an Acer Group Company

Altos
工作站/Workstaion
S25E1
BrainSphere™ P330 F6 SE
User Manual

Revision 1.0

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document and makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. Please Note: For the most up-to-date version of this manual, please see our website at https://www.altoscomputing.com.

Altos Computing Inc. (abbr. Altos) is established in 2017 and it is a subsidiary of Acer Inc. The business model of Altos is to provide the best streamlined and cost-effective integrated solutions thru in-house R&D working with ODM/IHV/ISV on servers, workstations, thin client, network and storage. In the era of demanding speed, Altos provides leading solution included, but not limited to High Performance Computing, Virtual Desktop Infrastructure, Cloud Infrastructure and Software Defined Storage, etc.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class A or Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in industrial environment for Class A device or in residential environment for Class B device. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

Manual Revision 1.0
Release Date: June 10, 2025

Printed in the Taiwan

Conventions

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

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

Warnings and Cautions

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

WARNING!

To reduce the risk of electric shock or damage to the equipment:

- *Do not disable the power cord grounding plug. The grounding plug is an important safety feature.*
- *Plug the power cord into a grounded (earthed) electrical outlet that is always easily accessible.*
- *Unplug all the power cords from the power supplies to disconnect power to the equipment.*
- *Shock Hazard! Disconnect all power supply cords before servicing.*
- *Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.*

WARNING!

To reduce the risk of personal injury from hot surfaces, allow the drivesand the internal system components to cool before touching them.

CAUTION!

- *Do not operate the system for long periods with the access panel open or removed. Operating the system in this manner results in improper airflow and improper cooling that can lead to thermal damage.*
- *Danger of explosion if battery is incorrectly replaced.*
- *Replace only with the same or equivalent type recommended by the manufacturer.*
- *Dispose of used batteries according to the manufacturer's instructions.*

Electrostatic Discharge (ESD)

CAUTION!

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

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without any component and pin touching. After removing a board from its

protective wrapper or from the system, place the board component side up on a grounded, static free sur- face. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

System power on/off: To remove power from system, you must remove the system from rack. Make sure the system is removed from the rack before opening the chassis, adding, or removing any non-hot plug components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the system and disconnect the cables attached to the system before servicing it. Otherwise, personal injury or equipment damage can result.

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

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

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fingertips or with a pair of fine needles nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can dam-age the contacts inside the jumper, causing intermittent problems with the function con-trolled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

CAUTION!

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

Regulatory Notices

WEEE Symbol Statement

The symbol shown below is on the product or on its packaging, which indicates that this product must be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.

Restriction of Hazardous Substances (RoHS) Directive Statement

Altos products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. More- over, we at Altos are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

California Proposition 65 Warning

WARNING!

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Battery WARNING!

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Electrical appliance specifications and operating temperature:

Rating (AC Input)	100-240Vac, 12A-6A, 50-60Hz 100-240V~, 15A-12A, 60-50Hz
Operating Temperature	10°C to 35°C
Non-operating temperature	-40°C to 60°C
Operating humidity	8%-80% (non-condensing)
Non-operating humidity	20%-95% (non-condensing)

工作站相關警告與注意事項


告

為了避免電擊危險或損壞設備請注意:

不要切斷電源線的接地端子，接地端子是一個很重要的安全防護。將電源線接到有接地功能的插座，此插座需位於使用者容易使用的範圍。電源線的配線要避免被踩到，被絆到或被過度彎折，重壓。


告

本設備關機後內部仍存在電源，須拔掉電源線才能完全切掉設備內部的電源。更換零件前請確定電源已經完全切斷。
電源線,電話線，網路線可能帶電，維修前除了移除電源線外也請移除所有連接線，避免電擊傷害或是設備損壞。
維修非支援熱插拔的零件時須將工作站從機櫃取下才能維修。


告

避免人員燙傷，觸摸磁碟機或是內部零件前請確保該零件已經冷卻。


告

工作站中有高速風扇，維修時請遠離風扇避免受傷。


告

本設備不能用在有兒童出現的區域。

如果更換錯誤電池會產生爆炸，請以相同或同型號電池更換使用。廢電池請回收。

警告:如果更換錯誤電池會產生爆炸，請以相同或同型電池更換

廢電池請回收

工作站開機時不要長時間移除蓋子，長時間移除蓋子會造成散熱功能失效造成損壞。

靜電會損害電子產品，建議您在符合靜電防護的工作環境操作工作站，如果無法確定環境的靜電防護。請穿上靜電手環並且將手環接到有接地的金屬表面如機櫃或機殼。拿取電路板時僅觸碰板子的邊緣，不要觸碰連接器。板子從防靜電包裝取出後只能放置在無靜電的桌面，零件面朝上。如果可以, 請使用防靜電泡棉. 避免使用靜電袋. 避免電路板與任何表面摩擦產生靜電。

依據中華民國國家標準 CNS 15663 第 5 節「含有標示」之規定，列出安圖斯產品中可能含有之「限用物質含有情況標示」

設備名稱：工作站						
單元	限用物質及其化學符號					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr^{+6})	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
金屬機構件	—	○	○	○	○	○
塑料機構件	○	○	○	○	○	○
電路板組件	—	○	○	○	○	○
電源供應器	—	○	○	○	○	○
電源線 / 其他線材	—	○	○	○	○	○
風扇	—	○	○	○	○	○
散熱模組 (金屬部分)	—	○	○	○	○	○
儲存設備	—	○	○	○	○	○
備考 1. " ○ " 係指該項限用物質之百分比含量未超出百分比含量基準值。 備考 2. " — " 係指該項限用物質為排除項目。						

報驗義務人:
安圖斯科技股份有限公司
新北市汐止區新台五路一段88號6樓

Product introduction

Altos P330 F6 SE is a high-performance workstation designed for media professionals, engineers, and creators who demand uncompromising computing power and seamless workflow integration. Powered by the Intel® Xeon® W processor with the Intel® W790 chipset, supporting up to 60 cores, it delivers exceptional multi-core performance, outstanding reliability, and extensive expansion capabilities, making it an ideal solution for media production, CAD/CAE, and visual simulation workloads.

Extreme Performance for Demanding Workloads:

- Up to **60 cores and 120 threads** delivers exceptional compute power for media production, simulation, and AI training.
- Supports up to **512GB DDR5** ECC memory enabling ultra-fast memory bandwidth and extensive I/O scalability for high-performance workstations.

Dual High-End GPU Support for Extreme Graphics Performance

- Integrated with a 2000W 80+ GOLD PSU, the system supports two high-performance graphics cards. ideal for rendering, simulation, and AI acceleration

Enterprise-Grade Reliability and Security:

- Supports **ECC memory** and Software RAID (0/1/5/10), ensuring stable system operation and reliable data protection for mission-critical workloads.
- Equipped with **Intel® vPro®**, **TPM 2.0**, **Secure Boot**, and **Intel® PTT**, delivering robust hardware-based security for professional environments.

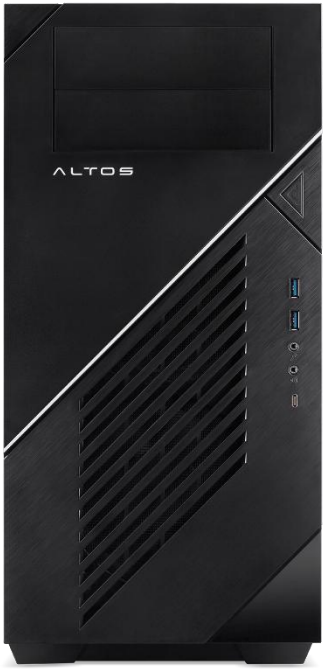
Next-Gen I/O and Connectivity:

- Supports **DDR5-4800** memory, **Wi-Fi 6**, **dual LAN**, **two M.2 SSDs**, and up to **10 USB ports**, including USB 3.2 Gen 2x2 (20Gbps) ports for ultra-fast data transfer.

Product specifications

CPU	**Intel® Xeon® Sapphire Rapids W Series Processor (LGA4677)**
Chipset	**Intel® W790**
RSTe	**SATA RAID 0,1,5,10 (Windows OS only)** **NVMe RAID 0,1,10 (Windows OS only)**
Memory	**8 DIMMs, 4-Channel, ECC RDIMM up to 512GB , DDR5 up to 4800 MHz**
PCIe Expansion	**5 PCIe Slots** • **3x PCIe x16 5.0** • **2x PCIe x16 5.0 (16/0, 8/8 mode)**
M.2	• **1x M.2 2280/22110 PCIe 4.0 x4 slot** • **1x M.2 2280 PCIe 4.0 x4 slot** • **1x M.2 2230 slot (Key E)**
Network	• **Intel® i226-LM (2.5G) + RealtekRTL8126-CG (5G)**
Media/Storage bays	• **[External bays] 1x 5.25“ ODD bay** • **[Internal bays] 4x 3.5” Hard disks**
I/O Ports	**Front I/O** **2x USB3.2 Gen 1, USB3.2 Gen 2x1 Type C, System LED (Power/HDD)** **Rear I/O** **2x RJ45 Ethernet LAN ports, 2x USB 3.2 Gen1, 2x USB 3.2 Gen2x1, 2x USB 2.0, 1x USB 3.2 Gen2x2 (Type C), 6 in 1 audio jack with SPDIF,CLR CMOS**
Power supply	• **850W 80PLUS® GOLD PSU and 2000W 80PLUS® Platinum PSU**
Dimensions	• **56L, 470 (D) x230 (W) x 518.5 (H) mm**
Compliance	• **CE, FCC, CB, BSMI**
OS Support	**Microsoft® Windows11 Pro, Ubuntu 25.04, RHEL**

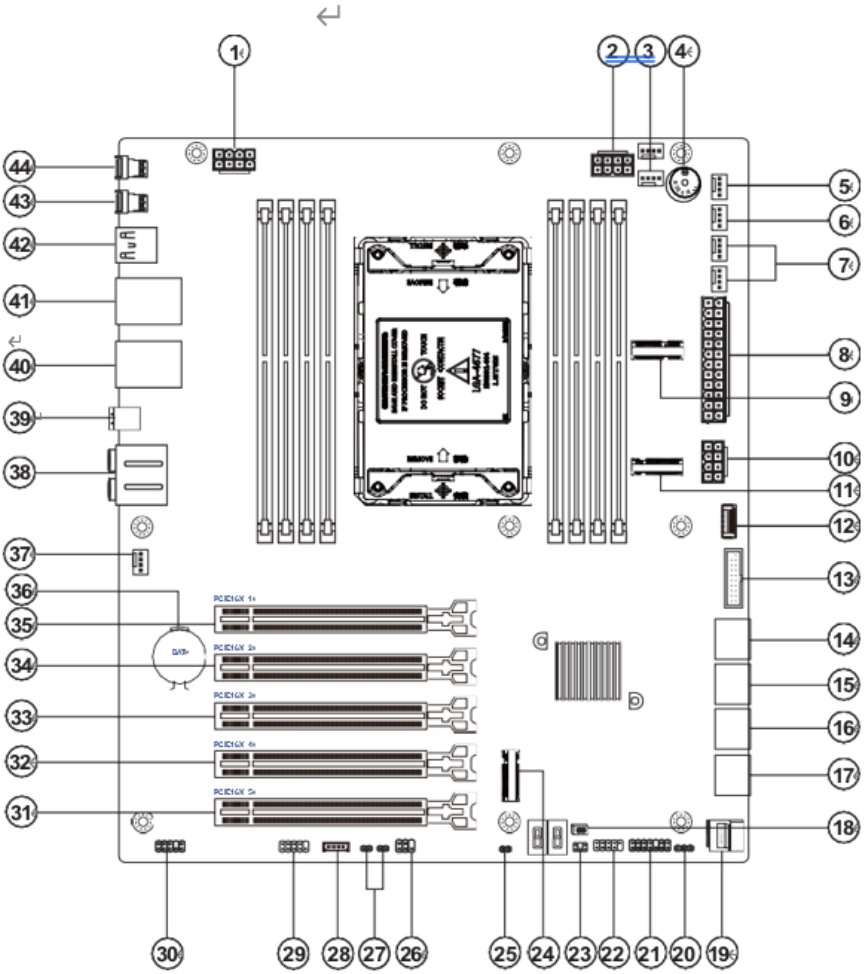
System Appearance



Front View

1	5.25-inch External accessible bay
2	Power Button/Power LED/HDD LED
3	2 USB3.2 Gen1 Type-A Ports
4	HDD Activity LED
5	HD Audio

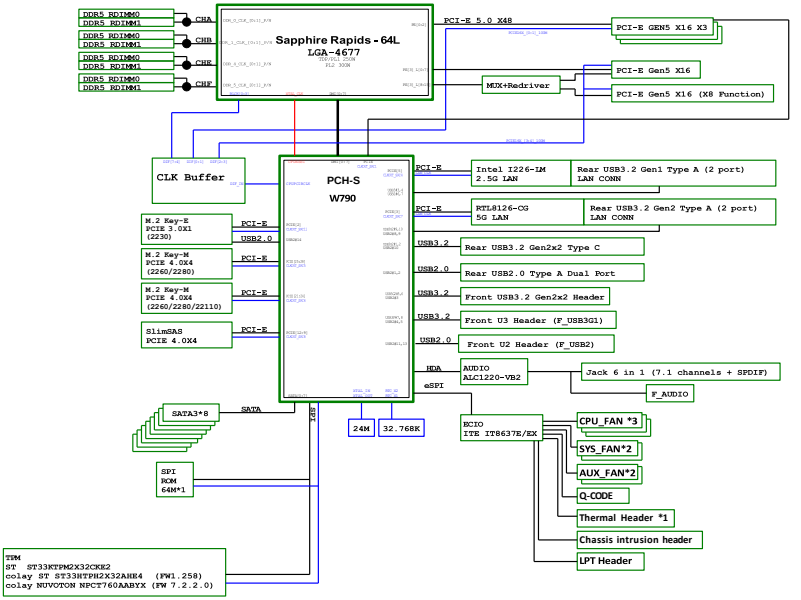
Motherboard Layout



Item	Code	Description
1	ATX_12V2	8-pin +12V power connector
2	ATX_12V1	8-pin +12V power connector
3	CPU_FAN	4-pin CPU cooling fan header
4	BZ	Buzzer header
5	PUMP_FAN	XXXXXXXXXXXXXXXXXX

6	SYS_FAN1	4-pin System cooling fan header #1
7	AUX_FAN1~2	XXXXXXXXXXXXXXXXXX
8	ATX_POWER	Standard 24-pin ATX power connector
9	M.2_1	M.2 2230 Key E slot for WiFi/CNVi
10	PCIE_8PIN_PWR	8-pin +12V power connector
11	M2_2	M.2 2280/22110 Key M slot for SSD Gen5 x4
12	F_U32G2X2	20-pin USB 3.2 Gen2 x2 header (Type C)
13	F_USB3G1	20-pin USB 3.2 Gen1 headers (Type A)
14	SATA3_D7U8	Serial ATA 6Gb/s connectors #7~8
15	SATA3_D5U6	Serial ATA 6Gb/s connectors #5~6
16	SATA3_D3U4	Serial ATA 6Gb/s connectors #3~4
17	SATA3_D1U2	Serial ATA 6Gb/s connectors #1~2
18	C_INTRUSION	2-pin Intrusion Alarm Pin header
19	SLIMSAS1	XXXXXXXXXXXXXXXXXX
20	12C_UPDATE	XXXXXXXXXXXXXXXXXX
21	F_PANEL	Front panel switch/LED header
22	FUSB2	Front panel USB 2.0 headers
23	THER_HD1	XXXXXXXXXXXXXXXXXX
24	M2_3	M.2 2260/2280 Key M slot for SSD PCIE Gen4 x4
25	FW_DEBUG	XXXXXXXXXXXXXXXXXX
26	ELOCK	XXXXXXXXXXXXXXXXXX
27	A1~2	XXXXXXXXXXXXXXXXXX
28	VROC_KEY	XXXXXXXXXXXXXXXXXX
29	BMC_HEADER	XXXXXXXXXXXXXXXXXX
30	F_AUDIO	Front panel audio header
31	PCIE16X_5	PCIe x16 Slot (Gen5 x16)
32	PCIE16X_4	PCIe x16 Slot (Gen5 x16)
33	PCIE16X_3	PCIe x16 Slot (Gen5 x16)
34	PCIE16X_2	PCIe x16 Slot (Gen5 x16)
37	PCIE16X_1	PCIe x16 Slot (Gen5 x16)
36	BT	Battery Socket
37	SYS_FAN2	4-pin system cooling fan header
38	AUDIO	Audio Connectors
39	RU32G2X2C	1*USB 3.2 Gen2x2 port Type-C
40	USB3LAN2G5	1*Intel I226-LM 2.5G LAN + 2*USB 3.2 Gen1 ports Type-A
41	USB3LAN5G	1*RTL8126-CG 5G LAN + 2*USB 3.2 Gen2x1 ports Type-A
42	R_USB2_1	Front panel USB 2.0 headers
43	CLR_CMOS_BTN	CLR_CMOS Button
44	BIOS_FLBK_BTN	BIOS Flashback Button

Block Diagram



Chapter 1 Hardware Installation

Installing and Removing the CPU

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

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

WARNING!

