GIGABYTE™

MW83-RP0

Motherboard - Intel® Xeon® W-3500/2500/3400/2400 - CEB UP

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

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

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

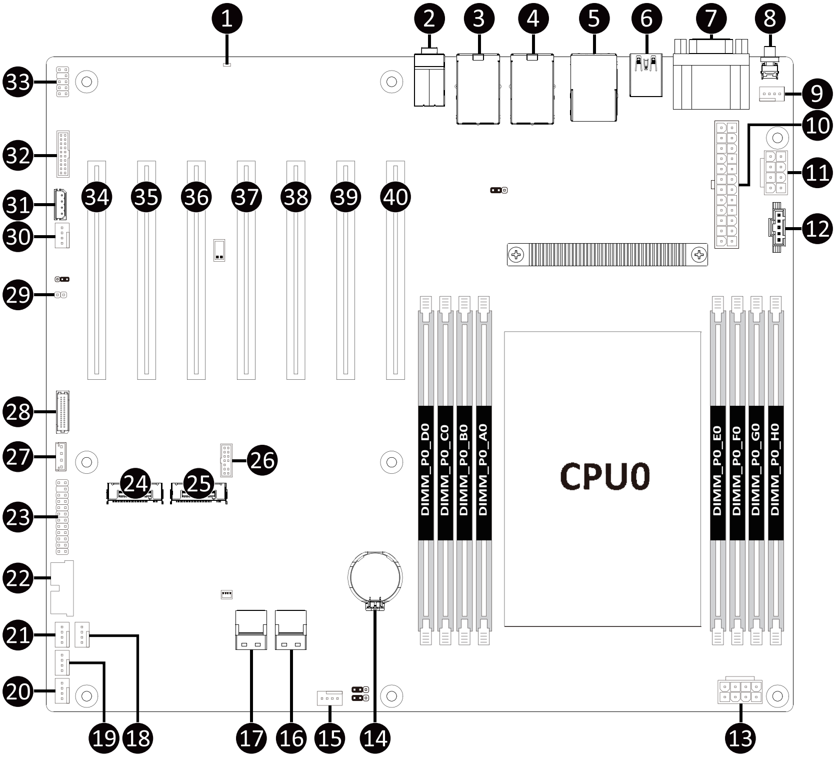
⚠ WARNING

- **INGESTION HAZARD:** This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours.**
- **KEEP** new and used batteries **OUT OF REACH of CHILDREN**
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.

- Battery type: CR2032, voltage rating: +3VDC.
- Non-rechargeable batteries are not to be recharged.
- Remove and immediately recycle or dispose of used batteries, batteries from equipment not used for an extended period of time according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Do not force discharge, recharge, disassemble, heat above (manufacturer's specified temperature rating) or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- For treatment information, call a local poison control center.
- The product contains non-replaceable batteries.

Table of Contents

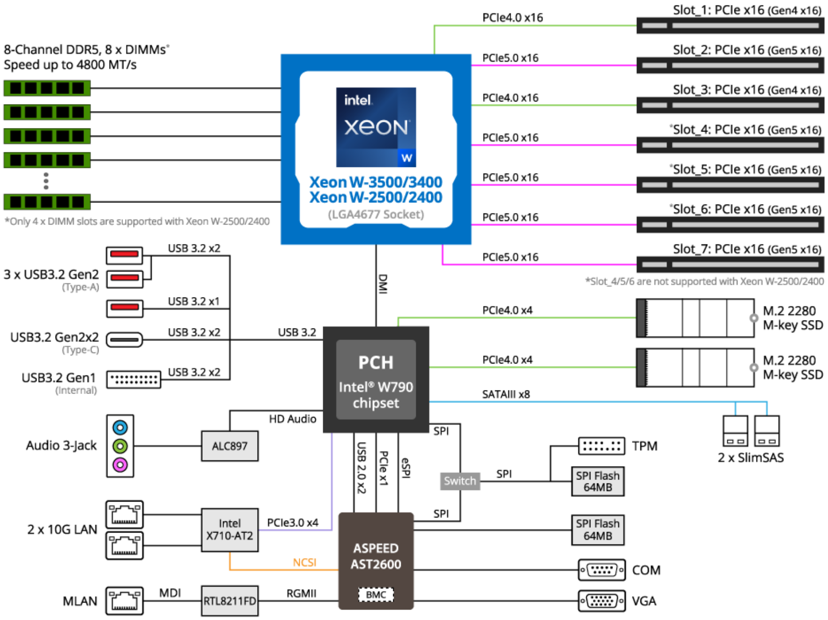
MW83-RP0 Motherboard Layout



Item	Code	Description
1	LED_BMC	BMC Firmware Readiness LED
2	AUDIO	Audio Connectors
3	LAN1	10GbE LAN Port #1
4	LAN2	10GbE LAN Port #2
5	USB3_MLAN	Server Management LAN Port (Top)/USB 3.2 Gen2 Type A Ports (Bottom)
6	USB32A/USB32C	USB 3.2 Gen2 Type A Port (Top)/USB 3.2 Gen2 Type C Port (Bottom)
7	COM1_VGA	Serial Port (Top)/VGA Port (Bottom)
8	SW_ID	ID Button with LED
9	CPU0_FAN	CPU Fan Connector
10	ATX1	2x12 Pin Main Power Connector
11	P12V_AUX2	2x4 Pin 12V Power Connector
12	PMBUS	PMBus Connector
13	P12V_AUX1	2x4 Pin 12V Power Connector
14	BAT	Battery Socket
15	SYS_FAN5	System Fan Connector #5
16	SL_SATA2	Slimline Connector #2 (SATA 6Gb/s Signal)
17	SL_SATA1	Slimline Connector #1 (SATA 6Gb/s Signal)
18	SYS_FAN2	System Fan Connector #2
19	SYS_FAN1	System Fan Connector #1
20	SYS_FAN3	System Fan Connector #3
21	SYS_FAN4	System Fan Connector #4
22	F_USB3	Front Panel USB 3.2 Gen2 Connector
23	FP_1	Front Panel Header
24	M2_0	M.2 Slot (PCIe Gen4 x4, Support NGFF-2280)
25	M2_1	M.2 Slot (PCIe Gen4 x4, Support NGFF-2280)
26	SPI_TPM	TPM Connector
27	SW_RAID	VROC Module Connector
28	BP_1	HDD Backplane Board Connector
29	CASE_OPEN	Case Open Intrusion Alert Header
30	SYS_FAN6	System Fan Connector #6
31	IPMB	IPMB Connector
32	CN_NCSI	NCSI Connector
33	F_AUDIO1	Front Audio Header
34	PCIE_1	PCIe x16 Slot (Gen4 x16)
35	PCIE_2	PCIe x16 Slot (Gen4 x16)
36	PCIE_3	PCIe x16 Slot (Gen4 x16)
37	PCIE_4	PCIe x16 Slot (Gen5 x16)[Note]
38	PCIE_5	PCIe x16 Slot (Gen5 x16)[Note]
39	PCIE_6	PCIe x16 Slot (Gen5 x16)[Note]
40	PCIE_7	PCIe x16 Slot (Gen5 x16)

(Note) Slot_4/5/6 are not supported with Intel® Xeon® W-2500/2400 Processors.

Block Diagram



Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual 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.
- To avoid any potential short circuit of the DIMM slots, please remove any stand-offs from the chassis that will be located underneath the DIMM slots, before installing the motherboard into the chassis.

1-2 Product Specifications

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

Form Factor	◆ CEB ◆ 304.8W x 266.7D (mm)
CPU	◆ Intel® Xeon® W-3500 Processors ◆ Intel® Xeon® W-2500 Processors* ◆ Intel® Xeon® W-3400 Processors ◆ Intel® Xeon® W-2400 Processors* ◆ Single processor, TDP up to 385W *Carriers for Intel® Xeon® W-2500/2400 Processors are not included. Please refer to the optional parts for proper support. Notice: Please select Intel® Xeon® W-3500/3400 Processors to enable all functions.
Socket	◆ 1 x LGA 4677 ◆ Socket E
Chipset	◆ Intel® W790
Memory	◆ *8 x DIMM slots ◆ DDR5 memory supported only ◆ 8-channel memory architecture ◆ RDIMM up to 64GB supported ◆ 3DS RDIMM up to 256GB supported ◆ Memory speed: Up to 4800 MT/s ***Only 4 x DIMM slots are supported with Intel® Xeon® W-2500/2400 Processors.** **NOTE: When installing memory modules, make sure to begin with the first socket of each channel, such as DIMM_P0_A0, DIMM_P0_B0, DIMM_P0_C0, DIMM_P0_D0**
LAN	◆ 2 x 10Gb/s LAN ports (1 x Intel® X710-AT2) - Support NCSI function ◆ 1 x 10/100/1000 Management LAN
Onboard Graphics	◆ Integrated in Aspeed® AST2600 - 1 x VGA port
Audio	◆ Realtek® ALC897 HD Audio Codec ◆ Supports 2/4/5.1/7.1 channel configurations ◆ 3 x Audio Jacks (Audio in/Audio out/Mic)
Storage Interface	**PCH:** ◆ 2 x SlimSAS connectors for 8 x SATA 6Gb/s

RAID	◆ Intel® SATA RAID 0/1/10/5
Expansion Slots	◆ Slot_7: PCIe x16 (Gen5 x16) slot, from CPU ◆ Slot_6: PCIe x16 (Gen5 x16) slot, from CPU* ◆ Slot_5: PCIe x16 (Gen5 x16) slot, from CPU* ◆ Slot_4: PCIe x16 (Gen5 x16) slot, from CPU* ◆ Slot_3: PCIe x16 (Gen4 x16) slot, from CPU ◆ Slot_2: PCIe x16 (Gen5 x16) slot, from CPU ◆ Slot_1: PCIe x16 (Gen4 x16) slot, from CPU ◆ 2 x M.2 slots: - M-key - PCIe Gen4 x4, from PCH - Support 2280 cards ***Slot_4/5/6 are not supported with Intel® Xeon® W-2500/2400 Processors.**
Internal I/O Connectors	◆ 1 x 24-pin ATX main power connector ◆ 2 x 8-pin ATX 12V power connectors ◆ 1 x CPU fan header ◆ 6 x System fan headers ◆ 1 x Front audio header ◆ 1 x USB 3.2 Gen1 x2 header ◆ 2 x M.2 slots ◆ 2 x SlimSAS connectors ◆ 1 x VROC connector ◆ 1 x Front panel header ◆ 1 x Backplane board header ◆ 1 x PMBus header ◆ 1 x IPMB header ◆ 1 x TPM header
Rear I/O Connectors	◆ 1 x USB 3.2 Gen2x2 (Type-C) ◆ 3 x USB 3.2 Gen2x1 (Type-A) ◆ 1 x VGA ◆ 1 x COM ◆ 2 x RJ45 ◆ 1 x MLAN ◆ 3 x Audio jacks ◆ 1 x ID button with LED
TPM	◆ 1 x TPM Header with SPI Interface - **Optional** TPM2.0 kit: CTM010

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

1-3 Installing and Removing the CPU

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

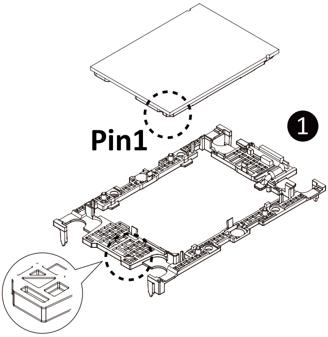
- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Unplug all cables from the power outlets.
- Disconnect all telecommunication cables from their ports.
- Place the system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

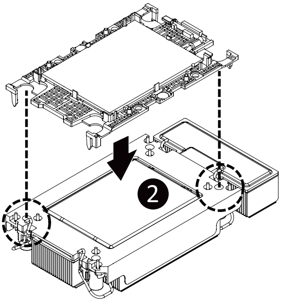
WARNING!

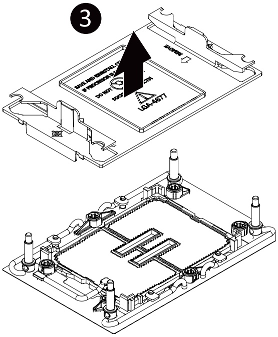
Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

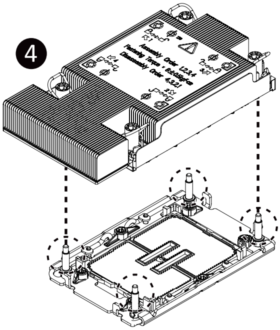
Follow these instructions to Install the CPU:

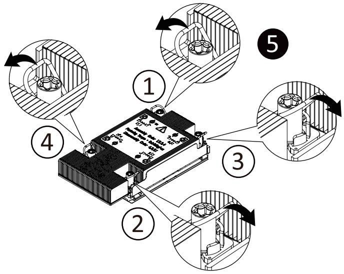
1. Align and install the processor on the carrier.
   NOTE: Apply thermal compound evenly on the top of the CPU. Remove the protective cover from the underside of the heat sink.
2. Carefully flip the heat sink cover. Then install the carrier assembly on the bottom of the heat sink and make sure the gold arrow is located in the correct direction.
3. Remove the CPU cover.
   NOTE: Save the CPU cover in the event that you need to remove the CPU from the socket.
4. Align the heat sink with the CPU socket by the guide pins and make sure the gold arrow is located in the correct direction. Then place the heat sink onto the top of the CPU socket.
5. Position the rotating wires into the latch position. Tighten the screws in a sequential order (1→2→3→4).
   NOTE: When dissembling the heat sink, loosen the screws in reverse order (4→3→2→1) and then move the rotating wires into the unlatch position.











NOTE!

- The illustrations of the heat-sink installation shown are for reference only.

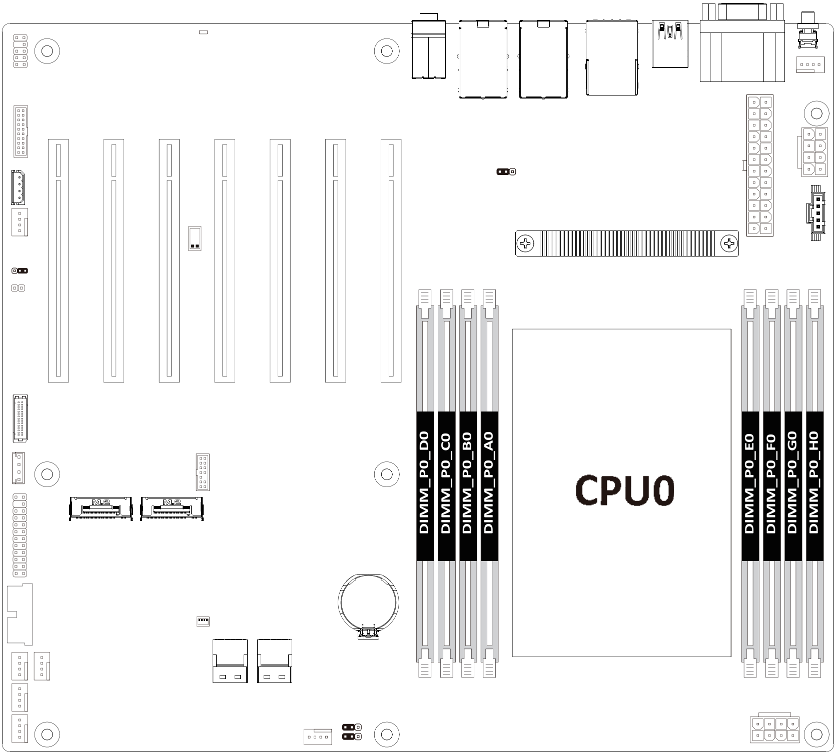
1-4 Installing and Removing Memory

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

- Make sure that the motherboard supports the memory. It is recommended to use memory of the same capacity, brand, speed, and chips.
- 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.

1-4-1 8-Channel Memory Configuration

This motherboard provides 8 DDR5 memory slots and supports 8-Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.

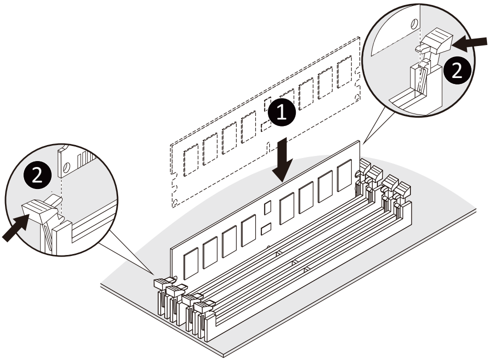


1-4-2 Installing and Removing a Memory Module

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

Follow these instructions to install a DIMM module:

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



1-4-3 DIMM Population Table

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)	Speed (MT/s); Voltage (V); DIMM per Channel (DPC)
			1DPC*
		16Gb	1.1V
RDIMM	SRx8 (RC D)	16GB	4800
	SRx4 (RC C)	32GB	
	SRx4 (RC F) 9x4	32GB	
	DRx8 (RC E)	32GB	
	DRx4 (RC A)	64GB	
	DRx4 (RC B) 9x4	64GB	
RDIMM 3DS	(4R/8R)x4 (RC A)	2H-128GB 4H-256GB	

*1DPC applies to 1SPC or 2SPC implementations (SPC - Sockets Per Channel)

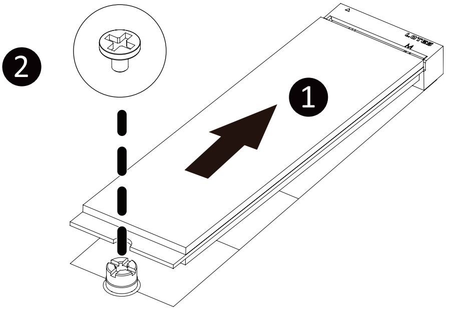
NOTE!

- Only 4 x DIMM slots are supported with Intel® Xeon® W-2500/2400 Processors.

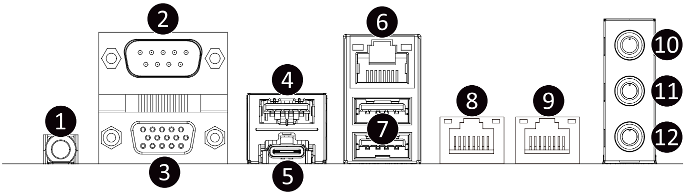
1-5 Installing the M.2 SSD Module

Follow the steps below to install a M.2 SSD module on your motherboard.

Step1. Insert the M.2 SSD module into the slot.
Step2. Secure it with the screw, tightening as necessary to fasten the M.2 SSD module in place.



1-6 Back Panel Connectors



❶ **ID button with LED**

When the system identification is active, the ID LED on the front/ back panel glows blue.

❷ **Serial Port**

Connect to serial-based mouse or data processing devices.

❸ **VGA Port**

Connect to a monitor device.

❹ **USB 3.2 Gen2 Type-A Port**

The USB port supports the USB 3.2 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

❺ **USB 3.2 Gen2 Type-C Port**

The USB port supports the USB 3.2 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

❻ **Server Management LAN Port**

The LAN port provides Internet connection with data transfer speeds of 10/100/1000Mbps. This port is the dedicated LAN port for Server Management.

❼ **USB 3.2 Gen2 Ports**

The USB port supports the USB 3.2 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive etc.

❽ **10GbE LAN Port #2**

The Gigabit Ethernet LAN port provides Internet connection at up to 10 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

❾ **10GbE LAN Port #1**

The Gigabit Ethernet LAN port provides Internet connection at up to 10 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

❿ **Line In Jack (Blue)**

The default Line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc

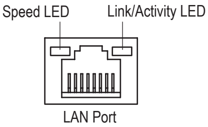
⓫ **Line Out Jack (Green)**

The default Line Out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

⓬ **Mic In Jack (Pink)**

The default MIC In jack. A microphone can be connected to the MIC In jack.

