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STABLE Robust Design, Quality Parts

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Server/Workstation
Motherboard

B650D4U-1L

B665D4U-1L

User Manual

English



Version 1.0

Published December 2022

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- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B 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 equipment 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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“Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate”

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Please refer to <https://www.asrockrack.com/general/about.asp?cat=Responsibility> for information disclosure based on regulation requirements ASRock Rack is complied with:



DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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Chapter 1 Introduction

Thank you for purchasing ASRock Rack **B650D4U-1L** / **B665D4U-1L** motherboard, a reliable motherboard produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack's commitment to quality and endurance.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the software support.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock Rack website without further notice. You may find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack's Website: www.ASRockRack.com

*If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
<http://www.asrockrack.com/support/>*

1.1 Package Contents

- ASRock Rack B650D4U-1L / B665D4U-1L Motherboard
(micro ATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x 24.4 cm)
- Quick Installation Guide
- 1 x I/O Shield
- 1 x Screw for M.2 Socket



If any items are missing or appear damaged, contact your authorized dealer.

1.2 Specifications

B650D4U-1L / B665D4U-1L	
Physical Status	
Form Factor	Micro-ATX
Dimension	9.6" x 9.6" (244 mm x 244 mm)
Processor System	
CPU	Supports AMD Ryzen 7000 Series Processors
Socket	1 Socket AM5 (LGA 1718)
Thermal Design Power (TDP)	120W (Air) / 170W (Liquid)
Chipset	B650D4U-1L: AMD B650 B665D4U-1L: AMD Pro B665
System Memory	
Supported DIMM Quantity	4 DIMM slots (2DPC)
Supported Type	DDR5 288-pin ECC/non-ECC UDIMM
Max. Capacity per DIMM	32GB
Max. DIMM Frequency	5200 MHz
Voltage	1.1V
Note	Memory support is to be validated.
PCIe Expansion Slots (SLOT7 close to CPU)	
SLOT7	PCIe5.0 x4 [CPU]
SLOT6	PCIe5.0 x16 [CPU]
SLOT4	PCIe4.0 x1 [FCH]
Other PCIe Expansion Connectors	
M.2 slot	M2_2 (PCIe4.0 x4), supports 2280/2242 form factor [FCH]
OCuLink	OCuLink1 (PCIe4.0 x4) [CPU]
SATA/SAS Storage	
FCH Built-in Storage	AMD PRO B665 (4 SATA 6Gb/s): 4 SATA 7-pin
Ethernet	
Additional Ethernet Controller	Intel® i210AT: 1 RJ45 (1GbE)
USB	
Controller/Hub	AMD PRO B665, CPU

Connectors/ headers	External: 4 Type-A (USB3.2 Gen1) Internal: 1 header (19-pin, 2 USB3.2 Gen1) 1 header (9-pin, 2 USB2.0)
Graphics	
Controller	AMD Processors with Graphics: 1 HDMI, 1 DisplayPort
Security	
TPM	1 (13-pin, SPI)
Rear I/O	
Video output	1 DisplayPort 1.4, 1 HDMI 1.4
USB	4 Type-A (USB3.2 Gen1)
RJ45	1 (1GbE)
Hardware Monitor	
Temperature	CPU, MB, Card Side, PRO B665
Fan	Fan Tachometer, Multi-Speed Control, CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature)
Voltage	VCORE, VDDCR_SOC_SIO, VDDIO_MEM_SIO, VDD_MISC_SIO, +1.8V_SIO, +1.05V_ALW_SIO, AVSB, VTT, 3V, 5V, 12V, 3VSB, 5VSB
System BIOS	
BIOS type	AMI UEFI BIOS; 256Mb (32MB) SPI Flash ROM
Features	Plug and Play, ACPI 6.4 compliance wake up events, SMBIOS 3.5
Internal Connectors/Headers	
PSU connector	1 (24-pin, ATX main power), 2 (8-pin, ATX 12V)
Auxiliary panel header	1 (18-pin): chassis intrusion, system fault LED, LAN activity LED
System panel header	1 (9-pin): power switch, reset switch, system power LED, HDD activity LED
Speaker header	1
Fan header	7 (4-pin)
Buzzer	1
TPM header	1 (13-pin, SPI)
80 debug port header	1 (3-pin)
Clear CMOS	1

LED Indicators	
Standby Power LED	1 (5VSB)
80 debug port LED	1
Support OS	
OS	<p>Microsoft® Windows*:</p> <ul style="list-style-type: none"> - Windows 10 (64 bit) - Windows 11 (64 bit) <p>Linux*:</p> <ul style="list-style-type: none"> - Ubuntu 22.04.1 (64 bit) <p><i>* On the Windows system, Raid mode supports UEFI Boot only.</i> <i>* The Linux system doesn't support Raid Mode.</i> <i>* Please refer to our website for the latest OS support list.</i></p>
Enviroment	
Operating temperature	10 - 35°C (50 - 95 degF)
Non-operating temperature	-40 - 70°C (-40 - 158degF)

NOTE: Please refer to our website for the latest specifications.



This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. After that, onboard LAN1&2 can wake up S5 under OS.



If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

1.3 Unique Features

ASRock Rack Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows[®]. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Rack Instant Flash.

Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

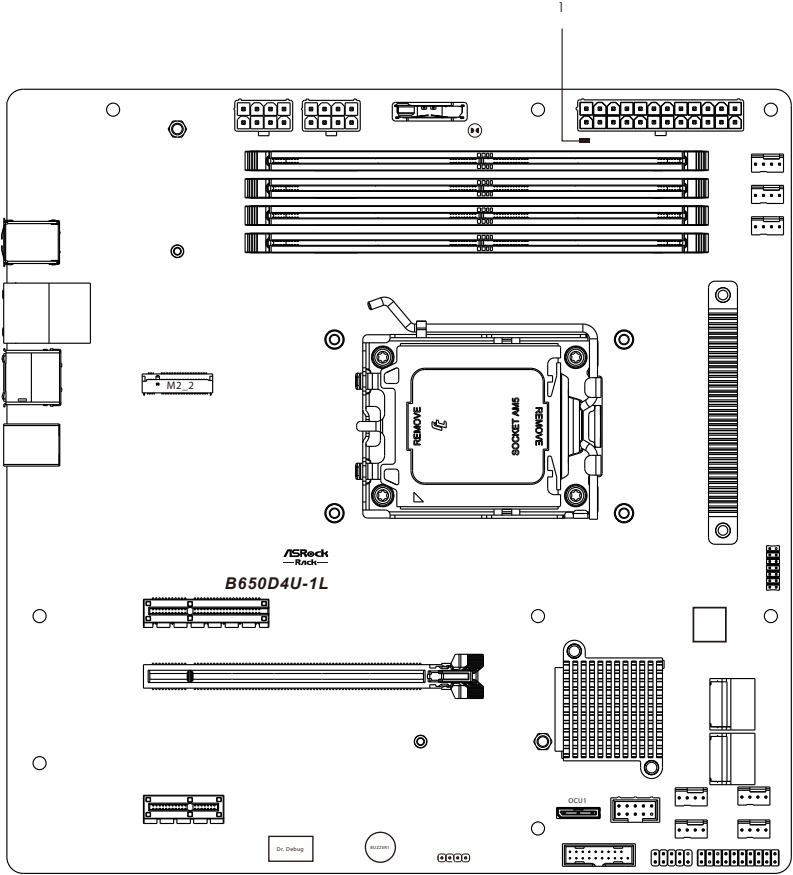
The diagram shows the rear view of the ASRock Rack B650D4U-1L/B665D4U-1L motherboard. Key components and ports include:

- Top Panel:** ATX12V1, ATX12V2, BATTERY1, and ATXPOWER1 connectors.
- Left Side:** USB 3.2 Gen1 Ports (USB3_1, USB3_2, USB3_3), LAN1, DP1, and USB 3.2 Gen1 Ports (USB3_4, USB3_5, USB3_6).
- Bottom Left:** M2_2 slot.
- Bottom Center:** CPU1 socket (Socket AM5) with "REMOVE" labels on the sides.
- Bottom Right:** AMD B665 chipset, BIOS ROM, and TPM_BIOS_FH1.
- Right Side:** FAN1, FAN2, FAN3, FAN4, FAN5, FAN6, FAN7, and FAN8 headers.
- Bottom Right:** USB 1_1, USB 1_2, USB 3_1, USB 3_2, USB 3_3, USB 3_4, USB 3_5, USB 3_6, USB 3_7, USB 3_8, and USB 3_9 headers.
- Bottom Center:** PCI4, PCI6, and PCI7 slots.
- Bottom Left:** D1, Delay, and AUDIO1 headers.
- Bottom Right:** PANEL1, AUX_PANEL1, and PANEL2 headers.
- Bottom Right:** SATA6_1, SATA6_2, and SATA6_3 headers.
- Bottom Right:** OC1 header.
- Bottom Right:** USB 3_1, USB 3_2, USB 3_3, USB 3_4, USB 3_5, USB 3_6, USB 3_7, USB 3_8, and USB 3_9 headers.
- Bottom Right:** USB 3_1, USB 3_2, USB 3_3, USB 3_4, USB 3_5, USB 3_6, USB 3_7, USB 3_8, and USB 3_9 headers.

