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Industry Standard, Flexible Architecture

GREEN

Less Heat, Less Power Consumption

STABLE

Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

SPC741D10HM3

User Manual

English

Version 1.00
Published Jan. 2026

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WARNING

THIS PRODUCT CONTAINS A BUTTON BATTERY
If swallowed, a button battery can cause serious injury or death.
Please keep batteries out of sight or reach of children.

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CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

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

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Licensee's specific rights may vary from country to country.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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

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

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

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

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

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

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

Contents

Chapter 1 Introduction

Thank you for purchasing ASRock Rack ***SPC741D10HM3*** 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 he software support.

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

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

1.1 Package Contents

- ASRock Rack SPC741D8HM3 motherboard (Half-Width form factor: 6.6" x 17")
- Quick installation guide
- 2 Screws for M.2 sockets
- 2 CPU Non-Fabric carriers (1xE1A, 1xE1B)

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

English

1.2 Specifications

SPC741D10HM3	
Physical Status	
Form Factor	Half-Width
Dimension	6.6” x 17” (167.64 x 431.80mm)
Processor System	
CPU	Supports 5th and 4th Gen Intel® Xeon® Scalable Processors
Socket	Single Socket E (LGA4677)
Chipset	Intel® C741
System Memory	
Supported DIMM Quantity	10 DIMM slots (2DPC/1DPC)
Supported Type	288-pin DDR5 RDIMM/RDIMM-3DS
Max. Capacity per DIMM	RDIMM: 96GB RDIMM-3DS: 2H- 128 GB / 4H- 256 GB
Max. DIMM Frequency	5600MT/s (1DPC)/4400 MT/s (2DPC) on 5th Gen Intel® Xeon® Scalable Processors 4800MT/s (1DPC)/4400 MT/s (2DPC) on 4th Gen Intel® Xeon® Scalable Processors
Voltage	1.1V
Note: Memory support is to be validated.	
PCIe Expansion Slots	
PCIe x16	SLOT1: Slim Cool Edge (PCIe5.0/CXL1.1 x16) [CPU]
Other PCIe Expansion Connectors	
M.2	2 M-key (PCIe5.0 x4), supports 22110/2280 form factor [CPU]
MCIO	1 MCIO (PCIe5.0 x8) [CPU]
OCuLink	2 OCuLink (PCIe3.0 x4 or 4 SATA 6Gb/s) [PCH]
SATA/SAS Storage	
PCH Built-in Storage	Intel® 741 (Up to 8 SATA 6Gb/s, support RAID 0/1/5/10): 2 Oculink
Ethernet	
OCP Slot	3 OCP NIC 3.0 (PCIe5.0/CXL1.1 x16) [CPU]
Server Management	
BMC Controller	ASPEED AST2600: IPMI2.0 with iKVM and vMedia support
IPMI Dedicated GLAN	1 RJ45 Dedicated IPMI LAN port by Realtek RTL8211F
Graphics	
Controller	ASPEED AST2600: 1 Mini DP (VGA), 1 header

Rear I/O	
UID Button/LED	1 UID button w/ LED
Video Port	1 Mini-DP* (VGA, adapter cable required) **The Mini Display Port provides VGA analog output. To connect to a D-Sub (VGA) display, an adapter cable is required. Please contact ASRock Rack for cable availability.*
USB Port	2 Type-A (USB3.2 Gen1)
LAN Port	1 dedicated IPMI
Internal Connectors/Headers	
Power Connector	2 Micro-Hi (8-pin, 12V), 1 (19-pin, CMBoard Standby Power 12V)
Other Power Connector	1 (6-pin) for HDD power
Note: User can connect 12VCON1, 12VCON2 and CM_SB_R simultaneously to provide power.	
Auxiliary Panel Header	1 (18-pin): chassis intrusion, system fault LED, locate, SMBus
System Panel Header	1 (9-pin): power switch, reset switch, system power LED, HDD activity LED
NMI Header	1
COM Header	1 (9-pin)
VGA Header	1 (15-pin)
Speaker Header	1 (4-pin)
Fan Headers	6 (6-pin)
Thermal Sensor Header	1
TPM Header	1 (13-pin, SPI)
VROC Header	1
SGPIO Headers	2
HSBP	1
SMbus Header	1
PMbus Header	1
IPMB Header	1
Clear CMOS	1 (contact pads)
USB Header	1 (19-pin, 2 USB 3.2 Gen1)
Others	1 P80 Debug Header
LED Indicators	
Standby Power LED	1
Fan Fail LEDs	6
BMC Heartbeat LED	1
CPU Caterr LED	1

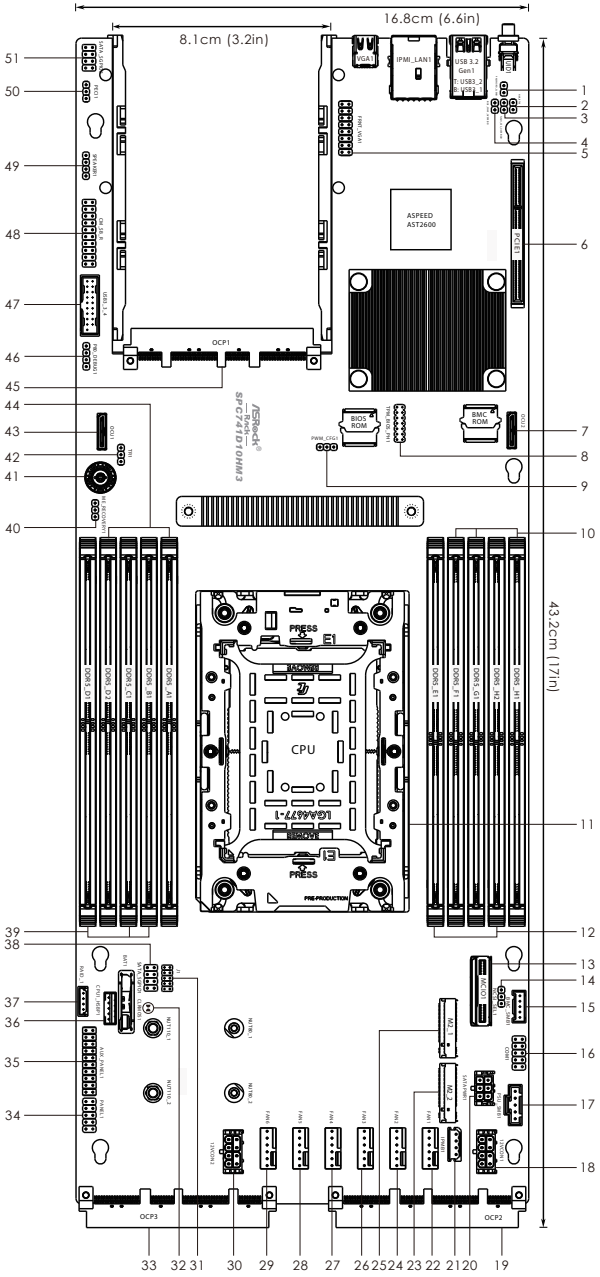
System BIOS	
Type	AMI UEFI BIOS: 512Mb SPI Flash ROM
Features	Plug and Play (PnP), ACPI 4.0 and above compliance wake up events, SMBIOS 3.4 and above , ASRock Rack Instant Flash
Hardware Monitor	
Temperature	CPU, MB, Card Side, TR1 Temperature Sensing
Fan	Fan Tachometer CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) Fan Multi-Speed Control
Voltage	CPU1_PVCCIN, PVDDQ_ABCD, PVDDQ_EFGH, 1.05V_PCH, 1.8V_PCH, +BAT, PVNN_PCH, 3.3V, 5V, 12V, 3.3VSB, 5VSB
Supported OS	
OS	Microsoft® Windows® - Server 2022 (64bit) Linux® - Red Hat Enterprise Linux Server 8.4 (64bit)/8.5 (64bit)/9.2 (64bit) - SUSE Enterprise Linux Server 15 SP3 (64bit) - Ubuntu 21.10 (64bit)/22.04.2 (64bit) Hypervisor: - VMWare® ESXi 7.0 U3g/8.0 * On the Ubuntu system is not support Raid mode. * Please refer to the website for the latest OS support list.
Enviroment	
Temperature	Operation Temperature: 10°C ~ 35°C Non Operation Temperature: -40°C ~ 70°C
Humidity	Non operation humidity: 20% ~ 90% (Non condensing)

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

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

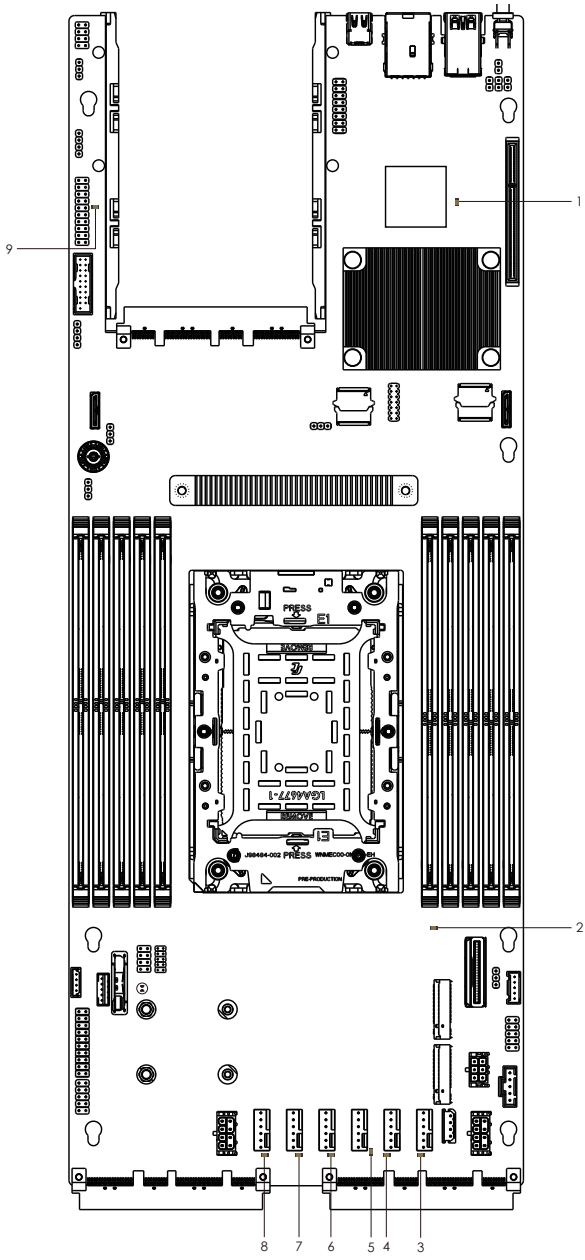


No.	Description
1	Password Reset Jumper (PASSWORD_CLEAR1)
2	Non Maskable Interrupt Button (NMI_BTN1)
3	Flash Security Jumper (FLASH_SEC_OVERRIDE1)
4	BIOS Swap Override Jumper (BIOS_SWAP_OVERRIDE1)
5	Front VGA Header (FRNT_VGA1)
6	PCI Express 5.0 x16 Slot (PCIE1)
7	OCuLink Connector (4 SATA 6Gb/s) (OCU2)
8	SPI TPM Header (TPM_BIOS_PH1)
9	PWM Configuration Header (PWM_CFG1)
10	3 x 288-pin DDR5 DIMM Slots (DDR5_F1, DDR5_G1, DDR5_H1)*
11	LGA 4677 CPU Socket (CPU1)
12	2 x 288-pin DDR5 DIMM Slots (DDR5_E1, DDR5_H2)*
13	Mini Cool Edge IO x8 Connector (MCIO1)
14	NCSI Mode Jumper (NCSI_SEL1)
15	BMC SMBus Header (BMC_SMB1)
16	Serial Port Header (COM1)
17	PSU SMBus Header (PSU_SMB1)
18	ATX 12V Power Connector (12VCON1)
19	OCP NIC 3.0 Slot (PCIe5.0 x16) (OCP2)
20	SATA Power Connector (SATAPWR1)
21	Intelligent Platform Management Bus Header (IPMB1)
22	System Fan Header (FAN1)
23	M-key M.2 Socket (M2_2) (Type 22110/2280)
24	System Fan Header (FAN2)
25	M-key M.2 Socket (M2_1) (Type 22110/2280)
26	System Fan Header (FAN3)
27	System Fan Header (FAN4)
28	System Fan Header (FAN5)
29	System Fan Header (FAN6)
30	ATX 12V Power Connector (12VCON2)
31	Front Panel Board Header (J1)
32	Clear CMOS Pad (CLRMOS1)
33	OCP NIC 3.0 Slot (PCIe5.0 x16) (OCP3)
34	System Panel Header (PANEL1)