LAN and ID Button LEDs



10GbE LAN LED:

State	Description
Yellow On	5Gbps, 2.5Gbps, 1Gps data rate
Green On	10Gbps data rate
Off	100Mbps data rate

10/100/1000 LAN LED:

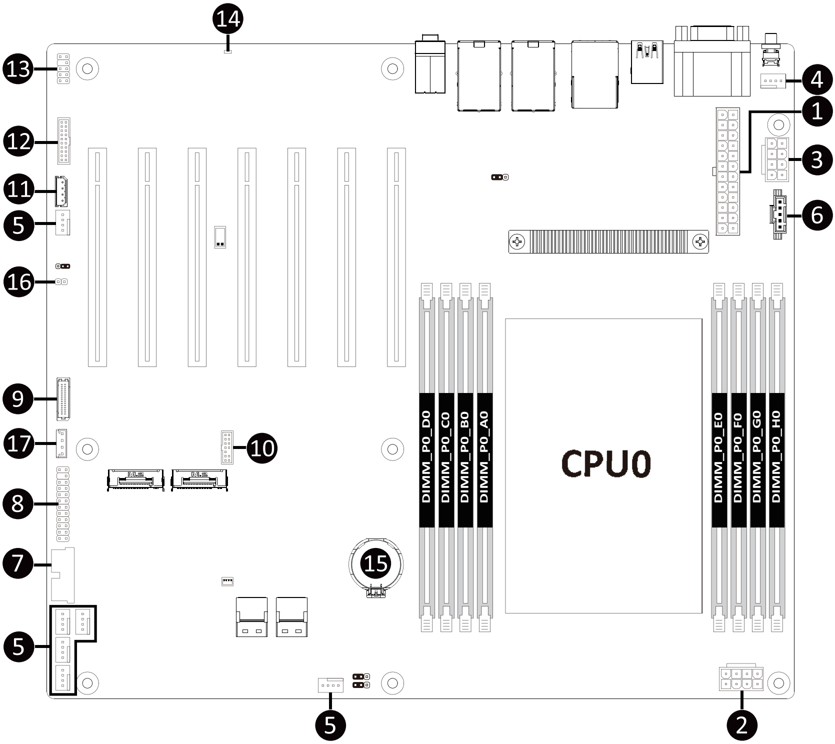
State	Description
Yellow On	1Gbps data rate
Green On	100Mbps data rate
Off	10Mbps data rate

ID button/LED:

State	Description
Blue On	System identification is active
Off	System identification is disabled

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

1-7 Internal Connectors



1)	ATX1	11)	IPMB
2)	P12V_AUX1	12)	CN_NCSI
3)	P12V_AUX2	13)	F_AUDIO1
4)	CPU0_FAN	14)	LED_BMC
5)	SYS_FAN1/2/3/4/5/6	15)	BAT
6)	PMBUS	16)	CASE_OPEN
7)	F_USB3	17)	SW_RAID
8)	FP_1		
9)	BP_1		
10)	SPI_TPM		

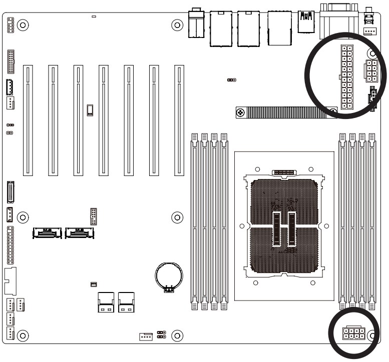
Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

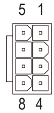
1/2/3) ATX1/P12V_AUX1/P12V_AUX2
(2x12 Main Power Connector and 2x4 12V Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation. The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.

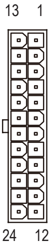


P12V_AUX1/P12V_AUX2



Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V

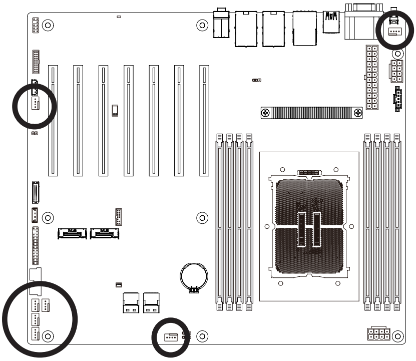
ATX

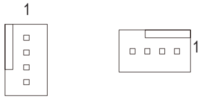


Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	NC
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

4/5) CPU0_FAN/SYS_FAN1/2/3/4/5/6 (Fan Headers)

The motherboard has one 4-pin CPU fan header (CPU_FAN), and six 4-pin (SYS_FAN) system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The motherboard supports CPU fan speed control, which requires the use of a CPU fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



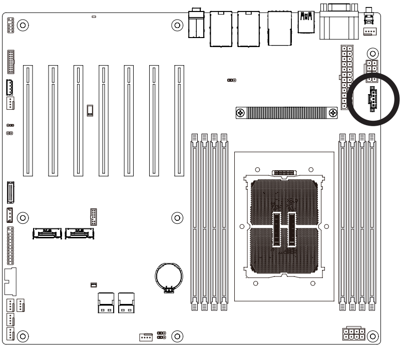


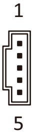
Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

6) PMBus Connector

The Power Management Bus (PMBus) is a variant of the System Management Bus (SMBus) which is targeted at digital management of power supplies.

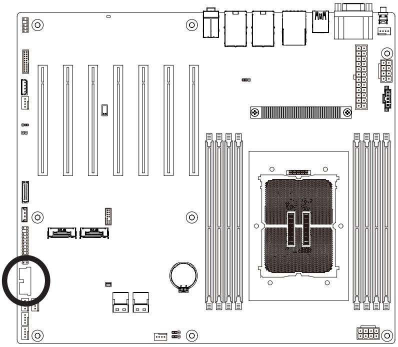


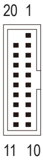


Pin No.	Definition
1	PMBus Clock
2	PMBus Data
3	PMBus Alert
4	GND
5	3.3V Sense

7) F_USB3 (Front Panel USB 3.2 Gen2 Connector)

The connector/header conform to USB 2.0/ 3.0 specification. Each USB connector/header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

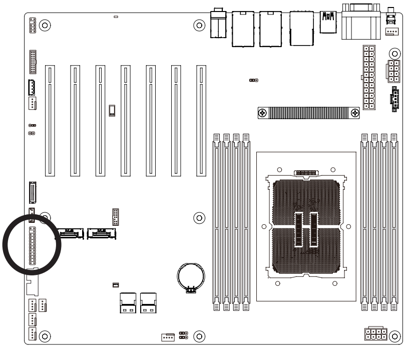


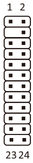


Pin No.	Definition	Pin No.	Definition
1	Power	11	IntA_P2_D+
2	IntA_P1_SSRX-	12	IntA_P2_D-
3	IntA_P1_SSRX+	13	GND
4	GND	14	IntA_P2_SSTX+
5	IntA_P1_SSTX-	15	IntA_P2_SSTX-
6	IntA_P1_SSTX+	16	GND
7	GND	17	IntA_P2_SSRX+
8	IntA_P1_D-	18	IntA_P2_SSRX-
9	IntA_P1_D+	19	Power
10	NC	20	No Pin

8) FP_1 (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

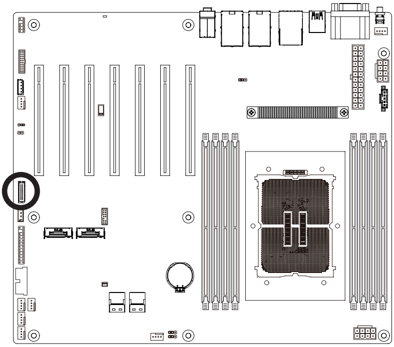


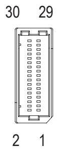


Pin No.	Definition	Pin No.	Definition
1	Power LED+	2	5V Standby
3	No Pin	4	ID LED+
5	Power LED-	6	ID LED-
7	HDD LED+	8	System Status LED+
9	HDD LED-	10	System Status LED -
11	Power Button	12	LAN1 Active LED+
13	GND	14	LAN1 Link LED-
15	Reset Button	16	SMBus Data
17	GND	18	SMBus Clock
19	ID Button	20	Case Open
21	GND	22	LAN2 Actve LED+
23	NMI Switch	24	LAN2 Link LED-

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

9) BP_1 (HDD Backplane Board Connector)

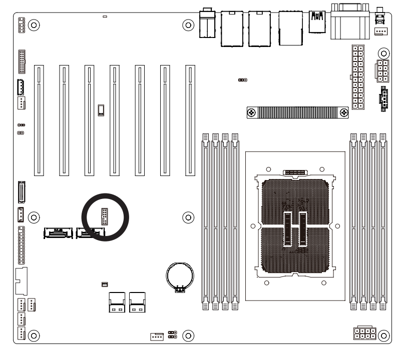


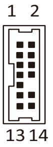


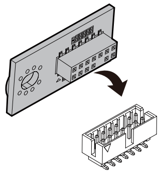
Pin No.	Definition	Pin No.	Definition
1	HP_ALERT_L	2	BPMI DIN/OUT
3	GND	4	BPMI DOUT/IN
5	BPMI_LOAD	6	GND
7	BPMI_CLK	8	PLD_Program_EN
9	GLED_AMB_N	10	GLED_GRN_N
11	FAN_IRQ_N	12	Reserved
13	BP_SCL	14	GND
15	BP_SDA	16	BP_RST_N
17	SMB_U2_TMP_SCL	18	GND
19	SMB_U2_TMP_SDA	20	12C_DEV_RST
21	PH_HP_SCL0	22	GND
23	PH_HP_SDA0	24	GND
25	PH_HP_SCL1	26	GND
27	PH_HP_SDA1	28	GND
29	P3V3_AUX	30	P3V3_AUX

10) SPI_TPM (Trusted Platform Module Connector)

Trusted Platform Module (TPM) is an international standard for a secure cryptoprocessor, a dedicated microcontroller designed to secure hardware through integrated cryptographic keys.



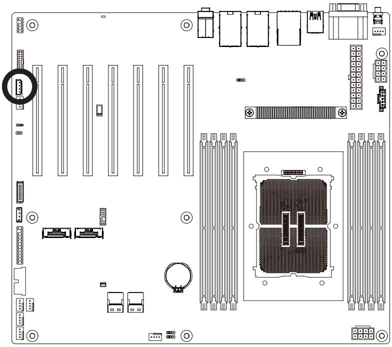


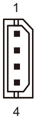


Pin No.	Definition	Pin No.	Definition
1	Clock	8	NC
2	P_3V3_AUX	9	NC
3	LPC_RST	10	No Pin
4	NC	11	NC
5	SPI_MISO	12	GND
6	IRQ_SPI	13	SPI_CS_N
7	SPI_MOSI	14	GND

11) IPMB (Intelligent Platform Management Bus) Connector

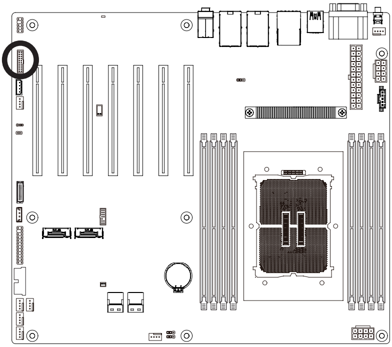
The Intelligent Platform Management Bus Communications Protocol defines a byte-level transport for transferring Intelligent Platform Management Interface Specification (IPMI) messages between intelligent I2C devices.

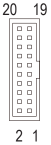




Pin No.	Definition
1	Clock
2	Data
3	GND
4	VCC

12) CN_NCSI (NCSI Connector)

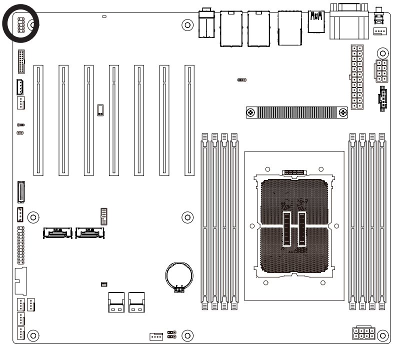


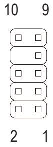


Pin No.	Definition	Pin No.	Definition
1	NCSI_CLK	2	GND
3	NCSI_RX_D0	4	GND
5	NCSI_RX_D1	6	GND
7	NCSI_CRS_DV	8	GND
9	NCSI_RX_ER	10	GND
11	P3V3_AUX	12	GND
13	NCSI_TX_D1	14	GND
15	NCSI_TX_D0	16	GND
17	NCSI_TX_EN	18	GND
19	NCSI_PRESENT	20	P3V3_AUX

13) F_AUDIO1 (Front Panel Audio Header)

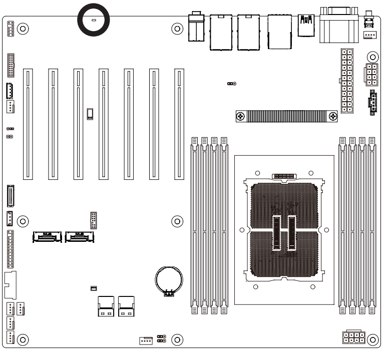
The front panel audio header supports Intel High Definition audio (HD). You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.





Pin No.	Definition
1	MIC_L
2	GND
3	MIC_R
4	Power (3.3V)
5	LINE_R
6	GND
7	AUDIO_JD
8	NA
9	LINE_L
10	GND

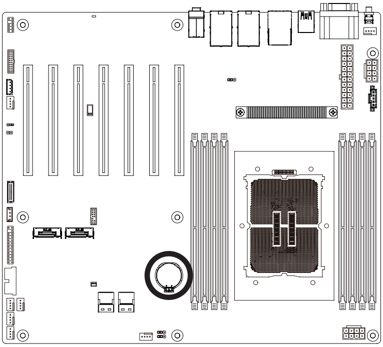
14) LED_BMC (BMC Firmware Readiness LED)

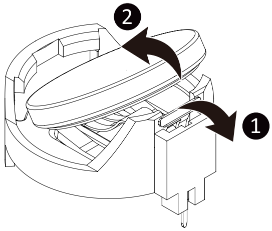


State	Description
On	BMC firmware is initial
Blink	BMC firmware is ready
Off	AC loss

15) BAT (Battery Socket)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.

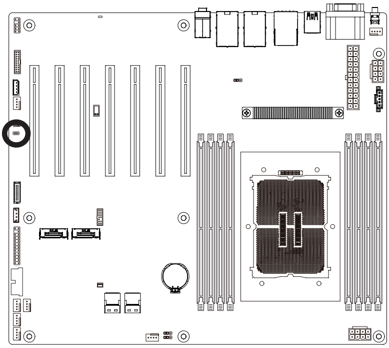




- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- Used batteries must be handled in accordance with local environmental regulations.

16) CASE_OPEN (Case Open Intrusion Alert Header)

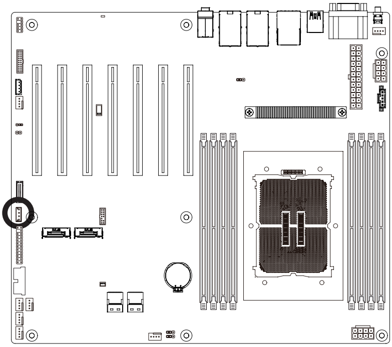
This motherboard provides a chassis detection feature that detects if the chassis cover has been removed. This function requires a chassis with chassis intrusion detection design.

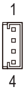


▫▫ Open: Normal Operation (Default)

▪▪ Closed: Active Chassis Intrusion Alert

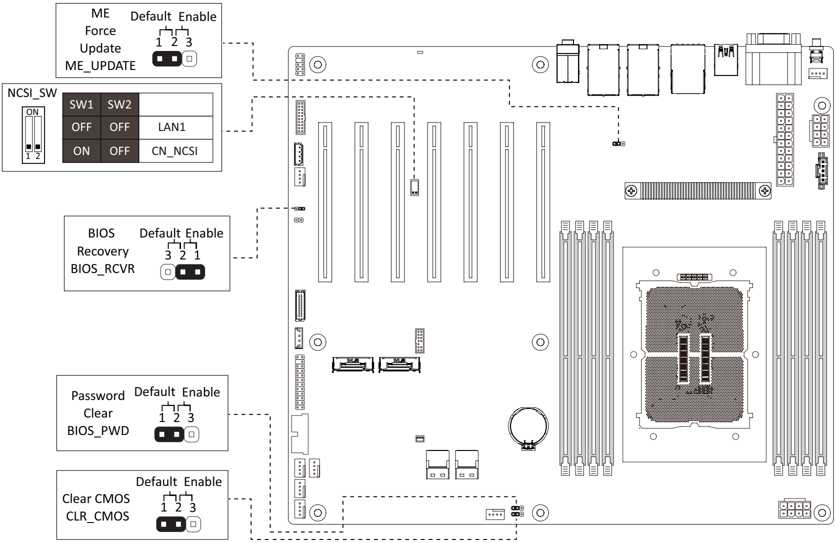
17) SW_RAID (SATA RAID Upgrade Key)





Pin No.	Definition
1	GND
2	P_3V3_AUX
3	GND
4	PCH_SATA_RAID_KEY

1-8 Jumper Settings



SW1	SW2	
OFF	OFF	LAN1
ON	OFF	CN_NCSI

Chapter 2 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 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

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

- **Main**

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

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

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

  This setup page includes all the submenu options for configuring the functions of the Platform Controller Hub.
- **Server Management**

  Server additional features enabled/disabled setup menus.
- **Security**

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

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

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

  This setup page provides items for configuration of the boot sequence.
- **Save & Exit**

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

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

2-1 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.

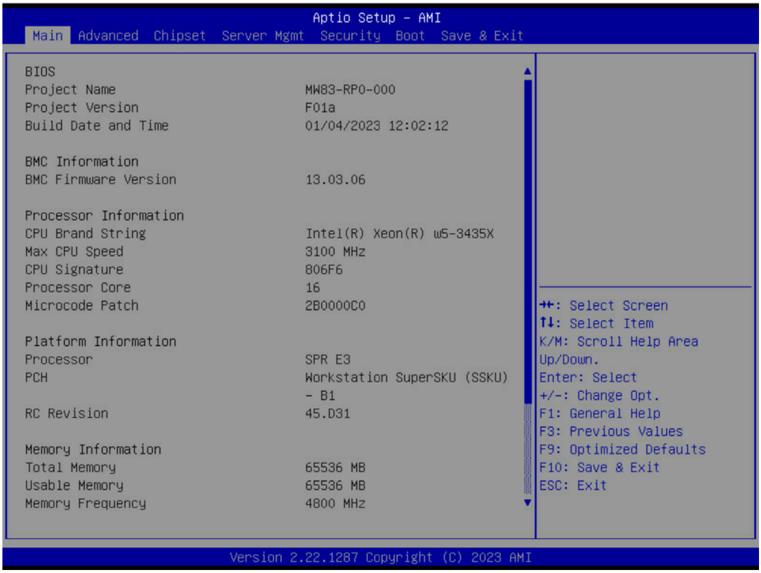
Main Menu Help

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.



