OPEN
Industry Standard, Flexible Architecture

GREEN
Less Heat, Less Power Consumption

STABLE
Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

1U4L2E-B650 RPSU

User Manual

English

Version 1.10
Published Oct. 2024

Copyright Notice:

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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 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 skilled person 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

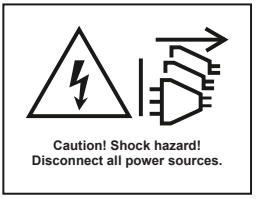
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

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 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.

Contents

Chapter 1 Introduction

Thank you for purchasing 1U4L2E-B650 RPSU, 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 disk drive trays, and other main components this system supports. If the system is pre-installed a serverboard, please refer to the user's manual of the serverboard for the information of the serverboard components, specifications and BIOS settings.

System	ASRock Rack Server Board
1U4L2E-B650 RPSU	B650D4U

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
1U4L2E-B650 RPSU (1U Barebone)	1
System Board (MB)*	1
Power Supply Unit*	2
System Fan*	6
HDD Backplane (BPB)*	2
Front Panel Board (FPB)*	1
Riser cable*	1
Accessory Box	1
1U Cooler/Heatsink	1
Slide Rail	1

** The components are pre-installed.*

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

1.2 Specifications

1U4L2E-B650 RPSU	
System Physical Status	
Form Factor	1U Rackmount
Dimension (D x W x H)	676.5 x 438 x 43.4 mm (26.6" x 17.2" x 1.7")
Support MB	B650D4U
Front Panel	
Buttons	• Power • System Reset
LEDs	• Power • Hard Drive Activity • LANs • System Event
I/O Ports	2 Type-A (USB3.2 Gen1)
External Drive Bay / Storage	
Front Side Drive Bay	• 2 Hot-swap 3.5" SATA or 2 Fixed 2.5" NVMe* (PCIe4.0 x4) drive bays • 2 Hot-swap 3.5" SATA drive bays **If support 2 NVMe drive bays, only M2_2 can be used.*
Internal Side	• M2_1 (PCIe5.0 x4), supports 2280/2242 form factor [CPU] • M2_2* (PCIe4.0 x4), supports 2280/2242 form factor [FCH]
System Fan	
Fan	6 PWM Hot-swap 40x56 mm fans
Power Supply	
Type	1+1 Slim PSU
Output Watts	650W
Efficiency	80-PLUS Platinum
AC Input	100-240Vrms, 50/60Hz

**Please be noted that the functions are supported depending on the type of the server board.*

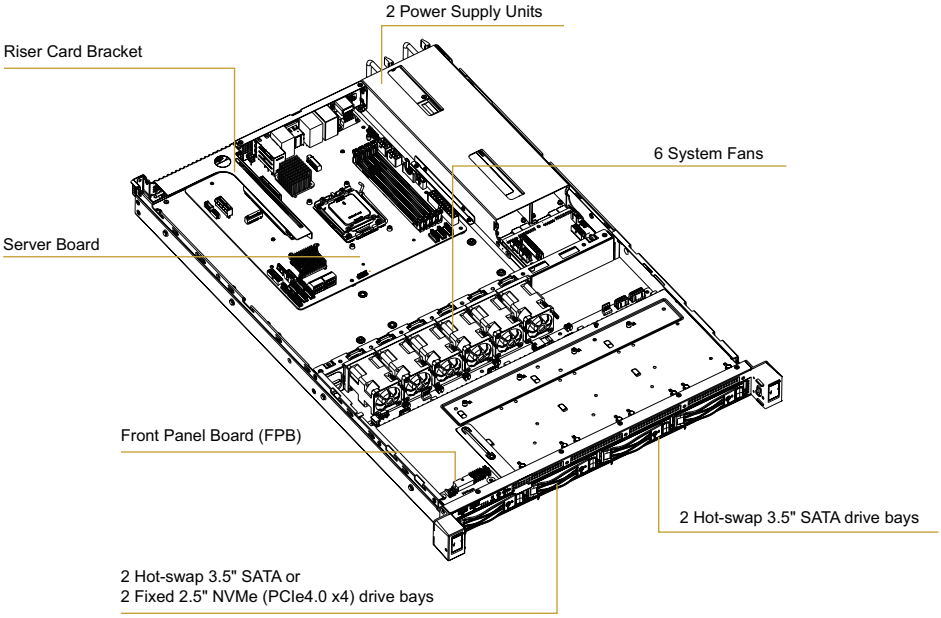
Please refer to the user manual of the motherboard you use for detailed information about motherboard components and features.

English

Chapter 2 Server System Overview

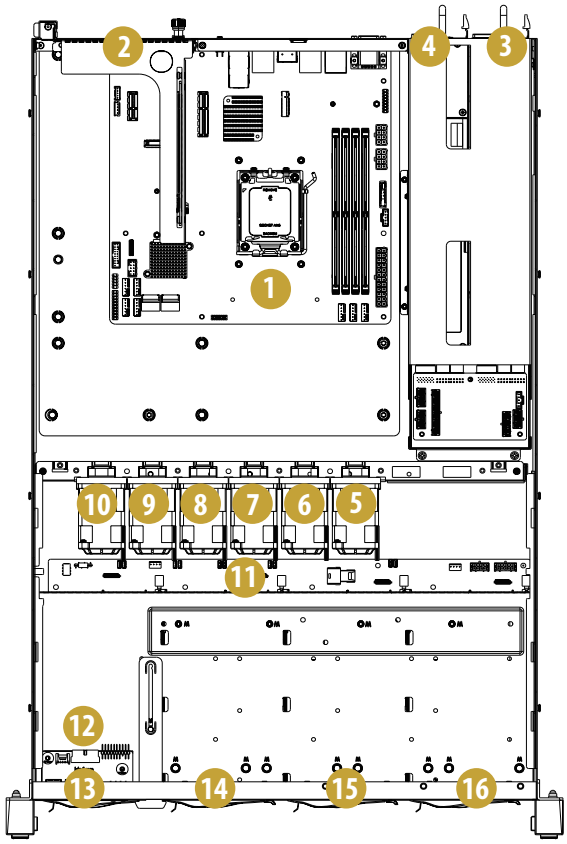
This chapter provides diagrams showing the location of important components of the server system.

