

OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation

Motherboard

1U4L4E Series

User Manual

English



Version 1.02

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

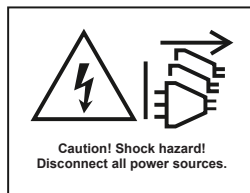
CAUTION

**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 1U4L4E Series, 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
1U4L4E-ICX/2T	SPC621D8U-2T
1U4L4E-ROME/2T	ROMED8U-2T
1U4L4E-GENOA/2T	GENOAD8UD-2T/X550
1U4L4E-EGS/2T	SPC741D8UD-2T/X550



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 1U4L4E-	Quantity			
	ICX/2T	ROME/2T	GENOA/2T	EGS/2T
1U4L4E Series (1U Barebone)	1	1	1	1
System Board (MB)	1	1	1	1
Power Supply Unit	2	2	2	2
System Fan	6	6	6	6
Fan Board (FB)	1	0	0	0
Hard Drive Backplane (BPB)	2	2	2	2
Front Panel Board (FPB)	1	1	1	1
Riser Board (BPB SLIMLINE Connections)	1	0	0	0
Riser Board (PCIe x16)	1	1	1	1
Accessory Box	1	1	1	1
1U Cooler/Heatsink	1	1	1	1
Slide Rail	1	1	1	1



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

1.2 Specifications

1U4L4E-ICX/2T	
System	
Form Factor	1U Rackmount
Dimension	676.5 x 438 x 43.4mm (26.6" x 17.2" x 1.7")
Support MB	SPC621D8U-2T
Front Panel	
Button	Power button w/ LED, ID button w/ LED, system reset
LED	Hard drive activity, LAN 1/2, system event
External Drive Bay / Storage	
Front Side Drive Bay	4 Hot-swap 2.5" NVMe (PCIe3.0 x4)/SATA drive bays 4 Hot-swap 3.5" SATA drive bays
Internal Side	1 M-key (PCIe3.0 x4 or SATA 6Gb/s), supports 2280 form factor
Power Supply	
Type	1+1 Slim PSU
Output Watt	750W
Efficiency	80-PLUS Platinum
System Fan	
Fan	6 40x56mm fans
Processor System	
CPU	Supports 3rd Gen Intel® Xeon® Scalable processors
Socket	Single Socket P+ (LGA 4189)
Chipset	Intel® C621A
System Memory	
Supported DIMM Quantity	8 DIMM slots (1DPC)
Supported Type	Supports DDR4 288-pin RDIMM, LRDIMM, RDIMM/LRDIMM-3DS, Intel® Optane™ Persistent Memory 200 series
Max. Capacity per DIMM	RDIMM: up to 64GB RDIMM-3DS: up to 256GB LRDIMM: up to 128GB LRDIMM-3DS: up to 256GB

Max. DIMM Frequency	Max. 3200MHz
Voltage	1.2V
PCIe Expansion Slot	
PCIe x16	1 FHHL PCIe4.0 x16 via RBIUX16_G4
Ethernet	
Additional GbE Controller	Intel® X710-AT2: 2 RJ45 (10GbE)
Server Management	
BMC Controller	ASPEED AST2500
IPMI Dedicated GLAN	1 Realtek RTL8211E for dedicated management GLAN
Graphics	
Controller	ASPEED AST2500
VRAM	DDR4 16MB
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) 1 Dedicated IPMI
System BIOS	
BIOS Type	AMI 256Mb SPI Flash ROM
BIOS Features	ASRock Rack Instant Flash, ACPI 4.0, SMBIOS 3.3, Plug and Play (PnP)
Hardware Monitor	
Temperature	CPU, PCH, MB, card side temperature sensing
Fan	CPU/Rear/Front fan tachometer CPU quiet fan (allows chassis fan speed auto-adjust by CPU temperature) CPU/Rear/Front 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

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.

1U4L4E-ROME/2T	
System	
Form Factor	1U Rackmount
Dimension	676.5 x 438 x 43.4mm (26.6" x 17.2" x 1.7")
Support MB	ROMED8U-2T
Front Panel	
Button	Power button w/ LED, ID button w/ LED, system reset
LED	Hard drive activity, LAN 1/2, system event
External Drive Bay / Storage	
Front Side Drive Bay	4 Hot-swap 2.5" NVMe (PCIe3.0 x4)/SATA drive bays 4 Hot-swap 3.5" SATA drive bays
Internal Side	1 M-key (PCIe4.0 x4 or SATA 6Gb/s); support 2280 form factor
Power Supply	
Type	1+1 Slim PSU
Output Watt	750W
Efficiency	80-PLUS Platinum
System Fan	
Fan	6 40x56mm fans
Processor System	
CPU	Supports AMD EPYC™ 7003 (with AMD 3D V-Cache™ Technology*)/7002 series processors *A BIOS update is required to support AMD EPYC™ 7003 series processors with AMD 3D V-Cache™ Technology.
Socket	Single Socket SP3 (LGA 4094)
Chipset	System on Chip
System Memory	
Supported DIMM Quantity	8 DIMM slots (1DPC)
Supported Type	Supports DDR4 288-pin RDIMM, LRDIMM, RDIMM/LRDIMM-3DS
Max. Capacity per DIMM	RDIMM: up to 64GB LRDIMM: up to 128GB RDIMM/LRDIMM-3DS: up to 256GB

Max. DIMM Frequency	RDIMM/LRDIMM: max. 3200MHz
Voltage	1.2V
PCIe Expansion Slot	
PCIe x16	1 FHHL PCIe4.0 x16 via RB1UX16_G4
Ethernet	
Additional GbE Controller	1 Intel® X710-AT2: 2 RJ45 (10GbE)
Server Management	
BMC Controller	ASPEED AST2500
IPMI Dedicated GLAN	1 Realtek RTL8211E for dedicated management GLAN
Graphics	
Controller	ASPEED AST2500
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) 1 Dedicated IPMI
System BIOS	
BIOS Type	32MB AMI UEFI Legal BIOS
BIOS Features	Plug and Play (PnP), ACPI 6.3 Compliance Wake Up Events, SMBIOS 3.3.0, ASRock Rack Instant Flash
Hardware Monitor	
Temperature	CPU, memory temperature sensing
Fan	CPU/Rear/Front fan tachometer CPU quiet fan (allows chassis fan speed auto-adjust by CPU temperature) CPU/Rear/Front fan multi-speed control
Voltage	Vsoc, Vcpu, VCCM, VPPM, 3v/5v/12v, +BAT, 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.

1U4L4E-GENOA/2T	
System	
Form Factor	1U Rackmount
Dimension	676.5 x 438 x 43.4mm (26.6" x 17.2" x 1.7")
Support MB	GENOAD8UD-2T/X550
Front Panel	
Button	Power button w/ LED, ID button w/ LED, system reset
LED	Hard drive activity, LAN 1/2, system event
I/O Port	2 Type-A (USB3.2 Gen1)
External Drive Bay / Storage	
Front Side Drive Bay	4 Hot-swap 2.5" NVMe (PCIe5.0 x4)/SATA/SAS* drive bays 4 Hot-swap 3.5" SATA drive bays *SAS drive is only supported with additional RAID/HBA cards.
Front Side Backplane	4-port NVMe/SATA/SAS* passive backplane 4-port SATA passive backplane *SAS drive is only supported with additional RAID/HBA cards.
Internal Side	2 M-key (PCIe5.0 x4); support 2280/2260/2242/2230 form factor
Power Supply	
Type	1+1 Slim PSU
Output Watt	750W
Efficiency	80-PLUS Platinum
System Fan	
Fan	6 PWM easy-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	8 DIMM slots (1DPC)
Supported Type	Supports DDR5 288-pin RDIMM, RDIMM-3DS
Max. Capacity per DIMM	RDIMM: 128GB (2Rx4) RDIMM-3DS: 256GB (2Rx4)
Max. DIMM Frequency	4800MHz
PCIe Expansion Slot	
PCIe x16	Rear: 1 FHHL PCIe5.0 x16 via RB1UX16R_G5
Ethernet	
Additional GbE Controller	Intel® X550-AT2: 2 RJ45 (10GbE)
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) 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, TR1 temperature sensing
Fan	CPU/Rear/Front fan tachometer CPU quiet fan (allows chassis fan speed auto-adjust by CPU temperature) CPU/Rear/Front fan multi-speed control
Voltage	VCORE, VCCSA, VCCM, 3V, 5V, 12V, +BAT, 3VSB, 5VSB, VCCIO, +2.5V_VPP
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.

1U4L4E-EGS/2T

System

Form Factor	1U Rackmount
Dimension	676.5 x 438 x 43.4mm (26.6" x 17.2" x 1.7")
Support MB	SPC741D8UD-2T/X550

Front Panel

Button	Power w/ LED, UID w/ LED, system reset
LED	Hard drive activity, LAN 1/2 activity, system event
I/O Port	2 Type-A (USB2.0)

External Drive Bay / Storage

Front Side Drive Bay	4 Hot-swap 2.5" NVMe (PCIe5.0 x4)/SATA/SAS* drive bays 4 Hot-swap 3.5" SATA drive bays *SAS drive is only supported with additional RAID/HBA cards.
Front Side Backplane	4-port NVMe/SATA/SAS* passive backplane 4-port SATA passive backplane *SAS drive is only supported with additional RAID/HBA cards.
Internal Side	1 M-key (PCIe3.0 x4); support 2280 form factor

Power Supply

Type	1+1 Slim PSU
Output Watt	750W
Efficiency	80-PLUS Platinum
AC Input	100-240V, 60/50Hz

System Fan

Fan	6 PWM hot-swap 40x56mm fans
-----	-----------------------------

Processor System

CPU	Supports 5th and 4th Gen Intel® Xeon® scalable processors
Socket	Single Socket E (LGA 4677)
Thermal Design Power	max. up to 300W
Chipset	Intel® C741

System Memory	
Supported DIMM Quantity	8 DIMM slots (1DPC)
Supported Type	288-pin DDR5 RDIMM/ RDIMM-3DS
Max. Capacity per DIMM	RDIMM: 96GB RDIMM-3DS: 256GB
Max. DIMM Frequency	5600MT/s* on 5th Gen Intel® Xeon® scalable processors 4800MT/s* on 4th Gen Intel® Xeon® scalable processors *Memory speed and capacity support varies by CPU SKU.
Voltage	1.1V
PCIe Expansion Slot	
PCIe x16	1 FHHL PCIe5.0 x16 via RB1UX16R_G5
Ethernet	
Additional GbE Controller	2 RJ45 (10GbE) by Intel® X550-AT2
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
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) 1 Dedicated IPMI
System BIOS	
BIOS Type	AMI UEFI BIOS; 512Mb SPI Flash ROM
BIOS 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, PCH, MB, card side temperature sensing
Fan	Fan tachometer CPU quiet fan (allows chassis fan speed auto-adjust by CPU temperature) Fan multi-speed control
Voltage	1.05V_PCH, 1.8V_PCH, +BAT, PVNN_PCH, 3.3V, 5V, 12V, 3.3VSB, 5VSB, 12V, +12VSB
Environment	
Temperature	Operation temperature: 10°C ~ 35°C Non operation temperature: -40°C ~ 70°C
Humidity	Non operation humidity: 20% ~ 90% (non condensing)

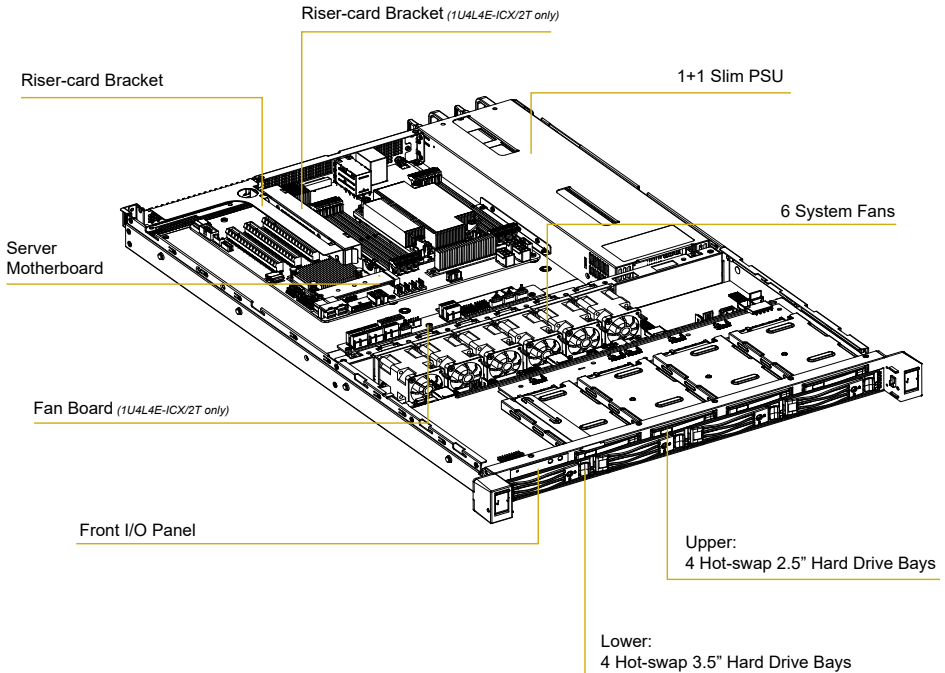


The functions are supported depending on the type of the server motherboard. Refer to the server motherboard user manual for more information.