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

Follow these instructions to Install the CPU:

1. Align and install the processor on the carrier.

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

2. Carefully flip the heat sink cover. Then install the carrier assembly on the bottom of the heat sink and make sure the gold arrow is located in the correct direction.

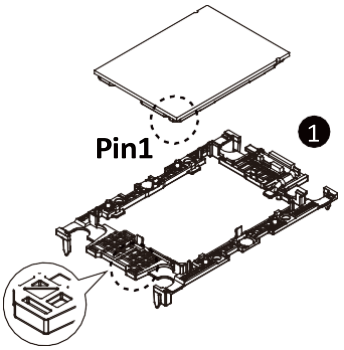
3. Remove the CPU cover.

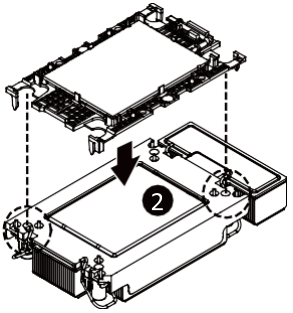
   NOTE: Save the CPU cover in the event that you need to remove the CPU from the socket.

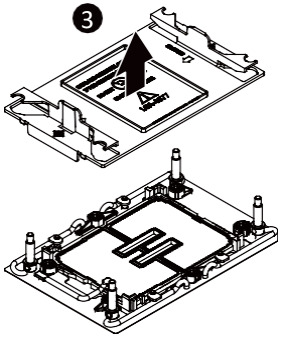
4. Align the heat sink with the CPU socket by the guide pins and make sure the gold arrow is located in the correct direction. Then place the heat sink onto the top of the CPU socket.

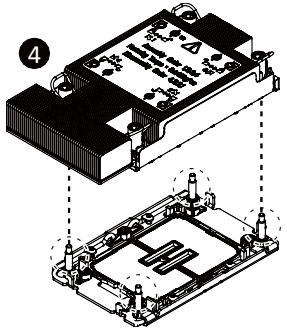
5. Position the rotating wires into the latch position. Tighten the screws in a sequential order (1→2→3→4).

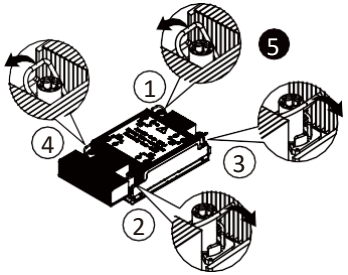
   NOTE: When dissembling the heat sink, loosen the screws in reverse order (4→3→2→1) and then move the rotating wires into the unlatch position.











Note!

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

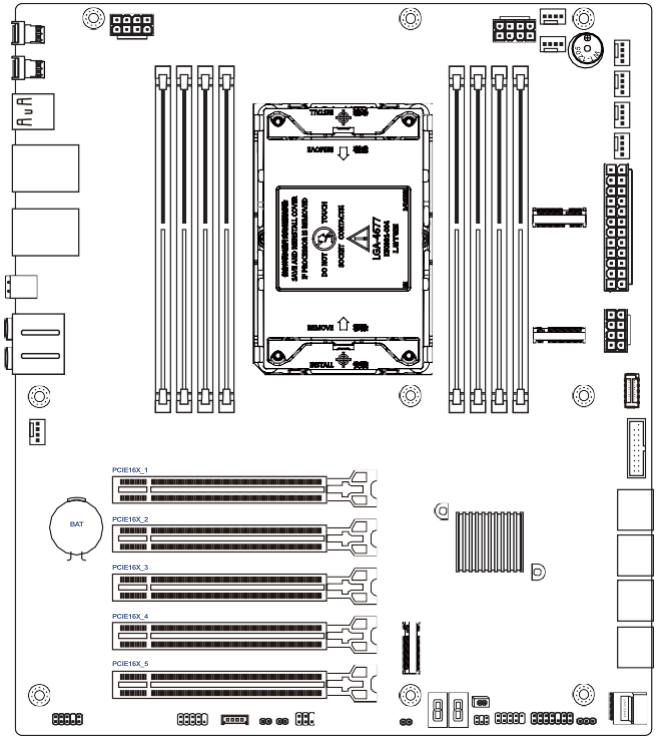
1-1 Installing and Removing Memory

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.

1-1-1 4-Channel Memory Configuration

This motherboard provides 8 DDR5 memory slots and supports 4-Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.



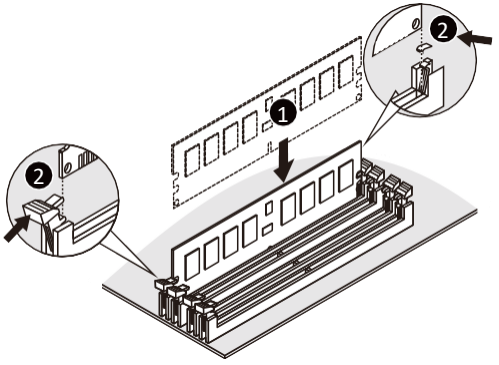
1-1-2 Installing and Removing a Memory Module

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.



1-1-3 DIMM Population Table

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)	Speed (MT/s); Voltage (V); DIMM per Channel (DPC)	
			1DPC*	2DPC*
		16Gb	1.1V	
RDIMM	SRx8 (RC D)	16GB	4800	4400
	SRx4 (RC C)	32GB		
	DRx8 (RC E)	32GB		
	DRx4 (RC A)	64GB		
RDIMM 3DS	(4R/8R)x4 (RC A)	2H-128GB 4H-256GB		

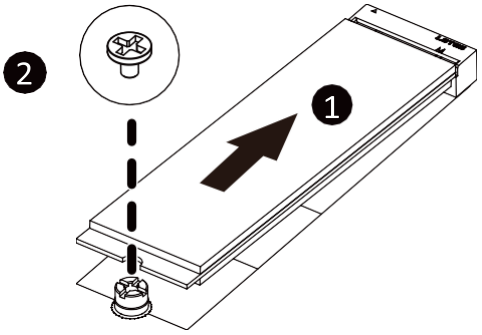
*1DPC applies to 1SPC or 2SPC implementations (SPC - Sockets Per Channel)

1-2 Installing the M.2 SSD Module

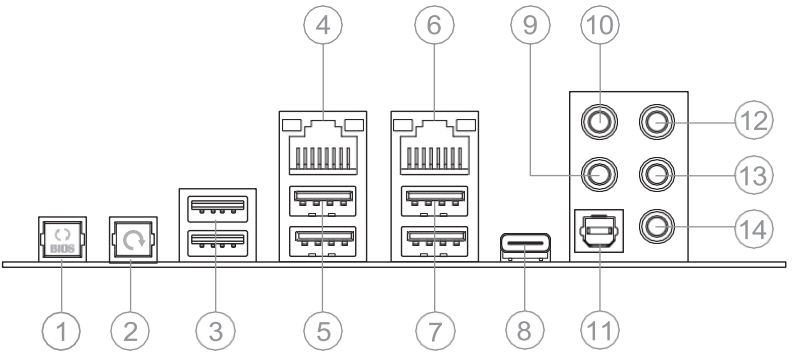
Follow the steps below to install a M.2 SSD module on your motherboard.

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.



1-3 Back Panel Connectors



1. BIOS_FLBK_BTN

XXXXXXXXXXXXXXXXXXXXXXXXX.

2. CLR_CMOS_BTN

XXXXXXXXXXXXXXXXXXXXXXXXX.

3. RUSB 2_1 Ports

Use the USB 2.0 ports to connect USB 2.0 devices.

4. 5GbE LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 5 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

5. USB 3.2 Gen2x1 Type A 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.

6. 2.5GbE LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 2.5 Gbps data rate. See the section below for a description of the states of the LAN port LEDs.

7. USB 3.2 Gen1 Type A 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.

8. USB 3.2 Gen2x2 Type C port

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

9. Center/Sub out

XXXXXXXXXXXXXXXXXXXXXXXXX.

10. Side Surround L/R

XXXXXXXXXXXXXXXXXXXXXXXXX.

11. Rear Surround L/R

XXXXXXXXXXXXXXXXXXXXXXXXX.

12. Line-in (blue)

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

13. Line-out (Green)

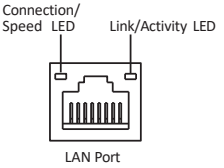
The default Line Out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

14. Mic In (Pink)

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

2.5GbE LAN LED:

Status	Description
Yellow On	1 Gbps, 100Mbps data rate
Green On	2.5 Gbps data rate
Off	10 Mbps data rate



0/100/1000 LAN LED:

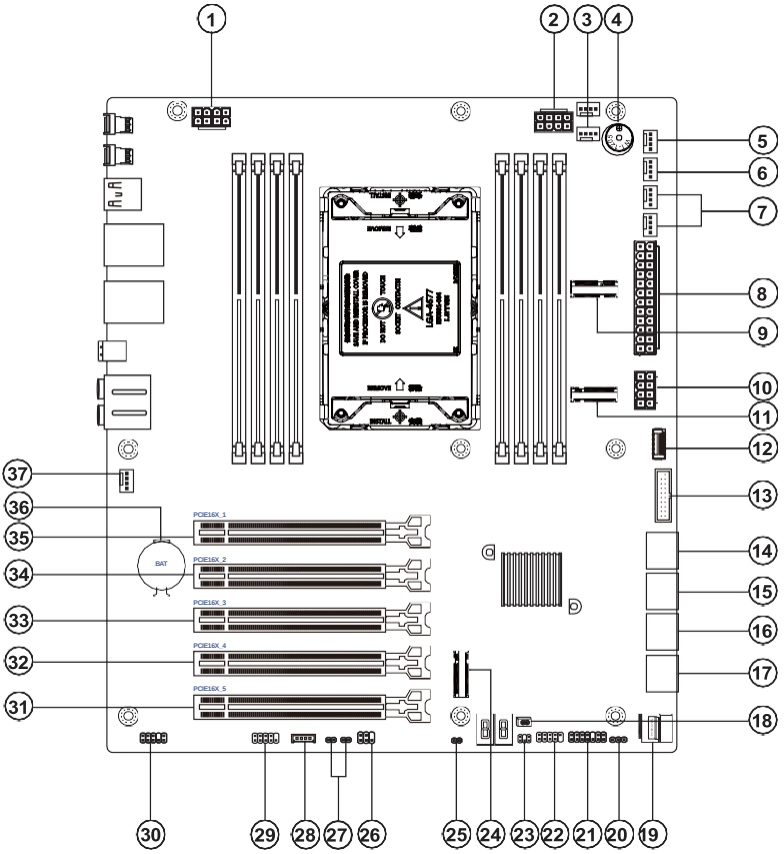
Status	Description
Yellow On	1 Gbps data rate
Green On	100 Mbps data rate
Off	10 Mbps data rate

ID Button / LED:

Status	Description
Blue on	System identification is active
Off	System identification is disable

- 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.

1-4 Internal Connectors



No.	Code	Description	No.	Code	Description
1	ATX_12V2	8-pin +12V power connector	20	12C_UPDATE	
2	ATX_12V1	8-pin +12V power connector	21	F_PANEL	Front panel switch/LED header
3	CPU_FAN	4-pin CPU cooling fan header	22	FUSB2	Front panel USB 2.0 headers
4	BZ	Buzzer header	23	THER_HD1	System Thermal Sensor Header
5	PUMP_FAN	XXXXXXXX	24	M2_3	M.2 2260/2280 Key M slot for SSD PCIE Gen4 x4
6	SYS_FAN1	4-pin System cooling fan header #1	25	FW_DEBUG	XXXXXXXX
7	AUX_FAN1~2	XXXXXXXX	26	ELOCK	XXXXXXXX
8	ATX_POWER	Standard 24-pin ATX power connector	27	A1~2	XXXXXXXX
9	M.2_1	M.2 2230 Key E slot for WiFi/CNVi	28	VROC_KEY	XXXXXXXX
10	PCIE_8PIN_PWR	8-pin +12V power connector	29	BMC_HEADER	XXXXXXXX
11	M2_2	M.2 2280/22110 Key M slot for SSD Gen5 x4	30	F_AUDIO	Front panel audio header
12	F_U32G2X2	20-pin USB 3.2 Gen2 x2 header (Type C)	31	PCIE16X_5	PCIe x16 Slot (Gen5 x16)
13	F_USB3G1	20-pin USB 3.2 Gen1 headers (Type A)	32	PCIE16X_4	PCIe x16 Slot (Gen5 x16)
14	SATA3_D7U8	Serial ATA 6Gb/s connectors #7~8	33	PCIE16X_3	PCIe x16 Slot (Gen5 x16)
15	SATA3_D5U6	Serial ATA 6Gb/s connectors #5~6	34	PCIE16X_2	PCIe x16 Slot (Gen5 x16)
16	SATA3_D3U4	Serial ATA 6Gb/s connectors #3~4	35	PCIE16X_1	PCIe x16 Slot (Gen5 x16)
17	SATA3_D1U2	Serial ATA 6Gb/s connectors #1~2	36	BT	Battery Socket
18	C_INTRUSION	2-pin Intrusion Alarm Pin header	37	SYS_FAN2	4-pin system cooling fan header
19	SLIMSAS1	XXXXXXXX			

Read the following guidelines before connecting external devices:

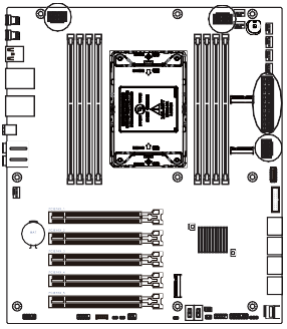
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the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

1/2/8/10) ATX_12V1/ATX_12V2/ATX_POWER/PCIE_8PIN_PWR (2x4 12V Power Connector and 2x12 Main 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.

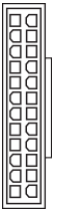
To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.

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.



ATX_12V1/ATX_12V2/PCIE_8PIN_PWR

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

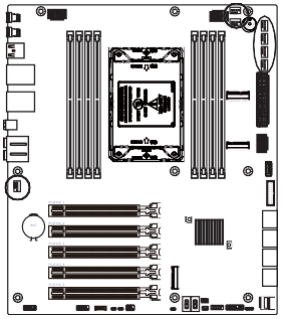


ATX_POWER

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

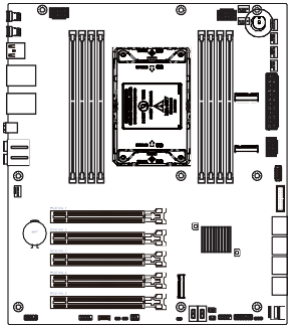
3/5/6/7/37) CPU_FAN/PUMP_FAN/SYS_FAN1/AUX_FAN1~2/SYS_FAN2 (CPU Fan/PUMP_FAN/System Fan/AUX_FAN Headers)

The motherboard has two 4-pin CPU fan headers (CPU_FAN), one 4-pin PUMP fan header (PUMP_FAN), two 4-pin system fan headers (SYS_FAN) and two 4-pin AUX fan headers (AUX_FAN1~2). 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	Pin No.	Definition
1	GND	3	Sense
2	+12V	4	Speed Control

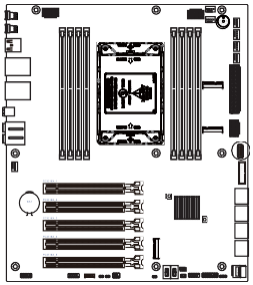
4) BZ: Buzzer Header

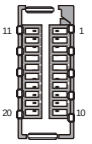


Pin No.	Definition	Pin No.	Definition
1	Power +5V	3	GND
2	_	4	Signal

12) F_U32G2X2 (Front Panel USB 3.2 Gen2 x2 Header)

This Motherboard implements one USB 3.2 Gen2 x2 header (Type C) supporting 2 extra front USB 3.2 Gen2 x2 ports, which delivers 10Gb/s transfer rate.

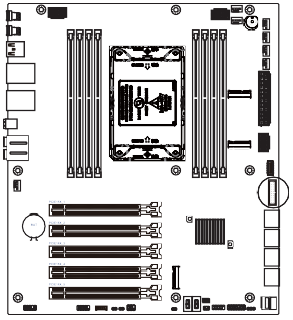


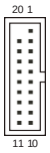


Pin No.	CC2	Pin No.	Definition
1	VBUS	11	CC2
2	TX1+	12	D+
3	TX1-	13	D-
4	GND	14	GND
5	RX1+	15	RX2-
6	RX1-	16	RX2+
7	VBUS	17	GND
8	CC1	18	TX2-
9	-	19	TX2+
10	-	20	VBUS

13) F_USB3G1 (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.

