GIGABYTE™

R143-EG2-AAC2

Rack Server - AMD EPYC™ 8005/8004 Server Processors - 1U UP 1 x PCIe Gen5 GPU

User Manual

Rev. 1.0

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Documentation Classifications

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

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

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

For More Information

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

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

CAUTION!

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

Electrostatic Discharge (ESD)

CAUTION!

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

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without 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 fingertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can dam-age the contacts inside the jumper, causing intermittent problems with the function con-trolled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

Table of Contents

Chapter 1 Hardware Installation 9
1-1 Installation Precautions 9
1-2 Product Specifications 10
1-3 System Block Diagram 13
Chapter 2 System Appearance 14
2-1 Front View 14
2-2 Rear View 15
2-3 Front Panel LEDs and Buttons 16
2-3-1 RoT LEDs 17
2-4 Rear System LAN LEDs 19
2-5 Power Supply Unit (PSU) LED 20
2-6 Hard Disk Drive LEDs 21
Chapter 3 System Hardware Installation 22
3-1 Removing Chassis Cover 23
3-2 Removing and Installing the Fan Duct 24
3-3 Removing and installing the Heat Sink 25
3-4 Installing the CPU 26
3-5 Installing the Memory 27
3-5-1 Six Channel Memory Configuration 27
3-5-2 Installing the Memory 28
3-5-3 DIMM Population Table 29
3-5-4 Processor and Memory Module Matrix Table 30
3-6 Installing the GPU Card 31
3-7 Installing the PCI Expansion Card 32
3-8 Installing the Mezzanine Card 33
3-8-1 OCP 3.0 33
3-9 Installing the Hard Disk Drive 34
3-10 Installing the M.2 Device and Heat Sink 35
3-11 Replacing the Fan Assembly 36
3-12 Replacing the Power Supply 37
3-13 Cable Routing 38
Chapter 4 Motherboard Components 44
4-1 Motherboard Components 44

4-2 Jumper Setting 46
4-3 Backplane Board Storage Connector 47
4-3-1 CBP10C0 47
Chapter 5 BIOS Setup 48
5-1 The Main Menu 50
5-2 Advanced Menu 53
5-2-1 CPU Configuration 54
5-2-2 NVMe Configuration 55
5-2-3 SATA Configuration 56
5-2-4 USB Configuration 57
5-2-5 PCI Subsystem Settings 59
5-2-6 AST2600 Super IO Configuration 61
5-2-7 Serial Port Console Redirection 63
5-2-8 Network Stack Configuration 66
5-2-9 Post Report Configuration 68
5-2-10 Trusted Computing 69
5-2-11 PSP Firmware Versions 70
5-2-12 S5 RTC Wake Settings 71
5-2-13 Graphic Output Configuration 72
5-2-14 KMS Policy Configuration 73
5-2-15 AMD Mem Configuration Status 75
5-2-16 Tls Auth Configuration 76
5-2-17 RAM Disk Configuration 77
5-2-18 iSCSI Configuration 78
5-3 AMD CBS Menu 79
5-3-1 CPU Common Options 80
5-3-2 DF Common Options 86
5-3-3 UMC Common Options 94
5-3-4 NBIO Common Options 113
5-3-5 FCH Common Options 125
5-3-6 SOC Miscellaneous Control 133
5-3-7 CXL Common Options 135
5-4 AMD PBS Menu 137
5-4-1 RAS 138
5-5 Chipset Setup Menu 140
5-5-1 North Bridge 141
5-6 Server Management Menu 142
5-6-1 System Event Log 144
5-6-2 View FRU Information 145

5-6-3 BMC VLAN Configuration 146
5-6-4 BMC Network Configuration 147
5-6-5 IPv6 BMC Network Configuration 148
5-7 Security Menu 149
5-7-1 Secure Boot 150
5-8 Boot Menu 152
5-9 Save & Exit Menu 154
5-10 BIOS Recovery 156

Chapter 1 Hardware Installation

1-1 Installation Precautions

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

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

1-2 Product Specifications

NOTE:

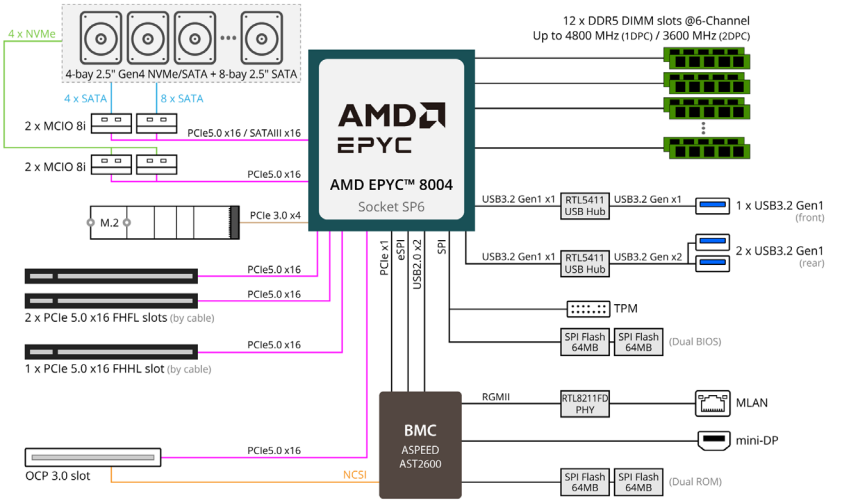
We reserve the right to make any changes to the product specifications and product-related information without prior notice.

System Dimension	◆ 1U ◆ 438mm (W) x 43.5mm (H) x 815mm (D)
CPU	◆ AMD EPYC™ 8005 Server Processors ◆ AMD EPYC™ 8004 Server Processors ◆ Single processor, cTDP up to 225 W
Socket	◆ 1 x LGA 4677 ◆ Socket E
Chipset	◆ Intel® C741 Chipset
Memory	◆ 12 x DIMM slots ◆ Support DDR5 RDIMM ◆ 6-Channel memory per processor **AMD EPYC™ 8005:** ◆ Up to 6400 MT/s (1DPC), 5200 MT/s (2DPC) **AMD EPYC™ 8004:** ◆ Up to 4800 MT/s (1DPC), 3600 MT/s (2DPC)
LAN	**Rear:** ◆ 1 x 10/100/1000 Mb/s Management LAN
Video	◆ Integrated in ASPEED® AST2600 - 1 x Mini-DP
Storage	**Front hot-swap:** ◆ 4 x 2.5" Gen4 NVMe/SATA/SAS [1] ◆ 8 x 2.5" SATA/SAS [1] **Internal M.2:** ◆ 1 x M.2 (2280/22110), PCIe Gen3 x4 [1] SAS card is required to support SAS drives
SAS	◆ Require SAS add-in cards
RAID	◆ Require RAID add-in cards

Expansion Slot	◆ **PCIe Cable x 3:** - 1 x FHFL x16 (Gen5 x16), for GPUs - 1 x FHFL x16 (Gen5 x16) [1] - 1 x FHHL x16 (Gen5 x16) ◆ 1 x OCP NIC 3.0 (Gen5 x16) - Support NCSI function [1] Blocked when a dual-slot GPU is installed.
Front I/O	◆ 1 x USB 3.2 Gen1 port (Type-A) ◆ 1 x Power button with LED ◆ 1 x ID button with LED ◆ 1 x Reset button ◆ 2 x LAN activity LEDs (disabled) ◆ 1 x Storage activity LED ◆ 1 x System status LED
Rear I/O	◆ 2 x USB 3.2 Gen1 ports (Type-A) ◆ 1 x Mini-DP ◆ 1 x MLAN port ◆ 1 x ID LED
Backplane I/O	◆ Speed and bandwidth: PCIe Gen4 x4 or SATA 6Gb/s or SAS 12Gb/s
TPM	◆ 1 x TPM header with SPI interface - **Optional** TPM 2.0 kit: CTM010
Power Supply	◆ 1+1 1300W (240V) 80 PLUS Platinum redundant power supplies ◆ AC Input: - 100-240V~/ 12-7A, 50-60Hz - 200-240V~/ 8A, 50-60Hz ◆ DC Input: - 240Vdc/ 6.5A ◆ DC Onput: - Max 1000W/ 100-240V~ + 12V/ 80.5A + 12Vsb/ 3A - Max 1300W/ 200-240V~ or 240Vdc Input + 12V/ 105.4A + 12Vsb/ 3A NOTE: ◆ The power supply specifications provided herein is for the default server configuration. Different SKUs have different PSU specs, so please see the system rating label on the server for the accurate PSU specification.

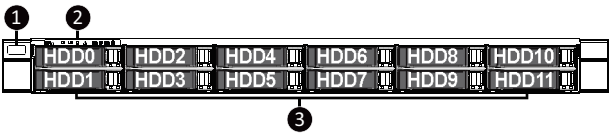
System Management	◆	ASPEED® AST2600 Baseboard Management Controller
	◆	GIGABYTE Management Console web interface
	◆	Dashboard
	◆	HTML5 KVM
	◆	Sensor Monitor (Voltage, RPM, Temperature, CPU Status …etc.)
	◆	Sensor Reading History Data
	◆	FRU Information
	◆	SEL Log in Linear Storage / Circular Storage Policy
	◆	Hardware Inventory
	◆	Fan Profile
	◆	System Firewall
	◆	Power Consumption
	◆	Power Control
	◆	Advanced power capping
	◆	LDAP / AD / RADIUS Support
	◆	Backup & Restore Configuration
	◆	Remote BIOS/BMC/CPLD Update
	◆	Event Log Filter
	◆	User Management
	◆	Media Redirection Settings
	◆	PAM Order Settings
	◆	SSL Settings
	◆	SMTP Settings
Operating Properties	◆	Operating temperature: 10°C to 35°C
	◆	Operating humidity: 8-80% (non-condensing)
	◆	Non-operating temperature: -40°C to 60°C
	◆	Non-operating humidity: 20%-95% (non-condensing)

1-3 System Block Diagram



Chapter 2 System Appearance

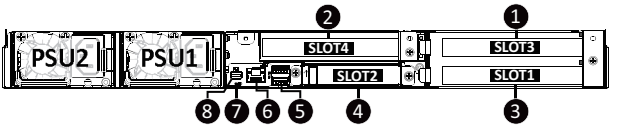
2-1 Front View



No.	Description
1.	Front USB 3.2 Gen1 Port
2.	Front Panel LEDs and Buttons
3.	2.5" Drive Bays
Note! Drives with green latches support NVMe.	

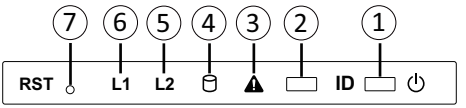
- Please Go to Chapter **2-3 Front Panel LED and Buttons** for detail description of function LEDs.

2-2 Rear View



No.	Description
1.	PCIe Slot
2.	PCIe Slot
3.	PCIe Slot
4.	OCP 3.0 Slot (Option/SFF)
5.	USB 3.2 Gen1 Port x 2
6.	Server Management LAN Port
7.	ID LED
8.	Mini DisplayPort

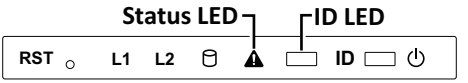
2-3 Front Panel LEDs and Buttons



No.	Name	Color	Status	Description
1.	Power button with LED	Green	On	System is powered on
		N/A	Off	System is not powered on or in ACPI S5 state (power off)
2.	ID Button(Note)			Press the button to activate system identification
3.	System Status LED(Note)	Green	Solid On	System is operating normally.
		Amber	Solid On	Critical condition, may indicate: System fan failure System temperature
			Blink	Non-critical condition, may indicate: Redundant power module failure Temperature and voltage issue Chassis intrusion
		N/A	Off	System is not ready, may indicate: POST error NMI error Processor or terminator missing
4.	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.
5.	LAN 2 Active/ Link LED	The function is disabled.		
6.	LAN 1 Active/ Link LED	The function is disabled.		
7.	Reset Button			Press the button to reset the system.

(Note) If your server features RoT function, please see the following section for detail LED behavior.

2-3-1 RoT LEDs



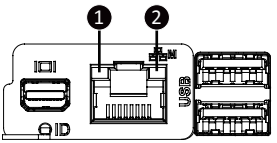
	LED on Front panel(Note5)	
	ID LED	Status LED
EC Firmware (FW) Authentication fail or not exit		
EC FW is broken or not exit (Note1)	OFF	OFF
Authenticating/Recovering BMC/BIOS Images		
Authenticating Images	OFF	OFF
Recovering BMC Active Flash	Blinks Blue 4 times per second	Blinks Green 4 times per second
Recovering BIOS Active Flash	Blinks Blue 4 times per second	Blinks Green 4 times per second
Authentication (AUTH) Pass		
Recovering BIOS Active Flash	OFF	OFF
BMC : AUTH pass after doing recovery **BIOS : AUTH pass after doing recovery**	OFF	OFF
BMC : AUTH pass after doing recovery **BIOS : AUTH pass**	OFF	OFF
BMC : AUTH pass **BIOS : AUTH pass after doing recovery**	OFF	OFF
Active Flash Authentication (AUTH) Fail		
BMC : AUTH Fail(Note2)	Blinks Blue 1 time per second	Blinks Green 1 time per second
BIOS : AUTH fail(Note2)	Blinks Blue 1 time per second	Blinks Amber 1 time per second

BMC : AUTH fail after doing recovery(Note3)	Blinks Blue 2 times per second [ON OFF OFF]	Blinks Green 2 times per second [ON OFF OFF]
BIOS : AUTH fail after doing recovery(Note3)	Blinks Blue 2 times per second [ON OFF OFF]	Blinks Amber 2 times per second [ON OFF OFF]
Backup Flash Authentication Fail(Note4)		
BMC : AUTH fail	Blinks Blue 2 times per second [ON OFF ON OFF]	Blinks Green 2 times per second [ON OFF ON OFF]
BIOS : AUTH fail	Blinks Blue 2 times per second [ON OFF ON OFF]	Blinks Amber 2 times per second [ON OFF ON OFF]

NOTE!

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

2-4 Rear System LAN LEDs

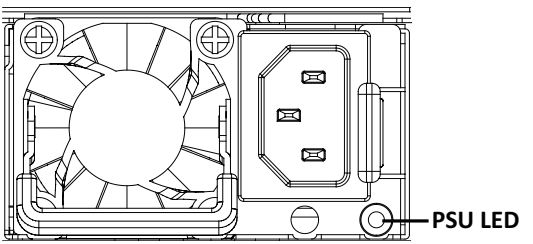


No.	Name	Color	Status	Description
1.	1GbE Speed LED	Yellow	On	1 Gbps data rate
		Green	On	100 Mbps data rate
		N/A	Off	10 Mbps data rate
2.	1GbE Link/ Activity LED	Green	On	Link between system and network or no access
			Blink	Data transmission or receiving is occurring
		N/A	Off	No data transmission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

2-5 Power Supply Unit (PSU) LED

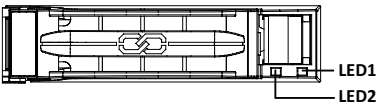
NOTE!

The power supply may be vary based on the system configuration.



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

LED #2	HDD Present	No HDD
Green	ON	OFF

NOTE:

*1: Depends on HBA/Utility Spec.

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

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

Chapter 3 System Hardware Installation



Pre-installation Instructions

Computer components and electronic circuit boards can be damaged by 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.

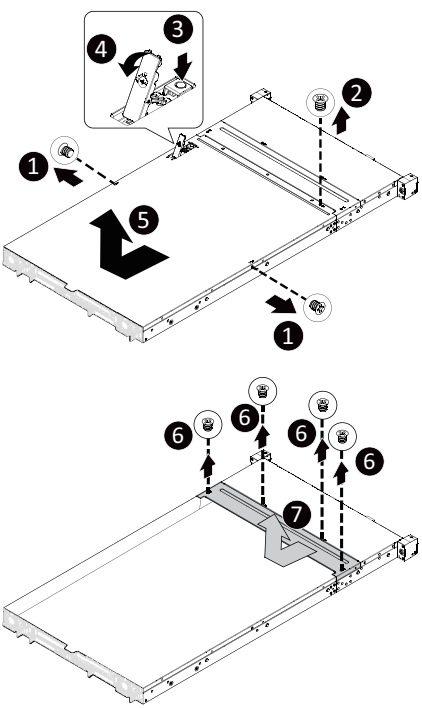
3-1 Removing Chassis Cover

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 chassis cover:

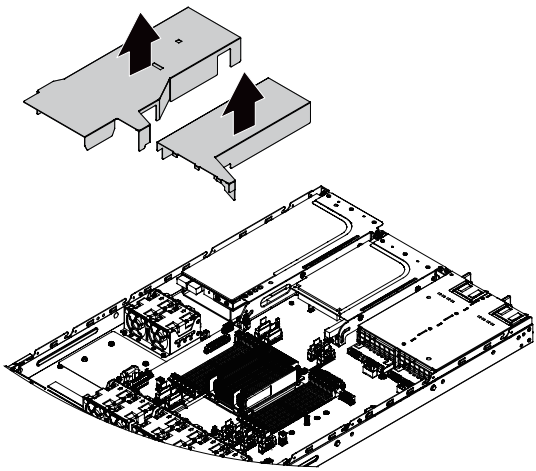
1. Remove the screws on both sides of the back chassis cover. (**Note: For safe shipping, installation screws are added and should be removed before deployment/putting it in the server cabinet.**)
2. Remove the screw securing the back chassis cover.
3. Push button to unlock the handle.
4. Pull the grip handle to open the panel cover.
5. Slide the back chassis cover towards the rear and remove the chassis cover in the direction indicated.
6. Remove the screw securing the middle chassis cover.
7. Slide the middle chassis cover towards the rear and remove the chassis cover in the direction indicated.
8. To reinstall the chassis cover reverse steps 2-7.



3-2 Removing and Installing the Fan Duct

Follow these instructions to remove/install the fan duct:

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



3-3 Removing and installing the Heat Sink

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

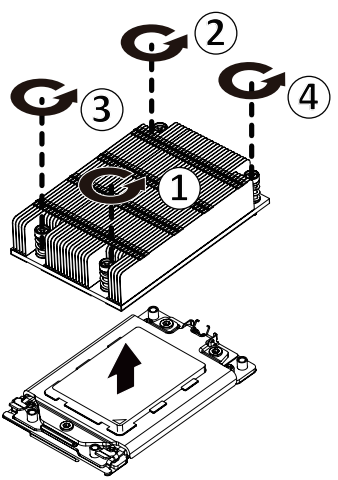
- Always turn off the computer and unplug the power cord from the power outlet before installing the heat sink to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system unit on a flat and stable surface.
- Open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

WARNING!

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

Follow these instructions to remove/install the heat sink:

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



- When installing the heat sink to CPU, use T-20 6-Lobe screwdriver to tighten 4 captive nuts in sequence as 1-4. The screw tightening torque: 13.8 ± 1.3 kgf-cm.
- To ensure the system operates properly, make sure the heat sink is seated on the processor firmly.

3-4 Installing the CPU

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.

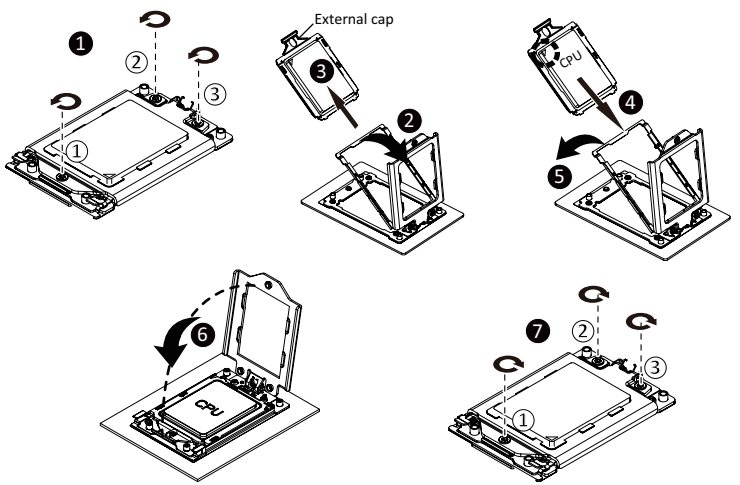
WARNING!

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. Loosen the three captive screws securing the CPU cover in sequential order (1 → 2 → 3).
2. Flip open the CPU cover.
3. Remove the CPU carrier from the CPU frame using the handle on the CPU carrier.
4. Using the handle on the CPU carrier insert the new CPU carrier with CPU installed into the CPU frame.

   NOTE: Ensure the CPU is installed in the CPU carrier in the correct orientation, with the triangle on the CPU aligned to the top left corner of the CPU carrier.
5. Flip the CPU frame with CPU installed into place in the CPU socket.
6. Flip the CPU cover into place over the CPU socket.
7. Tighten the CPU cover screws in sequential order (1 → 2 → 3) to secure the CPU cover in place.



- Tighten the CPU cover screws, use T-20 6-Lobe driver to tighten 3 captive nuts in sequence as 1-3.
- The screw tightening torque: 13.8 ± 1.3 kgf-cm.

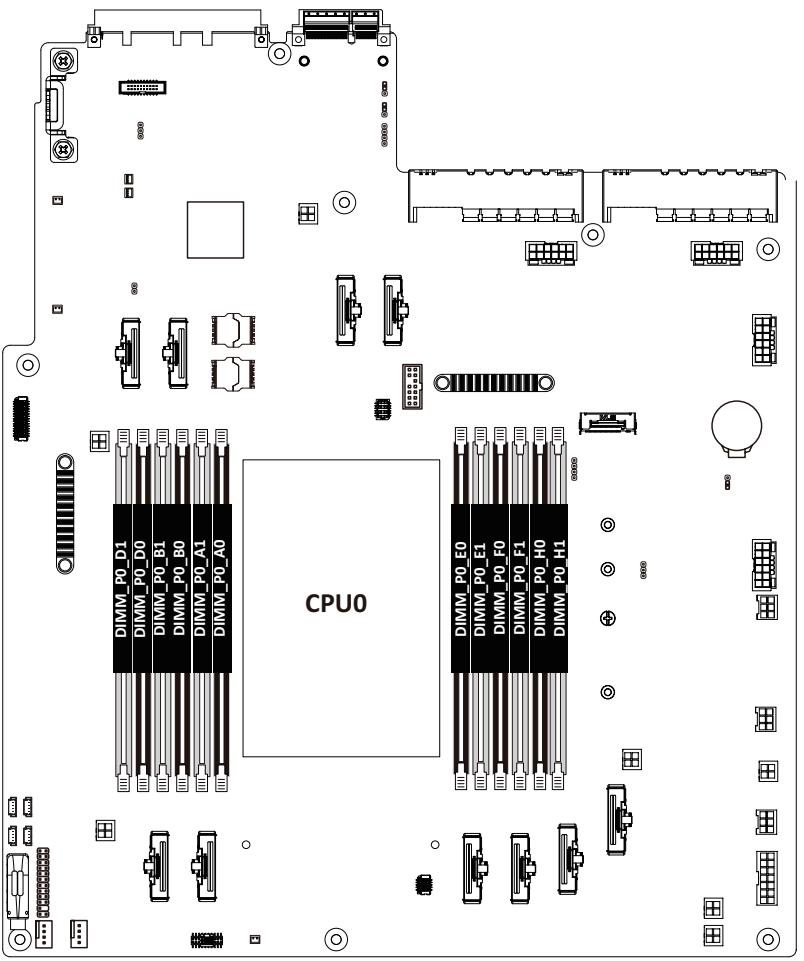
3-5 Installing the Memory

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.

3-5-1 Six Channel Memory Configuration

This motherboard provides 12 DDR5 memory slots and supports 6-Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



3-5-2 Installing the Memory

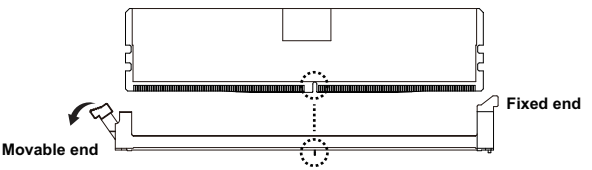
Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR5 DIMMs on this motherboard.

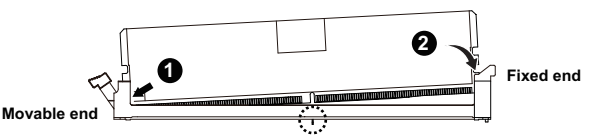
Make sure your DIMM slots have a single latch or a double latch.

Follow these instructions to install a DIMM module with Single Latch :

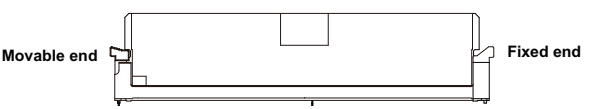
1. Open the plastic latch of the memory slot, then place the memory module as pre-inserted vertically position.



2. Hold it with both hands, insert the memory module into the movable end first, and then insert the memory module into the fixed end.



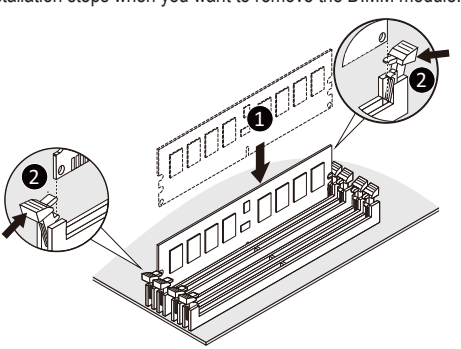
3. Then use both hands to insert the memory module vertically into the DIMM slot and push it down. Close the plastic latch at the edge of the DIMM slots to lock the memory module.



4. Reverse the installation steps when you want to remove the memory module.

Follow these instructions to install a DIMM module with Double Latch:

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.



3-5-3 DIMM Population Table

EPYC 8004 Memory Speed based on DIMM Population (Two DIMM per Channel)

DIMM Type	DIMM Population		Max EPYC 8004 DDR5 Frequency (MT/s)
	DIMM 0	DIMM 1	14-layer 77mil PCB stackup
RDIMM	--	1R	4800
	1R	1R	4000
	--	2R	4800
	2R	2R	3600

EPYC 8005 Memory Speed based on DIMM Population (Two DIMM per Channel)

DIMM Type	DIMM Population		Max EPYC 8005 DDR5 Frequency (MT/s)[1]		
	DIMM0	DIMM1	6400 MT/s Grade DIMM	5600 MT/s Grade DIMM	4800 MT/s Grade DIMM
RDIMM	-	1R	5200	4800	4800
	1R	1R	4400	4000	4000
	-	2R	5200	4800	4800
	2R	2R	4000	3600	3600
3DS RDIMM*	-	2Rx4 yH	5200	4800	4800
	2R xH	2Rx4 yH	4000	3600	3600
*For 3DS RDIMM			When x = 2		DIMM Ranks = 4
			When x = 4		DIMM Ranks = 8

1. Frequency subject to change based on validation. Maximum frequency references 14L 77 mil low-DK PCB stackup.

3-5-4 Processor and Memory Module Matrix Table

Memory Q'ty	CPU0											
	D1	D0	B1	B0	A1	A0	E0	E1	F0	F1	H0	H1
1 DIMM					V							
2 DIMM					V			V				
4 DIMM	V				V			V				V
6 DIMM	V		V		V			V		V		V
8 DIMM	V	V			V	V	V	V			V	V
12 DIMM	V	V	V	V	V	V	V	V	V	V	V	V

3-6 Installing the GPU Card

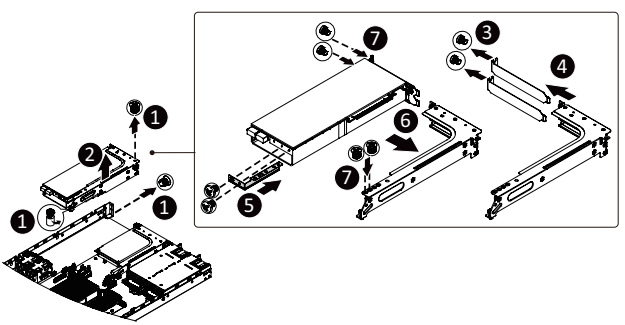
Before you install/remove the GPU card:

- 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.

- The GPU cards need to be purchased.

Follow these instructions to install the GPU card:

1. Remove the screws and loosen the thumbscrew securing the riser bracket.
2. Lift up the riser bracket out of system.
3. Remove the two screws securing the GPU card slot covers in place.
4. Remove the GPU card slot covers.
5. Attach the support bracket to the side of GPU Card and secure it with two screws.
6. Insert the GPU card into the selected slot. Make sure the GPU card is properly seated.
7. Install the screws to secure the GPU card in place.
8. Reverse the previous steps to remove the GPU card.



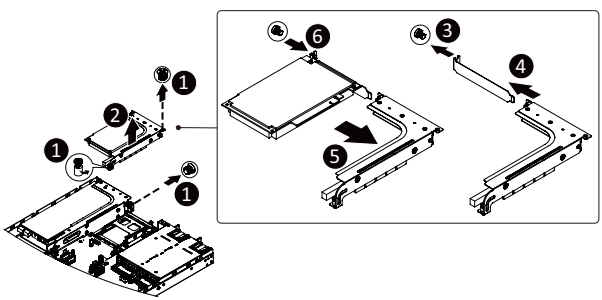
3-7 Installing the PCI Expansion Card

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

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

Follow these instructions for a PCI Expansion card:

1. Remove the screws and loosen the thumbscrew securing the riser bracket.
2. Lift up the riser bracket out of system.
3. Remove the screw securing the slot cover from the riser bracket.
4. Remove the slot cover from the riser bracket.
5. Orient the PCIe card with the riser guide slot and push in the direction of the arrow until the PCIe card sits in the PCIe card connector.
6. Secure the PCIe card with the screw.
7. Reverse the previous steps to install the riser bracket.