No.	Description
1	2 x 288-pin DDR5 DIMM Slots (DDR5_A2, DDR5_B2)*
2	2 x 288-pin DDR5 DIMM Slots (DDR5_A1, DDR5_B1)*
3	ATX 12V Power Connector (ATX12V1)
4	ATX 12V Power Connector (ATX12V2)
5	Clear CMOS Pad (CLRCMOS1)
6	ATX Power Connector (ATXPWR1)
7	System Fan Connector (FAN1)
8	System Fan Connector (FAN7)
9	System Fan Connector (FAN6)
10	AMD Socket AM5 (LGA 1718)
11	PWM Configuration Header (PWM_CFG1)
12	SPI TPM Header (TPM_BIOS_PH1)
13	SATA3 Connectors (SATA_1)(Upper), (SATA_0)(Lower)
14	SATA3 Connectors (SATA_3)(Upper), (SATA_2)(Lower)
15	System Fan Connector (FAN4)
16	System Fan Connector (FAN3)
17	Auxiliary Panel Header (AUX_PANEL1)
18	System Panel Header (PANEL1)
19	System Fan Connector (FAN5)
20	USB 3.2 Gen1 Header (USB3_7_8)
21	USB 2.0 Header (USB_1_2)
22	OCuLink x4 Connector (OCU1)
23	System Fan Connector (FAN2)
24	Speaker Header (SPEAKER1)
25	PCI Express 4.0 x1 Card Slot (PCIE4)
26	PCI Express 5.0 x16 Card Slot (PCIE6)
27	PCI Express 5.0 x4 Card Slot (PCIE7)
28	M.2 Socket (M2_2) (Type 2242/2280)

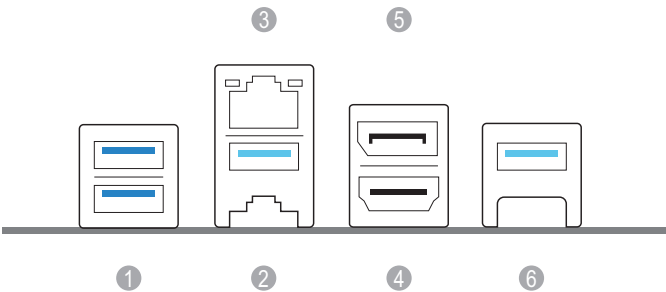
* For DIMM installation and configuration instructions, please see p.18 (Installation of Memory Modules (DIMM)) for more details.

1.5 Onboard LED Indicators



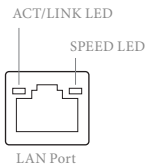
No.	Item	Status	Description
1	SB_PWR1	Green	STB PWR ready

1.6 I/O Panel



No.	Description	No.	Description
1	USB 3.2 Gen1 Ports (USB3_1_2)	4	HDMI Port (HDMI1)
2	USB 3.2 Gen1 Port (USB3_4)	5	DisplayPort (DP1)
3	1G LAN RJ-45 Port (LAN1)*	6	USB 3.2 Gen1 Port (USB3_6)

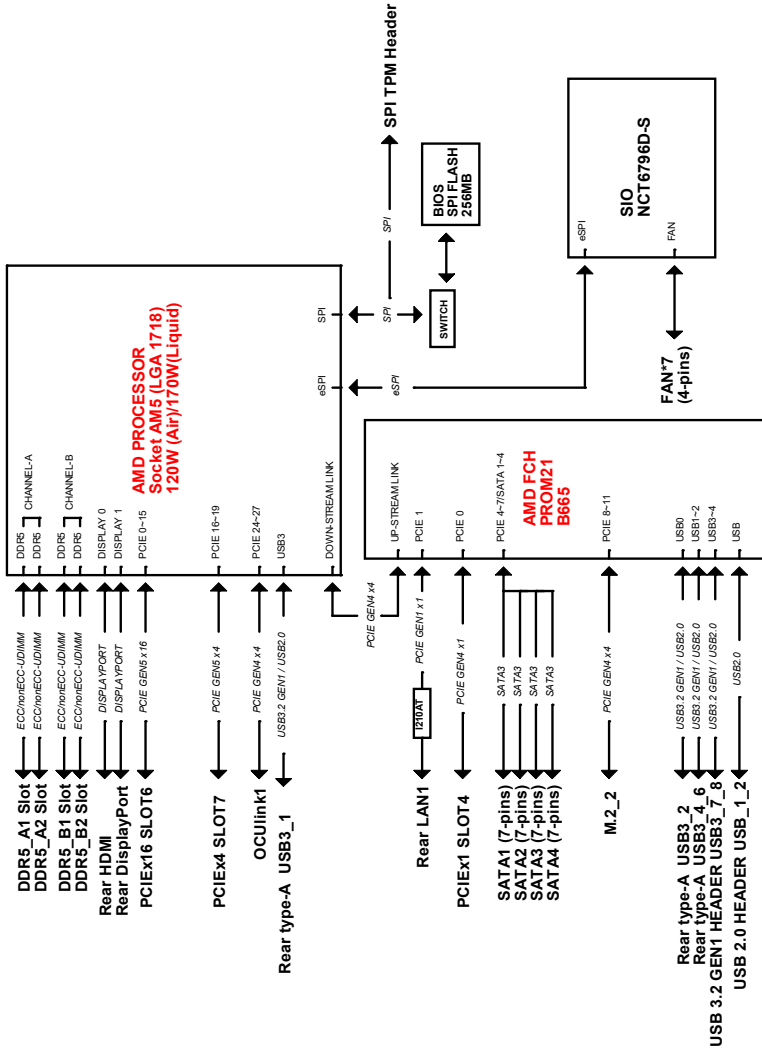
There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



1G LAN Port (LAN1) LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection or no link
Blinking Orange	Data Activity	Yellow	100Mbps connection
On	Link	Green	1Gbps connection

B650D4U-1L / B665D4U-1L



Chapter 2 Installation

This is a micro-ATX form factor (9.6" x 9.6", 24.4 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.



Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

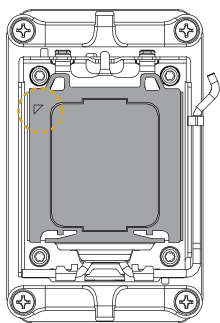
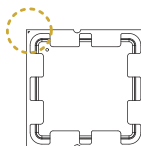


Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 Installing the CPU

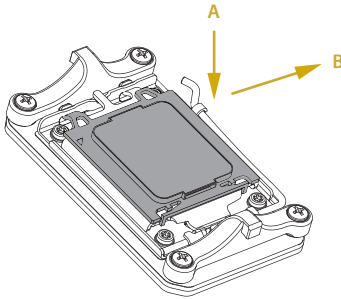


1. Before you insert the 1718-Pin CPU into the socket, please check if the **PnP cap** is on the socket, if the CPU surface is unclean, or if there are any **bent pins** in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power cables before installing the CPU.

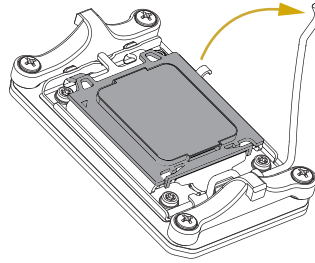


Turn your CPU to the correct orientation before opening the CPU socket cover.

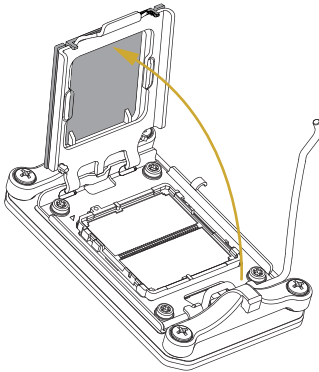
1



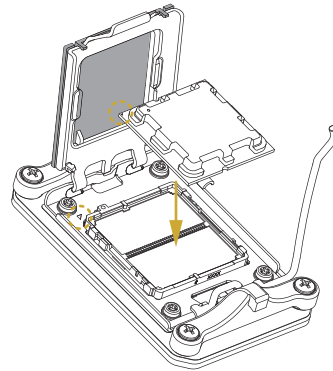
2



3

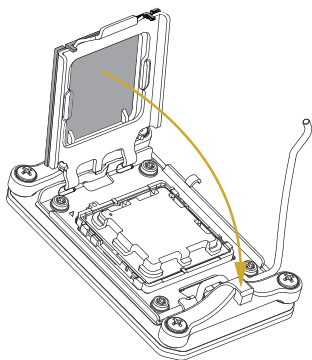


4

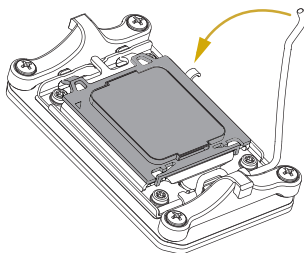


Carefully place the CPU in as flat as possible.
Do not drop it.

5



6

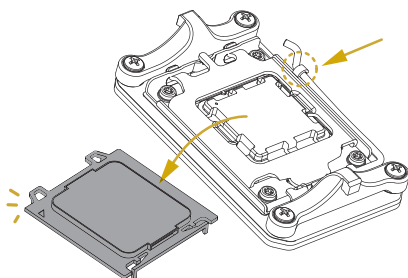


Make sure the CPU is aligned with the socket before locking it into place.

7



Make sure the black cover plate is always in place until it pops off when closing the socket lever.



Please save the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

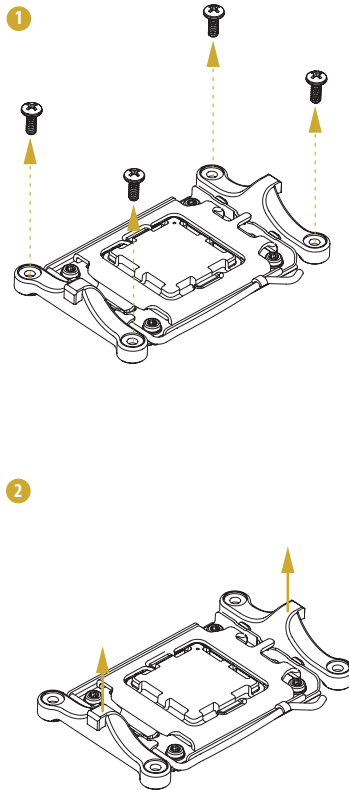
2.4 Installing the CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other.

