable, Disable. Default setting is Enable. ◆ Memory Corrected Error - Enable/Disable Memory Corrected Error. - Options available: Enable, Disable. Default setting is Enable. ◆ Uncorrected Error disable Memory - Enable/Disable the Memory that triggers Uncorrected Error. - Options available: Enable, Disable. Default setting is Disable.	

Parameter	Description
PCle Error Enabling	Press [Enter] to configure advanced items. PCIE Error Enable/Disable PCIE error. Options available: Enable, Disable. Default setting is Disable. Uncorrected Error ^(Note) Enables and escalates Uncorrectable/Recoverable Errors to error pins. Options available: Enable, Disable. Default setting is Enable. Fatal Error Enable ^(Note) Enables and escalates Fatal Errors to error pins. Options available: Enable, Disable. Default setting is Enable. Assert NMI on SERR ^(Note) Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. Options available: Enable, Disable. Default setting is Enable. Assert NMI on PERR ^(Note) Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs. Options available: Enable, Disable. Default setting is Enable.

5-3-11 Power Policy



Parameter	Description
Power Policy Quick Settings	Selects a Power Policy Quick Setting.
	Options available: Standard, Best Performance, Energy Efficient, Turbo
	Lock. Default setting is Standard .
	Conventional Intel SpeedStep Technology switches both voltage and
SpeedStep (Pstates)	frequency in tandem between high and low levels in response to processor
SpeedStep (Fstates)	load.
	Options available: Enabled, Disabled. Default setting is Enabled .
	When this item is enabled, the processor will automatically ramp up the
Turbo Mode	clock speed of 1-2 of its processing cores to improve its performance.
TUIDO MOGE	When this item is disabled, the processor will not overclock any of its core.
	Options available: Enabled, Disabled. Default setting is Enabled .
	Enable/Disable the BIOS to enable the report from the CPU C6 state (ACPI
CPU C6 report	C3) to the OS.
	Options available: Disabled, Enabled, Auto. Default setting is Disabled .
	Enable/Disable the C1E support for lower power consumption. Takes effect
Enhanced Halt State (C1E)	after reboot.
	Options available: Enabled, Disabled. Default setting is Disabled .
	Configures the C-State package limit.
Package C State	Options available: C0/C1 state, C2 state, C6(non Retention) state,
	C6(Retention) state, Auto. Default setting is Auto .

Parameter	Description
Hyper-Threading [ALL]	The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance. Options available: Enabled, Disabled. Default setting is Enabled .
Hardware Prefetcher	Options available: Enabled, Disabled. Default setting is Enabled .
Adjacent Cache Prefetch	Options available: Enabled, Disabled. Default setting is Enabled .
DCU Streamer Prefetcher	Options available: Enabled, Disabled. Default setting is Enabled .
Isoc Mode	Enable/Disable the Isochronous support in order to meet the QoS requirements (Quality of Service). Options available: Auto, Enabled, Disabled. Default setting is Auto .
Intel® VT for Directed I/O (VT-d)	Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables. Options available: Enabled, Disabled. Default setting is Enabled .
Link Frequency Select	Selects the UPI link frequency. Options available: 9.6GT/s, 10.4GT/s, 11.2GT/s, Auto. Default setting is Auto .

5-4 Server Management Menu



Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Disabled .
FRB-2 Timer ^(Note1) timeout	Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is 6 minutes .
FRB-2 Timer Policy ^(Note1)	Configures the FRB2 Timer policy. Options available: Do Nothing, Reset, Power Down, Power Cycle. Default setting is Do Nothing .
OS Watchdog Timer	Enable/Disable OS Watchdog Timer function. Options available: Enabled, Disabled. Default setting is Disabled .
OS Wtd Timer Timeout ^(Note2)	Configures OS Watchdog Timer. The value is between 1 to 30 minutes. Default setting is 10 minutes .
OS Wtd Timer Policy ^(Note2)	Configure OS Watchdog Timer Policy. Options available: Reset, Do Nothing, Power Down, Power Cycle. Default setting is Reset .
Wait BMC Ready	POST wait BMC ready and reboot system. Options available: Disabled, 2 minutes, 4 minutes, 6 minutes. Default setting is 2 minutes .

(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.

Parameter	Description
System Event Log	Press [Enter] to configure advanced items.
View FRU Information	Press [Enter] to view the FRU information.
BMC VLAN Configuration	Press [Enter] to configure advanced items.
BMC network Configuration	Press [Enter] to configure advanced items.
IPv6 BMC Network Configuration	Press [Enter] to configure advanced items.

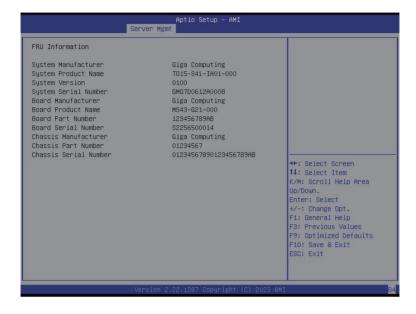
5-4-1 System Event Log



Parameter	Description
Enabling / Disabling Options	
SEL Components	Change this item to enable or disable all features of System Event Logging during boot. Options available: Enabled, Disabled. Default setting is Enabled .
Erasing Settings	
Erase SEL	Choose options for erasing SEL. Options available: No, Yes, On next reset, Yes, On every reset. Default setting is No .
When SEL is Full	Choose options for reactions to a full SEL. Options available: Do Nothing, Erase Immediately, Delete Oldest Record. Default setting is Do Nothing .
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 Error code.

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.