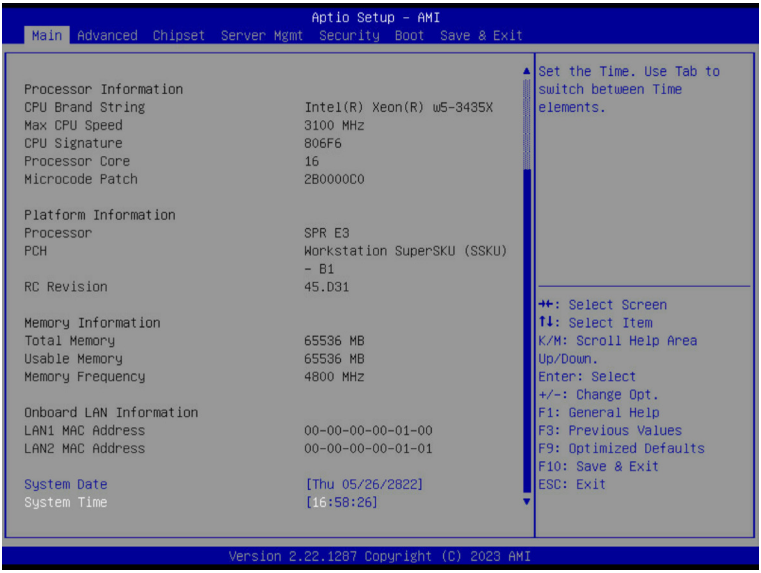
```
                              Aptio Setup - AMI
   Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

  BIOS
  Project Name                      MW83-RP0-000
  Project Version                   F01a
  Build Date and Time               01/04/2023 12:02:12

  BMC Information
  BMC Firmware Version              13.03.06

  Processor Information
  CPU Brand String                  Intel(R) Xeon(R) w5-3435X
  Max CPU Speed                     3100 MHz
  CPU Signature                     806F6
  Processor Core                    16
  Microcode Patch                   2B0000C0               →←: Select Screen
                                                           ↑↓: Select Item
  Platform Information                                     K/M: Scroll Help Area
  Processor                         SPR E3                 Up/Down.
  PCH                               Workstation SuperSKU (SSKU) Enter: Select
                                    - B1                   +/-: Change Opt.
  RC Revision                       45.D31                 F1: General Help
                                                           F3: Previous Values
  Memory Information                                       F9: Optimized Defaults
  Total Memory                      65536 MB               F10: Save & Exit
  Usable Memory                     65536 MB               ESC: Exit
  Memory Frequency                  4800 MHz

               Version 2.22.1287 Copyright (C) 2023 AMI
```



```
                              Aptio Setup - AMI
  Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

  Processor Information                                  Set the Time. Use Tab to
  CPU Brand String          Intel(R) Xeon(R) w5-3435X    switch between Time
  Max CPU Speed             3100 MHz                     elements.
  CPU Signature             806F6
  Processor Core            16
  Microcode Patch           2B0000C0

  Platform Information
  Processor                 SPR E3
  PCH                       Workstation SuperSKU (SSKU)
                            - B1
  RC Revision               45.D31
                                                         ++: Select Screen
  Memory Information                                     ↑↓: Select Item
  Total Memory              65536 MB                     K/M: Scroll Help Area
  Usable Memory             65536 MB                     Up/Down.
  Memory Frequency          4800 MHz                     Enter: Select
                                                         +/-: Change Opt.
  Onboard LAN Information                                F1: General Help
  LAN1 MAC Address          00-00-00-00-01-00            F3: Previous Values
  LAN2 MAC Address          00-00-00-00-01-01            F9: Optimized Defaults
                                                         F10: Save & Exit
  System Date               [Thu 05/26/2822]             ESC: Exit
  System Time               [16:58:26]

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```

Parameter	Description
BIOS Information	
Project Name	Displays the project name information.
Project Version	Displays version number of the BIOS setup utility.
Build Date and Time	Displays the date and time when the BIOS setup utility was created.
BMC Information(Note1)	
BMC Firmware Version(Note1)	Displays BMC firmware version information.
Processor Information	
CPU Brand String/ Max CPU Speed / CPU Signature / Processor Core / Microcode Patch	Displays the technical information for the installed processor(s).
Platform Information	
Processor/ PCH/ RC Revision	Displays the information of the installed processor(s) and PCH.
Memory Information(Note2)	
Total Memory	Displays the total memory size of the installed memory.
Usable Memory	Displays the usable memory size of the installed memory.

(Note1) Functions available on selected models.

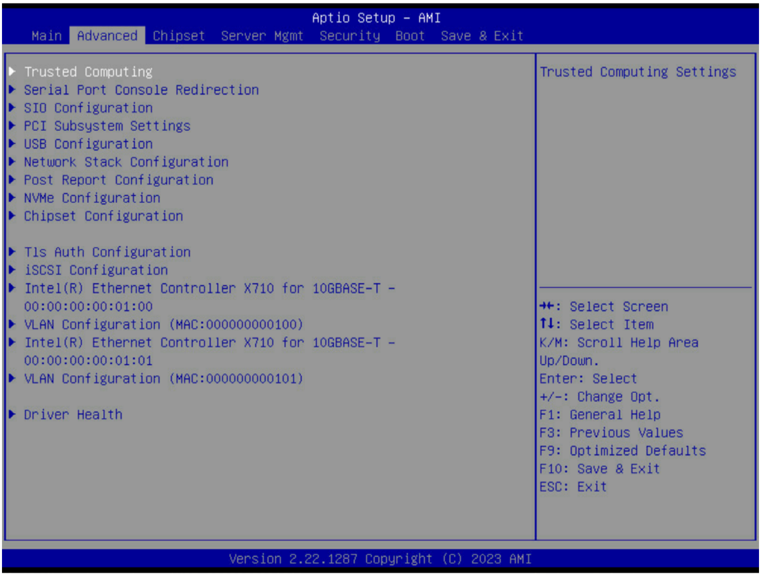
(Note2) This section will display capacity and frequency information of the memory that the customer has installed.

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

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

2-2 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.



```
                              Aptio Setup - AMI
   Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

► Trusted Computing                                      Trusted Computing Settings
► Serial Port Console Redirection
► SIO Configuration
► PCI Subsystem Settings
► USB Configuration
► Network Stack Configuration
► Post Report Configuration
► NVMe Configuration
► Chipset Configuration

► Tls Auth Configuration
► iSCSI Configuration
► Intel(R) Ethernet Controller X710 for 10GBASE-T -
  00:00:00:00:01:00                                      →←: Select Screen
► VLAN Configuration (MAC:000000000100)                  ↑↓: Select Item
► Intel(R) Ethernet Controller X710 for 10GBASE-T -      K/M: Scroll Help Area
  00:00:00:00:01:01                                      Up/Down.
► VLAN Configuration (MAC:000000000101)                  Enter: Select
                                                         +/-: Change Opt.
► Driver Health                                          F1: General Help
                                                         F3: Previous Values
                                                         F9: Optimized Defaults
                                                         F10: Save & Exit
                                                         ESC: Exit

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```
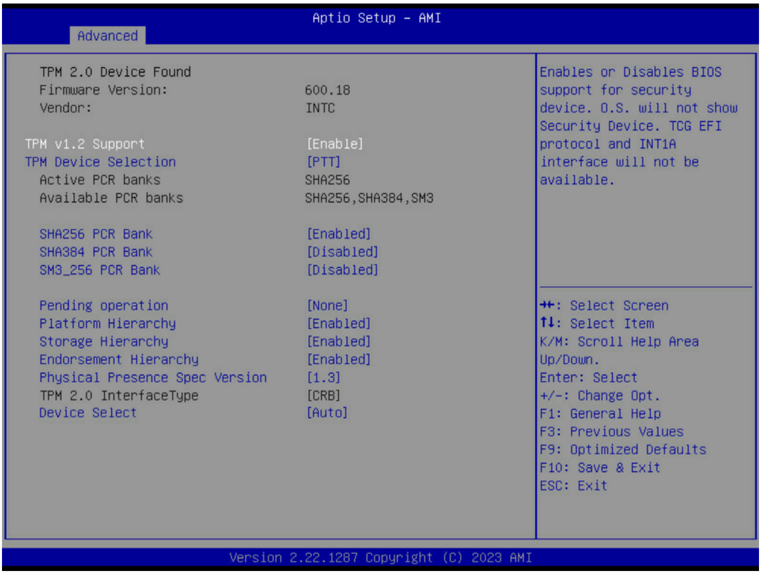

2-2-1 Trusted Computing



```
                              Aptio Setup - AMI
    Advanced
  TPM 2.0 Device Found                                  Enables or Disables BIOS
  Firmware Version:              600.18                 support for security
  Vendor:                        INTC                   device. O.S. will not show
                                                        Security Device. TCG EFI
TPM v1.2 Support                 [Enable]               protocol and INT1A
TPM Device Selection             [PTT]                  interface will not be
  Active PCR banks               SHA256                 available.
  Available PCR banks            SHA256,SHA384,SM3

  SHA256 PCR Bank                [Enabled]
  SHA384 PCR Bank                [Disabled]
  SM3_256 PCR Bank               [Disabled]

  Pending operation              [None]                 →←: Select Screen
  Platform Hierarchy             [Enabled]              ↑↓: Select Item
  Storage Hierarchy              [Enabled]              K/M: Scroll Help Area
  Endorsement Hierarchy          [Enabled]              Up/Down.
  Physical Presence Spec Version [1.3]                  Enter: Select
  TPM 2.0 InterfaceType          [CRB]                  +/-: Change Opt.
  Device Select                  [Auto]                 F1: General Help
                                                        F3: Previous Values
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit

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```
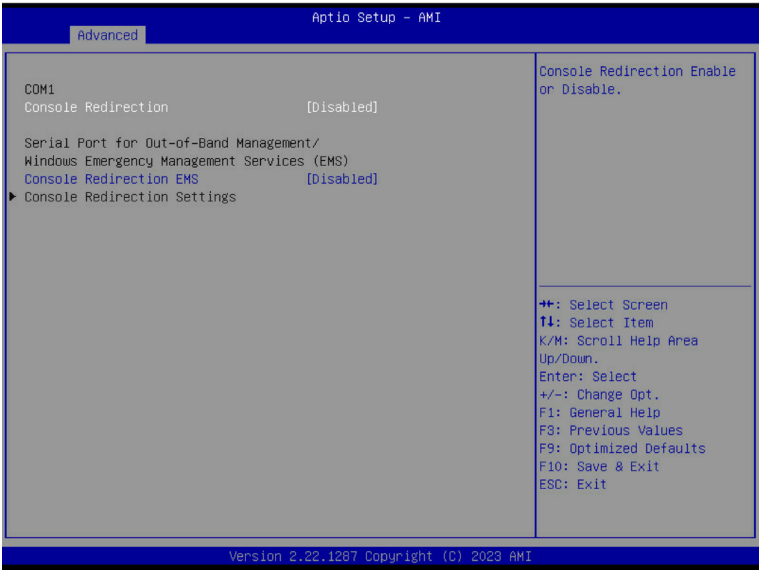

Parameter	Description
TPM 2.0 Device Found	
Firmware Version/ Vendor	Displays the firmware version and Vendor information.
TPM v1.2 Support	Enable/Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available. Options available: Disable, Enable. Default setting is **Enable**.
TPM Device Selection	Selets TPM device. Options available: dTPM, PTT. Default setting is **PTT**.
Active PCR banks/ Available PCR banks	Displays active/available Platform Configuration Register (PCR) banks.
SHA256 PCR Bank	Enable/Disable SHA256 PCR bank. Options available: Disabled, Enabled. Default setting is **Enabled**.
SHA384 PCR Bank	Enable/Disable SHA384 PCR bank. Options available: Disabled, Enabled. Default setting is **Disabled**.
SM3_256 PCR Bank	Enable/Disable SM3_256 PCR bank. Options available: Disabled, Enabled. Default setting is **Disabled**.

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

2-2-2 Serial Port Console Redirection



```
                          Aptio Setup - AMI
     Advanced

 COM1                                              Console Redirection Enable
 Console Redirection             [Disabled]        or Disable.

 Serial Port for Out-of-Band Management/
 Windows Emergency Management Services (EMS)
 Console Redirection EMS         [Disabled]
▶ Console Redirection Settings



                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   K/M: Scroll Help Area
                                                   Up/Down.
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F3: Previous Values
                                                   F9: Optimized Defaults
                                                   F10: Save & Exit
                                                   ESC: Exit

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```

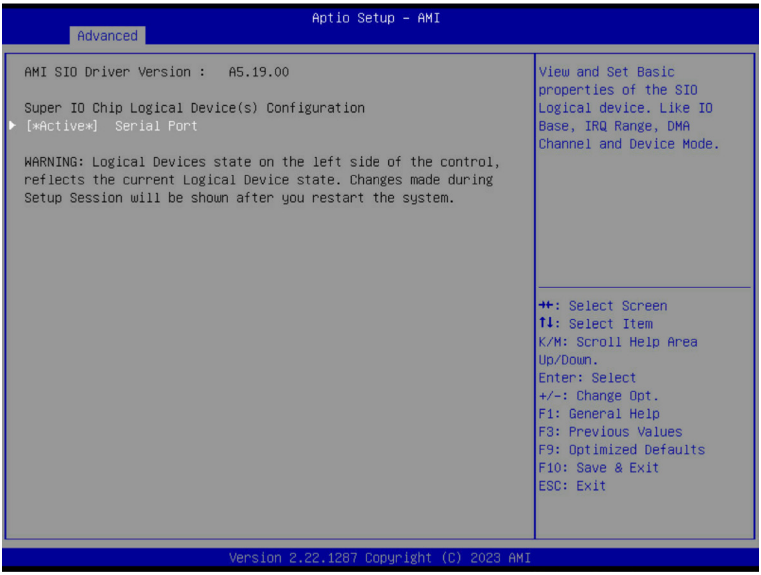
Parameter	Description
COM1 Console Redirection(Note)	Console redirection enables the users to manage the system from a remote location. Options available: Enabled, Disabled. Default setting is **Disabled**.
COM1 Console Redirection Settings	Press [Enter] to configure advanced items. **Please note that this item is configurable when COM1 Console Redirection is set to Enabled.** ◆ Terminal Type – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100PLUS, VT-UTF8, ANSI. Default setting is **VT100PLUS**. ◆ Bits per second – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 38400, 57600, 115200. Default setting is **115200**. ◆ Data Bits – Selects the number of data bits used for console redirection. – Options available: 7, 8. Default setting is **8**.

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

Parameter	Description
COM1 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. Default setting is **None**. ◆ Stop Bits – Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. – Options available: 1, 2. Default setting is **1**. ◆ Flow Control – Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. – Options available: None, Hardware RTS/CTS. Default setting is **None**. ◆ VT-UTF8 Combo Key Support – Enable/Disable the VT-UTF8 Combo Key Support. – Options available: Enabled, Disabled. Default setting is **Enabled**. ◆ Recorder Mode – When this mode enabled, only texts will be send. This is to capture Terminal data. – Options available: Enabled, Disabled. Default setting is **Disabled**. ◆ Resolution 100x31 – Enable/Disable extended terminal resolution. – Options available: Enabled, Disabled. Default setting is **Enabled**. ◆ Putty KeyPad – Selects Function Key and KeyPad on Putty. – Options available: VT100, LINUX, XTERMR6, SC0, ESCN, VT400. Default setting is **VT100**.

Parameter	Description
Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS) Console Redirection(Note)	EMS console redirection allows the user to configure Console Redirection Settings to support Out-of-Band Serial Port management. Options available: Enabled, Disabled. Default setting is **Disabled**.
Serial Port for Out-of-Band EMS Console Redirection Settings	Press [Enter] to configure advanced items. **Please note that this item is configurable when Serial Port for Out-of-Band Management EMS Console Redirection is set to Enabled.** ◆ Out-of-Band Mgmt Port – Microsoft Windows Emergency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port. – Default setting is **COM1**. ◆ Terminal Type EMS – Selects a terminal type to be used for console redirection. – Options available: VT100, VT100PLUS, VT-UTF8, ANSI. Default setting is **VT100PLUS**. ◆ Bits per second EMS – Selects the transfer rate for console redirection. – Options available: 9600, 19200, 57600, 115200. Default setting is **115200**. ◆ Flow Control EMS – Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. – Options available: None, Hardware RTS/CTS, Software Xon/Xoff. Default setting is **None**.

2-2-3 SIO Configuration



```
Aptio Setup - AMI
Advanced

AMI SIO Driver Version :   A5.19.00

Super IO Chip Logical Device(s) Configuration
▶ [*Active*]  Serial Port

WARNING: Logical Devices state on the left side of the control,
reflects the current Logical Device state. Changes made during
Setup Session will be shown after you restart the system.
```

```
View and Set Basic
properties of the SIO
Logical device. Like IO
Base, IRQ Range, DMA
Channel and Device Mode.

→←: Select Screen
↑↓: Select Item
K/M: Scroll Help Area
Up/Down.
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```
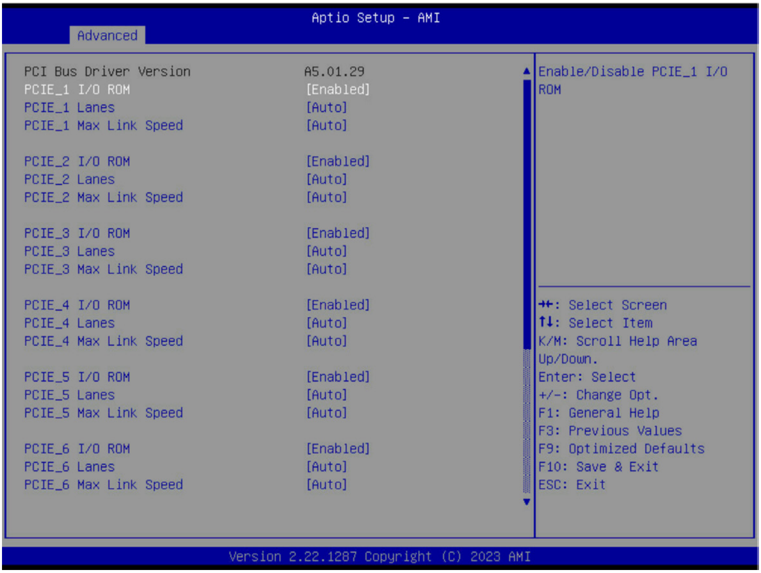
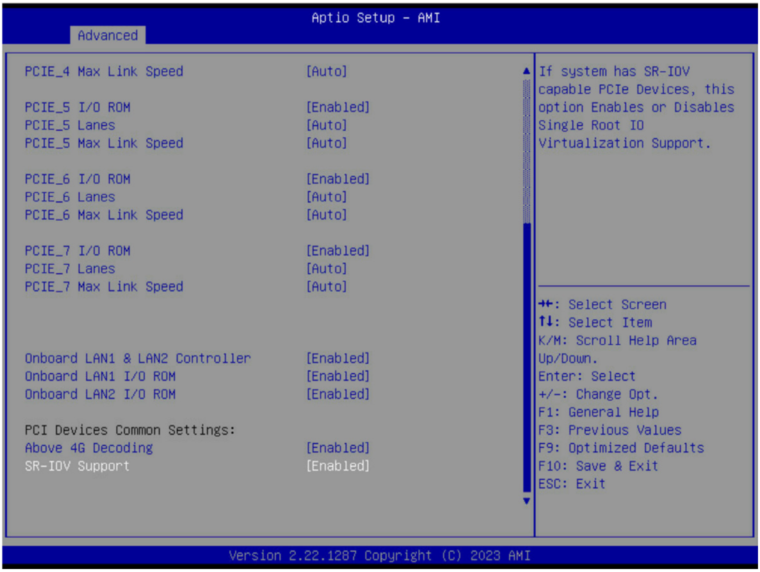

Parameter	Description
AMI SIO Driver Version	Displays the AMI SIO driver version information.
Super IO Chip Logical Device(s) Configuration	
[*Active*] Serial Port	Press [Enter] to configure advanced items. ◆ Use This Device – When set to Enabled allows you to configure the serial port settings. When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

2-2-4 PCI Subsystem Settings



```
                         Aptio Setup - AMI
        Advanced

 PCI Bus Driver Version              A5.01.29       ▲ Enable/Disable PCIE_1 I/O
 PCIE_1 I/O ROM                      [Enabled]        ROM
 PCIE_1 Lanes                        [Auto]
 PCIE_1 Max Link Speed               [Auto]

 PCIE_2 I/O ROM                      [Enabled]
 PCIE_2 Lanes                        [Auto]
 PCIE_2 Max Link Speed               [Auto]

 PCIE_3 I/O ROM                      [Enabled]
 PCIE_3 Lanes                        [Auto]
 PCIE_3 Max Link Speed               [Auto]

 PCIE_4 I/O ROM                      [Enabled]        →←: Select Screen
 PCIE_4 Lanes                        [Auto]           ↑↓: Select Item
 PCIE_4 Max Link Speed               [Auto]           K/M: Scroll Help Area
                                                      Up/Down.
 PCIE_5 I/O ROM                      [Enabled]        Enter: Select
 PCIE_5 Lanes                        [Auto]           +/-: Change Opt.
 PCIE_5 Max Link Speed               [Auto]           F1: General Help
                                                      F3: Previous Values
 PCIE_6 I/O ROM                      [Enabled]        F9: Optimized Defaults
 PCIE_6 Lanes                        [Auto]           F10: Save & Exit
 PCIE_6 Max Link Speed               [Auto]           ESC: Exit
                                                    ▼

              Version 2.22.1287 Copyright (C) 2023 AMI
```



```
                         Aptio Setup - AMI
        Advanced

 PCIE_4 Max Link Speed               [Auto]         ▲ If system has SR-IOV
                                                      capable PCIe Devices, this
 PCIE_5 I/O ROM                      [Enabled]        option Enables or Disables
 PCIE_5 Lanes                        [Auto]           Single Root IO
 PCIE_5 Max Link Speed               [Auto]           Virtualization Support.