No.	Description
35	Auxiliary Panel Header (AUX_PANEL1)
36	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
37	Virtual RAID On CPU Header (RAID_1)
38	SATA SGPIO Connector (SATA_SGPIO1)
39	3 x 288-pin DDR5 DIMM Slots (DDR5_B1, DDR5_C1, DDR5_D1)*
40	ME Recovery Jumper (ME_RECOVERY1)
41	Thumbscrew
42	Thermal Sensor Header (TR1)
43	OCuLink Connector (4 SATA 6Gb/s) (OCU1)
44	2 x 288-pin DDR5 DIMM Slots (DDR5_A1, DDR5_D2)*
45	OCP NIC 3.0 Slot (PCIe5.0 x16) (OCP1)
46	P80 Debug Header (P80_DEBUG1)
47	USB 3.2 Gen1 Header (USB3_3_4)
48	CM Board Standby Power Header (CM_SB_R)
49	Speaker Header (SPEAKER1)
50	CPU PECI Mode Jumper (PECI1)
51	SATA SGPIO Connector (SATA_SGPIO2)

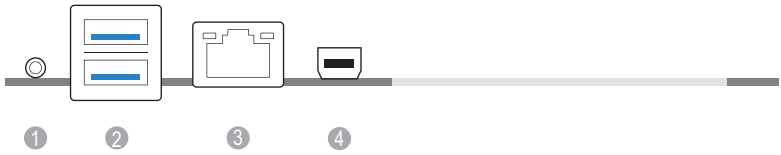
**For DIMM installation and configuration instructions, please see p.21 (Installing the Memory Modules (DIMM)) for more details.*

1.5 Onboard LED Indicators



No.	Item	Status	Description
1	BMC_LED1	Blinking four times and then off	Start initialization after AC power-on or BMC reset
		Blinking at 1Hz	BMC ready
		Steady on Steady off Other frequency	Error (The actual behavior depends on the state at the time of failure)
2	CPU_CATERR1	Red	CPU CATERR error
3	LED_FAN1	Red	FAN1 failed
4	LED_FAN2	Red	FAN2 failed
5	LED_FAN3	Red	FAN3 failed
6	LED_FAN4	Red	FAN4 failed
7	LED_FAN5	Red	FAN5 failed
8	LED_FAN6	Red	FAN6 failed
9	SB_PWR1	Green	STB PWR ready

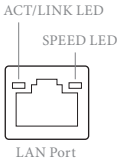
1.6 I/O Panel



No.	Description	No.	Description
1	UID Switch (UID1)	3	LAN RJ-45 Port (IPMI_LAN1)*
2	USB 3.2 Gen1 Ports (USB3_1_2)	4	Mini Display Port (VGA1)

LAN Port LED Indications

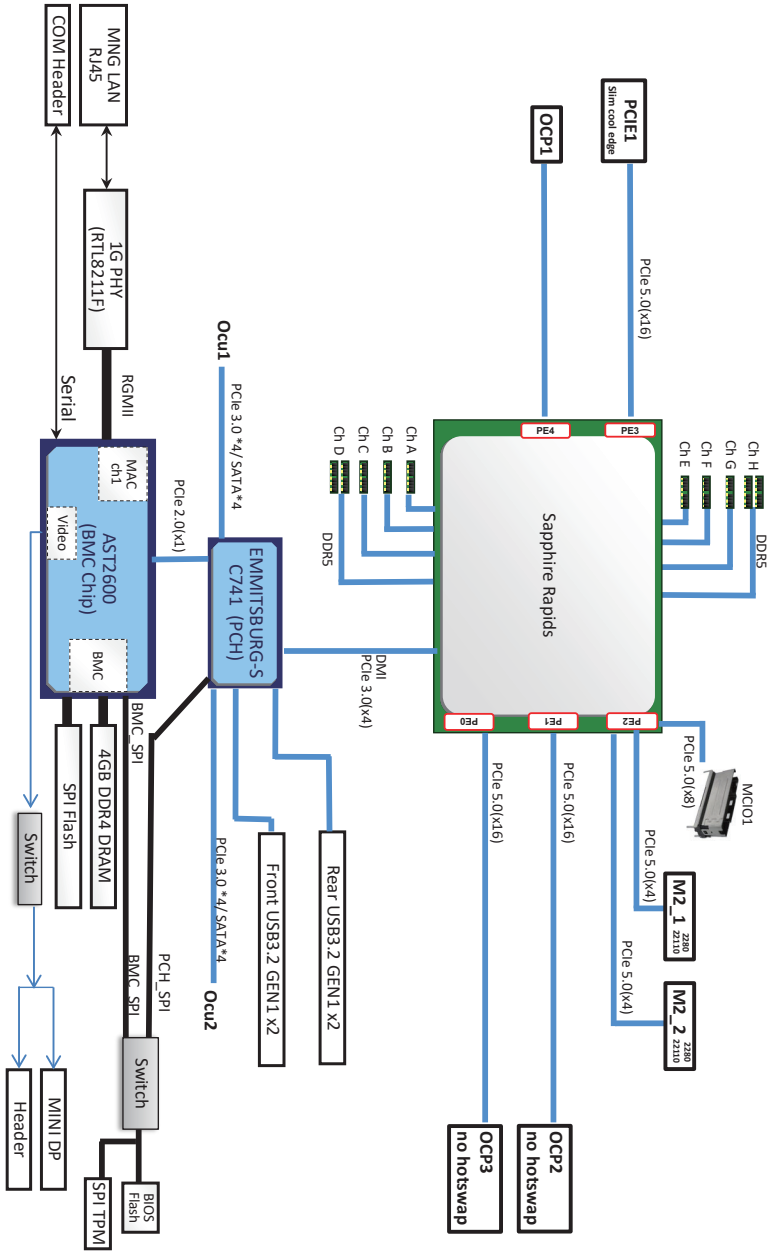
*There is an LED on each side of IPMI LAN port. Please refer to the table below for the LAN port LED indications.



IPMI LAN Port LED Indications

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

1.7 Block Diagram



Chapter 2 Installation

This is a Half-Width form factor (6.6" x 17") motherboard. Before installing the motherboard, study the configuration of the chassis to ensure that the motherboard fits into it.

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

2.1 Screw Holes

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

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

2.2 Pre-installation Precautions

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

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

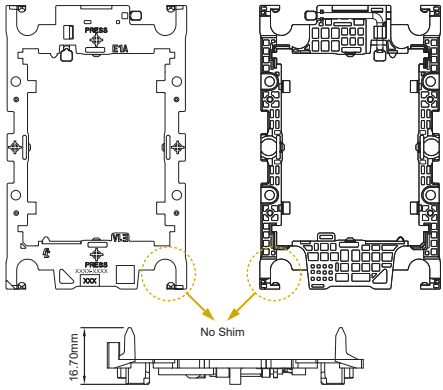
2.3 Installing the CPU and Heatsink

1. *Unplug all power cables before installing the CPU.*
2. *Illustration in this documentation are examples only.*

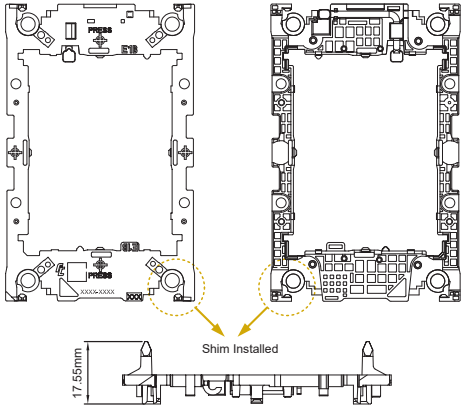
Carrier Used

Carrier Type	Xeon® SP XCC	Xeon® SP MCC/LCC
Carrier Code	E1A	E1B
Shim	No	Yes
Carrier Height	16.70mm	17.55mm

XCC Carrier



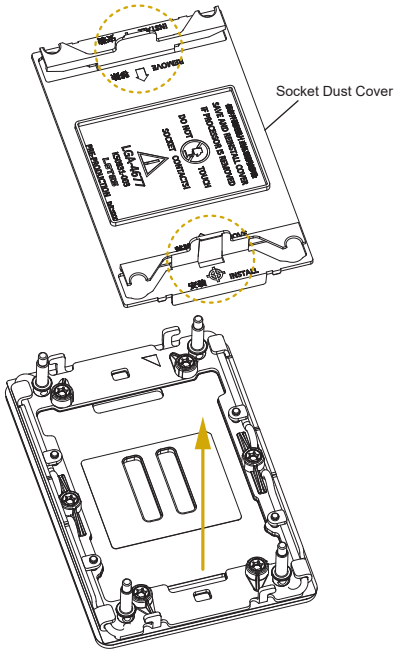
MCC Carrier



English

Follow the steps below to finish the CPU installation and please save the Socket Dust Cover when returning for service.

1



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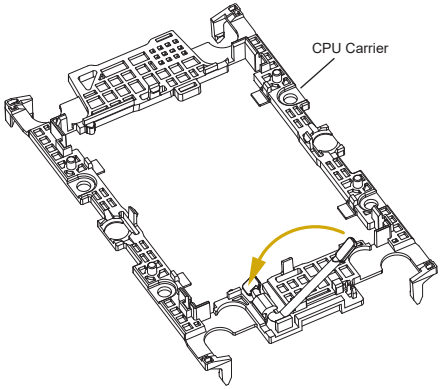

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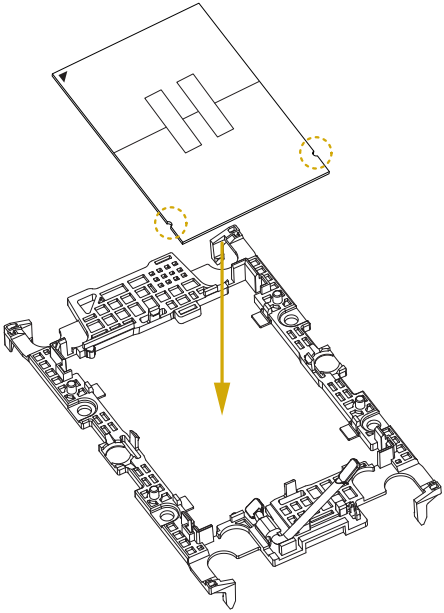

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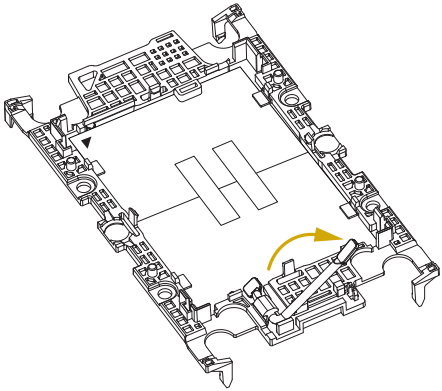

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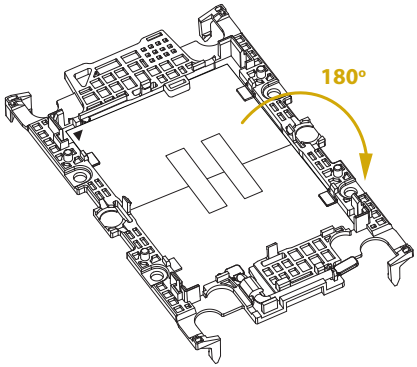

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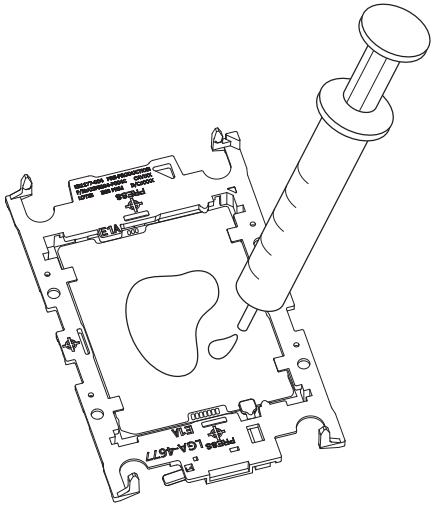

