


ORION HF X210R-G6

User Manual




About this User Manual


This user manual provides the information on Installation and maintenance of the Orion HF X210R-G6.


 **Caution:** Experienced technicians should perform the Installation and maintenance.

Document title: **ORION HF X210R-G6**
Document number: **Initial Release**
Document update date: **July 2023**

The following Notes, Cautions and Warnings might appear in this user manual.

 **Note:** Explains an important point or tip to help you to better use of the product.

 **Caution:** Indicates the potential damage to hardware or loss of data, security problems, or performance issues and tells you to avoid the problem.

 **Warning:** Indicates that an action or step can result in physical harm, property or hardware damage.

To avoid damaging your server, perform the following steps before you begin working inside the server.

1. Ensure that you follow the Safety Instruction.
2. Ensure that your work surface is flat and clean to prevent the server cover from being scratched.
3. Turn off your server.
4. Disconnect all network cables from the server.

CAUTION: To disconnect a network cable, first unplug the cable from your server and then unplug the cable from the network device. After you finish working inside the server, replace all covers, panels, and screws before connecting to the power source.

Safety instructions

Use the following safety guidelines to protect your server from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

You have read the safety information that shipped with your server.

A component can be replaced or, if purchased separately, installed by performing the removal procedure in the reverse order.

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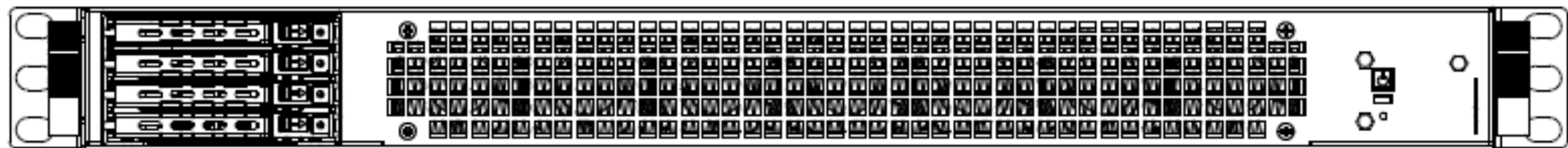
1. ORION HF X210R-G6 Specifications

The ORION HFX210R-G6 is a single socket, 1U rackmount form factor server and supports the following specification.

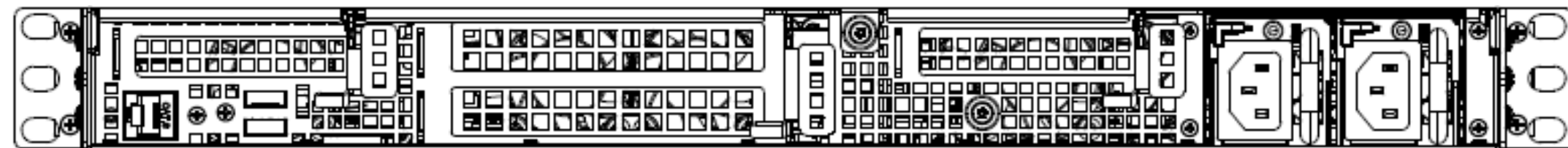
Form Factor	1U
Chipset	Intel® Z690
Processor	Single Intel® Core™ i9-13900KS or i9-13900KF Overclocked up to 5.7GHz* *Maximum clock speed may vary depending on applications and workloads
Cooling System	High Performance Liquid Cooled System, Closed Loop and Maintenance Free
Memory	Up to 128GB (4 x DIMM), DDR5 6000 MHz Non-ECC, Un-buffered Memory 2-Channel Architecture
Network Controller	1 x Intel® i225-V 2.5Gb Ethernet
Storage Controller	Onboard Intel® Z690 Rapid Storage Technology supports NVMe RAID 0/1/5, SATA RAID 0/1/5/10
Storage	4 x 2.5" SSD Hot-swappable HDD/SSD bays 7mm M.2_1 slot (Key M), type 2242/2260/2280/22110 (supports PCIe 4.0 x4 mode) M.2_2 slot (Key M), type 2242/2260/2280 (supports PCIe 4.0 x4 mode) M.2_3 slot (Key M), type 2242/2260/2280/22110 (supports PCIe 4.0 x4 mode) M.2_4 slot (Key M), type 2242/2260/2280 (supports PCIe 4.0 x4 & SATA modes)
Expansion Slots	1 x PCIe 5.0 x16 FHFLDW or 2 x PCIe 5.0 x8 FHFLSW * 1 x PCIe 3.0 x16 slot (supports x4 mode or x4/x4 mode) Low-Profile *Motherboard supports PCIe 5.0 but expansion slots will first be available with PCIe 4.0 riser
Front I/O	1 x Power Button/LED
Rear I/O	1 x VGA 2 x USB 3.0 1 x 2.5GbE RJ45 LAN 1 x 1GbE RJ45 Management LAN
System Management	AST2600 Advanced Graphics & Remote Management Processor IPMI 2.0 and Redfish 1.11 Compliant Web-based user interface for remote management & iKVM Remote, unblocked, BIOS-level access and control
Chassis Features	Toolless mounting motherboard and toolless rail kit
Power Supply	1+1 Redundant 1000W or 1500W 80 PLUS Platinum Power Supply
Environment	Operating: 10°C to 25°C (50°F to 77°F) @ 8% to 90% (non-condensing) Non-operating: -20°C to 70°C (-4°F to 158°F) @ 5% to 95% (non-condensing)
Dimensions (DxWxH)	764mm x 436mm x 44mm (30" x 17.24" x 1.7")
Estimated Weight	16.5kg (37.4lbs)
Warranty	CIARA's limited hardware warranty includes a one year, parts and labour with return to CIARA USA or Canada. Customers may purchase an extended warranty of up to 3 years on parts and labour with different support levels. Please contact CIARA at 1-877-242-7272 for complete warranty details including limitations and transferability.
OS Support	Linux® RHEL 8.6 and RHEL 9.0, support for other versions available upon request.
Notes	*Maximum clock speed may vary depending on applications and workloads.

2. Chassis Overview

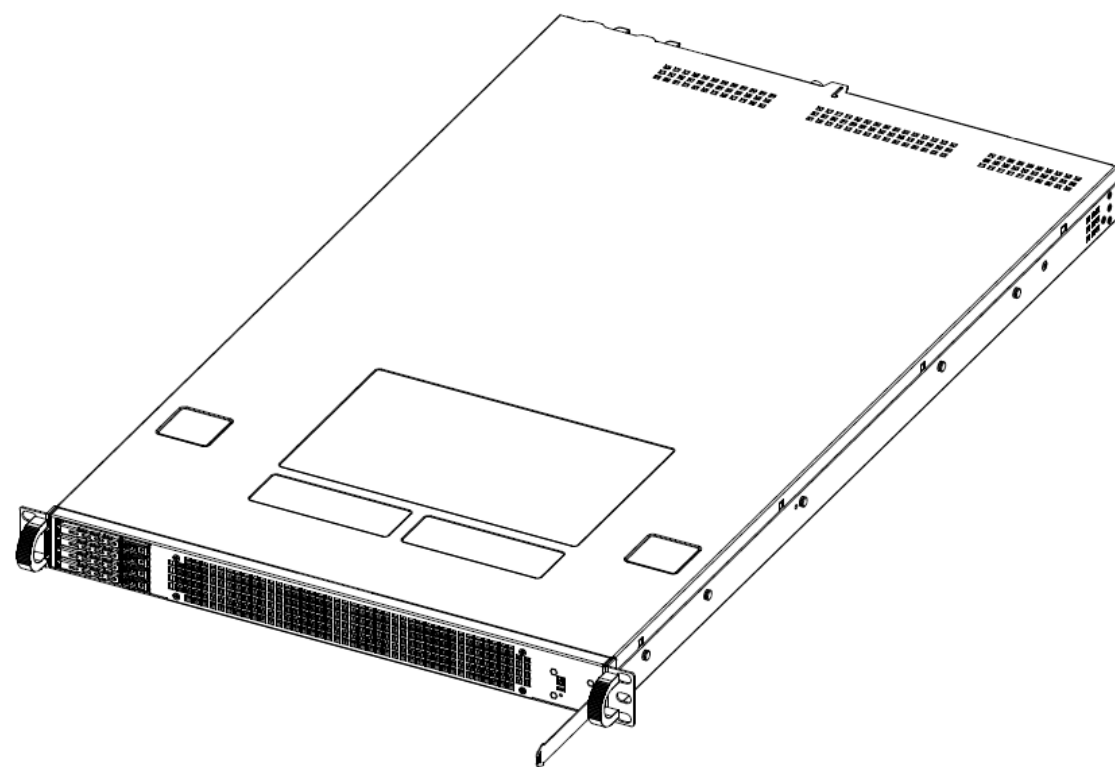
The following illustrations are the Orion HF X210R-G6 chassis Front, Back and Side views.



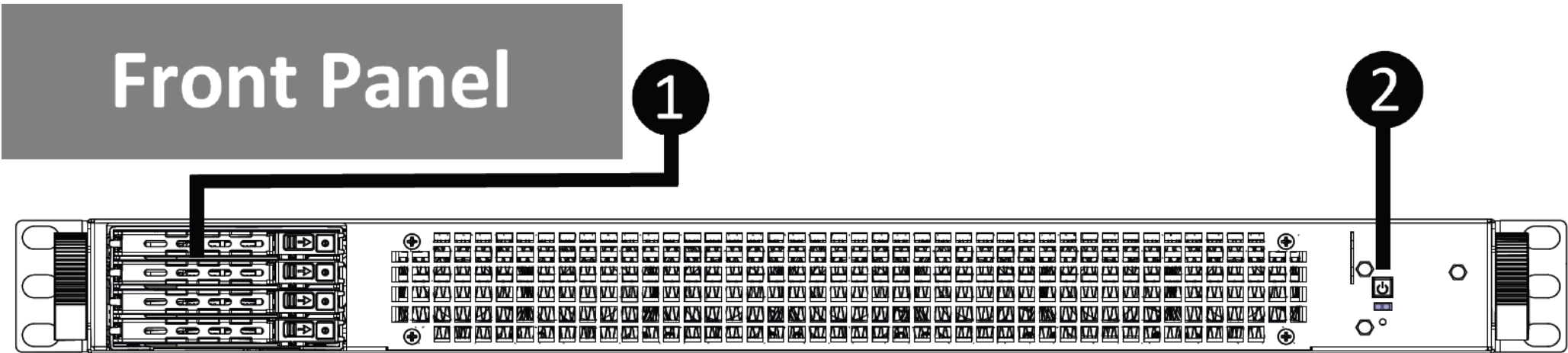
Front View



Rear View

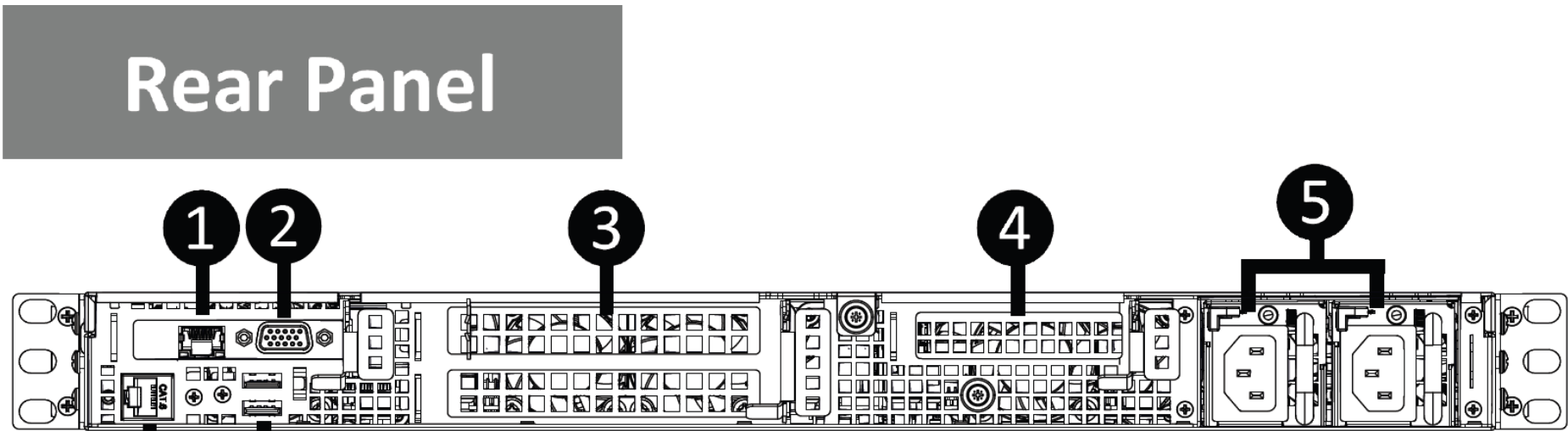


3. Front Panel Components



- 1 SSD Drive Bay x 4
- 2 Front Panel LED and Buttons

4. Rear Panel Components

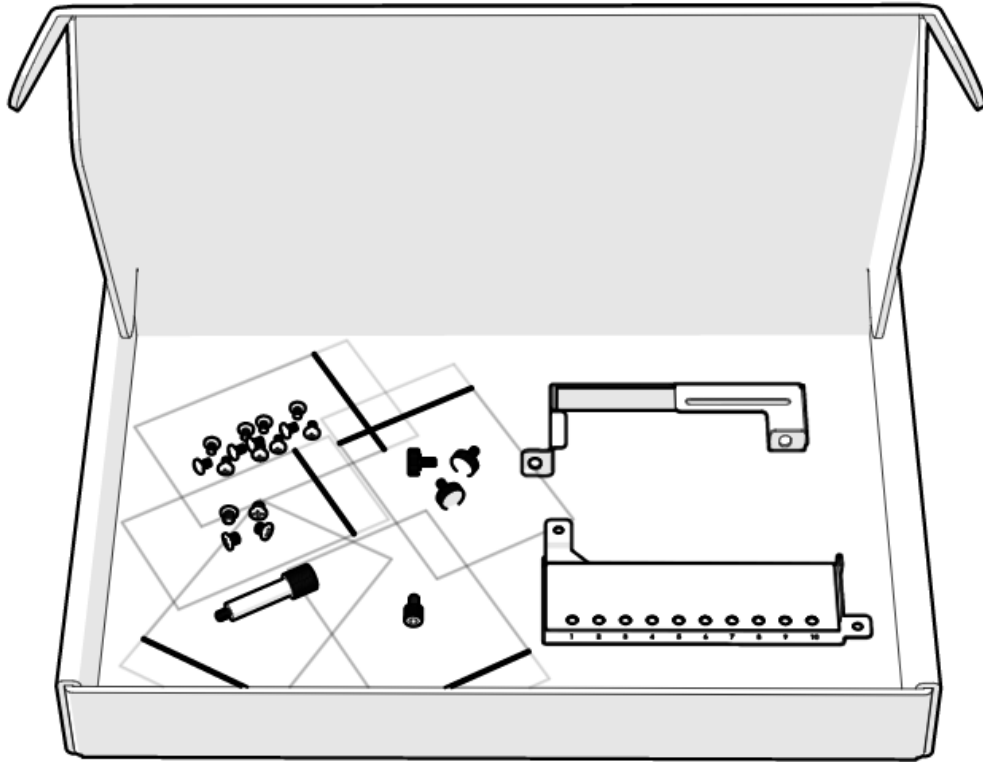


- 1 1G LAN Management RJ-45 Port
- 2 VGA Port
- 3 PCIe Expansion x 2
- 4 PCIe Expansion x 1
- 5 Power Inlet x 2
- 6 2.5G LAN RJ-45 Port
- 7 USB 3.2 Gen 1 Type-A x 2

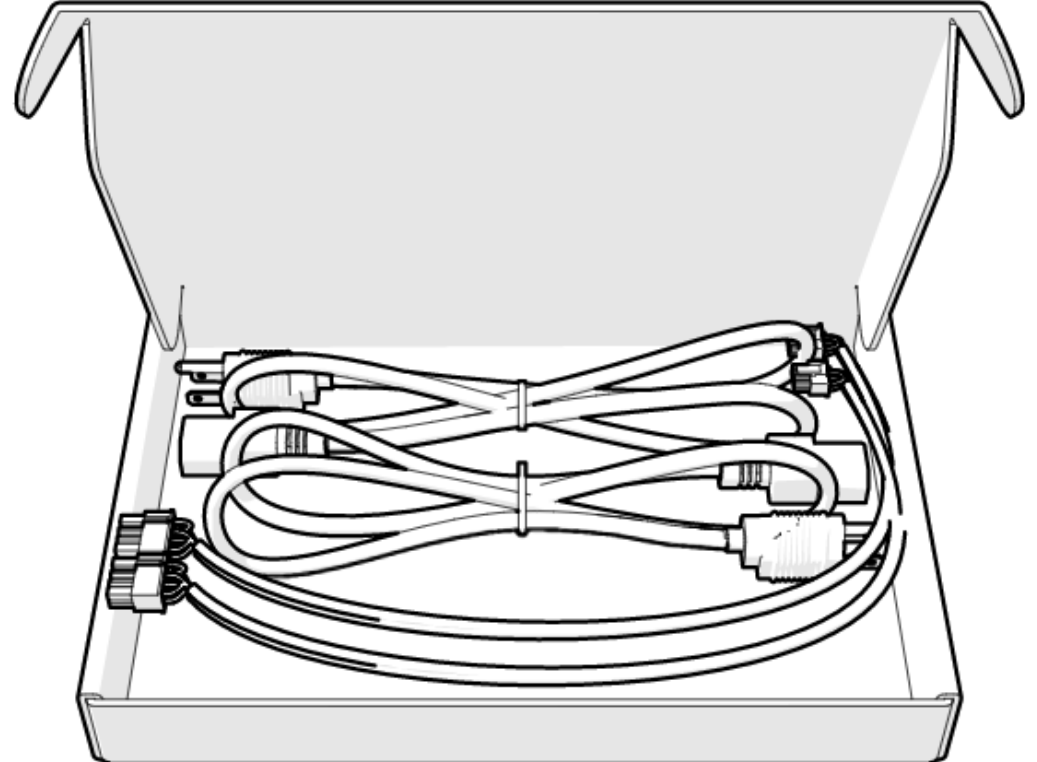
5. Accessory Boxes & Rails

The Orion HF x210R-G6 server includes (2) accessory boxes:

