

GIGABYTE™

G182-C20

AMD Ryzen™ Threadripper Server System – 1U Gen3 NVMe

User Manual

Rev. 1.0

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Documentation Classifications

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

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

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

For More Information

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




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

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

Conventions

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

	NOTE! Gives bits and pieces of additional information related to the current topic.
	CAUTION! Gives precautionary measures to avoid possible hardware or software problems.
	WARNING! Alerts you to any damage that might result from doing or not doing specific actions.

Server Warnings and Cautions

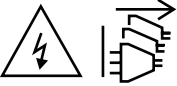
Before installing a server, be sure that you understand the following warnings and cautions.



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 all the power cords from the power supplies to disconnect power to the equipment.



- Shock Hazard! Disconnect all power supply cords before servicing.
- 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.



WARNING!

This equipment is not suitable for use in locations where children are likely to be present.



WARNING!

This equipment is intended to be used in Restrict Access Location. The access can only be gained by Skilled person.

Only authorized by well trained professional person can access the restrict access location.



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 only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

Electrostatic Discharge (ESD)



CAUTION!

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

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without any component and pin touching. 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.

System power on/off: To remove power from system, you must remove the system from rack. 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 and disconnect the cables attached to the system before servicing it. Otherwise, personal injury or equipment damage can result.

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

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

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with 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 damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

**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.

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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.

 CPU	<ul style="list-style-type: none"> Support 3rd Generation AMD Ryzen™ Threadripper™ processors
 Chipset	<ul style="list-style-type: none"> AMD TRX40
 Memory	<ul style="list-style-type: none"> 8 x DIMM slots DDR4 memory supported only Quad Channel memory architecture Support for ECC Un-buffered DIMM, non-ECC Un-buffered DIMM modules Total up to 256GB of system memory (32 GB single DIMM capacity) Memory speed: Up to 2133/ 2400/ 2667/ 2933/ 3200 MHz
 Onboard Graphics	<ul style="list-style-type: none"> Integrated in Aspeed® AST2500 2D Video Graphic Adapter with PCIe bus interface 1920x1200@60Hz 32bpp
 LAN	<ul style="list-style-type: none"> 2 x 10GbE LAN ports (Intel® X550-AT2), NCSI supported 1 x 10/100/1000 management LAN
 Expansion Slots	<ul style="list-style-type: none"> Slot_4: 1 x PCIe x16(Gen4 x16 bus)slot; Occupied by CRSG213, Gen4 x16 GPU card Slot_3: 1 x PCIe x16(Gen4 x8 bus)slot; Occupied by CNVP124, Gen3 2x NVMe HBA Slot_2: 1 x PCIe x16(Gen4 x16 bus)slot;Occupied by CRSG213, Gen4 x16 GPU card Slot_1: 1 x PCIe x16(Gen4 x8 bus)slot;no function
 Storage Interface	<ul style="list-style-type: none"> 2 x SlimSAS (with 8 x SATA 6Gb/s or 2 x PCIe Gen4 x4) connectors 4 x SATA 6Gb/s ports
 RAID	<ul style="list-style-type: none"> RAID 0, RAID 1, and RAID 10
 Internal I/O Connectors	<ul style="list-style-type: none"> 2 x SlimSAS connectors: SL_SAS1;Occupied CBPG021,Gen3 1x SATA HBA SL_SAS2;no function
 Rear I/O Connectors	<ul style="list-style-type: none"> 2 x USB 3.0 ports 1 x VGA port 2 x RJ45 ports 1 x MLAN port 1 x ID button with LED
 TPM	<ul style="list-style-type: none"> 1 x TPM header with SPI interface Optional TPM2.0 kit: CTM010



System Management

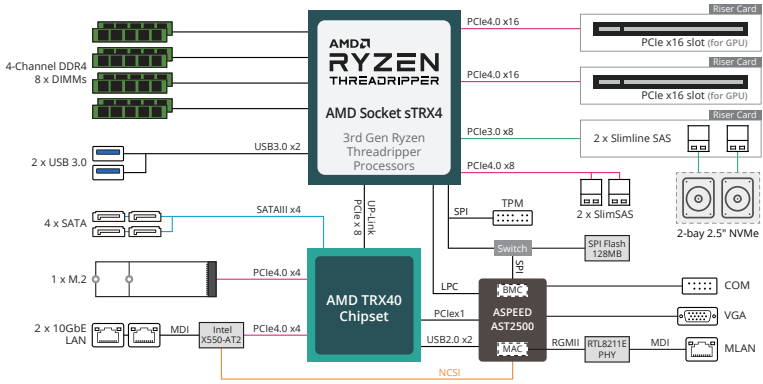
- ◆ Aspeed® AST2500 management controller
- ◆ GIGABYTE Management Console (AMI MegaRAC SP-X) web interface
- ◆ Dashboard
- ◆ JAVA Based Serial Over LAN
- ◆ HTML5 KVM
- ◆ Sensor Monitor (Voltage, RPM, Temperature, CPU Status ...etc.)
- ◆ Sensor Reading History Data
- ◆ FRU Information
- ◆ SEL Log in Linear 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
- ◆ OS Compatibility



Form Factor

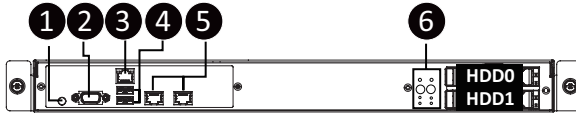
- ◆ ATX
- ◆ 478mm (W) x 43.5mm (H) x 730mm (D)

1-3 System Block Diagram



Chapter 2 System Appearance

2-1 Front View



No.	Description
1.	ID Button with LED
2.	VGA Port
3.	Server Management LAN Port
4.	USB 3.2 Port x 2
5.	10G LAN Port x 2
6.	Front Panel LEDs and Buttons



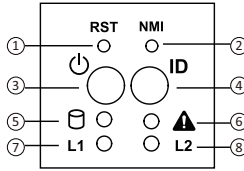
- Please Go to Chapter **2-3 Front Panel LED** and Buttons for detail description of function LEDs.

2-2 Rear View



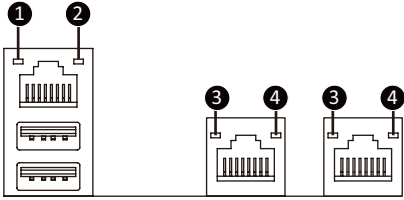
No.	Description
1.	GPU Card Slot
2.	GPU Card Slot

2-3 Front Panel LED and Buttons



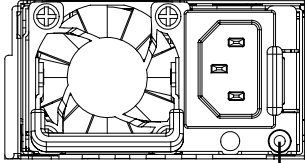
No.	Name	Color	Status	Description
1.	Reset Button			Press the button to reset the system.
2.	NMI button			Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server.
3.	Power button with LED	Green	On	System is powered on
		Green	Blink	System is in ACPI S1 state (sleep mode)
		N/A	Off	<ul style="list-style-type: none"> System is not powered on or in ACPI S5 state (power off) System is in ACPI S4 state (hibernate mode)
4.	ID Button			Press the button to activate system identification
5.	HDD Status LED	Green	On	HDD locate
			Blink	HDD access
		Amber	On	HDD fault
		Green/Amber	Blink	HDD rebuilding
		N/A	Off	No HDD access or no HDD fault.
6.	System Status LED	Green	Solid On	System is operating normally.
			Solid On	Critical condition, may indicate: System fan failure System temperature issue
		Amber	Blink	Non-critical condition, may indicate: Redundant power module failure Temperature and voltage issue Chassis intrusion
			N/A	Off
7/8.	LAN 1/2 Active/Link LEDs	Green	Solid On	Link between system and network or no access.
		Green	Blink	Data trasmission or receiving is occuring
		N/A	Off	No data transmission or receiving is occuring

2-4 System LAN LEDs



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

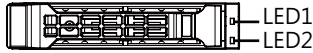
2-5 Power Supply Unit LED



PSU LED

State	Description
OFF	No AC power to all power supplies
1Hz Green Blinking	AC present / only standby on / Cold redundant mode
2Hz Green Blinking	Power supply firmware updating mode
Amber	AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power
	Power supply critical event causing shut down: failure, OCP, OVP, fan failure and UVP
1 Hz Amber Blinking	Power supply warning events where the power supply continues to operate: high temp, high power, high current and slow fan

2-6 Hard Disk Drive LEDs



RAID SKU		LED1	Locate	HDD Fault	Rebuilding	HDD Access	HDD Present (No Access)
No RAID configuration (via HBA)	Disk LED (LED on Back Panel)	Green	ON(*1)	OFF		BLINK (*2)	OFF
		Amber	OFF	OFF		OFF	OFF
	Removed HDD Slot (LED on Back Panel)	Green	ON(*1)	OFF		--	--
		Amber	OFF	OFF		--	--
RAID configuration (via HW RAID Card or SW RAID Card)	Disk LED	Green	ON	OFF		BLINK (*2)	OFF
		Amber	OFF	ON	(Low Speed: 2 Hz)	OFF	OFF
	Removed HDD Slot	Green	ON(*1)	OFF	(*3)	--	--
		Amber	OFF	ON	(*3)	--	--

LED 2	HDD Present	No HDD
Green	ON	OFF

NOTE:

*1: Depends on HBA/Utility Spec.

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

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

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Chapter 3 System Hardware Installation



Pre-installation Instructions

Computer components and electronic circuit boards can be damaged electrostatic discharge. 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 Chassis Cover

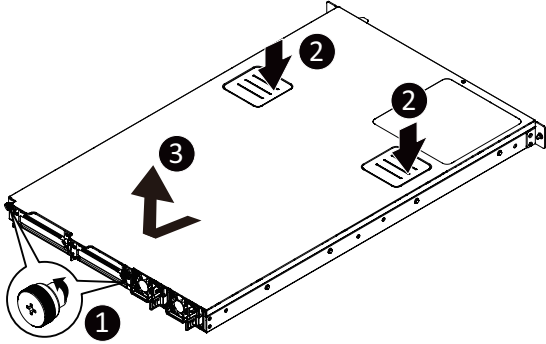


Before you remove or install the system cover

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

Follow these instructions to remove the rear system cover:

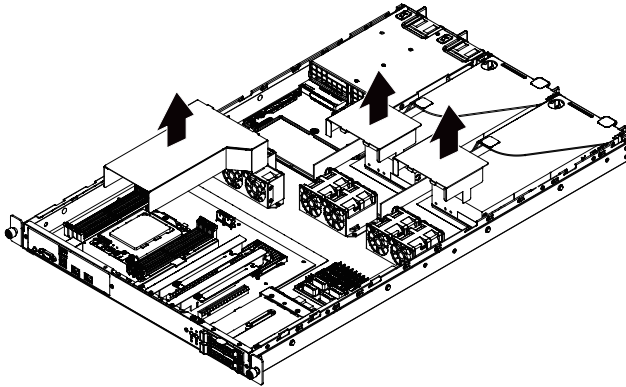
1. Loosen and remove the thumbscrew securing the top cover.
2. Push down the indentation located at the side of the back chassis
3. Slide the cover horizontally to the back and remove the cover in the direction of the arrow.



3-2 Removing and Installing the Fan Duct

Follow these instructions to remove/install the fan duct:

1. Lift up to remove the two fan ducts
2. To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until its firmly seats



3-3 Installing the CPU and Heat Sink



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

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



WARNING!

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

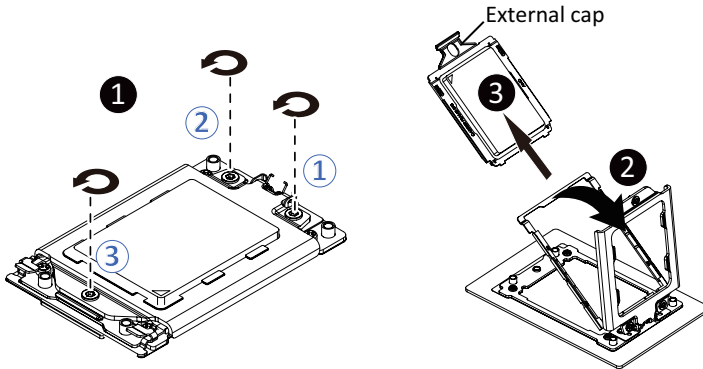
Follow these instructions to install the CPU:

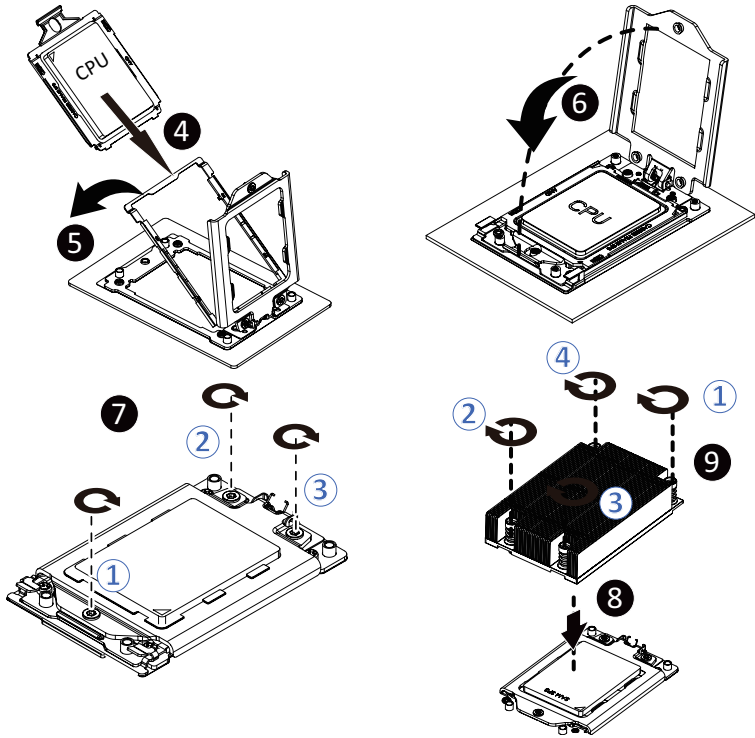
1. Align and install the processor on the carrier, making sure to line up the triangle markers on the corner of the CPU to the triangle mark on the corner of the CPU carrier.
2. Slide the carrier assembly into the channels of the carrier bracket.
3. Close the carrier bracket so that it firmly latches on to the CPU socket.
4. Close the CPU socket cover.
5. Tighten and secure the CPU socket cover screws in the following order (3→2→1).

NOTE: When removing the CPU socket cover, loosen the screws in reverse order (1→2→3).

NOTE: Apply thermal compound evenly on the top of the CPU. Remove the protective cover from the underside of the heat sink.

6. Align and place the heatsink onto the top of the CPU socket.
7. To secure the heatsink, tighten the four screws to the CPU socket.
8. Repeat steps 1-7 for the second CPU and heatsink.
9. To remove the heatsinks and CPUs, follow steps 1-7 in reverse order.





- When installing the heat sink over the CPU, use T30-Lobe driver to tighten the 4 captive nuts in sequential order (1→2→3→4).
- The screw tightening torque: $8 \pm 0.5\text{kgf-cm}$ ($17.0 \pm 1.0\text{ lbf-in}$)

3-4 Installing the Memory

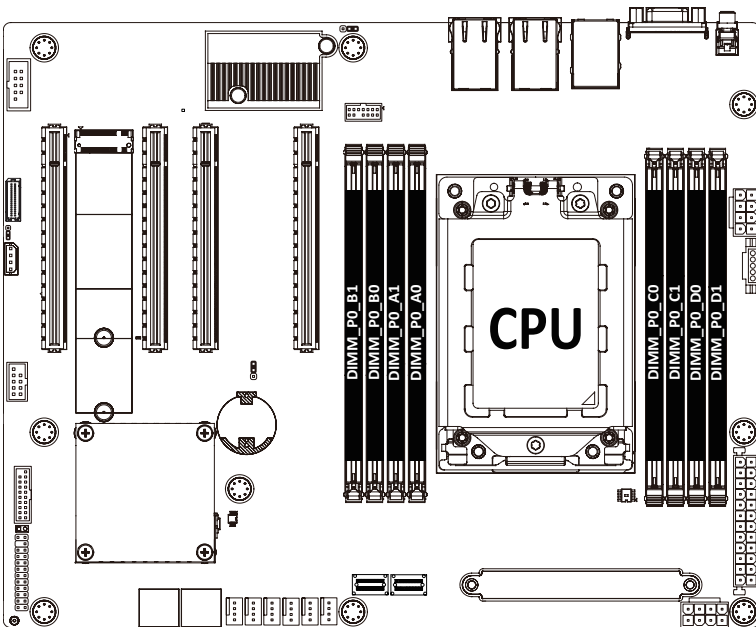


Read the following guidelines before you begin to install the memory:

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

3-4-1 Four Channel Memory Configuration

This motherboard provides 8 DDR4 memory sockets and supports Four Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Four Channel memory mode will be four times of the original memory bandwidth.



3-4-2 Installing a Memory



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 DDR4 DIMMs on this motherboard.

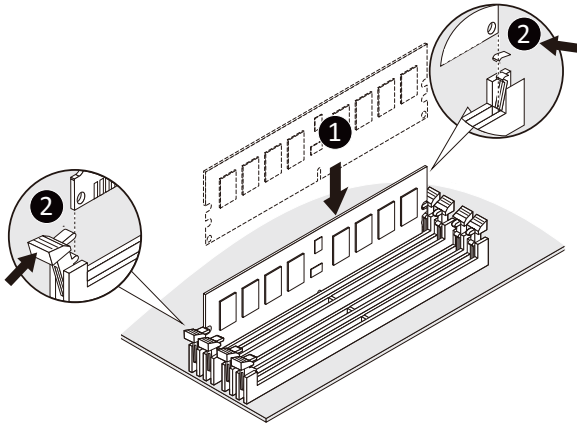


NOTE!

DIMM must be populated in order starting from A1/B1/C1/D1 socket.