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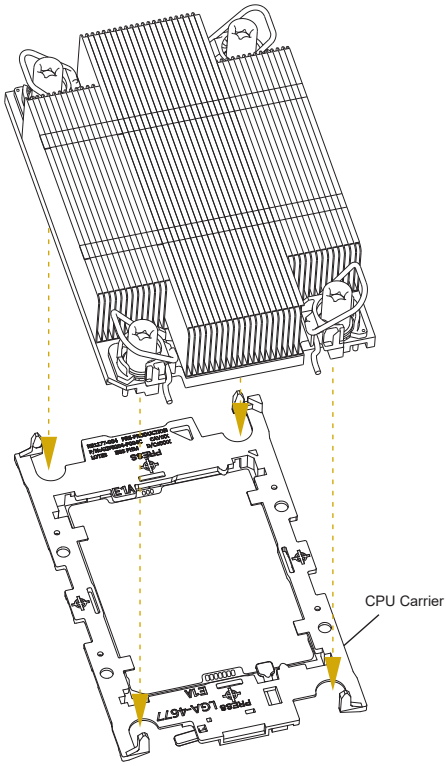

English

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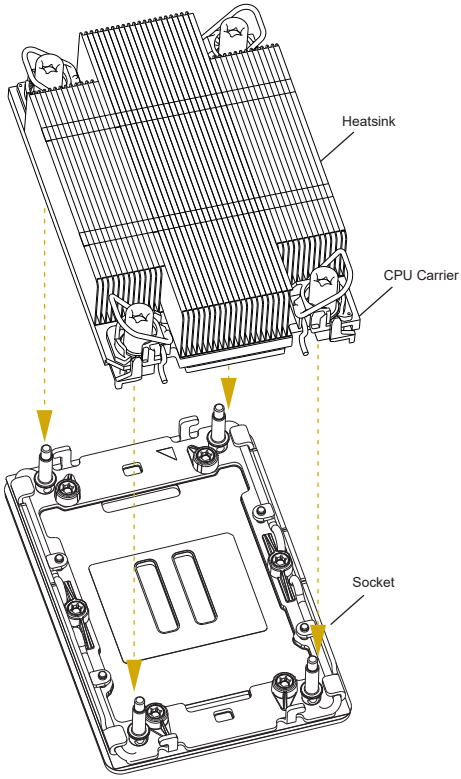

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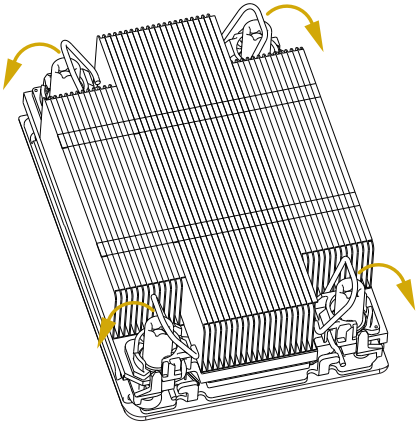
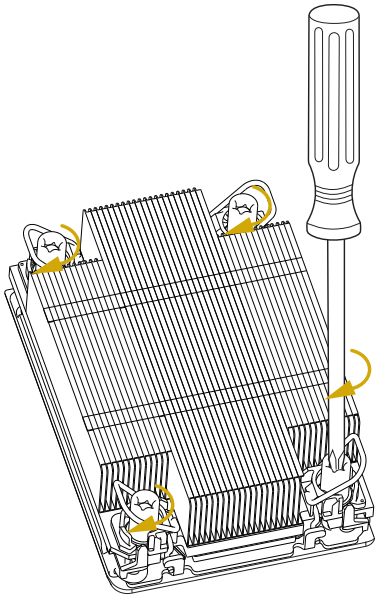


10



2.4 Installing the Memory Modules (DIMM)

This motherboard provides ten 288-pin DDR5 (Double Data Rate 5) DIMM slots in two groups, and supports Single/Dual Channel Memory Technology.

CPU	
DDR5_A1, B1, C1, D1, D2	DDR5_E1, F1, G1, H1, H2

1. *It is not allowed to install a DDR, DDR2 , DDR3 or DDR4 memory module into a DDR5 slot; otherwise, this motherboard and DIMM may be damaged.*
2. *For dual channel configuration, it needs to install identical (the same brand, speed, size and chip-type) DDR5 DIMM pairs.*
3. *It is unable to activate Dual Channel Memory Technology with singular memory installed.*

2.4.1 Memory Support

4th Gen Intel® Xeon® Scalable Processors - SP

Type	Ranks Per DIMM and Data Width	DRAM Density & DIMM Capacity			Speed (MT/s); Voltage (V); DIMM Per Channel (DPC)	
					1DPC[1]	2DPC
		16Gb	24Gb[2]	32Gb	1.1V	
RDIMM	SRx8 (RC D)	16GB	24GB	NA	4800	4400
	SRx4 (RC C)	32GB	48GB	NA		
	SRx4 (RC F) 9x4	32GB	NA	NA		
	DRx8 (RC E)	32GB	48GB	NA		
	DRx4 (RC A)	64GB	96GB	128GB		
	DRx4 (RC B) 9x4	64GB	NA	NA		
RDIMM-3DS	(4R/8R) x4 (RC A)	2H-128GB 4H-256GB	NA	NA		

Note1: 1DPC applies to 1 SPC or 2SPC implementations (SPC-Sockets Per Channel).
Note2: 24Gb XCC only w/ limited configs: 1DPC all DIMM types, 2DPC 96GB only. Only 8 and 16 DIMM configs, no fallbacks.
Note3: The memory speed will be 4800 MT/s 1DPC and 4400 MT/s 2DPC.
Note4: The table is for reference only.

English

5th Gen Intel® Xeon® Scalable Processors - SP

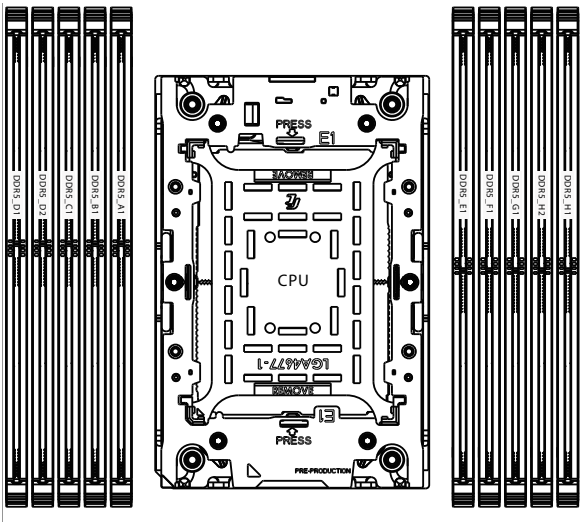
Type	Ranks Per DIMM and Data Width	DRAM Density & DIMM Capacity			Speed (MT/s); Voltage (V); DIMM Per Channel (DPC)	
					1DPC[1]	2DPC
		16Gb	24Gb	32Gb	1.1V	
RDIMM	SRx8 (RC D)	16GB	24GB[2]	NA	5600[3]	4400[3]
	SRx4 (RC C)	32GB	48GB[2]	NA		
	SRx4 (RC F) 9x4	NA	NA	NA		
	DRx8 (RC E)	32GB	48GB[2]	NA		
	DRx4 (RC A)	64GB	96GB	128GB		
	DRx4 (RC B) 9x4	NA	NA	NA		
RDIMM-3DS	(4R/8R) x4 (RC A)	2H-128GB 4H-256GB	NA	NA	5600[4]	

Note1: 1DPC applies to 1 SPC or 2SPC implementations (SPC-Sockets Per Channel).
Note2: 24Gb 2DPC not POR w/ 24GB and 48GB DIMMs.
Note3: DDR5-5600 RDIMMs will be limited to 5600 MT/s 1DPC and 4400 MT/s 2DPC. DDR5-4800 DIMMs will be limited to 4800 MT/s 1DPC and 4400 MT/s 2DPC.
Note4: DDR5-5600 DIMM are required for 5600 and 5200 1DPC speeds.
Note5: EE LCC DDR5 memory support POR is 16GB/24GB/32GB at 4400 for 1DPC and 2DPC.
Note6: The table is for reference only.

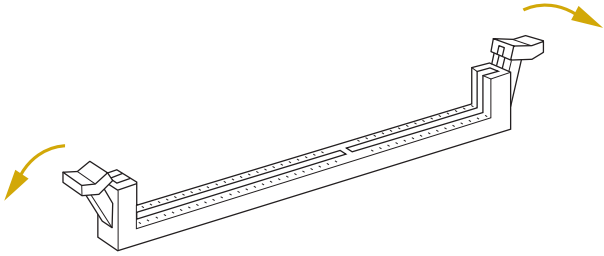
2.4.2 Memory Configurations

DIMM Count	Channel Count	DIMM Channel										
		D1	D2	C1	B1	A1		E1	F1	G1	H2	H1
1	1					V						
1	1							V				
1	1				V							
1	1								V			
2	2					V				V		
2	2			V				V				
4	4			V		V	CPU	V		V		
6	6	V		V		V		V	V	V		
6	6			V	V	V		V		V		V
6	6	V		V	V			V	V			V
6	6	V			V	V			V	V		V
8	8	V		V	V	V		V	V	V		V
10	8	V	V	V	V	V		V	V	V	V	V

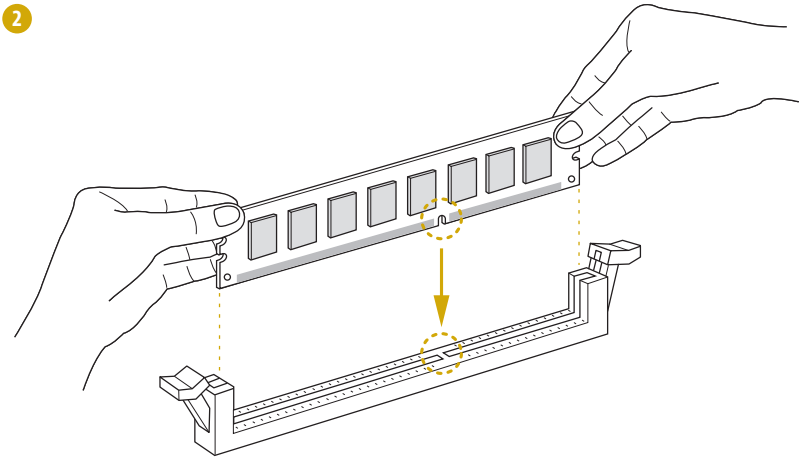
The Symbol V indicates the slot is populated.



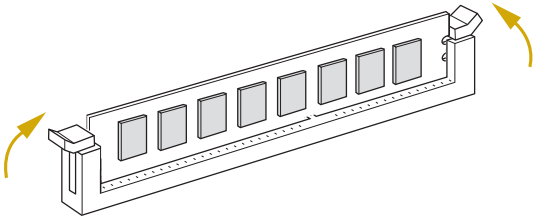
1



2



3



2.5 Expansion Slot (PCI Express Slot)

There is a PCI Express slot on this motherboard.

PCIE slot:

PCIE1 (PCIE 5.0 x16 slot, from CPU) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE1	5.0	x16	x16	CPU

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.

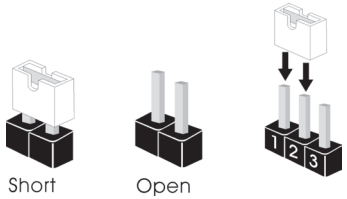
Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5. Fasten the card to the chassis with screws.

Step 6. Replace the system cover.

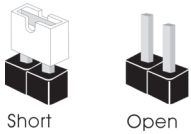
2.6 Jumper Setup

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.6, No. 40)	 Normal Mode (Default)	 ME Recovery Mode
CPU PECI Mode Jumper (3-pin PECI1) (see p.6, No. 50)	 CPU PECI connected to BMC (Default)	 CPU PECI connected to PCH
NCSI Mode Jumper (3-pin NCSI_SEL1) (see p.6, No. 14)	 NCSI for OCP3 (Default)	 NCSI for OCP2

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".

