

GIGABYTE™

MW94-RP0

Motherboard

- Intel® Xeon® 600 Processors for Workstations
- E-ATX 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 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

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

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⚠ 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.



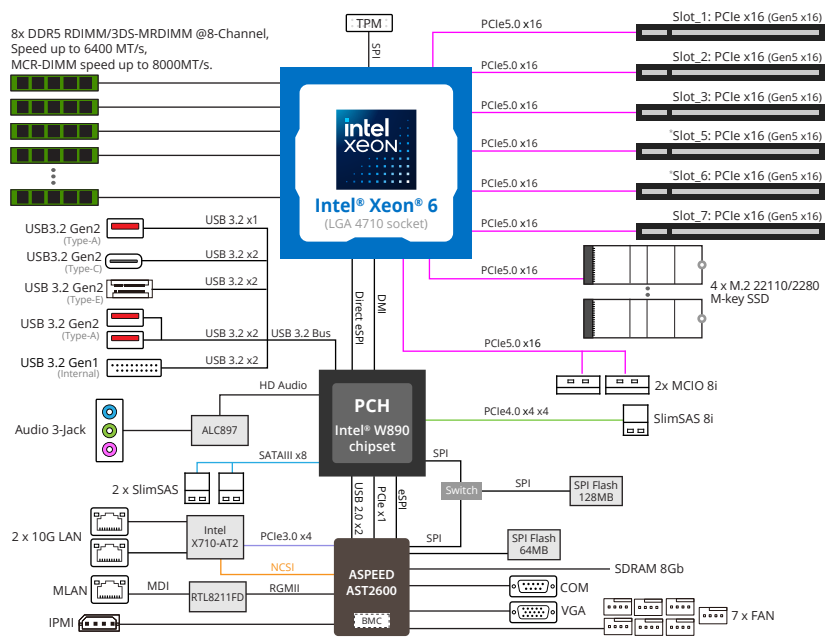
- Battery type: CR2032, voltage rating: +3VDC.
- Non-rechargeable batteries are not to be recharged.
- Remove and immediately recycle or dispose of used batteries, batteries from equipment not used for an extended period of time according to local regulations and keep away from children. Do NOT dispose 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.

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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.

1-2 Product Specifications

 Form Factor	♦ E-ATX ♦ 304.8 x 330.2
 CPU	♦ Intel® Xeon® 600 Processors for workstations ♦ Single processor, TDP up to 350W [Note] Please select Intel® Xeon® 690/670/650 processors to enable all functions.
 Socket	♦ 1 x LGA 4710-2 ♦ Socket E2
 Chipset	♦ Intel® W890
 Memory Type	♦ 8 x DIMM slots^[1] ♦ Support DDR5 RDIMM/MRDIMM ♦ 8-channel memory per processor ♦ RDIMM: Up to 6400 MT/s ♦ MRDIMM: 8000 MT/s^[2] [1] MRDIMMs are supported only on select SKUs and only in a 1DPC configuration [2] MRDIMMs are supported only on select SKUs.
 LAN	♦ 2 x 10Gb/s LAN (1 x Intel® X710-AT2) - Support NCSI function ♦ 1 x 10/100/1000 Mbps Management LAN
 Video	♦ 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	♦ MCIO: - 2 x MCIO 8i for 4 x Gen5 NVMe, from CPU^[1] ♦ SlimSAS: - 1 x SlimSAS 8i for 2 x Gen4 NVMe, from PCH - 2 x SlimSAS 4i for 8 x SATA, from PCH ♦ M.2: - 4 x M.2 (2280/22110), PCIe Gen5 x4, from CPU [1] Require Intel® Xeon® 690/670/650 processors.
 RAID	♦ Intel® SATA RAID 0/1/10/5 ♦ Onboard VROC key header

	PCIe Expansion Slots	♦ Slot_7: PCIe x16 (Gen5 x16), from CPU ♦ Slot_6: PCIe x16 (Gen5 x16), from CPU [1] ♦ Slot_5: PCIe x16 (Gen5 x16), from CPU ♦ Slot_3: PCIe x16 (Gen5 x16), from CPU ♦ Slot_2: PCIe x16 (Gen5 x16), from CPU [1] ♦ Slot_1: PCIe x16 (Gen5 x16), from CPU ♦ 2 x MCIO 8i (Gen5 x8), from CPU [1] Slot_2/6 require Intel® Xeon® 690/670/650 processors.
	Internal I/O	♦ 1 x 24-pin ATX main power connector ♦ 2 x 8-pin ATX 12V power connectors ♦ 1 x 4-pin power connector (for PCIe slots) ♦ 1 x CPU fan header ♦ 6 x System fan headers ♦ 1 x Front audio header ♦ 1 x USB 3.2 Gen2x2 header (Type-E) ♦ 1 x USB 3.2 Gen1 x2 header ♦ 4 x M.2 slots ♦ 2 x MCIO 8i connectors ♦ 1 x SlimSAS 8i connector ♦ 2 x SlimSAS 4i 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 port (Type-C) ♦ 3 x USB 3.2 Gen2x1 ports (Type-A) ♦ 1 x VGA port ♦ 1 x Serial port ♦ 2 x RJ45 ports ♦ 1 x MLAN port ♦ 3 x Audio jacks ♦ 1 x ID button with LED
	Security Modules	♦ 1 x TPM header with SPI interface - Optional TPM2.0 kit: CTM012
	Board Management	♦ Aspeed® AST2600 Baseboard Management Controller ♦ GIGABYTE Management Console web interface
	PSU Connectors	♦ 1 x 24-pin ATX main power connector ♦ 2 x 8-pin ATX 12V power connectors ♦ 1 x 4-pin power connector (for PCIe slots)



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)

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

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.



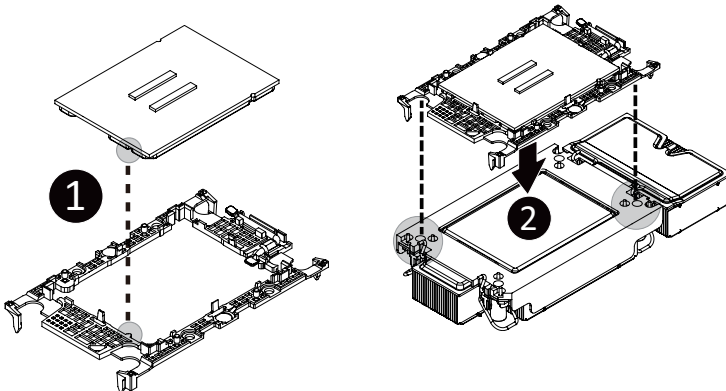
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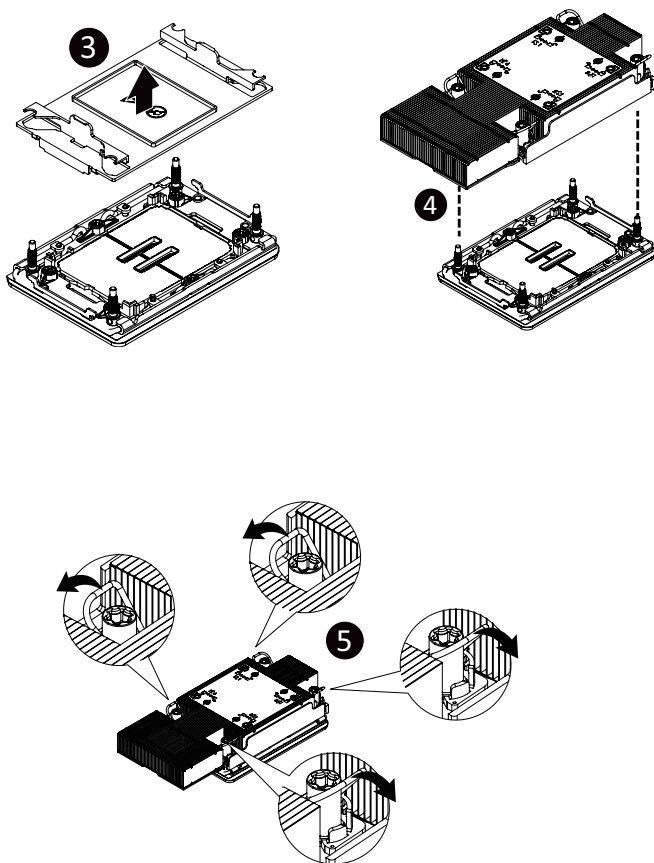
Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

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 disassembling 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

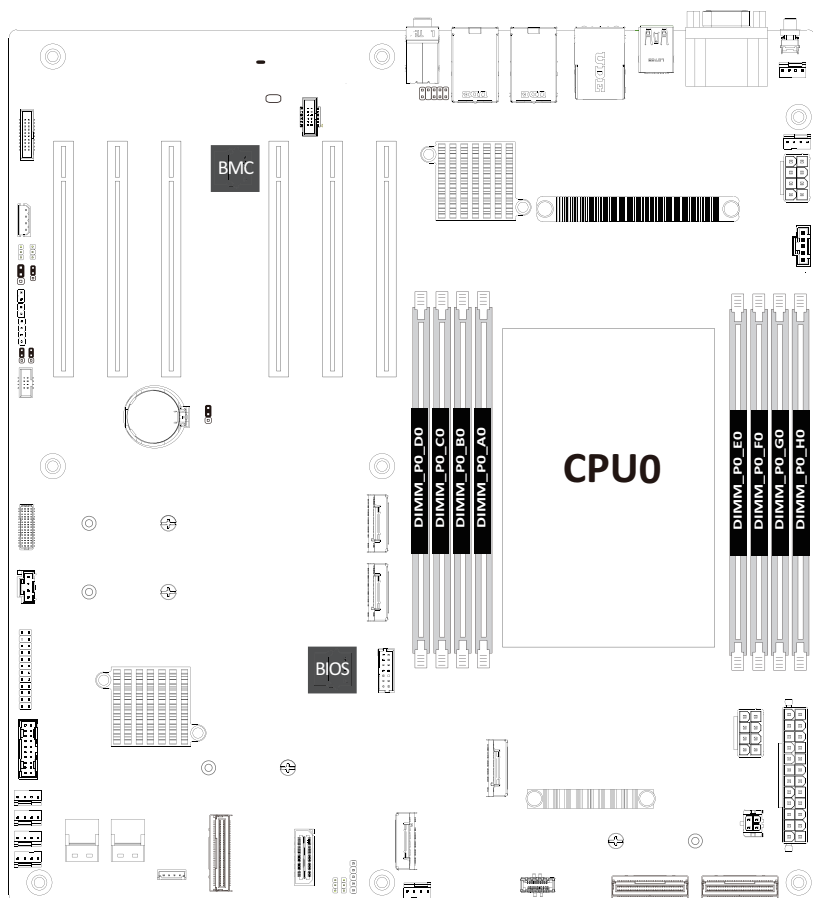


Read the following guidelines before you begin to install the memory:

- 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.



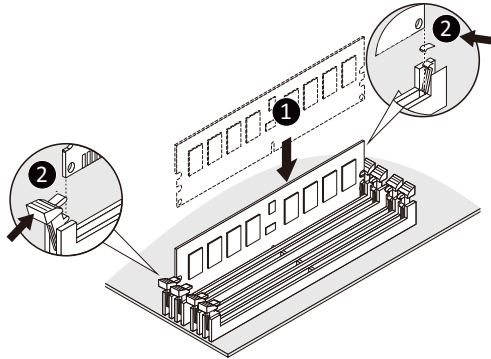
1-4-2 Installing and Removing a Memory Module



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 DIMM module.



1-4-3 Processor and Memory Module Matrix Table

Memory Q'ty for each CPU	CPU0							
	D0	C0	B0	A0	E0	F0	G0	H0
1 DIMM				V				
2 DIMM				V	V			
4 DIMM		V		V	V		V	
8 DIMM	V	V	V	V	V	V	V	V

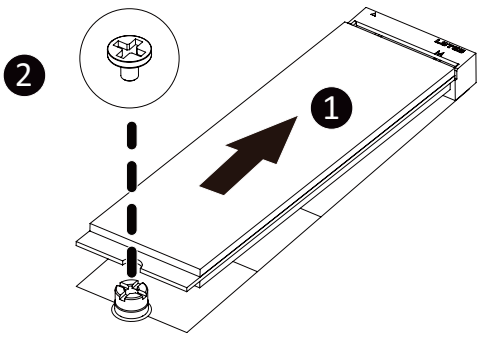
1-4-4 DIMM Population Table

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)						Channel Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel Density (DPC)	
		DRAM Density							
		16Gb		24Gb		32Gb		1DPC/2SPC	2DPC/2SPC
		1DPC	2DPC	1DPC	2DPC	1DPC	2DPC	1.1V	
RDIMM	1Rx8	16GB	16GB	24GB	24GB			6400, 6000,	
	1Rx4	32GB	32GB	48GB	48GB			5600, 5200, 4800	5200, 4800
	2Rx8	32GB	32GB	48GB				(DDR5-6400 rated RDIMMS only)	(DDR5-6400 rated RDIMMS only)
	2Rx4	64GB	64GB	96GB	96GB	128GB	128GB		
RDIMM 3DS	4Rx4					256GB	256GB		
	8Rx4	256GB	256GB						
MRDIMM	2Rx8	32GB						8000, 7200	N/A (no 2DPC configs for MCR)
	2Rx4	64GB						(MCR-8800 only)	

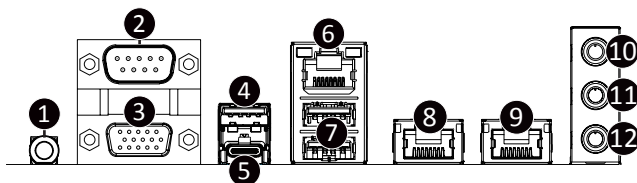
1-5 Installing the M.2 SSD Module

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



1 ID Button with LED

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

2 Serial Port (RJ45 Type)

Connect to serial-based mouse or data processing devices.

3 VGA Port

Connect to a monitor device.

4,7 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.

5 USB 3.2 Gen2 Type C Port

This port supports the USB 3.2 Gen2 specification with data transfer rates up to 10 Gbps and features a reversible connector design.

6 Server Management 10/100/1000 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.

8 Data LAN Port #2

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

9 Data LAN Port #1

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

10 Line In Port (Blue)

Connects to external audio devices such as a CD/DVD player or other audio output sources for audio recording or processing.

