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STABLE Robust Design, Quality Parts

Stable and
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Server/Workstation
Motherboard

SP2C621D32LM3

User Manual

English



Version 1.0

Published June 2023

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 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.



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



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

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Chapter 1 Introduction

Thank you for purchasing ASRock Rack **SP2C621D32LM3** 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 driver installation



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

About technical supporting for this motherboard, please refer to the website for future information. <http://www.asrockrack.com/support/>

1.1 Package Contents

- ASRock Rack **SP2C621D32LM3** Motherboard
(L-shape Proprietary Form Factor: 18.8-in x 17.0-in, 47.75 cm x 43.18 cm)
- Quick Installation Guide
- 1 x Screw for M.2 Socket
- 2 x CPU Non-Fabric Carrier



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

1.2 Specifications

SP2C621D32LM3	
MB Physical Status	
Form Factor	L-shape Proprietary
Dimension	18.8" x 17" (47.75 cm x 43.18 cm)
Processor System	
CPU	3 rd gen Intel® Xeon® Processor Scalable processors
Socket	1+1 Socket P+ (LGA 4189)
Thermal Design Power	270W
Chipset	Intel® C621A
System Memory	
Capacity	32 DIMM slots
Type	- Eight Channel Memory Technology (2DPC) - Support 288-pin DDR4 3200/2933/2666/2400/2133/1866 DDR4 RDIMM/RDIMM-3DS/LRDIMM/LRDIMM-3DS/ Intel®Optane™ Persistent Memory 200 Series
DIMM Size Per DIMM	- RDIMM: 64GB, 32GB, 16GB, 8GB - RDIMM-3DS: 256GB, 128GB, 64GB, 32GB - LRDIMM: 128GB, 64GB, 32GB - LRDIMM-3DS: 256GB, 128GB, 64GB, 32GB - Intel®Optane™ Persistent Memory 200 Series: 512GB, 256GB, 128GB
DIMM Frequency	- RDIMM: 3200MHz - LRDIMM: 3200MHz - 3DS: 3200MHz - Intel®Optane™ Persistent Memory 200 Series: 3200MHz, 2933MHz, 2666MHz
Voltage	1.2V
Expansion Slot	
PCIe 4.0 x24	Slot1: PCIe x24 (PCIe 4.0 x24) CPU0 (on board with GPGPU card extra power support connector) Slot2: PCIe x24 (PCIe 4.0 x24) CPU1 (on board with GPGPU card extra power support connector)
PCIe 4.0 x16	Slot3: PCIe x16 (PCIe 4.0 x16) CPU1 (on board with GPGPU card extra power support connector)
Storage	
SATA Controller	Intel® C621A (14 SATA 6Gb/s, support RAID 0/1/5/10): 12 via 3 mini-SAS HD connectors 1 via 7+2 pin SATA DOM or M.2 connector 1 via 7 pin SATA connector

M.2	1 (M2_1: M-key (PCIe 3.0 x4 or SATA 6Gb/s); Type 2230/2242/2260/2280)
SlimSAS	6
Ethernet	
Interface	Gigabit LAN 10/100/1000 Mb/s
LAN	1 x RJ45 Dedicated IPMI LAN port - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports PXE
Mezzanine Slot	OCP NIC 3.0 4C+ (PCIe4.0 x16) CPU0
Management	
BMC Controller	ASPEED AST2500 : IPMI (Intelligent Platform Management Interface) 2.0 with Ikm and vMedia support
IPMI Dedicated GLAN	1 x Realtek RTL8211E for dedicated management GLAN
Features	- Watch Dog - NMI
Graphics	
Controller	ASPEED AST2500
VRAM	DDR4 256MB
Rear Panel I/O	
VGA Port	1 x D-Sub
Serial Port	1
USB 3.2 Gen1 Port	2
LAN Port	- 1 (IPMI 2.0) - LAN Ports with LED (ACT/LINK LED and SPEED LED)
UID Button/LED	1
Power Button	1
System Fault LED	1
Internal Connector	
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, front LAN LED)
Front Panel	1
TPM_BIOS_PH1	1
IPMB Header	1
Front VGA Header	1
Fan Header	6 Fans (2x3-pin) for 2U system + 8 Fans (1x6pin) for 1U system

ATX Power	4 (2x4 pin, 12V) for PCIE cards 1 (2x2 pin, 12V,5V) for HDD 1 (3-pin) for SATA DOM 1 (2x6 pin, 12V) for HSBP 1 (5-pin CRPS IN +12V/+12VSB, max. 1600W) for PDB
USB 3.2 Gen1 Header	1 (support 2 USB 3.2 Gen1 ports)
Vertical Type-A USB 3.2 Gen1	1
USB 2.0 Header	1 (support 2 USB 2.0 ports)
Smbus from BMC	3
NMI Header	1
SGPIO Header	1
CPU_HSBP	2
RAID_1 Header	1
Buzzer	1
Dr. Debug	1
OH/FanFail LED	8 (only Fan Fail LED)
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
Hardware Monitor	
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

Support OS

OS	Microsoft® Windows® (Server OS) - Server 2016 (64 bit) - Server 2019 (64 bit) Linux® - Red Hat Enterprise Linux Server 7.8 (64 bit) / 8.2 (64 bit) - CentOS 7.8 (64 bit) / 8.2 (64 bit) - SUSE Enterprise Linux Server 12 SP5 (64 bit) / 15 SP1 (64 bit) - Ubuntu 19.04 (64 bit) / 20.04 (64 bit) Hypervisor - VMWare® ESXi 6.7 U3 / vSphere 6.7 U3 - VMWare® ESXi 7.0.0 / vSphere 7.0.0 - Hyper-V Windows® Server 2016 - Hyper-V Windows® Server 2019 <i>*Please refer to our website for the latest OS support list.</i>
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Environment

Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C
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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 ~ LAN4 can wake up S5 under OS.

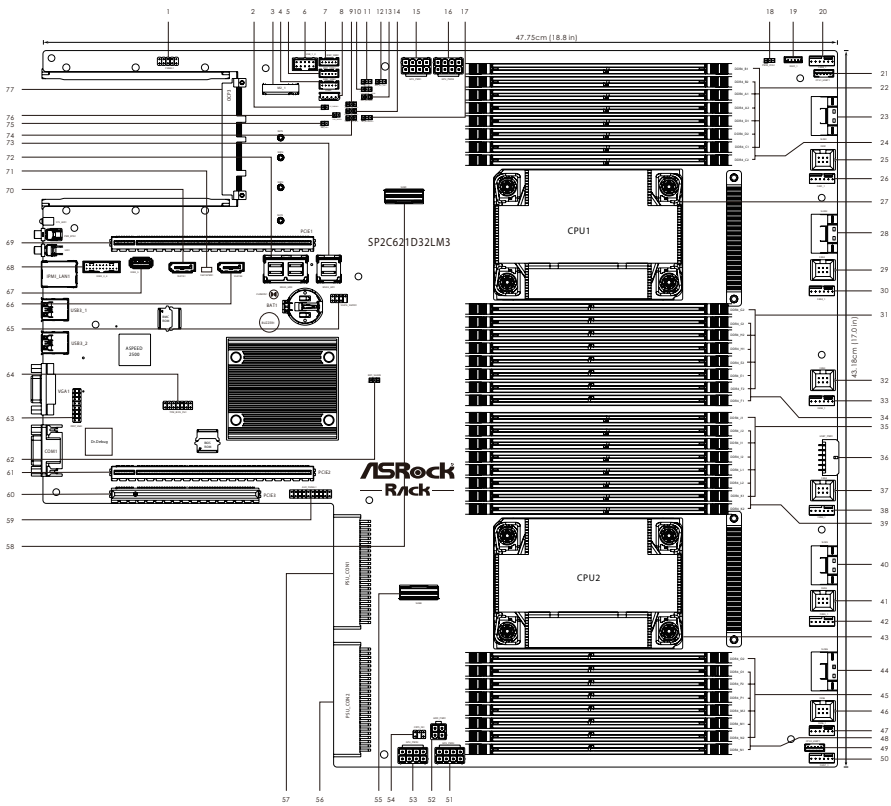


If installing Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If installing the drivers only, it will pass the WHQL tests.

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



No.	Description
1	System Panel Header (PANEL1)
2	Jumper (PS_PWROK1)
3	M.2 Socket (M2_1) (Type 2230 / 2242 / 2260 / 2280)
4	BMC SMBus Header (BMC_SMB3)
5	BMC SMBus Header (BMC_SMB2)
6	USB 2.0 Header (USB_1_2)
7	BMC SMBus Header (BMC_SMB1)
8	Intelligent Platform Management Bus Header (IPMB1)
9	PMBUS Mode Jumper (PMBUS_SEL_CLK1)
10	Password Reset Jumper (PASSWORD_CLEAR)
11	QAT Mode Jumper (QAT_SEL)
12	ESPI/LPC Selection Jumper (ESPI_LPC_SEL1)
13	BIOS Recovery Jumper (BIOS_RECOVERY)
14	PMBUS Mode Jumper (PMBUS_SEL_DAT1)
15	GPU Power Connector (GPU_PWR1)
16	GPU Power Connector (GPU_PWR4)
17	ME Recovery Jumper (ME_RECOVERY1)
18	PWM Configuration Header (PWM_CFG1)
19	Virtual RAID On CPU Header (RAID_1)
20	System Fan Connector (for 1U System) (FAN8_1)
21	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
22	4 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1, DDR4_C1, DDR4_D1)*
23	Slimline NVMe Connector (SLIM2)
24	4 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2, DDR4_C2, DDR4_D2)*
25	System Fan Connector (for 2U System) (FAN1)
26	System Fan Connector (for 1U System) (FAN1_1)
27	LGA 4189 CPU Socket (CPU1)
28	Slimline NVMe Connector (SLIM3)
29	System Fan Connector (for 2U System) (FAN2)
30	System Fan Connector (for 1U System) (FAN2_1)
31	4 x 288-pin DDR4 DIMM Slots (DDR4_E2, DDR4_F2, DDR4_G2, DDR4_H2)*
32	System Fan Connector (for 2U System) (FAN3)