Follow these instructions to install the Memory:

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



3-4-3 DIMM Population Table

UDIMM Maximum Frequency Supported Table

DIMMs Populated	DIMM			Frequency (MT/s)
	1R	2R	XR	1.2V
1	1	--	--	3200
	--	--	1	3200
2	2	--	--	2933
	--	1	1	2677



Note:

- Memory capacity 64GB/channel
- DIMM must be populated in sequential alphabetic order, starting with bank A.
- When populating DIMMs into a channel, slot numbers having the suffix "1" must be populated first, then followed by slot numbers having the suffix "0".

3-5 Installing the GPU Card

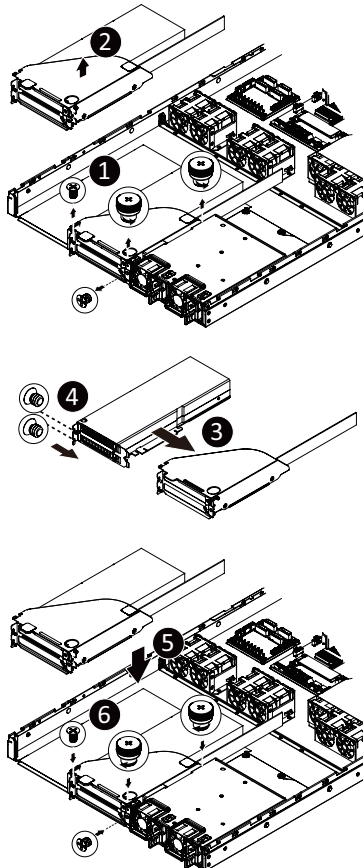


Before you install the GPU card:

- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered down and all power sources have been disconnected from the server prior to installing a GPU card. Make sure the system is not turned on or connected to AC power.
- Failure to observe these warnings could result in personal injury or damage to the equipment.

Follow these instructions to install the GPU card:

1. Remove the two screws and two thumbscrews securing the GPU card cage and remove the cage from the system.
2. Insert the GPU card into the selected slot. Make sure the GPU card is properly seated.
3. Install the two screws to secure the GPU card in place.
4. Reverse step 1-3 to install the GPU card and cage into the system.



3-6 Installing the Hard Disk Drive

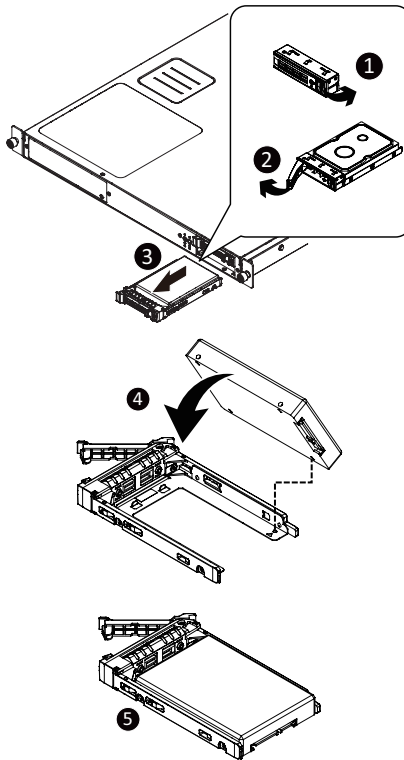


Read the following guidelines before you begin to install the Hard disk drive:

- 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 HDD is connected to the HDD connector on the backplane.

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

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



3-7 Installing and Removing an M.2 Solid State Drive

Follow these instructions to install an optional M.2 solid state drive (SSD):



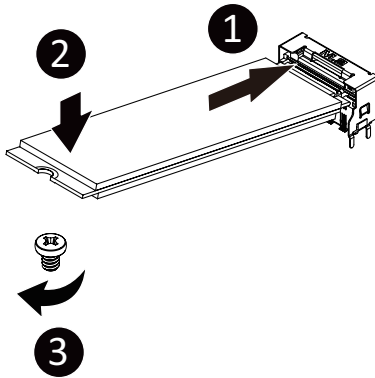
NOTE:

To install/remove the M.2 heatsink use a No. 1 Phillips-head screwdriver with a screw torque of $1.5 \pm 0.2 \text{ kg}^{\ast}\text{cm}$

1. Place the solid state drive into the M.2 connector.
2. Secure the solid state drive to the motherboard with a single screw.

NOTE: The position of the screw will depend on the size of the SSD. Refer to the second image below for proper placement.

3. Reverse steps 1-2 to remove the solid state drive.



3-8 Replacing the FAN Assembly

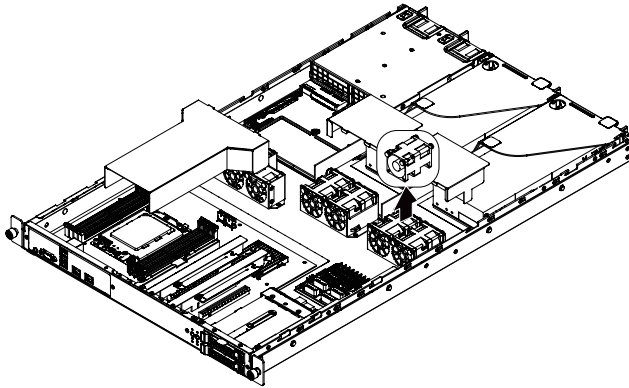


- Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered-down and all power sources have been disconnected from the server prior to removing/installing a system fan.

Failure to observe these warnings could result in personal injury or damage to equipment.

Follow these instructions to replace the fan assembly:

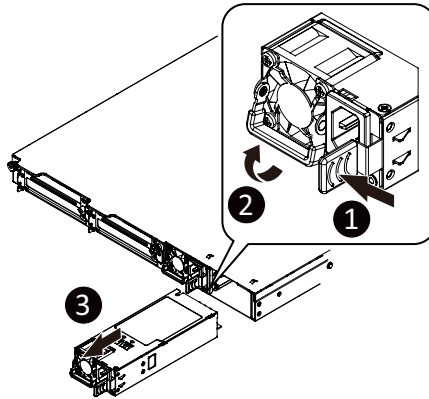
1. Lift up the fan assembly from the chassis.
2. Reverse the previous steps to install the replacement fan assembly.



3-9 Replacing the Power Supply

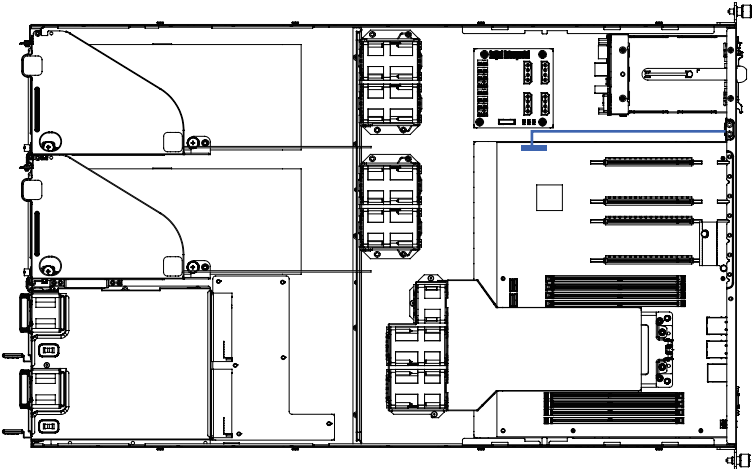
Follow these instructions to replace the power supply:

1. Press the retaining clip on the left side of the power supply unit along the direction of the arrow.
2. Pull the power supply handle at the same time and pull out the power supply unit.
3. Insert the replacement power supply unit firmly into the chassis. Connect the AC power cord to the replacement power supply.
4. Repeat steps 1-3 for replacement of the second power supply.

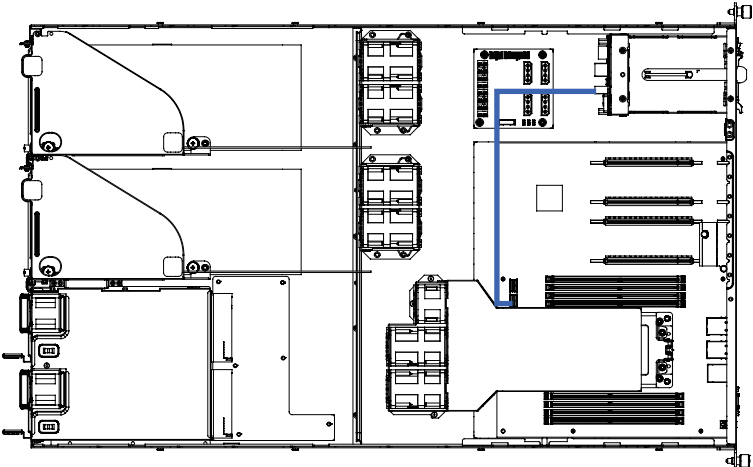


3-10 Cable Routing

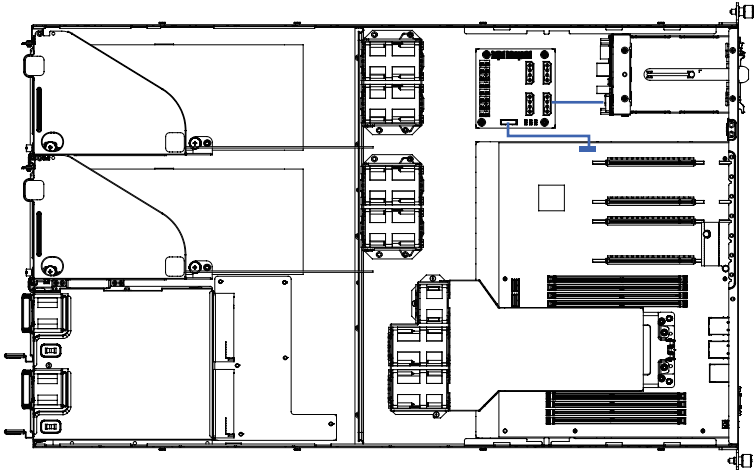
Front Switch Cable/Front LED Cable



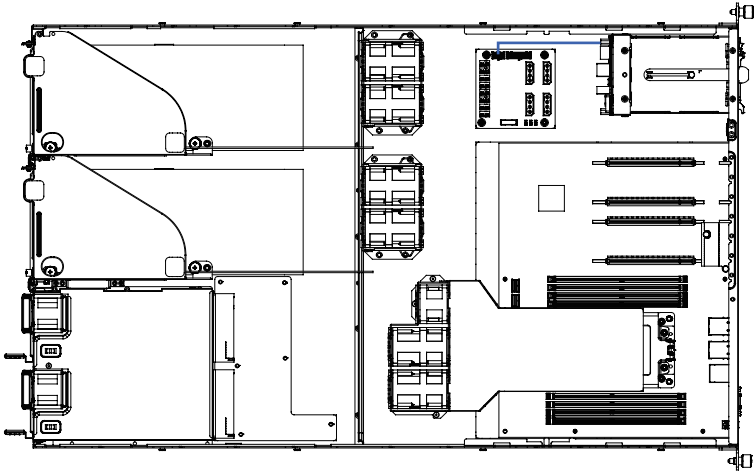
On-Board SATA to HDD Back Plane Board Cable