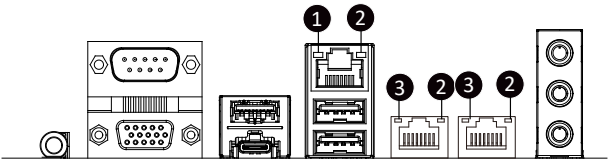
11 Line Out Port (Green)

Connects to speakers or headphones. This is the primary audio output for the system.

12 Mic In Port (Pink)

Connects to a microphone for voice input or audio recording.

1-7 LAN LEDs

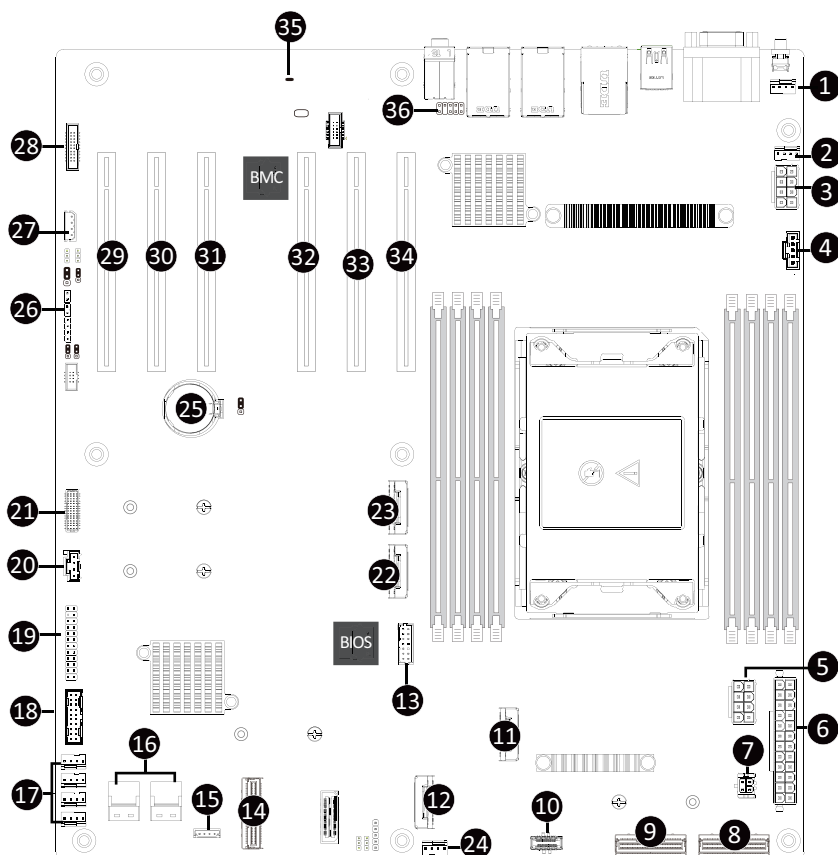


No.	Name	Color	Status	Description
1.	1GbE Speed LED	Yellow	On	1 Gbps data rate
		Green	On	100 Mbps data rate
		N/A	Off	10 Mbps data rate
2.	1GbE Link / Activity LED	Green	On	Link between system and network or no access
			Blink	Data transmission or reception is occurring.
		N/A	Off	No data transmission or reception is occurring.
3.	10GbE Speed LED	Yellow	On	5, 2.5, 1Gbps data rate
		Green	On	10 Gbps data rate
		N/A	Off	100 Mbps data rate



- 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.

1-8 Internal Connectors



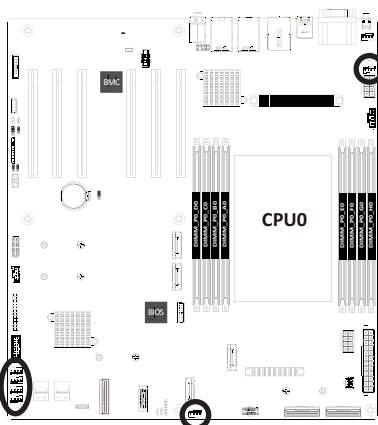
Read the following guidelines before connecting external devices:

- 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.

No.	Code	Description
1	SYS_FAN4	System Fan Connector #4
2	CPU0_FAN	CPU0 Fan Connector
3	P12V_AUX2	2x4 Pin 12V Power Connector
4	PMBUS	PMBus Connector
5	P12V_AUX1	2x4 Pin 12V Power Connector
6	ATX	2x12 Pin Main Power Connector
7	PCIE_PWR	2x2 Pin 12V Power Connector
8	U2_P0_P7CA	MCIO Connector
9	U2_P0_P7GE	MCIO Connector
10	F_USB3_2	Front Panel USB 3.2 Gen2 Connector
11	M2_0	M.2 Slot (PCIe Gen5 x2, Support NGFF-2280/22110)
12	M2_1	M.2 Slot (PCIe Gen5 x2, Support NGFF-2280/22110)
13	SPL_TPM	TPM Connector
14	U2_PCH_PE1	SlimSAS 8i Connector
15	SW_RAID	SATA RAID Upgrade Key(VROC Module Connector)
16	SL_SATA1/SL_SATA2	Slimline Connector #1/#2 (SATA 6Gb/s Signal)
17	SYS_FAN1 SYS_FAN2 SYS_FAN3 SYS_FAN5	System Fan Connector #1 System Fan Connector #2 System Fan Connector #3 System Fan Connector #5
18	F_USB3	Front Panel USB 3.2 Gen1 Connector
19	FP_1	Front Panel Header
20	BMC_USB2B	BMC USB Connector
21	BP_1	HDD Backplane Board Connector
22	M2_2	M.2 Slot (PCIe Gen5 x2, Support NGFF-2280/22110)
23	M2_3	M.2 Slot (PCIe Gen5 x2, Support NGFF-2280/22110)
24	SYS_FAN6	System Fan Connector #6
25	BAT	Battery Socket
26	CASE_OPEN	Case Open Intrusion Header
27	IPMB	Intelligent Platform Management Bus Connector
28	CN_NCSI	NCSI Connector
29	PCIE_1	PCIe x16 Slot (Gen5 x16)
30	PCIE_2	PCIe x16 Slot (Gen5 x16)
31	PCIE_3	PCIe x16 Slot (Gen5 x16)
32	PCIE_5	PCIe x16 Slot (Gen5 x16)
33	PCIE_6	PCIe x16 Slot (Gen5 x16)
34	PCIE_7	PCIe x16 Slot (Gen5 x16)
35	LED_BMC	BMC Firmware Readiness LED
36	F_AUDIO	Front Audio Header

1/2/17/24) CPU0_FAN / SYS_FAN1 ~ 6 (CPU Fan Connector / System Fan Connectors)

The motherboard has one 4-pin CPU fan header (CPU_FAN), and two 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.



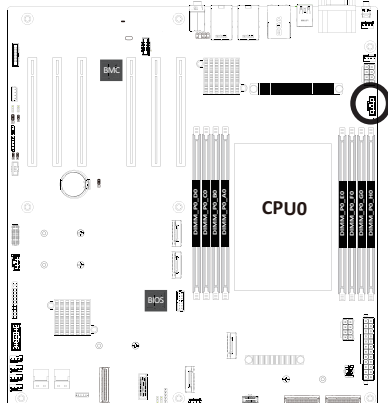
Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control



- 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.

4) 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

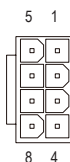
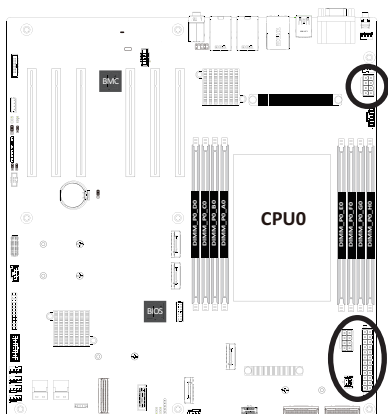
3/5/6/7) P12V_AUX2/P12V_AUX1/ATX/PCIE_PWR

(2x4 12V Power Connector, 2x12 Main Power Connector and 2x2 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

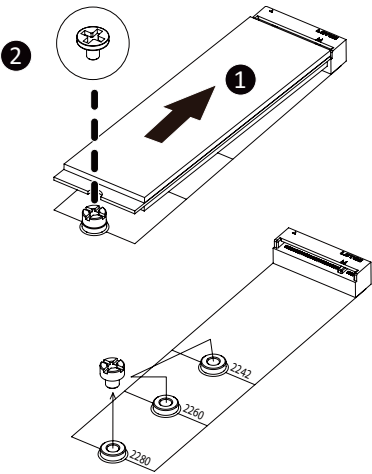
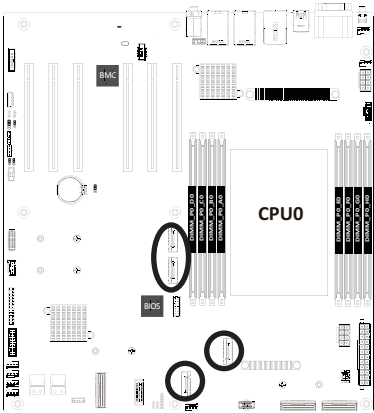


ATX

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

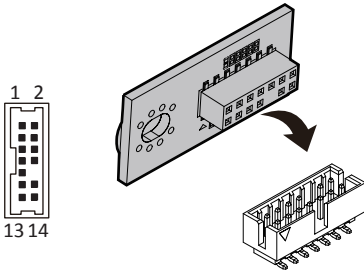
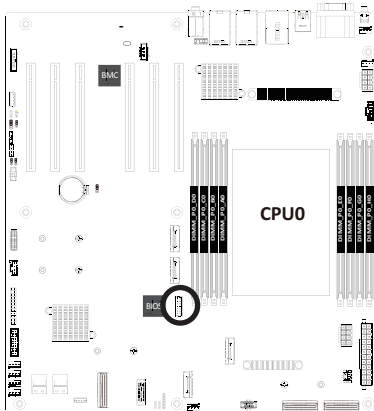
11/12/22/23) M2_0~3 (M.2 Module)

The M.2 slot is used to install small form factor SSDs or wireless modules, providing high-speed data transfer via PCIe or SATA interfaces.



13) SPI_TPM (Trusted Platform Module Connector)

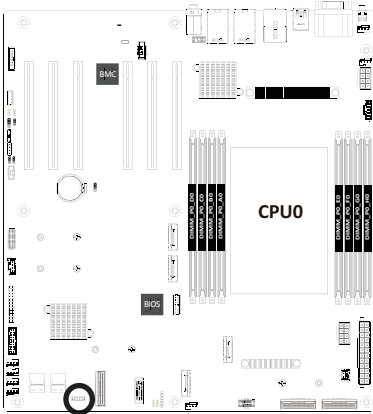
Trusted Platform Module (TPM) is an international standard for a secure cryptoprocessor, a dedicated microcontroller designed to secure hardware through integrated cryptographic keys.



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

15) SW_RAID (SATA RAID Upgrade Key(VROC Module Connector))

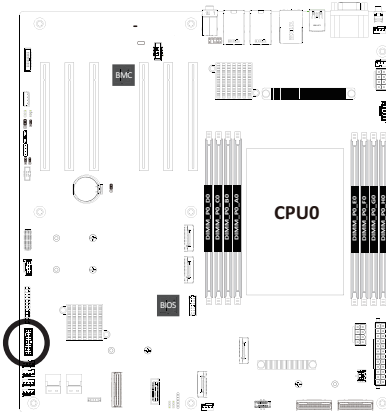
The connector is used to install a physical hardware key that unlocks Intel® Virtual RAID on CPU (VROC) features, allowing for advanced RAID configurations (such as RAID 5 or 10) on NVMe or SATA storage arrays.



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

18) F_USB3 (Front Panel USB 3.2 Gen1 Connector)

The connectors conform to USB 3.2 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



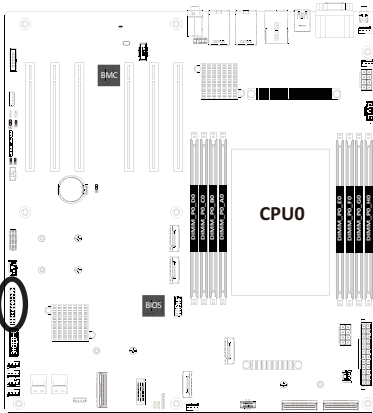
Pin No.	Definition	Pin No.	Definition
1	Power	11	IntA_P2_D+
2	IntA_P1_SSRX-	12	IntA_P2_D-
3	IntA_P1_SSRX+	13	GND
4	GND	14	IntA_P2_SSTX+
5	IntA_P1_SSTX-	15	IntA_P2_SSTX-
6	IntA_P1_SSTX+	16	GND
7	GND	17	IntA_P2_SSRX+
8	IntA_P1_D-	18	IntA_P2_SSRX-
9	IntA_P1_D+	19	Power
10	NC	20	No Pin

19) 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.



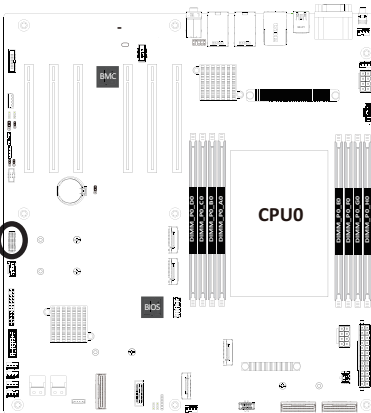
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.



1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
21 22
23 24

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 Active LED+
23	NMI Switch	24	LAN2 Link LED-

21) BP_1 (HDD Backplane Board Connector)

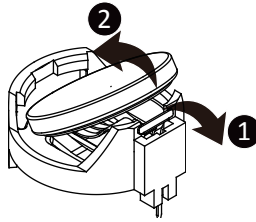
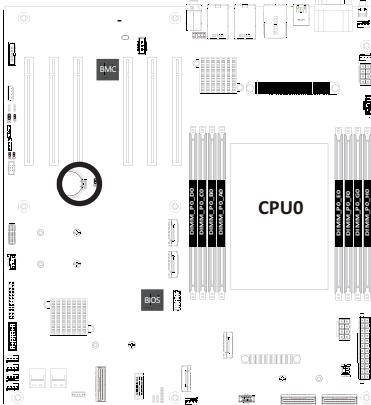


30 29
2 1

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	I2C_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

25) BAT (Battery Socket)

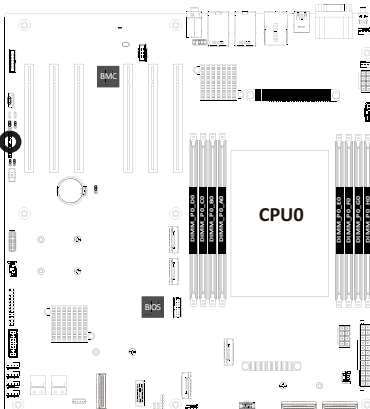
The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.