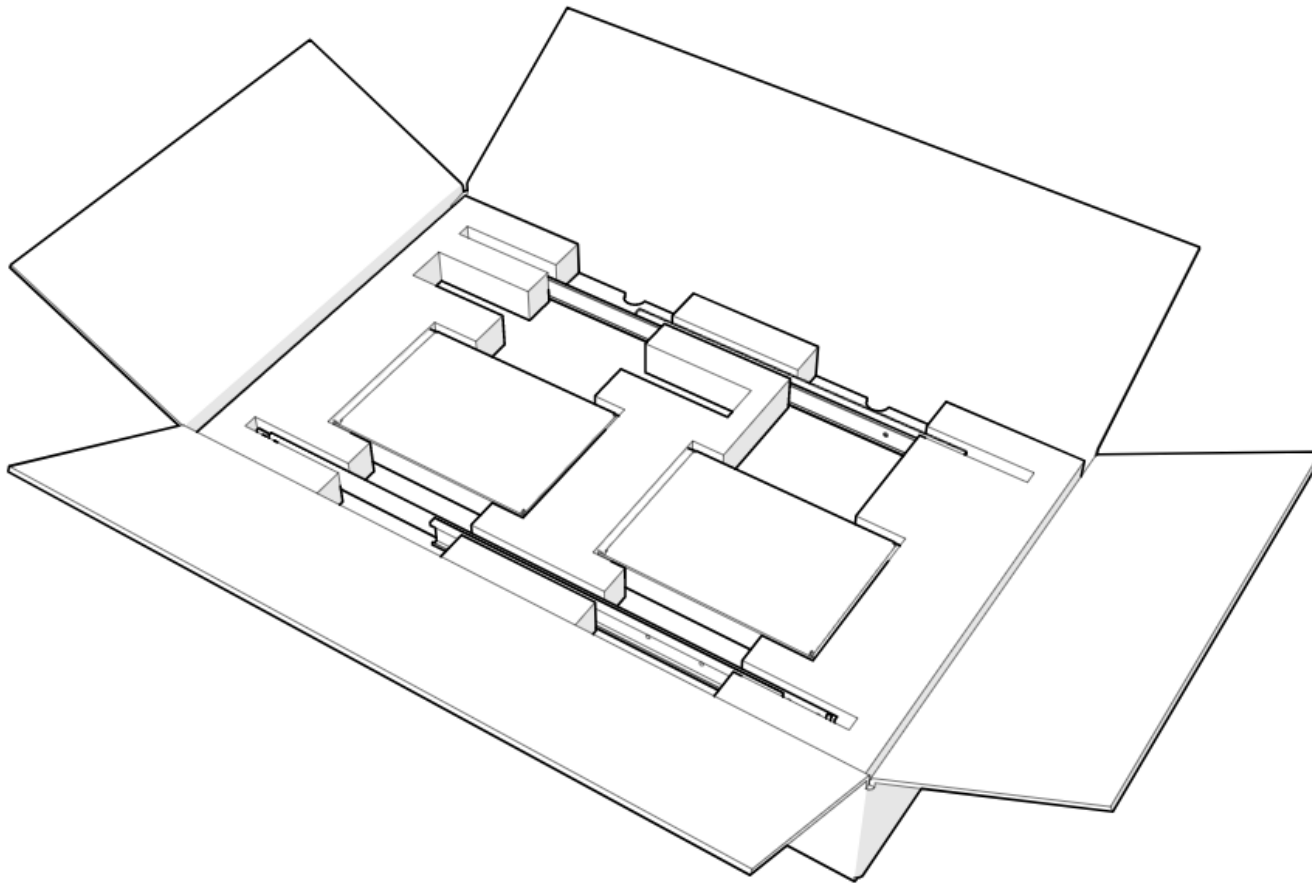
Accessory Box #1 with Brackets and Screws*



Accessory Box #2 with (2) Cables*



The rails, bezel box and both accessory boxes are placed as shown below in the box with the server. *

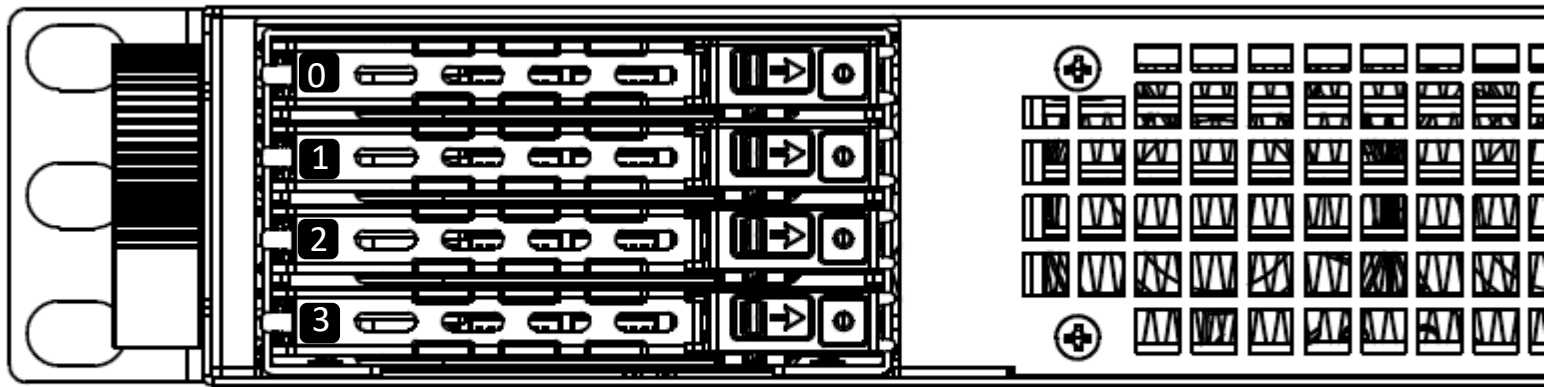


*ALL PICTURES SHOWN ARE FOR ILLUSTRATION PURPOSE ONLY.ACTUAL PRODUCT MAY VARY.

6. Labelling

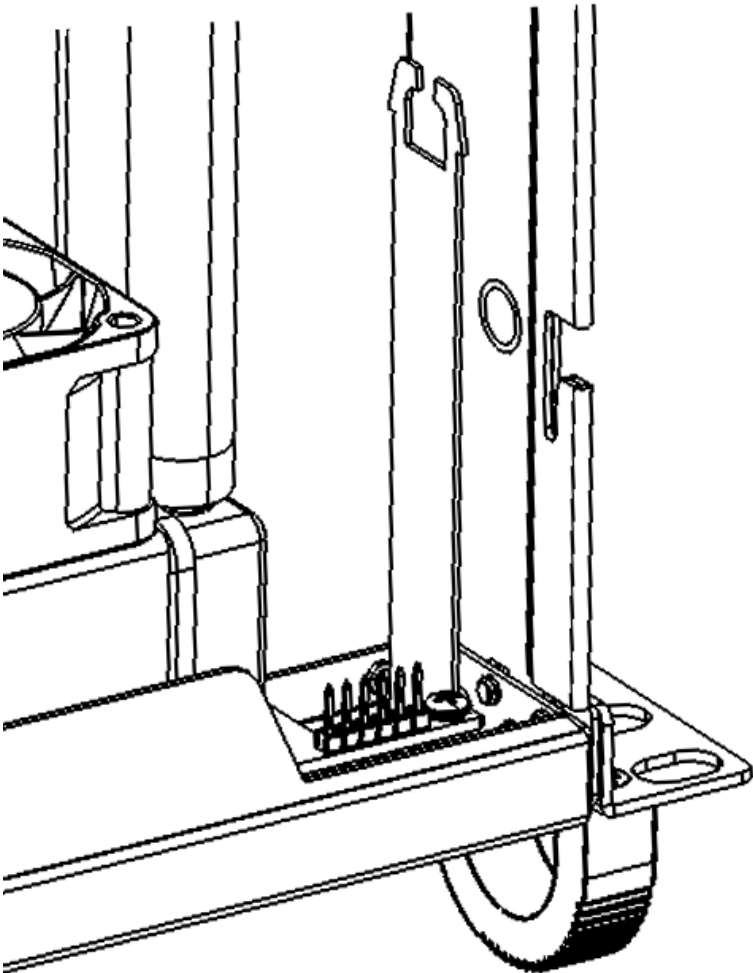
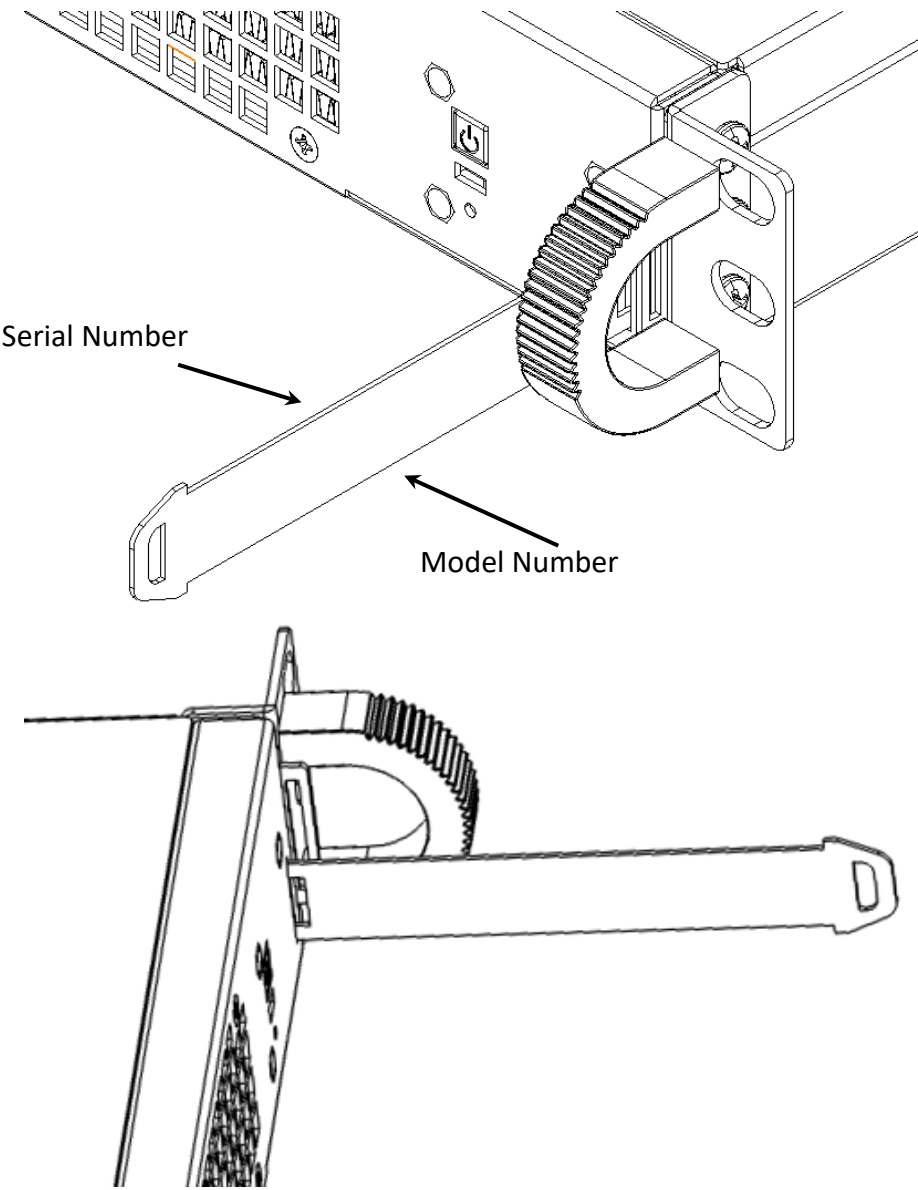
This section provides information on the different labels found on the server.

6.1 HDD trays

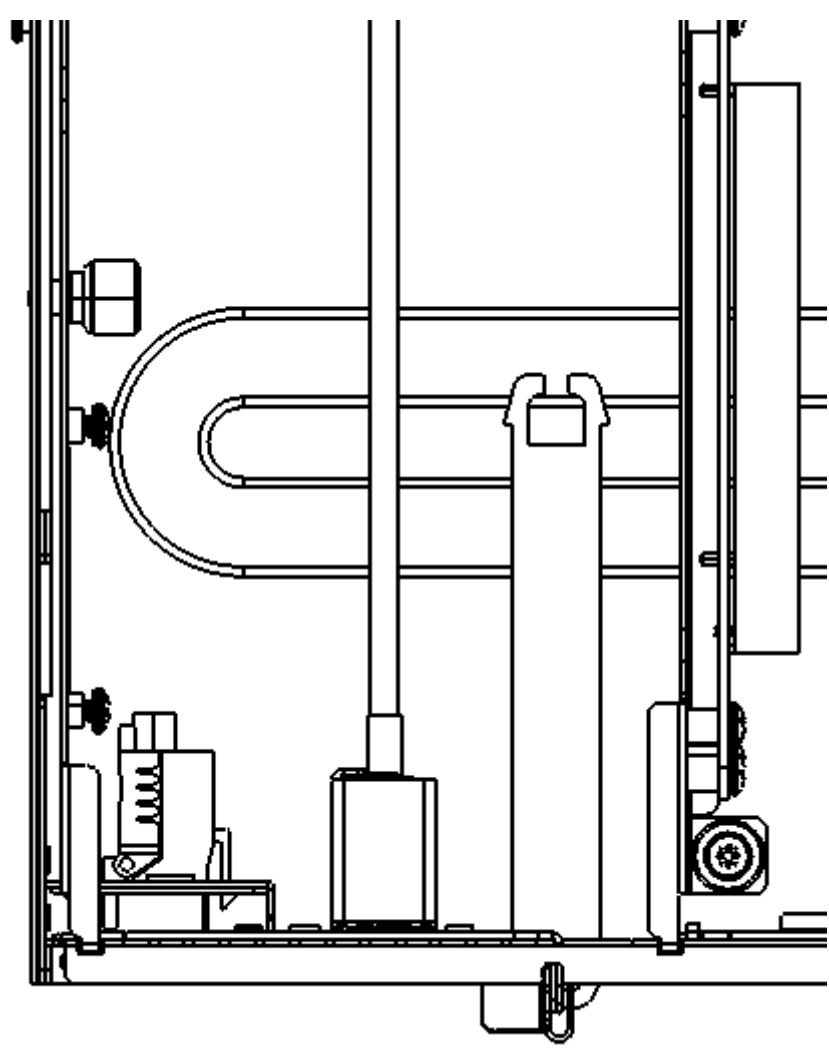
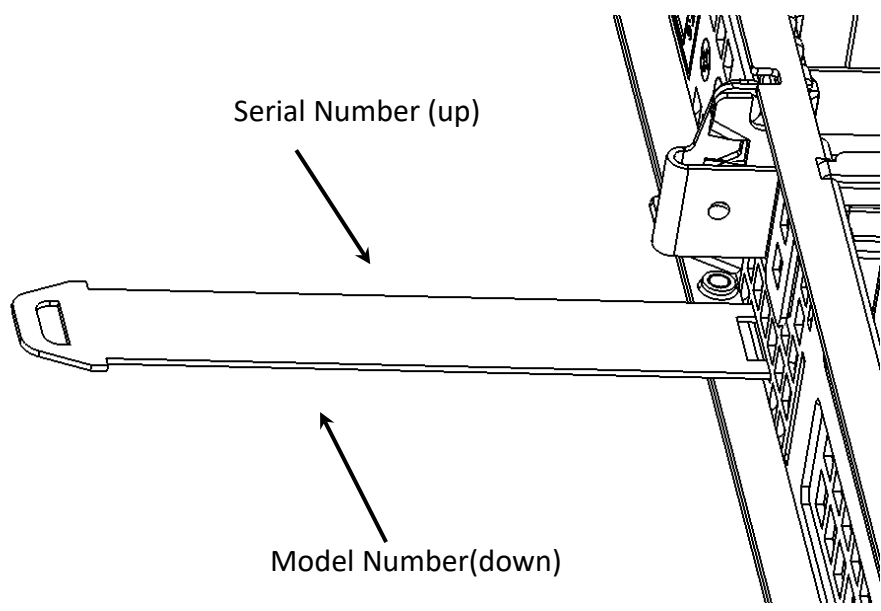


6.2 System Serial Numbers and Model Number Labels

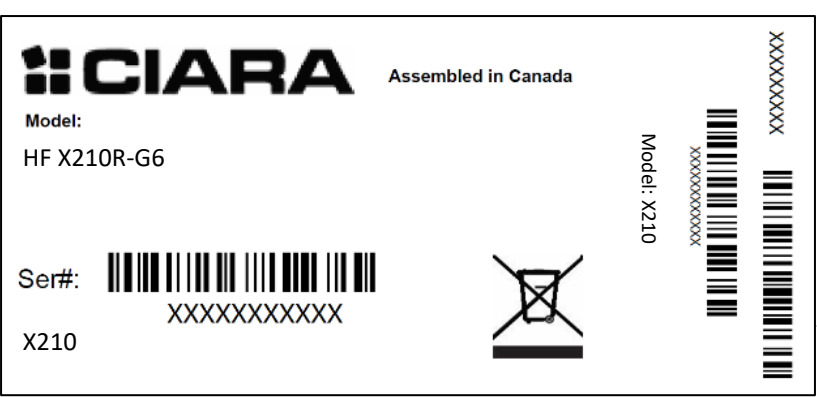
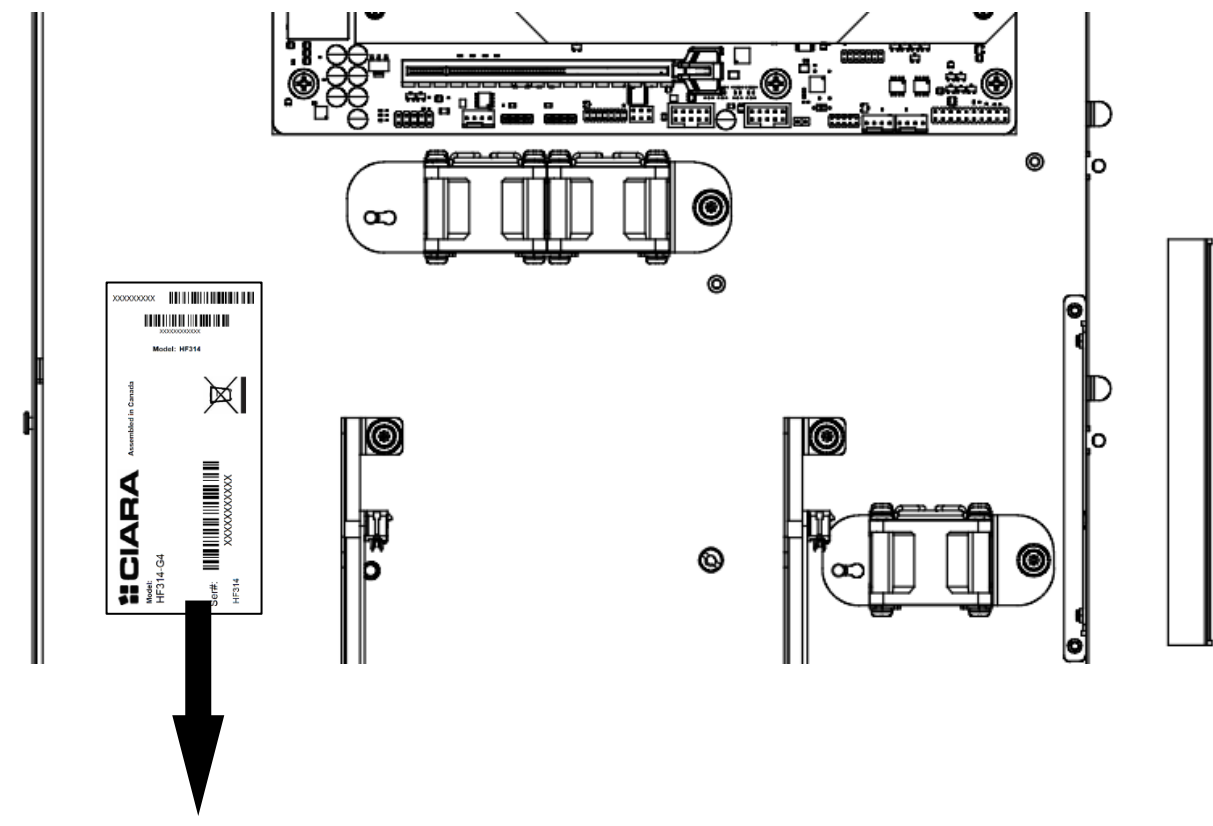
6.2.1 Front a e