2.1 System Components



**The illustrations in this User Manual are for references only. The actual product may be slightly different by SKU.*

2.2 Internal Features

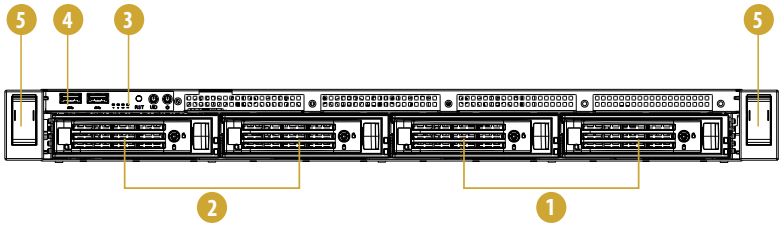


No.	Description
1	Serverboard
2	Add-in card x16(for PCIE slot on the server board)
3	Power Supply Units (PSU1)
4	Power Supply Units (PSU2)
5	System Fan 1

No.	Description
6	System Fan 2
7	System Fan 3
8	System Fan 4
9	System Fan 5
10	System Fan 6
11	3.5" Drive Backplane Board (BPB1)
12	Front Panel Board (FPB)
13	3.5" Hot-Swap SATA Drive Bay or 2.5" Fixed NVMe (PCIe4.0 x4) drive bay
14	3.5" Hot-Swap SATA Drive Bay or 2.5" Fixed NVMe (PCIe4.0 x4) drive bay
15	3.5" Hot-Swap SATA Drive Bay
16	3.5" Hot-Swap SATA Drive Bay

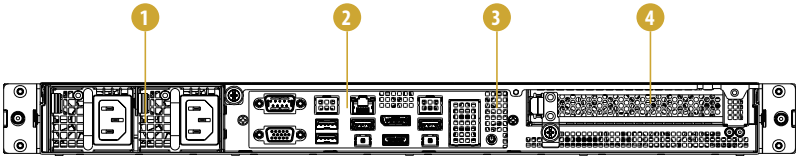
**If support 2 NVMe drive bays, only M2_2 can be used.*

2.3 System Front Panel



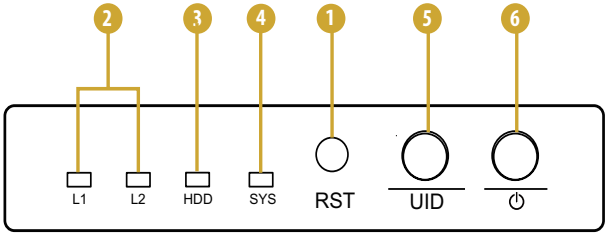
No.	Description
1	3.5" Hot-Swap SATA Drive Bays
2	3.5" Hot-Swap SATA Drive Bays or 2.5" Fixed NVMe (PCIe4.0 x4) drive bays
3	Control Panel (depends on the specification of the server board)
4	2 x USB Ports
5	Thumbscrew Covers

2.4 System Rear Panel



No.	Description
1	2 x Power Supply Units (PSU)
2	I/O Shield (depends on the specification of the server board)
3	Rear Vent
4	Add-in card x16 (for PCIE slot on the server board)

2.5 Front Control Panel Buttons and LEDs



No.	Description
1	System Reset Button
2	LAN1 and LAN2 Activity LED
3	Hard Drive Tray Status LED
4	System Status LED
5	ID Button and LED
6	Power Button and LED

**Please be noted that the functions are supported depending on the type of the server board.*

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

LAN LED	
Status	**Description**
Blinking Green	Network access
Solid Green	LAN is present
Off	No LAN is present

Hard Drive Tray Status LED	
Status	**Description**
Blinking Green	Hard Drive Tray access
Off	Hard Drive Tray idle

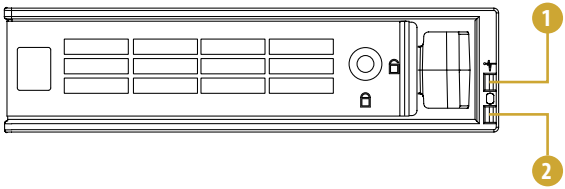
System Status LED	
Status	**Description**
Red	System process fault
Off	Running or normal operation

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

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

2.6 Drive Tray LEDs

3.5" Hard Drive Tray



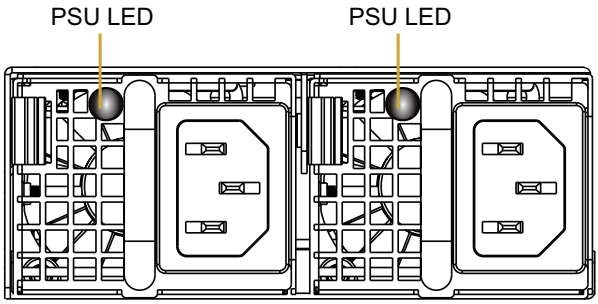
No.	Description
1	Hard Drive Tray Power LED
2	Hard Drive Tray Activity LED

Status LED Definitions

Hard Drive Tray Power LED	
Status	**Description**
Solid Blue	Hard Drive Tray powered-on
Off	No power to Hard Drive Tray

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

2.7 PSU LED



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

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.