Chapter 2 Server System Overview

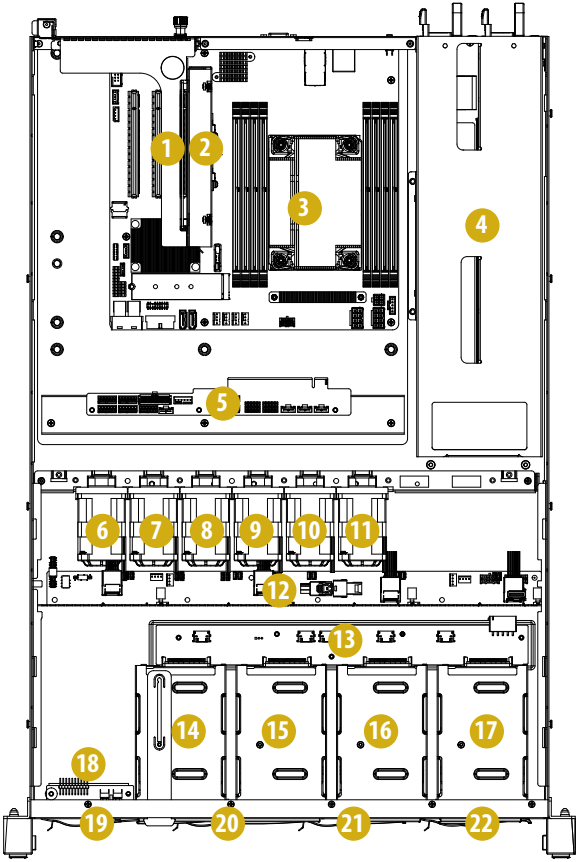
This chapter provides diagrams showing the location of important components of the server system.

2.1 System Components



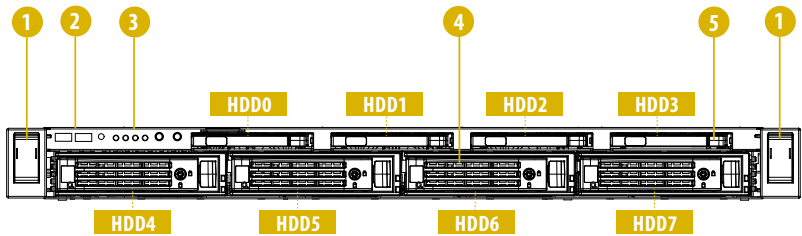
Note: The illustrations in this user manual are for references only. The actual product may be slightly different by SKU.

2.2 Internal Features



No.	Description
1	Riser-card (PCIe x16) (RB1)
2	1U4L4E-ICX/2T: Riser-card (for BPB connections) (RB2) 1U4L4E-ROME/2T, 1U4L4E-GENOA/2T, 1U4L4E-EGS/2T: N/A
3	Server motherboard
4	1+1 Slim PSU
5	1U4L4E-ICX/2T: Fan board 1U4L4E-ROME/2T, 1U4L4E-GENOA/2T, 1U4L4E-EGS/2T: N/A
6	System fan (FAN6)
7	System fan (FAN5)
8	System fan (FAN4)
9	System fan (FAN3)
10	System fan (FAN2)
11	System fan (FAN1)
12	3.5" Hard drive backplane board (BPB1)
13	2.5" Hard drive backplane board (BPB2)
14	Hot-swap 2.5" hard drive bay (HDD0)
15	Hot-swap 2.5" hard drive bay (HDD1)
16	Hot-swap 2.5" hard drive bay (HDD2)
17	Hot-swap 2.5" hard drive bay (HDD3)
18	Front panel board (FPB)
19	Hot-swap 3.5" hard drive bay (HDD4)
20	Hot-swap 3.5" hard drive bay (HDD5)
21	Hot-swap 3.5" hard drive bay (HDD6)
22	Hot-swap 3.5" hard drive bay (HDD7)

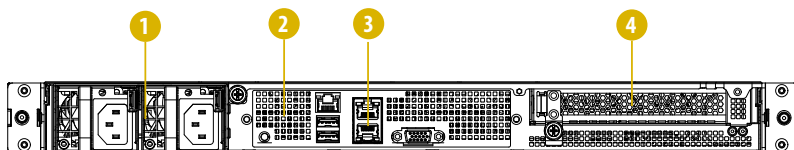
2.3 System Front Panel



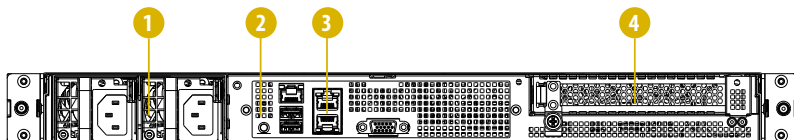
No.	Description
1	Thumbscrew covers
2	2 USB ports (1U4L4E-GENOA/2T, 1U4L4E-EGS/2T only)
3	Front I/O panel
4	4 Hot-swap 3.5" hard drive bays (3.5" SATA hard drive)
5	4 Hot-swap 2.5" hard drive bays (2.5" 7mm NVMe / SATA SSD / SAS hard drive)

2.4 System Rear Panel

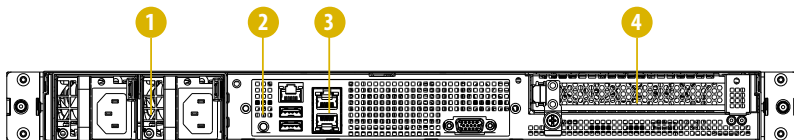
1U4L4E-ICX/2T, 1U4L4E-EGS/2T:



1U4L4E-ROME/2T:



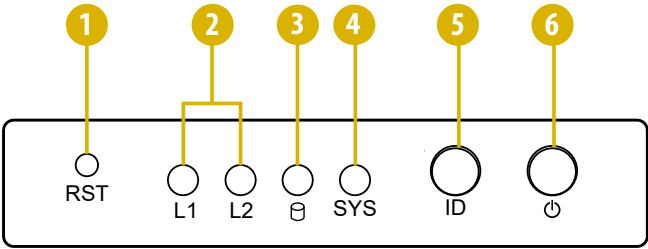
1U4L4E-GENOA/2T:



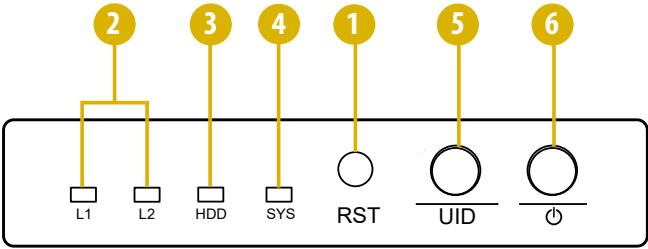
No.	Description
1	1+1 Slim PSU
2	Rear vent
3	Rear I/O panel (depends on the specification of the server motherboard)
4	PCIe slot (for the riser-card)

2.5 Front I/O Panel

1U4L4E-ICX/2T, 1U4L4E-ROME/2T:



1U4L4E-GENOA/2T, 1U4L4E-EGS/2T:



No.	Description
1	System reset button
2	LAN1 and LAN2 LEDs
3	Hard drive activity LED
4	System event LED
5	ID button w/ LED
6	Power button w/ LED

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

System 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.

ID Button

Press the ID button to toggle the front panel ID LED and the baseboard ID LED on and off. This allows user to locate the server that working on from behind a rack of servers.

Power Button

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

Status LED Definitions

LAN1 and LAN2 LEDs	
Status	Description
Off	No LAN is present.
Green	LAN is present.
Blinking Green	Network access

Hard Drive Activity LED	
Status	Description
Off	Hard drive idle
Blinking Green	Hard drive access

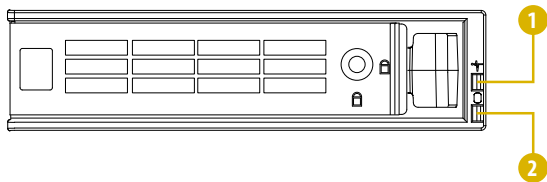
System Event LED	
Status	Description
Off	Running or normal operation
Red	System process fault

ID LED	
Status	Description
Off	System identification is disabled.
Blue	System identification is active.

Power LED	
Status	Description
Off	Power off
Blue	Power on
Blinking Blue	Standby (sleep) mode

2.6 Hard Drive Tray LED

3.5" Hard Drive Tray



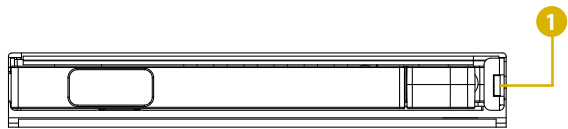
No.	Description
1	Hard drive power LED
2	Hard drive activity LED

Status LED Definitions

Hard Drive Power LED	
Status	Description
Off	No power to hard drive
Blue	Hard drive powered-on

Hard Drive Activity LED	
Status	Description
Off	Hard drive powered-off
Green	Hard drive active
Blinking Green	Hard drive accessing or reading
Red	Hard drive failed

2.5" Hard Drive Tray

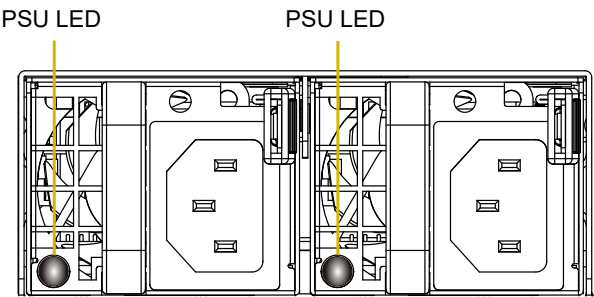


No.	Description
1	Hard drive LED

Status LED Definitions

Hard Drive LED	
Status	Description
Off	Hard drive powered-off
Green	Hard drive active
Blinking Green	Hard drive accessing or reading
Red	Hard drive failed
Blinking Red (1Hz)	Hard drive reconnection
Blinking Red (4Hz)	Hard drive positioning

2.7 PSU LED



PSU Status LED	
Status	Description
Green	Normal work; output ON and OK
Blinking Green (0.5Hz)	AC Present Only 12VSB on (PS off) or PS in Smart Redundant state
Amber	Module fault/protection in operating mode (failure, OCP, OVP, Fan Fail, OTP, UVP) AC cord unplugged
Blinking Amber (0.5Hz)	Warning (high temp, high power, high current, slow fan)

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)
- Fan Board (Pre-installed, if supported)
- Hard Drive Backplane (Pre-installed)



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

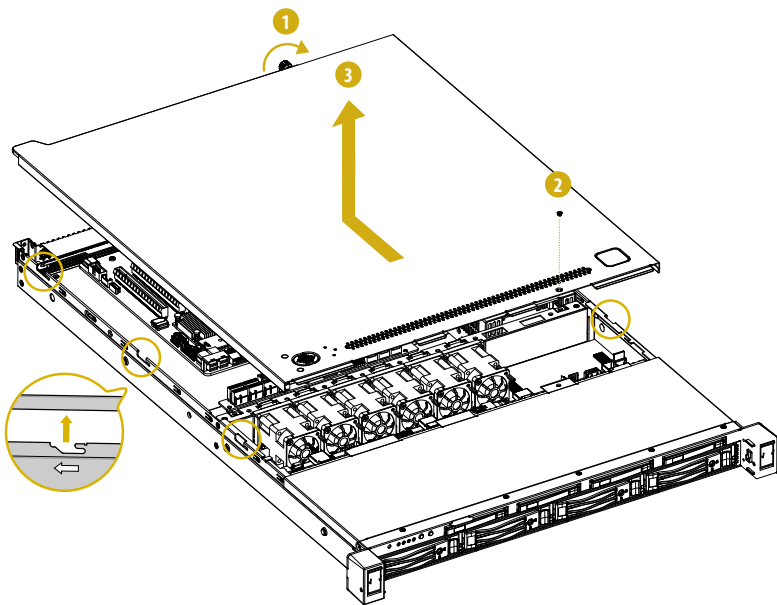
3.1 Server Top Cover

Removing the Server Top Cover

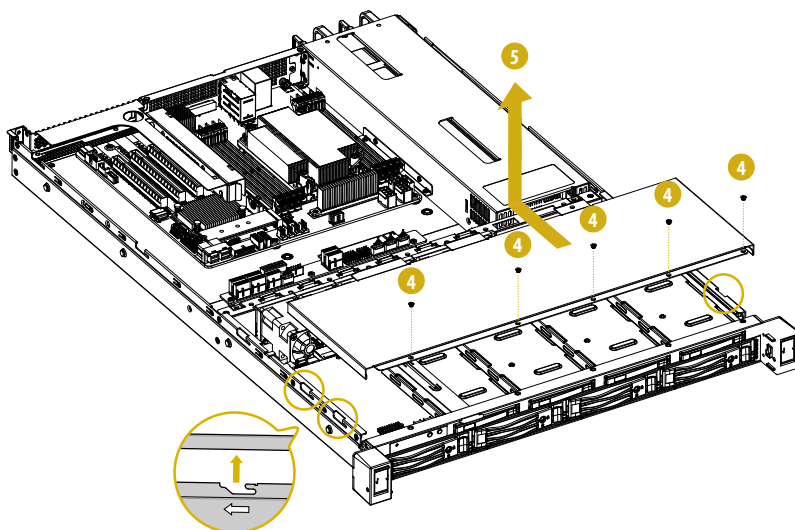


1. Before removing the top covers, power off the server and unplug the power cord.
2. The system must be operated with all the chassis top covers installed to ensure proper cooling.

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

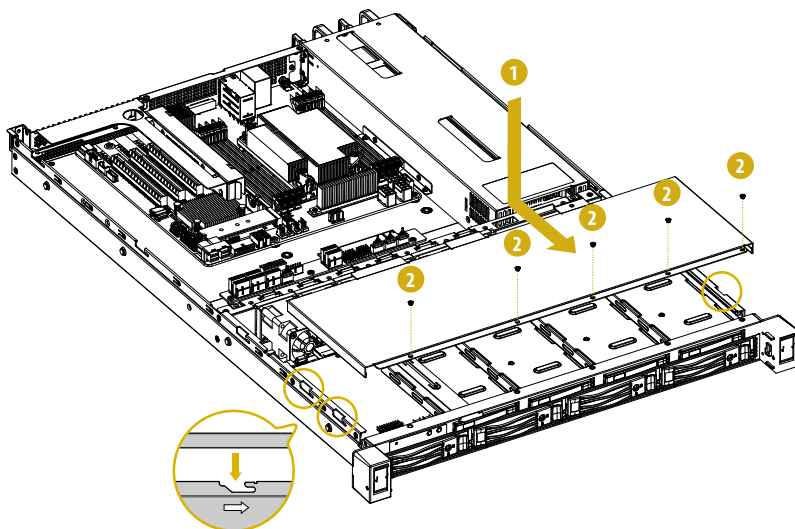


4. Remove all screws securing the top front cover to the chassis.
5. Push the top front cover toward the REAR of the chassis to release the cover from the locked position. Lift up and remove the cover.

