



OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

RM138 Series

User Manual

English



Version 1.0

Published August 2020

Copyright©2020 ASRock Rack Inc. All rights reserved.

Copyright Notice:

No part of this documentation may be reproduced, transcribed, transmitted, or translated in any language, in any form or by any means, except duplication of documentation by the purchaser for backup purpose, without written consent of ASRock Rack Inc.

Products and corporate names appearing in this documentation may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

Disclaimer:

Specifications and information contained in this documentation are furnished for informational use only and subject to change without notice, and should not be constructed as a commitment by ASRock Rack. ASRock Rack assumes no responsibility for any errors or omissions that may appear in this documentation.

With respect to the contents of this documentation, ASRock Rack does not provide warranty of any kind, either expressed or implied, including but not limited to the implied warranties or conditions of merchantability or fitness for a particular purpose.

In no event shall ASRock Rack, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of data, interruption of business and the like), even if ASRock Rack has been advised of the possibility of such damages arising from any defect or error in the documentation or product.



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

- 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.

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.

Contents

Chapter 1 Introduction	1
1.1 Shipping Box Contents	2
1.2 Specifications	3
Chapter 2 Server System Overview	4
2.1 System Components	4
2.2 Internal Features	5
2.3 System Front Panel	7
2.4 System Rear Panel	8
2.5 Front Control Panel Buttons and LEDs	9
2.6 PSU LED	11
Chapter 3 Hardware Installation and Maintenance	12
3.1 Server Top Cover	13
3.2 Hard Drive	15
3.3 Power Supply	19
3.4 System Fan	20
3.5 Add-on Card (Low-Profile)	21
3.6 Add-on Card (Full-Height)	24
3.7 LAN Mezzanine Card	27
Appendix A	30
Mezzanine Card Support List	30
Appendix B	31
Installing the CPU and Heatsink	31

Appendix C	35
Installation of Memory Modules (DIMM)	35

Chapter 1 Introduction

Thank you for purchasing RM138 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.



Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock Rack's website without further notice. If you require technical support related to this product, please visit our website for specific information about the model you are using.

ASRock Rack's Website: www.ASRockRack.com



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

1.1 Shipping Box Contents

Item	Quantity	
	RM138-C622LM/4L	RM138-C622LM/10S
RM138 Series Barebone (1U form factor)	1	1
System Board (MB)	1	1
Power Supply Units	2	2
System Fans	6	6
HDD Backplane (BPB)	1	1
Front Panel Board (FPB)	1	1
LAN Mezzanine Card (M350R)	1	1
3.5" HDD	4	0
2.5" HDD	0	10
USB 3.0 Cable	1	1
MiniSAS Cable	1	3
HDD Power Cable	1	1
SMBus Cable	1	1
Front Panel Board Cable	1	1

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

1.2 Specifications

RM138 Series	
System Physical Status	
Form Factor	1U Rackmount
Dimension	735mm X 438.5mm X 43.2mm (L/W/H, w/o ear)
Support MB Size	L shape , 16.7" x17" inch (EP2C622D24LM/1U)
Front Panel	
Buttons	• Power button • UID button
LEDs	• Power LED • Identification LED • Hard drive activity LED (RM138-C622LM/4L only) • System event LED
I/O Ports	• 2 x USB 3.0 ports
External Drive Bay	
Front Side Drive Bay	RM138-C622LM/4L: 4 x 3.5" HDD HotSwap RM138-C622LM/10S: 10 x 2.5" HDD HotSwap
System Cooling	
Fan	6 x 40*56 mm PWM (Hot-swap)
Power Supply	
Type	2 (1+1), Redundant CPRS PSU
Output Watts	800W, Platinum

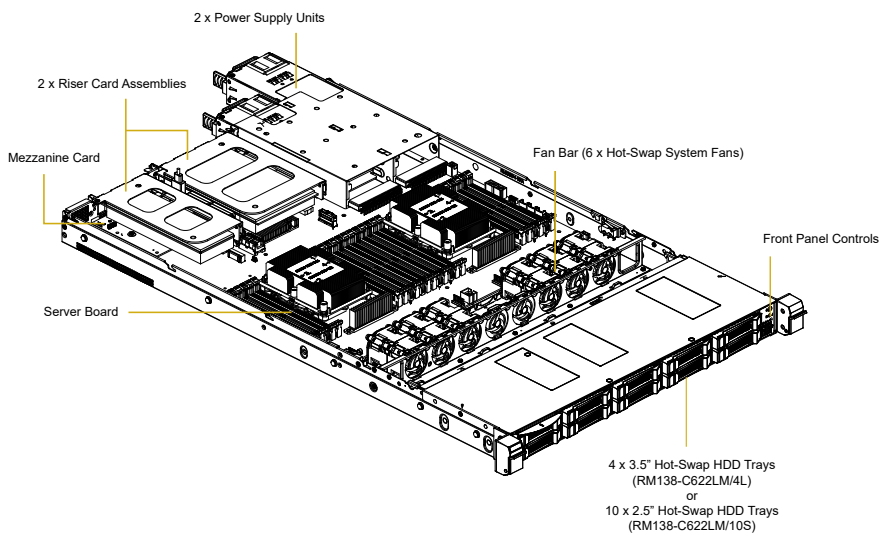


Please refer to the user manual of the motherboard you use for detailed information about motherboard components and features.