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 yourself 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 tray(s)
- Power Supply Unit(s) (Pre-installed)
- System Fans (Pre-installed)
- Server Board (Pre-installed)
- Fan Board (Pre-installed, if supported)
- Hard Drive Tray Backplane (Pre-installed)

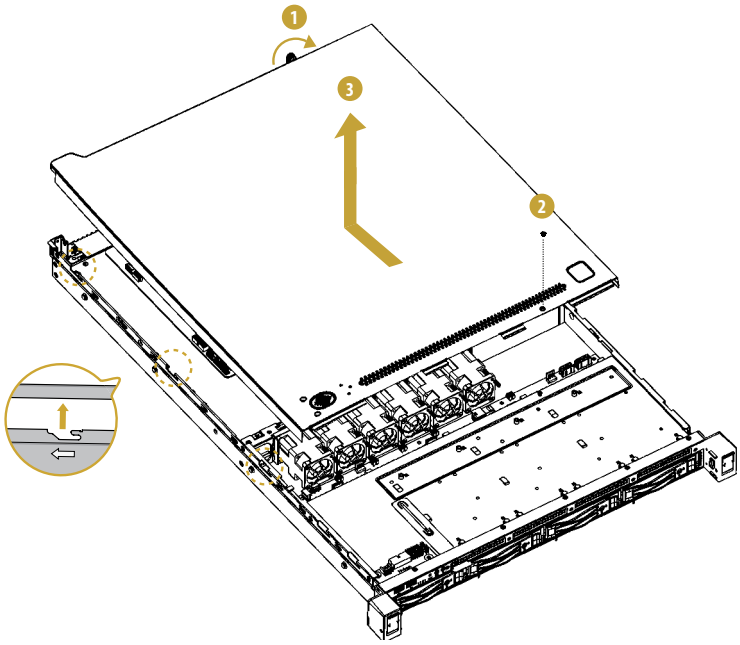
> ⚠ *1. Some components are already pre-installed. Simply properly connect the relavant cables before or after installation. See the Quick Installation Guide for more details.*
> *2. Refer to the user manual of the server board for instructions on how to install server board components.*

3.1 Server Top Covers

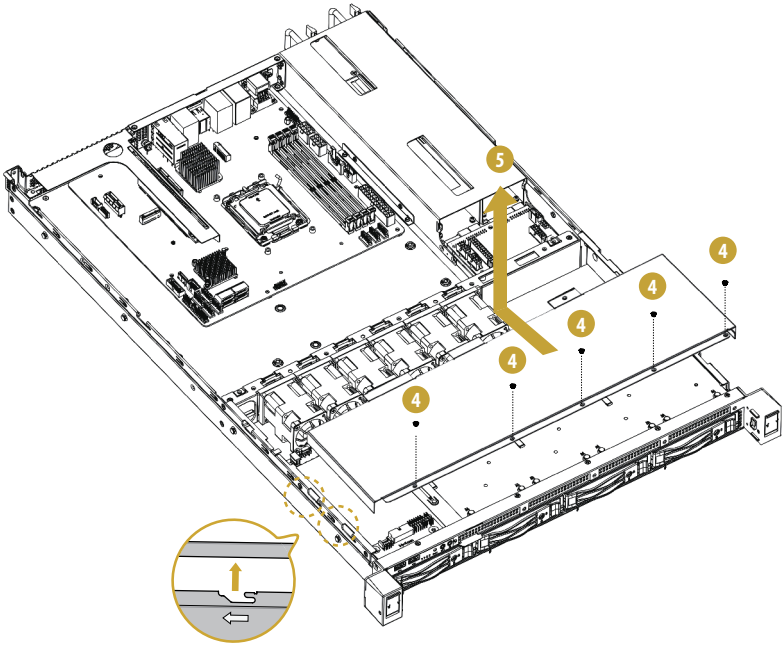
Removing the Server Top Covers

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 that secures the top rear cover to the chassis.
3. Push the top rear cover toward the REAR of the chassis to remove the cover from the locked position. Lift up and remove the top rear cover.

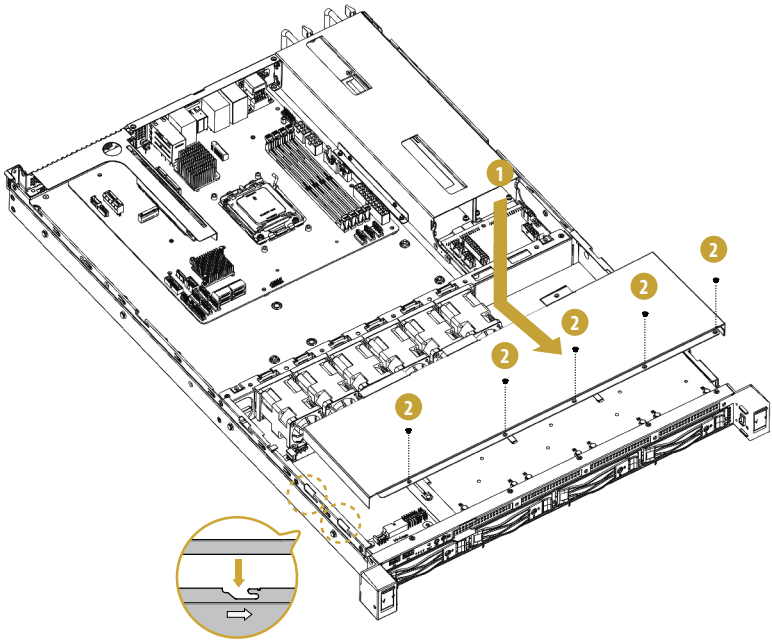


4. Remove all screws that secure the top front cover to the chassis.
5. Push the top front cover toward the REAR of the chassis to remove the cover from the locked position. Lift up and remove the top front cover.

