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Server/Workstation

Motherboard

AMPONED8-2T/BCM

User Manual

English



Version 1.20

Published Nov. 2025

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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.

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:

- Reorient or relocate the receiving antenna.
- 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.



ASRock Rack INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Directives. Full text of EU declaration of conformity is available at: <http://www.asrockrack.com>

ASRock Rack follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASRock Rack product is in line with global environmental regulations. In addition, ASRock Rack disclose the relevant information based on regulation requirements.

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



ASRock Rack INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related UKCA Directives. Full text of UKCA declaration of conformity is available at: <http://www.asrockrack.com>



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 **AMPONED8-2T/BCM** 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. Find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack's Website: www.ASRockRack.com

*Please visit the website for specific information and technical support:
<http://www.asrockrack.com/support/>*

1.1 Package Contents

- ASRock Rack AMPONED8-2T/BCM motherboard
(CEB form factor: 12" x 10.5", 30.5cm x 26.7cm)
- Quick installation guide
- 1 I/O shield
- 1 ATX 4P to 24P power cable (8cm)
- 1 SATA power cable (80cm)
- 1 Screw for M.2 socket



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

1.2 Specifications

AMPONED8-2T/BCM	
MB Physical Status	
Form Factor	CEB
Dimension	12" x 10.5" (30.5cm x 26.7cm)
Processor System	
CPU	Supports AmpereOne® family Processors
Socket	1 Socket (LGA5964)
Chipset	System on Chip
System Memory	
DIMM Quantity	8 DIMM slots (1DPC)
Type	Supports DDR5 288-pin RDIMM, RDIMM-3DS
Max. Capacity per DIMM	512GB
Max. DIMM Frequency	5200MHz
Voltage	1.1V
<i>Note: Memory capacity, frequency, and voltage support is to be validated.</i>	
PCIe Expansion Slots	
PCIe x16	SLOT6: FL PCIe5.0 x16
	SLOT5: FL PCIe5.0 x16
	SLOT4: FL PCIe5.0 x16
	SLOT3: FL PCIe5.0 x16
	SLOT2: FL PCIe5.0 x16
	SLOT1: FL PCIe5.0 x16
Other PCIe Expansion Connectors	
M.2	1 M-key (PCIe5.0 x4), supports 22110/2280 form factor
Others	2 MCIO (PCIe5.0 x8)
Ethernet	
Additional GbE Controller	Broadcom BCM57416: 2 RJ45 (10GbE)
Server Management	
BMC Controller	ASPEED AST2600
IPMI Dedicated GLAN	1 Realtek RTL8211F for dedicated management GLAN
Graphics	
Controller	ASPEED AST2600: 1 Mini-DisplayPort 1.1a
Rear I/O	
UID Button/ LED	1 UID button w/ LED
Video Port	1 Mini-DisplayPort 1.1a
USB Port	4 Type-A (USB3.2 Gen1)
LAN Port	2 RJ45 (10GbE), 1 dedicated IPMI

Internal Connectors/Headers	
Power Connector	1 (4-pin, ATX PSU signal) w/ ATX 24-pin adapter cable, 3 (8-pin, ATX 12V), 1 (6-pin for GPU Slot)
Other Power Connector	1 (6-pin) for HDD power
Auxiliary Panel Header	1 (18-pin): chassis intrusion, system fault LED, LAN activity LEDs, locate, SMBus
System Panel Header	1 (9-pin): power switch, reset switch, system power LED, HDD activity LED
COM Header	1
Speaker Header	1 (4-pin)
Fan Header	8 (6-pin)
TPM Header	1 (13-pin, SPI)
HSBP	1
SMBus Header	1
PMbus Header	1
IPMB Header	1
USB Header	1 (19-pin, 2 USB3.2 Gen1)
Clear CMOS	1 (contact pads)
Others	1 Buzzer
LED Indicators	
Standby Power LED	1
Fan Fail LED	8
BMC Heartbeat LED	1
System BIOS	
Type	AMI UEFI BIOS; 512Mb (64MB) SPI Flash ROM
Features	ASRock Rack Instant Flash, ACPI 6.4, SMBIOS 3.6.0 and above, Plug and Play (PnP)
Hardware Monitor	
Temperature	CPU, MB Temperature sensing
Fan	Fan Tachometer Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) Fan Multi-Speed Control
Voltage	VCORE, VD2D, VSOC, AVDD, AVDDH, 3V, 5V, 12V, +BAT, 3VSB, 5VSB

Support OS	
OS	Linux®: - RHEL 9.2 aarch64 - Ubuntu 22.04.3 arm64 - Ubuntu 24.04.2 arm64 - SUSE SLE 15.5 aarch64 - Fedora 42 - Debian 12.11.0 <i>*Please refer to the website for the latest OS support list.</i>
Environment	
Temperature	Operating temperature: 10°C ~ 35°C Non Operating temperature: -40°C ~ 70°C
Humidity	Non Operation Humidity: 20% ~ 90% (Non condensing)

NOTE: Please refer to the 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.

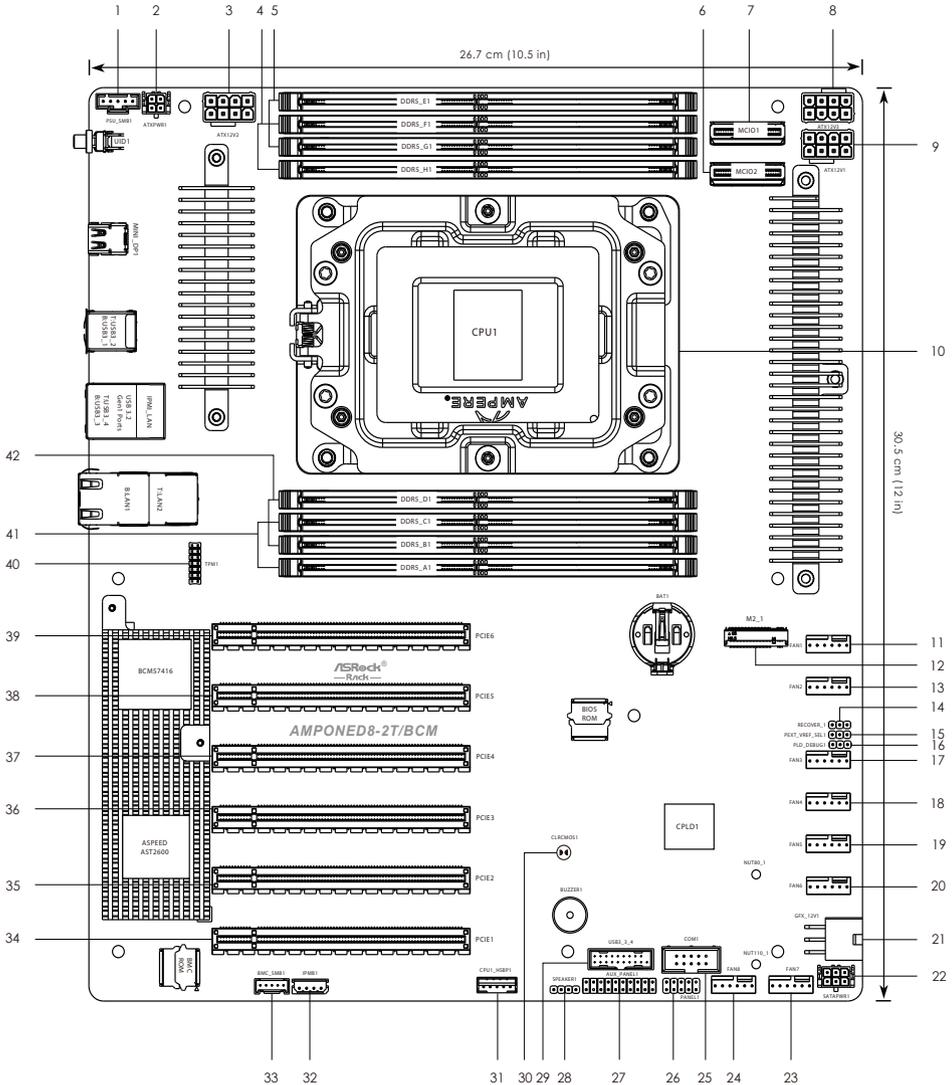


If installing Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If installing the drivers only, it will pass the WHQL tests.

1.3 Unique Features

ASRock Rack Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows user to update system BIOS without entering operating systems first like MS-DOS or Windows. With this utility, 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 the USB flash drive, floppy disk or hard drive, then update the 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.

1.4 Motherboard Layout



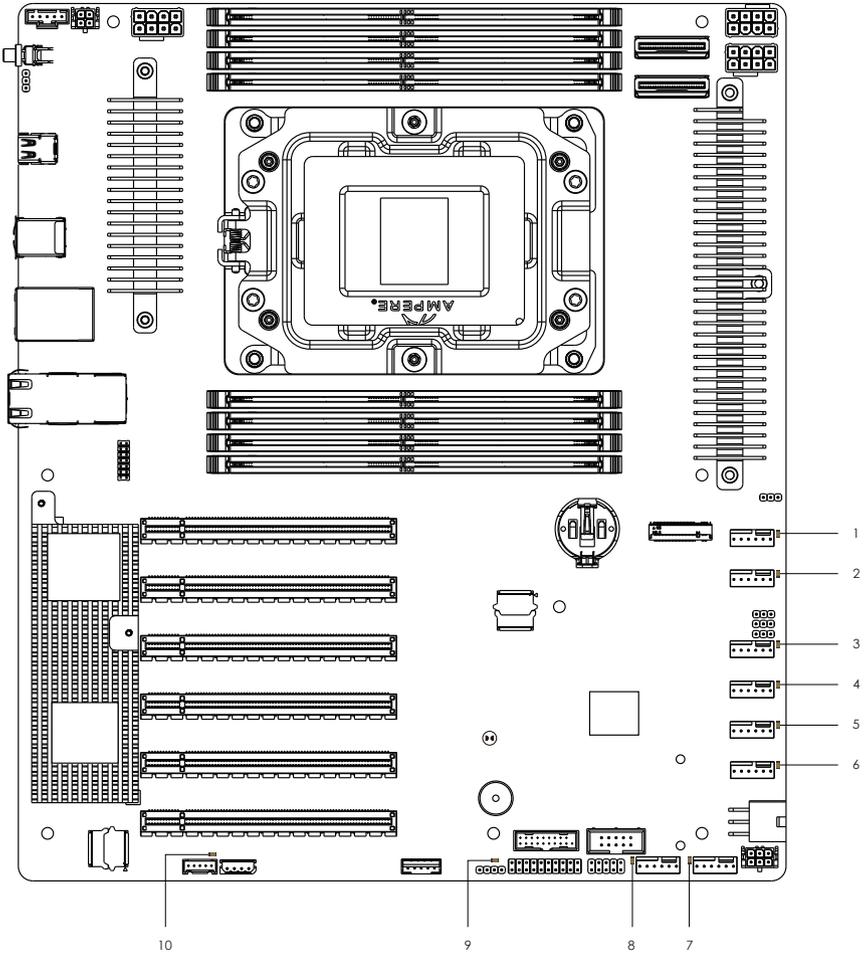
The illustration here is for references only. The actual layout may slightly vary depending on the model and the version used.