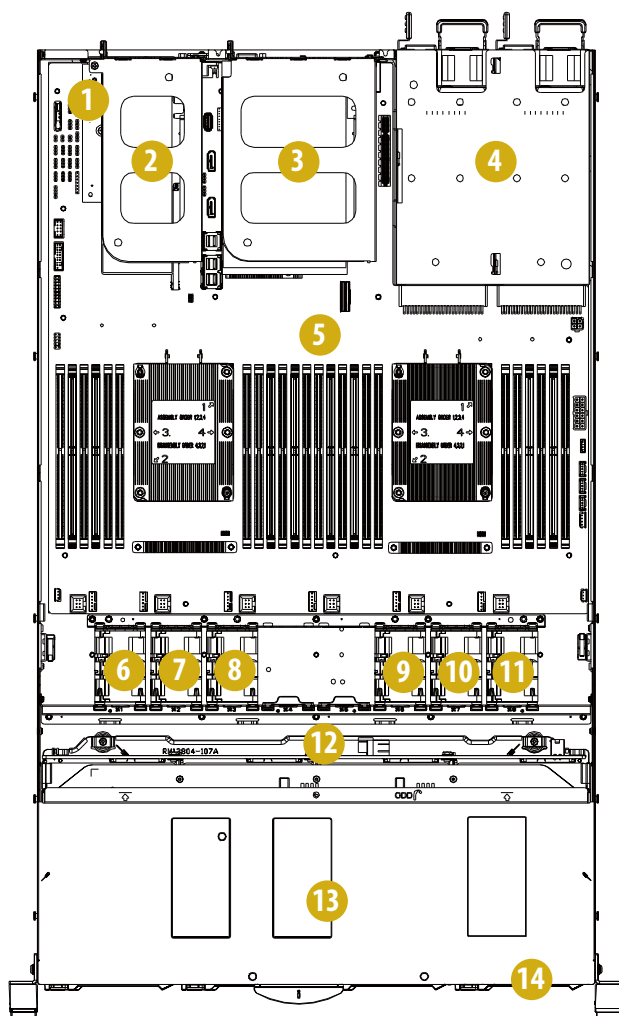
Chapter 2 Server System Overview

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

2.1 System Components



2.2 Internal Features

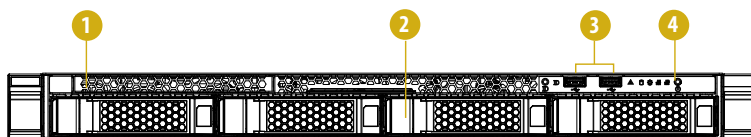


No.	From
1	LAN Mezzanine Card Slot
2	Riser Card Assembly 1
3	Riser Card Assembly 2 or Storage Mezzanine Card*
4	2 x Power Supply Units
5	Serverboard
6	System Fan 1 (Hot-swappable)
7	System Fan 2 (Hot-swappable)
8	System Fan 3 (Hot-swappable)
9	System Fan 4 (Hot-swappable)
10	System Fan 5 (Hot-swappable)
11	System Fan 6 (Hot-swappable)
12	HDD Backplane Board (BPB)
13	10 x 2.5" or 4 x 3.5" SATA 3(6Gb/s) HDDs
14	Front Control Panel (2 x USB 3.0 ports)

** Please remove the Riser Card Assembly 2 if you want to install a storage mezzanine card.*

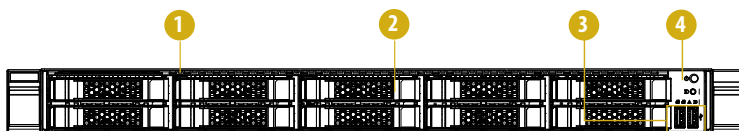
2.3 System Front Panel

RM138-C622LM/4L



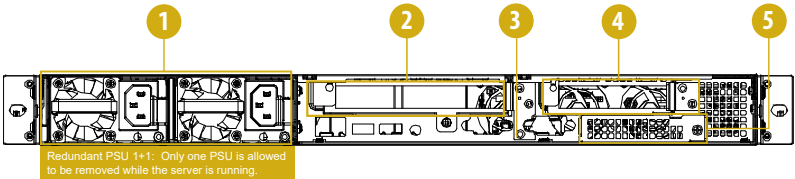
No.	Description
1	Front Vent
2	4 x 3.5" SATA3 (6Gb/s) / SAS(12Gb) HDDs (with RAID/HBA card)
3	2 x USB 3.0 Ports
4	Front Control Panel

RM138-C622LM/10S



No.	Description
1	Front Vent
2	10 x 2.5" SATA3(6Gb/s)/ SAS(12Gb) HDDs (with RAID/HBA card)
3	2 x USB 3.0 Ports
4	Front Control Panel

2.4 System Rear Panel

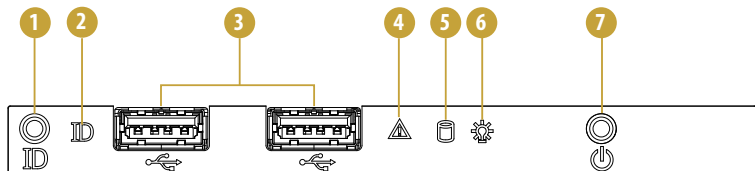


No.	Description
1	2 x Power Supply Units
2	Add-on PCIE Card Slots (Full-Height, on Riser Card Assembly)
3	I/O Shield (depends on the specification of the server board)
4	Add-on PCIE Card Slots (Low-Profile, on Riser Card Assembly)
5	Mezzanine Card Slot

2.5 Front Control Panel Buttons and LEDs

Front Control Panel

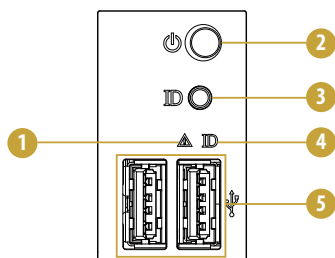
RM138-C622LM/4L



No.	Description
1	UID Button
2	UID LED
3	USB 3.0 Ports
4	System Event LED
5	HDD Activity LED
6	Power LED
7	Power Button

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

RM138-C622LM/10S



No.	Description
1	System Event LED
2	Power Button and LED
3	UID Button
4	UID LED
5	USB 3.0 Ports

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

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.

ID Button

Press the ID button to toggle the front panel ID LED and the baseboard ID LED on and off. You are able to locate the server you're working on from behind a rack of servers.

Status LED Definitions

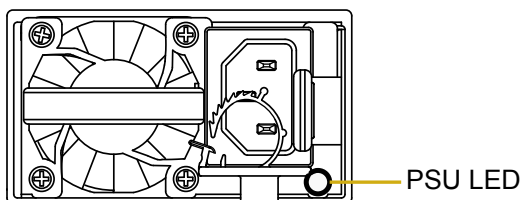
Power LED	
Status	Description
Blue	Power on
Off	Power off

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

HDD Activity LED	
Status	Description
Blinking Green	HDD access
Off	HDD idle

System Event LED	
Status	Description
Off	Running or normal operation
Red	At least one sensor has critical alert

2.6 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 you assemble the chassis and install components.

Before You Begin

Before you work 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 dark.
- (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 you press 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 you have 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.

- 2.5" / 3.5" HDD(s)
- Power Supply Units (Pre-installed)
- System Fans (Pre-installed)
- Server Board (Pre-installed)
- HDD Backplane Boards (Pre-installed)
- Front Panel Board (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 user manual of the server board you use for instructions on how to install server board components.

