

OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

1U12E-GENOA/2L2T

User Manual

English



Version 1.12

Published Oct. 2025

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

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

CALIFORNIA, USA ONLY

The Lithium battery adopted on this server 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”

ASRock Rack’s Website: www.ASRockRack.com

Setting up the Server in a Restricted Access Location/Restricted Access Area

- Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.
- Leave enough clearance (25 inches in the front and 30 inches in the back of the rack) to allow the front door to be opened completely and to allow for sufficient airflow.
- This product is for installation merely in a Restricted Access Location.
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.
- Only skilled person and Instructed person can remove the chassis covers to access the inside of the system.

Replaceable Batteries

CAUTION

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS**

Warning

When removal of the chassis lid required for servicing:

- Turn off power and unplug any power cords/cables, and
- Reinstall the chassis lid before restoring power.



Important Safety Instructions

Pay close attention to the following safety instructions before performing any of the operation. Basic safety precautions should be followed to protect yourself from harm and the product from damage:

- Operation of the product should be carried out by suitably trained, qualified, and certified personnel only to avoid risk of injury from electrical shock or energy hazard.
- Disconnect the power cord from the wall outlet when installing or removing main system components, such as the server motherboard and power supply unit.
- Place the system on a stable and flat surface.
- Use extreme caution when working with high-voltage components.
- When handling parts, use a grounded wrist strap designed to prevent static discharge.
- Keep the area around the system clean and clutter-free.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags when not in use.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- The power cord must be connected to a socket or outlet with a ground connection.

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Chapter 1 Introduction

Thank you for purchasing 1U12E-GENOA/2L2T, a reliable barebone system 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.

This guide provides the instructions of insertion and extraction of chassis components, such as chassis covers, system fans, power supplies, hard drive trays, and other main components this system supports. If the system is pre-installed a server motherboard, refer to the server motherboard user manual for the information of the server motherboard components, specifications and BIOS settings.

System	ASRock Rack Server Motherboard
1U12E-GENOA/2L2T	GENOAD24QM3-2L2T/BCM



Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice.



The illustrations shown in this manual are for reference purposes only and may not exactly match the model purchased.



If requiring technical support related to this system, please visit the website for specific information about the using model.
<http://www.asrockrack.com/support/>

1.1 Shipping Box Contents

Item	Quantity
IU12E-GENOA/2L2T Barebone (1U form factor)	1
System Motherboard (MB)*	1
Power Supply Units*	2
System Fans*	6
HDD Backplane (BPB)*	1
Power Distribution Board (PDB)*	1
Riser-cards*	2
Accessory Box	1
1U Cooler	1
Slide Rail	1
Quick Installation Guide	1

* The components are pre-installed.

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

1.2 Specifications

1U12E-GENOA/2L2T	
System	
Form Factor	1U Rackmount
Dimension	676.5 x 438 x 43.4mm (26.6" x 17.2" x 1.7")
Support MB	GENOAD24QM3-2L2T/BCM
Front Panel	
Button	Power, reset, ID buttons
LED	Power, LAN 1/2, system event, ID LEDs
I/O Port	1 Type-A (USB3.2 Gen1)
External Drive Bay / Storage	
Front Side Drive Bay	12 Hot-swap 2.5" NVMe (PCIe5.0 x4)/SATA/SAS* drive bays *SAS drive is only supported with additional RAID/HBA cards.
Front Side Backplane	12-port NVMe/SATA/SAS* passive backplanes *SAS drive is only supported with additional RAID/HBA cards.
Internal Side	2 M-key (PCIe5.0 x4); support 22110/2280/2260 form factor
Power Supply	
Type	1+1 Slim PSU
Output Watt	1000W
Efficiency	80-PLUS Platinum
AC Input	100-240V, 60/50Hz
System Fan	
Fan	6 PWM hot-swap 40x56mm fans
Processor System	
CPU	Supports AMD EPYC™ 9005*/9004 (with AMD 3D V-Cache™ Technology) and 97x4 series processors *A BIOS update is required to support AMD EPYC™ 9005 series processors.
Socket	Single socket SP5 (LGA 6096)
Thermal Design Power	Up to 300W
Chipset	System on Chip

System Memory	
Supported DIMM Quantity	24 DIMM slots (2DPC)
Supported Type	Supports DDR5 288-pin RDIMM, RDIMM-3DS
Max. Capacity per DIMM	RDIMM: 128GB (2Rx4) RDIMM-3DS: 256GB (2Rx4)
Max. DIMM Frequency	RDIMM: 4800MHz (1DPC) RDIMM 1R: 4000MHz (2DPC) RDIMM 2R: 3600MHz (2DPC) RDIMM-3DS: 4800MHz (1DPC); 3600MHz (2DPC)
Voltage	1.1V
PCIe Expansion Slot	
PCIe x16	Rear: 2 FHHL PCIe5.0 x16
Ethernet	
Additional GbE Controller	Broadcom BCM57416: 2 RJ45 (10GbE) Intel® i210: 2 RJ45 (1GbE)
OCP Slot	1 OCP NIC 3.0 (PCIe5.0 x16)
Server Management	
BMC Controller	ASPEED AST2600
IPMI Dedicated GLAN	1 Realtek RTL8211F for dedicated management GLAN
Graphics	
Controller	ASPEED AST2600
VRAM	DDR4 512MB
Rear I/O	
UID Button/ LED	1 UID button w/ LED
VGA Port	1 DB15 (VGA)
USB3.2 Gen1 Port	2 Type-A (USB3.2 Gen1)
RJ45	2 RJ45 (10GbE) 2 RJ45 (1GbE) 1 Dedicated IPMI

System BIOS	
BIOS Type	AMI UEFI BIOS; 256Mb (32MB) SPI Flash ROM
BIOS Features	ASRock Rack Instant Flash, ACPI 6.4 and above compliance wake up events, SMBIOS 3.5.0 and above, Plug and Play (PnP)
Hardware Monitor	
Temperature	CPU, MB, card side, TR1 temperature sensing
Fan	Fan tachometer Quiet fan (allows chassis fan speed auto-adjust by CPU temperature) Fan multi-speed control
Voltage	VDDCR_CPU, VDDCR_SOC, VDDIO, VDD_18_S5, VDD_33_S5, VDD_11_S3, +3V, +5V, +12V, +BAT, +1V8SB, 3VSB, 5VSB
Environment	
Temperature	Operation temperature: 10°C ~ 35°C Non operation temperature: -40°C ~ 70°C
Humidity	Non operation humidity: 20% ~ 90% (non condensing)

