

MINISFORUM

New Gen AI Workstation Series

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• Disclaimer

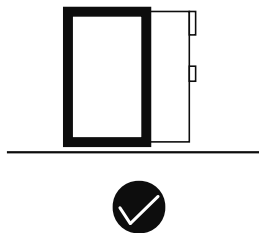
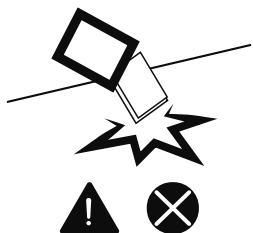
1. Thank you for purchasing MS-02-Ultra product.
2. The contents mentioned in this disclaimer are related to your safety, legal rights and responsibilities. Please pay attention to any warnings, cautions and attention signs on the manual and product labels, and install according to the manual in the manual.
3. The product is relatively complex, so users need to have basic hands-on installation skills and safety knowledge. Please exercise caution during the installation process.
4. Before using this product, please read the manual carefully to ensure that the product can be set up correctly. Failure to follow the warnings, cautions, and attention signs specified in the manual may damage the product or data, and may result in personal or property injury or loss.
5. Once you use this product, you are deemed to have carefully read the contents and requirements of the disclaimer, warnings, cautions, and attention signs, and to have understood and accepted all such content. You agree to take full responsibility for any consequences arising from the use of this product, and commit to using it solely for legitimate purposes, as well as agreeing to this disclaimer and any policies or instructions formulated by MINISFORUM.
6. In addition to the warranty terms, MINISFORUM is not legally responsible for damage or injury caused directly or indirectly by using this product, especially those caused by failure to operate in accordance with safety instructions. Users should follow the manual mentioned in this disclaimer and manual.
7. The final interpretation right of this disclaimer belongs to MINISFORUM.

• Tips for Use

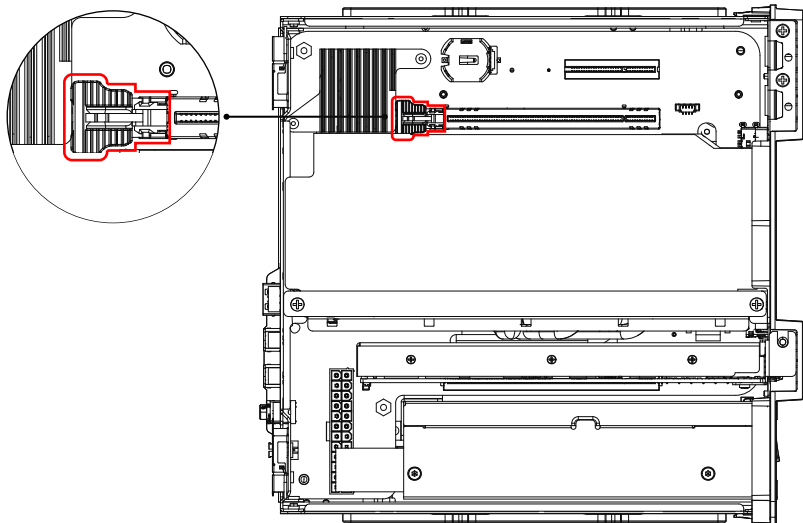
1. Dust, moisture and drastic temperature changes will affect the product's service life, so please try to avoid placing the product in such environments.
2. The suitable temperature for this product is 0°C ~ 35°C.
3. When using this product, please ensure there is sufficient heat dissipation space around it. Avoid placing small items such as paper scraps, screws, and wires near the product's adapter, slots, or ports, as this may cause short circuits or poor contact. Do not insert any objects into the product's internal components to prevent device short circuits or circuit damage.
4. This device should be installed and operated with a minimum distance of 20 cm between the radiator and your body.
5. When you use the power extension cords, the total current of all connected products should be within the rated current of cables, ensuring stable operation.

• Precautions

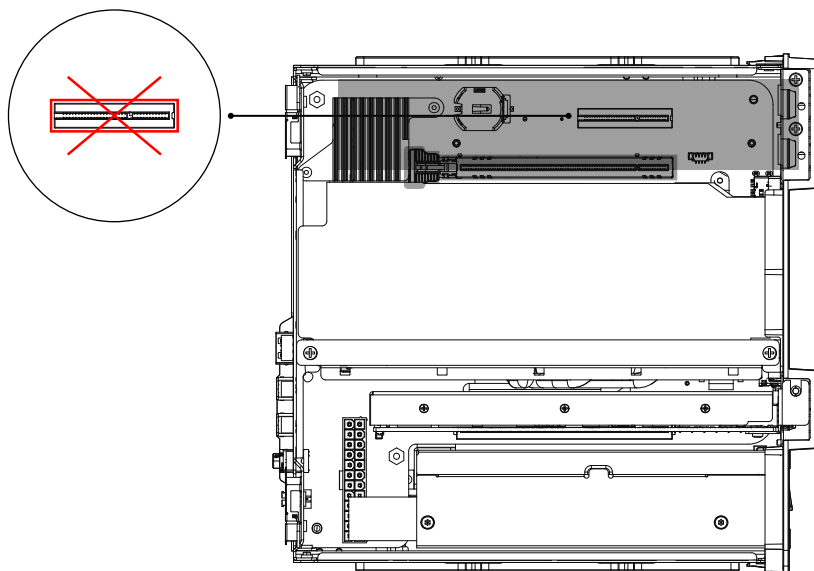
- ▲ The motherboard core module supports tool-free quick removal. After placing the device on the desktop, loosen the two hand-tightened screws of the back cover and pull out the motherboard core module. After loosening the hand-tightened screws, do not place the device in a suspended position. Suspended placement may cause the motherboard core to slide out due to free fall, and dropping could result in crushing injuries and host damage.



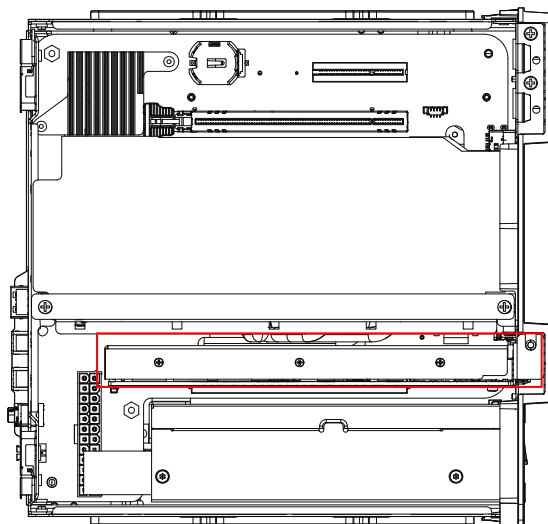
▲ To remove the PCIe x16 slot, unlock the PCIe slot first.



