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STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

ROME2D32TM3

User Manual

English



Version 1.10

Published Dec. 2024

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- (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:

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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.



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Chapter 1 Introduction

Thank you for purchasing ASRock Rack **ROME2D32TM3** 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 ROME2D32TM3 Motherboard
(T-Shape Proprietary Form Factor: 18.8607" x 17.0149")
- Quick Installation Guide
- 2 x Screws for M.2 Sockets



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

1.2 Specifications

ROME2D32TM3	
Physical Status	
Form Factor	Proprietary T-shape
Dimension (W*D)	18.8607" x 17.0149"
Processor System	
Supported CPU	Support AMD EPYC™ 7003 and 7002 Series Processors
Socket	1+1 Socket SP3 (LGA 4094)
Max. Thermal Design Power (TDP)	280 W
Chipset	System on chip
System Memory	
Memory channels per CPU	8+8 channels
Supported DIMM Q'ty	16+16 DIMM slots (2DPC)
Supported Type	288-pin DDR4 RDIMM, LRDIMM, RDIMM/LRDIMM-3DS, NVDIMM-N
Max. Frequency	3200 MT/s
Max. Capacity per DIMM	RDIMM:64GB, LRDIMM:128GB, RDIMM/LRDIMM-3DS: 256GB, NVDIMM-N: 32GB
Voltage	1.2V
Note:	Max. memory capacity and frequency are to be validated
PCIe Expansion Slots	
Slot 3	Gen Z 8C (PCIe4.0 x32) [CPU1]
Slot 2	Gen Z 8C (PCIe4.0 x32) [CPU2]
Slot 1	Gen Z 4C+ (PCIe4.0 x16) [CPU2]
Other PCIe Expansion Connectors	
M.2	1 M-key (PCIe4.0 x4 or SATA 6Gb/s); support 2280/2260/2242/2230 form factor [CPU1] 1 M-key (PCIe4.0 x2 or SATA 6Gb/s); support 2280/2242 form factor [CPU1]
SlimSAS	1 SlimSAS (PCIe4.0x8) [CPU1] 1 SlimSAS (PCIe4.0x8 or 8 SATA 6Gb/s) [CPU1] 4 SlimSAS (PCIe4.0x8) [CPU2]
Note:	SLIM2 support PCIe only while installing 2 processors
SATA/SAS Storage	
SATA	AMD EPYC 7003/7002 (8 SATA 6Gb/s): 1 Mini-SAS HD, 1 SATA 7-pin, 1 SATA DOM, 2 M.2

Networking	
Additional Ethernet Controller	1 Intel®i350-AM2: 2 RJ45 (1GbE)
Mezzanine Slot	OCP NIC 3.0 (PCIe4.0 x16) [CPU1]
USB	
Connectors/ headers	External: 2 Type A (USB3.2 Gen1) Internal: 1 via vertical Type A (USB3.2 Gen1)
Graphics	
Controller	ASPEED AST2500: 1 DB15
Serial	
COM	1 RJ45
Security	
TPM	13-pin header (SPI)
Rear I/O	
Button	1 UID
Video	1 DB15 (VGA)
Serial port	1 RJ45 (COM)
USB	2 Type A (USB3.2 Gen1)
RJ45	2 RJ45(1GbE), 1 dedicated IPMI
Note:	USB will only function when CPU1 is populated
System Monitoring	
Temperature	CPU, PCH, MB, Card side Temperature Sensing
Fan	CPU/Rear/Front Fan Tachometer CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) CPU/Rear/Front Fan Multi-Speed Control
Voltage	CPU1_PVCCIN, CPU2_PVCCIN, PVDDQ_ ABCD, PVDDQ_ EFGH, PVDDQ_ IJKL, PVDDQ_ MNOP, 1.05V_PCH, 1.8V_PCH, +BAT, PVNN_PCH, 3.3V, 5V, 12V, 3.3VSB, 5VSB
Server Management	
Controller	ASPEED AST2500: IPMI2.0 with iKVM and vMedia support
BIOS	
BIOS type	AMI 256 Mb SPI Flash ROM
Features	ASRock Rack Instant Flash, ACPI 5.0, SMBIOS 2.3, Plug and Play (PnP)

Other Internal headers	
PSU connector	2 (CRPS IN +12V/+12VSB, max. 2700W)
Other power connector	3 (2x2 pin, 12V) for PCIE cards, 1 (2x2 pin, 12V,5V) for HDD, 1 (3-pin) for SATA DOM, 1 (2x2 pin, 12V) for HSBP, 1 (2x6 pin, 12V) for HSBP
Auxiliary panel	1 (26-pin): system fault LED, locate, SMBus
SGPIO	2
VGA	1
NMI button	1
Fan	6 (2x3-pin) for 2U system, 8 (2x4pin) for 1U system
TPM	1 (13-pin,SPI), 1(17-pin, LPC)
IPMB	1
HSBP	1
SMbus	3
Clear CMOS	1 (contact pads)
LED Indicators	
BMC Heartbeat LED	1
StandbyPower LED	1
FanFail LED	8
80 debug port LED (2 digit)	1
System BIOS	
BIOS Type	256Mb AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP) - ACPI 2.0 Compliance Wake Up Events - SMBIOS 2.8 Support - ASRock Rack Instant Flash
Support OS	
OS	Microsoft® Windows*: - Server 2016 (64 bit) - Server 2019 (64 bit) - Server 2022 (64 bit) Linux*: - RedHat Enterprise Linux Server 8.3 (64 bit) / 8.4 (64 bit) - CentOS 8.3 (64 bit) / 8.4 (64 bit) - SUSE SLES 12.5 (64 bit) / 15.2 (64 bit) - Ubuntu 18.04.5 (64 bit) Hypervisor: - VMWare® ESXi 6.7.0 u3 / vSphere 6.7.0 u3 - VMWare® ESXi 7.0 U1 / vSphere 7.0 U1 - VMWare® ESXi 7.0U2a / vSphere 7.0U2b - CITRIX Hypervisor 8.2.0 <i>*Please refer to our website for the latest OS support list.</i>

Operating Enviroment	
Temperature	Operation temperature: 10°C ~ 35°C Non operation temperature: -40°C ~ 70°C

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.

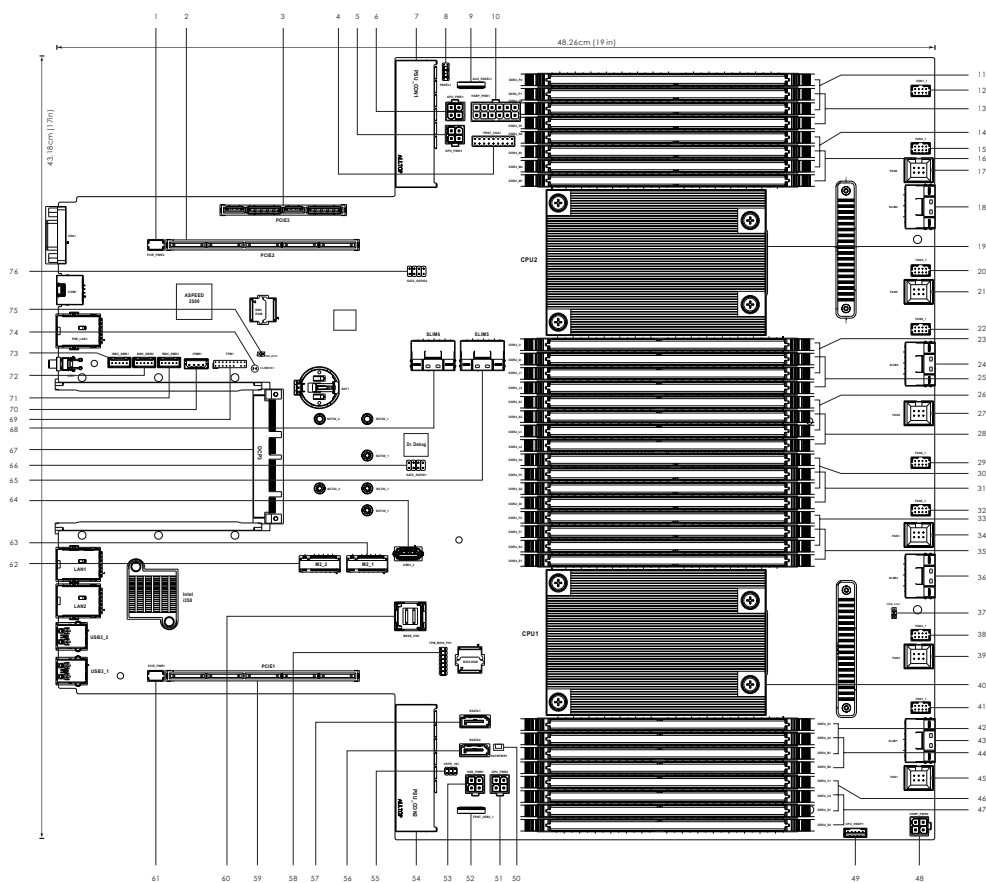


If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

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.