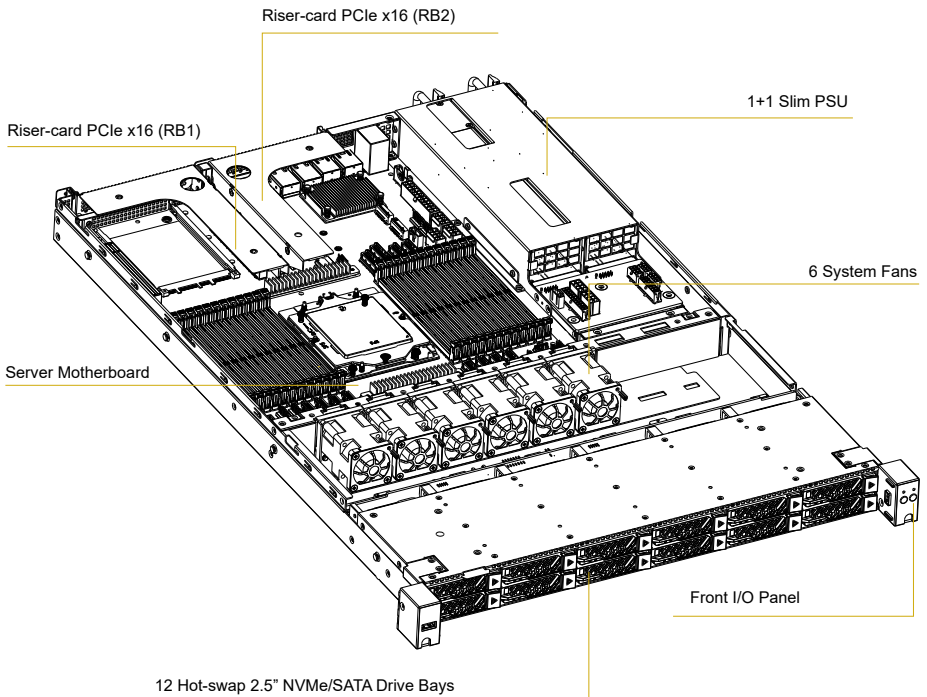


The functions are supported depending on the type of the server motherboard. Refer to the server motherboard user manual for more information.

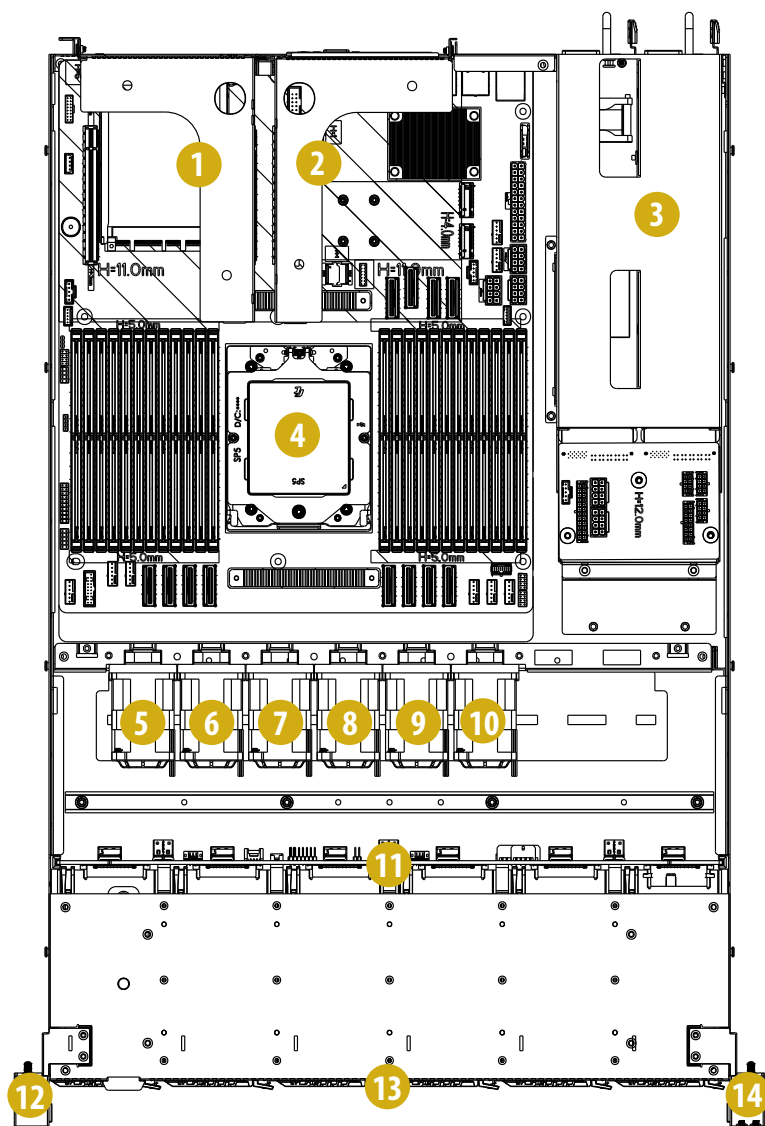
Chapter 2 Server System Overview

This chapter provides diagrams showing the location of important components of the server system.

2.1 System Components

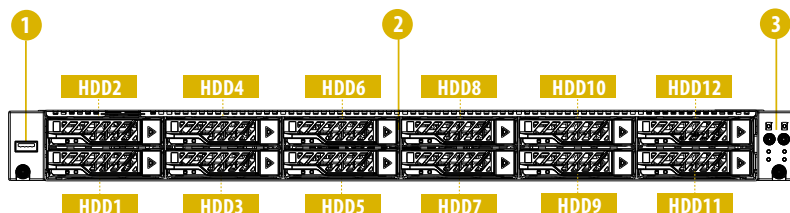


2.2 Internal Features



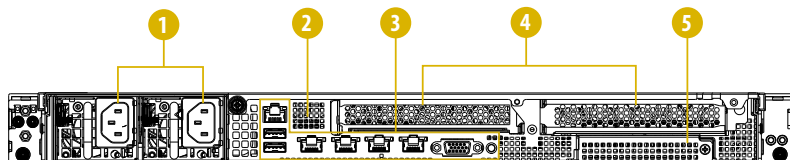
No.	Description
1	Riser-card (PCIe x16) (RB1)
2	Riser-card (PCIe x16) (RB2)
3	1+1 Slim PSU
4	Server motherboard
5	System fan (FAN6)
6	System fan (FAN5)
7	System fan (FAN4)
8	System fan (FAN3)
9	System fan (FAN2)
10	System fan (FAN1)
11	2.5" Hard drive backplane board (BPB)
12	1 Type-A (USB3.2 Gen1) port
13	12 Hot-swap 2.5" NVMe (PCIe5.0 x4)/SATA drive bays
14	Front I/O panel

2.3 System Front Panel



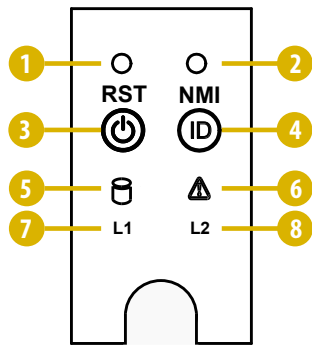
No.	Description
1	1 Type-A (USB3.2 Gen1) port
2	12 Hot-swap 2.5" NVMe (PCIe5.0 x4)/SATA drive bays
3	Front I/O panel

2.4 System Rear Panel



No.	Description
1	1+1 Slim PSU
2	Rear vent
3	Rear I/O panel (depends on the specification of the server motherboard)
4	2 FHHL PCIe5.0 x16 slots (for the riser-cards)
5	1 OCP NIC 3.0 (PCIe5.0 x16) slot

2.5 Front I/O Panel



No.	Description
1	Reset button
2	NMI button
3	Power button w/ LED
4	ID button w/ LED
5	Hard drive status LED
6	System event LED
7	LAN1 LED
8	LAN2 LED

Note: The functions are supported depending on the type of the server motherboard.