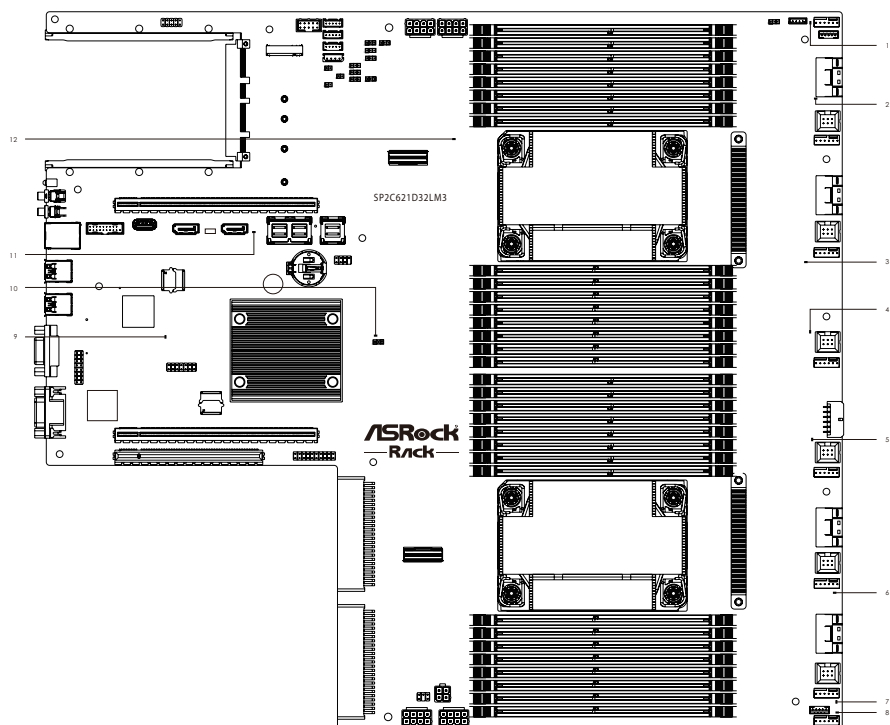
No.	Description
33	System Fan Connector (for 1U System) (FAN3_1)
34	4 x 288-pin DDR4 DIMM Slots (DDR4_E1, DDR4_F1, DDR4_G1, DDR4_H1)*
35	4 x 288-pin DDR4 DIMM Slots (DDR4_I1, DDR4_J1, DDR4_K1, DDR4_L1)*
36	HDD Backplane Power Connector (HSBP_PWR1)
37	System Fan Connector (for 2U System) (FAN4)
38	System Fan Connector (for 1U System) (FAN4_1)
39	4 x 288-pin DDR4 DIMM Slots (DDR4_I2, DDR4_J2, DDR4_K2, DDR4_L2)*
40	Slimline NVMe Connector (SLIM5)
41	System Fan Connector (for 2U System) (FAN5)
42	System Fan Connector (for 1U System) (FAN5_1)
43	LGA 4189 CPU Socket (CPU2)
44	Slimline NVMe Connector (SLIM6)
45	4 x 288-pin DDR4 DIMM Slots (DDR4_M2, DDR4_N2, DDR4_O2, DDR4_P2)*
46	System Fan Connector (for 2U System) (FAN6)
47	System Fan Connector (for 1U System) (FAN6_1)
48	4 x 288-pin DDR4 DIMM Slots (DDR4_M1, DDR4_N1, DDR4_O1, DDR4_P1)*
49	Backplane PCI Express Hot-Plug Connector (CPU2_HSBP1)
50	System Fan Connector (for 1U System) (FAN7_1)
51	GPU Power Connector (GPU_PWR2)
52	HDD Power Connector (HDD_PWR1)
53	GPU Power Connector (GPU_PWR3)
54	PDB Power Connector (CRPS_IN1)
55	Slimline NVMe Connector (SLIM4)
56	PSU Connector (PSU_CON2)
57	PSU Connector (PSU_CON1)
58	Slimline NVMe Connector (SLIM1)
59	Auxiliary Panel Header (AUX_PANEL1)
60	PCI Express 4.0 x16 Slot (PCIE3)
61	PCI Express 4.0 x24 Slot (PCIE2)
62	ESPI Flash Sharing Jumper (ESPI_SHARE)
63	Front VGA Header (FRNT_VGA1)
64	TPM-SPI Header (TPM_BIOS_PH1)
65	SATA SGPIO Connector (SSATA_SGPIO1)
66	SATA3 DOM Connector (SSATA0)

No.	Description
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67	Vertical Type A USB 3.2 Gen1 Connector (USB3_5)
68	USB 3.2 Gen1 Header (USB3_3_4)
69	PCI Express 4.0 x24 Slot (PCIE1)
70	SATA3 DOM Connector (SSATA1)
71	SATA DOM Power Connector (SSATAPWR1)
72	Mini-SAS HD Connector (MSAS_HD0)
73	Mini-SAS HD Connector (MSAS_HD1)
74	PMBUS Mode Jumper (PMBUS_SEL_ALT1)
75	Non Maskable Interrupt Button (NMI_BTN1)
76	BIOS Swap Override Header (ESPI_MODE1)
77	OCP 3.0 Gen4 x16 Mezzanine Card Slot (OCP3)

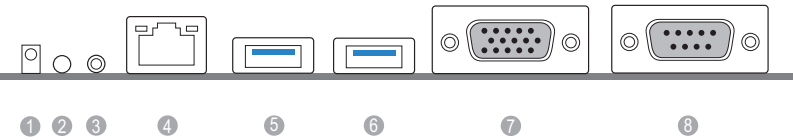
**For DIMM installation and configuration instructions, please see p.22 (Installation of Memory Modules (DIMM)) for more details.*

1.5 Onboard LED Indicators



No.	Item	Status	Description
1	LED_FAN8	Red	FAN8_1 failed
2	LED_FAN1	Red	FAN1_1 failed
3	LED_FAN2	Red	FAN2_1 failed
4	LED_FAN3	Red	FAN3_1 failed
5	LED_FAN4	Red	FAN4_1 failed
6	LED_FAN5	Red	FAN5_1 failed
7	LED_FAN6	Red	FAN6_1 failed
8	LED_FAN7	Red	FAN7_1 failed
9	BLED	Green	BMC heartbeat LED
10	SB_PWR1	Green	STB PWR ready
11	HDD_LED	Green	HDD activity LED
12	LED_CATERR1	Red	CPU CATERR error

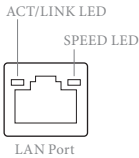
1.6 I/O Panel



No.	Description	No.	Description
1	System Fault LED (SYS_FAULT_LED1)	5	USB 3.2 Gen1 Port (USB3_1)
2	Power Switch (PWR_BTN1)	6	USB 3.2 Gen1 Port (USB3_2)
3	UID Switch (UID1)	7	VGA Port (VGA1)
4	LAN RJ-45 Port (IPMI_LAN)*	8	Serial Port (COM1)

LAN Port LED Indications

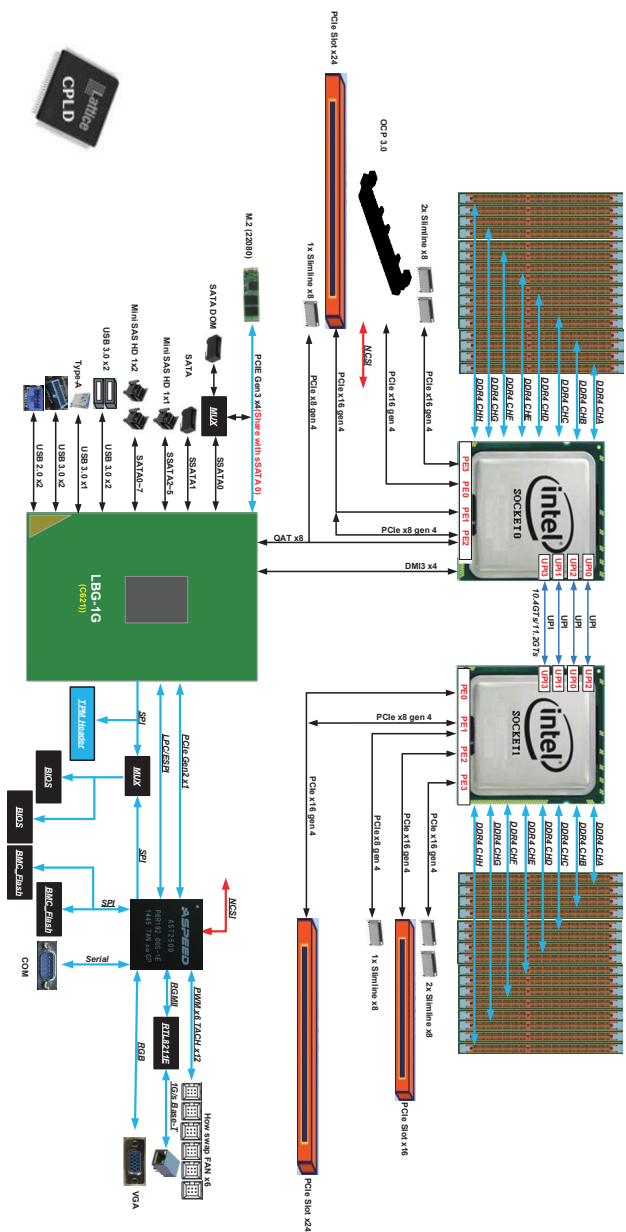
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



Dedicated IPMI LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10M bps connection or no link
Blinking Yellow	Data Activity	Off	100M bps connection
On	Link	Green	1G bps connection

1.7 Block Diagram



Chapter 2 Installation

This is a L-shape Proprietary form factor (18.8-in x 17.0-in, 48.26 cm x 43.18 cm) motherboard. Before installing the motherboard, study the configuration of the 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 and motherboard damages.

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 damage.



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.



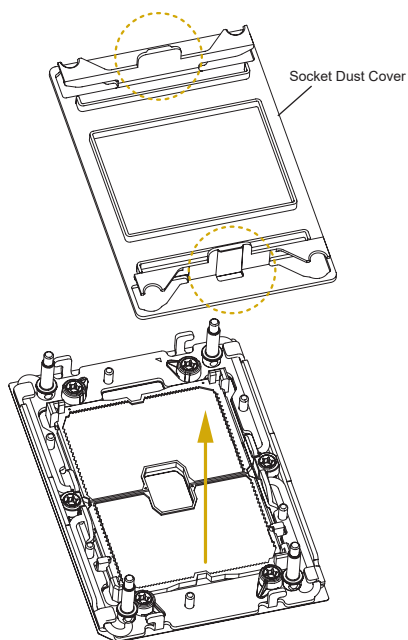
Before installing or removing any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 Installing the CPU and Heatsink



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.

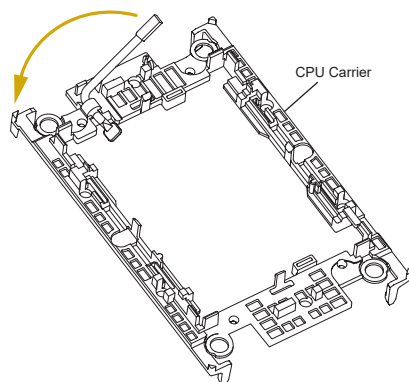
1



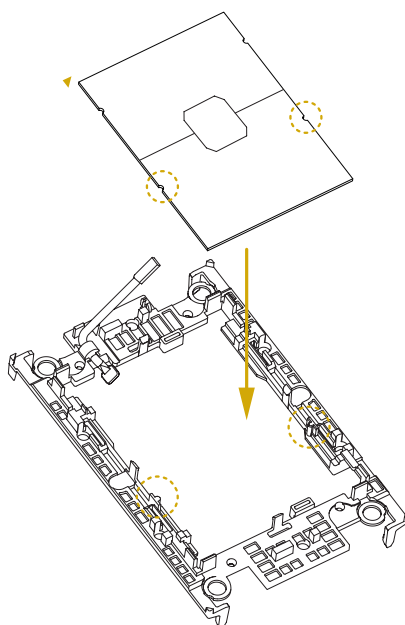


1. Before installing the heatsink, it needs to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.
2. Illustration in this documentation are examples only. Heatsink or fan cooler type may differ.