▲ Installing a dual-slot graphics card in the PCIe x16 slot will render the PCIe x4 slot unusable.



- ▲ The MS-02-Ultra with 285HX comes with a default PCIe to 25G+2xNVMe adapter card, which will occupy this slot.



• Maintenance Guideline

1. Do not step on the power cord or put anything on your Mini PC.
2. Do not spill water or any other liquid over this product.
3. There's still some current passing through even when the system is off. To avoid severe damage caused by possible electric shock, please plug out all power cables from sockets temporarily before cleaning or moving this product.
4. If you encounter the technical problems with the product, please unplug the power cord and contact our technical support team or authorized retailers.

• FAQ

1. If you purchased a barebone system and installed the Windows operating system yourself, please ensure that the Windows Fast Startup feature is disabled. This feature may cause abnormal operation of your device.
2. The integrated graphics will occupy a portion of the system memory as dedicated GPU memory.
3. Only the M.2 interface next to WiFi supports both NVMe and SATA protocols. Other M.2 SSD interfaces do not support SATA parsing and only support PCIe NVMe SSDs.
4. The PCIe slot near PSU uses MINISFORUM's proprietary protocol. The network port and two NVMe interfaces can only be expanded simultaneously when a PCIe card compatible with MS-02-Ultra is inserted. If a third-party PCIe card is inserted, it will only support one PCIe 4.0x4 device.
5. The PCIe x16 slot next to CPU supports splitting. You can set the split mode in the BIOS settings, with the maximum split mode being PCIe x8+PCIe x4+PCIe x4.

6. None of the Type-C ports will provide power when the device is turned off or in standby or sleep mode.

7. The preferred memory slots are those on the CPU side. Using only the memory slots on the back side of CPU may result in boot failure.

8. Some PCIe devices may have speed compatibility issues with PCIe 5.0/PCIe 4.0. In case of any PCIe speed compatibility issues, you can lower the PCIe speed in BIOS for better compatibility.

9. For enhanced system stability, the SSD on MS-02-Ultra's dedicated PCIe 25G network card runs in PCIe 3.0 x4 mode by default. For higher performance, you can manually set it to PCIe 4.0 mode in BIOS.

Warning! Enabling PCIe 4.0 may cause compatibility issues, and any risks or liabilities arising from this shall be borne by the user.

10. For optimal idle power consumption and user experience, the ASPM feature of SSD is enabled by default. If SSD compatibility issues arise, it can be disabled in BIOS to enhance SSD compatibility.

11. For better performance, inserting a dedicated graphics card will disable the integrated graphics card by default. This will prevent the onboard USB4, USB4V2, and HDMI® ports from providing display output when a dedicated graphics card is inserted.

If you need to use the onboard display output function or the acceleration function of the integrated graphics card, you can still enable the integrated graphics card under Advanced->Onboard Setting in the BIOS menu.

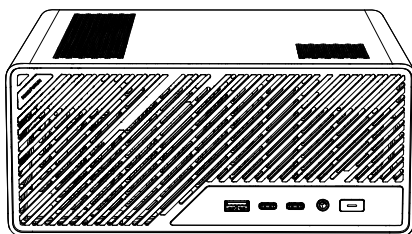
12. The MS-02-Ultra features a four-slot memory design, with slightly lower memory compatibility compared to typical dual-slot Mini PCs. The default frequency is 4400/4800MHz. Barebone system users are advised to visit (github.com/minisforum-docs/MS-02-Ultra) to check memory compatibility and confirm that the memory being used is not on the incompatibility list.

Note: --- This information contains additional instructions for this item.

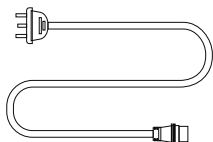
Important! --- This information contains instructions that must be followed.

Warning! --- This information contains details related to ensuring the safety of users and the product.