1.4 Motherboard Layout



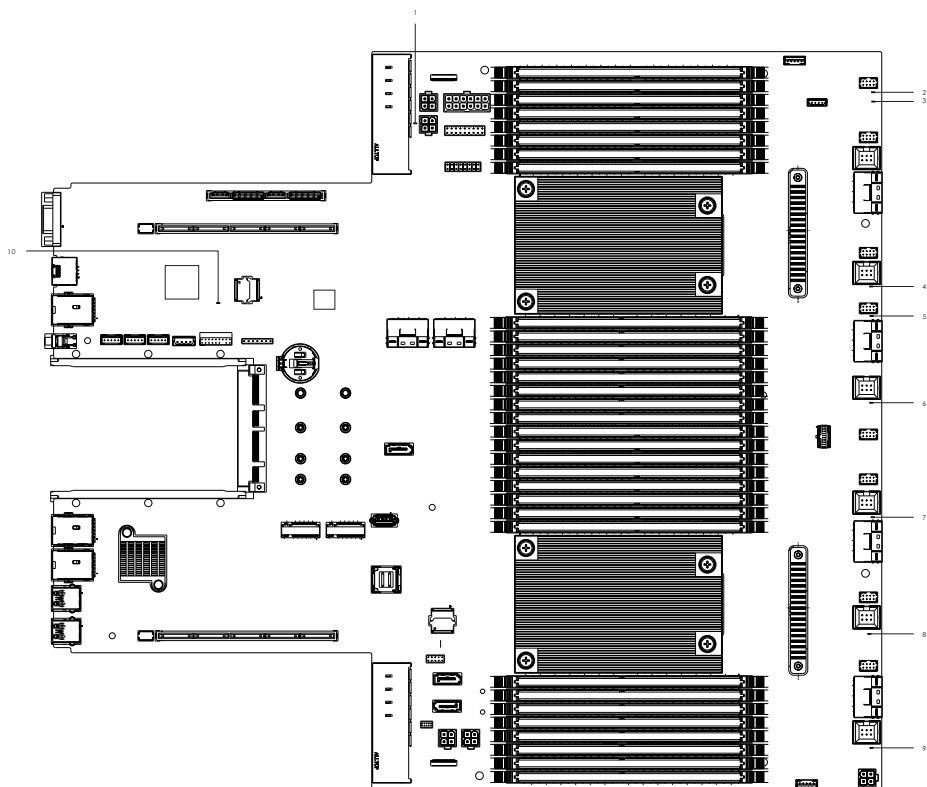
No.	Description
1	PCIE Power Connector (PCIE_PWR2)
2	PCIE 4.0 x32 Slot (PCIE2)
3	PCIE 4.0 x16 Slot (PCIE3)
4	Front VGA Header (FRONT_VGA1)
5	GPU Power Connector (GPU_PWR3)
6	GPU Power Connector (GPU_PWR1)
7	Power Supply Unit Connector (PSU_CON1)
8	System Panel Header (PANEL1)
9	Auxiliary Panel Header (AUX_PANEL1)
10	HDD Backplane Power Connector (HSBP_PWR1)
11	2 x 288-pin DDR4 DIMM Slots (DDR4_O2, DDR4_P2)*
12	System Fan Connector (FAN7_1) <i>(for 1U system)</i>
13	2 x 288-pin DDR4 DIMM Slots (DDR4_O1, DDR4_P1)*
14	2 x 288-pin DDR4 DIMM Slots (DDR4_M2, DDR4_N2)*
15	System Fan Connector (FAN6_1) <i>(for 1U system)</i>
16	2 x 288-pin DDR4 DIMM Slots (DDR4_M1, DDR4_N1)*
17	System Fan Connector (FAN6) <i>(for 2U system)</i>
18	Slimline x8 Connector (SLIM4)
19	AMD Socket SP3 (LGA 4094) (CPU2)
20	System Fan Connector (FAN5_1) <i>(for 1U system)</i>
21	System Fan Connector (FAN5) <i>(for 2U system)</i>
22	System Fan Connector (FAN8_1) <i>(for 1U system)</i>
23	2 x 288-pin DDR4 DIMM Slots (DDR4_I1, DDR4_J1)*
24	Slimline x8 Connector (SLIM3)
25	2 x 288-pin DDR4 DIMM Slots (DDR4_I2, DDR4_J2)*
26	2 x 288-pin DDR4 DIMM Slots (DDR4_K1, DDR4_L1)*
27	System Fan Connector (FAN4) <i>(for 2U system)</i>
28	2 x 288-pin DDR4 DIMM Slots (DDR4_K2, DDR4_L2)*
29	System Fan Connector (FAN4_1) <i>(for 1U system)</i>
30	2 x 288-pin DDR4 DIMM Slots (DDR4_G2, DDR4_H2)*
31	2 x 288-pin DDR4 DIMM Slots (DDR4_G1, DDR4_H1)*
32	System Fan Connector (FAN3_1) <i>(for 1U system)</i>
33	2 x 288-pin DDR4 DIMM Slots (DDR4_E2, DDR4_F2)*

No.	Description
34	System Fan Connector (FAN3) <i>(for 2U system)</i>
35	2 x 288-pin DDR4 DIMM Slots (DDR4_E2, DDR4_F2)*
36	Slimline x8 Connector (SLIM2)
37	PWM Configuration Header (PWM_CFG1)
38	System Fan Connector (FAN2_1) <i>(for 1U system)</i>
39	System Fan Connector (FAN2) <i>(for 2U system)</i>
40	AMD Socket SP3 (LGA 4094) (CPU1)
41	System Fan Connector (FAN1_1) <i>(for 1U system)</i>
42	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1)*
43	Slimline x8 Connector (SLIM1)
44	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2)*
45	System Fan Connector (FAN1) <i>(for 2U system)</i>
46	2 x 288-pin DDR4 DIMM Slots (DDR4_C1, DDR4_D1)*
47	2 x 288-pin DDR4 DIMM Slots (DDR4_C2, DDR4_D2)*
48	HDD Backplane Power Connector (HSBP_PWR2)
49	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
50	SATA DOM Power Connector (SATAPWR1)
51	GPU Power Connector (GPU_PWR2)
52	Front USB 3.2 Gen1 Header (FRNT_USB3_1)
53	HDD Power Connector (HDD_PWR1)
54	Power Supply Unit Connector (PSU_CON2)
55	PDB Power Connector (CRPS_IN1)
56	SATA DOM Connector (SSATA0)
57	SATA Connector (SSATA1)
58	TPM-SPI Header (TPM_BIOS_PH1)
59	PCIe 4.0 x32 Slot (PCIe1)
60	MiniSAS HD Connector (MSAS_HD0)
61	PCIe Power Connector (PCIe_PWR1)
62	M.2 Socket (M2_2) (Type 2242/2280)
63	M.2 Socket (M2_1) (Type 2230/2242/2260/2280)
64	Vertical Type A USB 3.2 Gen1 Connector (USB3_3)
65	Slimline x8 Connector (SLIM5)
66	SATA SGPIO Connector (SATA_SGPIO1)
67	OCP 3.0 Gen4 x16 Mezzanine Card Slot (OCP3)

No.	Description
68	Slimline x8 Connector (SLIM6)
69	TPM Header (TPM1)
70	Intelligent Platform Management Bus Header (IPMB1)
71	BMC SMBus Header (BMC_SMB3)
72	BMC SMBus Header (BMC_SMB2)
73	BMC SMBus Header (BMC_SMB1)
74	Clear CMOS Pad (CLRMOS1)
75	Non Maskable Interrupt Button (NMI_BTN1)
76	SATA SGPIO Connector (SATA_SGPIO2)

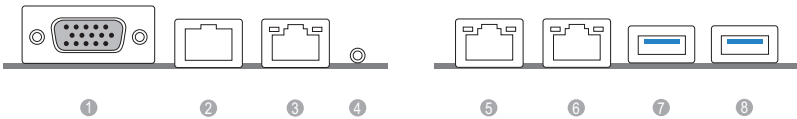
* For DIMM installation and configuration instructions, please see p.20 (Installation of Memory Modules (DIMM)) for more details.

1.5 Onboard LED Indicators



No.	Item	Status	Description
1	SB_PWR1	Green	STB PWR ready
2	FAN_LED7	Red	FAN7_1 failed
3	FAN_LED6	Red	FAN6_1 failed
4	FAN_LED5	Red	FAN5_1failed
5	FAN_LED8	Red	FAN8_1 failed
6	FAN_LED4	Red	FAN4_1 failed
7	FAN_LED3	Red	FAN3_1 failed
8	FAN_LED2	Red	FAN2_1 failed
9	FAN_LED1	Red	FAN1_1 failed
10	BMC_LED1	Green	BMC heartbeat LED

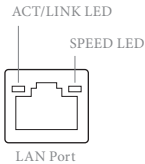
1.6 I/O Panel



No.	Description	No.	Description
1	VGA Header (VGA1)	5	1G LAN RJ-45 Port (LAN1)**
2	Serial Port (RJ45) (COM1)	6	1G LAN RJ-45 Port (LAN2)**
3	IPMI LAN Header (IPMI_LAN1)*	7	USB 3.2 Gen1 Port (USB3_2)
4	UID Switch (UID)	8	USB 3.2 Gen1 Port (USB3_1)

LAN Port LED Indications

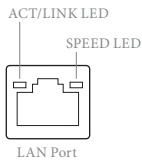
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



Dedicated IPMI LAN Port LED Indications

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

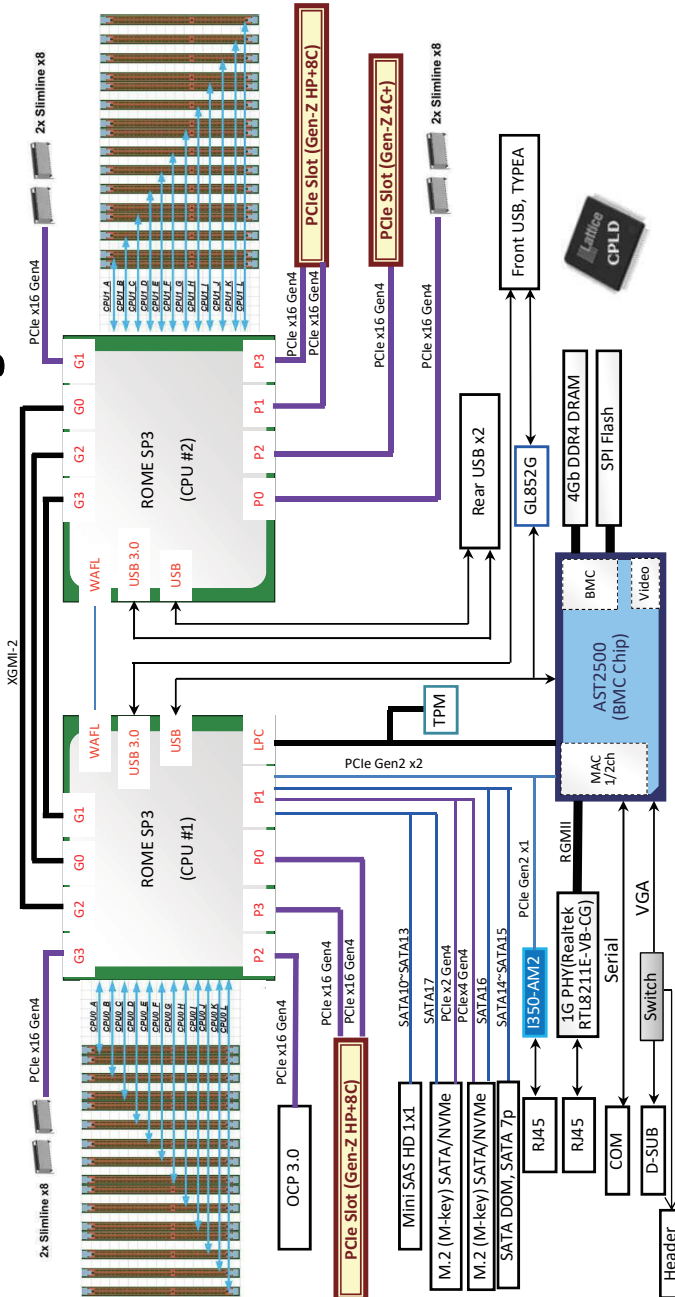
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



1G LAN Port (LAN1, LAN2) LED Indications

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

ROME2D32TM3 MB Block Diagram



Chapter 2 Installation

This is a T-Shape Proprietary form factor (17" x 19", 43.18 cm x 48.26 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.