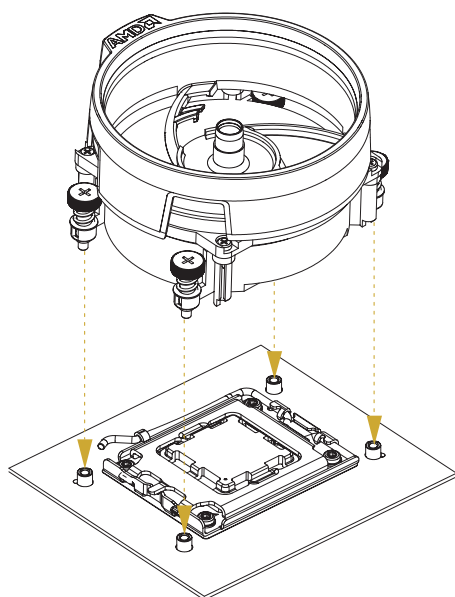


Please turn off the power or remove the power cord before changing a CPU or heatsink.

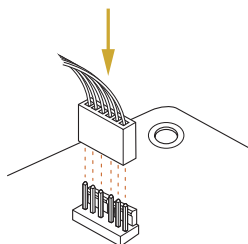
Installing the CPU Cooler



3



4



2.5 Installing Memory Modules (DIMM)

This motherboard provides four 288-pin DDR5 (Double Data Rate 5) DIMM slots, and supports Dual Channel Memory Technology.

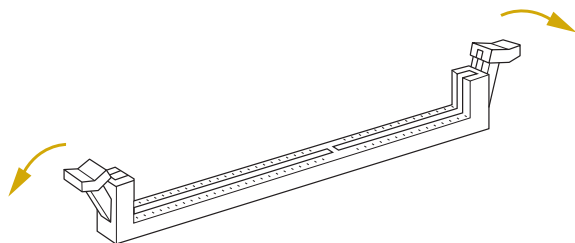


1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR5 DIMM pairs.
2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.
3. It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory module into a DDR5 slot; otherwise, this motherboard and DIMM may be damaged.
4. The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

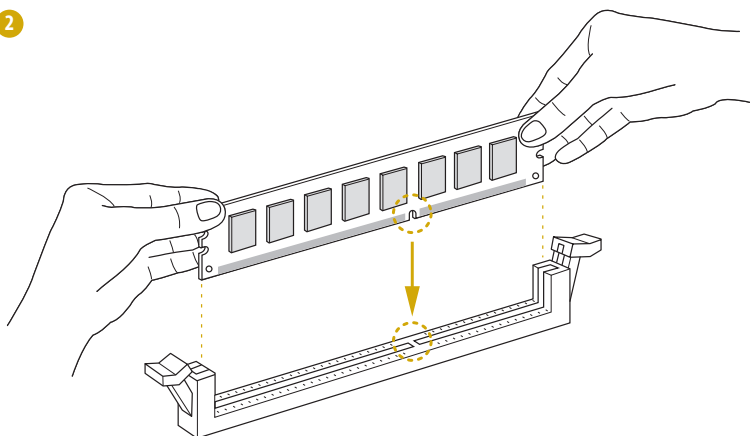
Recommended Memory Configuration

	Priority	A1	A2	B1	B2
1 DIMM	1	Populated			
	2			Populated	
2 DIMMS	1	Populated		Populated	
	2	Populated	Populated		
	3			Populated	Populated
4 DIMMS	1	Populated	Populated	Populated	Populated

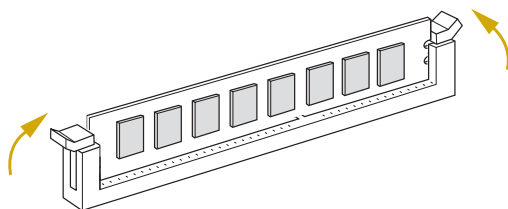
1



2



3



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

2.6 Expansion Slots (PCI Express Slots)

There are 3 PCI Express slots on this motherboard.

PCIe slot:

PCIe4 (PCIe 4.0 x1 slot, from FCH) is used for PCI Express x1 lane width cards.

PCIe6 (PCIe 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

PCIe7 (PCIe 5.0 x4 slot, from CPU) is used for PCI Express x4 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIe7	5.0	x4	x4	CPU
PCIe6	5.0	x16	x16	CPU
PCIe4	4.0	x1	x1	FCH

Installing an expansion card

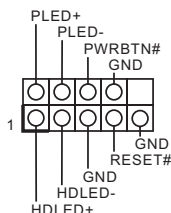
- Step 1. Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

2.7 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.

System Panel Header
(9-pin PANEL1)
(see p.6, No. 18)



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments. Particularly note the positive and negative pins before connecting the cables.



PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):

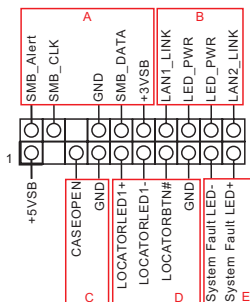
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

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

Auxiliary Panel Header (18-pin AUX PANEL1) (see p.6, No. 17)



This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.



A. Front panel SMBus connecting pin (6-1 pin FPSMB):

This header allows you to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN1_LED, LAN2_LED):

These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

C. Chassis intrusion pin (2-pin CHASSIS):

This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

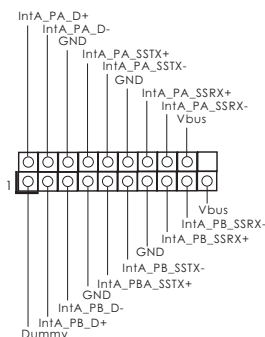
D. Locator LED (4-pin LOCATOR):

This header is for the locator switch and LED on the front panel.

E. System Fault LED (2-pin LOCATOR):

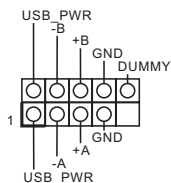
This header is for the Fault LED on the system.

USB 3.2 Gen1 Header
(19-pin USB3_7_8)
(see p.6, No. 20)



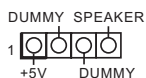
Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. This USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

USB 2.0 Header
(9-pin USB_1_2)
(see p.6, No. 21)



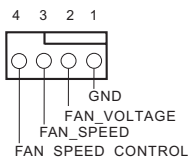
There is one USB 2.0 header on this motherboard. Each USB 2.0 header can support two ports.

Chassis Speaker Header
(4-pin SPEAKER1)
(see p.6, No. 246)



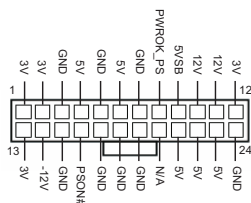
Please connect the chassis speaker to this header.

System Fan Connectors
(4-pin FAN1)
(see p.6, No. 7)
(4-pin FAN2)
(see p.6, No. 23)
(4-pin FAN3)
(see p.6, No. 16)
(4-pin FAN4)
(see p.6, No. 15)
(4-pin FAN5)
(see p.6, No. 19)
(4-pin FAN6)
(see p.6, No. 9)
(4-pin FAN7)
(see p.6, No. 8)



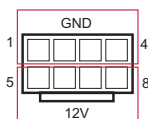
Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

ATX Power Connector
(24-pin ATXPWR1)
(see p.6, No. 6)



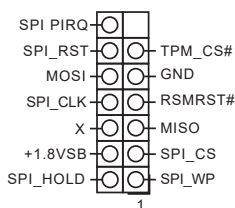
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connectors
(8-pin ATX12V1)
(see p.6, No. 3)
(8-pin ATX12V2)
(see p.6, No. 4)



This motherboard provides one 8-pin and one 4-pin ATX 12V power connectors.

TPM-SPI Header
(13-pin TPM_BIOS_PH1)
(see p.6, No. 12)



This connector supports Trusted Platform Module (TPM) system for SPI interface, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

PWM Configuration Header
(3-pin PWM_CFG1)
(see p.6, No. 11)



This header is used for PWM configurations.

Clear CMOS Pad
(CLRMOI)
(see p.6, No. 5)



This allows you to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.

Serial ATA3 Connectors

(SATA0)

(see p.6, No. 13)

(SATA1)

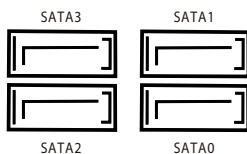
(see p.6, No. 13)

(SATA2)

(see p.6, No. 14)

(SATA3)

(see p.6, No. 14)



These two SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

OCuLink x4 Connector

(OCU1)

(see p.6, No. 22)



Please connect a PCIE SSD or an OCulink-to-SATA x4 cable to the connector.

2.8 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
0x10	PEI_CORE_STARTED
0x11	PEI_CAR_CPU_INIT
0x15	PEI_CAR_NB_INIT
0x19	PEI_CAR_SB_INIT
0x31	PEI_MEMORY_INSTALLED
0x32	PEI_CPU_INIT
0x33	PEI_CPU_CACHE_INIT
0x34	PEI_CPU_AP_INIT
0x35	PEI_CPU_BSP_SELECT
0x36	PEI_CPU_SMM_INIT
0x37	PEI_MEM_NB_INIT
0x3B	PEI_MEM_SB_INIT
0x4F	PEI_DXE_IPL_STARTED
0x60	DXE_CORE_STARTED
0x61	DXE_NVRAM_INIT
0x62	DXE_SBRUN_INIT

0x63 DXE_CPU_INIT

0x68 DXE_NB_HB_INIT

0x69 DXE_NB_INIT

0x6A DXE_NB_SMM_INIT

0x70 DXE_SB_INIT

0x71 DXE_SB_SMM_INIT

0x72 DXE_SB_DEVICES_INIT

0x78 DXE_ACPI_INIT

0x79 DXE_CSM_INIT

0x90 DXE_BDS_STARTED

0x91 DXE_BDS_CONNECT_DRIVERS

0x92 DXE_PCI_BUS_BEGIN

0x93 DXE_PCI_BUS_HPC_INIT

0x94 DXE_PCI_BUS_ENUM

0x95 DXE_PCI_BUS_REQUEST_RESOURCES

0x96 DXE_PCI_BUS_ASSIGN_RESOURCES

0x97 DXE_CON_OUT_CONNECT

0x98 DXE_CON_IN_CONNECT

0x99	DXE_SIO_INIT
0x9A	DXE_USB_BEGIN
0x9B	DXE_USB_RESET
0x9C	DXE_USB_DETECT
0x9D	DXE_USB_ENABLE
0xA0	DXE_IDE_BEGIN
0xA1	DXE_IDE_RESET
0xA2	DXE_IDE_DETECT
0xA3	DXE_IDE_ENABLE
0xA4	DXE_SCSI_BEGIN
0xA5	DXE_SCSI_RESET
0xA6	DXE_SCSI_DETECT
0xA7	DXE_SCSI_ENABLE
0xA8	DXE_SETUP_VERIFYING_PASSWORD
0xA9	DXE_SETUP_START
0xAB	DXE_SETUP_INPUT_WAIT
0xAD	DXE_READY_TO_BOOT
0xAE	DXE_LEGACY_BOOT