Reset Button

When the system is completely unresponsive, press the system reset button to reboot the server without shutting it off and initialize the system.

NMI (Nonmaskable Interrupt) Button

Press the NMI button with a paper clip or pin to generate a nonmaskable interrupt and to put the server in a halt state for examination.

Power Button

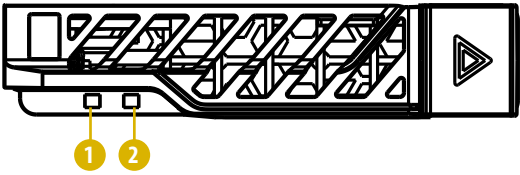
Press the power switch button to toggle the system power-on and power-off modes. To remove all power from the system completely, disconnect the power cord from the server.

Status LED Definitions

Power LED	
Status	Description
Off	Power off
Green	Power on

LAN1 and LAN2 LEDs	
Status	Description
Amber	Link between system and network or no access
Blinking Amber	Network access

2.6 Hard Drive Tray LED



No.	Description
1	Hard drive status LED
2	Hard drive tray activity LED

LED Definitions

Status (No. 1)	Activity (No. 2)	Description
Off	Off	Drive not present
Blue	Green	Drive present (not active)
Blue	Blinking Green at 4Hz	Drive present (active)
Blinking Blue at 4Hz*	Green	Locate
Red*	Green	Fail
Blinking Red at 1Hz*	Blinking Green at 4Hz	Rebuild

**Work in RAID only*

Chapter 3 Hardware Installation and Maintenance

This chapter helps user to assemble the chassis and install components.

Before You Begin

Before working with the server, pay close attention to the “Important Safety Instructions” at the beginning of this manual.



Ensure the motherboard battery is installed before unplugging the power cord or installing/removing the motherboard. Failure to follow this precaution may result in physical injury or damage to motherboard components.

1. Make sure the server is powered off.

Power down the server if it is still running.

- (1) Press the Power button to power off the server from full-power mode to standby-power (sleep) mode. The Power LED at the front turns from solid green to blinking green.
- (2) Disconnect the power cord first from the AC outlet and then from the server. The power LED turns off.



The server is not completely powered down when pressing the Power button on the front panel. The Power button lets the server toggle between Power On and Standby (Sleep) modes. Some internal circuitry remain active in the Standby mode. To remove all power from the system completely, be sure to disconnect the power cord from the server.

2. Ensure having a clean and stable working environment. Avoid dust and dirt because contaminants may cause malfunctions.
3. Ground properly before touching any system component. A discharge of static electricity may damage components. Wear a grounded wrist strap if available.

Installing Procedures

The followings are prerequisite to be installed.

- 3.5" or 2.5" Hard Drive(s)
- Power Supply Units (Pre-installed)
- System Fans (Pre-installed)
- Server Motherboard (Pre-installed)



1. Some components are already pre-installed. Simply properly connect the relevant cables before or after installation.
2. Refer to the server motherboard user manual for instructions on how to install server motherboard components.

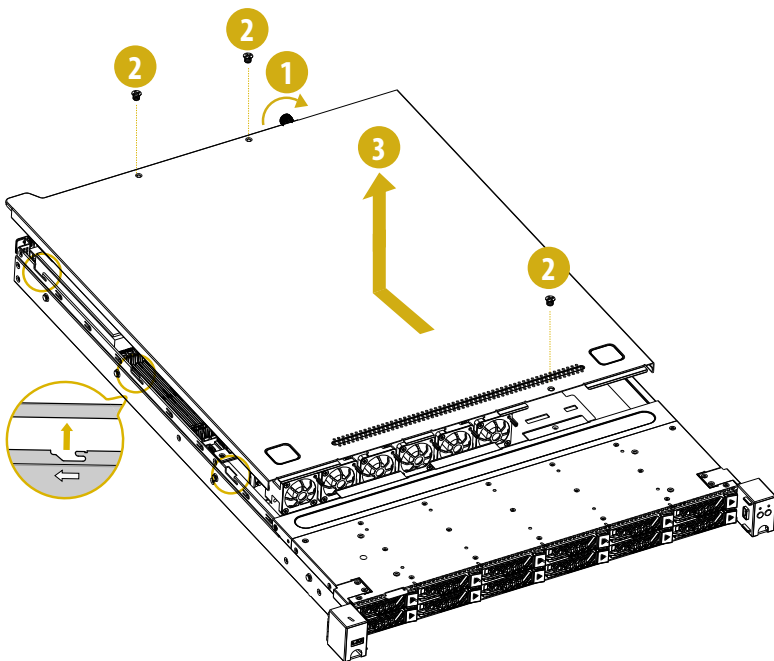
3.1 Server Top Cover

Removing the Server Top Cover

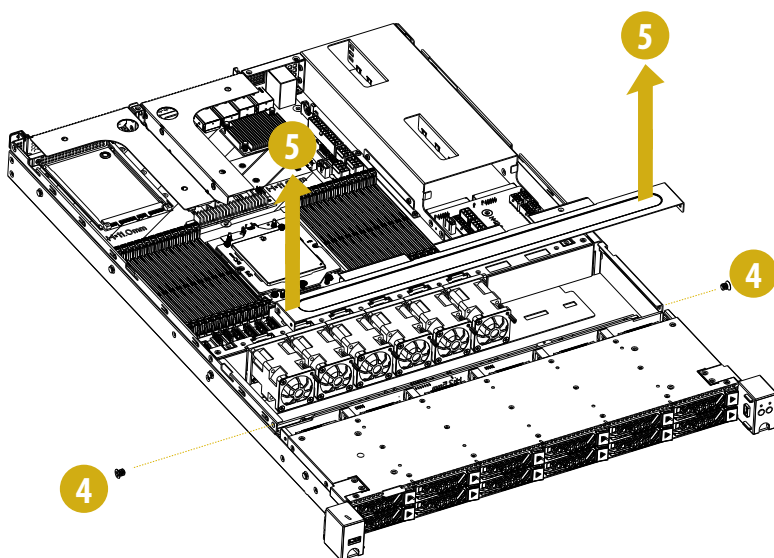


1. Before removing the top cover, power off the server and unplug the power cord.
2. The system must be operated with the chassis top cover installed to ensure proper cooling.

1. Hand-release the thumbscrew on the rear of the chassis.
2. Remove the screws securing the top rear cover to the chassis.
3. Push the cover toward the REAR of the chassis to release the cover from the locked position. Lift up and remove the cover.