6.2.2 Rear Panel










6.2.3 Inside Chassis



6.3 Support and Certification Labels

CIARA		X210
MODEL CODE	Orion HFX210R-G6	
	MFG DATE	2023-06
SUPPORT INFORMATION		SERIAL NUMBER  XXXXXXXXXXXXXX
T:	E:	
		27706

CIARA		X210
MODEL CODE Orion HFX210R-G6		INPUT 100-240V~ 50/60 Hz 15A
CUSTOM SN XXXXXXXXXXXXX	ASSET TAG	
SERIAL NUMBER  XXXXXXXXXXXXXX	<p>This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions:</p> <p>(1) This device may not cause harmful interference, and</p> <p>(2) This device must accept any interference received, including interference that may cause undesired operation. CAN ICES3[A]</p> <div>  </div> <div> </div> <p>Made in Canada</p> <p>27706</p>	



型号 (Modell):

Orion HFX210R-G6


AC 输入 (INPUT): 100-127V, 12A 50-60Hz X2
200-240V, 6.5A 50-60Hz X2

警告! 在进行维修之前, 请断开所有电源连接
此為甲類資訊技術設備, 於居住環境中使用時, 可能會造成頻頻擾動。
在此種情況下, 使用者會被要求採取某些適當的對策。

警告: 此為A級產品, 在生活環境中, 該產品可能會造成無線電干擾。
在這種情況下, 可能需要用戶對其干擾採取可行的措施。

CAUTION: Slide/rail mounted equipment is not to be used as a shelf
or a work space. Disconnect all power to the unit before servicing.

X210



R-R-HYP-HF314-G4

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.
CAN ICES-3 (A)/NMB-3(A)

Risk of explosion if
battery is replaced
by an incorrect
type.
Dispose of used
batteries according
to the instructions.

Laitte on liitettävä suojammoituskoskettimilla
varustettuun pistorasiaan. Apparatet må tilkoples jorden
stikkontakt. Apparaten skall anslutas till jordat uttag.

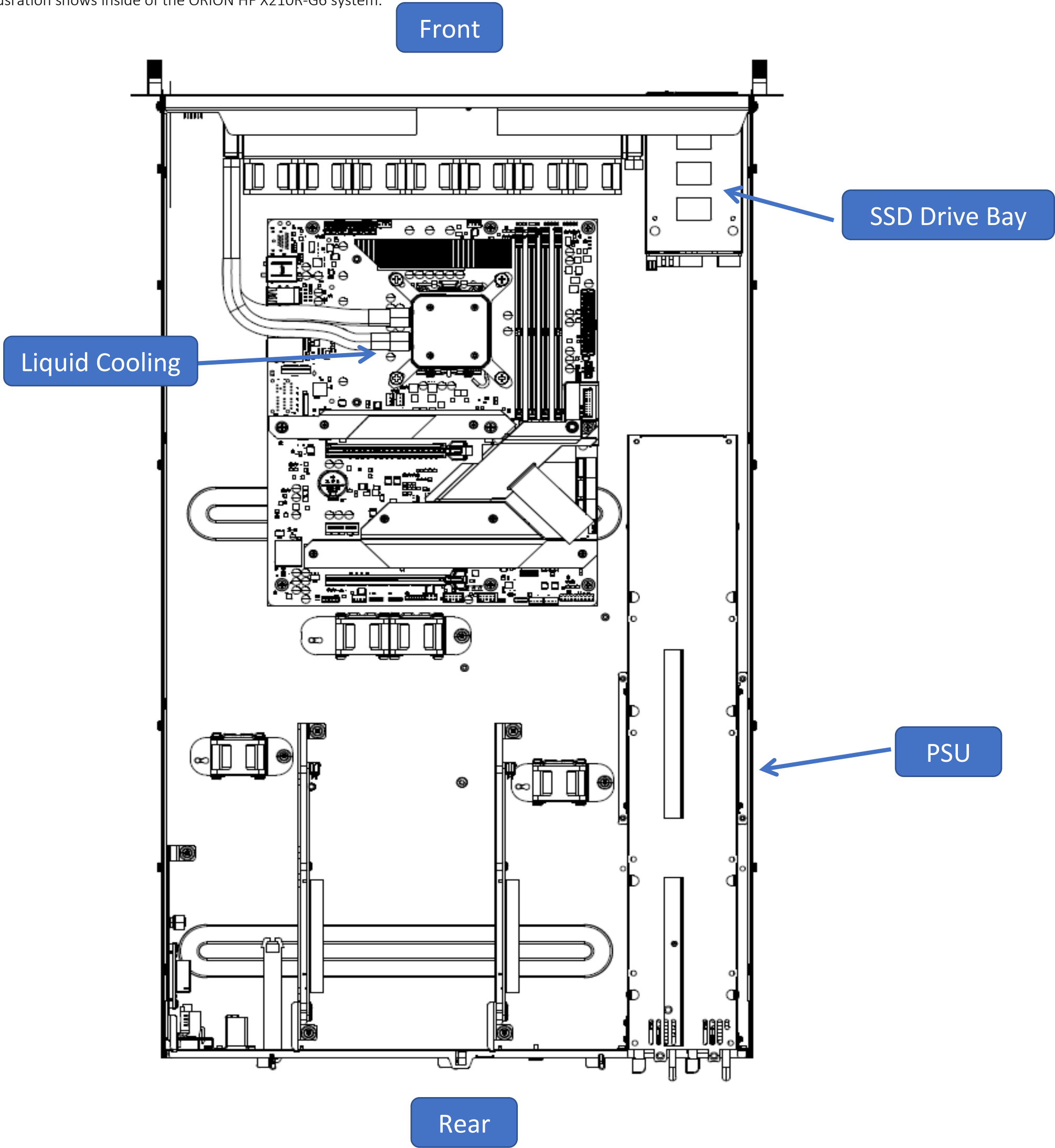
Cet appareil numérique de la classe A respecte toutes les
exigences du Règlement sur le matériel brouilleur du Canada

製造商 (manufacturer): Hypertechnologie Ciara Inc
服务器 Rack-Mountable Serve
加拿大製造 Assembled in Canada

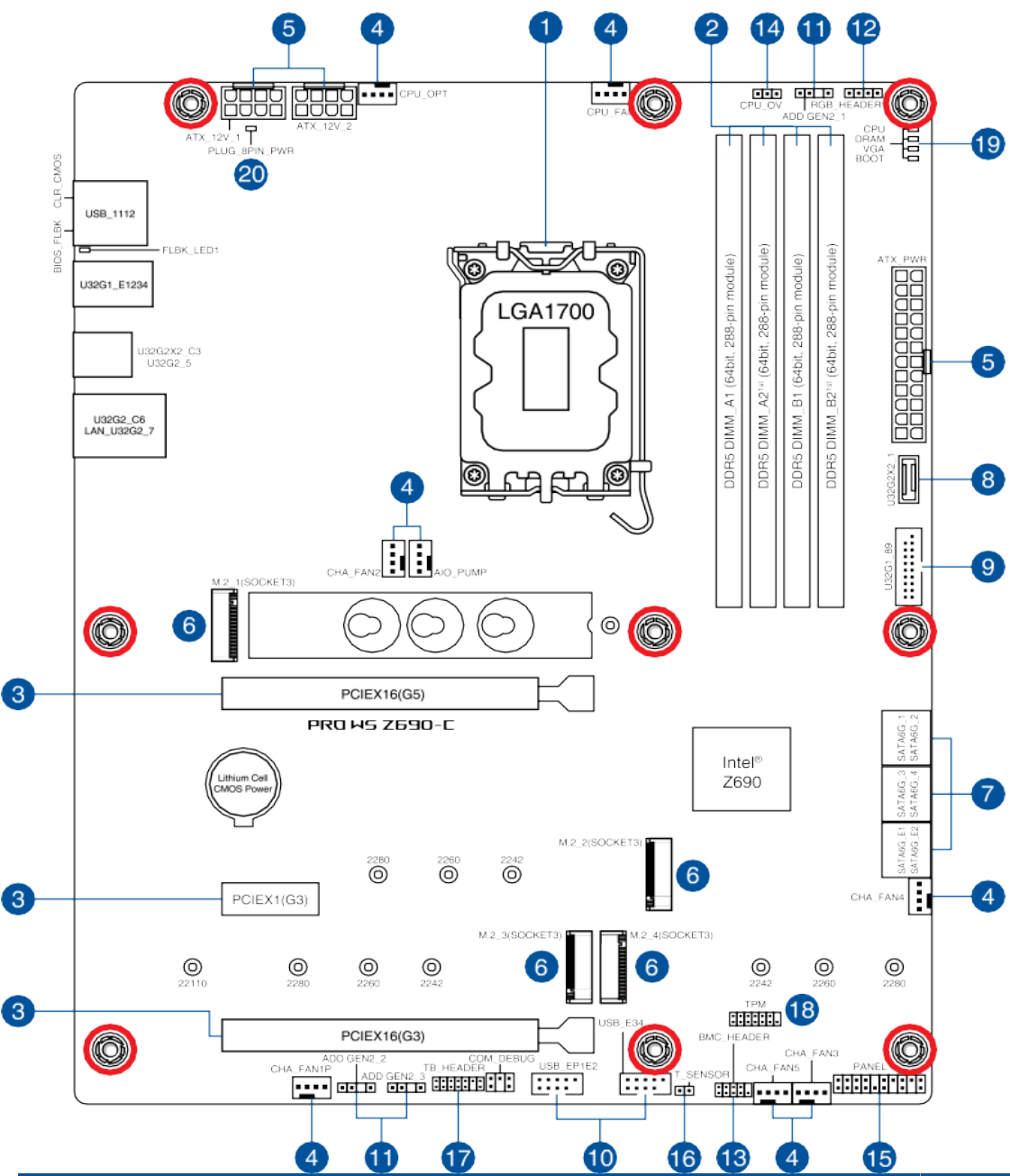
製造商 Manufactured on: /

7. Chassis Layout

The following illustration shows inside of the ORION HF X210R-G6 system.



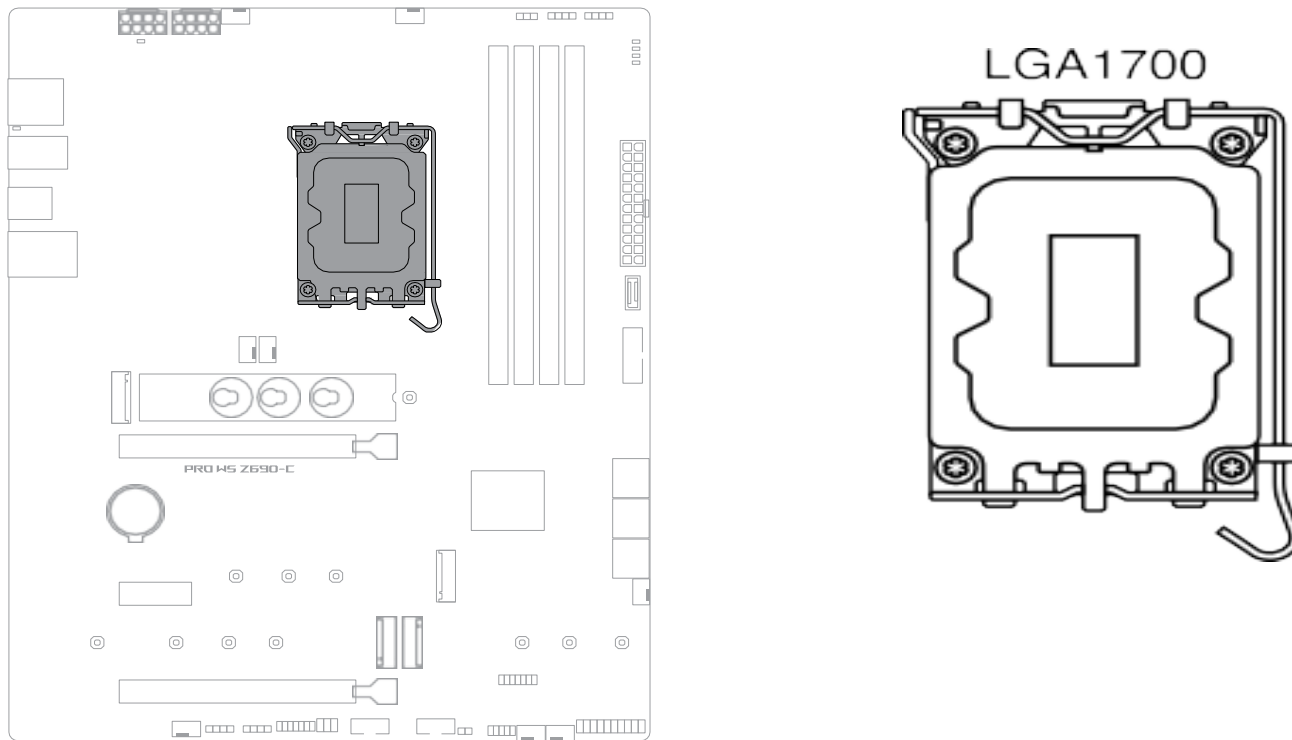
8. Detailed Motherboard Layout



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16. Thermal Sensor header	25
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8.1 CPU Socket

The motherboard comes with a LGA1700 socket designed for 13th Gen Intel® Core™ & 12th Gen Intel® Core™, Pentium® Gold and Celeron® Processors.

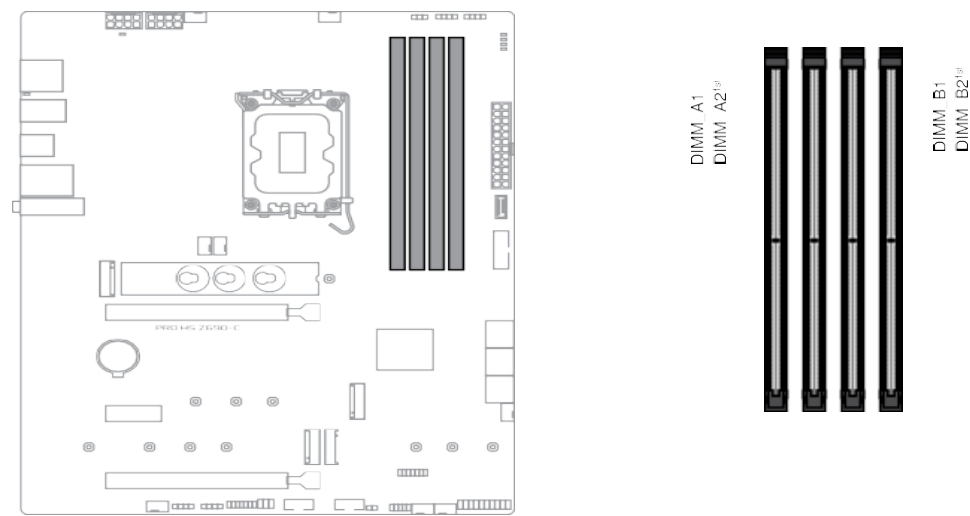


- Ensure that you install the correct CPU designed for LGA1700 socket only. DO NOT install a CPU designed for other sockets on the LGA1700 socket.
- The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU.
- Ensure that all power cables are unplugged before installing the CPU.
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. CIARA will shoulder the cost of repair only if the damage is shipment/ transit-related.
- Keep the cap after installing the motherboard. CIARA will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1700 socket.
- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

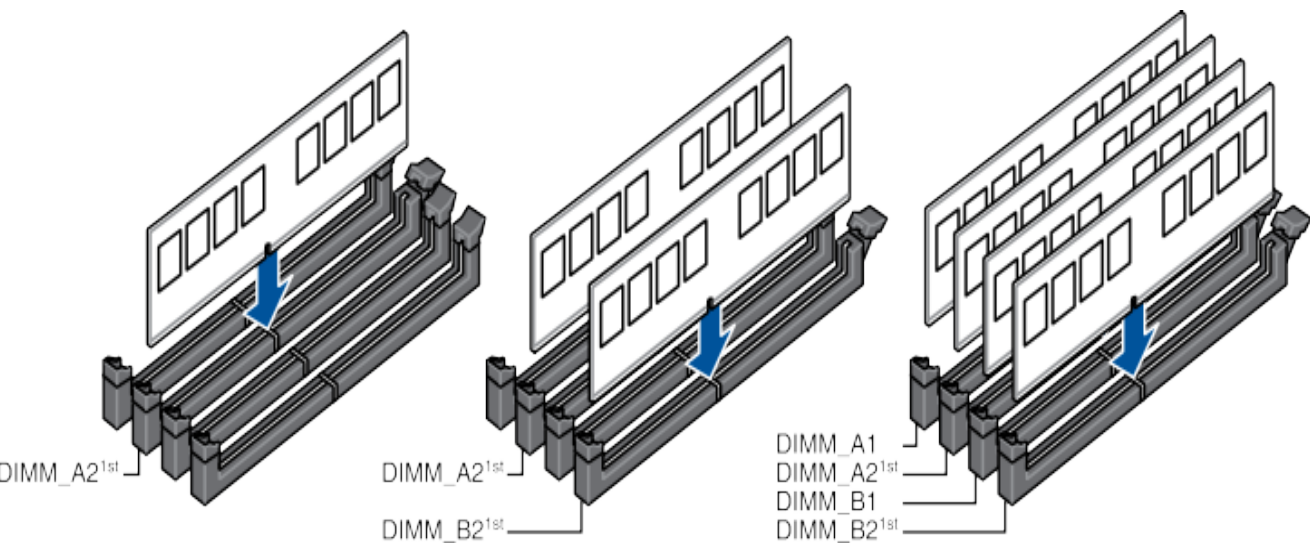
8.2 DIMM slots

The motherboard comes with Dual Inline Memory Modules (DIMM) slots designed for DDR5 (Double Data Rate 5) memory modules.