3-8 Installing the Mezzanine Card

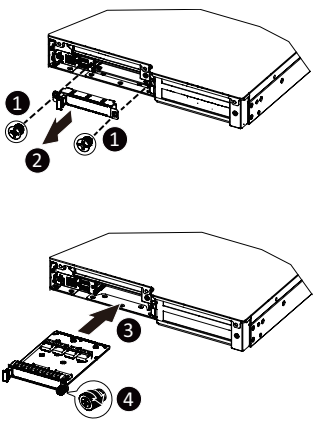
3-8-1 OCP 3.0

Use of the following type of OCP 3.0 NIC is recommended:

- OCP 3.0 SFF with Pull Tab
- OCP 3.0 SFF with Ejector Latch

Follow these instructions to install an OCP 3.0 mezzanine card:

1. Remove the two screws securing the mezzanine card slot cover.
2. Remove the slot cover from the system.
3. Insert the OCP 3.0 mezzanine card into the card slot ensuring that the card is firmly connected to the connector on the motherboard.
4. Tighten the thumbnail screw to secure the OCP 3.0 mezzanine card in place.
5. Reverse the previous steps to replace the OCP 3.0 mezzanine card.



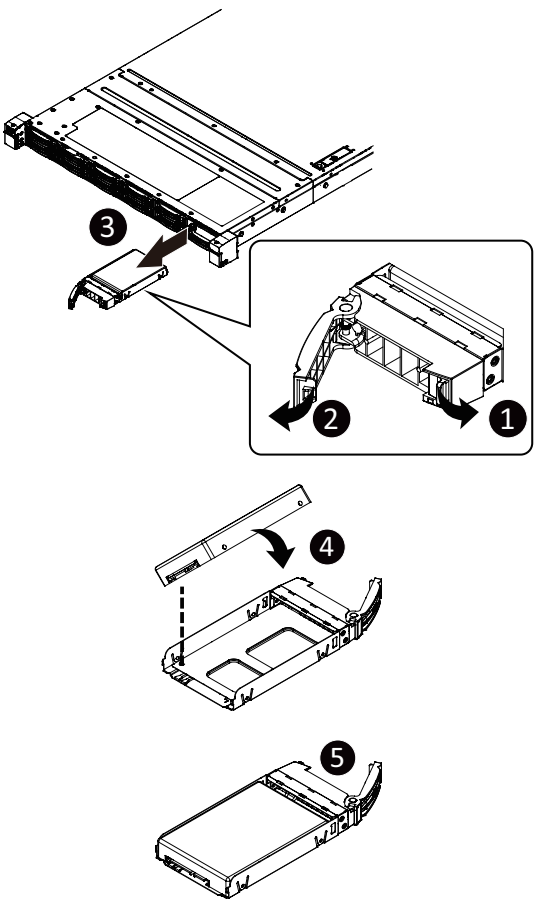
3-9 Installing the Hard Disk Drive

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

- 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" HDD:

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



3-10 Installing the M.2 Device and Heat Sink

CAUTION

The position of the stand-off screw will depend on the size of the M.2 device. The stand-off screw is pre-installed for 22110 cards as standard. Refer to the size of the M.2 device and change the position of the stand-off screw accordingly.

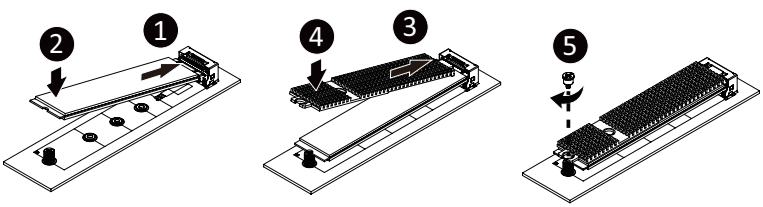
WARNING:

Please ensure a heatsink is attached to any M.2 device installed into the system. Installing an M.2 device without any heatsink may result in the system overheating or system performance being throttled.

- To install/remove the M.2 module and Heatsink use a No. 1 Phillips-head screwdriver with a screw torque of 1.5 ± 0.2 kgf*cm

Follow these instructions to install the M.2 device and heat sink:

1. Insert the M.2 device into the M.2 connector.
2. Press down on the M.2 device.
3. Install the thermal pad of the M.2 device to the M.2 device.
4. Press down on the thermal pad.
5. Secure the M.2 device and its thermal pad to the motherboard with a single screw.
6. Reverse steps 1-2 to remove the M.2 device.

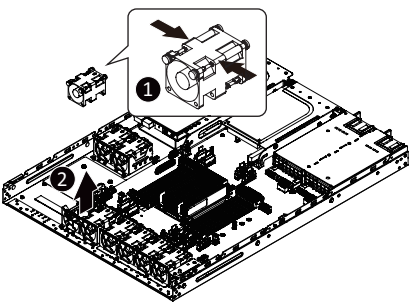


3-11 Replacing the Fan Assembly

- 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 replacing 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.



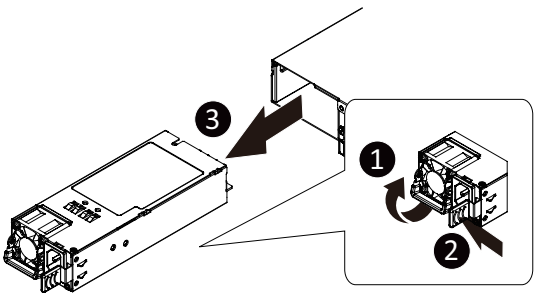
3-12 Replacing the Power Supply

CAUTION!

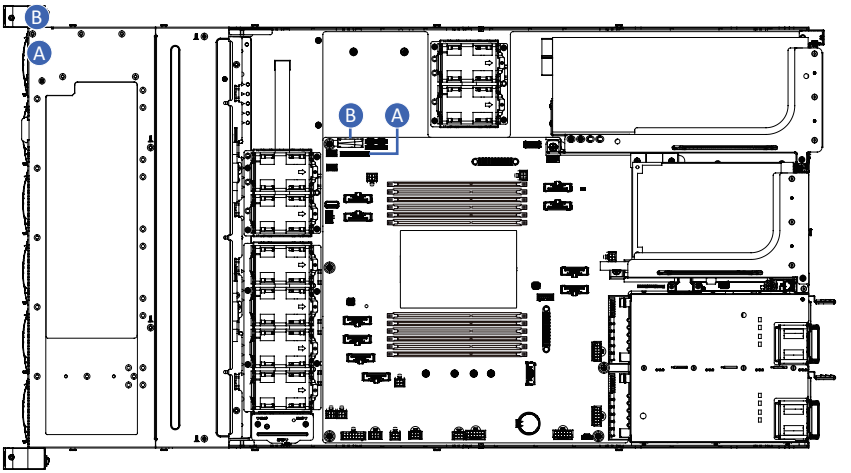
- In order to reduce the risk of injury from electric shock, disconnect AC power from the power supply before removing the power supply from the system

Follow these instructions to replace the power supply:

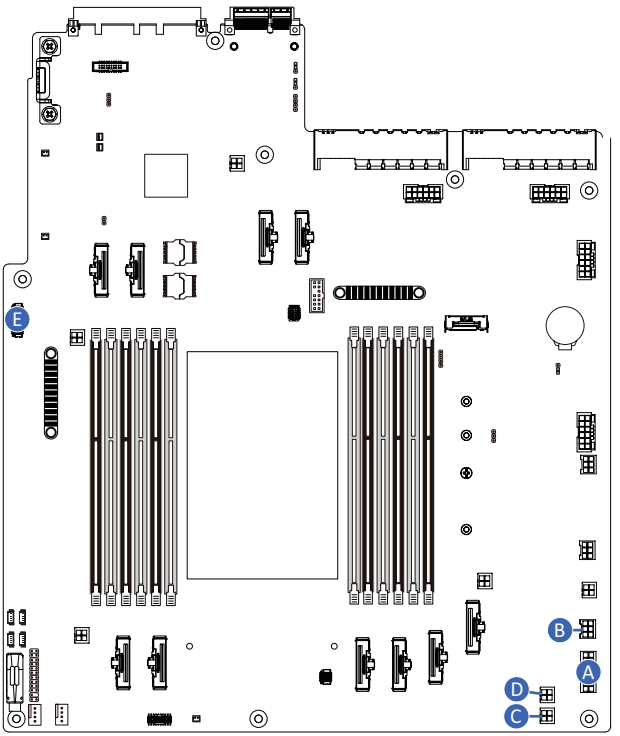
1. Flip and then grasp the power supply handle.
2. Press the retaining clip on the top side of the power supply in the direction indicated.
3. Pull out the power supply using the handle.
4. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply.

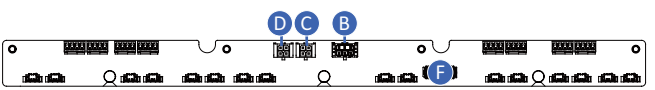


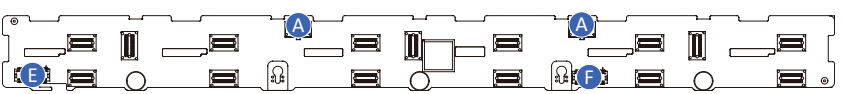
3-13 Cable Routing



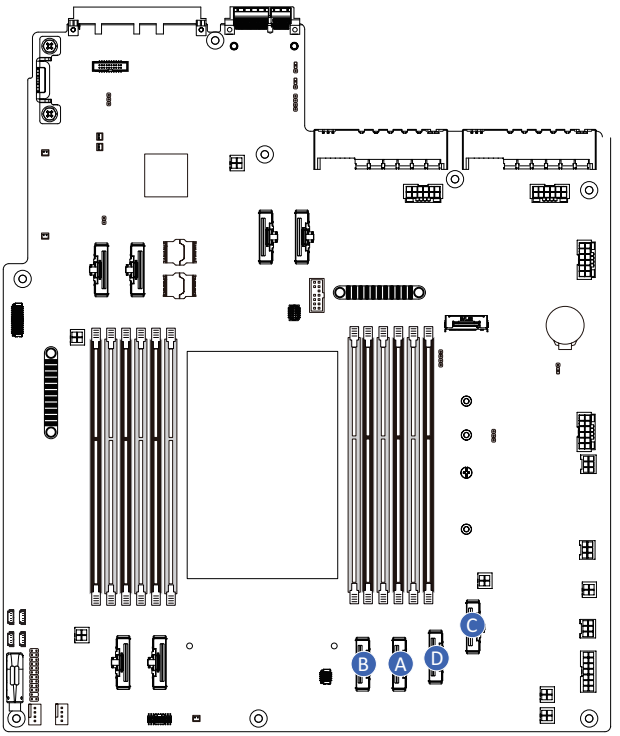
A	Front Switch/LED Cable	Motherboard: FP_1
		Front IO Board: FP_1
B	Front USB 3 Cable	Motherboard: F_USB3
		--

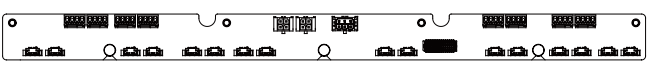

E
B
A
D
C

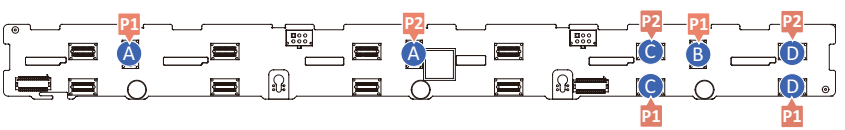

D
C
B
F


A
A
E
F

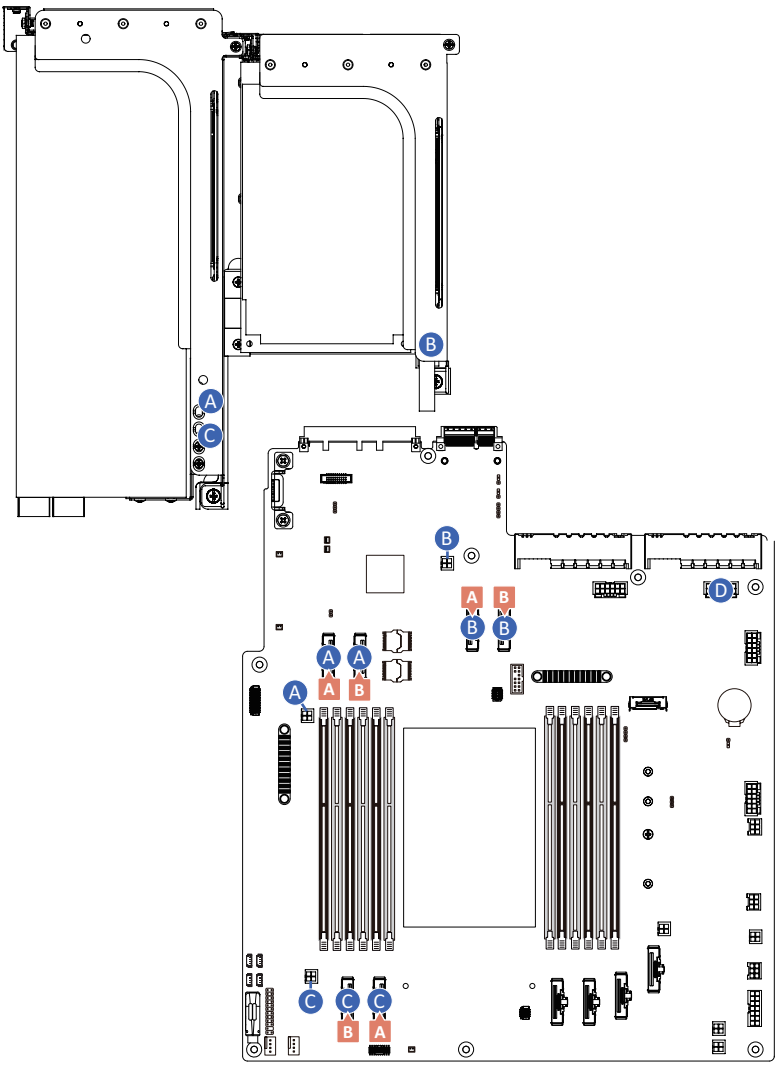
A	Backplane Board Power Cable	Motherboard: BP_ATX1
		Backplane Board: ATX1/ATX2
B	Backplane Board Power Cable	Motherboard: BP_ATX2
		Fan Board: ATX1
C	Fan Board Power Cable	Motherboard: P12V_BP1
		Fan Board: 12V_BP1
D	Fan Board Power Cable	Motherboard: P12V_BP2
		Fan Board: 12V_BP2
E	Backplane Board Signal Cable	Motherboard: BP_1
		Backplane Board: BP_1
F	Backplane Board Signal Cable	Backplane Board: BP_SERIES
		Fan Board: BP_1







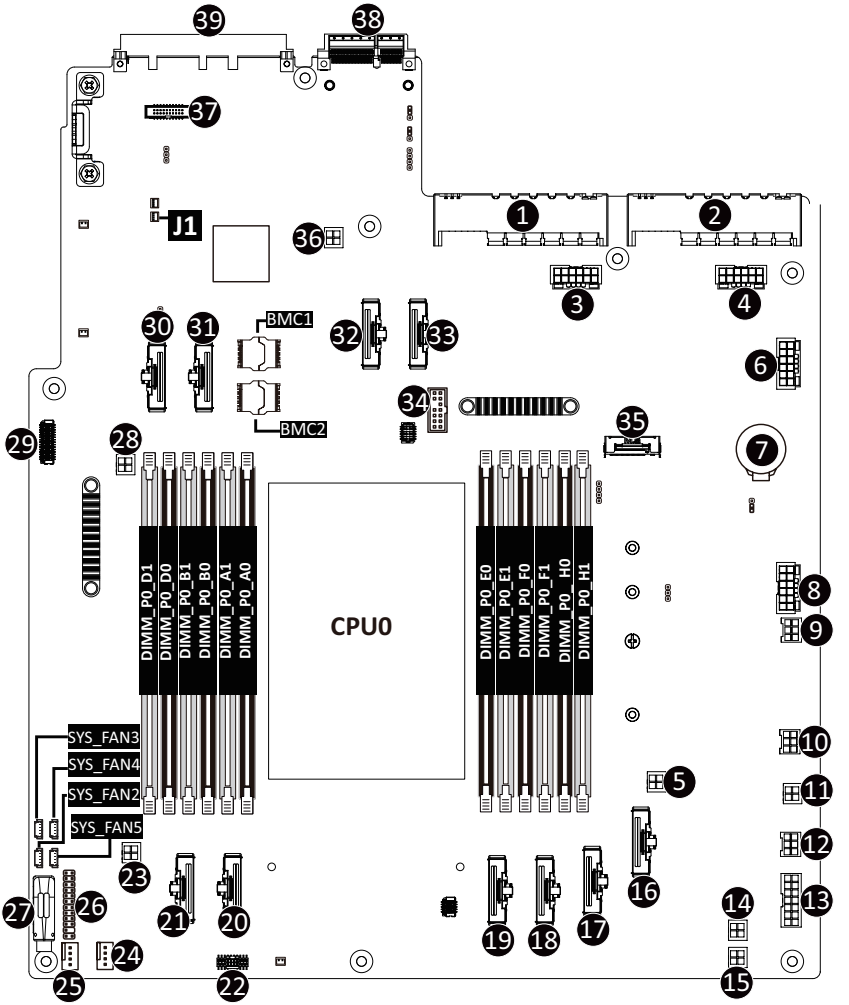
A	SATA Cable	Motherboard: U2_P0_G3_0
		Backplane Board: SL_SAS0/SL_SAS1
B	SATA Cable	Motherboard: U2_P0_G3_1
		Backplane Board: SL_SAS2
C	NVMe Cable	Motherboard: U2_P0_G2_0
		Backplane Board: U.2_8/ U.2_9
D	NVMe Cable	Motherboard: U2_P0_G2_1
		Backplane Board: U.2_10/ U.2_11


A
B
C
D

A	PCIe Slot Signal Cable	SLOT3 Cable
		Motherboard: U2_P0_P0_0/U2_P0_P0_1
	PCIe Slot Power Cable	SLOT3 Power Cable
		Motherboard: U2_P0_PWR
B	PCIe Slot Signal Cable	SLOT4 Cable
		Motherboard: U2_P0_P2_0/U2_P0_P2_1
	PCIe Slot Power Cable	SLOT4 Power Cable
		Motherboard: U2_P2_PWR
C	PCIe Slot Signal Cable	SLOT1 Cable
		Motherboard: U2_P0_G0_0/U2_P0_G0_1
	PCIe Slot Power Cable	SLOT1 Power Cable
		Motherboard: U2_G0_PWR
D	GPU Power Cable	Motherboard: P12V_GPU1
		GPU Card

Chapter 4 Motherboard Components

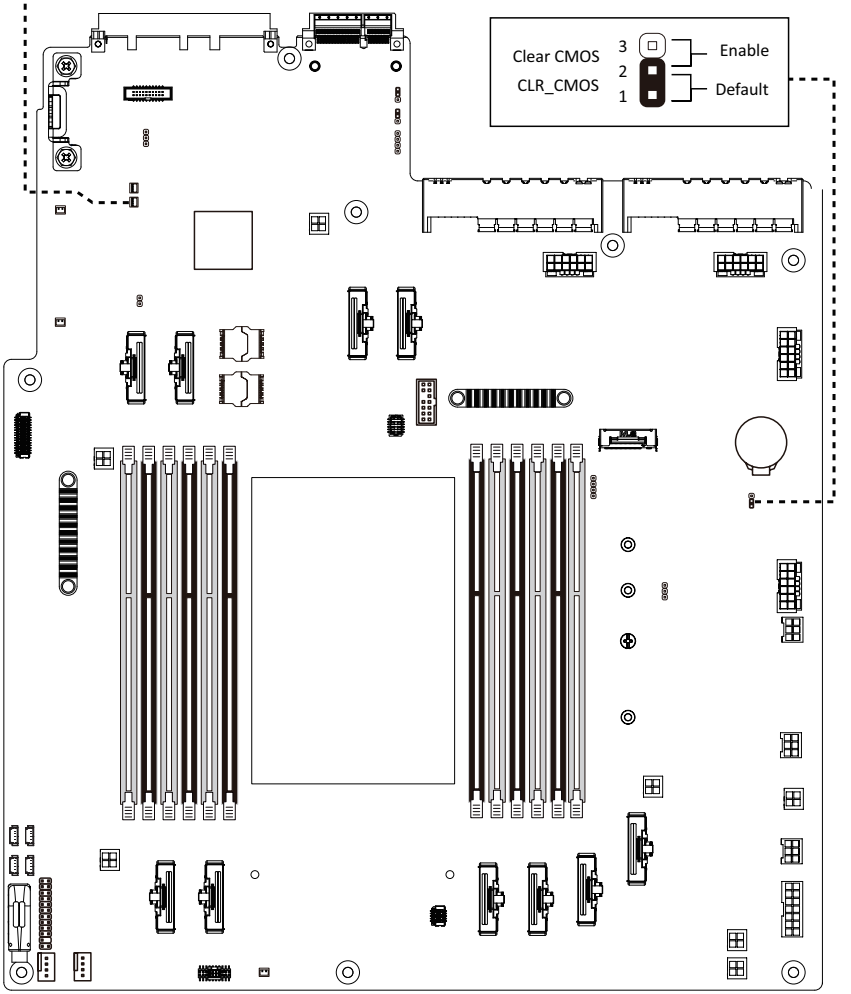
4-1 Motherboard Components



Item	Description
1	Power Supply Connector#1 (PSU1)
2	Power Supply Connector#2 (PSU2)
3	P12V GPU Power Connector (P12V_GPU2)
4	P12V GPU Power Connector (P12V_GPU1)
5	2 x 2 Pin MCIO to PCIe Cable P12V Power Cable (U2_G2_PWR)
6	P12V GPU Power Connector (P12V_GPU3)
7	System Battery (BAT)
8	P12V GPU Power Connector (P12V_GPU4)
9	2 x 3 Pin Backplane ATX Power Connector (BP_ATX4)
10	2 x 3 Pin Backplane ATX Power Connector (BP_ATX3)
11	2 x 2 Pin P12V Backplane Power Connector (P12V_BP3)
12	2 x 3 Pin Backplane ATX Power Connector (BP_ATX2)
13	2 x 7 Pin Backplane ATX Power Connector (BP_ATX1)
14	2 x 2 Pin P12V Backplane Power Connector (P12V_BP2)
15	2 x 2 Pin P12V Backplane Power Connector (P12V_BP1)
16	MCIO Connector (U2_P0_G2_0)
17	MCIO Connector (U2_P0_G2_1)
18	MCIO Connector (U2_P0_G3_0)
19	MCIO Connector (U2_P0_G3_1)
20	MCIO Connector (U2_P0_G0_0)
21	MCIO Connector (U2_P0_G0_1)
22	AMD Hardware Debug tool Header (HDR)
23	2 x 2 Pin MCIO to PCIe Cable P12V Power Cable (U2_G0_PWR)
24	CPU Fan Connector (CPU0_FAN1)
25	System Fan Connector (SYS_FAN1)
26	Front Panel Connector (FP_1)
27	Front Panel USB 3.2 Gen1 Connector (F_USB3)
28	2 x 2 Pin MCIO to PCIe Cable P12V Power Cable (U2_P0_PWR)
29	HDD Backplane Board Connector (BP_1)
30	MCIO Connector (U2_P0_P0_0)
31	MCIO Connector (U2_P0_P0_1)
32	MCIO Connector (U2_P0_P2_0)
33	MCIO Connector (U2_P0_P2_1)
34	TPM Module Connector (SPI Interface)
35	M.2 Slot (M2_0)
36	2 x 2 Pin MCIO to PCIe Cable P12V Power Cable (U2_P2_PWR)
37	NCSI Connector (CN_NCSI)
38	Connect to rear mDP, USB3.2 Gen1 MLAN function (SLOT_IO)
39	OCP 3.0 Connector (PCIe Gen5 x16)(OCP1)

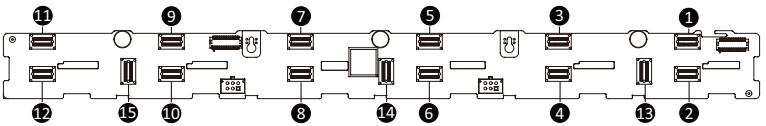
4-2 Jumper Setting

J1		ON	OFF
1	HSMB_SEL	BIOS Defined	
2	PMBUS_SEL	BIOS Defined	
3	BIOS_PWD	Clear supervisor password	Normal [Default]
4	BIOS_RCVR	BIOS recovery mode	Normal [Default]



4-3 Backplane Board Storage Connector

4-3-1 CBP10C0



Item	Description
1	SlimLine Connector (SFF-8654 4i/U_2_0)
2	SlimLine Connector (SFF-8654 4i/U_2_1)
3	SlimLine Connector (SFF-8654 4i/U_2_2)
4	SlimLine Connector (SFF-8654 4i/U_2_3)
5	SlimLine Connector (SFF-8654 4i/U.2_4)
6	SlimLine Connector (SFF-8654 4i/U.2_5)
7	SlimLine Connector (SFF-8654 4i/U.2_6)
8	SlimLine Connector (SFF-8654 4i/U.2_7)
9	SlimLine Connector (SFF-8654 4i/U_2_8)
10	SlimLine Connector (SFF-8654 4i/U_2_9)
11	SlimLine Connector (SFF-8654 4i/U_2_10)
12	SlimLine Connector (SFF-8654 4i/U_2_11)
13	SlimLine Connector (SFF-8654 4i/SL_SAS0)
14	SlimLine Connector (SFF-8654 4i/SL_SAS1)
15	SlimLine Connector (SFF-8654 4i/SL_SAS2)

Chapter 5 BIOS Setup

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

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



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

BIOS Setup Program Function Keys

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

- **Main**
  This setup page includes all the items of the standard compatible BIOS.
- **Advanced**
  This setup page includes all the items of AMI BIOS special enhanced features.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **AMD CBS**
  This setup page includes the common items for configuration of AMD motherboard-related information.
- **AMD PBS Option**
  This setup page includes the common items for configuration of AMD CPM RAS related settings.
- **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.

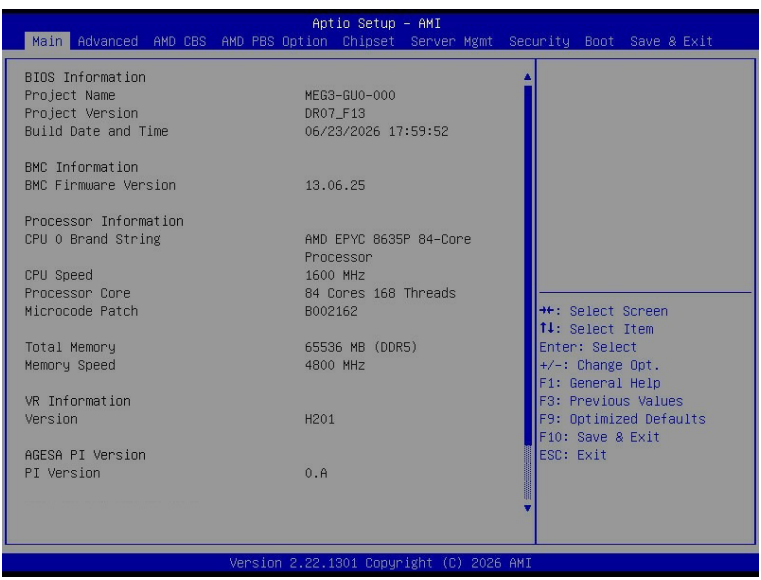
Main Menu Help

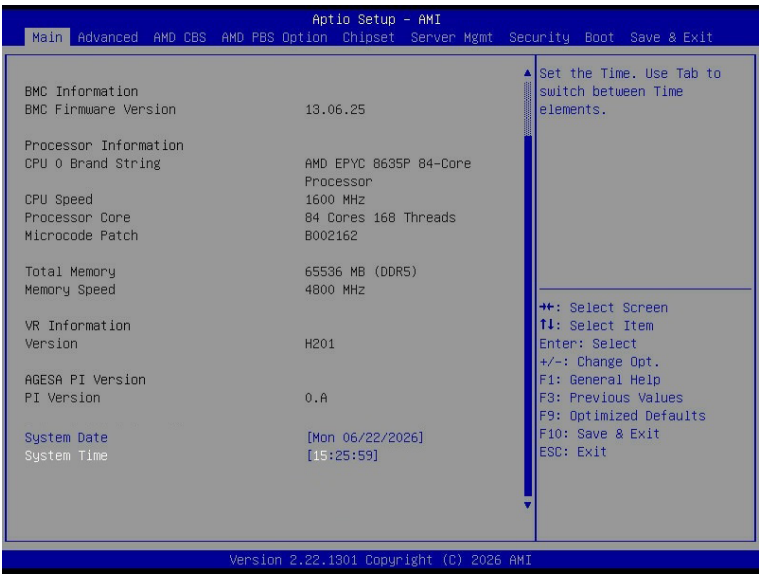
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

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).
Total Memory(Note2)	Displays the total memory size of the installed memory.
Memory Speed(Note2)	Displays the frequency information of the installed memory.
VR Information Version	Displays VR version information.
AGESA PI Version	
PI Version	Displays AGESA PI version information.

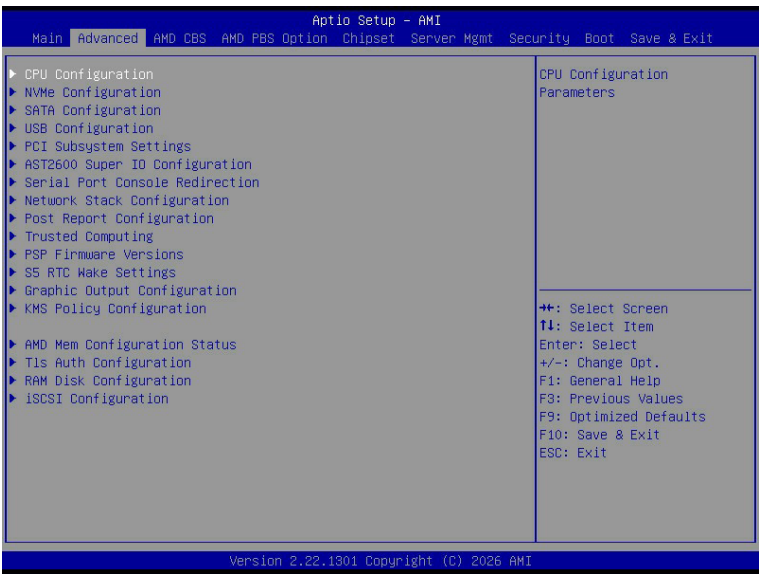
(Note1) Functions available on selected models.