 PCIE_6 I/O ROM                      [Enabled]
 PCIE_6 Lanes                        [Auto]
 PCIE_6 Max Link Speed               [Auto]

 PCIE_7 I/O ROM                      [Enabled]
 PCIE_7 Lanes                        [Auto]
 PCIE_7 Max Link Speed               [Auto]
                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      K/M: Scroll Help Area
 Onboard LAN1 & LAN2 Controller      [Enabled]        Up/Down.
 Onboard LAN1 I/O ROM                [Enabled]        Enter: Select
 Onboard LAN2 I/O ROM                [Enabled]        +/-: Change Opt.
                                                      F1: General Help
 PCI Devices Common Settings:                         F3: Previous Values
 Above 4G Decoding                   [Enabled]        F9: Optimized Defaults
 SR-IOV Support                      [Enabled]        F10: Save & Exit
                                                      ESC: Exit
                                                    ▼

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```
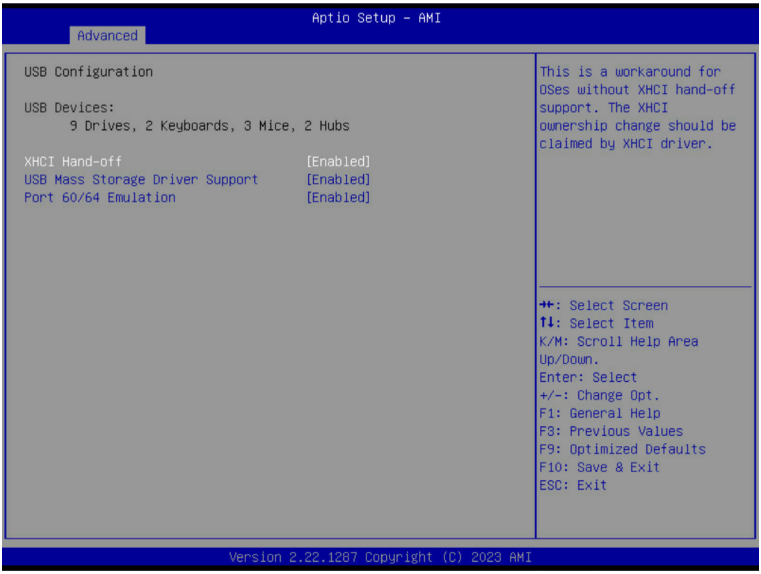

Parameter	Description
PCI Bus Driver Version	Displays the PCI Bus Driver version information.
PCIE_# I/O ROM(Note1)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is **Enabled**.
PCIE_# Lanes(Note1)	Change the PCIe lanes. Default setting is **Auto**.
PCIE_#_Max Link Speed(Note1)	Configure PCIe max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is **Auto**.
Onboard LAN1 & LAN2 Controller(Note3)	Enable/Disable the onboard LAN devices. Options available: Enabled, Disabled. Default setting is **Enabled**.
Onboard LAN1/ LAN2 I/O ROM(Note2)	Enable/Disable the onboard LAN devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is **Enabled**.
PCI Devices Common Settings	
Above 4G Decoding	Enable/Disable memory mapped I/O to 4GB or greater address space (Above 4G Decoding). Options available: Enabled, Disabled. Default setting is **Enabled**.
SR-IOV Support	If the system has SR-IOV capable PCIe devices, this item Enable/Disable Single Root IO Virtualization Support. Options available: Enabled, Disabled. Default setting is **Enabled**.

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

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

2-2-5 USB Configuration



```
                              Aptio Setup - AMI
      Advanced

  USB Configuration                                  This is a workaround for
                                                     OSes without XHCI hand-off
  USB Devices:                                       support. The XHCI
        9 Drives, 2 Keyboards, 3 Mice, 2 Hubs        ownership change should be
                                                     claimed by XHCI driver.
  XHCI Hand-off                      [Enabled]
  USB Mass Storage Driver Support    [Enabled]
  Port 60/64 Emulation               [Enabled]



                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     K/M: Scroll Help Area
                                                     Up/Down.
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F3: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

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```
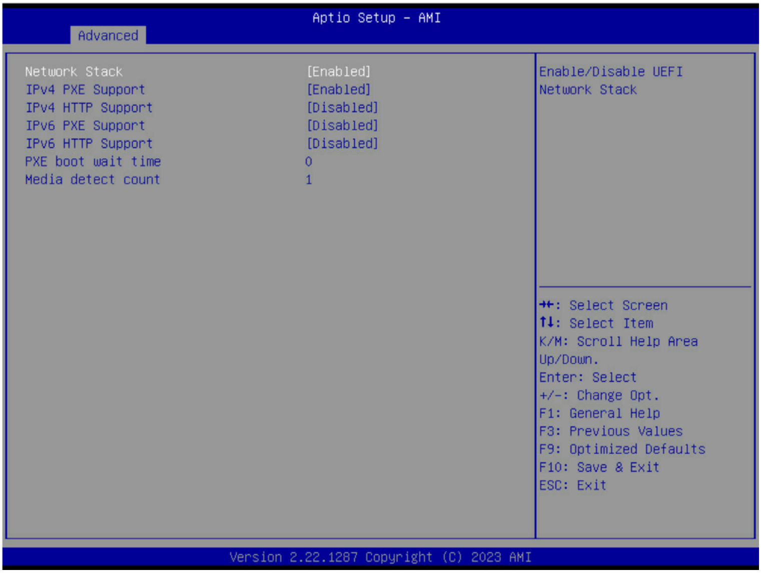

Parameter	Description
USB Configuration	
USB Devices:	Displays the USB devices connected to the system.
XHCI Hand-off	Enable/Disable the XHCI (USB 3.0) Hand-off support. Options available: Enabled, Disabled. Default setting is **Enabled**.
USB Mass Storage Driver Support(Note)	Enable/Disable the USB Mass Storage Driver Support. Options available: Enabled, Disabled. Default setting is **Enabled**.
Port 60/64 Emulation	Enables the I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OSes. Options available: Enabled, Disabled. Default setting is **Enabled**.

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

2-2-6 Network Stack Configuration



```
                              Aptio Setup - AMI
        Advanced

  Network Stack                      [Enabled]        Enable/Disable UEFI
  IPv4 PXE Support                   [Enabled]        Network Stack
  IPv4 HTTP Support                  [Disabled]
  IPv6 PXE Support                   [Disabled]
  IPv6 HTTP Support                  [Disabled]
  PXE boot wait time                 0
  Media detect count                 1

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      K/M: Scroll Help Area
                                                      Up/Down.
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F3: Previous Values
                                                      F9: Optimized Defaults
                                                      F10: Save & Exit
                                                      ESC: Exit

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```
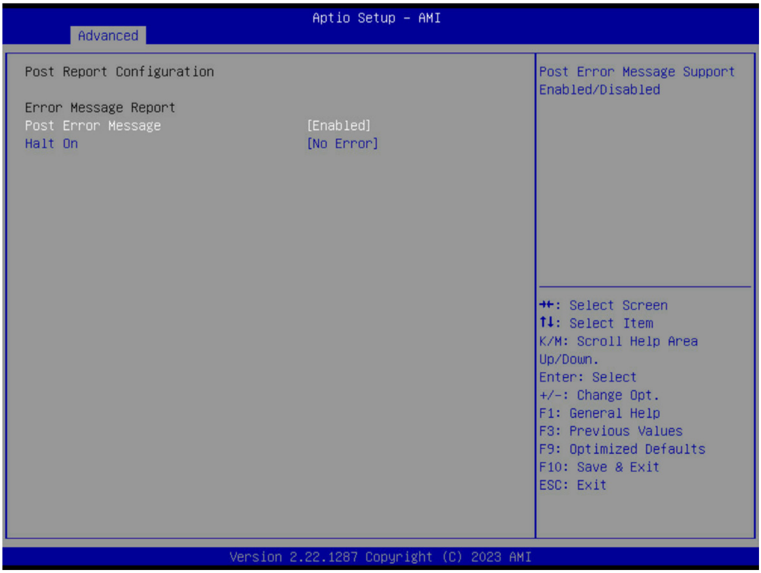

Parameter	Description
Network Stack	Enable/Disable the UEFI network stack. Options available: Enabled, Disabled. Default setting is **Enabled**.
Ipv4 PXE Support	Enable/Disable the Ipv4 PXE feature. Options available: Enabled, Disabled. Default setting is **Enabled**.
Ipv4 HTTP Support	Enable/Disable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

2-2-7 Post Report Configuration



```
                              Aptio Setup - AMI
    Advanced

 Post Report Configuration                                Post Error Message Support
                                                          Enabled/Disabled
 Error Message Report
 Post Error Message                 [Enabled]
 Halt On                            [No Error]

                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          K/M: Scroll Help Area
                                                          Up/Down.
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F3: Previous Values
                                                          F9: Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit

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```
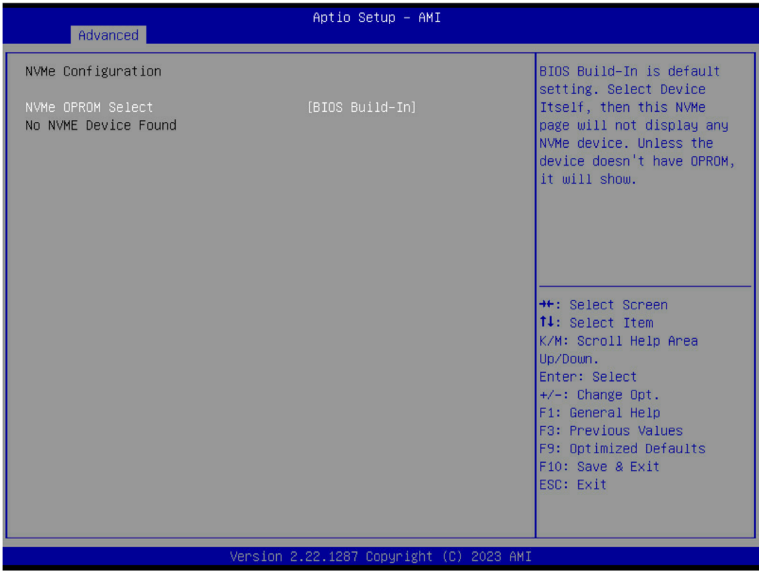

Parameter	Description
Post Report Configuration	
Error Message Report	
Post Error Message	Enable/Disable the POST Error Message support. Options available: Enabled, Disabled. Default setting is **Enabled**.
Halt On	Options available: No Error, All Error. Default setting is **No Error**.

2-2-8 NVMe Configuration



```
                                  Aptio Setup - AMI
       Advanced

 NVMe Configuration                                       BIOS Build-In is default
                                                          setting. Select Device
 NVMe OPROM Select                  [BIOS Build-In]       Itself, then this NVMe
 No NVME Device Found                                     page will not display any
                                                          NVMe device. Unless the
                                                          device doesn't have OPROM,
                                                          it will show.

                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          K/M: Scroll Help Area
                                                          Up/Down.
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F3: Previous Values
                                                          F9: Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit

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```
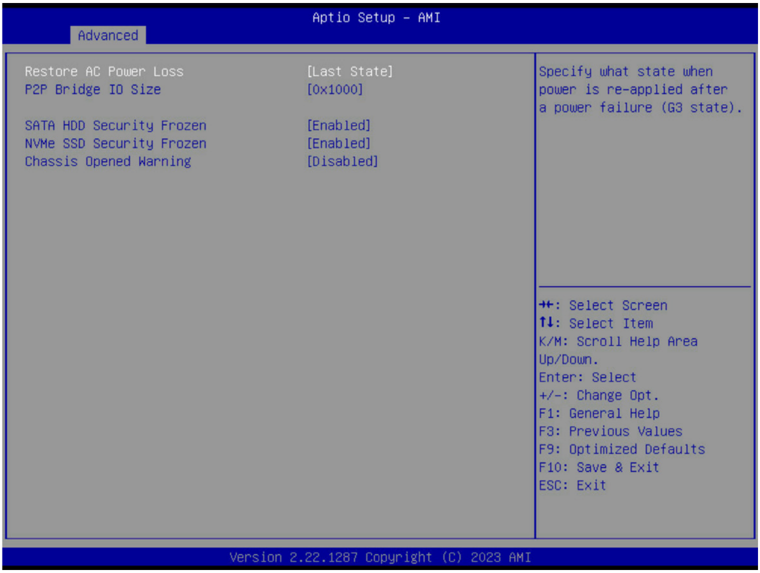

Parameter	Description
NVMe Configuration	Displays the NVMe devices connected to the system.
NVMe OPROM Select	Options available: BIOS Build-In, NVMe Device. Default setting is **BIOS Build-In**.

2-2-9 Chipset Configuration



```
                              Aptio Setup - AMI
     Advanced

  Restore AC Power Loss               [Last State]      Specify what state when
  P2P Bridge IO Size                  [0x1000]          power is re-applied after
                                                        a power failure (G3 state).
  SATA HDD Security Frozen            [Enabled]
  NVMe SSD Security Frozen            [Enabled]
  Chassis Opened Warning              [Disabled]

                                                        ++: Select Screen
                                                        ↑↓: Select Item
                                                        K/M: Scroll Help Area
                                                        Up/Down.
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F3: Previous Values
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit

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```
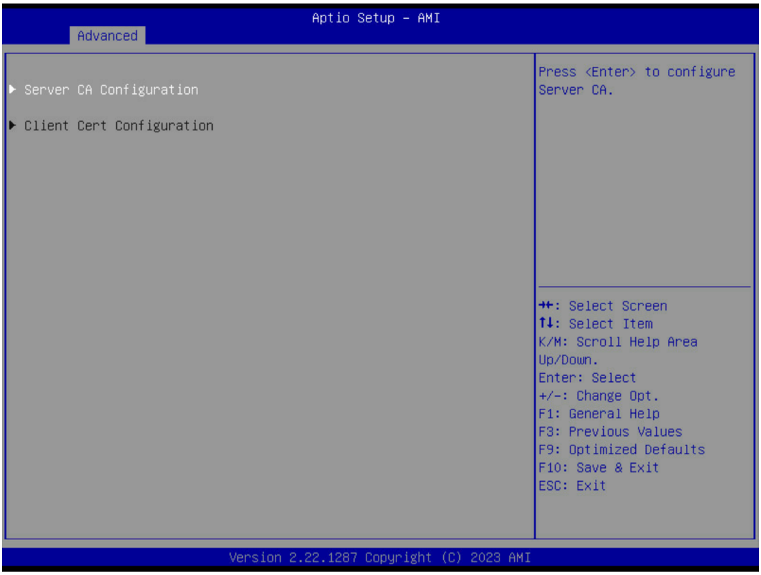

Parameter	Description
Restore on AC Power Loss(Note)	Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, Unspecified. The default setting depends on the BMC setting.
P2P Bridge IO Size	Specifies P2P Bridge IO aligned to the size. Options available: 0x100, 0x150, 0x1000. Default setting is **0x1000**.
SATA HDD Security Frozen	Enable/Disable this item to send freeze lock command to SATA HDD. Options available: Enabled, Disabled. Default setting is **Enabled**.
NVMe SSD Security Frozen	Attempt to send freeze lock command to NVMe SSDs during boot. Options available: Enabled, Disabled. Default setting is **Enabled**.
Chassis Opened Warning	Enable/Disable the chassis intrusion alert function. Options available: Enabled, Disabled, Clear. Default setting is **Disabled**.

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

2-2-10 Tls Auth Configuration



```
                         Aptio Setup - AMI
   Advanced

▶ Server CA Configuration                        Press <Enter> to configure
                                                 Server CA.
▶ Client Cert Configuration

                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 K/M: Scroll Help Area
                                                 Up/Down.
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F3: Previous Values
                                                 F9: Optimized Defaults
                                                 F10: Save & Exit
                                                 ESC: Exit

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```
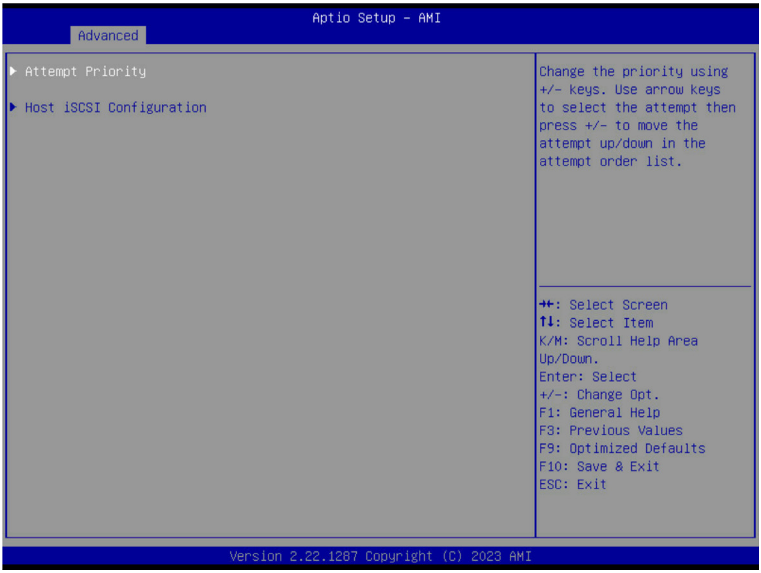

Parameter	Description
Server CA Configuration	Press [Enter] for configuration of advanced items. ◆ Enroll Cert – Press [Enter] to enroll a certificate • Enroll Cert Using File • Cert GUID Input digit character in 1111111-2222-3333-4444-1234567890ab format. – Commit Changes and Exit – Discard Changes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

2-2-11 iSCSI Configuration



```
                         Aptio Setup - AMI
      Advanced

▶ Attempt Priority                          Change the priority using
                                            +/- keys. Use arrow keys
▶ Host iSCSI Configuration                  to select the attempt then
                                            press +/- to move the
                                            attempt up/down in the
                                            attempt order list.

                                            →←: Select Screen
                                            ↑↓: Select Item
                                            K/M: Scroll Help Area
                                            Up/Down.
                                            Enter: Select
                                            +/-: Change Opt.
                                            F1: General Help
                                            F3: Previous Values
                                            F9: Optimized Defaults
                                            F10: Save & Exit
                                            ESC: Exit

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```
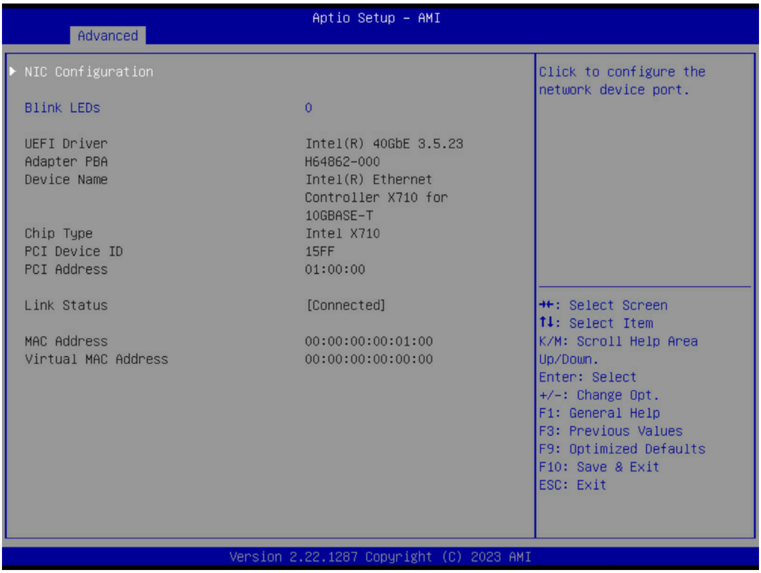
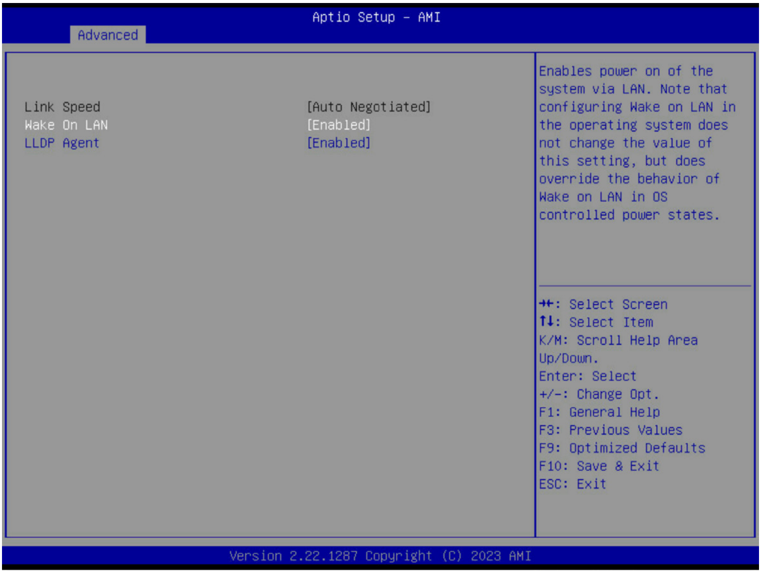

Parameter	Description
Attempt Priority	Press [Enter] configure advanced items. ◆ Attempt Priority – Use arrow keys to select the attempt, then press +/- keys to move the attempt up/down in the attempt order list. ◆ Commit Changes and Exit
Host iSCSI Configuration	Press [Enter] to configure advanced items. ◆ iSCSI Initiator Name – Only IQN format is accepted. Range: from 4 to 223 ◆ Add an Attempt ◆ Delete Attempts ◆ Change Attempt Order

2-2-12 Intel(R) Ethernet Controller X710 for 10GBASE-T



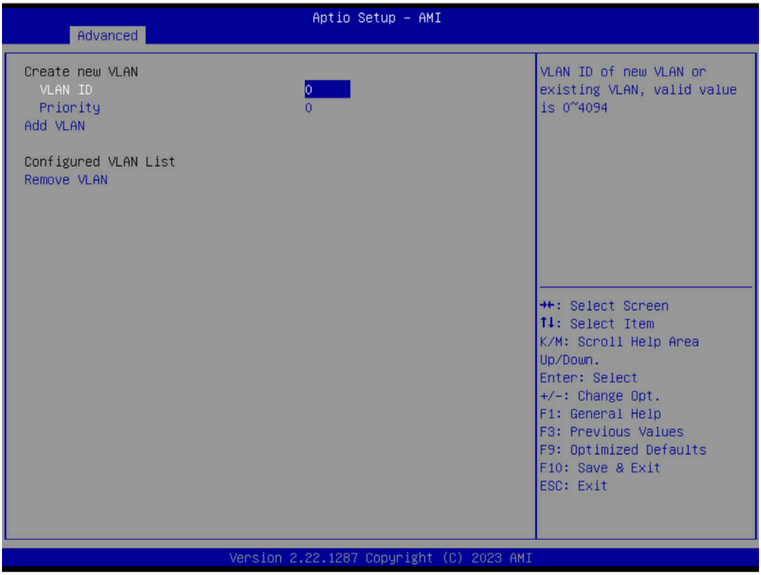
```
                              Aptio Setup - AMI
        Advanced