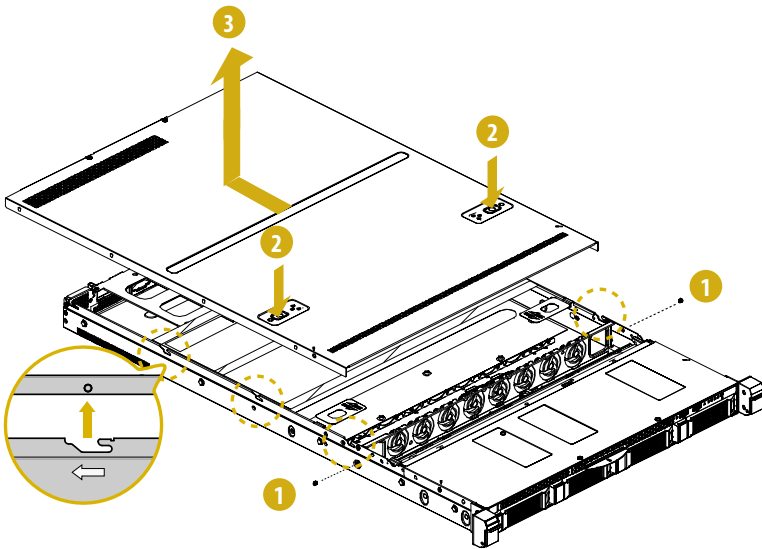
3.1 Server Top Cover

Removing the Server Top Cover



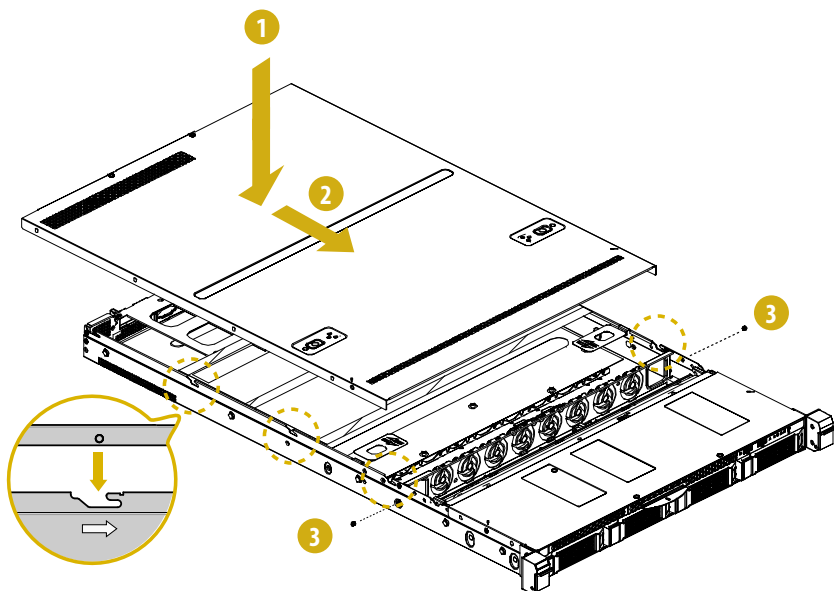
1. Before removing the top cover, power off the server and unplug the power cord.
2. The system must be operated with all the chassis top cover installed to ensure proper cooling.

1. Release the screws.
2. Push the cover latch button to release the latch handle and the cover.
3. Push the top front cover toward the rear of the chassis to remove the cover from the locked position. Lift the chassis top cover off the chassis.



Installing the Server Top Covers

1. Lower the top cover on the chassis , with the latch handle open.
2. Make sure the side latches align with the cutouts. Push the cover toward the front side of the chassis.
3. Close the latch handle.



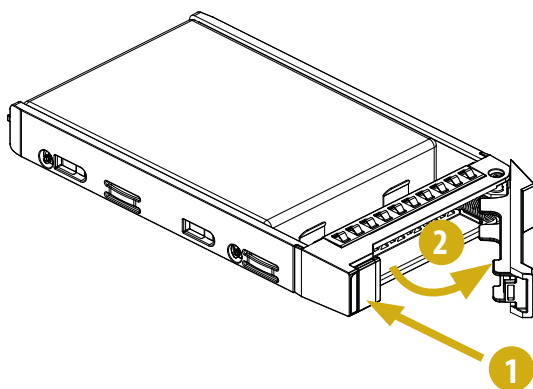
3.2 Hard Drive

3.2.1 Installing a Hard Disk Drive into 2.5" Hard Drive Tray

The chassis supports hot-swappable 2.5" hard drives.

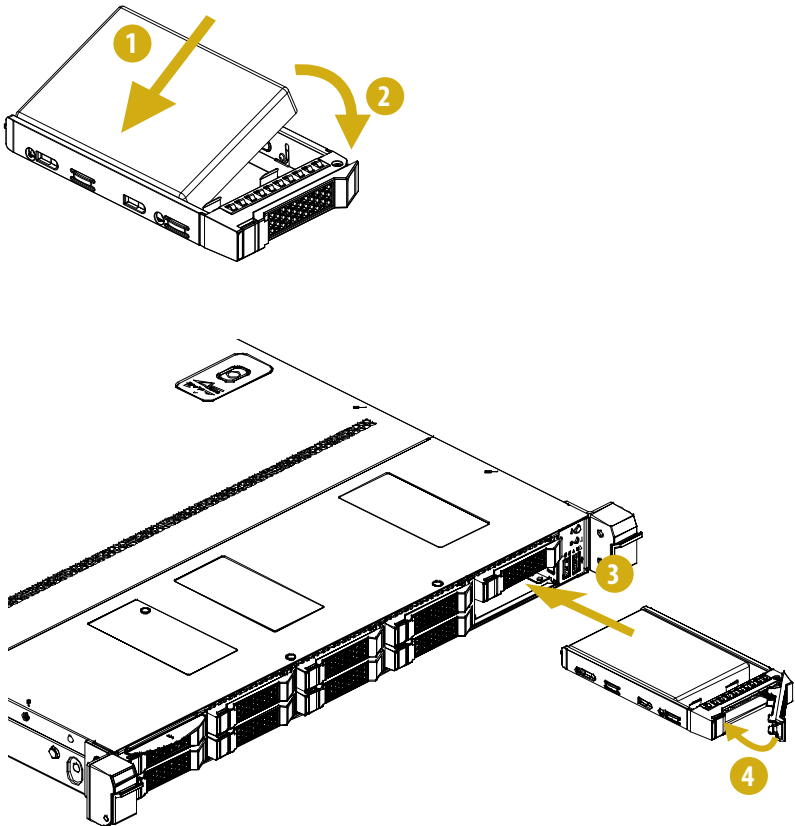
Removing 2.5" Hard Drive Trays from the Chassis

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 hard drive out of the HDD tray.



Installing a 2.5" Hard Drive to the Hard Drive Tray

1. Engage two embossed pins into the side dimples on the tray.
2. Carefully push down the other side of the tray until the other two embossed pins and side dimples lock into place.
3. Slide the drive tray into the HDD bay until the drive is fully seated.
4. Push in the locking lever to lock the HDD tray into place.

