

Technical Specification

Workstation Creator! Rev3

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Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Instructions that you **MUST** follow to complete a task.



NOTE: Tips and additional information to help you complete a task.

Typography

Bold text

Indicates a menu or an item to select.

Italics

Used to emphasize a word or a phrase.

<Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.

Example: <Enter> means that you must press the Enter or Return key.

<Key1> + <Key2> + <Key3>

If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

specifications summary

CPU	<p>LGA1151 socket for 8th Gen Intel® Core™ Processor</p> <p>Supports 14nm CPU</p> <p>Supports Intel® Turbo Boost Technology 2.0*</p> <p>* Support of these features depends on the CPU types.</p>
Chipset	Intel® Z370 Chipset
Memory	<p>4 x DIMM, max. 64GB, DDR4 4000(O.C.)*/3866(O.C.)* / 3733(O.C.)*/3600(O.C.)*/3466(O.C.)*/3400(O.C.)*/3333(O.C.)*/3300(O.C.)*/3200(O.C.)* / 3000(O.C.)*/2800(O.C.)*/2666/2400/2133 MHz, non-ECC, un-buffered memory</p> <p>Dual channel memory architecture</p> <p>Supports Intel® Extreme Memory Profile (XMP)</p> <p>* Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.</p>
Expansion slots	<p>2 x PCIe 3.0/2.0 x16 slots (supports x16, x8/x8, x8/x4+x4*, x8+x4+x4/x0**)</p> <p>1 x PCI Express 3.0/2.0 x16 slot (max. at x4 mode, compatible with PCIe x1, x2 and x4 devices)</p> <p>4 x PCI Express 3.0/2.0 x1 slots</p> <p>* For 2 Intel® SSD on CPU support, install a Hyper M.2 X16 card (sold separately) into the PCIeX16_2 slot, then enable this card under BIOS settings.</p> <p>** For 3 Intel® SSD on CPU support, install a Hyper M.2 X16 card (sold separately) into the PCIeX16_1 slot, then enable this card under BIOS settings.</p>
VGA	<p>Integrated Graphics Processor- Intel® HD Graphics support</p> <p>Multi-VGA output support: DisplayPort/HDMI/DVI-D ports</p> <p>Supports DisplayPort 1.2* with max. resolution 4096 x 2304@60Hz</p> <p>Supports HDMI 1.4b with max. resolution 4096 x 2160@24Hz / 2560 x 1600@60Hz</p> <p>Supports DVI-D with max. resolution 1920 x 1200@60Hz</p> <p>Supports Intel® InTru™ 3D/Quick Sync Video/Clear Video HD Technology/ Insider™</p> <p>Supports up to 3 displays simultaneously</p> <p>Maximum shared memory of 1024MB</p> <p>* DP 1.2 Multi-Stream Transport compliant, supports DP 1.2 monitor daisy chain up to 3 displays</p>
Multi-GPU support	<p>Supports NVIDIA® 2-Way/Quad-GPU SLI™ Technology (with 2 PCIe x16 graphics card)</p> <p>Supports AMD® 3-Way/Quad-GPU CrossFireX™ Technology</p>
USB	<p>Intel® Z370 Chipset</p> <ul style="list-style-type: none"> - 6 x USB 3.1 Gen 1 ports (4 ports @mid-board, 2 ports @back panel, blue) - 6 x USB 2.0/1.1 ports (4 ports @mid-board, 2 ports @back panel) <p>Asmedia® USB 3.1 Gen 2 controller</p> <ul style="list-style-type: none"> - 1 x USB 3.1 Gen 2 port @back panel (teal blue, Type-A) - 1 x USB 3.1 Gen 2 port @back panel (USB Type C™)

(continued on the next page)