▶ NIC Configuration                                  Click to configure the
                                                     network device port.
  Blink LEDs                    0

  UEFI Driver                   Intel(R) 40GbE 3.5.23
  Adapter PBA                   H64862-000
  Device Name                   Intel(R) Ethernet
                                Controller X710 for
                                10GBASE-T
  Chip Type                     Intel X710
  PCI Device ID                 15FF
  PCI Address                   01:00:00

  Link Status                   [Connected]          →←: Select Screen
                                                     ↑↓: Select Item
  MAC Address                   00:00:00:00:01:00    K/M: Scroll Help Area
  Virtual MAC Address           00:00:00:00:00:00    Up/Down.
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F3: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

                 Version 2.22.1287 Copyright (C) 2023 AMI
```



```
                              Aptio Setup - AMI
        Advanced

                                                     Enables power on of the
  Link Speed                    [Auto Negotiated]    system via LAN. Note that
  Wake On LAN                   [Enabled]            configuring Wake on LAN in
  LLDP Agent                    [Enabled]            the operating system does
                                                     not change the value of
                                                     this setting, but does
                                                     override the behavior of
                                                     Wake on LAN in OS
                                                     controlled power states.

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     K/M: Scroll Help Area
                                                     Up/Down.
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F3: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

                 Version 2.22.1287 Copyright (C) 2023 AMI
```

Parameter	Description
NIC Configuration	Press [Enter] to configure advanced items. ◆ Link Speed – Default setting is **Auto Negotiated**. ◆ Wake On LAN – Enables power on of the system via LAN. Note that configuring Wake on LAN in the operating system does not change the value of this setting, but does override the behavior of Wake on LAN in OS controlled power states. – Options available: Enabled, Disabled. Default setting is **Enabled**. ◆ LLDP Agent – Enable/Disable firmware's LLDP Agent. – Options available: Enabled, Disabled. Default setting is **Enabled**
Blink LEDs	Identifies the physical network port by blinking the associated LED. Press the numeric keys to adjust desired values (up to 15 seconds).
UEFI Driver	Displays the technical specifications for the Network Interface Controller.
Adapter PBA	Displays the technical specifications for the Network Interface Controller.
Device Name	Displays the technical specifications for the Network Interface Controller.
Chip Type	Displays the technical specifications for the Network Interface Controller.
PCI Device ID	Displays the technical specifications for the Network Interface Controller.
PCI Address	Displays the technical specifications for the Network Interface Controller.
Link Status	Displays the technical specifications for the Network Interface Controller.
MAC Address	Displays the technical specifications for the Network Interface Controller.
Virtual MAC Address	Displays the technical specifications for the Network Interface Controller.

2-2-13 VLAN Configuration



```
                              Aptio Setup - AMI
    Advanced
  Create new VLAN                                     VLAN ID of new VLAN or
    VLAN ID                   0                       existing VLAN, valid value
    Priority                  0                       is 0~4094
  Add VLAN

  Configured VLAN List
  Remove VLAN


                                                      ++: Select Screen
                                                      ↑↓: Select Item
                                                      K/M: Scroll Help Area
                                                      Up/Down.
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F3: Previous Values
                                                      F9: Optimized Defaults
                                                      F10: Save & Exit
                                                      ESC: Exit

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```
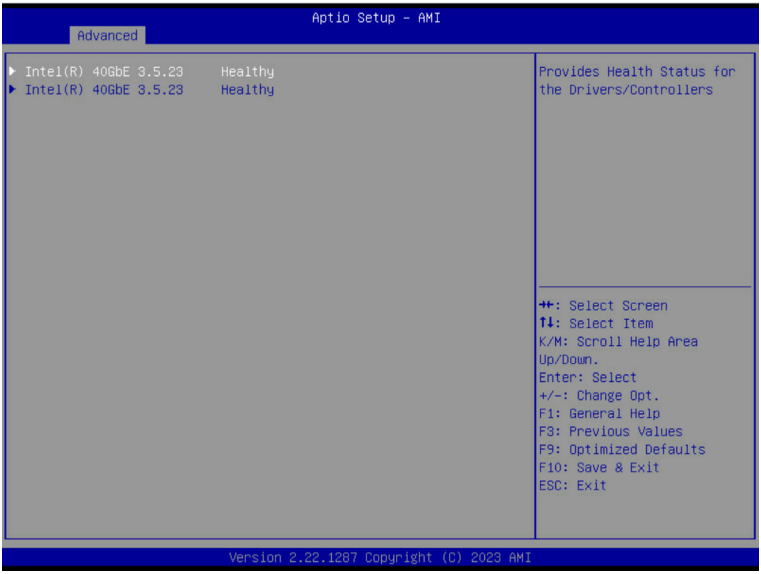

Parameter	Description
Enter Configuration Menu	Press [Enter] to configure advanced items. ◆ Create new VLAN ◆ VLAN ID – Sets VLAN ID for a new VLAN or an existing VLAN. – Press the <+> / <-> keys to increase or decrease the desired values. – The valid range is from 0 to 4094. ◆ Priority – Sets 802.1Q Priority for a new VLAN or an existing VLAN. – Press the <+> / <-> keys to increase or decrease the desired values. – The valid range is from 0 to 7. ◆ Add VLAN – Press [Enter] to create a new VLAN or update an existing VLAN. ◆ Configured VLAN List ◆ Remove VLAN – Press [Enter] to remove an existing VLAN.

2-2-14 Driver Health



```
Aptio Setup - AMI
Advanced

▶ Intel(R) 40GbE 3.5.23      Healthy
▶ Intel(R) 40GbE 3.5.23      Healthy

Provides Health Status for
the Drivers/Controllers

→←: Select Screen
↑↓: Select Item
K/M: Scroll Help Area
Up/Down.
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

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```
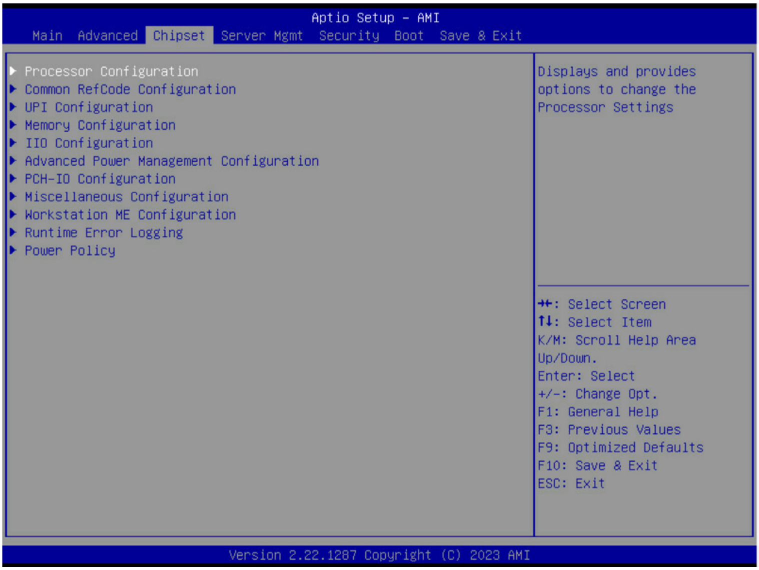

Parameter	Description
Driver Health	Displays driver health status of the devices/controllers if installed.

2-3 Chipset Menu

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



```
                          Aptio Setup - AMI
  Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

▶ Processor Configuration                      Displays and provides
▶ Common RefCode Configuration                 options to change the
▶ UPI Configuration                            Processor Settings
▶ Memory Configuration
▶ IIO Configuration
▶ Advanced Power Management Configuration
▶ PCH-IO Configuration
▶ Miscellaneous Configuration
▶ Workstation ME Configuration
▶ Runtime Error Logging
▶ Power Policy
                                               →←: Select Screen
                                               ↑↓: Select Item
                                               K/M: Scroll Help Area
                                               Up/Down.
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F3: Previous Values
                                               F9: Optimized Defaults
                                               F10: Save & Exit
                                               ESC: Exit

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```
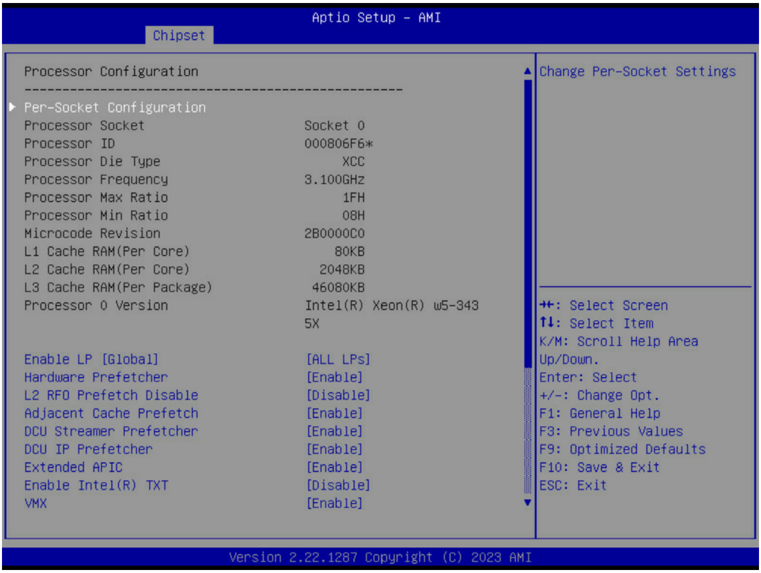

2-3-1 Processor Configuration



```
                              Aptio Setup - AMI
          Chipset

 Processor Configuration                                 Change Per-Socket Settings
 --------------------------------------------------
▶ Per-Socket Configuration
 Processor Socket                      Socket 0
 Processor ID                          000806F6*
 Processor Die Type                        XCC
 Processor Frequency                   3.100GHz
 Processor Max Ratio                       1FH
 Processor Min Ratio                       08H
 Microcode Revision                    2B0000C0
 L1 Cache RAM(Per Core)                   80KB
 L2 Cache RAM(Per Core)                 2048KB
 L3 Cache RAM(Per Package)             46080KB
 Processor 0 Version                   Intel(R) Xeon(R) w5-343     →←: Select Screen
                                       5X                          ↑↓: Select Item
                                                                   K/M: Scroll Help Area
 Enable LP [Global]                    [ALL LPs]                   Up/Down.
 Hardware Prefetcher                   [Enable]                    Enter: Select
 L2 RFO Prefetch Disable               [Disable]                   +/-: Change Opt.
 Adjacent Cache Prefetch               [Enable]                    F1: General Help
 DCU Streamer Prefetcher               [Enable]                    F3: Previous Values
 DCU IP Prefetcher                     [Enable]                    F9: Optimized Defaults
 Extended APIC                         [Enable]                    F10: Save & Exit
 Enable Intel(R) TXT                   [Disable]                   ESC: Exit
 VMX                                   [Enable]

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```

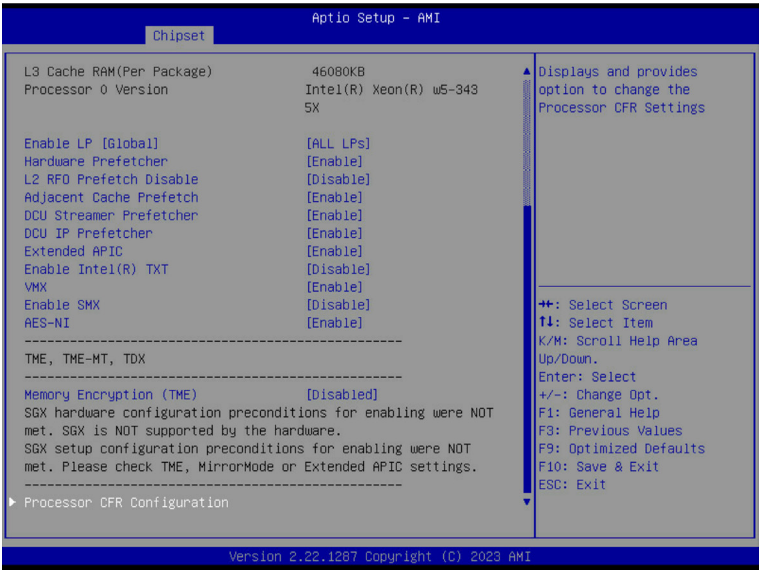

```
                              Aptio Setup - AMI
          Chipset

 L3 Cache RAM(Per Package)              46080KB                    Displays and provides
 Processor 0 Version                   Intel(R) Xeon(R) w5-343     option to change the
                                       5X                          Processor CFR Settings

 Enable LP [Global]                    [ALL LPs]
 Hardware Prefetcher                   [Enable]
 L2 RFO Prefetch Disable               [Disable]
 Adjacent Cache Prefetch               [Enable]
 DCU Streamer Prefetcher               [Enable]
 DCU IP Prefetcher                     [Enable]
 Extended APIC                         [Enable]
 Enable Intel(R) TXT                   [Disable]
 VMX                                   [Enable]
 Enable SMX                            [Disable]                   →←: Select Screen
 AES-NI                                [Enable]                    ↑↓: Select Item
 --------------------------------------------------                K/M: Scroll Help Area
 TME, TME-MT, TDX                                                  Up/Down.
 --------------------------------------------------                Enter: Select
 Memory Encryption (TME)               [Disabled]                  +/-: Change Opt.
 SGX hardware configuration preconditions for enabling were NOT    F1: General Help
 met. SGX is NOT supported by the hardware.                        F3: Previous Values
 SGX setup configuration preconditions for enabling were NOT       F9: Optimized Defaults
 met. Please check TME, MirrorMode or Extended APIC settings.      F10: Save & Exit
 --------------------------------------------------                ESC: Exit
▶ Processor CFR Configuration

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```
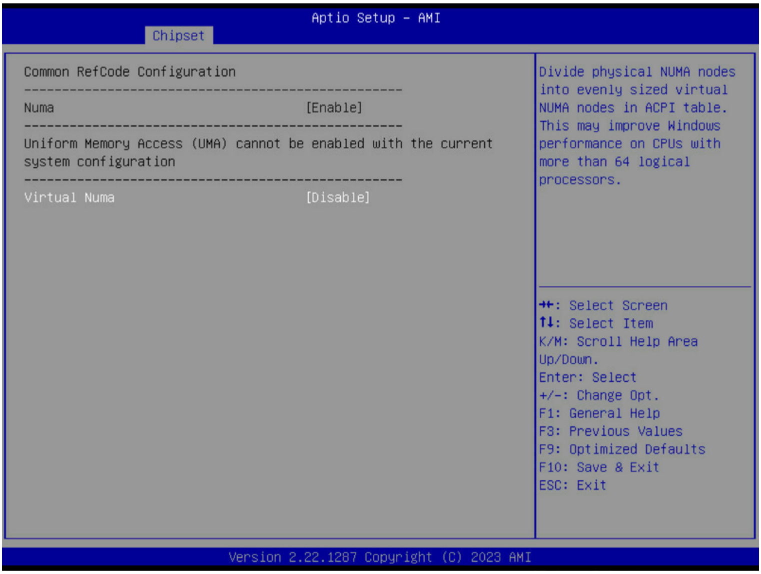

Parameter	Description
Processor Configuration	
Pre-Socket Configuration	Press [Enter] to configure advanced items. ◆ CPU Socket 0 Configuration – Core Disable Bitmap(Hex) • Number of Cores to enable. 0 means all cores. FFFFFFF means to disable all cores. The maximum value depends on the number of CPUs available. Press the numeric keys to adjust desired values.
Processor Socket / Processor ID / Processor Die Type / Processor Frequency / Processor Max Ratio / Processor Min Ratio / Microcode Revision / L1 Cache RAM(Per Core) / L2 Cache RAM(Per Core) / L3 Cache RAM(Per Package) / Processor # Version	Displays the technical specifications for the installed processor(s).
Enable LP [Global]	Enables Logical processor (Software Method to Enable/Disable Logical Processor threads). Options available: ALL LPs, Single LP. Default setting is **ALL LPs**.
Hardware Prefetcher	Select whether to enable the speculative prefetch unit of the processor. Options available: Enable, Disable. Default setting is **Enable**.
L2 RF0 Prefetch Disable	Options available: Enable, Disable. Default setting is **Disable**.
Adjacent Cache Prefetch	When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched. Options available: Enable, Disable. Default setting is **Enable**.
DCU Streamer Prefetcher	Enable/Disable DCU streamer prefetcher. Options available: Enable, Disable. Default setting is **Enable**.
DCU IP Prefetcher	Enable/Disable DCU IP Prefetcher. Options available: Enable, Disable. Default setting is **Enable**.
Extended APIC	Enable/Disable extended APIC support. Note: The VT-d will be enabled automatically when x2APIC is enabled. Options available: Enable, Disable. Default setting is **Enable.**
Enable Intel(R) TXT	Enable/Disable the Intel Trusted Execution Technology support function. Options available: Enable, Disable. Default setting is **Disable.**
VMX	Enable/Disable the Vanderpool Technology. This will take effect after rebooting the system. Options available: Enable, Disable. Default setting is **Enable**.
Enable SMX	Enable/Disable the Safer Mode Extensions (SMX) support function. Options available: Enable, Disable. Default setting is **Disable**.
AES-NI	Enable/Disable the AES-NI support. Options available: Enable, Disable. Default setting is **Enable**.

Parameter	Description
Memory Encryption (TME)(Note)	Enable/Disable memory encryption (TME). Options available: Enabled, Disabled. Default setting is **Disabled**.
Total Memory Encryption Multi-Tenant (TME-MT)	Options available: Enabled, Disabled. Default setting is **Disabled**.
Processor CFR Configuration	Press [Enter] to configure advanced items. ◆ Provision S3M CFR – Options available: Disable, Enable. Default setting is **Enable**. ◆ Manual Commit S3M FW CFR – Options available: Disable, Enable, Auto. Default setting is **Auto**. ◆ Provision PUcode CFR – Options available: Disable, Enable. Default setting is **Enable**. ◆ Manual Commit PUcode CFR – Options available: Enable, Disable, Auto. Default setting is **Auto**. ◆ Socket0 CFR Revision Info – Displays CFR Revision information of the socket.