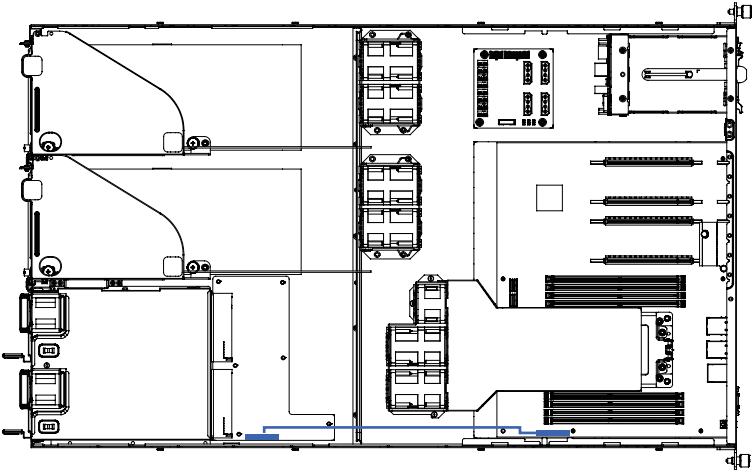
HDD Back Plane Board Signal Cable



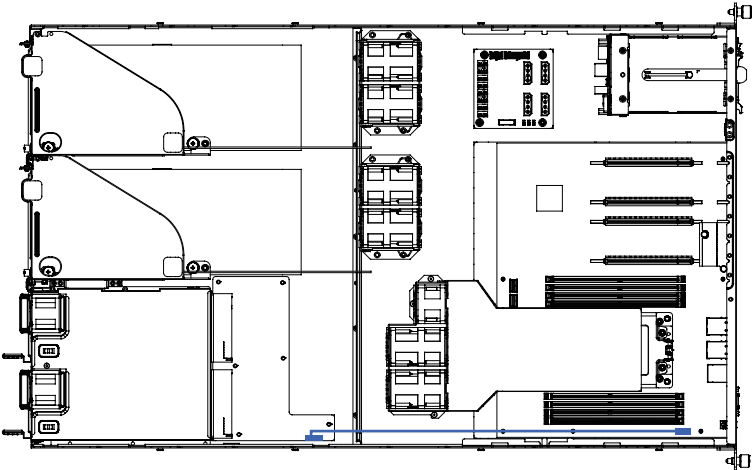
HDD Back Plane Board Power Cable



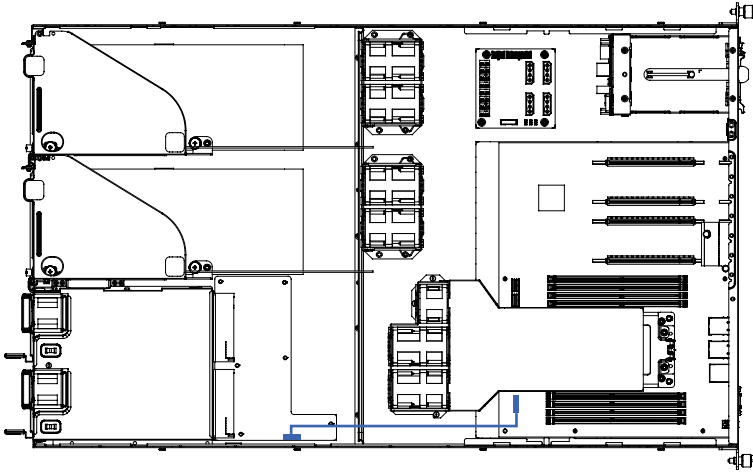
Motherboard Power Cable



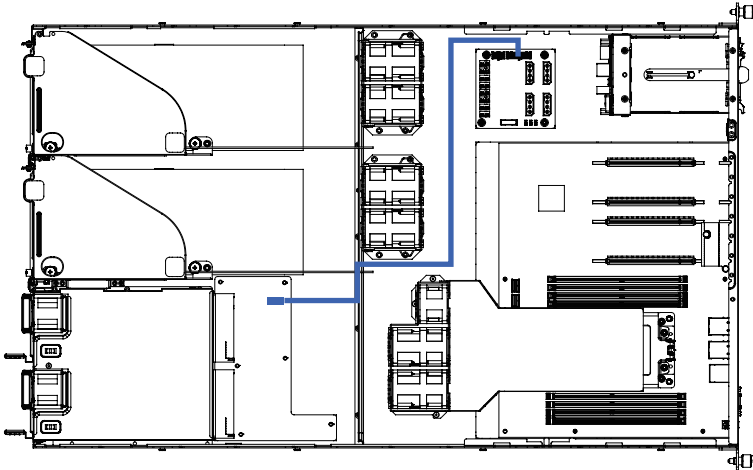
CPU Power Cable



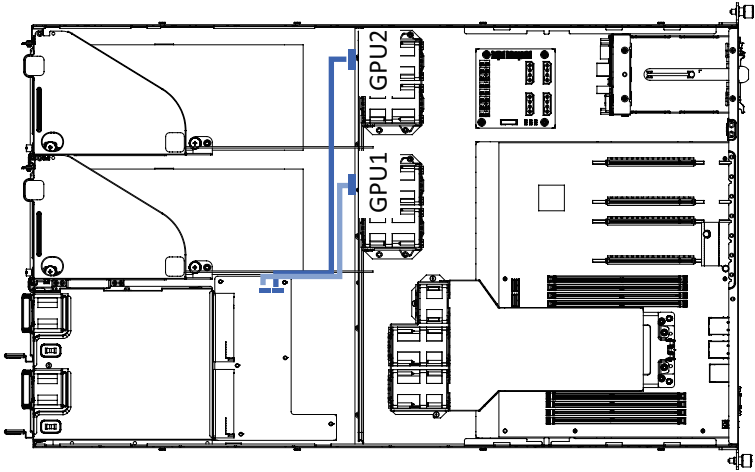
12V Power Cable



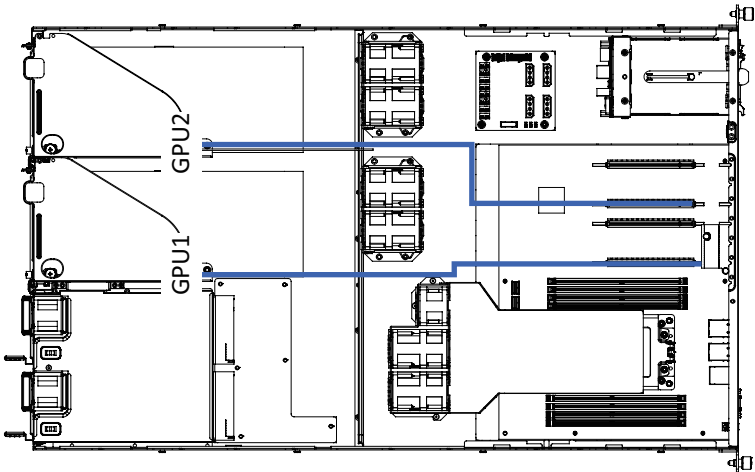
Fan Board Power Cable



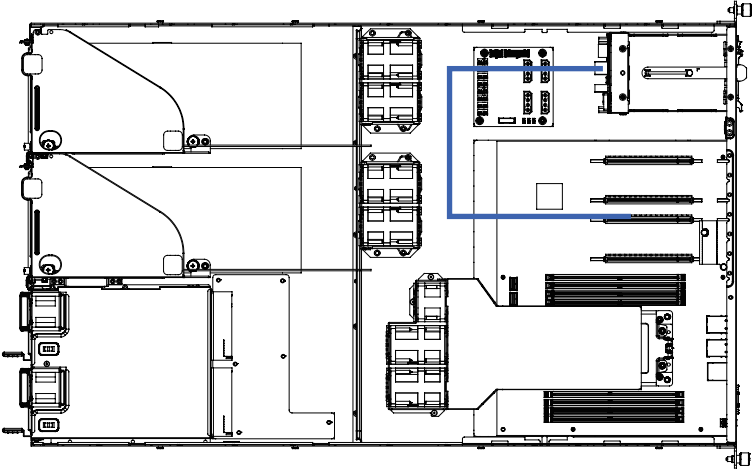
GPU Card Power Cable



GPU Card Signal Cable

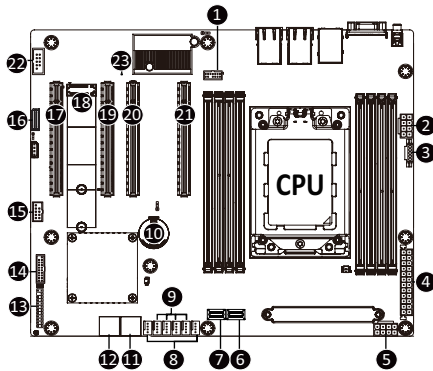


NMVe to HDD Back Plane Board Cable



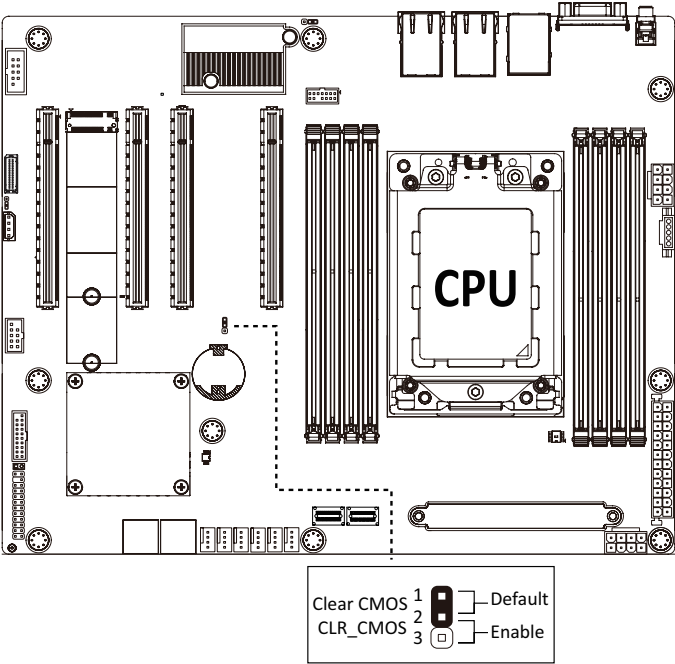
Chapter 4 Motherboard Components

4-1 Motherboard Components



Item	Description
1	TPM Module Connector
2	2 x 4 Pin 12V Power Connector
3	PMBus Connector
4	2 x 12 Pin System Power Connector
5	2 x 4 Pin 12V Power Connector
6	SlimLine SAS 4i Connector (SL_SAS1/SATA III/NVMe Signal)
7	SlimLine SAS 4i Connector (SL_SAS2/SATA III/NVMe Signal)
8	System Fan Connector
9	System Fan Connector
10	System Battery Socket
11	SATA III 6Gb/s Connector (SATA_0_1)
12	SATA III 6Gb/s Connector (SATA_2_3)
13	Front Panel Connector
14	Front panel USB 3.0 Connector
15	Front Panel USB 2.0 Connector
16	HDD Back Plane Board Connector
17	PCIe x16 Slot (Gen4 x8)
18	M.2 slot (PCIe Gen4 x4, Support NGFF-2280/22110)
19	PCIe x16 Slot (Gen4 x16)
20	PCIe x16 Slot (Gen4 x8)
21	PCIe x16 Slot (Gen4 x16)
22	Serial Port Connector
23	BMC Firmware Readiness LED

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 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

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

■ **Main**

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

■ **Advanced**

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

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

■ **Chipset**

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

■ **Server Management**

Server additional features enabled/disabled setup menus.

■ **Security**

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

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

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

■ **Boot**

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

■ **Save & Exit**

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

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

5-1 The Main Menu

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

Main Menu Help

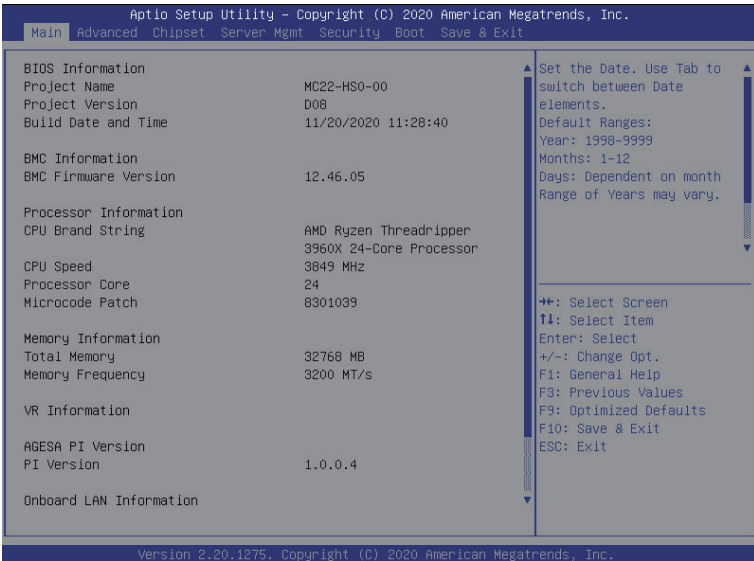
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

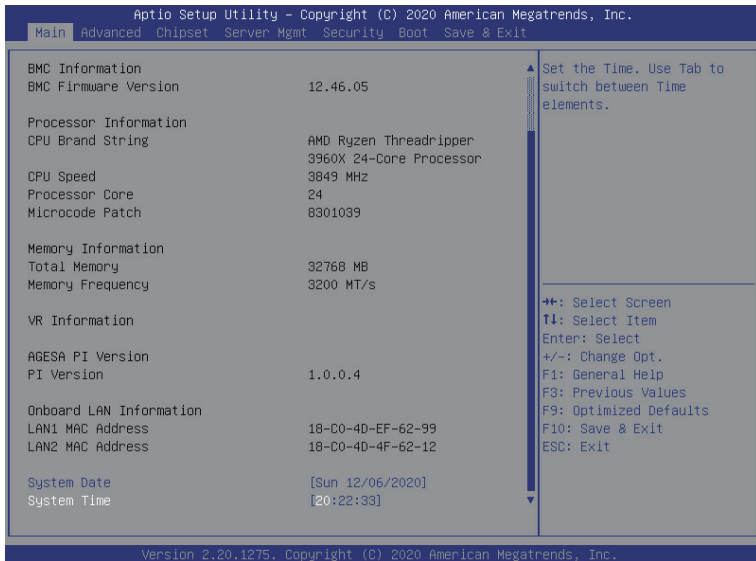
Submenu Help

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



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





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/ CPU Speed / Processor Core / Microcode Patch	Displays the technical specifications for the installed processor(s).
Memory Information	
Total Memory ^(Note2)	Displays the total memory size of the installed memory.
Memory Frequency ^(Note2)	Displays the frequency information of the installed memory.
VR Information	
AGESA PI Version	
PI Version	Displays AGESA PI version information.

(Note1) Functions available on selected models.

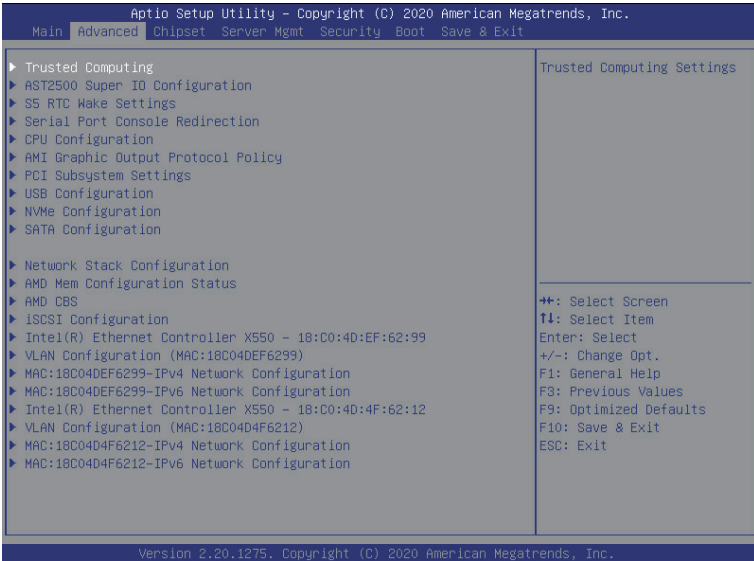
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

Parameter	Description
Onboard LAN Information	
LAN1 MAC Address ^(Note)	Displays LAN MAC address information.
LAN2 MAC Address ^(Note)	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.

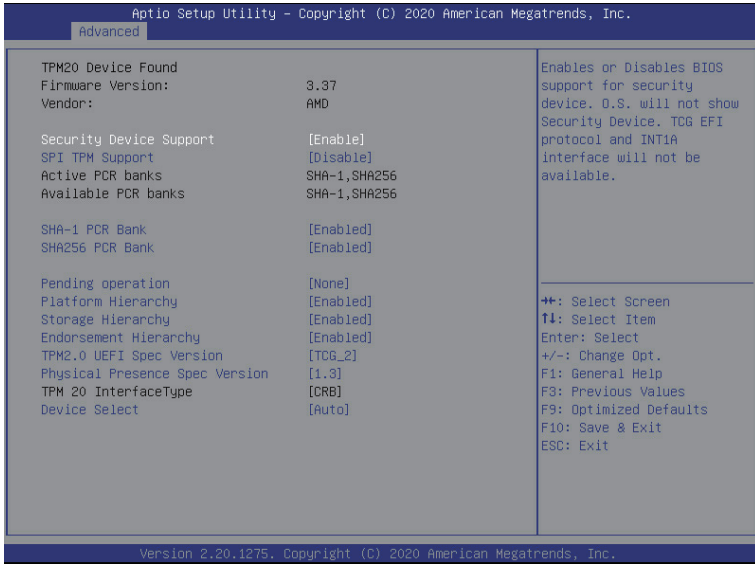
(Note) The number of LAN ports listed will depend on the motherboard / system model.

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.



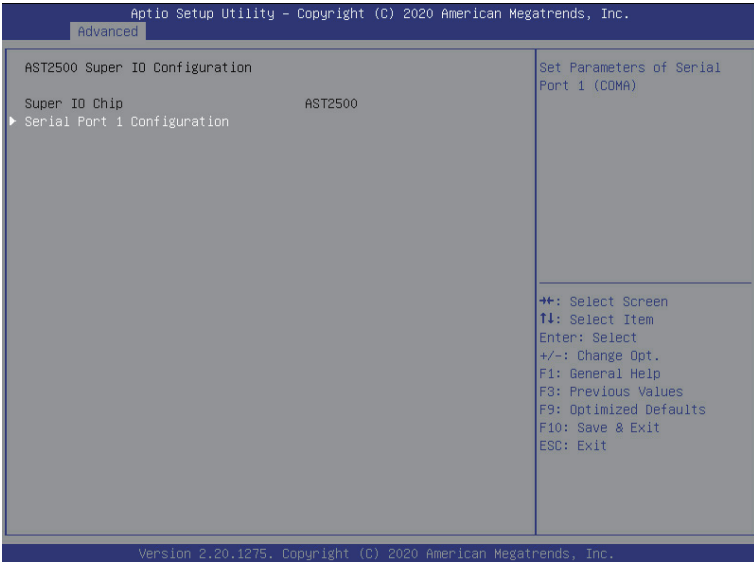
5-2-1 Trusted Computing



Parameter	Description
TPM20 Device Found	
Firmware Version	Displays the firmware version information.
Vendor	Displays the vendor information.
Security Device Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Enable, Disable. Default setting is Enable .
SPI TPM Support	Enable/Disable SPI TPM Support. Options available: Enable, Disable. Default setting is Disable .
Active PCR banks	Displays active Platform Configuration Register (PCR) banks.
Available PCR banks	Displays available PCR banks.
SHA-1 PCR Bank	Enable/Disable SHA-1 PCR bank. Options available: Enabled, Disabled. Default setting is Enabled .
SHA256 PCR Bank	Enable/Disable SHA256 PCR bank. Options available: Enabled, Disabled. Default setting is Enabled .

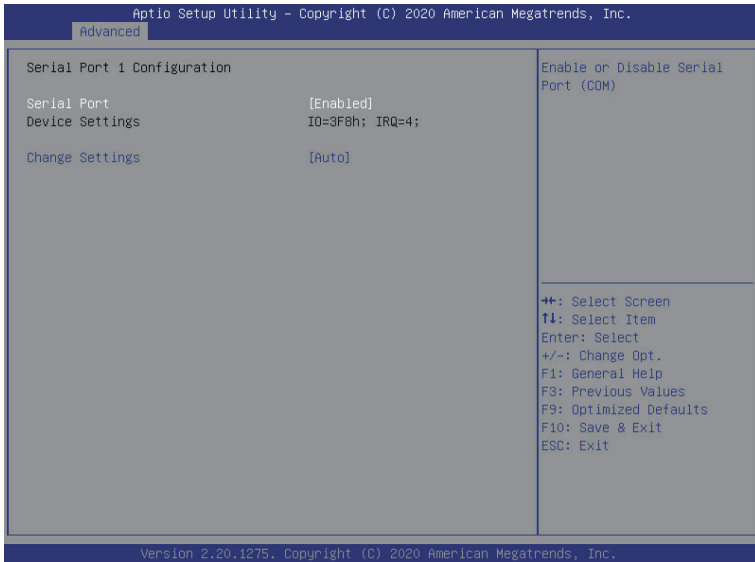
Parameter	Description
Pending operation	Schedule an operation for the security device. NOTE: Your computer will reboot during restart in order to change the state of a security device. Options available: None, TPM Clear. Default setting is None .
Platform Hierarchy	Enable/Disable platform hierarchy. Options available: Enabled, Disabled. Default setting is Enabled .
Storage Hierarchy	Enable/Disable storage hierarchy. Options available: Enabled, Disabled. Default setting is Enabled .
Endorsement Hierarchy	Enable/Disable endorsement hierarchy. Options available: Enabled, Disabled. Default setting is Enabled .
TPM2.0 UEFI Spec Version	Selects the TCG2 spec version support. Options available: TCG_1_2, TCG_2. Default setting is TCG2 .
Physical Presence Spec Version	Selects the physical presence spec version. Options available: 1.2, 1.3. Default setting is 1.3 .
TPM 20 InterfaceType	Displays the TPM 2.0 interface type.
Device Select	Selects the TPM device. Options available: TPM 1.2, TPM 2.0, Auto. Default setting is Auto .

5-2-2 AST2500 Super IO Configuration



Parameter	Description
AST2500 Super IO Configuration	
Super IO Chip	Displays the super IO chip information
Serial Port 1 Configuration	Press [Enter] for configuration of advanced items.

5-2-2-1 Serial Port 1 Configuration



Parameter	Description
Serial Port 1 Configuration	
Serial Port ^(Note1)	Enable/Disable the Serial Port (COM). When set to Enabled allows you to configure the Serial port 1 settings. When set to Disabled, displays no configuration for the serial port. Options available: Enabled, Disabled. Default setting is Enabled .
Devices Settings ^(Note2)	Displays the Serial Port 1 device settings.
Change Settings ^(Note2)	Select an optimal settings for Super IO Device. Options available for Serial Port 1: Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; Default setting is Auto .

(Note1) Advanced items prompt when this item is defined.

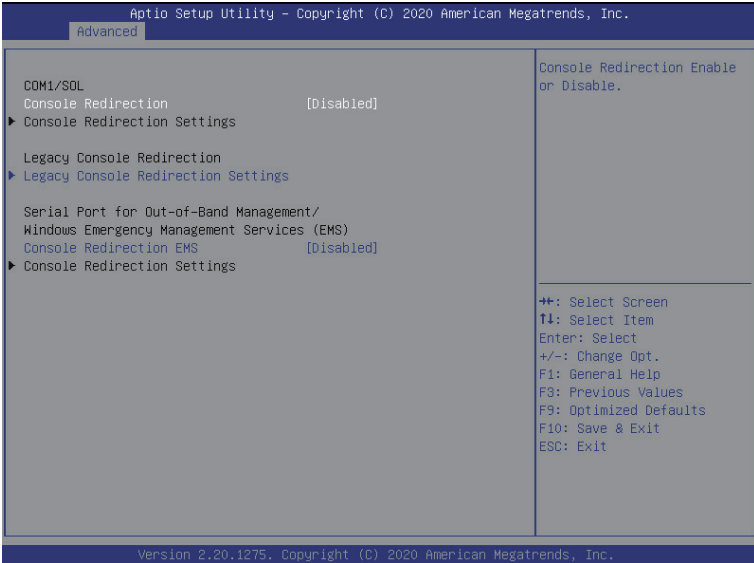
(Note2) This item appears when **Serial Port** is set to **Enabled**.