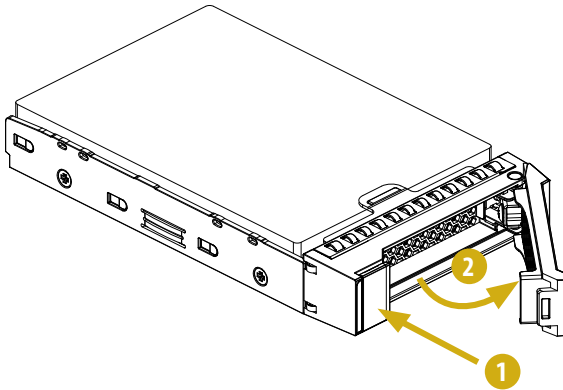


3.2.2 Installing a Hard Disk Drive into 3.5" Hard Drive Tray

The chassis supports hot-swappable 3.5" hard drives.

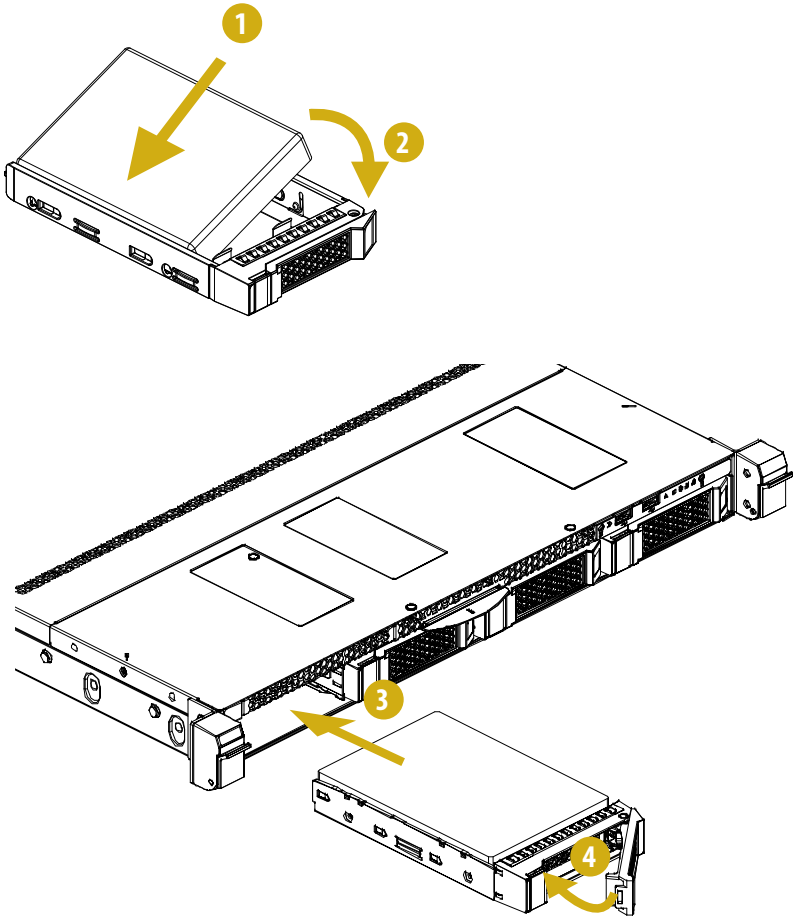
Removing 3.5" Hard Drive Trays from the Chassis

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 hard drive out of the HDD tray.



Installing a 3.5" Hard Drive to the Hard Drive Tray

1. Engage two embossed pins into the side dimples on the tray.
2. Carefully push down the other side of the tray until the other two embossed pins and side dimples lock into place.
3. Slide the drive tray into the HDD bay until the drive is fully seated.
4. Push in the locking lever to lock the HDD tray into place.



3.3 Power Supply

Installing and Removing the Power Supply



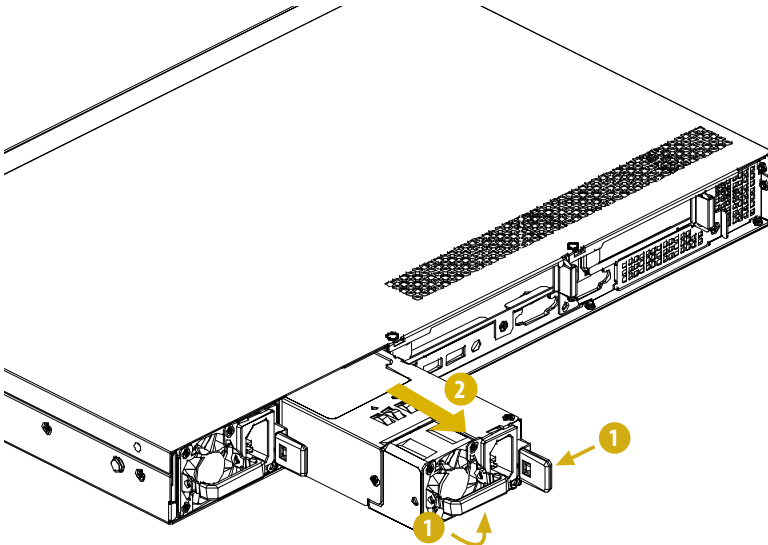
Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.

Installing the Power Supply Unit

The system can accommodate four AC or two DC power supplies in the bay at the rear of the chassis. Each unit provides up to 1200 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.

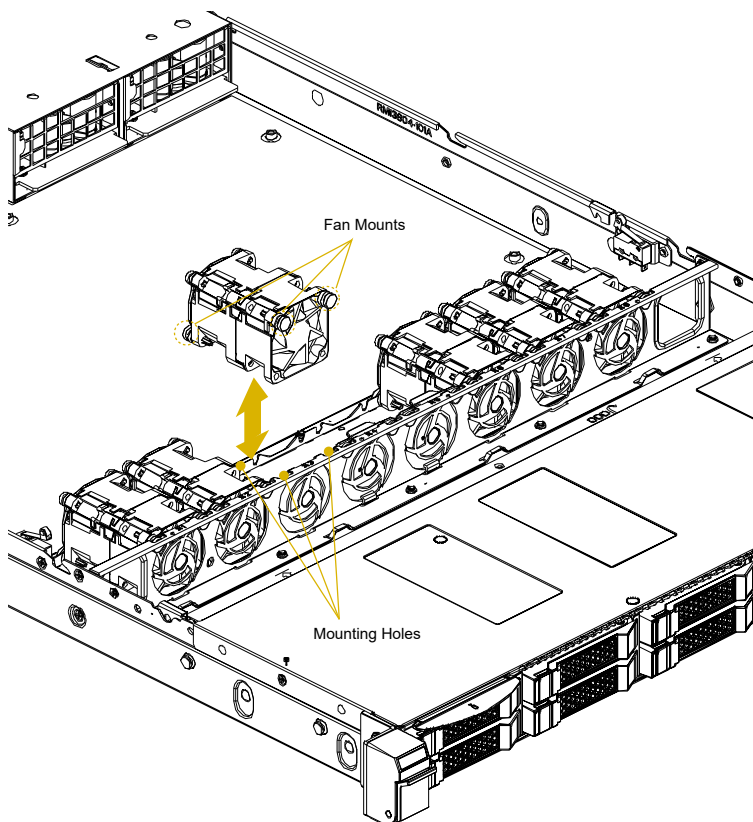
1. Align the power supply unit with the power supply slot. Ensure that the LED appears on the lower right when you are installing the power supply unit.
2. Carefully slide the PSU all the way into the power supply bay until it clicks into place.