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

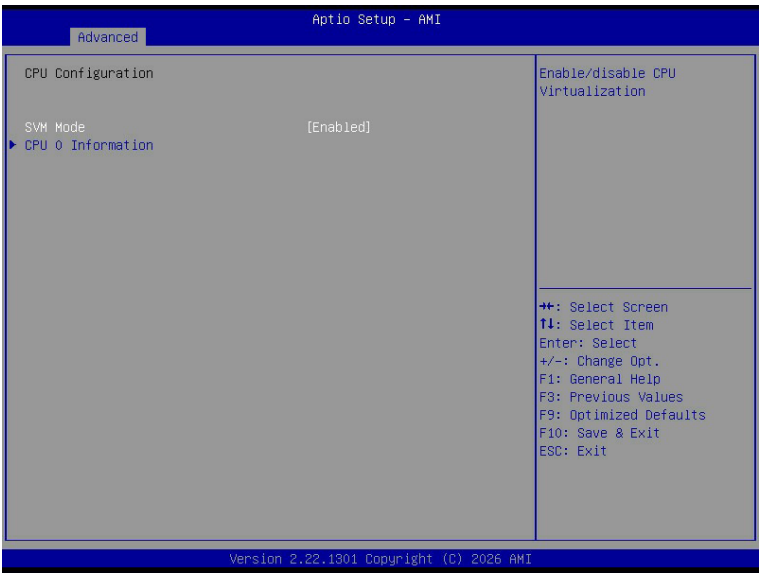
Parameter	Description
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

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.

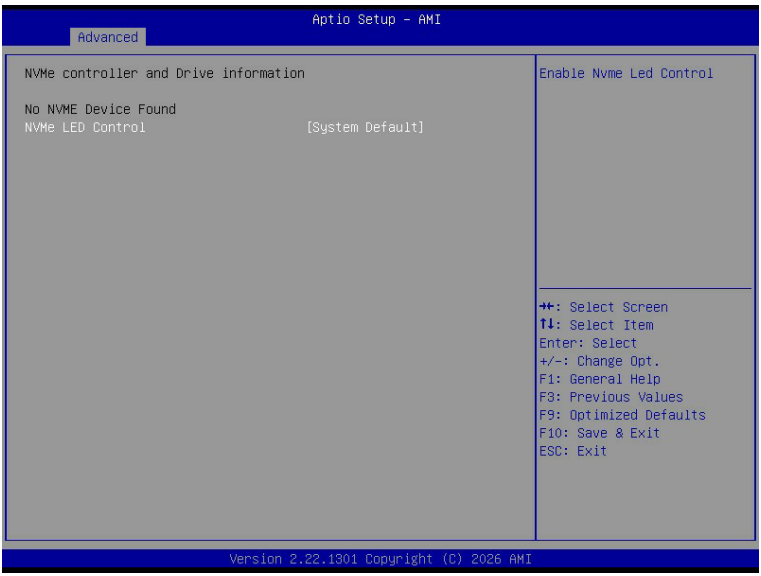


5-2-1 CPU Configuration



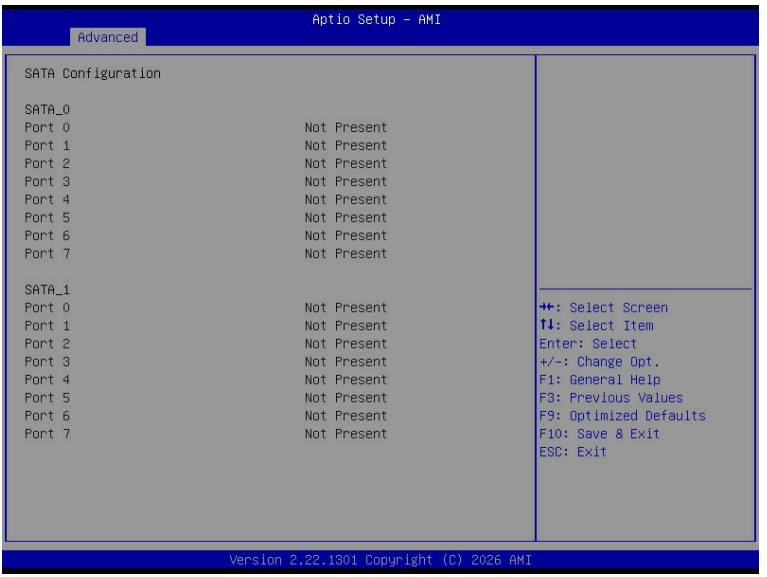
Parameter	Description
SVM Mode	Enable/Disable the CPU Virtualization. Options available: Disabled, **Enabled**.
CPU 0 Information	Press [Enter] to view the memory information related to CPU 0.

5-2-2 NVMe Configuration



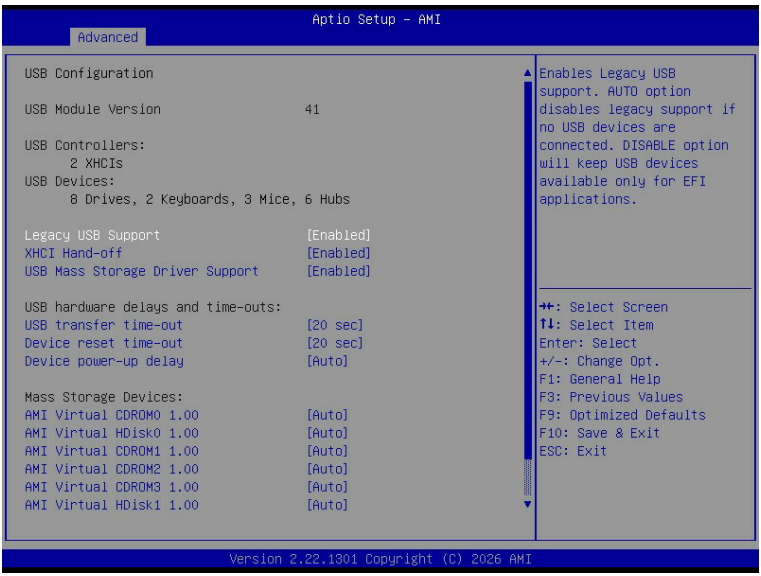
Parameter	Description
NVMe Configuration	Displays the NVMe devices connected to the system.
NVMe LED Control	Enable/Disable NVMe LED Control. Options available: **System Default**, Disabled, Enabled.

5-2-3 SATA Configuration



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

5-2-4 USB Configuration

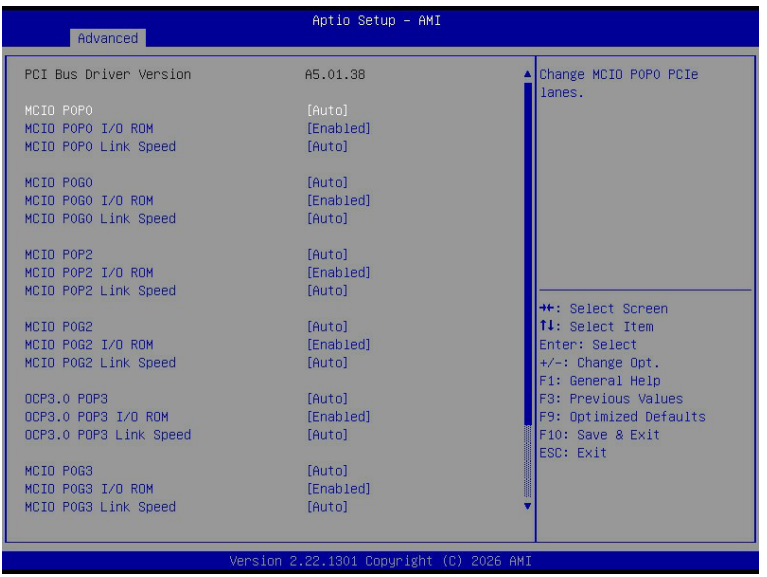


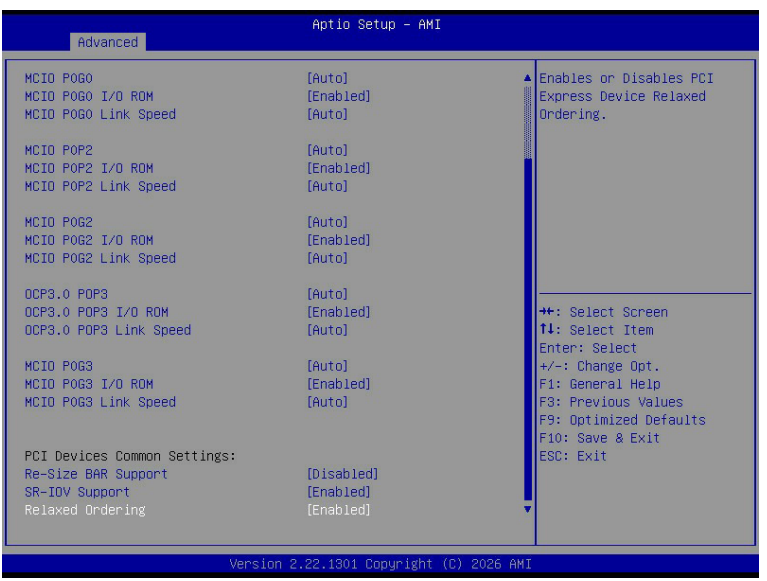
Parameter	Description
USB Configuration	
USB Module Version	Displays the USB module version information.
USB Controllers	Displays the supported USB controllers.
USB Devices:	Displays the USB devices connected to the system.
Legacy USB Support	Enable/Disable the Legacy USB support function. AUTO option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

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

Parameter	Description
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.
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.

5-2-5 PCI Subsystem Settings



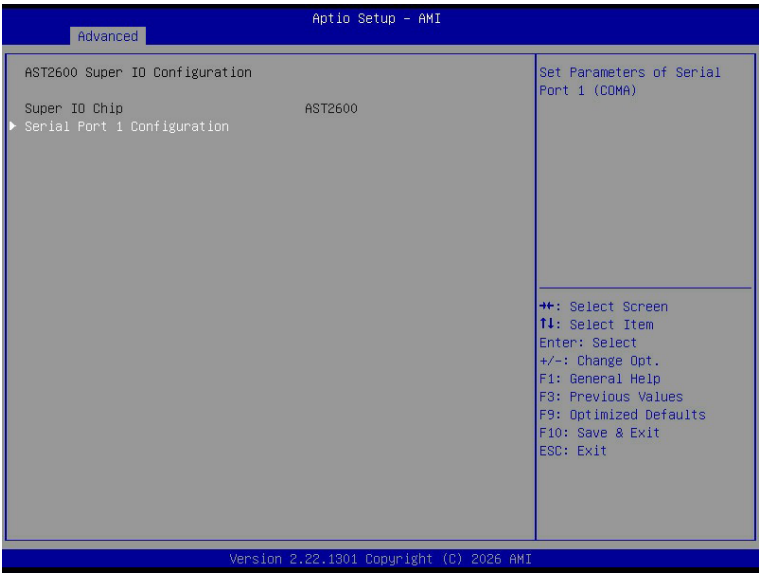


Parameter	Description
PCI Bus Driver Version	Displays the PCI Bus Driver version information.
MCIO P0P0/ P0G0/ P0P2/ P0G2 (Note1)	Change the MCIO PCIe lanes. Options available: Disabled, **Auto**, x16, x8x8, x8x4x4, x4x4x8, x4x4x4x4.
MCIO P0P0/ P0G0/ P0P2/ P0G2 I/O ROM(Note1)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Disabled, **Enabled**.
MCIO P0P0/ P0G0/ P0P2/ P0G2 Link Speed(Note1)	Configure MCIO PCIe max link speed. Options available: **Auto**, Gen4, Gen3, Gen2, Gen1.
OCP3.0 P0P3 (Note2)	Change the OCP PCIe lanes. Options available: Disabled, **Auto**, x16, x8x8, x8x4x4, x4x4x8, x4x4x4x4.
OCP3.0 P0P3 I/O ROM(Note2)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Disabled, **Enabled**.
OCP3.0 P0P3 Link Speed(Note2)	Configure OCP PCIe max link speed. Options available: **Auto**, Gen4, Gen3, Gen2, Gen1.
MCIO P0G3(Note1)	Change MCIO PCIe lanes. Options available: Disabled, **Auto**, SATA, x16, x8x8, x8x4x4, x4x4x8, x4x4x4x4.
MCIO P0G3 I/O ROM(Note1)	When enabled, this setting will initialize the device expansion ROM for the related devices. Options available: Disabled,**Enabled**.
MCIO P0G3 Link Speed(Note1)	Configure MCIO PCIe max link speed. Options available: **Auto**, Gen4, Gen3, Gen2, Gen1.
PCI Devices Common Settings	
Re-Size BAR Support	If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support. Options available: **Disabled**, Enabled.
SR-IOV Support	If the system has SR-IOV capable PCIe devices, this item Enable/ Disable Single Root IO Virtualization Support. Options available: Disabled, **Enabled**.
Relaxed Ordering	Enable/Disable PCI express device relaxed ordering. Options available: Disabled, **Enabled**.

(Note1) This section is dependent on the available MCIO connector.

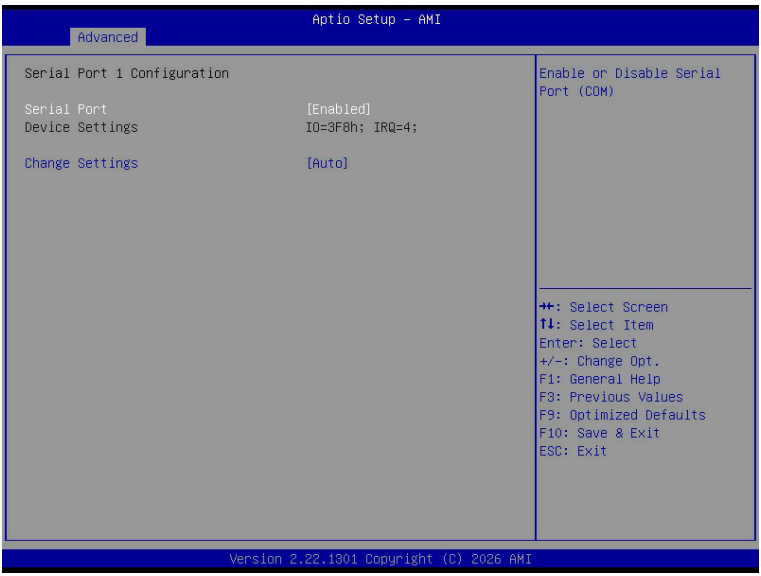
(Note2) This section is dependent on the available OCP slot.

5-2-6 AST2600 Super IO Configuration



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

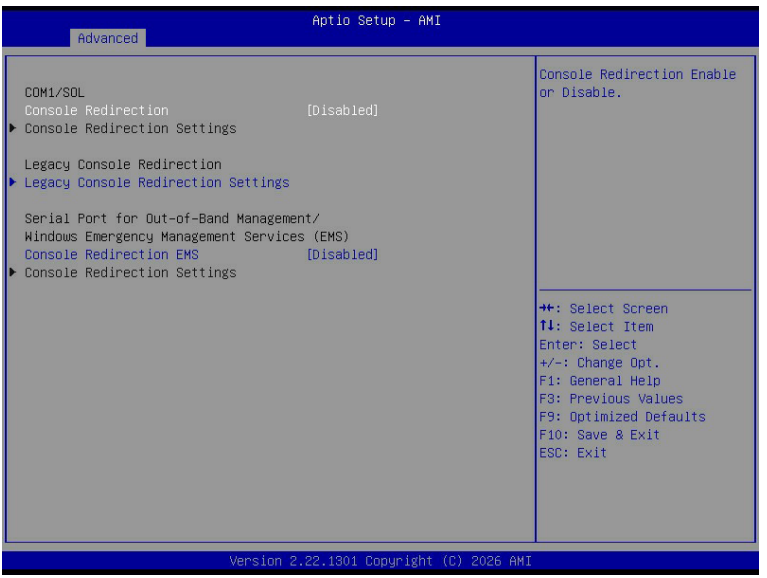
5-2-6-1 Serial Port 1 Configuration



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

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

5-2-7 Serial Port Console Redirection



Parameter	Description
COM1/Serial Over LAN Console Redirection(Note)	Select whether to enable console redirection for specified device. Console redirection enables the users to manage the system from a remote location. Options available: Enabled, **Disabled**.
COM1/Serial Over LAN Console Redirection Settings	Press [Enter] to configure advanced items. **Please note that this item is configurable when COM1/Serial Over LAN Console Redirection is set to Enabled.** ◆ Terminal Type – Selects a terminal type to be used for console redirection. – Options available: VT100, **VT100Plus**, ANSI, VT-UTF8. ◆ Bits per second – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 38400, 57600, **115200**. ◆ Data Bits – Selects the number of data bits used for console redirection. – Options available: 7, **8**.

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

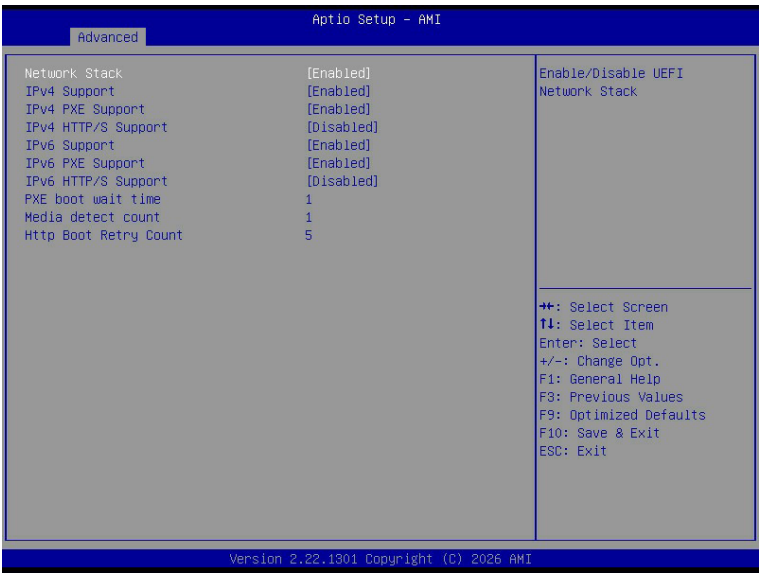
Parameter	Description
COM1/Serial Over LAN Console Redirection Settings (continued)	◆ Parity – A parity bit can be sent with the data bits to detect some transmission errors. – Even: parity bit is 0 if the num of 1's in the data bits is even. – Odd: parity bit is 0 if num of 1's in the data bits is odd. – Mark: parity bit is always 1. Space: Parity bit is always 0. – Mark and Space Parity do not allow for error detection. – Options available: **None**, Even, Odd, Mark, Space. ◆ Stop Bits – Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. – Options available: **1**, 2. ◆ Flow Control – Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. – Options available: **None**, Hardware RTS/CTS. ◆ VT-UTF8 Combo Key Support – Enable/Disable the VT-UTF8 Combo Key Support. – Options available: **Enabled**, Disabled. ◆ Recorder Mode – When this mode enabled, only texts will be send. This is to capture Terminal data. – Options available: Enabled, **Disabled**. ◆ Resolution 100x31 – Enable/Disable extended terminal resolution. – Options available: **Enabled**, Disabled. ◆ Putty KeyPad – Selects Function Key and KeyPad on Putty. – Options available: **VT100**, LINUX, XTERMR6, SC0, ESCN, VT400.

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

Parameter	Description
Legacy Console Redirection	
Legacy Console Redirection Settings	Press [Enter] to configure advanced items. ◆ Redirection COM Port – Selects a COM port for Legacy serial redirection. – Default setting is **COM1/SOL**. ◆ Resolution – Selects the number of rows and columns used in Console Redirection for legacy OS support. – Options available: **80x24**, 80x25. ◆ Redirect After POST – When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. – Options available: **Always Enable**, BootLoader.
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection(Note)	EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management. Options available: **Disabled**, Enabled.
Serial Port for Out-of-Band EMS Console Redirection Settings	Press [Enter] to configure advanced items. **Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.** ◆ Out-of-Band Mgmt Port – Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port. – Default setting is **COM1/SOL**. ◆ Terminal Type – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100Plus, **ANSI**, VT-UTF8. ◆ Bits per second – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 57600, **115200**. ◆ Flow Control – Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. – Options available: **None**, Hardware RTS/CTS, Software Xon/Xoff.

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

5-2-8 Network Stack Configuration



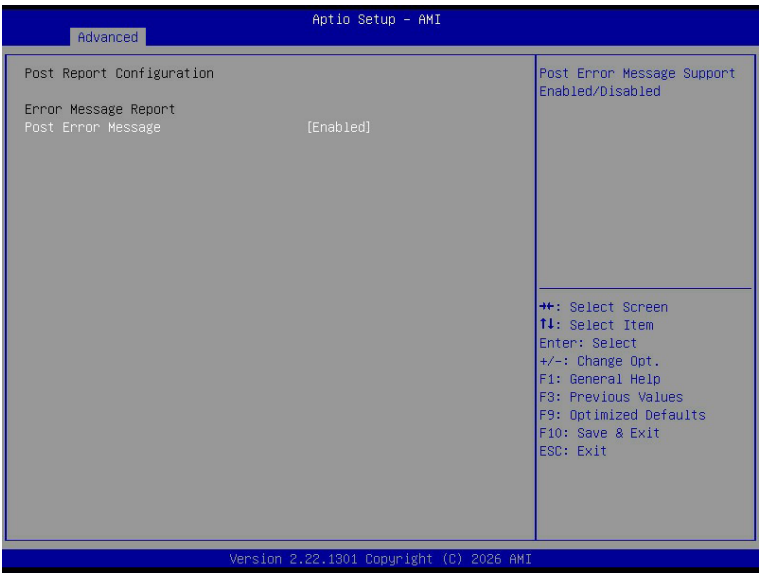
Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: **Enabled**, Disabled.
Ipv4 Support(Note)	Enable/Disable the Ipv4 support. Options available: **Enabled**, Disabled.
Ipv4 PXE Support(Note)	Enable/Disable the Ipv4 PXE feature. Options available: **Enabled**, Disabled.
Ipv4 HTTP/S Support(Note)	Enable/Disable the Ipv4 HTTP feature. Options available: Enabled, **Disabled**.
Ipv6 Support(Note)	Enable/Disable the Ipv6 support. Options available: **Enabled**, Disabled.
Ipv6 PXE Support(Note)	Enable/Disable the Ipv6 PXE feature. Options available: **Enabled**, Disabled.
Ipv6 HTTP/S Support(Note)	Enable/Disable the Ipv6 HTTP feature. Options available: Enabled, **Disabled**.
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**.

Parameter	Description
Http Boot Retry count(Note)	The minimum value is 0 and the maximum is 50. "0" means no retry. Press the <+> / <-> keys to increase or decrease the desired values.

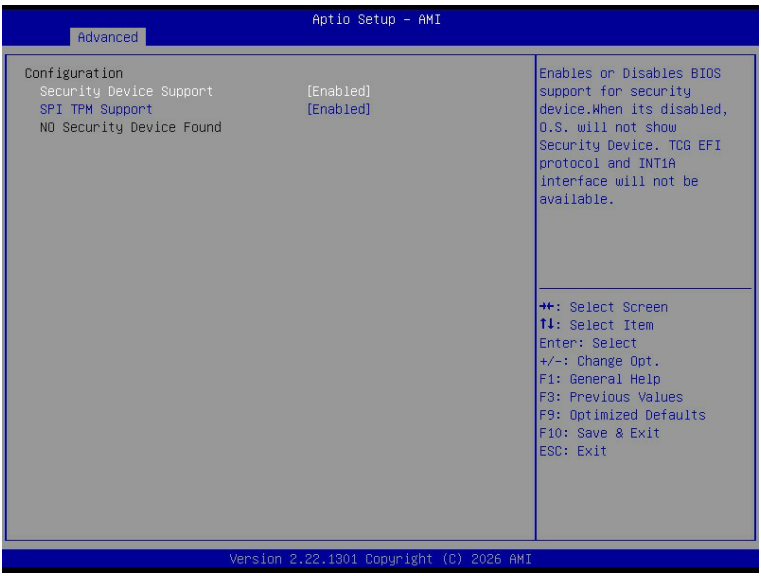
(Note) This item appears when **Network Stack** is set to **Enabled**.

5-2-9 Post Report Configuration



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

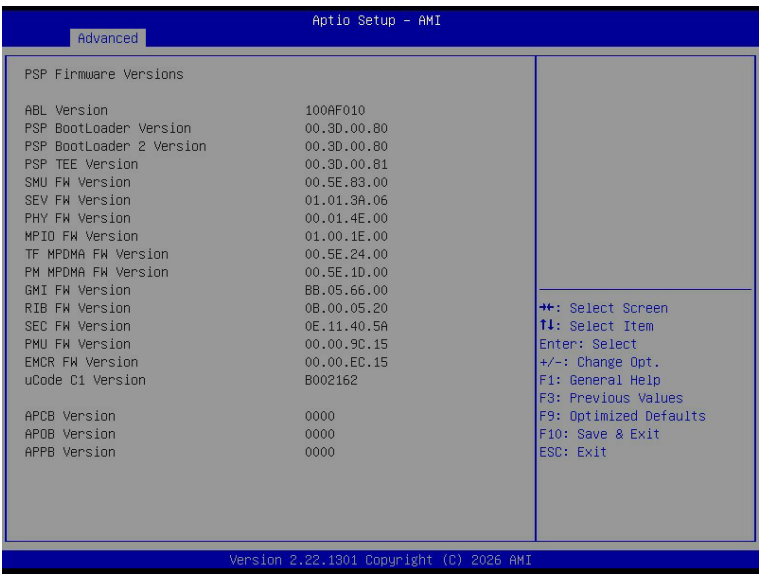
5-2-10 Trusted Computing



Parameter	Description
Configuration	
Security Device Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Disabled, **Enabled**.
SPI TPM Support	Select Enable to activate TPM support feature. Options available: Disabled, **Enabled**.

5-2-11 PSP Firmware Versions

The PSP Firmware Versions page displays the basic PSP firmware version information. Items on this window are non-configurable.

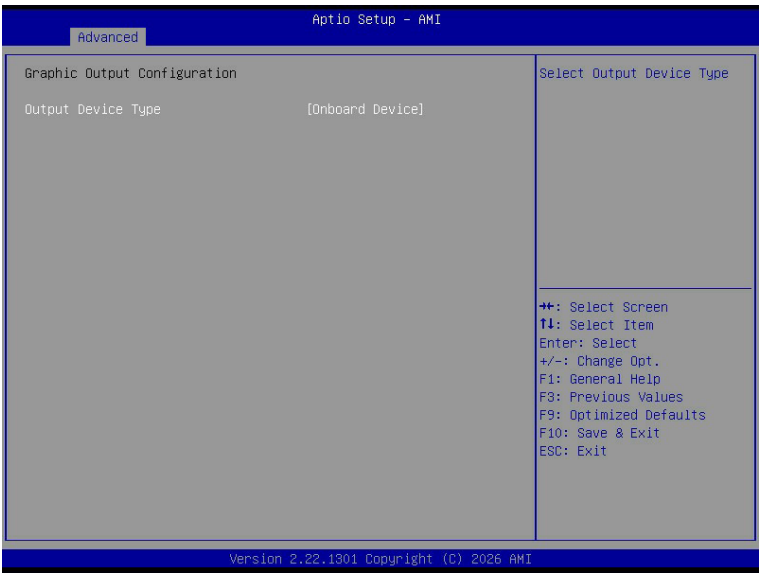


5-2-12 S5 RTC Wake Settings



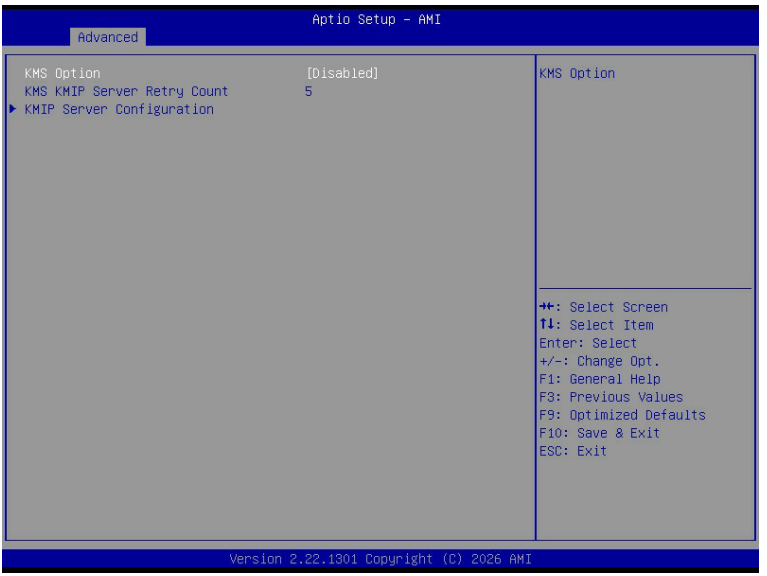
Parameter	Description
Wake System from S5	Enable/Disable system wake on alarm event. Options available: **Disabled**, Fixed Time, Dynamic Time. When Fixed Time is selected, system will wake on the hr::min::sec specified.