5-2-3 S5 RTC Wake Settings



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

5-2-4 Serial Port Console Redirection



Parameter	Description
COM1/Serial Over LAN Console Redirection ^(Note)	<p>Select whether to enable console redirection for specified device. Console redirection enables the users to manage the system from a remote location.</p> <p>Options available: Enabled, Disabled. Default setting is Disabled.</p>
COM1/Serial Over LAN Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <p>Please note that this item is configurable when COM1/Serial Over LAN Console Redirection is set to Enabled.</p> <ul style="list-style-type: none"> ◆ Terminal Type <ul style="list-style-type: none"> – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100+, ANSI, VT-UTF8. Default setting is ANSI. ◆ Bits per second <ul style="list-style-type: none"> – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 38400, 57600, 115200. Default setting is 115200. ◆ Data Bits <ul style="list-style-type: none"> – Selects the number of data bits used for console redirection. – Options available: 7, 8. Default setting is 8.

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

Parameter	Description
COM1/Serial Over LAN Console Redirection Settings (continued)	<ul style="list-style-type: none"> ◆ Parity <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – Enable/Disable the VT-UTF8 Combo Key Support. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Recorder Mode^(Note) <ul style="list-style-type: none"> – 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) <ul style="list-style-type: none"> – Enable/Disable extended terminal resolution. – Options available: Enabled, Disabled. Default setting is Enabled. ◆ Putty KeyPad^(Note) <ul style="list-style-type: none"> – Selects FunctionKey and KeyPad on Putty. – Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is VT100.

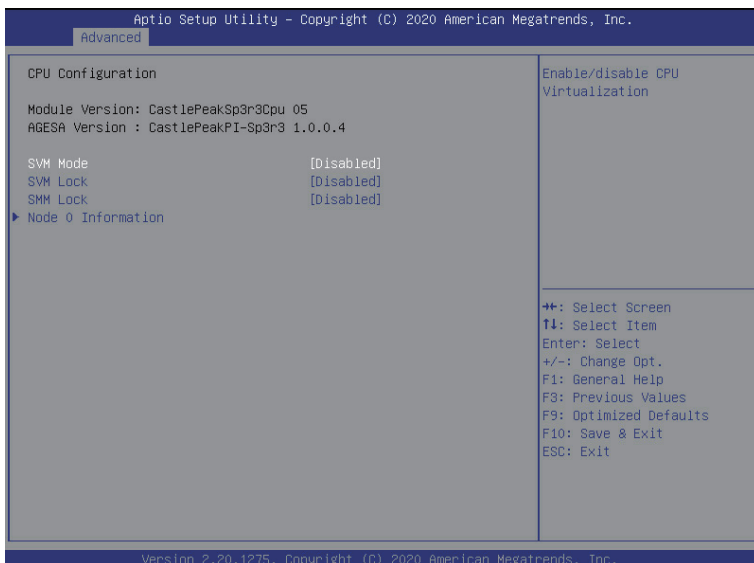
(Note) Advanced items prompt when this item is defined.

Parameter	Description
Legacy Console Redirection	
Legacy Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Redirection COM Port <ul style="list-style-type: none"> – Selects a COM port for Legacy serial redirection. – Options available: COM1/SOL, COM2. Default setting is COM1/SOL. ◆ Resolution <ul style="list-style-type: none"> – 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 <ul style="list-style-type: none"> – 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)	<p>EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management.</p> <p>Options available: Enabled, Disabled. Default setting is Disabled.</p>
Serial Port for Out-of-Band EMS Console Redirection Settings	<p>Press [Enter] to configure advanced items.</p> <p>Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.</p> <ul style="list-style-type: none"> ◆ Out-of-Band Mgmt Port <ul style="list-style-type: none"> – Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port. – Default setting is COM1/SOL. ◆ Terminal Type EMS <ul style="list-style-type: none"> – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100+, ANSI, VT-UTF8. Default setting is ANSI. ◆ Bits per second EMS <ul style="list-style-type: none"> – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 38400, 57600, 115200. Default setting is 115200.

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

Parameter	Description
Serial Port for Out-of-Band EMS Console Redirection Settings(continued)	<ul style="list-style-type: none"><li data-bbox="362 161 942 330">◆ Flow Control EMS<ul style="list-style-type: none"><li data-bbox="400 192 942 330">– Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.<li data-bbox="400 338 942 392">– Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is None.

5-2-5 CPU Configuration



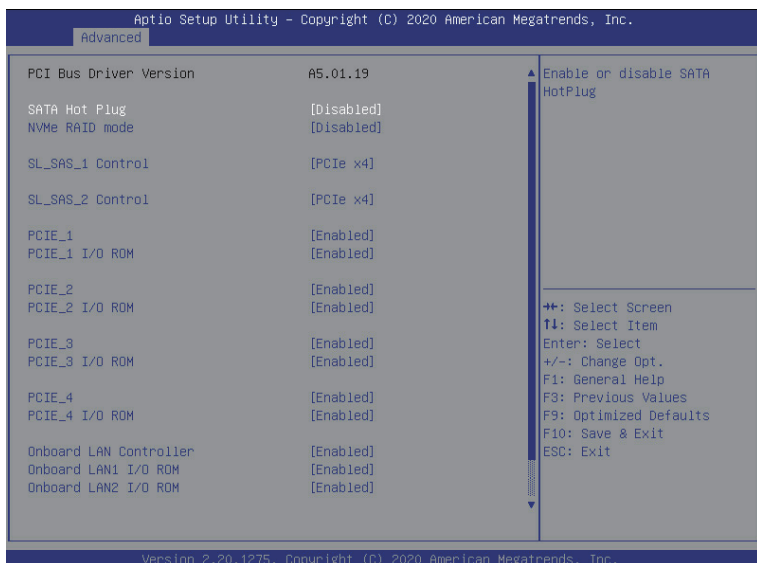
Parameter	Description
Module Version	Displays the module version information.
AGESA Version	Displays the AGESA version information.
SVM Mode	Enable/Disable the CPU Virtualization. Options available: Enabled, Disabled. Default setting is Disabled .
SVM Lock	Enable/Disable SVM lock. Options available: Enabled, Disabled. Default setting is Disabled .
SMM Lock	Enable/Disable SMM lock. Options available: Enabled, Disabled. Default setting is Disabled .
Node 0 Information	Press [Enter] to view the memory information related to Node 0.

5-2-6 AMI Graphic Output Protocol Policy



Parameter	Description
ASPEED Graphics PCI Adapter	
ASPEED Graphics Driver	
Output Select	Selects Monitor Output by Graphic Output Protocol.

5-2-7 PCI Subsystem Settings



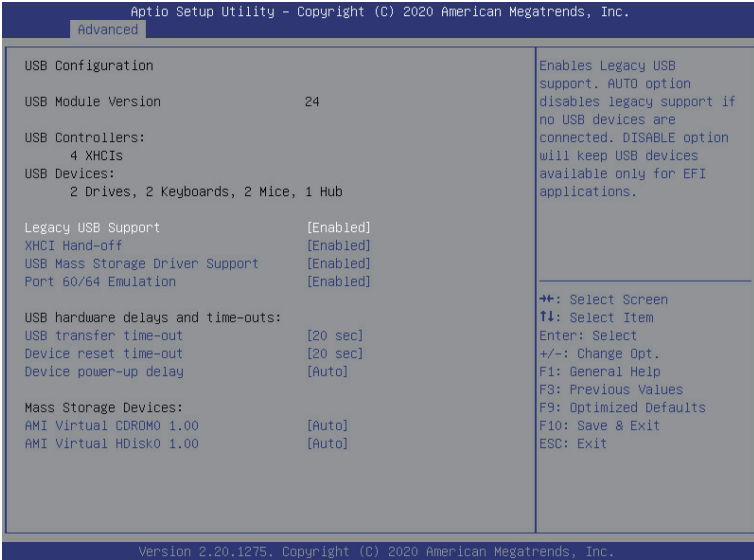
Parameter	Description
PCI Bus Driver Version	Displays the PCI Bus Driver version information.
SATA Hot Plug	Enable/Disable SATA Hot Plug. Options available: Enabled, Disabled. Default setting is Disabled .
NVMe RAID mode	Enable/Disable NVMe RAID mode. Options available: Enabled, Disabled. Default setting is Disabled .
SL_SAS_1/2 Control	Change the SL_SAS function. Options available: Disabled, SATA, PCIe x4. Default setting is PCIe x4 .
PCI_E_# ^(Note1)	Change the PCIe lanes. Options available: Disabled, Enabled, x4x4, x8x8, x8x4x4, x4x4x8, x4x4x4x4. Default setting is Enabled .
PCI_E_# 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 LAN Controller ^(Note2)	Enable/Disable the onboard LAN controller. Options available: Enabled, Disabled. Default setting is Enabled .
Onboard LAN1/2 I/O ROM ^(Note2)	Enable/Disable the onboard LAN devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled .

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

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

Parameter	Description
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 Disabled .

5-2-8 USB Configuration

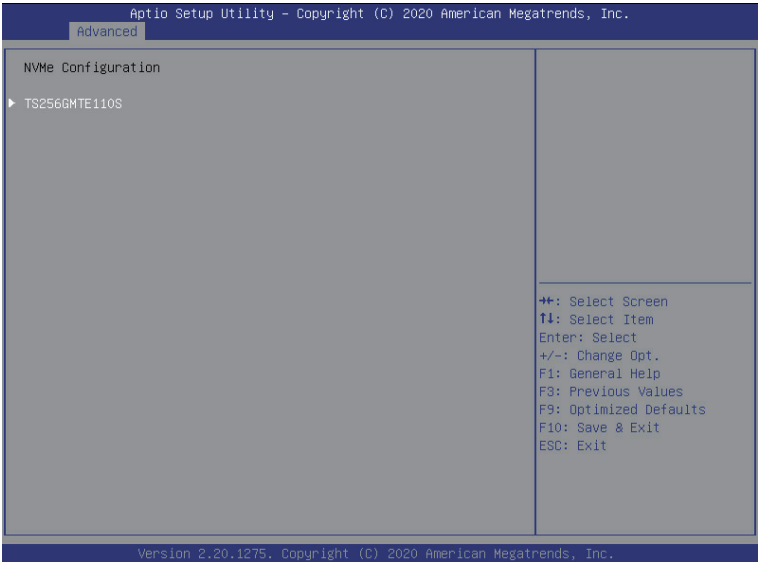


Parameter	Description
USB Configuration	
USB Module Version	Displays the USB module version information.
USB Controllers	Displays the supported USB controllers.
USB Devices:	Displays the USB devices connected to the system.
Legacy USB Support	Enable/Disable the Legacy USB support function. AUTO option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

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

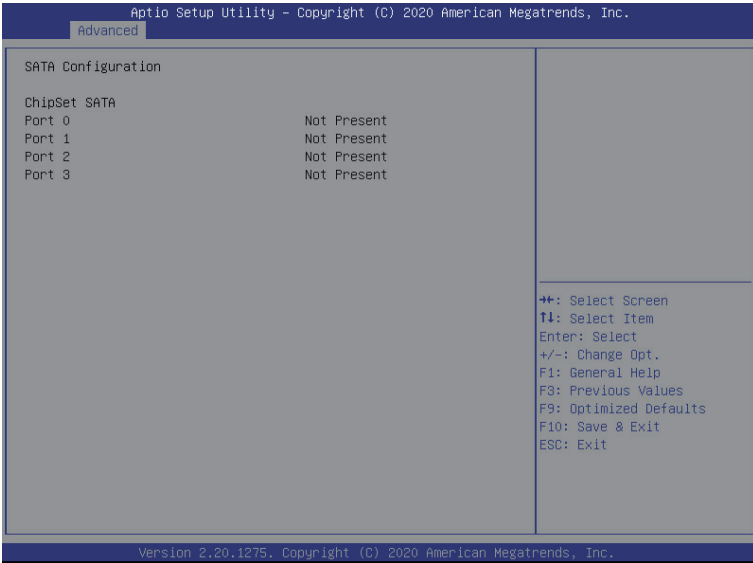
Parameter	Description
Port 60/64 Emulation	Enables the I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OS. Options available: Enabled, Disabled. Default setting is Enabled .
USB hardware delays and time-outs	
USB transfer time-out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

5-2-9 NVMe Configuration



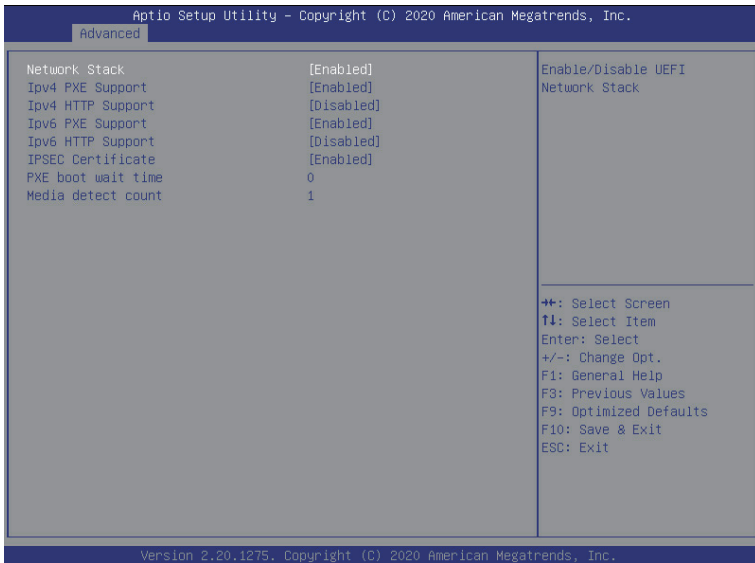
Parameter	Description
NVMe Configuration	Displays the NVMe devices connected to the system.

5-2-10 SATA Configuration



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

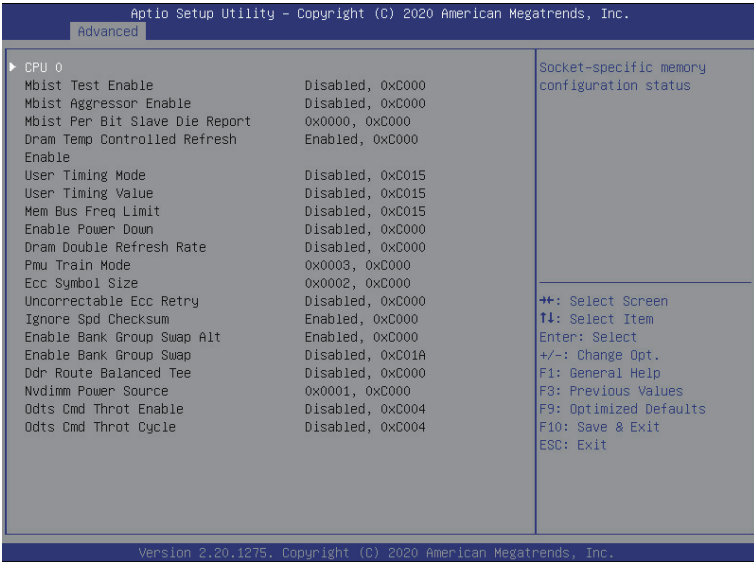
5-2-11 Network Stack Configuration



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

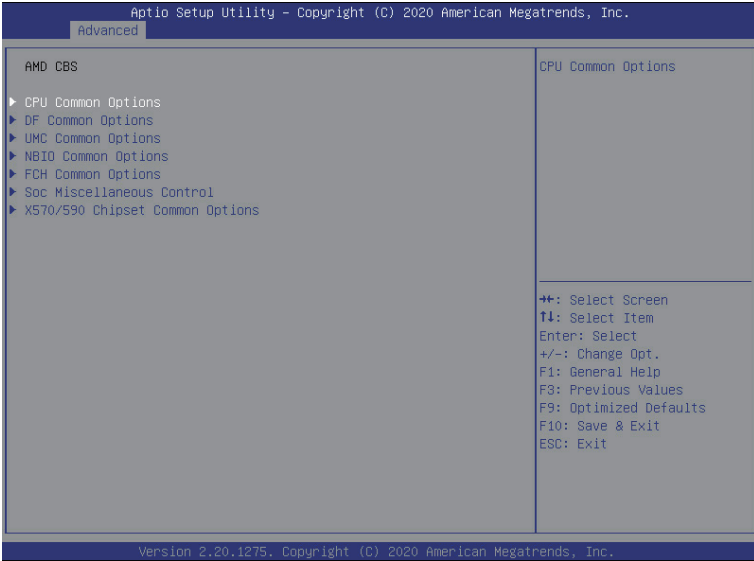
(Note) This item appears when **Network Stack** is set to **Enabled**.

5-2-12 AMD Mem Configuration Status



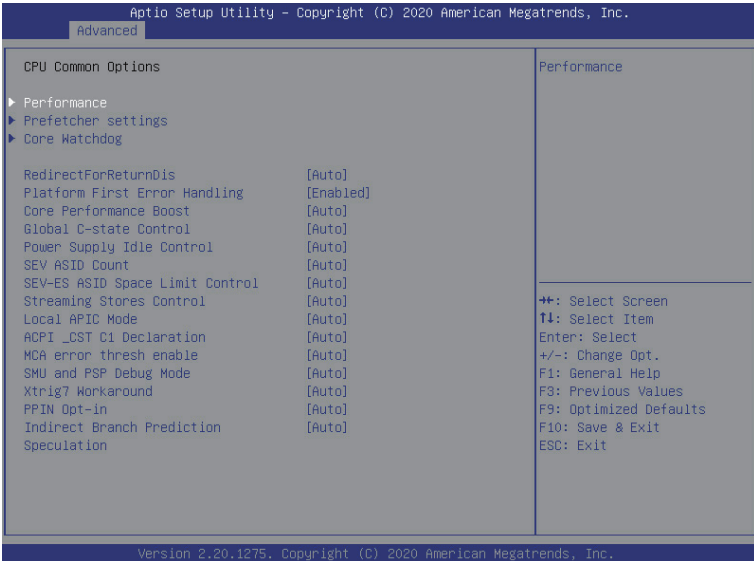
Parameter	Description
CPU0	Press [Enter] to view the memory configuration status related to CPU 0.