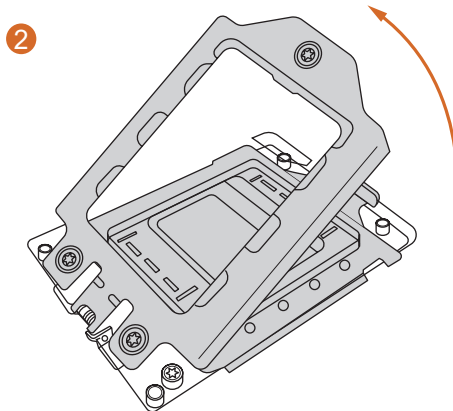
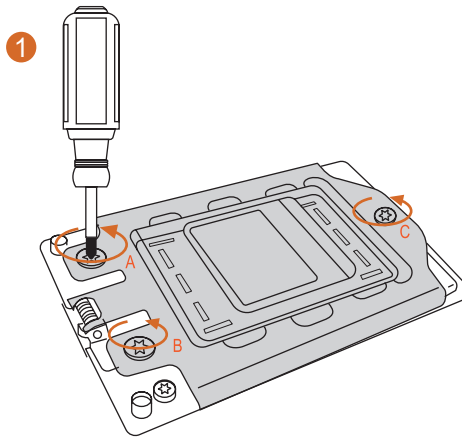


Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

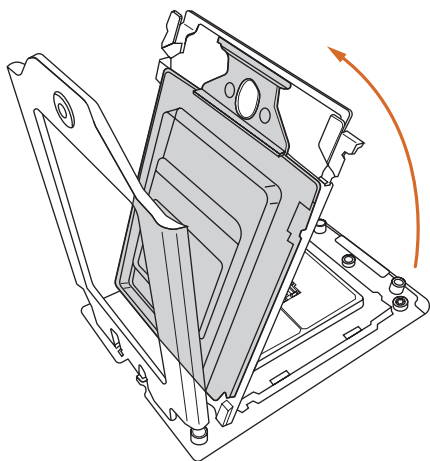
2.3 Installing the CPU



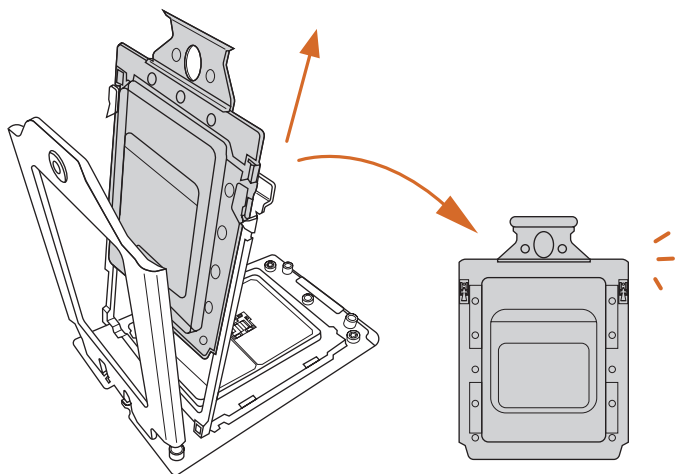
1. Before you insert the CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all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

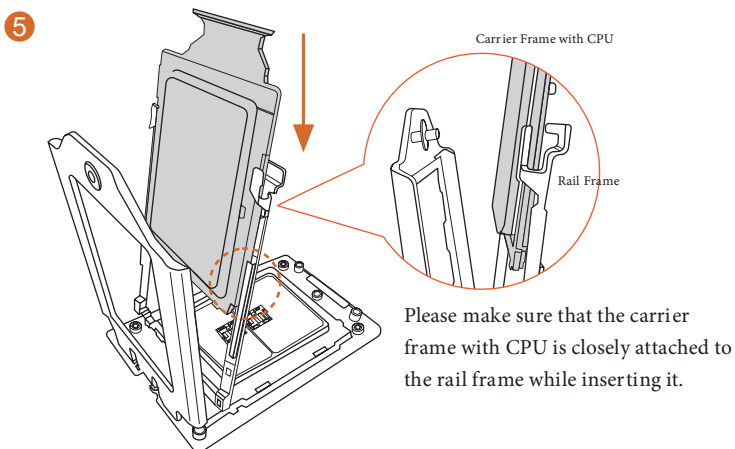


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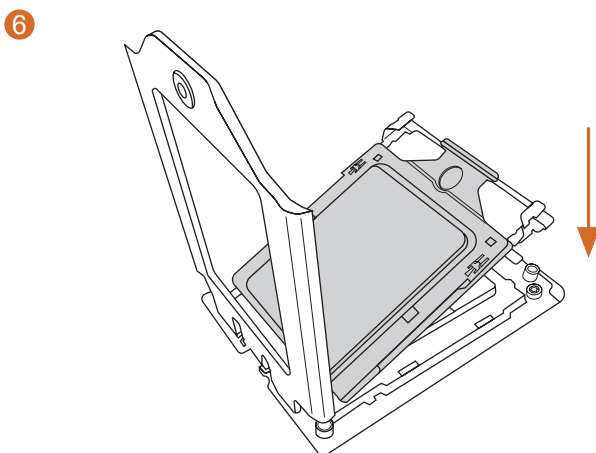


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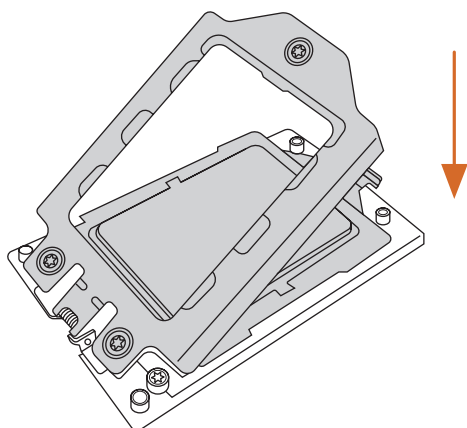




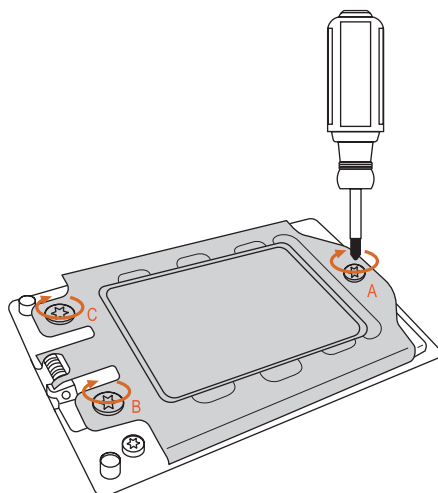
Install the carrier frame with CPU. Don't separate them.



7



8



2.4 Installation of Memory Modules (DIMM)

This motherboard provides thirty-two 288-pin DDR4 (Double Data Rate 4) DIMM slots in two groups, and supports Eight Channel Memory Technology.

CPU1	CPU2
DDR4_A1, B1, C1, D1, E1, F1, G1, H1	DDR4_I1, J1, K1, L1, M1, N1, O1, P1
DDR4_A2, B2, C2, D2, E2, F2, G2, H2	DDR4_I2, J2, K2, L2, M2, N2, O2, P2



1. For Eight channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM groups.
2. Eight Channel Memory Technology is enabled only when 8 or 16 memory modules are installed.
3. It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and DIMM may be damaged.

2.4.1 DIMM Population for DDR4

Recommended Memory Configurations

1 CPU Configurations

		DIMM(S)								
		1	2	3	4	5	6	7	8	16
CPU1	A1									#
	A2	#	#	#	#	#	#	#	#	#
	B1									#
	B2		#	#	#	#	#	#	#	#
	C1									#
	C2			#	#	#	#	#	#	#
	D1									#
	D2				#	#	#	#	#	#
	E1									#
	E2					#	#	#	#	#
	F1									#
	F2						#	#	#	#
	G1									#
	G2							#	#	#
	H1									#
	H2								#	#

The symbol # indicates the slot is populated.

2 CPU Configurations

		DIMM(S)										
		1	2	3	4	5	6	7	8	16	32	
CPU1	A1											#
	A2	#	#	#	#	#	#	#	#	#	#	#
	B1											#
	B2			#	#	#	#	#	#	#	#	#
	C1											#
	C2					#	#	#	#	#	#	#
	D1											#
	D2							#	#	#	#	#
	E1											#
	E2									#	#	#
	F1											#
	F2									#	#	#
	G1											#
	G2									#	#	#
	H1											#
	H2									#	#	#
CPU2	I1											#
	I2		#	#	#	#	#	#	#	#	#	#
	J1											#
	J2				#	#	#	#	#	#	#	#
	K1											#
	K2						#	#	#	#	#	#
	L1											#
	L2								#	#	#	#
	M1											#
	M2									#	#	#
	N1											#
	N2									#	#	#
	O1											#
	O2									#	#	#
	P1											#
	P2									#	#	#

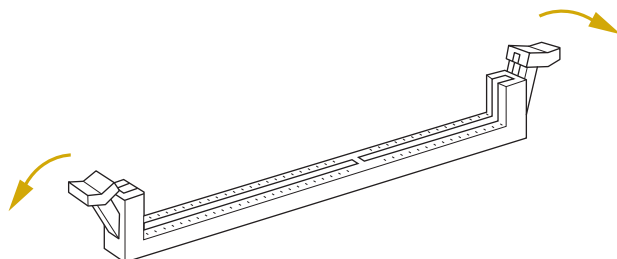
The symbol # indicates the slot is populated.

2.4.2 DIMM Population for NVDIMM-N

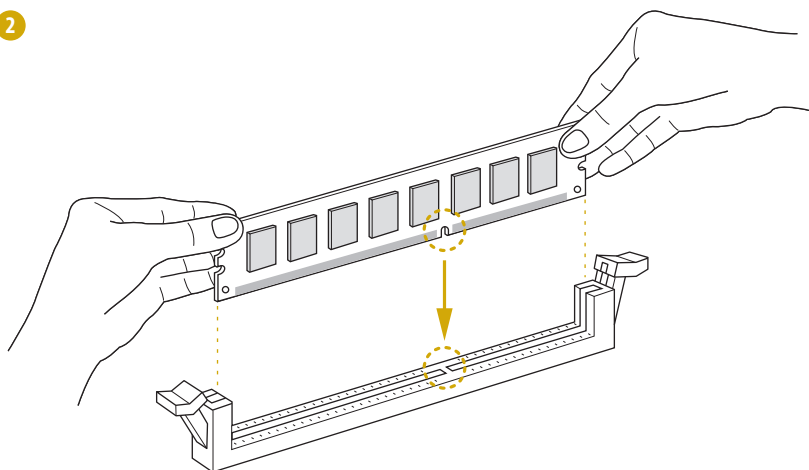
The followings are the NVDIMM population rules.