No.	Description
1	PSU SMBus (PSU_SMB1)
2	ATX Power Connector (ATXPWR1)
3	ATX 12V Power Connector (ATX12V2)
4	2 DDR5 DIMM Slots (DDR5_F1, DDR5_H1)*
5	2 DDR5 DIMM Slots (DDR5_E1, DDR5_G1)*
6	Mini Cool Edge IO Connector (MCIO2)
7	Mini Cool Edge IO Connector (MCIO1)
8	ATX 12V Power Connector (ATX12V3)
9	ATX 12V Power Connector (ATX12V1)
10	CPU Socket (LGA5964) (CPU1)
11	System Fan Header (FAN1)
12	M.2 Socket (M2_1) (Type 22110 / 2280)
13	System Fan Header (FAN2)
14	Recover Jumper (RECOVER_1, reserved for internal test)
15	CPU Voltage Selection Jumper (PEXT_VREF_S0_SEL1)
16	PLD Debug Jumper (PLD_DEBUG1, reserved for internal test)
17	System Fan Header (FAN3)
18	System Fan Header (FAN4)
19	System Fan Header (FAN5)
20	System Fan Header (FAN6)
21	Graphics 12V Power Connector (GFX_12V1)
22	SATA Power Connector (SATAPWR1)
23	System Fan Header (FAN7)
24	System Fan Header (FAN8)
25	COM Port Header (COM1)
26	System Panel Header (PANEL1)
27	Auxiliary Panel Header (AUX_PANEL1)
28	Speaker Header (SPEAKER1)
29	USB 3.2 Gen1 Header (USB3_3_4)
30	Clear CMOS Pad (CLR_CMOS1)
31	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
32	Intelligent Platform Management Bus Header (IPMB1)
33	BMC SMBus Header (BMC_SMB1)

No.	Description
34	PCI Express 5.0 x16 Slot (PCIE1)
35	PCI Express 5.0 x16 Slot (PCIE2)
36	PCI Express 5.0 x16 Slot (PCIE3)
37	PCI Express 5.0 x16 Slot (PCIE4)
38	PCI Express 5.0 x16 Slot (PCIE5)
39	PCI Express 5.0 x16 Slot (PCIE6)
40	SPI TPM Header (TPM1)
41	2 DDR5 DIMM Slots (DDR5_A1, DDR5_C1)*
42	2 DDR5 DIMM Slots (DDR5_B1, DDR5_D1)*

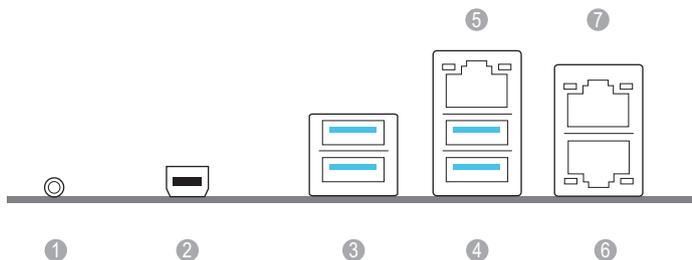
**For DIMM installation and configuration instructions, please see p.20 (Installing the Memory Modules (DIMM)) for more details.*

1.5 Onboard LED Indicators



No.	Item	Status	Description
1	FAN_LED1	Red	FAN1 failed
2	FAN_LED2	Red	FAN2 failed
3	FAN_LED3	Red	FAN3 failed
4	FAN_LED4	Red	FAN4 failed
5	FAN_LED5	Red	FAN5 failed
6	FAN_LED6	Red	FAN6 failed
7	FAN_LED7	Red	FAN7 failed
8	FAN_LED8	Red	FAN8 failed
9	SB_PWR1	Green	STB PWR ready
10	BMC_LED1	Green	BMC heartbeat LED

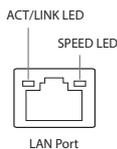
1.6 I/O Panel



No.	Description	No.	Description
1	UID Switch (UID1)	5	LAN RJ-45 Port (IPMI_LAN)*
2	Mini Display Port (MINI_DP1)	6	10G LAN RJ-45 Port (LAN1, shared NIC)**
3	USB 3.2 Gen1 Ports (USB3_1_2)	7	10G LAN RJ-45 Port (LAN2)**
4	USB 3.2 Gen1 Ports (USB3_3_4)		

LAN Port LED Indications

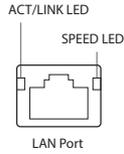
*There is an LED on each side of IPMI LAN port. Please refer to the table below for the LAN port LED indications.



IPMI LAN Port LED Indications

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

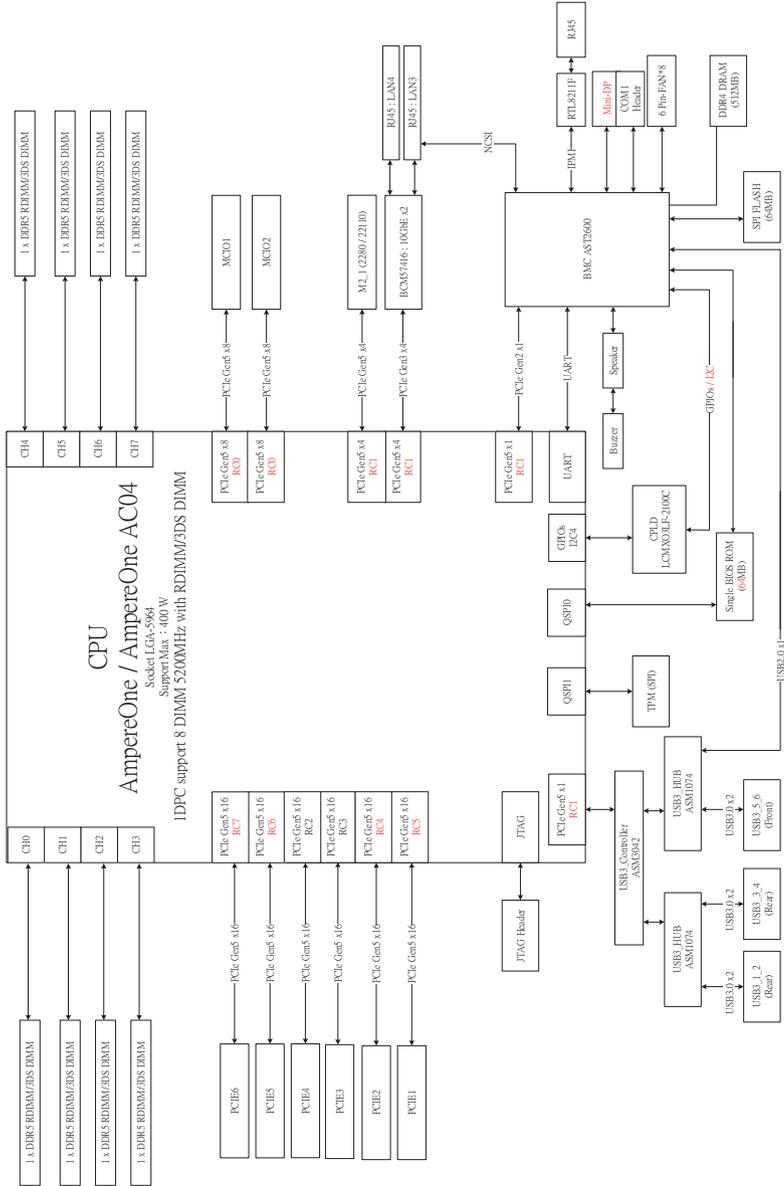
**There is an LED on each side of the 10G LAN port. Please refer to the table below for the LAN port LED indications.



10G LAN Port LED Indications (LAN1, LAN2)

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

1.7 Block Diagram



Chapter 2 Installation

This is a CEB form factor (12" x 10.5", 30.5cm x 26.7cm) motherboard. Before installing the motherboard, study the configuration of the chassis to ensure that the motherboard fits into it.



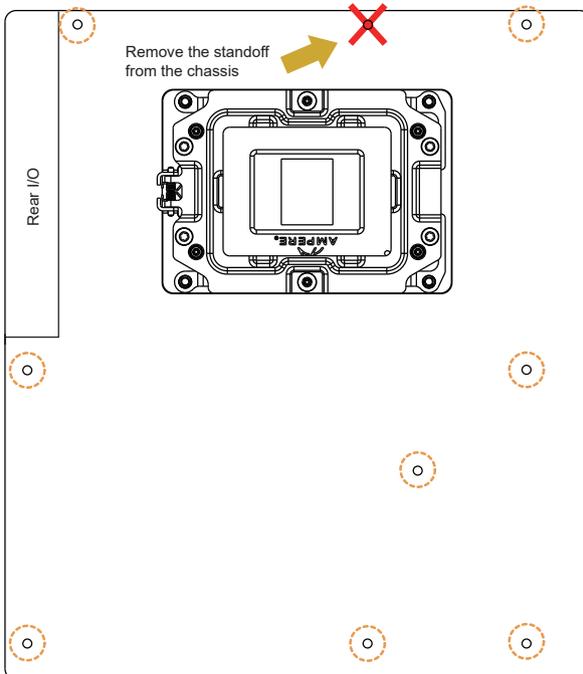
1. Ensure the motherboard battery is installed before unplugging the power cord or installing/removing the motherboard.
2. Before installing or removing any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.1 Screw Holes

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



Attention! Before installing this motherboard, be sure to unscrew and remove the standoff at the marked location, under the motherboard, from the chassis, in order to avoid electrical short circuit and motherboard damages.





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

2.2 Pre-installation Precautions

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

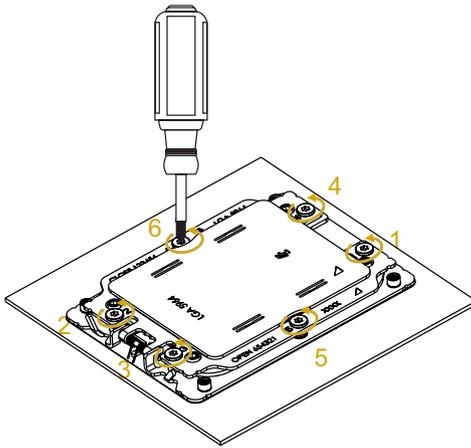
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place the motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before handling the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever 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.