5-2-13 AMD CBS



Parameter	Description
AMD CBS	
CPU Common Options	Press [Enter] for configuration of advanced items.
DF Common Options	Press [Enter] for configuration of advanced items.
UMC Common Options	Press [Enter] for configuration of advanced items.
NBIO Common Options	Press [Enter] for configuration of advanced items.
FCH Common Options	Press [Enter] for configuration of advanced items.
Soc Miscellaneous Control	Press [Enter] for configuration of advanced items.
X570/590 Chipset Common Options	Press [Enter] for configuration of advanced items.

5-2-13-1 CPU Common Options

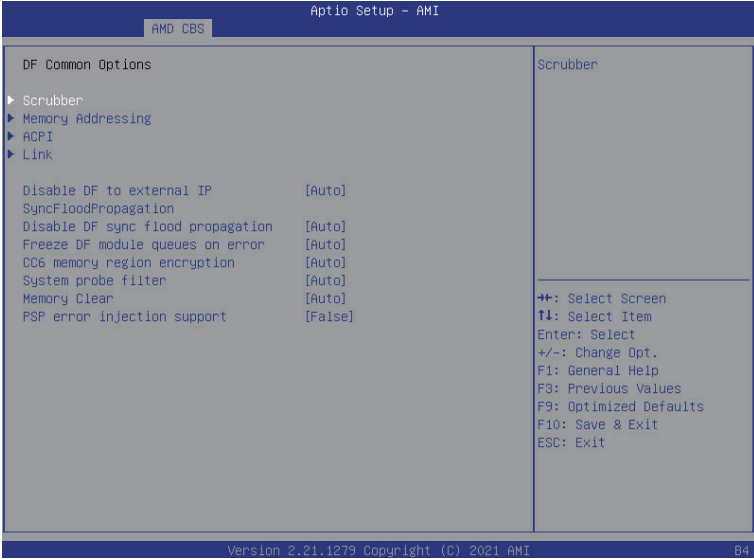


Parameter	Description
CPU Common Options	
Performance	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ Custom Core Pstates <ul style="list-style-type: none"> – Allows you to accept or decline enabling Custom Core Pstates. When accepted, you can disable or customize core pstates.
Prefetcher settings	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ L1 Stream HW Prefetcher <ul style="list-style-type: none"> – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ L2 Stream HW Prefetcher <ul style="list-style-type: none"> – Options available: Auto, Enabled, Disabled. Default setting is Auto.
Core Watchdog	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ Core Watchdog Timer Enable <ul style="list-style-type: none"> – Enable/Disable CPU Watchdog Timer. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Core Watchdog Timer Interval^(Note) <ul style="list-style-type: none"> – Specifies the CPU Watchdog Timer interval. – Default setting is Auto. ◆ Core Watchdog Timer Severity^(Note) <ul style="list-style-type: none"> – Specifies the CPU Watchdog Timer Severity. – Options available: Auto, No Error, Transparent, Corrected, Deferred, Uncorrected, Fatal. Default setting is Auto.

(Note) This item appears when **Core Watchdog Timer Enable** is set to **Enabled**.

Parameter	Description
RedirectForReturnDis	From a workaround for GCC/C000005 issue for XV Core on CZ A0, setting MSRC001_1029 Decode Configuration (DE_CFG) bit 14 [DecfgNoRdrctForReturns] to 1. Options available: Auto, 1, 0. Default setting is Auto .
Platform First Error Handling	Enable/Disable PFEH, cloak individual banks, and mask deferred error interrupts from each bank. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Core Performance Boost	Enable/Disable the Core Performance Boost function. Options available: Auto, Disabled. Default setting is Auto .
Global C-State Control	Controls the IO based C-state generation and DF C-states. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Power Supply Idle Control	Configures the Power Supply Idle Control. Options available: Auto, Low Current Idle, Typical Current Idle. Default setting is Auto .
SEV ASID Count	Specifies the maximum valid ASID, which affects the maximum system physical address space. Options available: Auto, 253 ASIDs, 509 ASIDs. Default setting is Auto .
SEV-ES ASID Space Limit Control	Space limit control for SEV-ES ASIDs. Options available: Auto, Manual. Default setting is Auto .
Streaming Stores Control	Enable/Disable the Streaming Stores functionality. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Local APIC Mode	Sets the Local APIC Mode. Options available: Auto, xAPIC, x2APIC. Default setting is Auto .
ACPI_CST C1 Decaration	Determines whether or not to declare the C1 state to the OS. Options available: Auto, Enabled, Disabled. Default setting is Auto .
MCA error thresh enable	Enable MCA error thresholding. Options available: Auto, False, True. Default setting is Auto .
SMU and PSP Debug Mode	When this option is enabled, specific uncorrected errors detected by the PSP FW or SMU FW will hand and not reset the system. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Xtrig7 Workaround	Options available: Auto, No Workaround, Bronze Workaround, Sliver Workaround. Default setting is Auto .
PPIN Opt-in	Enable/Disable the PPIN feature. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Indirect Branch Prediction Speculation	Options available: Auto, Enabled, Disabled. Default setting is Auto .

5-2-13-2 DF Common Options

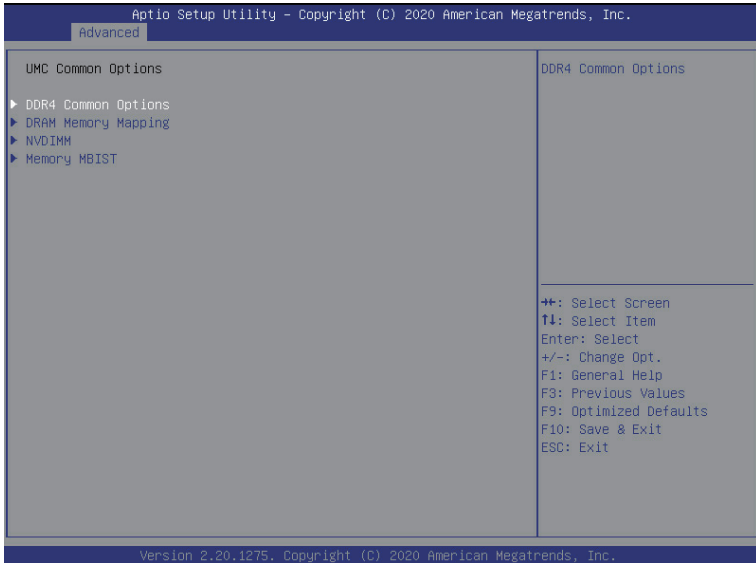


Parameter	Description
DF Common Options	
Scrubber	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ DRAM scrub time <ul style="list-style-type: none"> – Provide a value that is the number of hours to scrub memory. – Options available: Auto, Disabled, 1 hour, 4 hours, 8 hours, 16 hours, 24 hours, 48 hours. Default setting is Auto. ◆ Poison scrubber control <ul style="list-style-type: none"> – Enable/Disable the Poison scrubber control feature. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Redirect scrubber control <ul style="list-style-type: none"> – Enable/Disable the Redirect scrubber control feature. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Redirect scrubber limit <ul style="list-style-type: none"> – Sets the redirect scrubber limit. – Options available: Auto, 2, 4, 8, Infinite. Default setting is Auto. <p>Press [Enter] for configuration of advanced items.</p>
Memory Addressing	<ul style="list-style-type: none"> ◆ NUMA nodes per socket <ul style="list-style-type: none"> – Specifies the number of desired NUMA nodes per socket. – Options available: Auto, NPS0, NPS1, NPS2, NPS4. Default setting is Auto. ◆ Poison scrubber control <ul style="list-style-type: none"> – Enable/Disable the Memory interleaving feature. – Options available: Auto, Disabled. Default setting is Auto.

Parameter	Description
Memory Addressing (continued)	<ul style="list-style-type: none"> ◆ Memory interleaving size <ul style="list-style-type: none"> – Controls the memory interleaving size. This determines the starting address of the interleave (bit 8, 9, 10 or 11). – Options available: Auto, 256Bytes, 512Bytes, 1KB, 2KB. Default setting is Auto. ◆ 1TB remap <ul style="list-style-type: none"> – Enable/Disable to remap DRAM out of the space just below the 1TB boundary. The ability to remap depends on DRAM configuration, NPS, and interleaving selection, and may not always be possible. – Options available: Auto, Do not remap, Attempt to remap. Default setting is Auto. ◆ DRAM map inversion <ul style="list-style-type: none"> – Enable/Disable the DRAM map inversion function. – Options available: Auto, Enabled, Disabled. Default setting is Auto.
ACPI	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ ACPI SRAT L3 Cache As NUMA Domain <ul style="list-style-type: none"> – Enable/Disable report each L3 cache as a NUMA Domain to the OS. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ ACPI SLIT Distance Control <ul style="list-style-type: none"> – Determines how the SLIT distances are declared. – Options available: Auto, Manual. Default setting is Auto. ◆ ACPI SLIT remote relative distance <ul style="list-style-type: none"> – Sets the remote socket distance for 2P systems as near (2.8) or far (3.2). – Options available: Auto, Near, Far. Default setting is Auto.
Link	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ GMI encryption control <ul style="list-style-type: none"> – Enable/Disable GMI link encryption. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ xGMI encryption control <ul style="list-style-type: none"> – Enable/Disable xGMI link encryption. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ CAKE CRC perf bounds Control <ul style="list-style-type: none"> – Options available: Auto, Manual. Default setting is Auto. ◆ 4-link xGMI max speed <ul style="list-style-type: none"> – Specifies the max speed of 4-link xGMI. – Options available: Auto, 10.667Gbps, 13Gbps, 16Gbps, 18Gbps. Default setting is 10.667Gbps. ◆ 3-link xGMI max speed <ul style="list-style-type: none"> – Specifies the max speed of 3-link xGMI. – Options available: Auto, 10.667Gbps, 13Gbps, 16Gbps, 18Gbps. Default setting is 10.667Gbps.

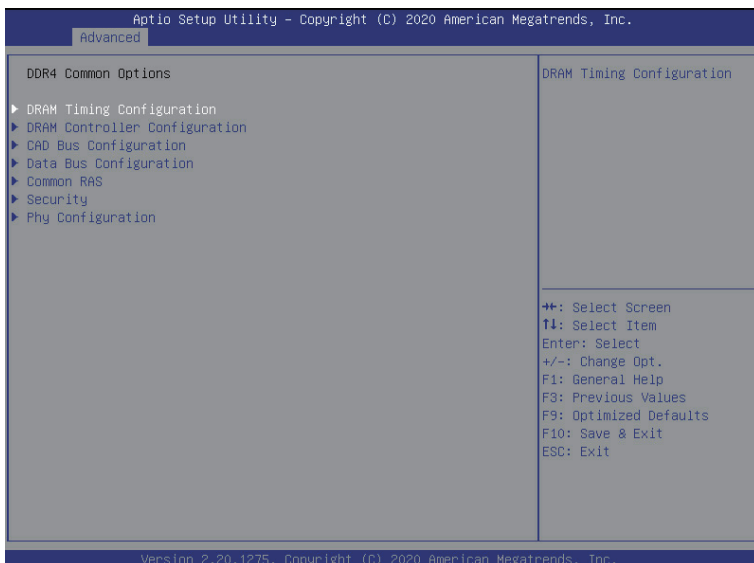
Parameter	Description
Link (continued)	<ul style="list-style-type: none"> ◆ xGMI TXEQ Mode <ul style="list-style-type: none"> – Configures xGMI TXEQ/RX vetting Mode. – Options available: Auto, TXEQ_Disabled, TXEQ_Lane, TXEQ_Link, TXEQ_RX_Vet. Default setting is Auto.
Disable DF to external downstream IP SyncFloodPropagation	Enable/Disable SyncFlood to UMC & downstream slaves. Options available: Auto, Sync flood disabled, Sync flood enabled. Default setting is Auto .
Disable DF sync flood propagation	Enable/Disable DF Sync Flood propagation. Options available: Auto, Sync flood disabled, Sync flood enabled. Default setting is Auto .
Freeze DF module queues on error	Options available: Auto, Enabled, Disabled. Default setting is Auto .
CC6 memory region encryption	Controls whether or not the CC6 save/restor memory is encrypted. Options available: Auto, Enabled, Disabled. Default setting is Auto .
System probe filter	Enable/Disable System probe filter. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Memory Clear	Enable/Disable the Memory Clear feature. Options available: Auto, Enabled, Disabled. Default setting is Auto .
PSP error injection support	Enable/Disable PSP error injection support. Options available: False, True. Default setting is False .

5-2-13-3 UMC Common Options



Parameter	Description
UMC Common Options	
DDR4 Common Options	Press [Enter] for configuration of advanced items.
DRAM Memory Mapping	Press [Enter] for configuration of advanced items.
NVDIMM	Press [Enter] for configuration of advanced items.
Memory MBIST	Press [Enter] for configuration of advanced items.

5-2-13-3-1 DDR4 Common Options

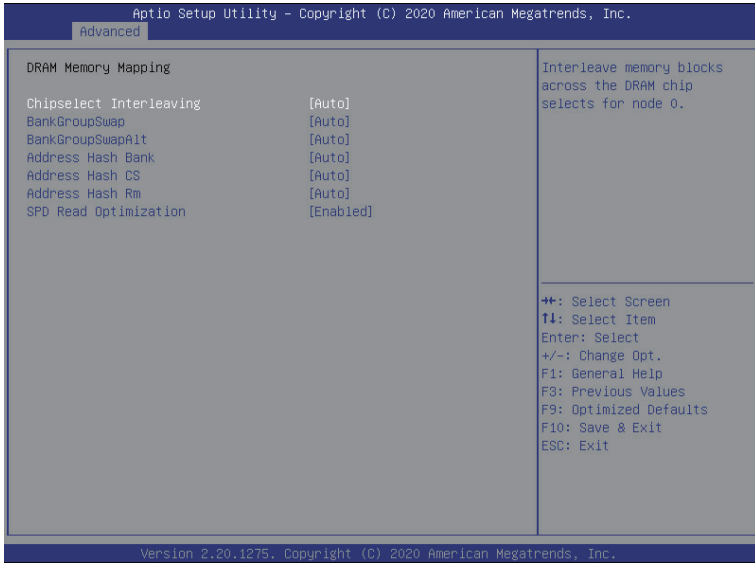


Parameter	Description
DDR4 Common Options	
DRAM Timing Configuration	<p>Press [Enter] to enable / disable restrictions for DDR4 frequency and voltage programming. Memory speeds will be capped at AMD guidelines.</p> <ul style="list-style-type: none"> ◆ Decline ◆ Accept <ul style="list-style-type: none"> – Overclock: Enable/Disable Memory Overclock Settings. – Options available: Auto, Enabled. Default setting is Auto.
DRAM Controller Configuration	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ DRAM Power Options <ul style="list-style-type: none"> – Power Down Enable <ul style="list-style-type: none"> » Enable/Disable DDR power down mode. » Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Cmd2T <ul style="list-style-type: none"> – Selects the Cmd2T mode on ADDR/CMD. – Options available: Auto, 1T, 2T. Default setting is Auto. ◆ Gear Down Mode <ul style="list-style-type: none"> – Enable/Disable the Gear Down Mode function. – Options available: Auto, Enabled, Disabled. Default setting is Auto.
CAD Bus Configuration	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ CAD Bus Timing User Controls <ul style="list-style-type: none"> – Setup time on CAD bus signals to Auto or Manual. – Options available: Auto, Manual. Default setting is Auto.

Parameter	Description
CAD Bus Configuration (continued)	<ul style="list-style-type: none"> ◆ CAD Bus Drive Strength User Controls <ul style="list-style-type: none"> – Drive Strength on CAD bus signals to Auto or Manual. – Options available: Auto, Manual. Default setting is Auto.
	Press [Enter] for configuration of advanced items.
Data Bus Configuration	<ul style="list-style-type: none"> ◆ Data Bus Configuration User Controls <ul style="list-style-type: none"> – Specifies the mode for drive strength to Auto or Manual. – Options available: Auto, Manual. Default setting is Auto.
	Press [Enter] for configuration of advanced items.
Common RAS	<ul style="list-style-type: none"> ◆ Data Poisoning <ul style="list-style-type: none"> – Enable/Disable the Data Poisoning function. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ DRAM Post Package Repair <ul style="list-style-type: none"> – Enable/Disable the DRAM Post Package Repair function. – Options available: Enable, Disable. Default setting is Disable. ◆ RCD Parity <ul style="list-style-type: none"> – Enable/Disable the RCD Parity function. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ DRAM Address Command Parity Retry <ul style="list-style-type: none"> – Enable/Disable the DRAM Address Command Parity Retry function. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Max Parity Error Replay <ul style="list-style-type: none"> – Configures the Max Parity Error Replay. (0~0x3f). – Default setting is 8. – Please note that this item is configurable when DRAM Address Command Parity Retry is set to Enabled. ◆ Write CRC Enable <ul style="list-style-type: none"> – Enable/Disable the Write CRC function. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ DRAM Write CRC Enable and Retry Limit <ul style="list-style-type: none"> – Enable/Disable DRAM Write CRC Enable and Retry Limit. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Max Write CRC Error Replay <ul style="list-style-type: none"> – Configures the Max Write CRC Error Replay. (0~0x3f). – Default setting is 8. – Please note that this item is configurable when DRAM Write CRC Enable and Retry Limit is set to Enabled. ◆ Disable Memory Error Injection <ul style="list-style-type: none"> – Options available: False, True. Default setting is True. ◆ ECC Configuration <ul style="list-style-type: none"> – DRAM ECC Symbol Size <ul style="list-style-type: none"> » Configures the DRAM ECC Symbol Size. » Options available: Auto, x4, x8. Default setting is Auto.