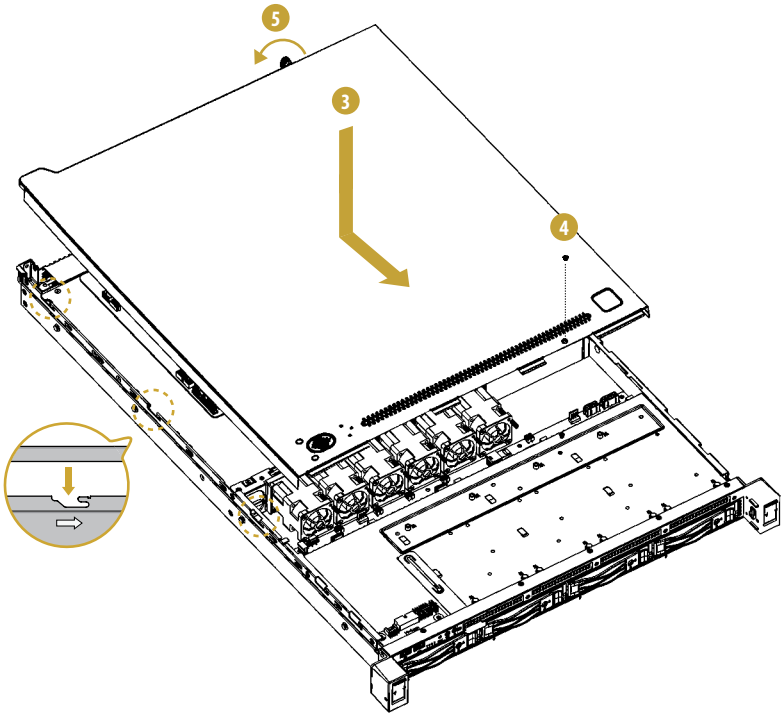


Installing the Server Top Covers

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



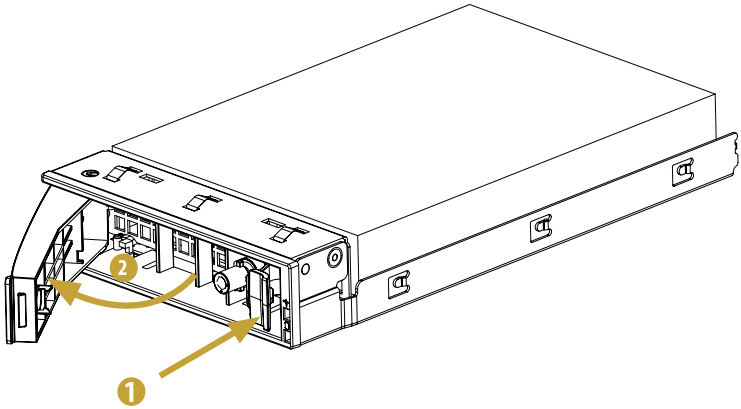
3. Then lower the top rear cover on the chassis, making sure the side latches align with the cutouts. Slide the top rear cover toward the FRONT of the chassis.
4. Secure the top rear cover in place with a screw.
5. Hand-tighten the thumbscrew on the rear side of the chassis.



3.2 Hard Drive

Removing 2.5" and 3.5" Hard Drive

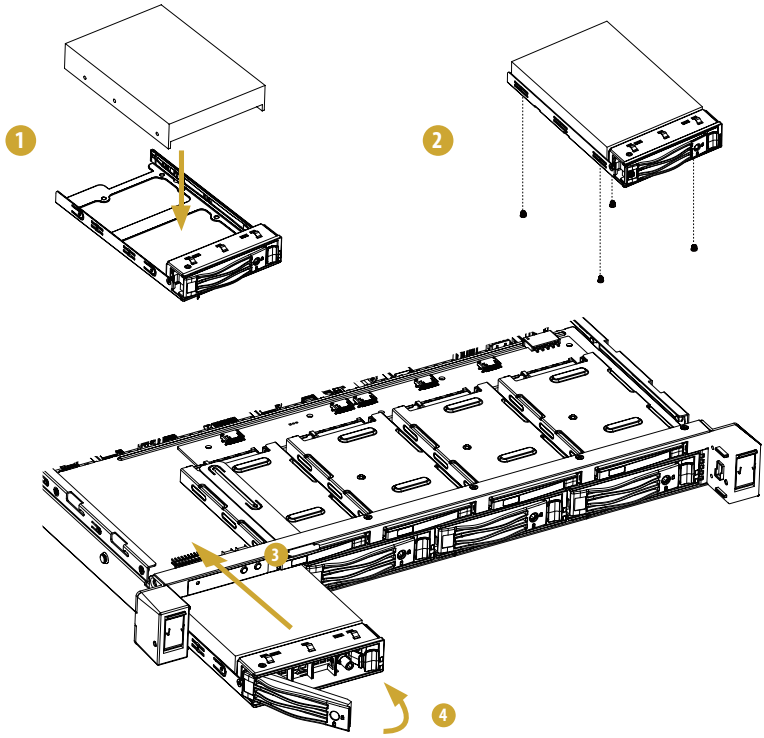
1. Press the locking lever latch on the drive tray to unlock the retention lever.
2. Rotate the lever out and away from the module and pull the hard drive out of the hard drive bay.