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

2-3-2 Common RefCode Configuration



```
                         Aptio Setup - AMI
        Chipset
 Common RefCode Configuration                          Divide physical NUMA nodes
 --------------------------------------------------    into evenly sized virtual
 Numa                                  [Enable]        NUMA nodes in ACPI table.
 --------------------------------------------------    This may improve Windows
 Uniform Memory Access (UMA) cannot be enabled with the current   performance on CPUs with
 system configuration                                  more than 64 logical
 --------------------------------------------------    processors.
 Virtual Numa                          [Disable]

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       K/M: Scroll Help Area
                                                       Up/Down.
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F3: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

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```
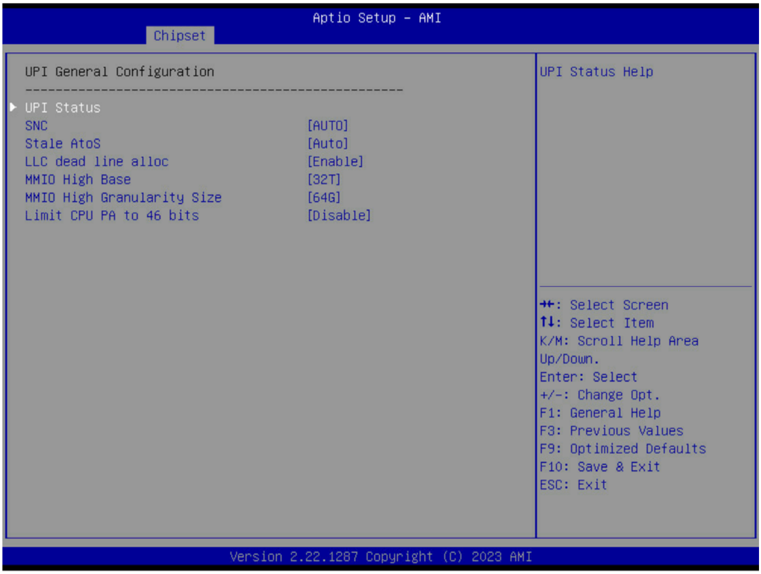

Parameter	Description
Common RefCode Configuration	
Numa	Default setting is **Enable**.
Virtual Numa	Divide physical NUMA nodes into evenly sized virtual NUMA nodes in ACPI table. This may improve Windows performance on CPUs with more than 64 logical processors. Options available: Enable, Disable. Default setting is **Disable**.

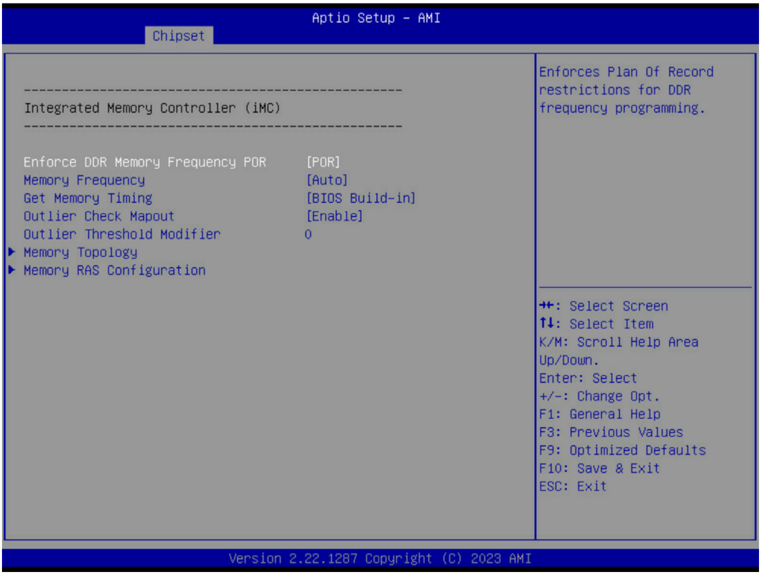
2-3-3 UPI Configuration



```
                              Aptio Setup - AMI
          Chipset
 UPI General Configuration                              UPI Status Help
 --------------------------------------------------
▶ UPI Status
 SNC                                    [AUTO]
 Stale AtoS                             [Auto]
 LLC dead line alloc                    [Enable]
 MMIO High Base                         [32T]
 MMIO High Granularity Size             [64G]
 Limit CPU PA to 46 bits                [Disable]
                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        K/M: Scroll Help Area
                                                        Up/Down.
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F3: Previous Values
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit
                 Version 2.22.1287 Copyright (C) 2023 AMI
```

Parameter	Description
UPI General Configuration	Press [Enter] to configure advanced items. ◆ UPI Status – Press [Enter] to view the Uncore status. ◆ SNC – Enable/Disable Sub NUMA Cluster function. – Options available: Auto, Disable, Enable SNC2 (2-clusters), Enable SNC4 (4-clusters). Default setting is **Auto**. ◆ Stale AtoS – Enable/Disable Stale A to S directory optimization. – Options available: Disable, Enable, Auto. Default setting is **Auto**. ◆ LLC dead line alloc – Enable/Disable fill dead lines in LLC. – Options available: Disable, Enable, Auto. Default setting is **Enable**. ◆ MMIO High Base – Options available: 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T. Default setting is **32T**. ◆ MMIO High Granularity Size – Selects the allocation size used to assign mmioh resources. – Options available: 1G, 4G, 16G, 64G, 256G, 1024G. Default setting is **64G**. ◆ Limit CPU PA to 46 bits – Options available: Disable, Enable. Default setting is **Disable**.

2-3-4 Memory Configuration



```
                         Aptio Setup - AMI
       Chipset

  --------------------------------------------------  Enforces Plan Of Record
  Integrated Memory Controller (iMC)                  restrictions for DDR
  --------------------------------------------------  frequency programming.

  Enforce DDR Memory Frequency POR     [POR]
  Memory Frequency                     [Auto]
  Get Memory Timing                    [BIOS Build-in]
  Outlier Check Mapout                 [Enable]
  Outlier Threshold Modifier           0
▶ Memory Topology
▶ Memory RAS Configuration
                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      K/M: Scroll Help Area
                                                      Up/Down.
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F3: Previous Values
                                                      F9: Optimized Defaults
                                                      F10: Save & Exit
                                                      ESC: Exit

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```

Parameter	Description
Integrated Memory Controller (iMC)	
Enforce DDR Memory Frequency POR	When set to Enable, the system enforces Plan Of Record restrictions for DDR frequency programming. Options available: POR, Disable. Default setting is **POR**.
Memory Frequency	Configures the maximum memory frequency. If Enforce POR is disabled, user will be able to run at higher frequencies than the memory support (limited by processor support). Default setting is **Auto**.
Get Memory Timing	Auto is the detected SPD value and use it, otherwise use BIOS Build-in. Options available: Auto, BIOS Build-in. Default setting is **BIOS Build-in**.
Outlier Check Mapout	Enable/Disable Vendor Specific DIMM Outlier check and mapout. Options available: Enable, Disable. Default setting is **Enable**.
Outlier Threshold Modifier	Specifies how much to modify the base outlier threshold. Default setting is **0**.
Memory Topology	Press [Enter] to view memory topology with DIMM population information.

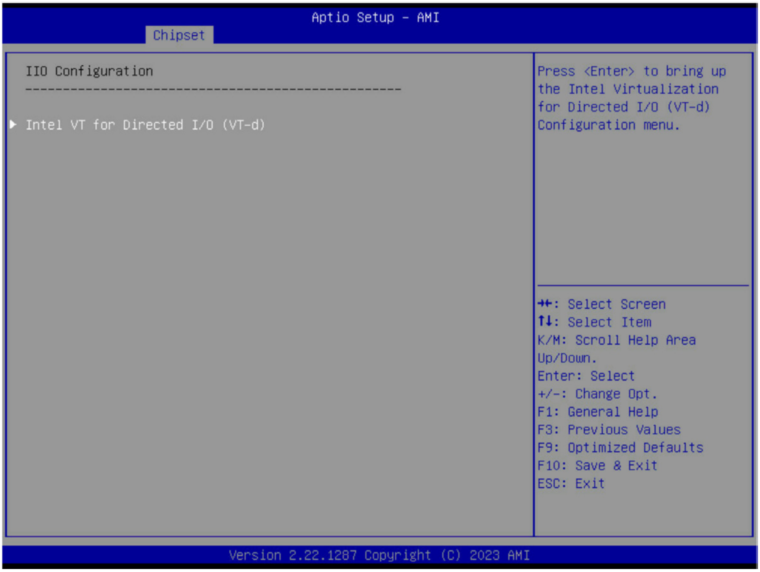
Parameter	Description
Memory RAS Configuration	Press [Enter] to configure advanced items. ◆ Mirror Mode(Note) – Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Enables the Mirror Mode will disable the XPT Prefetch. – Options available: Disabled, Full Mirror Mode, Partial Mirror Mode. Default setting is **Disabled**. ◆ Partial Mirror 1 Size (GB) – Selects multiplier of 1GB for the size of the SAD to be created. ◆ Memory Correctable Error Flood Policy – Options available: Disable, Once, Frequency. Default setting is **Frequency**. ◆ Correctable Error Threshold – Correctable Error Threshold (0x01-0x7fff) used for sparing, and leaky bucket. – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Trigger SW Error Threshold(Note) – Enable/Disable Sparing trigger SW Error Match Threshold. – Options available: Disabled, Enabled. Default setting is **Disabled**. ◆ SW Per Bank Threshold – SW Per Bank Threshold (1-0x7FFF) used for DDR bank level error. – Press the <+> / <-> keys to increase or decrease the desired values. ◆ SW Correctable Error Time Window – SW Correctable Error time window based interface in hour (0-24). – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Leaky bucket time window based interface – Enable/Disable leaky bucket time window based interface. – Options available: Disabled, Enabled. Default setting is **Disabled**. ◆ Leaky bucket time window based interface Hour – Leaky bucket time window based interface hour used for DDR (0-24). – Press the <+> / <-> keys to increase or decrease the desired values.

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

Parameter	Description
Memory RAS Configuration (continued)	◆ Leaky bucket time window based interface Minute – Leaky bucket time window based interface minute used for DDR (0-60). – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Leaky bucket low bit – Configures leaky bucket low bit (0x1 - 0x29). – Press the <+> / <-> keys to increase or decrease the desired values. ◆ Leaky bucket high bit – Configures leaky bucket high bit (0x1 - 0x29). – Press the <+> / <-> keys to increase or decrease the desired values. ◆ ADDDC Sparing(Note) – Enable/Disable ADDDC Sparing. – Options available: Disabled, Enabled. Default setting is **Disabled**. ◆ Enable ADDDC Error Injection – Options available: Disabled, Enabled. Default setting is **Enabled**. ◆ Patrol Scrub – Options available: Disabled, Enable at End of POST. Default setting is **Enable at End of POST**. ◆ Patrol Scrub Interval – Selects the number of hours (1-24) required to complete full scrub. A value of zero means auto. ◆ DDR5 ECS – Options available: Disabled, Enabled, Enable ECS with Result Collection. Default setting is **Enabled**.

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

2-3-5 IIO Configuration



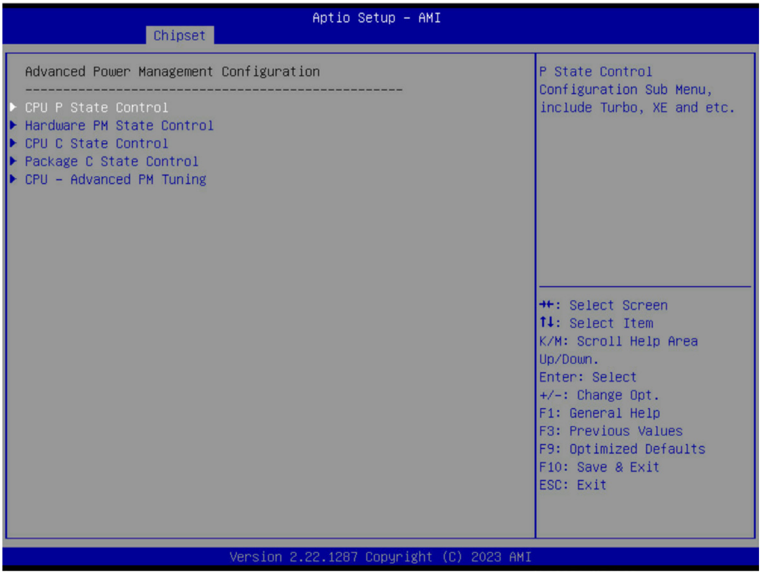
```
                         Aptio Setup – AMI
      Chipset
 IIO Configuration                                  Press <Enter> to bring up
 --------------------------------------------------  the Intel Virtualization
                                                    for Directed I/O (VT-d)
▶ Intel VT for Directed I/O (VT-d)                  Configuration menu.

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    K/M: Scroll Help Area
                                                    Up/Down.
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F3: Previous Values
                                                    F9: Optimized Defaults
                                                    F10: Save & Exit
                                                    ESC: Exit
              Version 2.22.1287 Copyright (C) 2023 AMI
```

Parameter	Description
IIO Configuration	
Intel® VT for Directed I/O (VT-d)	Press [Enter] to configure advanced items. ◆ Intel® VT for Directed I/O – Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables. – Options available: Enable, Disable. Default setting is **Enable**. ◆ ACS Control – Enable: Programs ACS only to Chipset PCIe Root Ports Bridges. – Disable: Programs ACS to all PCIe bridges. – Default setting is **Enable**. ◆ Cache Allocation – Options available: Enable, Disable. Default setting is **Enable**. ◆ DevTLB Invalidation Timeout Configuration – Options available: Auto, 68s to 103s, 8s to 12s, 268ms to 402ms, 8ms to 12ms, 131us to 196us. Default setting is **Auto**. ◆ Opt-Out Illegal MSI Mitigation – Enable/Disable Opt-Out Illegal 0xFEE Platform Mitigation. – Options available: Disable, Enable. Default setting is **Disable**.

Parameter	Description
	◆ DMA Control Opt-In Flag – Enable/Disable DMA_CTRL_PLATFORM_OPT_IN_FLAG in DMAR table in ACPI. Not compatible with Direct Device Assignment (DDA). – Options available: Enable, Disable. Default setting is **Disable**. ◆ Interrupt Remapping – Enable/Disable the interrupt remapping support function. – Options available: Auto, Enable, Disable. Default setting is **Auto** ◆ x2APIC Opt Out – Options available: Enable, Disable. Default setting is **Disable**. ◆ Pre-boot DMA Protection – Options available: Enable, Disable. Default setting is **Disable**. ◆ SATC Support – Options available: Enable, Disable. Default setting is **Enable**. ◆ RHSA Support – Options available: Enable, Disable. Default setting is **Enable**. ◆ PCIe ACSCTL – Options available: Enable, Disable. Default setting is **Disable**. ◆ Source Validation(Note) – Options available: Disabled, Enabled. Default setting is **Disabled**. ◆ Translation Blocking(Note) – Options available: Disabled, Enabled. Default setting is **Disabled**. ◆ P2P Request Redirect(Note) – Options available: Disabled, Enabled. Default setting is **Enabled**. ◆ P2P Completion Redirect(Note) – Options available: Disabled, Enabled. Default setting is **Enabled**. ◆ Upstream Forwarding Enable(Note) – Options available: Disabled, Enabled. Default setting is **Enabled**.

(Note) This item is configurable when **PCIe ACSCTL** is set to **Enable**.

2-3-6 Advanced Power Management Configuration



```
                              Aptio Setup - AMI
          Chipset

  Advanced Power Management Configuration          P State Control
  ---------------------------------------------    Configuration Sub Menu,
▶ CPU P State Control                              include Turbo, XE and etc.
▶ Hardware PM State Control
▶ CPU C State Control
▶ Package C State Control
▶ CPU - Advanced PM Tuning

                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   K/M: Scroll Help Area
                                                   Up/Down.
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F3: Previous Values
                                                   F9: Optimized Defaults
                                                   F10: Save & Exit
                                                   ESC: Exit

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```
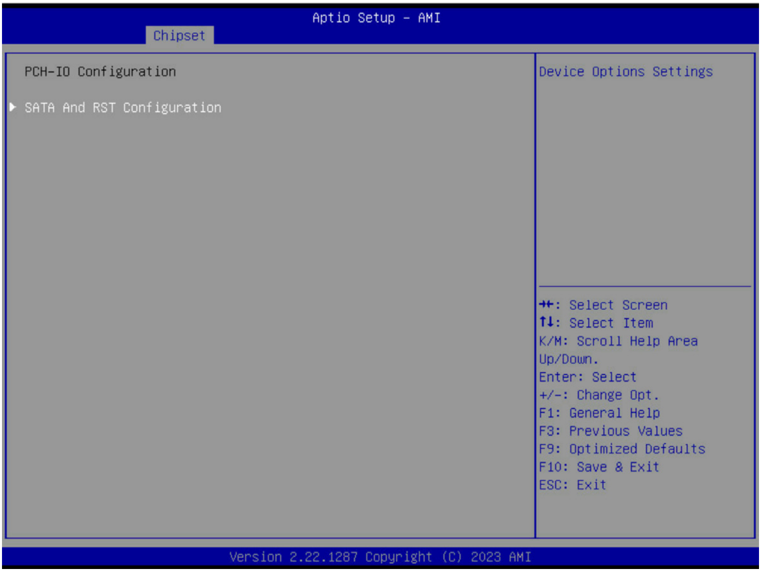

Parameter	Description
CPU P State Control	Press [Enter] to configure advanced items. ◆ SpeedStep (Pstates) – Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. – Options available: Enable, Disable. Default setting is **Enable**. ◆ Turbo Mode – When this item is enabled, the processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance. When this item is disabled, the processor will not overclock any of its core. – Options available: Enable, Disable. Default setting is **Enable**.
Hardware PM State Control	Press [Enter] to configure advanced items. ◆ Hardware P-States – When this item is disabled, the processor hardware chooses a P-state based on OS Request (Legacy P-States). – In Native mode, the processor hardware chooses a P-state based on OS guidance. – In Out of Band mode, the processor hardware autonomously chooses a P-state (with no OS guidance). – Options available: Disable, Native Mode, Out of Band Mode, Native Mode with No Legacy Support. Default setting is **Native Mode**.

Parameter	Description
CPU C State Control	Press [Enter] to configure advanced items. ◆ Enable Monitor MWAIT – Allows Monitor and MWAIT instructions. – Options available: Disable, Enable, Auto. Default setting is **Auto**. ◆ CPU C6 Report – Enable/Disable CPU C6(ACPI C3) report to OS. – Options available: Disable, Enable, Auto. Default setting is **Auto**. ◆ Enhanced Halt State (C1E) – Core C1E auto promotion control. Takes effect after reboot. – Options available: Enable, Disable. Default setting is **Enable**.
Package C State Control	Press [Enter] to configure advanced items. ◆ Package C State – Configures the state for the C-State package limit. – Options available: C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, No Limit, Auto. Default setting is **Auto**.
CPU - Advanced PM Tuning	Press [Enter] to configure advanced items. ◆ Energy Perf BIAS – Press [Enter] to configure advanced items. • Power Performance Tuning » Options available: OS Controls EPB, BIOS Controls EPB, PECI Controls EPB. Default setting is **OS Controls EPB**. • Energy_PERF_BIAS_CFG mode(Note) » Options available: Performance, Balanced Performance, Balanced Power, Power. Default setting is **Balanced Performance**.

(Note) This item is configurable when **Power Performance Tuning** is set to **BIOS Controls EPB**.

2-3-7 PCH Configuration



```
                         Aptio Setup - AMI
          Chipset

  PCH-IO Configuration                          Device Options Settings

▶ SATA And RST Configuration








                                                →←: Select Screen
                                                ↑↓: Select Item
                                                K/M: Scroll Help Area
                                                Up/Down.
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F3: Previous Values
                                                F9: Optimized Defaults
                                                F10: Save & Exit
                                                ESC: Exit

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```

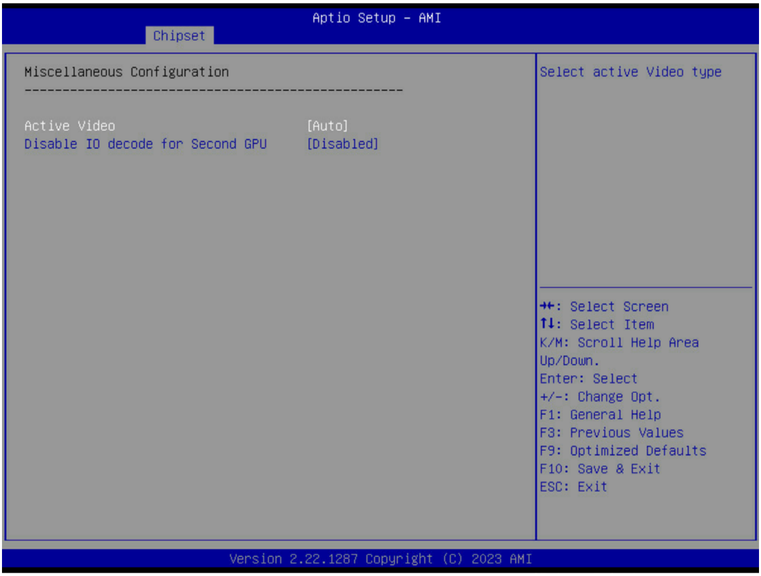
Parameter	Description
PCH-IO Configuration	
SATA And RST Configuration	◆ SATA Controller And RST Configuration – Press [Enter] to configure advanced items. • SATA Configuration » Enable/Disable SATA controller. » Options available: Enabled, Disabled. Default setting is **Enabled**. • SATA Mode Selection » Configures on chip SATA type. » AHCI Mode: When set to AHCI, the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time. » RAID Mode: When set to RAID, the SATA controller enables both its RAID and AHCI functions. You will be allowed to access the RAID setup utility at boot time. » Options available: AHCI, RAID. Default setting is **AHCI**. • RAID Device ID(Note) » Choose RAID Device ID. » Options available: Client, Alternate, Server. Default setting is **Server**.