A DDR5 memory module is notched differently from a DDR, DDR2, DDR3, or DDR4 module. DO NOT install a DDR, DDR2, DDR3, or DDR4 memory module to the DDR5 slot.



Recommended memory configurations



Memory configurations

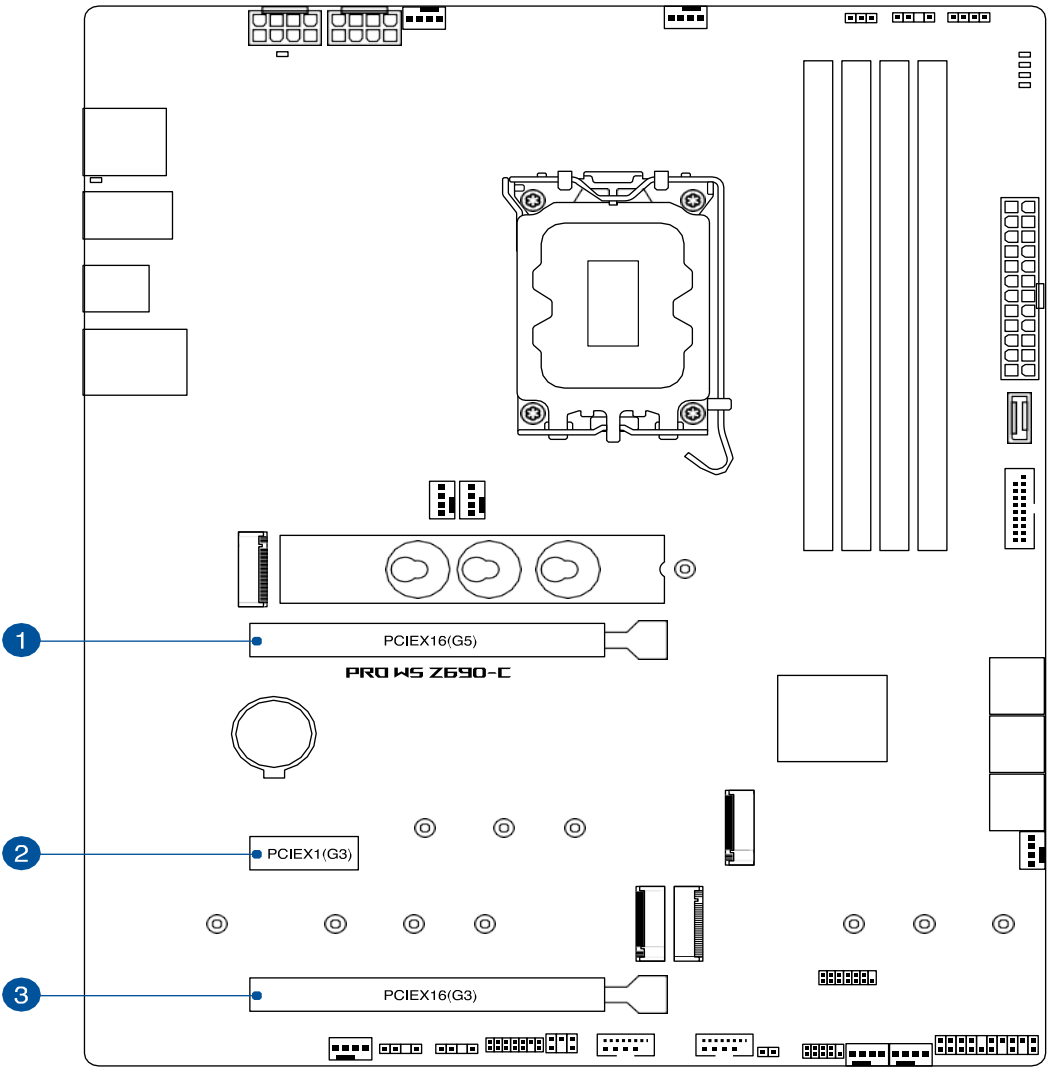
You may install 8GB, 16GB, and 32GB unbuffered and non-ECC DDR5 DIMMs into the DIMM sockets.

You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
- For system stability, use a more efficient memory cooling system to support a full memory load or overclocking condition.
- Always install the DIMMS with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.
- Visit the CIARA website for the latest QVL.

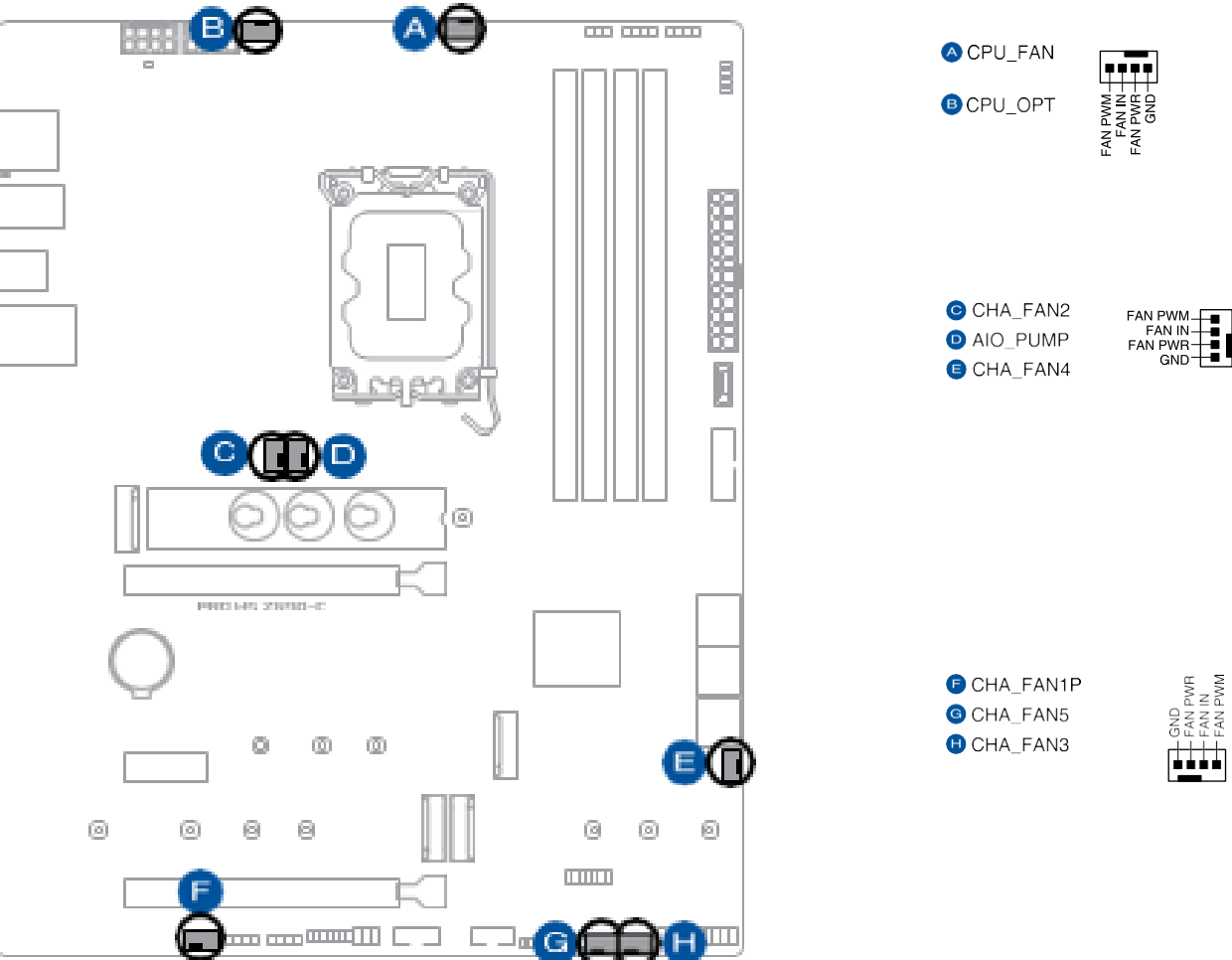
8.3 Expansion slots

Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.



8.4 Fan and Pump headers

The Fan and Pump headers allow you to connect fans or pumps to cool the system. When an CIARA HYDRANODE fan is connected to a CIARA HYDRANODE fan connector, the CIARA HYDRANODE function will be available.



- DO NOT forget to connect the fan cables to the fan headers. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan headers!
- Ensure the cable is fully inserted into the header.

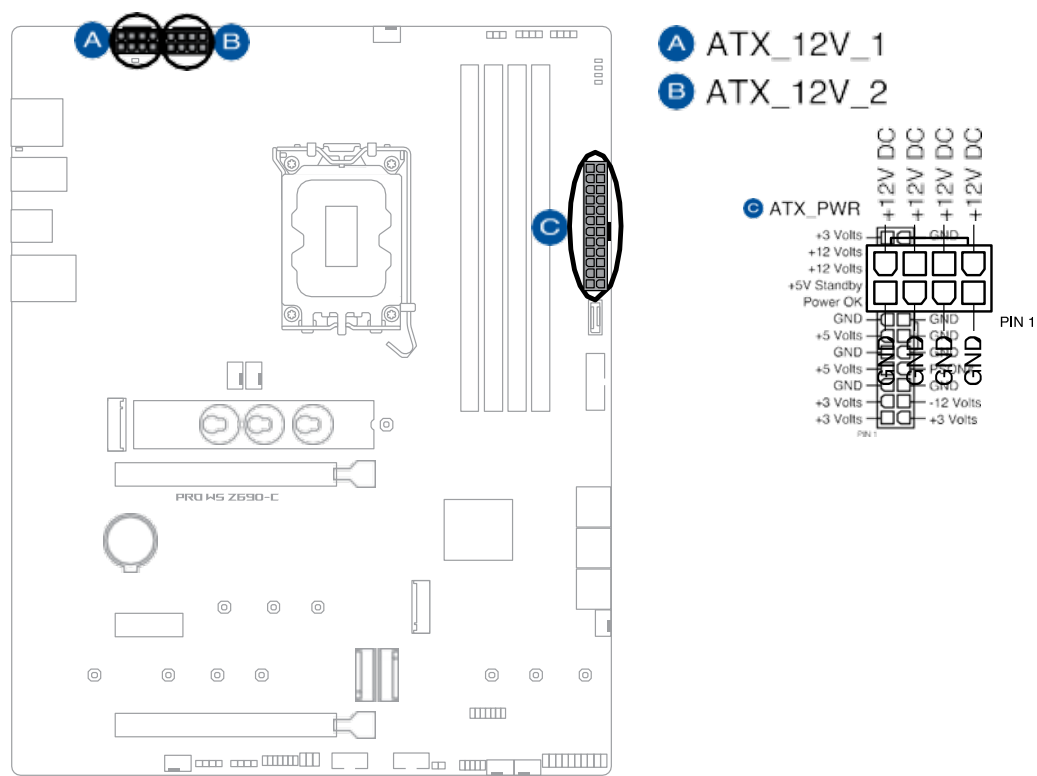
For water cooling kits, connect the pump connector to the AIO_PUMP header.

CHA_FAN1P can support CIARA HYDRANODE fans.

Header	Max. Current	Max. Power	Default Speed	Shared Control
CPU_FAN	1A	12W	Q-Fan Controlled	A
CPU_OPT	1A	12W	Q-Fan Controlled	A
CHA_FAN1P	1A	12W	Q-Fan Controlled	-
CHA_FAN2	1A	12W	Q-Fan Controlled	-
CHA_FAN3	1A	12W	Q-Fan Controlled	-
CHA_FAN4	1A	12W	Q-Fan Controlled	-
CHA_FAN5	1A	12W	Q-Fan Controlled	-
AIO_PUMP	1A	12W	Full Speed	-

8.5 Power connectors

These Power connectors allow you to connect your motherboard to a power supply. The power supply plugs are designed to fit in only one orientation, find the proper orientation and push down firmly until the power supply plugs are fully inserted.

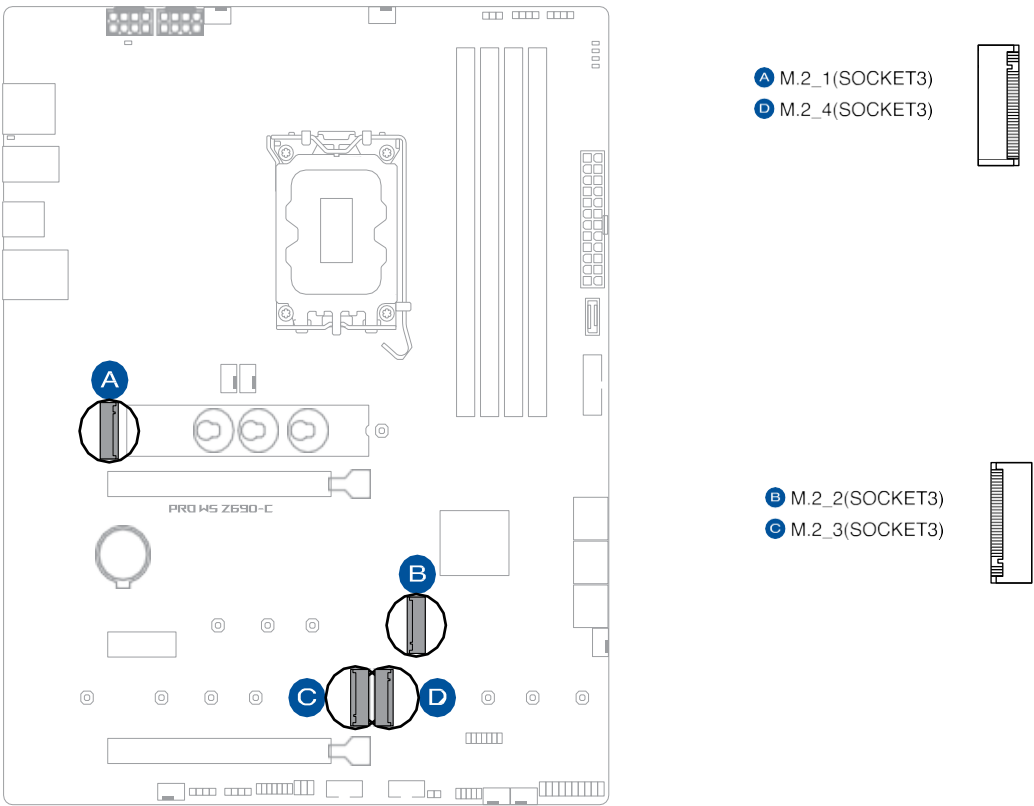


Ensure to connect the 8-pin power plug, or connect both 8-pin power plugs.

- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later version) and provides a minimum power of 350 W.
- We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability.

8.6 M.2 slot

The M.2 slot allows you to install M.2 devices such as M.2 SSD modules.

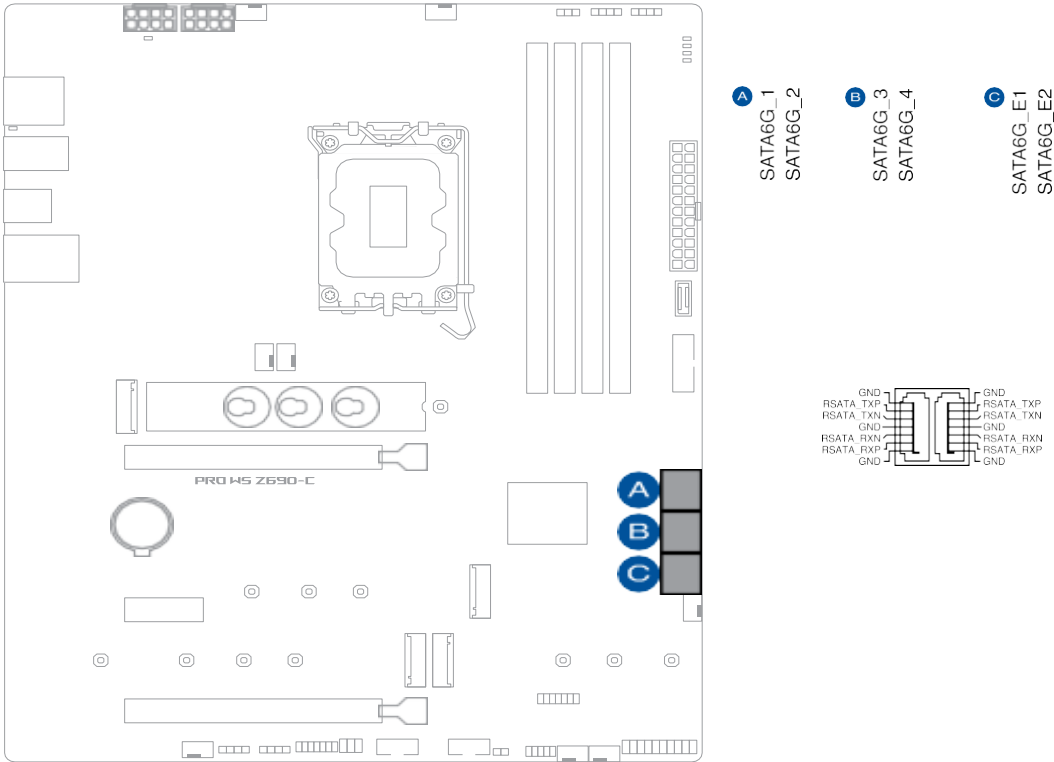


- Intel® 13th & 12th Gen Processors:
 - M.2_1 supports PCIE 4.0 x4 mode M Key design and type 2242 / 2260 / 2280 / 22110 storage devices.
- Intel® Z690 Chipset:
 - M.2_2 supports PCIE 4.0 x4 mode M Key design and type 2242 / 2260 / 2280 storage devices.
 - M.2_3 supports PCIE 4.0 x4 mode M Key design and type 2242 / 2260 / 2280 / 22110 storage devices.
 - M.2_4 supports PCIE 4.0 x4 and SATA mode M Key design and type 2242 / 2260 / 2280 storage devices.
 - Intel® Rapid Storage Technology supports Intel® Optane Memory H Series on PCH attached M.2 slots.
- Intel® Rapid Storage Technology supports NVMe RAID 0/1/5, SATA RAID 0/1/5/10.
- When M.2_4 is operating in SATA mode, SATA6G_2 will be disabled.