- BIOS version 1.0.0.0 is required for NVDIMM-N enablement.
- NVDIMMs can occupy a channel exclusively or share a channel with a standard DDR4 DIMM.
- If sharing a channel, the NVDIMM module type must be the same as the DDR DIMM base module type and have the same DRAM width (x4 or x8, for example). This channel cannot be interleaved.
- There must be at least one standard DIMM in the system. A system with 100% NVDIMMs is not supported.
- RDIMM must be in lowest-numbered UMC.

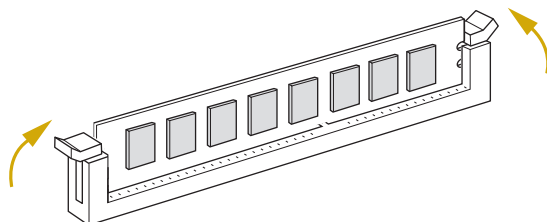
1



2



3



2.5 Expansion Slots (PCI Express Slots)

There are 3 PCI Express slots on this motherboard.

PCIe slot:

PCIe1 (PCIe 4.0 Gen Z 8C x32 slot, from CPU1) is used for PCI Express x32 lane width cards.

PCIe2 (PCIe 4.0 Gen Z 8C x32 slot, from CPU2) is used for PCI Express x32 lane width cards.

PCIe3 (PCIe 4.0 Gen Z 4C+ 8C x16 slot, from CPU2) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIe1	4.0 Gen Z 8C	x32	x32	CPU1
PCIe2	4.0 Gen Z 8C	x32	x32	CPU2
PCIe3	4.0 Gen Z 4C+ 8C	x16	x16	CPU2

Installing an expansion card

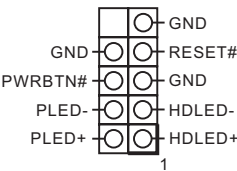
- Step 1. Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit 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.

2.6 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.7, No. 8)



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, reset 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.

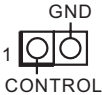
Auxiliary Panel Header
(18-pin AUX_PANEL1)
(see p.7, No. 9)



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

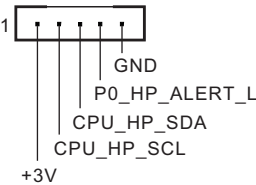
AUX_PANEL1	
PIN	NET
1	+3VSB
2	+3VSB
3	N/A
4	LOCATORLED+
5	PLED-
6	LOCATORLED-
7	+3V
8	System Fault LED-
9	System Fault LED+
10	HDLED-
11	PWRBTN#
12	LED PWR
13	GND
14	LAN1 LINK
15	RESET#
16	SMB DATA
17	SMB CLK
18	GND
19	LOCATORBTN#
20	N/A
21	N/A
22	N/A
23	LED PWR
24	LAN2 LINK
25	GND
26	GND

Non Maskable Interrupt
Button Header
(2-pin NMI_BTN1)
(see p.7, No. 58)



Please connect a NMI device to this header.

Backplane PCI Express
Hot-Plug Connector
(5-pin CPU1_HSBP1)
(see p.7, No. 49)



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

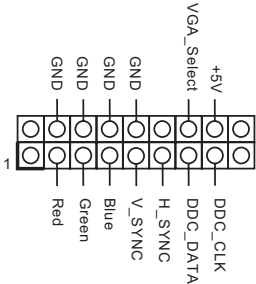
Front USB 3.2 Gen1
Header
(19-pin FRNT_USB3_1)
(see p.7, No. 52)



FRNT_USB3_1	
PIN	NET
1	Vbus
2	Vbus
3	Vbus
4	Vbus
5	Vbus
6	Vbus
7	GND
8	GND
9	GND
10	GND
11	GND
12	GND
13	GND
14	GND
15	INTA PA SSRX-
16	INTA PA SSRX+
17	GND
18	INTA PA SSTX-
19	INTA PA SSTX+
20	GND
21	IntA PA D-
22	IntA PA D+
23	GND
24	IntA PB D-
25	IntA PB D+
26	GND

Besides three 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 one USB 3.2 Gen1 port and one USB 2.0 port.

Front VGA Header
(17-pin VGA1)
(see p.7, No. 4)



Please connect either end of VGA cable to VGA header.

System Fan Connectors

(for 2U system)

(6-pin FAN1)

(see p.7, No. 45)

(6-pin FAN2)

(see p.7, No. 39)

(6-pin FAN3)

(see p.7, No. 34)

(6-pin FAN4)

(see p.7, No. 27)

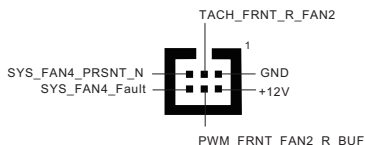
(6-pin FAN5)

(see p.7, No. 21)

(6-pin FAN6)

(see p.7, No. 17)

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



System Fan Connectors

(for 1U system)

(6-pin FAN1_1)

(see p.7, No. 41)

(6-pin FAN2_1)

(see p.7, No. 38)

(6-pin FAN3_1)

(see p.7, No. 32)

(6-pin FAN4_1)

(see p.7, No. 29)

(6-pin FAN5_1)

(see p.7, No. 20)

(6-pin FAN6_1)

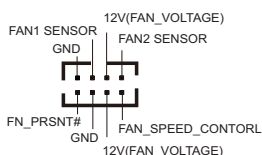
(see p.7, No. 15)

(6-pin FAN7_1)

(see p.7, No. 12)

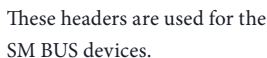
(6-pin FAN8_1)

(see p.7, No. 22)



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

(see p.7, No. 71)

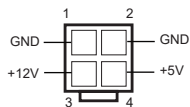


This connector supports SPI Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

This connector supports 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.

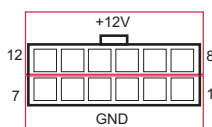
This motherboard provides three GPU power connectors.

SATA Power Connector
(4-pin HDD_PWR1)
(see p.7, No. 53)



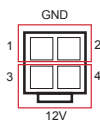
Please use a SATA power cable to connect this SATA Power Connector and your SATA HDD for supplying power from the motherboard, when using DC-IN mode without SATA power supply.

Backplane Power Connector
(12-pin HSBP_PWR1)
(see p.7, No. 10)

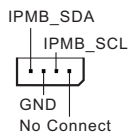


Please connect a 12-pin power cable to this connector to connect a HDD.

(4-pin HSBP_PWR2)
(see p.7, No. 48)

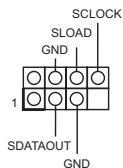


Intelligent Platform Management Bus header
(4-pin IPMB1)
(see p.7, No. 70)



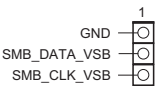
This 4-pin connector is used to provide a cabled baseboard or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.

Serial General Purpose Input/Output Headers
(7-pin SATA_SGPIO1)
(see p.7, No. 66)
(7-pin SATA_SGPIO2)
(see p.7, No. 76)



This header supports Serial Link interface for onboard SATA connections.

PWM Configuration
Header
(3-pin PWM_CFG1)
(see p.7, No. 37)



This header is used for PWM configurations.

USB 3.2 Gen1 Connector
(USB3_3)
(see p.7, No. 64)

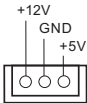


Mini SAS HD Connector
(MSAS_HD0)
(see p.7, No. 60)



The Mini SAS HD connector supports SAS/SATA data cables for internal storage devices. The current SAS3/ SATA3 interface allows up to 12.0 Gb/s data transfer rate. For connecting SAS HDDs, please contact SAS data cable dealers.

SATA DOM Power
Connectors
(3-pin SATAPWR1)
(see p.7, No. 50)



Please connect the power cable on the SATA DOM to the connector.

Serial ATA3 DOM
Connector
(SSATA0)
(see p.7, No. 56)



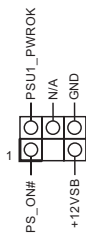
The SATA3 DOM connector supports both a SATA DOM (Disk-On-Module) and a SATA data cable for internal storage device.

Serial ATA3 Connectors
(SSATA0)
(see p.7, No. 56)
(SSATA1)
(see p.7, No. 57)



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

PDB Power Connector
(5-pin CRPS_IN1)
(see p.7, No. 55)



When a power distribution board is needed, use a power cable to connect this connector and the PDB for power supply.

Clear CMOS Pad
(CLRCMOS1)
(see p.7, No. 74)



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

Slimline SAS Connectors

Right-Angle:

(SLIM1)

(see p.7, No. 43)

(SLIM2)

(see p.7, No. 36)

(SLIM3)

(see p.7, No. 24)

(SLIM4)

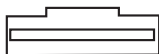
(see p.7, No. 18)

(SLIM5)

(see p.7, No. 65)

(SLIM6)

(see p.7, No. 68)



These connectors are used for the NVME PCIE devices.

A1	77 79 75	B1
A2		B2
A3		B3
A4		B4
A5		B5
A6		B6
A7		B7
A8		B8
A9		B9
A10		B10
A11		B11
A12		B12
A13		B13
A14		B14
A15		B15
A16		B16
A17		B17
A18		B18
A19		B19
A20		B20
A21		B21
A22		B22
A23		B23
A24		B24
A25		B25
A26		B26
A27		B27
A28		B28
A29		B29
A30		B30
A31		B31
A32		B32
A33		B33
A34		B34
A35		B35
A36		B36
A37	78 80 76	B37

80-pin

Pin	Definition	Pin	Definition
A1	GND_1	B1	GND_12
A2	RX_0+	B2	TX_0+
A3	RX_0-	B3	TX_0-
A4	GND_2	B4	GND_13
A5	RX_1+	B5	TX_1+
A6	RX_1-	B6	TX_1-
A7	GND_3	B7	GND_14
A8	SIDEBAND_7A	B8	SIDEBAND_0A
A9	SIDEBAND_4A	B9	SIDEBAND_1A
A10	GND	B10	GND
A11	SIDEBAND_A+	B11	SIDEBAND_5A
A12	SIDEBAND_A-	B12	SIDEBAND_6A
A13	GND_4	B13	GND_15
A14	RX_2+	B14	TX_2+
A15	RX_2-	B15	TX_2-
A16	GND_5	B16	GND_16
A17	RX_3+	B17	TX_3+
A18	RX_3-	B18	TX_3-
A19	GND_6	B19	GND_17
A20	RX_4+	B20	TX_4+
A21	RX_4-	B21	TX_4-
A22	GND_7	B22	GND_18
A23	RX_5+	B23	TX_5+
A24	RX_5-	B24	TX_5-
A25	GND_8	B25	GND_19
A26	SIDEBAND_7B	B26	SIDEBAND_0B
A27	SIDEBAND_4B	B27	SIDEBAND_1B
A28	GND	B28	GND
A29	SIDEBAND_B+	B29	SIDEBAND_5B
A30	SIDEBAND_B-	B30	SIDEBAND_6B
A31	GND_9	B31	GND_20
A32	RX_6+	B32	TX_6+
A33	RX_6-	B33	TX_6-
A34	GND_10	B34	GND_21
A35	RX_7+	B35	TX_7+
A36	RX_7-	B36	TX_7-
A37	GND_11	B37	GND_32
75	NP_NC_1	78	P_GND_3
76	NP_NC_2	79	P_GND_2
77	P_GND_1	80	P_GND_4

2.7 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

2.8 Identification purpose LED/Switch

With the UID button, You are able to locate the server you're working on from behind a rack of servers.