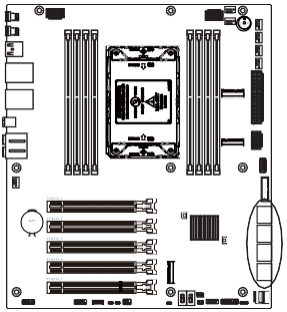


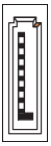


Pin No.	CC2	Pin No.	Definition
1	Power	11	IntA_P2_D+
2	IntA_P1_SSRX-	12	IntA_P2_D-
3	IntA_P1_SSRX+	13	GND
4	GND	14	IntA_P2_SSTX+
5	IntA_P1_SSTX-	15	IntA_P2_SSTX-
6	IntA_P1_SSTX+	16	GND
7	GND	17	IntA_P2_SSRX+
8	IntA_P1_D-	18	IntA_P2_SSRX-
9	IntA_P1_D+	19	Power
10	NC	20	-

14/15/16/17) SATA3_D7U8/SATA3_D5U6/SATA3_D3U4/SATA3_D1U2 (Serial ATA Connectors)

SATA 1~8 connectors support the Serial ATA 6Gb/s device, simpler disk drive cabling and easier PC assembly. It eliminates limitations of the current Parallel ATA interface. But maintains register compatibility and software compatibility with Parallel ATA.

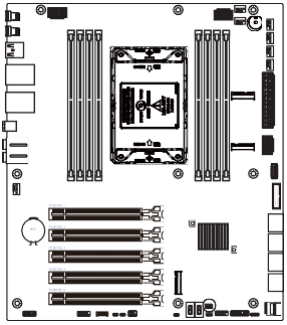




Pin No.	Definition	Pin No.	Definition
1	Ground	5	TX-
2	RX-	6	TX+
3	RX+	7	Ground
4	Ground	8	-

18) C_INTRUSION (Case Open Intrusion Alert Header)

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

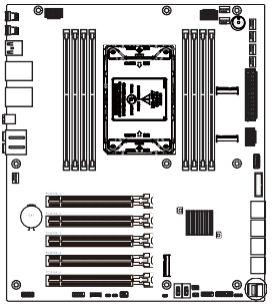


Open: Normal Operation (Default)

Closed: Active Chassis Intrusion Alert

19) SLIMSAS1 (XXXXXXXXXXXXXXXXXXXX)

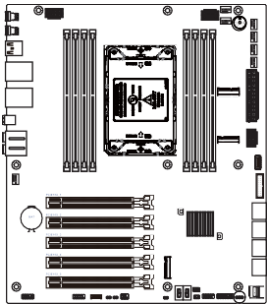
XXXXXXXXXXXXXXXXXX.



Pin No.	Definition	Pin No.	Definition
1			
2			
3			
4			

20) 12C_UPDATE (XXXXXXXXXXXXXXXXXXXX)

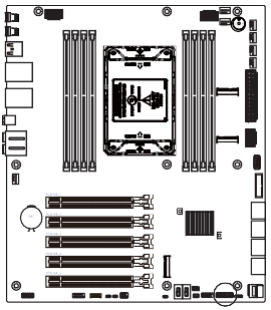
XXXXXXXXXXXXXXXXXX.

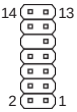


Pin No.	Definition
1	Ground
2	RX-
3	RX+

21) F_PANEL (Front panel header)

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases.

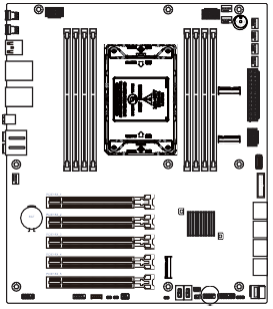




Pin No.	CC2	Pin No.	Definition
1	HDD LED Power	8	GND
2	GLED0	9	NC
3	HDD_LED	10	KEY
4	GLED1	11	+5VSB
5	GND	12	LAN_LED
6	PWRSW	13	NC
7	HWRST_L	14	LAN_LED

22) USB2 (Front Panel USB 2.0 Header)

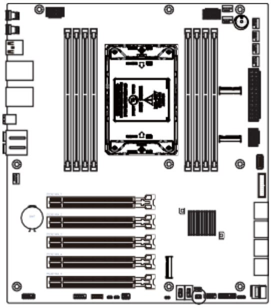
The onboard F_USB1 header delegates for card reader, it supports additional one USB 2.0 port.

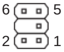


Pin No.	CC2	Pin No.	Definition
1	Power +5V	6	USB Port B (+)
2	Power +5V	7	GND
3	USB Port A (-)	8	GND
4	USB Port B (-)	9	-
5	USB Port A (+)	10	NC

23) THER_HD1 (System Thermal Sensor Header)

XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXX.

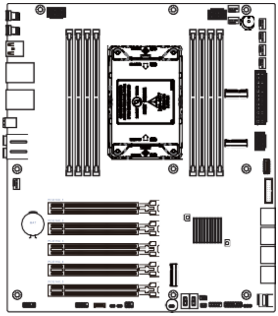




Pin No.	CC2	Pin No.	Definition
1	XXXXXXXX	4	-
2	XXXXXXXX	5	XXXXXXXX
3	XXXXXXXX	6	XXXXXXXX

25) FW_DEBUG (Front Panel USB 2.0 Header)

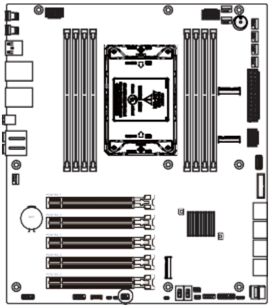
XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXX.

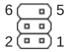


Pin No.	CC2
1	XXXXXXXX
2	XXXXXXXX

26) ELOCK (XXXXXXXXXXXXXXXX)

XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXX.

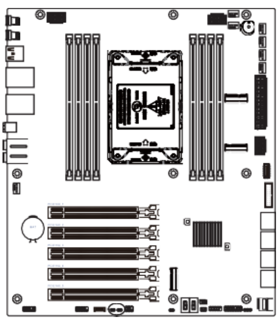




Pin No.	CC2	Pin No.	Definition
1	XXXXXXXX	4	-
2	XXXXXXXX	5	XXXXXXXX
3	XXXXXXXX	6	XXXXXXXX

27) A1~2 (2-pin GPIO Headers)

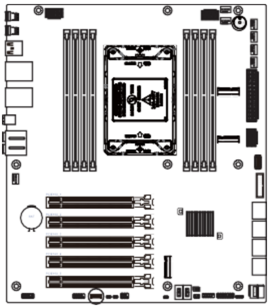
XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXX.



Pin No.	CC2
1	GPIO
2	GND

28) VROC_KEY (XXXXXXXXXXXXXXXX)

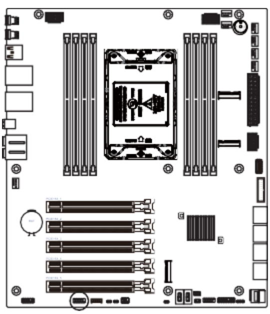
XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXX.

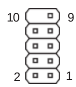


Pin No.	CC2	Pin No.	Definition
1	XXXXXXXX	3	XXXXXXXX
2	XXXXXXXX	4	XXXXXXXX

29) BMC_HEADER (XXXXXXXXXXXXXXXX)

XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXX.

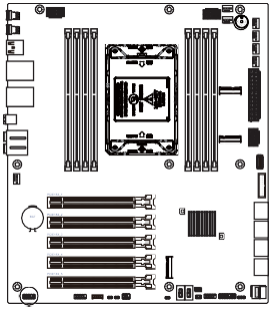




Pin No.	CC2	Pin No.	Definition
1	XXXXXXXX	6	XXXXXXXX
2	XXXXXXXX	7	XXXXXXXX
3	XXXXXXXX	8	XXXXXXXX
4	XXXXXXXX	9	XXXXXXXX
5	XXXXXXXX	10	-

30) F_AUDIO (Front Panel Audio Header)

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

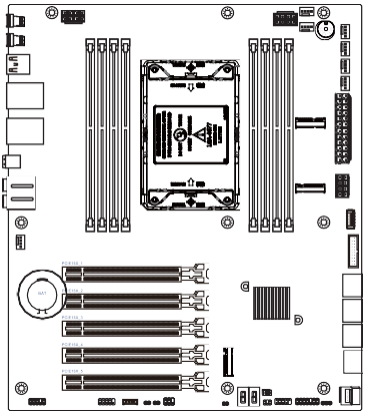


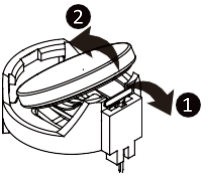
Pin No.	CC2	Pin No.	Definition
1	MIC-L	6	GND
2	GND	7	AUDIO_JD
3	MIC-R	8	-
4	Power(3.3V)	9	LINE-L
5	LINE-R-	10	GND

Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer

36) BT (Battery Scoket)

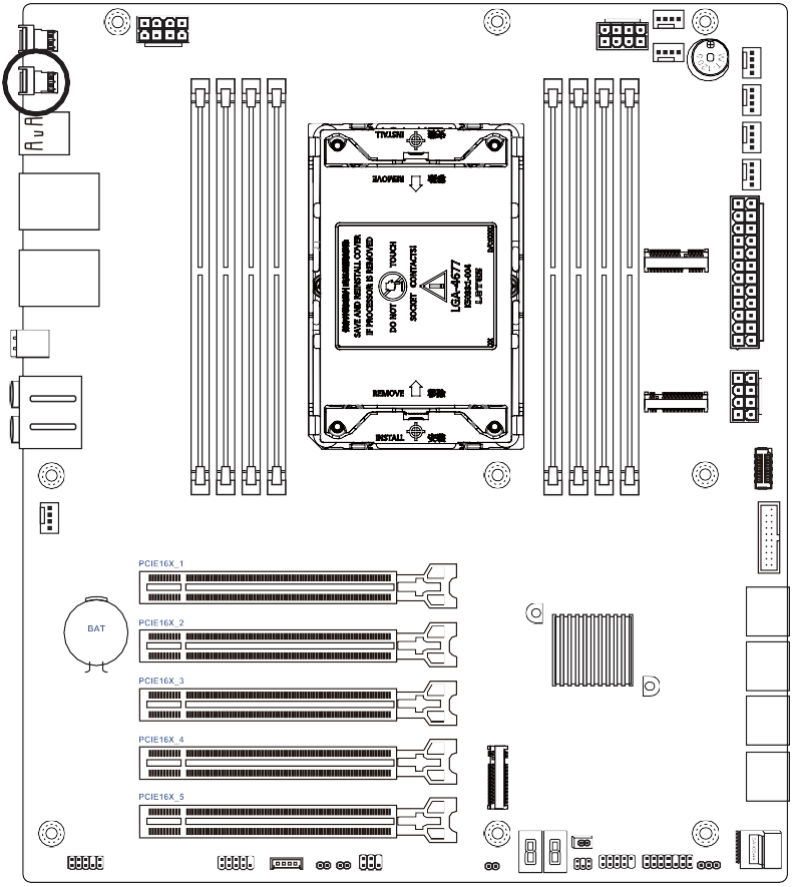
The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





- 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.

1-5 Jumper Settings



Jumper Name	Jumper Setting
Clear CMOS	1-2: Nomal operation (Default) 2-3: Clear CMOS data

Chapter 2 BIOS Setup

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

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

- BIOS flashing is potentially risky, if you do not encounter any problems when using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the Exit section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

<f><g>	Move the selection bar to select the screen
<h><i>	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.

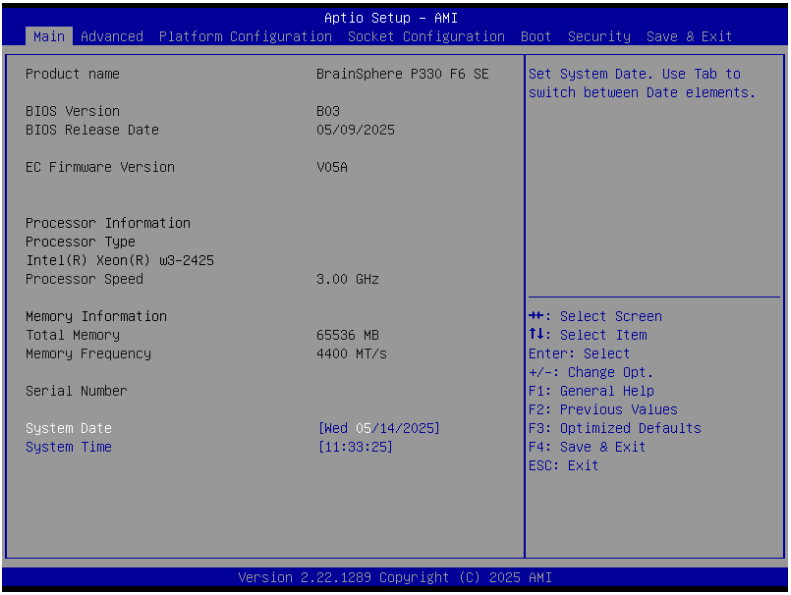
Main Menu Help

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.

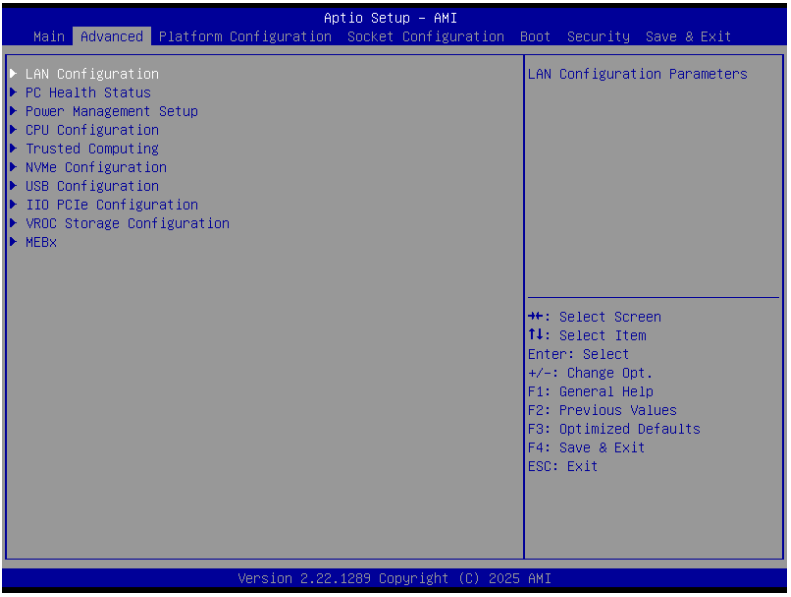
- When the system is not stable as usual, select the Restore Defaults item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.



Parameter	Description
Project Name	Displays the project name information.
BIOS Version	Displays the information of system BIOS version.
BIOS Release Date	Displays the BIOS Release Date of system BIOS.
EC Firmware Version	Displays the information of EC firmware version.
Processor Information	Displays the technical information for the installed processor(s).
Processor Type	XXXXXXXXXXXX
Intel(R) Xeon(R) w3-2425	XXXXXXXXXXXX
Processor Speed	This item shows the processor speed.
Memory Information	Displays the information of the memory size.
Total Memory	Displays the total memory size of the installed memory.
Memory Frequency	Displays the frequency information of the installed memory.
Serial Number	This item shows the information of system serial number.
System Date	Sets the date following the weekday-month-day-year format.
System Time	Sets the system time following the hour-minute-second format.

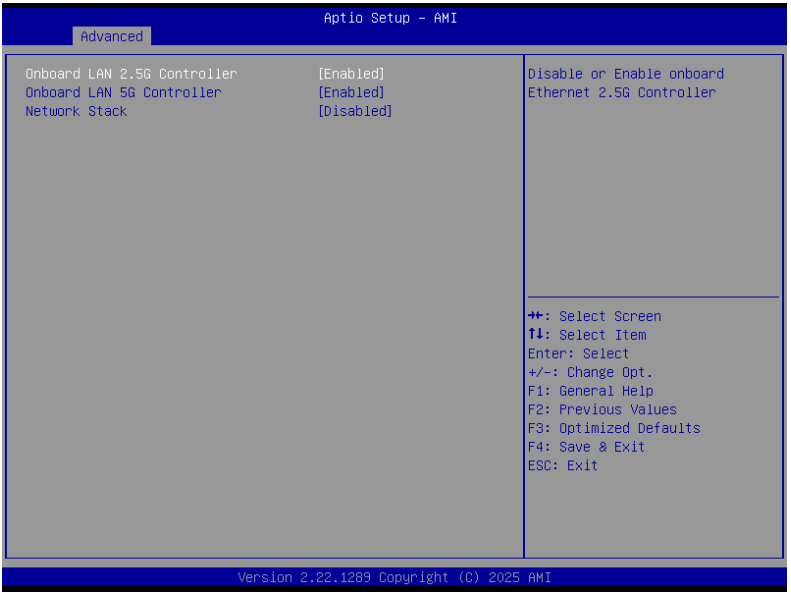
2-2 Advanced Menu

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 LAN Configuration

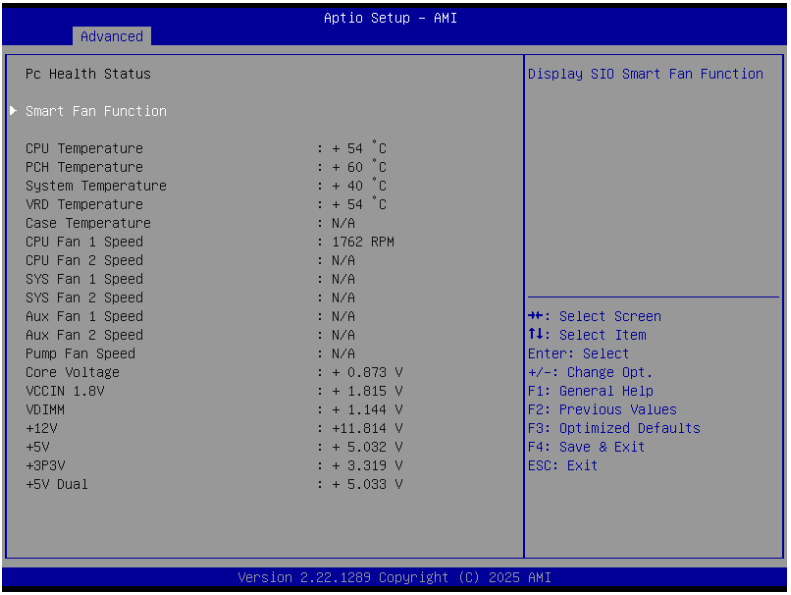
The item in the menu shows the LAN-related information that the BIOS automatically detects.