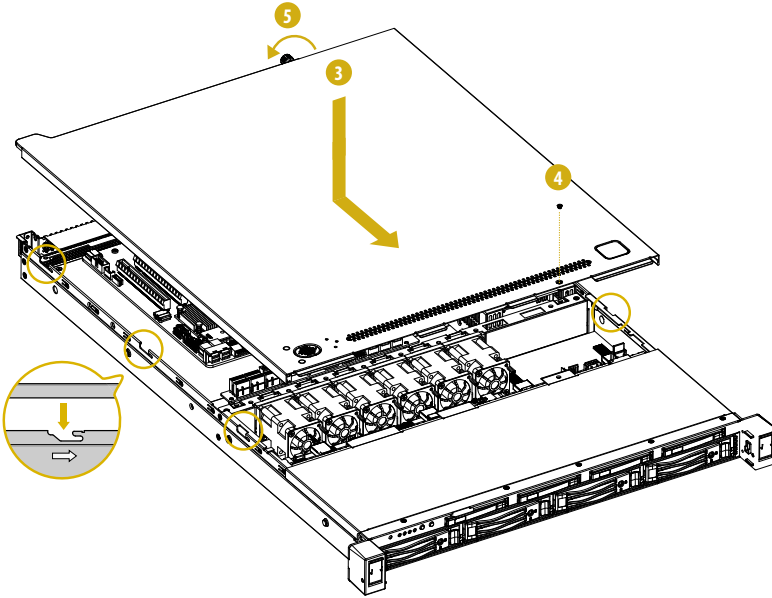


Installing the Server Top Cover

1. Lower the top front cover on the chassis, making sure the side latches align with the cutouts. Slide the cover toward the FRONT of the chassis.
2. Secure the cover to the chassis with screws.



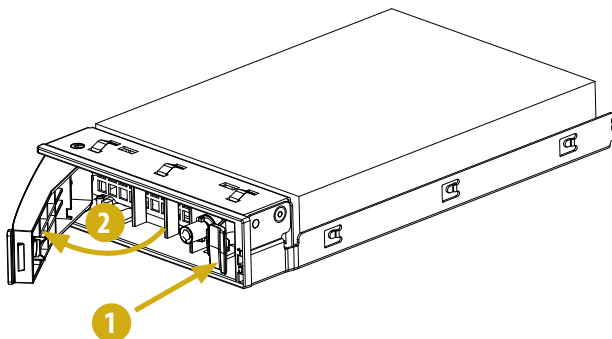
3. Lower the top rear cover on the chassis, making sure the side latches align with the cutouts. Slide the cover toward the FRONT of the chassis.
4. Secure the cover in place with the screw.
5. Hand-tighten the thumbscrew on the rear side of the chassis.



3.2 Hard Drive

Removing the 2.5" or 3.5" Hard Drive Tray from the Chassis

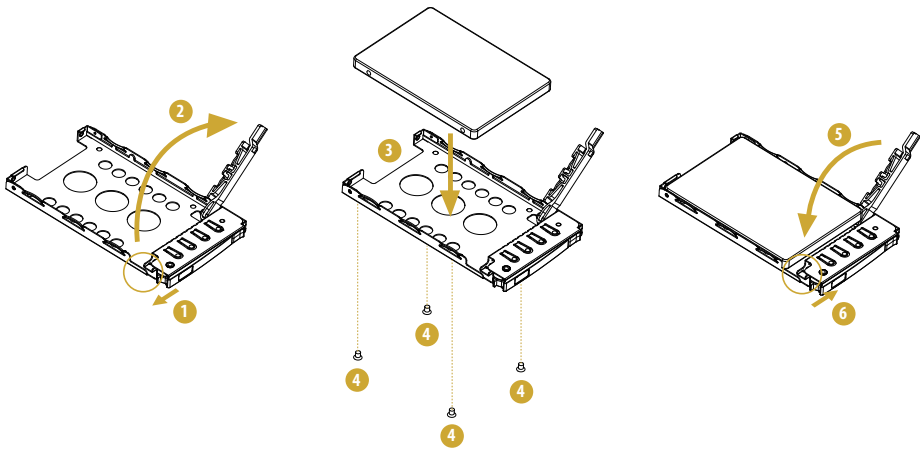
1. Press the locking lever latch on the drive tray to unlock the retention lever.
2. Rotate the lever out and away from the module bay and pull the tray out.



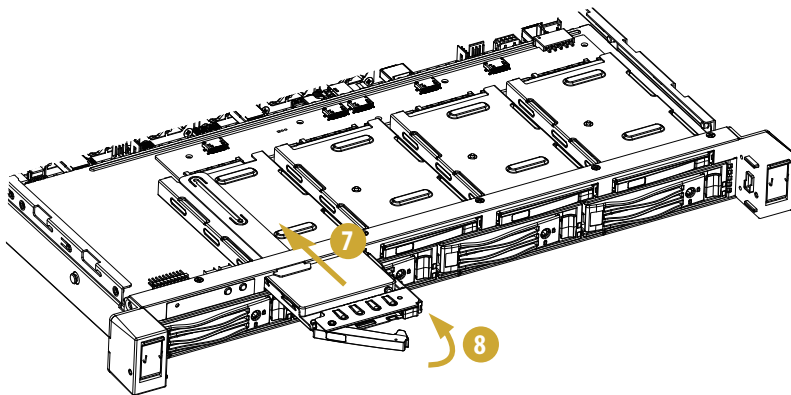
The illustrations shown in this manual are examples only. The actual system may differ slightly.

Installing the 2.5" Hard Drive

1. Pull the lever a little bit toward the LEFT side to release it from the locked position.
2. Open the lever.
3. Place the 2.5" hard drive into the tray with the printed circuit board side facing down.
Carefully align the mounting holes in the hard drive and the tray.
4. Secure the hard drive with the screws.
5. Close the lever.
6. Push the lever a little bit toward the RIGHT side and make sure it is locked.

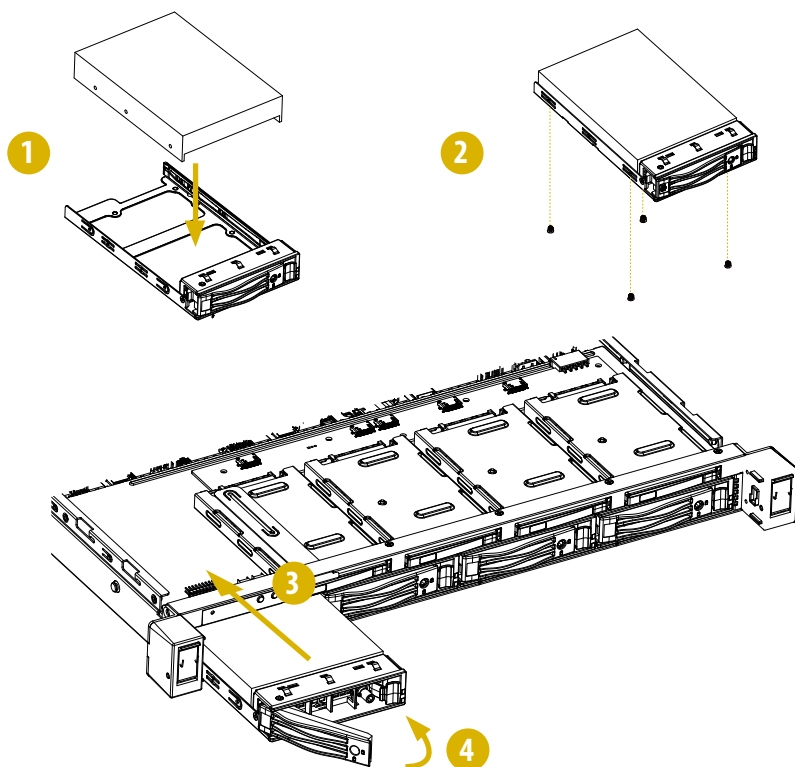


7. Slide the drive tray into the hard drive bay until the drive is fully seated.
8. Push in the locking lever to lock the hard drive tray in place.



Installing the 3.5" Hard Drive

1. Place the 3.5" hard drive into the tray with the printed circuit board side facing down.
Carefully align the mounting holes in the hard drive and the tray.
2. Secure the hard drive with the screws.
3. Slide the drive tray into the hard drive bay until the drive is fully seated.
4. Push in the locking lever to lock the hard drive tray in place.



3.3 Power Supply

The 1U4L4E Series system can accommodate two power supplies in the bay at the rear of the chassis. Each unit provides up to 750W of power. One power supply is required for full load operation, with the other power supply purely as a redundant, load-sharing backup. It can be removed without affecting system operation.



1. Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.
2. The redundant system does not require powering down the server.

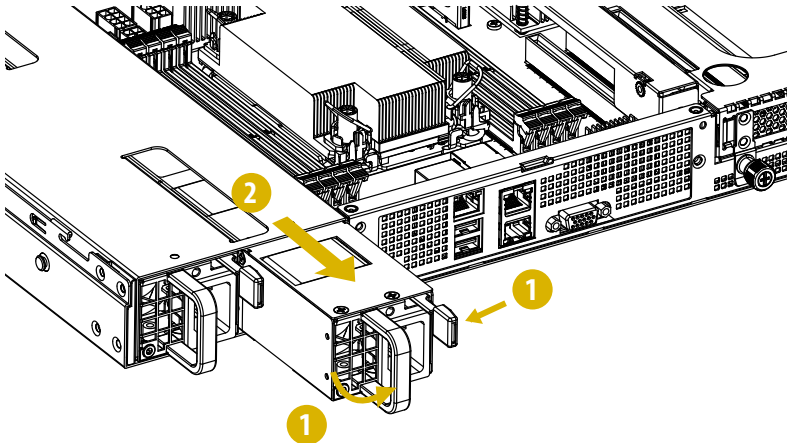
Removing the Power Supply Unit

To remove a failed power supply, identify the failed power supply by checking the power supply LEDs on the PSU.

1. Hold onto the power supply handle while pressing the locking lever towards the power supply handle.

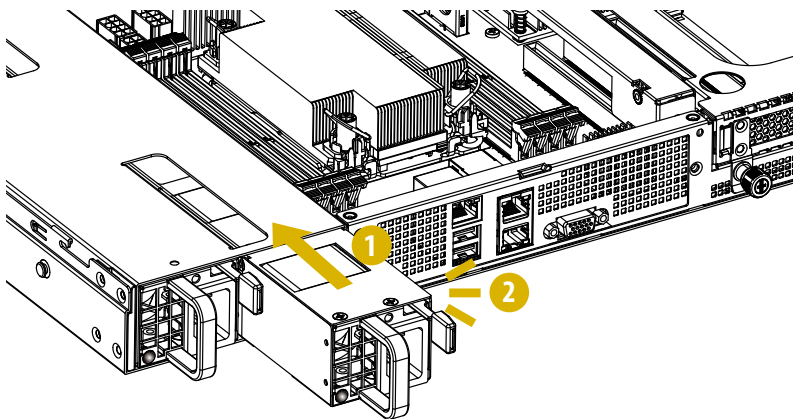
Note: The illustration is for references only. The actual PSU type may be slightly different by models.

2. Pull out the power supply unit from the chassis.



Installing the Power Supply Unit

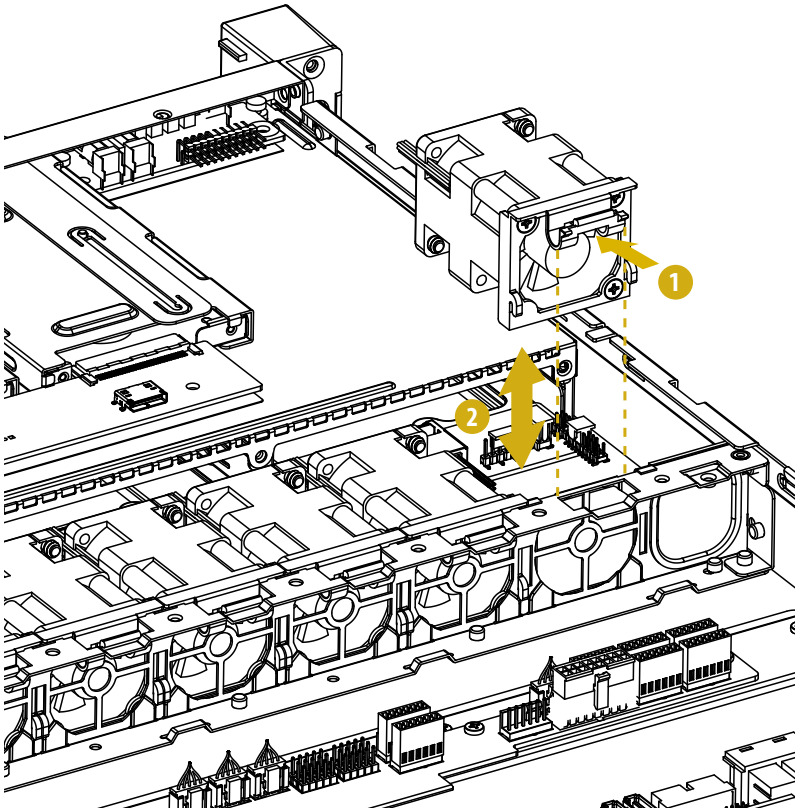
1. Align the power supply unit with the power supply bay. Ensure the LED appears on the lower left when installing the power supply unit.
2. Carefully slide the PSU all the way into the power supply bay until it clicks into place.



3.4 System Fan

Replacing the System Fan

1. Press and hold the clip on the fan. Align the mounting holes on the fan bar with the fan mount on the replacement fan. Be aware of the mount location of each fan.
2. Gently place the fan on the fan bar. Make sure the fan is well seated. Connect the end of the fan cable to the fan connector.