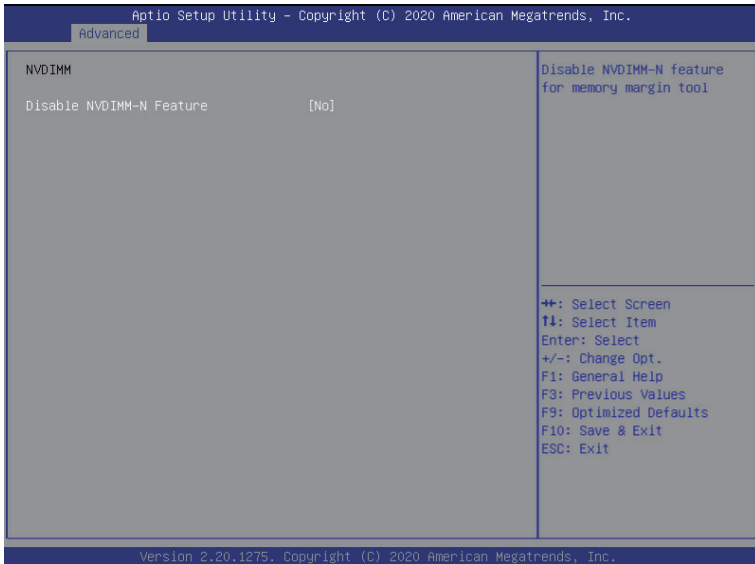
Parameter	Description
Common RAS (continued)	<ul style="list-style-type: none"> - DRAM ECC Enable <ul style="list-style-type: none"> » Enable/Disable DRAM ECC. When set to Auto, it will set ECC to enable. » Options available: Auto, Enabled, Disabled. Default setting is Auto. - DRAM UECC Retry <ul style="list-style-type: none"> » Enable/Disable DRAM UECC Retry. » Options available: Auto, Enabled, Disabled. Default setting is Auto.
Security	<p data-bbox="362 413 747 435">Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ TSME <ul style="list-style-type: none"> - Enable/Disable transparent secure memory encryption. - Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Data Scramble <ul style="list-style-type: none"> - Enable/Disable Data Scrambling. - Options available: Auto, Enabled, Disabled. Default setting is Auto.
Phy Configuration	<p data-bbox="362 619 747 641">Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ PMU Training <ul style="list-style-type: none"> - DFE Read Training <ul style="list-style-type: none"> » Perform 2D Read Training with DFE on. » Options available: Auto, Enable, Disable. Default setting is Auto. - FFE Write Training <ul style="list-style-type: none"> » Perform 2D Write Training with FFE on. » Options available: Auto, Enable, Disable. Default setting is Auto. - PMU Pattern Bits Control <ul style="list-style-type: none"> » Options available: Auto, Manual. Default setting is Auto. - MR6VrefDQ Control <ul style="list-style-type: none"> » Options available: Auto, Manual. Default setting is Auto. - CPU Vref Training Seed Control <ul style="list-style-type: none"> » Options available: Auto, Manual. Default setting is Auto.

5-2-13-3-2 DRAM Memory Mapping



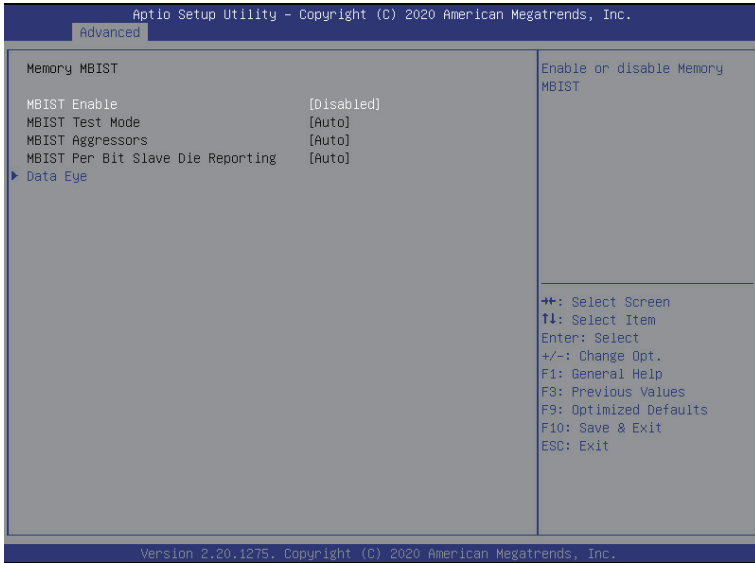
Parameter	Description
DRAM Memory Mapping	
Chipselect Interleaving	Interleave memory blocks across the DRAM chip selects for node 0. Options available: Auto, Disabled. Default setting is Auto .
BankGroupSwap	Configures the BankGroupSwap. BankGroupSwap (BGS) is a new memory mapping option in AGESA that alters how applications get assigned to physical locations within the memory modules. When this option sets to Auto, it is null: No help string. Options available: Auto, Enabled, Disabled. Default setting is Auto .
BankGroupSwapAlt	Configures the BankGroupSwapAlt. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Address Hash Bank	Enable/Disable bank address hashing. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Address Hash CS	Enable/Disable CS address hashing. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Address Hash Rm	Enable/Disable RM address hashing. Options available: Auto, Enabled, Disabled. Default setting is Auto .
SPD Read Optimization	Enable/Disable SPD Read Optimization. Options available: Auto, Enabled, Disabled. Default setting is Auto .

5-2-13-3-3 NVDIMM



Parameter	Description
NVDIMM	Displays the information of the devices/controllers if installed
Disable NVDIMM-N Feature	Enable/Disable NVDIMM-N feature for memory margin tool. Options available: No, Yes. Default setting is NO .

5-2-13-3-4 Memory MBIST



Parameter	Description
Memory MBIST	
MBIST Enable	Enable/Disable the Memory MBIST function. Options available: Enabled, Disabled. Default setting is Disabled .
MBIST Test Mode ^(Note)	Selects MBIST Test Mode. Interface Mode: Tests Single and Multiple CS transactions and Basic Connectivity. Data Eye Mode: Measures Voltage vs. Timing. Options available: Auto, Both, Interface Mode, Data Eye Mode. Default setting is Auto .
MBIST Aggressors ^(Note)	Enable/Disable MBIST Aggressor test. Options available: Auto, Enabled, Disabled. Default setting is Auto .
MBIST Per Bit Slave Die Reporting ^(Note)	Enable/Disable to report 2D data eye results in ABL log for each DQ, Chipselect, and Channel. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Data Eye	Press [Enter] to configure advanced items. <ul style="list-style-type: none"> ◆ Pattern Select <ul style="list-style-type: none"> – Options available: PRBS, SSO, Both. Default setting is PRBS. ◆ Pattern Length <ul style="list-style-type: none"> – Determines the pattern length. The possible options are N=3....12.

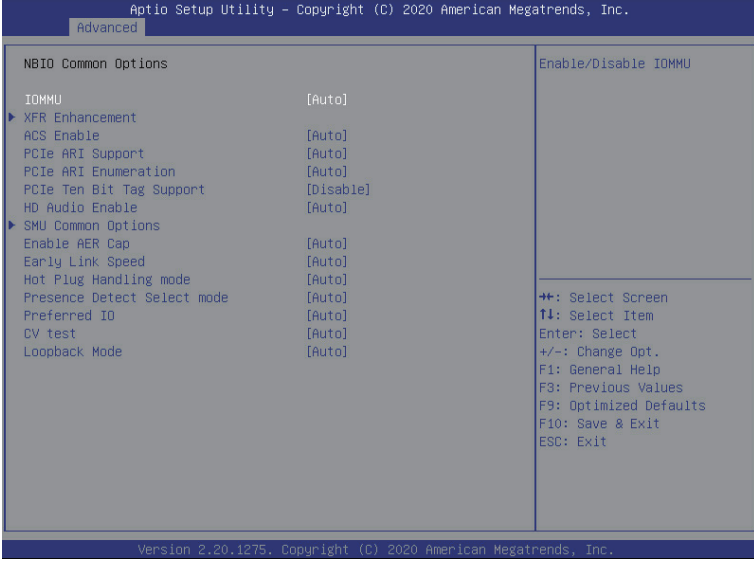
(Note) This item is available when **MBIST Enable** is set to **Enabled**.

Parameter	Description
Data Eye (Continued)	<ul style="list-style-type: none"> ◆ Aggressor Channel <ul style="list-style-type: none"> – This item helps read the aggressors channels. – Options available: Disabled, 1 Aggressor Channel, 3 Aggressor Channels, 7 Aggressor Channels. Default setting is 1 Aggressor Channel. ◆ Aggressor Static Lane Control <ul style="list-style-type: none"> – Enable/Disable the Aggressor Static Lane Control function. – Options available: Enabled, Disabled. Default setting is Disabled. ◆ Aggressor Static Lane Select Upper 32 bits^(Note1) ◆ Aggressor Static Lane Select Lower 32 bits^(Note1) ◆ Aggressor Static Lane Select ECC^(Note1) ◆ Aggressor Static Lane Value^(Note1) ◆ Target Static Lane Control <ul style="list-style-type: none"> – Enable/Disable the Target Static Lane Control function. – Options available: Enabled, Disabled. Default setting is Disabled. ◆ Target Static Lane Select Upper 32 bits^(Note2) ◆ Target Static Lane Select Lower 32 bits^(Note2) ◆ Target Static Lane Select ECC^(Note2) ◆ Target Static Lane Value^(Note2) ◆ Worst Case Margin Granularity <ul style="list-style-type: none"> – Options available: Per Chip Select, Per Nibble. Default setting is Per Chip Select. ◆ Read Voltage Sweep Step Size <ul style="list-style-type: none"> – Options available: 1, 2, 4. Default setting is 1. ◆ Read Timing Sweep Step Size <ul style="list-style-type: none"> – Options available: 1, 2, 4. Default setting is 1. ◆ Write Voltage Sweep Step Size <ul style="list-style-type: none"> – Options available: 1, 2, 4. Default setting is 1. ◆ Write Timing Sweep Step Size <ul style="list-style-type: none"> – Options available: 1, 2, 4. Default setting is 1.

(Note1) This item is configurable when **Aggressor Static Lane Control** is set to **Enabled**.

(Note2) This item is configurable when **Target Static Lane Control** is set to **Enabled**.

5-2-13-4 NBIO Common Options

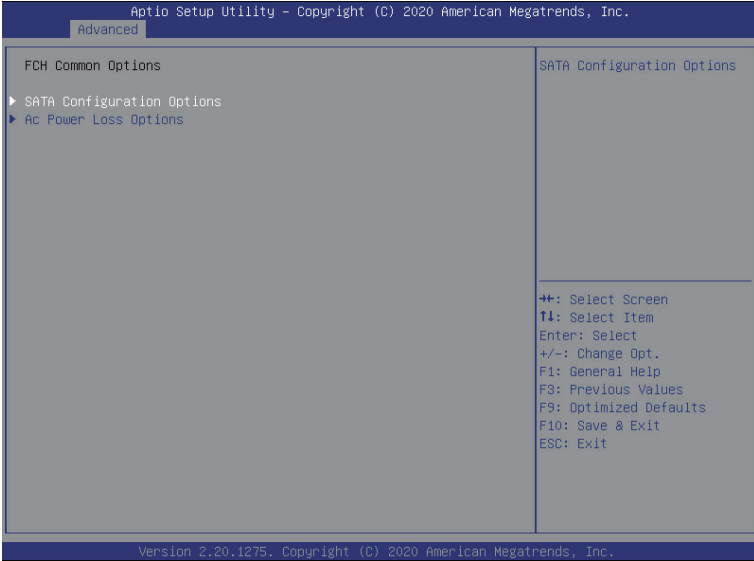


Parameter	Description
NBIO Common Options	
IOMMU	Enable/Disable the IOMMU function. Options available: Auto, Enabled, Disabled. Default setting is Auto .
XFR Enhancement	<p>Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> ◆ Declined ◆ Accepted <ul style="list-style-type: none"> – Precision Boost Overdrive <ul style="list-style-type: none"> » Options available: Auto, Enable, Disable, Manual. Default setting is Auto. – Precision Boost Overdrive Scalar <ul style="list-style-type: none"> » Options available: Auto, Disabled, Manual. Default setting is Auto. ◆ FCLK Frequency <ul style="list-style-type: none"> – Specifies the FCLK frequency. Default setting is Auto. ◆ SOC OVERCLOCK VID <ul style="list-style-type: none"> – Specifies the Voltage ID (VID) value for VDDR_SOC to support overclocking. NOTE: This is a VID value in hex and not a voltage level and applied if DDR speed is > 2933. ◆ UCLK DIV1 MODE <ul style="list-style-type: none"> – Options available: Auto, UCLK==MEMCLK, UCLK==MEMCLK/2. Default setting is Auto. ◆ VDDP Voltage Control <ul style="list-style-type: none"> – Options available: Auto, Manual. Default setting is Auto.

Parameter	Description
XFR Enhancement (continued)	<ul style="list-style-type: none"> ◆ VDDG Voltage Control <ul style="list-style-type: none"> – Options available: Auto, Manual. Default setting is Auto. ◆ SoC/Uncore OC Mode <ul style="list-style-type: none"> – Forces CPU SoC/Uncore components (e.g. Infinity Fabric, memory, and integrated graphics) to run at their maximum specified frequency at all times. May improve performance at the expense of idle power savings. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ LN2 Mode <ul style="list-style-type: none"> – Send a message to SMU to help with cold boot and operating under LN2 conditions for GMI2. – Options available: Auto, Enabled, Disabled. Default setting is Auto.
ACS Enable	AER must be enabled for ACS enable to work. Options available: Auto, Enable, Disabled. Default setting is Auto .
PCIe ARI Support	Enable/Disable Alternative Routing-ID Interpretation. Options available: Auto, Enabled, Disabled. Default setting is Auto .
PCIe ARI Enumeration	Options available: Auto, Enabled, Disabled. Default setting is Auto .
PCIe Ten Bit Tag Support	Enable/Disable PCIe ten bit tags for supported devices. (Auto=Disabled) Options available: Auto, Enabled, Disabled. Default setting is Auto .
HD Audio Enable	Options available: Auto, Enabled, Disabled. Default setting is Auto .
SMU Common Options	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ cTDP Control <ul style="list-style-type: none"> – Selects use the fused TDP or set customized TDP. **TDP is used to define the RC thermal model only** – Options available: Auto, Manual. Default setting is Auto. ◆ Fan Control <ul style="list-style-type: none"> – Fan Table Control <ul style="list-style-type: none"> » Options available: Auto, Manual. Default setting is Auto. ◆ EfficiencyModeEn <ul style="list-style-type: none"> – Options available: Auto, Enabled. Default setting is Auto. ◆ Package Power Limit Control <ul style="list-style-type: none"> – Selects use the fused PPT or set customized PPT. **PPT will be used as the ASIC power limit** – Options available: Auto, Manual. Default setting is Auto. ◆ APBDIS <ul style="list-style-type: none"> – Options available: Auto, 0, 1. Default setting is Auto. ◆ DF Cstates <ul style="list-style-type: none"> – Enable/Disable DF C-states. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ CPPC <ul style="list-style-type: none"> – Options available: Auto, Enabled, Disabled. Default setting is Auto.

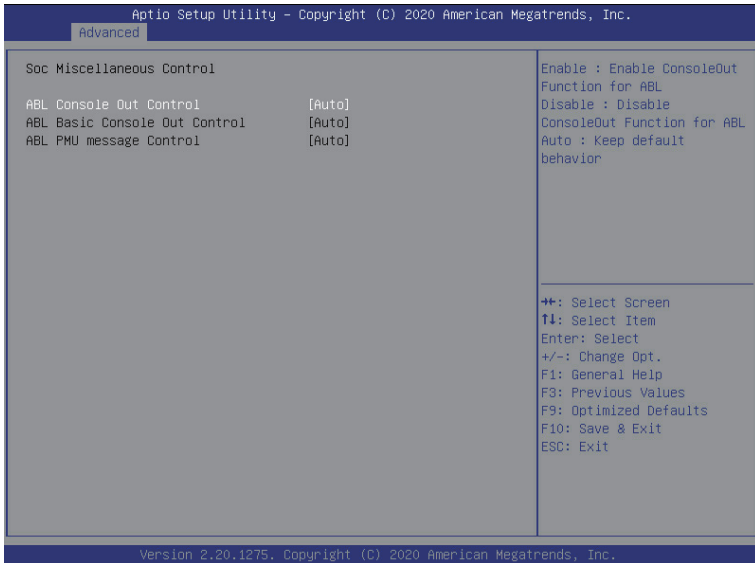
SMU Common Options (continued)	<ul style="list-style-type: none"> ◆ CPPC Preferred Cores <ul style="list-style-type: none"> – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ NBIO LCLK DPM <ul style="list-style-type: none"> – This setting controls how the NBIO Power Management is controlled. – Options available: Auto, Manual. Default setting is Auto.
Enable AER Cap	Enable/Disable Advanced Error Reporting Capability. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Early Link Speed	Configures Early Link Speed. Options available: Auto, Gen1, Gen2. Default setting is Auto .
Hot Plug Handling mode	Controls the Hot Plug Handling mode. Options available: Auto, A0 Mode, OS First (No Error Handling), OS First (Error Handling-Not Implemented), Firmware First (Not Implemented). Default setting is Auto .
Presence Detect Select mode	Controls the Presence Detect Select mode. Options available: Auto, OR, AND. Default setting is Auto .
Preferred IO	Preferred IO select type. Manual: Bus Number manually. Auto: Default. Options available: Auto, Manual. Default setting is Auto .
CV test	Enable/Disable the running PCIECV tool support. Options available: Auto, Enabled, Disabled. Default setting is Auto .
Loopback Mode	Enable/Disable the PCIe loopback mode. Options available: Auto, Enabled, Disabled. Default setting is Auto .