- 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.

26) CASE_OPEN (Case Open Intrusion Alert Header)

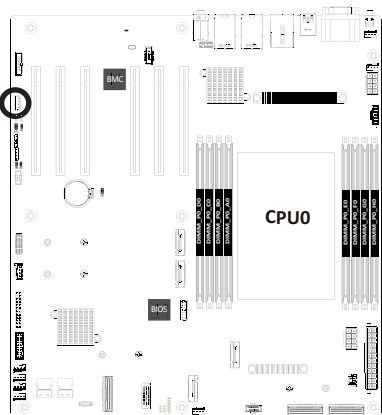
This motherboard provides a chassis detection feature that detects if the chassis cover has been removed. This function requires a chassis with chassis intrusion detection design.



- ☐ Open: Normal Operation (Default)
- ☒ Closed: Active Chassis Intrusion Alert

27) IPMB (IPMB Connector)

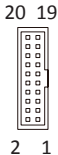
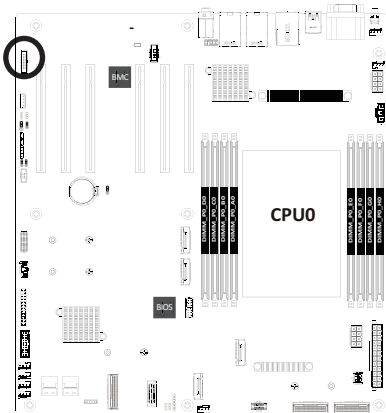
The IPMB connector is used to connect Intelligent Platform Management Bus (IPMB) devices in a computer system for remote monitoring and management capabilities.



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

28) CN_NCSI (NCSI Connector)

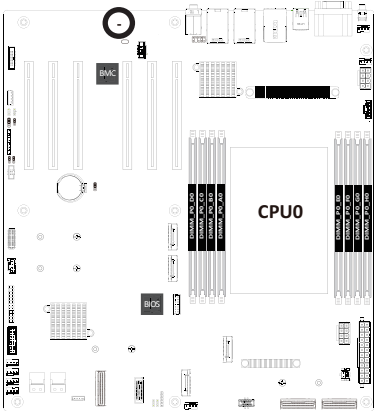
The NCSI connector is used to connect the BMC to a Network Interface Controller (NIC) to enable remote out-of-band management through shared network ports.



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_CRD_V	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

35) LED_BMC (BMC Firmware Readiness LED)

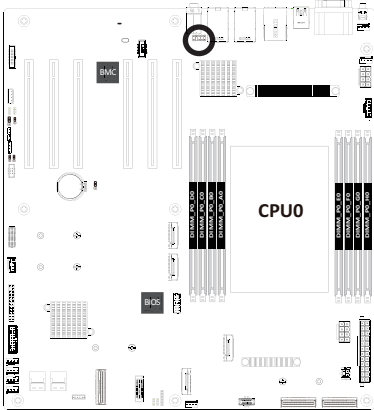
The BMC Firmware Readiness LED header is a status LED that indicates the functional readiness and "heartbeat" of the BMC firmware.



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

36) F_AUDIO (Front Audio Header)

The Front Audio header is used to connect the chassis front panel audio jacks to the motherboard for headphone and microphone access.



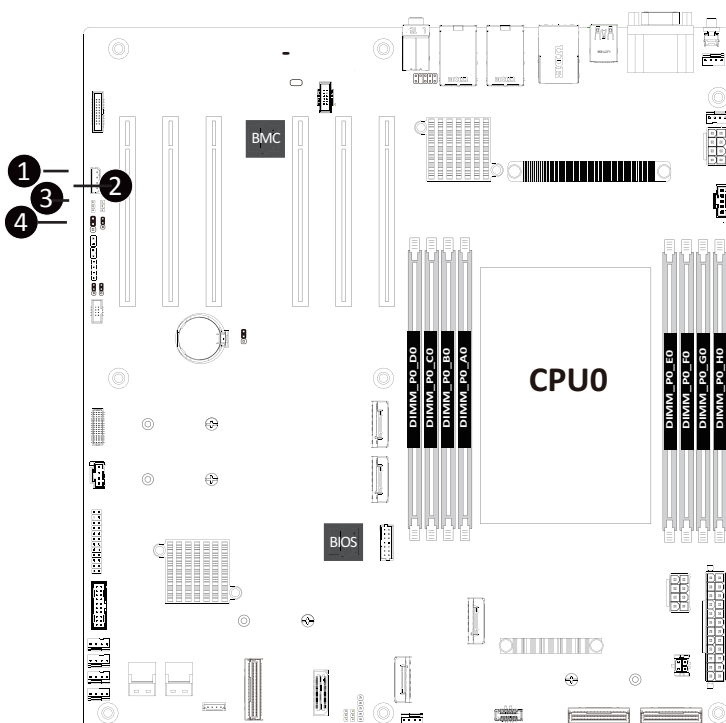
10 9



2 1

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

1-9 Jumper Settings



No.	Jumper Name	Jumper Setting
1	ME Force Update	1-2: Enable 2-3: Default
2	BIOS Recovery (BIOS_RCVR)	1-2: Default 2-3: Enable
3	Password Clear (BIOS_PWD)	1-2: Default 2-3: Enable
4	Clear CMOS (CLR_CMOS)	1-2: Normal operation (Default) 2-3: Clear CMOS data (Enable)

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 key during the POST when the power is turned on.



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

BIOS Setup Program Function Keys

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

■ **Main**

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

■ **Advanced**

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

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

■ **Chipset**

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

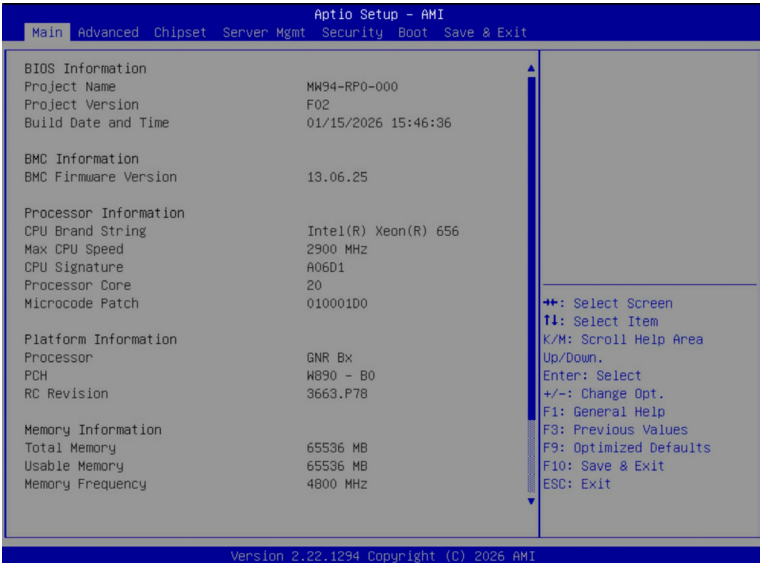
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

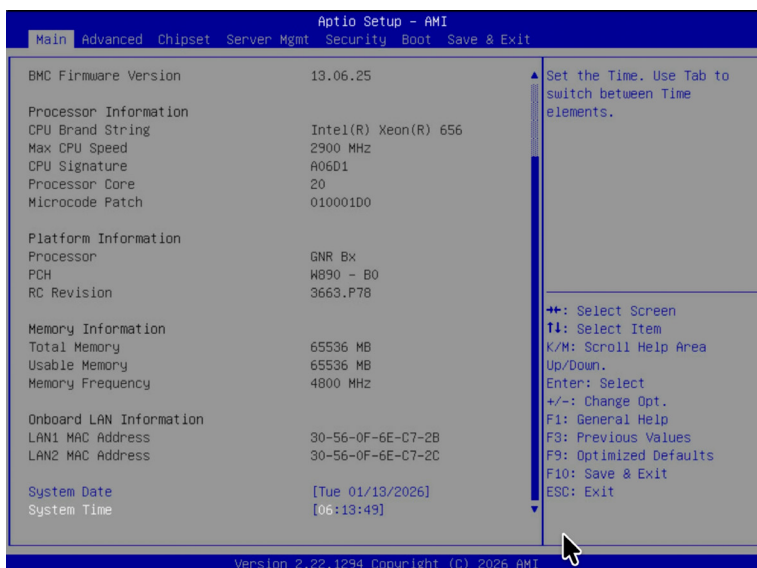
Submenu Help

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.





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.

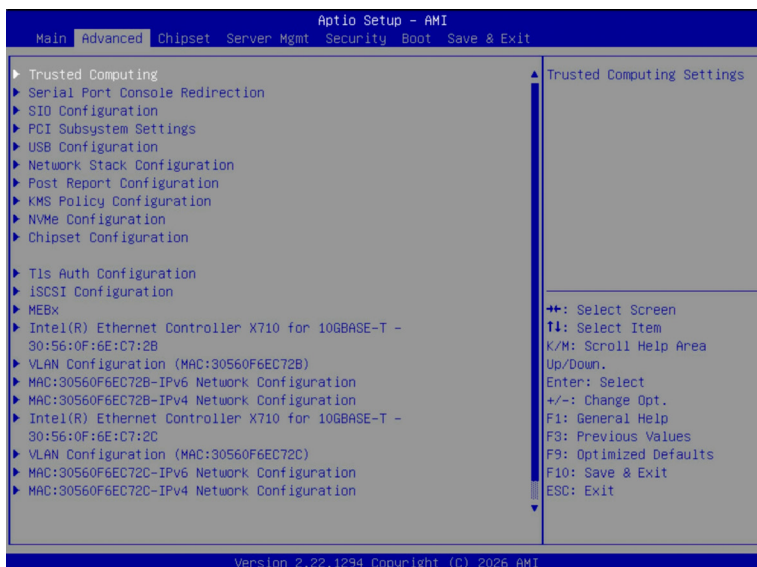
(Note1) Functions available on selected models.

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

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.

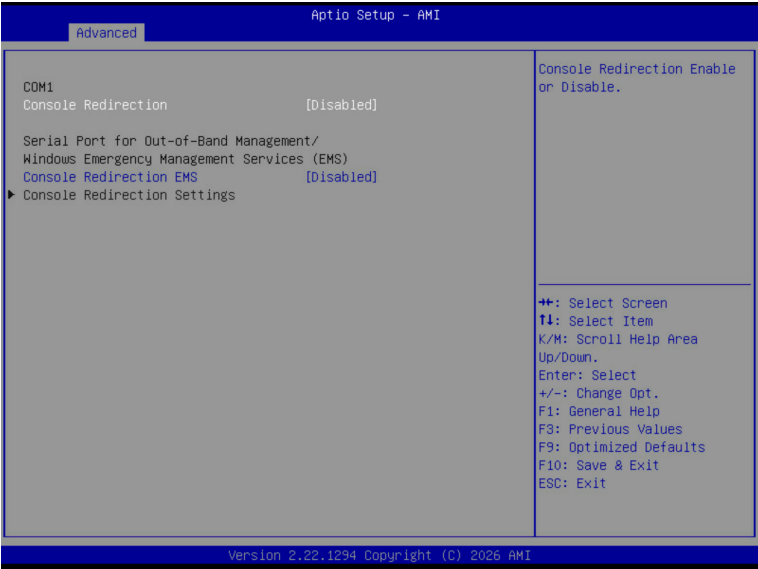


2-2-1 Trusted Computing



Parameter	Description
Configuration	
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 .

2-2-2 Serial Port Console Redirection



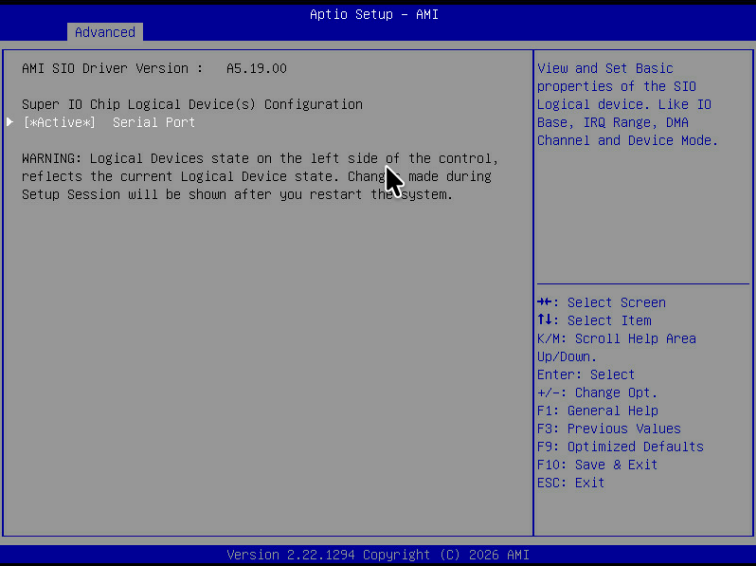
Parameter	Description
COM1 Console Redirection ^(Note)	Console redirection enables the users to manage the system from a remote location. Options available: Enabled, Disabled. Default setting is Disabled .
COM1 Console Redirection Settings	Press [Enter] to configure advanced items. Please note that this item is configurable when COM1 Console Redirection is set to Enabled. ◆ Terminal Type – Selects a terminal type to be used for console redirection. – Options available: VT100, 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



Parameter	Description
AMI SIO Driver Version	Displays the AMI SIO driver version information.
Super IO Chip Logical Device(s) Configuration	
	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.
[*Active*] Serial Port	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	A5.01.32	Enable/Disable PCIe_1 I/O ROM
PCI_E_1 I/O ROM	[Enabled]	
PCI_E_1 Data Link Feature Exchange function	[Auto]	
PCI_E_1 PXE Boot	[Enabled]	
PCI_E_1 Lanes	[Auto]	
PCI_E_1 Max Link Speed	[Auto]	
PCI_E_2 I/O ROM	[Enabled]	
PCI_E_2 Data Link Feature Exchange function	[Auto]	
PCI_E_2 PXE Boot	[Enabled]	
PCI_E_2 Lanes	[Auto]	
PCI_E_2 Max Link Speed	[Auto]	
PCI_E_3 I/O ROM	[Enabled]	++: Select Screen T1: 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
PCI_E_3 Data Link Feature Exchange function	[Auto]	
PCI_E_3 PXE Boot	[Enabled]	
PCI_E_3 Lanes	[Auto]	
PCI_E_3 Max Link Speed	[Auto]	
PCI_E_5 I/O ROM	[Enabled]	
PCI_E_5 Data Link Feature Exchange function	[Auto]	
Version 2.22.1294 Copyright (C) 2026 AMI		