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

Parameter	Description
SATA And RST Configuration(continued)	• SATA Port 0/1/2/3/4/5/6/7 » The category identifies SATA hard drives that are installed in the computer. System will automatically detect HDD type. • Port 0/1/2/3/4/5/6/7 » Enable/Disable Port 0/1/2/3/4/5/6/7 device. » Options available: Enabled, Disabled. Default setting is **Enabled**. • Hot Plug (for Port 0/1/2/3/4/5/6/7) » Enable/Disable HDD Hot-Plug function. » Options available: Enabled, Disabled. Default setting is **Enabled**. • Spin Up Device (for Port 0/1/2/3/4/5/6/7) » If enabled for any of ports staggered spin up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot. » Options available: Enabled, Disabled. Default setting is **Disabled**. ◆ Low Power S0 Idle Capability – Options available: Enabled, Disabled. Default setting is **Disabled**. ◆ PUIS Enable(Note) – Options available: Enabled, Disabled. Default setting is **Disabled**.

(Note) This item is configurable when **Low Power S0 Idle Capability** is set to **Enabled**.

2-3-8 Miscellaneous Configuration



```
                         Aptio Setup - AMI
          Chipset

  Miscellaneous Configuration                          Select active Video type
  --------------------------------------------------

  Active Video                     [Auto]
  Disable IO decode for Second GPU [Disabled]
                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       K/M: Scroll Help Area
                                                       Up/Down.
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F3: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

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```
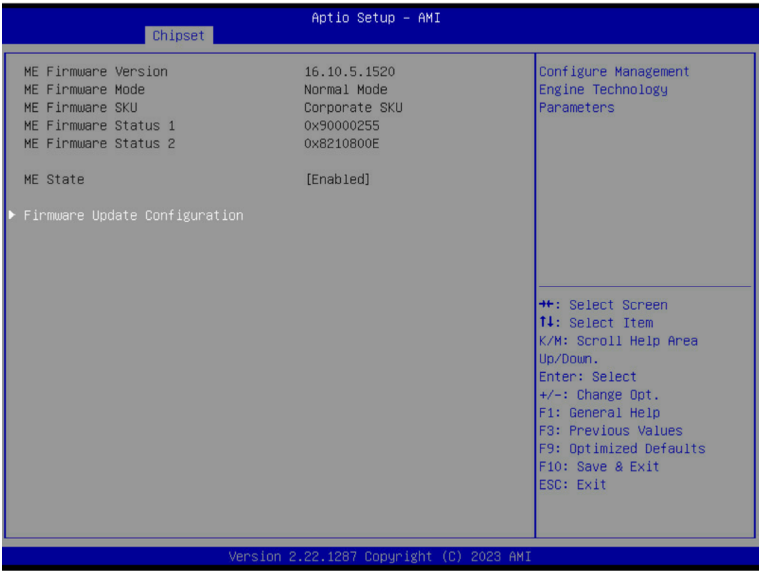

Parameter	Description
Miscellaneous Configuration	
Active Video	Selects the active video type. Options available: Auto, Onboard Device, PCIE Device, Specific PCIE Device. Default setting is **Auto**.
Disable IO decode for Second GPU	Enables this knob to disable IO decode on second GPU in a Dual GPU ML Config. Options available: Enabled, Disabled. Default setting is **Disabled**.

2-3-9 Server ME Configuration



```
                         Aptio Setup - AMI
         Chipset
 ME Firmware Version                   16.10.5.1520        Configure Management
 ME Firmware Mode                      Normal Mode         Engine Technology
 ME Firmware SKU                       Corporate SKU       Parameters
 ME Firmware Status 1                  0x90000255
 ME Firmware Status 2                  0x8210800E

 ME State                              [Enabled]

▶ Firmware Update Configuration
                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           K/M: Scroll Help Area
                                                           Up/Down.
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F3: Previous Values
                                                           F9: Optimized Defaults
                                                           F10: Save & Exit
                                                           ESC: Exit

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```
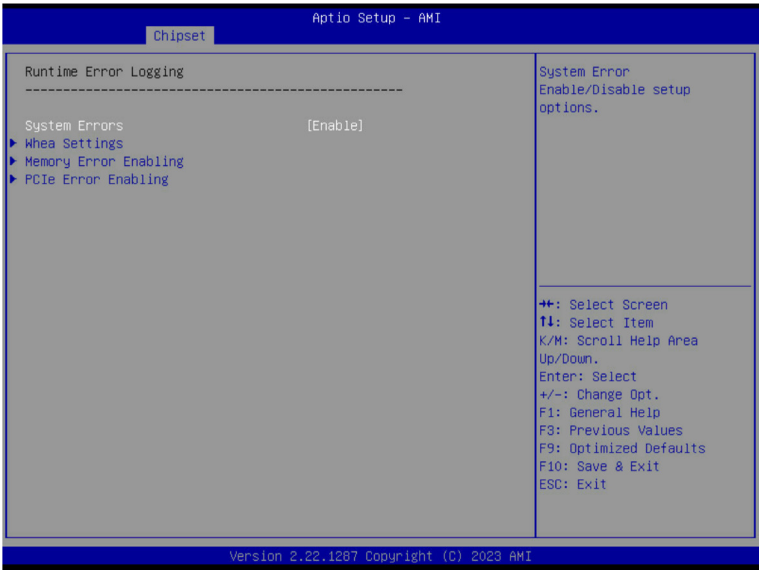

Parameter	Description
ME Firmware Version	Displays the operational firmware version.
ME Firmware Mode	Displays the operational firmware mode.
ME Firmware SKU	Disaplays ME firmware sku information.
ME Firmware Status #1/#2	Displays ME firmware status information.
ME State	Default setting is **Enabled**.
Firmware Update Configuration	Press [Enter] to configure advanced items. ◆ Me FW Image Re-Flash – Enable/Disable ME firmware image re-flash function. – Options available: Disabled, Enabled. Default setting is **Disabled**.

2-3-10 Runtime Error Logging Settings



```
                              Aptio Setup - AMI
            Chipset
  Runtime Error Logging                                 System Error
  --------------------------------------------------    Enable/Disable setup
                                                        options.
  System Errors                      [Enable]
▶ Whea Settings
▶ Memory Error Enabling
▶ PCIe Error Enabling
                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        K/M: Scroll Help Area
                                                        Up/Down.
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F3: Previous Values
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit

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```
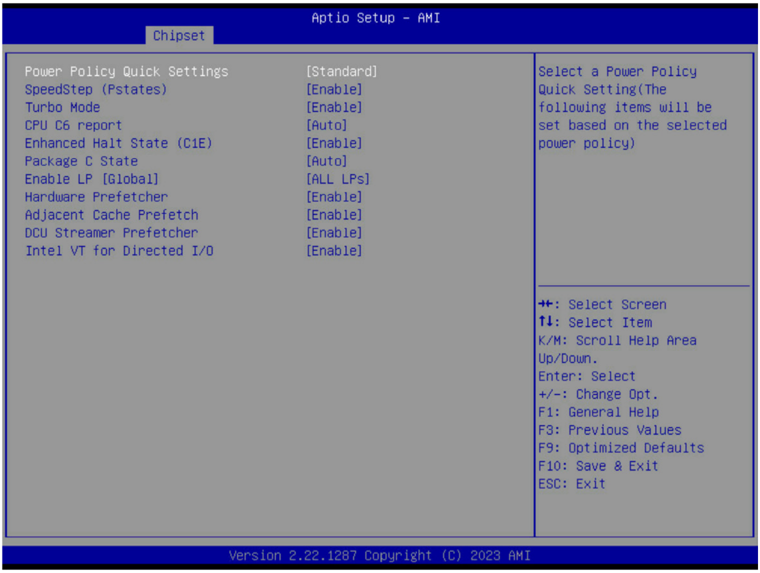

Parameter	Description
Runtime Error Logging	
System Errors	Enable/Disable system error logging function. Options available: Enable, Disable. Default setting is **Enable**.
Whea Settings	Press [Enter] to configure advanced items. ◆ WHEA (Windows Hardware Error Architecture) Support – Enable/Disable WHEA Support. – Options available: Enable, Disable. Default setting is **Enable**.
Memory Error Enabling	Press [Enter] to configure advanced items. ◆ Memory Corrected Error – Enable/Disable Memory Corrected Error. – Options available: Enable, Disable. Default setting is **Enable**. ◆ Uncorrected Error disable Memory – Enable/Disable the Memory that triggers Uncorrected Error. – Options available: Enable, Disable. Default setting is **Disable**.
PCIe Error Enabling	Press [Enter] to configure advanced items. ◆ PCIE Error – Enable/Disable PCIE error. – Options available: Enable, Disable. Default setting is **Disable**. ◆ Corrected Error(Note) – Enables and escalates Correctable Errors to error pins. – Options available: Enable, Disable. Default setting is **Disable**.

(Note) This item appears when **PCIE Error** is set to **Enable**.

Parameter	Description
PCIe Error Enabling	◆ Uncorrected Error(Note) – Enables and escalates Uncorrectable/Recoverable Errors to error pins. – Options available: Enable, Disable. Default setting is **Enable**. ◆ Fatal Error Enable(Note) – Enables and escalates Fatal Errors to error pins. – Options available: Enable, Disable. Default setting is **Enable**. ◆ Assert NMI on SERR(Note) – Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a system error (SERR) occurs. – Options available: Enabled, Disabled. Default setting is **Enabled**. ◆ Assert NMI on PERR(Note) – Enable/Disable BIOS generates a non-maskable interrupt (NMI) and logs an error when a processor bus parity error (PERR) occurs. – Options available: Enabled, Disabled. Default setting is **Enabled**.

(Note) This item appears when **PCIE Error** is set to **Enable**.

2-3-11 Power Policy

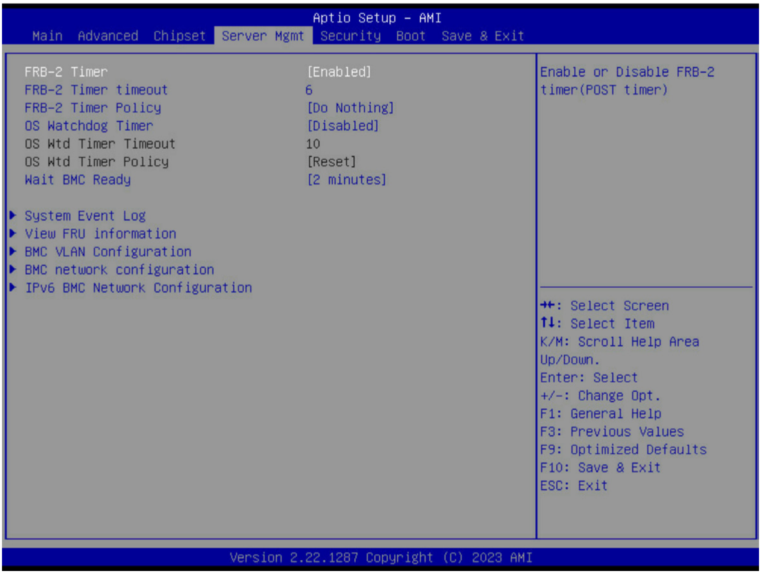


```
                         Aptio Setup - AMI
          Chipset

 Power Policy Quick Settings          [Standard]     Select a Power Policy
 SpeedStep (Pstates)                  [Enable]       Quick Setting(The
 Turbo Mode                           [Enable]       following items will be
 CPU C6 report                        [Auto]         set based on the selected
 Enhanced Halt State (C1E)            [Enable]       power policy)
 Package C State                      [Auto]
 Enable LP [Global]                   [ALL LPs]
 Hardware Prefetcher                  [Enable]
 Adjacent Cache Prefetch              [Enable]
 DCU Streamer Prefetcher              [Enable]
 Intel VT for Directed I/O            [Enable]

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     K/M: Scroll Help Area
                                                     Up/Down.
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F3: Previous Values
                                                     F9: Optimized Defaults
                                                     F10: Save & Exit
                                                     ESC: Exit

               Version 2.22.1287 Copyright (C) 2023 AMI
```

Parameter	Description
Power Policy Quick Settings	Selects a Power Policy Quick Setting. Options available: Standard, Best Performance, Energy Efficient. Default setting is **Standard**.
SpeedStep (Pstates)	Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. Options available: Enable, Disable. Default setting is **Enable**.
Turbo Mode	When this item is enabled, the processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance. When this item is disabled, the processor will not overclock any of its core. Options available: Enable, Disable. Default setting is **Enable**.
CPU C6 report	Enable/Disable the BIOS to enable the report from the CPU C6 state (ACPI C3) to the OS. Options available: Disable, Enable, Auto. Default setting is **Auto**.
Enhanced Halt State (C1E)	Enable/Disable the C1E support for lower power consumption. Takes effect after reboot. Options available: Enable, Disable. Default setting is **Enable**.
Package C State	Configures the C-State package limit. Options available: C0/C1 state, C2 state, C6(non Retention) state, C6(Retention) state, No Limit, Auto. Default setting is **Auto**.

Parameter	Description
Enable LP [Global]	Enables Logical processor (Software Method to Enable/Disable Logical Processor threads). Options available: ALL LPs, Single LP. Default setting is **ALL LPs**.
Hardware Prefetcher	Options available: Enable, Disable. Default setting is **Enable**.
Adjacent Cache Prefetch	Options available: Enable, Disable. Default setting is **Enable**.
DCU Streamer Prefetcher	Options available: Enable, Disable. Default setting is **Enable**.
Intel® VT for Directed I/O	Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables. Options available: Enable, Disable. Default setting is **Enable**.

2-4 Server Management Menu



```
                              Aptio Setup - AMI
  Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

  FRB-2 Timer                          [Enabled]       Enable or Disable FRB-2
  FRB-2 Timer timeout                  6               timer(POST timer)
  FRB-2 Timer Policy                   [Do Nothing]
  OS Watchdog Timer                    [Disabled]
  OS Wtd Timer Timeout                 10
  OS Wtd Timer Policy                  [Reset]
  Wait BMC Ready                       [2 minutes]

▶ System Event Log
▶ View FRU information
▶ BMC VLAN Configuration
▶ BMC network configuration
▶ IPv6 BMC Network Configuration
                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       K/M: Scroll Help Area
                                                       Up/Down.
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F3: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

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```
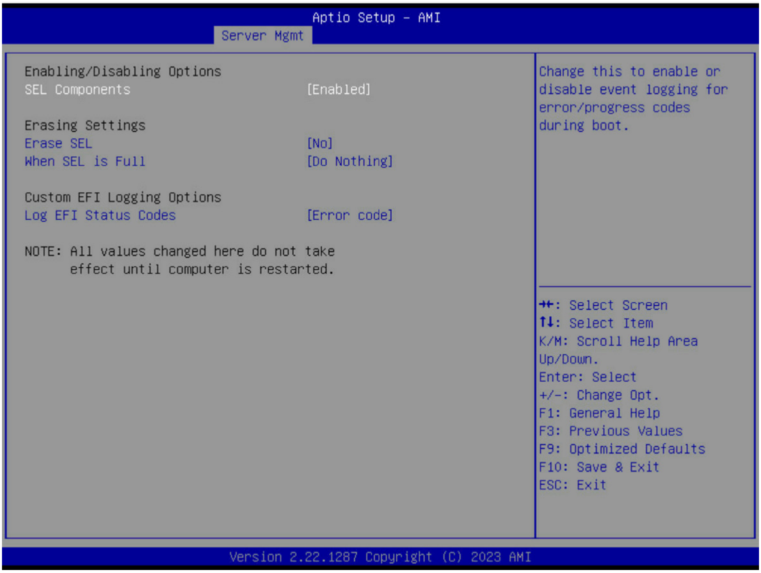

Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is **Enabled**.
FRB-2 Timer(Note1) timeout	Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is **6 minutes**.
FRB-2 Timer Policy(Note1)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

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

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

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

2-4-1 System Event Log

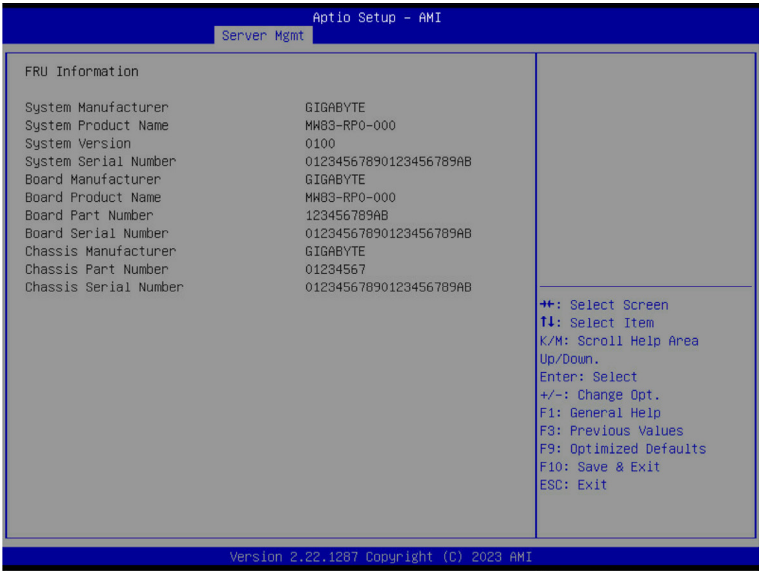


```
                              Aptio Setup - AMI
                         Server Mgmt

 Enabling/Disabling Options                                 Change this to enable or
 SEL Components                   [Enabled]                 disable event logging for
                                                            error/progress codes
 Erasing Settings                                           during boot.
 Erase SEL                        [No]
 When SEL is Full                 [Do Nothing]

 Custom EFI Logging Options
 Log EFI Status Codes             [Error code]

 NOTE: All values changed here do not take
       effect until computer is restarted.
                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            K/M: Scroll Help Area
                                                            Up/Down.
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F3: Previous Values
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit

                  Version 2.22.1287 Copyright (C) 2023 AMI
```