0xAF	DXE_EXIT_BOOT_SERVICES
0xB0	RT_SET_VIRTUAL_ADDRESS_MAP_BEGIN
0xB1	RT_SET_VIRTUAL_ADDRESS_MAP_END
0xB2	DXE_LEGACY_OPROM_INIT
0xB3	DXE_RESET_SYSTEM
0xB4	DXE_USB_HOTPLUG
0xB5	DXE_PCI_BUS_HOTPLUG
0xB6	DXE_NVRAM_CLEANUP
0xB7	DXE_CONFIGURATION_RESET
0xF0	PEI_RECOVERY_AUTO
0xF1	PEI_RECOVERY_USER
0xF2	PEI_RECOVERY_STARTED
0xF3	PEI_RECOVERY_CAPSULE_FOUND
0xF4	PEI_RECOVERY_CAPSULE_LOADED
0xE0	PEI_S3_STARTED
0xE1	PEI_S3_BOOT_SCRIPT
0xE2	PEI_S3_VIDEO_REPOST

0xE3	PEI_S3_OS_WAKE
0x50	PEI_MEMORY_INVALID_TYPE
0x53	PEI_MEMORY_NOT_DETECTED
0x55	PEI_MEMORY_NOT_INSTALLED
0x57	PEI_CPU_MISMATCH
0x58	PEI_CPU_SELF_TEST_FAILED
0x59	PEI_CPU_NO_MICROCODE
0x5A	PEI_CPU_ERROR
0x5B	PEI_RESET_NOT_AVAILABLE
0xD0	DXE_CPU_ERROR
0xD1	DXE_NB_ERROR
0xD2	DXE_SB_ERROR
0xD3	DXE_ARCH_PROTOCOL_NOT_AVAILABLE
0xD4	DXE_PCI_BUS_OUT_OF_RESOURCES
0xD5	DXE_LEGACY_OPROM_NO_SPACE
0xD6	DXE_NO_CON_OUT
0xD7	DXE_NO_CON_IN

0xD8 DXE_INVALID_PASSWORD

0xD9 DXE_BOOT_OPTION_LOAD_ERROR

0xDA DXE_BOOT_OPTION_FAILED

0xDB DXE_FLASH_UPDATE_FAILED

0xDC DXE_RESET_NOT_AVAILABLE

0xE8 PEI_MEMORY_S3_RESUME_FAILED

0xE9 PEI_S3_RESUME_PPI_NOT_FOUND

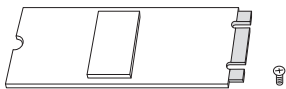
0xEA PEI_S3_BOOT_SCRIPT_ERROR

0xEB PEI_S3_OS_WAKE_ERROR

2.9 M.2 SSD Module Installation Guide

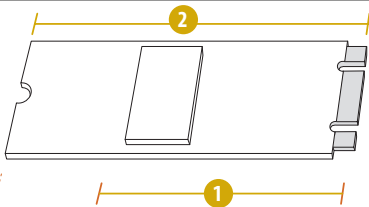
The M.2 Socket (M2_2, Key M) supports type 2242/2280 M.2 PCI Express module up to Gen4 x4 (16GT/s x4).

Installing the M.2 SSD Module



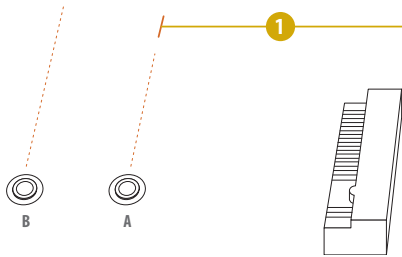
Step 1

Prepare a M.2 SSD module and the screw.

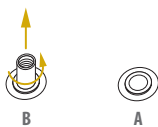


Step 2

Depending on the PCB type and length of your M.2 SSD module, find the corresponding nut location to be used.



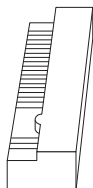
No.	1	2
Nut Location	A	B
PCB Length	4.2cm	8cm
Module Type	Type 2242	Type 2280



Step 3

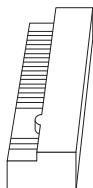
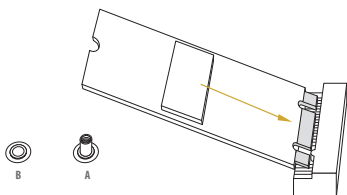
Move the standoff based on the module type and length. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut.

Otherwise, release the standoff by hand.



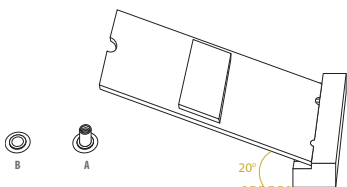
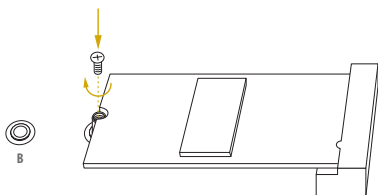
Step 4

Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.



Step 5

Align and gently insert the M.2 SSD module into the M.2 slot. Please be aware that the M.2 SSD module only fits in one orientation.



Step 6

Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

Chapter 3 UEFI Setup Utility

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY; otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Item	Description
Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
Security	To set up the security features
Boot	To set up the default system device to locate and load the Operating System
Exit	To exit the current screen or the UEFI SETUP UTILITY

Use <←→> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

3.2 Main Screen

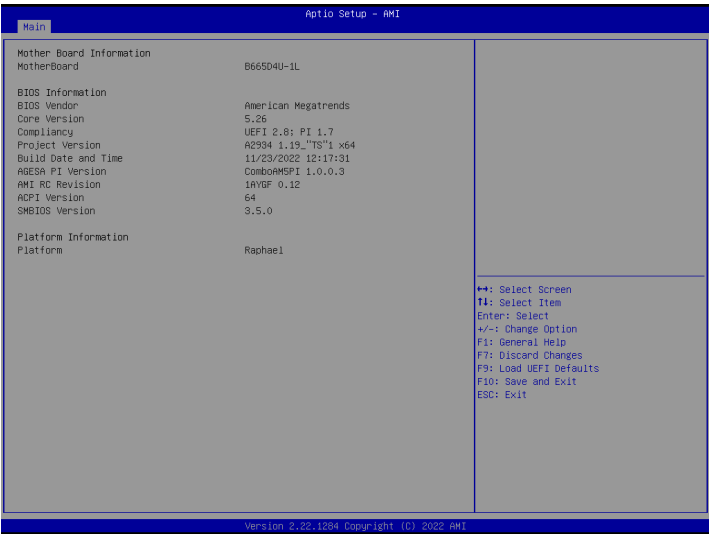
Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions for reference purpose only, and may vary from the latest BIOS and do not exactly match what you see on your screen.

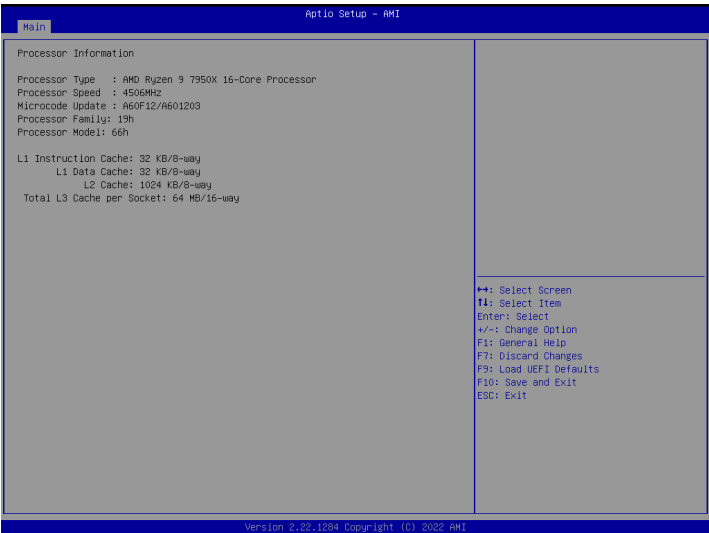
3.2.1 Motherboard Information

Press [Enter] to view the information of the motherboard.



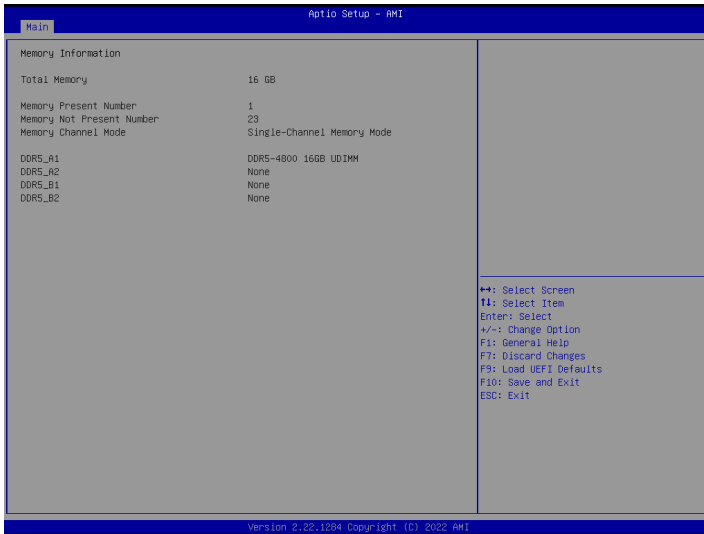
3.2.2 Processor Information

Press [Enter] to view the information of the processor.