3.4 System Fan

Replacing the System Fan

1. Unplug the fan connector and remove the failed fan.
2. Align the mounting holes on the fan bar with the fan mounts on the replacement fan corners.
3. Gently place the fan on the fan bar. Make sure the fan is well seated.
4. Connect the end of the fan cable to the fan connector.



3.5 Add-on Card (Low-Profile)

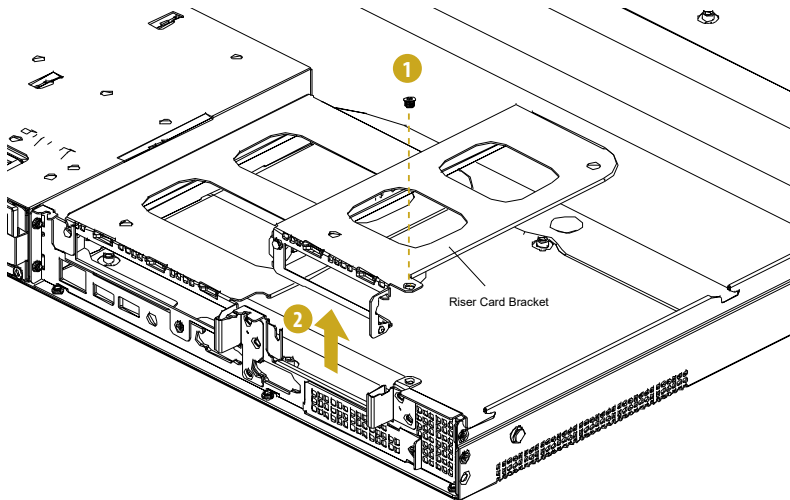


1. You can install an add-on card to the chassis with the riser card assembly installed on the serverboard.
2. Before installing the add-on card, power off the server and unplug the power cord.

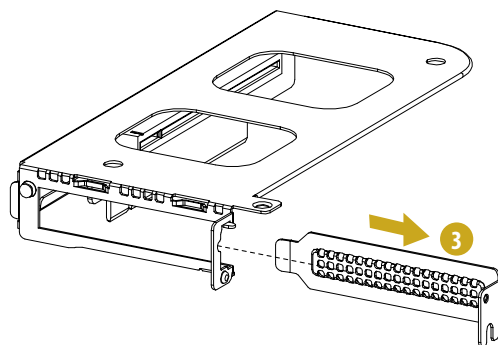
Please be noted that add-on card is supported for certain models only. Please check the rear panel of your chassis and see if a PCI Express slot is provided on the I/O shield.

3.5.1 Installing an Add-on Card

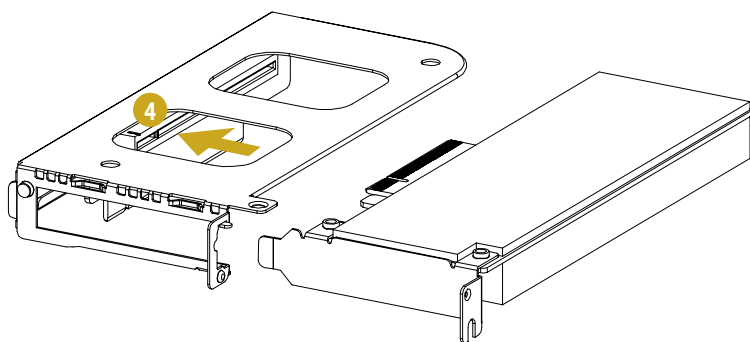
1. Remove the screw on the riser card bracket.
2. Lift and remove the riser-card bracket from the chassis.



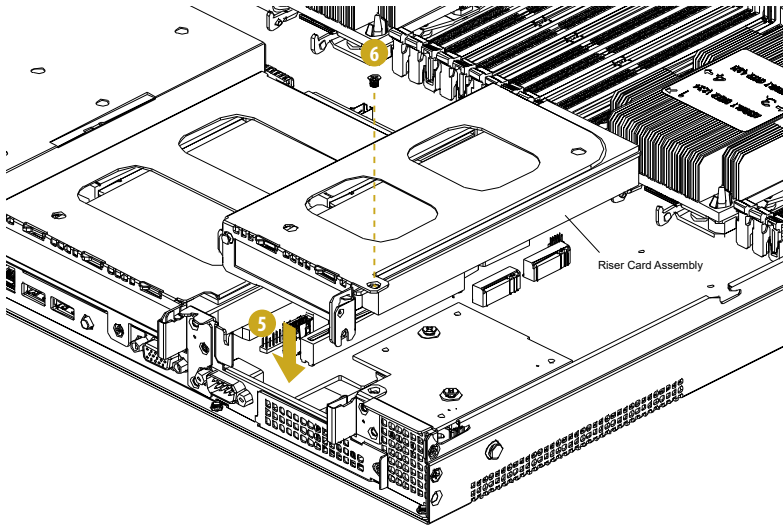
3. Slide the slot cover out sideways.



4. Install an add-on card into the riser-card assembly.



5. Install the add-on card assembly to the chassis. Align the plate of the add-on card with the openings in the back of the chassis.
6. Use the screw to secure the add-on card assembly to the chassis.