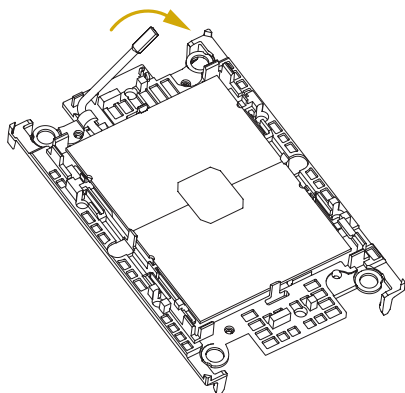
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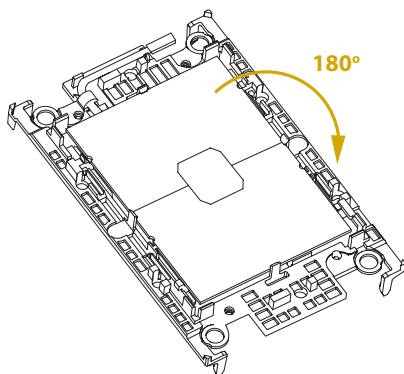
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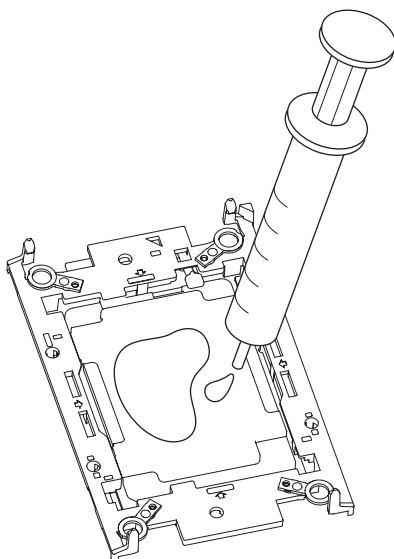
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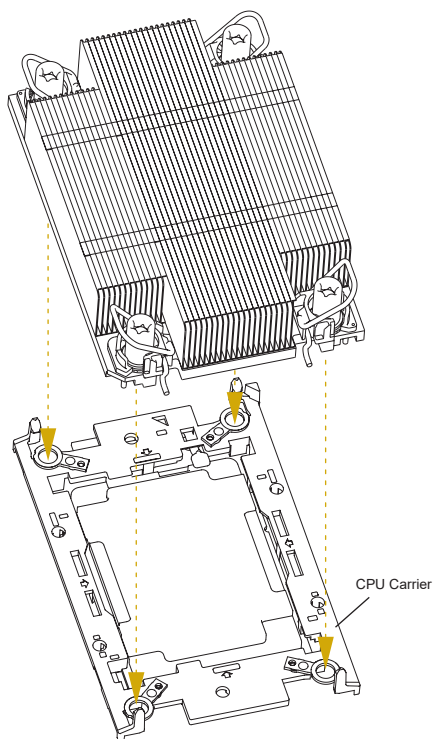
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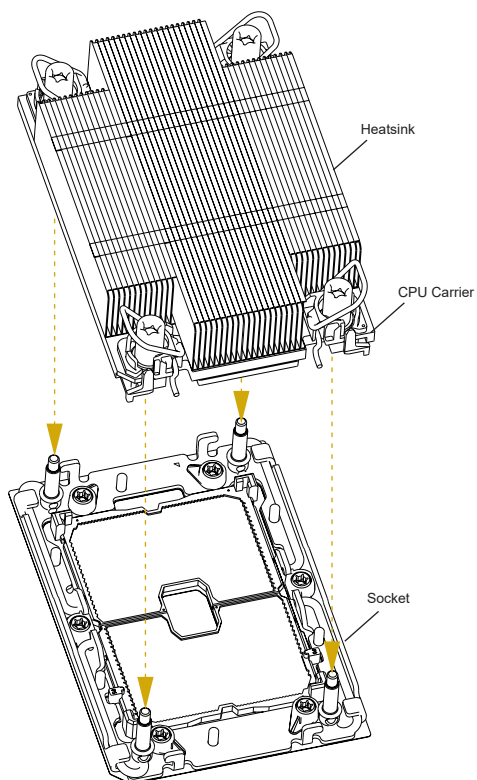


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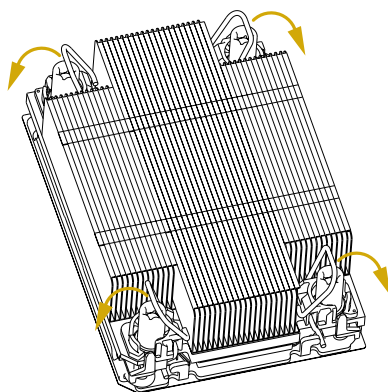


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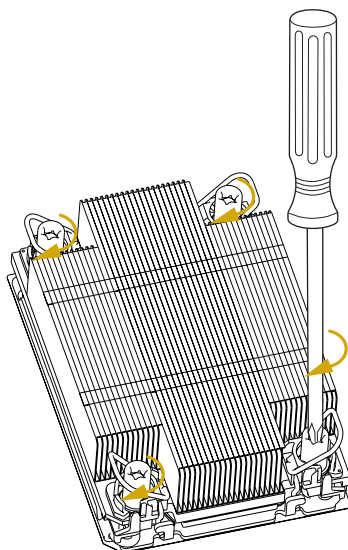




9



10



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 (Blue)	DDR4_I2, J2, K2, L2, M1, N1, O1, P1 (Blue)
DDR4_A2, B2, C2, D2, E2, F2, G2, H2 (White)	DDR4_I1, J1, K1, L1, M2, N2, O2, P2 (White)



1. For eight channel configuration, it always needs to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.
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.

Recommended Memory Configurations

1 CPU Configurations

		DIMM(S)						
		1	2	4	6	8	12	16
CPU1	A1		#	#	#	#	#	#
	B1	#			#	#	#	#
	C1			#	#	#	#	#
	D1					#		#
	E1		#	#	#	#	#	#
	F1				#	#	#	#
	G1			#	#	#	#	#
	H1					#		#
	A2						#	#
	B2						#	#
	C2						#	#
	D2							#
	E2						#	#
	F2						#	#
	G2						#	#
	H2							#

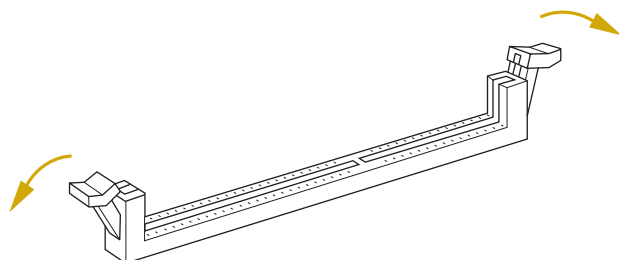
The symbol # indicates the slot is populated.

2 CPU Configurations

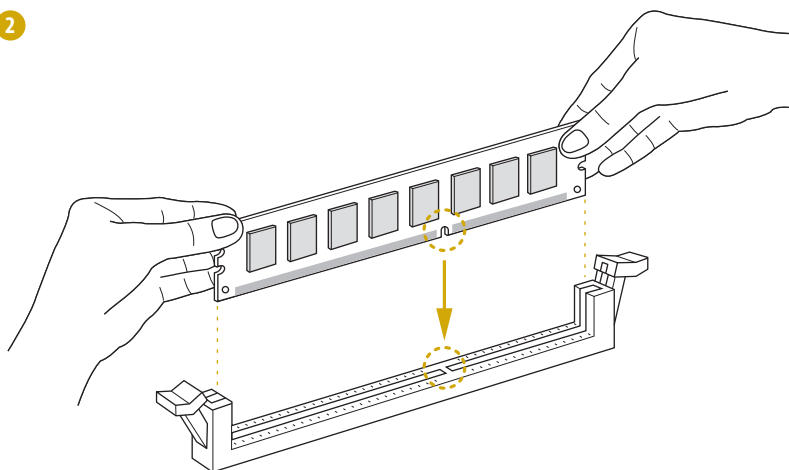
		DIMM(S)						
		1	2	4	6	8	12	16
CPU1	A1		#	#	#	#	#	#
	B1	#			#	#	#	#
	C1			#	#	#	#	#
	D1					#		#
	E1		#	#	#	#	#	#
	F1				#	#	#	#
	G1			#	#	#	#	#
	H1					#		#
	A2						#	#
	B2						#	#
	C2						#	#
	D2							#
	E2						#	#
	F2						#	#
	G2						#	#
	H2							#

		DIMM(S)						
		1	2	4	6	8	12	16
CPU2	I1		#	#	#	#	#	#
	J1	#			#	#	#	#
	K1			#	#	#	#	#
	L1					#		#
	M1		#	#	#	#	#	#
	N1				#	#	#	#
	O1			#	#	#	#	#
	P1					#		#
	I2						#	#
	J2						#	#
	K2						#	#
	L2							#
	M2						#	#
	N2						#	#
	O2						#	#
	P2							#

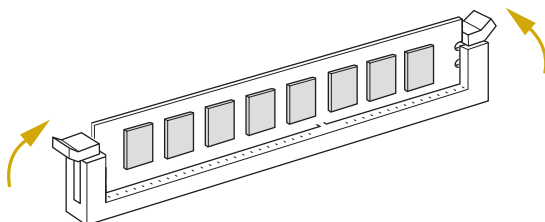
1



2



3



2.5 Expansion Slots (PCI and PCI Express Slots)

There are 3 PCI Express slots on this motherboard.

PCIe slots:

PCIE1 (PCIe 4.0 x24 slot, from CPU1) is used for PCI Express x24 lane width cards.

PCIE2 (PCIe 4.0 x24 slot, from CPU2) is used for PCI Express x24 lane width cards.

PCIE3 (PCIe 4.0 x16 slot, from CPU2) is used for PCI Express x16 lane width cards.

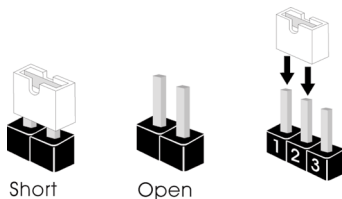
Slot	Generation	Mechanical	Electrical	Source
PCIE 3	4.0	x16	x16	CPU2
PCIE 2	4.0	x24	x24	CPU2
PCIE 1	4.0	x24	x24	CPU1

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. 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 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.