Parameter	Description
Onboard LAN 2.5G Controller	Use this item to enable or disable Onboard Intel I226-LM 2.5G LAN controller.
Onboard LAN 5G Controller	Use this item to enable or disable Onboard RTL8126-CG 5G LAN controller.
Network stack	Use this item to enable or disable Network Boot

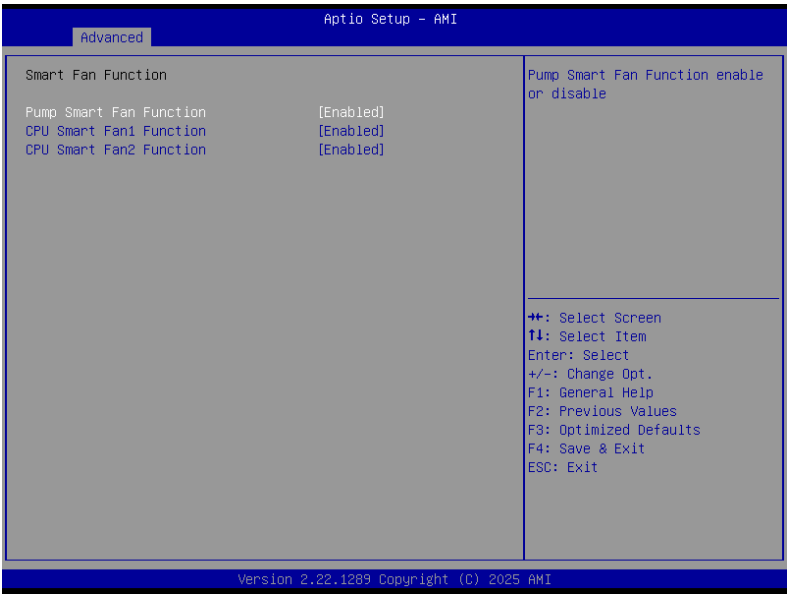
2-2-2 PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.



▶ *2-2-2-1 Smart Fan Function*

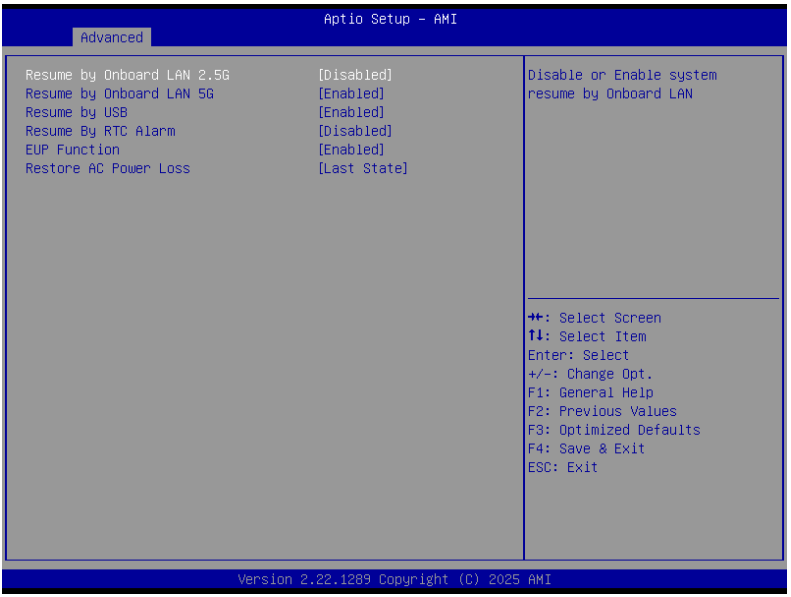
Scroll to this item and press <Enter> to view the following screen:



Parameter	Description
Smart Fan Function	
Pump Smart Fan Function	XXXXXXXXXXXX
CPU Smart Fan1 Function	XXXXXXXXXXXX
CPU Smart Fan2 Function	XXXXXXXXXXXX

2-2-3 Power Management Setup

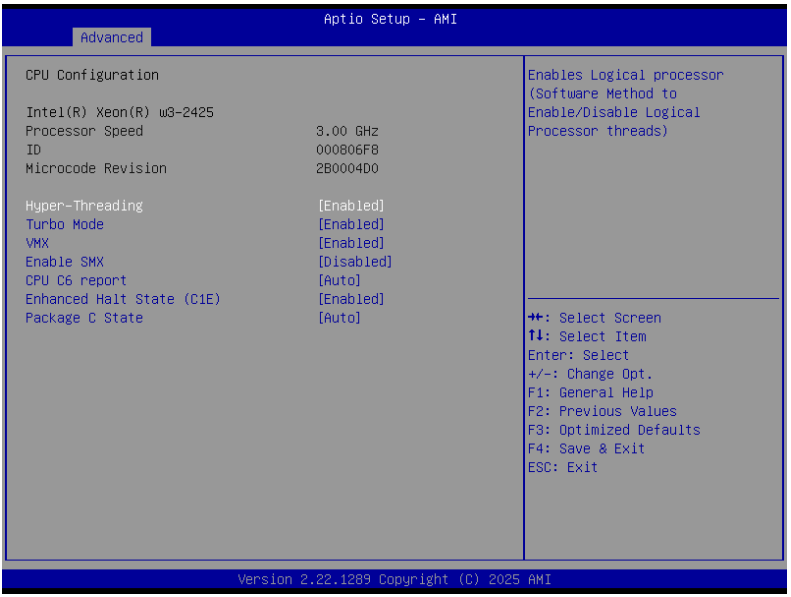
This page sets up some parameters for system power management operation.



Parameter	Description
Resume by Onboard LAN 2.5G	XXXXXXXXXXXX
Resume by Onboard LAN 5G	XXXXXXXXXXXX
Resume by USB	This item allows you to enable or disable the USB device wakeup function from S3 mode.
Resume By RTC Alarm	The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.
EUP Function	This item allows user to enable or disable EUP support.
Resume AC Power Loss	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.

2-2-4 CPU Configuration

The item in the menu shows the CPU Configuration.



Parameter	Description
Intel(R) Xeon(R) w3-2425	This is display-only field and displays the information of the CPU installed in your computer.
Processor Speed	This item shows the processor speed.
ID	This item shows the processor ID.
Microcode Revision	This item shows the Microcode Revision.
Hyper-Threading	This item is only available when the chipset supports Hyper-Threading and you are using a Hyper-Threading CPU.
Trubo Mode	XXXXXXXXXXXX
VMX	This item shows the computer supports the VMX or not.
Enable SMX	This item shows the computer supports the SMX or not.
CPU c6 report	XXXXXXXXXXXX
Enhanced Halt State(C1E)	Use this item to enable or disable the Enhanced C1 state.
Package C State	Use this item to set the Package C State limit.

2-2-5 Trusted Computing

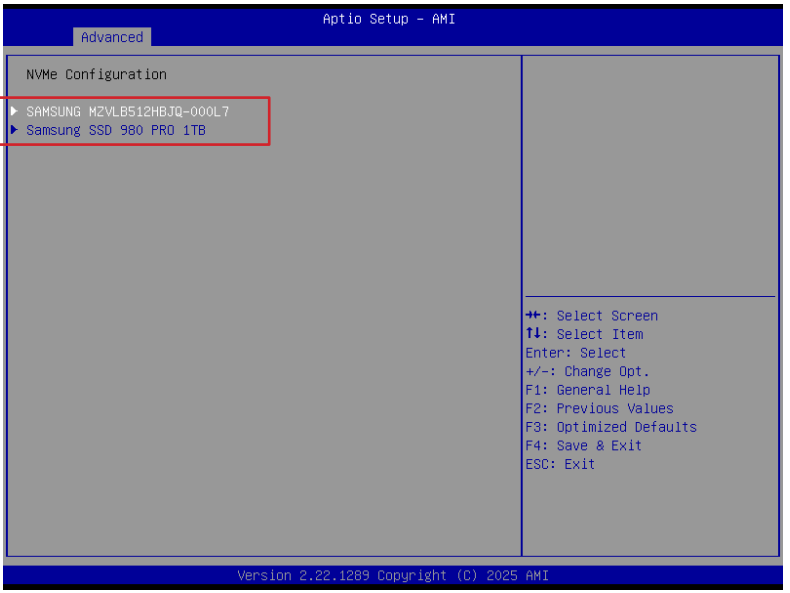
Use this item to show the information of trusted computing configuration.

Parameter	Description
Firmware Version/ Vendor	Displays the firmware version and Vendor information.
Security Device Support	XXXXXXXXXXXX
TPM Device Selection	Selets TPM device. Options available: dTPM, PTT. Default setting is PTT.
Active PCR banks/ Available PCR banks	PCR banks Displays active/available Platform Configuration Register (PCR) banks.
SHA256 PCR Bank	Enable/Disable SHA256 PCR bank. Options available: Disabled, Enabled. Default setting is Enabled.
SHA384 PCR Bank	Enable/Disable SHA384 PCR bank. Options available: Disabled, Enabled. Default setting is Disabled.
Pending operation	Schedule an operation for the security device. NOTE: Your computer will reboot during restart in order to change the state of a security device. Options available: None, TPM Clear. Default setting is None.
Platform Hierarchy	Enable/Disable platform hierarchy. Options available: Disabled, Enabled. Default setting is Enabled.

Storage Hierarchy	Enable/Disable storage hierarchy. Options available: Disabled, Enabled. Default setting is Enabled.
Endorsement Hierarchy	Enable/Disable endorsement hierarchy. Options available: Disabled, Enabled. Default setting is Enabled.
Physical Presence Spec Version	Selects the physical presence spec version. Options available: 1.2, 1.3. Default setting is 1.3.
Device select	Selects the TPM device. Options available: TPM 1.2, TPM 2.0, Auto. Default setting is Auto.

2-2-6 NVMe Configuration

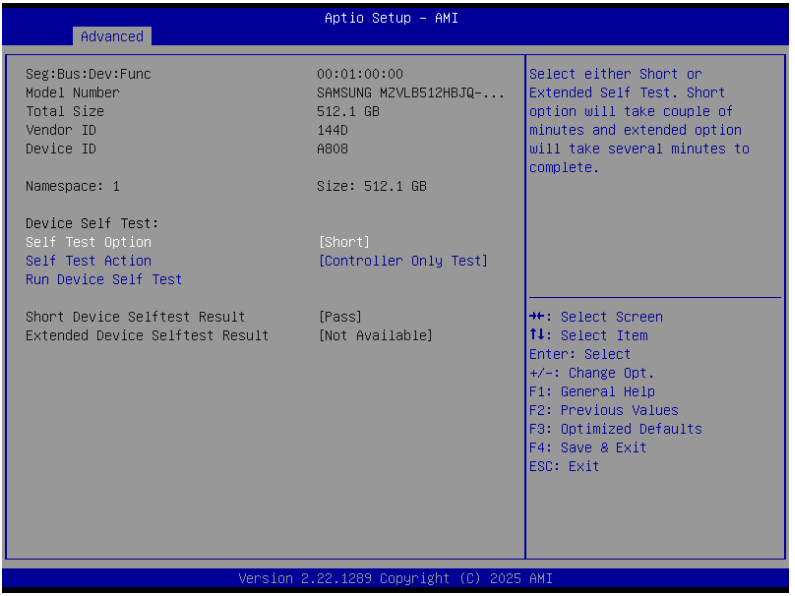
Use this item to show the mode of NVMe configuration options.



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

▶ *2-2-6-1 SAMSUNG MZVLB512HBJQ-000L7*

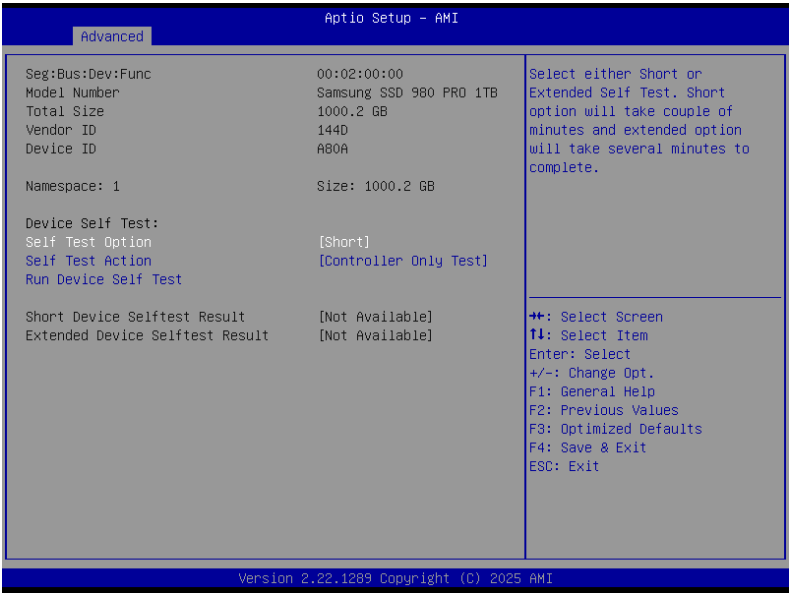
XXXXXXXXXXXXXXXXXXXXXXXXXXX:



Parameter	Description
Seg:Bus:Dev:Func	XXXXXXXXXXXX
Model Number	XXXXXXXXXXXX
Total Size	XXXXXXXXXXXX
Vendor ID	
Device ID	
Namespace:1	
Device Self Text:	
self Test option	
Self test Action	
Run Device Self Test	
Short Device Selftest Result	
Extended Device Selftest Result	

▶ *2-2-6-2 SAMSUNG SSD980 PRO 1TB*

XXXXXXXXXXXXXXXXXXXXXXXXXXX:



Parameter	Description
Seg:Bus:Dev:Func	XXXXXXXXXXXXX
Model Number	XXXXXXXXXXXXX
Total Size	XXXXXXXXXXXXX
Vendor ID	
Device ID	
Namespace:1	
Device Self Text:	
self Test option	
Self test Action	
Run Device Self Test	
Short Device Selftest Result	
Extended Device Selftest Result	

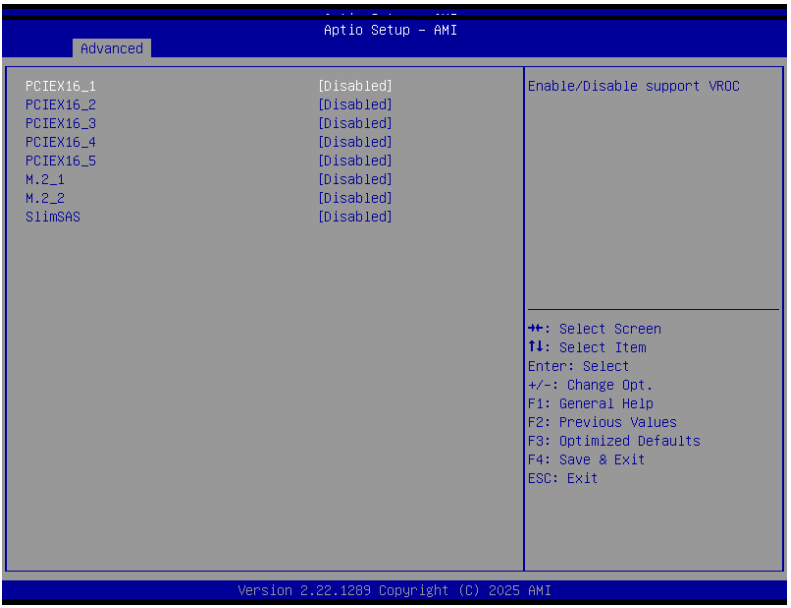
2-2-7 USB Configuration

Use this item to show the information of USB configuration.