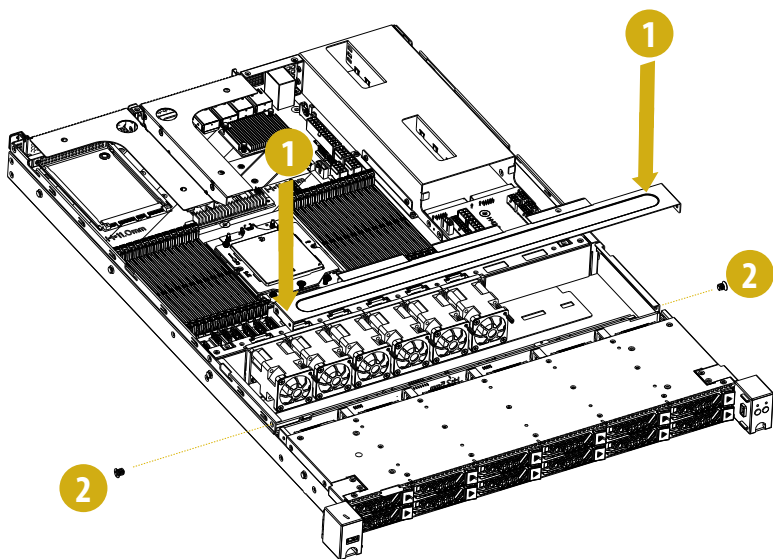


4. Remove the screws securing the top front cover to the chassis.
5. Lift up and remove the cover.

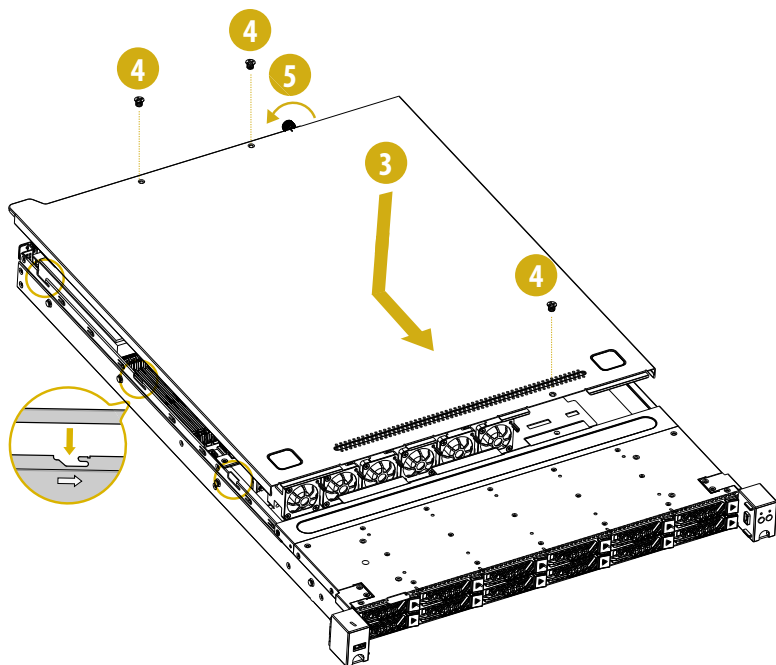


Installing the Server Top Cover

1. Place the top front cover on the chassis.
2. Secure the cover to the chassis with screws.



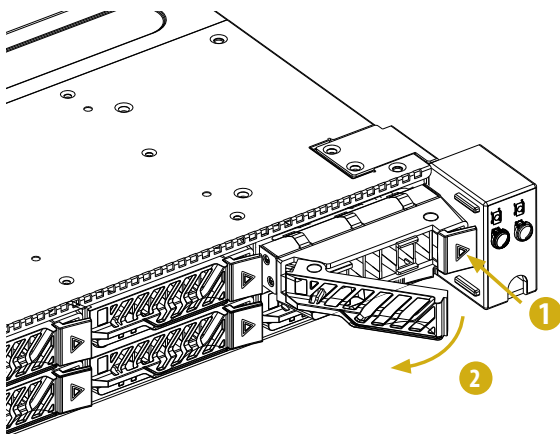
3. Lower the top rear cover on the chassis, making sure the side latches align with the cutouts. Slide the cover toward the FRONT.
4. Secure the cover in place with screws.
5. Hand-tighten the thumbscrew on the rear of the chassis.



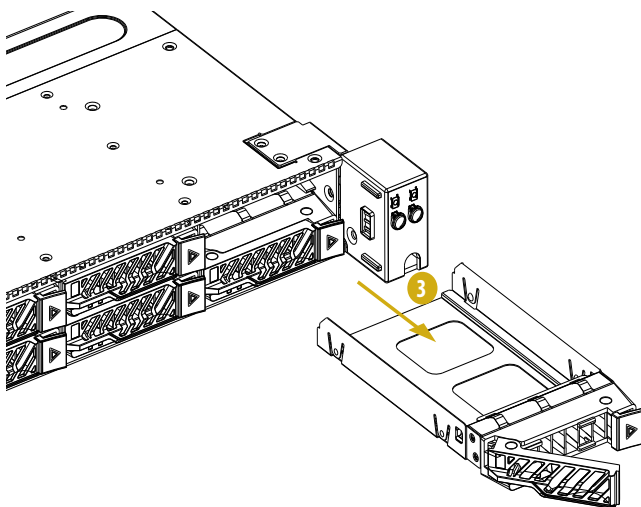
3.2 Hard Drive

Removing Hard Drive Tray from the Chassis

1. Press the locking lever latch on the drive tray to unlock the retention lever.
2. Rotate the lever out and away from the module bay.

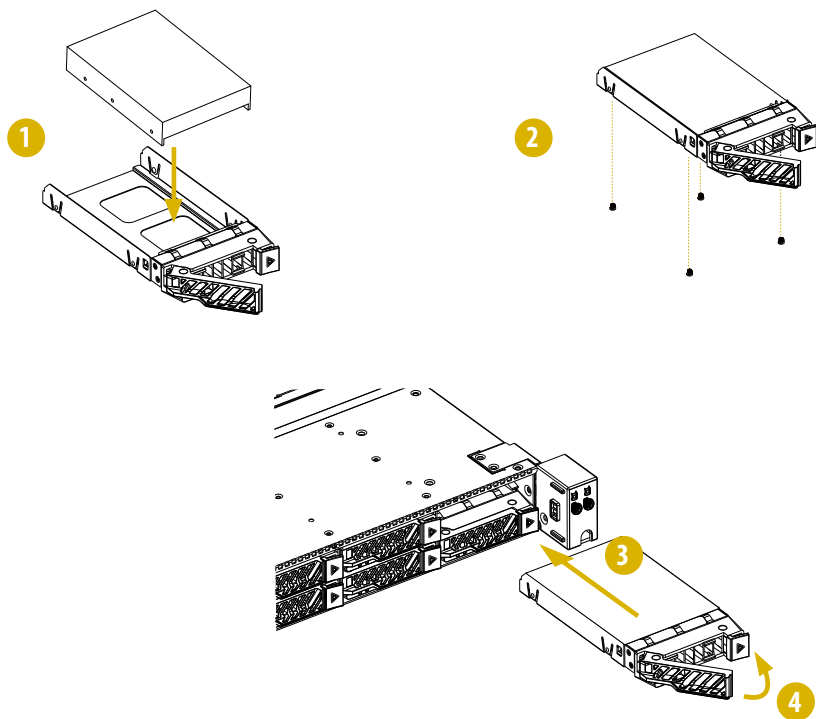


3. Pull the tray out.



Installing 2.5" Hard Drive

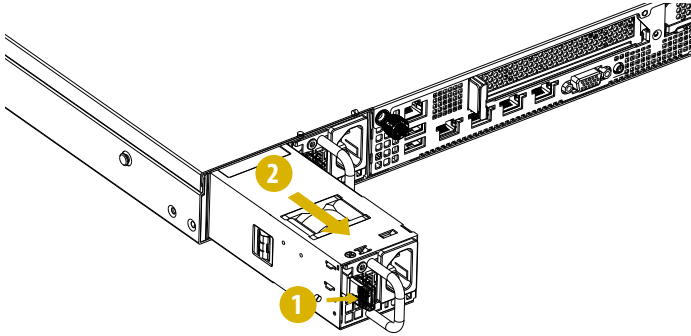
1. Place the hard drive into the tray with printed circuit board side facing down.
2. Secure the hard drive with the screws.
3. Slide the tray into the hard drive bay.
4. Push in the locking lever to lock the tray in place.