The M.2 SSD module is purchased separately.

8.7 SATA 6Gb/s port

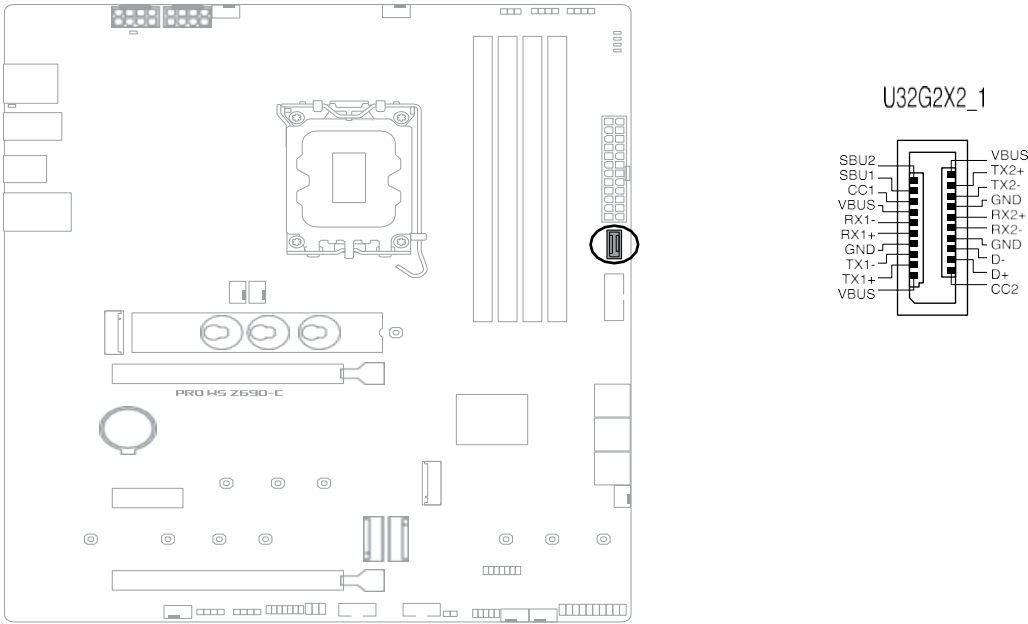
The SATA 6Gb/s port allows you to connect SATA devices such as optical disc drives and hard disk drives via a SATA cable.



- If you installed SATA storage devices to the **SATA6G_1-4** ports, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z690 chipset.
- RAID configuration and boot drives are not supported on the **SATA6G_E1-2** ports.
- When M.2_4 is operating in SATA mode, SATA6G_2 will be disabled.
- Before creating a RAID set, refer to the **RAID Configuration Guide**. You can download the **RAID Configuration Guide** from the CIARA website.

8.8 USB 3.2 Gen 2x2 Type-C® Front Panel connector

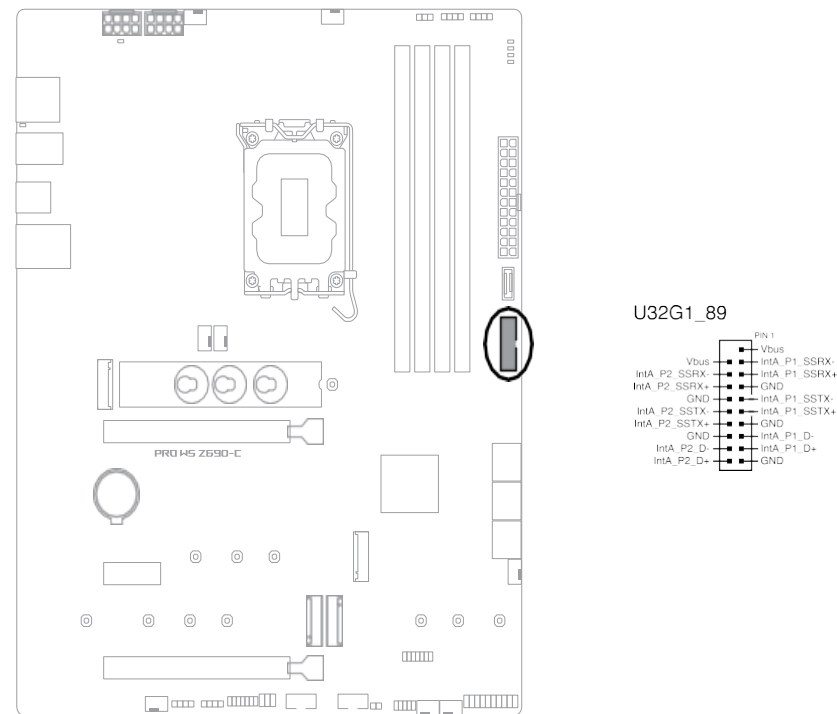
The USB 3.2 Gen 2x2 Type-C® connector allows you to connect a USB 3.2 Gen 2x2 Type-C® module for additional USB 3.2 Gen 2x2 ports on the front panel. The USB 3.2 Gen 2x2 Type-C® connector provides data transfer speeds of up to 20 Gb/s.



The USB 3.2 Gen 2x2 Type-C® module is purchased separately.

8.9 USB 3.2 Gen 1 header

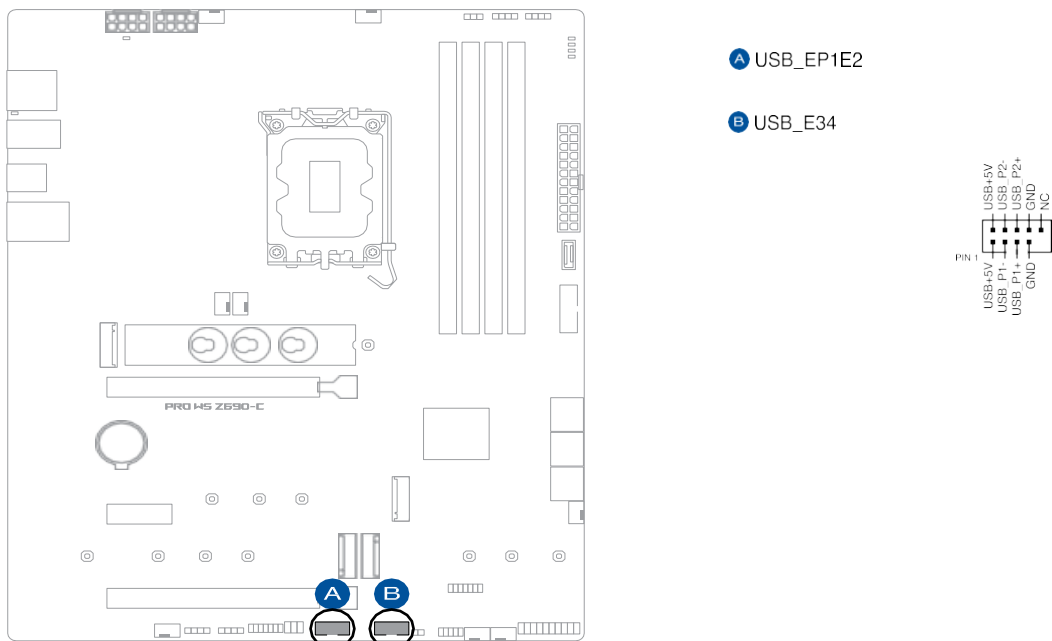
The USB 3.2 Gen 1 header allows you to connect a USB 3.2 Gen 1 module for additional USB 3.2 Gen 1 ports. The USB 3.2 Gen 1 header provides data transfer speeds of up to 5 Gb/s.



The USB 3.2 Gen 1 module is purchased separately.

8.10 USB 2.0 header

The USB 2.0 header allows you to connect a USB module for additional USB 2.0 ports. The USB 2.0 header provides data transfer speeds of up to 480 Mb/s.

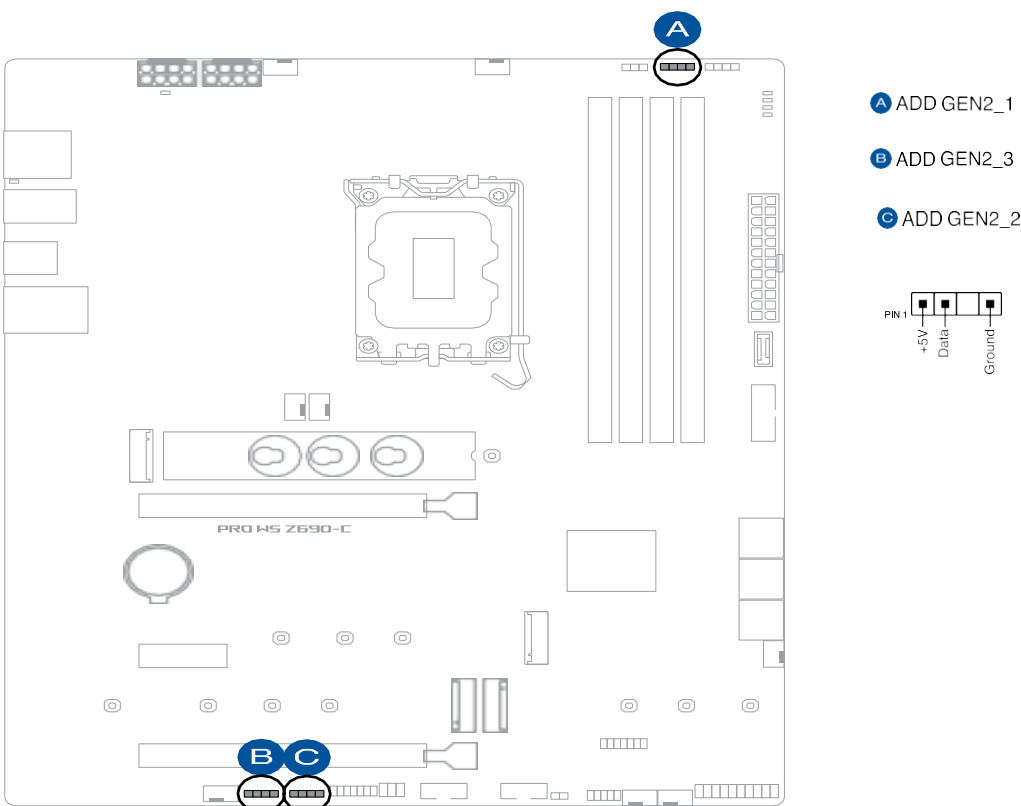


DO NOT connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

The USB 2.0 module is purchased separately.

8.11 Addressable Gen2 header

The Addressable Gen2 header allows you to connect individually addressable RGB WS2812B LED strips or WS2812B based LED strips.



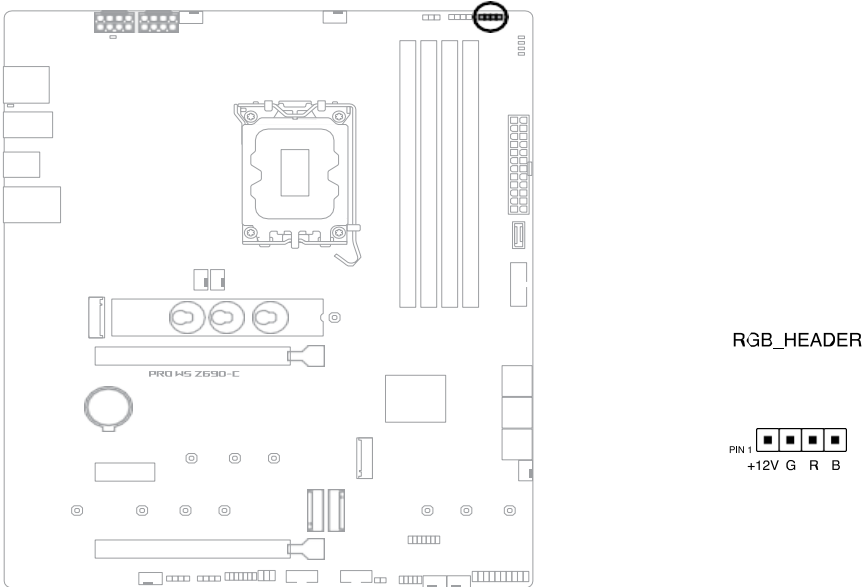
The Addressable Gen2 header supports WS2812B addressable RGB LED strips (5V/ Data/Ground), with a maximum power rating of 3A (5V), and the addressable headers on this board can handle a combined maximum of 500 LEDs.

Before you install or remove any component, ensure that the power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

- Actual lighting and color will vary with LED strip.
- If your LED strip does not light up, check if the addressable RGB LED strip is connected in the correct orientation, and the 5V connector is aligned with the 5V header on the motherboard.
- The addressable RGB LED strip will only light up when the system is powered on.
- The addressable RGB LED strip is purchased separately.

8.12 Aura RGB header

The Aura RGB header allows you to connect RGB LED strips.



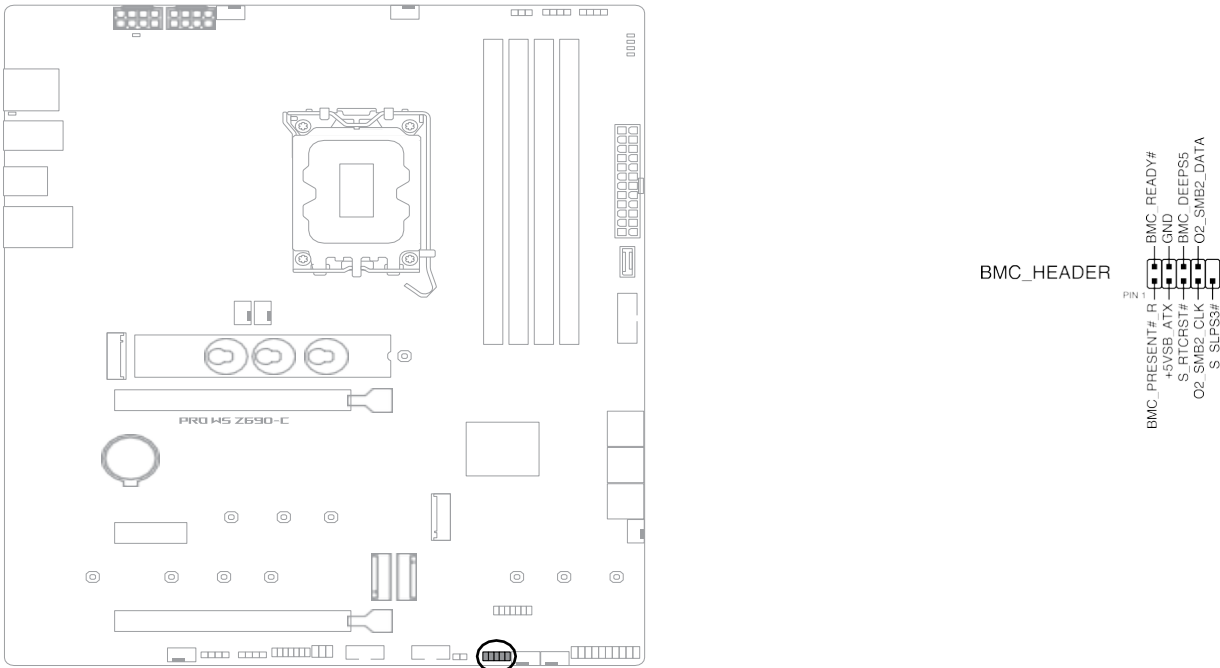
The Aura RGB header supports 5050 RGB multi-color LED strips (12V/G/R/B), with a maximum power rating of 3A (12V).

Before you install or remove any component, ensure that the power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

- Actual lighting and color will vary with LED strip.
- If your LED strip does not light up, check if the RGB LED extension cable and the RGB LED strip is connected in the correct orientation, and the 12V connector is aligned with the 12V header on the motherboard.
- The LED strip will only light up when the system is powered on.
- The LED strip is purchased separately.

8.13 MC header

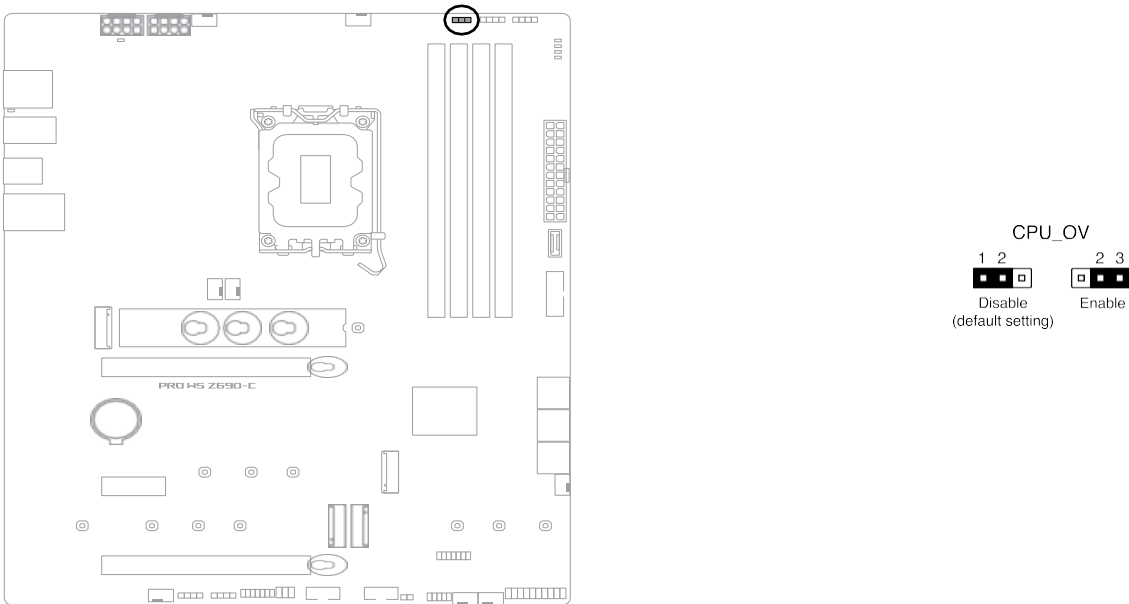
The BMC header allows you to connect and support an IPMI card.



- The IPMI card is purchased separately.
- For more information on the installation and information regarding the IPMI card, please visit www.ciara.com.