5-2-13 Graphic Output Configuration



Parameter	Description
Output Device Type	Selects output device type. Options available: First loaded Device, **Onboard Device**, External Device, Specific Device.

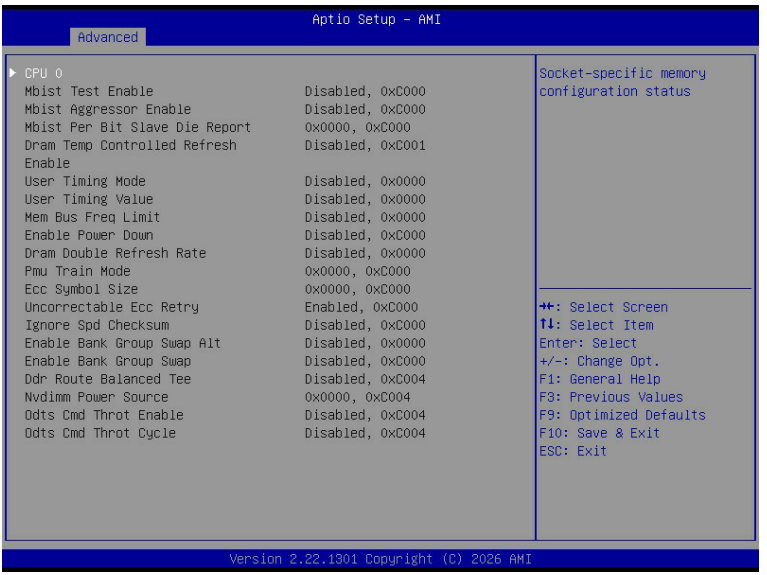
5-2-14 KMS Policy Configuration



Parameter	Description
KMS Option	Options available: **Disabled**, KMS with KMIP.
KMS KMIP Server Retry Count	Define KMS KMIP Server Retry Count.
KMIP Server Configuration	Press [Enter] to configure advanced items. ◆ KMIP Server IP address – Enter IP4 address in dotted-decimal notation. ◆ KMIP TCP Port number – Enter KMIP TCP Port number 100...9999. – Default setting is **5696**. ◆ Time Zone – Enter the correct time zone for this server. – Default setting is **GMT+8**. ◆ Client Credentials – Use User and password credentials to authenticate the client. – Options available: Disabled, **Enabled**. ◆ Client UserName – Enter Client identity: UserName. – Name Length: 0-63 characters. ◆ Client Password – Enter Client identity: Password. – Password Length: 0-31 characters.

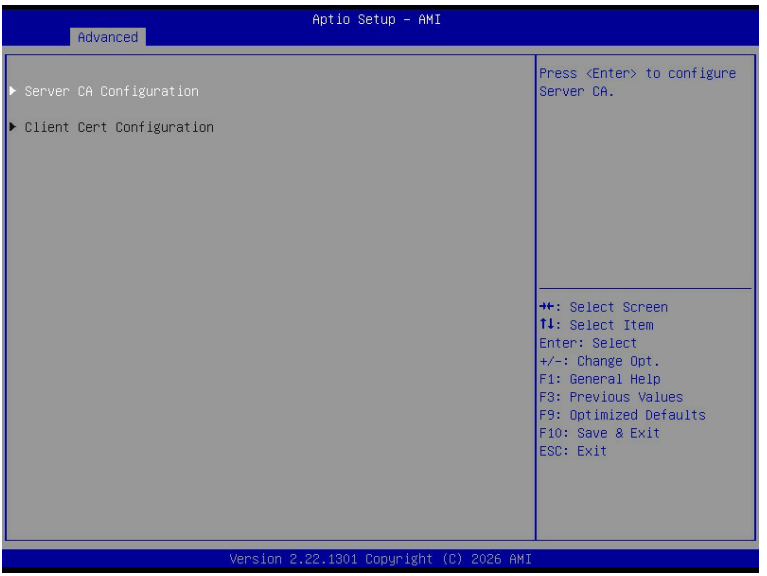
Parameter	Description
KMIP Server Configuration (continued)	◆ KMS TLS Certificate / Size – CA Certificate/ Client Private Key/ Client Certificate. » Enroll factory defaults or load the KMS TLS certificates from the file.

5-2-15 AMD Mem Configuration Status



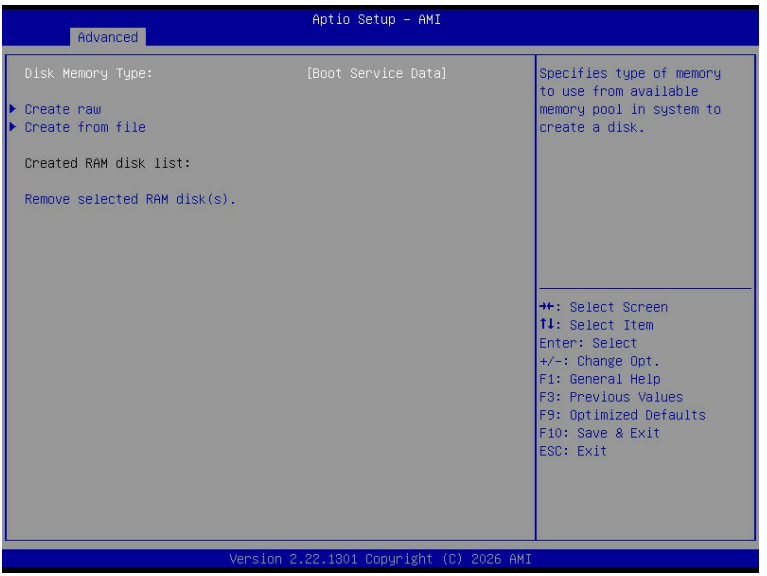
Parameter	Description
CPU 0	Press [Enter] to view the memory configuration status related to CPU 0.

5-2-16 Tls Auth Configuration



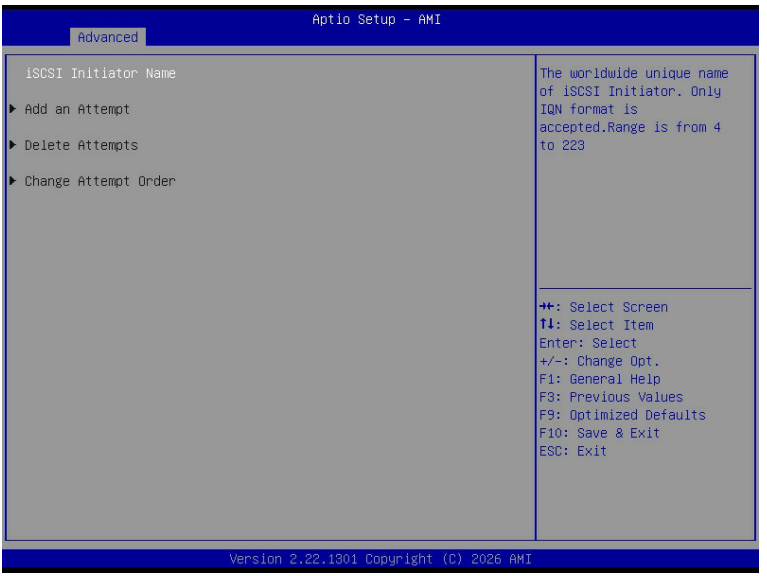
Parameter	Description
Server CA Configuration	Press [Enter] for configuration of advanced items. ◆ Enroll Cert – Press [Enter] to enroll a certificate • Enroll Cert Using File • Cert GUID Input digit character in 1111111-2222-3333-4444-1234567890ab format. – Commit Changes and Exit – Discard Changes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

5-2-17 RAM Disk Configuration



Parameter	Description
Disk Memory Type	Specifies the type of memory to use from available memory pool in system to create a disk. Options available: **Boot Service Data**, Reserved.
Create Raw	Creates a raw RAM disk. ◆ Size (Hex) – Input a valid RAM disk size that should be multiple of the RAM disk block size. ◆ Create & Exit ◆ Discard & Exit
Create from file	Creates a RAM disk from a given file.
Created RAM disk list	
Remove selected RAM disk(s)	Selects the RAM disk(s) to remove.

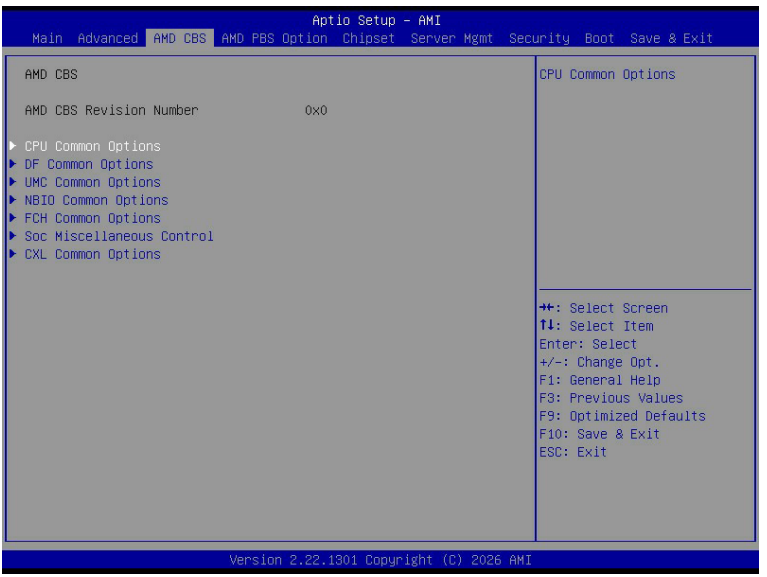
5-2-18 iSCSI Configuration



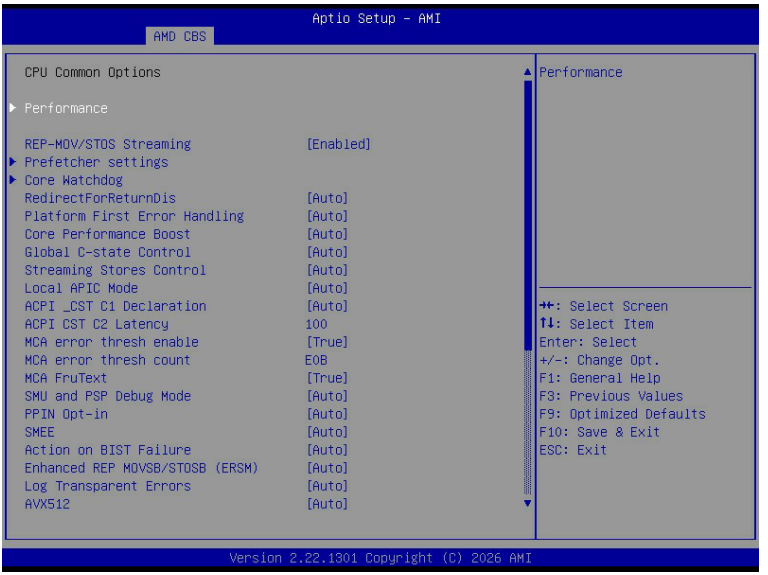
Parameter	Description
iSCSI Initiator Name	Press [Enter] and name iSCSI Initiator. Only IQN format is accepted. Range: from 4 to 223
Add an Attempt	Press [Enter] to configure advanced items.
Delete Attempts	Press [Enter] to configure advanced items.
Change Attempt Order	Press [Enter] to configure advanced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

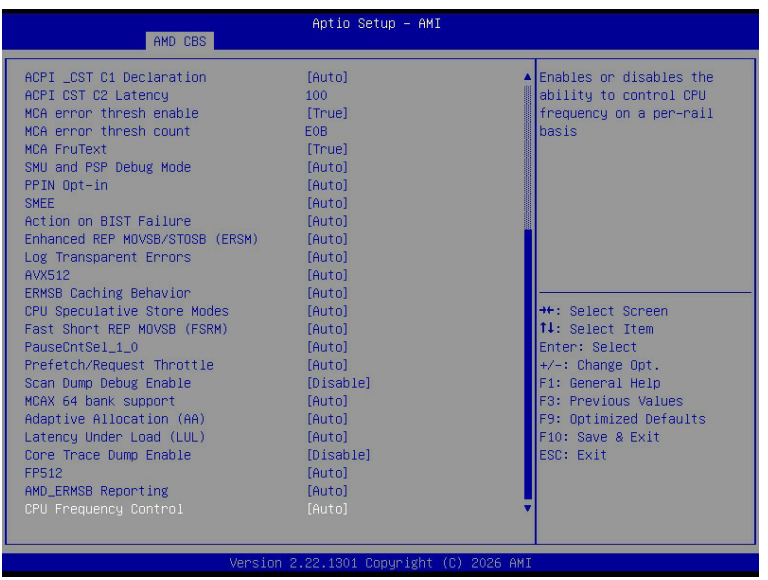
5-3 AMD CBS Menu

AMD CBS menu displays submenu options for configuring the CPU-related information that the BIOS automatically sets. Select a submenu item, then press [Enter] to access the related submenu screen.



5-3-1 CPU Common Options

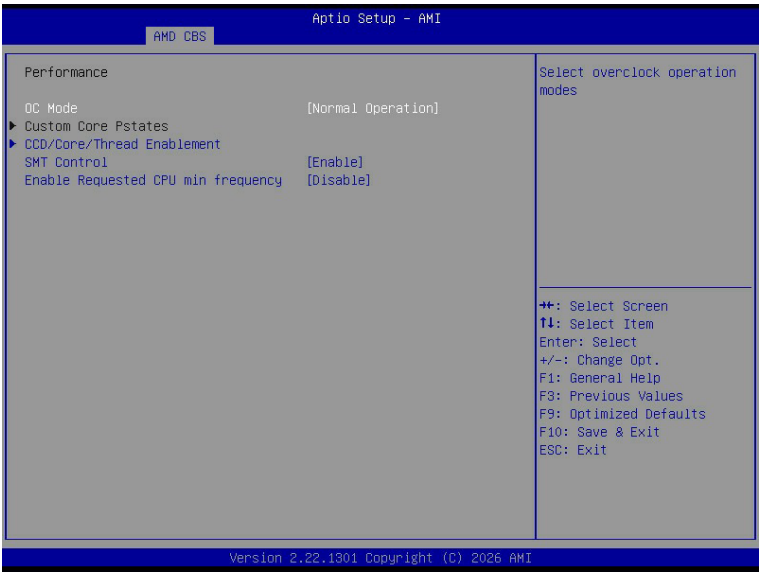




Parameter	Description
CPU Common Options	
Performance	Press [Enter] for configuration of advanced items.
REP-MOV/STOS Streaming	Allow REP-MOV/STOS to use non-caching streaming stores for large sizes. Options available: Disabled, **Enabled**.
Prefetcher settings	Press [Enter] for configuration of advanced items.
Core Watchdog	Press [Enter] for configuration of advanced items.
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.
Platform First Error Handling	Enable/Disable PFEH, cloak individual banks, and mask deferred error interrupts from each bank. Options available: Enabled, Disabled, **Auto**.
Core Performance Boost	Enable/Disable the Core Performance Boost function. Options available: Disabled, **Auto**.
Global C-state Control	Controls the IO based C-state generation and DF C-states. Options available: Disabled, Enabled, **Auto**.
Streaming Stores Control	Enable/Disable the Streaming Stores functionality. Options available: Disabled, Enabled, **Auto**.
Local APIC Mode	Sets the Local APIC Mode. Options available: xAPIC, x2APIC, **Auto**.
ACPI_CST C1 Declaration	Determines whether or not to declare the C1 state to the OS.. Options available: Disabled, Enabled, **Auto**.
ACPI CST C2 Latency	Enter in microseconds (decimal value).
MCA error thresh enable	Enable MCA error thresholding. Options available: False, **True**, Auto.
MCA error thresh count	Effective error threshold count = 0xFFF(4095) - <this value> (e.g. the default value of 0xFF5(4085) results in a threshold of 0xA (10)).
MCA FruText	Enable MCA FruText. Options available: False, **True**.
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: Disabled, Enabled, **Auto**.
PPIN Opt-in	Enable/Disable the PPIN feature. Options available: Disabled, Enabled, **Auto**.
SMEE	Controls the Secure Memory Encryption Enable (SMEE) function. Options available: Disable, Enable, **Auto**.
Action on BIST Failure	Action to take when a CCD BIST failure is detected. Options available: Do nothing, Down-CCD, **Auto**.
Enhanced REP MOVSB/ STOSB (ERSM)	Options available: Disabled, Enabled, **Auto**.
Log Transparent Errors	Enable/Disable the log Transparent errors function. Options available: **Auto**, Disabled, Enabled.

Parameter	Description
AVX512	Enable/Disable AVX512. Options available: Disabled, Enabled, **Auto**.
ERMSB Caching Behavior	Options available: Disabled, Enabled, **Auto**.
CPU Speculative Store Modes	Select the CPU speculative store modes. Options available: Balanced, More Speculative, Less Speculative, **Auto**.
Fast Short REP MOVSB (FSRM)	Options available: Disabled, Enabled, **Auto**.
PauseCntSel_1_0	Options available: **Auto**, 16 cycles, 32 cycles, 64 cycles, 128 cycles.
Prefetch/Request Throttle	Enables XI logic which calculates average latency, updates throttle level, and sends throttle level messages to L2. Options available: Disable, Enable, **Auto**.
Scan Dump Debug Enable	Options available: **Disable**, Enable.
MCAX 64 bank support	Options available: Disabled, Enabled, **Auto**.
Adaptive Allocation (AA)	Options available: Disabled, Enabled, **Auto**.
Latency Under Load (LUL)	Options available: Disabled, Enabled, **Auto**.
Core Trace Dump Enable	Options available: **Disable**, Enable.
FP512	Options available: Disabled, Enabled, **Auto**.
AMD_ERMSB Reporting	Options available: **Auto**, Disable, Enable.
CPU Frequency Control	Options available: **Auto**, Disable, Enable.

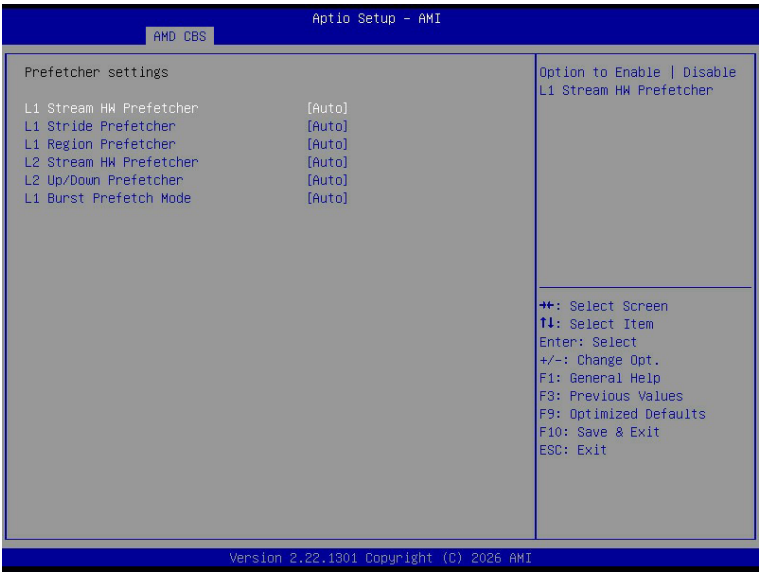
5-3-1-1 Performance



Parameter	Description
Performance	
OC Mode(Note)	Options available: **Normal Operation**, Customized.
Custom Core Pstates	Allows you to accept or decline enabling Custom Core Pstates. When accepted, you can disable or customize core pstates.
CCD/Core/Thread Enablement	Allows you to accept or decline enabling CCDs, processor cores and threads. When accepted, you can control the number of CCDs to be used, and the number of cores to be used. ◆ CCD Control – Options available: **Auto**, 2 CCDs, 4 CCDs, 6 CCDs, 8 CCDs, 10 CCDs. ◆ Core Control – Options available: **Auto**, ONE(1+0), TWO(2+0), THREE(3+0), FOUR(4+0), FIVE(5+0), SIX(6+0).
SMT Control	Can be used to disable symmetric multithreading. To re-enable SMT, a POWER CYCLE is needed after select the 'Enable' option. Select 'Auto' base on BIOS PCD. (PcdAmdSmtMode) default setting. Options available: Disable, **Enable**, Auto.
Enable Requested CPU min frequency	Options available: **Disable**, Enable.

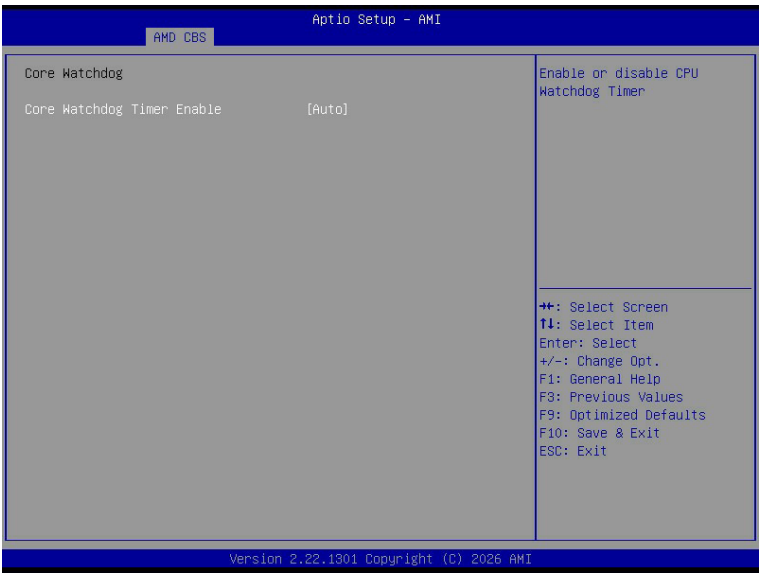
(Note) Advanced items are configurable when this item is defined.

5-3-1-2 Prefetcher Settings



Parameter	Description
Prefetcher settings	
L1 Stream HW Prefetcher	Enable/Disable L1 Stream HW Prefetcher. Options available: Disable, Enable, **Auto**.
L1 Stride Prefetcher	Use memory access history of individual instructions to fetch additional lines when each access is a constant distance from the previous. Enable/Disable L1 Stride Prefetcher. Options available: Disable, Enable, **Auto**.
L1 Region Prefetcher	Use memory access history to fetch additional lines when the data access for a given instruction tends to be followed by other data accesses. Enable/Disable L1 Region Prefetcher. Options available: Disable, Enable, **Auto**.
L2 Stream HW Prefetcher	Enable/Disable L2 Stream HW Prefetcher. Options available: Disable, Enable, **Auto**.
L2 Up/Down Prefetcher	Use memory access history to determine whether to fetch the next or previous line for all memory accesses. Enable/Disable L2 Up/Down Prefetcher. Options available: Disable, Enable, **Auto**.
L1 Burst Prefetch Mode	Enable/Disable L1 Burst Prefetch Mode. Options available: Disable, Enable, **Auto**.

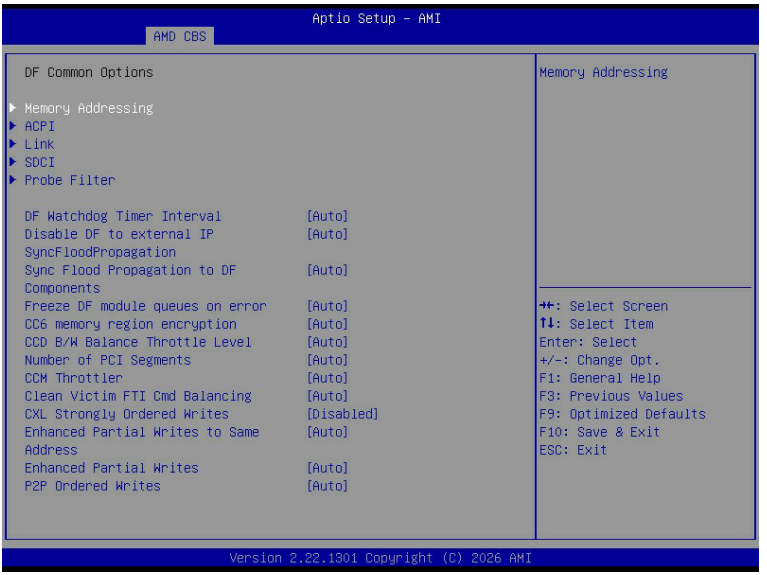
5-3-1-3 Core Watchdog



Parameter	Description
Core Watchdog	
Core Watchdog Timer Enable(Note)	Enable/Disable CPU Watchdog Timer. Options available: Disabled, Enabled, **Auto**.
Core Watchdog Timer Interval	Select the CPU Watchdog Timer interval. Options available: 2.681s, 1.340s, 669.41ms, 334.05ms, 166.37ms, 82.53ms, 40.61ms, 20.970ms, 10.484ms,5.241ms, 2.620ms, 1.309ms, 654.08us, 326.4us, 162.56us, 80.64us, 39.68us, **Auto**.

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

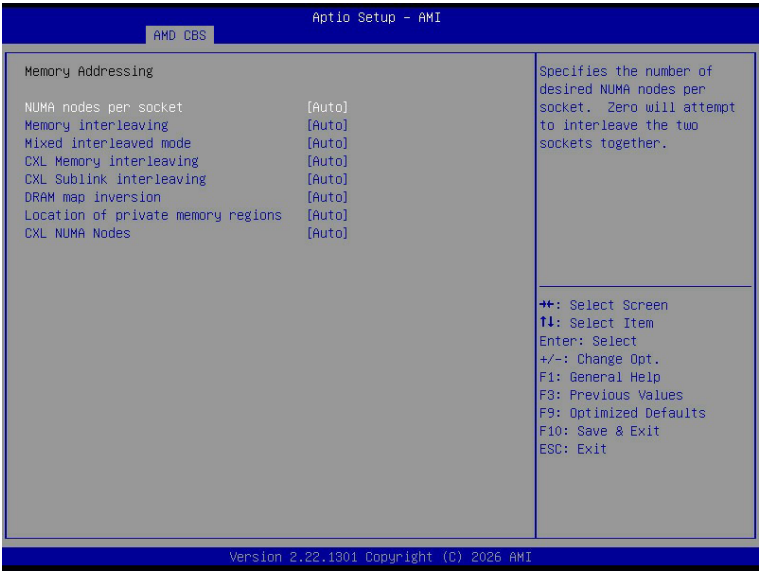
5-3-2 DF Common Options



Parameter	Description
DF Common Options	
Memory Addressing	Press [Enter] for configuration of advanced items.
ACPI	Press [Enter] for configuration of advanced items.
Link	Press [Enter] for configuration of advanced items.
SDCI	Press [Enter] for configuration of advanced items.
Probe Filter	Press [Enter] for configuration of advanced items.
DF Watchdog Timer Interval	Configures the Data Fabric watchdog timer interval. Options available: **Auto**, 41ms, 166ms, 334ms, 669ms, 1.34 seconds, 2.68 seconds, 5.36 seconds.
Disable DF to external IP sync flood propagation	Enable/Disable SyncFlood to UMC & downstream slaves. Options available: Sync flood disabled, Sync flood enabled, **Auto**.
Sync flood propagation to DF Components	Enable/Disable DF Sync Flood propagation. Options available: Sync flood disabled, Sync flood enabled, **Auto**.
Freeze DF module queues on error	Options available: Disabled, Enabled, **Auto**.
CC6 memory region encryption	Controls whether or not the CC6 save/restor memory is encrypted. Options available: Disabled, Enabled, **Auto**.
CCD B/W Balance Throttle Level	Options available: **Auto**, Level 0, Level 1, Level 2, Level 3, Level 4.
Number of PCI Segments	Options available: **Auto**, 1 Segment, 2 Segments.

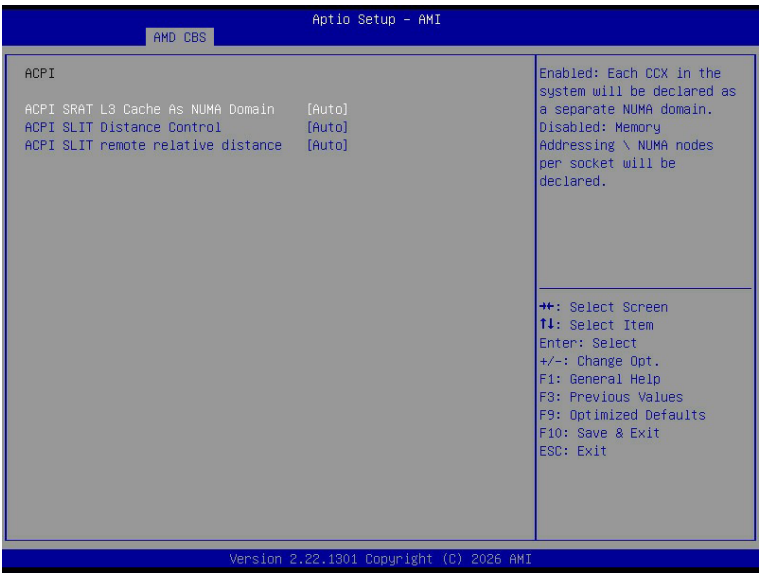
Parameter	Description
CCM Throttler	Options available: Disabled, Enabled, **Auto**.
Clean Victim FTI Cmd Balancing	Options available: Disabled, Enabled, **Auto**.
CXL Strongly Ordered writes	Options available: **Disabled**, One at a time.
Enhanced Partial Writes to Same Address	Options available: Disabled, Enabled, **Auto**.
Enhanced Partial Writes	Options available: Disabled, Enabled, **Auto**.
P2P Ordered Writes	Options available: Disabled, Enabled, **Auto**.