3.5 Riser-card (for BPB Connections)

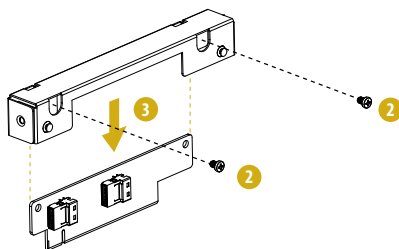
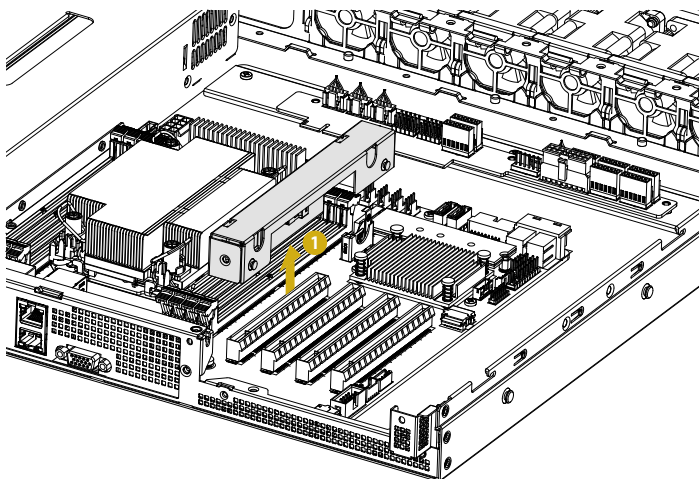


Before installing the riser-card, power off the server and unplug the power cord.

Removing the Riser-card Assembly from the Chassis

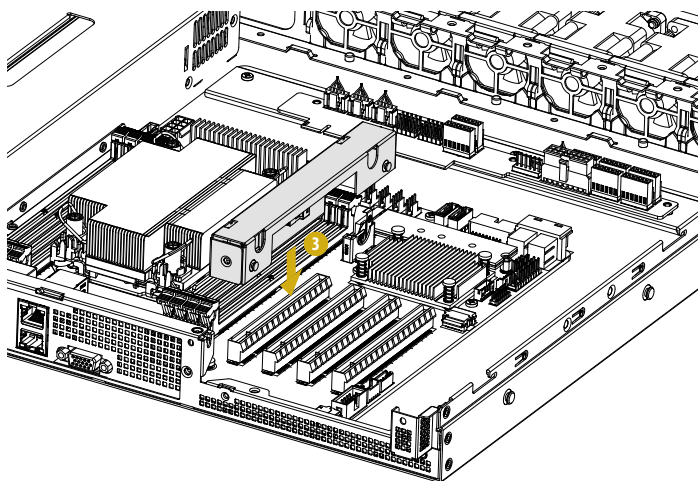
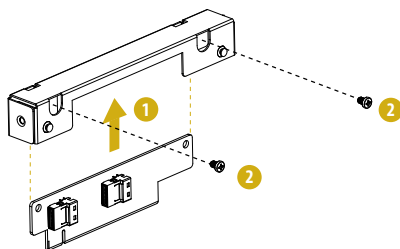
This riser-card bracket can only be installed in the chassis with the riser-card. To remove the bracket, simply lift up the riser-card assembly.

1. Lift up the riser-card assembly.
2. Remove the screws.
3. Remove the riser-card.



Installing the Riser-card

1. Install the riser-card to the riser-card bracket.
2. Secure the riser-card to the bracket with screws.
3. Install the riser-card assembly to the chassis.



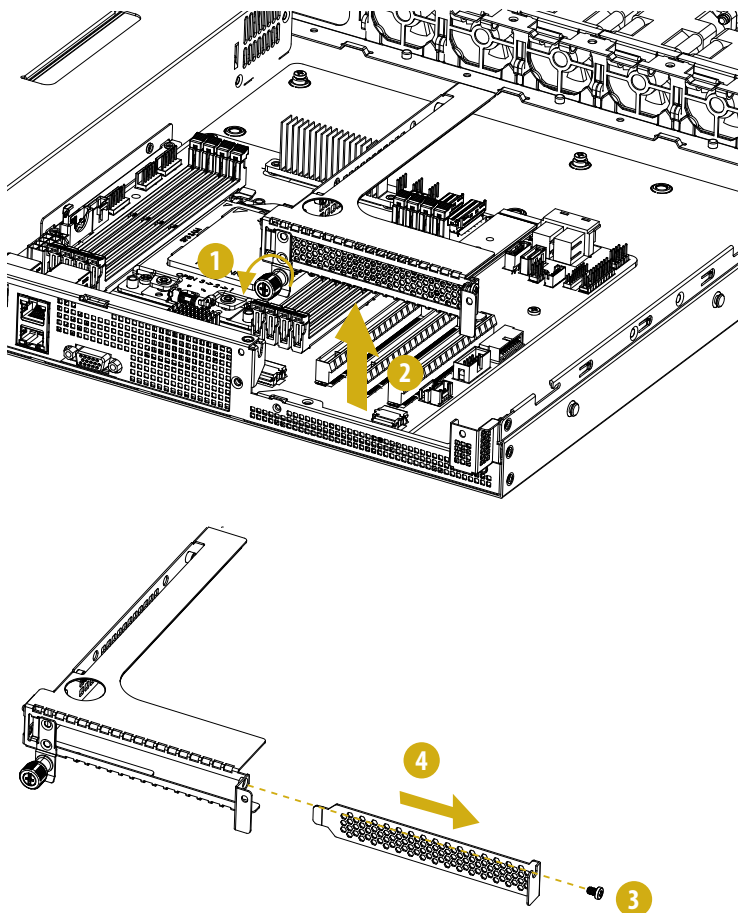
3.6 Add-in Card (Riser-card PCIe x16)



1. Install an add-in card to the chassis only when having a riser-card installed on the server motherboard.
2. Before installing the add-in card, power off the server and unplug the power cord.

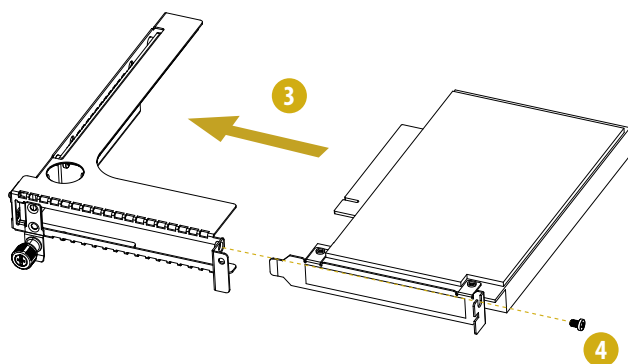
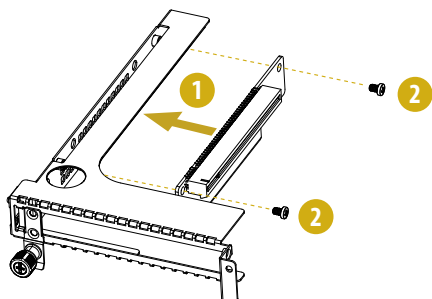
Removing the Riser-card Bracket from the Chassis

1. Hand-release the thumbscrew securing the riser-card bracket on the chassis.
2. Lift up the riser-card bracket.
3. Remove the screw securing the blanking plate on the bracket.
4. Slide the blanking plate out sideways.

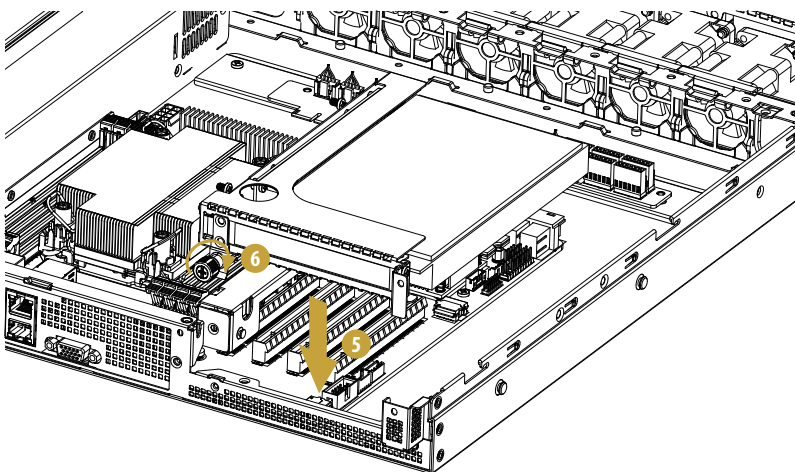


Installing the Riser-card and Add-in Card

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

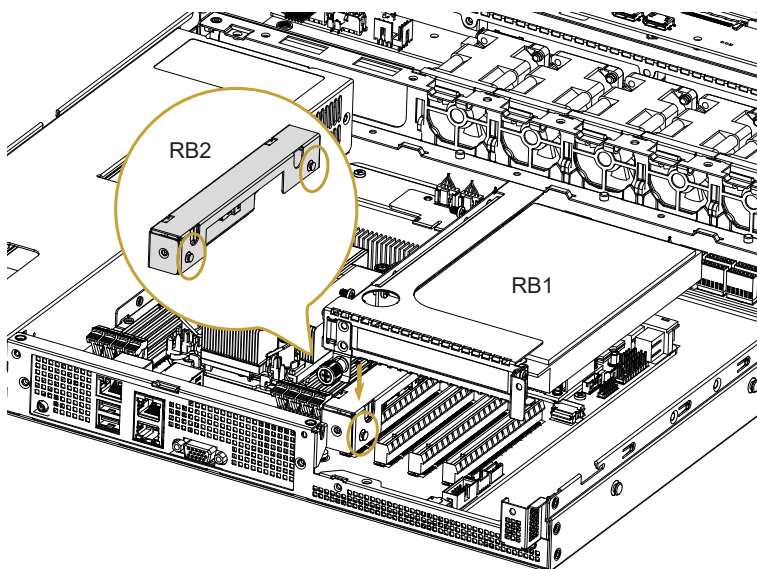


5. Align the add-in card assembly with the opening of the chassis.
6. Hand-tighten the thumbscrew to secure the assembly to the chassis.



Note *(IU4L4E-ICX/2T only)*

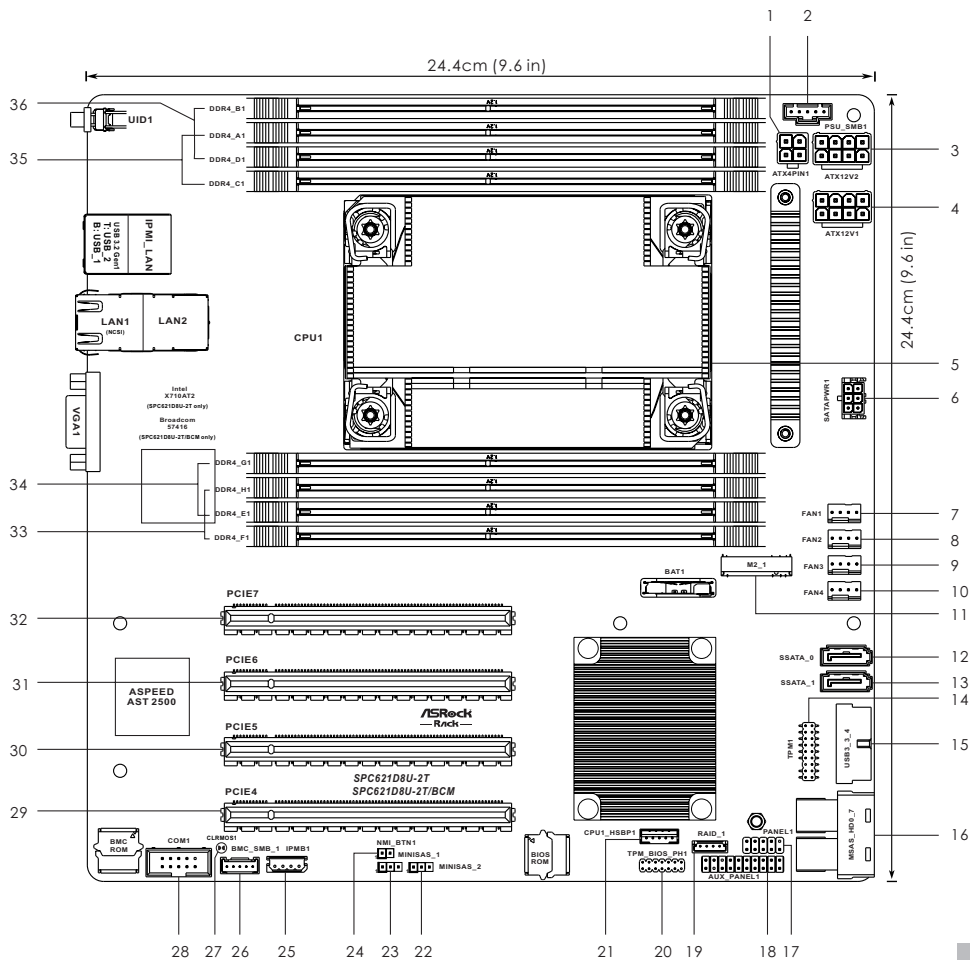
For IU4L4E-ICX/2T system, if installing the riser-card to both the BPB connections (RB2) and PCIe x16 card (RB1), it is necessary to install RB2 first then RB1. Meanwhile, make sure RB1 is well hanged and mounted on the RB2.