2.3 Installing the CPU

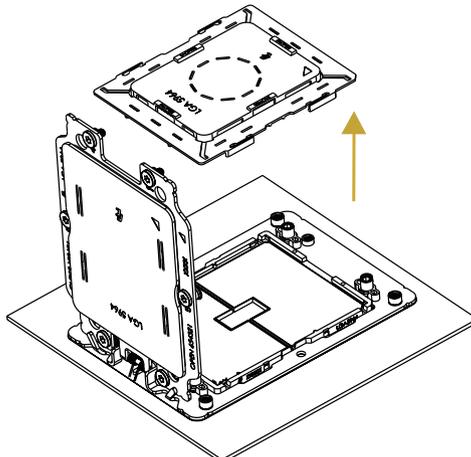


1. Before inserting the CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all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

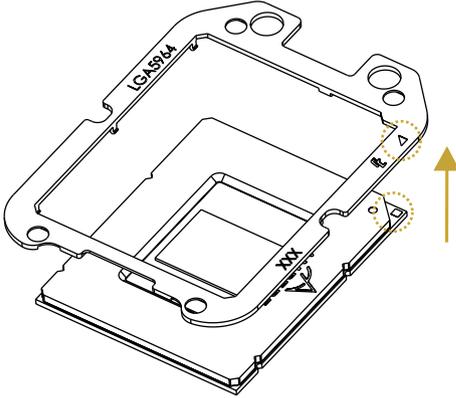
- 1 Use the T20 screwdriver to loosen the screws in a sequential order 6 > 5 > 4 > 3 > 2 > 1.



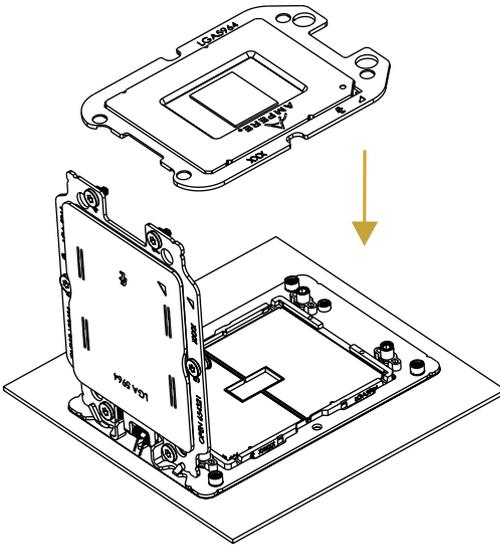
- 2 Open the cover and remove the cap.



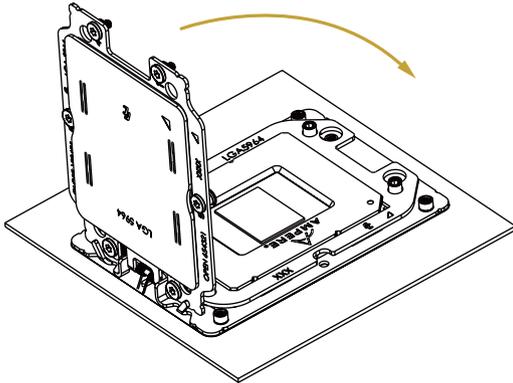
- 3 Install the CPU to the carrier and lock in place.



- 4 Insert the CPU with carrier to the socket.

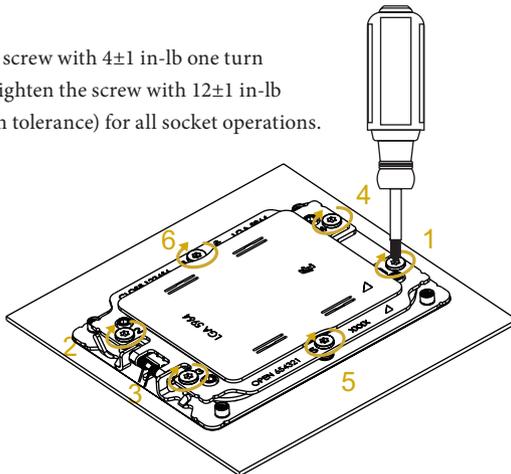


- 5 Close the cover.

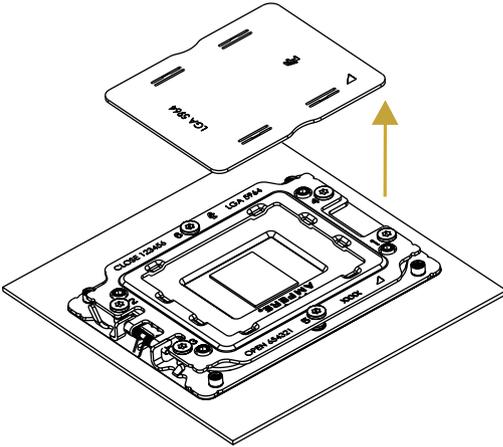


- 6 Tighten the screws in a sequential order
1 > 2 > 3 > 4 > 5 > 6.

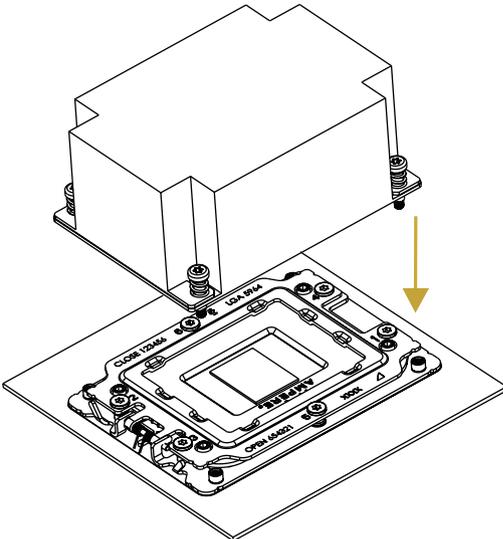
Install the screw with 4 ± 1 in-lb one turn
and then tighten the screw with 12 ± 1 in-lb
(maximum tolerance) for all socket operations.



- 7 Remove the socket transparent cap.



- 8 Install the heatsink.



2.4 Installing the Memory Modules (DIMM)

This motherboard provides eight DDR5 (Double Data Rate 5) DIMM slots in two groups, and supports Single Channel Memory Technology.



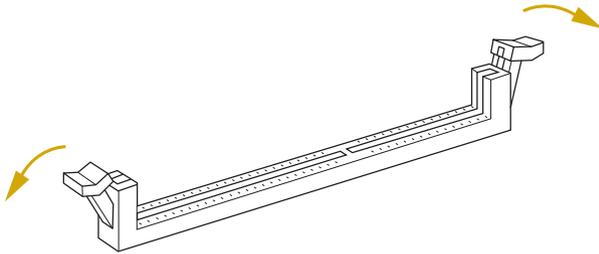
1. Before installing a memory module, make sure to turn off the computer and unplug the powercord from the power outlet to prevent damage to the memory module.
2. It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory module into a DDR5 slot; otherwise, this motherboard and DIMM may be damaged.
3. For eight channel configuration, it needs to install identical (the same brand, speed, size and chip-type) DDR5 DIMMs.

Recommended Memory Configurations

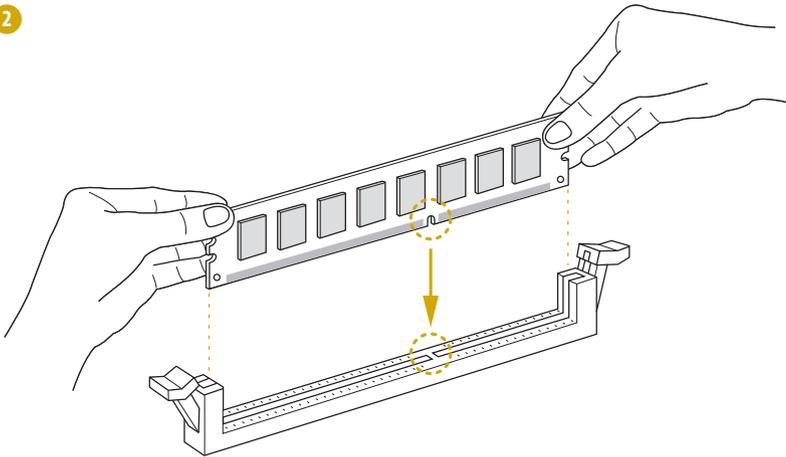
	CPU1							
	A1	B1	C1	D1	E1	F1	G1	H1
1 DIMM	V							
4 DIMMS	V		V		V		V	
8 DIMMS	V	V	V	V	V	V	V	V

The symbol V indicates the slot is populated.

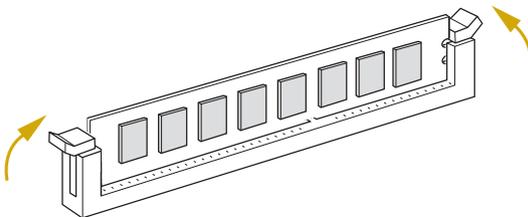
1



2



3



2.5 Expansion Slots (PCI Express Slots)

There are 6 PCI Express slots on this motherboard.

PCIe slots:

PCIe1 (PCIe 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

PCIe2 (PCIe 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

PCIe3 (PCIe 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

PCIe4 (PCIe 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

PCIe5 (PCIe 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

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

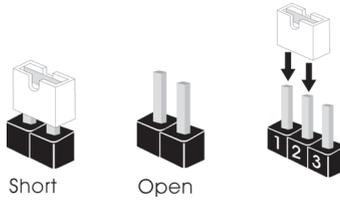
Slot	Generation	Mechanical	Electrical	Source
PCIe1	5.0	x16	x16	CPU1
PCIe2	5.0	x16	x16	CPU1
PCIe3	5.0	x16	x16	CPU1
PCIe4	5.0	x16	x16	CPU1
PCIe5	5.0	x16	x16	CPU1
PCIe6	5.0	x16	x16	CPU1

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 starting the installation.
- Step 2. Remove the system unit cover (if the motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that intending to use on the chassis. Keep the screw for later use.
- Step 4. Install the PCIe card to the riser card.
- Step 5. Align the riser-card assembly connector with the slot on the system board. Press firmly until the riser-card assembly is completely seated on the slot.
- Step 6. Fasten the card to the chassis with the screw.
- Step 7. Replace the system cover.

2.6 Jumper Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is “Short”. If no jumper cap is placed on the pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when a jumper cap is placed on these 2 pins.