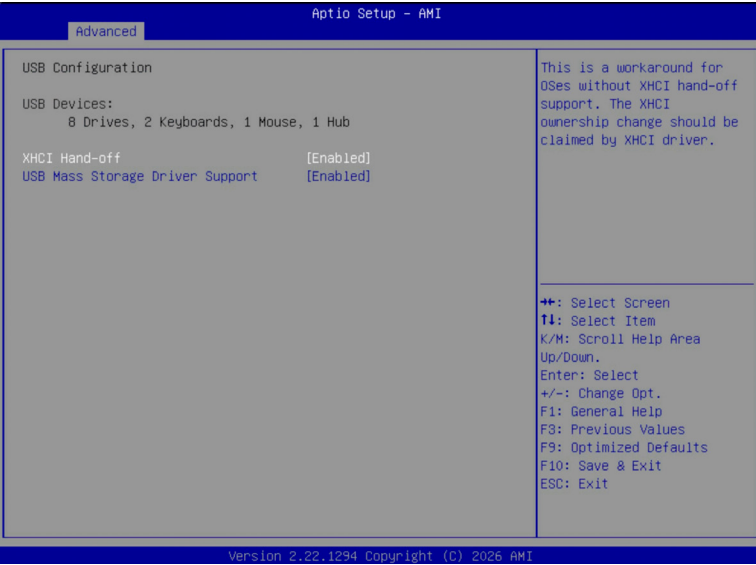
Aptio Setup - AMI		
Advanced		
PCI_E_6 PXE Boot	[Enabled]	If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.
PCI_E_6 Lanes	[Auto]	
PCI_E_6 Max Link Speed	[Auto]	
PCI_E_7 I/O ROM	[Enabled]	
PCI_E_7 Data Link Feature Exchange function	[Auto]	
PCI_E_7 PXE Boot	[Enabled]	
PCI_E_7 Lanes	[Auto]	
PCI_E_7 Max Link Speed	[Auto]	
Onboard LAN1 & LAN2 Controller	[Enabled]	
Onboard LAN1 I/O ROM	[Enabled]	
Onboard LAN2 I/O ROM	[Enabled]	++: Select Screen T1: 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
PCI Devices Common Settings:		
Re-Size BAR Support	[Disabled]	
SR-IOV Support	[Enabled]	
Version 2.22.1294 Copyright (C) 2026 AMI		

Parameter	Description
PCI Bus Driver Version	Displays the PCI Bus Driver version information.
SLOT# I/O ROM ^(Note1)	When enabled, this setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled, Disabled. Default setting is Enabled .
SLOT# Lanes ^(Note1)	Change the PCIe lanes. Default setting is Auto .
SLOT# Max Link Speed ^(Note1)	Configure PCIe max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is Auto .
M2M I/O ROM ^(Note2)	Enable/Disable M2M devices, and initializes device expansion ROM. Options available: Enabled, Disabled. Default setting is Enabled .
M2M Lanes ^(Note2)	Change the M2M PCIe lanes. Options available: Auto, x4, x2x2. Default setting is Auto .
M2M Max Link Speed ^(Note2)	Configure M2M max link speed. Options available: Auto, Gen1, Gen2, Gen3, Gen4, Gen5. Default setting is Auto .
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 M.2 Slot.

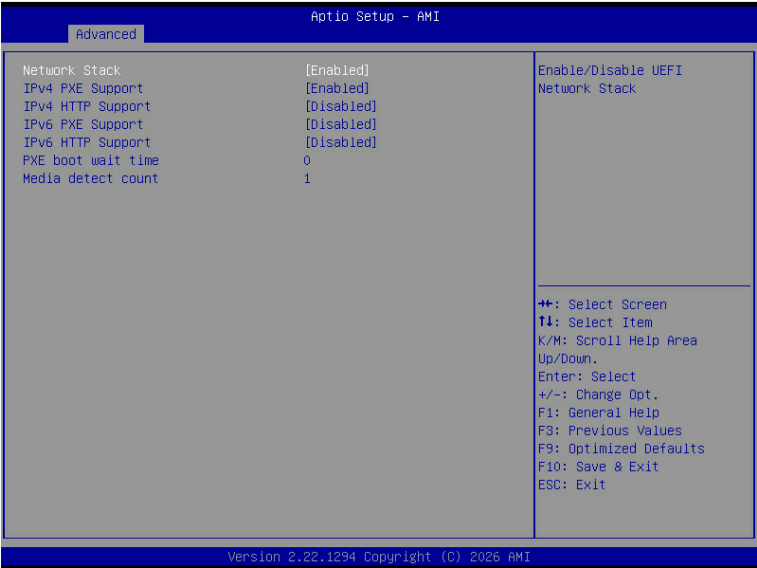
2-2-5 USB Configuration



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

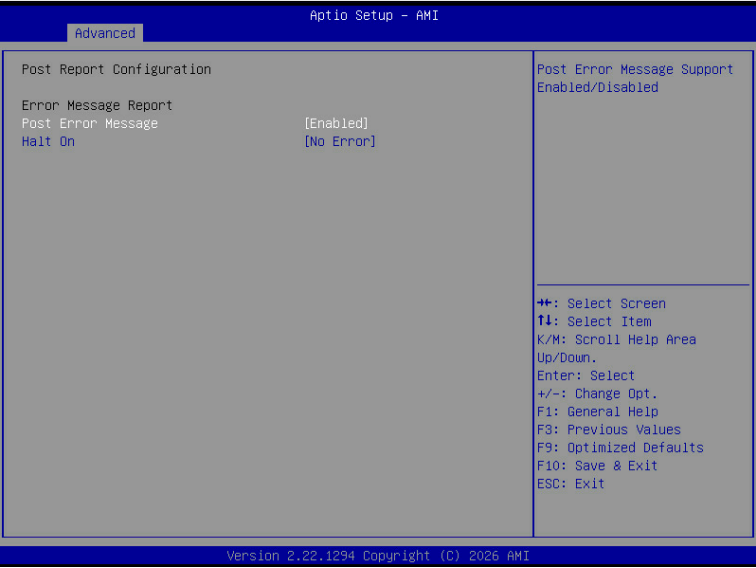
(Note) This item is present only if you attach USB devices.

2-2-6 Network Stack Configuration



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



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 .

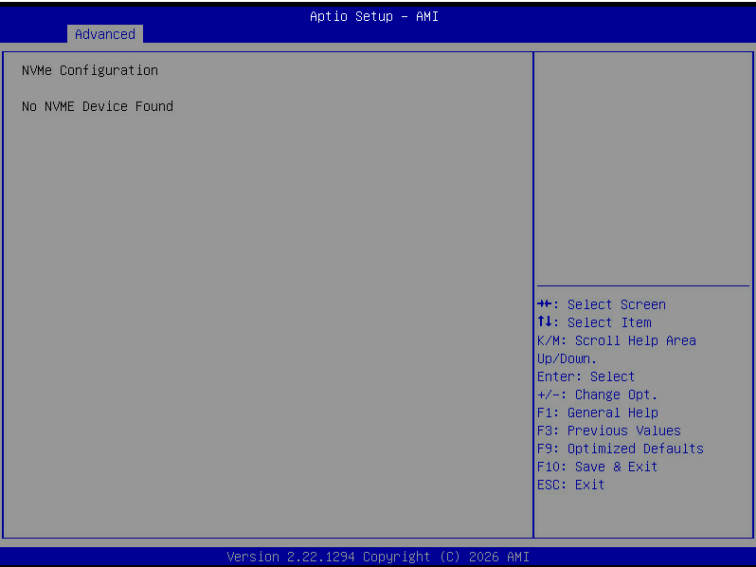
2-2-8 KMIP Server Configuration

Aptio Setup - AMI		
Advanced		
KMS Option	[Disabled]	KMS Option
KMS KMIP Server Retry Count	5	
▶ KMIP Server 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
Version 2.22.1294 Copyright (C) 2026 AMI		

Aptio Setup - AMI		
Advanced		
KMIP Server IP address	0.0.0.0	Enter IP4 address in dotted-decimal notation Example: 192.168.10.12
KMIP TCP Port number	5696	
Time Zone	[GMT +8]	
Client Credentials	[Enabled]	
Client UserName	UserName	
Client Password		
KMS TLS Certificate Size		
▶ CA Certificate	0	
▶ Client Certificate	0	
▶ Client Private Key	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 2.22.1294 Copyright (C) 2026 AMI		

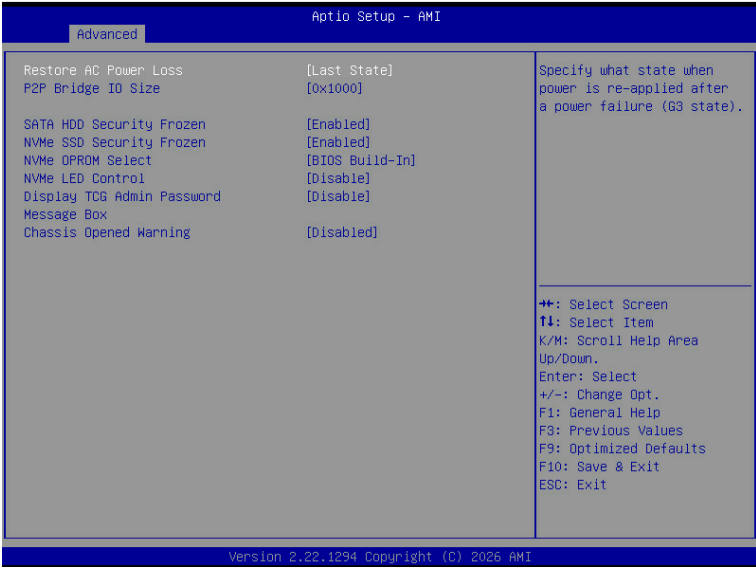
Parameter	Description
KMIP Server IP address	
KMIP TCP Port Number	
Time Zone	Enter the correct time zone for this server. Default setting is GMT+8 .
Client Credentials	Use User and password credentials to authenticate the Client. Options available: Enabled, Disabled, Clear. Default setting is Enabled .
Client UserName	Enter Client identify: UserName. Name Length: 0-63 characters.
Client Password	Enter Client identify: Password. Password Length: 0-31 characters.
KMS TLC Certificate / Size	
CA Certificate	Enroll factory defaults or load the KMS TLS certificates from the file.
Client Certificate	Enroll factory defaults or load the KMS TLS certificates from the file.
Client Private Key	Enroll factory defaults or load the KMS TLS certificates from the file.

2-2-9 NVMe Configuration



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

2-2-10 Chipset Configuration

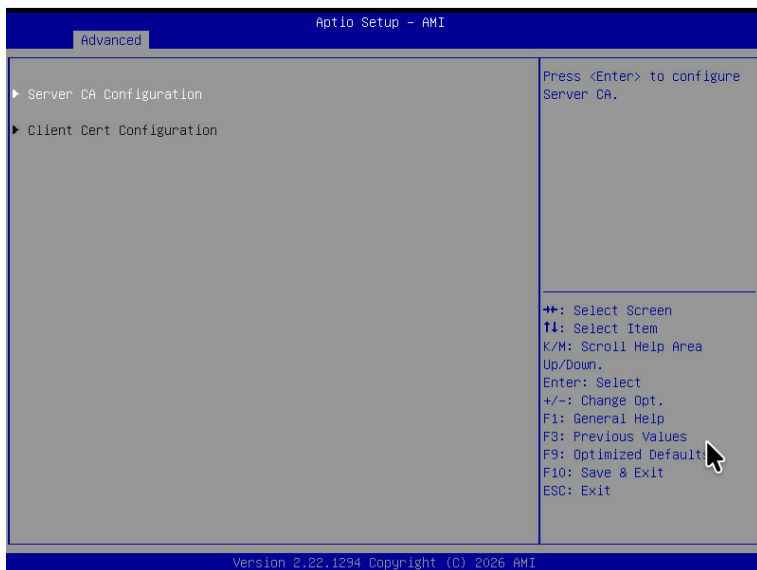


Parameter	Description
Restore on AC Power Loss ^(Note)	Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Power Off, the system remains off after power shutdown. Options available: Last State, Power Off, Power On, Unspecified. The default setting depends on the BMC setting.
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 .
NVMe OPROM Select	Options available: BIOS Build-In, NVMe Device, Disabled. Default setting is BIOS Build-In .
NVMe LED Control	Enable/Disable allow user control NVMe LED. It only available the NVMe device direct connect to CPU. Options available: Disable, Enable. Default setting is Disable .

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

Parameter	Description
Chassis Opened Warning	Enable/Disable the chassis intrusion alert function. Options available: Enabled, Disabled, Clear. Default setting is Disabled .