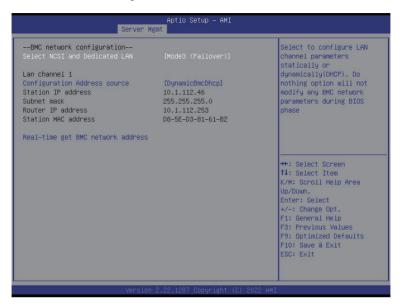


5-4-3 BMC VLAN Configuration



Parameter	Description
BMC VLAN Configuration	
BMC VLAN ID	Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When
	set to 0, BMC VLAN ID will be disabled.
BMC VLAN Priority	Select to configure BMC VLAN Priority. The valid range is from 0 to 7.
	When BMC VLAN ID is set to 0, BMC VLAN Priority will not be selected.

5-4-4 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 DynamicBmcDhcp.
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.

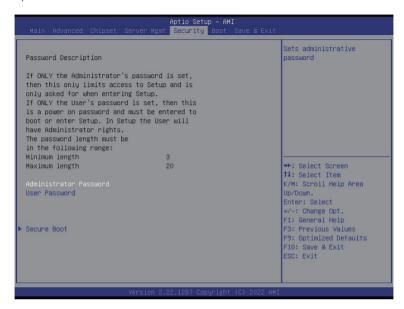
5-4-5 IPv6 BMC Network Configuration



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 Enable.
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 Enable Dynamic-Obtained by BMC running DHCP .
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.

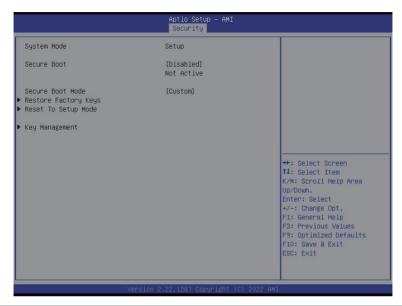
User Password

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 Disabled .
Secure Boot Mode ^(Note)	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 Custom .
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.
Reset To Setup Mode	Reset the system to Setup Mode.

_		
Pa	ram	eter

Description

Press [Enter] to configure advanced items.

Please note that this item is configurable when Secure Boot Mode is set to Custom.

- Factory Key Provision
 - Allows to provision factory default Secure Boot keys when system is in Setup Mode.
 - Options available: Enabled, Disabled. Default setting is **Disabled**.
- Restore Factory Keys
 - Installs all factory default keys. It will force the system in User Mode.
 - Options available: Yes, No.
- Reset To Setup Mode
 - Reset the system to Setup Mode.
 - Options available: Yes, No.
- Export Secure Boot variables
 - Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.
- Enroll Efi Image
 - Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db).
- Device Guard Ready
- Remove 'UEFI CA' from DB
 - Press [Enter] to remove Microsoft UEFI CA from Secure Boot DB.

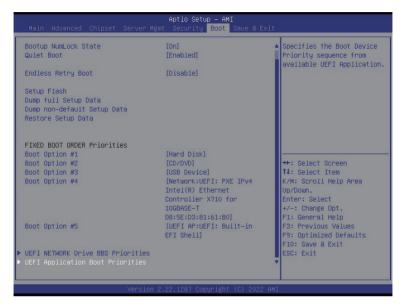
Key Management

- Restore DB defaults
 - Restore DB variable to factory defaults.
- Secure Boot variable
 - Displays the current status of the variables used for secure boot.
- Platform Key (PK)
 - Displays the current status of the Platform Key (PK).
 - Press [Enter] to configure a new PK.
 - Options available: Update.
- Key Exchange Keys (KEK)
 - Displays the current status of the Key Exchange Key Database (KEK).
 - Press [Enter] to configure a new KEK or load additional KEK from storage devices.
 - Options available: Update, Append.
- Authorized Signatures (DB)
 - Displays the current status of the Authorized Signature Database.
 - Press [Enter] to configure a new DB or load additional DB from storage devices.
 - Options available: Update, Append.
- Forbidden Signatures (DBX)
 - Displays the current status of the Forbidden Signature Database.
 - Press [Enter] to configure a new dbx or load additional dbx from storage devices.
 - Options available: Update, Append.

Parameter	Description	
Key Management (continued)	 Authorized TimeStamps (DBT) Displays the current status of the Authorized TimeStamps Database. Press [Enter] to configure a new DBT or load additional DBT from storage devices. Options available: Update, Append. OsRecovery Signatures Displays the current status of the OsRecovery Signature Database. Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices. Options available: Update, Append. 	

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.

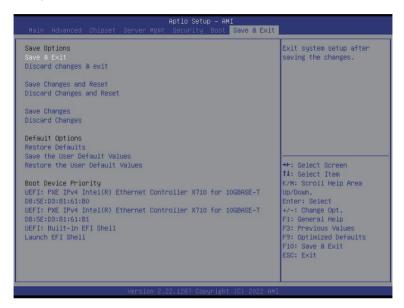


Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is On .
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is Enabled .
Setup Flash	Press [Enter] to run setup flash.
Dump full Setup Data	Press [Enter] to dump full setup data to file.
Dump non-default Setup Data	Press [Enter] to dump non-default setup data to file.
Restore Setup Data	Press [Enter] to restore setup data from file.
Boot mode select	Selects the boot mode. Options available: LEGACY, UEFI. Default setting is UEFI .

Parameter	Description
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: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI Network Drive BBS Priorities	Press [Enter] to configure the boot priority.
UEFI Application Boot Priorities	Press [Enter] to configure the boot priority.

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	

Parameter	Description
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 POST Beep code (AMI standard)

5-8-1 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	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

5-8-2 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