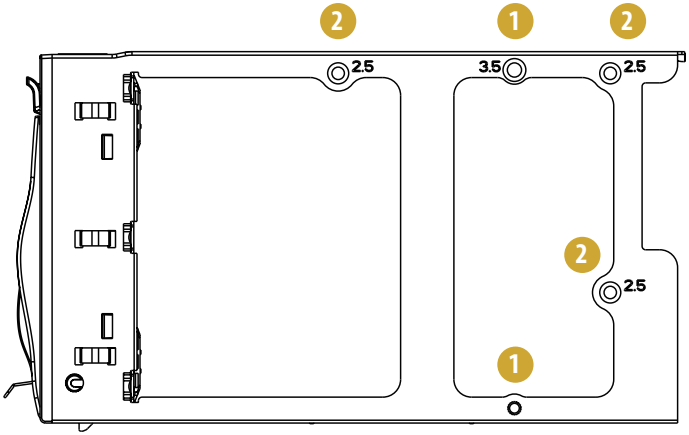
The illustrations shown in this manual are examples only, the actual system may differ slightly .

Installing a 2.5″ and 3.5″ Hard Drive to the Hard Drive Tray

1. Place the 2.5" and 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 using 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 into place.



Screw Holes Located on the Hard Drive Tray



No.	Description
1	3.5" hard drive tray screw position
2	2.5" hard drive tray screw position

3.3 Power Supply

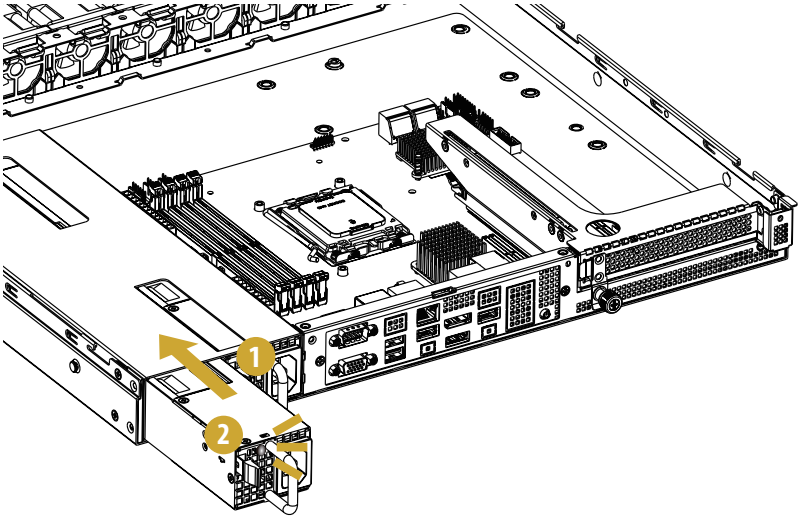
Installing and Removing the Power Supply

> *Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.*

The 1U4L2E-B650 RPSU system can accommodate two AC or two DC power supplies in the bay at the rear of the chassis. Each unit provides up to 650 Watts 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.

Installing the Power Supply Unit

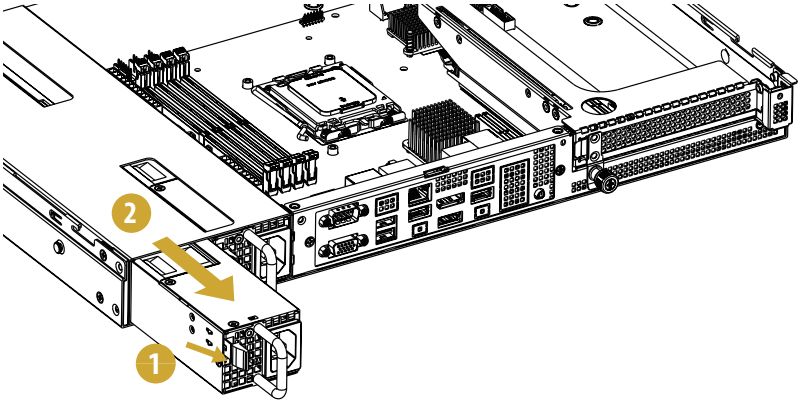
1. Align the power supply unit with the power supply slot. Ensure that the LED appears on the lower left when installing the power supply unit.
2. Carefully slide the PSU all the way into the power supply bay until it clicks into place.



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.*
   **The illustration is for references only. The actual PSU type may be slightly differnet by models.*
2. Pull out the power supply from the chassis.