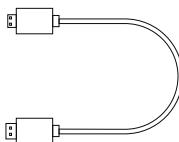
Package Contents



MINI PC



Power Cord */



HDMI® Cable */



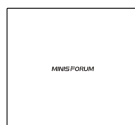
SSD Heatsink */



Clip */



Mylar
(PCIe expansion card area) */

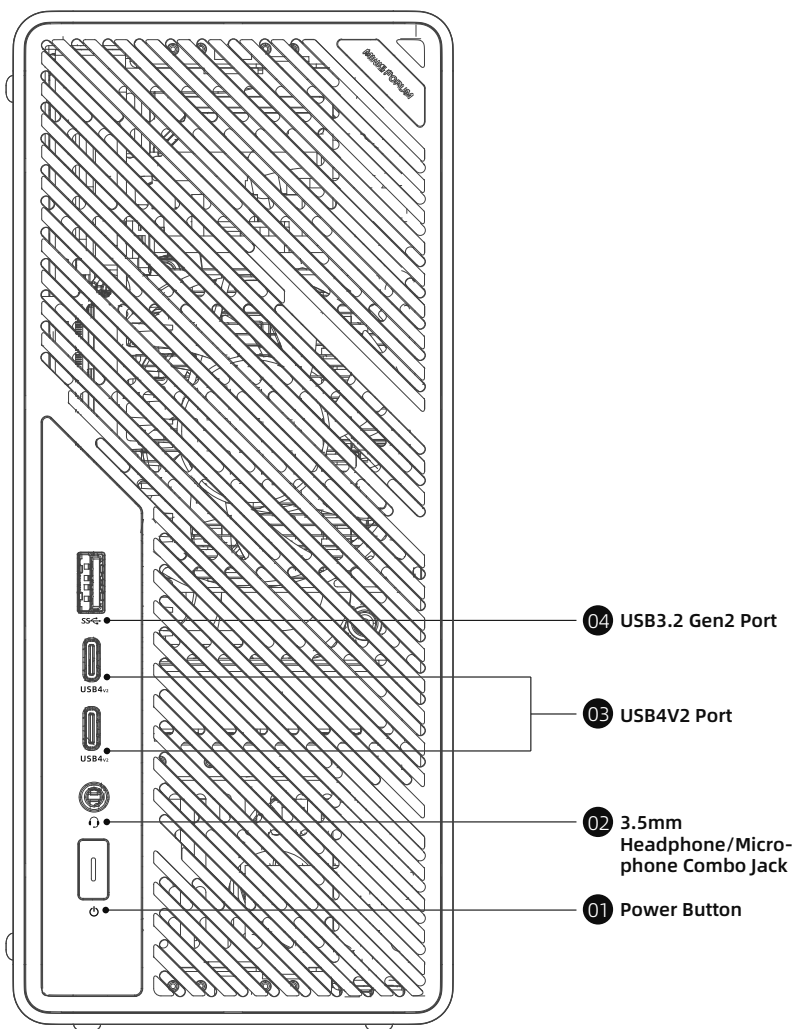


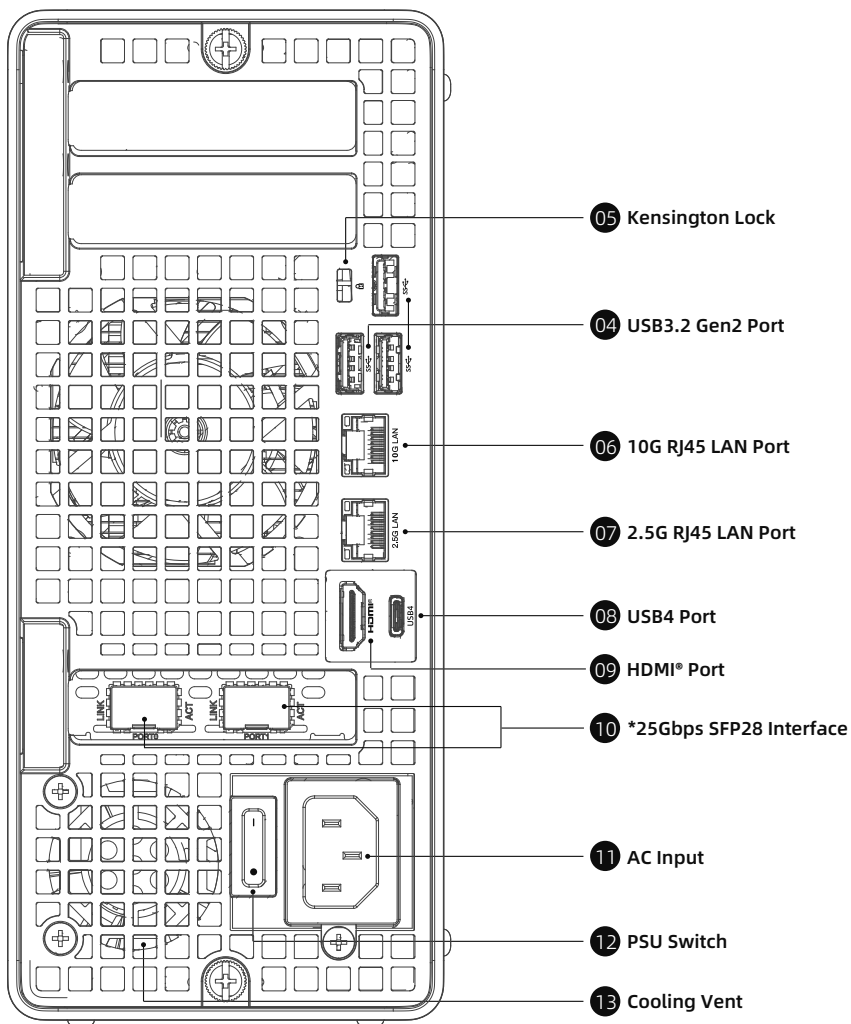
User Manual */

Note:

* The power adapter and other accessories included in the box will vary depending on the model parameter or area purchased.

3 Getting to Know Your Mini PC





Interface Introduction

01 Power Button

The Power button allows you to turn the Mini PC on/off. When the Mini PC is powered on, press this button to enter sleep mode, or press and hold it for 10 seconds to force shut down the Mini PC.

02 3.5mm Headphone/Microphone Combo Jack

This connector is used to connect audio output signals to a power amplifier or headphones. You can also use it to connect an external microphone or output signals from an audio device.

03 USB4V2 Port

This interface supports USB4V2 (TBT5) transfer protocol, with a maximum data transfer rate of 80 Gbps. It supports Alt DP audio-video output, provides only 5V external power supply, and enables PCIe data transfer as well as Thunderbolt Ethernet connectivity.

04 USB3.2 Gen2 Port

The USB3.2 Gen2 (Universal Serial Bus) port provides a transfer rate of up to 10 Gbps. It can connect devices such as keyboards, pointing devices, cameras, hard disks, printers, and scanners.

05 Kensington Lock

The Kensington Lock can be connected to a locker to prevent others from stealing your Mini PC.

06 10G RJ45 LAN Port

This RJ45 network port supports standard Ethernet cables and can connect to local area networks (LANs), with a transfer rate of 10 Gbps.

07 2.5G RJ45 LAN Port

This RJ45 network port supports standard Ethernet cables and can connect to local area networks (LANs), with a transfer rate of 2.5 Gbps.

08 USB4 Port

This interface supports USB4 transfer protocol, with a maximum data transfer rate of 40 Gbps. It supports Alt DP audio-video output, provides only 5V external power supply, and enables PCIe data transfer as well as Thunderbolt Ethernet connectivity.

09 HDMI® Port

The HDMI® port (High-Definition Multimedia interface) is uncompressed, fully digital audio/video interface that provides a common data connection channel for compatible devices. It can be used to connect external display devices and televisions.

10 *25Gbps SFP28 Interface

Note: This interface is only available on models equipped with 285HX.

Ultra-high-speed network interface. This interface supports a maximum network connection rate of 25 Gbps. When using SFP28 cables and modules, it can reach a transfer rate of 25 Gbps, while using SFP+ cables and modules allows for a transfer rate of 10 Gbps.

11 AC Input

Connect the power cord to a power source. The built-in high conversion rate power supply can convert AC power to DC power, providing power to your Mini PC.

Warning! To prevent damage to your Mini PC, please do not block the power's cooling vents.

12 PSU Switch

It is the switch for the built-in PSU power supply, with "O" for off and "I" for on.