CPU Voltage Selection

Jumper

(3-pin PEXT_VREF_SEL1)

(see p.6, No. 15)



AMPERE ONE
(EXT_VREF voltage=0.7V)



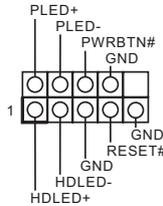
AMPERE ONE X
(EXT_VREF voltage=0.6V)
(Default)

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. 26)



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 and configure the way to turn off the 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):

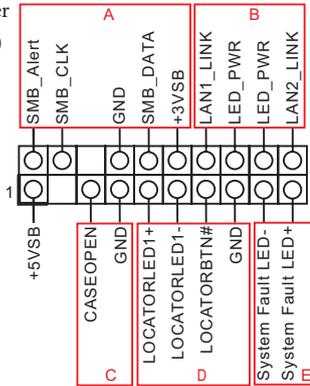
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S4 sleep state or powered off (S5).

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, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting the 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. 27)



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 user 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 user 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 SYSTEM STATUS):

This header is for the Fault LED on the system.

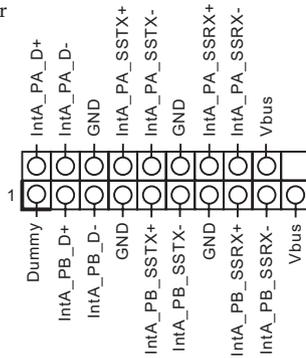


Please attention to the address configuration to avoid conflicts in usage.

BMC SMBus 8:

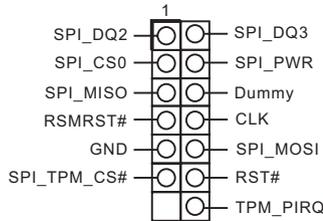
1. FRU (SMBus Address=A8/A9)
2. Thermal sensor (SMBus Address=E2/E3)
3. CPLD (SMBus Address=38/39)
4. AUX Panel (SMBus Address - Optional)

USB 3.2 Gen1 Header
(19-pin USB3_3_4)
(see p.6, No. 29)



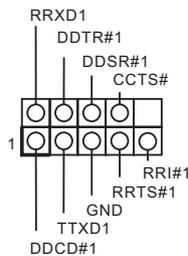
Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. This USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

SPI TPM Header
(13-pin TPM1)
(see p.6, No. 40)



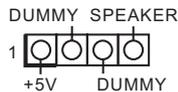
This connector supports SPI Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

COM Port Header
(9-pin COM1)
(see p.6, No. 25)



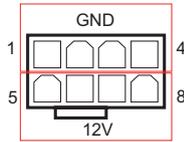
This COM1 header supports a serial port module.

Chassis Speaker Header
(4-pin SPEAKER1)
(see p.6, No. 26)



Please connect the chassis speaker to this header.

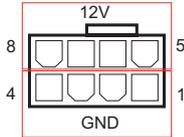
ATX 12V Power Connectors
 (8-pin ATX12V1)
 (see p.6, No. 9)
 (8-pin ATX12V2)
 (see p.6, No. 3)



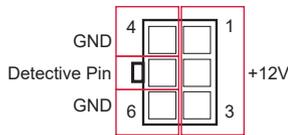
This motherboard provides three 8-pin ATX 12V power connectors.

**CPU power connectors with two-sided latches may interfere due to limited space between ATX12V1 and ATX12V3. Please verify connector compatibility before installation.*

(8-pin ATX12V3)
 (see p.6, No. 8)

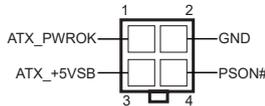


Graphics 12V Power Connector
Right Angle:
 (6-pin GFX_12V1)
 (see p.6, No. 21)



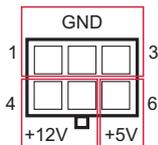
This motherboard provides a 6-pin Graphics 12V power connector.

ATX Power Connector
 (4-pin ATXPWR1)
 (ATX 24pin-to-4pin)
 (see p.6, No. 2)



The motherboard provides one 4-pin power/signal connector which is a required input for ATX power source. When using ATX power, it is necessary to use a 24pin-to-4pin power cable to connect between the 24pin power connector of PSU and the ATXPWR1 connector on the motherboard for power supply and signal communication.

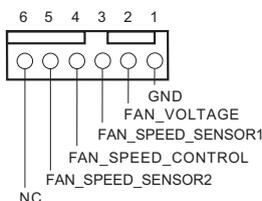
SATA Power Connector
 (6-pin SATAPWR1)
 (see p.6, No. 22)



Please use a power cable to connect this connector and a HDD.

System Fan Connectors

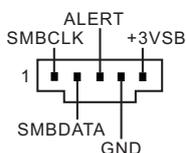
- (6-pin FAN1)
(see p.6, No. 11)
- (6-pin FAN2)
(see p.6, No. 13)
- (6-pin FAN3)
(see p.6, No. 17)
- (6-pin FAN4)
(see p.6, No. 18)
- (6-pin FAN5)
(see p.6, No. 19)
- (6-pin FAN6)
(see p.6, No. 20)
- (6-pin FAN7)
(see p.6, No. 23)
- (6-pin FAN8)
(see p.6, No. 24)



Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control. The fan max. current is 5A and the max. power is 60Watts.

PSU SMBus

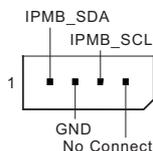
- (PSU_SMB1)
(see p.6, No. 1)



PSU SMBus monitors the status of the power supply, fan and system temperature.

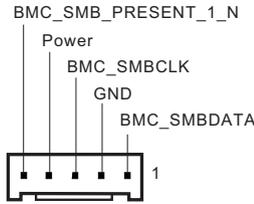
Intelligent Platform Management Bus header

- (4-pin IPMB1)
(see p.6, No. 32)



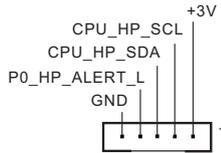
This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.

BMC SMBus Headers
(5-pin BMC_SMB1)
(see p.6, No. 33)



This header is used for the SM BUS devices.

Backplane PCI Express
Hot-Plug Connectors
(5-pin CPU1_HSBP1)
(see p.6, No. 31)



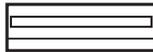
These headers are used for the hot plug feature of HDDs on the backplane.

Clear CMOS Pad
(CLR_CMOS1)
(see p.6, No. 30)



CLR_CMOS1 allows user to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.

MCIO Connectors
(MCIO1)
(see p.6, No. 7)
(MCIO2)
(see p.6, No. 6)



These connectors are used for the PCIE devices.

MCIO1 Pin Definition

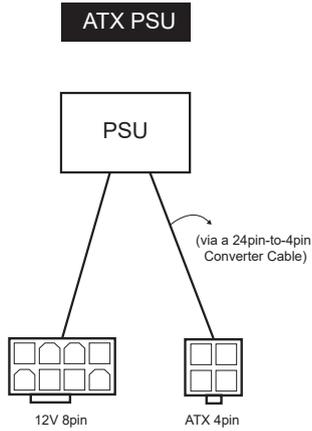
Pin	Definition	Pin	Definition
A1	GND	B1	GND
A2	RXP7	B2	TXP7
A3	RXN7	B3	TXN7
A4	GND	B4	GND
A5	RXP6	B5	TXP6
A6	RXN6	B6	TXN6
A7	GND	B7	GND
A8	BP_TYPE	B8	MCIO1_1_SMB_SCL
A9	WAKE#	B9	MCIO1_1_SMB_SDA
A10	GND	B10	GND
A11	MCIO1_1_DP	B11	MCIO1_1_PERST_L
A12	MCIO1_1_DN	B12	MCIO1_1_PRSTNT_N
A13	GND	B13	GND
A14	RXP5	B14	TXP5
A15	RXN5	B15	TXN5
A16	GND	B16	GND
A17	RXP4	B17	TXP4
A18	RXN4	B18	TXN4
A19	GND	B19	GND
A20	RXP3	B20	TXP3
A21	RXN3	B21	TXN3
A22	GND	B22	GND
A23	RXP2	B23	TXP2
A24	RXN2	B24	TXN2
A25	GND	B25	GND
A26	BP_TYPE	B26	MCIO1_2_SMB_SCL
A27	WAKE#	B27	MCIO1_2_SMB_SDA
A28	GND	B28	GND
A29	MCIO1_2_DP	B29	MCIO1_2_PERST_L
A30	MCIO1_2_DN	B30	MCIO1_2_PRSTNT_N
A31	GND	B31	GND
A32	RXP1	B32	TXP1
A33	RXN1	B33	TXN1
A34	GND	B34	GND
A35	RXP0	B35	TXP0
A36	RXN0	B36	TXN0
A37	GND	B37	GND
75	NP_NC_1	76	NP_NC_2
77	PGND_1	78	PGND_3
79	PGND_2	80	PGND_4

MCIO2 Pin Definition

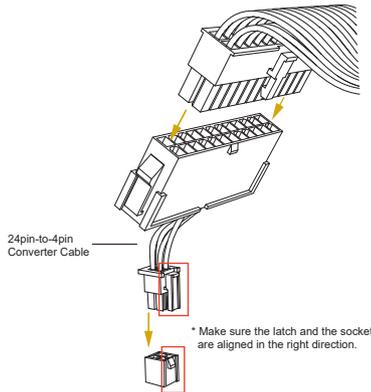
Pin	Definition	Pin	Definition
A1	GND	B1	GND
A2	RXP15	B2	TXP15
A3	RXN15	B3	TXN15
A4	GND	B4	GND
A5	RXP14	B5	TXP14
A6	RXN14	B6	TXN14
A7	GND	B7	GND
A8	BP_TYPE	B8	MCIO2_1_SMB_SCL
A9	WAKE#	B9	MCIO2_1_SMB_SDA
A10	GND	B10	GND
A11	MCIO2_1_DP	B11	MCIO2_1_PERST_L
A12	MCIO2_1_DN	B12	MCIO2_1_PRSNT_N
A13	GND	B13	GND
A14	RXP13	B14	TXP13
A15	RXN13	B15	TXN13
A16	GND	B16	GND
A17	RXP12	B17	TXP12
A18	RXN12	B18	TXN12
A19	GND	B19	GND
A20	RXP11	B20	TXP11
A21	RXN11	B21	TXN11
A22	GND	B22	GND
A23	RXP10	B23	TXP10
A24	RXN10	B24	TXN10
A25	GND	B25	GND
A26	BP_TYPE	B26	MCIO2_2_SMB_SCL
A27	WAKE#	B27	MCIO2_2_SMB_SDA
A28	GND	B28	GND
A29	MCIO2_2_DP	B29	MCIO2_2_PERST_L
A30	MCIO2_2_DN	B30	MCIO2_2_PRSNT_N
A31	GND	B31	GND
A32	RXP9	B32	TXP9
A33	RXN9	B33	TXN9
A34	GND	B34	GND
A35	RXP8	B35	TXP8
A36	RXN8	B36	TXN8
A37	GND	B37	GND
75	NP_NC_1	76	NP_NC_2
77	PGND_1	78	PGND_3
79	PGND_2	80	PGND_4

2.8 ATX PSU Power Connections

This motherboard supports 3 8-pin and a 4-pin ATX power input. Please refer to the table below for the required connections between the motherboard and the power supply.