3.6 Add-on Card (Full-Height)

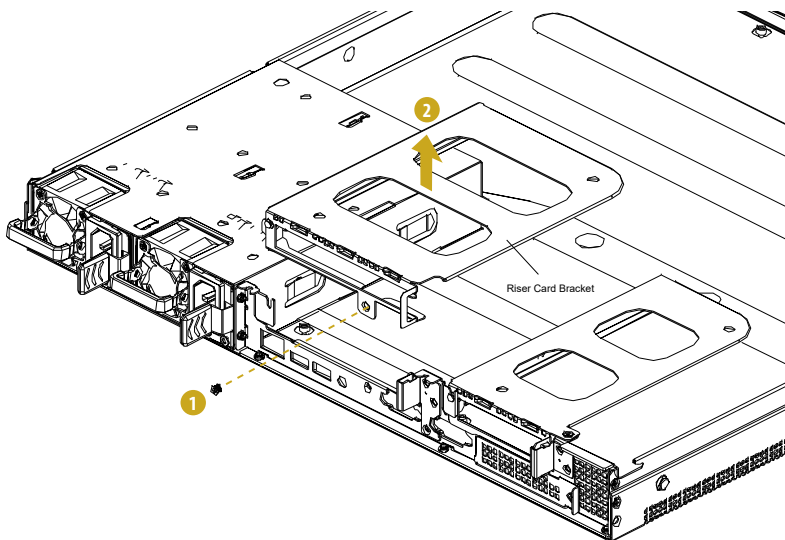


1. You can install an add-on card to the chassis with the riser card assembly installed on the serverboard.
2. Before installing the add-on card, power off the server and unplug the power cord.

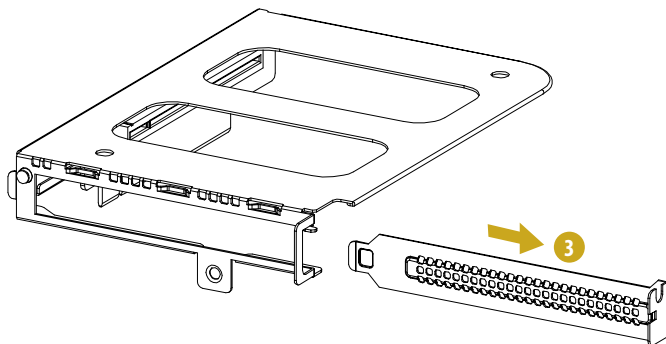
Please be noted that add-on card is supported for certain models only. Please check the rear panel of your chassis and see if a PCI Express slot is provided on the I/O shield.

3.6.1 Installing an Add-on Card

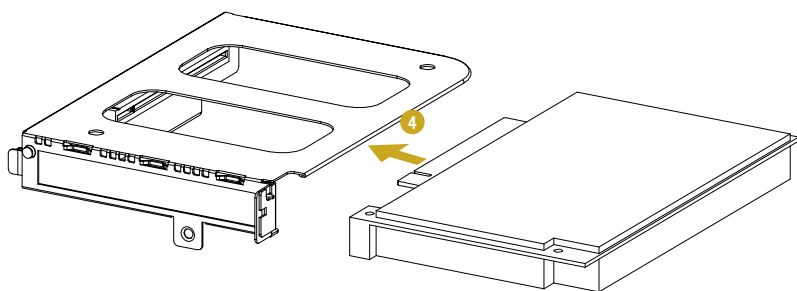
1. Remove the screw on the riser card bracket.
2. Lift and remove the riser-card bracket from the chassis.



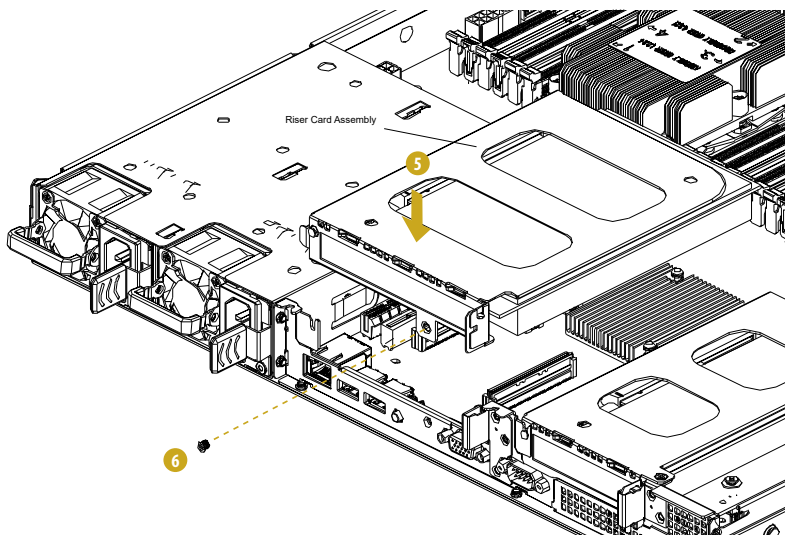
3. Slide the slot cover out sideways.



4. Install an add-on card into the riser-card assembly.

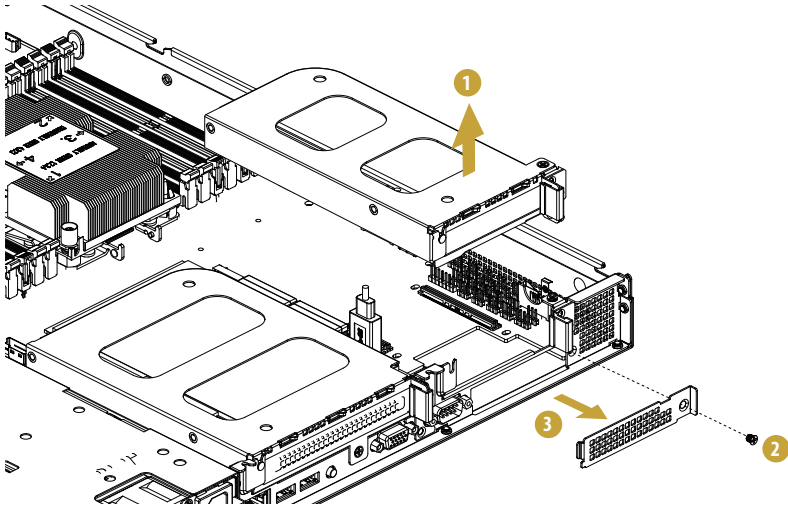


5. Install the add-on card assembly to the chassis. Align the plate of the add-on card with the openings in the back of the chassis.
6. Use the screw to secure the add-on card assembly to the chassis.