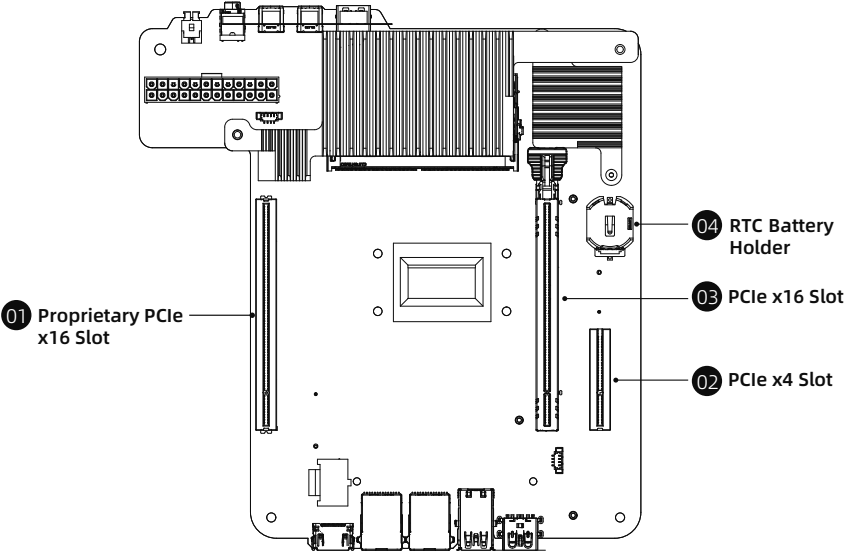
13 Cooling Vent

The cooling vents allow your Mini PC chassis to expel hot air out.

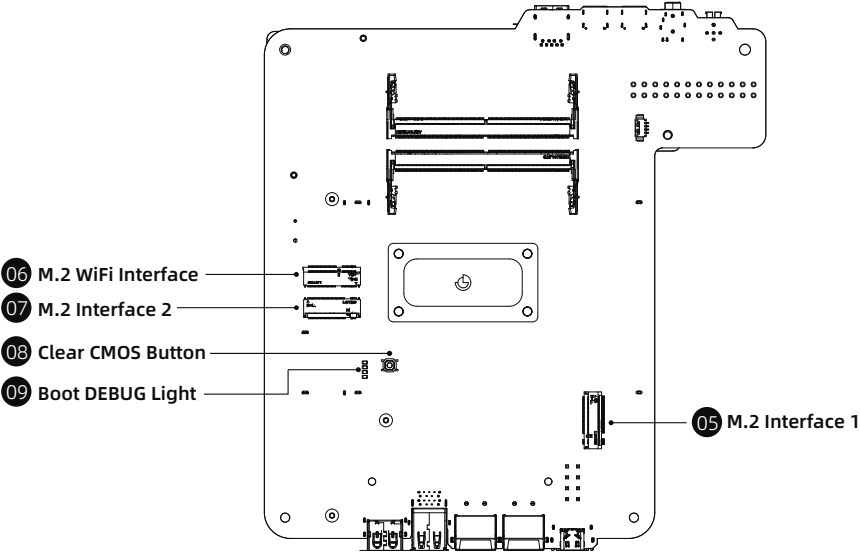
Important! For optimum heat dissipation and air ventilation, ensure that the cooling vents are free from obstructions (such as paper, books, clothes, transmission lines).

Motherboard Layout

Front



Back



Motherboard Ports

01 Proprietary PCIe x16 Slot

1. This PCIe slot uses MINISFORUM's proprietary protocol. The network port and two NVMe interfaces can only be expanded simultaneously when a PCIe card compatible with MS-02-Ultra is inserted. If a third-party PCIe card is inserted, it will only support one PCIe 4.0x4 device. The first PCIe x4 of this interface is directly connected to CPU, and NVMe's PCIe x4 connects to PCH.

2. * A PCIe to 25G+2xNVMe adapter card dedicated to the MS-02-Ultra will only be included with devices equipped with 285HX.

3. This slot uses a proprietary protocol, and supports up to three devices simultaneously. The slot doesn't use splitting technology. It is designed with all the necessary signals for three full PCIe devices.

Note: This slot does not support standard splitting protocols.

02 PCIe x4 Slot

1. It connects to PCH and supports up to PCIe 4.0x4 PCIe slot.

2. This interface only supports a physical PCIe x8 length and does not accommodate PCIe x16 length cards.

03 PCIe x16 Slot

1. It directly connects to CPU and supports up to PCIe 5.0x16 PCIe slot.

2. It supports splitting, and you can set the splitting mode in BIOS settings, with a maximum split mode of PCIe x8+PCIe x4+PCIe x4.

3. Some PCIe devices may have speed compatibility issues with PCIe 5.0/PCIe 4.0. To resolve PCIe speed compatibility issues, you can lower the PCIe speed in BIOS for better compatibility.

04 RTC Battery Holder

The RTC battery holder is a component designed to hold a coin cell battery for the real-time clock (RTC) module. It is used to secure the battery and provide continuous power to RTC, preventing the loss of clock data.

05 M.2 Interface 1

It connects to SSD hard drive, and supports only PCIe protocol, with a maximum speed of PCIe 5.0x4.

06 M.2 WiFi Interface

It is the M.2 E KEY WiFi interface, and supports up to PCIe 4.0x1/CNVio3 protocols, as well as USB2 protocol.

07 M.2 Interface 2

It connects to SSD hard drive, and supports both PCIe and SATA protocols, with a maximum speed of PCIe 4.0x4.

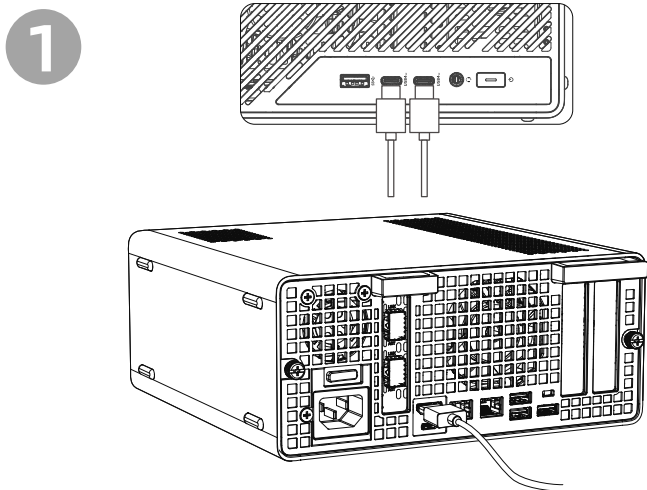
08 Clear CMOS Button

Please remove the power source and hold the reset hole for 10 seconds to restore the BIOS to its factory default settings.