5-3-2-1 Memory Addressing



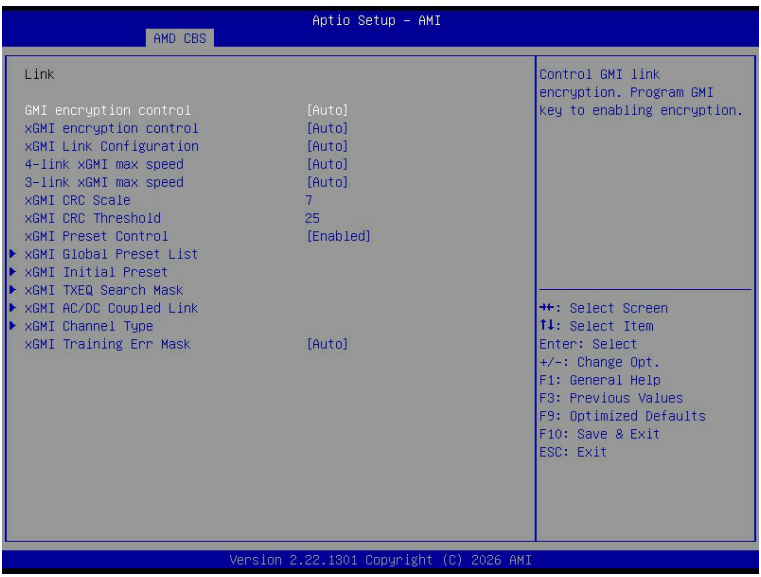
Parameter	Description
Memory Addressing	
NUMA nodes per socket	Specifies the number of desired NUMA nodes per socket. Options available: NPS0, NPS1, NPS2, NPS4, Auto. Default setting is **Auto**. NOTE! • **Available options may vary by system configuration.** • **Only dual processor configuration supports NPS0.**
Memory interleaving	Enable/Disable the Memory interleaving feature. Options available: Disabled, Enabled, **Auto**.
Mixed interleaving mode	Allows for interleaving UMC and CXL together. Options available: Disabled, Enabled, **Auto**.
CXL Memory interleaving	Options available: Disabled, Enabled, **Auto**.
CXL Sublink interleaving	Options available: Enable, Disable, **Auto**.
DRAM map inversion	Enable/Disable the DRAM map inversion function. Options available: Disabled, Enabled, **Auto**.
Location of private memory regions	Controls whether or not the private memory regions (PSP, SMU and CC6) are at the top of DRAM or distributed. Options available: Distributed, Consolidated, **Auto**.
CXL NUMA Nodes	Options available: One node per socket, One node per address range, **Auto**.

5-3-2-2 ACPI



Parameter	Description
ACPI	
ACPI SRAT L3 Cache As NUMA Domain	Enable/Disable report each L3 cache as a NUMA Domain to the OS. Options available: Disabled, Enabled, **Auto**.
ACPI SLIT Distance Control	Determines how the SLIT distances are declared. Options available: Manual, **Auto**.
ACPI SLIT remote relative distance	Sets the remote socket distance for 2P systems as near (2.8) or far (3.2). Options available: Near, Far, **Auto**.

5-3-2-3 Link

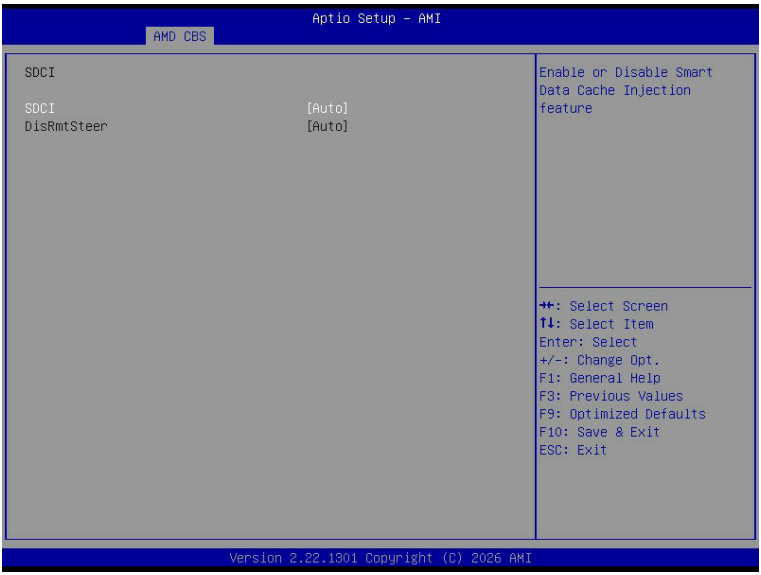


Parameter	Description
GMI encryption control	Enable/Disable GMI link encryption. Options available: Disabled, Enabled, **Auto**.
xGMI encryption control	Enable/Disable xGMI link encryption. Options available: Disabled, Enabled, **Auto**.
xGMI Link Configuration	Configures the number of xGMI2 links used on a multi-socket system. Options available: **Auto**, 3 xGMI Links, 4 xGMI Links, 2 xGMI Links + 2 PCI Links.
4-link xGMI max speed	Specifies the max speed of 4-link xGMI. Options available: 20Gbps, 25Gbps, 32Gbps, **Auto**.
3-link xGMI max speed	Specifies the max speed of 3-link xGMI. Options available: 20Gbps, 25Gbps, 32Gbps, **Auto**.
xGMI CRC Scale	Configures leaky bucket scale for xGMI and WAFL CRC errors. Every scale milliseconds an error will leak from the CRC counter. Default setting is **7**.
xGMI CRC Threshold	Configures leaky bucket threshold for xGMI and WAFL CRC errors. If link CRC counter exceeds this threshold, an error will be logged. Default setting is **25**.
xGMI Preset Control	Enable/Disable xGMI Preset control. Options available: Disabled, **Enabled**, Auto.
xGMI Global Preset List	Press [Enter] to configure the xGMI Preset list.
xGMI Initial Preset	Press [Enter] to configure the xGMI Initial Preset CPU link.
xGMI TXEQ Search Mask	Press [Enter] to configure the xGMI TXEQ Search Mask CPU link.

Parameter	Description
xGMI AC/DC Coupled Link	Press [Enter] to configure the xGMI AC/DC Coupled link. ◆ xGMI AC/DC Coupled Link Control(Note) – Options available: Manual, **Auto**.
xGMI Channel Type	Press [Enter] to configure the xGMI Channel Type. ◆ xGMI Channel Type Control(Note) – Options available: Manual, **Auto**.
xGMI Training Err Mask	Options available: Disable, Enable, **Auto**.

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

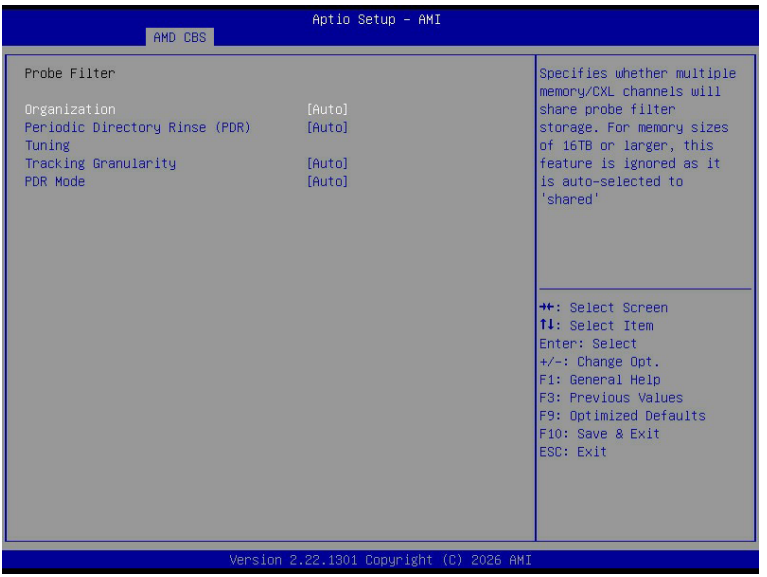
5-3-2-4 SDCI



Parameter	Description
SDCI(Note)	Options available: Disabled, Enabled, **Auto**.
DisRmSteer	Options available: Disabled, Enabled, **Auto**.

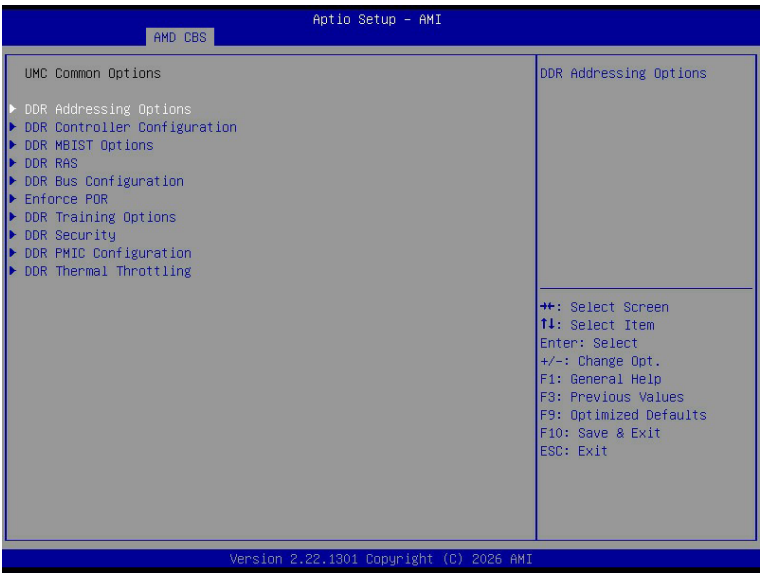
(Note) Advanced items prompt when this item is defined.

5-3-2-5 Probe Filter



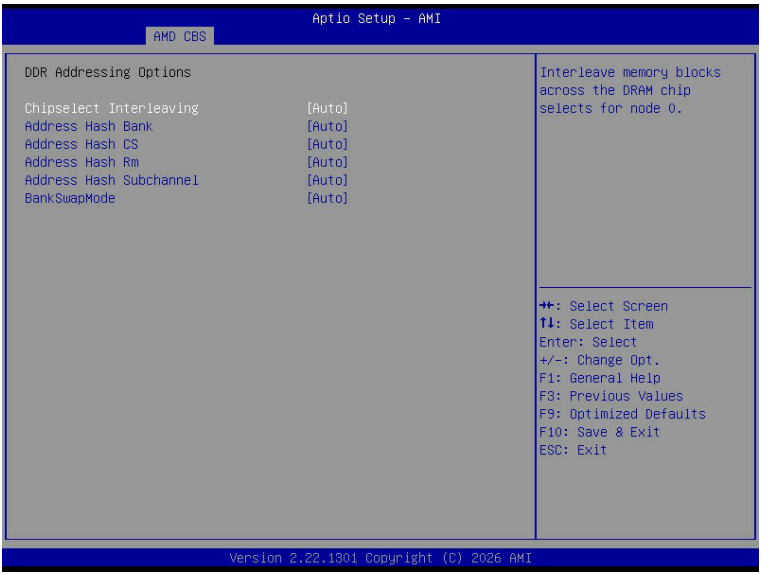
Parameter	Description
Organization	Specifies whether multiple memory/CXL channels will share probe filter storage. Options available: **Auto**, Dedicated, Shared.
Periodic Directory Rinse (PDR) Tuning	Controls PDR settings that may impact performance by workload and/or processor. Options available: Periodic, Blended, **Auto**.
Tracking Granularity	Options available: Finer-Grain, Coarser-Grain, **Auto**.
PDR Mode	Options available: **Auto**, Selective, All.

5-3-3 UMC Common Options



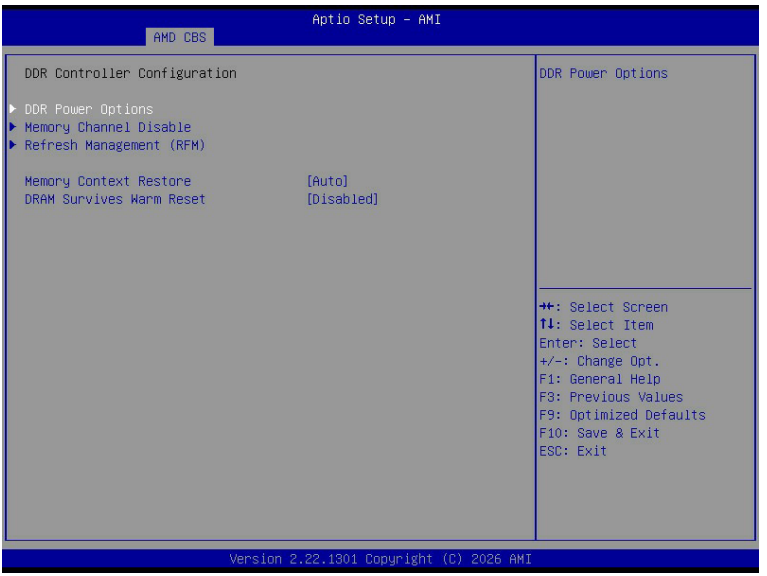
Parameter	Description
UMC Common Options	
DDR Addressing Options	Press [Enter] for configuration of advanced items.
DDR Controller Configuration	Press [Enter] for configuration of advanced items.
DDR MBIST Options	Press [Enter] for configuration of advanced items.
DDR RAS	Press [Enter] for configuration of advanced items.
DDR Bus Configuration	Press [Enter] for configuration of advanced items.
Enforce POR	Press [Enter] for configuration of advanced items.
DDR Training Options	Press [Enter] for configuration of advanced items.
DDR Security	Press [Enter] for configuration of advanced items.
DDR PMIC Configuration	Press [Enter] for configuration of advanced items.
DDR Thermal Throttling	Press [Enter] for configuration of advanced items.

5-3-3-1 DDR Addressing Options



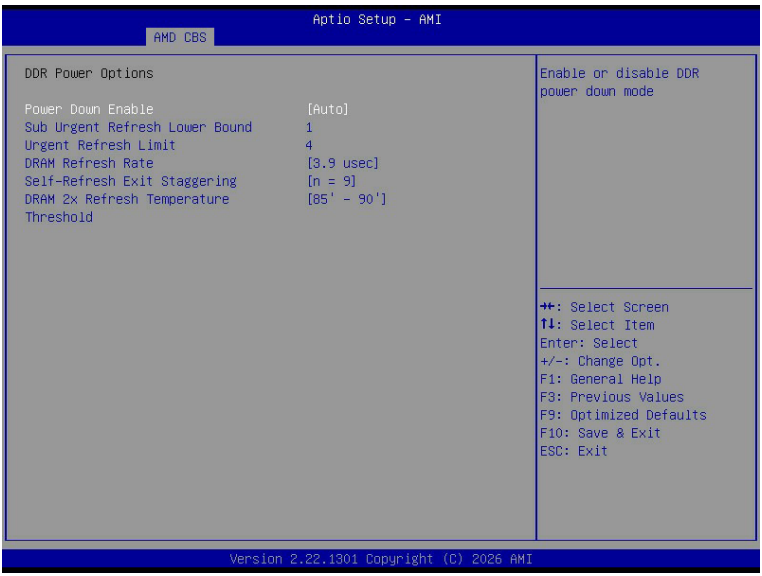
Parameter	Description
DDR Addressing Options	
Chipselect Interleaving	Interleaves memory blocks across the DRAM chip selects for node 0. Options available: Disabled, **Auto**.
Address Hash Bank	Enable or disable bank addressing hashing. Options available: Disabled, Enabled, **Auto**.
Address Hash CS	Enable or disable CS addressing hashing. Options available: **Auto**, Enabled, Disabled.
Address Hash Rm	Enable or disable RM addressing hashing for 3DS DIMMs. Options available: **Auto**, Enabled, Disabled.
Address Hash Subchannel	Enable or disable sub-channel addressing hashing. Options available: **Auto**, Enabled, Disabled.
BankSwapMode	Options available: **Auto**, Disabled, Swap CPU.

5-3-3-2 DDR Controller Configuration



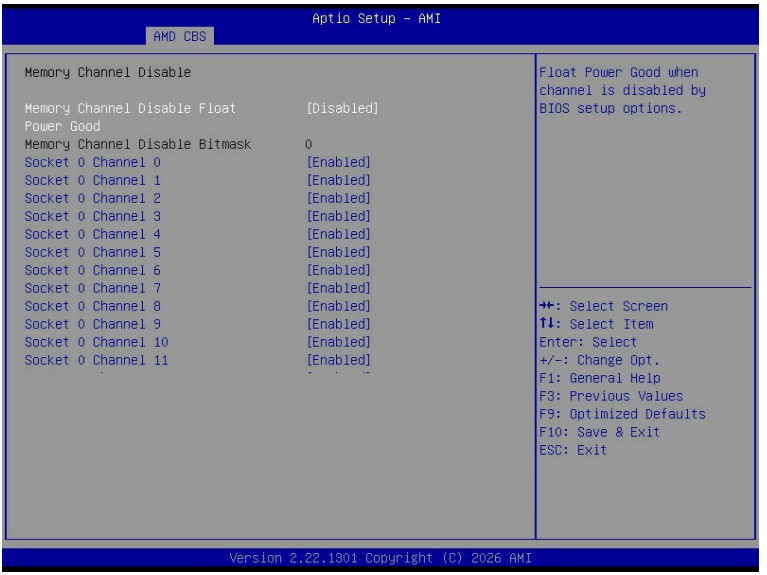
Parameter	Description
DDR Controller Configuration	
DDR Power Options	Press [Enter] for configuration of advanced items.
Memory Channel Disable	Press [Enter] for configuration of advanced items.
Refresh Management (RFM)	Press [Enter] for configuration of advanced items.
Memory Context Restore	Options available: Disabled, Enabled, **Auto**.
DRAM Survives Warm Reset	Options available: **Disabled**, Enabled.

5-3-3-2-1 DDR Power Options



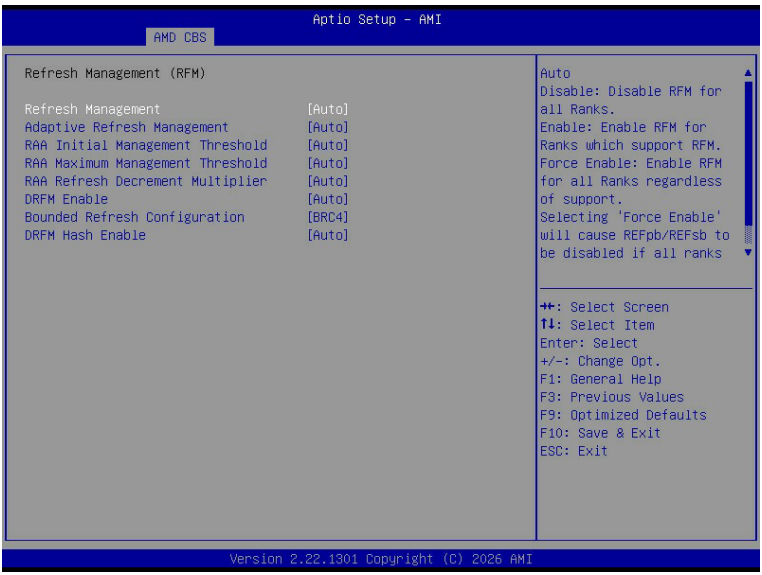
Parameter	Description
DDR Power Options	
Power Down Enable	Enable or disable DDR power down mode. Options available: Disabled, Enabled, **Auto**.
Sub Urgent Refresh Lower Bound	Specifies the stored refresh limit required to enter sub-urgent refresh mode.
Urgent Refresh Limit	Specifies the stored refresh limit required to enter urgent refresh mode.
DRAM Refresh Rate	DRAM refresh rate: 1.95us or 3.9us. Options available: **3.9 usec**, 1.95 usec.
Self-Refresh Exit Staggering	Options available: Disabled, n=1, n=2, n=3, n=4, n=5, n=6, n=7, n=8, **n=9**.
DRAM 2X Refresh Temperature Threshold	Options available: **85'-90'**, 90'-95', 95-100', >100'.

5-3-3-2-2 Memory Channel Disable



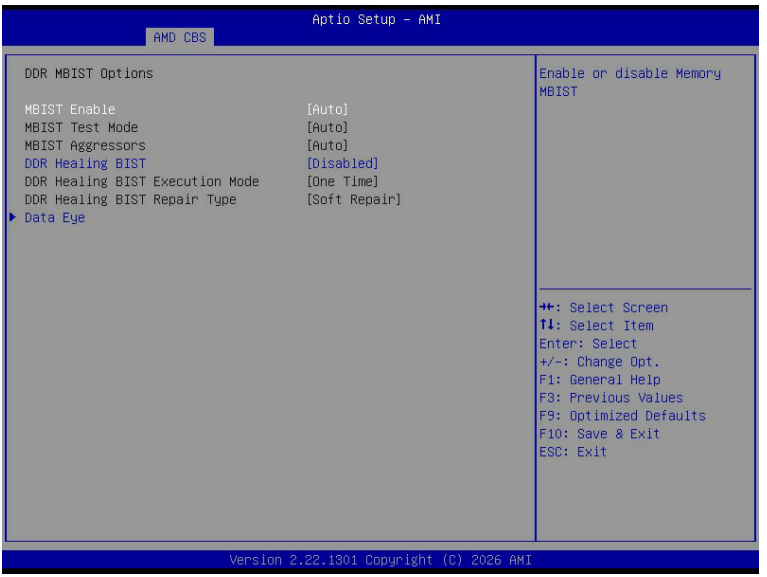
Parameter	Description
Memory Channel Disable	
Memory Channel Disable Float Power Good	Options available: **Disabled**, Enabled.
Memory Channel Disable Bitmask	
Socket 0 Channel_#	Options available: Disabled, **Enabled**.

5-3-3-2-3 Refresh Management (RFM)



Parameter	Description
Refresh Management (RFM)	
Refresh Management	Configure Refresh Management. Options available: **Auto**, Disable, Enable, Force Enable.
Adaptive Refresh Management	Options available: **Auto**, Disable, ARFM Level A, ARFM Level B, ARFM Level C.
RAA Initial Management Threshold	Override Rolling Accumulated ACT Initial Management Threshold. Options available: **Auto**, 32, 40, 48, 56, 64, 72, 80.
RAA Maximum Management Threshold	Override Rolling Accumulated ACT Maximum Management Threshold. Options available: **Auto** ,3X, 4X, 5X, 6X.
RAA Refresh Decrement Multiplier	Override RAA Refresh Decrement Multiplier. Options available: **Auto**, 0.5, 1.
DRFM Enable	Options available: **Auto**, Disable, Enable.
Bounded refresh Configuration	Options available: BRC2, BRC3, **BRC4**.
DRFM Hash Enable	Options available: **Auto**, Disable, Enable.

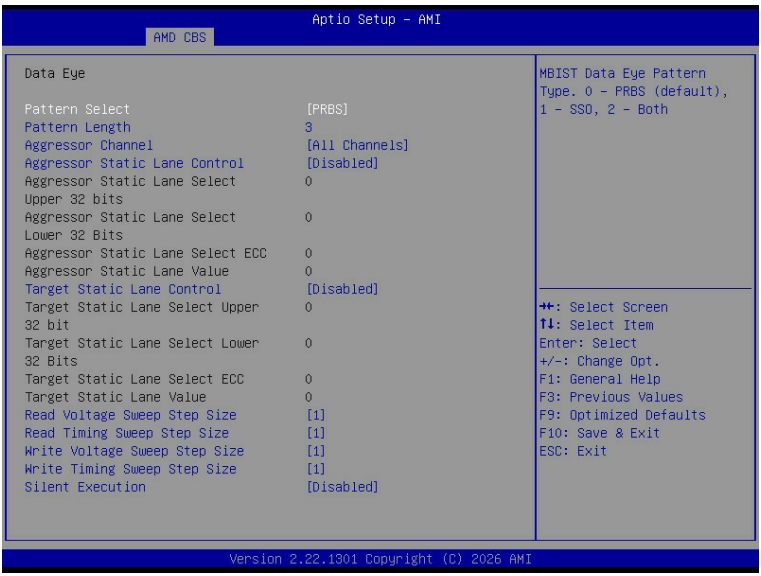
5-3-3-3 DDR MBIST Options



Parameter	Description
DDR MBIST Options	
MBIST Enable	Enable/Disable the Memory MBIST function. Options available: Disabled, Enabled, **Auto**.
MBIST Test Mode(Note1)	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.
MBIST Aggressors(Note1)	Enable/Disable MBIST Aggressor test. Options available: **Auto**, Enabled, Disabled.
DDR Healing BIST	Options available: **Disabled**, PMU Mem BIST, Self-Healing Mem BIST, PMU and Self-Healing Mem BIST.
DDR Healing BIST Execution Mode(Note2)	Options available: **One Time**, Every boot.
DDR Healing BIST Repair Type(Note2)	For DRAM errors found in the BIOS memory BIST select the repair type. Options available: **Soft Repair**, Hard Repair, No Repairs -Test only.
Data Eye	Press [Enter] to configure advanced items.

(Note1) This item can be configured when **MBIST Enable** is set to **Enabled**.
(Note2) This item can be configured when **DDR Healing BIST** is defined.

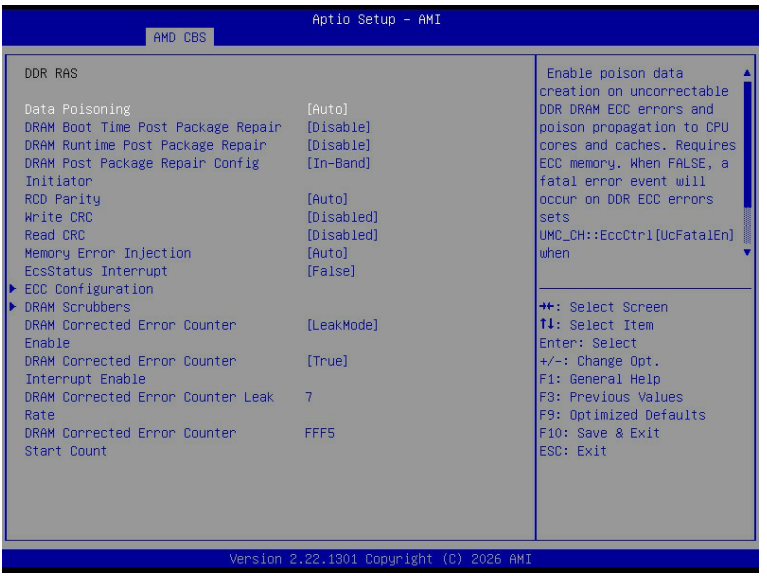
5-3-3-3-1 Data Eye



Parameter	Description
Data Eye	
Pattern Select	Options available: **PRBS**, SSO, Both.
Pattern Length	Determines the pattern length. The possible options are N=3....12.
Aggressor Channel	This item helps read the aggressors channels. Options available: One Sub-Channel, Half Channels, **All Channels**.
Aggressor Static Lane Control	Enable/Disable the Aggressor Static Lane Control function. Options available: Enabled, **Disabled**.
Aggressor Static Lane Select Upper 32 bits	This item is configurable when **Aggressor Static Lane Control** is set to **Enabled**.
Aggressor Static Lane Select Lower 32 bits	This item is configurable when **Aggressor Static Lane Control** is set to **Enabled**.
Aggressor Static Lane Select ECC	This item is configurable when **Aggressor Static Lane Control** is set to **Enabled**.
Aggressor Static Lane Value	This item is configurable when **Aggressor Static Lane Control** is set to **Enabled**.
Target Static Lane Control	Enable/Disable the Target Static Lane Control function. Options available: Enabled, **Disabled**.

Parameter	Description
Target Static Lane Select Upper 32 bits	This item is configurable when **Target Static Lane Control** is set to **Enabled**.
Target Static Lane Select Lower 32 bits	This item is configurable when **Target Static Lane Control** is set to **Enabled**.
Target Static Lane Select ECC	This item is configurable when **Target Static Lane Control** is set to **Enabled**.
Target Static Lane Value	This item is configurable when **Target Static Lane Control** is set to **Enabled**.
Read Voltage Sweep Step Size	Configures the step size for read Data Eye voltage sweep. Options available: **1**, 2, 4.
Read Timing Sweep Step Size	Configures the step size for read Data Eye timing sweep. Options available: **1**, 2, 4.
Write Voltage Sweep Step Size	Configures the step size for write Data Eye voltage sweep. Options available: **1**, 2, 4.
Write Timing Sweep Step Size	Configures the step size for write Data Eye timing sweep. Options available: **1**, 2, 4.
Silent Execution	Execute MBIST Data Eye silently without ABL log output. Options available: Enabled, **Disabled**.

5-3-3-4 DDR RAS



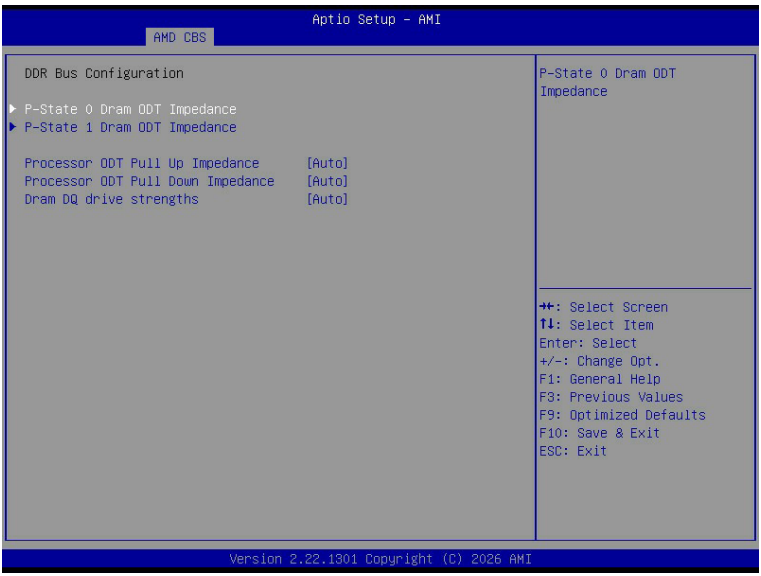
Parameter	Description
DDR RAS	
Data Poisoning	Enable/Disable the Data Poisoning function. Options available: **Auto**, Enabled, Disabled.
DRAM Boot Time Post Package Repair	Enable/Disable the DRAM Boot Time Post Package Repair function. Options available: Enable, **Disable**.
DRAM Runtime Post Package Repair	Enable/Disable the DRAM Runtime Post Package Repair function. Options available: Enable, **Disable**.
DRAM Post Package Repair Config Initiator	Options available: **In-Band**, Out of Band.
RCD Parity	Enable/Disable the RCD Parity function. Options available: **Auto**, Enabled, Disabled.
Write CRC	Options available: Auto, Enabled, **Disabled**.
Read CRC	Options available: Auto, Enabled, **Disabled**.
Memory Error Injection	Options available: False, True, **Auto**.
EcsStatus Interrupt	Options available: **False**, True.
ECC Configuration	Press [Enter] to configure advanced items. ◆ DRAM ECC Symbol Size – Configures the DRAM ECC Symbol Size. – Options available: x4, x16, **Auto**.