ME Recovery Jumper
(3-pin ME_RECOVERY1)
(see p.7, No. 17)



Normal Mode (Default)



ME Recovery Mode

PMBUS Mode Jumper
(3-pin PMBUS_SEL_CLK1)
(see p.7, No. 9)
(3-pin PMBUS_SEL_DAT1)
(see p.7, No. 14)
(3-pin PMBUS_SEL_ALT1)
(see p.7, No. 74)



PMBus connected to BMC
(Default)



PMBus connected to PCH

Password Reset Jumper
(3-pin PASSWORD_ CLEAR)
(see p.7, No. 10)



Normal Mode (Default)



Password Clear

BIOS Recovery Jumper
(3-pin BIOS_RECOVERY)
(see p.7, No. 13)



Normal Mode (Default)



Recover BIOS

ESPI/LPC Selection Jumper
(3-pin ESPI_LPC_SEL1)
(see p.7, No. 12)



ESPI (Default)



LPC

ESPI Flash Sharing Jumper
(3-pin ESPI_SHARE)
(see p.7, No. 62)



Master ESPI Flash Sharing
(Default)



Slave ESPI Flash Sharing

QAT Mode Jumper
(3-pin QAT_SEL)
(see p.7, No. 11)

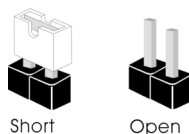


QAT Asymmetric (Default)



QAT Symmetric

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”.



BIOS Swap Override
Jumper
(ESPI_MODE1)
(see p.7, No. 76)



2-pin Jumper

Open: Disable Override (Default)
Short: Enable Override

Jumper
(PS_PWROK1)
(see p.7, No. 2)



2-pin Jumper

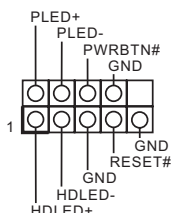
Open: Enable Delay (Default)
Short: Disable Delay

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.7, No.1)



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. 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):

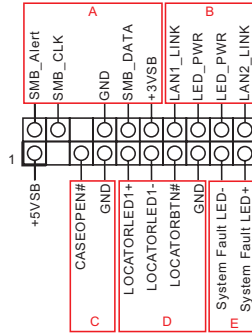
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S4 sleep state or powered off (S5).

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.7, No. 59)



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.

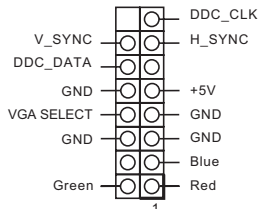
D. Locator LED (4-pin LOCATOR)

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

E. System Fault LED (2-pin LOCATOR)

This header is for the Fault LED on the system.

Front VGA Header (15-pin FRNT_VGA1) (see p.7, No.63)



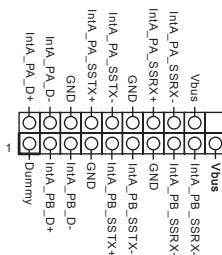
Please connect either end of VGA_2X8 cable to VGA header.

Serial ATA3 DOM
Connectors
(SSATA0)
(see p.7, No. 66)
(SSATA1)
(see p.7, No. 70)



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

USB 3.2 Gen1 Header
(19-pin USB3_3_4)
(see p.7, No. 68)

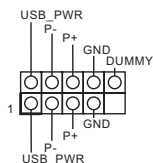


Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. This USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

Vertical Type A USB 3.2
Gen1 Connector
(USB3_5)
(see p.7, No. 67)

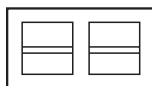


USB 2.0 Header
(9-pin USB_1_2)
(see p.7, No. 6)



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

Mini-SAS HD Connectors
(MSAS_HD0)
(see p.7, No. 72)



MSAS_HD0

(MSAS_HD1)
(see p.7, No. 73)



MSAS_HD1

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.

CPU Fan Connectors

(6-pin FAN1_1)

(see p.7, No. 26)

(6-pin FAN2_1)

(see p.7, No. 30)

(6-pin FAN3_1)

(see p.7, No. 33)

(6-pin FAN4_1)

(see p.7, No. 38)

(6-pin FAN5_1)

(see p.7, No. 42)

(6-pin FAN6_1)

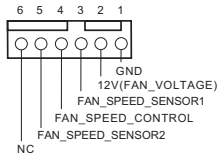
(see p.7, No. 47)

(6-pin FAN7_1)

(see p.7, No. 50)

(6-pin FAN8_1)

(see p.7, No. 20)



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

(6-pin FAN1)

(see p.7, No. 25)

(6-pin FAN2)

(see p.7, No. 29)

(6-pin FAN3)

(see p.7, No. 32)

(6-pin FAN4)

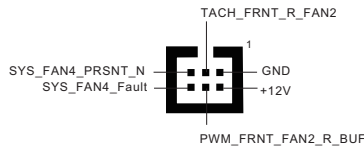
(see p.7, No. 37)

(6-pin FAN5)

(see p.7, No. 41)

(6-pin FAN6)

(see p.7, No. 46)



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

GPU Power Connectors

(8-pin GPU_PWR1)

(see p.7, No. 14)

(8-pin GPU_PWR2)

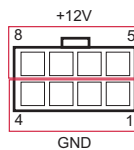
(see p.7, No. 49)

(8-pin GPU_PWR3)

(see p.7, No. 51)

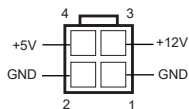
(8-pin GPU_PWR4)

(see p.7, No. 15)



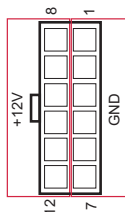
This motherboard provides four 8-pin GPU power connectors.

SATA Power Connector
(4-pin HDD_PWR1)
(see p.7, No. 52)



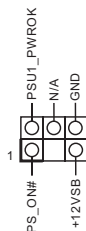
Please use a SATA power cable to connect this SATA Power Connector and the SATA HDD for supplying power from the motherboard, when using DC-IN mode without SATA power supply.

Backplane Power
Connector
Right-Angle:
(12-pin HSBP_PWR1)
(see p.7, No. 36)



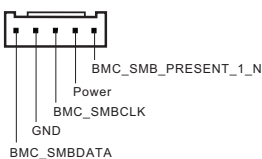
Please connect a 12-pin power cable to this connector to connect a HDD.

PDB Power Connector
(5-pin CRPS_IN1)
(see p.7, No. 54)



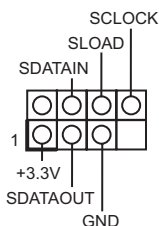
When a power distribution board is needed, use a power cable to connect this connector and the PDB for power supply.

Baseboard Management
Controller SMBus Headers
(5-pin BMC_SMB_1)
(see p.7, No. 7)
(5-pin BMC_SMB_2)
(see p.7, No. 5)
(5-pin BMC_SMB_3)
(see p.7, No. 4)



These headers are used for the SM BUS devices.

Serial General Purpose
Input/Output Header
(7-pin SSATA_SGPIO1)
(see p.7, No. 65)



The header supports Serial
Link interface for onboard
SATA connections.

Slimline NVME/SATA
Connectors
(SLIM1)

(see p.7, No. 28)

(SLIM4)

(see p.7, No. 58)

Right-Angle:

(SLIM2)

(see p.7, No. 23)

(SLIM3)

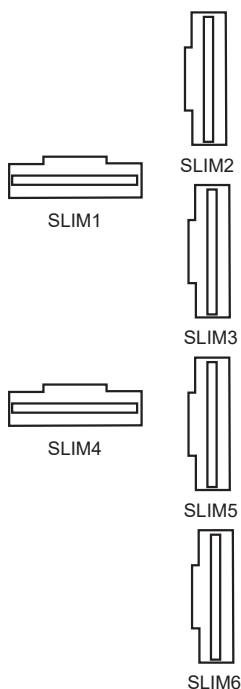
(see p.7, No. 54)

(SLIM5)

(see p.7, No. 40)

(SLIM6)

(see p.7, No. 44)



These connectors are used
for the NVME PCIE/SATA
devices.

CPU HP-SMBus

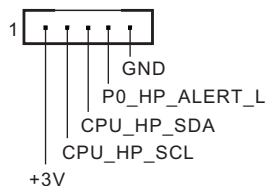
Connectors

(5-pin CPU1_HSBP1)

(see p.7, No. 21)

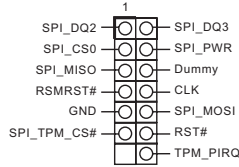
(5-pin CPU2_HSBP1)

(see p.7, No. 49)



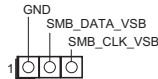
These headers are used for
the hot plug feature of HDDs
on the backplane.

SPI TPM Header
(13-pin TPM_BIOS_PH1)
(see p.7, No. 64)



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.

PWM Configuration
Header
(3-pin PWM_CFG1)
(see p.7, No. 18)



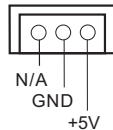
This header is used for PWM configurations.

Non Maskable Interrupt
Button Header
(2-pin NMI_BTN1)
(see p.7, No. 75)



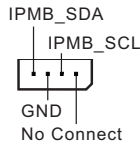
Please connect a NMI device to this header.

SATA DOM Power
Connector
(3-pin SSATAPWR1)
(see p.7, No. 71)



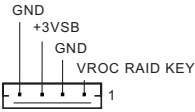
Please connect the power cables on the SATA DOM to the connector.

Intelligent Platform
Management Bus Header
(4-pin IPMB1)
(see p.7, No. 8)



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.

Virtual RAID On CPU
Header
(4-pin RAID_1)
(see p.7, No. 19)



This connector supports
Intel® Virtual RAID on CPU
and NVME/AHCI RAID on
CPU PCIE.

With the introduction of the Intel VROC product, there are three modes of operation:

SKU	HW key required	Key features
Pass-thru	Not needed	• Pass-thru only (no RAID) • LED Management • Hot Plug Support • RAID 0 support for Intel Fultondale NVMe SSDs
Standard	VROCSTANMOD	• Pass-thru SKU features • RAID 0, 1, 10
Premium	VROCPREMMOD	• Standard SKU features • RAID 5
ISS	VROCISSDMOD	• RAID 5 Write Hole Closure

*Only Intel SSDs are supported.
*For further details on VROC, please refer to the official information released by Intel.