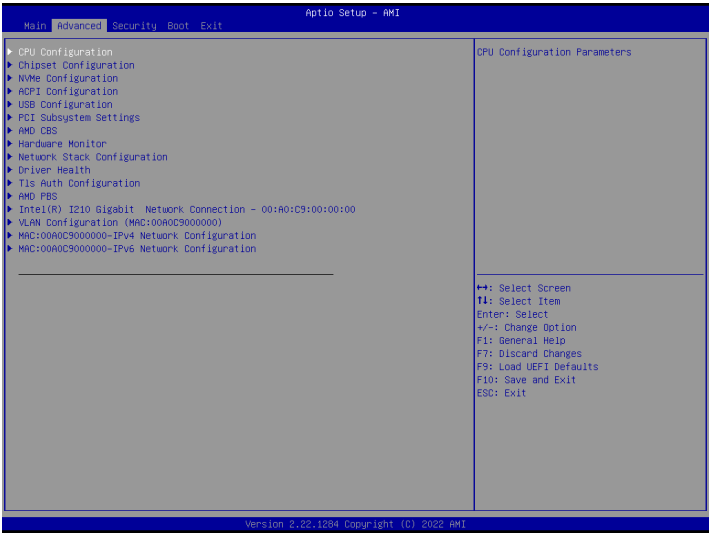
3.2.3 Memory Information

Press [Enter] to view the information of the memory.



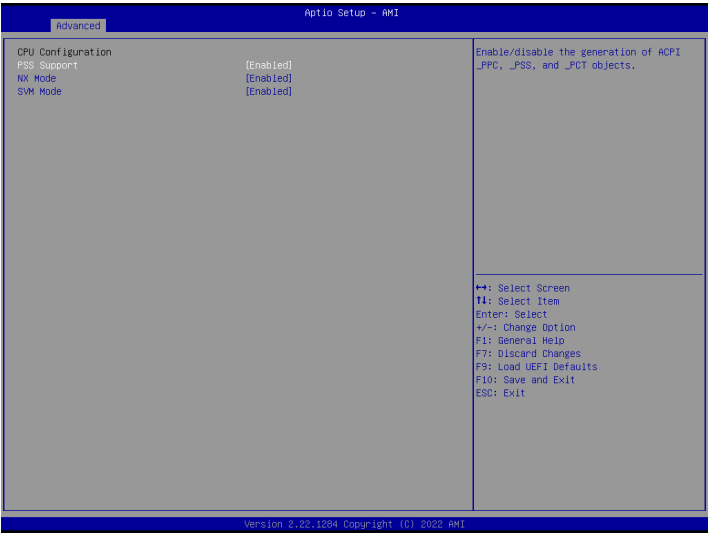
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, NVMe Configuration, ACPI Configuration, USB Configuration, PCI Subsystem Settings, AMD CBS, Hardware Monitor, Network Stack Configuration, Driver Health, Tls Auth Configuration, AMD PBS, Intel(R) I210 Gigabit Network Connection, VLAN Configuration, MAC Network Configuration, and MAC Network Configurations.



Setting wrong values in this section may cause the system to malfunction.

3.3.1 CPU Configuration



PSS Support

Use this item to enable or disable the generation of ACPI _PPC, _PSS, and _PCT objects.

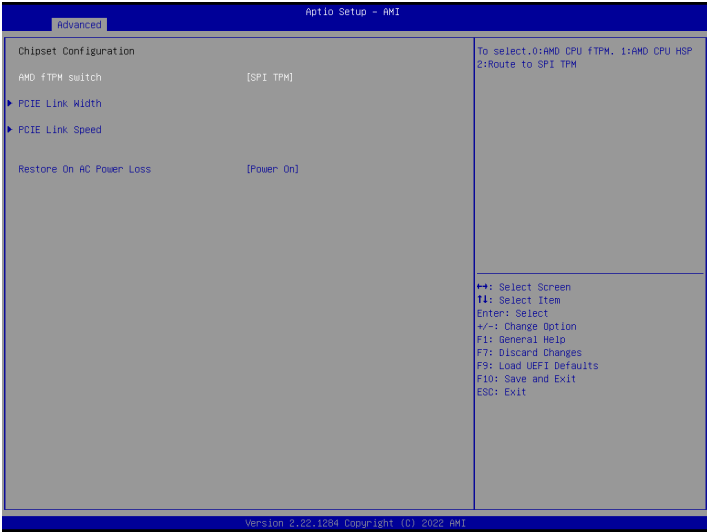
NX Mode

Use this item to enable or disable No-execute page protection Function.

SVM Mode

Use this item to enable or disable CPU Virtualization.

3.3.2 Chipset Configuration



AMD fTPM Switch

To select 0:AMD CPU fTPM, 1: AMD CPU HSP or 2: Route to SPI TPM.

PCIE Link Width

Displays PCIE Link Width information.

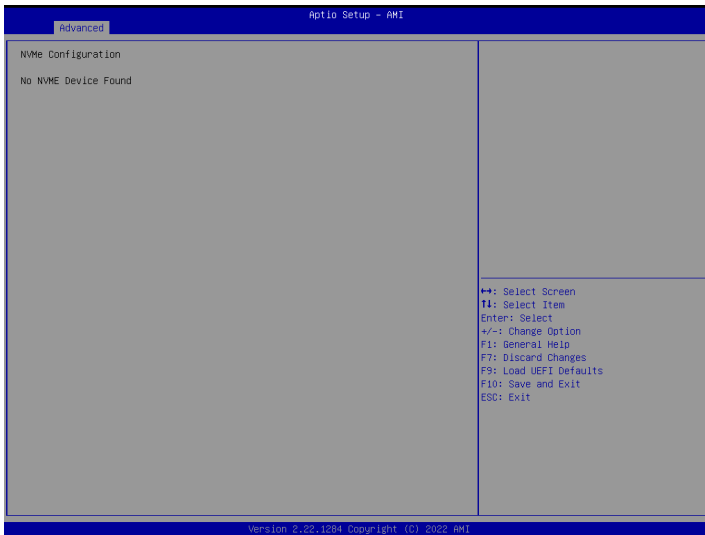
PCIE Link Speed

Use this item to configure PCIE Link Speed. The default value is [Auto].

Restore On AC Power Loss

Use this item to set the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

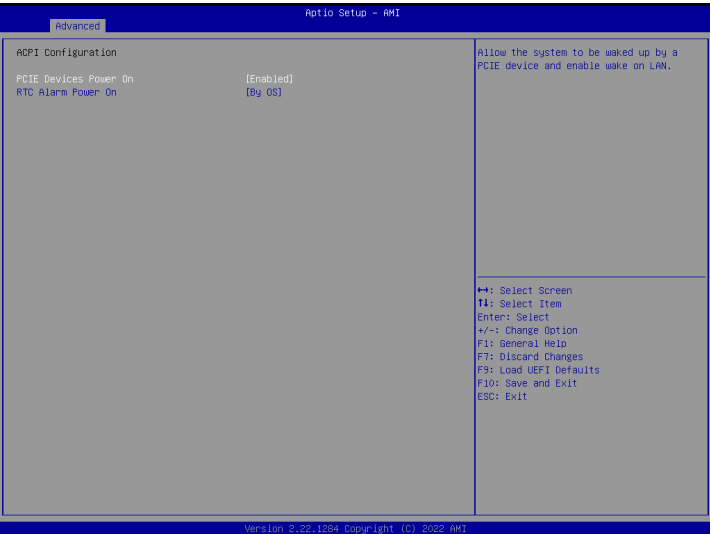
3.3.3 NVMe Configuration



NVMe Configuration

The NVMe Configuration displays the NVMe controller and Drive information.

3.3.4 ACPI Configuration



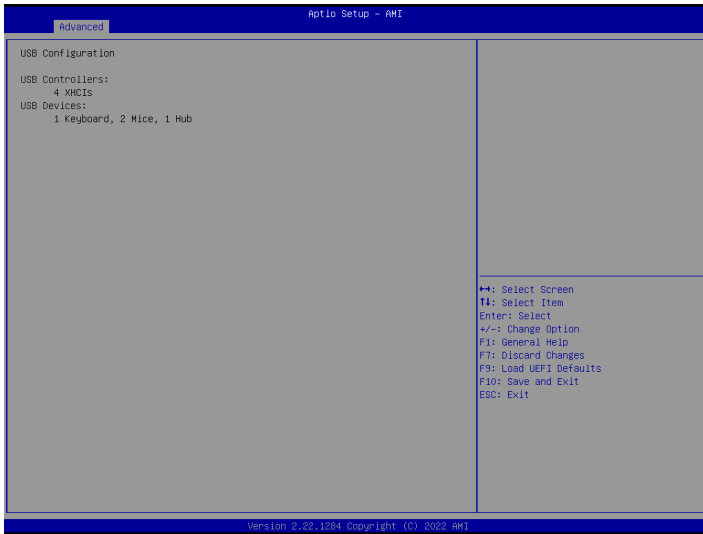
PCIE Devices Power On

This Allows the system to be waked up by a PCIE device and enable wake on LAN.

RTC Alarm Power On

This Allows the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

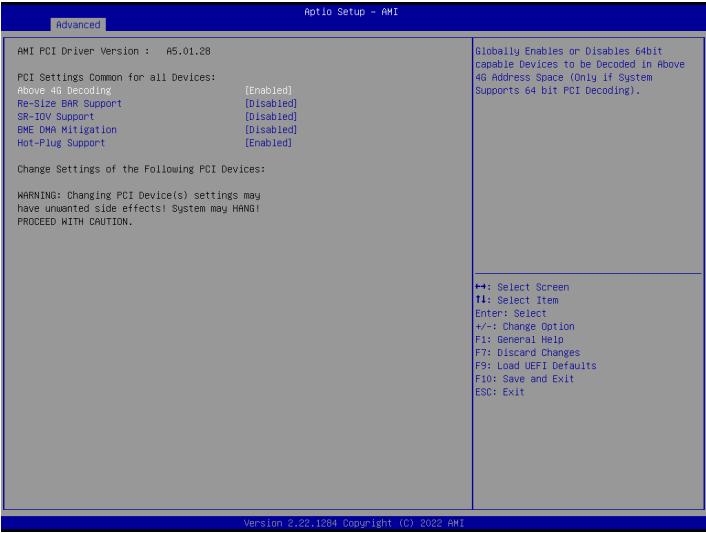
3.3.5 USB Configuration



USB Configuration

The USB Configuration displays the USB Controllers and USB Device informations.