Unit Identification
purpose LED/Switch
(UID1)

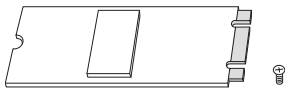


When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be truned on. Press the UID button again to turn off the indicator.

2.9 M.2 SSD Module Installation Guide (M2_1)

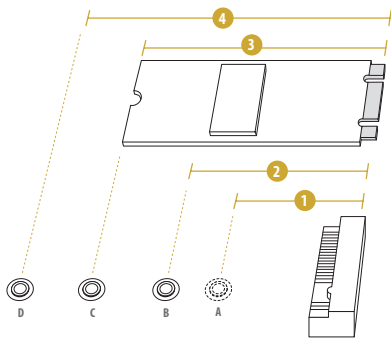
The Ultra M.2 Socket (M2_1, Key M) supports type 2242/2280 M.2 PCI Express module up to Gen4 x4 (64Gb/s).

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	3	4
Nut Location	A	B	C	D
PCB Length	3cm	4.2cm	6cm	8cm
Module Type	Type 2230	Type 2242	Type 2260	Type 2280



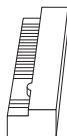
Step 3



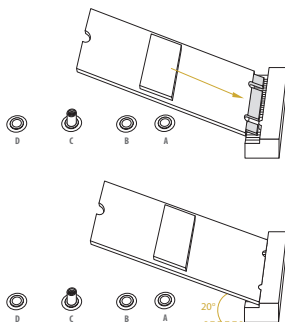
Move the standoff based on the module type and length. The standoff is placed at the nut location D by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.



Step 4

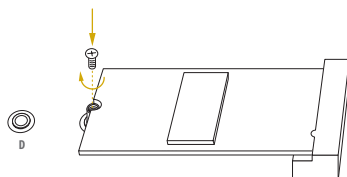


Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.



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.

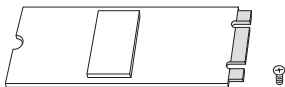
2.10 M.2 SSD Module Installation Guide (M2_2)

The M.2 Socket (M2_2, Key M) supports type 2242/2280 M.2 PCI Express module up to Gen4 x2 (32Gb/s).

Installing the M.2 SSD Module

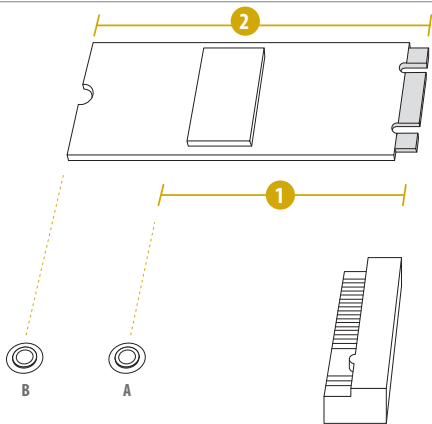
Step 1

Prepare a M.2_SSD (NGFF) module and the screw.

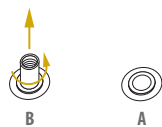


Step 2

Depending on the PCB type and length of your M.2_SSD (NGFF) 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

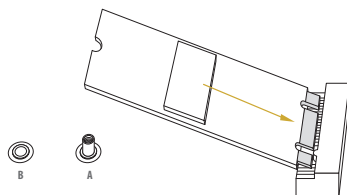
**Step 3**

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.

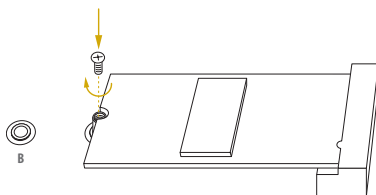
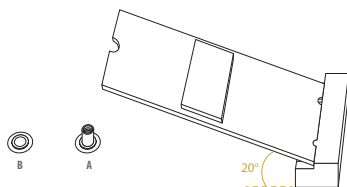
Otherwise, release the standoff by hand.

**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
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
Event Logs	For event log configuration
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.

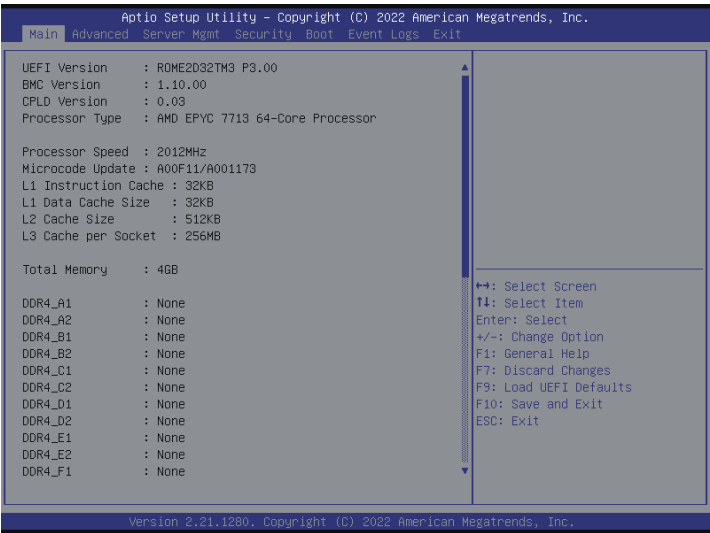
3.1.2 Navigation Keys

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

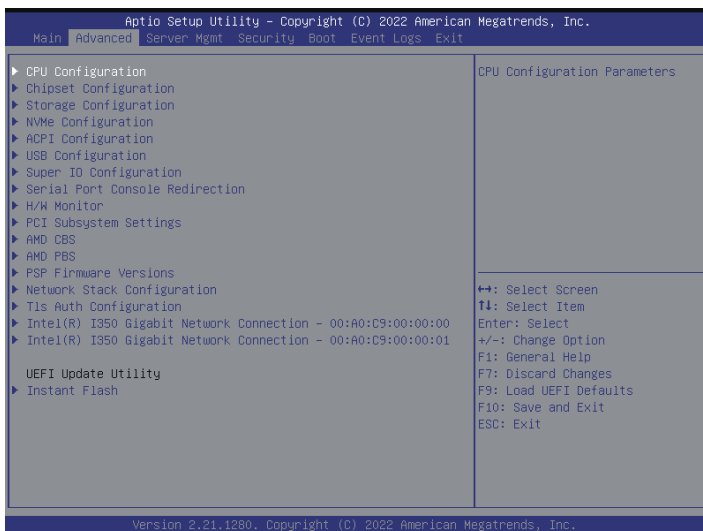
3.2 Main Screen

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.



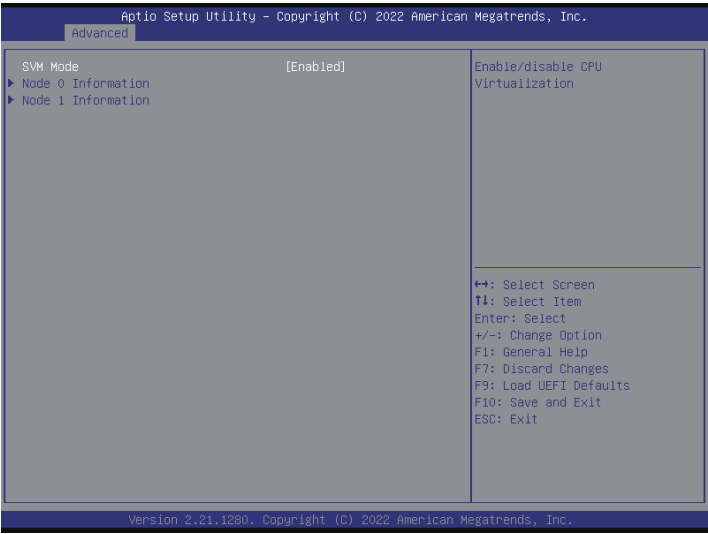
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, NVMe Configuration, ACPI Configuration, USB Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, PCI Subsystem Settings, AMD CBS, AMD PBS, PSP Firmware Versions, Network Stack Configuration, Tls Auth Configuration, and Instant Flash.



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

3.3.1 CPU Configuration



SVM Mode

Enable or disable CPU Virtualization.

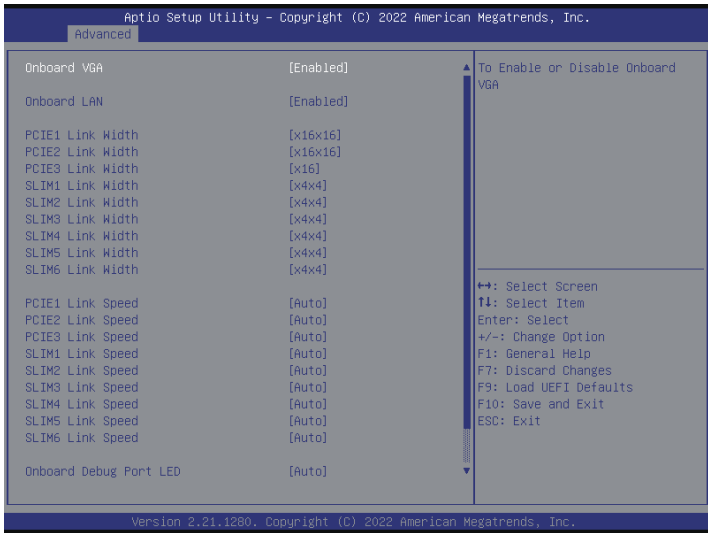
Node 0 Information

View Memory Information related to Node 0.

Node 1 Information

View Memory Information related to Node 1.

3.3.2 Chipset Configuration



Onboard VGA

Use this to enable or disable the Onboard VGA function. The default value is [Enabled].

Onboard LAN

Use this to enable or disable the onboard LAN. The default value is [Enabled].

PCIE1 Link Width

This allows you to select PCIE1 Link Width. The default value is [x16x16].

PCIE2 Link Width

This allows you to select PCIE2 Link Width. The default value is [x16x16].

PCIE3 Link Width

This allows you to select PCIE3 Link Width. The default value is [x16].

SLIM1 Link Width

This allows you to select SLIM1 Link Width. The default value is [x4x4].

SLIM2 Link Width

This allows you to select SLIM2 Link Width. The default value is [x4x4].

SLIM3 Link Width

This allows you to select SLIM3 Link Width. The default value is [x4x4].