The following diagram illustrates how to connect the bundled ATX 24pin-to-4pin converter cable.



2.9 Unit Identification purpose LED/Switch

Use the UID button locate the server working on behind a rack of servers.

Unit Identification
purpose LED/Switch
(UID1)



When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be turned on. Press the UID button again to turn off the indicator.



- 1. Press and hold the UID button for 4 seconds, the BMC will trigger an external reset.*
- 2. Press and hold the UID button for 10 seconds, the BMC will reset and load default values.*

2.10 Dual LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection(s) for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant images. Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.



The speed of transmission is subject to the actual network environment or status even with Teaming enabled.

Before setting up Teaming, please make sure whether the Switch (or Router) supports Teaming (IEEE 802.3ad Link Aggregation). Specify a preferred adapter in Intel PROSet. Under normal conditions, the Primary adapter handles all non-TCP/IP traffic. The Secondary adapter will receive fallback traffic if the primary fails. If the Preferred Primary adapter fails, but is later restored to an active status, control is automatically switched back to the Preferred Primary adapter.

Step 1

From **Device Manager**, open the properties of a team.

Step 2

Click the **Settings** tab.

Step 3

Click the **Modify Team** button.

Step 4

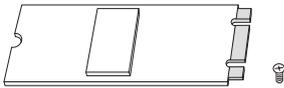
Select the adapter to the primary adapter and click the **Set Primary** button.

If it does not specify a preferred primary adapter, the software will choose an adapter of the highest capability (model and speed) to act as the default primary. If a failover occurs, another adapter becomes the primary. The adapter will, however, rejoin the team as a non-primary.

2.11 M.2_SSD Module Installation Guide

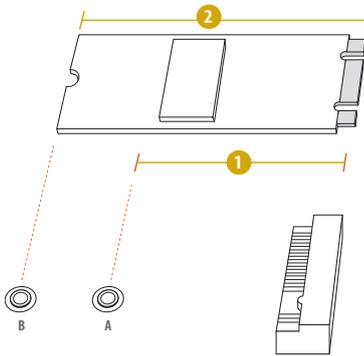
The M.2 Socket (M2_1, Key M) supports type 22110/2280 M.2 SATA 6.0 Gb/s module or M.2 PCI Express module up to Gen5 x4 (32GT/s x4).

Installing the M.2_SSD Module



Step 1

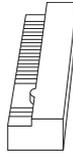
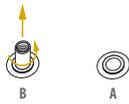
Prepare a M.2 SSD module and the screw.



Step 2

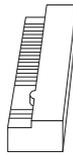
Depending on the PCB type and length of the M.2 SSD module, find the corresponding nut location to be used.

No.	1	2
Nut Location	A (NUT80_1)	B (NUT110_1)
PCB Length	8cm	11cm
Module Type	Type 2280	Type 22110



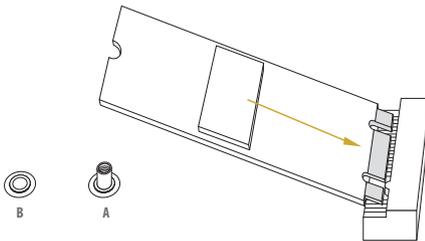
Step 3

Move the standoff based on the module type and length. Skip Step 3 and 4 and go straight to Step 5 if using the default nut. Otherwise, release the standoff by hand.



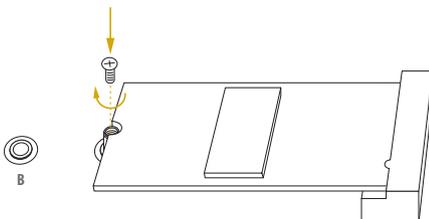
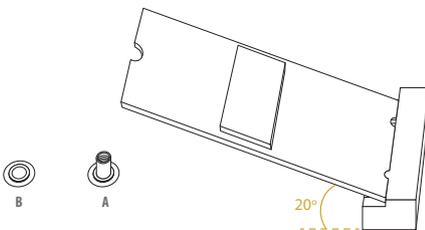
Step 4

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 the system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. Run the UEFI SETUP UTILITY when starting 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.

Restart the system by pressing <Ctrl> + <Alt> + <Delete> to enter the UEFI SETUP UTILITY after POST, or by pressing the reset button on the system chassis. This allows user to 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 seeing on the 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
Server Mgmt	To manage the server
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.

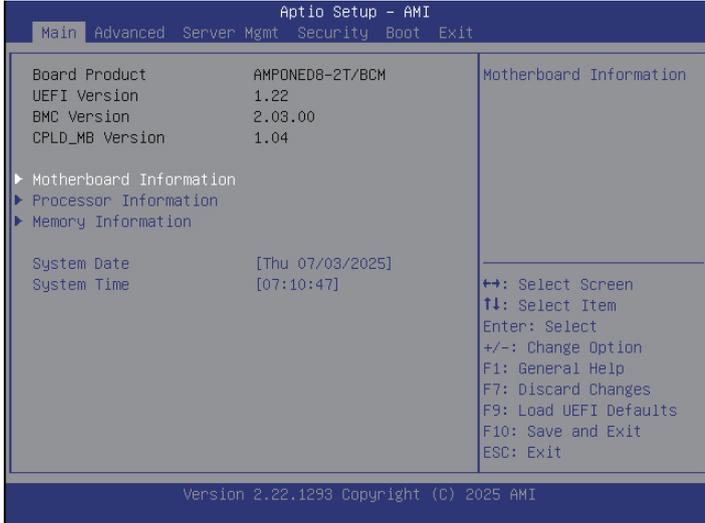
3.1.2 Navigation Keys

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

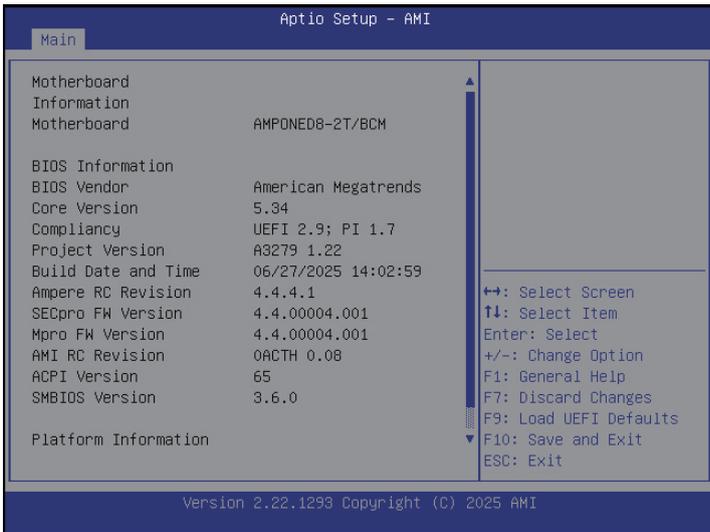
Once entering the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows user to set the system time and date.



The screenshots in this user manual are examples and for references only. The actual images may slightly vary depending on the model and the version used.

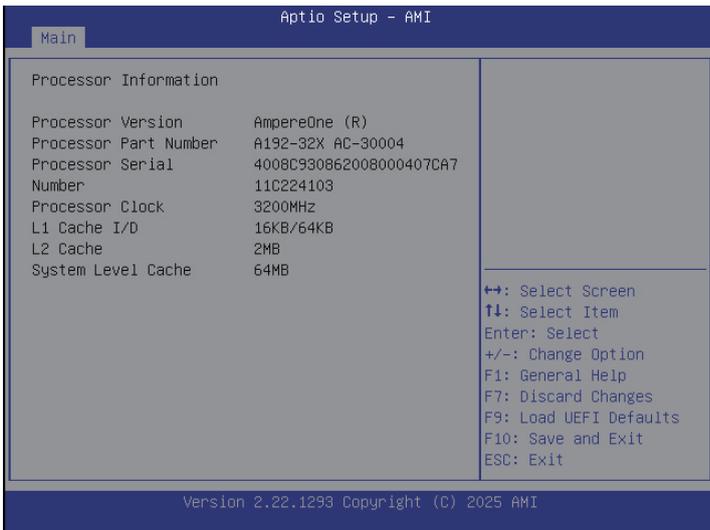
3.2.1 Motherboard Information

Press <Enter> to view the information of the motherboard.



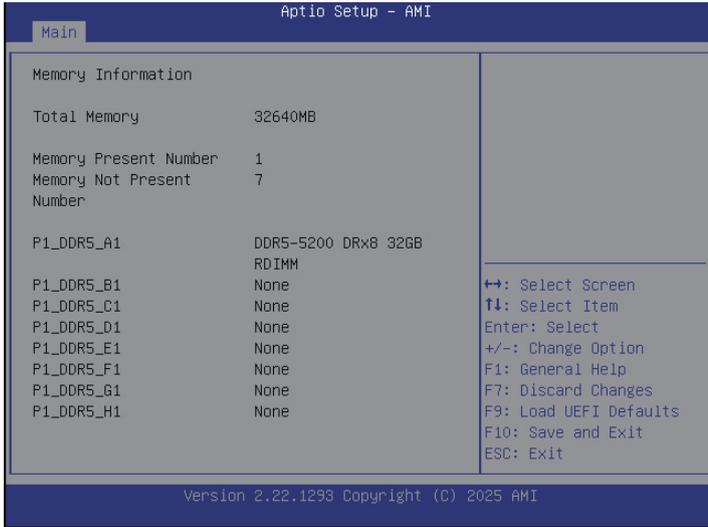
3.2.2 Processor Information

Press <Enter> to view the information of the processor.



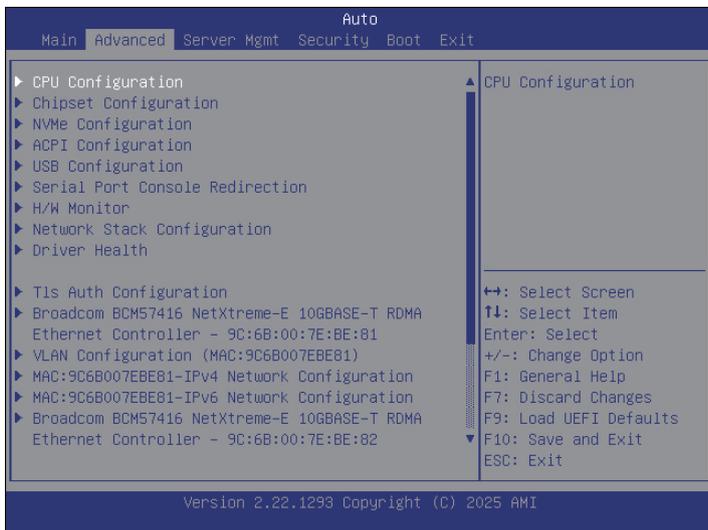
3.2.3 Memory Information

Press <Enter> to view the information of the memory.