3.3.6 PCI Subsystem Settings



Above 4G Decoding

Use this item to enable or disable 64bit capable Devices to be decoded in Above 4G Address Space (only if the system supports 64 bit PCI decoding).

Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option Enables/Disables Resizable BAR support.

SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables/Disables Single Root IO Virtualization Support.

BME DMA Mitigation

Re-enable Bus Master Attribute disabled during Pci enumeration for PCI Bridges after SMM Locked.

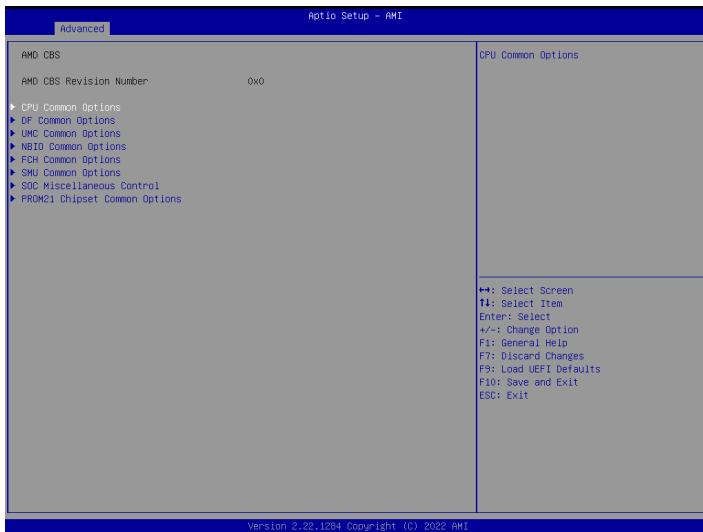
Hot-Plug Support

Use this item to enable or disable Hot-Plug support for the entire system. If System has Hot-Plug capable Slots and this option set to Enabled, it provides a Setup screen for selecting PCI resource padding for Hot-Plug.



*Changing PCI Device(s) settings may have unwanted side effects! System may HANG!
PROCEED WITH CAUTION.*

3.3.7 AMD CBS



CPU Common Options

Use this item to configure CPU common options.

DF Common Options

Use this item to configure DF common options.

UMC Common Options

Use this item to configure UMC common options.

NBIO Common Options

Use this item to configure NBIO common options.

FCH Common Options

Use this item to configure FCH common options.

SMU Common Options

Use this item to configure SMU common options.

Soc Miscellaneous Control

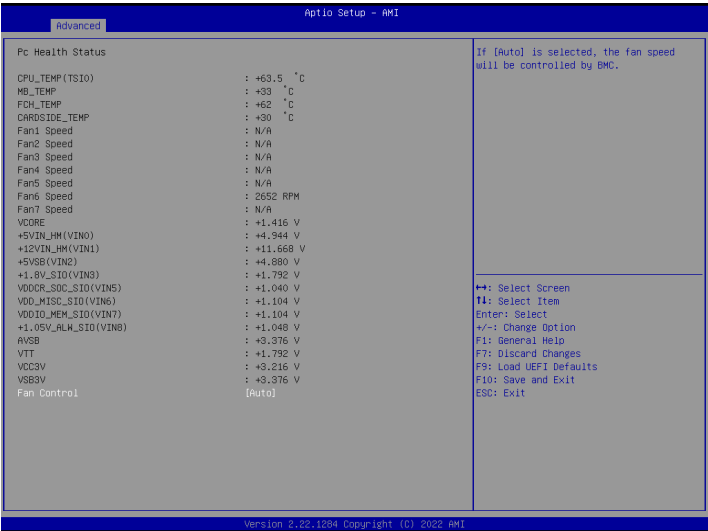
Use this item to configure Soc Miscellaneous control options.

PROM21 Chipset Common Options

Use this item to configure PROM21 Chipset common options.

3.3.8 Hardware Monitor

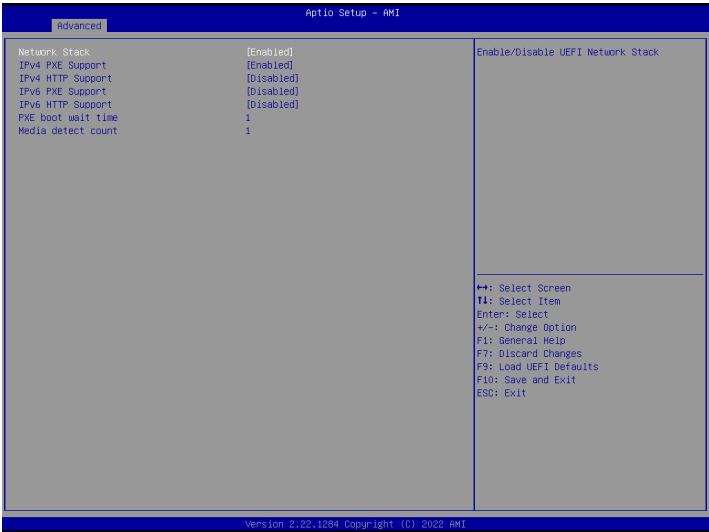
In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



Fan Control

If [Auto] is selected, the fan speed will be controlled by BMC . Select [Manual] to configurate Smart Fan Duty Controller.

3.3.9 Network Stack Configuration



Network Stack

Enable UEFI network stack can prevents you from performing single-user network boots and network installation. If disabled, the host does not use the network interface.

IPv4 PXE Support

Enable IPv4 PXE Boot support. If disabled, IPv4 PXE Boot Option is not supported.

IPv4 HTTP Support

Enable IPv4 HTTP Boot support. If disabled, IPv4 HTTP Boot Option is not supported.

IPv6 PXE Support

Enable IPv6 PXE Boot support. If disabled, IPv6 PXE Boot Option is not supported.

IPv6 HTTP Support

Enable IPv6 HTTP Boot support. If disabled, IPv6 HTTP Boot Option is not supported.

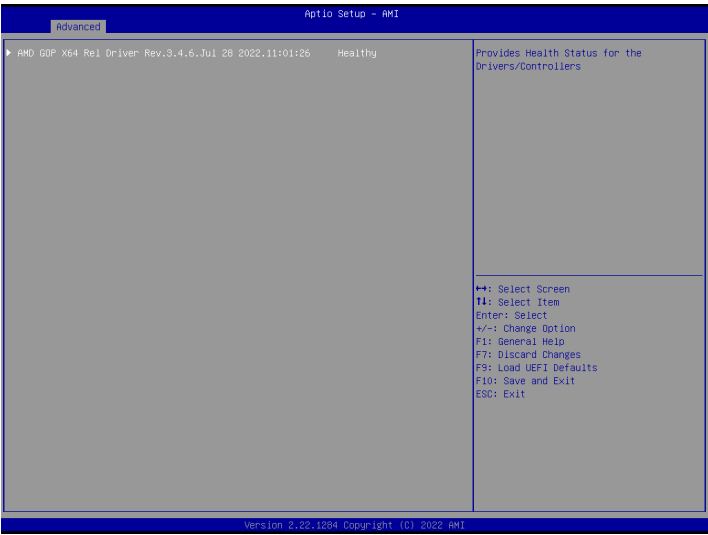
PXE Boot Wait Time

Specifies the wait time and press the ESC key to abort the PXE boot.

Media Detect Count

Specifies the number of times the presence of physical storage device are verified on a system reset or power cycle.

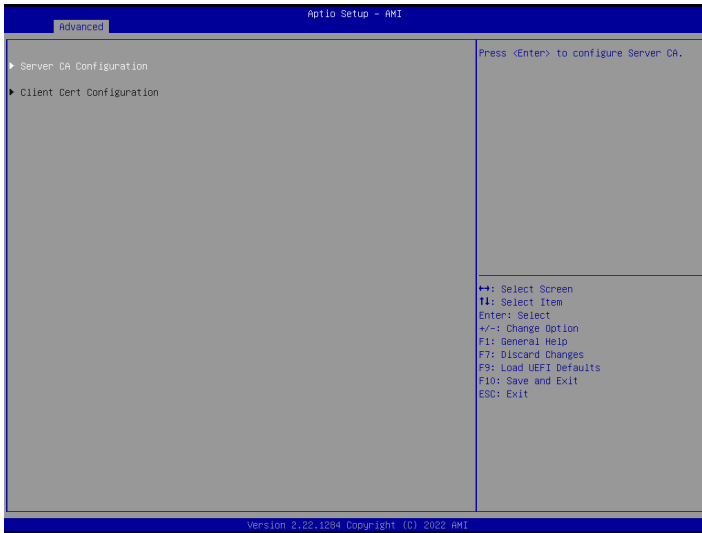
3.3.10 Driver Health



AMD GOP X64 Rel Driver Rev.3.4.6.Jul 28 2022.11:01:26 Healthy

Provides Health Status for the Drivers/Controllers.

3.3.11 Tls Auth Configuration



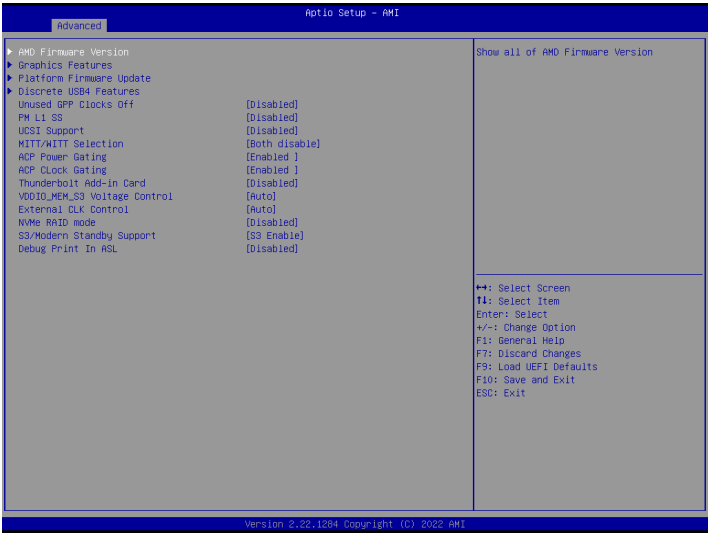
Server CA Configuration

Press [Enter] to configure Server CA.