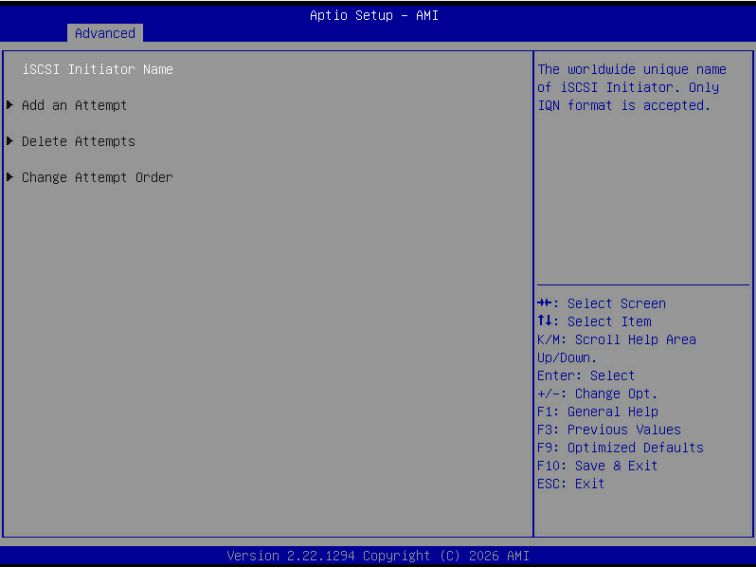
2-2-11 Tls Auth Configuration





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

2-2-12 iSCSI Configuration



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

2-2-13 MEBx



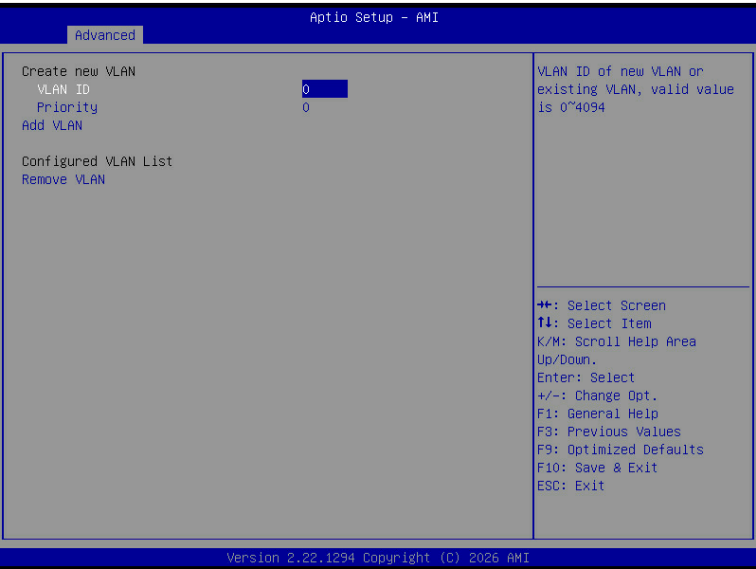
2-2-14 Intel® Ethernet Controller X710 for 10GB BASE-L

Aptio Setup - AMI	
Advanced	
► Firmware Image Properties ► NIC Configuration	
Blink LEDs 0	
UEFI Driver	Intel(R) 40GbE 4.9.49
Adapter PBA	H64862-000
Device Name	Intel(R) Ethernet Controller X710 for 10GBASE-T
Chip Type	Intel X710
PCI Device ID	15FF
PCI Address	30:00:00
Link Status	[Disconnected]
MAC Address	30:56:0F:6E:C7:2B
Virtual MAC Address	00:00:00:00:00:00
View device firmware version information.	
⬆⬆: 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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Aptio Setup - AMI	
Advanced	
Link Speed	[Auto Negotiated]
Wake On LAN	[Enabled]
Legacy Virtual LAN ID	0
LLDP Agent	[Enabled]
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.	
⬆⬆: 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 2.22.1294 Copyright (C) 2026 AMI	

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

2-2-15 VLAN Configuration



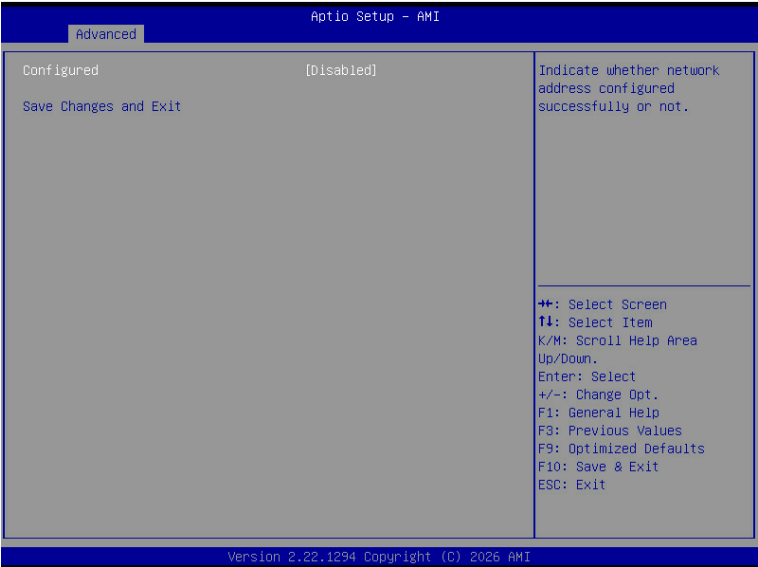
Parameter	Description
Enter Configuration Menu	Press [Enter] to configure advanced items. ♦ Create new VLAN ♦ VLAN ID – Sets VLAN ID for a new VLAN or an existing VLAN. – Press the <+> / <-> keys to increase or decrease the desired values. – The valid range is from 0 to 4094. ♦ Priority – Sets 802.1Q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

2-2-16 MAC IPv6 Network Configuration



Parameter	Description
Enter Configuration Menu	Press [Enter] to configure advanced items. - Displays the MAC Address information. - Interface ID - The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3. - DAD Transmit Count - The number of consecutive Neighbor solicitation messages sent while performing Duplicate Address Detection on a tentative address. A value of zero indicates that Duplicate Address Detection is not performed. - Policy - Options available: automatic, manual. Default setting is automatic. - Save Changes and Exit - Press [Enter] to save all configurations.

2-2-17 MAC IPv4 Network Configuration



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

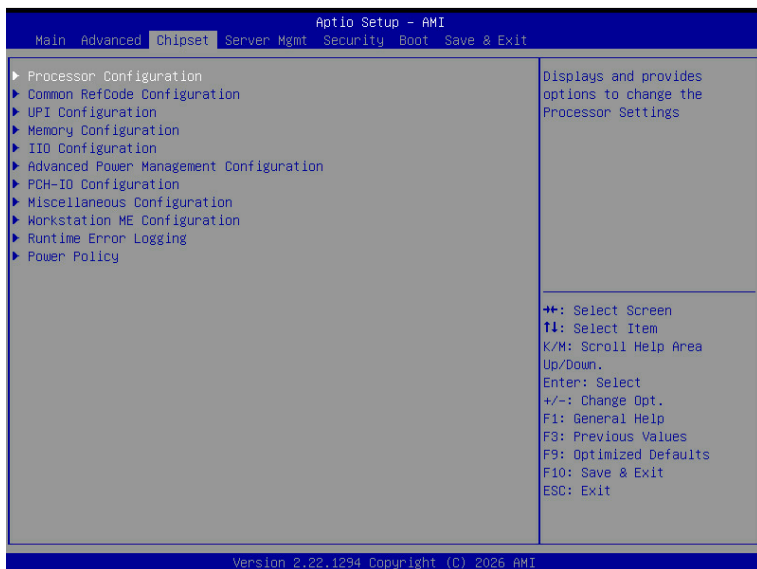
2-2-18 Driver Health



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.



2-3-1 Processor Configuration

Chipset		Aptio Setup - AMI	
Processor Configuration		Change Per-Socket Settings	
▶ Per-Socket Configuration Processor Socket Socket 0 Processor ID 000A06D1* Processor Frequency 2.900GHz Processor Max Ratio 10H Processor Min Ratio 08H Microcode Revision 010001D0 L1 Cache RAM(Per Core) 112KB L2 Cache RAM(Per Core) 2048KB L3 Cache RAM(Per Package) 73728KB Processor 0 Version Intel(R) Xeon(R) 656			
Enable LP [Global] [ALL LPs] Hardware Prefetcher [Enable] Adjacent Cache Prefetch [Enable] DCU Streamer Prefetcher [Auto] DCU IP Prefetcher [Enable] LLC Prefetch [Disable] Homeless Prefetch [Auto] FB Thread Slicing [Disable] AMP Prefetch [Enable] Enable Intel(R) TXT [Disable]		++: Select Screen T1: 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 2.22.1294 Copyright (C) 2026 AMI			

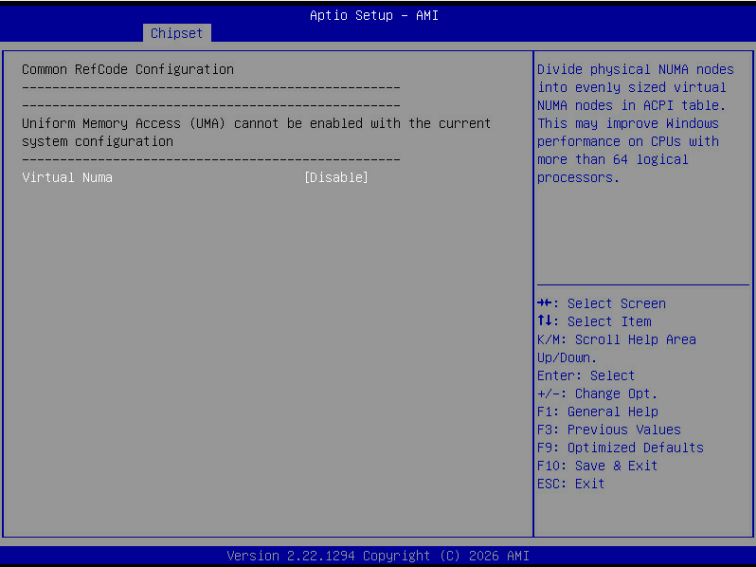
Chipset		Aptio Setup - AMI	
Processor Socket Socket 0 Processor ID 000A06D1* Processor Frequency 2.900GHz Processor Max Ratio 10H Processor Min Ratio 08H Microcode Revision 010001D0 L1 Cache RAM(Per Core) 112KB L2 Cache RAM(Per Core) 2048KB L3 Cache RAM(Per Package) 73728KB Processor 0 Version Intel(R) Xeon(R) 656		Enable/disable AES-NI support	
Enable LP [Global] [ALL LPs] Hardware Prefetcher [Enable] Adjacent Cache Prefetch [Enable] DCU Streamer Prefetcher [Auto] DCU IP Prefetcher [Enable] LLC Prefetch [Disable] Homeless Prefetch [Auto] FB Thread Slicing [Disable] AMP Prefetch [Enable] Enable Intel(R) TXT [Disable] VMX [Enable] Enable SMX [Disable] AES-NI [Enable]		++: Select Screen T1: 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 2.22.1294 Copyright (C) 2026 AMI			

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. FFFFFFFF 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.
Debug Consent	Options available: Enable, Disable. Default setting is Disable .

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.

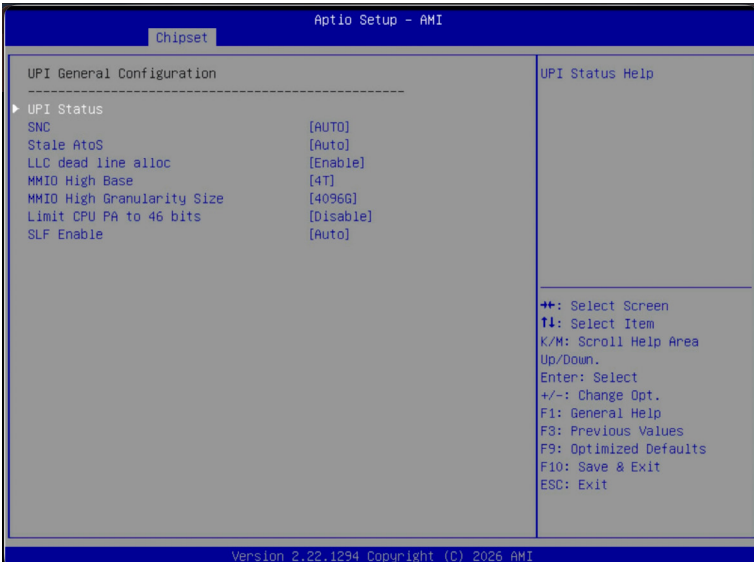
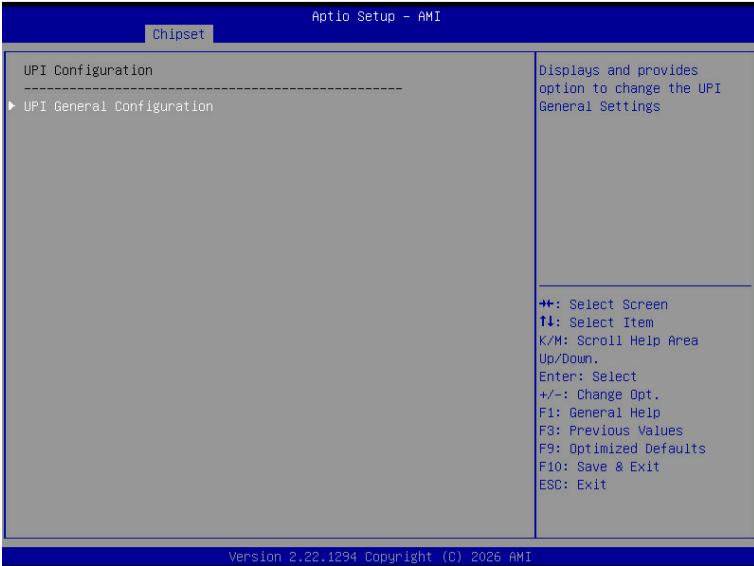
(Note) Advanced items prompt when this item is defined.