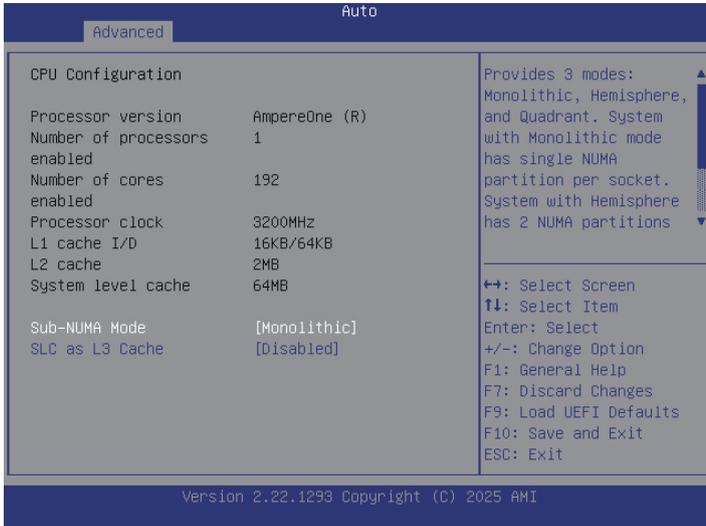
3.3 Advanced Screen

In this section, set the configurations for the following items: CPU Configuration, Chipset Configuration, NVMe Configuration, ACPI Configuration, USB Configuration, Serial Port Console Redirection, H/W Monitor, Network Stack Configuration, Driver Health, Tls Auth Configuration and Instant Flash.



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

3.3.1 CPU Configuration



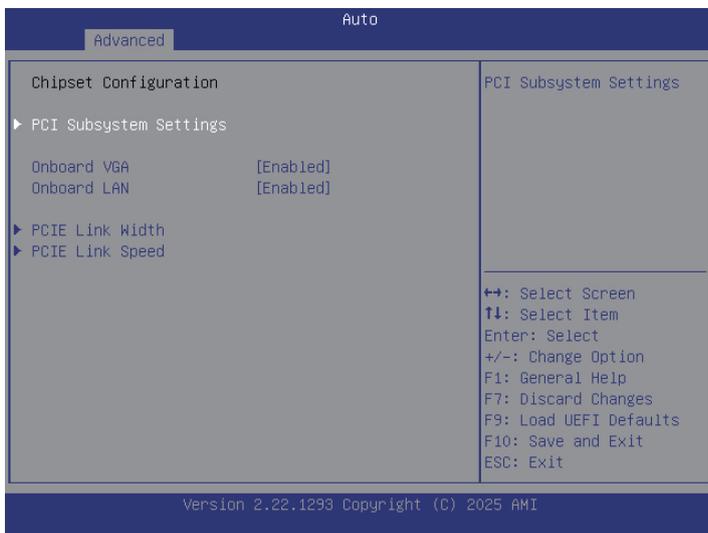
Sub-NUMA Mode

This item provides 3 modes including Monolithic, Hemisphere and Quadrant. System has single NUMA partition for each socket upon Monolithic mode. With Hemisphere mode, system has 2 NUMA partitions for each socket and Quadrant mode has 4 NUMA partitions for each socket.

SLC as L3 Cache

Use this item to enable or disable PPTT to indicate SLC as L3 Cache. This is limited to only 1P Monolithic mode.

3.3.2 Chipset Configuration



PCI Subsystem Settings

Use this item to configure PCI Subsystem Settings.

Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option enables or disables Resizable BAR support.

SR-IOV Support

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

Onboard VGA

Use this to enable or disable the Onboard VGA function.

Onboard LAN

Use this to enable or disable the Onboard LAN function.

PCIE Link Width

This displays the PCIE Link Width.

MCIO2/MCIO1 Link Width

The default value for MCIO2/MCIO1 is [Auto]-x4x4x4x4.

PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/PCIE6 Link Width

Configure the PCIE Link Width including [Auto], [x16], [x8x8], [x8x4x4], [x4x4x8] and [x4x4x4x4]. The default value is [Auto]-x16.

PCIE Link Speed

This displays the PCIE Link Speed.

MCIO1/MCIO2 Link Speed

Select Link Speed for this PCIe port. The default value is [Auto]-Gen5.

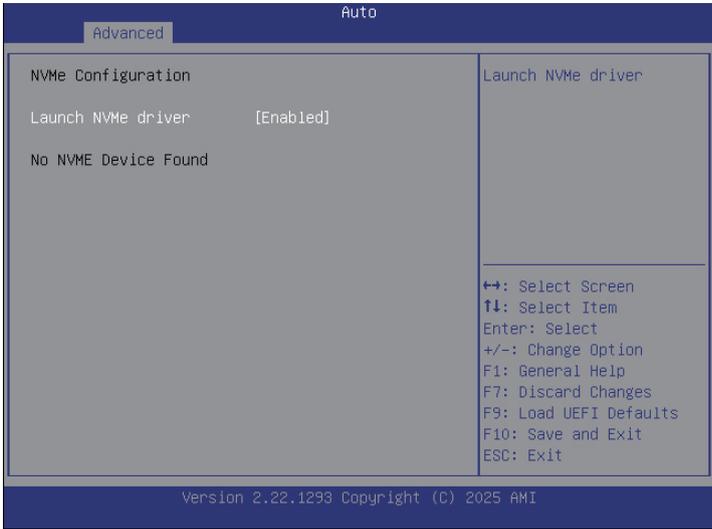
M2_1 Link Speed

Select Link Speed for this PCIe port. The default value is [Auto]-Gen5.

PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/PCIE6 Link Speed

Select Link Speed for this PCIe port. The default value is [Auto]-Gen5.

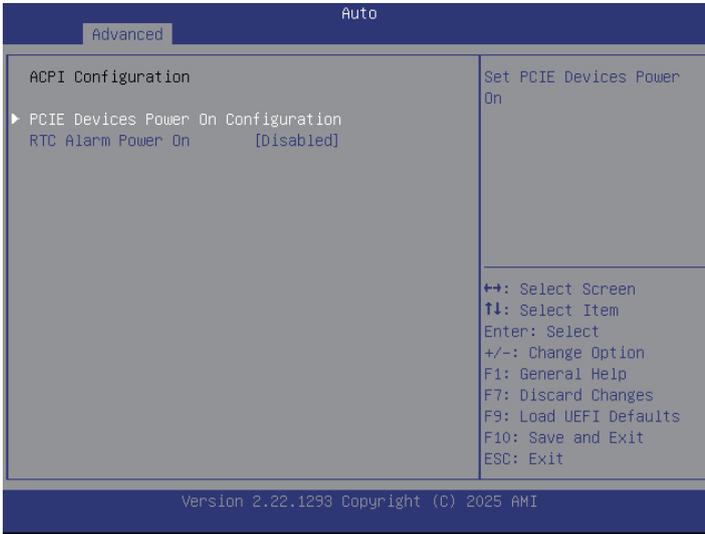
3.3.3 NVMe Configuration



Launch NVMe driver

Select this item to enable or disable launch NVMe driver.

3.3.4 ACPI Configuration



PCIE Devices Power On Configuration

Select this item to configure PCIE Devices Power On.

RTC Alarm Power On

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

RTC Alarm Date

Use this item to set Date of RTC power on feature.

RTC Alarm Hour

Use this item to set Hour of RTC power on feature.

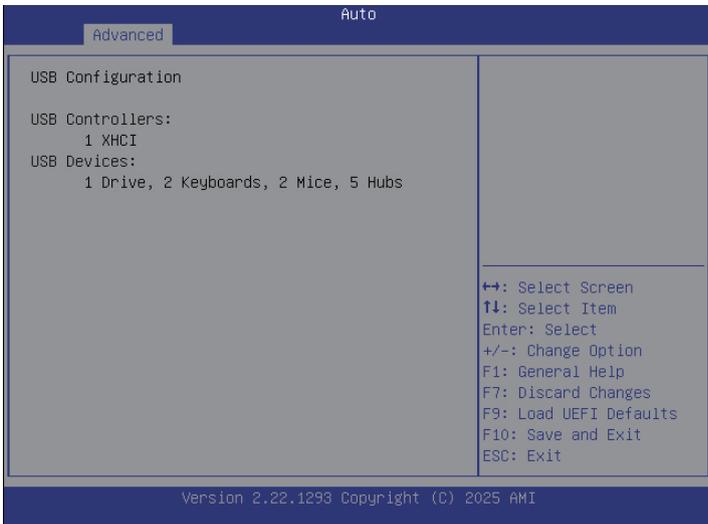
RTC Alarm Minute

Use this item to set Minute of RTC power on feature.

RTC Alarm Second

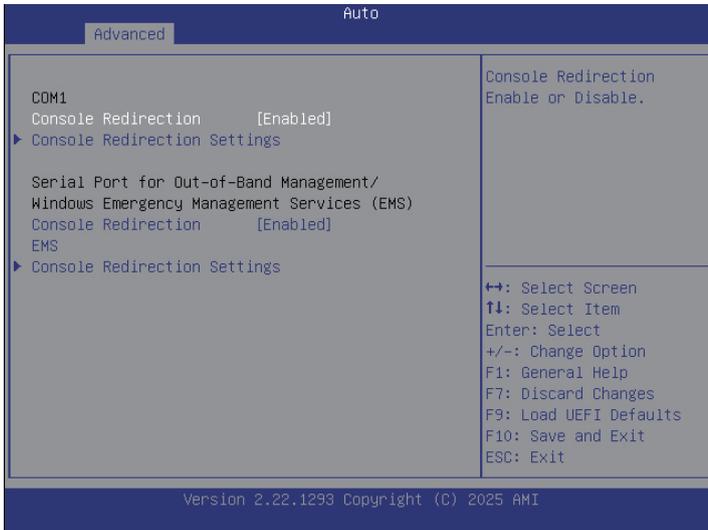
Use this item to set Second of RTC power on feature.

3.3.5 USB Configuration



This displays the USB Controllers and USB Devices information.

3.3.6 Serial Port Console Redirection



COM1

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, user can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how the computer and the host computer to which are connected exchange information. Both computers should have the same or compatible settings.

Terminal Type

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100Plus	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second

Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [38400], [57600] and [115200].

Data Bits

Use this item to set the data transmission size. The options include [7] and [8] (Bits).

Parity

Use this item to select the parity bit. The options include [None], [Even], [Odd], [Mark] and [Space].