2.8 Dr. Debug

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

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

0x63	DXE_CPU_INIT
0x68	DXE_NB_HB_INIT
0x69	DXE_NB_INIT
0x6A	DXE_NB_SMM_INIT
0x70	DXE_SB_INIT
0x71	DXE_SB_SMM_INIT
0x72	DXE_SB_DEVICES_INIT
0x78	DXE_ACPI_INIT
0x79	DXE_CSM_INIT
0x90	DXE_BDS_STARTED
0x91	DXE_BDS_CONNECT_DRIVERS
0x92	DXE_PCI_BUS_BEGIN
0x93	DXE_PCI_BUS_HPC_INIT
0x94	DXE_PCI_BUS_ENUM
0x95	DXE_PCI_BUS_REQUEST_RESOURCES
0x96	DXE_PCI_BUS_ASSIGN_RESOURCES
0x97	DXE_CON_OUT_CONNECT
0x98	DXE_CON_IN_CONNECT

0x99 DXE_SIO_INIT

0x9A DXE_USB_BEGIN

0x9B DXE_USB_RESET

0x9C DXE_USB_DETECT

0x9D DXE_USB_ENABLE

0xA0 DXE_IDE_BEGIN

0xA1 DXE_IDE_RESET

0xA2 DXE_IDE_DETECT

0xA3 DXE_IDE_ENABLE

0xA4 DXE_SCSI_BEGIN

0xA5 DXE_SCSI_RESET

0xA6 DXE_SCSI_DETECT

0xA7 DXE_SCSI_ENABLE

0xA8 DXE_SETUP_VERIFYING_PASSWORD

0xA9 DXE_SETUP_START

0xAB DXE_SETUP_INPUT_WAIT

0xAD DXE_READY_TO_BOOT

0xAE DXE_LEGACY_BOOT

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

0xE3 PEI_S3_OS_WAKE

0x50 PEI_MEMORY_INVALID_TYPE

0x53 PEI_MEMORY_NOT_DETECTED

0x55 PEI_MEMORY_NOT_INSTALLED

0x57 PEI_CPU_MISMATCH

0x58 PEI_CPU_SELF_TEST_FAILED

0x59 PEI_CPU_NO_MICROCODE

0x5A PEI_CPU_ERROR

0x5B PEI_RESET_NOT_AVAILABLE

0xD0 DXE_CPU_ERROR

0xD1 DXE_NB_ERROR

0xD2 DXE_SB_ERROR

0xD3 DXE_ARCH_PROTOCOL_NOT_AVAILABLE

0xD4 DXE_PCI_BUS_OUT_OF_RESOURCES

0xD5 DXE_LEGACY_OPROM_NO_SPACE

0xD6 DXE_NO_CON_OUT

0xD7 DXE_NO_CON_IN

0xD8	DXE_INVALID_PASSWORD
0xD9	DXE_BOOT_OPTION_LOAD_ERROR
0xDA	DXE_BOOT_OPTION_FAILED
0xDB	DXE_FLASH_UPDATE_FAILED
0xDC	DXE_RESET_NOT_AVAILABLE
0xE8	PEI_MEMORY_S3_RESUME_FAILED
0xE9	PEI_S3_RESUME_PPI_NOT_FOUND
0xEA	PEI_S3_BOOT_SCRIPT_ERROR
0xEB	PEI_S3_OS_WAKE_ERROR

2.9 Unit Identification purpose LED/Switch

With the UID button, it can be able to locate the server that are 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 turned on. Press the UID button again to turn off the indicator.

Power Switch
(PWR_BTN1)

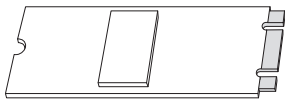


Power Switch allows users to quickly turn on/off the system.

2.10 M.2_SSD Module Installation Guide

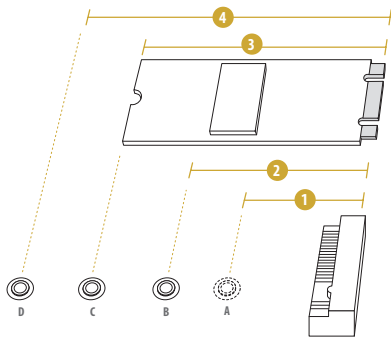
The M.2 Socket (M2_1, Key M) supports either a M.2 SATA3.6.0 Gb/s module or a M.2 PCI Express modul up to Gen3x4 (8Gb/s x4)

Installing the M.2_SSD Module



Step 1

Prepare a M.2_SSD module and the screw.



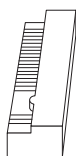
Step 2

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

No.	1	2	3	4
Nut Location	A	B	C	D
PCB Length	3cm	4.2cm	6cm	8cm
Module Type	Type2230	Type 2242	Type2260	Type 2280



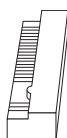
Step 3



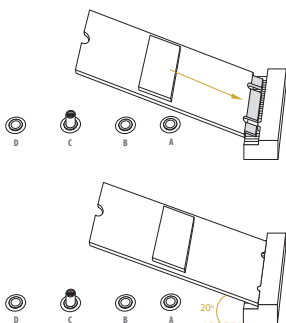
Move the standoff based on the module type and length. Skip Step 3 and 4 and go straight to Step 5 upon going to use the default nut. Otherwise, release the standoff by hand.



Step 4

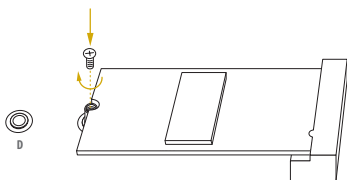


Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.



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 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> when entering the UEFI SETUP UTILITY after POST, or by pressing the reset button on the system chassis. It can be 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.

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.

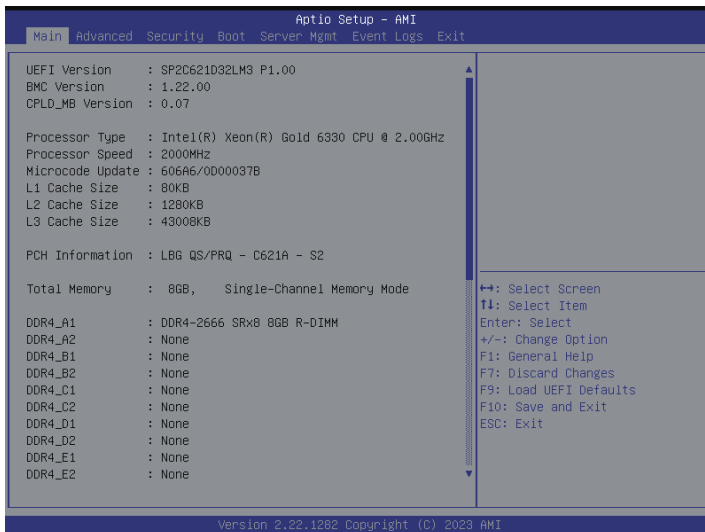
3.1.2 Navigation Keys

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

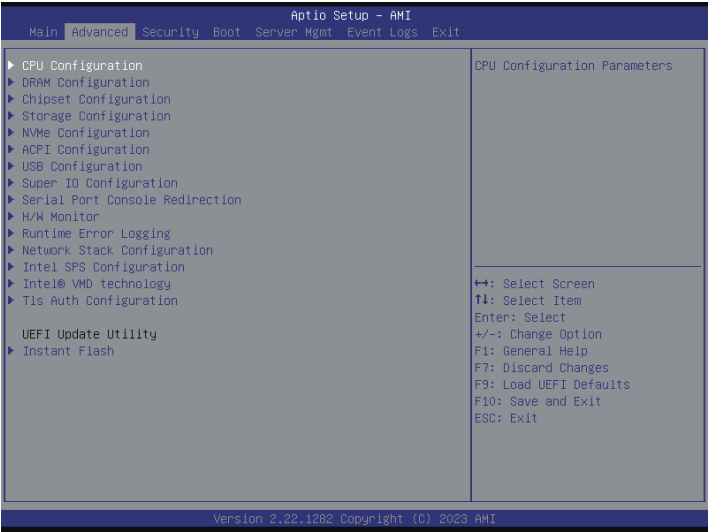
3.2 Main Screen

Once 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.



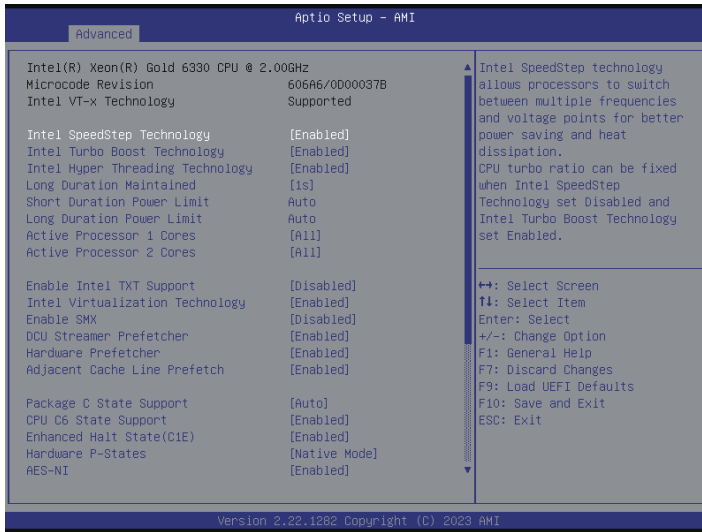
3.3 Advanced Screen

In this section, set the configurations for the following items: CPU Configuration, DRAM Configuration, Chipset Configuration, Storage Configuration, NVMe Configuration, ACPI Configuration, USB Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, Runtime Error Logging, Network Stack Configuration, Intel SPS Configuration, Intel(R) VMD Technology, Tls Auth Configuration and Instant Flash.



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

3.3.1 CPU Configuration



Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology set Disabled and Intel Turbo Boost Technology set Enabled.



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state.

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Long Duration Maintained

Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded.

Short Duration Power Limit

Configure Package Power Limit 2 in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Long Duration Power Limit

Configure Package Power Limit 1 in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Active Processor 1 Cores

Select the number of cores to enable in each processor package.

Active Processor 2 Cores

Select the number of cores to enable in each processor package.

Enable Intel TXT Support

Enables Intel Trusted Execution Technology Configuration.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Enable SMX

Use this item to enable Safer Mode Extensions.

DCU Streamer Prefetcher

DCU streamer prefetcher is an L1 data cache prefetcher (MSR 1A4h [2]).

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

Package C State Support

Enable CPU, PCIe, Memory, Graphics C State Support for power saving.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

Enhanced Halt State(C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

Hardware P-States

Disable: Hardware chooses a P-state based on OS Request (Legacy P-States)

Native Mode: Hardware chooses a P-state based on OS guidance

Out of Band Mode: Hardware autonomously chooses a P-state (no OS guidance)

AES-NI

Use this item to enable or disable AES-NI support.

CPU Thermal Throttling

Enable CPU internal thermal control mechanisms to keep the CPU from overheating.

SNC (Sub NUMA)

SNC disable will support 1-cluster (XPT/KTI Prefetch enable) 4-IMC way interleave.

SNC2 Enable supports 2-clusters SNC and 2-way IMC interleave. SNC4 Enable supports

4-clusters SNC and 1-way IMC interleave. Enable SNC2 or SNC4 will gray out iMC_ Interleave knob and UmaBasedClustering knob.

Delayed Authentication Mode (DAM) Override

Use this item to enable or disable overriding the state of the Delayed Authentication Mode (DAM).

UMA-Based Clustering

UMA Based Clustering options include Disable (ALL2ALL), Hemisphere (2 cluster), and Quadrant (4 cluster, not supported on ICX). These options are only valid when SNC is disabled. If SNC is enabled, UMA-Based Clustering is automatically disabled by BIOS.