SLIM4 Link Width

This allows you to select SLIM4 Link Width. The default value is [x4x4].

SLIM5 Link Width

This allows you to select SLIM5 Link Width. The default value is [x4x4].

SLIM6 Link Width

This allows you to select SLIM6 Link Width. The default value is [x4x4].

PCIE1 Link Speed

This allows you to select PCIE1 Slot Speed. The default value is [Auto].

PCIE2 Link Speed

This allows you to select PCIE2 Slot Speed. The default value is [Auto].

PCIE3 Link Speed

This allows you to select PCIE3 Slot Speed. The default value is [Auto].

SLIM1 Link Speed

This allows you to select SLIM1 Slot Speed. The default value is [Auto].

SLIM2 Link Speed

This allows you to select SLIM2 Slot Speed. The default value is [Auto].

SLIM3 Link Speed

This allows you to select SLIM3 Slot Speed. The default value is [Auto].

SLIM4 Link Speed

This allows you to select SLIM4 Slot Speed. The default value is [Auto].

SLIM5 Link Speed

This allows you to select SLIM5 Slot Speed. The default value is [Auto].

SLIM6 Link Speed

This allows you to select SLIM6 Slot Speed. The default value is [Auto].

Onboard Debug Port LED

Enable or disable the onboard Dr. Debug LED.

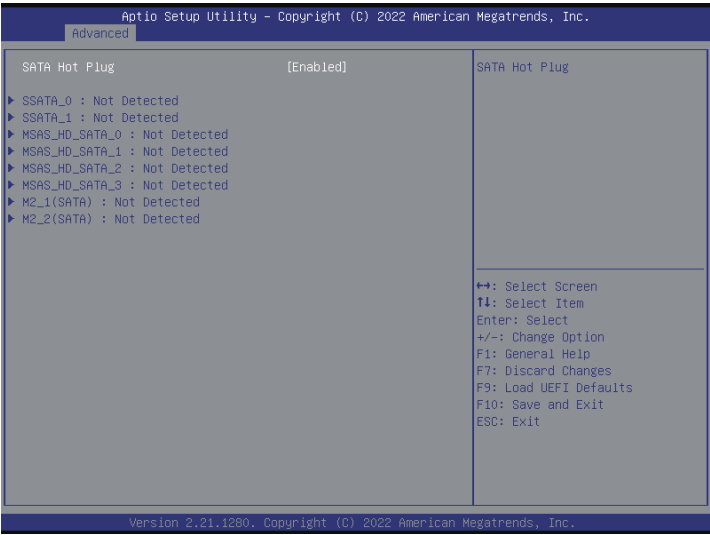
Restore AC Power Loss

This allows you 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.

Restore AC Power Current State

This allows you to restore AC Power Current State.

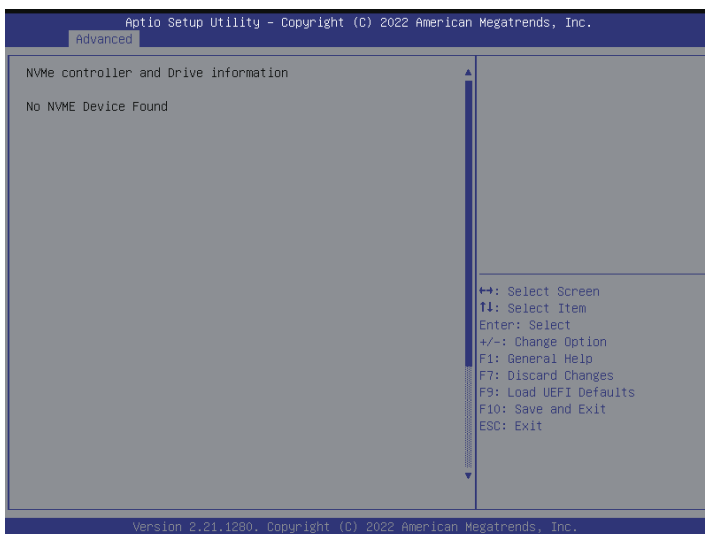
3.3.3 Storage Configuration



SATA Hot Plug

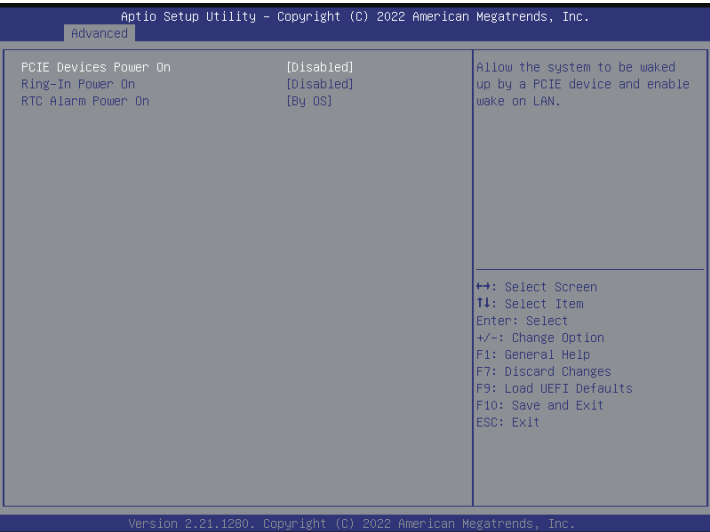
Enable/disable the SATA Hot Plug Function.

3.3.4 NVMe Configuration



The NVMe Configuration displays the NVMe controller and Drive information.

3.3.5 ACPI Configuration



PCIE Devices Power On

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

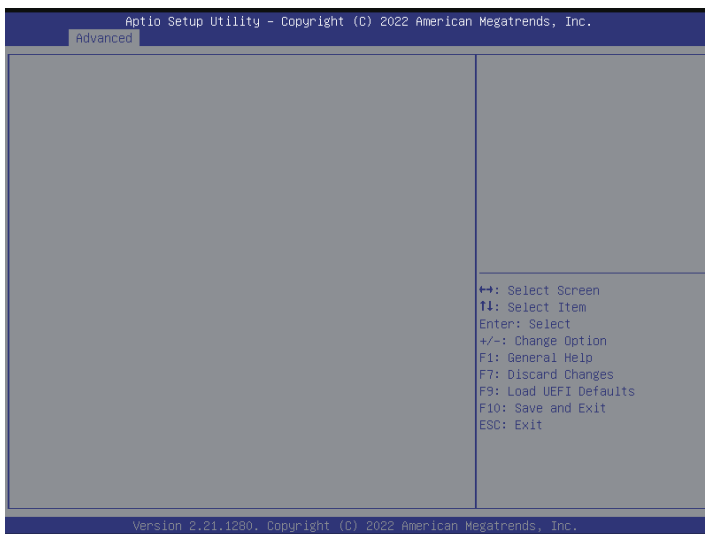
Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the powersoft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

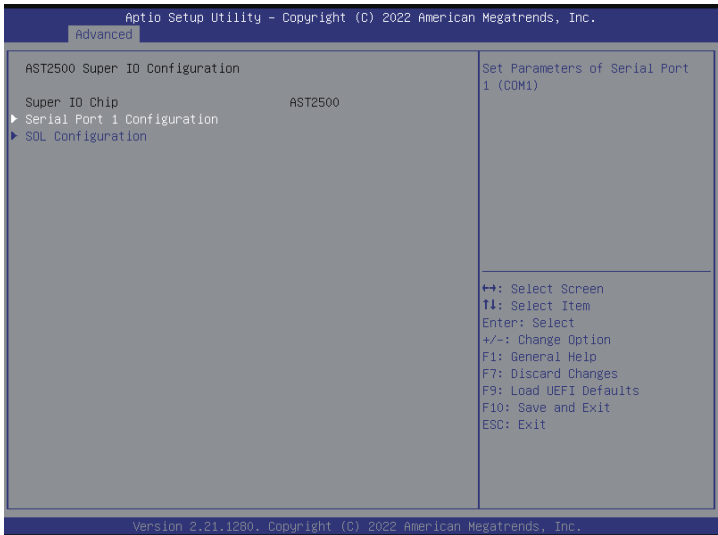
3.3.6 USB Configuration



Legacy USB Support

Use this option to enable or disable legacy support for USB devices. The default value is [Enabled]. (This item will be hidden when CSM is set to [Disabled].)

3.3.7 Super IO Configuration



Serial Port 1 Configuration

Use this item to set parameters of Serial Port 1 (COM).

Serial Port

Use this item to enable or disable the serial port.

Serial Port Address

Use this item to select an optimal setting for Super IO device.

SOL Configuration

Use this item to set parameters of SOL.

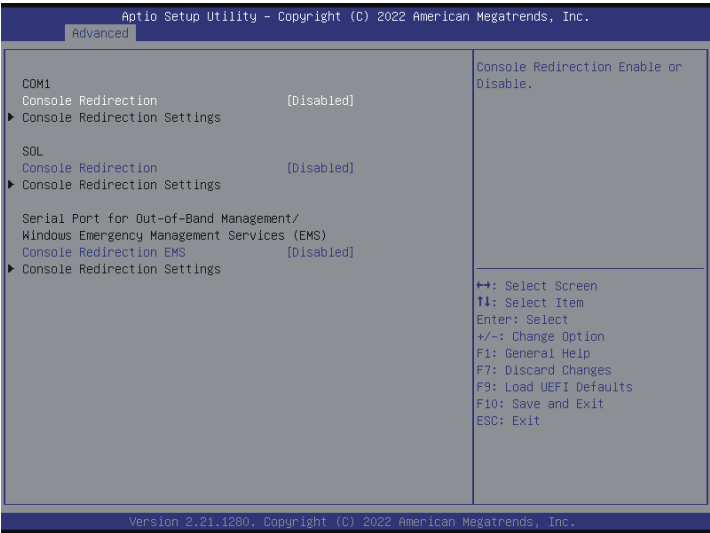
SOL Port

Use this item to set parameters of SOL.

Serial Port Address

Use this item to select an optimal setting for Super IO device.

3.3.8 Serial Port Console Redirection



COM1 / SOL

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you 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 your computer and the host computer to which you 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
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

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

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you 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 your computer and the host computer to which you 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].