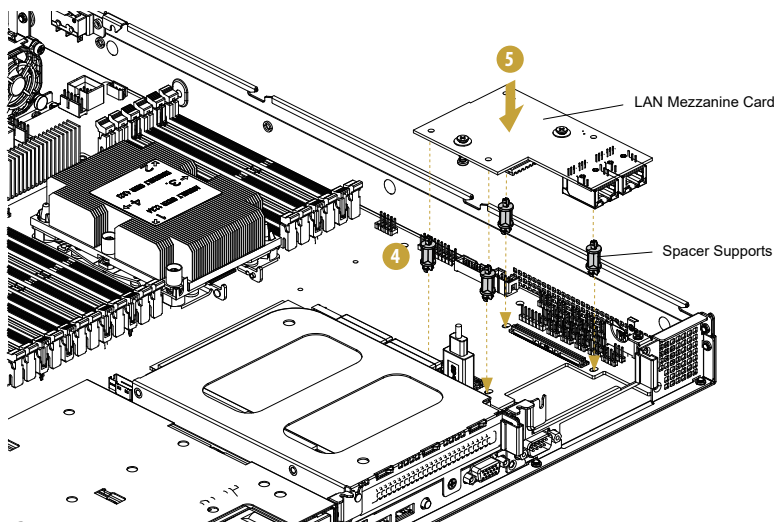


3.7 LAN Mezzanine Card

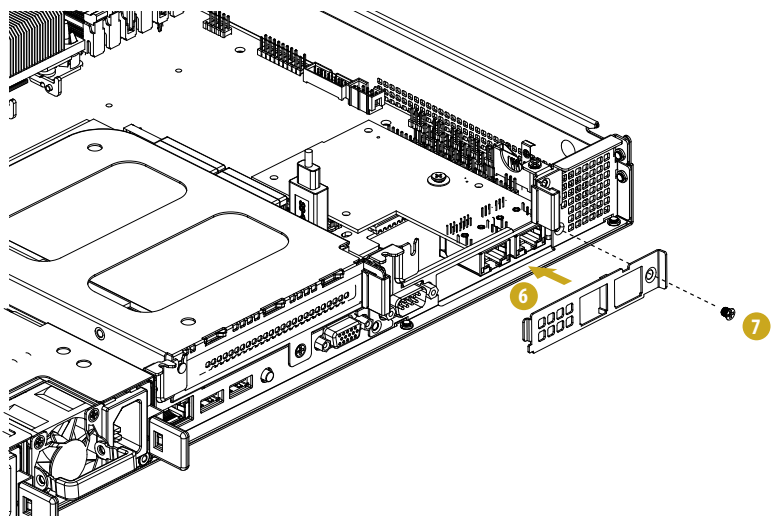
1. Remove the riser card assembly before installing a LAN mezzanine card. (See Chapter 3.4 *Add-on Card (Low-Profile)* for detailed instructions.)
2. Release the screw that secures the blanking plate to the chassis. Keep the screws for later use.
3. Remove the blanking plate.



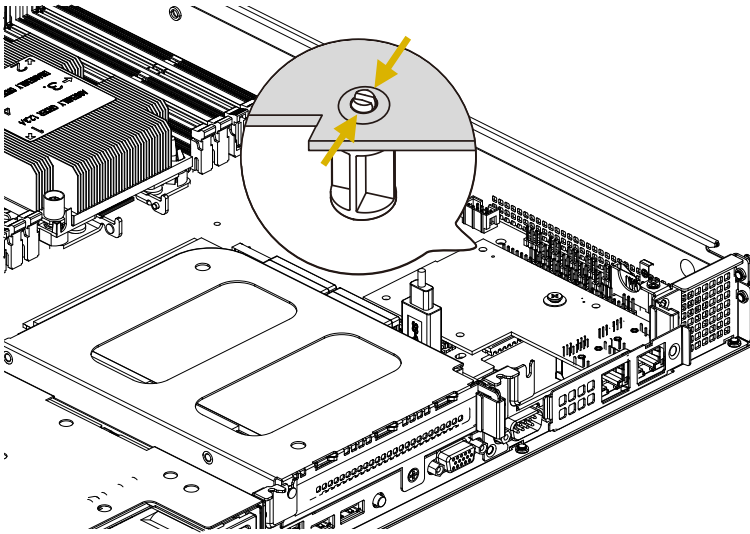
4. Install the four spacer supports into the server board around the mezzanine card slot.
5. Gently insert the mezzanine card into the mezzanine card slot.



6. Attach the matching I/O plate of the mezzanine card to the chassis.
7. User a screw to secure the plate to the chassis.



Note: Simply squeeze the top of each spacer support to release the mezzanine card.



Appendix A

Mezzanine Card Support List

This system supports the following ASRock Rack mezzanine cards.

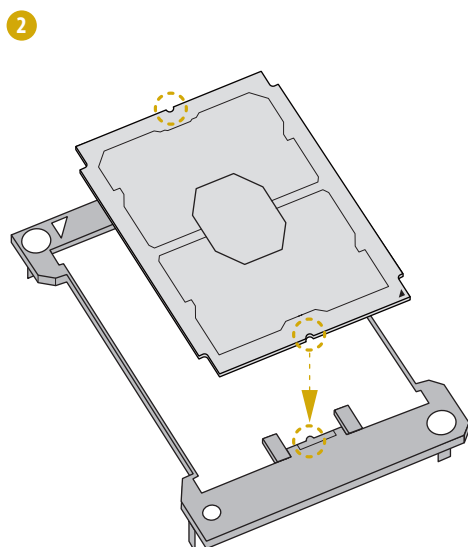
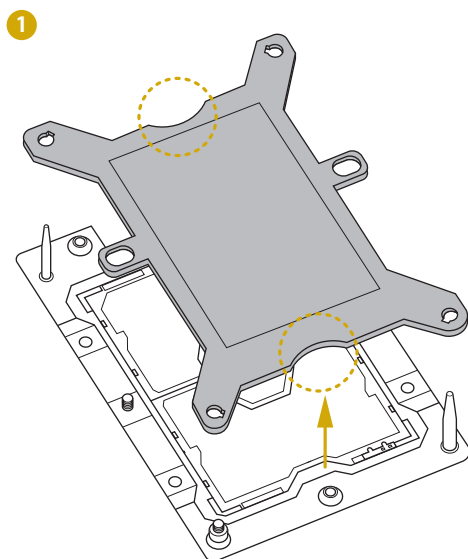
Mezz Card Type	Mezz Slot Type	Model
LAN Card	Mezz Type A	M350R
LAN Card	Mezz Type A	M540R
LAN Card	Mezz Type A	M599R
Storage Card	Mezz Type A	M3008
Storage Card	Mezz Type A	M3008S
Storage Card	Mezz Type A	M3108
Storage Card	Mezz Type A	M3616
PHI Card	Mezz Type C	MP-557R2
PHI Card	Mezz Type C	MP-1543R4
PHI Card	Mezz Type C	MP-4227R2