specifications summary

Storage	<p>Intel® Z370 Chipset with RAID 0, 1, 5, 10 and Intel Rapid Storage Technology support*</p> <ul style="list-style-type: none"> - 1 x M.2 Socket 3 with M Key, type 2242/2260/2280 storage devices support (both SATA & PCIe mode)** - 1 x M.2 Socket 3 with M Key, type 2242/2260/2280 storage devices support (PCIe mode only)*** - 6 x SATA 6.0 Gb/s ports (gray) - Ready for Intel® Optane Memory <p>* Supports PCIe RAID configurations via onboard M.2 storages.</p> <p>** The M.2_1 socket shares SATA_1 port when use M.2 SATA mode device. Adjust BIOS settings to use a SATA device.</p> <p>*** The M.2_2 socket shares SATA_56 ports when use M.2 PCIe mode device in X4 mode. Adjust BIOS settings to use M.2 PCIe devices in X4 mode.</p>
LAN	<p>Intel® I219-V Gigabit LAN- Dual interconnect between the integrated Media Access Controller (MAC) and physical layer (PHY)</p> <p>LAN Guard</p> <p>Turbo LAN Utility</p>
Audio	<p>Realtek® S1220A 8-channel high definition audio CODEC featuring Crystal Sound 3</p> <ul style="list-style-type: none"> - Power pre-regulator reduces power input noise to ensure consistent performance - Separate layer for left and right track, ensuring both sound deliver equal quality - Impedance sense for front and rear headphone outputs - Audio shielding ensures precise analog/digital separation and greatly reduced multi-lateral interference - EMI protection cover to prevent electrical noise to affect the amplifier quality - Internal audio Amplifier to enhance the highest quality sound for headphone and speakers - Unique de-pop circuit to reduce start-up popping noise to audio outputs - Premium Japan-made audio capacitors provides warm, natural, and immersive sound with exceptional clarity and fidelity - High quality 120dB SNR stereo playback output (Line-out@back) & 113dB SNR input (Line-in) support - Supports up to 32-Bit/192kHz playback* - DTS® Headphone:X™ - DTS® Connect - Supports jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O <p>* Due to limitations in HDA bandwidth, 32-Bit/192kHz is not supported for 8-Channel audio. 32-Bit/192kHz is only available under Windows® 10.</p>

(continued on the next page)

specifications summary

Exclusive Features

<Superb Performance>

OC Design: PRO Clock Technology

- Full BCLK range for extreme overclocking performance.

5-Way Optimization

- Whole system optimization with a single click! Perfectly consolidates better CPU performance, power saving, digital power control, system cooling and app usages.

DIGI+ Power Control

- CPU Power: Digital 8-phase power design
- iGPU Power: Digital 2-phase power design

TPU

- Auto Tuning, GPU Boost

EPU

- EPU

Fan Xpert 4 featuring Fan Auto Tuning function and multiple thermistors selection for optimized system cooling control

Turbo App featuring system performance tuning, network priority, and audio scene configuration for selected applications.

UEFI BIOS

CrashFree BIOS 3

EZ Flash 3

EZ Tuning Wizard

<Connectivity>

32Gb/s M.2 onboard - PCIe 3.0 x4

Intel® Thunderbolt 3 Support

- Blistering-fast 40Gb/s data transfers upgrades with ThunderboltEX 3 Card.

<EZ Management>

File Transfer

- Cloud GO!
- File Transfer

PC Cleaner

- Fast and easy way to get rid of unnecessary junk files

<Gaming>

AURA Lighting Control

3D Printing Friendly design

Turbo LAN

Turbo APP

(continued on the next page)

specifications summary

Exclusive Features	<p><EZ DIY></p> <p>Q-Design</p> <ul style="list-style-type: none">- Q-Shield- Q-LED (CPU, DRAM, VGA, Boot Device LED)- Q-Slot- Q-DIMM- Q-Connector
Special Features	<p>Special Features:</p> <p>M.2 Heat-sink Design</p> <p>SafeSlot</p> <ul style="list-style-type: none">- Protect your graphics card Investment <p>5X Protection III</p> <p>SafeSlot Core - Fortified PCIe with solid soldering</p> <p>LANGuard - Protects against LAN surges, lightning strikes and static-electricity discharges!</p> <p>Overvoltage Protection - World-class circuit-protecting power design</p> <p>DIGI+ VRM - 8+2 Phase digital power design</p> <p>DRAM Overcurrent Protection: Enhanced DRAM overcurrent protection</p> <p>Stainless - Steel Back I/O: 3X corrosion-resistance for greater durability!</p> <p>ESD Guards - Enhanced ESD protection</p> <ul style="list-style-type: none">- AI Suite 3- Ai Charger- MemOK!
Quiet Thermal Solution	<p>Quiet Thermal Design:</p> <ul style="list-style-type: none">- Fan Xpert 4- Fanless M.2 heatsink Design
Back Panel I/O Ports	<p>1 x DisplayPort</p> <p>1 x HDMI port</p> <p>1 x DVI-D</p> <p>1 x Optical S/PDIF out</p> <p>1 x Intel LAN (RJ45) port</p> <p>1 x USB 3.1 Gen 2 port (teal blue, Type A)</p> <p>1 x USB 3.1 Gen 2 port (USB TypeC™)</p> <p>2 x USB 3.1 Gen 1 ports</p> <p>2 x USB 2.0/1.1 ports</p> <p>8-channel Audio I/O ports</p>