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

2-4-2 View FRU Information

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



```
                                  Aptio Setup - AMI
                       Server Mgmt

FRU Information

System Manufacturer                 GIGABYTE
System Product Name                 MW83-RP0-000
System Version                      0100
System Serial Number                0123456789012345678 9AB
Board Manufacturer                  GIGABYTE
Board Product Name                  MW83-RP0-000
Board Part Number                   123456789AB
Board Serial Number                 0123456789012345678 9AB
Chassis Manufacturer                GIGABYTE
Chassis Part Number                 01234567
Chassis Serial Number               0123456789012345678 9AB

                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        K/M: Scroll Help Area
                                                        Up/Down.
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F3: Previous Values
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit

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```
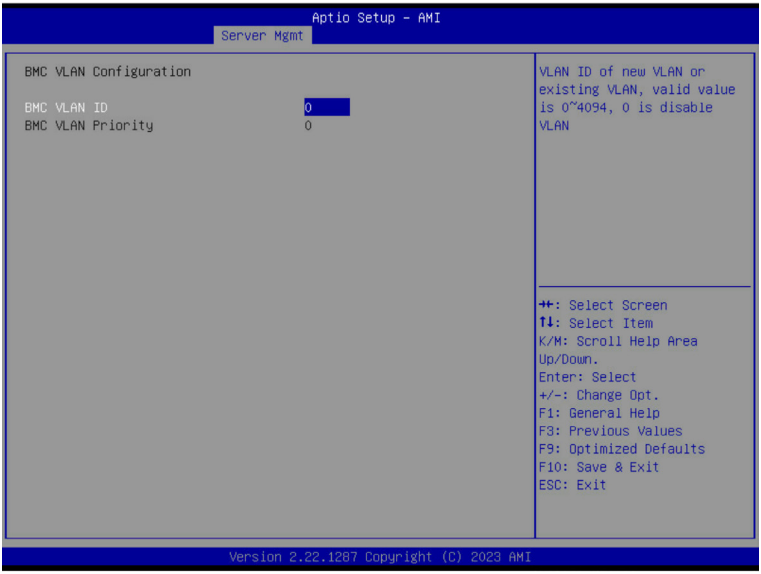

(Note) The model name will vary depends on the product you purchased

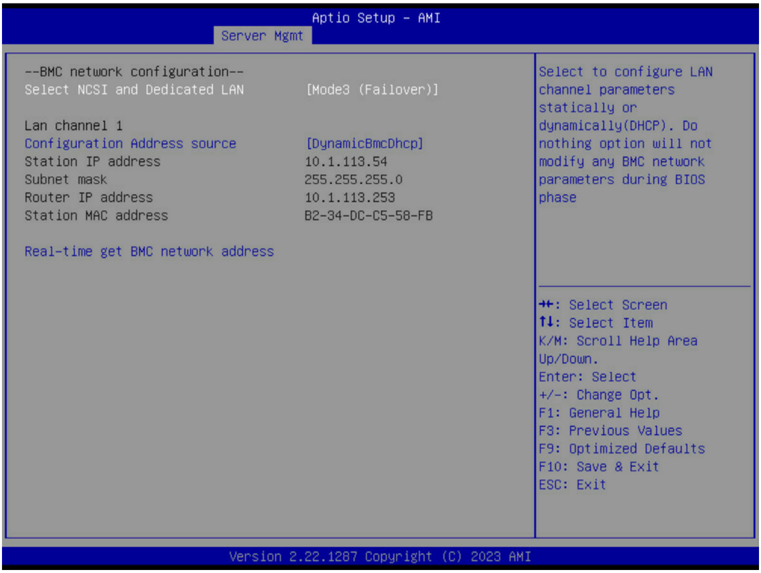
2-4-3 BMC VLAN Configuration



```
                         Aptio Setup - AMI
                    Server Mgmt
BMC VLAN Configuration                        VLAN ID of new VLAN or
                                              existing VLAN, valid value
BMC VLAN ID                  0                is 0~4094, 0 is disable
BMC VLAN Priority            0                VLAN

                                              →←: Select Screen
                                              ↑↓: Select Item
                                              K/M: Scroll Help Area
                                              Up/Down.
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F3: Previous Values
                                              F9: Optimized Defaults
                                              F10: Save & Exit
                                              ESC: Exit
               Version 2.22.1287 Copyright (C) 2023 AMI
```

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.

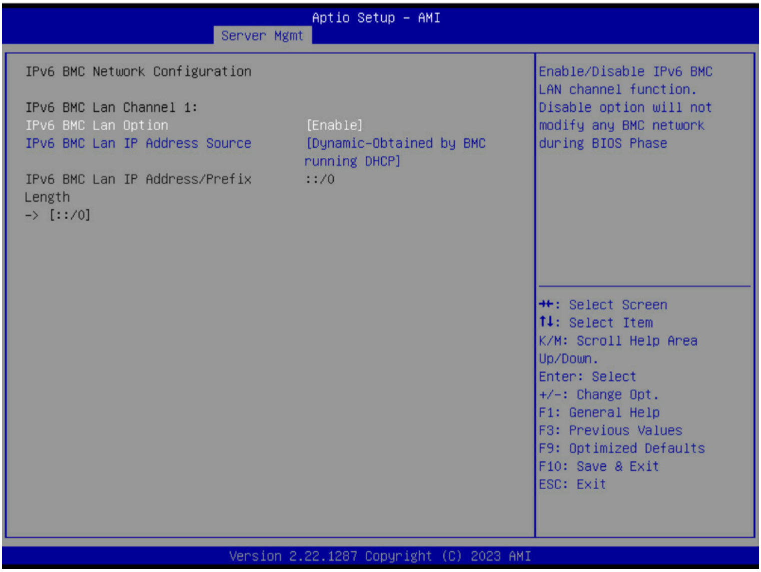
2-4-4 BMC Network Configuration



```
                              Aptio Setup - AMI
                        Server Mgmt
 --BMC network configuration--                          Select to configure LAN
 Select NCSI and Dedicated LAN      [Mode3 (Failover)]  channel parameters
                                                        statically or
 Lan channel 1                                          dynamically(DHCP). Do
 Configuration Address source       [DynamicBmcDhcp]    nothing option will not
 Station IP address                 10.1.113.54         modify any BMC network
 Subnet mask                        255.255.255.0       parameters during BIOS
 Router IP address                  10.1.113.253        phase
 Station MAC address                B2-34-DC-C5-58-FB

 Real-time get BMC network address
                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        K/M: Scroll Help Area
                                                        Up/Down.
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F3: Previous Values
                                                        F9: Optimized Defaults
                                                        F10: Save & Exit
                                                        ESC: Exit
               Version 2.22.1287 Copyright (C) 2023 AMI
```

Parameter	Description
BMC network configuration	
Select NCSI and Dedicated LAN	Options available: Do Nothing, Model1(Dedicated), Model2(NCSI), Mode3(Failover). Default setting is **Do Nothing**.
Lan Channel 1	
Configuration Address source	Selects to configure LAN channel parameters statically or dynamically (DHCP). Options available: Unspecified, Static, DynamicBmcDhcp. Default setting is **DynamicBmcDhcp**.
Station IP address	Displays IP Address information.
Subnet mask	Displays Subnet Mask information. Please note that the IP address must be in three digitals, for example, 192.168.000.001.
Router IP address	Displays the Router IP Address information.
Station MAC address	Displays the MAC Address information.
Real-time get BMC network address	Press [Enter] will set LAN mode and Address source and then get IP, Subnet, Gateway and MAC address.

2-4-5 IPv6 BMC Network Configuration

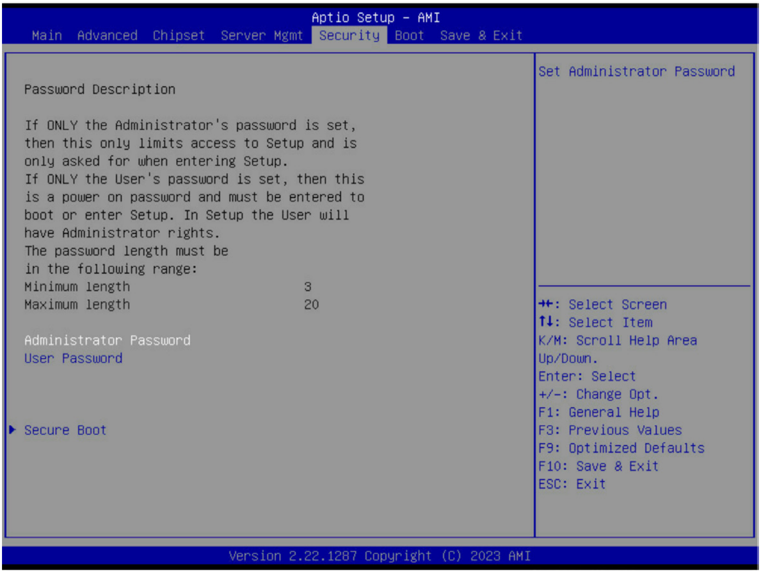


```
                         Aptio Setup - AMI
                 Server Mgmt

 IPv6 BMC Network Configuration                            Enable/Disable IPv6 BMC
                                                           LAN channel function.
 IPv6 BMC Lan Channel 1:                                   Disable option will not
 IPv6 BMC Lan Option               [Enable]                modify any BMC network
 IPv6 BMC Lan IP Address Source    [Dynamic-Obtained by BMC during BIOS Phase
                                   running DHCP]
 IPv6 BMC Lan IP Address/Prefix    ::/0
 Length
 -> [::/0]

                                                           ++: Select Screen
                                                           ↑↓: Select Item
                                                           K/M: Scroll Help Area
                                                           Up/Down.
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F3: Previous Values
                                                           F9: Optimized Defaults
                                                           F10: Save & Exit
                                                           ESC: Exit

              Version 2.22.1287 Copyright (C) 2023 AMI
```

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

2-5 Security Menu

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



```
Password Description

If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
The password length must be
in the following range:
Minimum length                     3
Maximum length                     20

Administrator Password
User Password


▶ Secure Boot
```

```
Set Administrator Password

→←: Select Screen
↑↓: Select Item
K/M: Scroll Help Area
Up/Down.
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit
```

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.

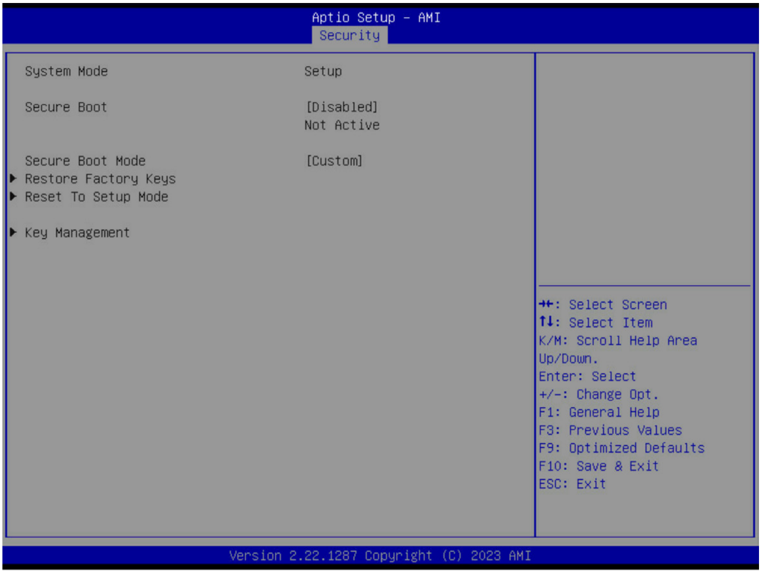
- User Password

  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.

2-5-1 Secure Boot

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



```
                         Aptio Setup - AMI
                             Security

 System Mode                           Setup

 Secure Boot                           [Disabled]
                                       Not Active

 Secure Boot Mode                      [Custom]
▶ Restore Factory Keys
▶ Reset To Setup Mode

▶ Key Management
                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       K/M: Scroll Help Area
                                                       Up/Down.
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F3: Previous Values
                                                       F9: Optimized Defaults
                                                       F10: Save & Exit
                                                       ESC: Exit

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```

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

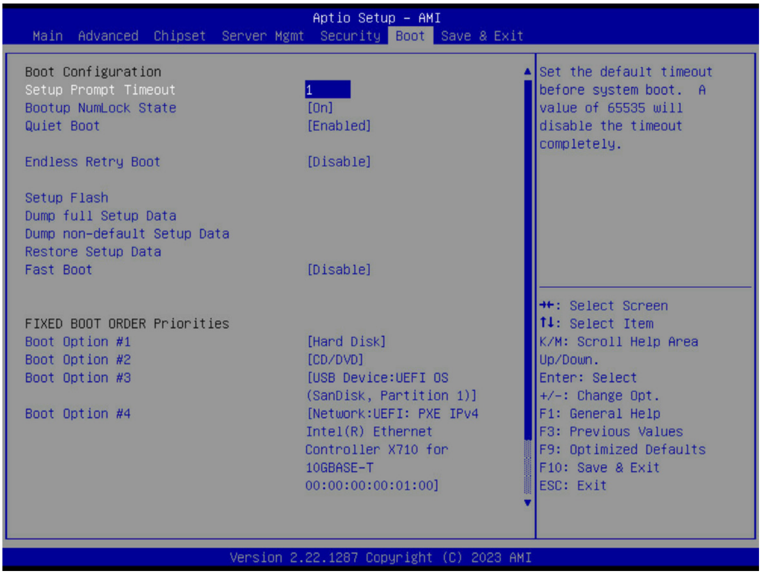
(Note) Advanced items prompt when this item is set to **Custom**.

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. Default setting is **Disabled**. ◆ Restore Factory Keys – Installs all factory default keys. It will force the system in User Mode. – Options available: Yes, No. ◆ Reset To Setup Mode – Reset the system to Setup Mode. – Options available: Yes, No. ◆ Enroll Efi Image – Press [Enter] to enroll SHA256 hash of the binary into Authorized Signature Database (db). ◆ Export Secure Boot variables – Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device. ◆ Secure Boot variable – Displays the current status of the variables used for secure boot. ◆ Platform Key (PK) – Displays the current status of the Platform Key (PK). – Press [Enter] to configure a new PK. – Options available: Update. ◆ Key Exchange Keys (KEK) – Displays the current status of the Key Exchange Key Database (KEK). – Press [Enter] to configure a new KEK or load additional KEK from storage devices. – Options available: Update, Append. ◆ Authorized Signatures (DB) – Displays the current status of the Authorized Signature Database. – Press [Enter] to configure a new DB or load additional DB from storage devices. – Options available: Update, Append. ◆ Forbidden Signatures (DBX) – Displays the current status of the Forbidden Signature Database. – Press [Enter] to configure a new dbx or load additional dbx from storage devices. – Options available: Update, Append.

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

2-6 Boot Menu

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



```
                              Aptio Setup - AMI
  Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

  Boot Configuration                                   ▲ Set the default timeout
  Setup Prompt Timeout              1                    before system boot.  A
  Bootup NumLock State              [On]                 value of 65535 will
  Quiet Boot                        [Enabled]            disable the timeout
                                                         completely.
  Endless Retry Boot                [Disable]

  Setup Flash
  Dump full Setup Data
  Dump non-default Setup Data
  Restore Setup Data
  Fast Boot                         [Disable]

                                                         →←: Select Screen
  FIXED BOOT ORDER Priorities                            ↑↓: Select Item
  Boot Option #1                    [Hard Disk]          K/M: Scroll Help Area
  Boot Option #2                    [CD/DVD]             Up/Down.
  Boot Option #3                    [USB Device:UEFI OS  Enter: Select
                                    (SanDisk, Partition 1)]  +/-: Change Opt.
  Boot Option #4                    [Network:UEFI: PXE IPv4  F1: General Help
                                    Intel(R) Ethernet    F3: Previous Values
                                    Controller X710 for  F9: Optimized Defaults
                                    10GBASE-T            F10: Save & Exit
                                    00:00:00:00:01:00]   ESC: Exit
                                                       ▼

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```
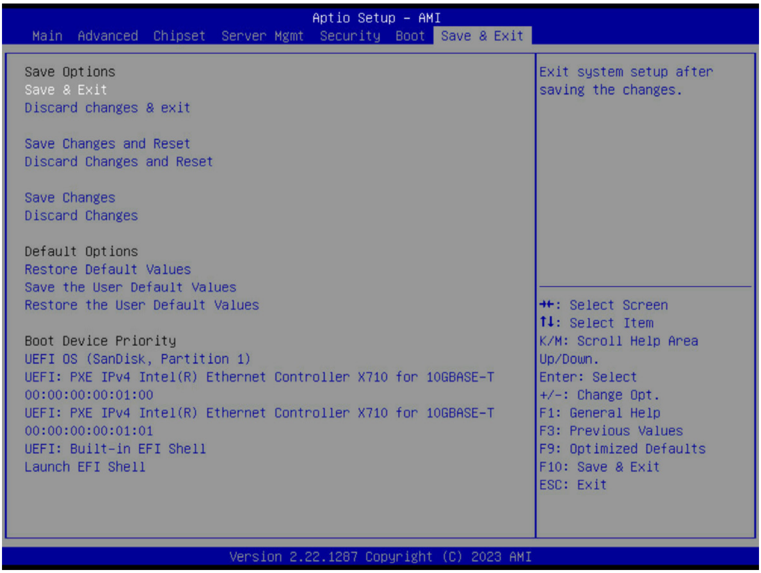

Parameter	Description
Boot Configuration	
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Press the numeric keys to input the desired values.
Bootup NumLock State	Enable/Disable the Bootup NumLock function. Options available: On, Off.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

Parameter	Description
FIXED BOOT ORDER Priorities	
Boot Option #1 / #2 / #3 / #4 / #5	Press [Enter] to configure the boot order priority. By default, the server searches for boot devices in the following sequence: 1. Hard drive. 2. CD-COM/DVD drive. 3. USB device. 4. Network. 5. UEFI.
UEFI Network Drive BBS Priorities	Press [Enter] to configure the boot priority.
UEFI Application Boot Priorities	Press [Enter] to configure the boot priority.

2-7 Save & Exit Menu

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



```
                              Aptio Setup - AMI
  Main  Advanced  Chipset  Server Mgmt  Security  Boot  Save & Exit

 Save Options                                            Exit system setup after
 Save & Exit                                             saving the changes.
 Discard changes & exit

 Save Changes and Reset
 Discard Changes and Reset

 Save Changes
 Discard Changes

 Default Options
 Restore Default Values
 Save the User Default Values
 Restore the User Default Values                         →←: Select Screen
                                                         ↑↓: Select Item
 Boot Device Priority                                    K/M: Scroll Help Area
 UEFI OS (SanDisk, Partition 1)                          Up/Down.
 UEFI: PXE IPv4 Intel(R) Ethernet Controller X710 for 10GBASE-T   Enter: Select
 00:00:00:00:01:00                                       +/-: Change Opt.
 UEFI: PXE IPv4 Intel(R) Ethernet Controller X710 for 10GBASE-T   F1: General Help
 00:00:00:00:01:01                                       F3: Previous Values
 UEFI: Built-in EFI Shell                                F9: Optimized Defaults
 Launch EFI Shell                                        F10: Save & Exit
                                                         ESC: Exit

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```

Parameter	Description
Save Options	
Save 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	

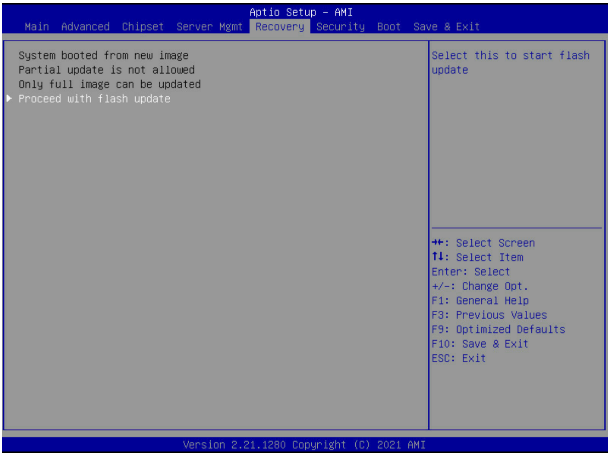
Parameter	Description
Restore Default Values	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the 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 Device Priority	Press [Enter] to configure the device as the boot-up drive.
Launch EFI Shell	Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.

2-8 BIOS Recovery

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

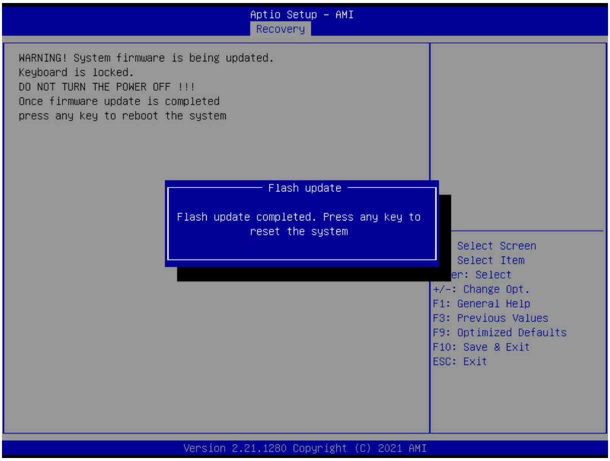
Recovery Instruction:

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



```
System booted from new image
Partial update is not allowed
Only full image can be updated
► Proceed with flash update
```

Select this to start flash update



```
WARNING! System firmware is being updated.
Keyboard is locked.
DO NOT TURN THE POWER OFF !!!
Once firmware update is completed
press any key to reboot the system
```

Flash update

Flash update completed. Press any key to reset the system

2-9 BIOS POST Beep code (AMI standard)

2-9-1 PEI Beep Codes

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

2-9-2 DXE Beep Codes

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