Parameter	Description
ECC Configuration (continued)	◆ DRAM ECC Enable – Enable/Disable DRAM ECC. When set to Auto, it will set ECC to enable. – Options available: Disabled, Enabled, **Auto**. ◆ DRAM UECC Retry – Enable/Disable DRAM UECC Retry. – Options available: **Auto**, Enabled, Disabled. ◆ Max DRAM UECC Error Replay(Note) – Default setting is **8**. ◆ Memory Clear – Options available: Enabled, Disabled, **Auto**. ◆ Address X0R after ECC – Options available: Enabled, Disabled, **Auto**. ◆ CipherText Hiding Enable – Options available: **Disable**, Enable.
DRAM Scrubbers	Press [Enter] to configure advanced items. ◆ DRAM ECS Mode – Options available: **Auto**, AutoECS, ManualECS, DisableECS. ◆ DRAM Redirect Scrubber Enable – Options available: **Auto**, Enabled, Disabled. ◆ DRAM Scrub Redirection Limit – Options available: 8 Scrubs, 4 Scrubs, 2 Scrubs, 1 Scrub, **Auto**. ◆ DRAM Scrub Time – Options available: Disabled, 1 hour, 4 hours, 6 hours, 8 hours, 12 hours, 16 hours, **24 hours**, 48 hours. ◆ ECS Config – DRAM Error Threshold Count » Options available: ETC_4, ETC_16, ETC_64, ETC_256, ETC_1024, ETC_4096, **Auto**. – DRAM ECS Count Mode » Options available: Row Count Mode, Code Word Count Mode, **Auto**. – DRAM AutoEcs during Self Refresh » Options available: AutoEcs Disabled, AutoEcs Enabled, **Auto**. – DRAM ECS WriteBack Suppression » Options available: **Auto**, Enable, Disable. – DRAM X4 WriteBack Suppression » Options available: **Auto**, Enable, Disable.

(Note) This item available when **DRAM UECC Retry** is set to **Enabled**.

Parameter	Description
DRAM Corrected Error Counter Enable	Configure DRAM Corrected Error Counter function. Options available: Disable, NoLeakMode, **LeakMode**.
DRAM Corrected Error Counter Interrupt Enable	Enable SMI when DRAM corrected Error Counter count exceeds the threshold value. Options available: False, **True**.
DRAM Corrected Counter Leak Rate	Program Rate value for DRAM Corrected Error Counter function. Default setting is **7**.
DRAM Corrected Error Counter Start Count	Program starting value for DRAM Corrected Error Counter function. Default setting is **FFF5**.

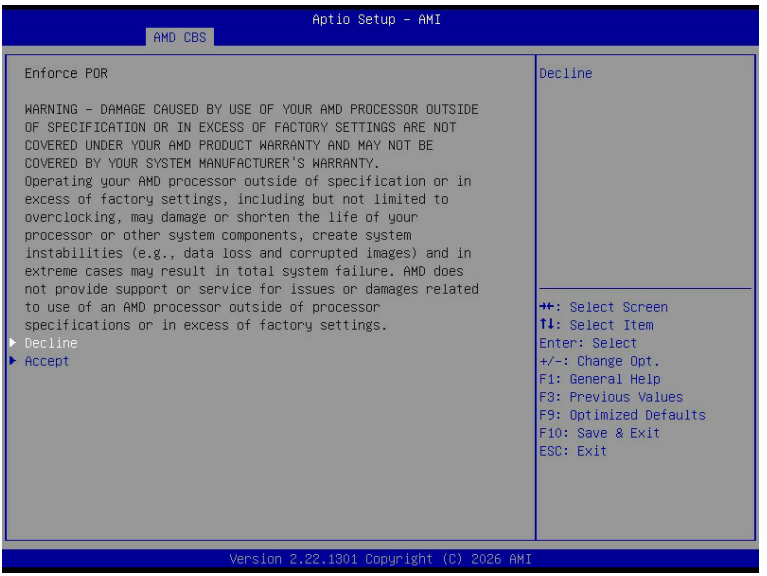
5-3-3-5 DDR Bus Configuration



Parameter	Description
DDR Bus Configuration	
P-State 0 Dram ODT Impedance	Press [Enter] to configure advanced items. ◆ RTT_NOM_WR P-State 0 – Default setting is **Auto**. ◆ RTT_NOM_RD P-State 0 – Default setting is **Auto**. ◆ RTT_WR P-State 0 – Default setting is **Auto**. ◆ RTT_PARK P-State 0 – Default setting is **Auto**. ◆ DQS_RTT PARK P-State 0 – Default setting is **Auto**.
P-State 1 Dram ODT Impedance	Press [Enter] to configure advanced items. ◆ RTT_NOM_WR P-State 1 – Default setting is **Auto**. ◆ RTT_NOM_RD P-State 1 – Default setting is **Auto**. ◆ RTT_WR P-State 1 – Default setting is **Auto**. ◆ RTT_PARK P-State 1 – Default setting is **Auto**. ◆ DQS_RTT PARK P-State 1 – Default setting is **Auto**.

Parameter	Description
Processor ODT Pull Up impedance	Select the ODT impedance for all DBYTE IOs. Options available: **Auto**, High Impedance, 480 ohm, 240 ohm, 160 ohm, 120 ohm, 96 ohm, 80 ohm, 68.6 ohm, 60 ohm, 53.3 ohm,48 ohm, 43.6 ohm, 40 ohm, 36.9 ohm, 34.3 ohm, 32 ohm, 30 ohm, 28.2 ohm, 26.7 ohm, 25.3 ohm.
Processor ODT Pull Down impedance	Select the ODT pull down impedance for all DBYTE IOs. Options available: **Auto**, High Impedance, 480 ohm, 240 ohm, 160 ohm, 120 ohm, 96 ohm, 80 ohm, 68.6 ohm, 60 ohm, 53.3 ohm,48 ohm, 43.6 ohm, 40 ohm, 36.9 ohm, 34.3 ohm, 32 ohm, 30 ohm, 28.2 ohm, 26.7 ohm, 25.3 ohm.
Dram DQ drive strengths	Select the Dram Pull-up and Pull-Down Output Driver Impedance for all DQ and DMI IOs. Options available: **Auto**, 48 ohm, 40 ohm, 34 ohm.

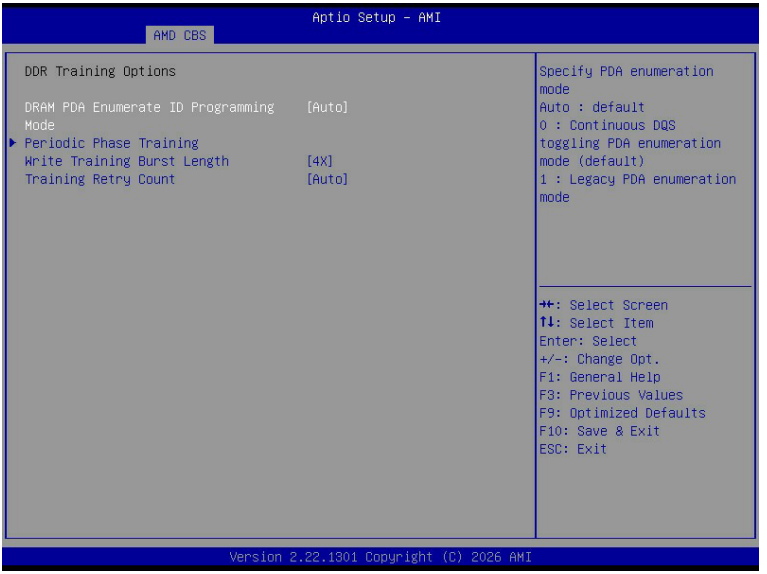
5-3-3-6 Enforce POR



Parameter	Description
Enforce POR	Decline/Accept to configure the advanced items.
Accept	
Active Memory Timing Settings(Note)	Active memory Timing Settings. Options available: Auto, **Enabled**.
Memory Target Speed	Specifies the memory target speed in MT/s. Options available: **Auto**, DDR3600, DDR4000, DDR4400, DDR4800, DDR5200, DDR5600, DDR6000, DDR6400.
SPD Timing	Press [Enter] to configure advanced items.
Non-SPD Timing	Press [Enter] to configure advanced items.

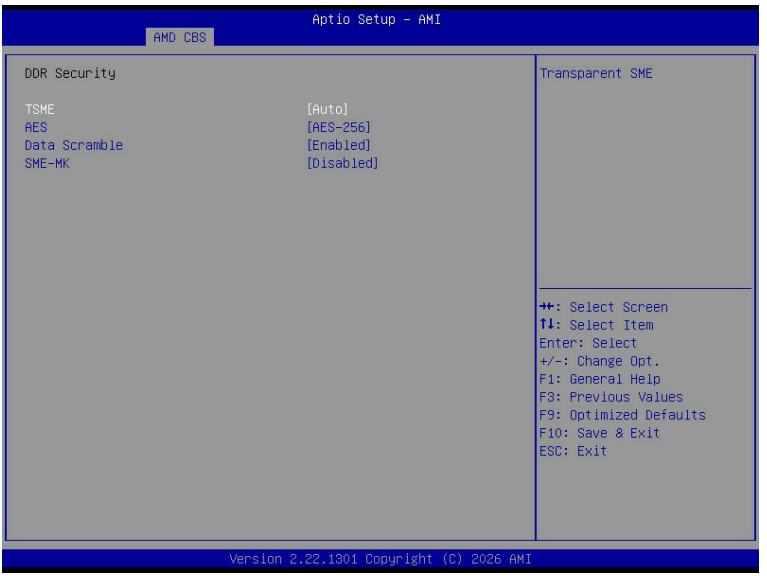
(Note) Advanced items prompt when this item is defined.

5-3-3-7 DDR Training Options



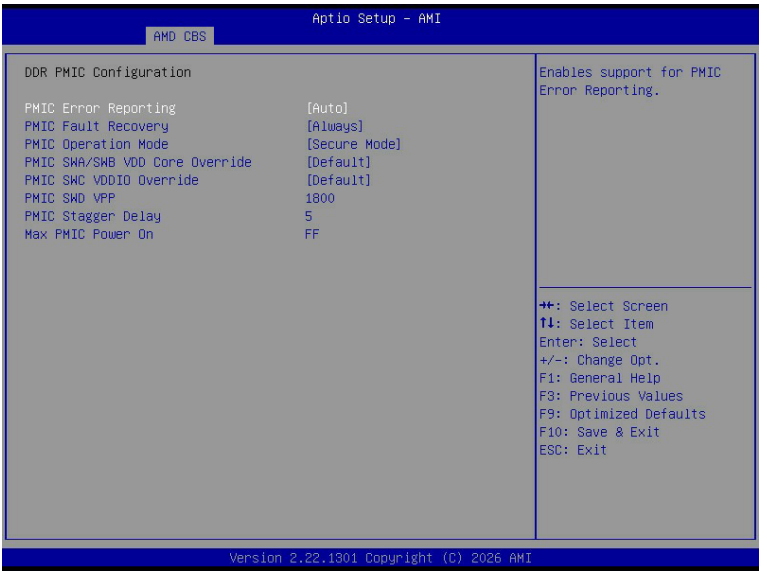
Parameter	Description
DDR Training Options	
DRAM PDA Enumerate ID Programming Mode	Specify PDA enumeration mode. Options available: **Auto**, Toggling PDA enumeration mode, Legacy PDA enumeration mode.
Periodic Phase Training	Press [Enter] to configure advanced items. ◆ Periodic Training Mode – Options available: Disabled, **Legacy**. ◆ Periodic Interval Mode – Options available: **Auto**, Manual.
Write Training Burst Length	Options available: **4x**, 8x.
Training Retry Count	Retry on PMU training failure, retry to all channels, including passed and failed channel. Options available: **Auto**, Disabled, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

5-3-3-8 DDR Security



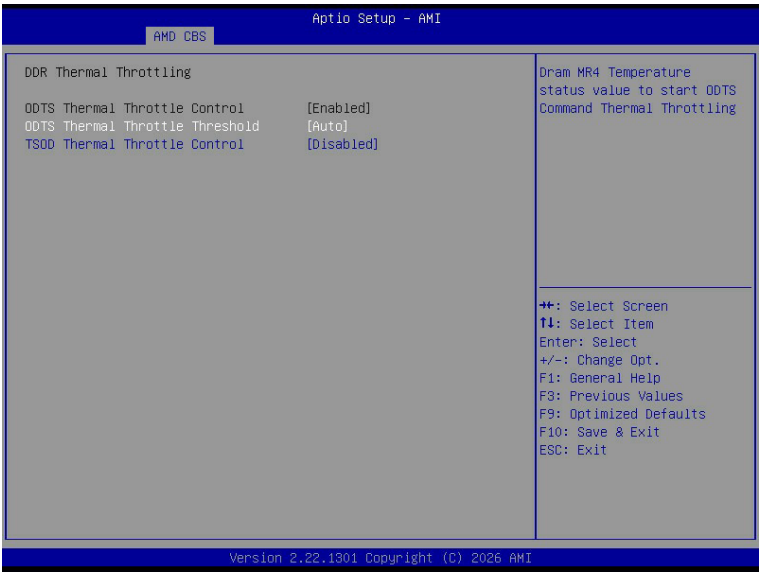
Parameter	Description
Security	
TSME	Enable/Disable Transparent SME. Options available: **Auto**, Enabled, Disabled.
AES	Options available: AES-128, **AES-256**.
Data Scramble	Enable/Disable Data Scrambling. Options available: **Enabled**, Disabled.
SME-MK	Options available: Enabled, **Disabled**.

5-3-3-9 DDR PMIC Configuration



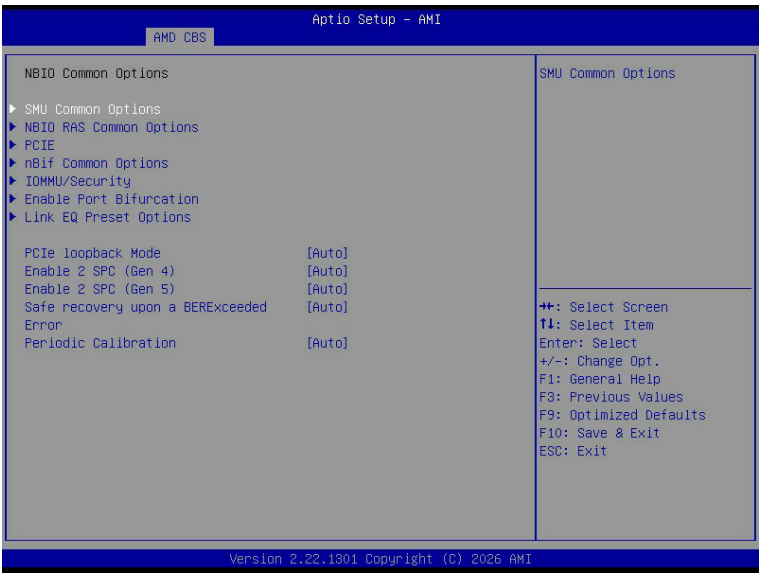
Parameter	Description
DDR PMIC Configuration	
PMIC Error Reporting	Enables support for PMIC Error Reporting. Options available: **Auto**, False, True.
PMIC Fault Recovery	Options available: **Always**, Never, Once.
PMIC Operation Mode	Options available: **Secure Mode**, Programmable Mode.
PMIC SWA/SWB VDD Core Override	Options available: **Default**, Override.
PMIC SWC VDDIO Override	Options available: **Default**, Override.
PMIC SWD VPP	Default setting is **1800**.
PMIC Stagger Delay	Default setting is **5**.
Max PMIC Power On	Default setting is **FF**.

5-3-3-10 DDR Thermal Throttling



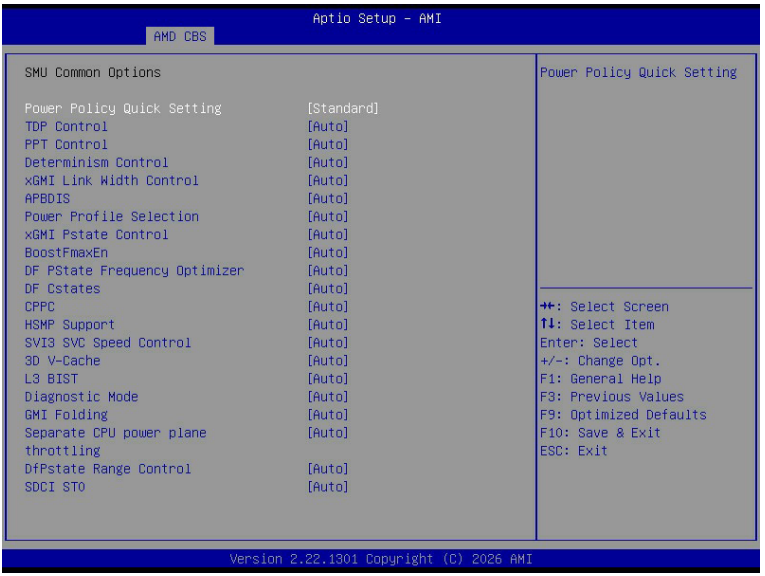
Parameter	Description
DDR Thermal Throttling	
ODTS Thermal Throttle Control	Default setting is **Enabled**.
ODTS Thermal Throttle Threshold	Options available: **Auto**, > 85'C, > 90'C, > 95'C.
TSOD Thermal Throttle Control	Options available: Enabled, **Disabled**.

5-3-4 NBIO Common Options



Parameter	Description
NBIO Common Options	
SMU Common Options	Press [Enter] for configuration of advanced items.
NBIO RAS Common Options	Press [Enter] for configuration of advanced items.
PCIE	Press [Enter] for configuration of advanced items.
nBif Common Options	Press [Enter] for configuration of advanced items.
IOMMU/Security	Press [Enter] for configuration of advanced items.
Enable Port Bifurcation	Press [Enter] for configuration of advanced items.
Link EQ Present Options	Press [Enter] for configuration of advanced items.
PCIe loopback Mode	Options available: Disabled, Enabled, **Auto**.
Enable 2SPC (Gen 4)	Options available: Disable, Enable, **Auto**.
Enable 2SPC (Gen 5)	Options available: Disable, Enable, **Auto**.
Safe recovery upon a BERExceeded Error	Options available: Disable, Enable, **Auto**.
Periodic Calibration	Options available: Disable, Enable, **Auto**.

5-3-4-1 SMU Common Options



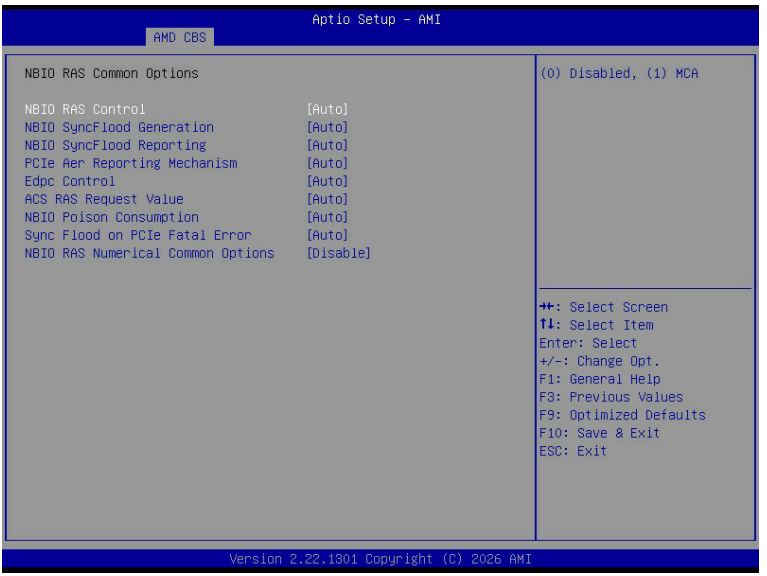
Parameter	Description
SMU Common Options	
Power Policy Quick Setting(Note)	Options available: **Standard**, Best Performance, Energy Efficient.
TDP Control(Note)	Options available: Manual, **Auto**.
TDP	TDP [W] (in decimal)
PPT Control(Note)	Options available: Manual, **Auto**.
PPT	PPT [W] (in decimal)
Determinism Control(Note)	Selects use the fused Determinism or set customized Determinism. Options available: Manual, **Auto**.
Determinism Enable	Options available: **Power**, Performance.
xGMI Link Width Control	Options available: Manual,**Auto**.
APBDIS	Options available: 0, 1, **Auto**.
Power Profile Selection	Options available: High Performance Mode, Efficiency Mode, Maximum IO Performance Mode, Balanced Memory Performance Mode, Balanced Core Performance Mode, Balanced Core Memory Performance Mode, **Auto**.
xGMI Pstate Control	Options available: Manual, **Auto**.

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

Parameter	Description
BoostFmaxEn(Note)	Options available: Manual, **Auto**.
BoostFmax	Specify the boost Fmax frequency limit to apply to all cores (MHz in decimal).
DF PState Frequency Optimizer	Options available: **Auto**, Enabled, Disabled.
DF Cstates	Options available: Disabled, Enabled, **Auto**.
CPPC	Enable/Disable the CPPC feature. Options available: Disabled, Enabled, **Auto**.
HSMP Support	Enable/Disable the HSMP support. Options available: Disabled, Enabled, **Auto**.
SVI3 SVC Speed Control	Options available: **Auto**, Manual.
3D V-Cache	Options available: **Auto**, Disable, 1 stack.
L3 BIST	Options available: **Auto**, Disable, Enable.
Diagnostic Mode	Options available: Disabled, Enabled, **Auto**.
GMI Folding	Options available: Disabled, Enabled, **Auto**.
Separate CPU power plane throttling	Options available: **Auto**, Disable, Enable.
DfPstate Range Support	Options available: Disable, Enable, **Auto**.
SDCI ST0	Options available: Disabled, Enabled, **Auto**.

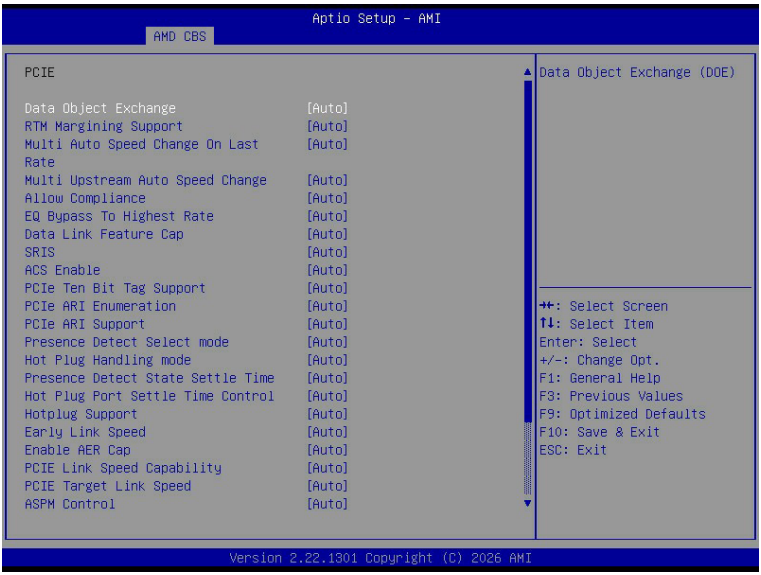
(Note) Advanced items prompt when this item is defined.

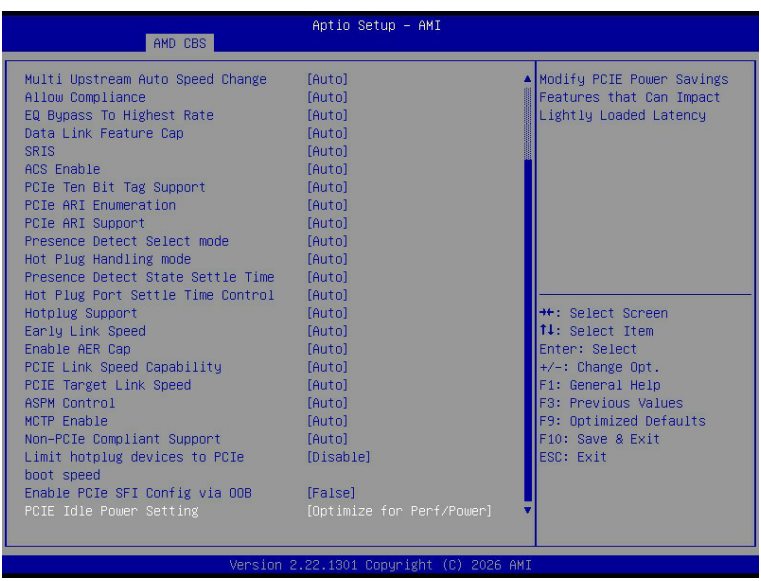
5-3-4-2 NBIO RAS Common Options



Parameter	Description
NBIO RAS Common Options	
NBIO RAS Control	Options available: Disabled, MCA, **Auto**.
NBIO SyncFlood Generation	The value may be used to mask SyncFlood caused by NBIO RAS options. Options available: Enabled, Disabled, **Auto**.
NBIO SyncFlood Reporting	The value may be used to enable SyncFlood reporting to APML. Options available: Enabled, Disabled, **Auto**.
PCIe Aer Reporting Mechanism	Selects the method of reporting AER errors from PCI Express. Options available: Firmware First, Firmware First but allow OS First, OS First, **Auto**.
Edpc Control	Options available: Disabled, Enabled, **Auto**.
ACS RAS Request Value	Options available: Direct Request Access Enabled, Request Blocking Enabled, Request Redirect Enabled, **Auto**.
NBIO Poison Consumption	Options available: **Auto**, Enabled, Disabled.
Sync Flood on PCIe Fatal Error	Options available: **Auto**, True, False.
NBIO RAS Numerical Common Options	Options available: **Disable**, Manual.

5-3-4-3 PCIE

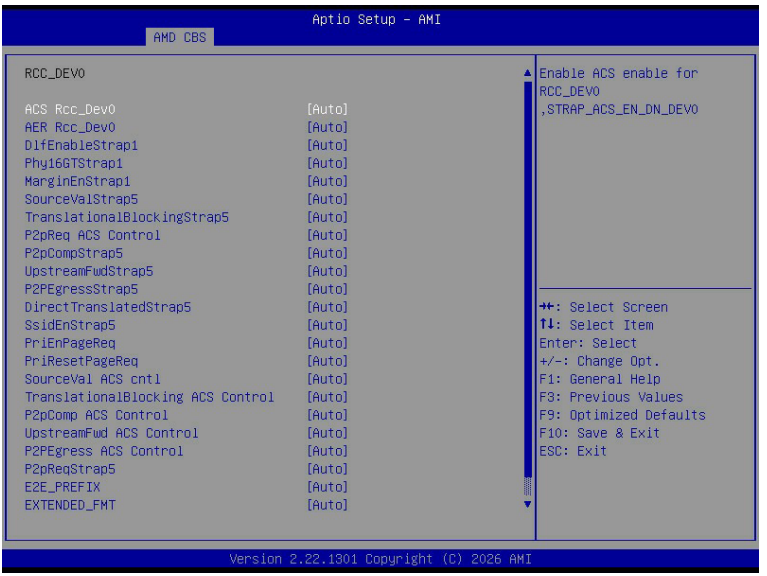

Aptio Setup – AMI
AMD CBS
PCIE
Data Object Exchange [Auto]
RTM Margining Support [Auto]
Multi Auto Speed Change On Last Rate [Auto]
Multi Upstream Auto Speed Change [Auto]
Allow Compliance [Auto]
EQ Bypass To Highest Rate [Auto]
Data Link Feature Cap [Auto]
SRIS [Auto]
ACS Enable [Auto]
PCIe Ten Bit Tag Support [Auto]
PCIe ARI Enumeration [Auto]
PCIe ARI Support [Auto]
Presence Detect Select mode [Auto]
Hot Plug Handling mode [Auto]
Presence Detect State Settle Time [Auto]
Hot Plug Port Settle Time Control [Auto]
Hotplug Support [Auto]
Early Link Speed [Auto]
Enable AER Cap [Auto]
PCIE Link Speed Capability [Auto]
PCIE Target Link Speed [Auto]
ASPM Control [Auto]
Data Object Exchange (DOE)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit
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Aptio Setup – AMI
AMD CBS
Multi Upstream Auto Speed Change [Auto]
Allow Compliance [Auto]
EQ Bypass To Highest Rate [Auto]
Data Link Feature Cap [Auto]
SRIS [Auto]
ACS Enable [Auto]
PCIe Ten Bit Tag Support [Auto]
PCIe ARI Enumeration [Auto]
PCIe ARI Support [Auto]
Presence Detect Select mode [Auto]
Hot Plug Handling mode [Auto]
Presence Detect State Settle Time [Auto]
Hot Plug Port Settle Time Control [Auto]
Hotplug Support [Auto]
Early Link Speed [Auto]
Enable AER Cap [Auto]
PCIE Link Speed Capability [Auto]
PCIE Target Link Speed [Auto]
ASPM Control [Auto]
MCTP Enable [Auto]
Non-PCIe Compliant Support [Auto]
Limit hotplug devices to PCIe boot speed [Disable]
Enable PCIe SFI Config via OOB [False]
PCIE Idle Power Setting [Optimize for Perf/Power]
Modify PCIE Power Savings Features that Can Impact Lightly Loaded Latency
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit
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Parameter	Description
PCIE	
Data Object Exchange	Options available: Disabled, Enabled, **Auto**.
RTM Margining Support	Options available: Disable, Enable, **Auto**.
Multi Auto Speed Change On Last Rate	Options available: Disable, Enable, **Auto**.
Multi Upstream Auto Speed Change	Options available: Disabled, Enabled, **Auto**.
Allow Compliance	When enabled, allows the PCIe RP to enter Polling.Compliance state. Options available: **Auto**, Disable, Enable.
EQ Bypass To Highest Rate	Options available: Disable, Enable, **Auto**.
Data Link Feature Cap	Options available: Disabled, Enabled, **Auto**.
SRIS	Options available: **Auto**, Disable, Enable.
ACS Enable	Enable/Disable ACS. Options available: Enable, Disabled, **Auto**.
PCIe Ten Bit Tag Support	Enable/Disable PCIe ten bit tags for supported devices. (Auto=Disabled) Options available: Disable, Enable, **Auto**.
PCIe ARI Enumeration	ARI Forwarding Enable for each downstream port. Options available: Disable, Enable, **Auto**.
PCIe ARI Support	Enable/Disable Alternative Routing-ID Interpretation. Options available: Disable, Enable, **Auto**.
Presence Detect Select mode	Controls the Presence Detect Select mode. Options available: OR, AND, **Auto**, In-Band Only, Out-Of-Band Only.
Hot Plug Handling mode	Controls the Hot Plug Handling mode. Options available: OS First, Firmware First/EDR if OS supports, Firmware First but allow OS First, System Firmware Intermediary, **Auto**.
Presence Detect State Settle Time	Options available: True, False, **Auto**.
Hot Plug Port Settle Time Control	Options available: **Auto**, Manual.
Hot Plug Support	Options available: **Auto**, Disabled.
Early Link Speed	Configures Early Link Speed. Options available: Max, Gen1, Gen2, **Auto**.
Enable AER Cap	Enable/Disable Advanced Error Reporting Capability. Options available: **Enable**, Disabled, Auto.