Total Memory Encryption (TME)

Use this item to enable or disable Total Memory Encryption (TME).

SW Guard Extensions (SGX)

Use this item to enable or disable Software Guard Extensions (SGX).

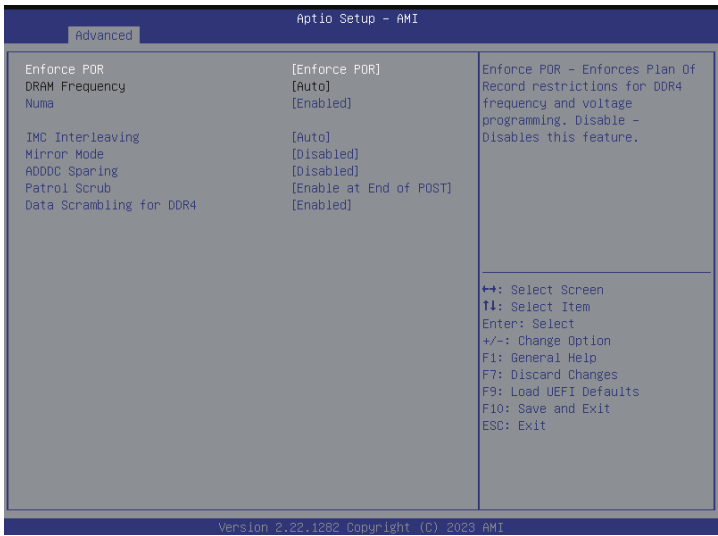
Enable/Disable SGX Auto MP Registration Agent

The MP registration agent is responsible for register the platform.

SGX Registration Server

Use this item to choose which server should be used for SGX registration.

3.3.2 DRAM Configuration



Enforce POR

Enable to enforce POR restrictions for DDR4 frequency and voltage programming.

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

Numa

Use this item to enable or disable Non Uniform Memory Access (NUMA).

IMC Interleaving

Select to configure IMC Interleaving settings.

Mirror Mode

Mirror Mode will set entire 1LM/2LM memory in system to be mirrored, consequently reducing the memory capacity by half. Mirror Enable will disable XPT Prefetch.

ADDDC Sparing

Enable or disable Memory Rank Sparing.

Patrol Scrub

Patrol Scrub is a background activity initiated by the processor to seek out and fix memory errors. The default value is [Enabled].

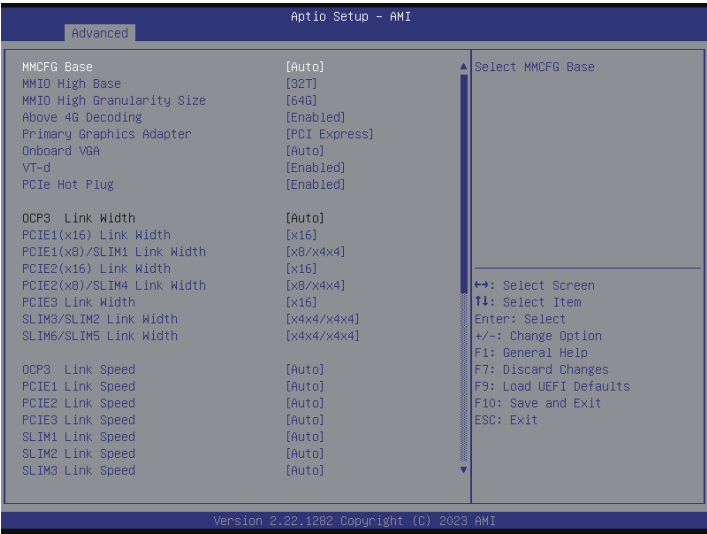
Data Scrambling for DDR4

Enable - Enables data scrambling for DDR4.

Disable - Disables this feature.

Auto - Sets it to the MRC default setting; current default is Enable.

3.3.3 Chipset Configuration



MMCFG Base

Use this item to select MMCFG Base.

MMIO High Base

Use this item to select MMIO High Base.

MMIO High Granularity Size

Use this item to select MMIO Granularity Size.

Above 4G Decoding

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

Primary Graphics Adapter

If PCI Express graphics card is installed on the motherboard, use this option to select PCI Express or Onboard VGA as the primary graphics adapter.

Onboard VGA

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

VT-d

Intel Virtualization Technology for Directed I/O helps the virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

PCIe Hot Plug

Use this item to enable or disable PCIe Hot Plug globally.

OCP3 Link Width

Use this item to select OCP3 Link Width.

PCIe1(x16) Link Width

Use this item to select PCIe1(x16) (x24 means x16 and x8) Link Width. The default value is [x16].

PCIe1(x8)/SLIM1 Link Width

Use this item to select PCIe1(x8) (x24 means x16 and x8) Link Width. The default value is [x8/x4x4].

PCIe2(x16) Link Width

Use this item to select PCIe2(x16) (x24 means x16 and x8) Link Width. The default value is [x16].

PCIe2(x8)/SLIM4 Link Width

Use this item to select PCIe2(x8) (x24 means x16 and x8) Link Width. The default value is [x8/x4x4].

PCIe3 Link Width

Use this item to select PCIe3 Link Width. The default value is [x16].

SLIM3/SLIM2 Link Width

Use this item to select SLIM3 Link Width. The default value is [x4x4/x4x4].

SLIM6/SLIM5 Link Width

Use this item to select SLIM5 Link Width. The default value is [x4x4/x4x4].

OCP3 Link Speed

Use this item to select OCP3 Link Speed. The default value is [Auto].

PCIe1 Link Speed

Use this item to select PCIe1 Link Speed. The default value is [Auto].

PCIE2 Link Speed

Use this item to select PCIE2 Link Speed. The default value is [Auto].

PCIE3 Link Speed

Use this item to select PCIE3 Link Speed. The default value is [Auto].

SLIM1/SLIM2/SLIM3 Link Speed

Use this item to select SLIM3/SLIM2 Link Speed. The default value is [Auto].

SLIM4/SLIM5/SLIM6 Link Speed

Use this item to select SLIM6/SLIM5 Link Speed. The default value is [Auto].

PCI-E ASPM Support (Global)

Select this item to enable or disable the ASPM support to all PCIe root ports.

OCP3 ASPM Support

This option enables or disables the ASPM support for all CPU downstream devices.

PCIE1 ASPM Support

This option enables or disables the ASPM support for all CPU downstream devices.

PCIE2 ASPM Support

This option enables or disables the ASPM support for all CPU downstream devices.

PCIE3 ASPM Support

This option enables or disables the ASPM support for all CPU downstream devices.

SLIM1/SLIM2/SLIM3 ASPM Support

This option enables or disables the ASPM support for all CPU downstream devices.

SLIM4/SLIM5/SLIM6 ASPM Support

This option enables or disables the ASPM support for all CPU downstream devices.

SR-IOV Support

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

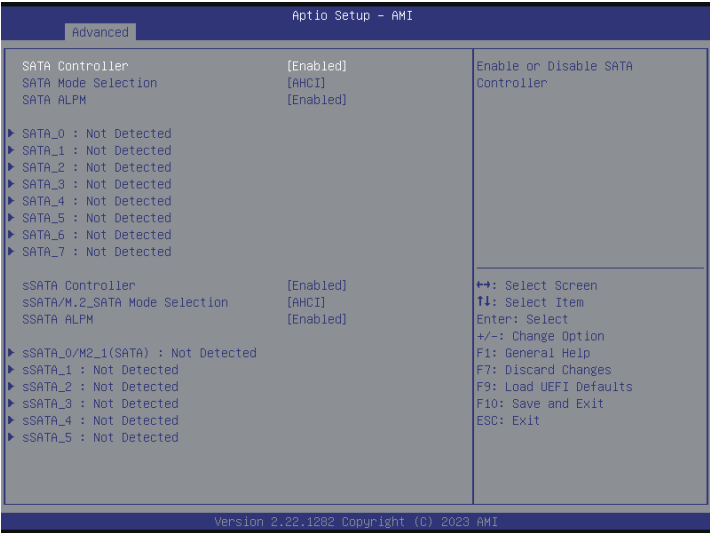
Restore AC Power Loss

Select 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

Use this item to restore AC Power Current State

3.3.4 Storage Configuration



SATA Controller

Use this item to enable or disable SATA Controllers.

SATA Mode Selection

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

SATA ALPM

Use this item to enable or disable Aggressive Link Power Management.

sSATA Controller

Use this item to enable or disable SATA Controllers.

sSATA/M.2_SATA Mode Selection

Identify the SATA/M.2_SATA port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

sSATA ALPM

Use this item to enable or disable Aggressive Link Power Management.

3.3.5 NVMe Configuration



The NVMe Configuration displays the NVMe controller and Drive information.

3.3.6 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 power-soft-off mode.

RTC Alarm Power On

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

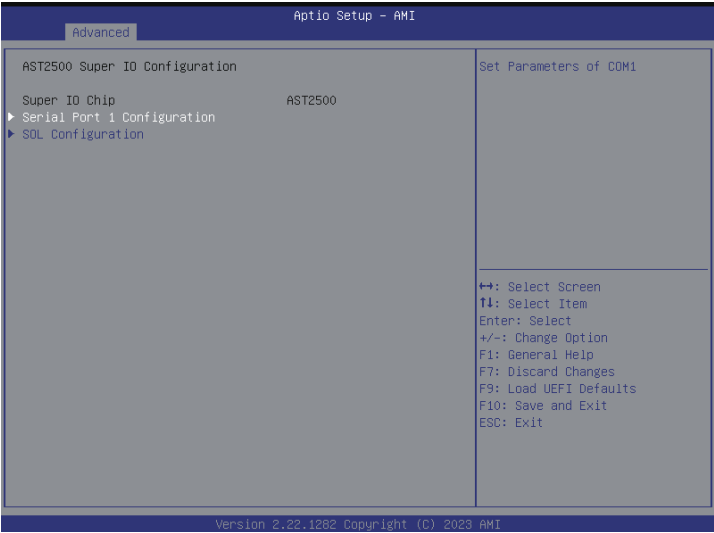
3.3.7 USB Configuration



Legacy USB Support

Use this option to enable or disable legacy support for USB devices. The default value is [Enabled].

3.3.8 Super IO Configuration



Serial Port 1 Configuration

Use this item to set parameters of Serial Port 1 (COM1).

Serial Port

Use this item to enable or disable the serial port.

Change Settings

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

SOL Configuration

Use this item to set parameters of SOL.