3.3 Power Supply

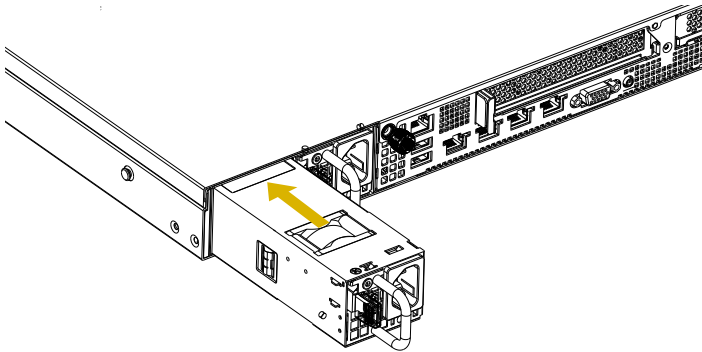
Removing the Power Supply Unit

1. Press the locking lever and hold on the handle.
2. Pull the old PSU out.



Installing the Power Supply Unit

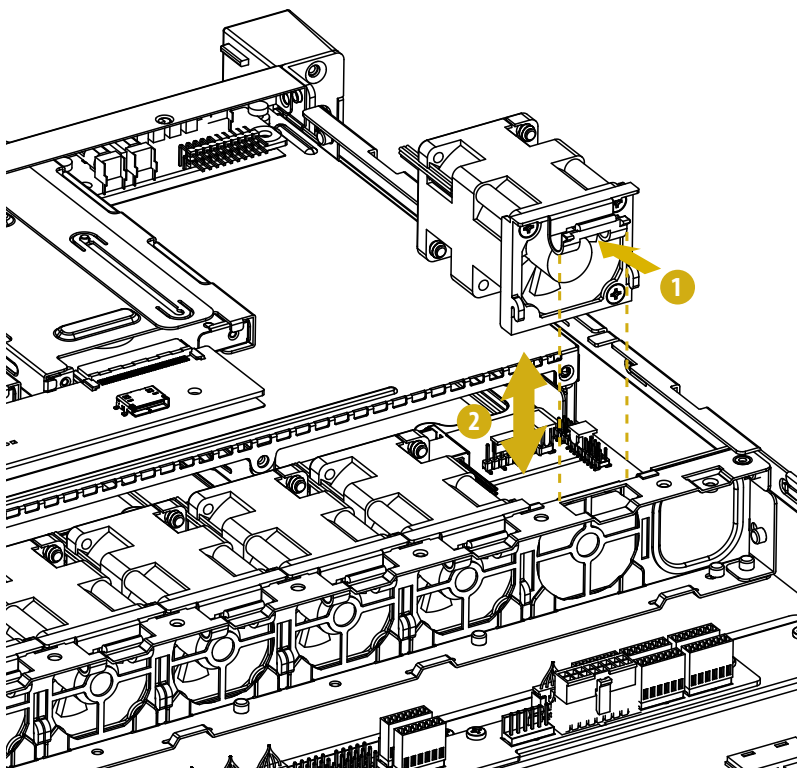
Slide the new PSU into the power supply bay.



3.4 System Fan

Replacing the Fan

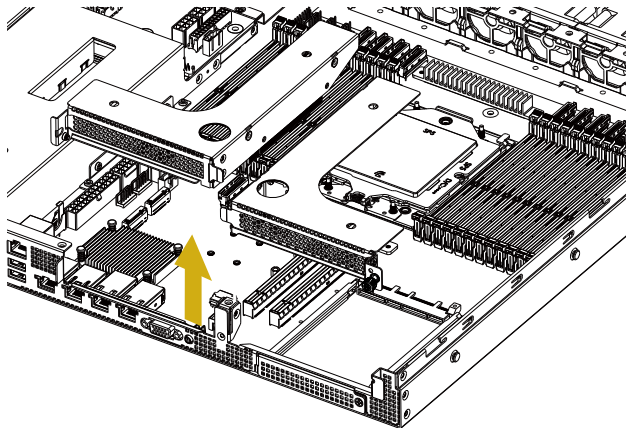
Press and hold the fan clip on to replace the fan.



3.5 Add-in Card

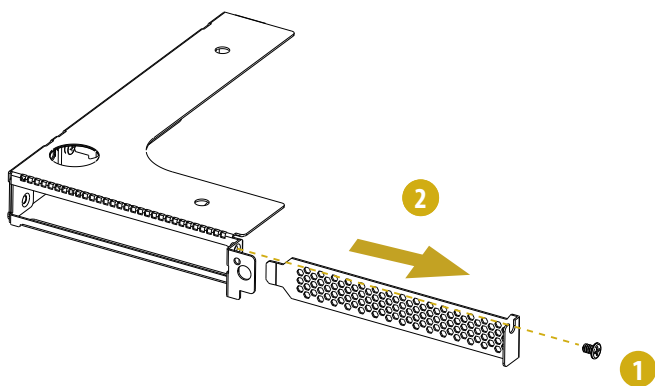
Removing the Riser-card Bracket from the Chassis

Hand-release the thumbscrew to lift up the riser-card bracket.

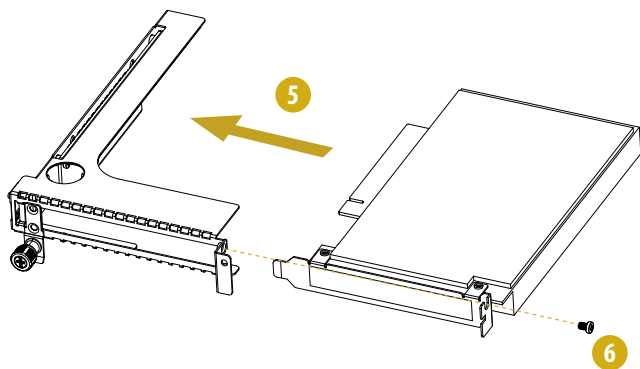
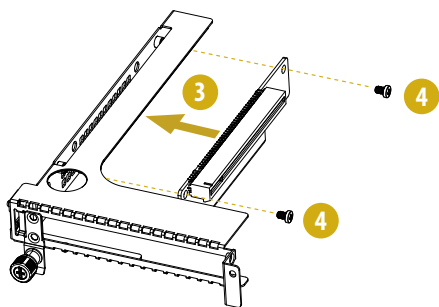


Installing the Riser-card and Add-in Card

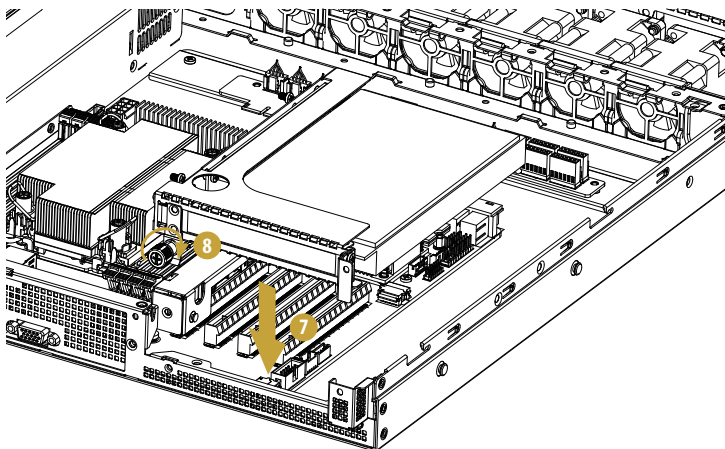
1. Remove the screw.
2. Slide the blanking plate out.