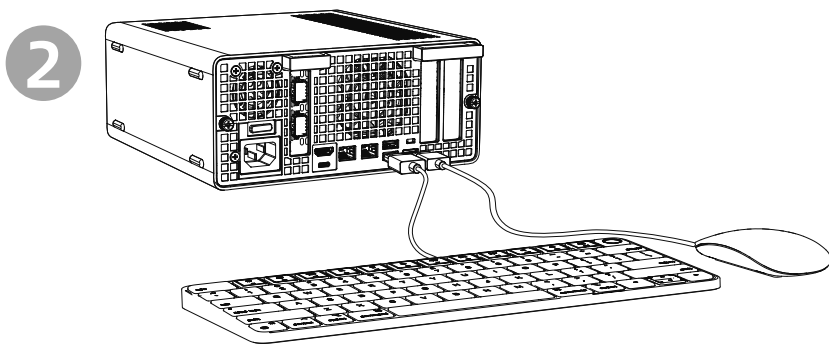
Important! If you encounter certain issues during use, you can first try to resolve them by holding the reset hole.

09 Boot DEBUG Light

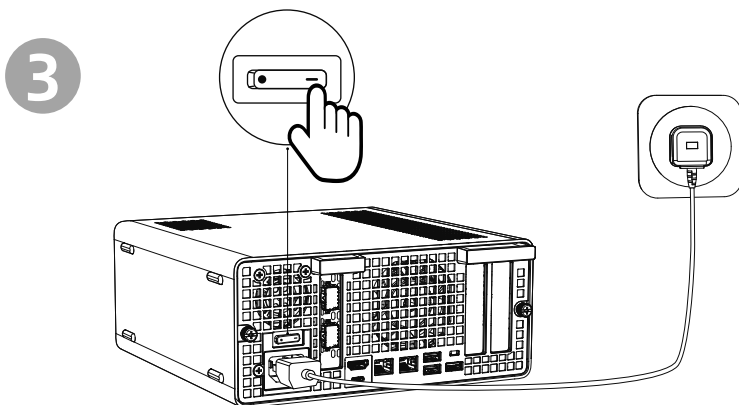
It can be used to debug boot failures. It includes CPU, RAM, VGA, and BOOT lights.



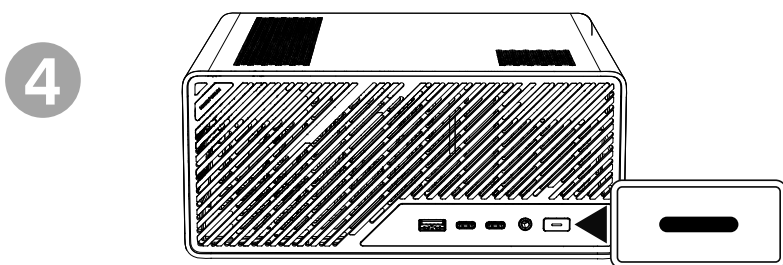
Connect the display to the Mini PC's HDMI® port/USB4/USB4V2 port.



Connect the keyboard and mouse.



Connect the provided power cord to your Mini PC.
Make sure that the AC power switch is in the "-" on position.



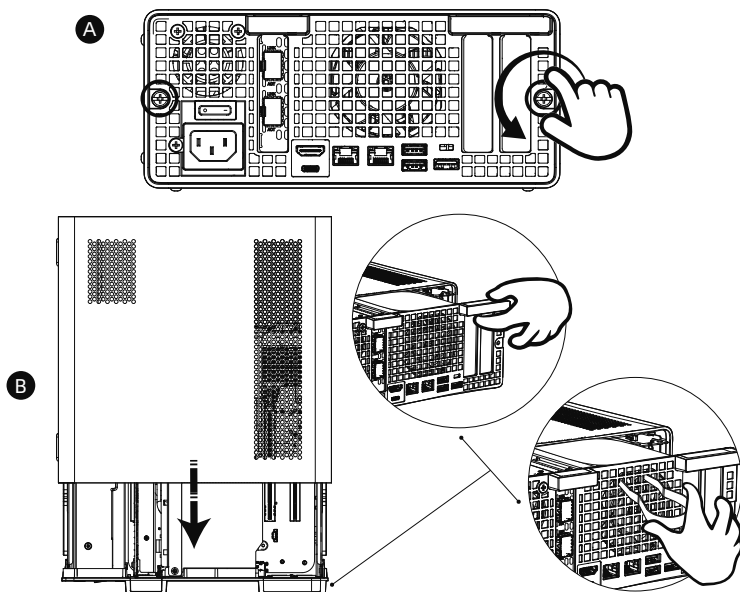
Turn on the power and start the Mini PC.

If the Mini PC is frozen or slow to respond, press and hold the power button at least for 10 seconds to force it shutdown.

To put your Mini PC on sleep mode, press the power button once.

Installation Guide

- 1 Remove the hand-tightened screws and pull out the motherboard slot.
(Alternatively, use the provided tool to pull out the motherboard slot at the indicated position.)



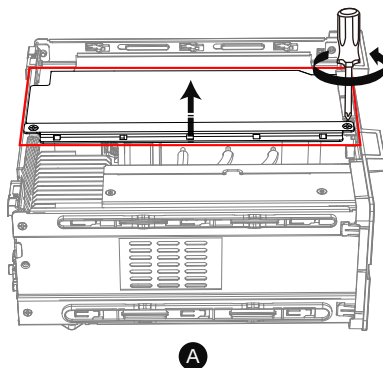
DIY DDR

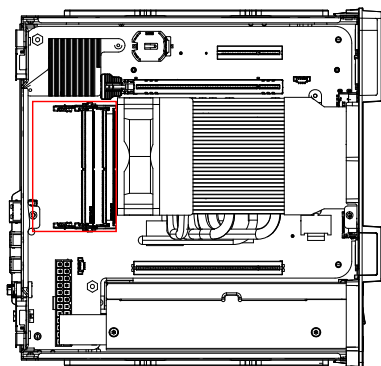
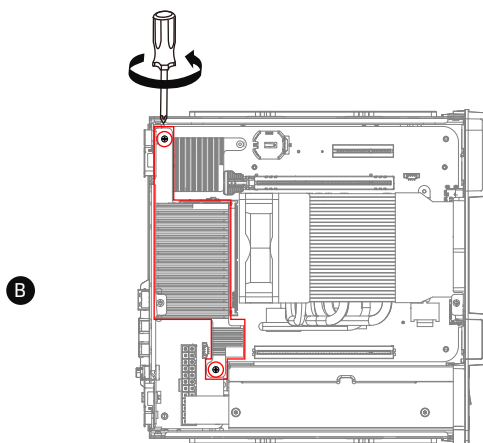
Important!