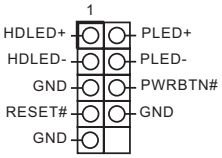


Password Reset Jumper (2-pin PASSWORD_ CLEAR1) (see p.6, No. 1)	 2-pin Jumper	Open: Password Clear Short: Normal Mode (Default)
Flash Security Jumper (FLASH_SEC_OVER-RIDE1) (see p.6, No. 3)	 2-pin Jumper	Open: Enable Flash Security (Default) Short: Disable Flash Security
BIOS Swap Override Jumper (BIOS_SWAP_OVER-RIDE1) (see p.6, No. 4)	 2-pin Jumper	Open: Disable Override (Default) Short: Enable Override

2.7 Onboard Headers and Connectors

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

System Panel Header
(9-pin PANEL1)
(see p.6, No. 34)



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.

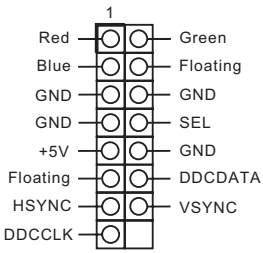
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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.

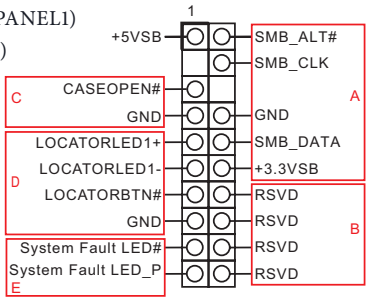
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting the chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Front VGA Header
(15-pin FRNT_VGA1)
(see p.6, No. 5)



Please connect either end of VGA_2X8 cable to VGA header.

Auxiliary Panel Header
(18-pin AUX_PANEL1)
(see p.6, No. 35)



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

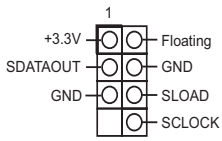
B. Reserved pin (4-pin RSVD)
These 4-pin are reserved for specified reosurce or device using.

C. Chassis intrusion pin (2-pin CHASSIS)
This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

D. Locator LED (4-pin LOCATOR)
This header is for the locator switch and LED on the front panel.

E. System Fault LED (2-pin SYSTEM STATUS)
This header is for the Fault LED on the system.

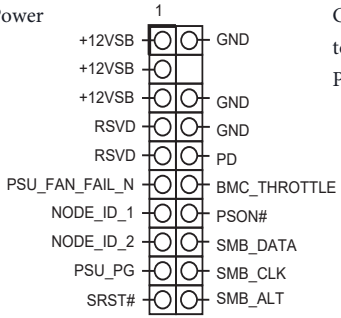
SATA SGPIO Connectors
(7-pin SATA_SGPIO1)
(see p.6, No. 38)
(7-pin SATA_SGPIO2)
(see p.6, No. 52)



The header supports Serial Link interface for onboard SATA connections.

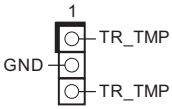
English

CM Board Standby Power Headers
(19-pin CM_SB_R)
(see p.6, No. 48)



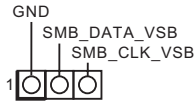
Connect this 19-pin header to the PSU for +12VSB and PSON PWROK.

Thermal Sensor Header
(3-pin TR1)
(see p.6, No. 42)



Please connect the thermal sensor cable to either pin 1-2 or pin 2-3 and the other end to the device to monitor its temperature.

PWM Configuration Header
(3-pin PWM_CFG1)
(see p.6, No. 9)

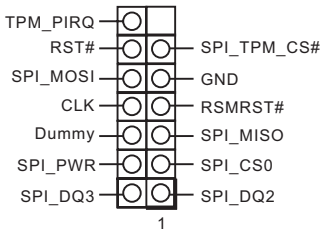


The header is used for PWM configurations.

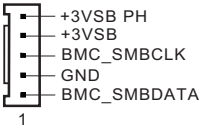
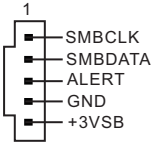
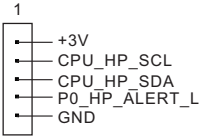
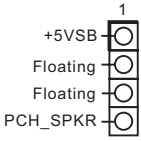
Non Maskable Interrupt Button Header
(NMI_BTN1)
(see p.6, No. 2)

Please connect a NMI device to this header.

SPI TPM Header
(13-pin TPM_BIOS_PH1)
(see p.6, No. 8)

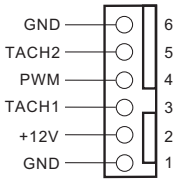


This connector supports Trusted Platform Module (TPM) system for SPI interface, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

OCuLink Connectors (OCU1) (see p.6, No. 43) (OCU2) (see p.6, No. 7)		Please connect PCIE SSDs to the connector.
BMC SMB Header (5-pin BMC_SMB1) (see p.6, No. 15)		The header is used for the SM BUS devices.
Clear CMOS Pad (CLRMOS1) (see p.6, No. 32)		This allows user to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.
PSU SMBus Header (5-pin PSU_SMB1) (see p.6, No. 17)		PSU SMBus monitors the status of the power supply, fan and system temperature.
Backplane PCI Express Hot-Plug Connector (5-pin CPU1_ HSBP1) (see p.6, No. 36)		This header is used for the hot plug feature of HDDs on the backplane.
Chassis Speaker Header (4-pin SPEAKER1) (see p.6, No. 49)		Please connect the chassis speaker to this header.

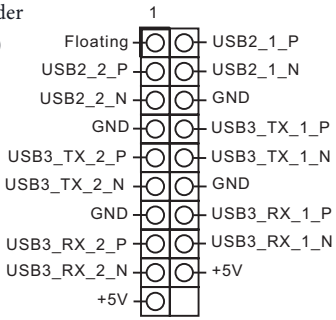
English

System Fan Headers
(6-pin FAN1)
(see p.6, No. 22)
(6-pin FAN2)
(see p.6, No. 24)
(6-pin FAN3)
(see p.6, No. 26)
(6-pin FAN4)
(see p.6, No. 27)
(6-pin FAN5)
(see p.6, No. 28)
(6-pin FAN6)
(see p.6, No. 29)



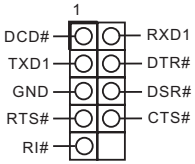
Please connect fan cables to the fan headers and match the black wire to the ground pin. All fans support Fan Control. The fan max. current is 5A and the max. power is 60Watts.

USB 3.2 Gen1 Header
(19-pin USB3_3_4)
(see p.6, No. 47)



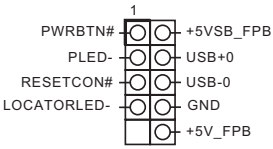
Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. This USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

Serial Port Header
(9-pin COM1)
(see p.6, No. 16)



This COM1 header supports a serial port module.

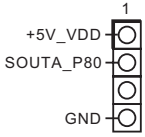
Front Panel Board Header
(9-pin J1)
(see p.6, No. 31)



Connect this header to the Front Panel Board on the system.

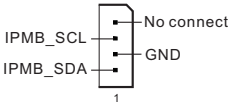
English

80 Debug Header
(4-pin P80_DEBUG)
(see p.6, No. 46)



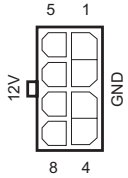
This header is used to connect to a debug display for showing the motherboard debug information.

Intelligent Platform Management Bus Header
(4-pin IPMB1)
(see p.6, No. 21)



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.

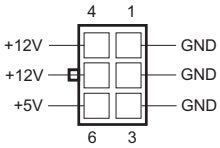
ATX 12V Power Connectors
(8-pin 12VCON1)
(see p.6, No. 18)
(8-pin 12VCON2)
(see p.6, No. 30)



This motherboard provides two 8-pin Micro-Hi 12V power connectors.

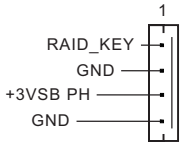
Note: User can connect 12VCON1, 12VCON2 and CM_SB_R simultaneously to provide power.

SATA Power Connector
(6-pin SATAPWR1)
(see p.6, No. 20)



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

Virtual RAID On CPU Header
(4-pin RAID_1)
(see p.6, No. 37)



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 • RAID 5 Write Hole Closure
ISS	VROCISSDMOD	

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

Mini Cool Edge IO x8 Connectors
(MCIO1)
(see p.6, No. 13)

This motherboard supports one Mini Cool Edge IO x8 Connectors. Please connect these connectors to the HDD backplane board.

MCIO1 Pin Definition

Pin	Defeinition	Pin	Defeinition
A1	GND	B1	GND
A2	RX_DP8	B2	TX_DN8
A3	RX_DN8	B3	TX_DP8
A4	GND	B4	GND
A5	RX_DP9	B5	TX_DN9
A6	RX_DN9	B6	TX_DP9
A7	GND	B7	GND
A8	TP_MCIO_0_SPARE_A1	B8	SMB_MCIO1_R_SCL1
A9	IRQ_LVC3_WAKE_N	B9	SMB_MCIO1_R_SDA1
A10	GND	B10	GND
A11	CLK_100M_MCIO1_DP0	B11	MCIO1_PERST_BUF1_N
A12	CLK_100M_MCIO1_DN0	B12	MCIO_1_PRSNT0_R_N
A13	GND	B13	GND
A14	RX_DN10	B14	TX_DN10
A15	RX_DP10	B15	TX_DP10
A16	GND	B16	GND
A17	RX_DN11	B17	TX_DN11
A18	RX_DP11	B18	TX_DP11
A19	GND	B19	GND
A20	RX_DN12	B20	TX_DP12
A21	RX_DP12	B21	TX_DN12
A22	GND	B22	GND
A23	RX_DN13	B23	TX_DP13
A24	RX_DP13	B24	TX_DN13
A25	GND	B25	GND
A26	TP_MCIO_0_SPARE_A2	B26	SMB_MCIO1_R_SCL2
A27	IRQ_LVC3_WAKE_N	B27	SMB_MCIO1_R_SDA2
A28	GND	B28	GND
A29	CLK_100M_MCIO1_DP1	B29	MCIO1_PERST_BUF2_N
A30	CLK_100M_MCIO1_DN1	B30	MCIO_1_PRSNT1_R_N
A31	GND	B31	GND
A32	RX_DN14	B32	TX_DP14
A33	RX_DP14	B33	TX_DN14
A34	GND	B34	GND
A35	RX_DP15	B35	TX_DP15
A36	RX_DN15	B36	TX_DN15
A37	GND	B37	GND
75	NP_NC_1	76	NP_NC_2
77	PGND_1	78	PGND_3
79	PGND_2	80	PGND_4

2.8 Dr. Debug

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

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

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

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

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

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

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

2.9 Unit Identification purpose LED/Switch

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

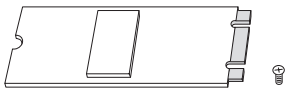
Unit Identification purpose LED/Switch (UID1)		When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be truned on. Press the UID button again to turn off the indicator.

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

2.10 M.2 SSD Module Installation Guide

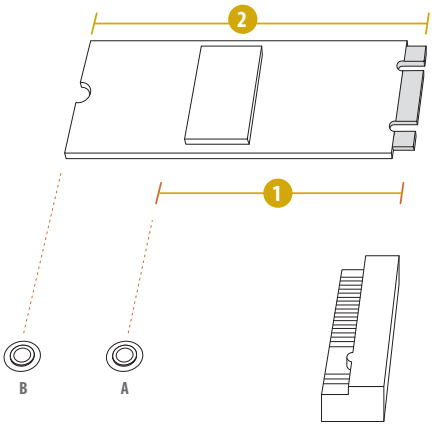
The M.2 Socket (M2_1/M2_2, Key M) supports a M.2 PCI Express moduel up to Gen5x4 (32Gb/s x4).

Installing the M.2 SSD Module



Step 1

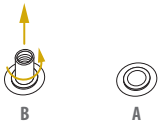
Prepare a M.2 SSD module and the screw.