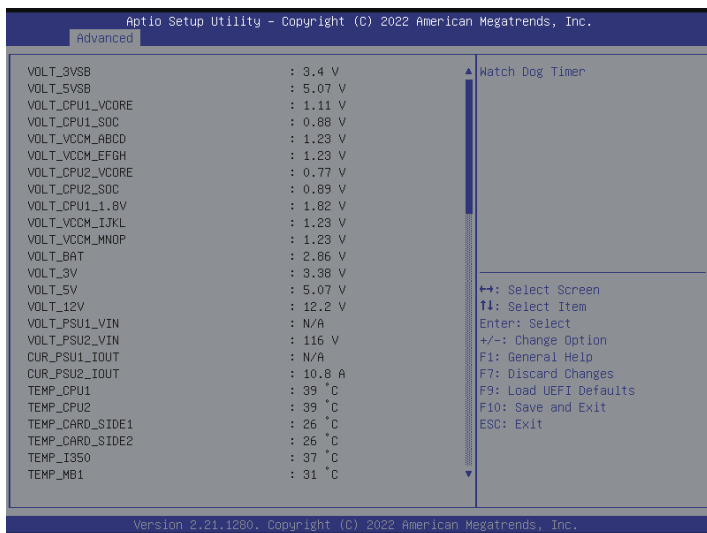
Data Bits EMS

Parity EMS

Stop Bits EMS

3.3.9 H/W Monitor

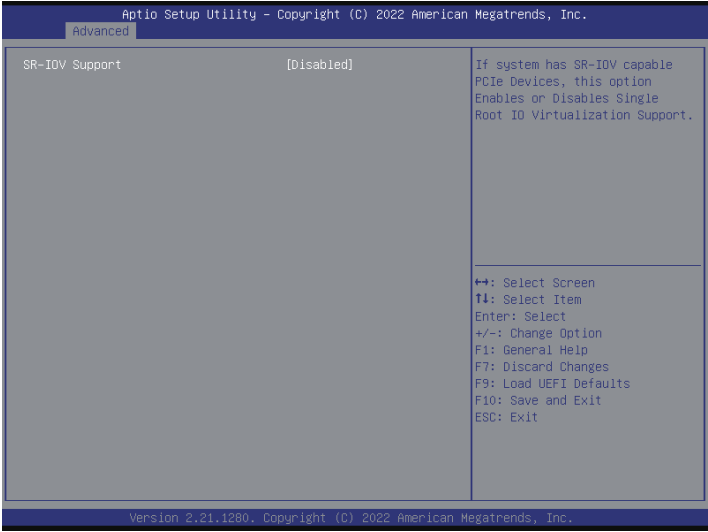
In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



Watch Dog Timer

This allows you to enable or disable the Watch Dog Timer. The default value is [Disabled].

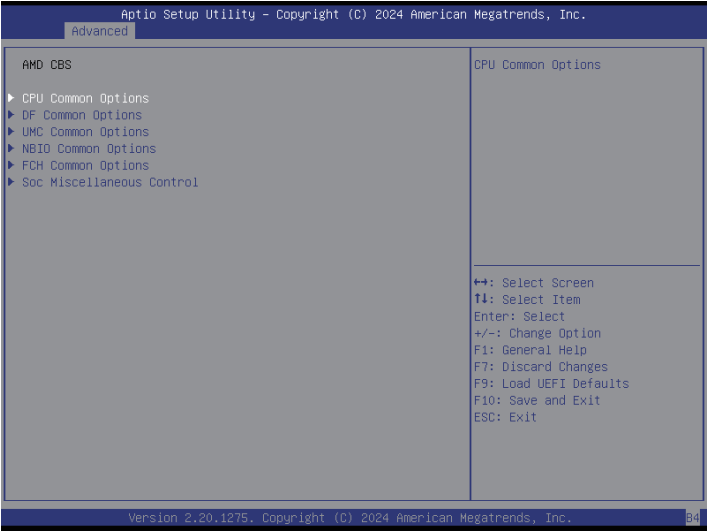
3.3.10 PCI Subsystem Settings



SR-IOV Support

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

3.3.11 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.

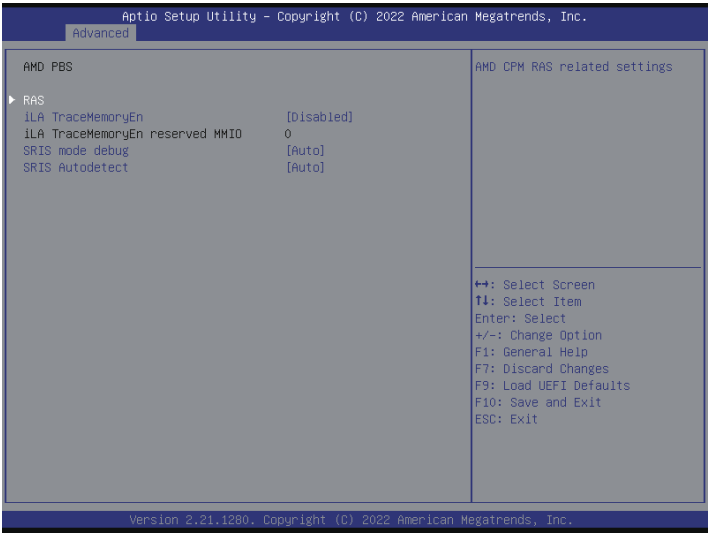
FCH Common Options

Use this item to configure FCH Common options.

Soc Miscellaneous Control

Use this item to configure Soc Miscellaneous Control options.

3.3.12 AMD PBS



RAS

Use this item to configure AMD CPM RAS related settings.

iLA TraceMemoryEn

Reserved 1M bytes MMIO space on 1M boundary when iLA TraceMemoryEn is enabled.

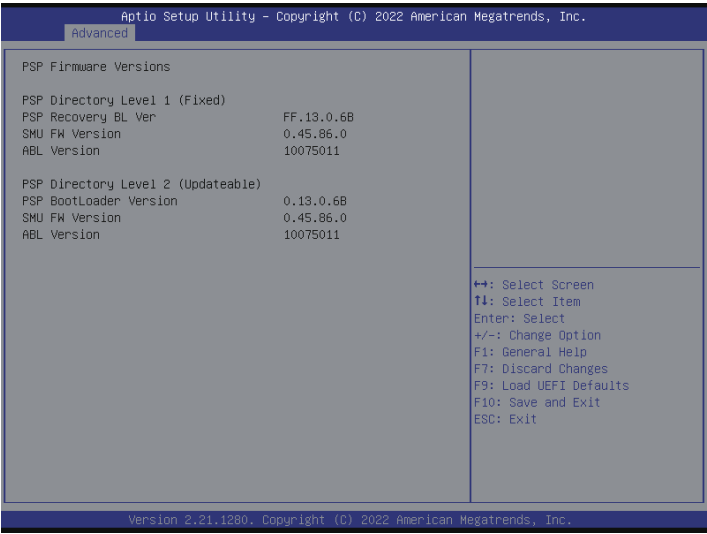
SRIS mode debug

Use this item to control SRIS mode debug.

SRIS Autodetect

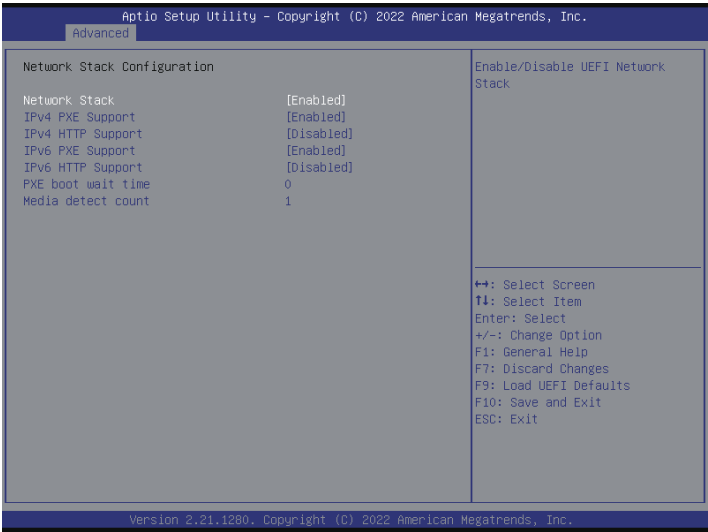
Use this item to control SRIS Autodetect.

3.3.13 PSP Firmware Versions



The PSP Firmware Versions displays the version information of PSP Recovery BL, PSP BootLoader, SMU FW, ABL, APCB, APDB, and APPB.

3.3.14 Network Stack Configuration



Network Stack

Use this item to enable or disable UEFI Network Stack.

IPv4 PXE Support

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

IPv4 HTTP Support

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

IPv6 PXE Support

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

IPv6 HTTP Support

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

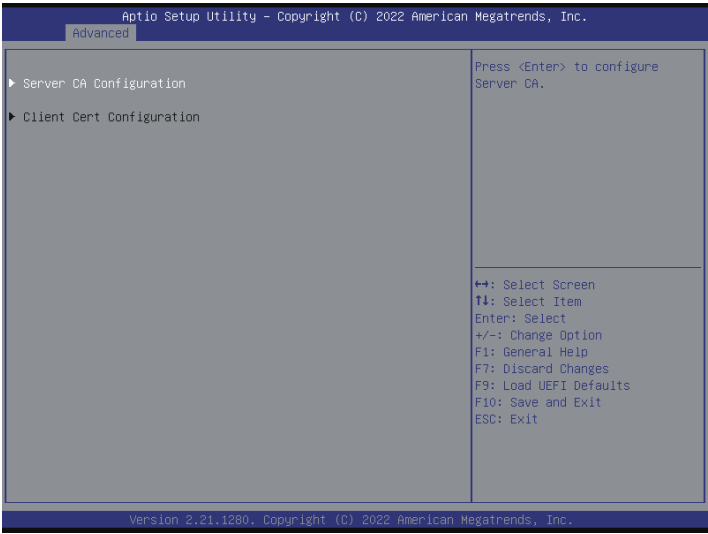
PXE boot wait time

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.

3.3.15 Tls Auth Configuration



Server CA Configuration

Press <Enter> to configure Server CA.

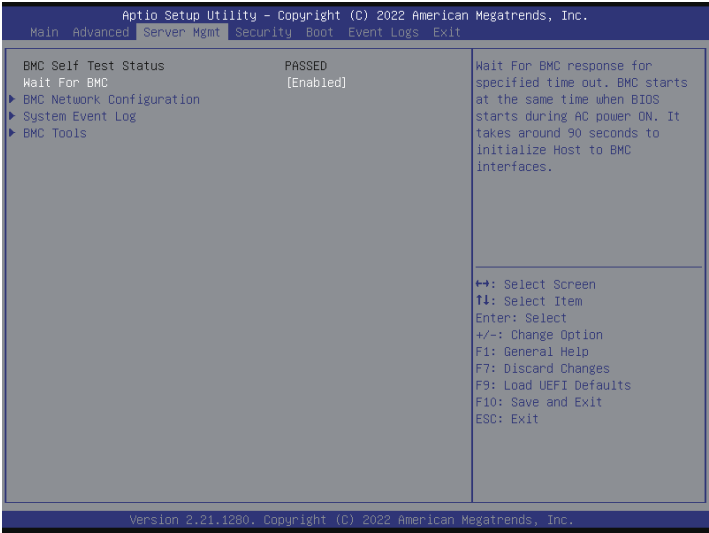
Client Cert Configuration

Press <Enter> to configure Client Cert.