1. MS-02-Ultra has 4 memory slots, supporting a maximum capacity of 256GB ECC. The two memory slots located on the CPU side are the main memory slots. If only two memory modules are used, they must be inserted into the slots on the CPU side.
2. The MS-02 Ultra features a four-slot memory design, with slightly lower memory compatibility compared to typical dual-slot Mini PCs. The default frequency is 4400/4800MHz. Barebone system users are advised to visit (github.com/minisforum-docs/MS-02-Ultra) to check memory compatibility and confirm that the memory being used is not on the incompatibility list.

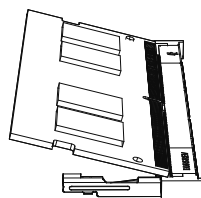
- 2 Use a tool to remove the fixing bracket and memory heatsink.
Install the memory module into the SODIMM slot by inserting it slantly into the buckles on both sides and fix it.

Front



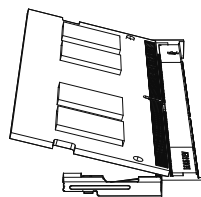
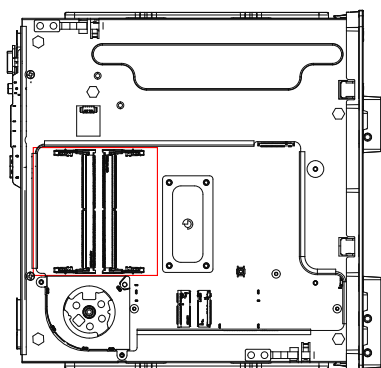


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- 3 Install the memory module into the SODIMM slot by inserting it slantly into the buckles on both sides and fix it.

Back

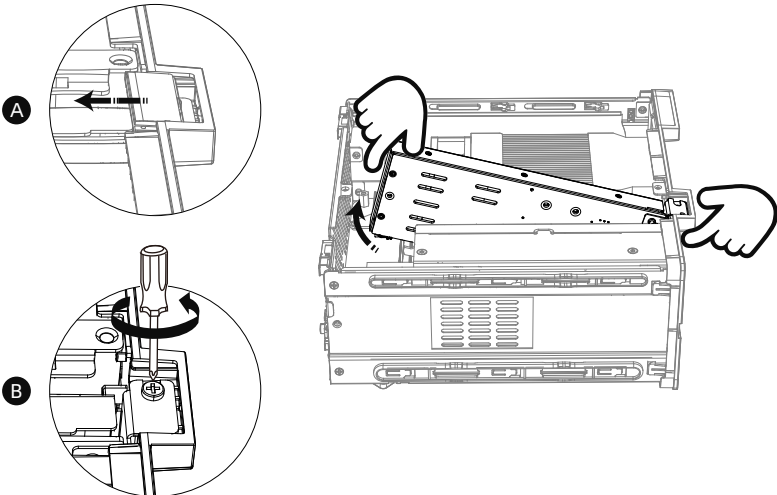


SSD on the DIY-specific PCIe to 25G+2xNVMe Adapter Card

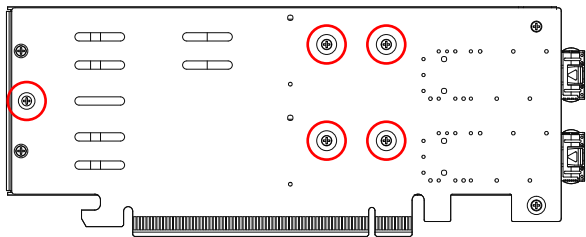
Front

Note: *A PCIe to 25G+2xNVMe adapter card dedicated to the M5-02-Ultra will only be included with devices equipped with 285HX.

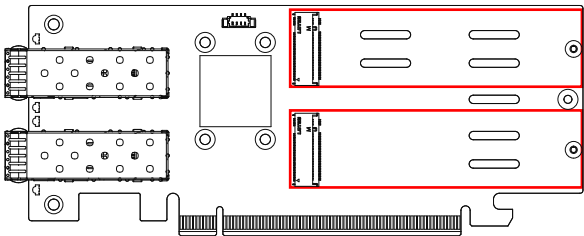
- 4 Slide open the PCIe bracket, use a tool to remove the PCIe fixing screws, and take out the PCIe to 25G+2xNVMe adapter card.

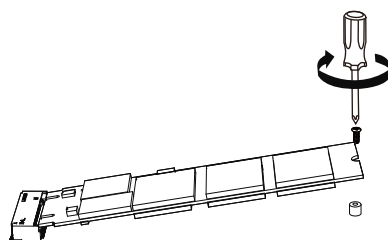


- 5 Use a tool to remove the fixing screws from the PCIe to 25G+2xNVMe adapter card.

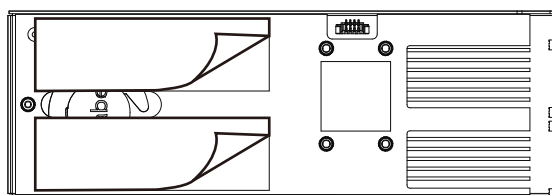


- 6 Align the SSD card with the notch in the card slot and insert it at an angle, then secure it with screws.

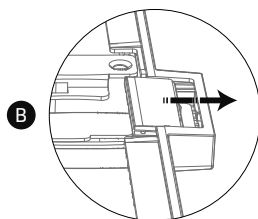
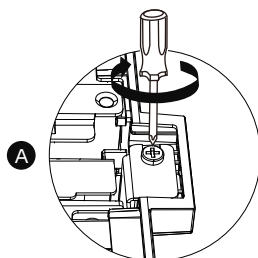
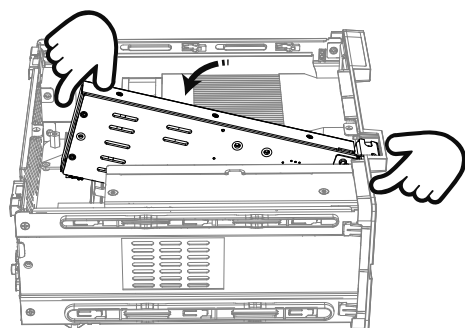




- 7 After mounting the SSD card, remove the protective film from the heatsink on the other side of the casing. Then, use a tool to re-lock the PCIe to 25G+2xNVMe adapter card.