Chapter 4 Server Motherboard

4.1 Layout

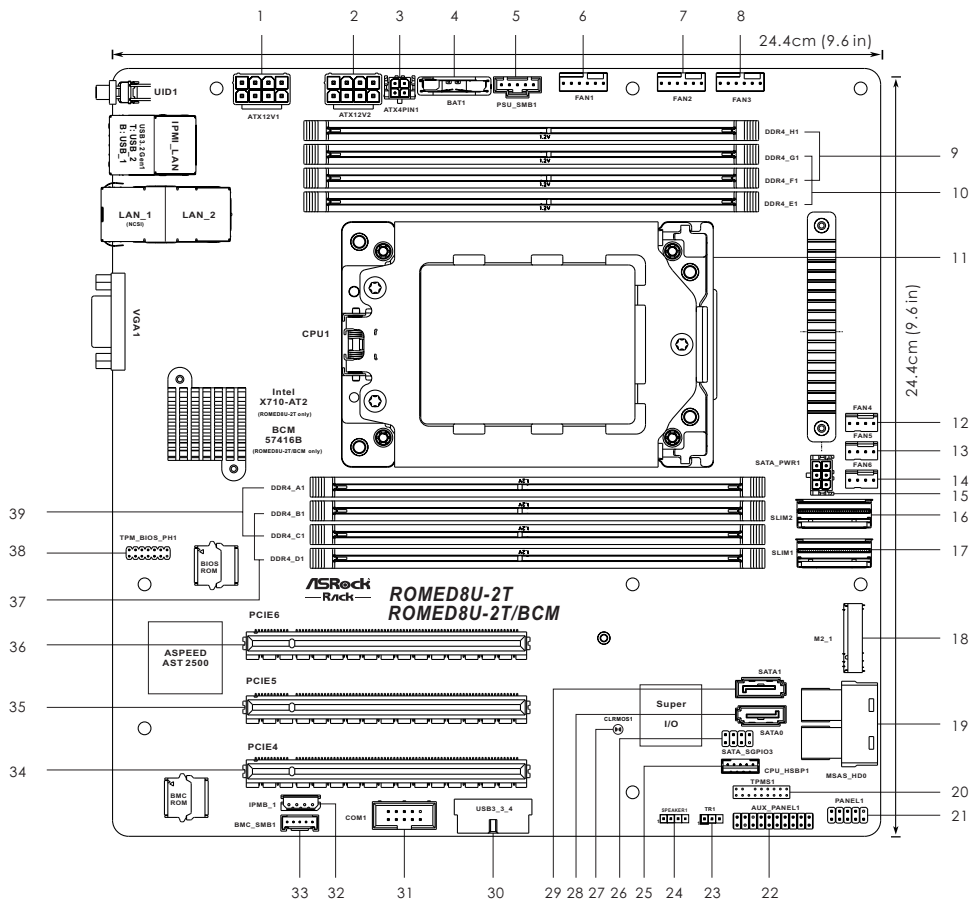
SPC621D8U-2T (for 1U4L4E-ICX/2T)



No.	Description
1	ATX 4-PIN Power Connector (ATX4PIN1 (<i>ATX 24pin-to-4pin</i>))
2	PSU SMBus Header (PSU_SMB_1)
3	ATX 12V Power Connector (ATX12V2)
4	ATX 12V Power Connector (ATX12V1)
5	Intel Socket P+ (LGA4189)
6	SATA Power Connector (SATA_PWR1)
7	System Fan Connector (FAN1)
8	System Fan Connector (FAN2)
9	System Fan Connector (FAN3)
10	System Fan Connector (FAN4)
11	M.2 Socket (M2_1) (Type 2280)
12	SATA3 Connector (SSATA_0)
13	SATA3 Connector (SSATA_1)
14	TPM Header (TPM1)
15	USB 3.2 Gen1 Header (USB3_3_4)
16	MiniSAS HD Connector (MSAS_HD0_7)
17	System Panel Header (PANEL1)
18	Auxiliary Panel Header (AUX_PANEL1)
19	Virtual RAID On CPU Header (RAID_1)
20	TPM-SPI Header (TPM_BIOS_PH1)
21	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
22	MiniSAS HD SATA/PCIE Selection Jumper (MINISAS_2)
23	MiniSAS HD SATA/PCIE Selection Jumper (MINISAS_1)
24	Non Maskable Interrupt Button (NMI_BTN1)
25	Intelligent Platform Management Bus Header (IPMB1)
26	BMC SMBus Header (BMC_SMB_1)
27	Clear CMOS Pad (CLRMOS1)
28	COM Header (COM1)
29	PCI Express 4.0 x16 Card Slot (PCIE4)
30	PCI Express 4.0 x16 Card Slot (PCIE5)
31	PCI Express 4.0 x16 Card Slot (PCIE6)
32	PCI Express 4.0 x16 Card Slot (PCIE7)
33	2 x 288-pin DDR4 DIMM Slots (DDR4_F1, DDR4_H1)

No.	Description
34	2 x 288-pin DDR4 DIMM Slots (DDR4_E1, DDR4_G1)
35	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_C1)
36	2 x 288-pin DDR4 DIMM Slots (DDR4_B1, DDR4_D1)

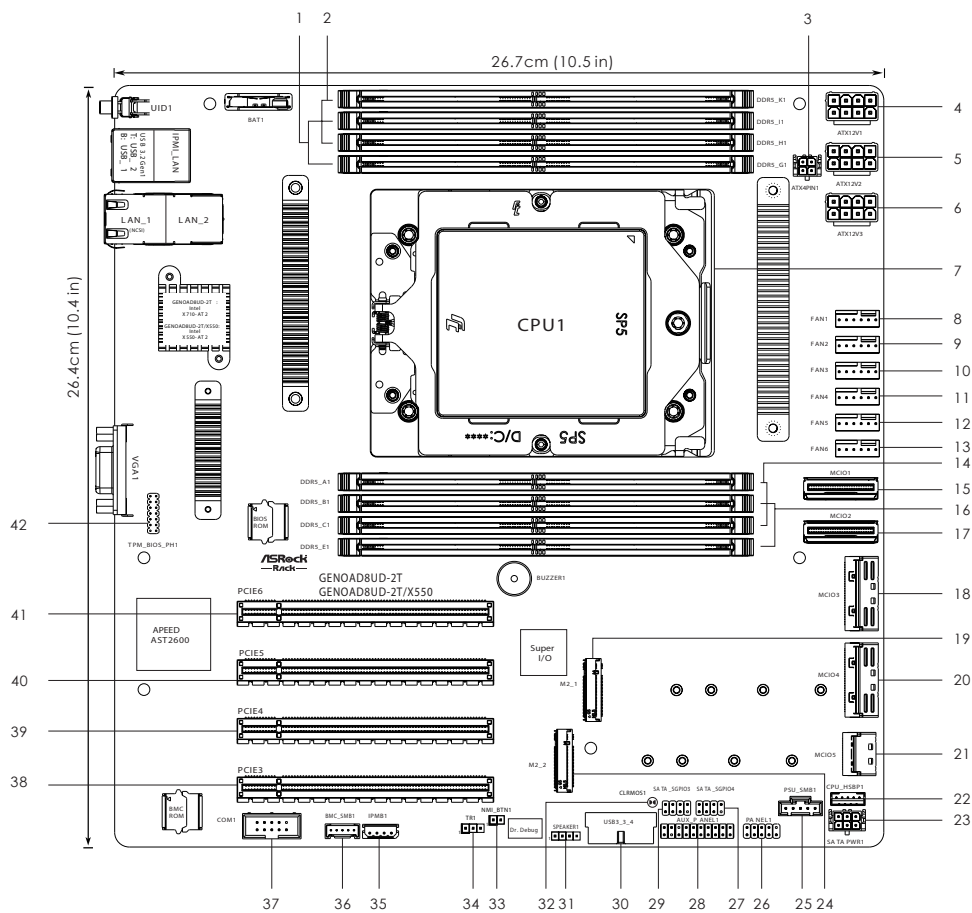
ROMED8U-2T (for 1U4L4E-ROME/2T)



No.	Description
1	ATX 12V Power Connector (ATX12V1)
2	ATX 12V Power Connector (ATX12V2)
3	ATX 4-PIN Power Connector (ATX4PIN1 (<i>ATX 24pin-to-4pin</i>))
4	Battery (BAT1)
5	PSU SMBus Header (PSU_SMB1)
6	System Fan Connector (FAN1)
7	System Fan Connector (FAN2)
8	System Fan Connector (FAN3)
9	2 x 288-pin DDR4 DIMM Slots (DDR4_F1, DDR4_H1)
10	2 x 288-pin DDR4 DIMM Slots (DDR4_E1, DDR4_G1)
11	AMD Socket SP3 (LGA4094)
12	System Fan Connector (FAN4)
13	System Fan Connector (FAN5)
14	System Fan Connector (FAN6)
15	SATA Power Connector (SATA_PWR1)
16	Low-Profile Slimline SAS Connector (SLIM2)
17	Low-Profile Slimline SAS Connector (SLIM1)
18	M.2 Socket (M2_1) (Type 2280)
19	MiniSAS HD Connector (MSAS_HD0)
20	TPM Header (TPMS1)
21	System Panel Header (PANEL1)
22	Auxiliary Panel Header (AUX_PANEL1)
23	Thermal Sensor Header (TR1)
24	Speaker Header (SPEAKER1)
25	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
26	SATA SGPIO Connector (SATA_SGPIO3)
27	Clear CMOS Pad (CLRMOS1)
28	SATA3 Connector (SATA0)
29	SATA3 Connector (SATA1)
30	USB 3.2 Gen1 Header (USB3_3_4)
31	COM Header (COM1)
32	Intelligent Platform Management Bus Header (IPMB_1)
33	BMC SMBus Header (BMC_SMB1)

No.	Description
34	PCI Express 4.0 x16 Card Slot (PCIE4)
35	PCI Express 4.0 x16 Card Slot (PCIE5)
36	PCI Express 4.0 x16 Card Slot (PCIE6)
37	2 x 288-pin DDR4 DIMM Slots (DDR4_B1, DDR4_D1)
38	TPM-SPI Header (TPM_BIOS_PH1)
39	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_C1)

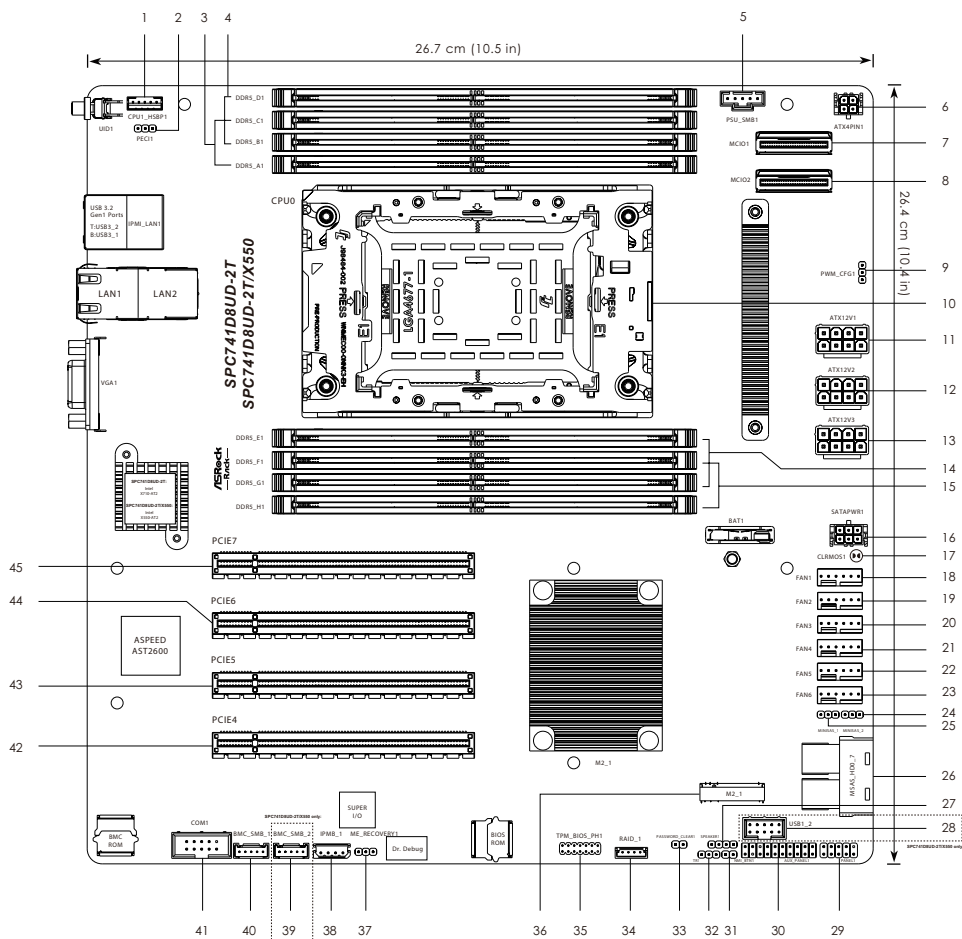
GENOAD8UD-2T/X550 (for 1U4L4E-GENOA/2T)



No.	Description
1	2 x 288-pin DDR5 DIMM Slots (DDR5_G1, DDR5_I1)
2	2 x 288-pin DDR5 DIMM Slots (DDR5_H1, DDR5_K1)
3	ATX 4-PIN Power Connector (ATX4PIN1) (ATX 24pin-to-4pin)
4	ATX 12V Power Connector (ATX12V1)
5	ATX 12V Power Connector (ATX12V2)
6	ATX 12V Power Connector (ATX12V3)
7	AMD Socket SP5 (SM-LGA-6096) (CPU1)
8	System Fan Connector (FAN1)
9	System Fan Connector (FAN2)
10	System Fan Connector (FAN3)
11	System Fan Connector (FAN4)
12	System Fan Connector (FAN5)
13	System Fan Connector (FAN6)
14	2 x 288-pin DDR5 DIMM Slots (DDR5_A1, DDR5_C1)
15	Mini Cool Edge IO x8 Connector (MCIO1)
16	2 x 288-pin DDR5 DIMM Slots (DDR5_B1, DDR5_E1)
17	Mini Cool Edge IO x8 Connector (MCIO2)
18	Mini Cool Edge IO x8 Connector (MCIO3)
19	M.2 Socket (M2_1) (Type 2230/2242/2260/2280)
20	Mini Cool Edge IO x8 Connector (MCIO4)
21	Mini Cool Edge IO x4 Connector (MCIO5)
22	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
23	SATA Power Connector (SATAPWR1)
24	M.2 Socket (M2_2) (Type 2230/2242/2260/2280)
25	PSU SMBus Header (PSU_SMB1)
26	System Panel Header (PANEL1)
27	SATA SGPIO Connector (SATA_SGPIO4)
28	Auxiliary Panel Header (AUX_PANEL1)
29	SATA SGPIO Connector (SATA_SGPIO3)
30	USB 3.2 Gen1 Header (USB3_3_4)
31	Chassis Speaker Header (SPEAKER1)
32	Clear CMOS Pad (CLRMOS1)
33	Non Maskable Interrupt Button (NMI_BTN1)
34	Thermal Sensor Header (TR1)