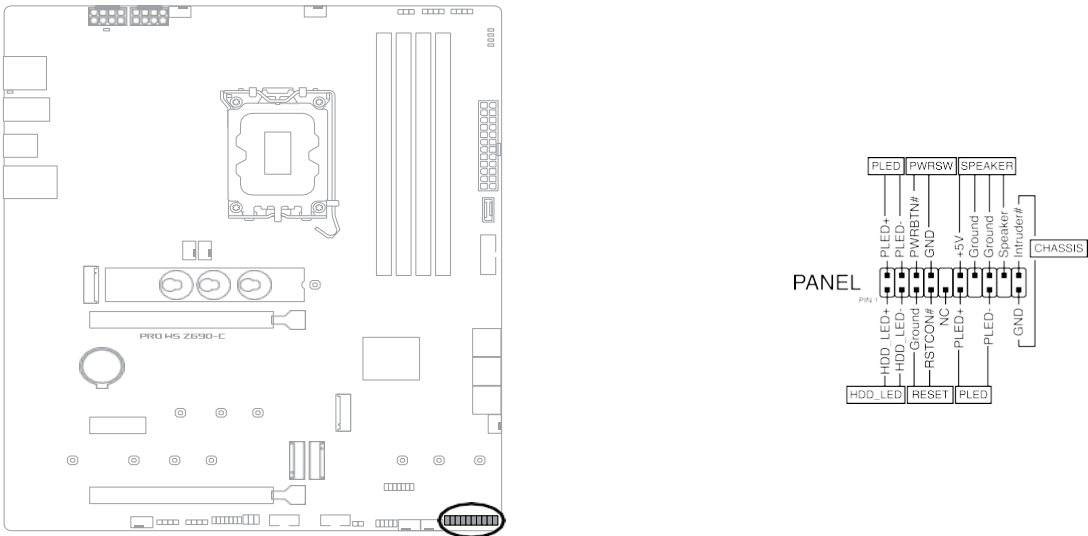
8.14 CPU Over Voltage jumper

The CPU Over Voltage jumper allows you to set a higher CPU voltage for a flexible overclocking system (depending on the type of the installed CPU). Set to pins 2-3 to increase the CPU voltage setting, or set to pins 1-2 to use the default CPU voltage setting.



8.15 System Panel header

The System Panel header supports several chassis-mounted functions.



- System Power LED header (PLED)

The 2-pin and/or 3-1 pin headers allow you to connect the System Power LED. The System Power LED lights up when the system is connected to a power source, or when you turn on the system power, and blinks when the system is in sleep mode.

- Storage Device Activity LED header (HDD_LED)

The 2-pin header allows you to connect the Storage Device Activity LED. The Storage Device Activity LED lights up or blinks when data is read from or written to the storage device or storage device add-on card.

- System Warning Speaker header (SPEAKER)

The 4-pin header allows you to connect the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- Power Button/Soft-off Button header (PWRSW)

The 3-1 pin header allows you to connect the system power button. Press the power button to power up the system, or put the system into sleep or soft-off mode (depending on the operating system settings).

- Reset button header (RESET)

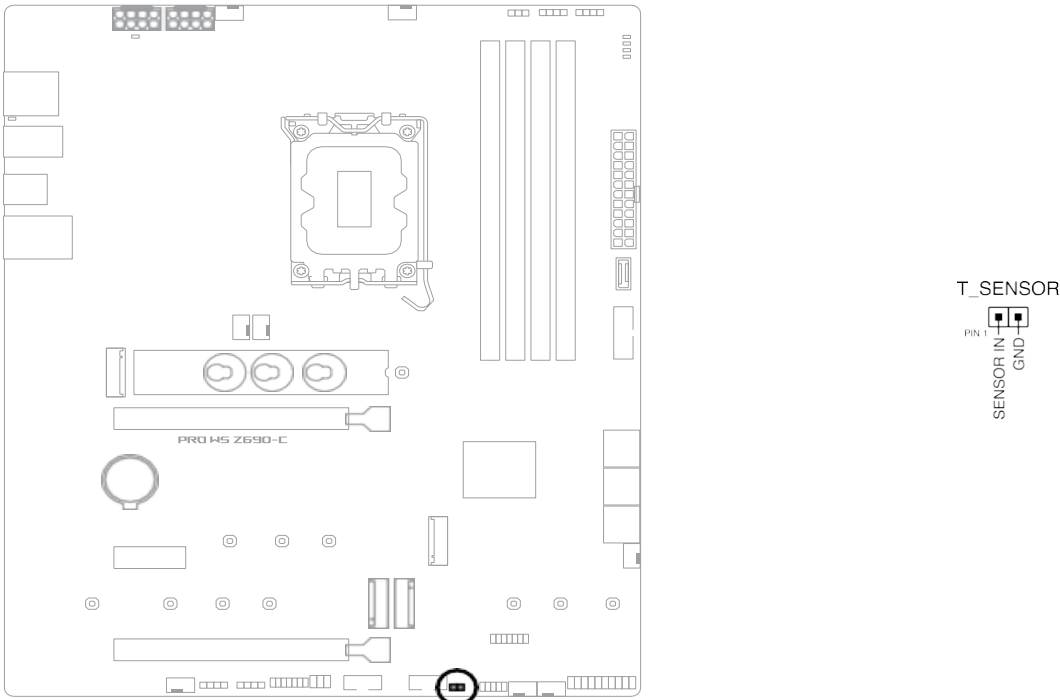
The 2-pin header allows you to connect the chassis-mounted reset button. Press the reset button to reboot the system.

- Chassis intrusion header (CHASSIS)

The 2-pin header allows you to connect the chassis-mounted intrusion detection sensor or switch. The chassis intrusion sensor or switch sends a high-level signal to the header when a chassis component is removed or replaced, the signal is then generated as a chassis intrusion event.

8.16 Thermal Sensor header

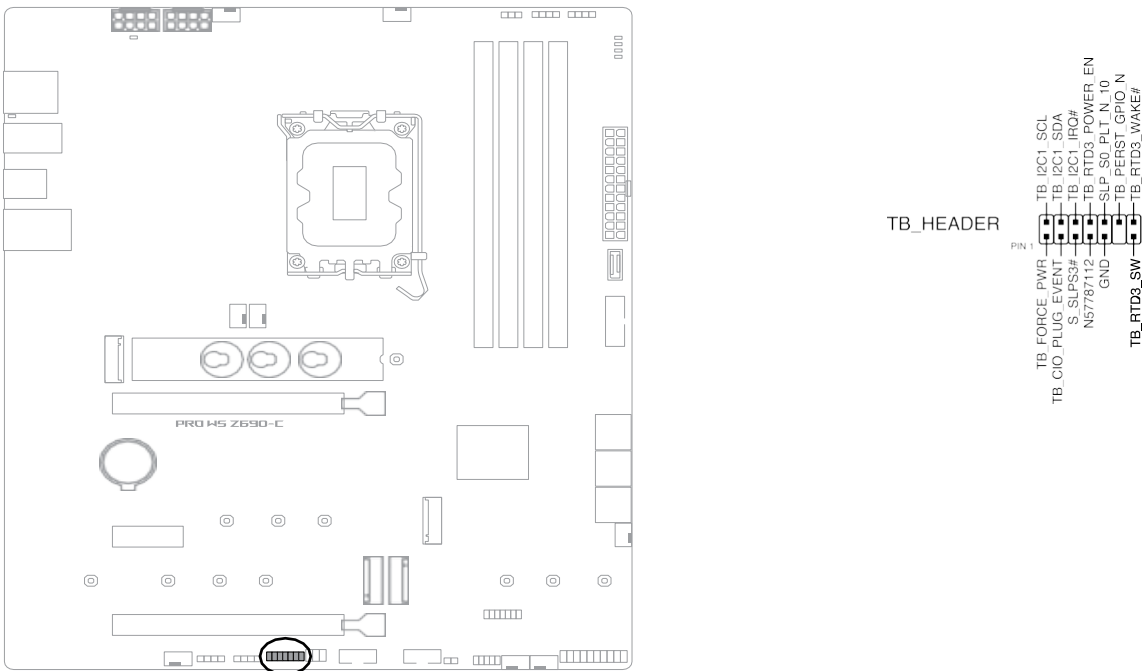
The Thermal Sensor header allows you to connect a sensor to monitor the temperature of the devices and the critical components inside the motherboard. Connect the thermal sensor and place it on the device or the motherboard’s component to detect its temperature.



The thermal sensor is purchased separately.

8.17 Thunderbolt™ header

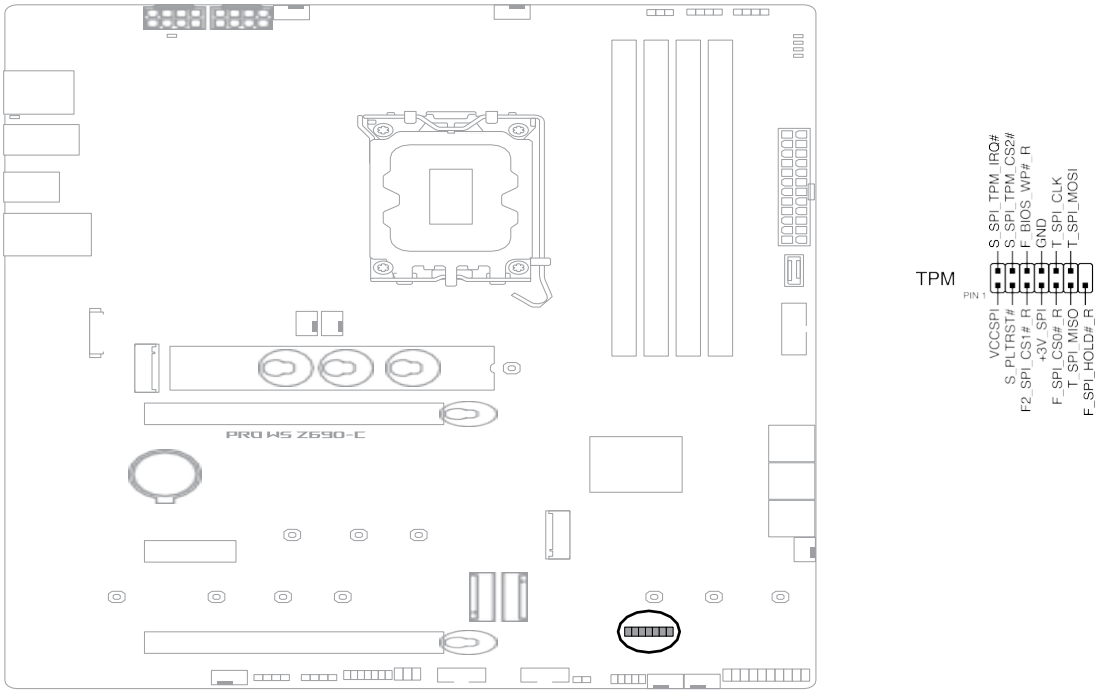
The Thunderbolt™ header allows you to connect an add-on Thunderbolt™ I/O card that supports Intel®’s Thunderbolt™ Technology, allowing you to connect Thunderbolt™-enabled devices to form a daisy-chain configuration.



- The add-on Thunderbolt™ I/O card and Thunderbolt™ cables are purchased separately.
- Please visit the official website of your purchased Thunderbolt™ card for more details on compatibility.

8.18 TPM header

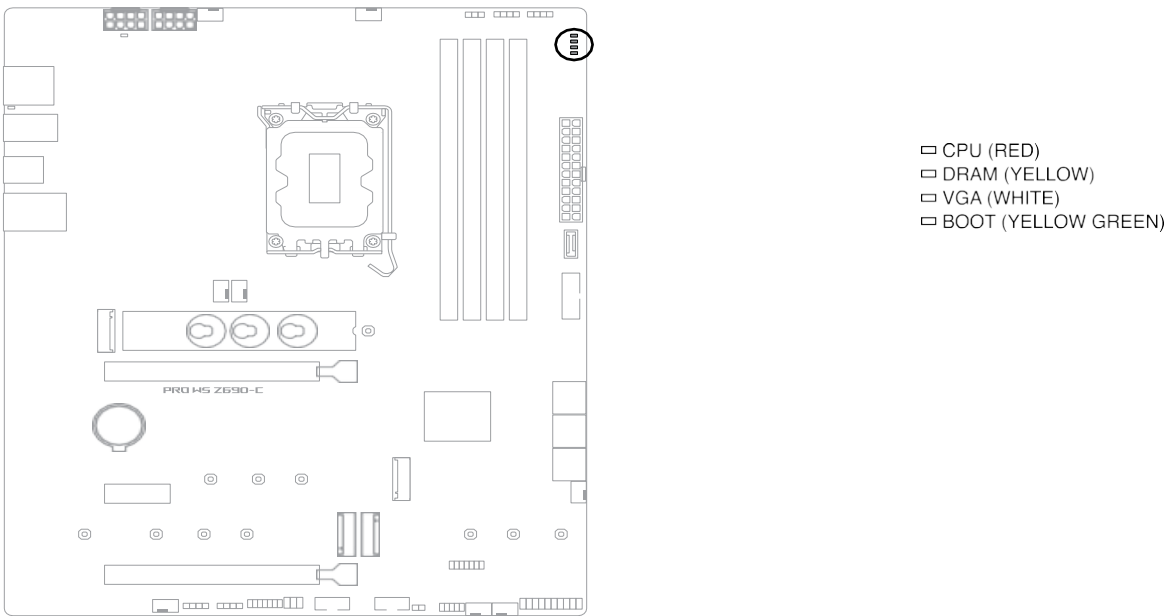
The TPM header allows you to connect a TPM module, which securely stores keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protect digital identities, and ensures platform integrity.



The TPM module is purchased separately.

8.19 Q-LEDs

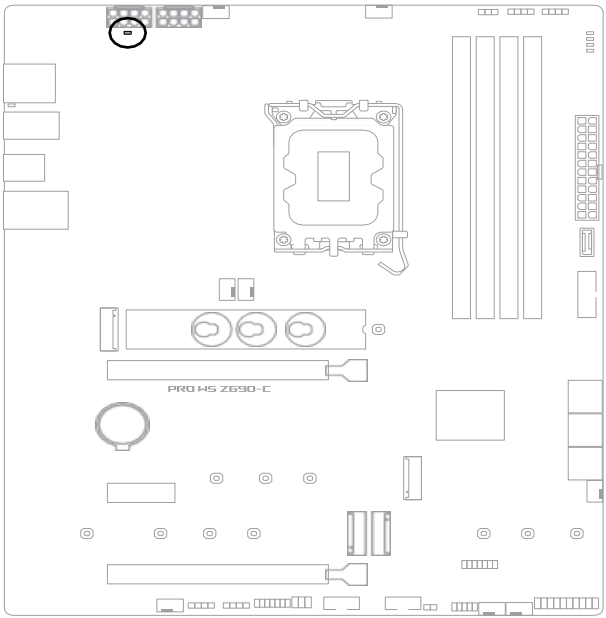
The Q-LEDs check key components (CPU, DRAM, VGA, and booting devices) during the motherboard booting process. If an error is found, the critical component’s LED stays lit up until the problem is solved.



The Q-LEDs provide the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.

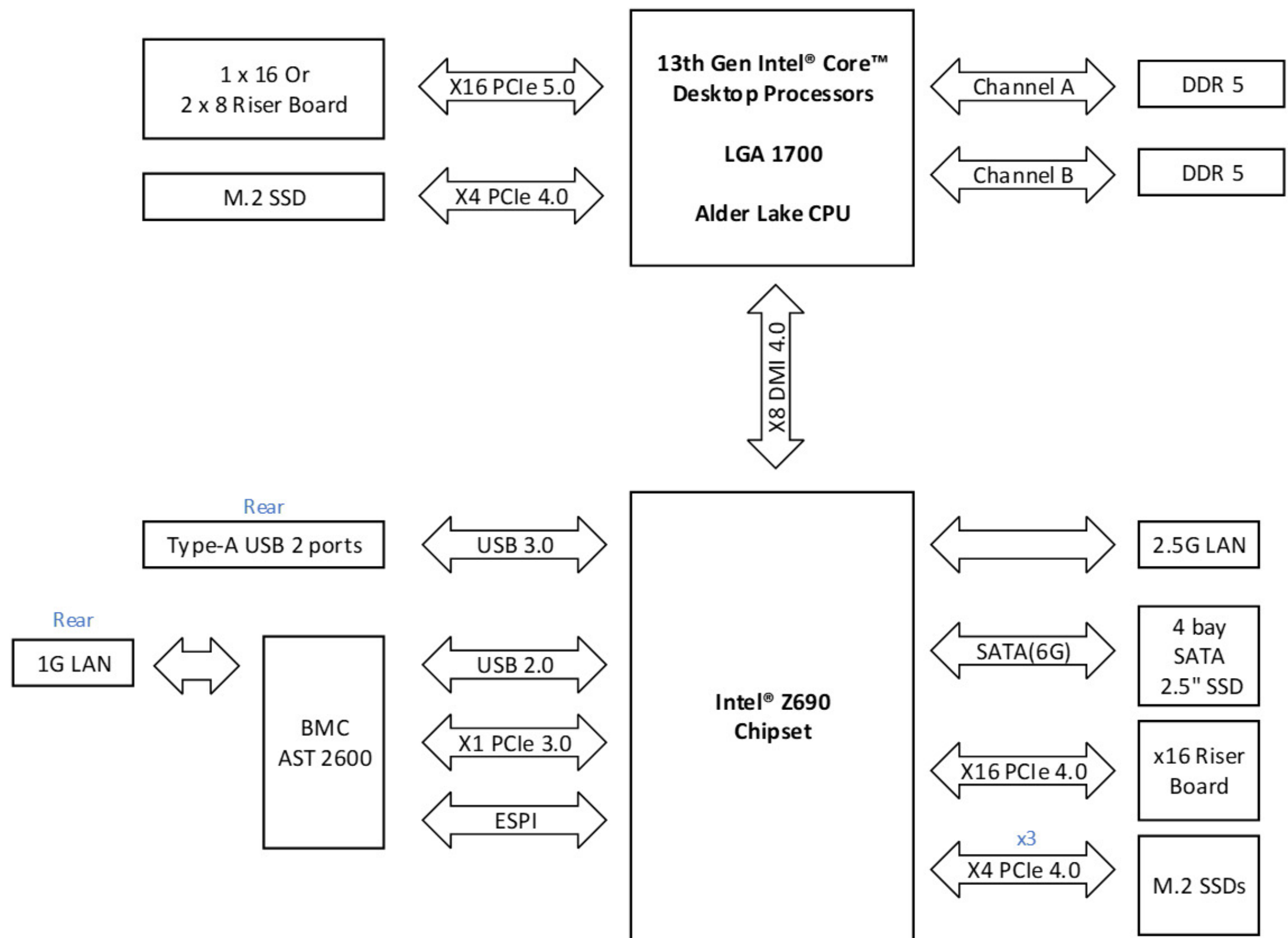
8.20 8-pin Power Plug LED

The 8-pin Power Plug LED lights up to indicate that the 8-pin power plug is not connected.