Client Cert Configuration

Press [Enter] to configure Client Cert.

3.3.12 AMD PBS



AMD Firmware Version

Show all of AMD Firmware Version.

Graphics Features

Graphics Features - HG, DGPU Features, BOMAC0.

Platform Firmware Update

Use this item to process Platform Firmware Update

Discrete USB4 Features

Discrete USB4 Features - PCIe resource, D3 support, Native USB4 suport and so on.

Unused GPP Clocks Off

Turn Unused GPP Clocks Off.

PM L1 SS

Enable for PM L1 SS and ASPM L1 SS.

UCSI Support

Enable for UCSI (USB Type-C Connector System Software Interface).

MITT/WITT Selection

Use this item to configure MITT/WITT Selection

ACP Power Gating

Use this item to enable or disable ACP Power Gating.

ACP Lock Gating

Use this item to enable or disable ACP CLOCK Gating.

Thunderbolt Add-in Card

Enable Thunderbolt AR/TR Add-in Card Support.

VDDIO_MEM_S3 Voltage Control

Use this item to configure voltage control for VDDIO_MEM_S3 with Auto or Manual selections.

External CLK Control

Use the item to configure External CLK Control with Auto (100Mhz CGPLL generated by default) / eCLK0 (EXT_GPP0_SRC) or GPP1 (External input thru GPP1).



Switch APU clocks source mapping will get stuck immediately (post code: B0005A5A), manual press cold reset button to bypass the stuck.

NVMe RAID mode

Use this item to enable or disable NVMe RAID mode. Please setting the 'PCIe/GFX Lanes Configuration' item according to the RAID configuration.

S3/Modern Standby Support

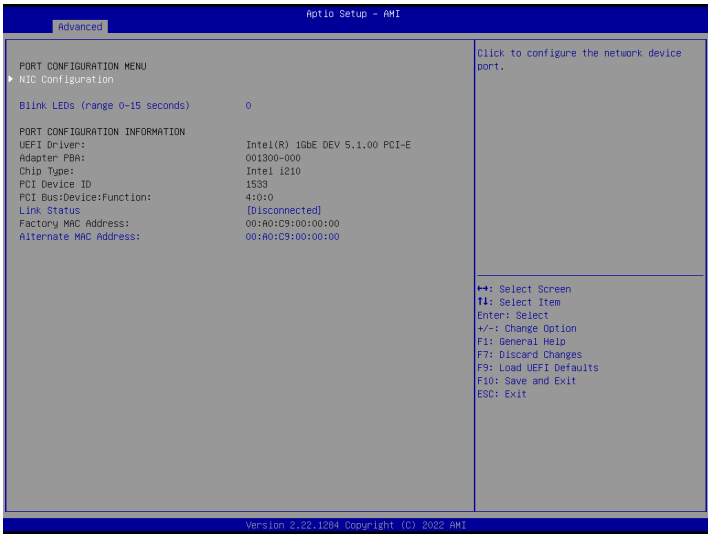
Switch S3/Modern Standby.

Debug Print In ASL

Enable Debug Print In ASL.

3.3.13 Inter (R) I210 Gigabit Network Connection

Configure Gigabit Ethernet device parameters.



NIC Configuration

Click this item to configure the network device port.

Blink LEDs (range 0-15 seconds)

Blink LEDs for the specified duration (up to 15 seconds)

Port Configuration Information

Displays port configuration information including UEFI Driver, Adapter PBA, Chip Type, PCI Device ID and PCI Bus: Device:Function, Link Status, Factory and Alternate MAC Address.

Link Status

Displays the Link Status.

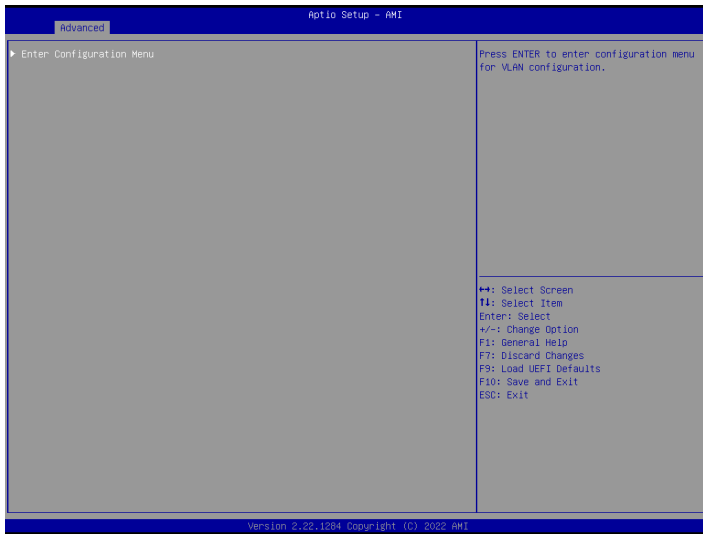
Factory MAC Address

Factory assigned MAC address of Ethernet port.

Alternate MAC Address

Alternate assigned MAC address of Ethernet port.

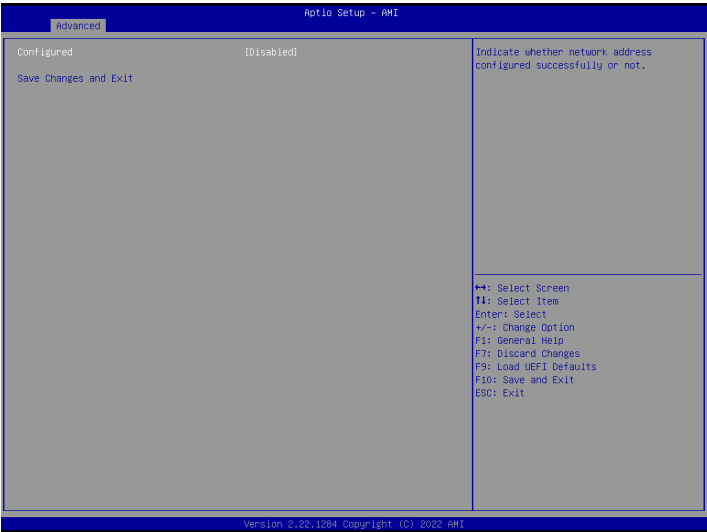
3.3.14 VLAN Configuration



Enter Configuration Menu

Press [Enter] to enter configuration menu for VLAN configuration.

3.3.15 IPv4 Network Configuration



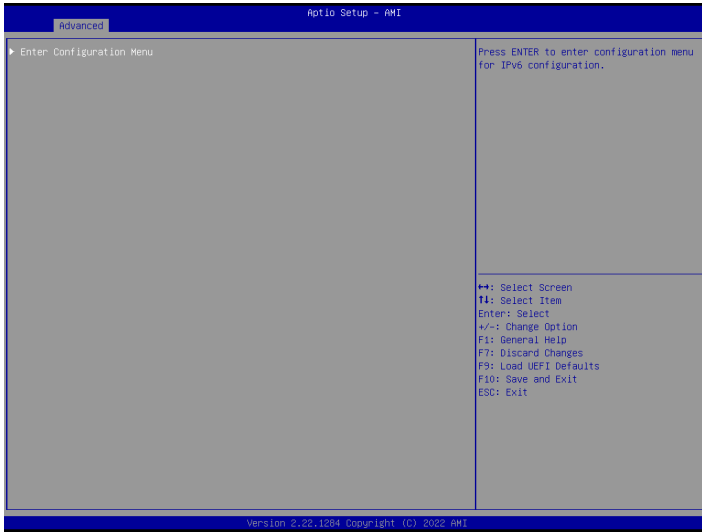
Configured

Indicate whether network address configured successfully or not.

Save Changes and Exit

Save changed value and exit.

3.3.16 IPv6 Network Configuration

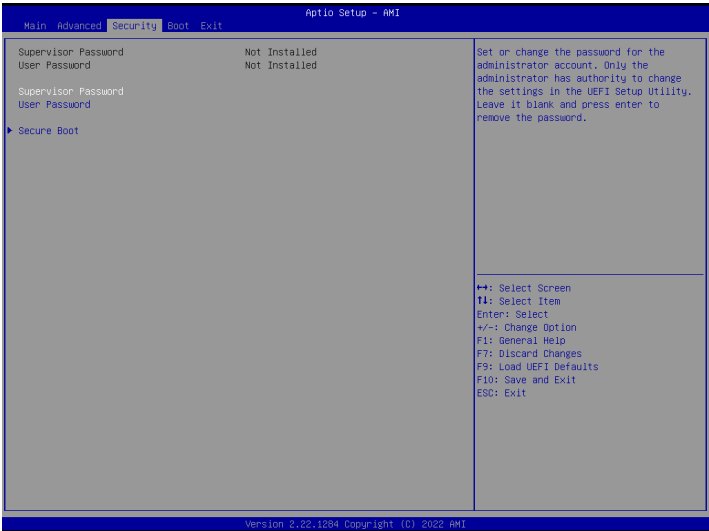


Enter Configuration Menu

Press [Enter] to enter configuration menu for IPv6 configuration.

3.4 Security

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press [Enter] to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press [Enter] to remove the password.