3. Install the riser-card to the bracket.
4. Secure the riser-card with screws.
5. Install the add-in card to the riser-card assembly.
6. Secure the assembly with the screw.



7. Align the add-in card assembly with the opening of the chassis. Place the assembly on the chassis.
8. Hand-tighten the thumbscrew to secure the assembly in place.

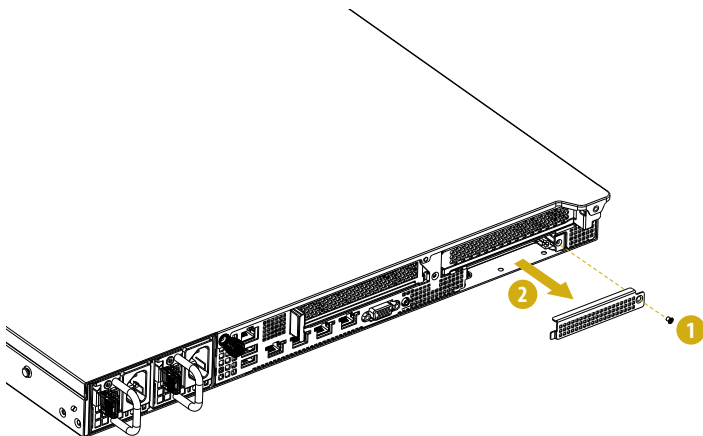


The illustration is for references only. The actual location may be slightly different by models.

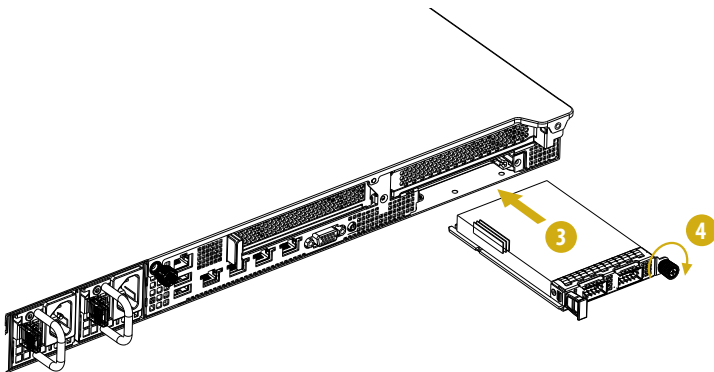
3.6 OCP Card

Installing OCP Card

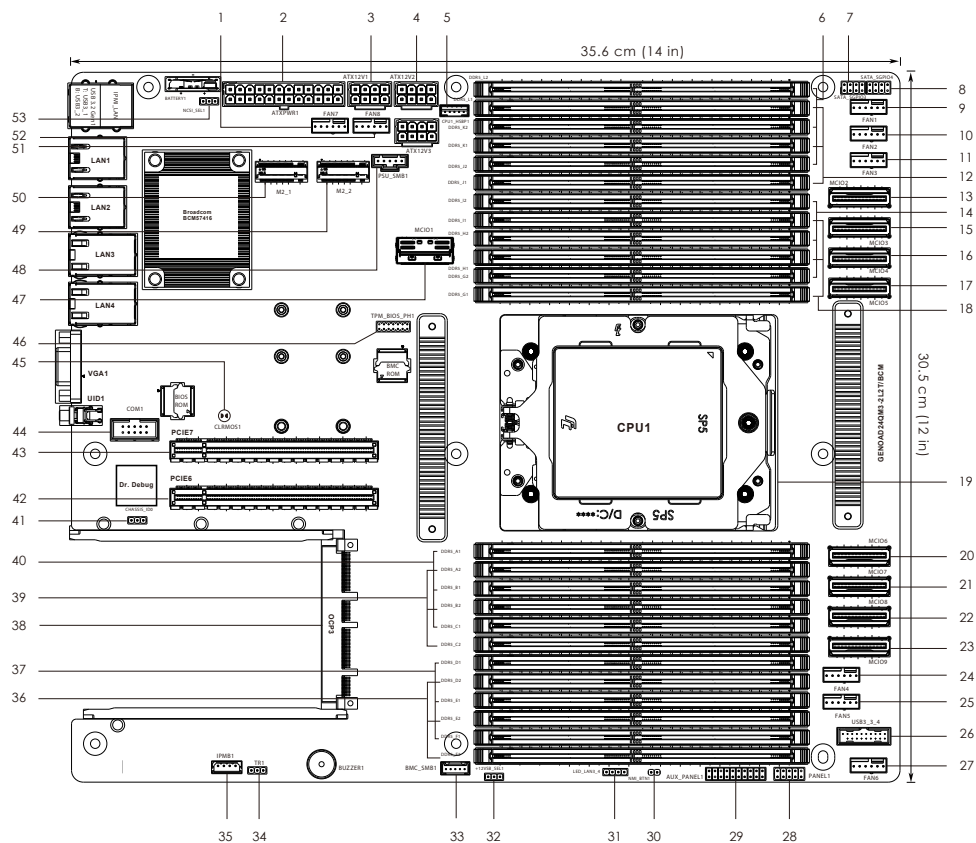
1. Remove the screw securing the slot cover to the chassis.
2. Remove the slot cover.



3. Install the OCP card into the slot.
4. Make sure the card is well seated and hand-tighten the thumbscrew on the face plate.