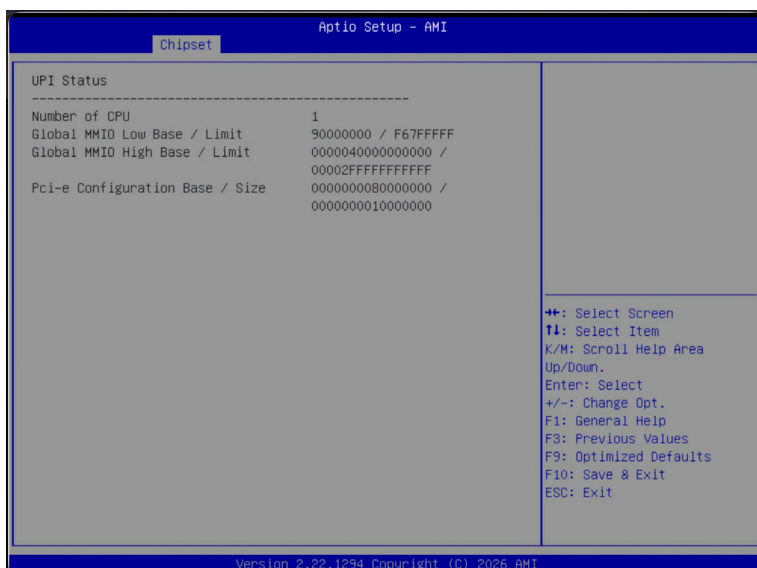
2-3-2 Common RefCode Configuration



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

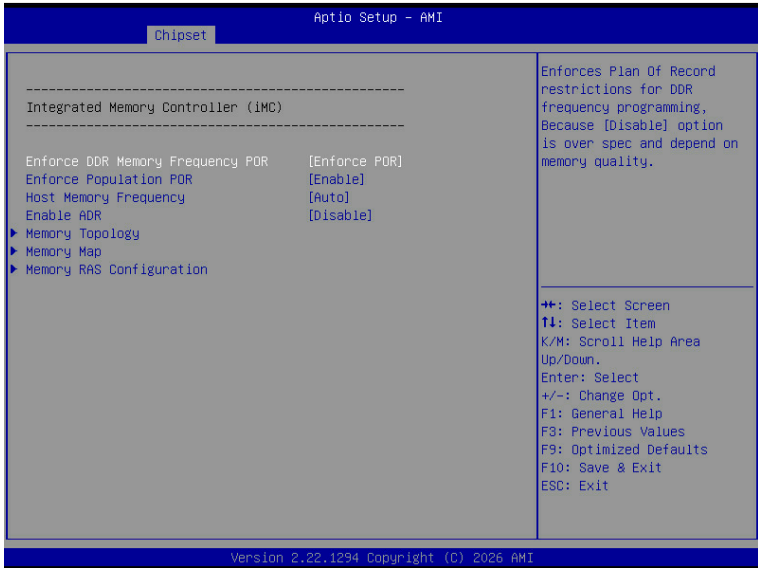




Parameter	Description
	Press [Enter] to configure advanced items. ◆ UPI Status – Press [Enter] to view the Uncore status. ◆ Link Frequency Select – Selects the UPI link frequency. – Options available: 12.8GT/s, 14.4GT/s, 16.0GT/s, Auto, Use Per Link Setting. Default setting is Auto. ◆ SNC – Enable/Disable Sub NUMA Cluster function. – Options available: Auto, Disable, Enable SNC2 (2-clusters), Enable SNC4 (4-clusters). Default setting is Auto.
UPI General Configuration	◆ 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. ◆ MMCFG Size – Options available: 64M, 128M, 256M, 512M, 1G, 2G, Auto. Default setting is 512M. ◆ MMIO High Base – Options available: 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T. Default setting is 4T.

Parameter	Description
UPI General Configuration (continued)	◆ 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



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 .
Enable ADR	Enables the detecting and enabling of ADR (Asynchronous DRAM Refresh) function. Options available: Enable, Disable. Default setting is Enable .
Legacy ADR Mode	Enable/Disable the Legacy ADR Mode. Options available: Enable, Disable, Auto. Default setting is Auto .
Minimum System Memory Size	Configures the minimum memory size. Options available: 2GB, 4GB, 6GB, 8GB. Default setting is 2GB .
ADR Data Save Mode	Specifies the Data Save Mode for ADR. Batterybacked or Type 01 NVDIMM. Options available: Disable, Batterybacked DIMMs, NVDIMMs, Copy to Flash. Default setting is NVDIMMs .
Assert ADR on Reset	Enable/Disable Assert ADR on Reset. Options available: Enabled, Disabled. Default setting is Disabled .

Parameter	Description
Assert ADR on S5	Enable/Disable Assert ADR on S5. Options available: Enabled, Disabled. Default setting is Disabled .
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 .
Memory Topology	Press [Enter] to view memory topology with DIMM population information.
Memory Map ^(Note1)	Press [Enter] to configure advanced items. ♦ Volatile Memory Mode – Selects 1LM or 2LM mode for volatile memory. – Options available: 1LM, 2LM. Default setting is 2LM.
Memory RAS Configuration	Press [Enter] to configure advanced items. ♦ Mirror Mode^(Note2) – 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. ♦ 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^(Note2) – 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^(Note2) – Enable/Disable leaky bucket time window based interface. – Options available: Disabled, Enabled. Default setting is Disabled.

(Note1) Advanced items prompt when HBM CPU is installed.

(Note2) Advanced items prompt when this item is defined.

Chipset		Aptio Setup - AMI	

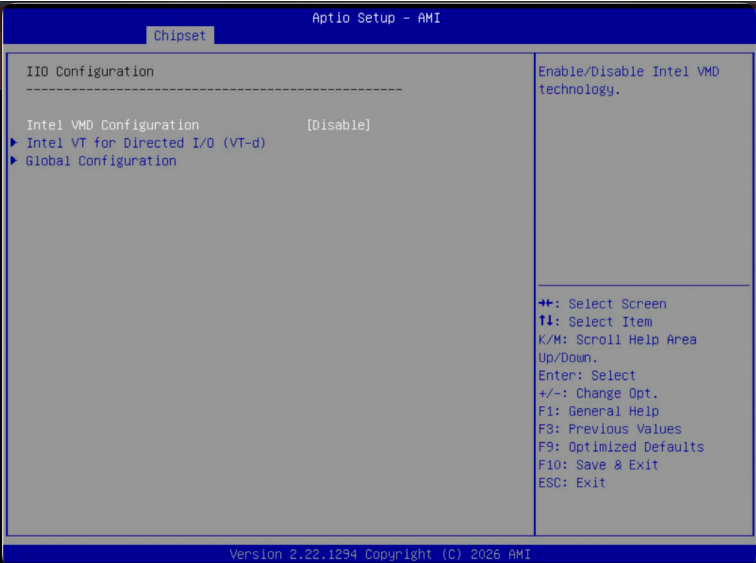
Memory RAS Configuration Setup			

Mirror Mode	[Disabled]	Full Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Partial Mirror Mode will enable the required size of memory to be mirrored. If rank sparing is enabled partial mirroring will not take effect. Enabling any	
Correctable Error Threshold	7FFF		
Leaky bucket time window based interface	[Disabled]		
Leaky bucket low bit	28		
Leaky bucket high bit	29		
ADDDC Sparing	[Disabled]		
Patrol Scrub Interval	24		
DDR5 ECS	[Enabled]	++: Select Screen TL: 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 2,22.1294 Copyright (C) 2026 AMI			

Parameter	Description
Memory RAS Configuration (continued)	♦ 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. ♦ 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



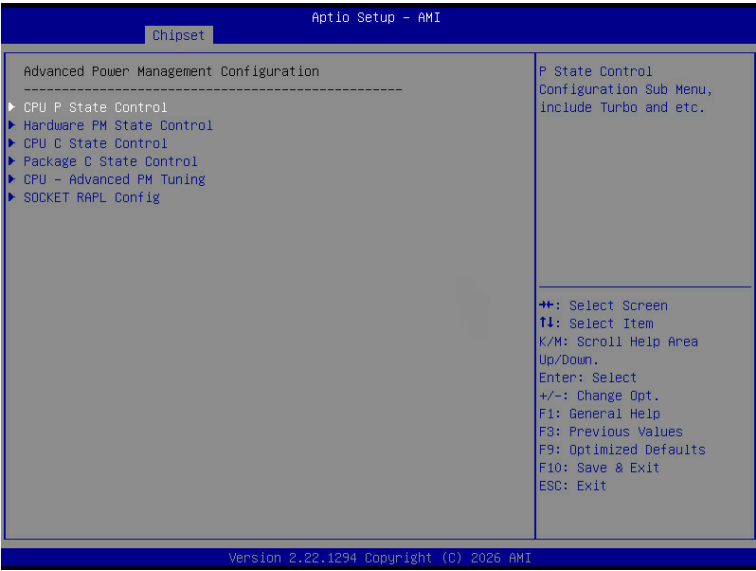
Parameter	Description
IIO Configuration	
	Press [Enter] to configure advanced items.
Intel® VT for Directed I/O (VT-d)	◆ Intel® VT for Directed I/O – Enable/Disable the Intel VT for Directed I/O (VT-d) support function by reporting the I/O device assignment to VMM through DMAR ACPI Tables. – Options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

Parameter	Description
Intel® VT for Directed I/O (VT-d) (continued)	◆ PCIe ACSCTL – Enable/Disable overwrite of PCI Access Control Services Control register in PCI root ports. – Options available: Disable, Enable. 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.
Intel® VMD technology	Press [Enter] to configure advanced items. ◆ Intel® VMD Configuration – Enable/Disable Intel® VMD technology. – Options available: Enable, Disable. Default setting is Disable. ◆ Intel® VMD for Non-Hotplug NVMe^(Note1) – Enable/Disable Intel® VMD for Non-Hotplug NVMe. – Options available: Enable, Disable. Default setting is Disable.
IIO-PCIe Express Global Options	
PCIe Max Read Request Size	Options available: Auto, 128B, 256B, 512B, 1024B, 2048B, 4096B. Default setting is 4096B .
Pcie Relaxed Ordering	Options available: No, Yes. Default setting is Yes .

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

(Note1) This item appears when **Intel® VMD Configuration** is set to **Enable**.

2-3-6 Advanced Power Management Configuration



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.

Apdio Setup - AMI					
Chipset					
CPU P State Control					Enables AVX ICCP pre-grant level override.
AVX License Pre-Grant Override [Disable] AVX P1 [Nominal]					

SST-PP	Core	P1	Package		
Level	Capable	Count	Ratio	TDP (W)	DTS_Max

0	Yes	020	29	210	103
1	No	000	00	000	000
2	No	000	00	000	000
3	No	000	00	000	000
4	No	000	00	000	000

SpeedStep (Pstates)					[Enable]
EIST PSD Function					[HW_ALL]
Boot performance mode					[Max Performance]
Turbo Mode					[Enable]
					++: Select Screen Tl: 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 2.22.1294 Copyright (C) 2026 AMI					

Apdio Setup - AMI	
Chipset	
Hardware PM State Control	
Hardware P-States	[Native Mode]
HardwarePM Interrupt	[Disable]
Native ASPM	[Auto]
Disable: Hardware chooses a P-state based on OS Request (Legacy P-States) Native Mode:Hardware chooses a P-state based on OS guidance Out of Band Mode:Hardware autonomously chooses a P-state (no OS guidance) NOTE: When HWP is 'Disable' on 'OOB',	
++: Select Screen Tl: 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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Aptio Setup - AMI		
Chipset		
CPU C State Control		Allows Monitor and MWAIT instructions.
Monitor MWAIT	[Enable]	
C1 to C1e Promotion	[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
ACPI C6x Enumeration	[Auto]	
C6x to C1 Demotion	[Enable]	
C1 Undemotion to C6x	[Enable]	
Version 2.22.1294 Copyright (C) 2026 AMI		

Aptio Setup - AMI		
Chipset		
Package C State Control		Package C State limit, the state Auto maps is program specific.
Package C State	[Auto]	
		++: 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 2.22.1294 Copyright (C) 2026 AMI		

Apdio Setup - AMI		
Chipset		
CPU - Advanced PM Tuning		
Current Compute Uncore Ratio Range: 08 - 22	0: Set dynamic Uncore frequency range from max and min fused values. Otherwise Uncore will run at a constant frequency ratio, the UFS algorithm will be disabled, but physical limits may still reduce frequency. NOTE: The user input will be clipped to the range	
Uncore Freq Ratio (COMPUTE)		

Uncore Freq Control [Mode 1] (IO)		
Current IO Uncore Ratio Range: 04 - 25	++: Select Screen T1: 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	
Uncore Freq Ratio (IO)		

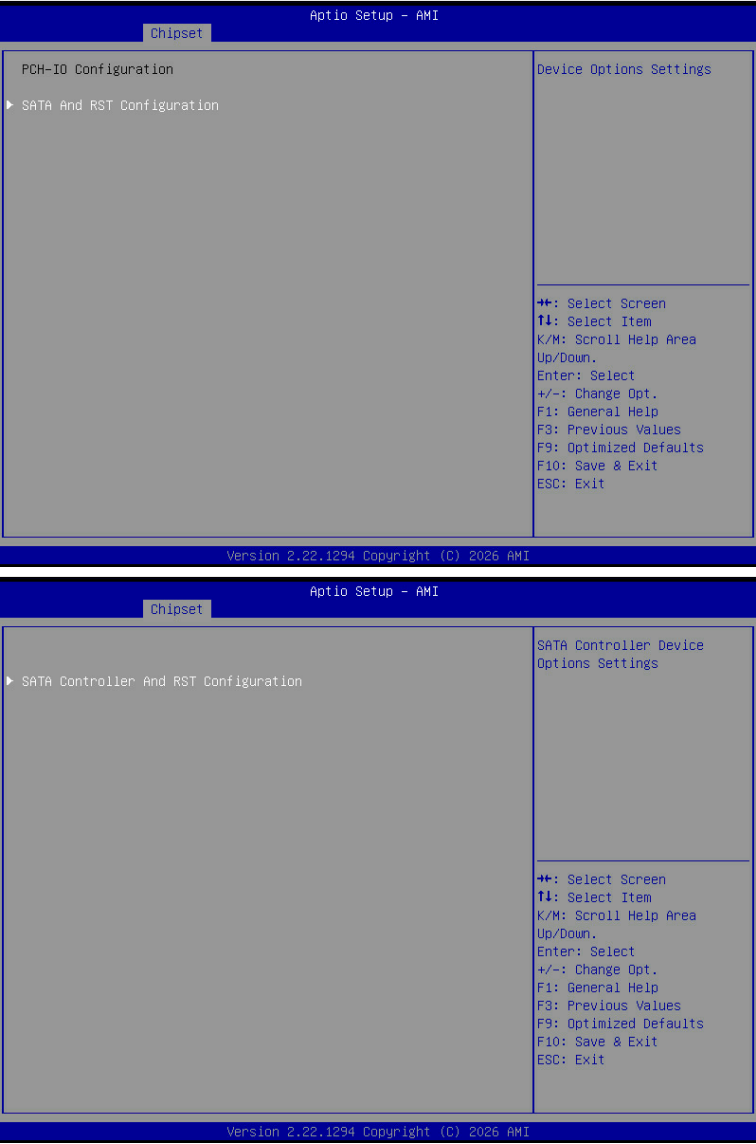
► Energy Perf BIAS Latency Optimized Mode [Enabled]		
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Apdio Setup - AMI	
Chipset	
SOCKET RAPL Config	
PL1 Power Limit 0	PL1 Power Limit in Watts. The value may vary from 0 to Fused TDP Value. If the value is 0, the Fused TDP value will be programmed. A value greater than Fused TDP value will not be programmed.
PL1 Time Window [20]	
PL2 Power Limit 0	
PL2 Time Window [0.012]	
++: Select Screen T1: 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 2.22.1294 Copyright (C) 2026 AMI	

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.
SOCKET RAPL Config	Press [Enter] to configure advanced items. ◆ PL1 Power Limit – PL1 Power Limit in Watts. The value may vary from 0 to Fused Value. If the value is 0, the fused value will be programmed. – Default setting is 0. ◆ PL1 Time Window – PL1 value in seconds. The value may vary from 0 to 448. – Default setting is 1. ◆ PL2 Power Limit – PL2 Power Limit in Watts. The value may vary from 0 to Fused Value. If the value is 0, BIOS programs 120% * TDP. – Default setting is 0. ◆ PL2 Time Window – PL1 value in seconds. The value may vary from 0 to 0.438. – Default setting is 0.012.