□ PLUG_8PIN_PWR

9. Motherboard Block Diagram



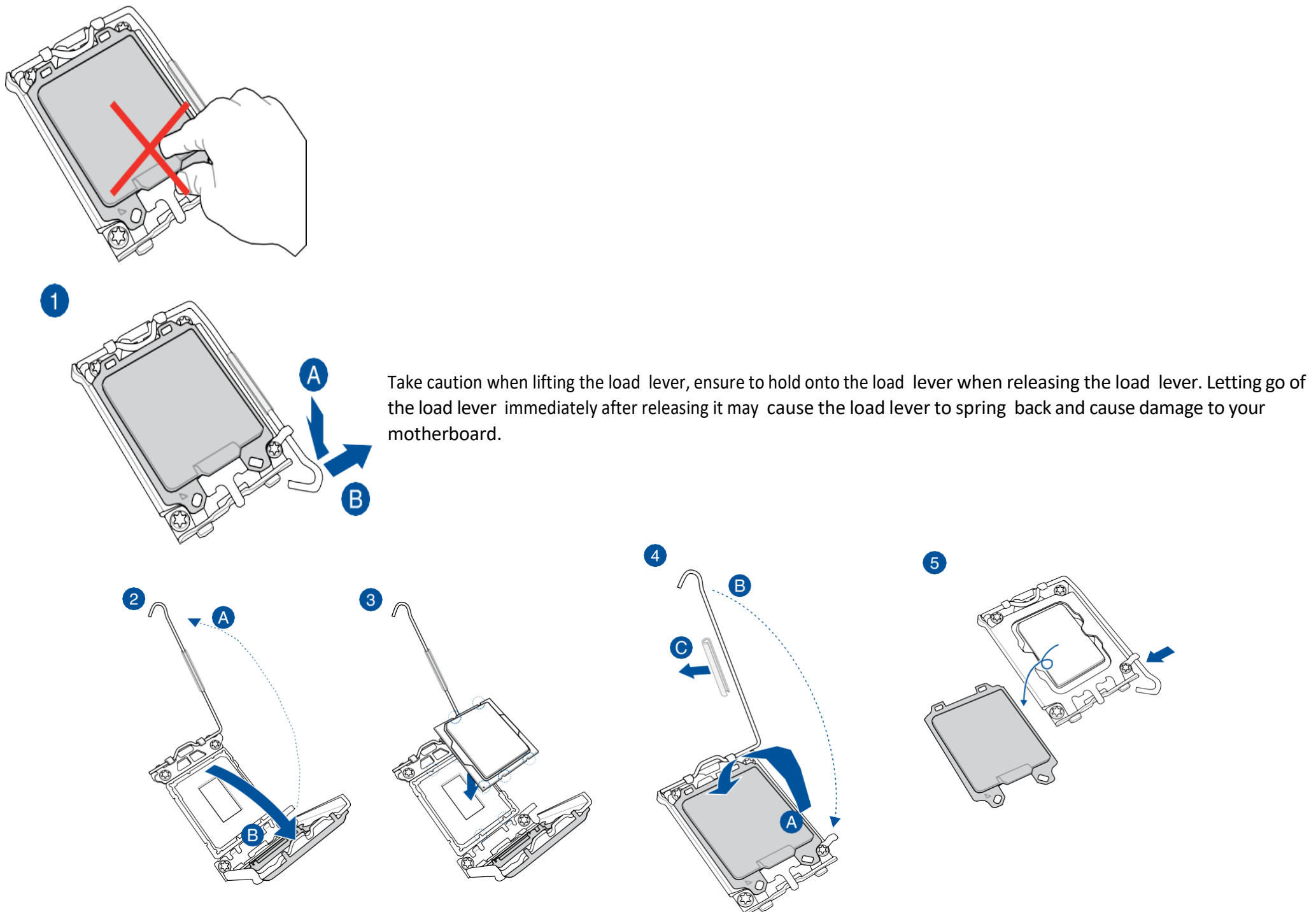
10. Basic Installation and Cabling

10.1 Building your PC system

The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

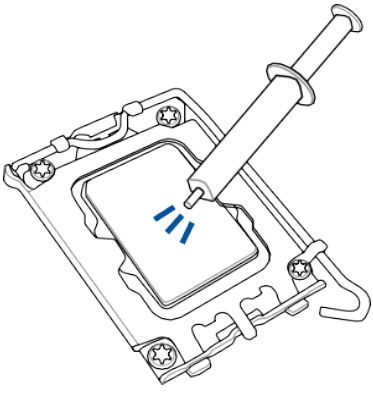
10.1.1 CPU installation

- Ensure that you install the correct CPU designed for LGA1700 socket only. DO NOT install a CPU designed for LGA1155, LGA1156, LGA1151, and LGA1200 sockets on the LGA1700 socket.
- CIARA will not cover damages resulting from incorrect CPU installation/removal, incorrect CPU orientation/placement, or other damages resulting from negligence by the user.



Ensure to remove the CPU Socket lever protector on the lever latch before locking the lever latch under the retention tab. Failure to do so may cause damages to your system when installing the cooling system.

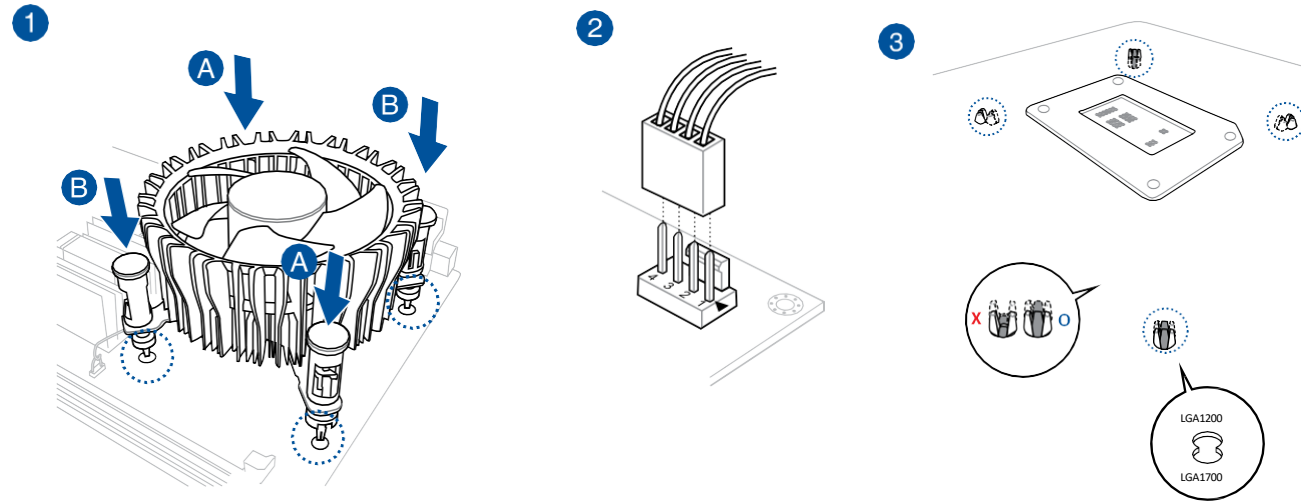
10.1.2 Cooling system installation



Apply Thermal Interface Material to the CPU cooling system and CPU before you install the cooling system, if necessary.

Ensure to remove the CPU Socket lever protector on the lever latch before installing the cooling system, failure to do so may cause damages to your system.

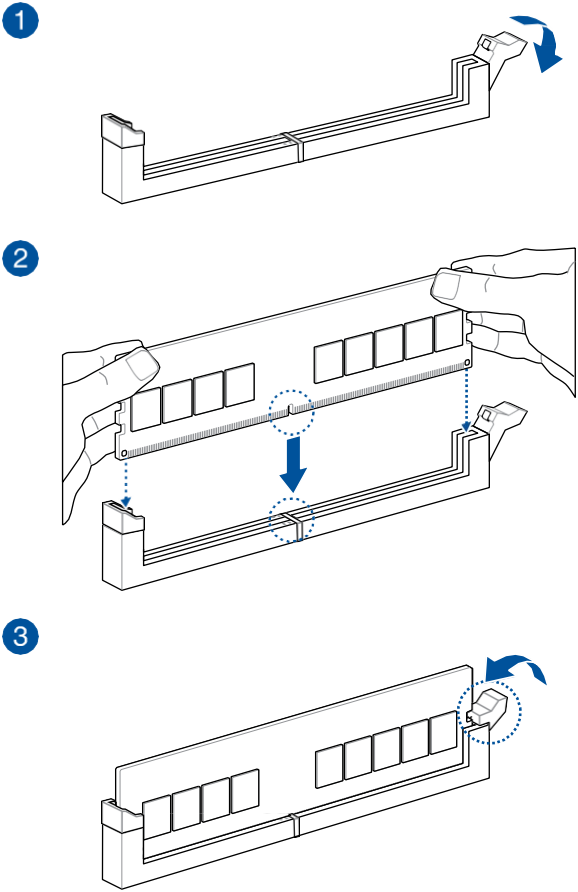
To install a CPU heatsink and fan assembly



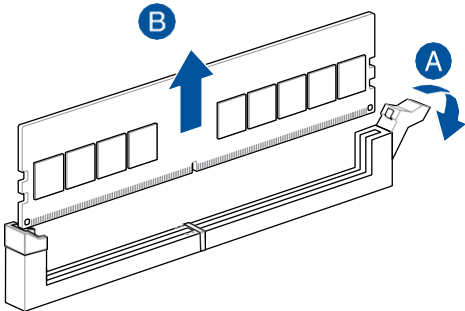
- We recommend using a LGA1700 compatible cooling system on an Intel® 600 series motherboard.
- Additional holes for LGA1200 compatible cooling systems are also available on CIARA' Intel® 600 series motherboards, however, we still strongly advise consulting with your cooling system vendor or manufacturer on the compatibility and functionality of the cooling system.
- Push-pin type LGA1200 compatible cooling systems cannot be installed to this motherboard.

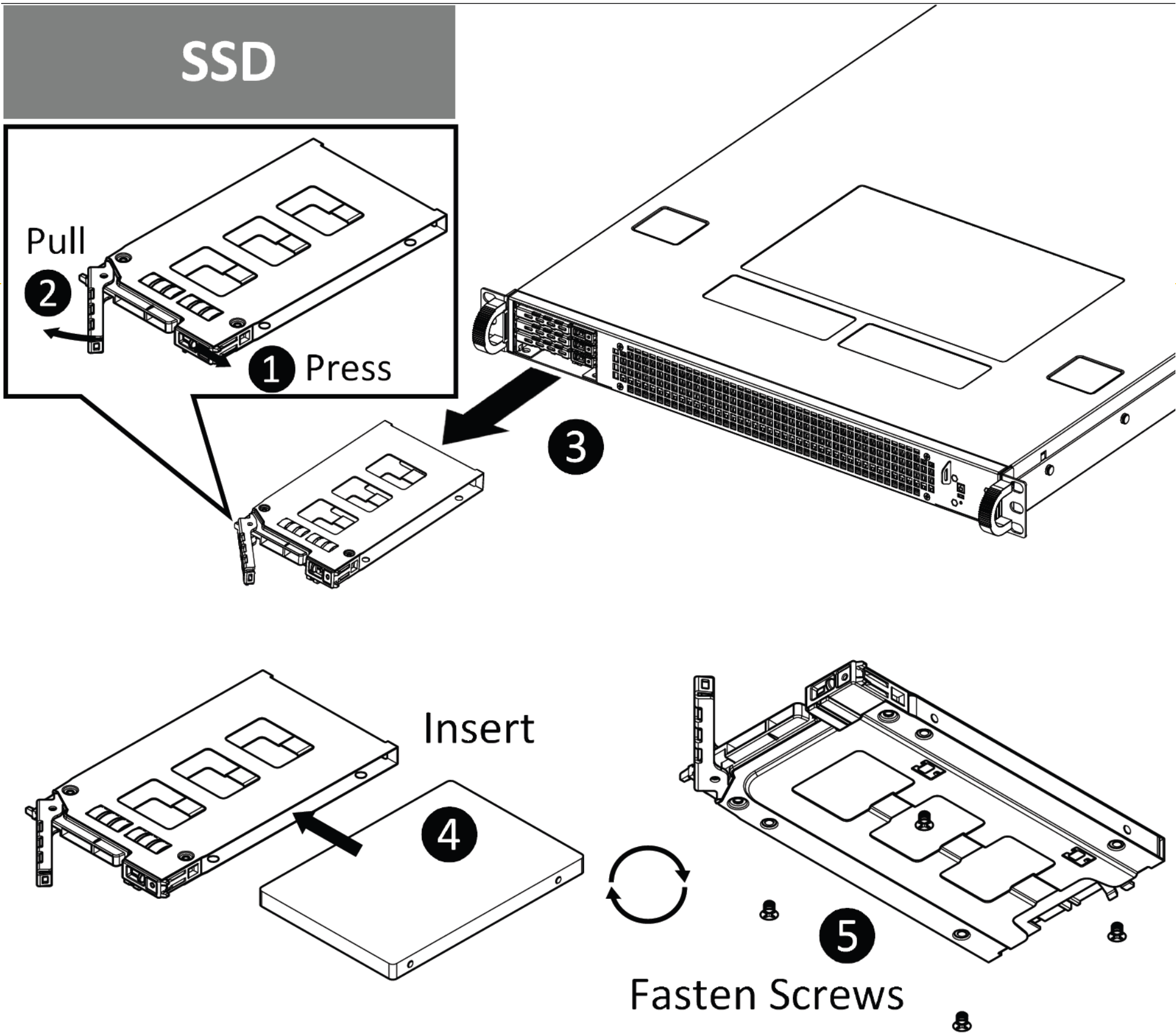
Make sure a click is heard when pushing the push-pins.