5-2-13-5 FCH Common Options



Parameter	Description
FCH Common Options	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ SATA Enable <ul style="list-style-type: none"> - Enable/Disable OnChip SATA controller. - Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ SATA RAS Support <ul style="list-style-type: none"> - Enable/Disable SATA RAS Support. - Options available: Auto, Enabled, Disabled. Default setting is Auto.
SATA Configuration Options	<ul style="list-style-type: none"> ◆ SATA Disabled AHCI Prefetch Function <ul style="list-style-type: none"> - Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Aggressive SATA Device Sleep Port 0 <ul style="list-style-type: none"> - Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ Aggressive SATA Device Sleep Port 1 <ul style="list-style-type: none"> - Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ SATA Controller options <ul style="list-style-type: none"> - Press [Enter] to configure advanced items.
AC Power Loss Options	<p>Press [Enter] for configuration of advanced items.</p> <ul style="list-style-type: none"> ◆ AC Loss Control <ul style="list-style-type: none"> - Selects the AC Loss Control Method. - Options available: Power Off, Power On, Last State. Default setting is Last State.

5-2-13-6 SOC Miscellaneous Control



Parameter	Description
SOC Miscellaneous Control	
ABL Console Out Control	Enable/Disable the ConsoleOut function for ABL. Options available: Auto, Enabled, Disabled. Default setting is Auto .
ABL Basic Console Out Control ^(Note)	Enable/Disable the Basic ConsoleOut function for ABL. Options available: Auto, Enabled, Disabled. Default setting is Auto .
ABL PMU message Control ^(Note)	To Control the total number of PMU debug messages. Options available: Auto, Detailed debug message, Coarse debug message, Stage completion, Firmware completion message only. Default setting is Auto .

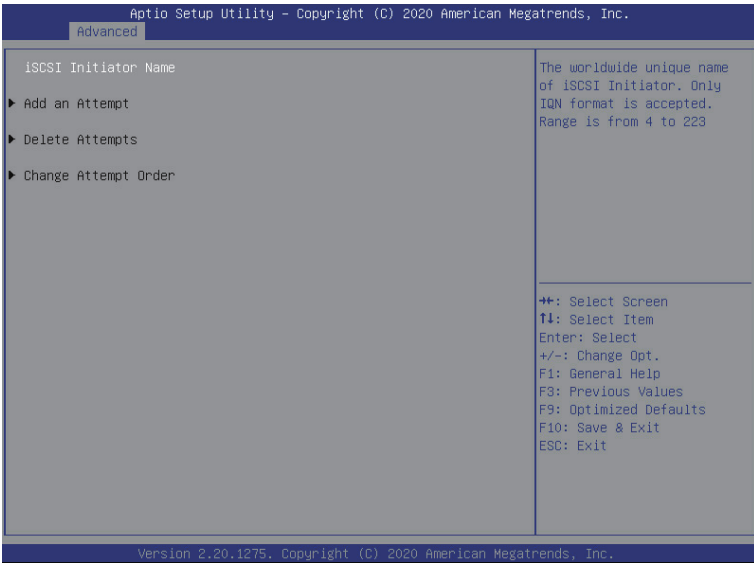
(Note) This item is configurable when **ABL Console Out Control** is set to **Enabled**.

5-2-13-7 X570/590 Chipset Common Options



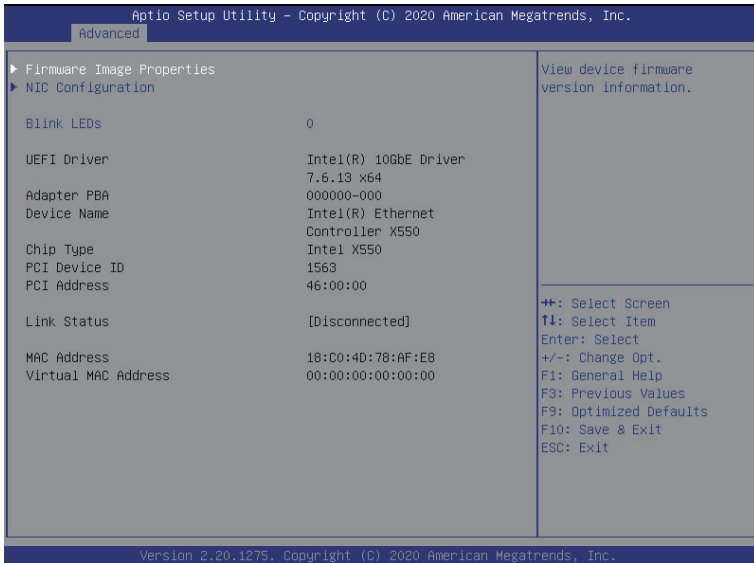
Parameter	Description
X570/590 Chipset Common Options	Press [Enter] for configuration of advanced items.
X570/590 Chipset SATA Configuration Options	<ul style="list-style-type: none"> ◆ X570/590 Chipset SATA0/1 Enable <ul style="list-style-type: none"> – Enable/Disable Bixby SATA controller. – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ X570/590 Chipset SATA Disabled AHCI Prefetch Function <ul style="list-style-type: none"> – Options available: Auto, Enabled, Disabled. Default setting is Auto. ◆ X570/590 Chipset Aggressive SATA Device Sleep Port 0/1 <ul style="list-style-type: none"> – Options available: Auto, Enabled, Disabled. Default setting is Auto.
X570/590 Chipset USB Configuration Options	<ul style="list-style-type: none"> ◆ X570/590 Chipset XHCI Controller0/1 enable <ul style="list-style-type: none"> – Enable/Disable USB3 Controller0/1. – Options available: Auto, Enabled, Disabled. Default setting is Auto.

5-2-14 iSCSI Configuration



Parameter	Description
iSCSI Initiator Name	Press [Enter] and name iSCSI Initiator. Only IQN format is accepted. Range: from 4 to 223
Add an Attempt	Press [Enter] to configure advanced items.
Delete Attempts	Press [Enter] to configure advanced items.
Change Attempt Order	Press [Enter] to configure advanced items.

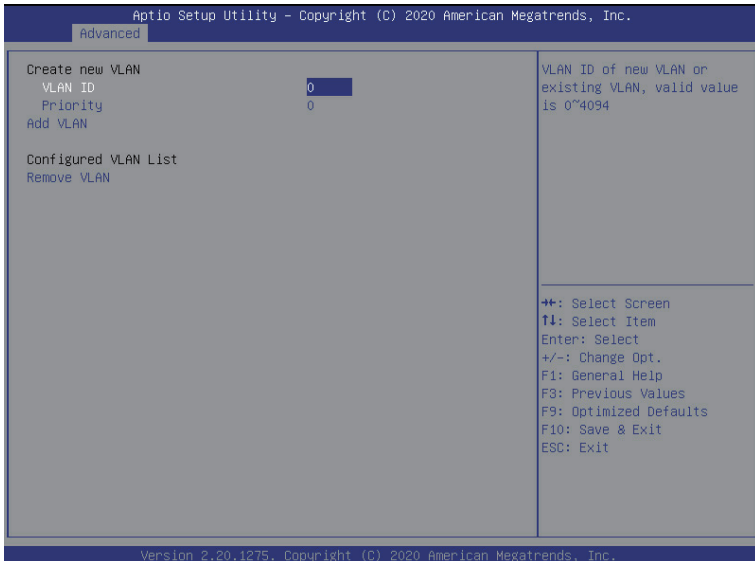
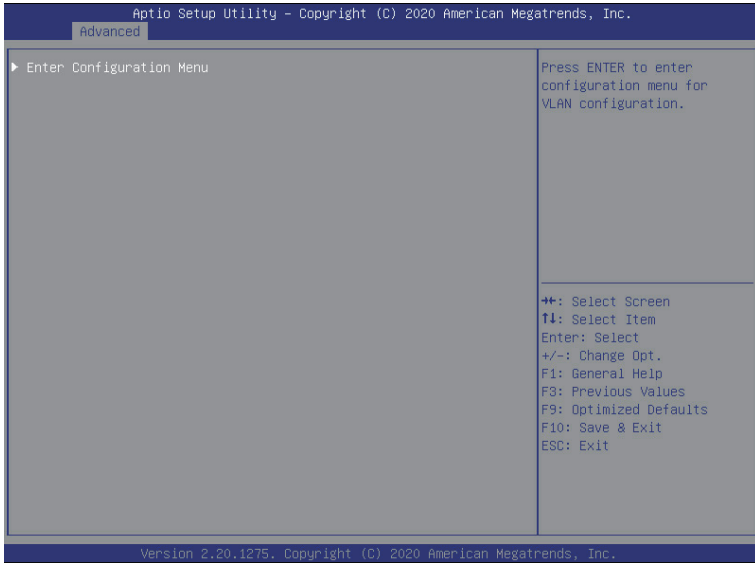
5-2-15 Intel X550 10GBASE-T Network Connection



Parameter	Description
Firmware Image Properties	Press [Enter] to view firmware image information.
NIC Configuration	<ul style="list-style-type: none"> ◆ Link Speed <ul style="list-style-type: none"> – Allows for automatic link speed adjustment. – Options available: Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full. Default setting is Auto Negotiated. ◆ Wake On LAN <ul style="list-style-type: none"> – 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.
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values.
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.

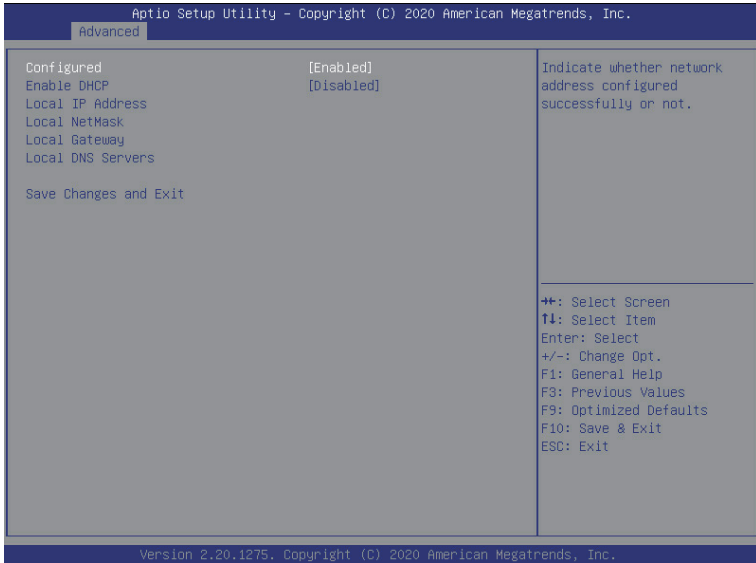
Parameter	Description
Link Status	Specifies the link status of the port.
MAC Address	Displays the MAC address of the Ethernet controller.
Virtual MAC Address	Displays the virtual MAC address of the Ethernet controller.

5-2-16 VLAN Configuration



Parameter	Description
Enter Configuration Menu	<p data-bbox="338 158 674 181">Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li data-bbox="338 189 522 213">◆ Create new VLAN <li data-bbox="338 221 451 244">◆ VLAN ID <ul style="list-style-type: none"> <li data-bbox="376 247 804 271">– Sets VLAN ID for a new VLAN or an existing VLAN. <li data-bbox="376 275 937 299">– Press the <+> / <-> keys to increase or decrease the desired values. <li data-bbox="376 304 666 327">– The valid range is from 0 to 4094. <li data-bbox="338 335 437 359">◆ Priority <ul style="list-style-type: none"> <li data-bbox="376 362 852 385">– Sets 802.1Q Priority for a new VLAN or an existing VLAN. <li data-bbox="376 390 937 413">– Press the <+> / <-> keys to increase or decrease the desired values. <li data-bbox="376 418 636 442">– The valid range is from 0 to 7. <li data-bbox="338 450 463 473">◆ Add VLAN <ul style="list-style-type: none"> <li data-bbox="376 476 905 500">– Press [Enter] to create a new VLAN or update an existing VLAN. <li data-bbox="338 508 551 531">◆ Configured VLAN List <li data-bbox="338 539 495 562">◆ Remove VLAN <ul style="list-style-type: none"> <li data-bbox="376 566 732 589">– Press [Enter] to remove an existing VLAN.

5-2-17 MAC IPv4 Network Configuration



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

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

5-2-18 MAC IPv6 Network Configuration

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Advanced

<p>▶ Enter Configuration Menu</p>	<p>Press ENTER to enter configuration menu for IPv6 configuration.</p>
<p> ⇧⇧: Select Screen ⇧↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F8: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit </p>	

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Advanced

<p>Interface Name : eth0</p> <p>Interface Type : Ethernet</p> <p>MAC address : 18-C0-4D-78-AF-E8</p> <p>Host addresses : FE80::1AD0:4DFF:FE78:AFE8/64</p> <p>Route Table : FE80::/64 >>::</p> <p>Gateway addresses :</p> <p>DNS addresses :</p> <p>Interface ID : 1A:C0:4D:FF:FE:78:AF:E8</p> <p>DAD Transmit Count : 1</p> <p>Policy : [automatic]</p> <p>Save Changes and Exit</p>	<p>The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3</p> <p> ⇧⇧: Select Screen ⇧↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F8: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit </p>
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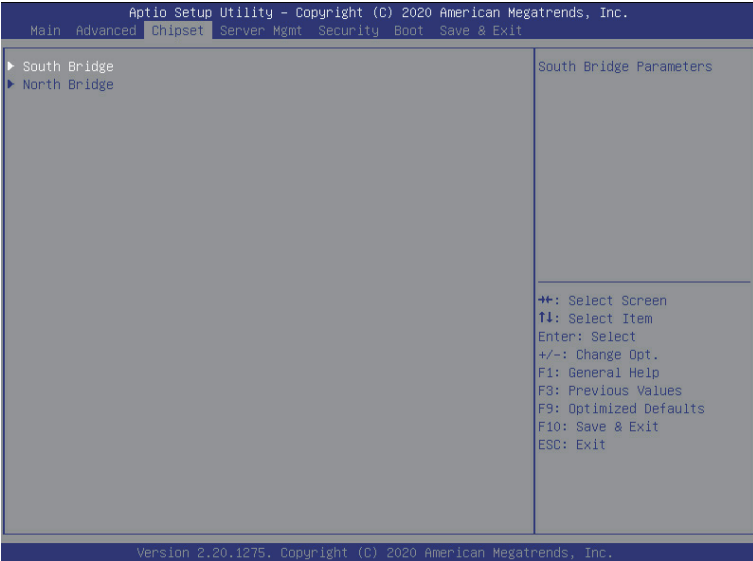
Version 2.20.1275, Copyright (C) 2020 American Megatrends, Inc.

Parameter	Description
Enter Configuration Menu	<p data-bbox="338 158 671 181">Press [Enter] to configure advanced items.</p> <ul style="list-style-type: none"> <li data-bbox="338 189 682 213">◆ Displays the MAC Address information. <li data-bbox="338 221 942 299">◆ Interface ID <ul style="list-style-type: none"> <li data-bbox="376 244 942 299">– The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3. <li data-bbox="338 307 942 448">◆ DAD Transmit Count <ul style="list-style-type: none"> <li data-bbox="376 330 942 448">– The number of consecutive Neighbor solicitation messages sent while performing Duplicate Address Detection on a tentative address. A value of zero indicates that Duplicate Address Detection is not performed. <li data-bbox="338 456 923 511">◆ Policy <ul style="list-style-type: none"> <li data-bbox="376 479 923 511">– Options available: automatic, manual. Default setting is automatic. <li data-bbox="338 519 708 561">◆ Save Changes and Exit <ul style="list-style-type: none"> <li data-bbox="376 542 708 561">– Press [Enter] to save all configurations.

5-3 Chipset Setup Menu

Chipset Setup menu displays submenu options for configuring the function of the South Bridge and North Bridge.

Select a submenu item, then press <Enter> to access the related submenu screen.



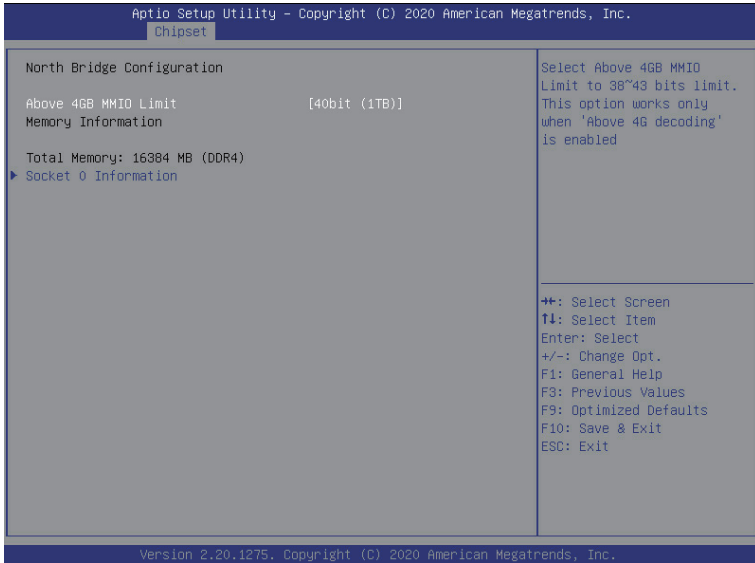
Parameter	Description
South Bridge	Press [Enter] for configuration of advanced items.
North Bridge	Press [Enter] for configuration of advanced items.