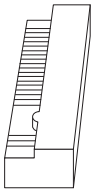


Step 2

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

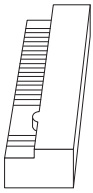
No.	1	2
Nut Location	A (NUT80_1/NUT80_2)	B (NUT110_1/NUT110_2)
PCB Length	8cm	11cm
Module Type	Type 2280	Type 22110





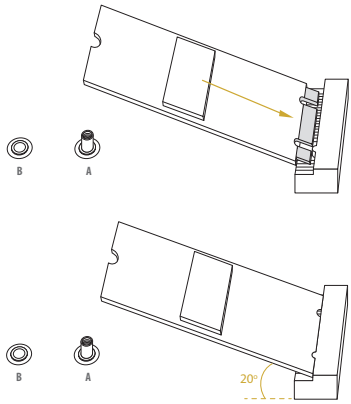
Step 3

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



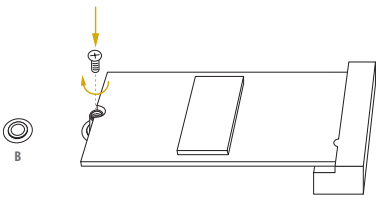
Step 4

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 <Del> 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> upon 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
Event Logs	For event log configuration
Security	To set up the security features
Boot	To set up the default system device to locate and load the Operating System
Exit	To exit the current screen or the UEFI SETUP UTILITY

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

English

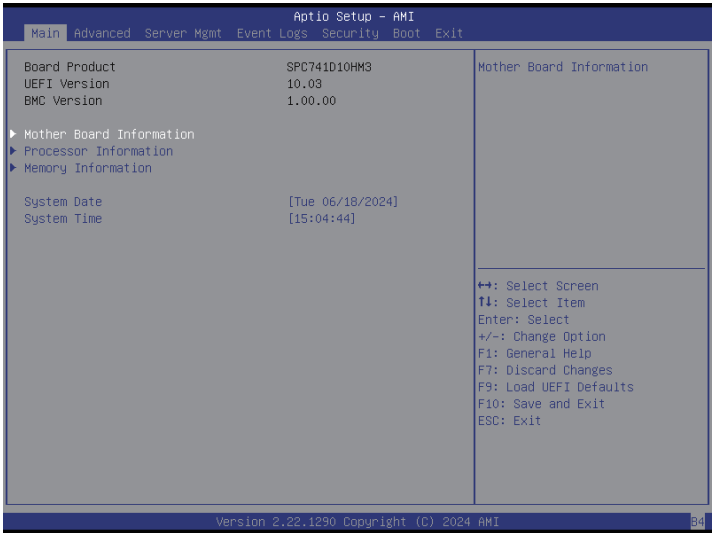
3.1.2 Navigation Keys

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

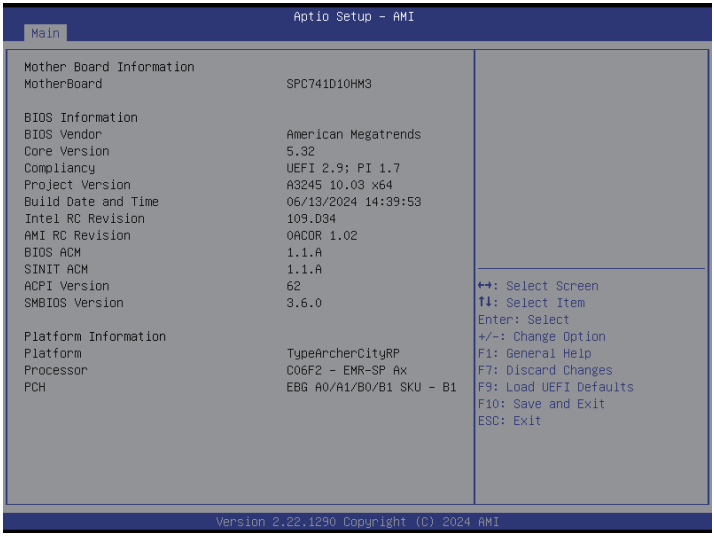
3.2 Main Screen

Entering the UEFI SETUP UTILITY, the Main screen displays the system overview. The Main screen provides system overview information and allows user to set the system time and date.



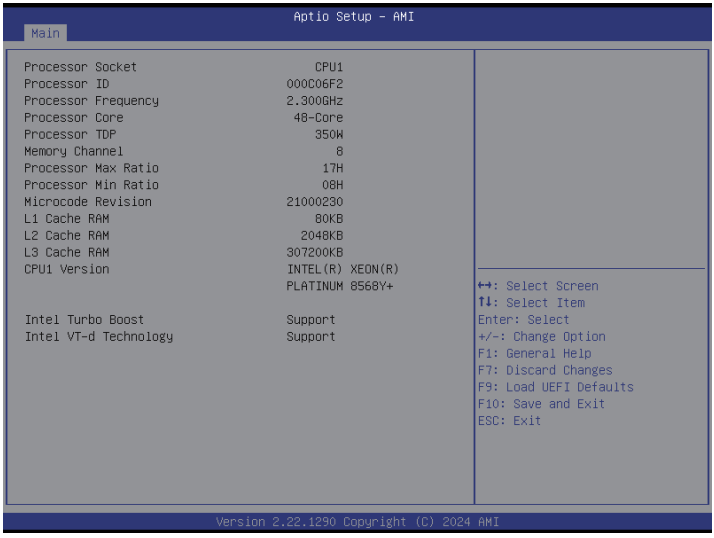
3.2.1 Motherboard Information

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



3.2.2 Processor Information

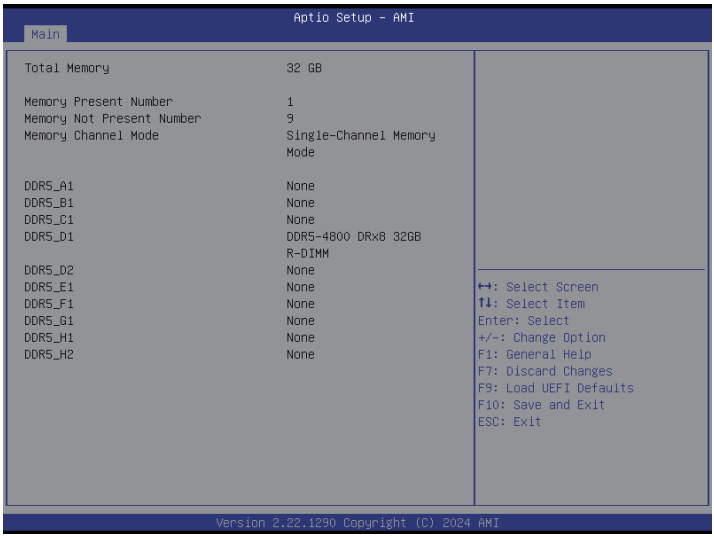
Press [Enter] to view the information of the processor.



English

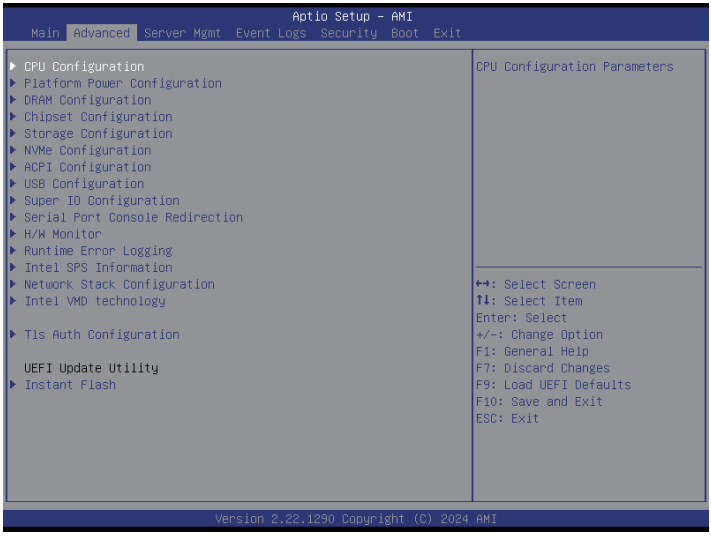
3.2.3 Memory Information

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



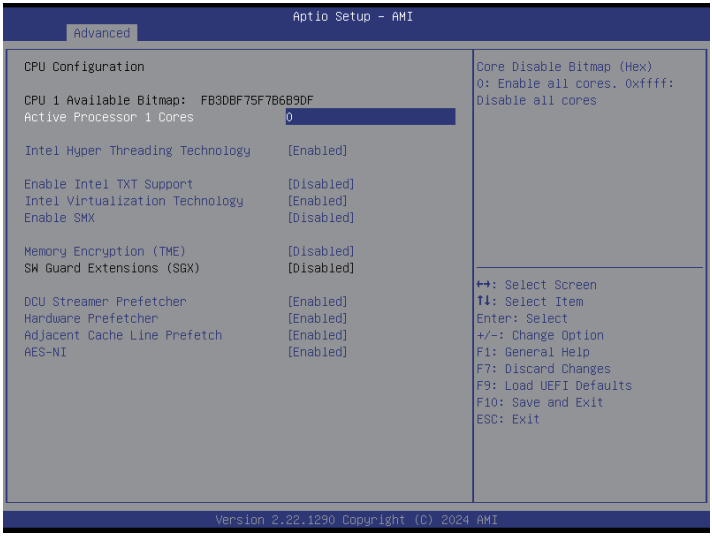
3.3 Advanced Screen

In this section, it allows user to configure and view the following items: CPU Configuration, Platform Power 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, Intel SPS Information, Network Stack Configuration, Intel 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



Active Processor 1 Cores

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

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.

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.

Memory Encryption (TME)

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

SW Guard Extensions (SGX)

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

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.

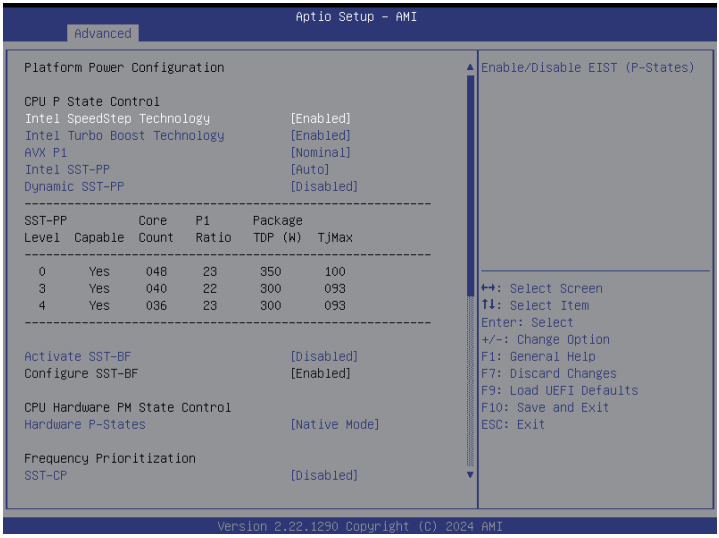
Adjacent Cache Line Prefetch

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

AES-NI

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

3.3.2 Platform Power 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.

AVX P1

Select this item to configure AVX P1 level.

Intel SST-PP

Select this item to configure hardware supported level.

Dynamic SST-PP

Select this item to enable or disable the Dynamic SST-PP.

HWP Native Mode is a pre-requisite for enabling Dynamic SST-PP.

Activate SST-BF

Select this item to enable or disable the SST-BF.

HWP Native Mode is a pre-requisite for enabling SST-BF; HWP Native Mode with No Legacy is a pre-requisite for configuring SST-BF.

Configure SST-BF

Select this item to enable or disable the BIOS to configure SST-BF High Priority Cores so that SW does not have to configure.

Hardware P-States

This item supports below selections:
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)
Native Mode with No Legacy Support: Hardware autonomously chooses a P-state based on OS guidance with no legacy support.

SST-CP

Select this item to enable or disable the SST-CP feature.

About SST configurations are base on the Intel® related supported specifications.

Enable Monitor MWAIT

Select this item to configure Monitor and MWAIT instructions whether Auto maps to enable.

CPU C6 State Support

Select this item to configure the CPU C6 (ACPI C3) report to OS.

Enhanced Halt State (C1E)

This item specific the Core C1E auto promotion Control whether takes effect after reboot.

Package C State Support

This item specific the Package C State limit, the state Auto maps is program specific.

Thermal Monitor

Select this item to enable or disable Thermal Monitor.