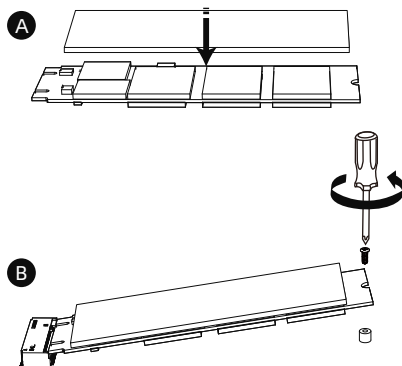
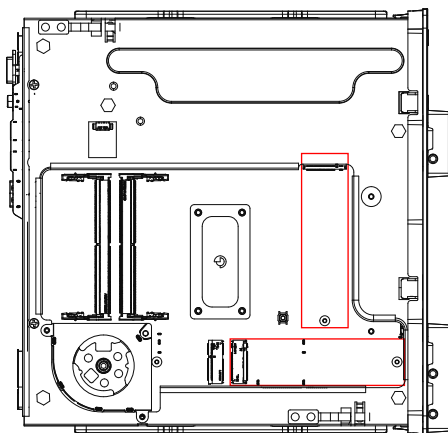
- 8 Insert the PCIe to 25G+2xNVMe adapter card into the proprietary PCIe x16 slot, tighten the PCIe fixing screws, and install the PCIe bracket.



DIY Onboard SSD

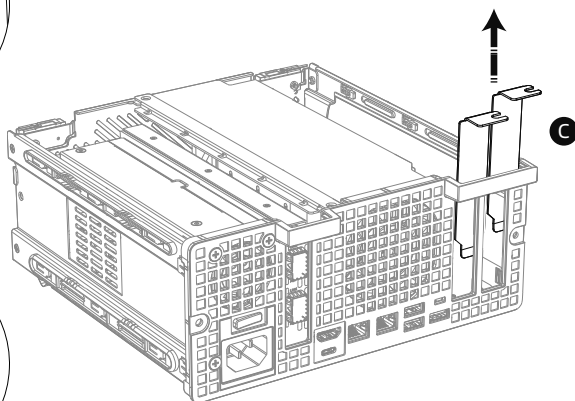
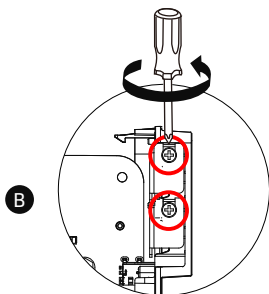
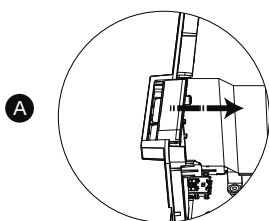
- 9 Attach the heatsink to the SSD card. Align the SSD card with the notch in the card slot and insert it at an angle, then secure it with screws.

Back

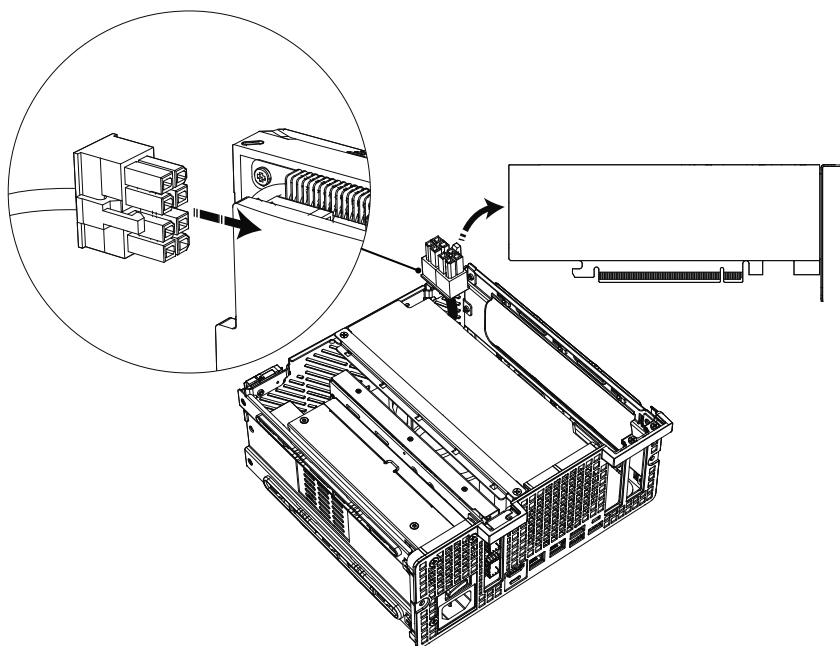


DIY PCIe Device (taking PCIe x16 slot as an example)

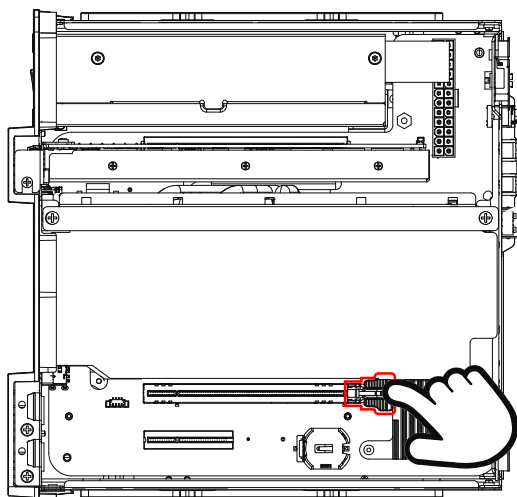
- 10 Slide open the PCIe bracket, use a tool to remove the PCIe fixing screws, and take out the decorative PCIe cover.



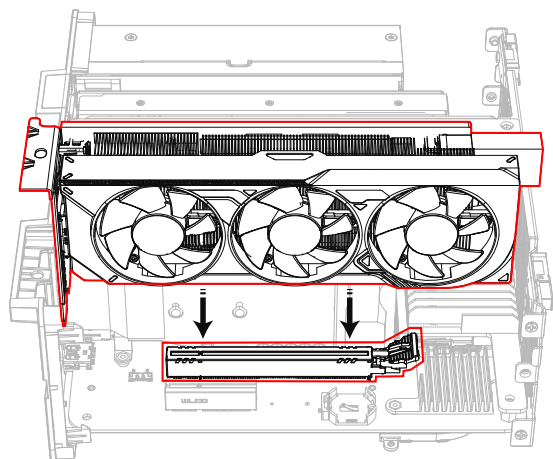
Important! *If the PCIe card requires separate power supply, make sure to connect the cable for separate PCIe power supply from the PSU first.