5-3-1 South Bridge



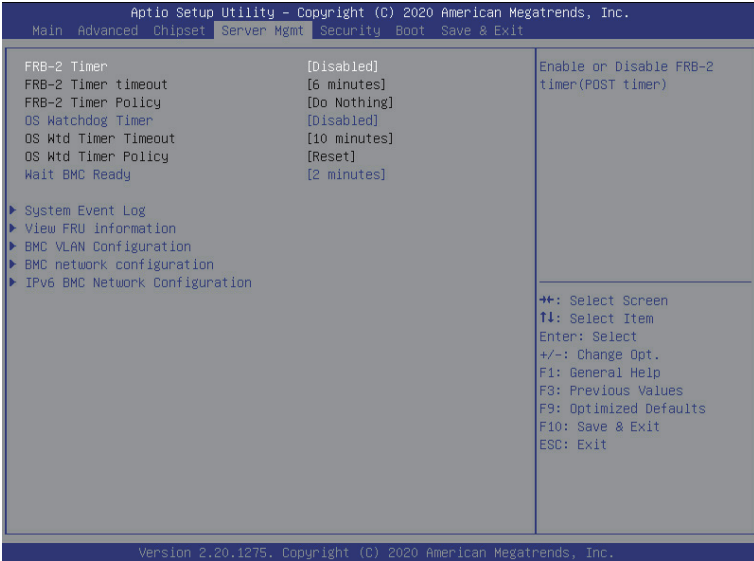
Parameter	Description
SB USB Configuration	Press [Enter] for configuration of advanced items. <ul style="list-style-type: none"> ◆ DIE0/1 XHCI Port <ul style="list-style-type: none"> – Enable/Disable XHCI Port. – Options available: Enabled, Disabled. Default setting is Enabled.

5-3-2 North Bridge



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

5-4 Server Management Menu



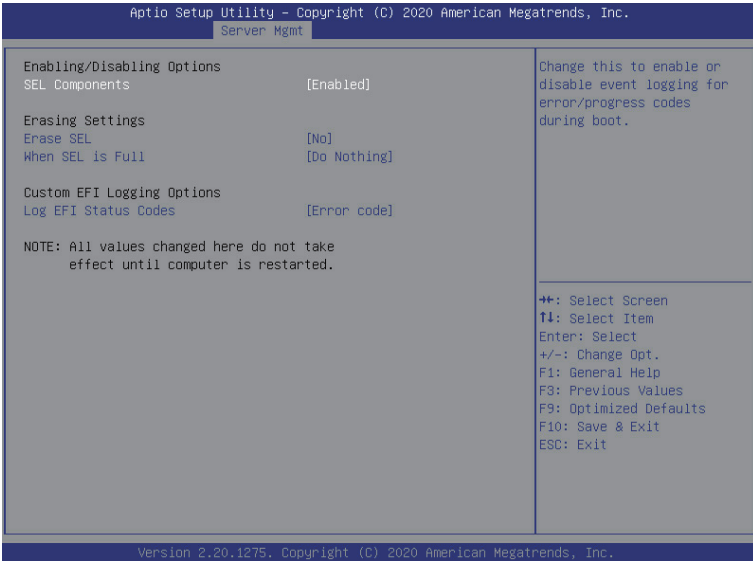
Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Enabled .
FRB-2 Timer ^(Note1) timeout	Configures the FRB2 Timer timeout. Options available: 3 minutes, 4 minutes, 5 minutes, 6 minutes. Default setting is 6 minutes .
FRB-2 Timer Policy ^(Note1)	Configures the FRB2 Timer policy. Options available: Do Nothing, Reset, Power Down. 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. Options available: 5 minutes, 10 minutes, 15 minutes, 20 minutes. Default setting is 10 minutes .
OS Wtd Timer Policy ^(Note2)	Configure OS Watchdog Timer Policy. Options available: Reset, Do Nothing, Power Down. 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 .
System Event Log	Press [Enter] to configure advanced items.

(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
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.

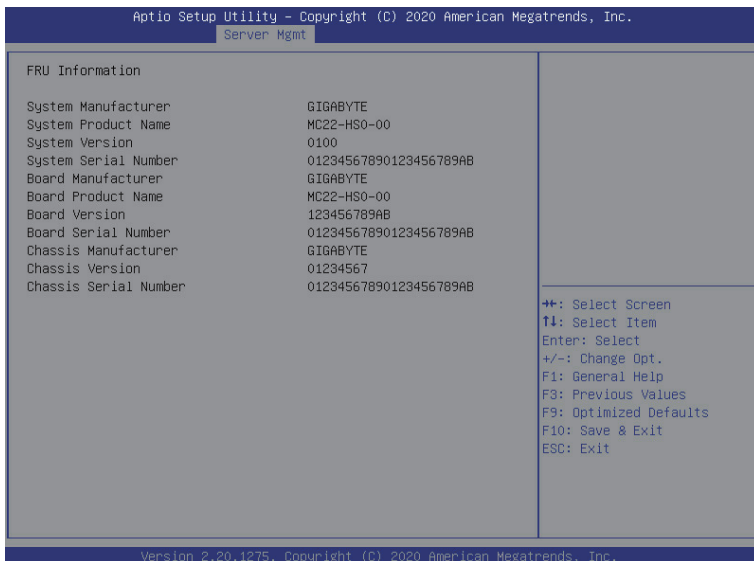
5-4-1 System Event Log



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. 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 .

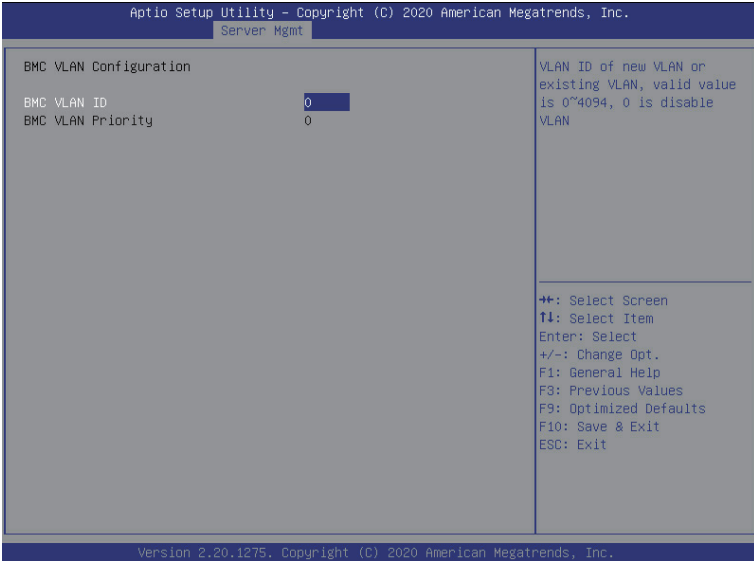
5-4-2 View FRU Information

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.



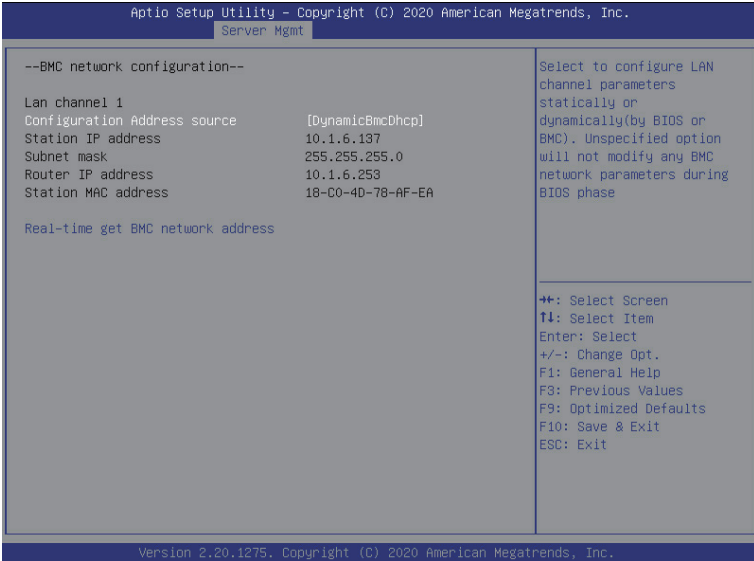
(Note) The model name will vary depends on the product you purchased

5-4-3 BMC VLAN Configuration



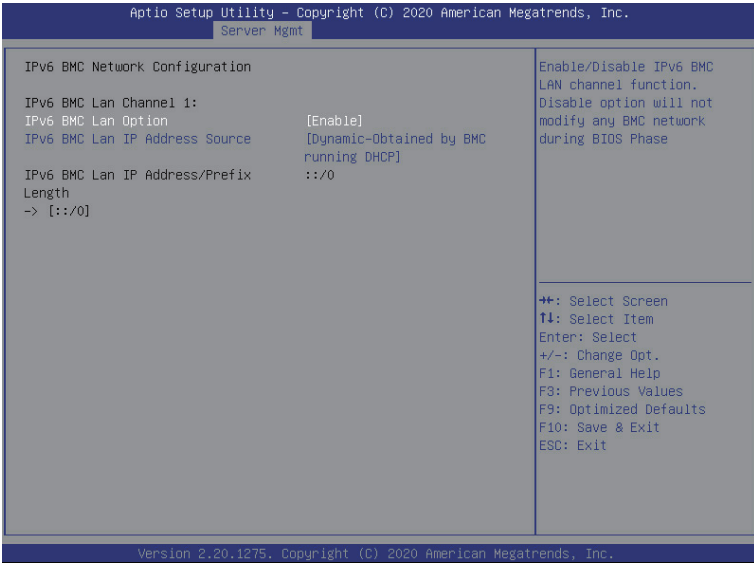
Parameter	Description
BMC VLAN Configuration	
BMC VLAN ID	Sets VLAN ID for a new VLAN or an existing VLAN. Press the <+> / <-> keys to increase or decrease the desired values. The valid range is from 0 to 4094.
BMC VLAN Priority	Sets 802.1Q Priority for a new VLAN or an existing VLAN. Press the <+> /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

5-4-4 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.

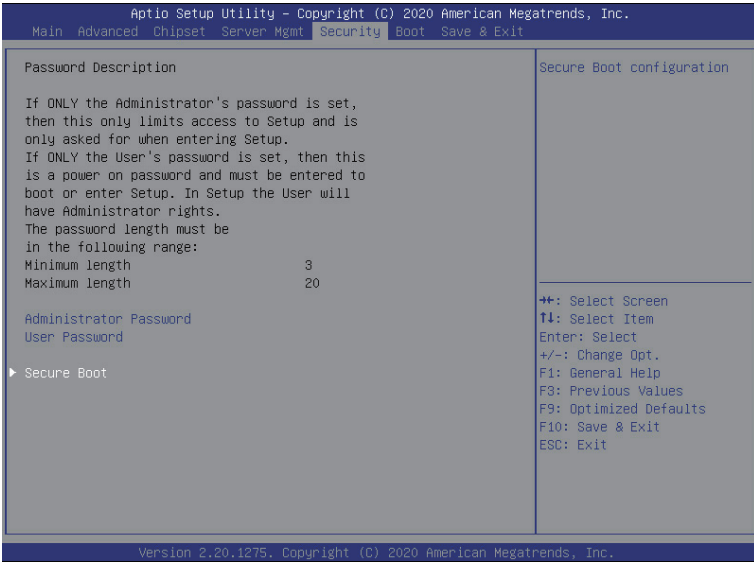
5-4-5 IPv6 BMC Network Configuration



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.



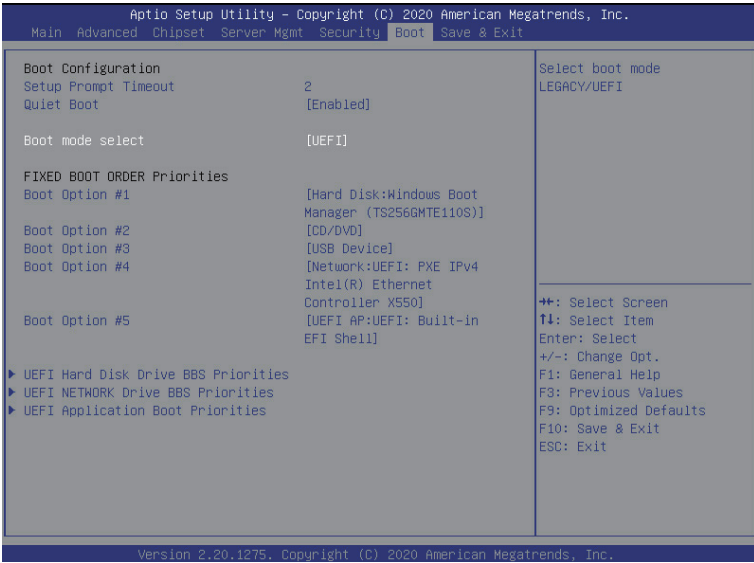
Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. Options available: Enabled, Disabled. Default setting is Disabled .
Secure Boot Mode ^(Note)	Secure Boot requires all the applications that are running during 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 Standard .
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.

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

Parameter	Description
Key Management	<p data-bbox="335 156 665 180">Press [Enter] to configure advanced items.</p> <p data-bbox="335 185 936 235">Please note that this item is configurable when Secure Boot Mode is set to Custom.</p> <ul style="list-style-type: none"> <li data-bbox="335 243 941 352">◆ Factory Key Provision <ul style="list-style-type: none"> <li data-bbox="367 266 941 321">– Allows to provision factory default Secure Boot keys when system is in Setup Mode. <li data-bbox="367 326 904 352">– Options available: Enabled, Disabled. Default setting is Disabled. <li data-bbox="335 357 925 431">◆ Restore Factory Keys <ul style="list-style-type: none"> <li data-bbox="367 381 925 404">– Installs all factory default keys. It will force the system in User Mode. <li data-bbox="367 409 606 431">– Options available: Yes, No. <li data-bbox="335 435 899 517">◆ Enroll Efi Image <ul style="list-style-type: none"> <li data-bbox="367 459 899 517">– Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db). <li data-bbox="335 522 696 572">◆ Restore DB defaults <ul style="list-style-type: none"> <li data-bbox="367 545 696 572">– Restore DB variable to factory defaults. <li data-bbox="335 577 893 627">◆ Secure Boot variable <ul style="list-style-type: none"> <li data-bbox="367 600 893 627">– Displays the current status of the variables used for secure boot. <li data-bbox="335 631 803 736">◆ Platform Key (PK) <ul style="list-style-type: none"> <li data-bbox="367 655 803 682">– Displays the current status of the Platform Key (PK). <li data-bbox="367 686 675 713">– Press [Enter] to configure a new PK. <li data-bbox="367 718 601 736">– Options available: Update. <li data-bbox="335 741 941 878">◆ Key Exchange Keys (KEK) <ul style="list-style-type: none"> <li data-bbox="367 765 941 791">– Displays the current status of the Key Exchange Key Database (KEK). <li data-bbox="367 796 904 846">– Press [Enter] to configure a new KEK or load additional KEK from storage devices. <li data-bbox="367 851 670 878">– Options available: Update, Append. <li data-bbox="335 882 904 1019">◆ Authorized Signatures (DB) <ul style="list-style-type: none"> <li data-bbox="367 906 904 932">– Displays the current status of the Authorized Signature Database. <li data-bbox="367 937 941 987">– Press [Enter] to configure a new DB or load additional DB from storage devices. <li data-bbox="367 992 670 1019">– Options available: Update, Append. <li data-bbox="335 1023 899 1160">◆ Forbidden Signatures (DBX) <ul style="list-style-type: none"> <li data-bbox="367 1047 899 1074">– Displays the current status of the Forbidden Signature Database. <li data-bbox="367 1078 888 1128">– Press [Enter] to configure a new dbx or load additional dbx from storage devices. <li data-bbox="367 1133 670 1160">– Options available: Update, Append. <li data-bbox="335 1165 925 1301">◆ Authorized TimeStamps (DBT) <ul style="list-style-type: none"> <li data-bbox="367 1188 925 1215">– Displays the current status of the Authorized TimeStamps Database. <li data-bbox="367 1219 904 1270">– Press [Enter] to configure a new DBT or load additional DBT from storage devices. <li data-bbox="367 1274 670 1301">– Options available: Update, Append. <li data-bbox="335 1306 915 1434">◆ OsRecovery Signatures <ul style="list-style-type: none"> <li data-bbox="367 1329 915 1356">– Displays the current status of the OsRecovery Signature Database. <li data-bbox="367 1361 888 1411">– Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices. <li data-bbox="367 1415 670 1434">– 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.

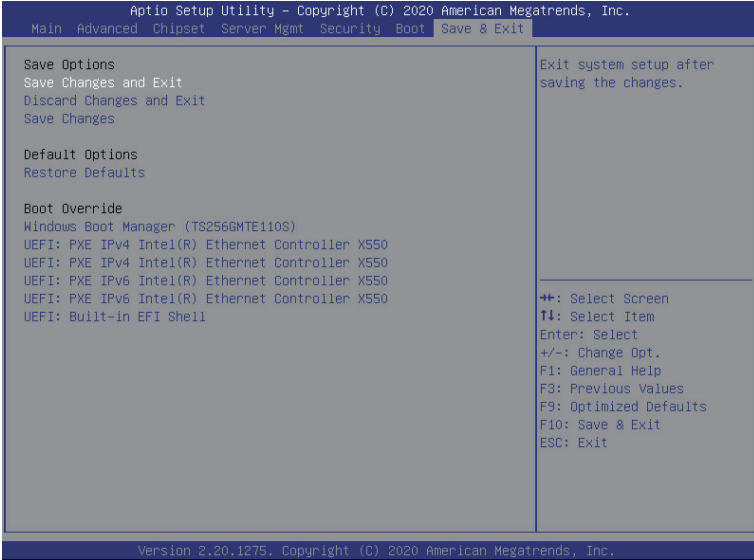


Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled, Disabled. Default setting is Enabled .
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	<p>Press [Enter] to configure the boot priority. By default, the server searches for boot devices in the following sequence:</p> <ol style="list-style-type: none"> 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI Hard Disk Drive BBS Priorities	Press [Enter] to configure the boot priority.
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	Saves changes done so far to any of the setup options. Options available: Yes, No.
Default Options	
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.
Boot Override	Press [Enter] to configure the device as the boot-up drive.

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	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

5-8-2 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