Power Performance Tuning

This allows user to decides which controls EFB.
OS Controls EPB: Specifies IA32_ENERGY_PERF_BIAS is used.
BIOS Controls EPB: Specifies ENERGY_PERF_BIAS_CONFIG is used.
PECI Controls EPB: Specifies PCS53 is used.

ENERGY_PERF_BIAS_CFG mode

This allows user to use input from ENERGY_PERF_BIAS_CONFIG mode seletion. PERF/ Balanced, Perf/Bananced or Power/Power.

Long Duration Power Limit

Select this item to configure the Long Duration Power Limit. PL1 Power Limit is in Watts and the value may vary from 0 to Fused Value. If the value is 0, the fused value will be programmed. A value greater than fused TDP value will not be programmed.

Long Duration Maintained

Select this item to configure the Long Duration Maintained value. PL1 value is in seconds. The value may vary from 0 to 448. Indicates the time window over which TDP value should be maintained.

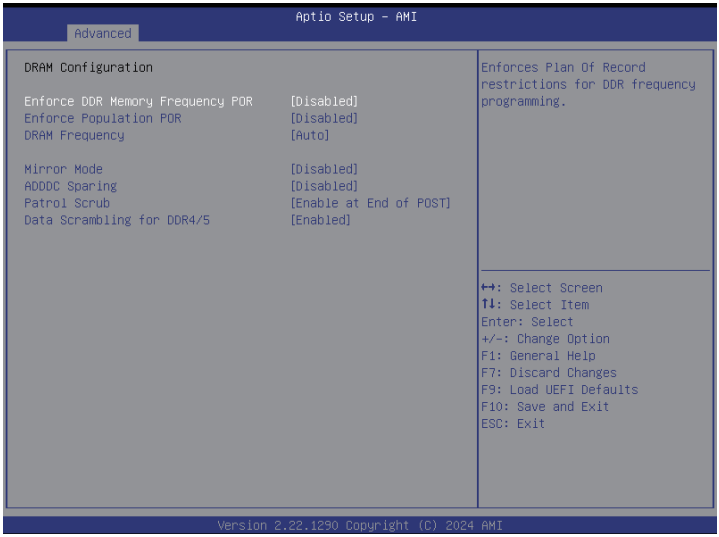
Short Duration Power Limit

Select this item to configure the Short Duration Power Limit. PL2 Power Limit in Watts. The value may vary from 0 to Fused Value. If the value is 0, BIOS programs 120% * TDP.

Short Duration Maintained

Select this item to configure the Short Duration Maintained value. PL2 value is in seconds. The value may vary from 0 to 0.438. Indicates the time window over which TDP value should be maintained.

3.3.3 DRAM Configuration



Enforce DDR Memory Frequency POR

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

Enforce Population POR

Select this time to enable or disable the Memory Population POR Enforcement.

DRAM Frequency

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

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.

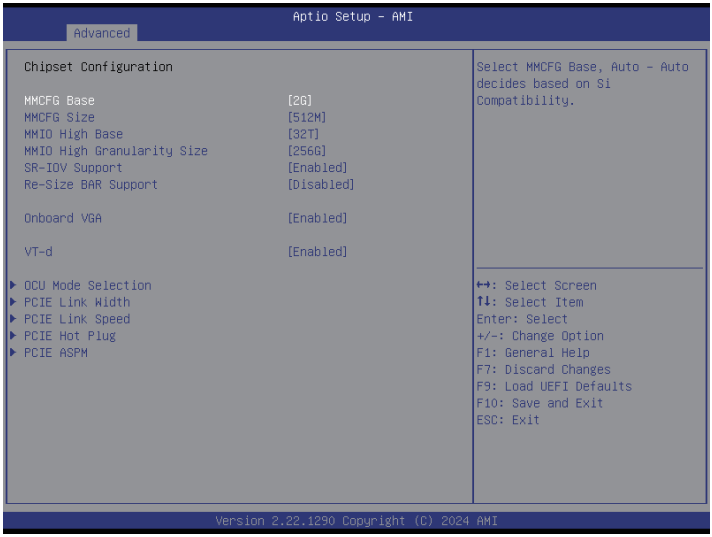
Data Scrambling for DDR4/5

Enable - Enables data scrambling for DDR4 and DDR5.

Disable - Disables this feature.

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

3.3.4 Chipset Configuration



MMCFG Base

Use this item to select MMCFG Base.

MMCFG Size

Use this item to select MMCFG Size.

MMIO High Base

Use this item to select MMIO High Base.

MMIO High Granularity Size

Use this item to select MMIO Granularity Size.

SR-IOV Support

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

Re-Size BAR Support

Enable or disable this item to Re-Size BAR supported upon the sysem has resizable BAR capable PCIe Devices.

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.

OCU Mode Selection

Select this item to configure OCU Mode.

OCU1/OCU2 Mode Selection
Select SATA or PCIe work in OCU port.

PCIE Link Width

Select this item to configure PCIE Link Width.

MCIO1 Link Width
Configure the PCIE Link Width for MCIO1. Auto - x4x4.

PCIE1 Link Width
Configure the PCIE Link Width for PCIE1. Auto - x16.

PCIE Link Speed

Select PCIE Link Speed.

OCU1/2 Link Speed
Select PCIE Link Speed. Auto - up to Gen3 (8GT/s).

OCP1/2/3 Link Speed
Select OCP1/2/3 Link Speed. Auto - up to Gen5 (32GT/s).

M2_2/M2_1 Link Speed
Select Link Speed for M2_2/M2_1. Auto - up to Gen5 (32Gt/s).

MCIO1 Link Speed
Select Link Speed for MCIO1. Auto - up to Gen5 (32Gt/s).

PCIE1 Link Speed
Select Link Speed for PCIE1. Auto - up to Gen5 (32Gt/s).

PCIE Hot Plug

Select this item to configure PCIE Hot Plug globally.

OCU1/2 Hot Plug
Enable or disable PCIE Hot Plug.

OCP1/2/3 Hot Plug
Enable or disable OCP Hot Plug.

MCIO1-1/MCIO1-2/PCIE1 Hot Plug
Enable or disable PCIE and MCIO Hot Plug.

MCIO1-1/MCIO1-2/PCIE1 Surprise Hot Plug
Enable or disable PCIE and MCIO Surprise Hot Plug.

PCIE ASPM

Selec this item to configure the PCIE ASPM.

PCI-E ASPM Support (Global)
Select this item to disable ASPM Support in all PCIe root ports.

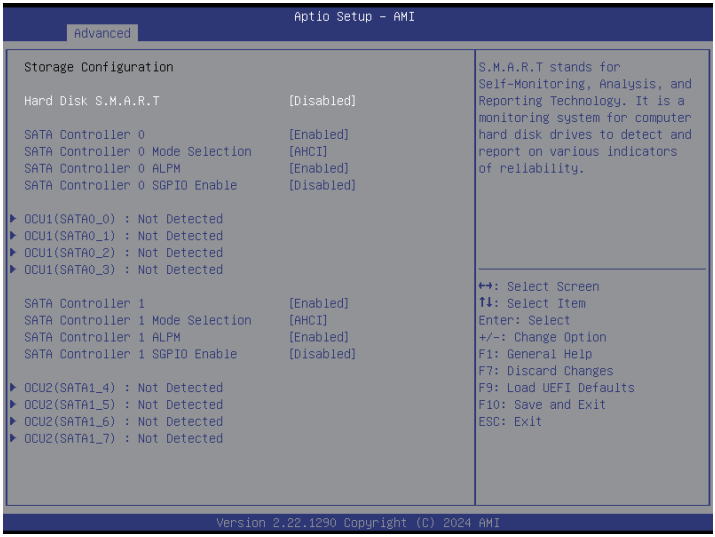
OCU1/2 ASPM Support
Select this item to configure PCIE Active State Power Management settings for OCU.

OCP1/2/3 ASPM Support
Select this item to configure PCIE Active State Power Management settings for OCP.

PCIE1 ASPM Support
Enables or disables the ASPM support for all CPU downstream devices. Select [Auto] for the default value.

MCIO1 ASPM Support
Enables or disables the ASPM support for all CPU downstream devices. Select [Auto] for the default value.

3.3.5 Storage Configuration



Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

SATA Controller 0/1

Use this item to enable or disable SATA Controllers.

SATA Controller 0/1 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 Controller 0/1 ALPM

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

SATA Controller 0/1 SGPIO Enable

Use this item to enable or disable Serial GPIO for SATA controller.

OCU1 (SATA0_0/1/2/3)/OCU2 (SATA1_4/5/6/7)

Select this item to configure the External SATA, Hot Plug, Spin Up Device and SATA Device Type.

3.3.6 NVMe Configuration

NVMe Configuration

The NVMe Configuration displays the NVMe controller and Drive information.

Launch NVMe driver

Select this item to enable or disable launch NVMe driver.

3.3.7 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.

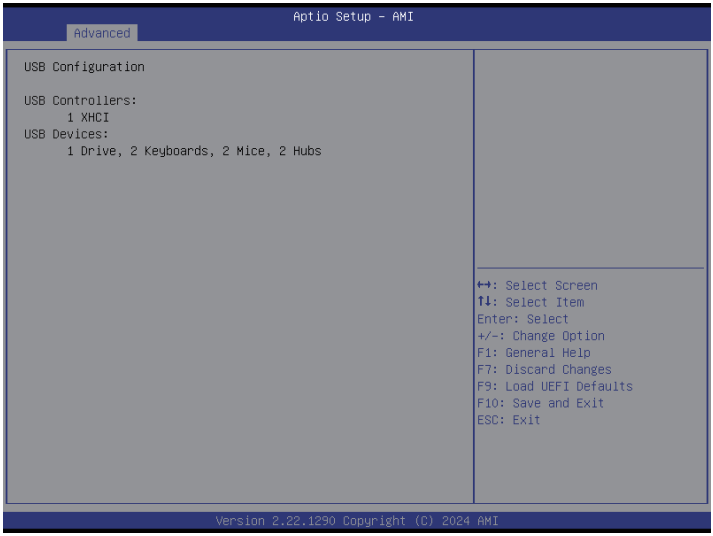
RTC Alarm Date
Use this item to set Date of RTC power on feature.

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

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

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

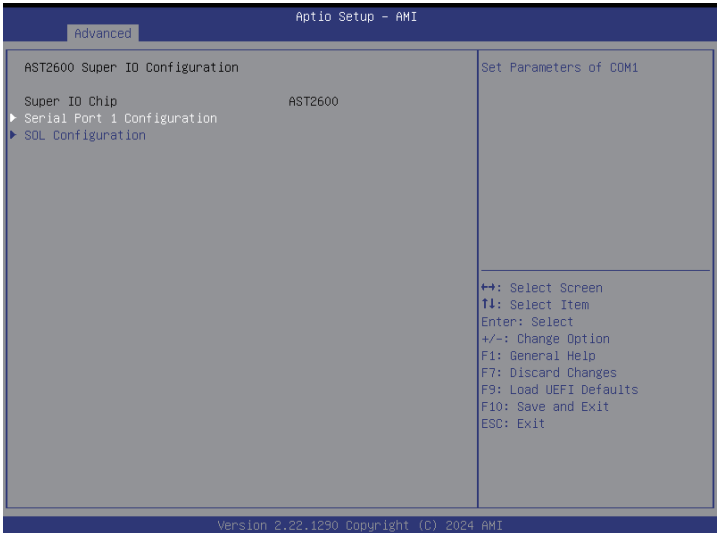
3.3.8 USB Configuration



USB Configuration

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

3.3.9 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.

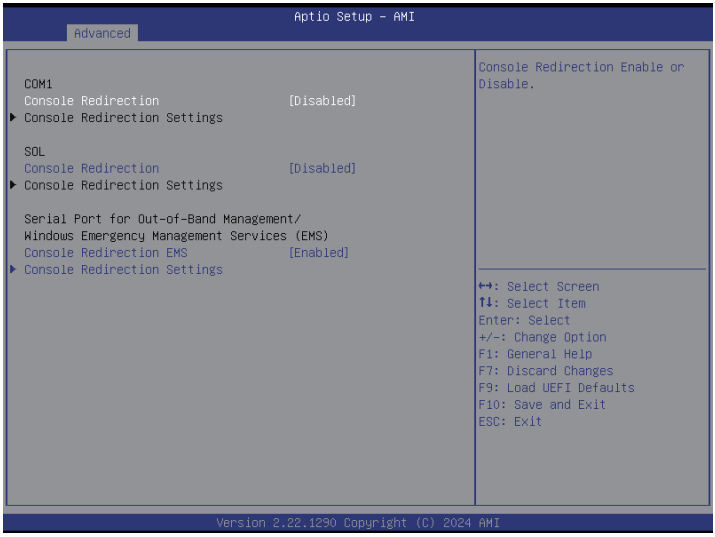
SOL Port

Use this item to set parameters of SOL.