3.3.16 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows[®]. Just save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your 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. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

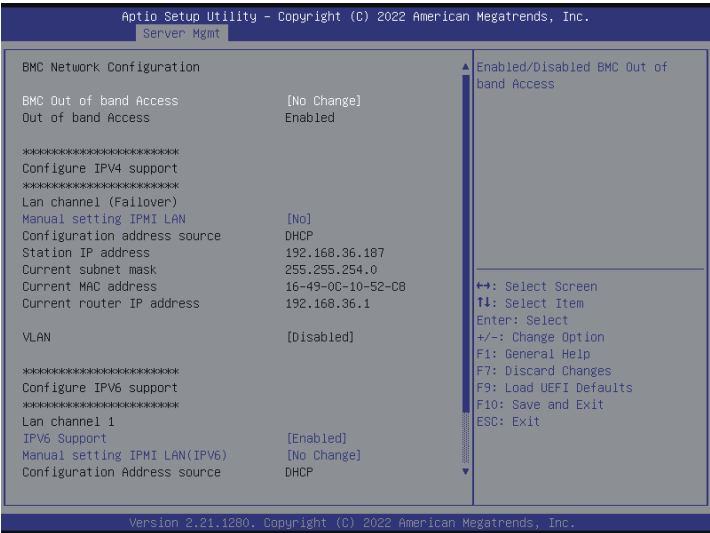
3.4 Server Mgmt



Wait For BMC

Wait For BMC response for specified time out. BMC starts at the same time when BIOS starts during AC power ON. It takes around 90 seconds to initialize Host to BMC interfaces.

3.4.1 BMC Network Configuration



Lan Channel (Failover)

Manual Setting IPMI LAN

If [No] is selected, the IP address is assigned by DHCP. If you prefer 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.



When [DHCP] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.



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/ipmi.asp>

IPv6 Support

Enable or Disable LAN1 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.

IPv6 Index

Set Selector for Static IP, range: 0 to 15.

3.4.2 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.

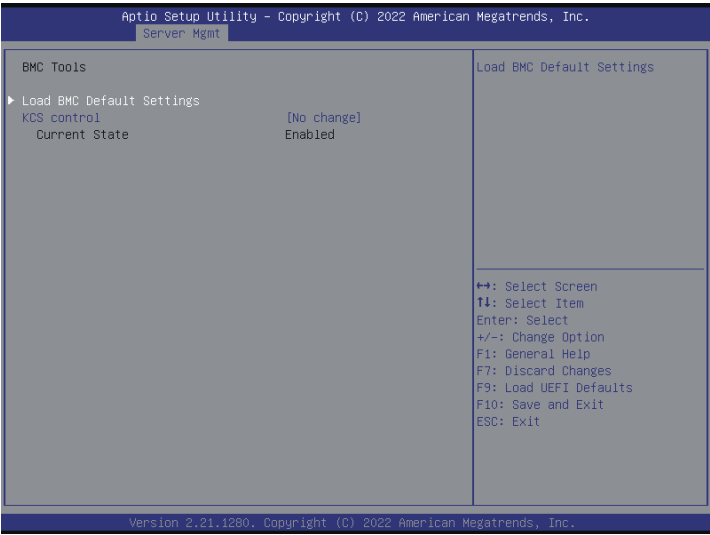
Log EFI Status Codes

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.

3.4.3 BMC Tools



Load BMC Default Settings

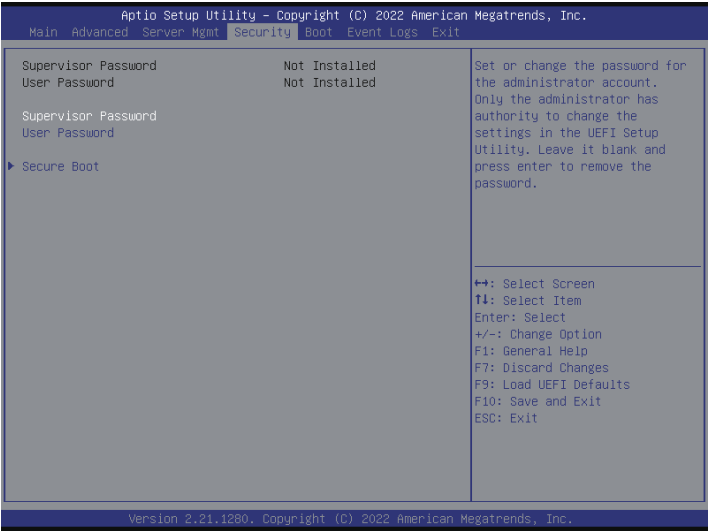
Use this item to load BMC default settings.

KCS control

Select the KSC interface state after POST end. If [Enabled] is selected, the BMC will remain KCS interface after POST stage. If [Disabled] is selected, the BMC will disable KCS interface after POST stage.

3.5 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 or disable Secure Boot Control. The default value is [Disabled]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

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

3.5.1 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.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db).

Restore DB defaults

Restore DB variable to factory defaults.

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: Default, External, Mixed

Key Exchange Keys

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: Default, External, Mixed

Key Source: Default, External, Mixed, Test

Authorized Signatures

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: Default, External, Mixed

Forbidden Signatures

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: Default, External, Mixed

Authorized TimeStamps

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: Default, External, Mixed

OsRecovery Signatures

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: Default, External, Mixed

3.6 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.

Boot Option #3

Use this item to set the system boot order.

Boot Option #4

Use this item to set the system boot order.

Boot Option #5

Use this item to set the system boot order.

Setup Prompt Timeout

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

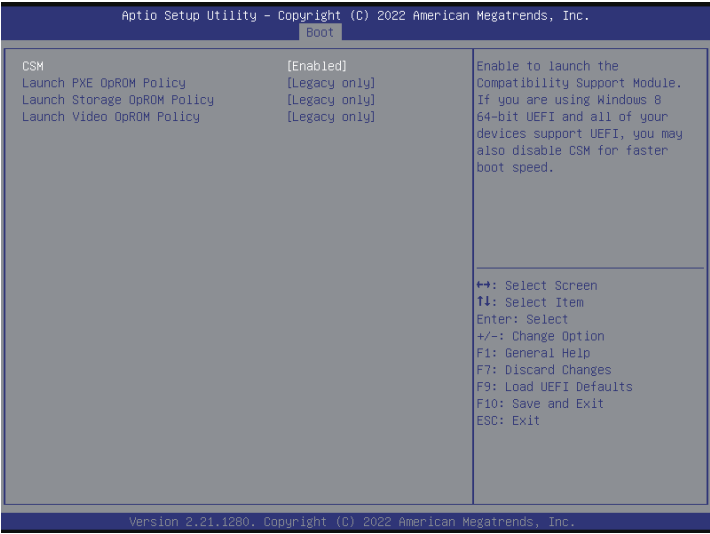
Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

3.6.1 CSM Parameters



CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows Server 2012 R2 or later versions 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.

Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

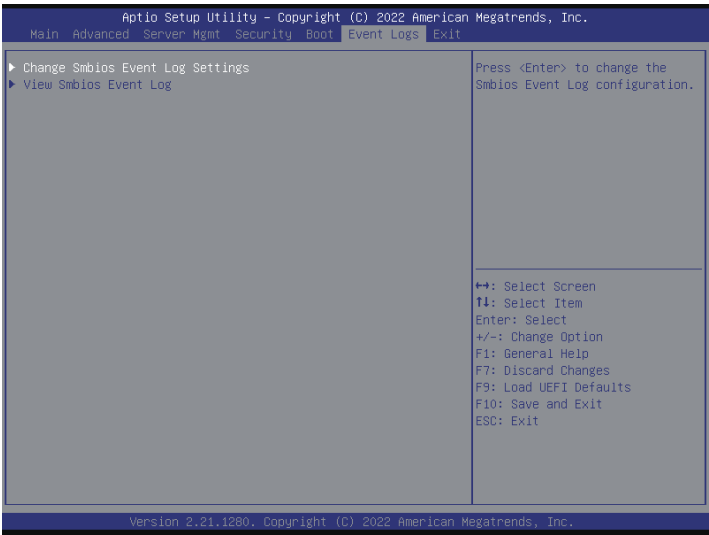
Launch Other Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

3.7 Event Logs



Change Smbios Event Log Settings

This allows you to configure the Smbios Event Log Settings.

When entering the item, you will see the followings:

Smbios Event Log

Use this item to enable or disable all features of the SMBIOS Event Logging during system boot.

Erase Event Log

The options include [No], [Yes, Next reset] and [Yes, Every reset]. If Yes is selected, all logged events will be erased.

When Log is Full

Use this item to choose options for reactions to a full Smbios Event Log. The options include [Do Nothing] and [Erase Immediately].

Log System Boot Event

Choose option to enable/disable logging of System boot event.

MECI (Multiple Event Count Increment)

Use this item to enter the increment value for the multiple event counter. The valid range is from 1 to 255.

METW (Multiple Event Time Window)

Use this item to specify the number of minutes which must pass between duplicate log

entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

Log EFI Status Code

Enable or disable the logging of EFI Status Codes as OEM reserved type E0 (if not already converted to legacy).

Convert EFI Status Codes to Standard Smbios Type

Enable or disable the converting of EFI Status Codes to Standard Smbios Types (Not all may be translated).

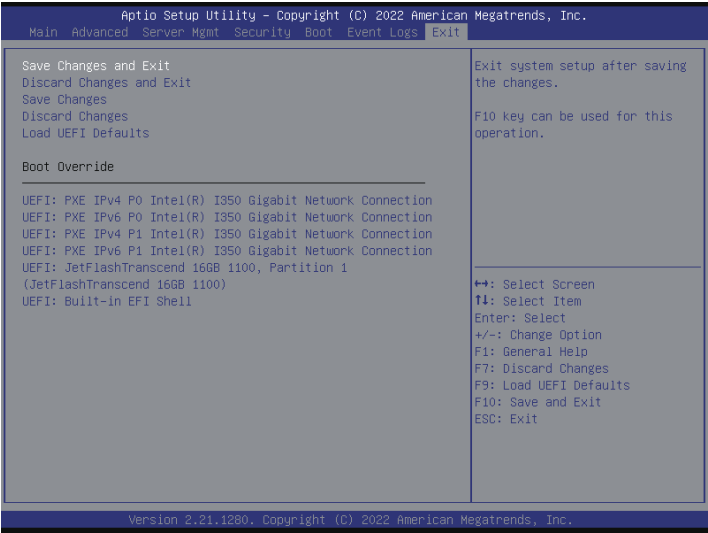
View Smbios Event Log

Press <Enter> to view the Smbios Event Log records.



All values changed here do not take effect until computer is restarted.

3.8 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.

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.

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, LRDIMM, 3DS and NVDIMMs.
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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