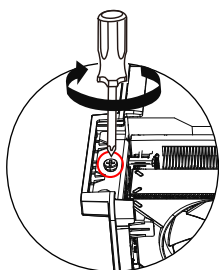
- 11 Unlock the PCIe x16 slot, insert the PCIe card, and tighten the fixing screws.



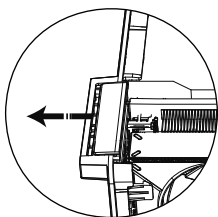
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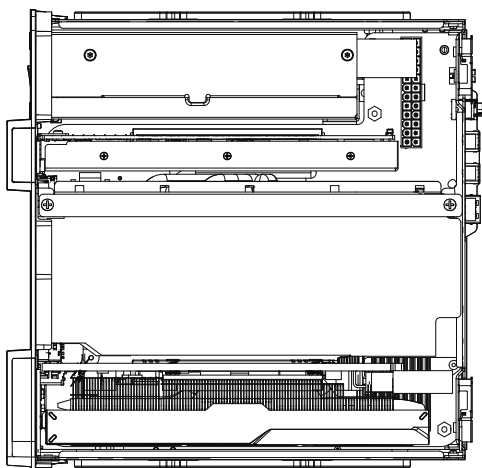
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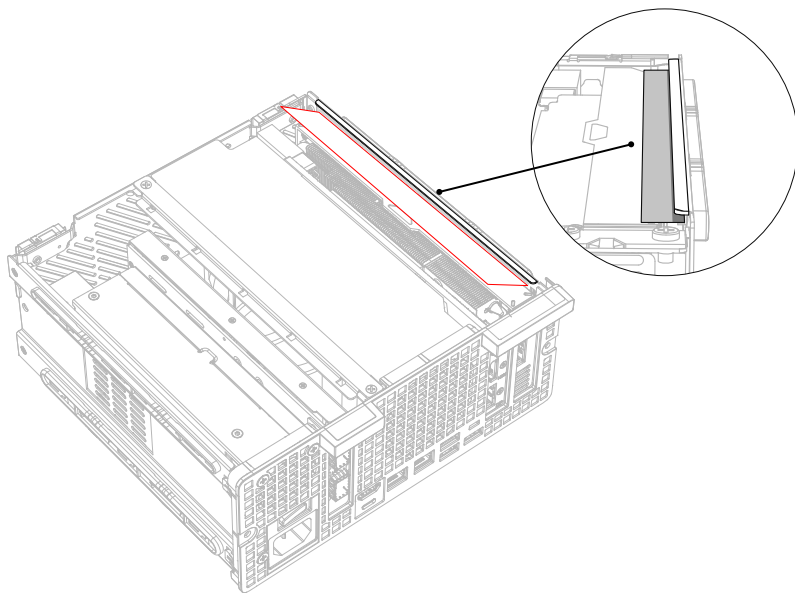
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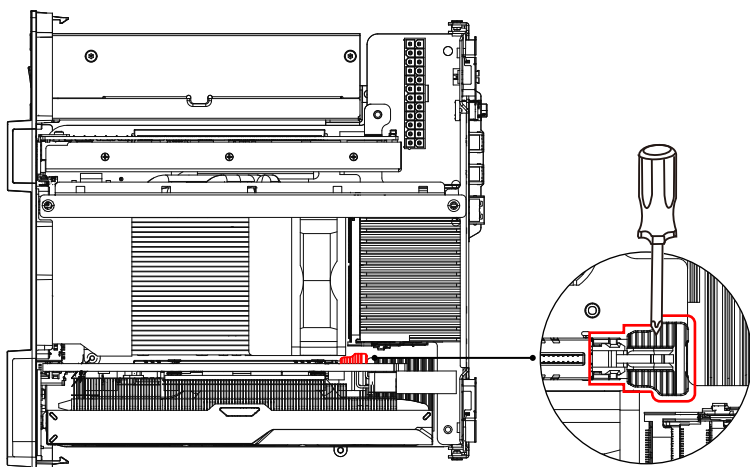
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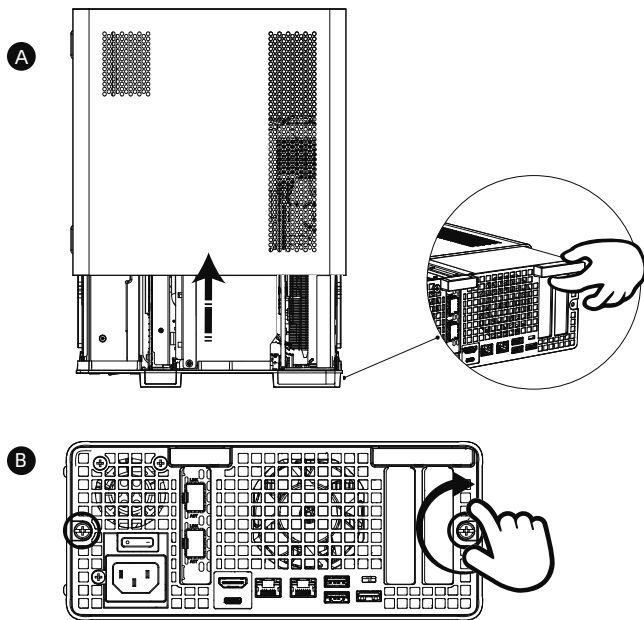
- 12 After installing the PCIe card, insert the mylar sheet from the accessory bag at an angle into the gap and then stick it onto the PCIe card.
- Important!** This is to prevent the hot air from the graphics card exhaust from being sucked back into the graphics card fan, which could cause a decrease in power consumption.



Warning! To remove the PCIe x16 slot, use a thin tool to unlock the PCIe slot first.



- 13 After completing the installation, reattach the motherboard slot and tighten the hand-tightened screws.



FCC STATEMENT

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radiocommunications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Transmitters in the 5.925-7.125 GHz band are prohibited from operating to control or communicate with unmanned aircraft systems.

FCC regulations restrict the operation of this device to indoor use only. It is prohibited on oil platforms, cars, trains, boats, and aircraft, except it is permitted in large aircraft while flying above 10,000 feet.

This product is only suitable for indoor use only.

联系信息

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