Parameter	Description
USB Configuration	
USB Port Disable Override	XXXXXXXXXXXX

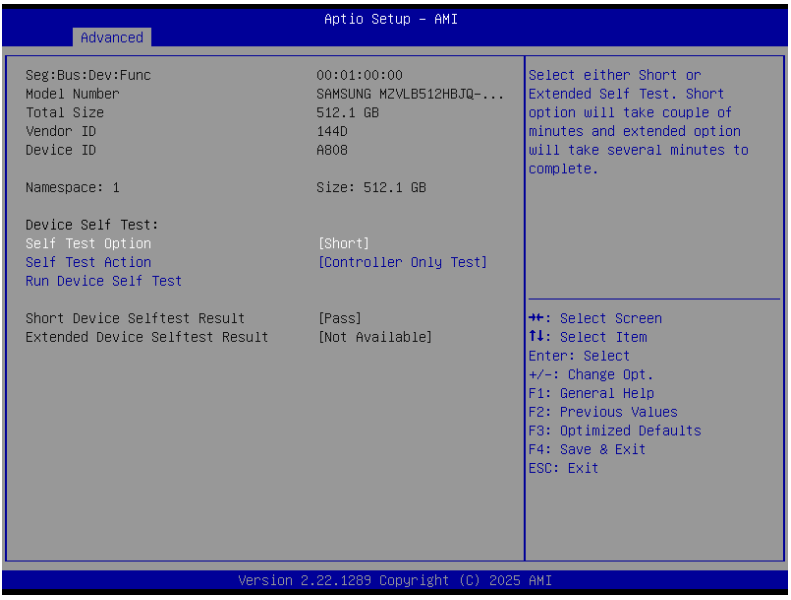
2-2-8 IIO PCIe Configuration

XXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



2-2-9 VROC StorageConfiguration

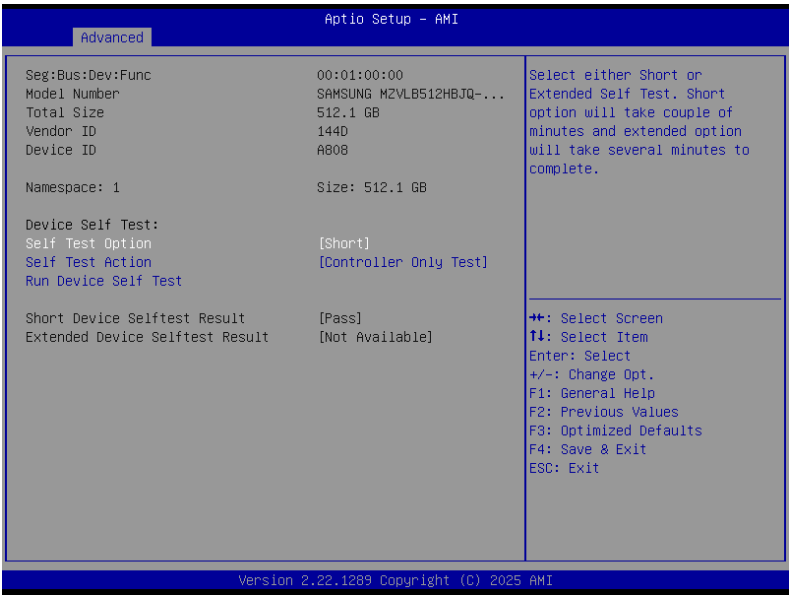
XXXXXXXXXXXXXXXXXXXX.



Parameter	Description
XXXXXXXXXXXXX	XXXXXXXXXXXXX
XXXXXXXXXXXXX	XXXXXXXXXXXXX

2-2-10 MEBX

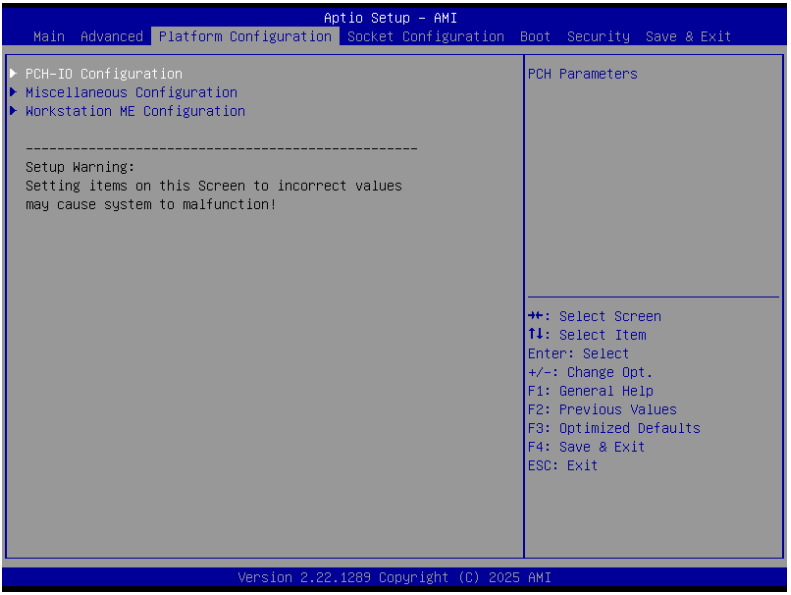
XXXXXXXXXXXXXXXXXXXX.



Parameter	Description
XXXXXXXXXXXXX	XXXXXXXXXXXXX
XXXXXXXXXXXXX	XXXXXXXXXXXXX

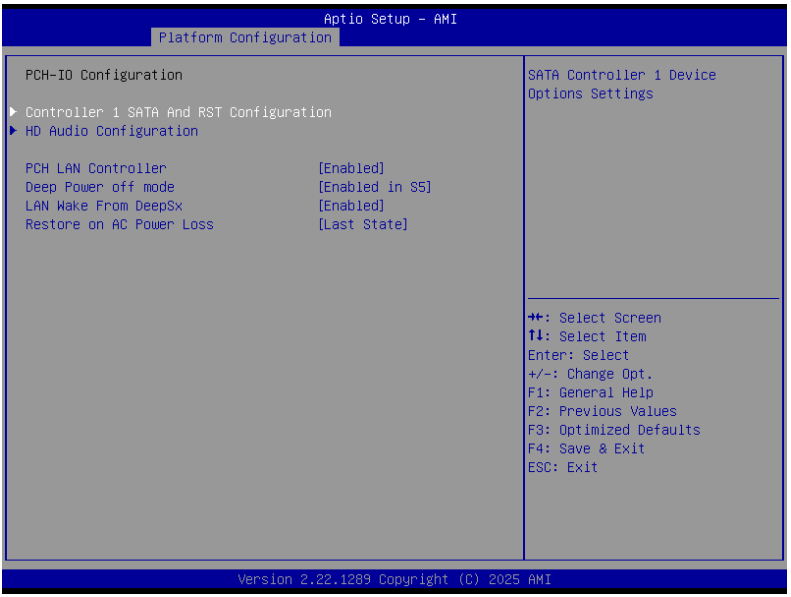
2-3 Platform Configuration Menu

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



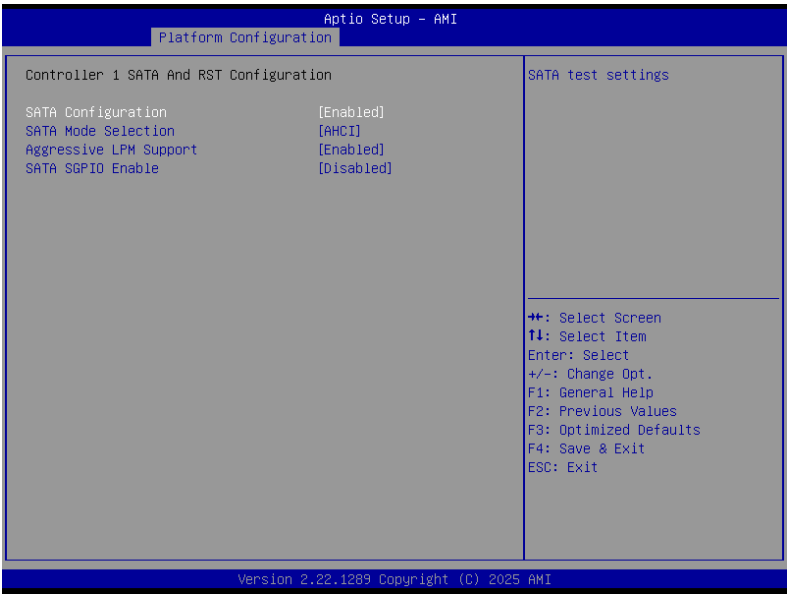
2-3-1 PCH-IO Configuration

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



▶ *2-3-1-1 SATA Configuration*

Press [Enter] to configure advanced items.



Parameter	Description
SATA Configuration	– Enable/Disable SATA controller. – Options available: Enabled, Disabled. Default setting is Enabled.
SATA Mode Selection	– Configures on chip SATA type. – AHCI Mode: When set to AHCI, the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time. – RAID Mode: When set to RAID, the SATA controller enables both its RAID and AHCI functions. You will be allowed to access the RAID setup utility at boot time. – Options available: AHCI, RAID. Default setting is AHCI.
Aggressive LPM Support	XXXXXXXXXXXX
SATA SGPIO Enablbe	

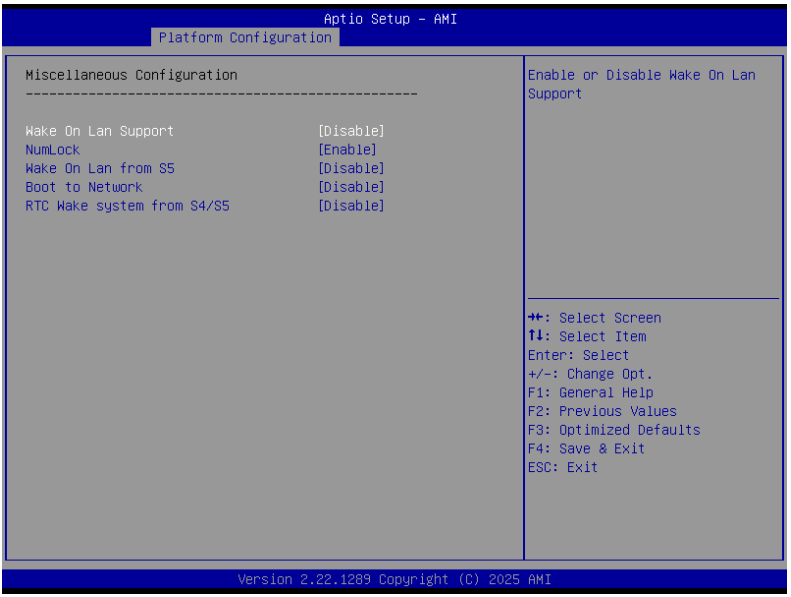
▶ *2-3-1-2 HD Audio Configuration*

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.

Parameter	Description
HD Audio	This item enables or disables Azalia HD audio.

2-3-2 Miscellaneous Configuration

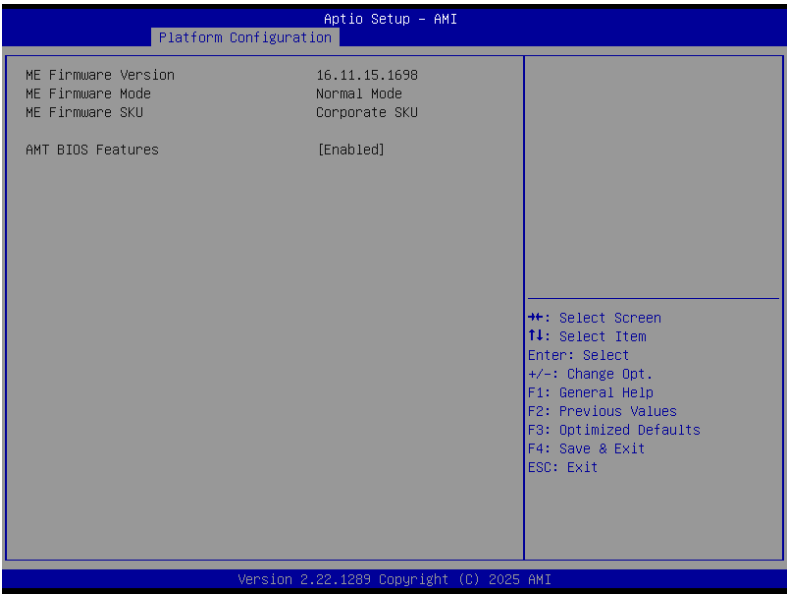
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
Wake On Lan Support	XXXXXXXXXXXX
NumLock	Enable/Disable the Bootup NumLock function. Options available: On, Off. Default setting is On.
Wake On Lan from S5	XXXXXXXXXXXX
Boot to Network	XXXXXXXXXXXX
RTC wake system from S4/S5	XXXXXXXXXXXX

2-3-3 Workstation ME Configuration

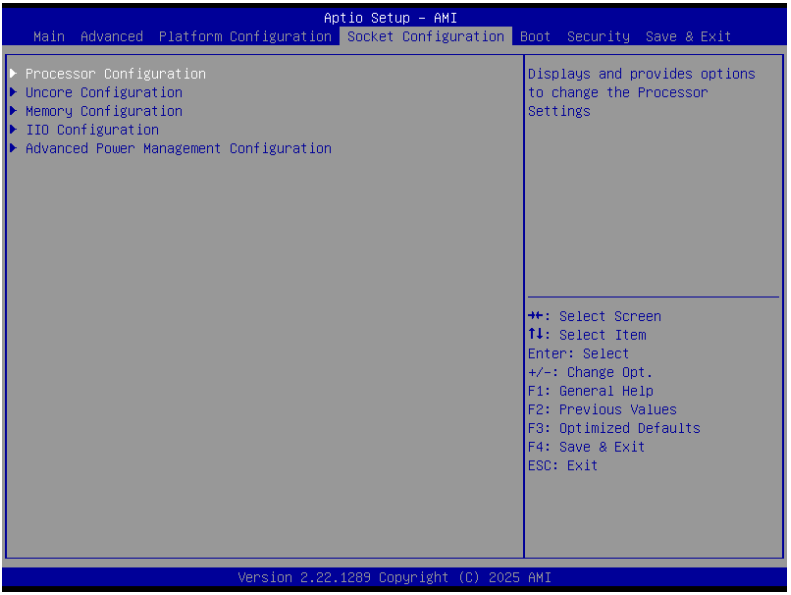
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
ME Firmware Version	Displays the operational firmware version.
ME Firmware Mode	Displays the operational firmware mode.
ME Firmware SKU	Disaplays ME firmware sku information.
AMT BIOS Features	XXXXXXXXXXXXX

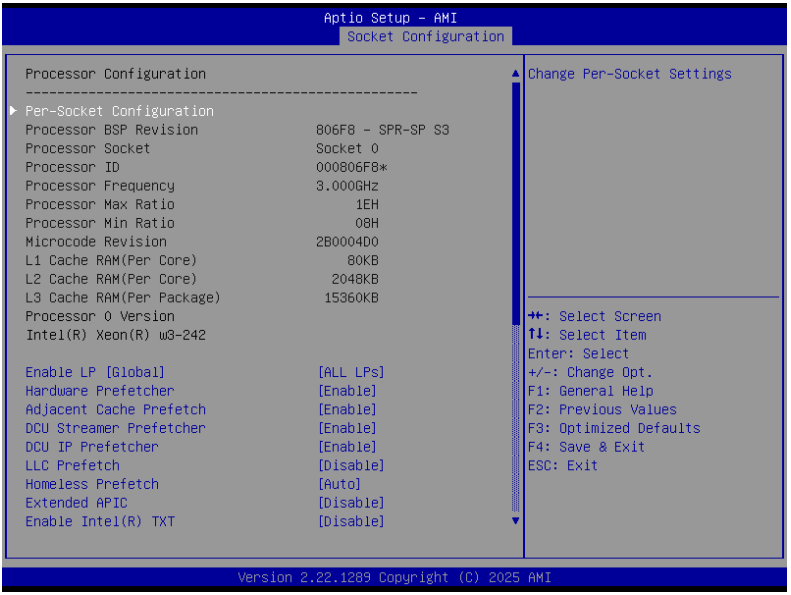
2-4 Socket Configuration Menu

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



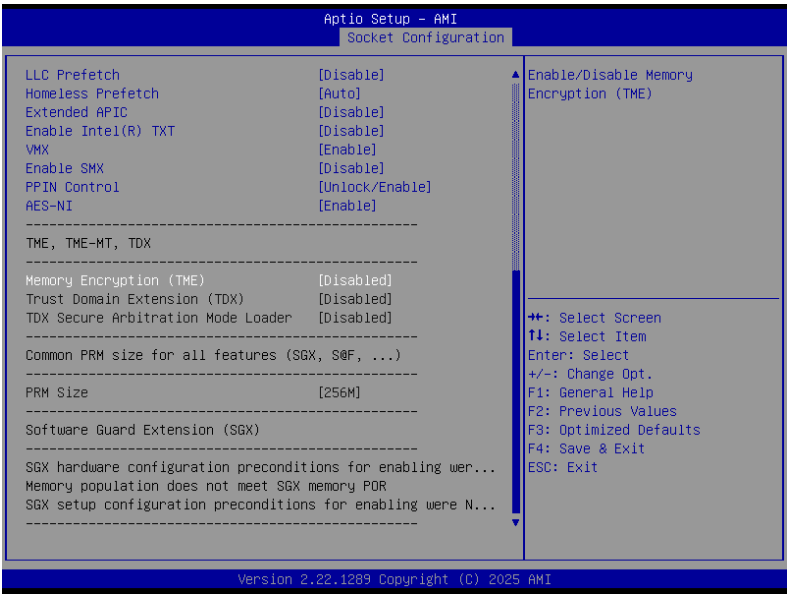
2-4-1 Processor Configuration

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



▶ *2-4-1-1 Per-Socket Configuration*

Press [Enter] to configure advanced items.