Parameter	Description
PCIE Link Speed Capability	Options available: Maximum speed, Gen1, Gen2, Gen3, Gen4, Gen5, **Auto**.
PCIE Target Link Speed	Options available: Maximum Speed, GEN1, GEN2, GEN3, GEN4, GEN5, **Auto**.
ASPM Control	Options available: Disable, L1, **Auto**.
MCTP Enable	Options available: Enable, Disable, **Auto**.
Non-PCIe Compliant Support	Options available: Enable, Disable, **Auto**.
Limit hotplug devices to PCIe boot speed	Options available: Enable, **Disable**, Auto.
Enable PCIe SFI Config via 00B	Options available: True, **False**.
PCIE Idle Power Setting	Options available: Optimize for Latency, **Optimize for Perf/Power**.

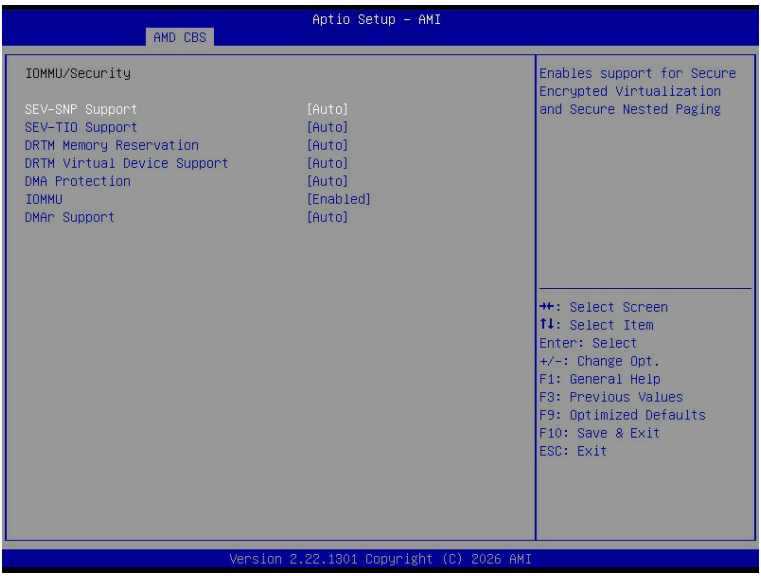
5-3-4-4 nBif Common Options



Parameter	Description
RCC_DEV0	◆ ACS Rcc_Dev0 – Options available: **Auto**, Disable, Enable. ◆ AER Rcc_Dev0 – Options available: **Auto**, Disable, Enable. ◆ DlfEnableStrap1 – Options available: **Auto**, Disable, Enable. ◆ Phy16GTStrap1 – Options available: **Auto**, Disable, Enable. ◆ MarginEnStrap1 – Options available: **Auto**, Disable, Enable. ◆ SourceValStrap5 – Options available: **Auto**, Disable, Enable. ◆ TranslationalBlockingStrap5 – Options available: **Auto**, Disable, Enable. ◆ P2pReq ACS Control – Options available: **Auto**, Disable, Enable. ◆ P2pCompStrap5 – Options available: **Auto**, Disable, Enable. ◆ UpstreamFwdStrap5 – Options available: **Auto**, Disable, Enable.

Parameter	Description
RCC_DEV0 (continued)	◆ P2PEgressStrap5 – Options available: **Auto**, Disable, Enable. ◆ DirectTranslatedStrap5 – Options available: **Auto**, Disable, Enable. ◆ SsidEnStrap5 – Options available: **Auto**, Disable, Enable. ◆ PriEnPageReq – Options available: **Auto**, Disable, Enable. ◆ PriResetPageReq – Options available: **Auto**, Disable, Enable. ◆ SourceVal ACS cntl – Options available: **Auto**, Disable, Enable. ◆ TranslationalBlocking ACS Control – Options available: **Auto**, Disable, Enable. ◆ P2pComp ACS Control – Options available: **Auto**, Disable, Enable. ◆ UpstreamFwd ACS Control – Options available: **Auto**, Disable, Enable. ◆ P2PEgress ACS Control – Options available: **Auto**, Disable, Enable. ◆ P2pReqStrap5 – Options available: **Auto**, Disable, Enable. ◆ E2E_PREFIX – Options available: **Auto**, Disable, Enable. ◆ EXTENDED_FMT – Options available: **Auto**, Disable, Enable. ◆ AtomicRoutingStrap5 – Options available: **Auto**, Disable, Enable.

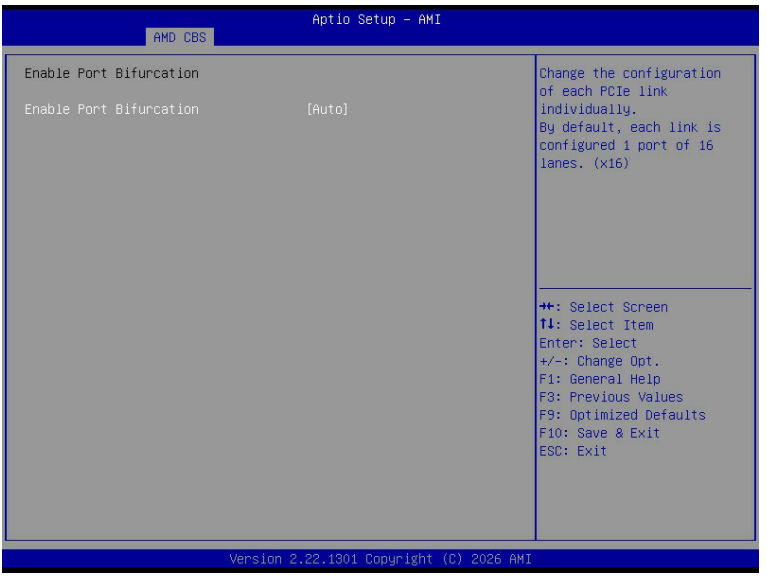
5-3-4-5 IOMMU/Security



Parameter	Description
SEV-SNP Support	Enable/Disable the SEV-SNP support. Options available: Disable, Enable, **Auto**.
SEV-TIO Support	Support Secure IO with TDSIP enabled devices. Options available: Disabled, Enabled, **Auto**.
DRTM Memory Reservation	Enable/Disable DRTM Memory reservation. Options available: Disabled, Enabled, **Auto**.
DRTM Virtual Device Support	Enable/Disable DRTM ACPI virtual device. Options available: Disabled, Enabled, **Auto**.
DMA Protection	Enable/Disable DMA remap support in IVRS IVinfo Field. Options available: **Auto**, Enabled, Disabled.
IOMMU	Enable/Disable the IOMMU function. Options available: Disabled, **Enabled**.
DMAr Support(Note)	Enable/Disable DMAr system protection during POST. Options available: Disabled, Enabled, **Auto**.

(Note) This item is configurable when **IOMMU** is set to **Enabled**.

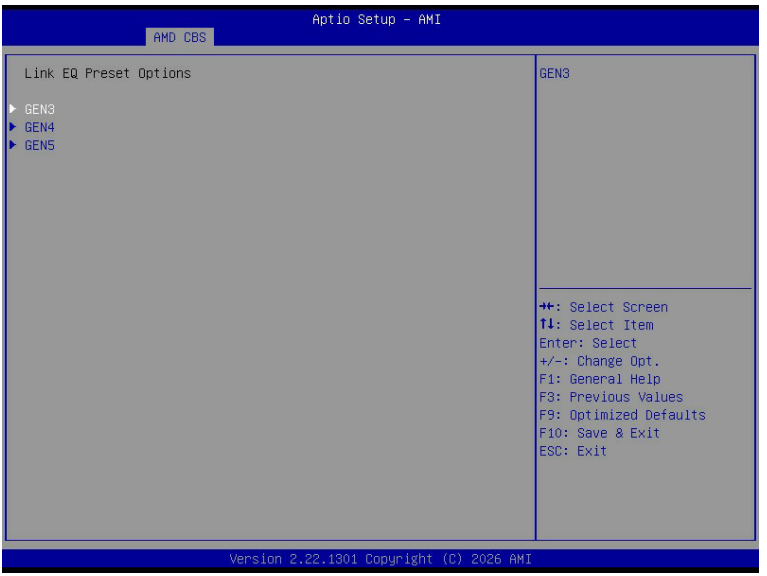
5-3-4-6 Enable Port Bifurcation



Parameter	Description
Enable Bifurcation(Note)	Options available: Disable, Enable, **Auto**.
P-Links Override	Press [Enter] to configure advanced items. ◆ P0/1/2/3 Override – Options available: **Auto**, 1 port of x8 + 2 ports of x4, 1 port of x8 + 8 ports of x1, 2 ports of x8, 4 ports of x4, 8 ports of x2.
G-Links Override	Press [Enter] to configure advanced items. ◆ G0/1/2/3 Override – Options available: **Auto**, 1 port of x8 + 2 ports of x4, 1 port of x8 + 8 ports of x1, 2 ports of x8, 4 ports of x4, 8 ports of x2.

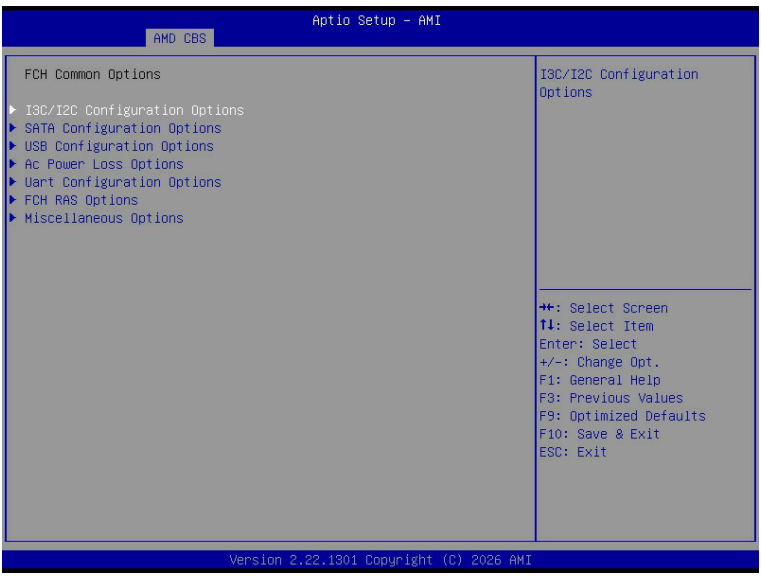
(Note) Advanced items prompt when this item is defined.

5-3-4-7 Link EQ Preset Options



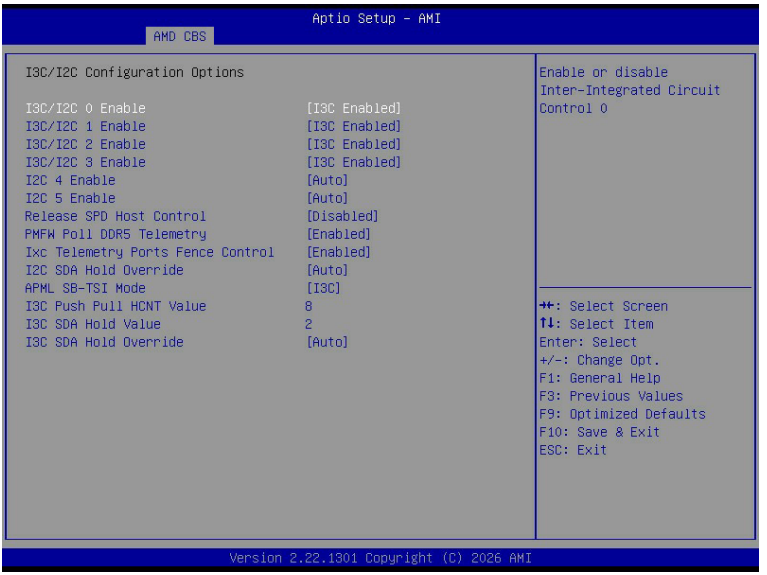
Parameter	Description
GEN3/4/5	Press [Enter] to configure advanced items. ◆ Preset Search Mask Configuration – Options available: Custom, **Auto**.

5-3-5 FCH Common Options



Parameter	Description
FCH Common Options	
I3C/I2C Configuration Options	Press [Enter] for configuration of advanced items.
SATA Configuration Options	Press [Enter] for configuration of advanced items.
USB Configuration Options	Press [Enter] for configuration of advanced items.
AC Power Loss Options	Press [Enter] for configuration of advanced items.
Uart Configuration Options	Press [Enter] for configuration of advanced items.
FCH RAS Options	Press [Enter] for configuration of advanced items.
Miscellaneous Options	Press [Enter] for configuration of advanced items.

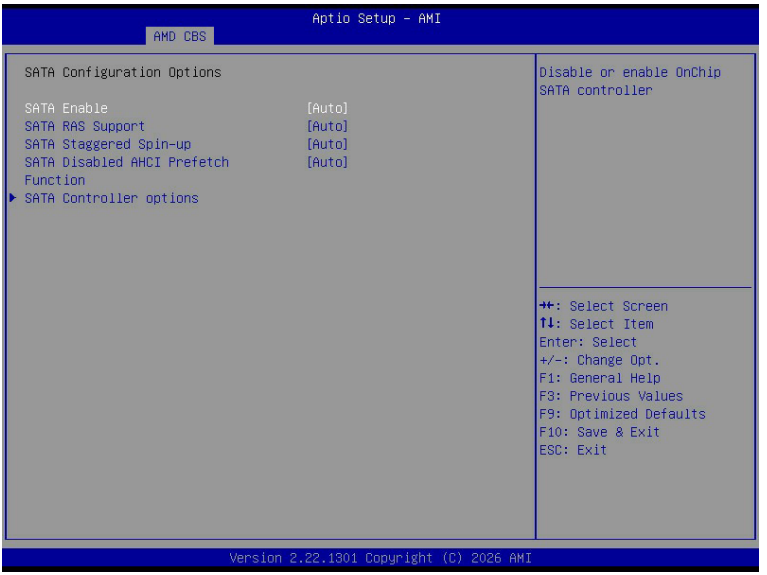
5-3-5-1 I3C/I2C Configuration Options



Parameter	Description
I3C/I2C Configuration Options	
I3C/I2C 0/1/2/3 Enable(Note)	Options available: Both Disabled, **I3C Enabled**, I2C Enabled, Auto.
I2C 4/5 Enable	Options available: Disabled, Enabled, **Auto**.
Release SPD Host Control	Options available: **Disabled**, Enabled.
PMFW Poll DDR5 Telemetry	Options available: Disabled, **Enabled**.
Ixc Telemetry Ports Fence Control	Options available: Disabled, **Enabled**.
I2C SDA Hold Override	Options available: Disabled, Enabled, **Auto**.
APML SB-TSI Mode	Options available: **I3C**, I2C.
I3C Push Pull HCNT Value	SCL push-pull High count for I3C transfers targeted to I3C devices.
I3C SDA Hold Value	Specifies I3C SDA Hold value.
I3C SDA Hold Override	Override I3C SDA Hold value. Options available: Disabled, Enabled, **Auto**.

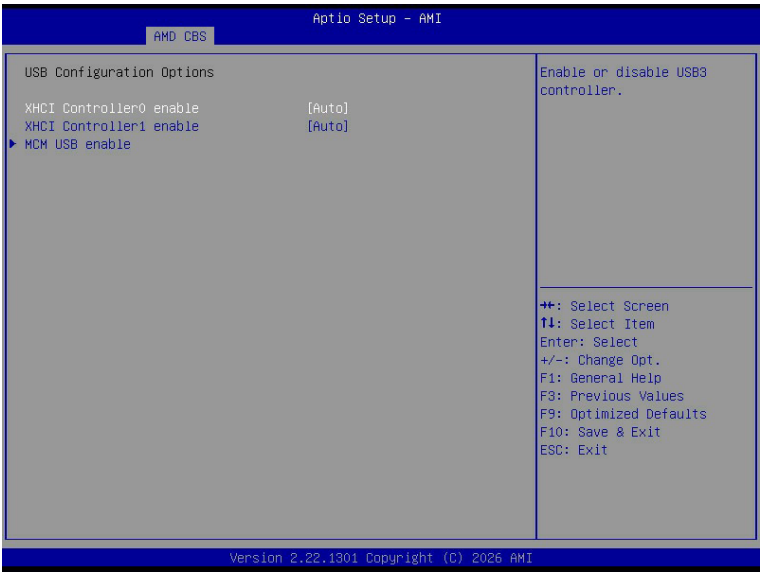
(Note) Advanced items prompt when this item is defined.

5-3-5-2 SATA Configuration Options



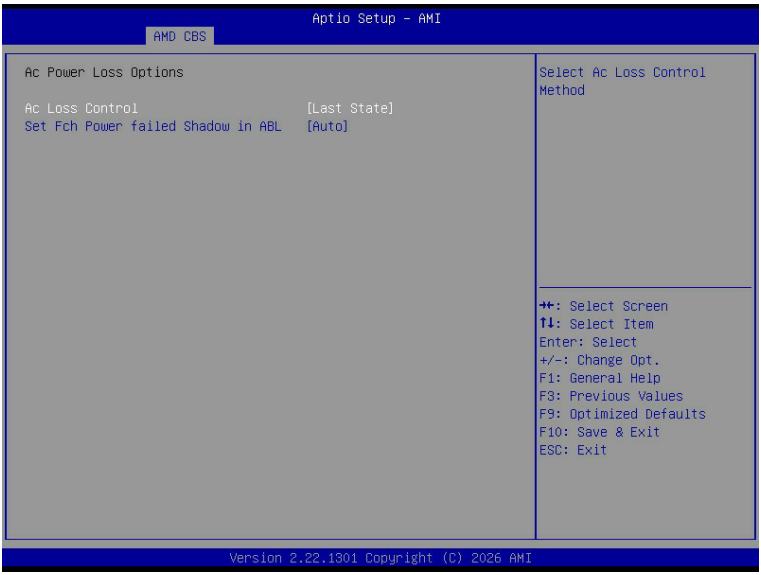
Parameter	Description
SATA Configuration Options	
SATA Enable	Enable/Disable OnChip SATA controller. Options available: Disabled, Enabled, **Auto**.
SATA RAS Support	Options available: Disabled, Enabled, **Auto**.
SATA Staggered Spin-up	Options available: Disabled, Enabled, **Auto**.
SATA Disabled AHCI Prefetch Function	Options available: Disabled, Enabled, **Auto**.
SATA Controller options	Press [Enter] for configuration of advanced items. ◆ SATA Controller Enable ◆ SATA Controller eSATA ◆ SATA Controller DevSlp ◆ SATA Controller SGPIO

5-3-5-3 USB Configuration Options



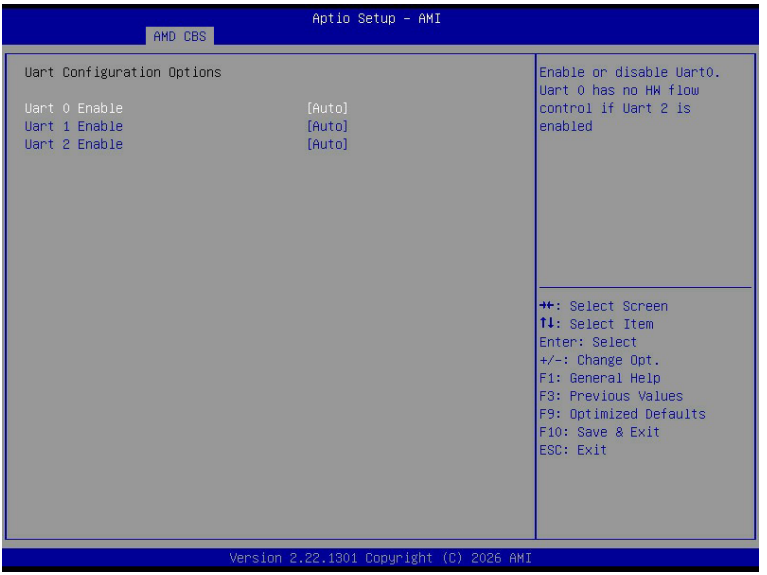
Parameter	Description
USB Configuration Options	
XHCI Controller0/1 enable	Enable/Disable USB controller. Options available: Enabled, Disabled, **Auto**.
MCM USB enable	Press [Enter] for configuration of advanced items. ◆ XHCI2/XHCI3 enable (Socket1) – Options available: Enabled, Disabled, **Auto**.

5-3-5-4 AC Power Loss Options



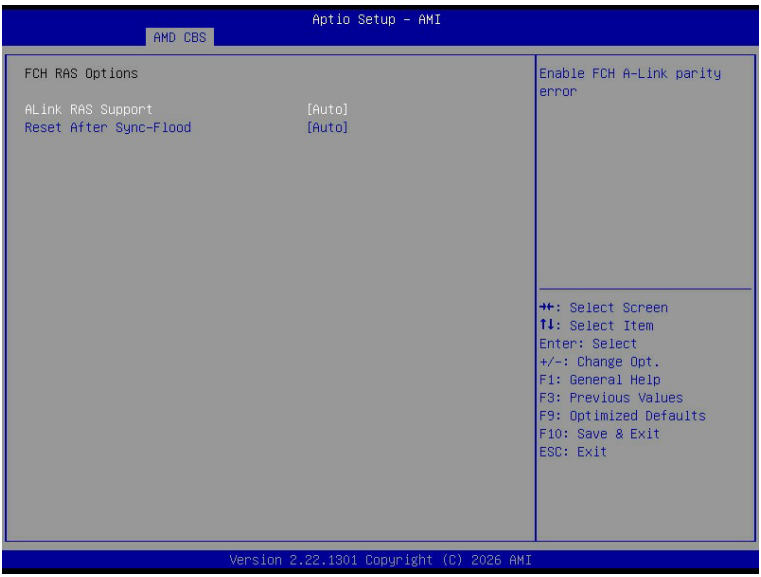
Parameter	Description
AC Power Loss Options	
AC Loss Control	Selects the AC Loss Control Method. Options available: Power Off, Power On, **Last State**.
Set FCH Power failed shadow in ABL	Enable/Disable set FCH power failed shadow by AC Loss control policy in ABL. Options available: Enabled, Disabled, **Auto**.

5-3-5-5 Uart Configuration Options



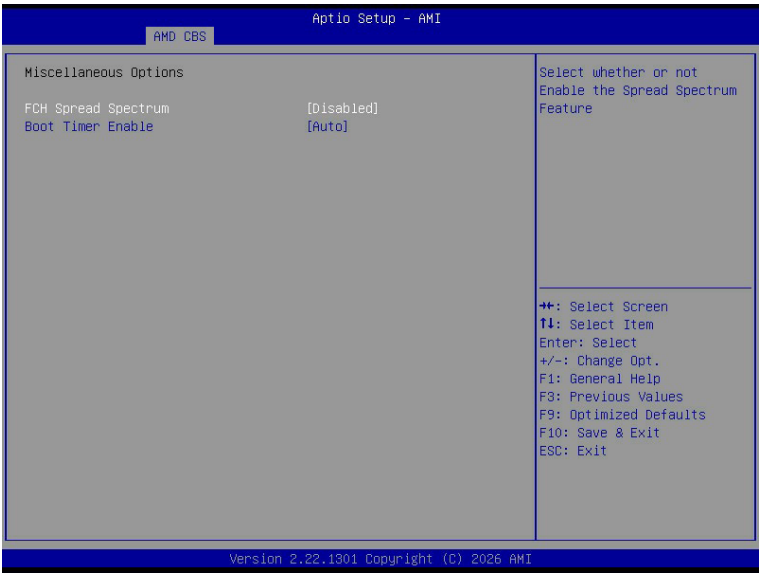
Parameter	Description
Uart Configuration Options	
Uart 0/1/2/3 Enable	Options available: Disabled, Enabled, **Auto**.

5-3-5-6 FCH RAS Options



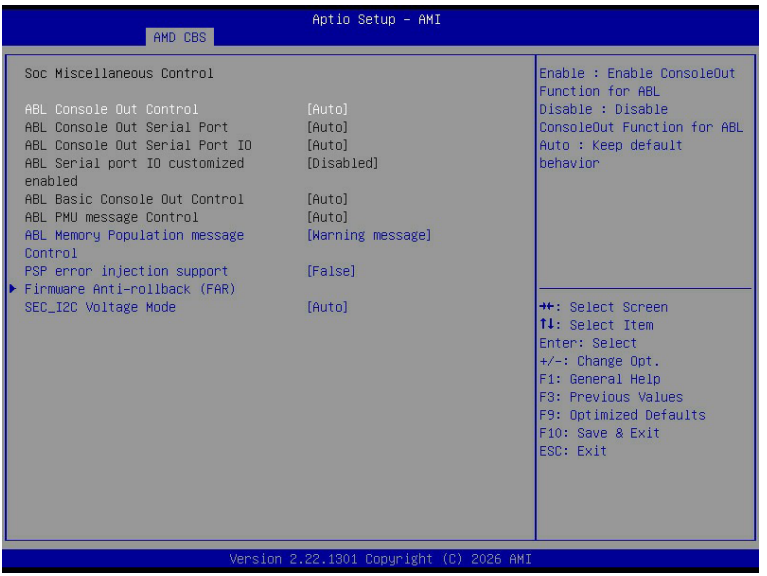
Parameter	Description
FCH RAS Options	
ALink RAS Support	Enable/Disable the ALink RAS Support. Options available: Disabled, Enabled, **Auto**.
Reset After Sync-Flood	Enables AB to forward downstream sync-flood message to system controller. Options available: Enable, Disable, **Auto**.

5-3-5-7 Miscellaneous Options



Parameter	Description
Miscellaneous Options	
FCH Spread Spectrum	Select whether or not Enable the Spread Spectrum Feature. Options available: **Disabled**, Enabled, Auto.
Boot Timer Enable	Enable/Disable Boot Timer. Options available: Disabled, Enabled, **Auto**.

5-3-6 SOC Miscellaneous Control

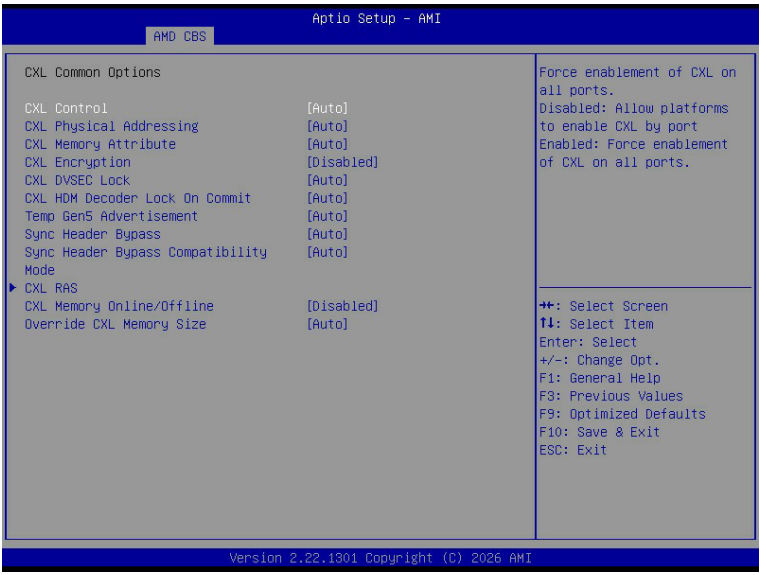


Parameter	Description
SOC Miscellaneous Control	
ABL Console Out Control(Note)	Enable/Disable the ConsoleOut function for ABL. Options available: Disable, Enable, **Auto**.
ABL Console Out Serial Portl(Note)	Options available: eSPI, SOC UART0, SOC UART1, **Auto**.
ABL Console Out Serial Port IO	Options available: 0x3F8, 0x2F8, 0x3E8, 0x2E8, **Auto**.
ABL Serial port IO customized enabled	Options available: **Disabled**, Enabled.
ABL Basic Console Out Control	Enable/Disable the Basic ConsoleOut function for ABL. Options available: Disable, Enable, **Auto**.
ABL PMU message Control	To Control the total number of PMU debug messages. Options available: **Auto**, Detailed debug message, Coarse debug message, Stage completion, Assertion messages, Firmware completion message only.
ABL Memory Population message Control	Options available: **Warning message**, Fatal error.