No.	Description
35	Intelligent Platform Management Bus Header (IPMB1)
36	BMC SMBus Header (BMC_SMB1)
37	COM Port Header (COM1)
38	PCI Express 5.0 x16 Slot (PCIE3)
39	PCI Express 5.0 x16 Slot (PCIE4)
40	PCI Express 5.0 x16 Slot (PCIE5)
41	PCI Express 5.0 x16 Slot (PCIE6)
42	SPI TPM Header (TPM_BIOS_PH1)

SPC741D8UD-2T/X550 (for 1U4L4E-EGS/2T)

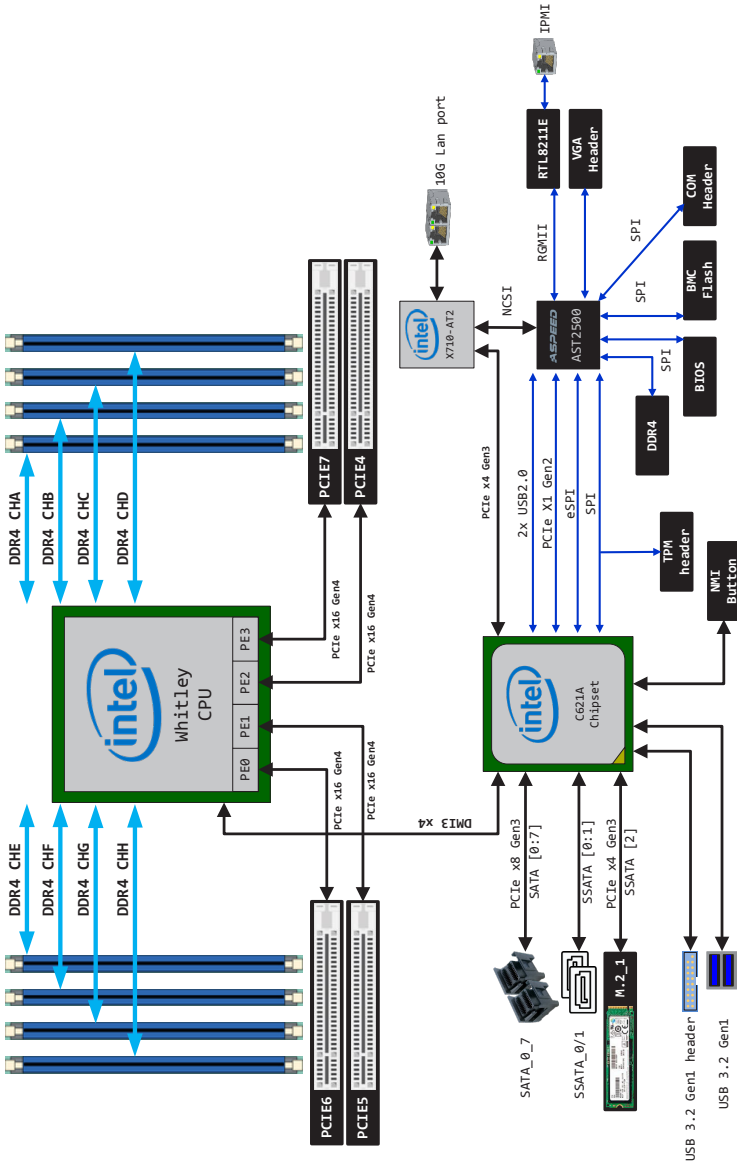


No.	Description
1	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
2	CPU PECI Mode Jumper (PECI1)
3	2 x 288-pin DDR5 DIMM Slots (DDR5_A1, DDR5_C1)
4	2 x 288-pin DDR5 DIMM Slots (DDR5_B1, DDR5_D1)
5	PSU SMBus Header (PSU_SMB1)
6	Micro-Fit ATX 4Pin Power Connector (ATX4PIN1)
7	Mini Cool Edge IO x8 Connector (MCIO1)
8	Mini Cool Edge IO x8 Connector (MCIO2)
9	PWM Configuration Header (PWM_CFG1)
10	LGA 4677 CPU Socket (CPU0)
11	ATX 12V Power Connector (ATX12V1)
12	ATX 12V Power Connector (ATX12V2)
13	ATX 12V Power Connector (ATX12V3)
14	2 x 288-pin DDR5 DIMM Slots (DDR5_E1, DDR5_G1)
15	2 x 288-pin DDR5 DIMM Slots (DDR5_F1, DDR5_H1)
16	Micro-Fit SATA Power Connector (SATAPWR1)
17	Clear CMOS Pad (CLRMO1)
18	System Fan Connector (FAN1)
19	System Fan Connector (FAN2)
20	System Fan Connector (FAN3)
21	System Fan Connector (FAN4)
22	System Fan Connector (FAN5)
23	System Fan Connector (FAN6)
24	MiniSAS HD SATA/PCIE Selection Jumper (MINISAS_2)
25	MiniSAS HD SATA/PCIE Selection Jumper (MINISAS_1)
26	MiniSAS HD Connector (MSAS_HD0_7)
27	Speaker Header (SPEAKER1)
28	USB 2.0 Header (USB1_2) (<i>SPC741D8UD-2T/X550 only</i>)
29	System Panel Header (PANEL1)
30	Auxiliary Panel Header (AUX_PANEL1)
31	Non Maskable Interrupt Button (NMI_BTN1)
32	Thermal Sensor Header (TR1)
33	Password Reset Jumper (PASSWORD_CLEAR1)

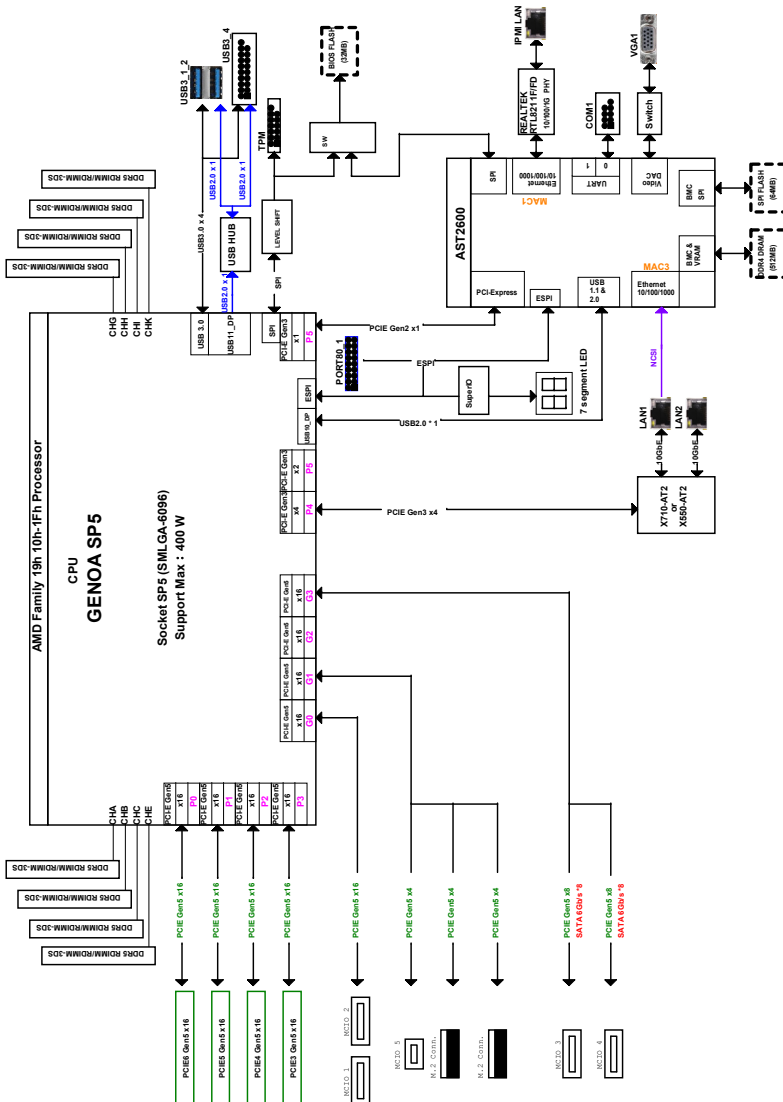
No.	Description
34	Virtual RAID On CPU Header (RAID_1)
35	SPI TPM Header (TPM_BIOS_PH1)
36	M-key M.2 Socket (M2_1) (Type 2280)
37	ME Recovery Jumper (ME_RECOVERY1)
38	Intelligent Platform Management Bus Header (IPMB_1)
39	BMC SMBus Header (BMC_SMB_2) (<i>SPC741D8UD-2T/X550 only</i>)
40	BMC SMBus Header (BMC_SMB_1)
41	Serial Port Header (COM1)
42	PCI Express 5.0 x16 Slot (PCIE4)
43	PCI Express 5.0 x16 Slot (PCIE5)
44	PCI Express 5.0 x16 Slot (PCIE6)
45	PCI Express 5.0 x16 Slot (PCIE7)

4.2 Block Diagram

SPC621D8U-2T (for 1U4L4E-ICX/2T)



GENOAD8UD-2T/X550 (for 1U4L4E-GENOA/2T)



English



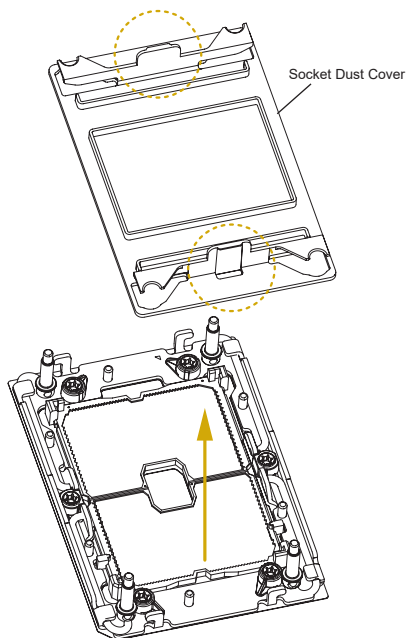
4.3 Installing the CPU and Heatsink

LGA 4189 Socket (for 1U4L4E-ICX/2T)



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

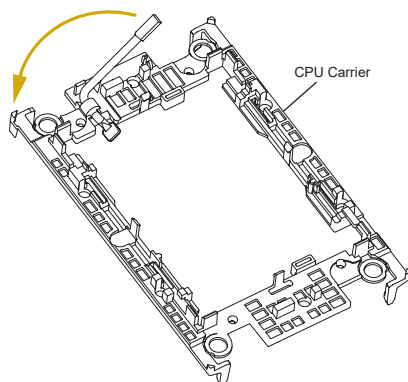
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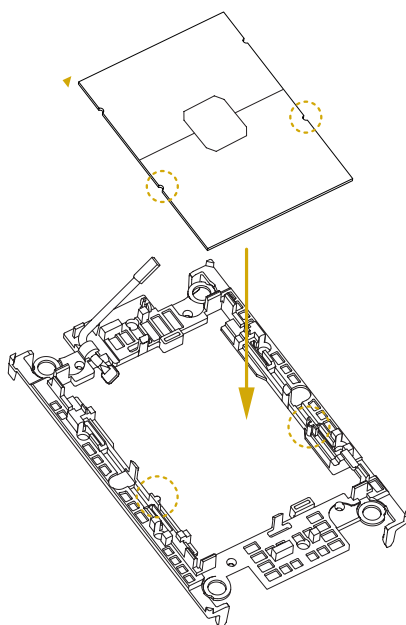


1. Before installing the heatsink, spray thermal interface material between the CPU and the heat-sink to improve heat dissipation.
2. Illustration in this documentation are examples only. Heatsink or fan cooler type may differ.