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

2-3-7 PCH-IO Configuration



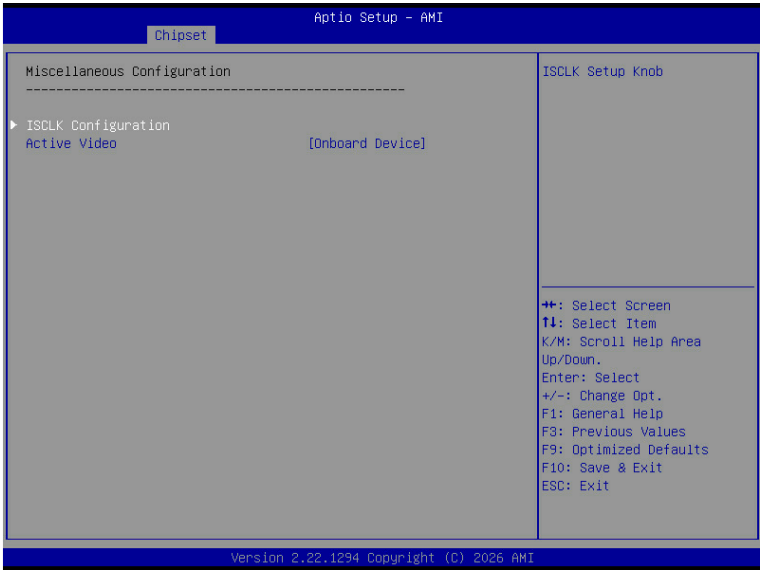
Parameter	Description
PCI Express Configuration	Press [Enter] to configure the PCI Express root ports settings.
SATA Configuration	Press [Enter] to configure SATA device options and storage features.
USB Configuration	Press [Enter] to configure USB settings, including port-specific controls.

Aptio Setup - AMI		
Chipset		
SATA Controller And RST Configuration		▲ Enable/Disable SATA Device.
SATA Controller(s)	[Enabled]	
SATA Mode Selection	[AHCI]	
Port 0	[Not Installed]	
SATA Port 0	[Enabled]	
Hot Plug	[Disabled]	
Spin Up Device	[Disabled]	
Port 1	[Not Installed]	
SATA Port 1	[Enabled]	
Hot Plug	[Disabled]	
Spin Up Device	[Disabled]	
Port 2	[Not Installed]	
SATA Port 2	[Enabled]	▲▲: Select Screen
Hot Plug	[Disabled]	T1: Select Item
Spin Up Device	[Disabled]	K/M: Scroll Help Area
Port 3	[Not Installed]	Up/Down.
SATA Port 3	[Enabled]	Enter: Select
Hot Plug	[Disabled]	+/-: Change Opt.
Spin Up Device	[Disabled]	F1: General Help
Port 4	[Not Installed]	F3: Previous Values
SATA Port 4	[Enabled]	F9: Optimized Defaults
Hot Plug	[Disabled]	F10: Save & Exit
Spin Up Device	[Disabled]	ESC: Exit
		▼
Version 2.22.1294 Copyright (C) 2026 AMI		

Aptio Setup - AMI		
Chipset		
Spin Up Device	[Disabled]	▲ If enabled for any of
Port 2	[Not Installed]	ports Staggered Spin Up
SATA Port 2	[Enabled]	will be performed and only
Hot Plug	[Disabled]	the drives which have this
Spin Up Device	[Disabled]	option enabled will spin
Port 3	[Not Installed]	up at boot. Otherwise all
SATA Port 3	[Enabled]	drives spin up at boot.
Hot Plug	[Disabled]	
Spin Up Device	[Disabled]	
Port 4	[Not Installed]	
SATA Port 4	[Enabled]	▲▲: Select Screen
Hot Plug	[Disabled]	T1: Select Item
Spin Up Device	[Disabled]	K/M: Scroll Help Area
Port 5	[Not Installed]	Up/Down.
SATA Port 5	[Enabled]	Enter: Select
Hot Plug	[Disabled]	+/-: Change Opt.
Spin Up Device	[Disabled]	F1: General Help
Port 6	[Not Installed]	F3: Previous Values
SATA Port 6	[Enabled]	F9: Optimized Defaults
Hot Plug	[Disabled]	F10: Save & Exit
Spin Up Device	[Disabled]	ESC: Exit
Port 7	[Not Installed]	
SATA Port 7	[Enabled]	
Hot Plug	[Disabled]	
Spin Up Device	[Disabled]	
		▼
Version 2.22.1294 Copyright (C) 2026 AMI		

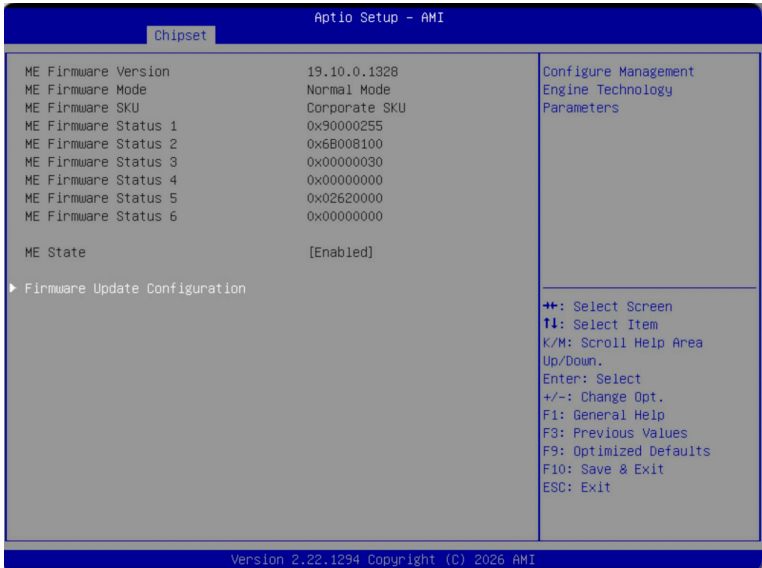
Parameter	Description
SATA Controller(s)	Enables or disables the integrated SATA controller.
SATA Mode Selection	Determines how SATA controllers operate. Options: AHCI (Default), RAID.
SATA Test Mode	Enables or disables SATA Test Mode for diagnostic purposes.
Aggressive LPM Support	Enables or disables Aggressive Link Power Management (ALPM) to save power.
SATA Port 0~7	Displays information for each SATA port and allows for individual port control (Enable/Disable, Hot Plug, etc.).

2-3-8 Miscellaneous Configuration



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 .
ISCLK Configuration	SSC1 and SSC2 Options available: Enable, Disable. Default setting is Enable .

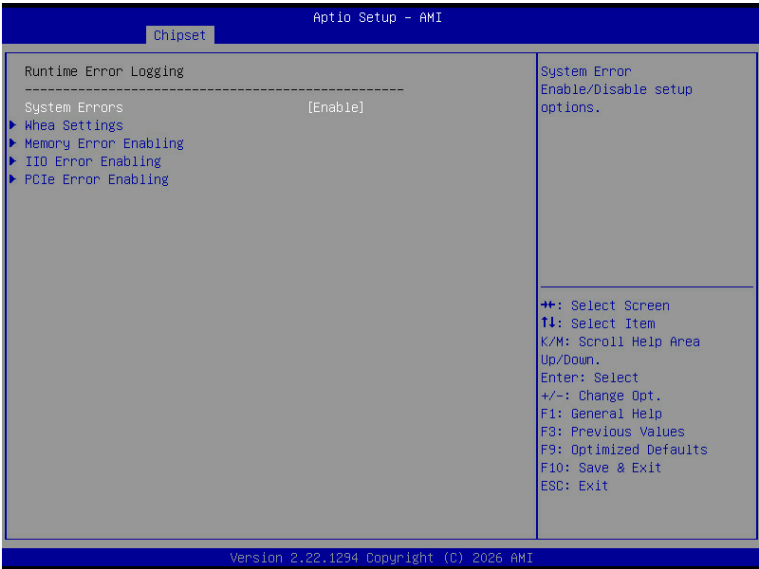
2-3-9 Workstation ME Configuration



Parameter	Description
ME Firmware Version	Displays the current version of the ME firmware (e.g., 19.10.0.1328).
ME Firmware Mode	Displays the current ME operating mode (e.g., Normal Mode).
ME Firmware SKU	Displays the stock-keeping unit (SKU) of the ME firmware (e.g., Corporate SKU).
ME Firmware Status 1~6	Displays hexadecimal status values for ME firmware, primarily used for engineering diagnostics.
ME State	Enables or disables the Intel® Management Engine. When set to [Disabled], the ME will enter "Temporarily Disabled Mode." Note: To prevent redundant commands, this option may appear grayed out after a change until the system is rebooted.
Firmware Update Configuration	Press [Enter] to enter the sub-menu for ME firmware update settings.

Aptio Setup - AMI		
Chipset		
Me FW Image Re-Flash	[Disabled]	Enable/Disable Me FW Image Re-Flash function. ** : Select Screen T1 : 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 2.22.1294 Copyright (C) 2026 AMI		

2-3-10 Runtime Error Logging Settings

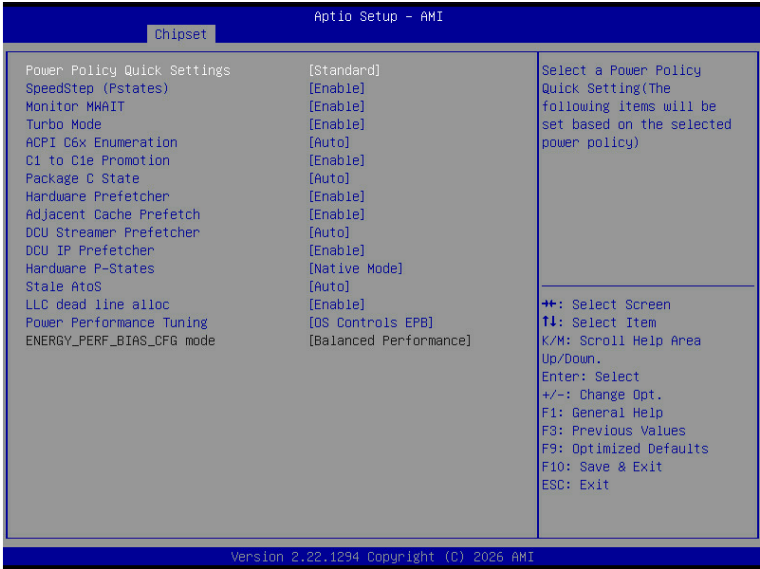


Parameter	Description
Runtime Error Logging	
System Errors	Enable/Disable system error logging function. Options available: Enable, Disable. Default setting is Enable .
S/W Error Injection Support	Enable/Disable software injection error logging function. Options available: Enable, Disable. Default setting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

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

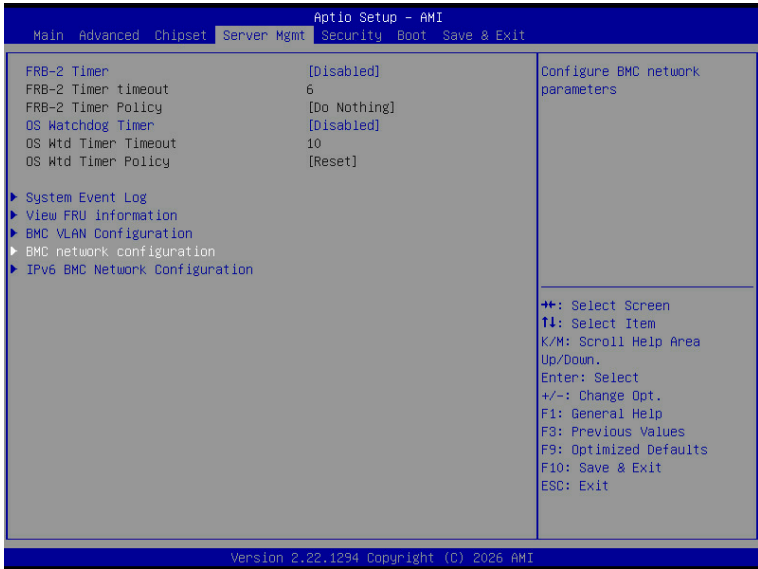
2-3-11 Power Policy



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



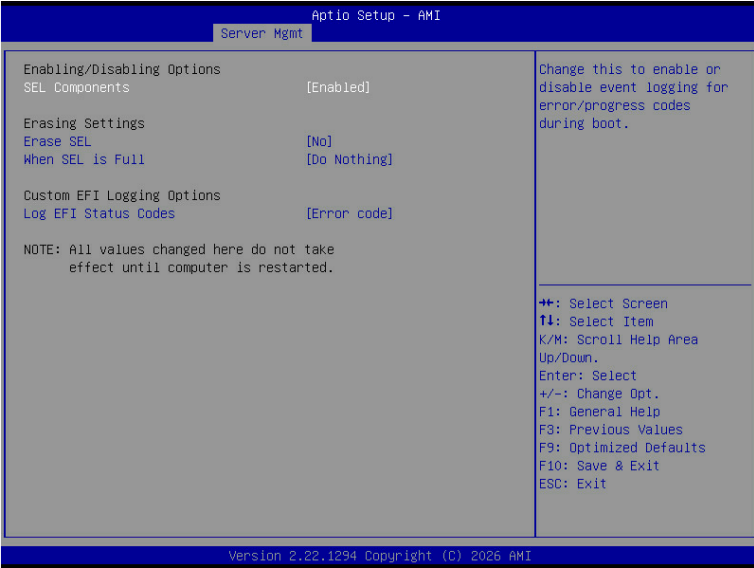
Parameter	Description
FRB-2 Timer	Enable/Disable FRB-2 timer (POST timer). Options available: Enabled, Disabled. Default setting is Enabled .
FRB-2 Timer ^(Note1) timeout	Configures the FRB2 Timer timeout. The value is between 1 to 30 minutes. Default setting is 6 minutes .
FRB-2 Timer Policy ^(Note1)	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.