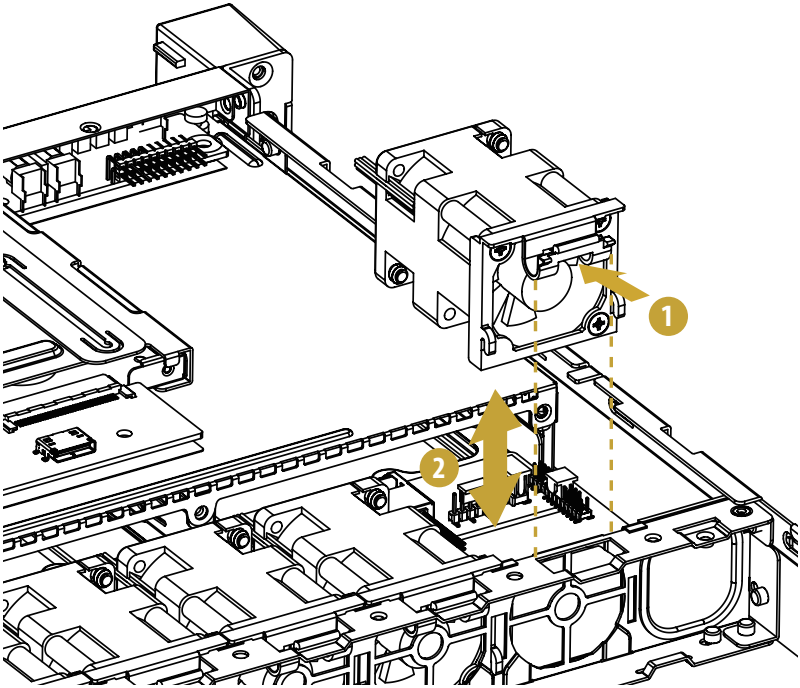


1. Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.
2. The redundant system does not require powering down the server.

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.
   Please 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.

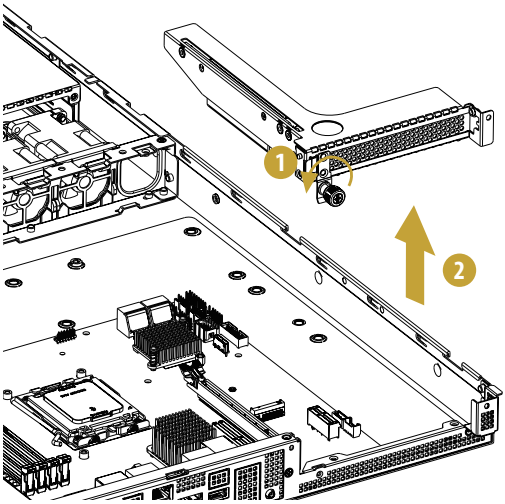


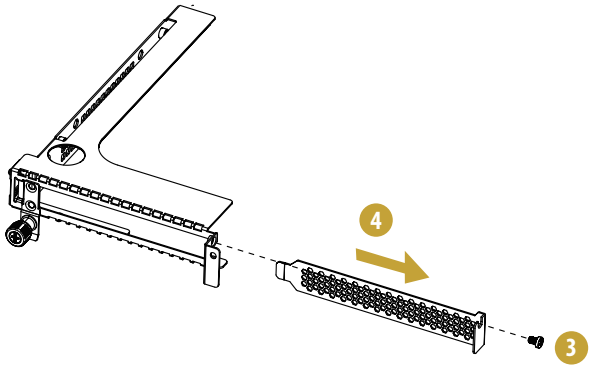
3.5 Add-in Card

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

Removing the Riser-Card Bracket from the Chassis

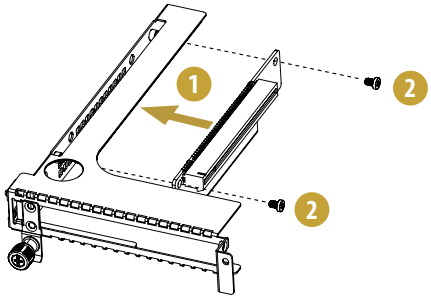
1. Hand-release the thumbscrew that secures the riser-card bracket on the chassis.
2. Lift up the riser-card bracket.
3. Remove the screw securing the blanking plate on the bracket.
4. Slide the blanking plate out sideways.