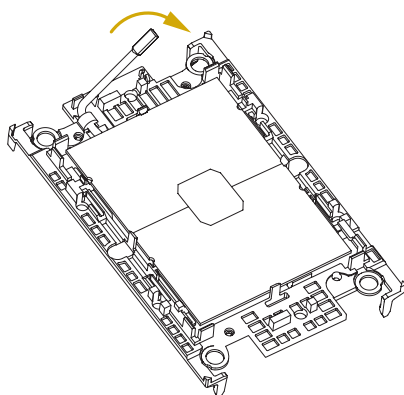
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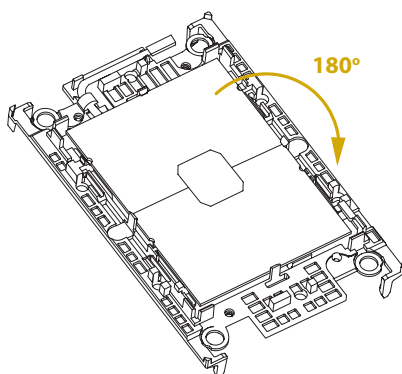
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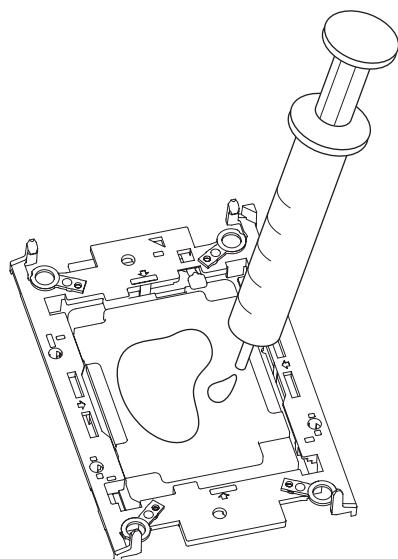
4



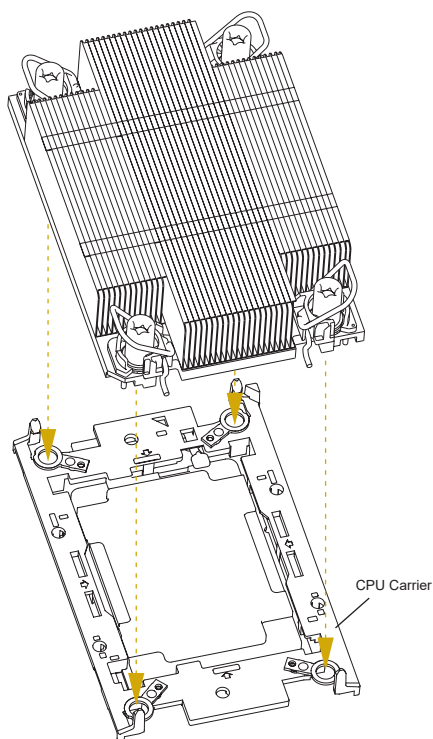
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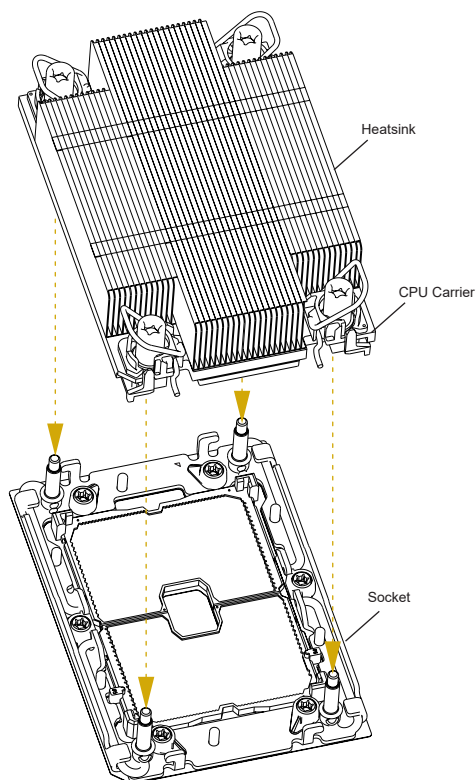
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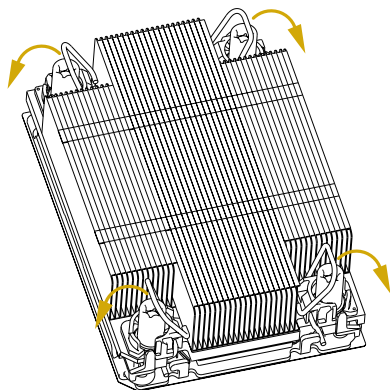
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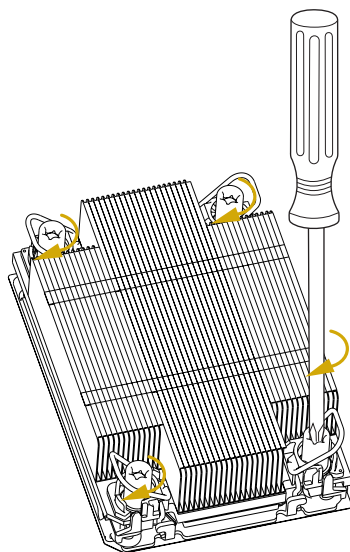
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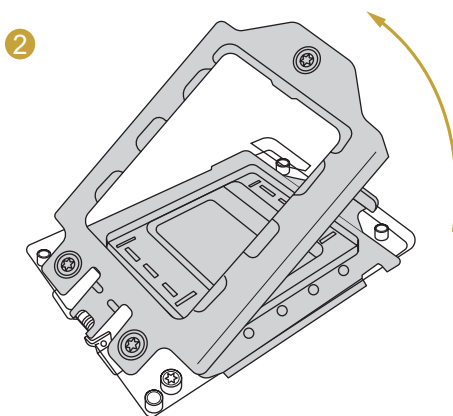
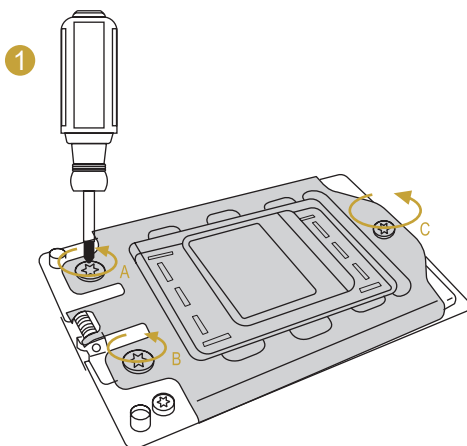


Illustrations in this user manual are provided for reference only and may slightly differ from actual product appearances.

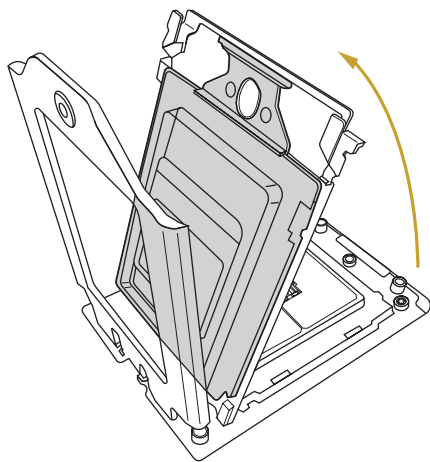
LGA 4094 Socket (for 1U4L4E-ROME/2T)



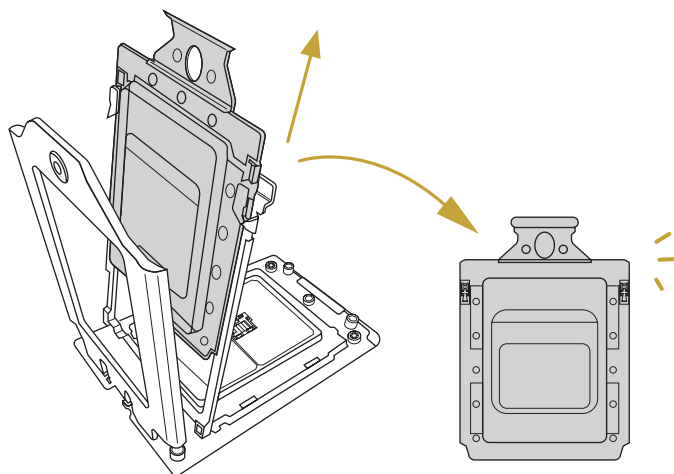
1. Before inserting the CPU into the socket, check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power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



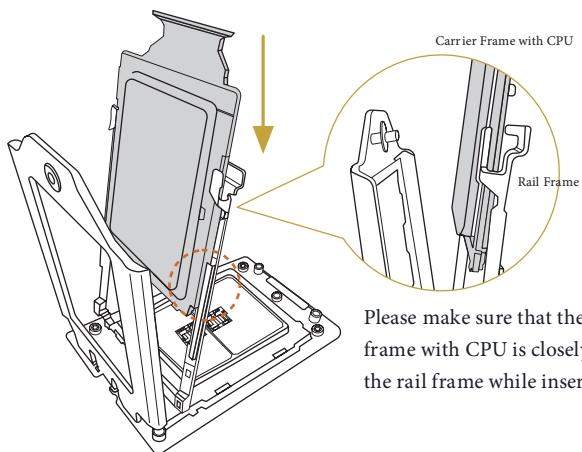
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4

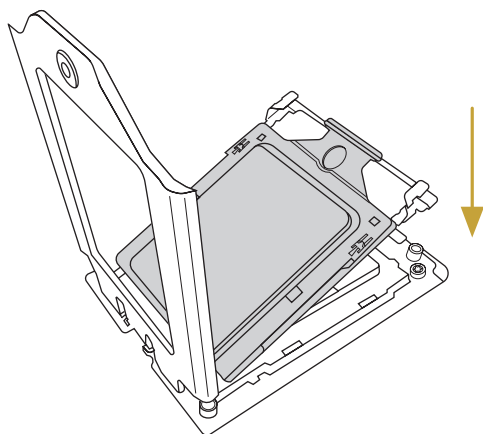


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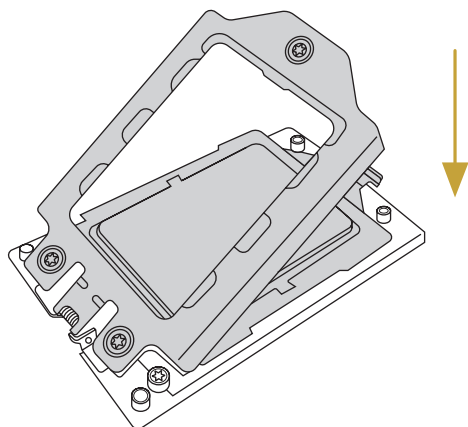


Install the carrier frame with CPU. Don't separate them.

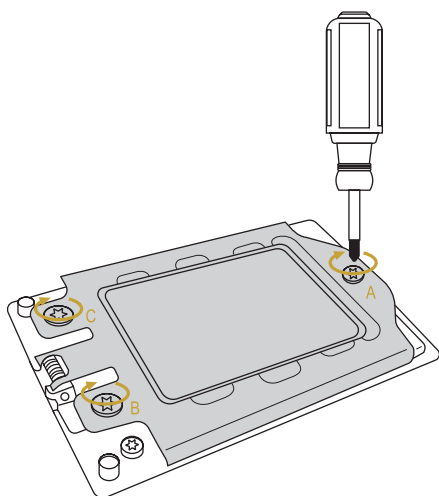
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7



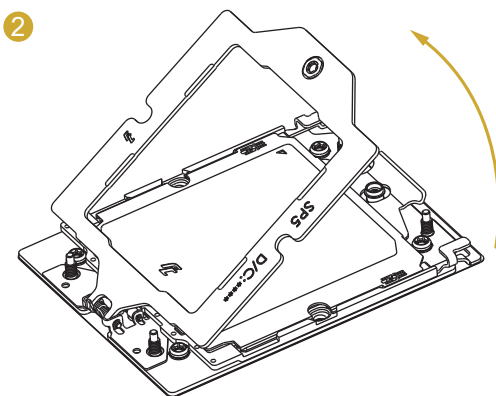
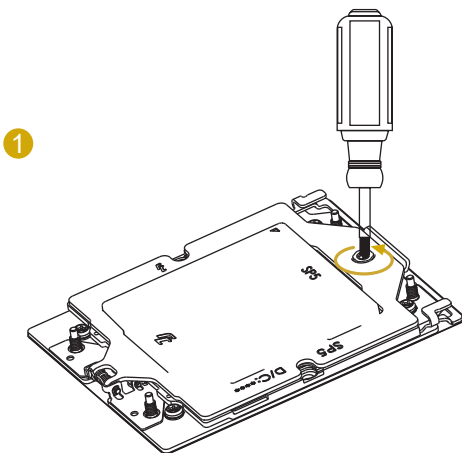
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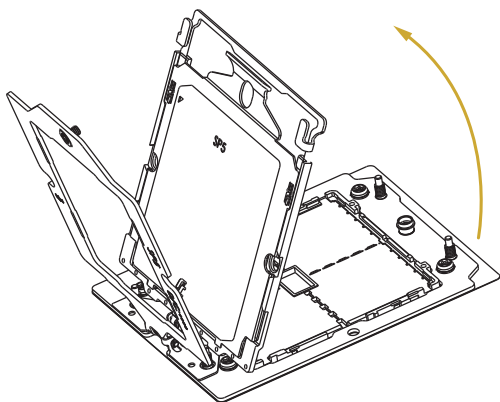
LGA 6096 Socket (for 1U4L4E-GENOA/2T)



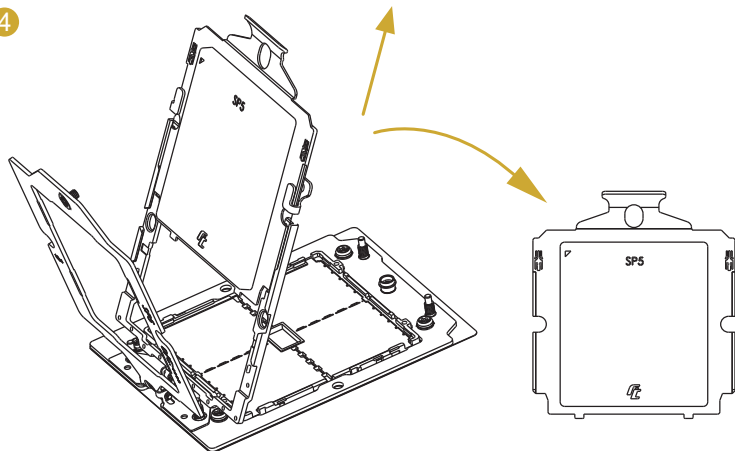
1. Before inserting the CPU into the socket, check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power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



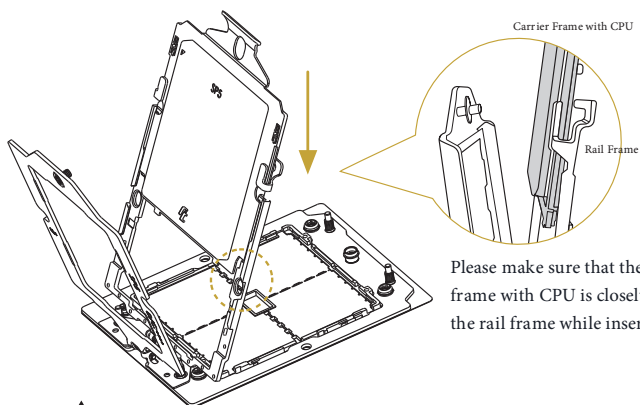
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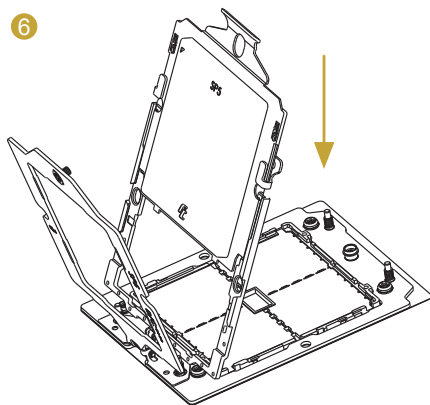


Please make sure that the carrier frame with CPU is closely attached to the rail frame while inserting it.