Stop Bits

The item indicates the end of a serial data packet. The standard setting is [1] Stop Bit. Select [2] Stop Bits for slower devices.

Flow Control

Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None] and [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.

Recorder Mode

Use this item to enable or disable Recorder Mode to capture terminal data and send it as text messages.

Resolution 100x31

Use this item to enable or disable extended terminal resolution support.

Putty Keypad

Use this item to select Function Key and Keypad on Putty.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

Console Redirection EMS

Use this option to enable or disable Console Redirection EMS. If this item is set to Enabled, user can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how the computer and the host computer to which are connected exchange information.

Out-of-Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

Terminal Type EMS

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second EMS

Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Flow Control EMS

Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None], [Hardware RTS/CTS], and [Software Xon/Xoff].

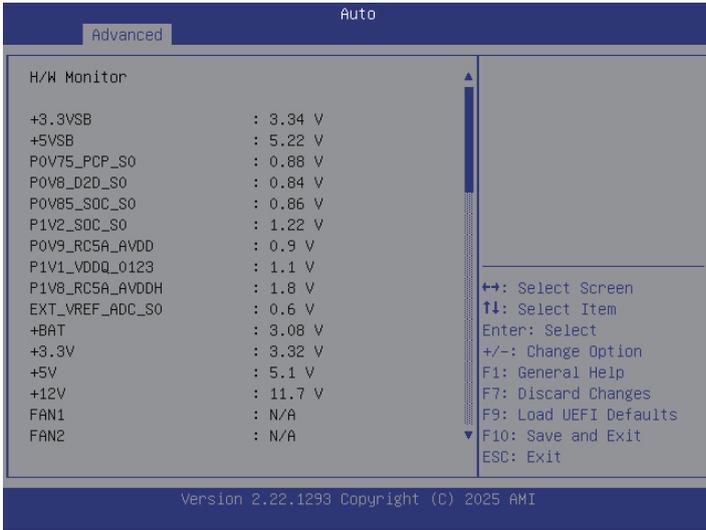
Data Bits EMS

Parity EMS

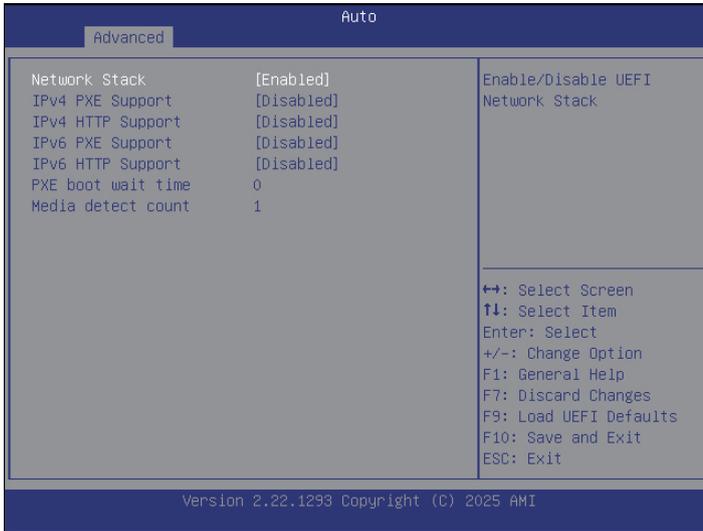
Stop Bits EMS

3.3.7 H/W Monitor

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



3.3.8 Network Stack Configuration



Network Stack

Use this to enable or disable UEFI Network Stack.

IPv4 PXE Support

Use this to enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

IPv4 HTTP Support

Use this to enable or disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.

IPv6 PXE Support

Use this to enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

IPv6 HTTP Support

Use this to enable or disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

PXE boot wait time

Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

Media detect count

Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

3.3.9 Driver Health



Broadcom NXE Gigabit Ethernet Driver Healthy

Provides Health Status for the Drivers/Controllers.

3.3.10 Tls Auth Configuration



Server CA Configuration

Press <Enter> to configure Server CA.

Enroll Cert

Press <Enter> to enroll cert.

Delete Cert

Press <Enter> to delete cert.

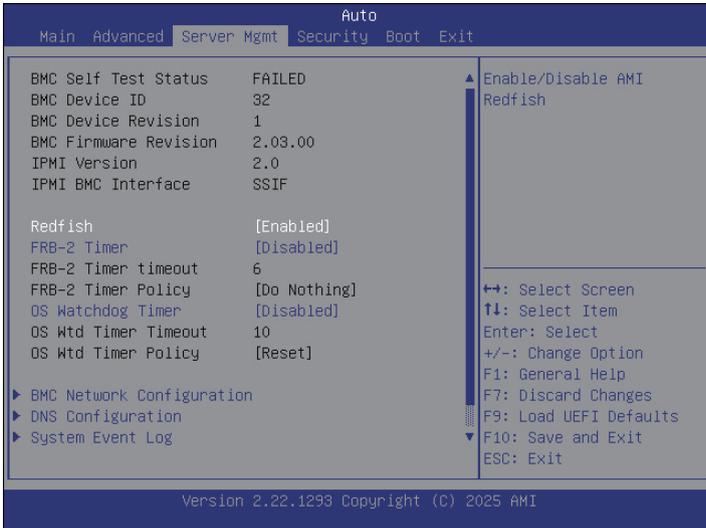
Client Cert Configuration

Press <Enter> to configure Client Cert.

3.3.11 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows user to update system UEFI without entering operating systems first like MSDOS or Windows®. Just save the new UEFI file to the USB flash drive, floppy disk or hard drive and launch this tool, then update the UEFI 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. Execute the Instant Flash utility, the utility will show the UEFI files and the respective information. Select the proper UEFI file to update UEFI, and reboot the system after the UEFI update process is completed.

3.4 Server Mgmt



Redfish

Use this item to enable or disable AMI Redfish.

FRB-2 Timer

Use this item to enable or disable FRB-2 timer (POST timer)

FRB-2 Timer Timeout

Use this to define the FRB-2 Time Expiration between 1 to 30 value.

FRB-2 Timer Policy

Configure how the system should respond. If the FRB-2 Timer expires is disabled, this item is not available.

OS Watchdog Timer

Use this item to enable or disable OS Watchdog Timer. If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads.

OS Wtd Timer Timeout

Configure the OS Boot Watchdog Timer Expiration between 1 to 30 min value. If the OS Boot Watchdog Timer is disabled, this item is not available.

OS Wtd Timer Policy

Configure how the system should respond if the OS Boot Watchdog Timer expires. If the OS Boot Watchdog Timer is disabled, this item is not available.

BMC Network Configuration

Use this to configure BMC network parameters.

DNS Configuration

Use this to configure DNS parameters.

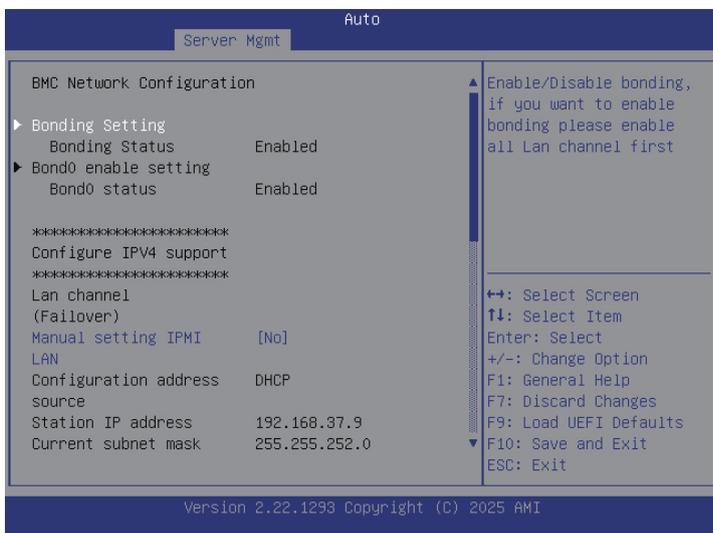
System Event Log

Press <Enter> to change the SEL event log configuration.

BMC Tools

Use this item to configure about KCS control, restore AC power loss and load BMC default settings.

3.4.1 BMC Network Configuration



Bonding Setting

Select this item to enable or disable bonding. Please enable all lan channel first when want to enable bonding.

Manual Setting IPMI LAN

If [No] is selected, the IP address is assigned by DHCP. If using a static IP address, toggle to [Yes], and the changes take effect after the system reboots. The default value is [No].

Configuration Address Source

Select to configure BMC network parameters statically or dynamically (by BIOS or BMC). Configuration options: [Static] and [DHCP].

Static: Manually enter the IP Address, Subnet Mask and Gateway Address in the BIOS for BMC LAN channel configuration.

DHCP: IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server.



The default login information for the IPMI web interface is:

Username: admin

Password: admin

For more instructions on how to set up remote control environment and use the IPMI management platform, please refer to the IPMI Configuration User Guide or go to the Support website at: <http://www.asrockrack.com/support/faq.asp>

VLAN

Enable or disable Virtual Local Area Network.

If [Enabled] is selected, configure the items below.

VLAN ID: Select this item to configure the VLAN ID setting, the Maximum value is 4094 and the Minimum value is 1.

VLAN Priority: Select this item to configure the VLAN Priority setting, the Maximum value is 7 and the Minimum value is 0.

IPV6 Support

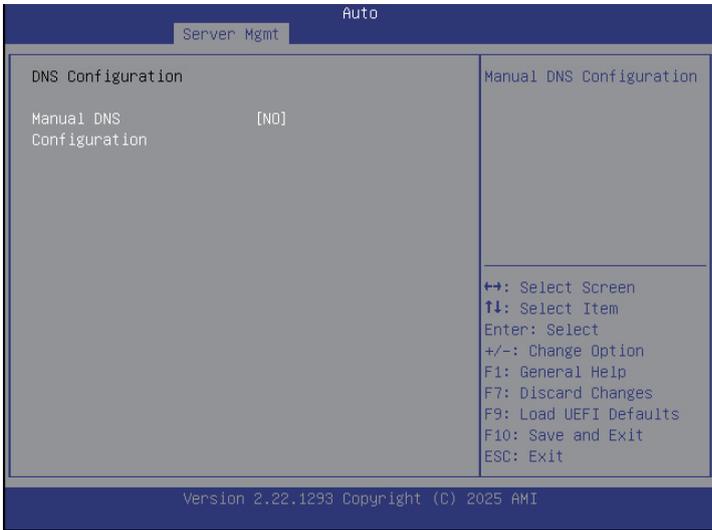
Enable or disable LAN IPV6 Support.

Manual Setting IPMI LAN(IPV6)

Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC).

Unspecified option will not modify any BMC network parameters during BIOS phase.