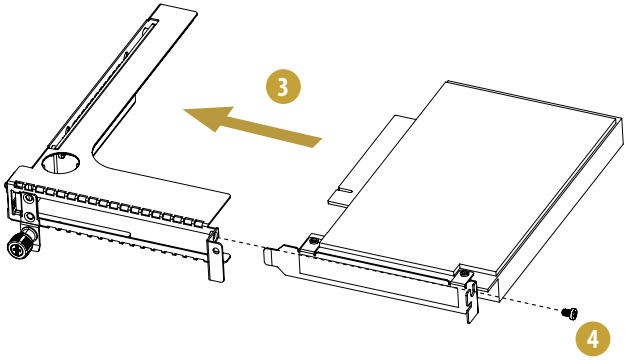




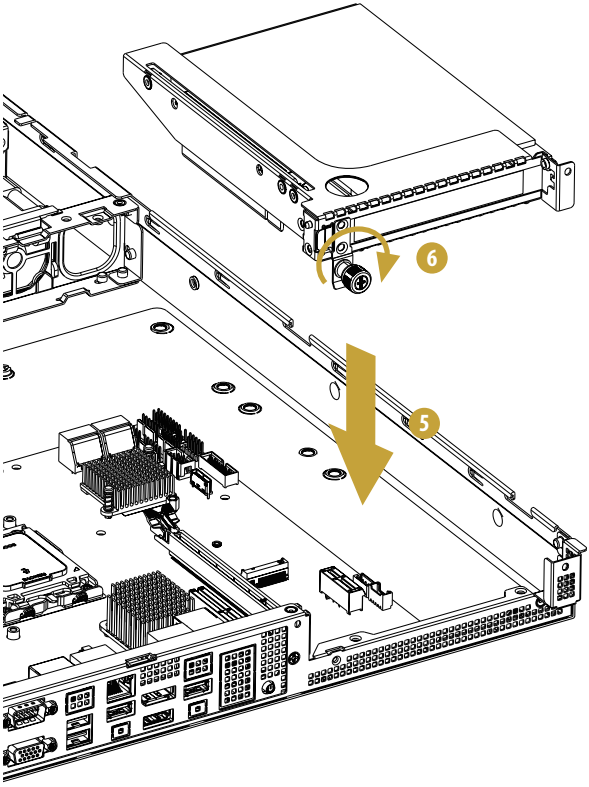
Installing the Add-in Card

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



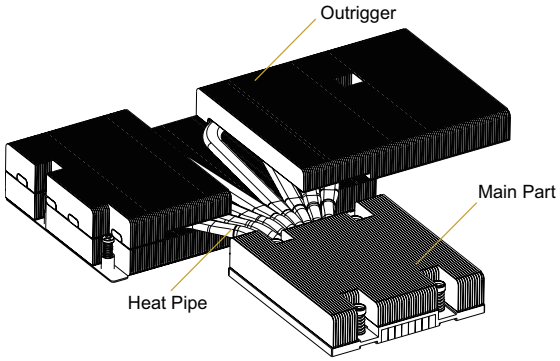


1. Align the riser-card assembly with the openings of the chassis.
2. Hand-tighten the thumbscrew to secure the assembly to the chassis.



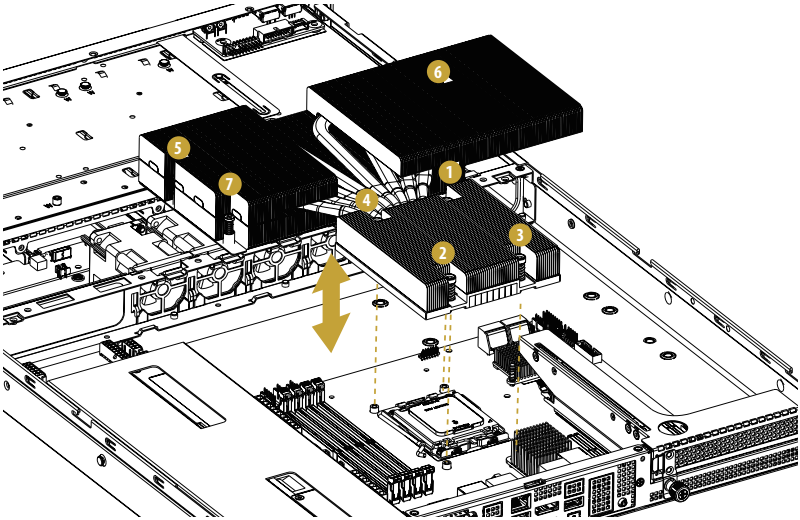
3.6 Installing the EVAC

EVAC (Enhanced Volume Air Cool Solution) is a heatsink module used for improving CPU cooling capability and memory cooling balance.
The EVAC consisted of main part, heat pipe and outrigger as shown below:



Replacing the EVAC

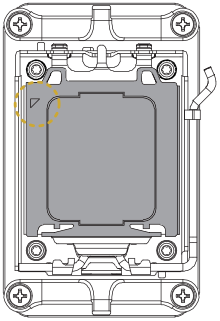
1. Set the torque wrench to 4.8 -5.2 Ib-in. One fourth a turn each time.
2. Tighten the screws in a sequential order 1 > 2 > 3 > 4 > 5 > 6 > 7. Loosen the screws in a reverse order.
3. To avoid damaging the heat pipe, please make sure hold both the main part and outrigger simultaneously when assembling the EVAC.

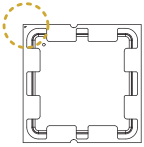


Appendix A

Installing the CPU

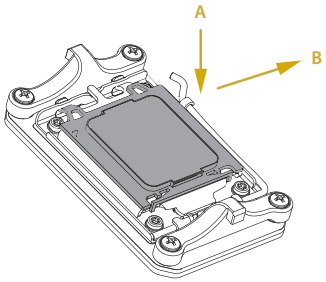
1. *Before you insert the 1718-Pin CPU into the socket, please check if the **PnP cap** is on the socket, if the CPU surface is unclean, or if there are any **bent pins** in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.*
2. *Unplug all power cables before installing the CPU.*





⚠ Turn your CPU to the correct orientation before opening the CPU socket cover.

1



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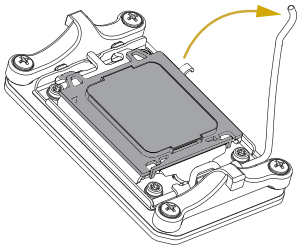

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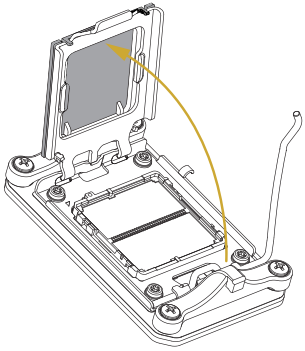

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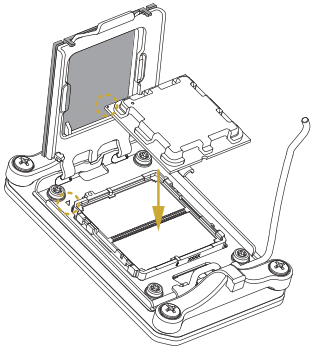
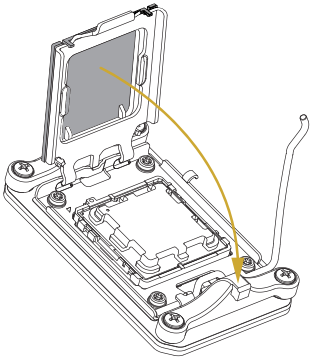


⚠ Carefully place the CPU in as flat as possible. Do not drop it.