4.1 Layout



No.	Description
1	System Fan Connector (FAN7)
2	ATX Power Connector (ATXPWR1)
3	ATX 12V Power Connector (ATX12V1)
4	ATX 12V Power Connector (ATX12V2)
5	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
6	3 288-pin DDR5 DIMM Slots (DDR5_J2, DDR5_K2, DDR5_L2)*
7	SATA SGPIO Connector (SATA_SGPIO3)
8	SATA SGPIO Connector (SATA_SGPIO4)
9	System Fan Connector (FAN1)
10	System Fan Connector (FAN2)
11	System Fan Connector (FAN3)
12	3 288-pin DDR5 DIMM Slots (DDR5_J1, DDR5_K1, DDR5_L1)*
13	Mini Cool Edge IO Connector (MCIO2)
14	3 288-pin DDR5 DIMM Slots (DDR5_G2, DDR5_H2, DDR5_I2)*
15	Mini Cool Edge IO Connector (MCIO3)
16	Mini Cool Edge IO Connector (MCIO4)
17	Mini Cool Edge IO Connector (MCIO5)
18	3 288-pin DDR5 DIMM Slots (DDR5_G1, DDR5_H1, DDR5_I1)*
19	AMD Socket SP5 (SM-LGA-6096) (CPU1)
20	Mini Cool Edge IO Connector (MCIO6)
21	Mini Cool Edge IO Connector (MCIO7)
22	Mini Cool Edge IO Connector (MCIO8)
23	Mini Cool Edge IO Connector (MCIO9)
24	System Fan Connector (FAN4)
25	System Fan Connector (FAN5)
26	USB 3.2 Gen1 Header (USB3_3_4)
27	System Fan Connector (FAN6)
28	System Panel Header (PANEL1)
29	Auxiliary Panel Header (AUX_PANEL1)
30	Non Maskable Interrupt Button (NMI_BTN1)
31	Front LAN LED Connector (LED_LAN3_4)
32	OCP3 +12VSB Power Jumper (+12VSB_SEL1)
33	BMC SMBus Header (BMC_SMB1)

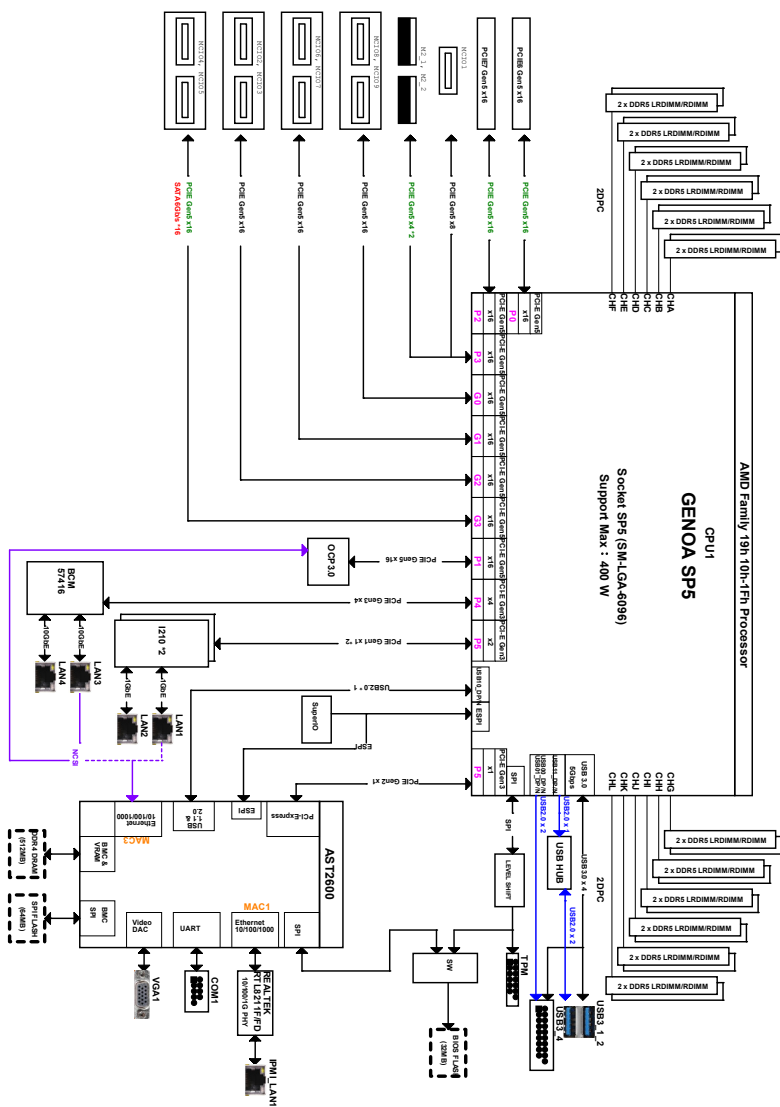
No.	Description
34	Thermal Sensor Header (TR1)
35	Intelligent Platform Management Bus Header (IPMB1)
36	3 288-pin DDR5 DIMM Slots (DDR5_D2, DDR5_E2, DDR5_F2)*
37	3 288-pin DDR5 DIMM Slots (DDR5_D1, DDR5_E1, DDR5_F1)*
38	OCN NIC 3.0 Slot (PCIe5.0 x16) (OCN1)
39	3 288-pin DDR5 DIMM Slots (DDR5_A2, DDR5_B2, DDR5_C2)*
40	3 288-pin DDR5 DIMM Slots (DDR5_A1, DDR5_B1, DDR5_C1)*
41	Chassis ID Jumper (CHASSIS_ID0)
42	PCI Express 5.0 x16 Slot (PCIe6)
43	PCI Express 5.0 x16 Slot (PCIe7)
44	COM Port Header (COM1)
45	Clear CMOS Pad (CLRMOS1)
46	SPI TPM Header (TPM_BIOS_PH1)
47	Mini Cool Edge IO Connector (MCIO1)
48	PSU SMBus Header (PSU_SMB1)
49	M.2 Socket (M2_2) (Type 2260/2280/22110)
50	M.2 Socket (M2_1) (Type 2260/2280/22110)
51	ATX 12V Power Connector (ATX12V3)
52	System Fan Connector (FAN8)
53	NCSI Mode Jumper (NCSI_SEL1)

NOTE:

* R2.0x server motherboard supports PCIE SPEED up to Gen4.

* R3.0x server motherboard supports PCIE SPEED up to Gen5.

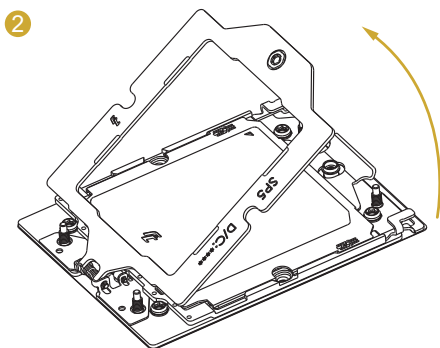
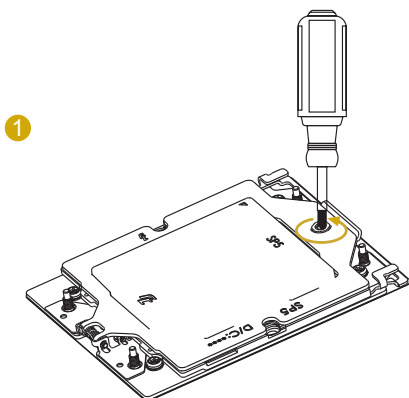
4.2 Block Diagram



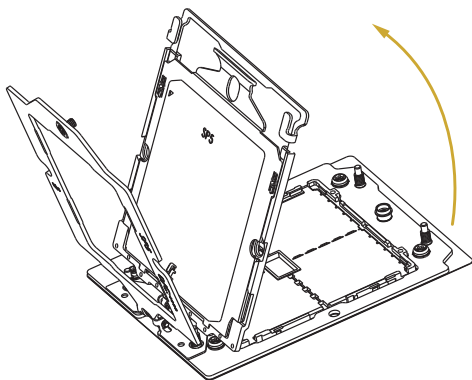
4.3 Installing the CPU and Heatsink (LGA 6096 Socket) Heatsink