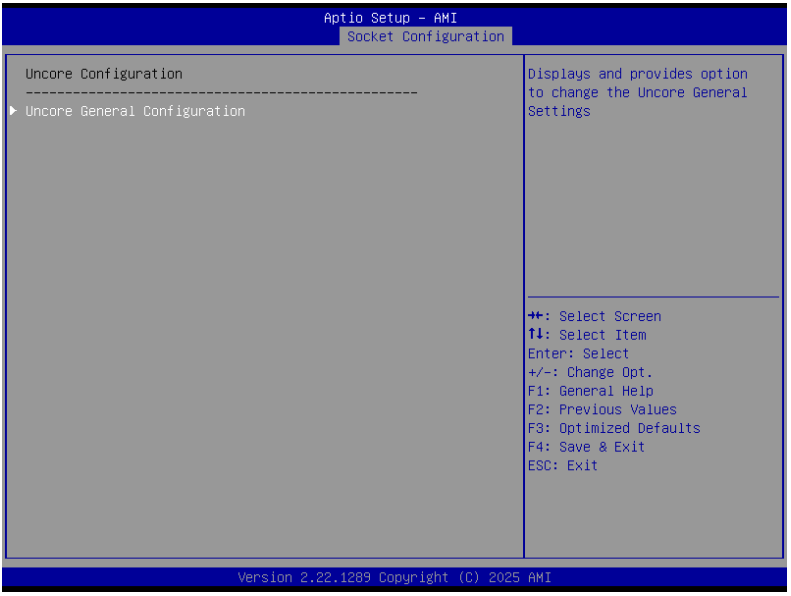


Parameter	Description
Homeless Prefetch	XXXXXXXXXXXX
Extended APIC	Enable/Disable extended APIC support. Note: The VT-d will be enabled automatically when x2APIC is enabled. Options available: Enable, Disable. Default setting is Enable.
Enable Intel(R) TXT	Enable/Disable the Intel Trusted Execution Technology 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.
PPIN Control	XXXXXXXXXXXX
AES-NI	Enable/Disable the AES-NI support. Options available: Enable, Disable. Default setting is Enable.

Memory Encryption	Enable/Disable memory encryption (TME). Options available: Enabled, Disabled. Default setting is Disabled.
Trust Domain Extension	XXXXXXXXXXXX
TDX Secure Arbitration Mode Loader	XXXXXXXXXXXX
PRM Size	XXXXXXXXXXXX
Software Guard Extension	XXXXXXXXXXXX

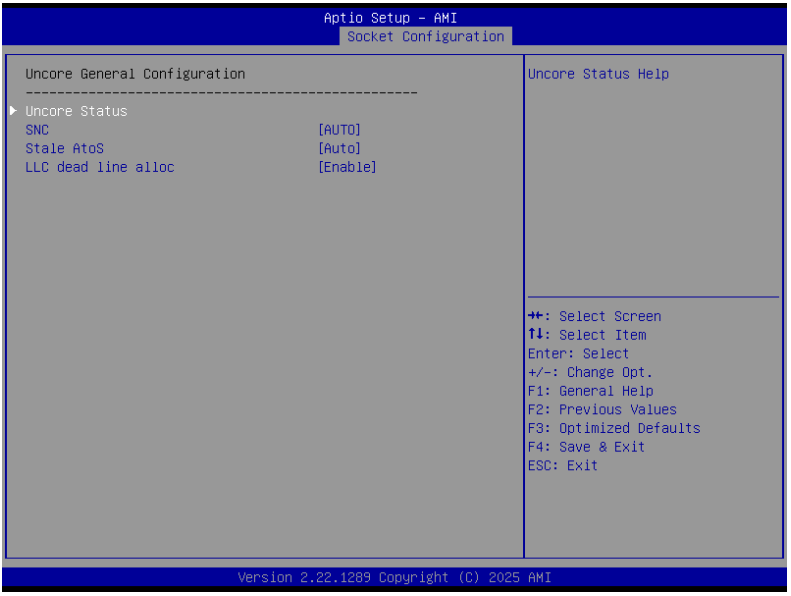
2-4-2 Uncore Configuration

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



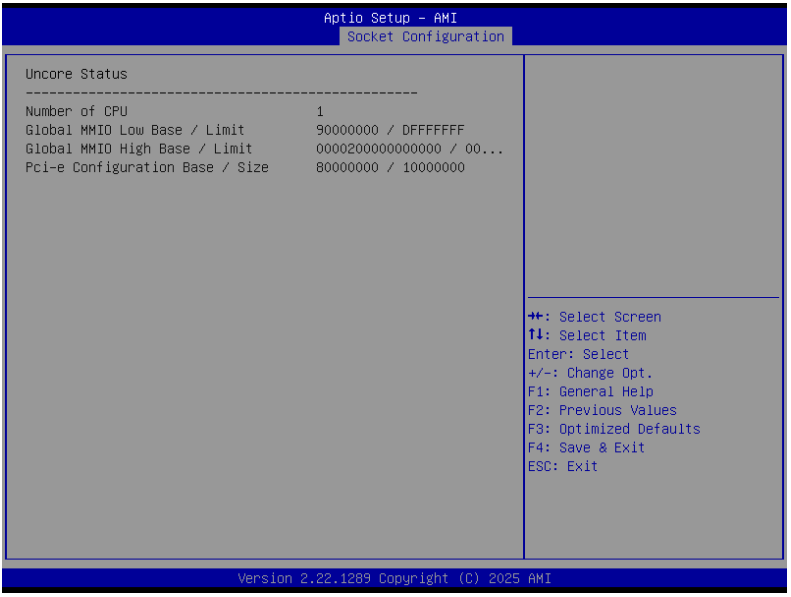
▶ *2-4-2-1 Uncore General Configuration*

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



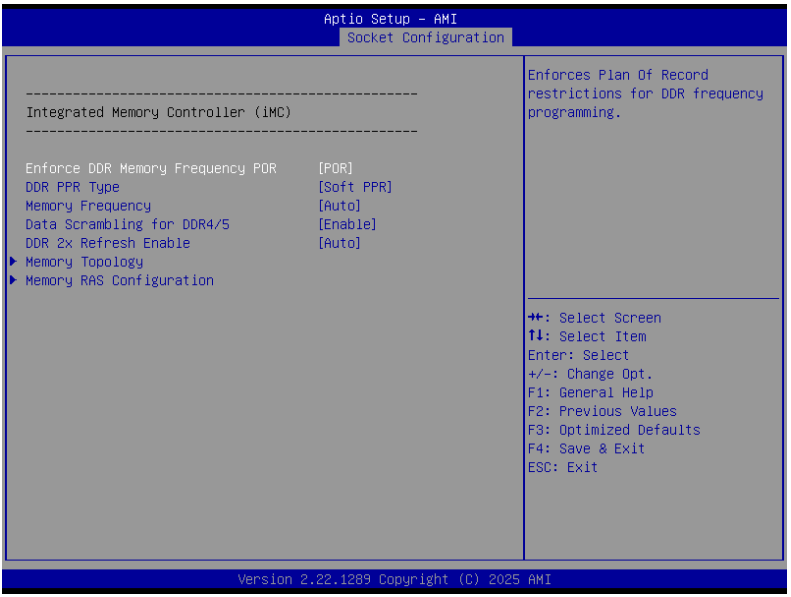
➤ Uncore General Configuration

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



2-4-3 Memory Configuration

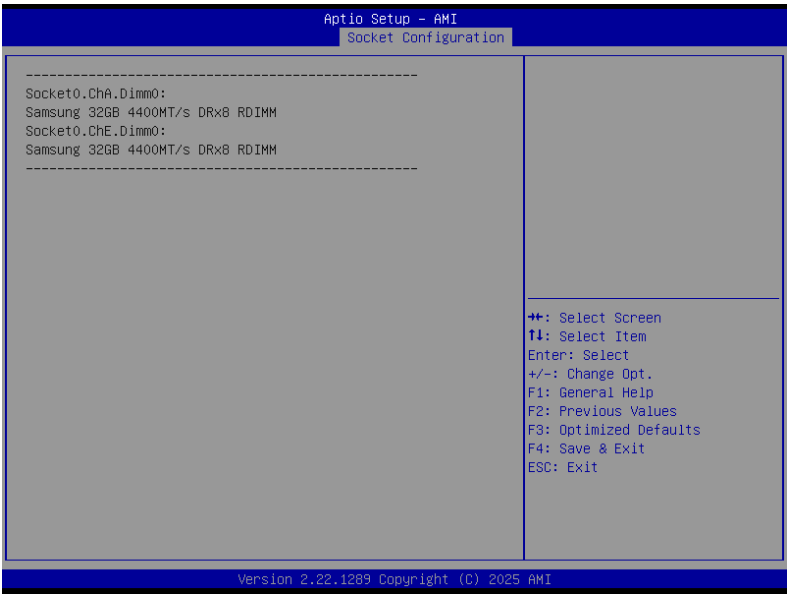
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



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.
DDR PPR Type	XXXXXXXXXXXXX
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.
Data Scrabling for DDR4/5	XXXXXXXXXXXXX
DDR 2X Refresh Enable	XXXXXXXXXXXXX

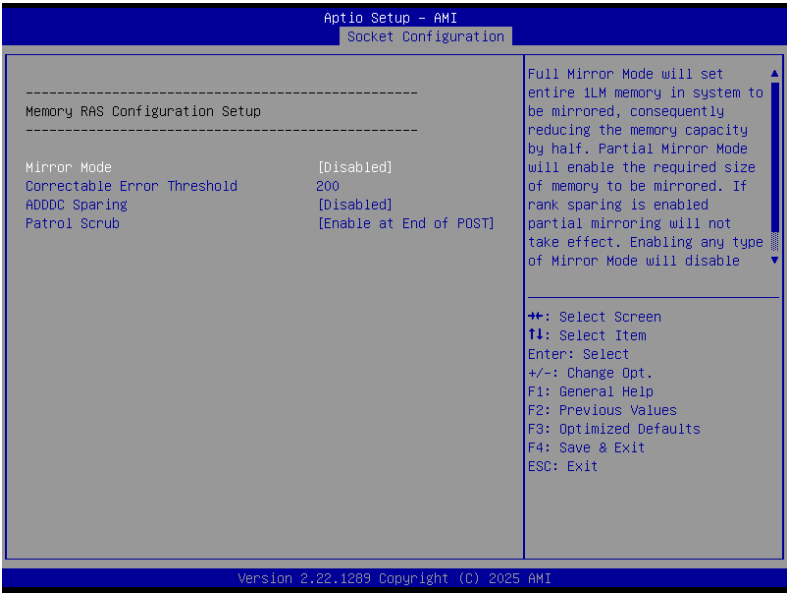
▶ *2-4-3-1 Memory Topology*

Press [Enter] to view memory topology with DIMM population information.



▶ *2-4-3-2 Memory RAS Configuration Setup*

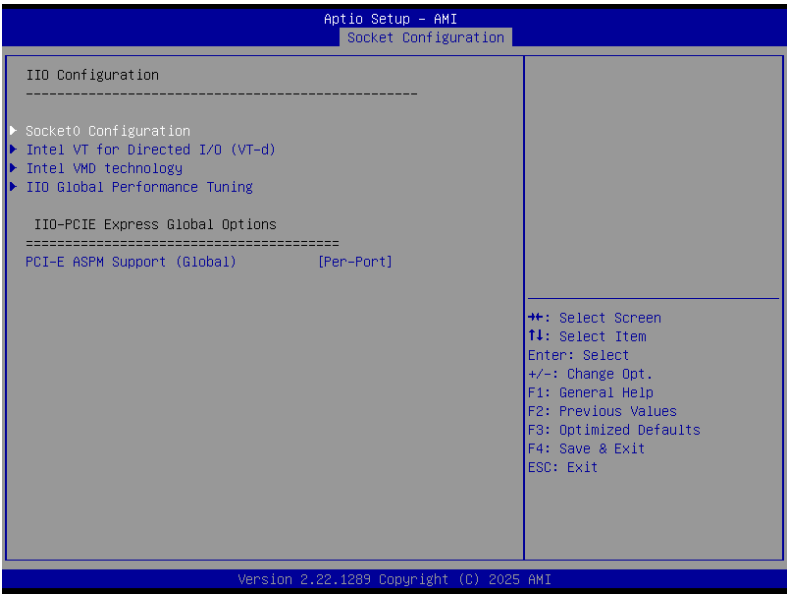
Press [Enter] to configure advanced items.



Parameter	Description
Mirror Mode	– Mirror Mode will set entire 1LM memory in system to be mirrored, consequently reducing the memory capacity by half. Enables the Mirror Mode will disable the XPT Prefetch. – Options available: Disabled, Full Mirror Mode, Partial Mirror Mode. Default setting is Disabled.
Correctable Error Threshold	– Correctable Error Threshold (0x01-0x7fff) used for sparing, and leaky bucket. – Press the <+> / <-> keys to increase or decrease the desired values.
ADDDC Sparing	– Enable/Disable ADDDC Sparing. – Options available: Disabled, Enabled. Default setting is Disabled.
Patrol Scrub	– Options available: Disabled, Enable at End of POST. Default setting is Enable at End of POST.

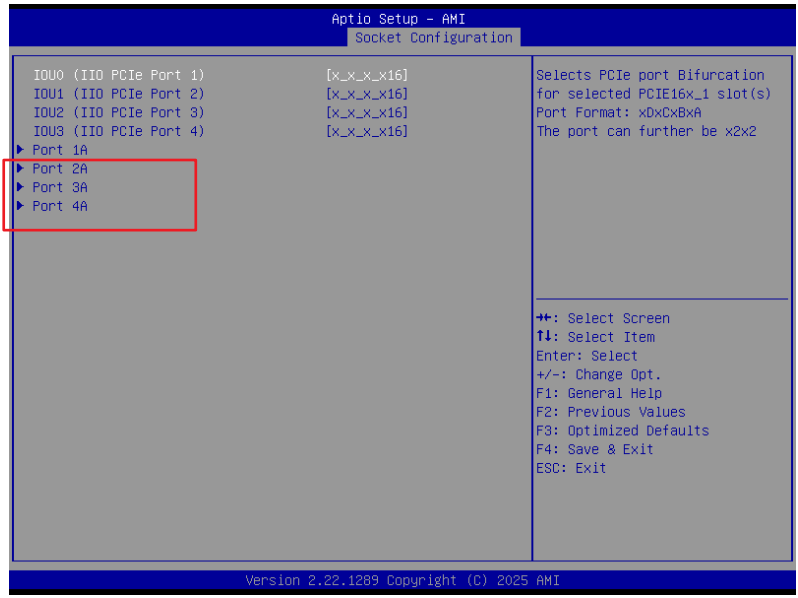
2-4-4 IIO Configuration

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



▶ *2-4-4-1 Secket0 Configuration*

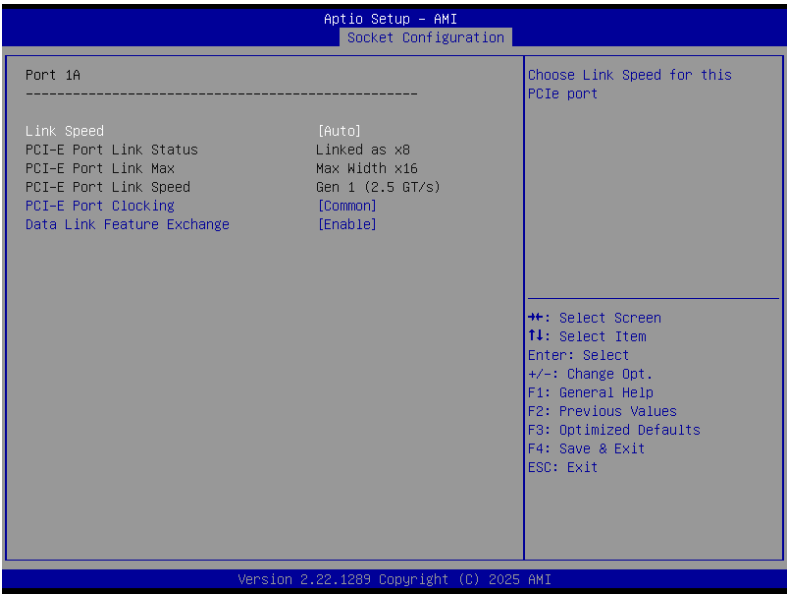
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
IOUO (IIO PCIe Port 1)	XXXXXXXXXXXX
IOU1 (IIO PCIe Port 2)	XXXXXXXXXXXX
IOU2 (IIO PCIe Port 3)	XXXXXXXXXXXX
IOU3 (IIO PCIe Port 4)	XXXXXXXXXXXX