3.4.2 DNS Configuration



Manual DNS Configuration

Select this item to manual configure DNS.

If [YES] is selected, configure the items below.

DNS Service

Use this item to enable or disable DNS Service Configuration.

Host Name Settings

Use this item to automatic or manual Host Name Settings.

Bond Register BMC

Use this item to enable or disable Bond Register BMC.

Bond Register Method

Use this item to configure Bond Register Method with Nsupdate or DHCP client FQDN/Hostname.

Domain Setting

This item supports Manual, Bond0_v4 and Bond0_v6 Domain Settings.

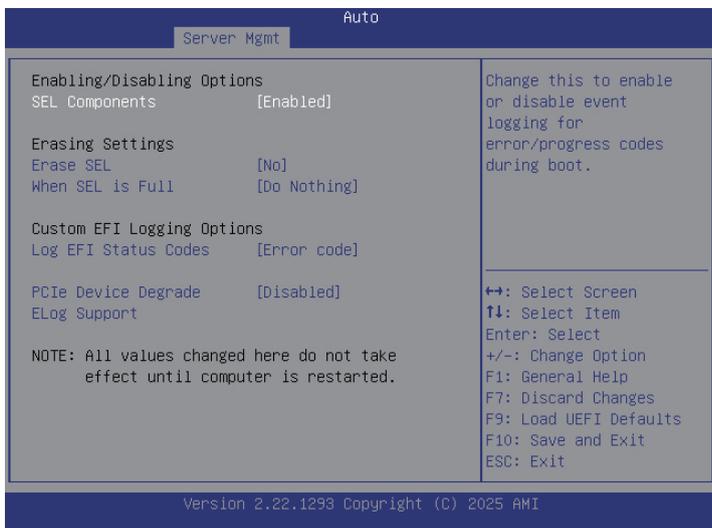
Domain Name Server Setting

This item supports Manual and Bond0 DNS Server Settings.

IP Priority

This item supports IPV4 and IPV6 IP Priority.

3.4.3 System Event Log



SEL Components

Change this to enable or disable event logging for error/progress codes during boot.

Erase SEL

Use this to choose options for erasing SEL.

When SEL is Full

Use this to choose options for reactions to a full SEL.

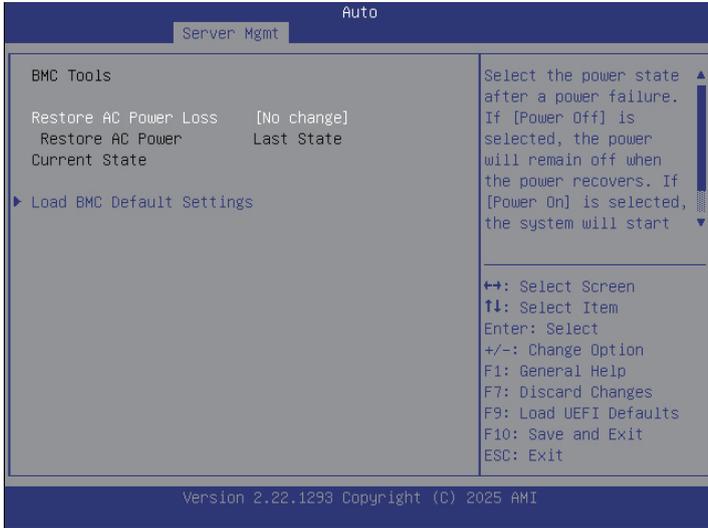
Log EFI Status Codes

Use this item to disable the logging of EFI Status Codes or log only error code or only progress code or both.

PCIe Device Degrade ELog Support

Use this item to enable or disable PCIe Device Degrade Error Logging Support.

3.4.4 BMC Tools



Restore AC Power Loss

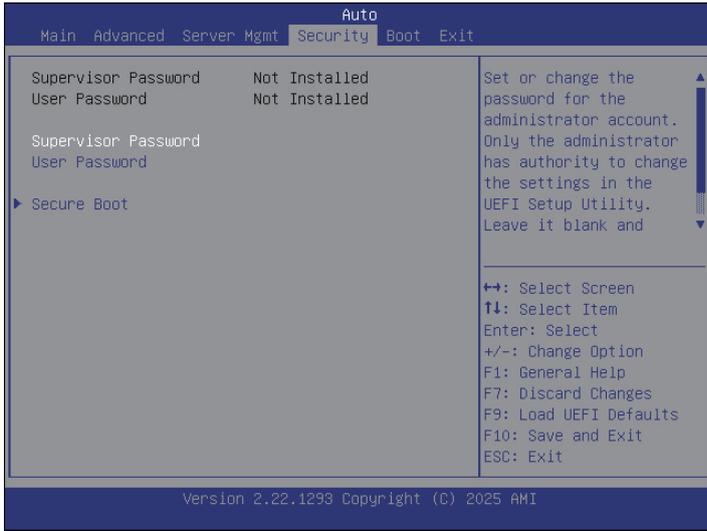
This allows user to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers. If [Last State] is selected, it will recover to the state before AC/power loss.

Load BMC Default Settings

Use this item to Load BMC Default Settings.

3.5 Security

This section allows user to set or change the supervisor/user password for the system. For the user password item is allowed user to 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

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset.

Secure Boot Mode

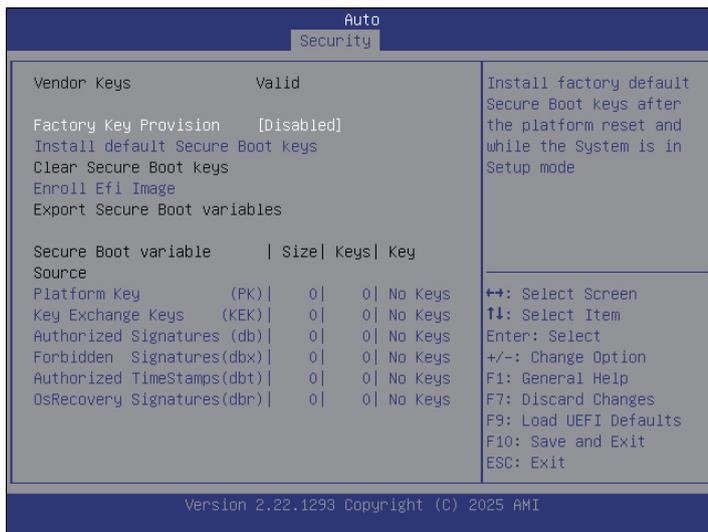
Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

Expert Key Management

Enables expert users to modify Secure Boot Policy variables without variable authentication.

3.5.1 Expert 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 to use secure boot.

Clear Secure Boot Keys

This 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

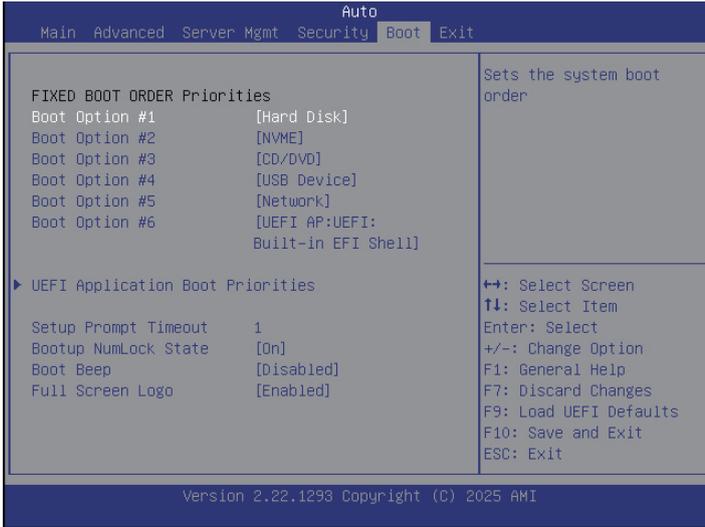
2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

3.6 Boot Screen

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



Boot Option #1/#2/#3/#4/#5/#6

Use this to set the system boot order.

UEFI Application Boot Priorities

Specifies the Boot Device Priority sequence from available UEFI Application.

Setup Prompt Timeout

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

Bootup NumLock State

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

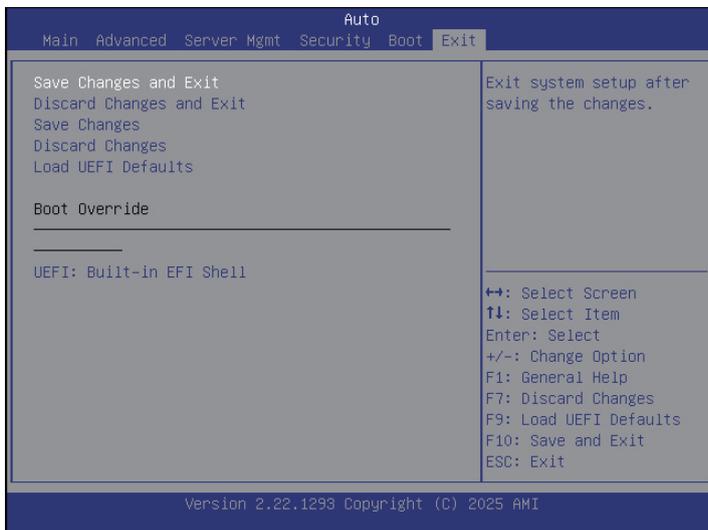
Boot Beep

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 message.

3.7 Exit Screen



Save Changes and Exit

When selecting 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 selecting 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 selecting this option, the following message “Save changes?” will pop-out. Select [Yes] to save all changes.

Discard Changes

When selecting this option, the following message “Discard changes?” will pop-out. Select [Yes] to discard all changes.

Load UEFI Defaults

Use this item to restore or load default values for all the setup options.

Chapter 4 Software Support

After all the hardware has been installed, it suggests to go to the official website at <http://www.ASRockRack.com> and make sure if there are any new updates of the BIOS / BMC firmware for the 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 the OS manufacturer. Please refer to the OS documentation for more instructions.

4.2 Download and Install Software Drivers

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

To download necessary drivers, go to the product page, click on the "Download" tab, choose the operating system that is used, and then download the using driver.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot the system.



Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries 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 DDR5 RDIMM, RDIMM-3DS.
3. Install more than one DIMM modules that 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 the power supply provides adequate and stable power.

Other problems...

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

5.2 Technical Support Procedures

If the problems are still unsolved, please contact ASRock Rack's technical support with the following information:

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

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 the invoice marked with the date of purchase is required. By calling the vendor or going to RMA website (<http://event.asrockrack.com/tsd.asp>) to 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 returning 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 the distributor first for any product related problems during the warranty period.

Contact Information

If it needs 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 contact the dealer for further information. For technical questions, please submit a support request form at <https://event.asrockrack.com/tsd.asp>

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