5



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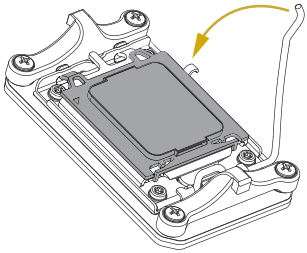
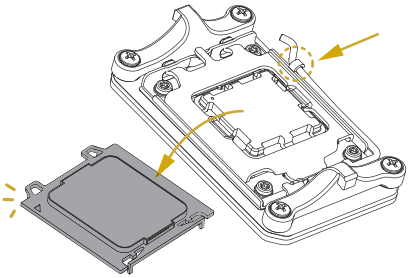


⚠ Make sure the CPU is aligned with the socket before locking it into place.

7



⚠ Make sure the black cover plate is always in place until it pops off when closing the socket lever.

Please save the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

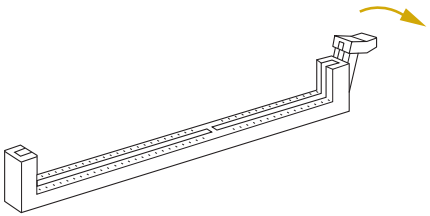
Appendix B

Installation of Memory Modules (DIMM)

The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation. For more information about DIMM installation, please refer to the User Manual that comes with the server board used.

Type A (Single Clip)

1



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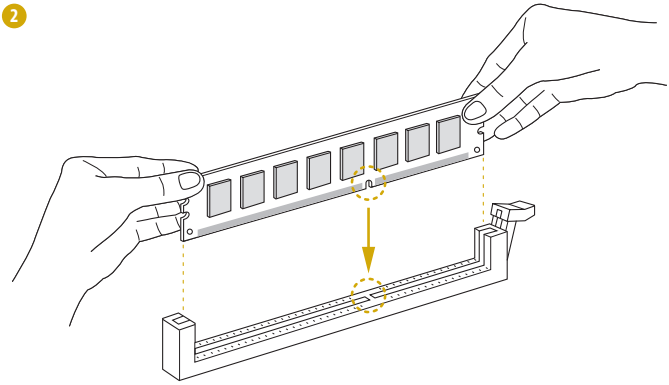

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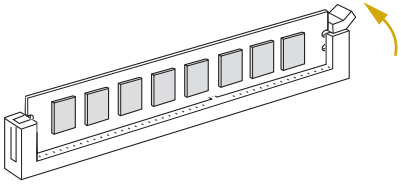
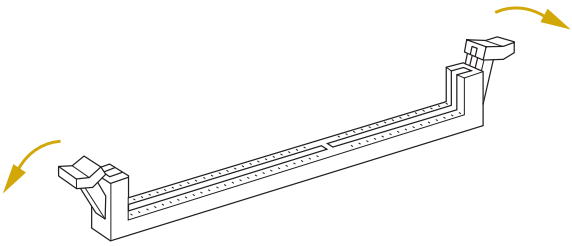


Type B (Two Clips)

1



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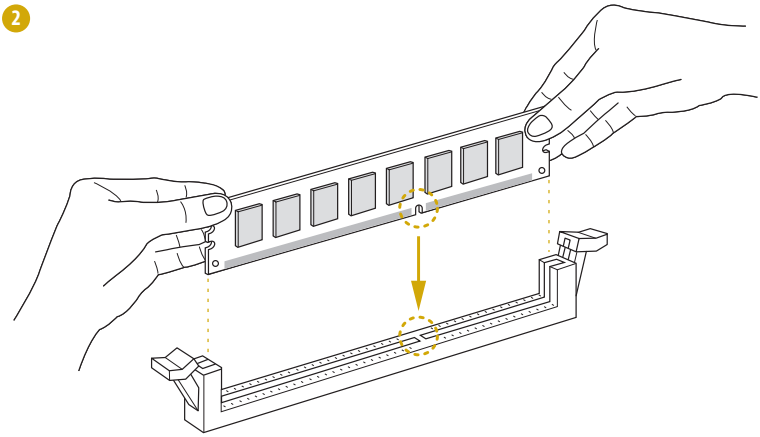

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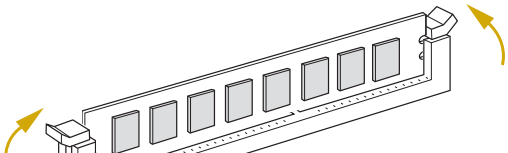
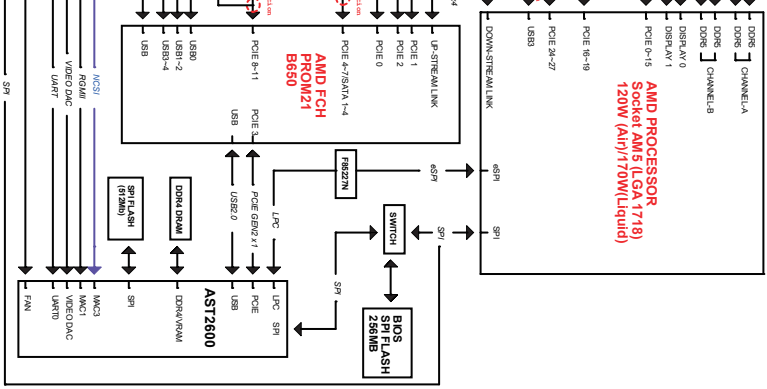


Appendix C

Block Diagram (B650D4U)



English

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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