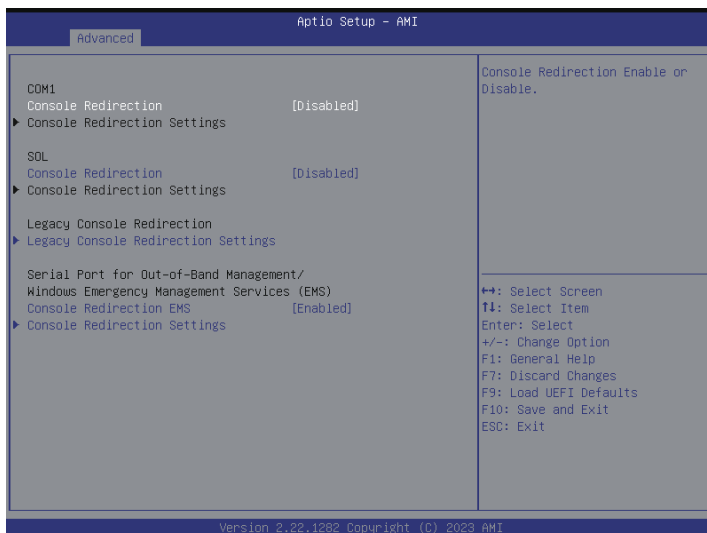
SOL Port

Use this item to set parameters of SOL.

Change Settings

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

3.3.9 Serial Port Console Redirection



COM1 / SOL

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, 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
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.

Legacy Console Redirection

Legacy Console Redirection Settings

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

Redirection COM Port

Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

Resolution

On Legacy OS, the Number of Rows and Columns supported redirection.

Redirect After POST

When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

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, 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].

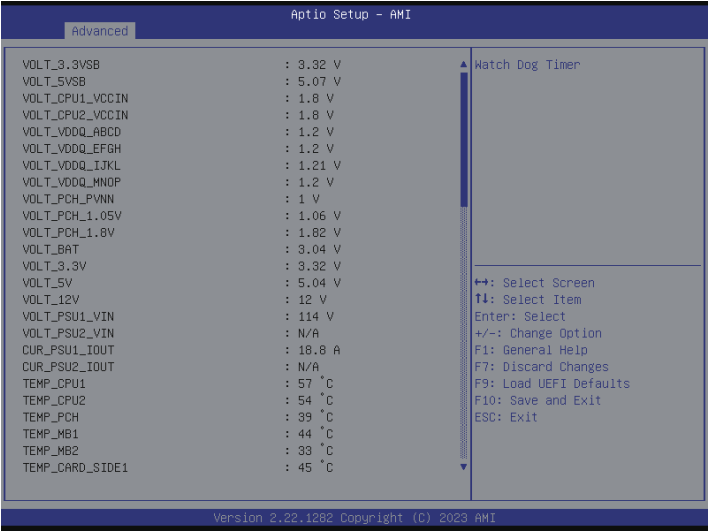
Data Bits EMS

Parity EMS

Stop Bits EMS

3.3.10 H/W Monitor

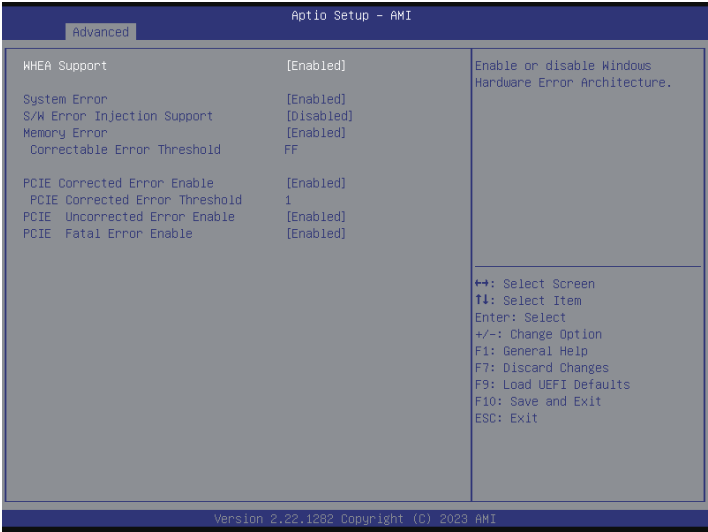
In this section, it allows user to monitor the status of the hardware on the system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



Watch Dog Timer

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

3.3.11 Runtime Error Logging



WHEA Support

Use this item to enable or disable Windows Hardware Error Architecture.

System Error

Use this item to enable or disable System Error feature. When it is set to [Enabled], it allows user to configure Memory Error and PCIe Error log features.

S/W Error Injection Support

When it is set to [Enabled], S/W Error Injection is supported by unlocking MSR Ox790.

Memory Error

Memory enabling and logging setup option.

Correctable Error Threshold

Correctable Error Threshold (0 - 0x7FFF) used for sparing, tagging, and leaky bucket.

PCIe Corrected Error Enable

Use this item to enable or disable PCIe Correctable errors.

PCIe Corrected Error Threshold

PCIe Correctable Error Threshold (0x01-0xFF) used for sparing, tagging, and leaky bucket.

PCIE Uncorrected Error Enable

Use this item to enable or disable PCIe Uncorrectable errors.

PCIE Fatal Error Enable

Use this item to enable or disable PCIe Ftal errors.

3.3.12 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.

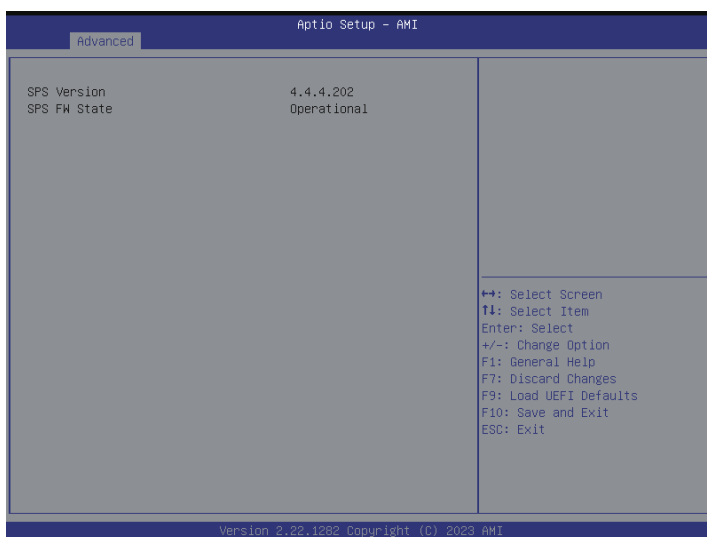
PXE boot wait time

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

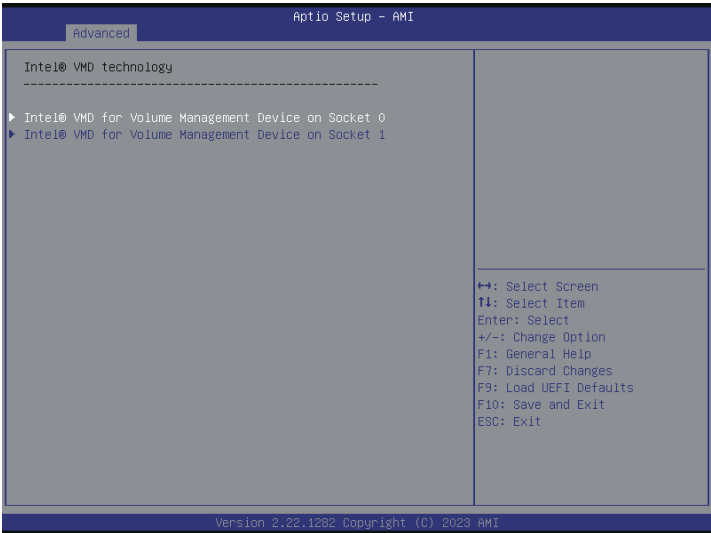
Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

3.3.13 Intel SPS Configuration



SPS screen displays the Intel SPS Configuration information, such as Operational Firmware Version and Firmware State.

3.3.14 Intel® VMD technology



Press <Enter> to bring up the Intel(R) VMD for Volume Management Device Configuration menu.

Intel(R) VMD for Volume Management Device on Socket 0

VMD Config for IOU 1 (PCIe1(x16))

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Enable/Disable Hot Plug for PCIe Root Ports A-D.

VMD Config for IOU 3 (PCIE1(x8)/SLIM1)

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Enable/Disable Hot Plug for PCIe Root Ports A-D.

VMD Config for IOU 4 (SLIM3/SLIM2)

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Use this item to enable or disable Hot Plug for PCIe Root Ports A-D.

Intel(R) VMD for Volume Management Device on Socket 1

VMD Config for IOU 0 (PCIe2(x16))

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Enable/Disable Hot Plug for PCIe Root Ports A-D.

VMD Config for IOU 1 (PCIE2(x8)/SLIM4)

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Enable/Disable Hot Plug for PCIe Root Ports A-D.

VMD Config for IOU 3 (PCIE3)

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Use this item to enable or disable Hot Plug for PCIe Root Ports A-D.

VMD Config for IOU 4 (SLIM6/SLIM5)

Enable/Disable VMD

Use this item to enable or disable VMD in this Stack.

When [Enabled], users are allowed to configure the options below.

VMD port A

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port B

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port C

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

VMD port D

Use this item to enable or disable Intel(R) Volume Management Device Technology on specific root port.

Hot Plug Capable

Use this item to enable or disable Hot Plug for PCIe Root Ports A-D.

3.3.15 Tls Auth Configuration



Server CA Configuration

Press <Enter> to configure Server CA.

Client Cert Configuration

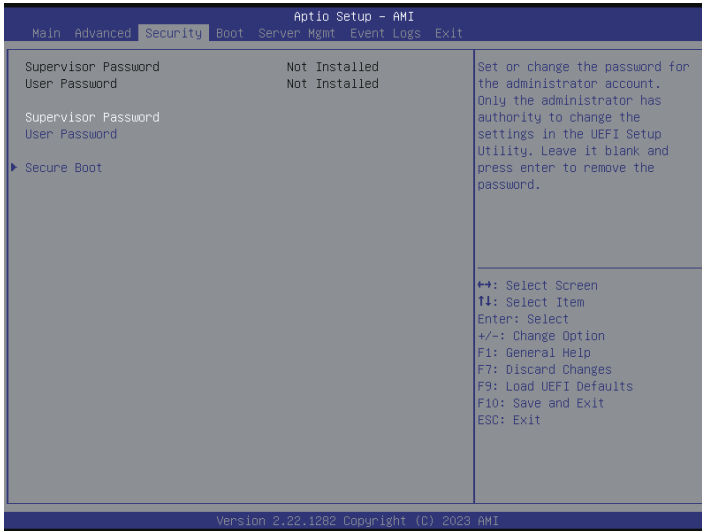
Press <Enter> to configure Client Cert.

3.3.16 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows user to update system UEFI without entering operating systems first like MS-DOS 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 their respective information. Select the proper UEFI file to update the UEFI, and reboot the system after the UEFI update process is completed.

3.4 Security

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

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.