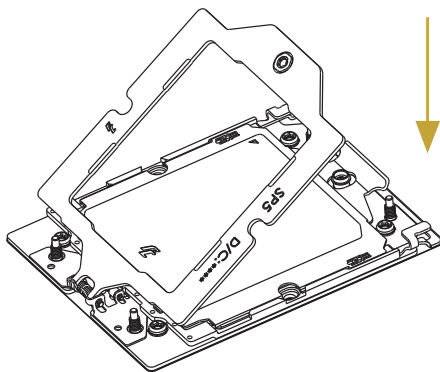


Install the carrier frame with CPU. Don't separate them.

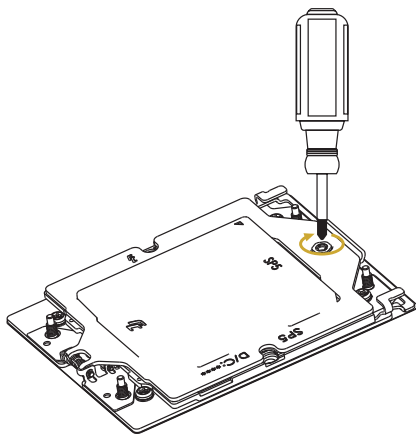
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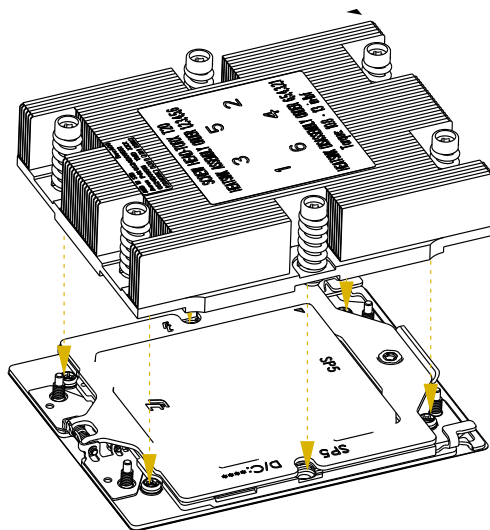
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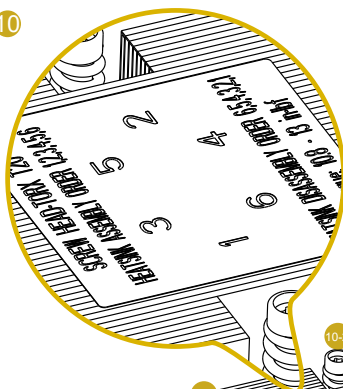
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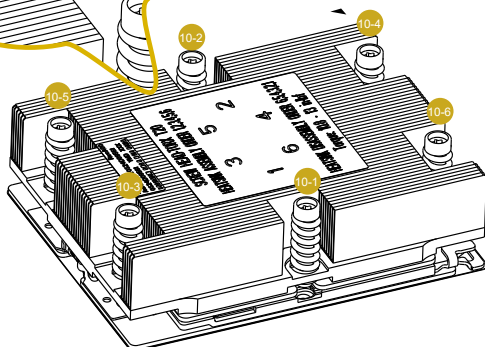
10



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.

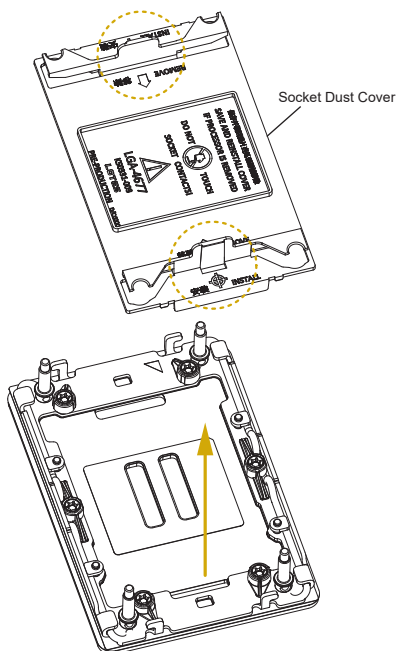


LGA 4677 Socket (for 1U4L4E-EGS/2T)

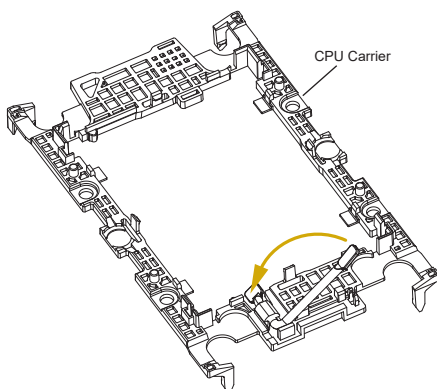


Unplug all power cables before installing the CPU.

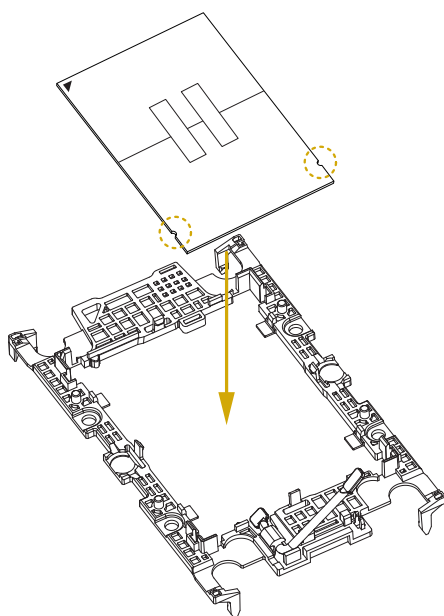
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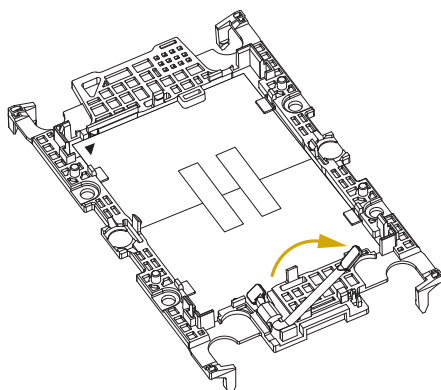
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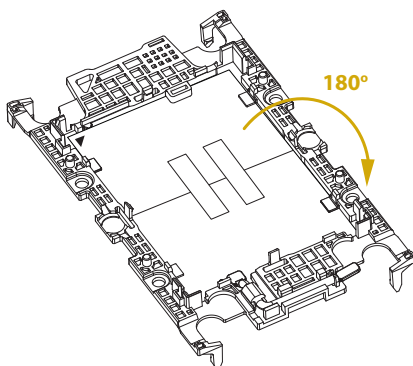
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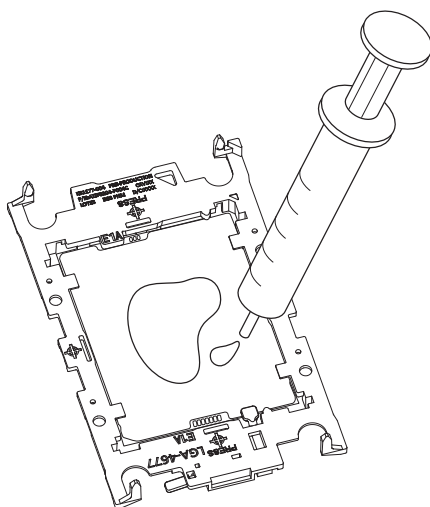
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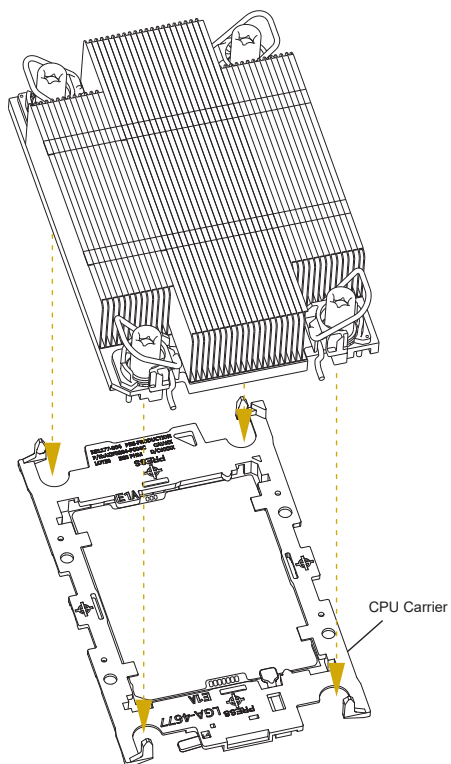
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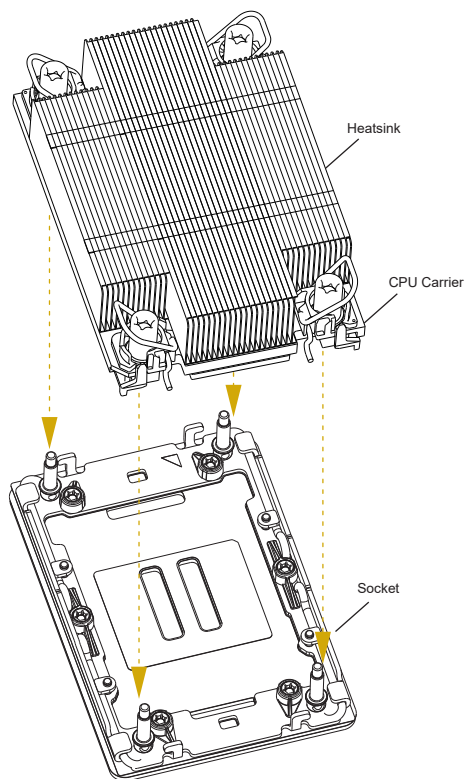


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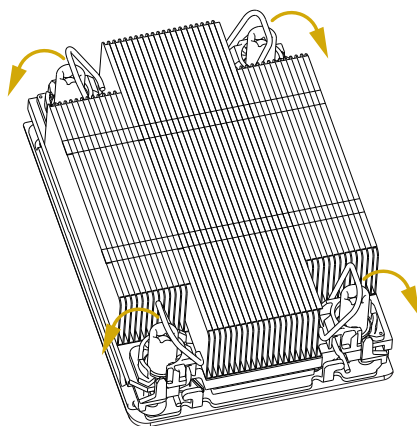


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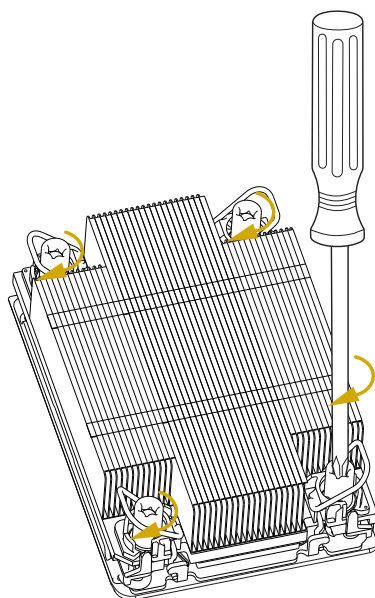




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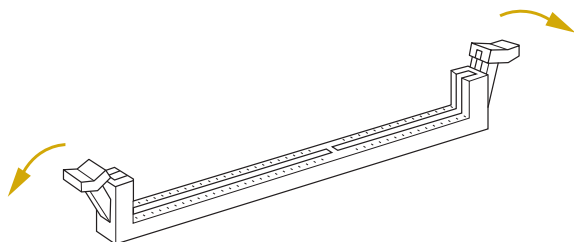


4.4 Installing Memory Modules (DIMM)

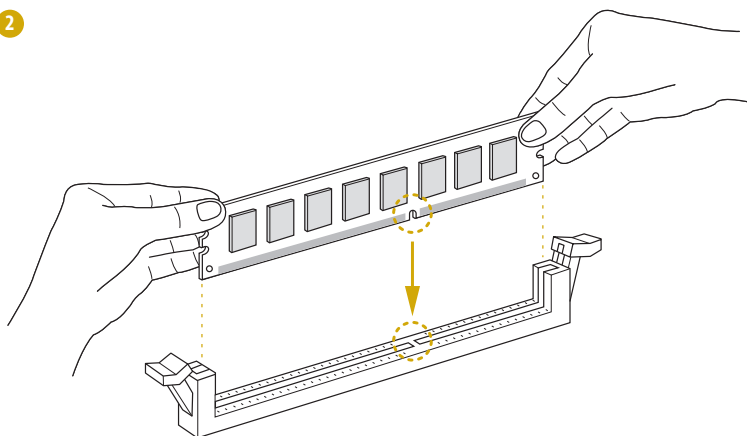


The DIMM only fits in one correct orientation. It will cause permanent damage to the server motherboard and the DIMM if forcing the DIMM into the slot at incorrect orientation. For more information about DIMM installation, refer to the server motherboard user manual.

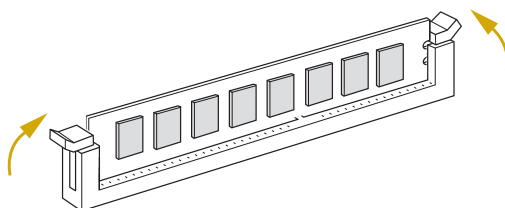
1



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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