10.1.3 Memory Installation

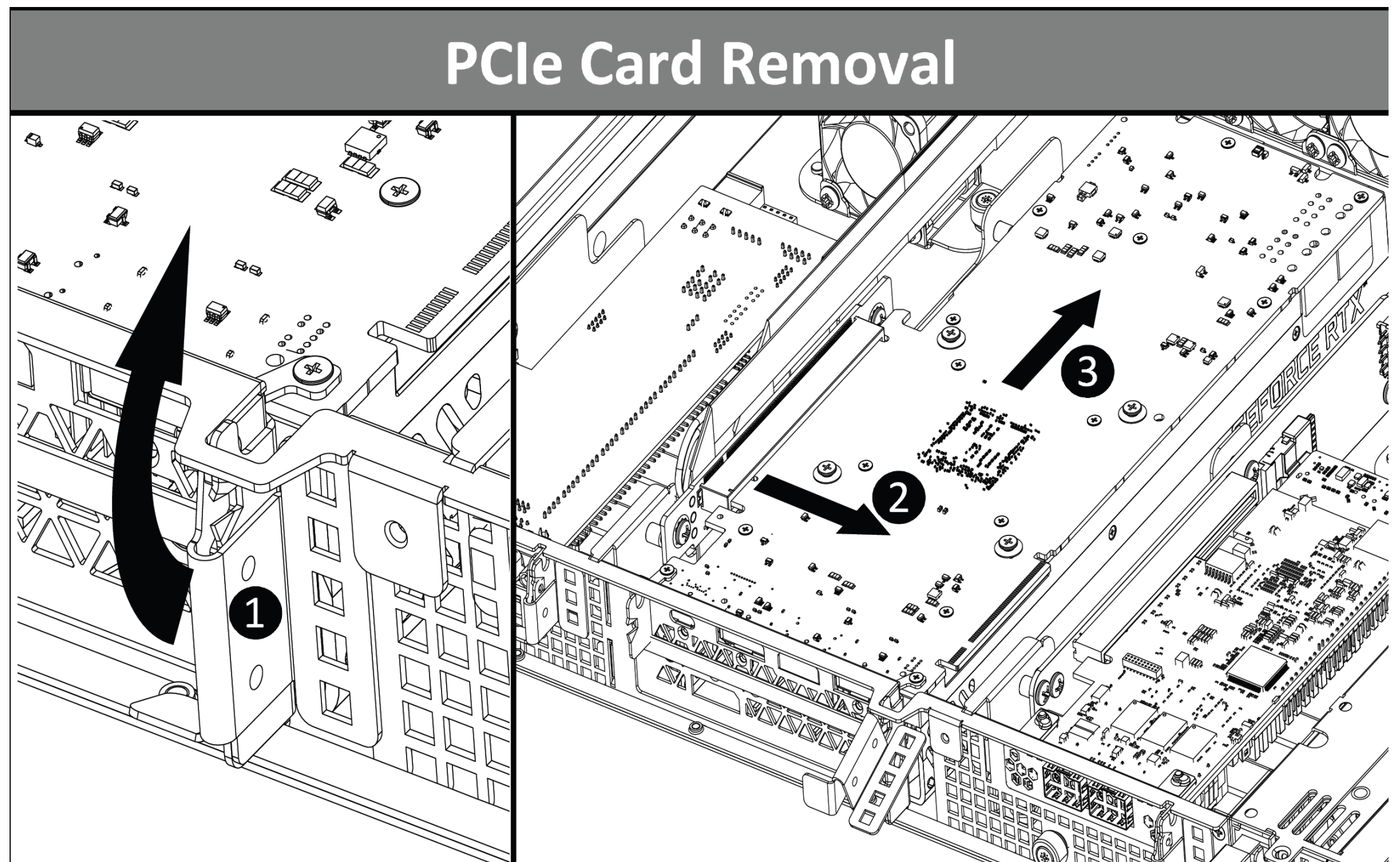


To remove a DIMM





12. PCIe Device Installation

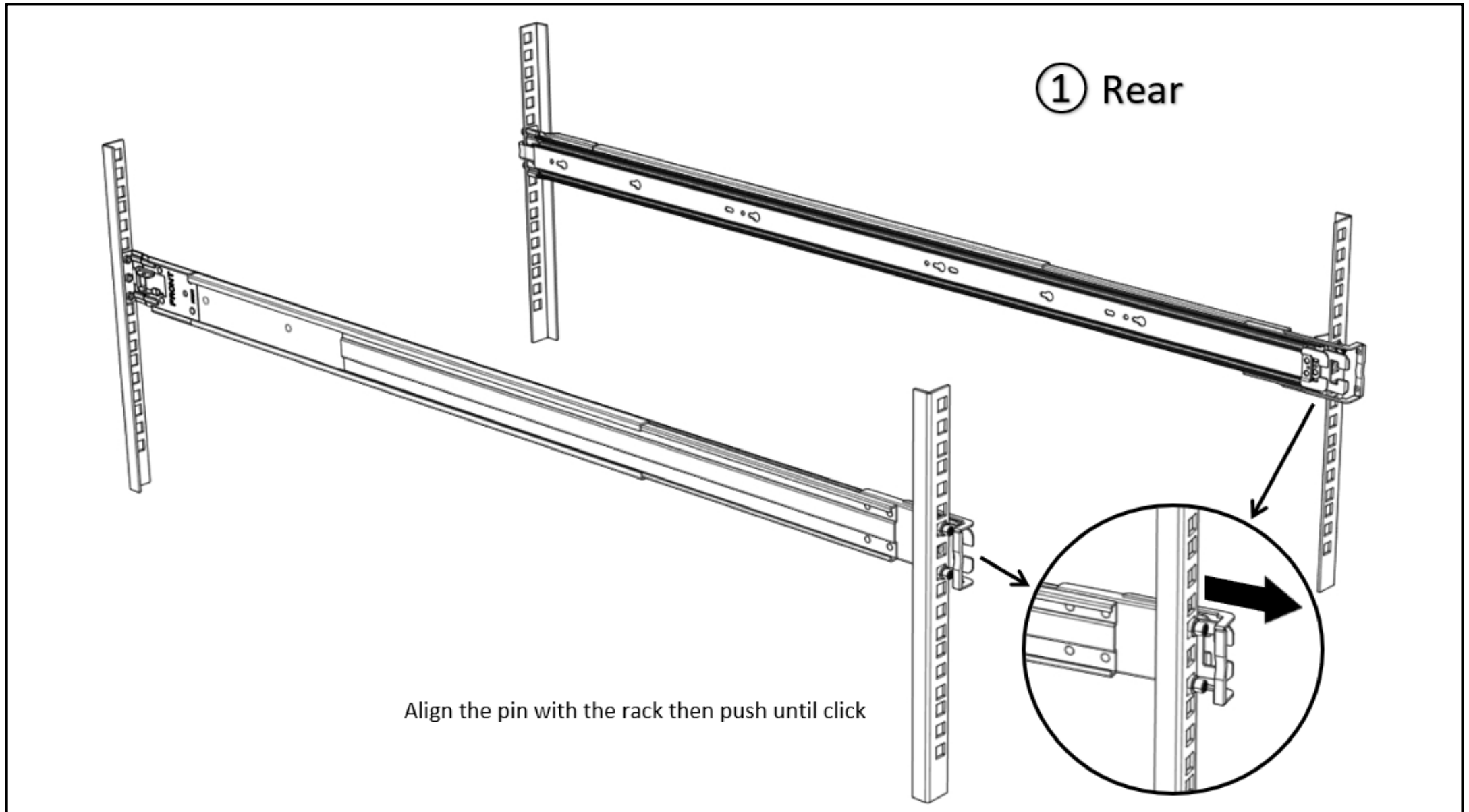


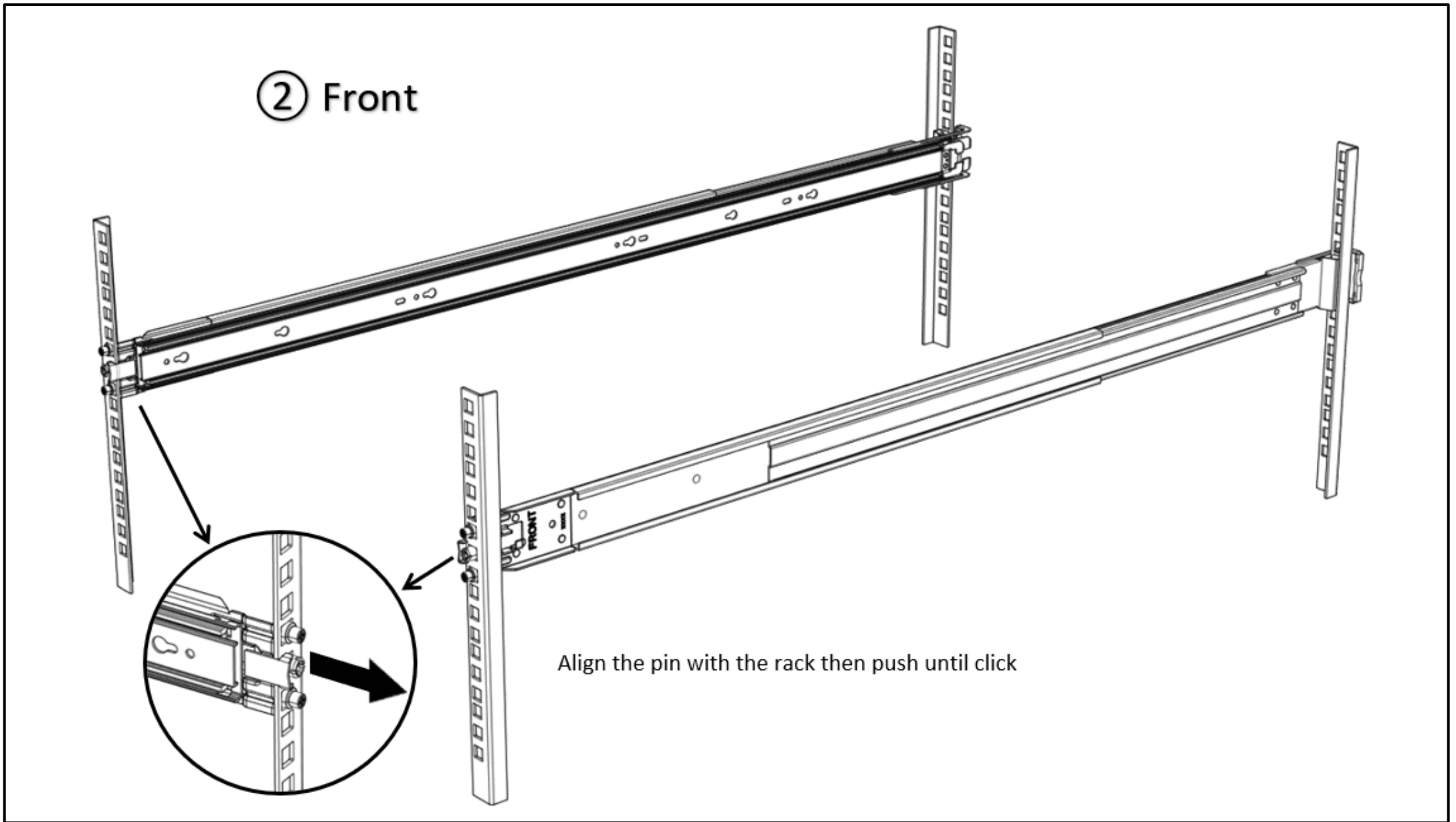
1. Lift up PCIe bracket latch
2. Pull out the card from PCIe slot
3. Remove the card
4. Repeat above procedure reversely for new card installation

13. Rack Mounting

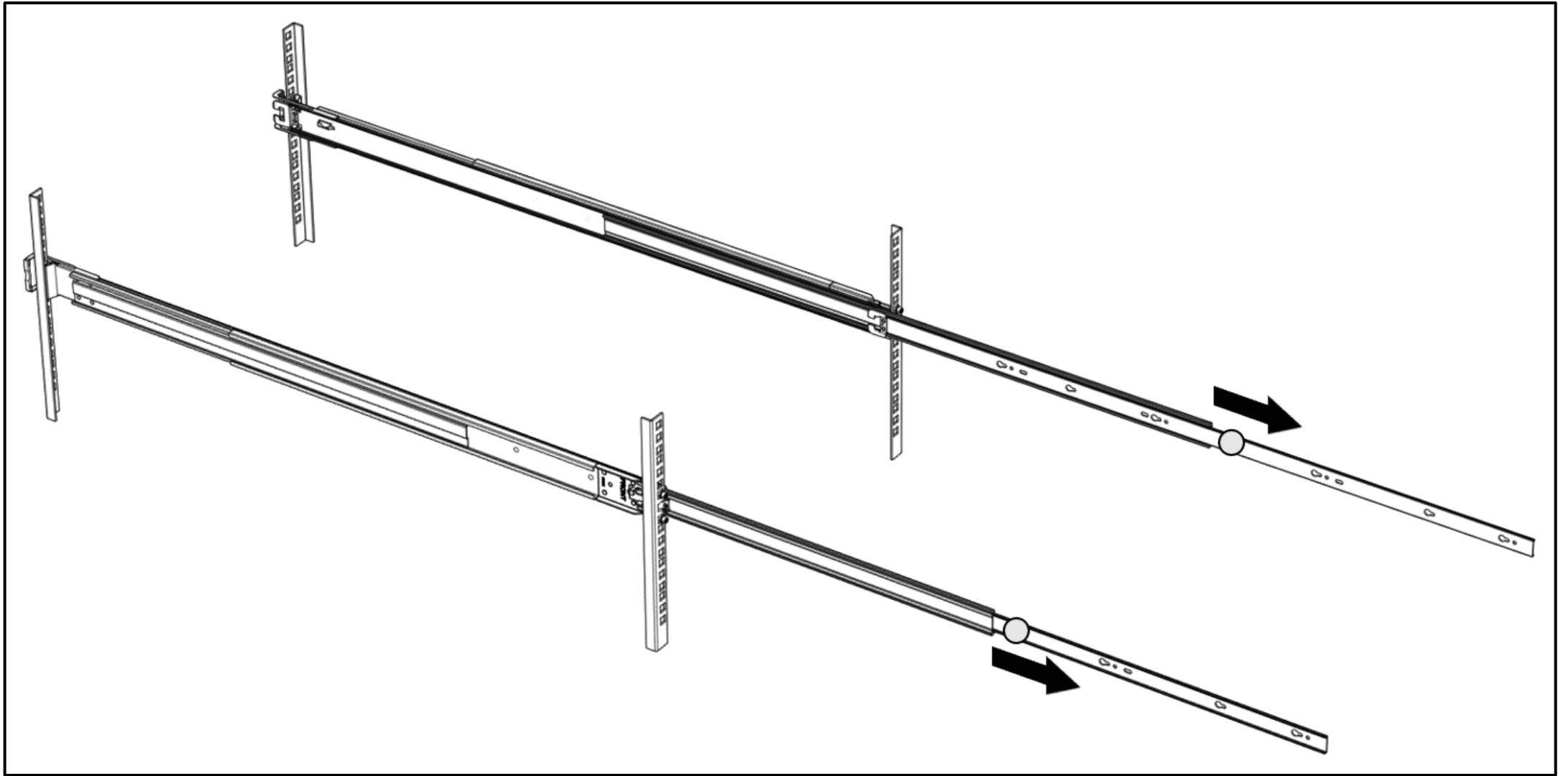
This section provides information on how to mount a system into the rack with the rack rails.

Step 1. Install rails into the rack

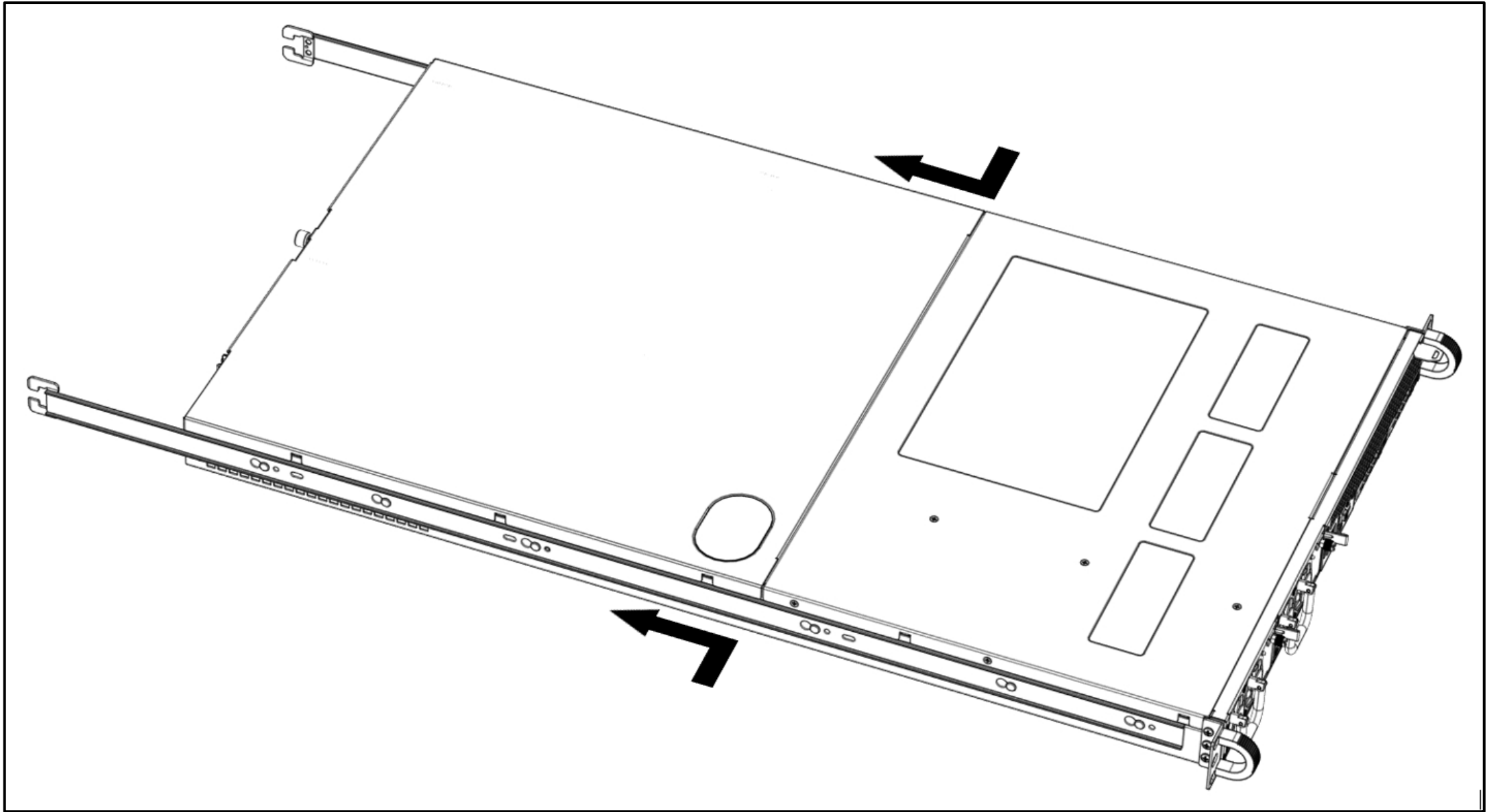




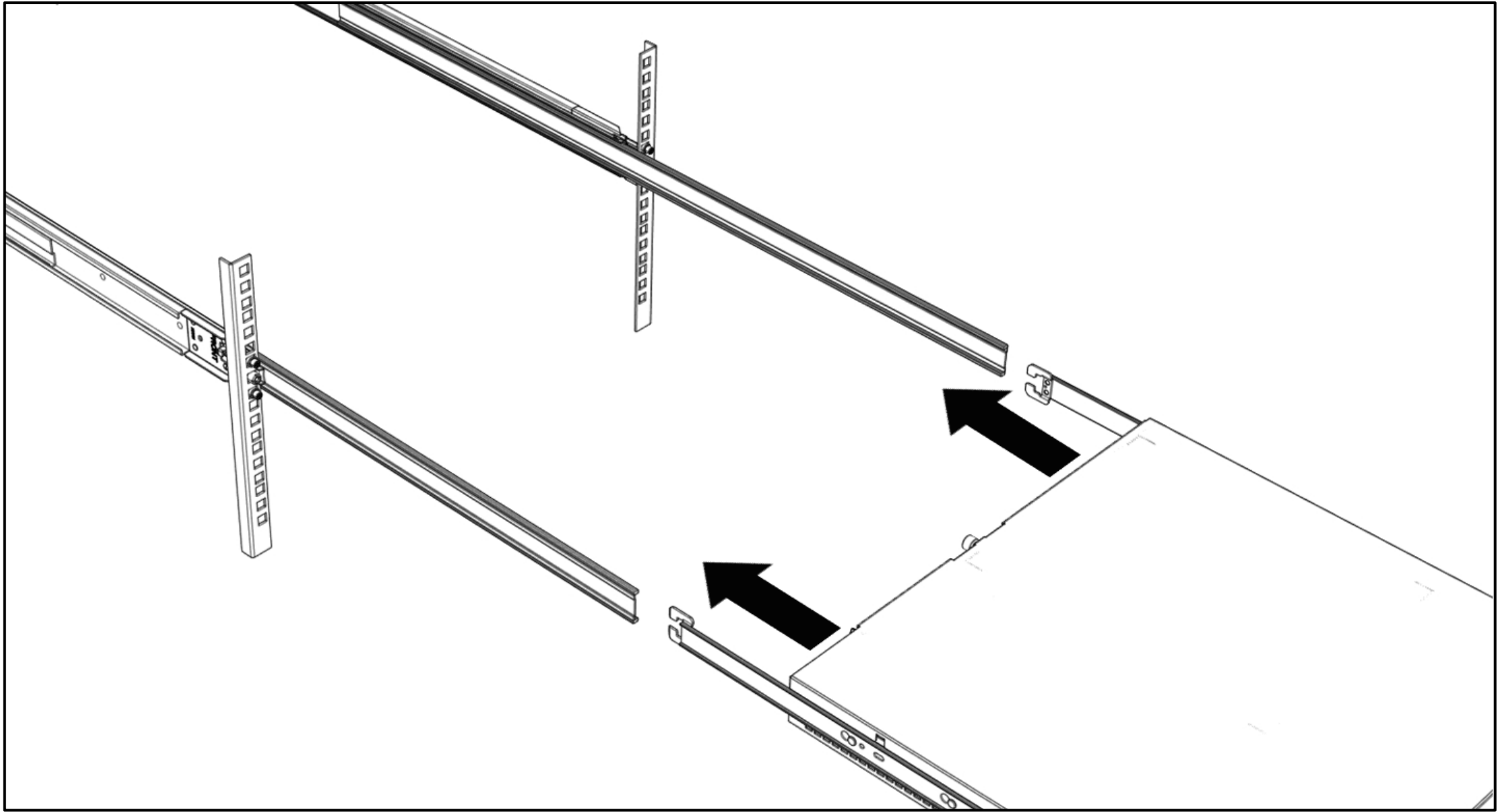
Step 2. Pull the inner and middle rails fully extended in lock position. Pull the white release button to slide out the inner rail.



Step 3. Align the inner rail with the chassis mounting key, push and slide to lock. (The chassis shown below is only for reference)



Step 4. Horizontally slide the chassis into the middle rail until click.



Step 5. Pull/Push the blue release button on the inner rail to unlock the chassis and then push the chassis into rack. (The chassis shown below is only for reference)