➤ Port 1A

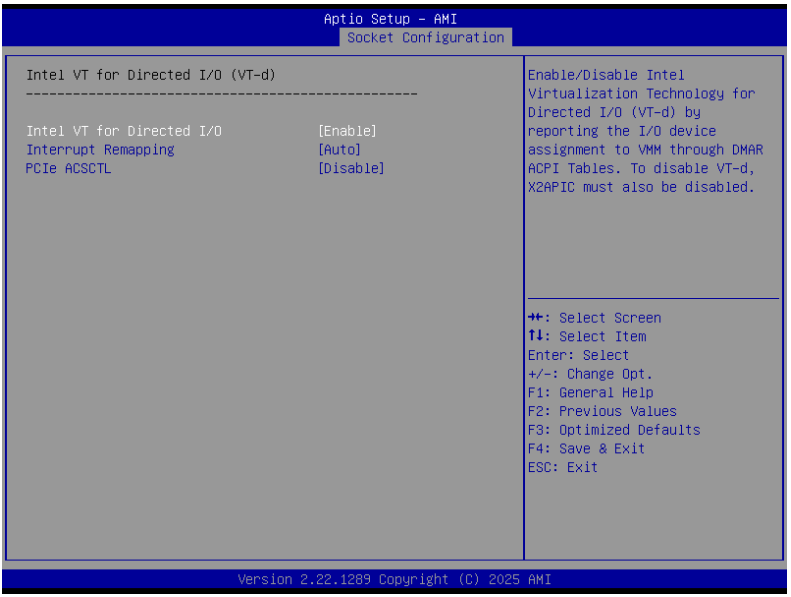
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
Link Speed	XXXXXXXXXXXX
PCI-E Port Link Status	XXXXXXXXXXXX
PCI-E Port Link Max	XXXXXXXXXXXX
PCI-E Port Link Speed	XXXXXXXXXXXX
PCI-E Port Link Clockking	XXXXXXXXXXXX
Data Link Feature Exchange	XXXXXXXXXXXX

▶ *2-4-4-2 Intel VT for Directed I/O (VT-d)*

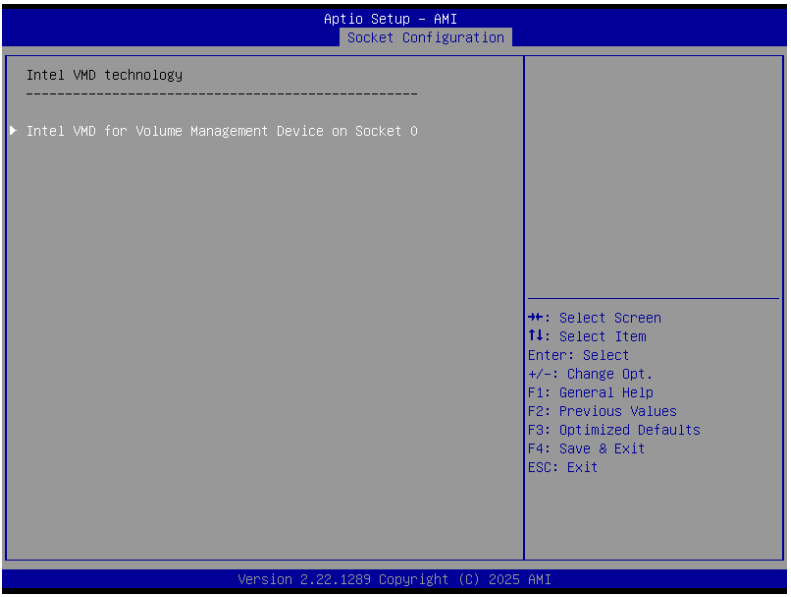
Press [Enter] to configure advanced items.



Parameter	Description
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.
Interrupt Remapping	– Enable/Disable the interrupt remapping support function. – Options available: Auto, Enable, Disable. Default setting is Auto
PCIe ACSCTl	– Options available: Enable, Disable. Default setting is Disable.

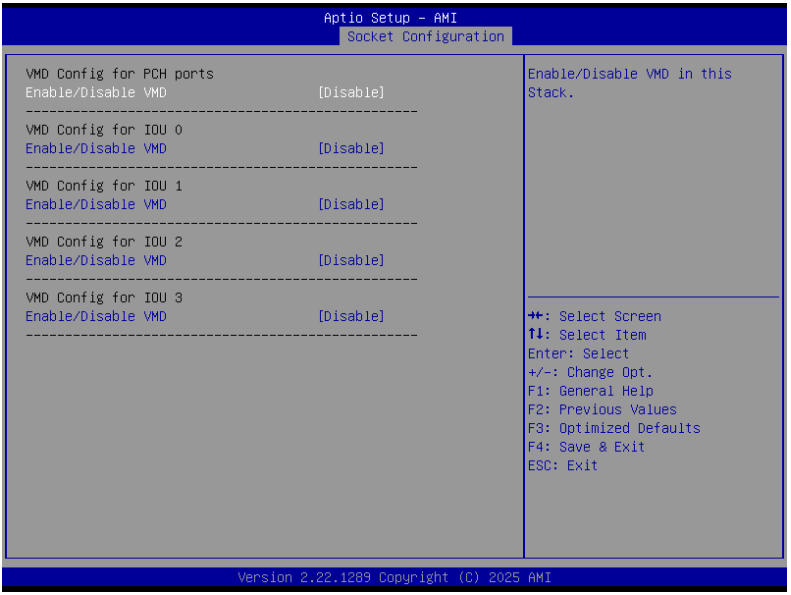
▶ *2-4-4-3 Intel VMD technology*

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



➤ Intel VMD for Volume Management Device on Socket 0

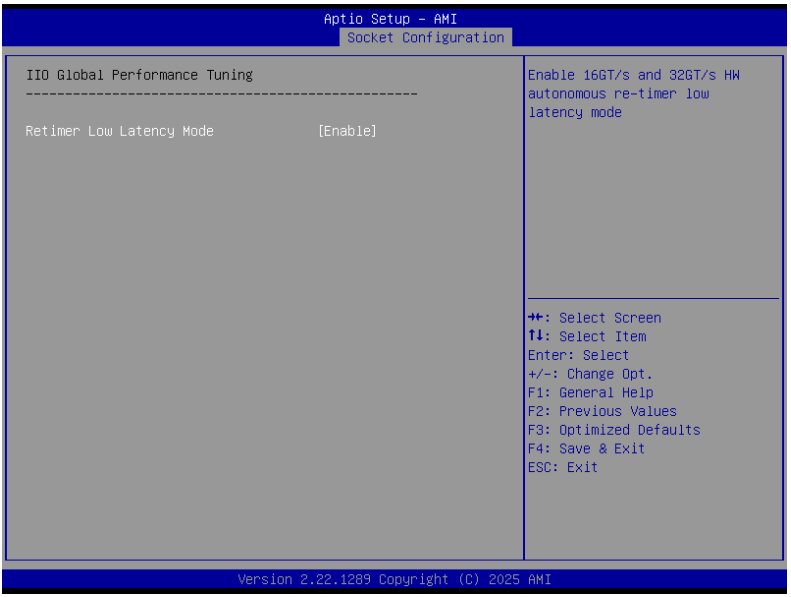
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
VMD Config for PCH ports	XXXXXXXXXXXXX
VMD Config for IOU 0	XXXXXXXXXXXXX
VMD Config for IOU 1	XXXXXXXXXXXXX
VMD Config for IOU 2	XXXXXXXXXXXXX
VMD Config for IOU 3	XXXXXXXXXXXXX

▶ *2-4-4-4 Intel Global Performane Tuning*

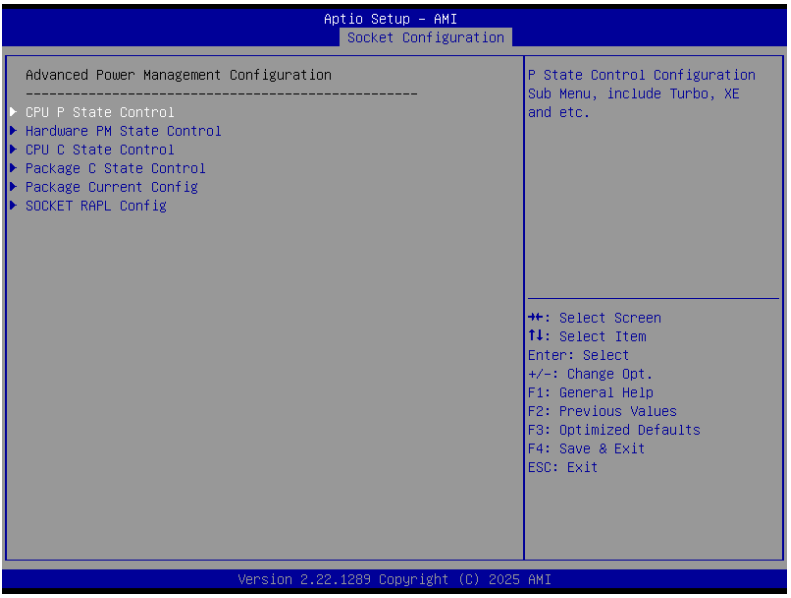
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
REtimer Low Latency Mode	XXXXXXXXXXXX

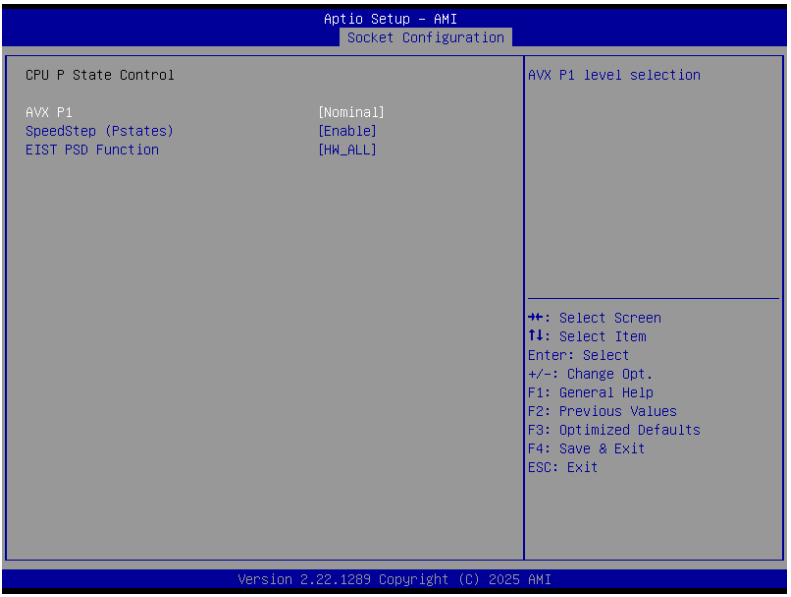
2-4-5 Advanced Power Management Configuration

Press [Enter] to configure advanced items.



▶ *2-4-5-1 CPU P State Control*

Press [Enter] to configure advanced items.



Parameter	Description
AVX P1	XXXXXXXXXXXX
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.
EIST PSD Function	XXXXXXXXXXXX

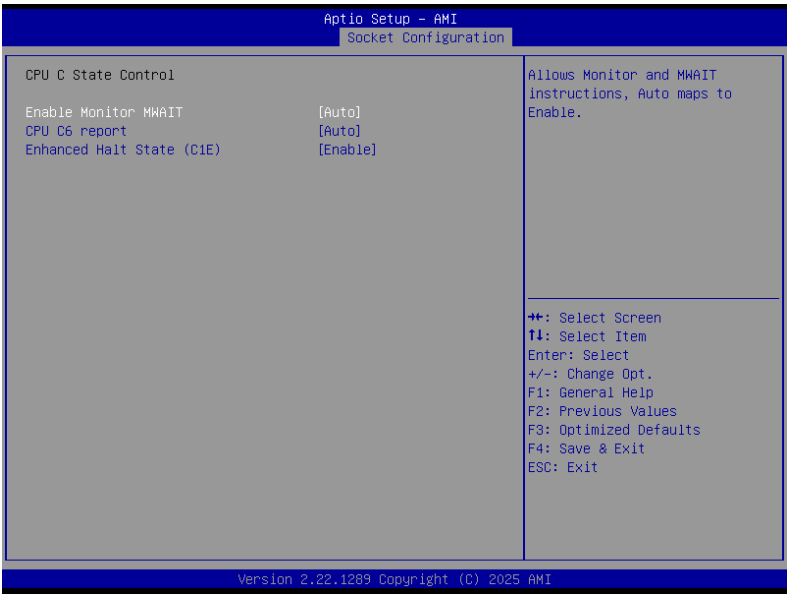
▶ *2-4-5-2 Hardware PM State Control*

Press [Enter] to configure advanced items.

Parameter	Description
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.

▶ *2-4-5-3 CPU C State Control*

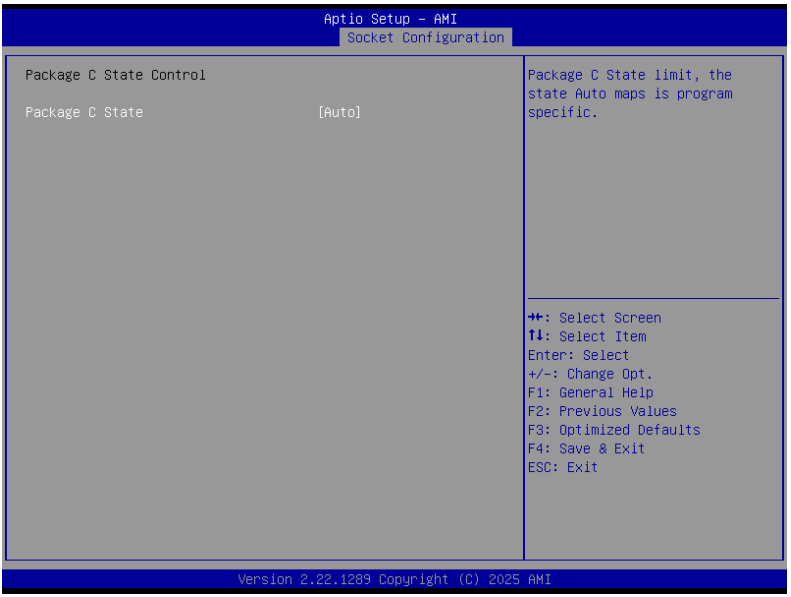
Press [Enter] to configure advanced items.



Parameter	Description
Enable Monitor MWAIT	– Allows Monitor and MWAIT instructions. – Options available: Disable, Enable, Auto. Default setting is Auto.
CPU C6 repor1	– 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.

▶ *2-4-5-4 Package C State Control*

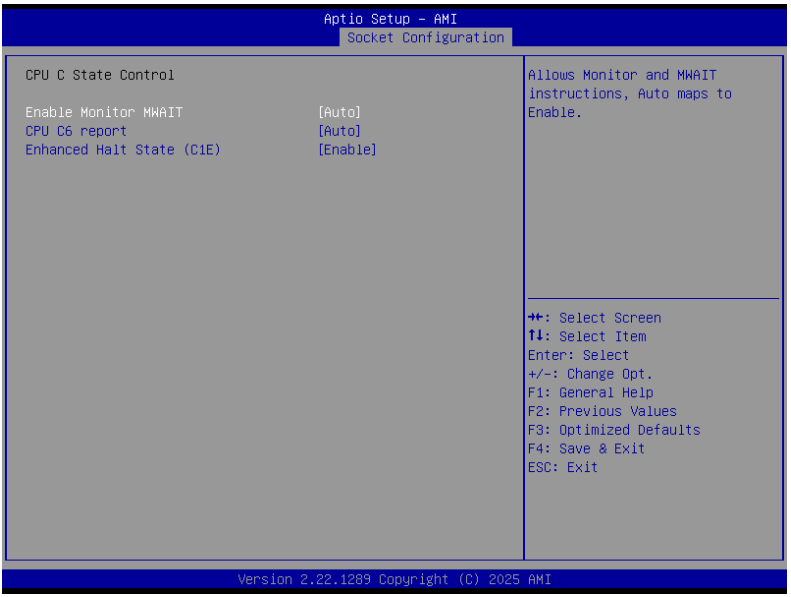
Press [Enter] to configure advanced items.



Parameter	Description
Package C Stat	– 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.

▶ *2-4-5-5 Package Current Config*

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.



Parameter	Description
Current Limit Override	XXXXXXXXXXXX
Lock Indication	XXXXXXXXXXXX

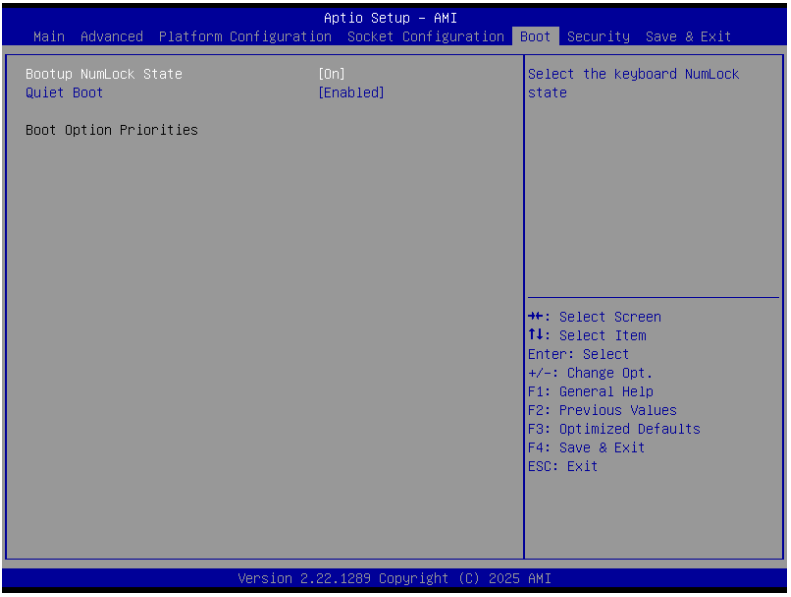
▶ *2-4-5-6 SOCKET RAPL Config*

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.