Change Settings

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

3.3.10 Serial Port Console Redirection



COM1 / SOL

Console Redirection

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

Console Redirection Settings

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

Terminal Type

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

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

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

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

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

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

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

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

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

Resolution 100x31
Use this item to enable or disable extended terminal resolution support.

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

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

Console Redirection EMS

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

Microsof t 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].

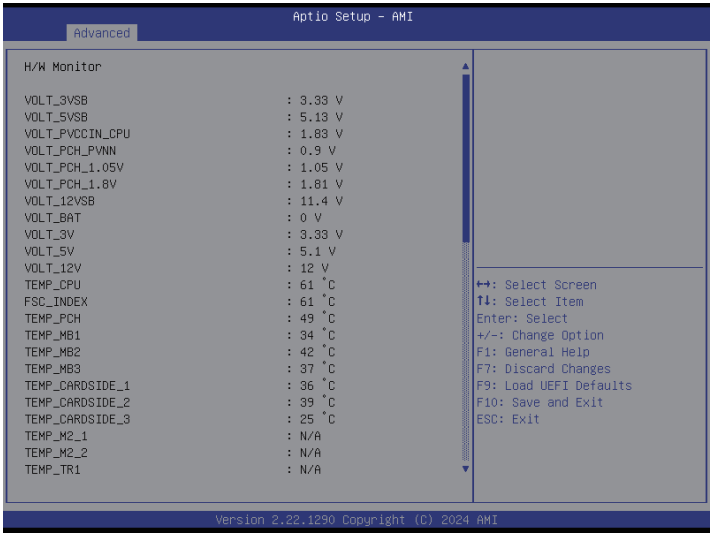
Data Bits EMS

Parity EMS

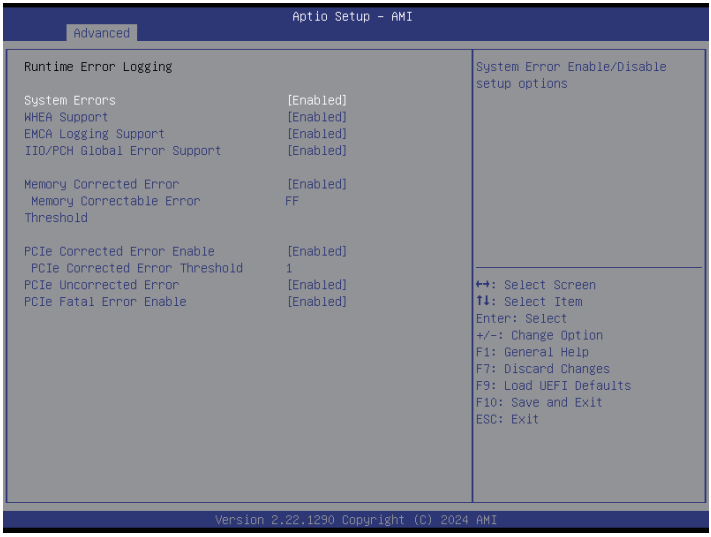
Stop Bits EMS

3.3.11 H/W Monitor

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



3.3.12 Runtime Error Logging



System Errors

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.

WHEA Support

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

EMCA Logging Support

Use this item to enable or disable EMCA Logging.

II0/PCH Global Error Support

Use this item to enable or disable II0/PCH Error Support.

Memory Corrected Error

Use this item to enable or disable Memory Corrected Error.

Memory 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.

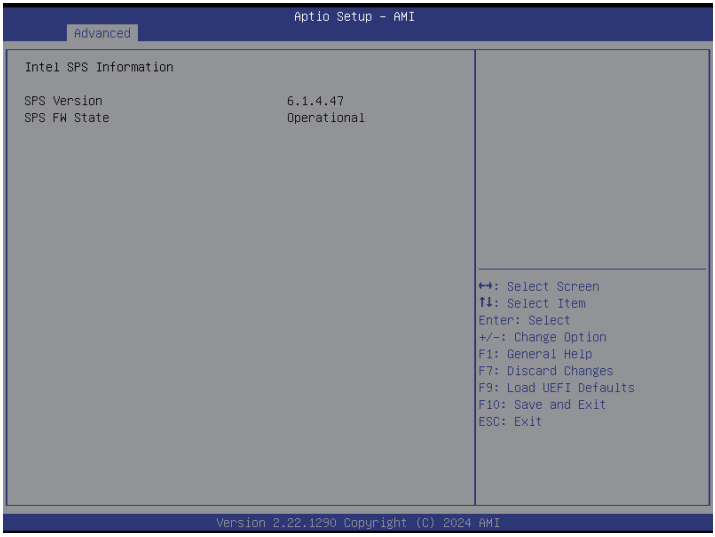
PCIE Uncorrected Error Enable

Use this item to enable or disable PCIe Uncorrectable errors.

PCIE Fatal Error Enable

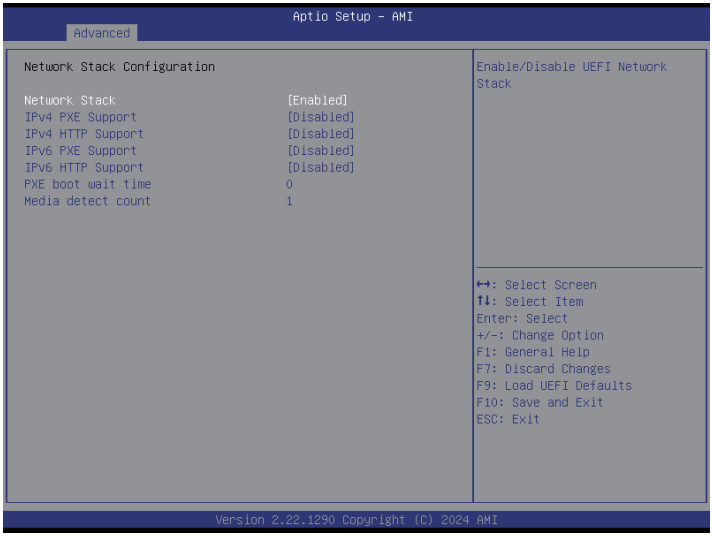
Use this item to enable or disable PCIe Ftal errors.

3.3.13 Intel SPS Configuration



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

3.3.14 Network Stack Configuration



Network Stack

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

IPv4 PXE Support

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

IPv4 HTTP Support

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

IPv6 PXE Support

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

IPv6 HTTP Support

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

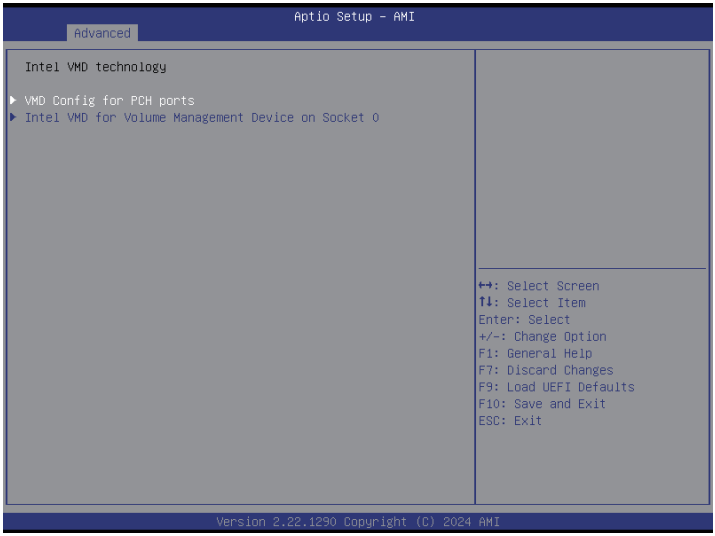
PXE Boot Wait Time

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

Media Detect Count

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

3.3.15 Intel® VMD technology



VMD Config for PCH ports

Use this item to enter VMD for PCH ports configuration menu .

Enable/Disable VMD

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

PCH Root Port 0/8 (OCU1/2)

Use this item to configure PCH root port.

Hot Plug Capable

Use this item to enable or disable Hot Plug for PCIe root ports.

Intel VMD for Volume Management Device on Socket 0

VMD Config for IOU0 (OCP3)/IOU1 (OCP2)/IOU2 (M2_2/M2_1/MCIO1)/ IOU3 (PCIE1)

Use this item to enable or disable Intel(R) Volume Management Device Technology in specific Stack.

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

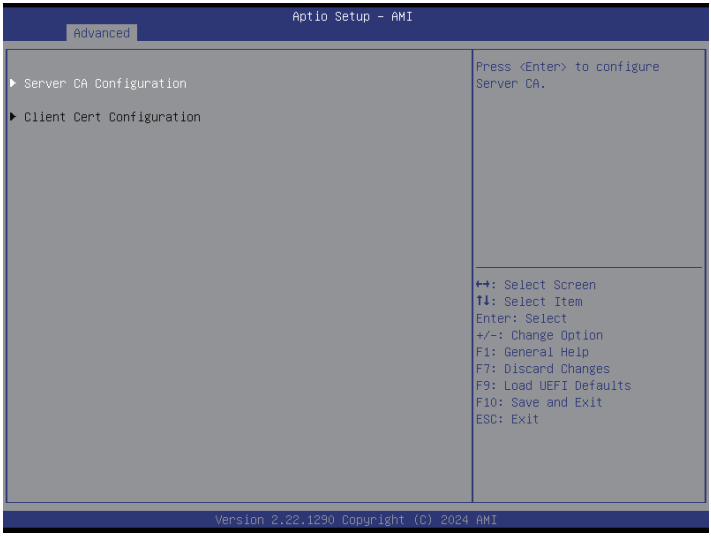
VMD port X

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 specific Ports.

3.3.16 Tls Auth Configuration



Server CA Configuration

Press <Enter> to configure Server CA.

Enroll Cert

Press <Enter> to enroll cert.

Delete Cert

Press <Enter> to delete cert.

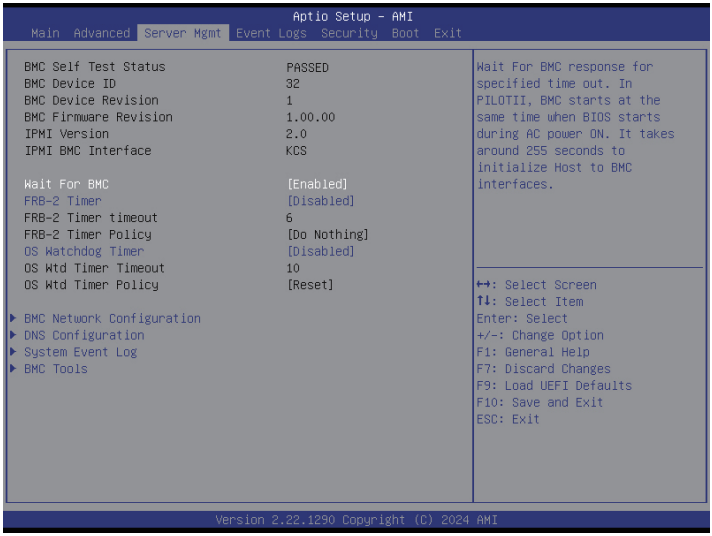
Client Cert Configuration

Press <Enter> to configure Client Cert.

3.3.17 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 the respective information. Select the proper UEFI file to update UEFI, and reboot the system after the UEFI update process is completed.

3.4 Server Mgmt



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.

FRB-2 Timer

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

FRB-2 Timer Timeout

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

FRB-2 Timer Policy

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

OS Watchdog Timer

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

OS Wtd Timer Timeout

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

OS Wtd Timer Policy

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

BMC Network Configuration

Select this item to configure BMC network parameters.

DNS Configuration

Select this item to configure DNS parameters.