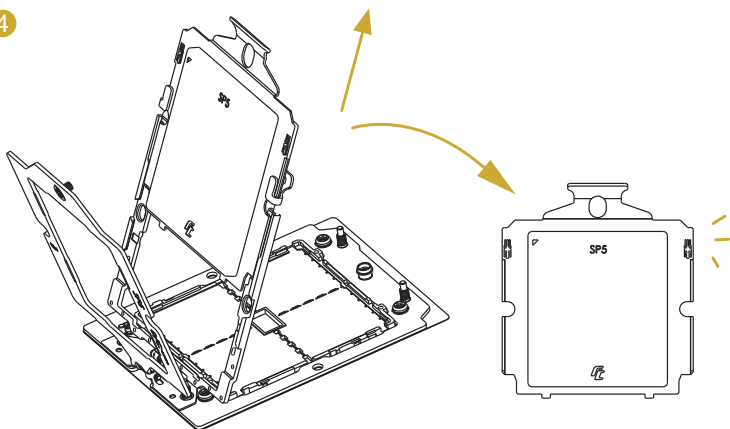
1. Before inserting the CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all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



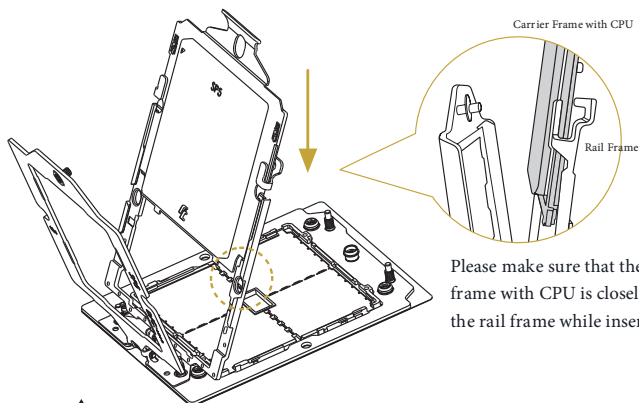
3



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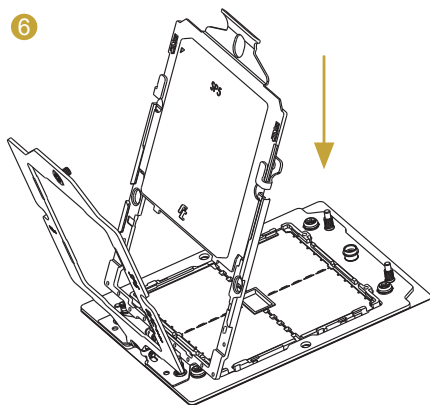


Please make sure that the carrier frame with CPU is closely attached to the rail frame while inserting it.

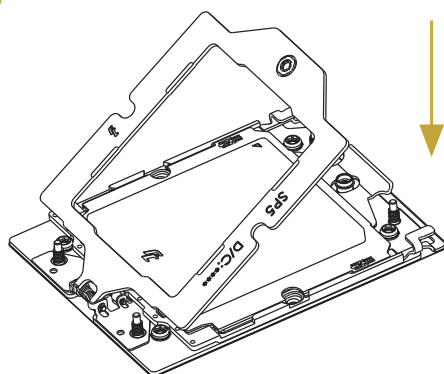


Install the carrier frame with CPU. Don't separate them.

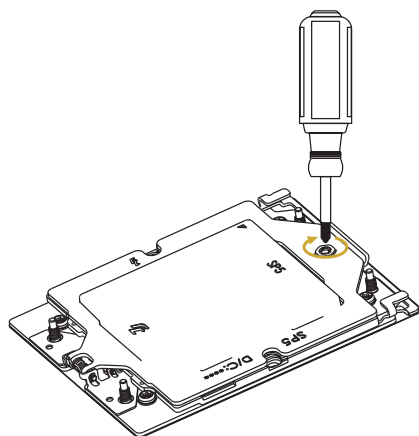
6



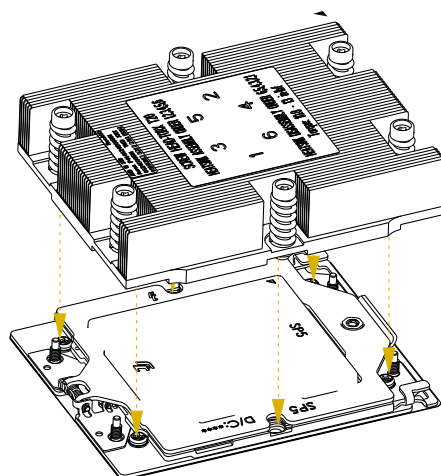
7



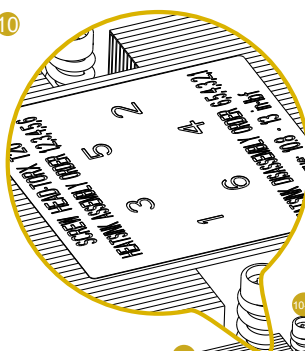
8



9

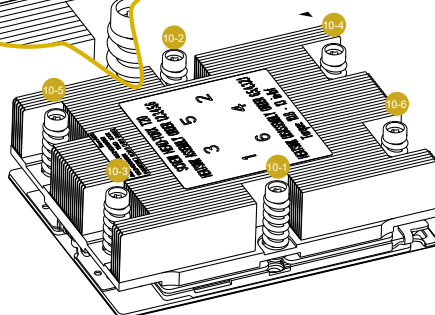


10



Set the torque wrench to 10.8-13.0 in.-lb.
One fourth a turn each time.

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

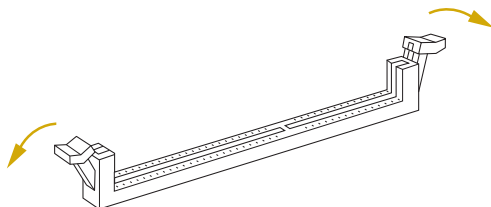


4.4 Installing the Memory Modules (DIMM)

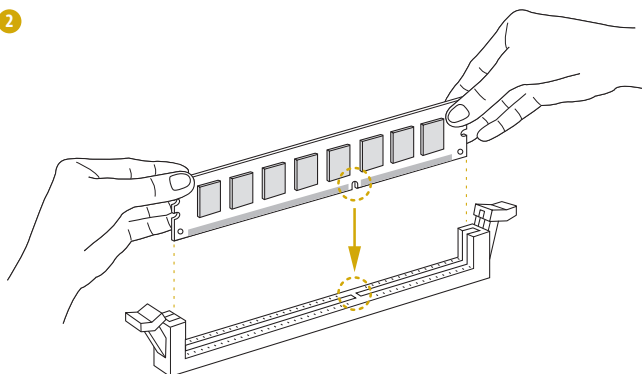


The DIMM only fits in one correct orientation. It will cause permanent damage to the server motherboard and the DIMM if forcing the DIMM into the slot at incorrect orientation. For more information about DIMM installation, refer to the server motherboard user manual.

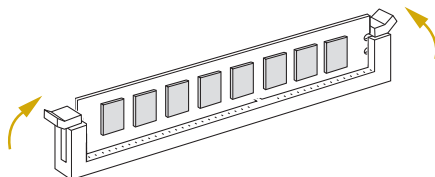
1



2



3



Contact Information

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

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