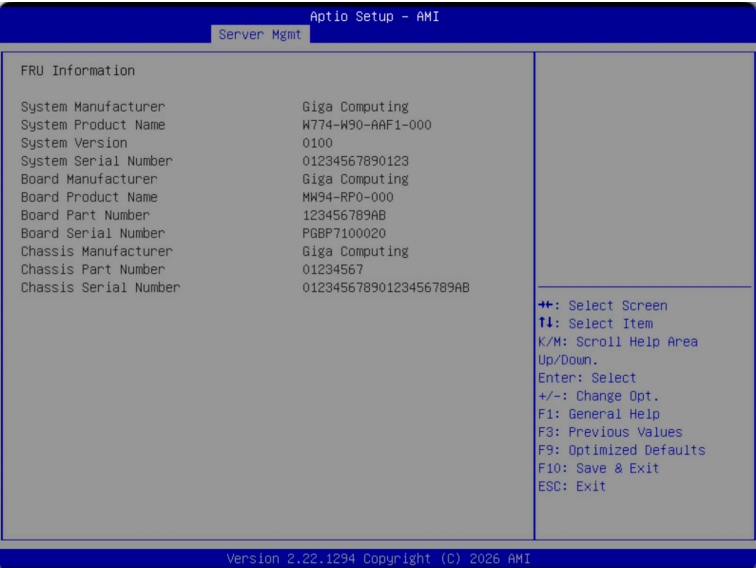
2-4-1 System Event Log



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 .

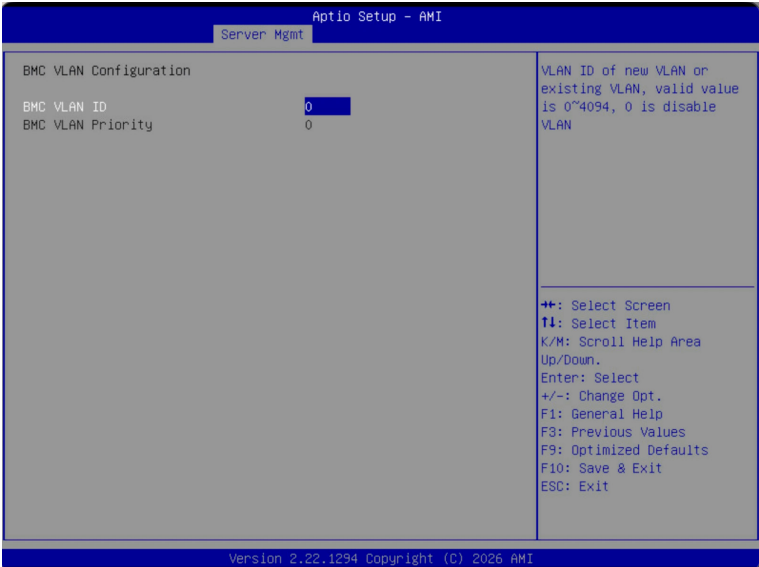
2-4-2 View FRU Information

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.



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

2-4-3 BMC VLAN Configuration



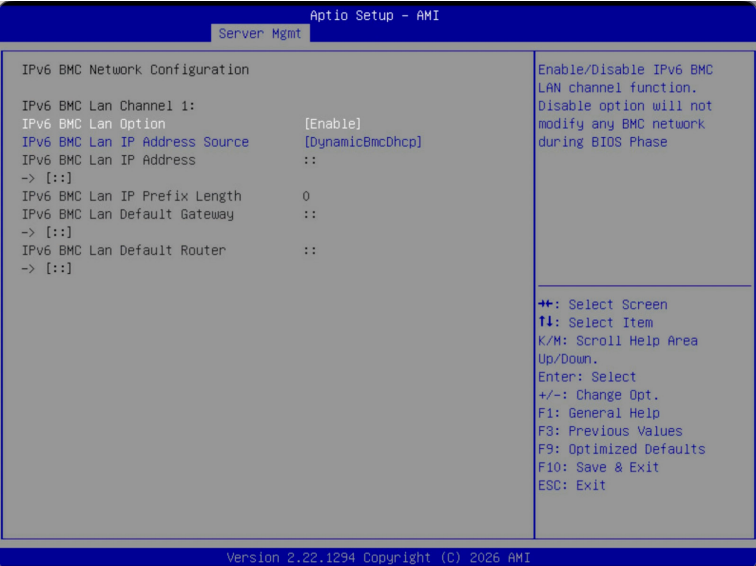
Parameter	Description
BMC VLAN Configuration	
BMC VLAN ID	Select to configure BMC VLAN ID. The valid range is from 0 to 4094. When set to 0, BMC VLAN ID will be disabled.
BMC VLAN Priority	Select to configure BMC VLAN Priority. The valid range is from 0 to 7. When BMC VLAN ID is set to 0, BMC VLAN Priority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

2-4-4 BMC Network Configuration



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.

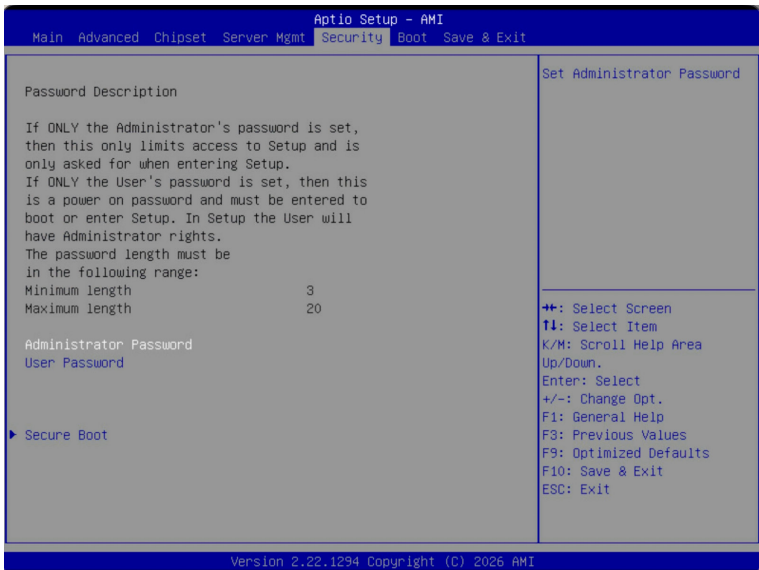
2-4-5 IPv6 BMC Network Configuration



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.



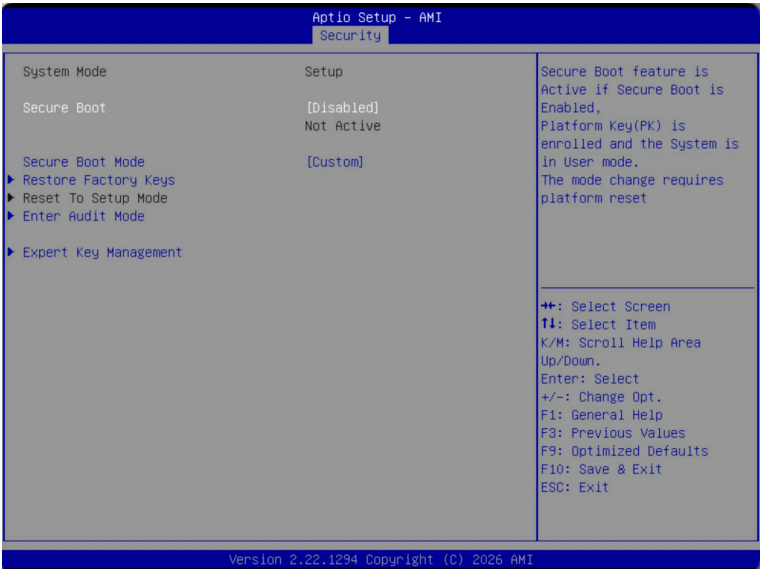
There are two types of passwords that you can set:

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



Parameter	Description
System Mode	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/ Disable the Secure Boot function. Options available: Enabled, Disabled. 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 the Operating System loads to the login screen have not been tampered with. When set to Standard, it will automatically load the Secure Boot keys from 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.

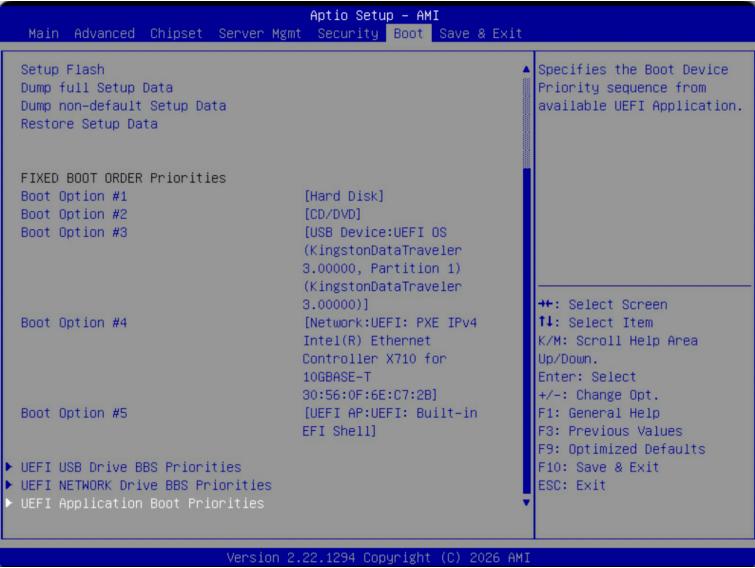
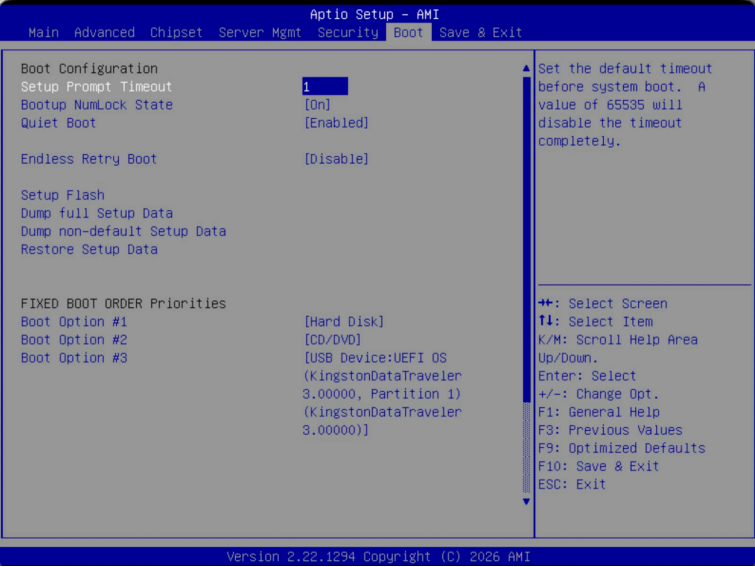
(Note) Advanced items prompt when this item is set to **Custom**.

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

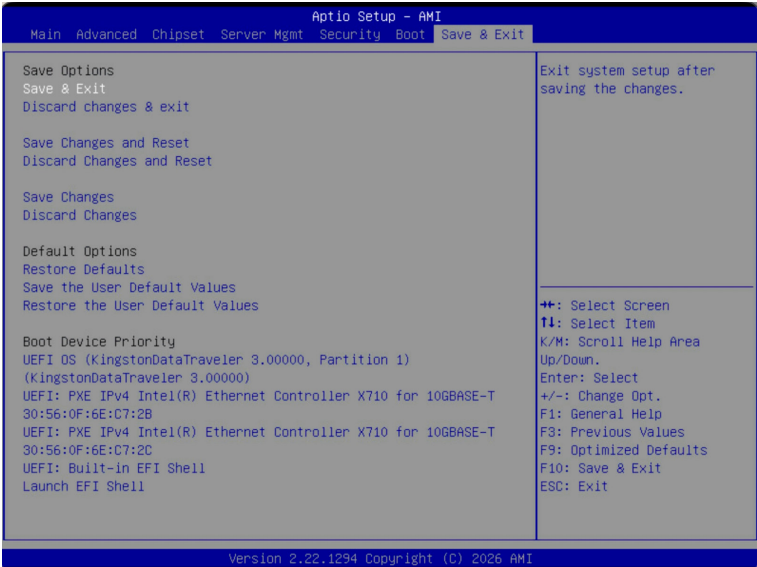
The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



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.
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 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>.



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	

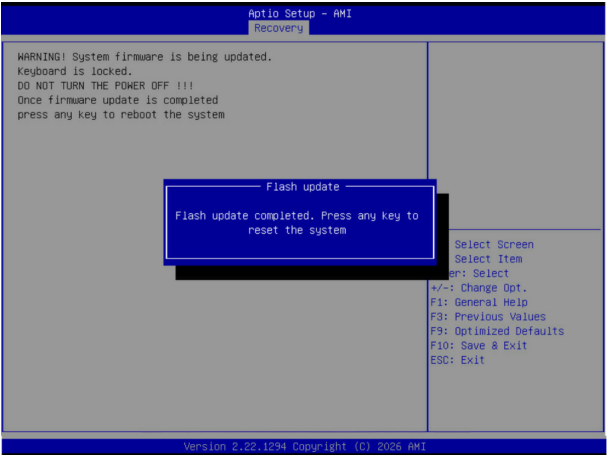
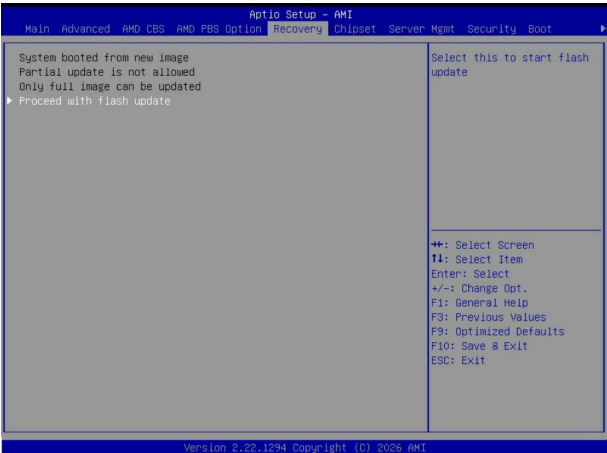
Parameter	Description
Restore Defaults	Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly. Options available: Yes, No.
Save the User Default Values	Saves the changes made as the user default settings. Options available: Yes, No.
Restore the User Default Values	Loads the user default settings for all BIOS setup parameters. Options available: Yes, No.
Boot 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.



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

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