**Please refer to our website for the latest support list.*

**Due to mechanical limits, use one type of the mezzanine card at a time.*

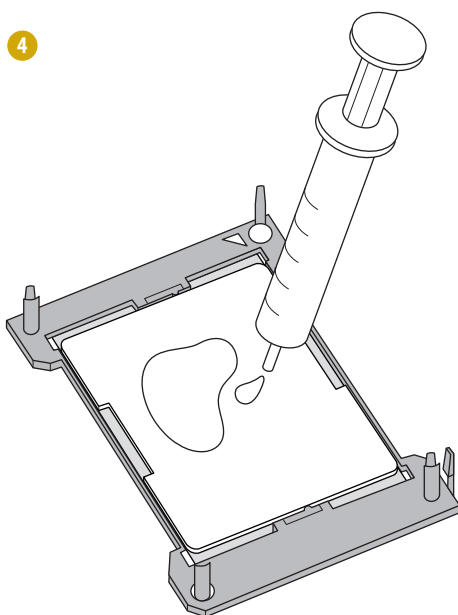
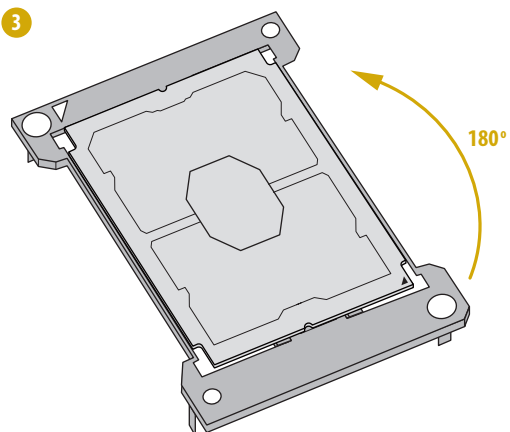
Appendix B

Installing the CPU and Heatsink

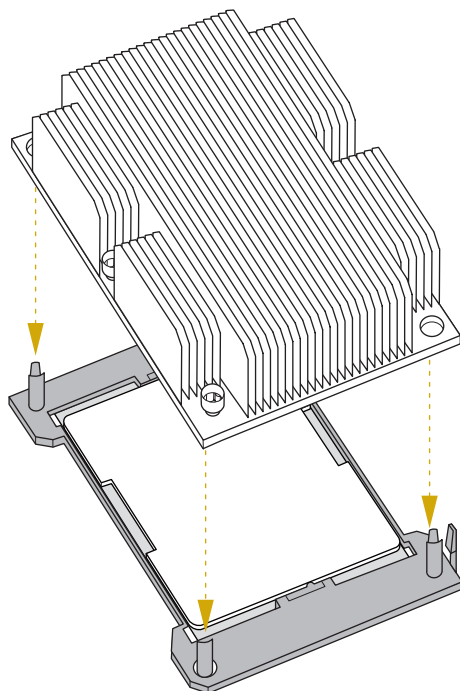




1. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.
2. Illustration in this documentation are examples only. Heatsink or fan cooler type may differ.

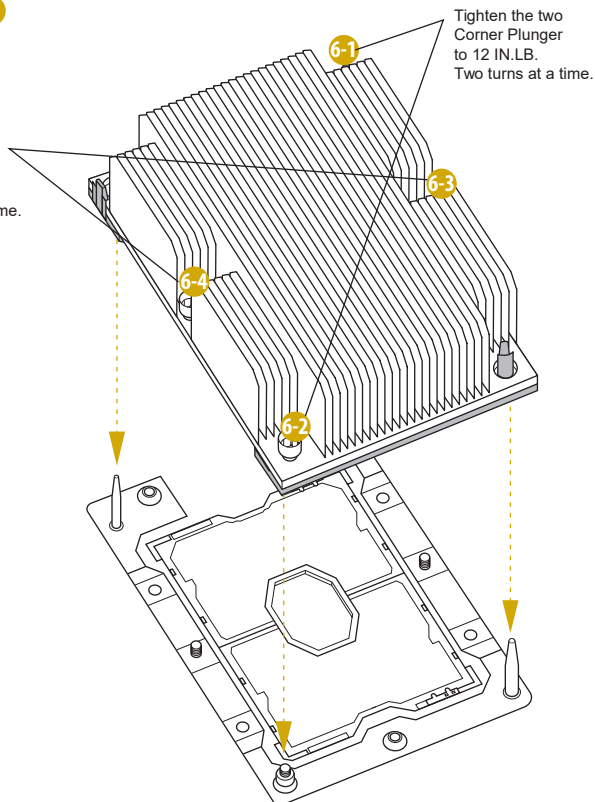


5



6

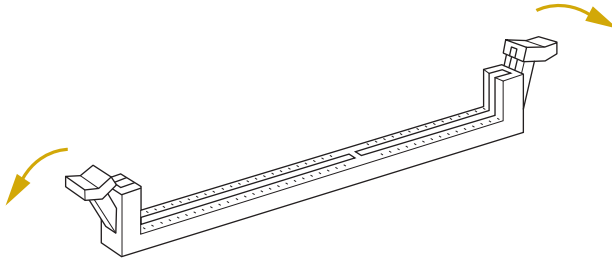
Tighten the two
Middle Nuts to
12 IN.LB.
Two turns at a time.



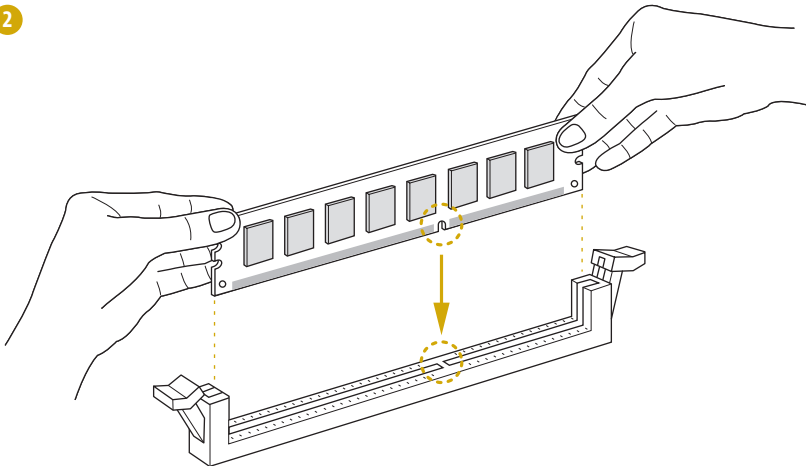
Appendix C

Installation of Memory Modules (DIMM)

1



2



3