Parameter	Description
Package RAPL Limit CSR Lock	XXXXXXXXXXXX
PL1 Power Limit	XXXXXXXXXXXX
PL1 Time Window	XXXXXXXXXXXX
PL2 Power Limit	XXXXXXXXXXXX
PL2 Time Window	XXXXXXXXXXXX

2-5 Boot Menu

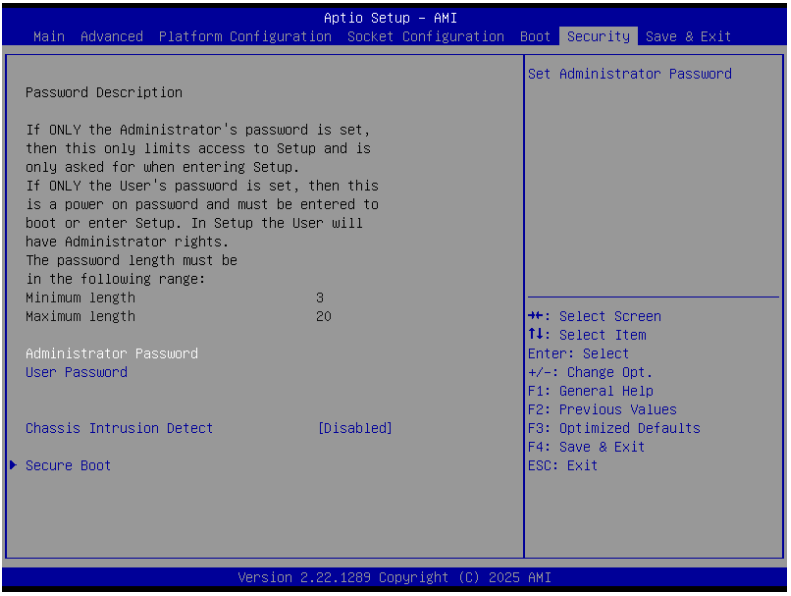
The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



Parameter	Description
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.
Boot Option Priorities	These items show the boot priorities.

2-6 Security Menu

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



Parameter	Description
Password Description	XXXXXXXXXXXX
Minimum length	XXXXXXXXXXXX
Maximum length	XXXXXXXXXXXX
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.
Chassis Intrusion Detect	This detects if the chassis cover has been removed. This function needs a chassis equipped with instrusion detection switch and needs to be enabled in BIOS.

▶ *2-6-1 Secure Boot*

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

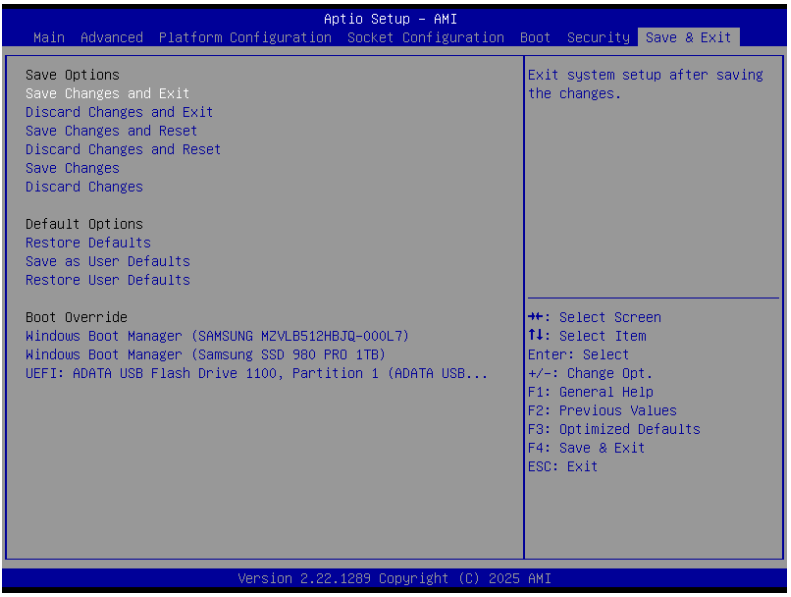
Parameter	Description
System Mode state	Displays if the system is in User mode or Setup mode.
Secure Boot	Enable/Disable the Secure Boot function. Options available: Enabled, Disabled. Default setting is Disabled.
Secure Boot mode	Secure Boot requires all the applications that are running during the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

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.

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.

2-7 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 Changes and Exit	Saves changes made and closes the BIOS setup. Options available: Yes, No.
Discard changes and Exit	Discards changes made and exits the BIOS setup. Options available: Yes, No.
Save Changes and Reset	Restarts the system after saving the changes made. Options available: Yes, No.
Discard Changes and Reset	Restarts the system without saving any changes. Options available: Yes, No.
Save Changes	Saves changes done so far to any of the setup options. Options available: Yes, No.
Discard Changes	Discards changes made and closes the BIOS setup. Options available: Yes, No.
Restore Default	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	Saves the changes made as the user default settings. Options available: Yes, No.
Restore the User Default Values	Loads the user default settings for all BIOS setup parameters. Options available: Yes, No.
Boot Override	Use this item to select the boot device.

Setting up the system
Pre-installation requirements

Selecting a site

Before unpacking and installing the system, select a suitable site for the system for maximum efficiency. Consider the following factors when choosing a site for the system:

- Near a grounded power outlet.
- Clean and dust-free
- Stable surface free from vibration.
- Well-ventilated and away from sources of heat.
- Secluded from electromagnetic fields produced by electrical devices such as air conditioners, radio and TV transmitters, etc.

Checking the package contents

Check the following items from the package:

- System unit
- Accessory box

If any of the above items is damaged or missing, contact your dealer immediately.

Save the boxes and packing materials for future use.

Turning on the system

After making sure that you have properly set up the system, applied power and connected all the necessary peripherals, you can now power on the system. Follow the procedure below.

Press the power button ⏻ ◦

The system starts up and displays a welcome message on the monitor. After that, a series of power-on self-test (POST) messages appears. The POST messages indicate if the system is running well or not.

Note: If the system does not turn on or boot after pressing the power button, go to the next section for the possible causes of the boot failure

Aside from the POST messages, you can determine if the system is in good condition by checking if the following occurred.

- The power status indicator on the front panel lights up blue.
- The Num Lock, Caps Lock and Scroll Lock indicators on the keyboard light up.

Power-on problems

If the system fails to boot after you have applied power, check the following factors that might have caused the boot failure.

- The external power cord may be loosely connected.
- Check the power cord connection from the power outlet to the power cord socket on the rear panel. Make sure that the cord is properly connected to the power outlet and to the power cord socket.
  No power comes from the grounded power outlet. Have an electrician check your power outlet.
- Loose or improperly connected internal power cables.

  Check the internal cable connections. If you are not confident to perform this step, ask a qualified technician to assist you.

Warning! Make sure all power cords are disconnected from the electrical outlet before performing this task.

Note: If you have gone through the preceding actions and the system still fails to boot, ask your dealer or a qualified technician for assistance.

Turning off the system

There are two ways to turn off the Server—via software or via hardware. The software procedure below applies to a system running on a Windows OS. For other shutdown procedures, refer to the related user documentation.

To turn off the system via software:

1. Press **<Ctrl>** + **<Alt>** + **<Delete>** on the attached keyboard or click **Start** on the Windows taskbar.
2. Select **Shut Down**.
3. Select Shut Down from the drop-down menu, then click **OK**.

To turn off the system via hardware

If you cannot shut down the Server via software, press the power button for at least four seconds. Quickly pressing the button may put the Server in a Suspend mode only.

Initial system startup problems

Problems that occur at initial system startup are usually caused by an incorrect installation or configuration. Hardware failure is a less possible cause. If the problem you are experiencing is with a specific application.

Initial troubleshooting checklist

- AC power is available at the wall outlet?
- Is the power supply module properly installed?
- Is the system power cord properly plugged into the power supply module socket? and connected to a NEMA 5-15R outlet for 100-120 V or a NEMA 6-15R outlet for 200-240 V?
- Are all peripheral cables correctly connected and secured?
- Did you press the system power button to turn the Server on (power on indicator should be lit green)?
- Are all device drivers properly installed?
- Are hard disk drive(s) properly formatted and configured?
- Are the BIOS configuration settings in the BIOS Setup Utility correct?
- Is the operating system properly loaded?
  Refer to the operating system documentation.
- Are all hardware components compliant with the tested components
- lists?
- Are all internal cables correctly connected and secured?
- Is the processor properly seated in its mainboard socket?
- Are all standoffs in the proper location and not touching any components, causing a potential short?
- Are all add-in expansion cards fully seated in their mainboard slots?
- Are all system jumpers correctly set?
- Are all switch settings on add-in boards and peripheral devices correct?

To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts (e.g., two add-in boards sharing the same interrupt).

Hardware diagnostic testing

This section provides a detailed approach to identifying a hardware problem and its cause.

Checking the boot-up status

Caution: Before disconnecting any peripheral cables from the Server, turn off the system and any peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral device.

1. Turn off the system and all external peripheral devices.
2. Disconnect all peripheral devices from the system, except for the keyboard and the display monitor.
3. Make sure the system power cord is plugged into a properly grounded AC outlet and in the power supply module cord socket.
4. Make sure the display monitor and keyboard are correctly connected to the system.
5. Turn on the display monitor.
6. Set the display brightness and contrast controls to at least two thirds of their maximum range.
   Refer the documentation that came with your display monitor.
7. If the operating system normally loads from the hard drive, make sure there is no diskette in floppy drive and no disc in the optical drive.
8. If the power indicator is lit, attempt to boot from a disc.
9. Turn on the system.

Verifying the condition of the storage devices

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity indicator should turn blue briefly. Check the activity indicators for the hard drive(s), and any other 5.25" device you may have installed.

If any of these indicators fail to light up, refer to related problems listed in the Specific problems and corrective actions section.

Specific problems and corrective actions

Listed below are specific problems that may arise during the use of your Server and their possible solutions

Confirming loading of the operating system

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear.

Specific problems and corrective actions

Listed below are specific problems that may arise during the use of your Server and their possible solutions

Specific problems and corrective actions

Listed below are specific problems that may arise during the use of your Server and their possible solutions.

Power indicator does not light.

Do the following:

- Make sure the power supply module is properly installed.
- Make sure the power cord is connected correctly.
- Make sure that the wall outlet has power. Test it by plugging in another device.
- Make sure the power indicator on the front panel is lit up.
- Remove all add-in cards and see if the system boots.
  If reboot is successful, install the cards back in one at a time with a reboot between each addition to determine if one of them is causing the problem.
- Make sure that you have properly installed system compliant memory modules, and that they are populated according to the system guidelines.
- Make sure that you have installed system compliant processors, and that they are populated according to the system guidelines.

Optical drive activity indicator does not light

Do the following:

- Make sure the SATA and power cables are properly connected.
- Check that relevant switches and jumpers on the drive are set correctly.
- Check that the drive is properly configured.

Optical drive tray cannot be ejected
Insert the tip of a paperclip into the small hole on the optical drive. Slowly pull the tray out from the drive until the tray is fully extended.

Optical drive cannot read a disc

Do the following:

- Make sure you are using the correct type of disc.
- Make sure the disc is properly seated in the drive.
- Make sure the disc is unscratched.
- Make sure the drive's cables are properly connected.

Newly installed memory modules are not detected.

Do the following:

- Make sure the memory modules specifications comply with the system requirements.
- Make sure the memory modules have been populated according to the system guidelines.
- Make sure the memory modules are properly installed on their mainboard slots.

Network activity indicators do not light.

Do the following:

- Make sure the correct network drivers are loaded on the system.
- Network might be idle.

Peripheral device connected to a USB port does not work.

Do the following:

- Reduce the number of external devices connected to a USB hub.
- Refer to the documentation that came with the device

There is problem with the software program.

Do the following:

- Verify that the software is properly configured for the system.
- Refer to the software installation and operation documentation for instructions on setting up and using the software. Try a different version of the software to see if the problem is with the copy you are using. If the other version runs correctly on the system, contact your vendor about the defective software.

No characters appear on the display monitor.

Do the following:

- Is the keyboard functioning? Test it by turning the Num Lock function on and off to check if the Num Lock indicator lights up.
- Is the display monitor plugged in and turned on? If you are using a switch box, is it switched to the correct system?
- Are the brightness and contrast controls on the video monitor properly adjusted?
- Is the display monitor signal cable properly connected?
- Does this display monitor work correctly if plugged into a different system?
- Remove all add-in cards and see if the system boots.
  If reboot is successful, install the cards back in one at a time with a reboot between each addition to determine if one of them is causing the problem.
- Make sure that you have properly installed system-compliant memory modules, and that they are populated according to the system guidelines.
- Make sure that you have installed system compliant processors, and that they are populated according to the system guidelines.

If you are using an add-in video controller card, do the following:

1. Verify that the display monitor works using the onboard video controller.
2. Verify that the add-in video controller card is fully seated in its slot.
3. Reboot the system for the changes to take effect.
4. If there are still no characters on the screen after you reboot the system, reboot it again.
   Take note of the beep codes emitted during POST. This information may be required if you seek technical assistance.
   If POST does not emit any beep code and characters still do not appear, the display monitor or the video controller may be defective. Contact your local Altos representative or authorized dealer for technical assistance.

Note: If POST does not emit any beep code and characters still do not

appear, the display monitor or the video controller may be defective. Contact your local Altos representative or authorized dealer for technical assistance.

Notices
Information for your safety and comfort

Safety instructions

Read these instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product.

Turning the product off before cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

CAUTION for plug as disconnecting device

Observe the following guidelines when connecting and disconnecting power to the power supply unit:

- Install the power supply unit before connecting the power cord to the AC power outlet.
- Unplug the power cord before removing the power supply unit from the computer.
- If the system has multiple sources of power, disconnect power from the system by unplugging all power cords from the power supplies.

CAUTION for accessibility

Be sure that the power outlet you plug the power cord into is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the electrical outlet.

Warnings

- Do not use this product near water.
- Do not place this product on an unstable cart, stand or table. If the product falls, it could be seriously damaged.
- Slots and openings are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This

product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind onto or into the product.
- To avoid damage of internal components and to prevent battery leakage, do not place the product on a vibrating surface.
- Never use it under sporting, exercising, or any vibrating environment which will probably cause unexpected short current or damage rotor devices, HDD, Optical drive, and even exposure risk from lithium battery pack.
- This product is not suitable for use with visual display workplace devices according to §2 of the German Ordinance for Work with Visual Display Units.

Using electrical power

- This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord.
- If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
- Do not overload a power outlet, strip or receptacle by plugging in too many devices. The overall system load must not exceed 80% of the branch circuit rating. If power strips are used, the load should not exceed 80% of the power strip's input rating.
- This product's power supply is equipped with a three-wire grounded plug. The plug only fits in a grounded power outlet. Make sure the power outlet is properly grounded before inserting the power supply plug. Do not insert the plug into a non-grounded power outlet. Contact your electrician for details.

Warning！ The grounding pin is a safety feature.
Using a power outlet that is not properly grounded may result in electric shock and/or injury.

Note: The grounding pin also provides good protection from unexpected noise produced by other nearby electrical devices that may interfere with the performance of this product.

- Use the product only with the supplied power supply cord set. If you need to replace the power cord set, make sure that the new power cord meets the following requirements: detachable type, UL listed/CSA certified, VDE approved or its equivalent, 4.6 meters (15 feet) maximum length.

Product servicing

Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.

Unplug this product from the wall outlet and refer servicing to qualified service personnel when:

- the power cord or plug is damaged, cut or frayed.
- liquid was spilled into the product.
- the product was exposed to rain or water.
- the product has been dropped or the case has been damaged.
- the product exhibits a distinct change in performance, indicating a need for service.
- the product does not operate normally after following the operating instructions.

Notes：Adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

This Server should be located in a restricted access location or an area with similar instruction.

Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

Disposal instructions

Do not throw this electronic device into the trash when discarding. To minimize pollution and ensure utmost protection of the global environment, please recycle.

Declaration of Conformity for EU countries

Hereby, Altos, declares that this system is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

List of applicable countries

This device must be used in strict accordance with the regulations and constraints in the country of use. For further information, please contact local office in the country of use. Please see http://ec.europa.eu/enterprise/rtte/implem.htm or the latest country list.

Note: The following sections are applicable only to Class A systems

FCC notice Class A

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help

Notice: Shielded cables
All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations. In compliance with FCC regulations, use shielded cables to connect to other computing devices.

Notice: Peripheral devices
Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class A limits may be attached to this equipment. Operation with non- certified peripherals is likely to result in interference to radio and TV reception.

Caution
Changes or modifications not expressly approved by the manufacture could void the user's authority, which is granted by the Federal Communications Commission, to operate this computer.

Operation conditions
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

HEVC