Secure Boot

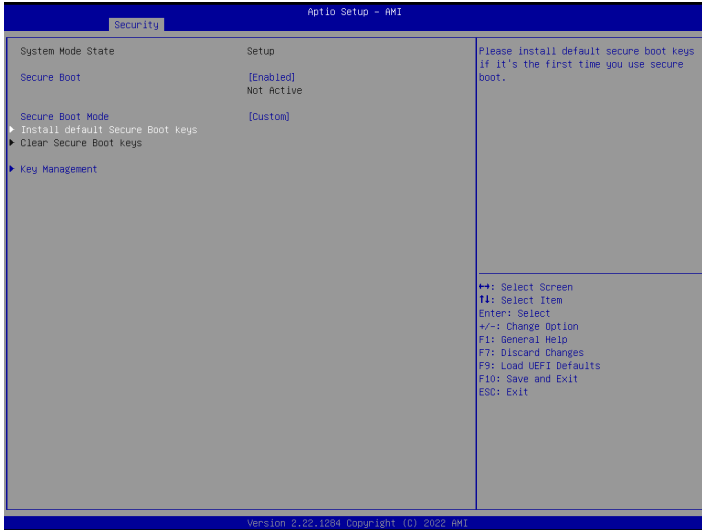
Use this to Enable/Disable Secure Boot Control. The default value is [Enabled]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

Secure Boot mode options: Standard/Custom. In Custom mode, Secure Boot Policy variables can be configured without authentication.

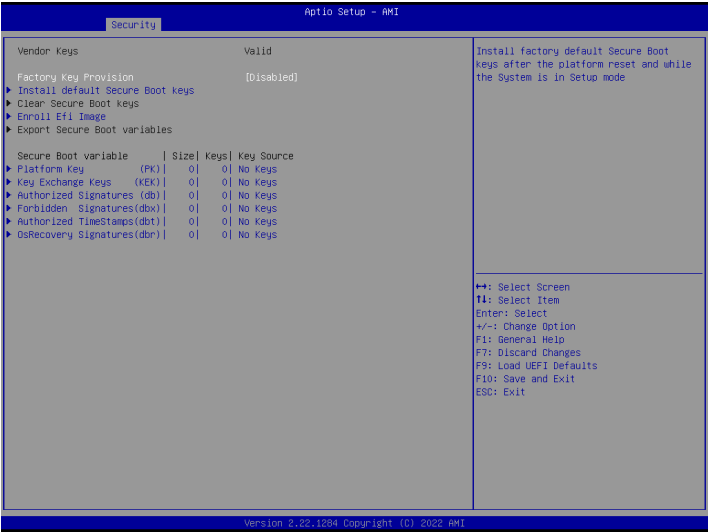
3.4.1 Install Default Secure Boot Keys

Please install default secure boot keys if it is the first time you use secure boot. Select Clear Secure Boot keys item to clear the assigned secure boot keys.



3.4.2 Key Management

In this section, expert users can modify Secure Boot Policy variables without full authentication.



Factory Key Provision

Install factory default Secure Boot Keys after the platform reset and while the system is in Setup mode.

Install Default Secure Boot Keys

Please install default secure boot keys if it's the first time you use secure boot.

Clear Secure Boot Keys

Force System to Setup Mode - clear all Secure Boot Variables. Change takes effect after reboot.

Enroll Efi Image

Allow the image to run in Secure Boot mode. 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.

Platform Key (PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

- a) EFI_SIGNATURE_LIST
- b) EFI_CERT_X509 (DER)
- c) EFI_CERT_RSA2048 (bin)
- d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Key Exchange Keys (KEK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

- a) EFI_SIGNATURE_LIST
- b) EFI_CERT_X509 (DER)
- c) EFI_CERT_RSA2048 (bin)
- d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized Signatures (db)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

- a) EFI_SIGNATURE_LIST
- b) EFI_CERT_X509 (DER)
- c) EFI_CERT_RSA2048 (bin)
- d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Forbidden Signatures (dbx)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized TimeStamps (dbt)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

OsRecovery Signatures (dbr)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

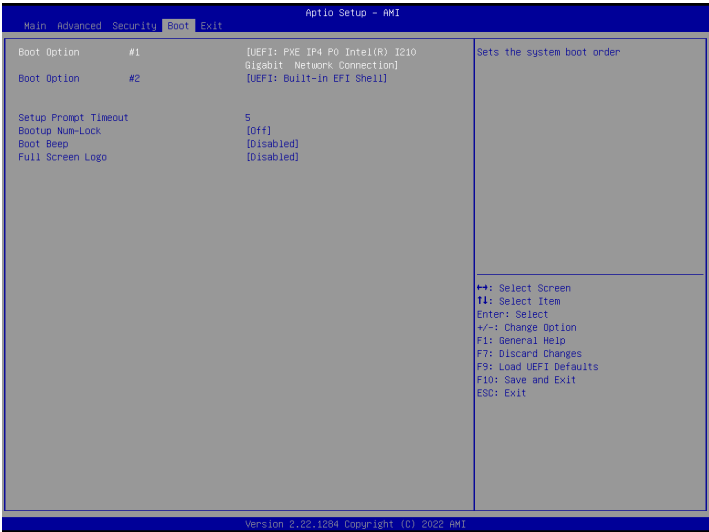
2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1

Use this item to set the system boot order.

Boot Option #2

Use this item to set the system boot order.

Setup Prompt Timeout

Configure the number of seconds to wait for the UEFI setup utility.

Bootup Num-Lock

Select whether Num Lock should be turned on or off when the system boots up.

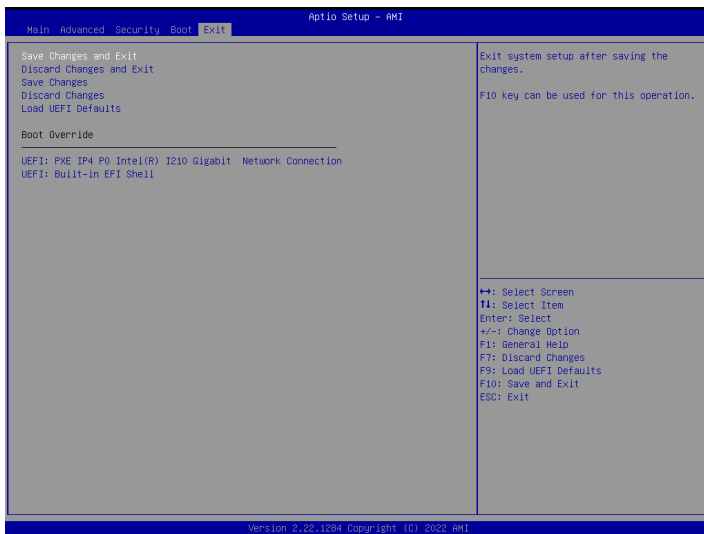
Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

Full Screen Logo

Enable to display the boot logo or disable to show normal POST messages.

3.6 Exit Screen



Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop-out. Press <F10> key or select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message “Discard changes and exit setup?” will pop-out. Press <ESC> key or select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Save Changes

When you select this option, the following message “Save changes?” will pop-out. Press <F7> key or select [Yes] to save all changes.

Discard Changes

When you select this option, the following message “Discard changes?” will pop-out. Press <F7> key or select [Yes] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Boot Override

These items displays the available devices. Select an item to start booting from the selected device.

Chapter 4 Software Support

After all the hardware has been installed, we suggest you go to our official website at <http://www.ASRockRack.com> and make sure if there are any new updates of the BIOS / BMC firmware for your motherboard.

4.1 Download and Install Operating System

This motherboard supports various Microsoft® Windows® Server / Linux compliant operating systems. Please download the operating system from your OS manufacturer. Please refer to your OS documentation for more instructions.

** Please download the Intel® SATA Floppy Image driver from the ASRock Rack's website (www.asrockrack.com) to your USB drive while installing OS in SATA RAID mode.*

4.2 Download and Install Software Drivers

This motherboard supports various Microsoft® Windows® compliant drivers. Please download the required drivers from our website at <http://www.ASRockRack.com>.

To download necessary drivers, go to the product page, click on the "Download" tab, choose the operating system you use, and select the driver you need to be downloaded.

4.3 Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, welcome to visit ASRock Rack's website at <http://www.ASRockRack.com>; or you may contact your dealer for further information.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.



Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries to you and damages to motherboard components.

1. Disconnect the power cable and check whether the PWR LED is off.
2. Unplug all cables, connectors and remove all add-on cards from the motherboard.
Make sure that the jumpers are set to default settings.
3. Confirm that there are no short circuits between the motherboard and the chassis.
4. Install a CPU and fan on the motherboard, then connect the chassis speaker and power LED.

If there is no power...

1. Confirm that there are no short circuits between the motherboard and the chassis.
2. Make sure that the jumpers are set to default settings.
3. Check the settings of the 115V/230V switch on the power supply.
4. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

If there is no video...

1. Try replugging the monitor cables and power cord.
2. Check for memory errors.

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR4 RDIMM/ RDIMM-3DS/ LRDIMM/ LRDIMM-3DS/ NVDIMM modules.
3. If you have installed more than one DIMM modules, they should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...

1. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.
2. Confirm whether your power supply provides adequate and stable power.

Other problems...

1. Try searching keywords related to your problem on ASRock Rack's FAQ page:
<http://www.asrockrack.com/support>

5.2 Technical Support Procedures

If you have tried the troubleshooting procedures mentioned above and the problems are still unsolved, please contact ASRock Rack's technical support with the following information:

1. Your contact information
2. Model name, BIOS version and problem type.
3. System configuration.
4. Problem description.

You may contact ASRock Rack's technical support at:
<http://www.asrockrack.com/support/tsd.asp>

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of your invoice marked with the date of purchase is required. By calling your vendor or going to our RMA website (<http://event.asrockrack.com/tsd.asp>) you may obtain a Returned Merchandise Authorization (RMA) number. The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when you return the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty does not cover damages incurred in shipping or from failure due to alteration, misuse, abuse or improper maintenance of products.

Contact your distributor first for any product related problems during the warranty period.

Contact Information

If you need to contact ASRock Rack or want to know more about ASRock Rack, you're welcome to visit ASRock Rack's website at <http://www.asrockrack.com>; or you may contact your dealer for further information. For technical questions, please submit a support request form at <https://event.asrockrack.com/tsd.asp>

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