3.4.1 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 using the 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

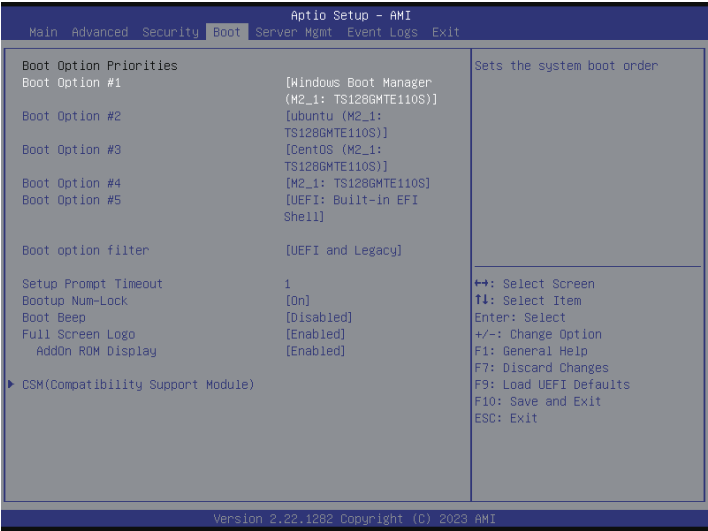
2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Default, External, Mixed

3.5 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

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.

Boot Option Filter

This option controls Legacy/UEFI ROMs priority.

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.

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.

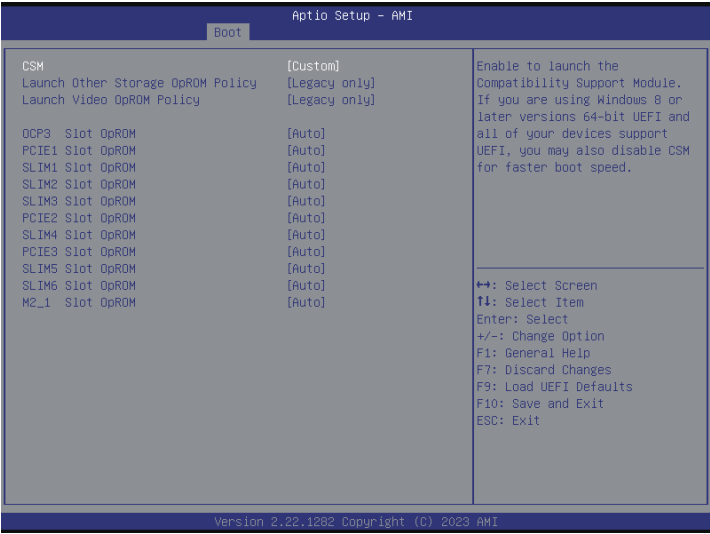
Full Screen Logo

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

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If enabling the option "Full Screen Logo", for seeing the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

3.5.1 CSM (Compatibility Support Module)



CSM

Enable to launch the Compatibility Support Module. Please do not disable unless it is running a WHCK test. Disable CSM for faster boot speed when using Windows 10 64-bit and all of the devices support UEFI.

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.

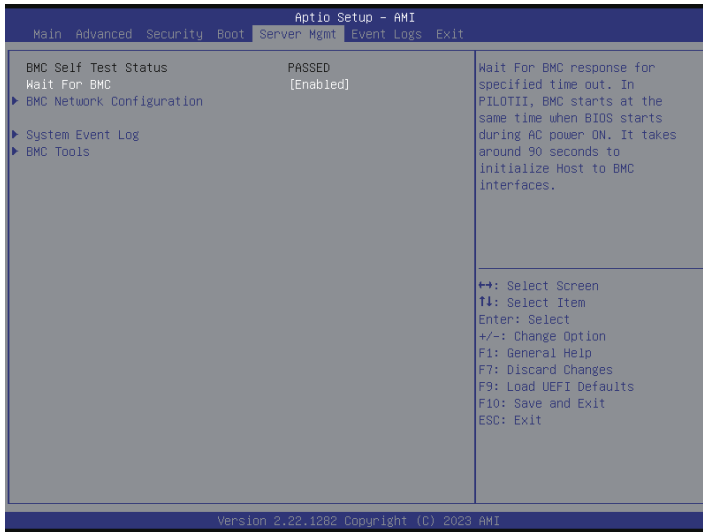
Launch Video OpROM Policy

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.

OCP3/PCIE1/SLIM1/SLIM2/SLIM3/PCIE2/SLIM4/SLIM5/SLIM6/M2_1 Slot OpROM

Use this item to select slot storage and Network Option ROM policy. In Auto option, the default is Disabled with NVMe device, but it is Legacy with other devices. (This item can't select Video Option ROM policy.)

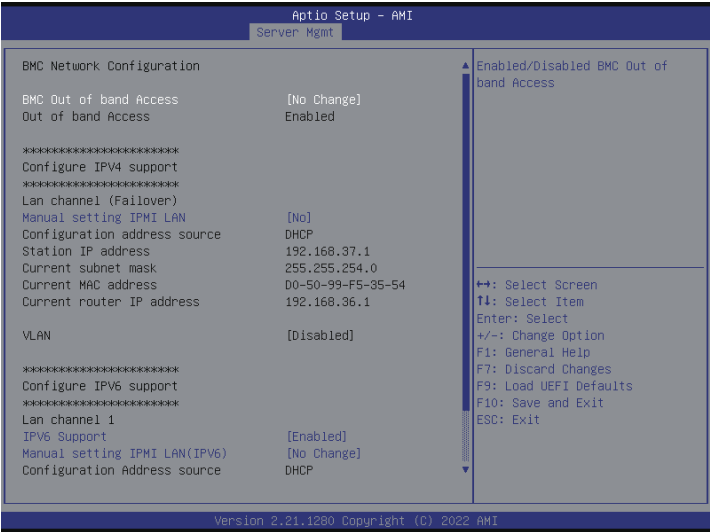
3.6 Server Mgmt



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.

3.6.1 BMC Network Configuration



BMC Out of Band Access

Enabled/Disabled BMC Out of band Access.

IPMI (eth0)

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

Enabled/Disabled Virtual Local Area Network.

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

IPV6 Support

Enabled/Disable LAN1 IPV6 Support.

Manual Setting IPMI LAN(IPV6)

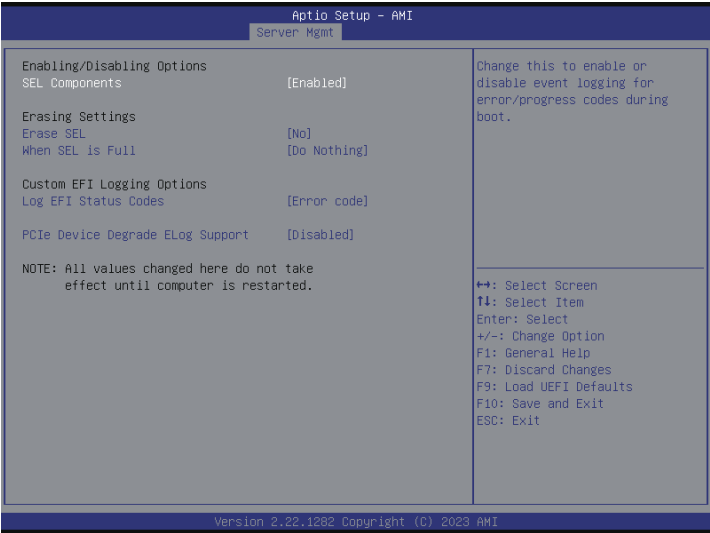
Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC).

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

IPV6 Index

IPV6 Index - Set Selector for Static IP, range 0 to 15.

3.6.2 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.

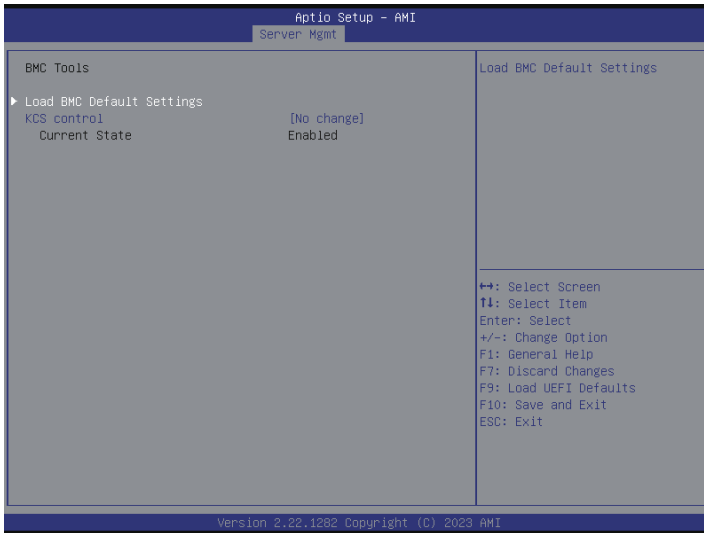
Log EFI Status Codes

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.

3.6.3 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.

3.7 Event Logs



Change Smbios Event Log Settings

This allows user to configure the Smbios Event Log Settings.

When entering the item, the screen displays following sub-items:

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.

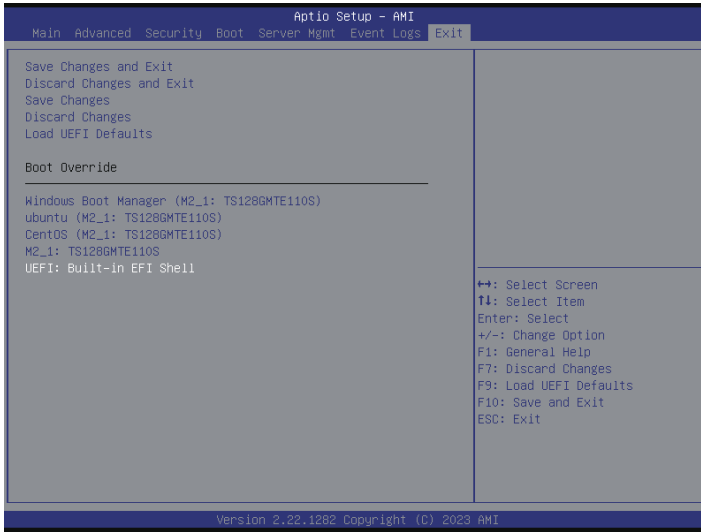
View Smbios Event Log

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 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. Press <F7> key or select [Yes] to save all changes.

Discard Changes

When selecting 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, 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.

**Please download the Intel® SATA Floppy Image driver from the ASRock Rack's website (www.asrockrack.com) to the 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 that is used, and then download the using driver.

4.3 Contact Information

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

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 motherboard damages.

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/3DS/LRDIMM/3DS/
Intel® Optane™ Persistent Memory 200 Series.
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 problem on ASRock Rack's FAQ page:
<http://www.asrockrack.com/support>

5.2 Technical Support Procedures

If having the troubleshooting procedures mentioned above and 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 our RMA website (<http://event.asrockrack.com/tsd.asp>) and 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

Contact ASRock Rack or want to know more about ASRock Rack, it's 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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