(Note) Advanced items are configurable when this item is defined.

Parameter	Description
PSP error injection support	Options available: **False**, True.
Firmware Anti-rollback (FAR)	Press [Enter] for configuration of advanced items. ◆ FAR enforcement state – Default setting is **Enabled**. ◆ SPL value in the CPU Fuse ◆ SPL value in the SPL table ◆ FAR Switch – Options available: Disabled, Enabled, **Auto**.
SEC_I2C Voltage Mode	Options available: **Auto**, 1.8V, 1.1V.

5-3-7 CXL Common Options

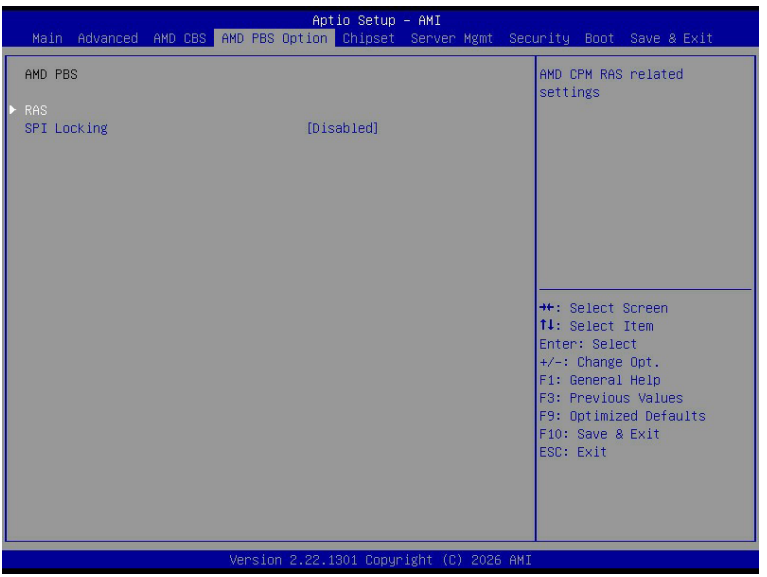


Parameter	Description
CXL Common Options	
CXL Control	Options available: **Auto**, Enabled, Disabled.
CXL Physical Addressing	Options available: Normalized address, System address, **Auto**.
CXL Memory Attribute	Options available: **Auto**, Enabled, Disabled.
CXL Encryption	Options available: Enabled, **Disabled**.
CXL DVSEC Lock	Options available: **Auto**, Enabled, Disabled.
CXL HDM Decoder Lock on Commit	Options available: **Auto**, Enabled, Disabled.
Temp Gen5 Advertisement	Options available: Disabled, Enabled, **Auto**.
Sync Header Bypass	Options available: **Auto**, Enabled, Disabled.
Sync Header Bypass Compatibility Mode	Options available: **Auto**, Enabled, Disabled.

Parameter	Description
CXL RAS	Press [Enter] for configuration of advanced items. ◆ CXL Protocol Error Reporting – Options available: Disabled, **SameAsPcieAer**, ForceAerFwFirstIfCxlPresent. ◆ CXL Component Error Reporting – Options available: Allow OS First, Force FW-First, **Debug FW-First**. ◆ CXL Root Port Isolation – Options available: **Auto**, Enabled, Disabled. ◆ CXL Root Port Isolation FW Notification. – Options available: **Auto**, Enabled, Disabled.
CXL Memory Online/Offline	All 4 Plink sots support memory online/offline. Only slot4 of Amber supports hot plug CXL memory interleaving automatically disabled globally when this CBS is enabled. Options available: Enabled, **Disabled**.
Override CXL Memory Size	Options available: 32GB, 64GB, 128GB, **Auto**.

5-4 AMD PBS Menu

AMD PBS Option menu displays submenu options for configuring the function of AMD PBS. Select a submenu item, then press [Enter] to access the related submenu screen.



Parameter	Description
RAS	Press [Enter] for configuration of advanced items.
SPI Locking	Enable/Disable SPI Locking for protect ROM part. Options available: **Disabled**, Enabled.

5-4-1 RAS

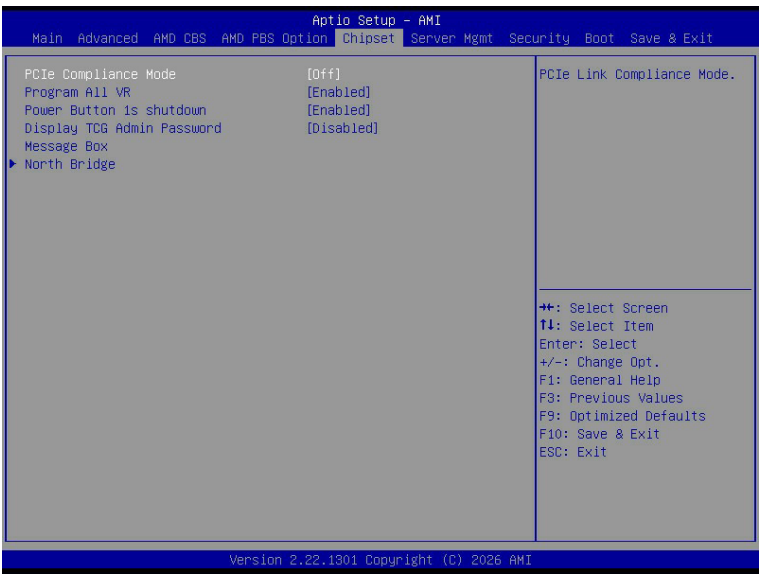


Parameter	Description
RAS Periodic SMI Control	Enable/Disable the Periodic SMI for polling [MCA Threshold] error. Options available: Disabled, **Enabled**.
SMI Threshold	Configures the SMI Threshold value.
SMI Scale	Configures the SMI Scale value.
SMI Scale Unit	Defines the unit of time scale. Options available: **millisecond**, second, minute.
SMI Period	Configures the SMI Period.
GHES Notify Type	Selects the Notification type for deferred/ corrected errors. Options available: **Polled**, SCI.
GHES UnCorr Notify Type	Selects the Notification type for uncorrected errors. Options available: Polled, **NMI**.
PCIe GHES Notify Type	Selects the Notification type for PCIe corrected errors. Options available: **Polled**, SCI.
PCIe UnCorr GHES Notify Type	Selects the Notification type for PCIe uncorrected errors. Options available: Polled, **NMI**.
PCIe Root Port Corr Err Mask Reg	Initialize the PCIe AER Corrected Error Mask register of Root Port.

Parameter	Description
PCIe Root Port UnCorr Err Mask Reg	Initialize the PCIe AER Uncorrected Error Mask register of Root Port.
PCIe Root Port UnCorr Err Sev Reg	Initialize the PCIe AER Uncorrected Error Severity register of Root Port.
PCIe Device Corr Err Mask Reg	Initialize the PCIe AER Corrected Error Mask register of PCIe device.
PCIe Device UnCorr Err Mask Reg	Initialize the PCIe AER Uncorrected Error Mask register of PCIe device.
PCIe Device UnCorr Err Sev Reg	Initialize the PCIe AER Uncorrected Error Severity register of PCIe device.
CXL DP CIE Mask Enable	Options available: Disabled, **Enabled**.
DRAM Hard Post Package Repair	This feature allows spare DRAM rows to replace malfunctioning rows via an in-field repair mechanism. Options available: **Disabled**, Enabled.
HEST DMC Structure Support	HEST DMC (Deferred Machine Check) Structure Support. Options available: **Disabled**, Enabled.
CXL Error Report Support	Enable/Disable CXL Error Reporting. Options available: **Disabled**, Enabled.

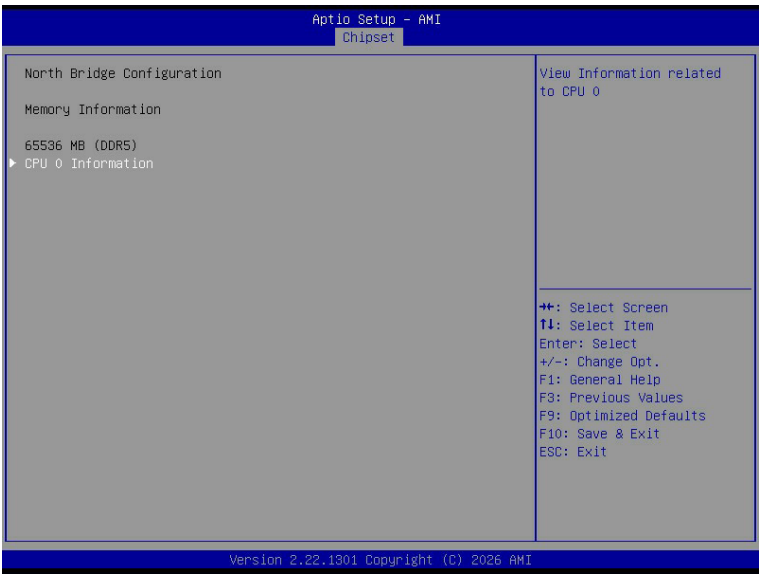
5-5 Chipset Setup Menu

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



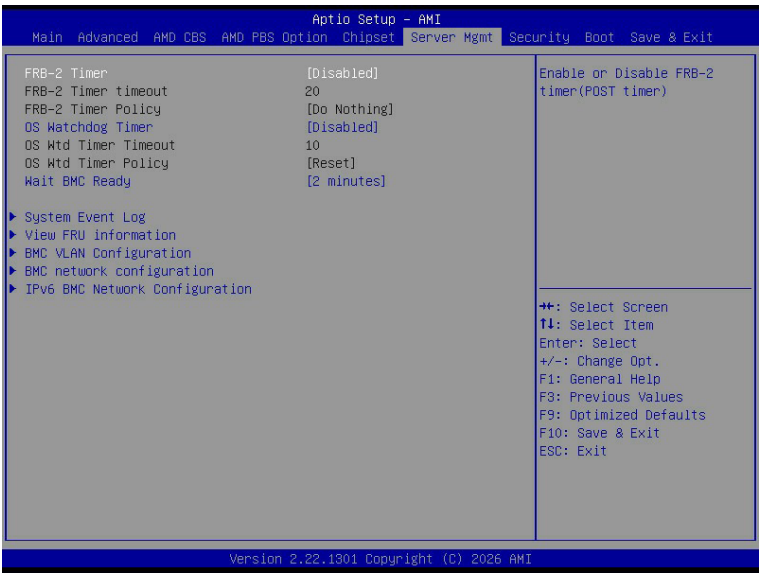
Parameter	Description
PCIe Compliance Mode	Options available: **Off**, On.
Program All VR	Enable/Disable program all VR on MB. Options available: Disabled, **Enabled**.
Power Button 1s shutdown	Enable/Disable Press power button 1 sec shutdown. Options available: Disabled, **Enabled**.
Display TCG Admin Password Message Box	Enable/Disable allow user control TCG Admin Password Message Box display at POST or not. Options available: **Disabled**, Enabled.
North Bridge	Press [Enter] for configuration of advanced items.

5-5-1 North Bridge



Parameter	Description
North Bridge Configuration Memory Information	
Total Memory	Displays the total memory information.
CPU 0 Information	Press [Enter] to view information related to CPU 0.

5-6 Server Management Menu



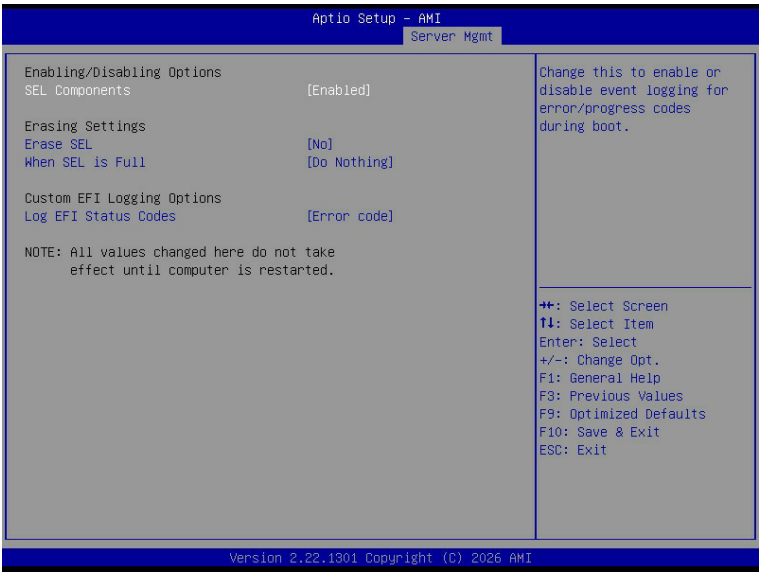
Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Default setting is **Disabled**.
FRB-2 Timer (Note1) timeout	Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is **30**.
FRB-2 Timer Policy(Note1)	Configures the FRB2 Timer policy. Options available: **Do Nothing**, Reset, Power Down, Power Cycle.
OS Watchdog Timer	Enable/Disable OS Watchdog Timer function. Options available: Enabled, **Disabled**.
OS Wtd Timer Timeout(Note2)	Configures OS Watchdog Timer. The value is between 1 to 30 minutes. Default setting is **10**.
OS Wtd Timer Policy(Note2)	Configure OS Watchdog Timer Policy. Options available: **Reset**, Do Nothing, Power Down, Power Cycle.
Wait BMC Ready	Post wait BMC ready and reboot system. Options available: Disabled, **2 minutes**, 4 minutes, 6 minutes.
System Event Log	Press [Enter] to configure advanced items.
View FRU Information	Press [Enter] to view the FRU information.

(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
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.

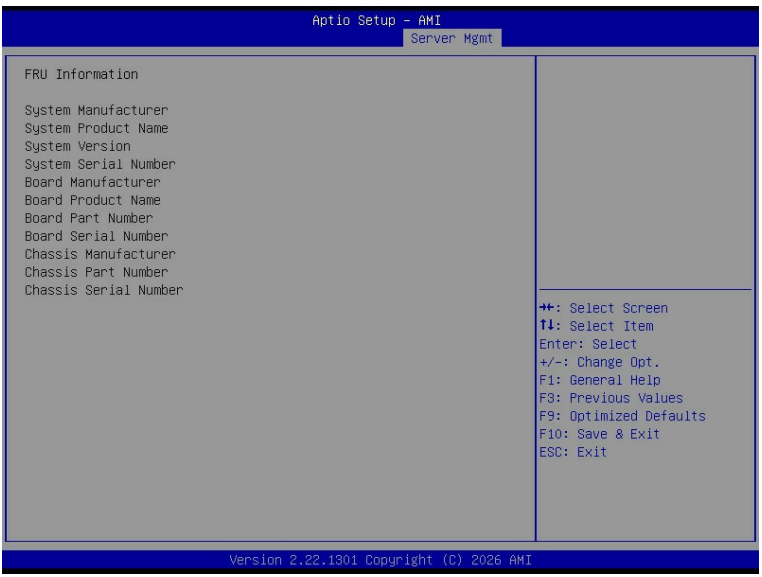
5-6-1 System Event Log



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.
Erasing Settings	
Erase SEL	Choose options for erasing SEL. Options available: **No**, Yes, On next reset, Yes, On every reset.
When SEL is Full	Choose options for reactions to a full SEL. Options available: **Do Nothing**, Erase Immediately, Delete Oldest Record.
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.

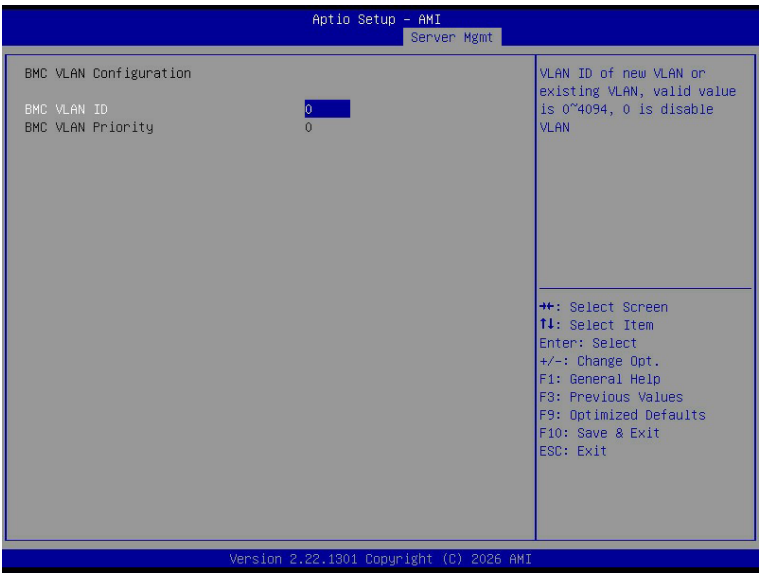
5-6-2 View FRU Information

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

5-6-3 BMC VLAN Configuration



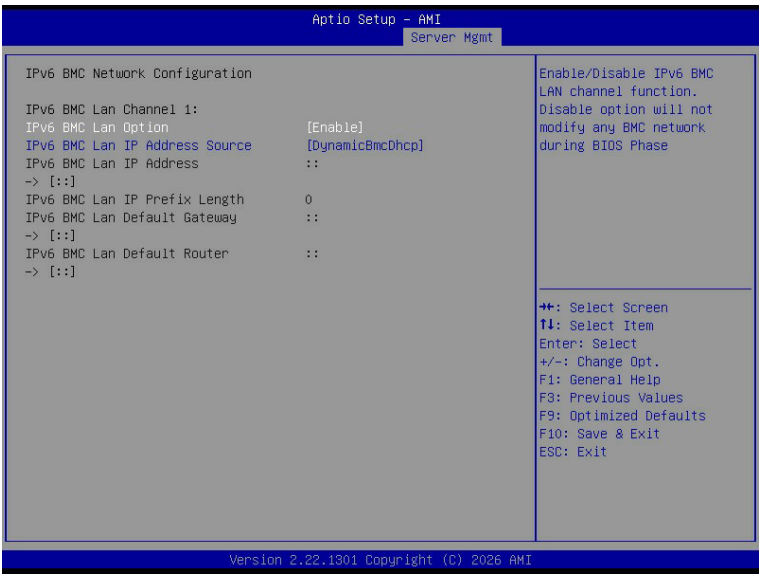
Parameter	Description
BMC VLAN Configuration	
BMC VLAN ID	Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When set to 0, BMC VLAN ID will be disabled.
BMC VLAN Priority	Select to configure BMC VLAN Priority. The valid range is from 0 to 7. When BMC VLAN ID is set to 0, BMC VLAN Priority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

5-6-4 BMC Network Configuration



Parameter	Description
Select NCSI and Dedicated LAN	Options available: Do Nothing, Mode1 (Dedicated), Mode2 (NCSI), **Mode3 (Failover)**.
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**.
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.
VLAN Support	Set BMC to enable/disable VLAN support. Options available: Enabled, **Disabled**.
Real-time get BMC network address	Press [Enter] will set LAN mode and Address source and then get IP, Subnet, Gateway and MAC address.

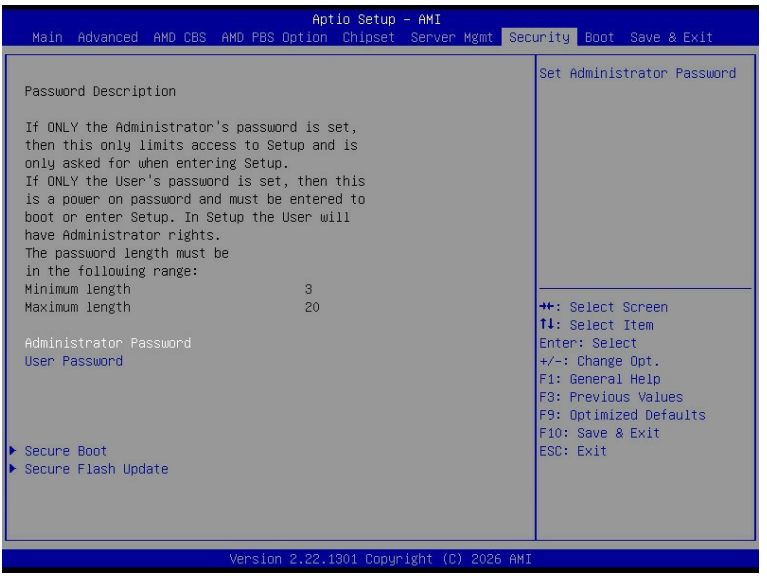
5-6-5 IPv6 BMC Network Configuration



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**.
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**.
IPv6 BMC Lan IP Address/ Prefix Length	Check if the IPv6 BMC LAN IP address matches those displayed on the screen.

5-7 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.

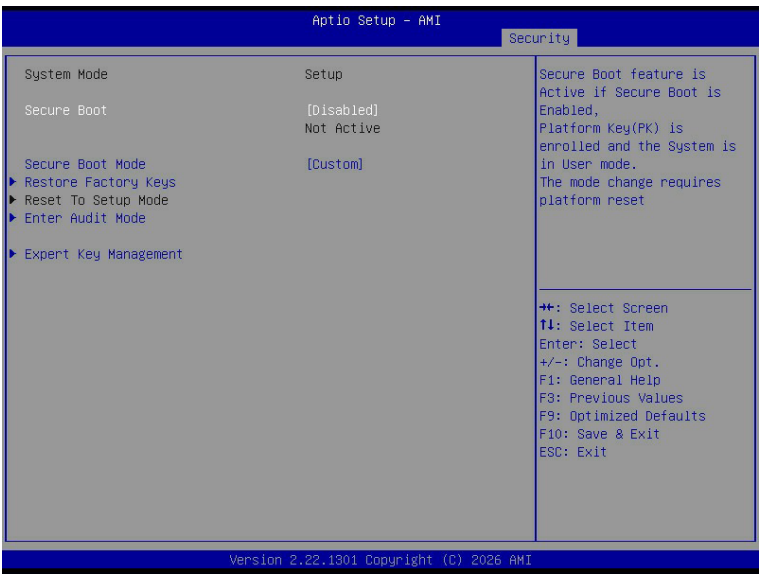
- User Password

  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.
Secure Flash Update	Press [Enter] to view firmware update information.

5-7-1 Secure Boot

The Secure Boot feature is applicable if supported by your Operating System. If your Operating System is not supporting Secure Boot, the system will hang when starting the Operating System.



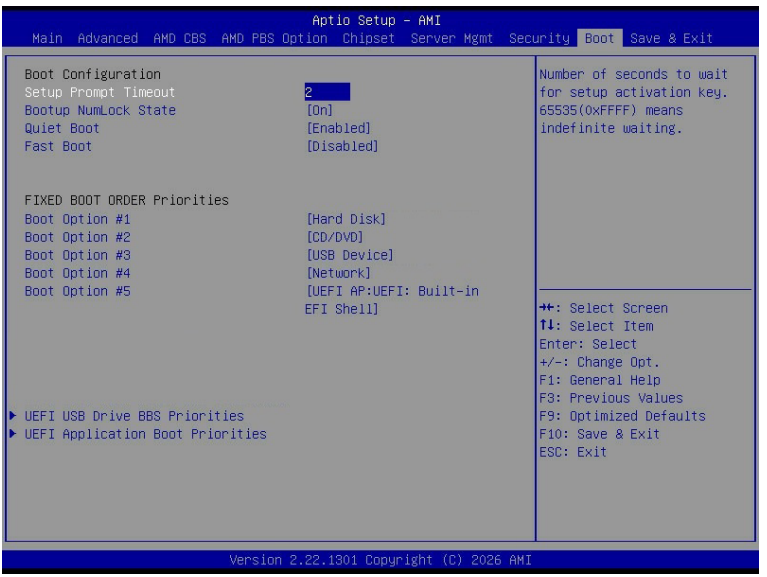
Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. Options available: Enabled, **Disabled**.
Secure Boot Mode(Note)	Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all files being loaded before the Operating System 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.
Restore Factory Keys	Forces the system to user mode and installs factory default Secure Boot key database.
Reset To Setup Mode	Press [Enter] to reset the system mode to Setup mode.
Enter Audit Mode	Press [Enter] to set the system mode to audit mode.

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

Parameter	Description
Key Management	Press [Enter] to configure advanced items. **Please note that this item is configurable when Secure Boot Mode is set to Custom.** ◆ Factory Key Provision – Allows to provision factory default Secure Boot keys when system is in Setup Mode. – Options available: Enabled, **Disabled**. ◆ Restore Factory Keys – Installs all factory default keys. It will force the system in User Mode. – Options available: Yes, No. ◆ Enroll Efi Image – Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db). ◆ Secure Boot variable – Displays the current status of the variables used for secure boot. ◆ Platform Key (PK) – Displays the current status of the Platform Key (PK). – Press [Enter] to configure a new PK. – Options available: Update. ◆ Key Exchange Keys (KEK) – Displays the current status of the Key Exchange Key Database (KEK). – Press [Enter] to configure a new KEK or load additional KEK from storage devices. – Options available: Update, Append. ◆ Authorized Signatures (DB) – Displays the current status of the Authorized Signature Database. – Press [Enter] to configure a new DB or load additional DB from storage devices. – Options available: Update, Append. ◆ Forbidden Signatures (DBX) – Displays the current status of the Forbidden Signature Database. – Press [Enter] to configure a new dbx or load additional dbx from storage devices. – Options available: Update, Append. ◆ Authorized TimeStamps (DBT) – Displays the current status of the Authorized TimeStamps Database. – Press [Enter] to configure a new DBT or load additional DBT from storage devices. – Options available: Update, Append. ◆ OsRecovery Signatures – Displays the current status of the OsRecovery Signature Database. – Press [Enter] to configure a new OsRecovery Signature or load additional OsRecovery Signature from storage devices. – Options available: Update, Append.

5-8 Boot Menu

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

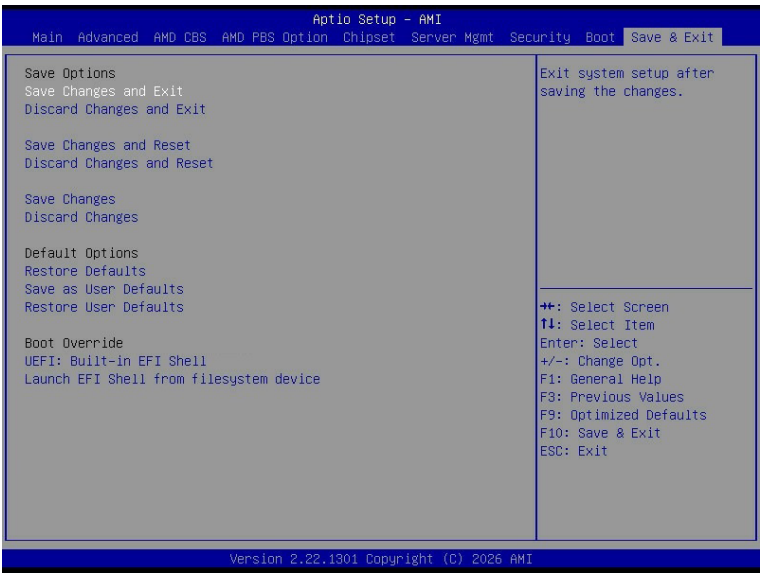


Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: **On**, Off.
Quiet Boot	Enable/Disable showing the logo during POST. Options available: Enabled, **Disabled**.
Fast Boot	Options available: **Disabled**, Enabled.
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.

Parameter	Description
UEFI NETWORK Drive BBS Priorities	Press [Enter] to configure the boot priority.
UEFI Application Boot Priorities	Press [Enter] to configure the boot priority.

5-9 Save & Exit Menu

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



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

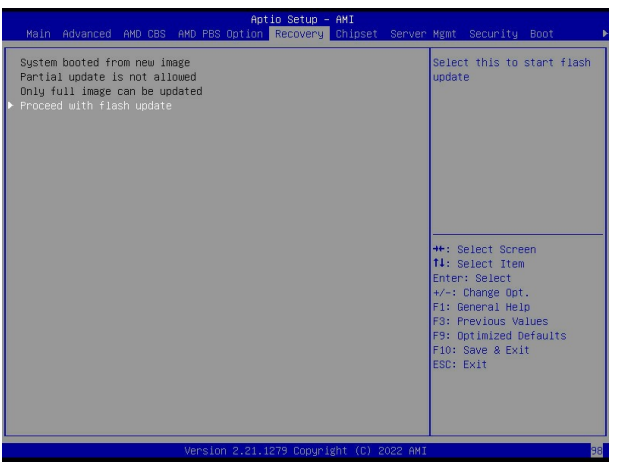
Parameter	Description
Restore Defaults	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system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

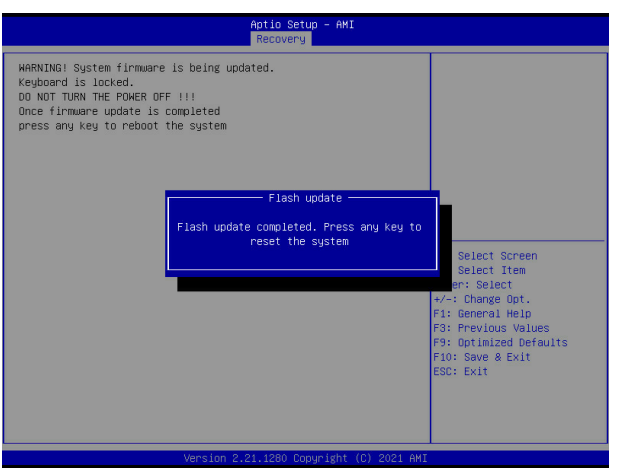
5-10 BIOS Recovery

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

Recovery Instruction:

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





Designed by