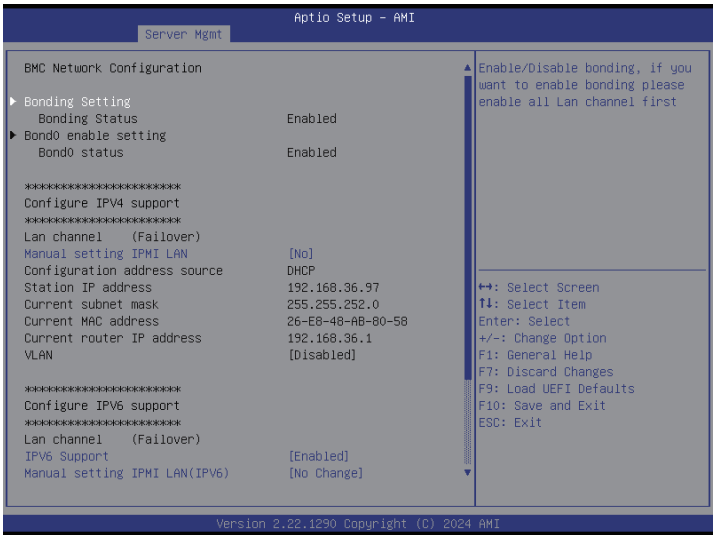
System Event Log

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

BMC Tools

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

3.4.1 BMC Network Configuration



Bonding Setting

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

Lan Channel (Failover)

Manual Setting IPMI LAN

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

VLAN

Enabled or disabled Virtual Local Area Network. If [Enabled] is selected, configure the items below.
VLAN ID: Select this item to configure the VLAN ID setting, the Maximum value is 4094 and the Minimum value is 1.
VLAN Priority: Select this item to configure the VLAN Priotity setting. the Maximum value is 7 and the Minimum value is 0.

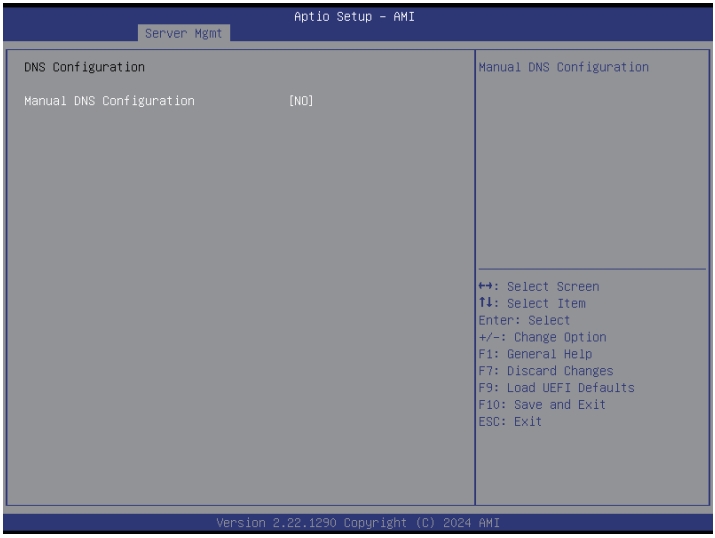
IPV6 Support

Enable or disable LAN1 IPV6 Support.

Manual Setting IPMI LAN(IPV6)

Select to configure LAN channel parameters statically or dynamucally(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

3.4.2 DNS Configuration



Manual DNS Configuration

Select this item to manual configure DNS.

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

DNS Service

Use this item to enable or disable DNS Service Configuration.

Host Name Settings

Use this item to automatic or manual Host Name Settings.

Bond Register BMC

Use this item to enable or disable Bond Register BMC.

Bond Register Method

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

Domain Setting

This item supports Manual, Bond0_v4 and Bond0_v6 Domain Settings.

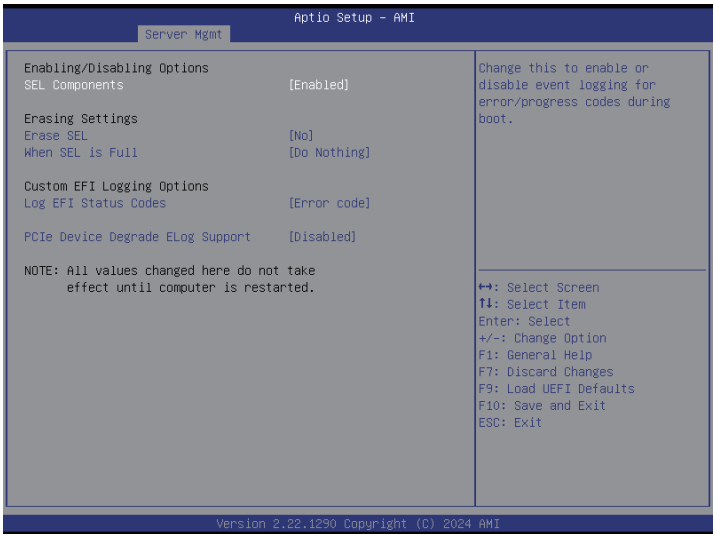
Domain Name Server Setting

This item supports Manual and Bond0 DNS Server Settings.

IP Priority

This item supports IPV4 and IPV6 IP Priority.

3.4.3 System Event Log



SEL Components

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

Erase SEL

Use this to choose options for earsing SEL.

When SEL is Full

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

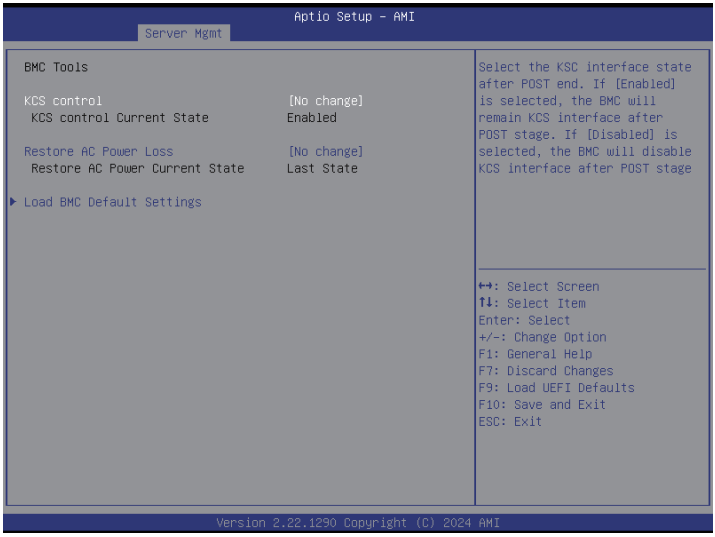
Log EFI Status Codes

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

PCIe Device Degrade ELog Support

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

3.4.4 BMC Tools



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.

Restore AC Power Loss

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

Load BMC Default Settings

Use this item to load BMC default settings.

3.5 Event Logs

Change Smbios Event Log Settings

Select this item 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 or disable logging of System boot event.

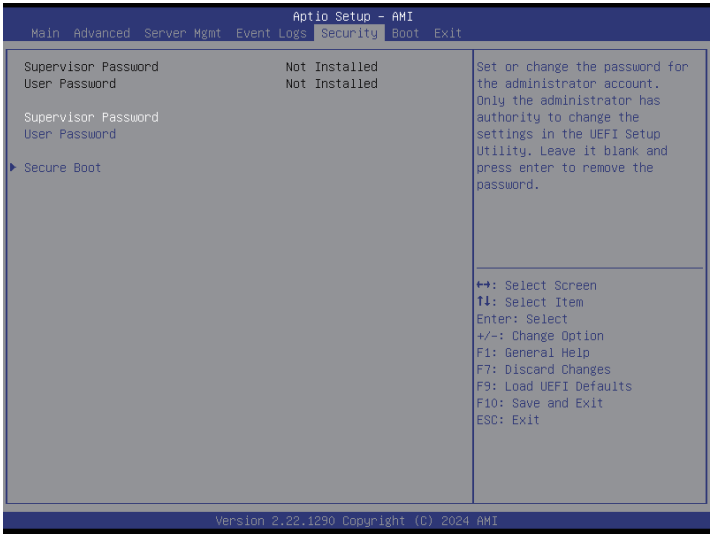
View Smbios Event Log

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

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

3.6 Security

In this section, set or change the supervisor/user password for the system. For the user password, also can 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. User is unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

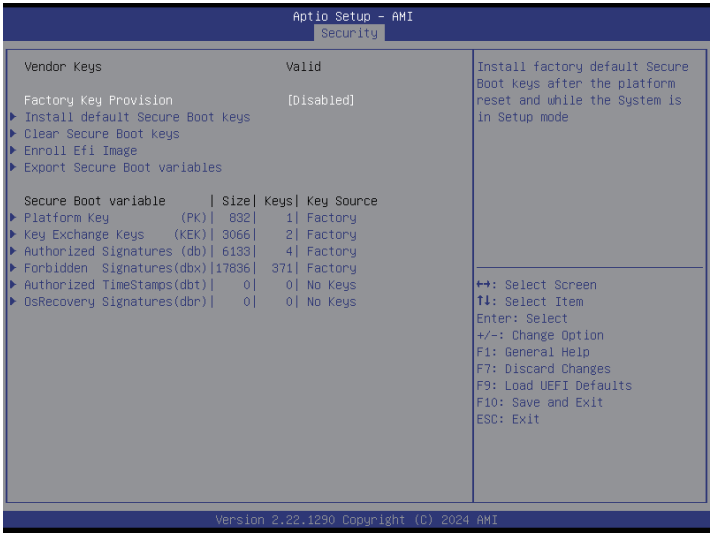
Use this to enable or disable Secure Boot Control. The default value is [Disabled]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

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

3.6.1 Expert Key Management

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



Factory Key Provision

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

Install Default Secure Boot Keys

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

Clear Secure Boot Keys

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

Enroll Efi Image

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

Export Secure Boot Variables

Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

Platform Key(PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Key Exchange Keys(KEK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized Signatures(db)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Forbidden Signatures(dbx)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized TimeStamps(dbt)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

OsRecovery Signatures(dbr)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

3.7 Boot Screen

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

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

Use this item to set the system boot order.

UEFI Application Boot Priorities

Specifies the Boot Device Priority sequence from available UEFI Application.

Setup Prompt Timeout

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

Bootup Num-Lock

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

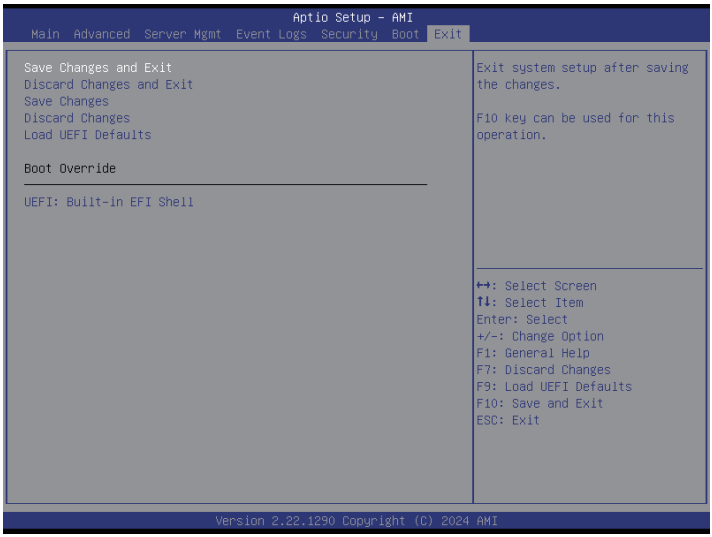
Boot Beep

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].

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 offical 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® Rapid Storage Technology Driver and Utility 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 the website at http://www.ASRockRack.com.

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

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot the system.

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

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

If there is no power...

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

If there is no video...

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

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR5 RDIMM/RDIMM-3DS.
3. Install more than one DIMM modules that should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...

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

Other problems...

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

5.2 Technical Support Procedures

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

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

Contact ASRock Rack's technical support at:
http://www.asrockrack.com/support/tsd.asp

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of the invoice marked with the date of purchase is required. By calling the vendor or going to RMA website (http://event. asrockrack.com/tsd.asp) to obtain a Returned Merchandise Authorization (RMA) number.

The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when returning the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

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

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

Contact Information

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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