(continued on the next page)

specifications summary

Internal I/O connectors	2 x USB 3.1 Gen 1 connectors support additional 4 USB ports (19-pin) 2 x USB 2.0/1.1 connectors support additional 4 USB ports 1 x M.2 Socket 3 (for M Key, type 2242/2260/2280 devices, PCIe mode) 1 x M.2 Socket 3 (for M Key, type 2242/2260/2280 devices, PCIe & SATA mode) 6 x SATA 6.0Gb/s connectors 1 x CPU Fan header (4-pin) for both 3-pin(DC mode) and 4-pin(PWM mode) CPU coolers control with auto detection support 1 x CPU OPT Fan header (4-pin) 1 x AIO Pump header (4-pin) 1 x M.2 Fan header (4-pin) 2 x Chassis Fan connectors (4-pin) for both 3-pin(DC mode) and 4-pin(PWM mode) coolers control with auto detection support 1 x Aura RGB Strip header 2 x 3D Mount screw ports 1 x Front panel audio connector (AAFP) 1 x Thunderbolt header (5-pin) for ASUS ThunderboltEX series support 1 x TPM connector 1 x COM connector 1 x 24-pin EATX Power connector 1 x 8-pin EATX 12V Power connector 1 x System Panel(Q-Connector) 1 x MemOK! button 1 x Power-on button 1 x CPU OV jumper 1 x Clear CMOS header 1 x Thermal Sensor header 1 x 5-pin EXT_FAN(Extension Fan) connector
BIOS	128 Mb Flash ROM, UEFI AMI BIOS, PnP, WfM2.0, SM BIOS 3.0, ACPI 6.0, Multi-language BIOS, EZ Flash 3, CrashFree BIOS 3, F11 EZ Tuning Wizard, F6 Qfan Control, F3 My Favorites, Last Modified log, F12 PrintScreen, and DRAM SPD (Serial Presence Detect) memory information.
Manageability	WfM 2.0, DMI 3.0, WOL by PME, PXE
Support DVD contents	Drivers Utilities EZ Update Anti-virus software (OEM version)
Operating system support	Windows® 10 64-bit
Form factor	ATX Form Factor, 12"x 9.6" (30.5cm x 24.4cm)



- Specifications are subject to change without notice.
- Visit the [website](#) for the software manual.

Package contents

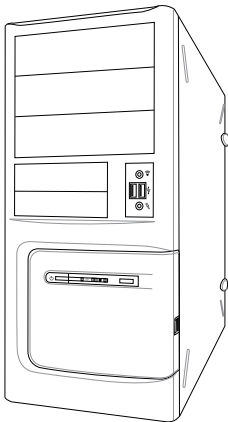
Check your motherboard package for the following items.

Motherboard	1 x motherboard
Cables	3 x Serial ATA 6.0 Gb/s cables
Accessories	1 x SLI HB BRIDGE (2-WAY-M)
	1 x Q-Shield
	1 x Q-Connector
	1 x M.2 screw package
Application DVD	1 x CPU Installation Tool
	1 x fan holder
Documentation	1 x Motherboard support DVD
	1 x User guide

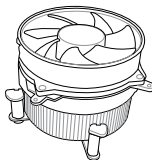


If any of the above items is damaged or missing, contact your retailer.

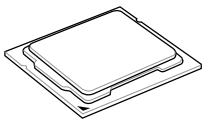
Installation tools and components



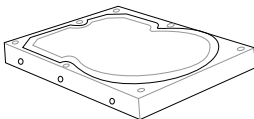
PC chassis



Intel® LGA1151 compatible CPU Fan



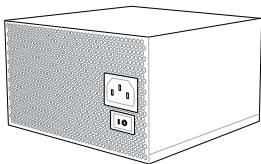
Intel® LGA1151 CPU



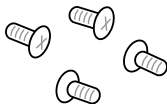
SATA hard disk drive



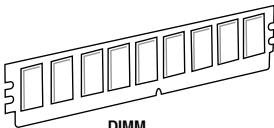
Phillips (cross) screwdriver



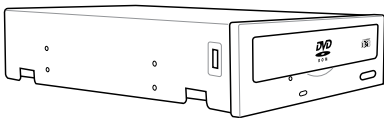
Power supply unit



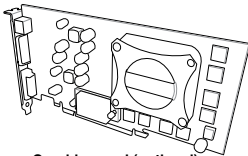
1 bag of screws



DIMM



SATA optical disc drive (optional)



Graphics card (optional)



M.2 SSD module (optional)



The tools and components in the table above are not included in the motherboard package.

Product Introduction

1

1.1 Motherboard overview

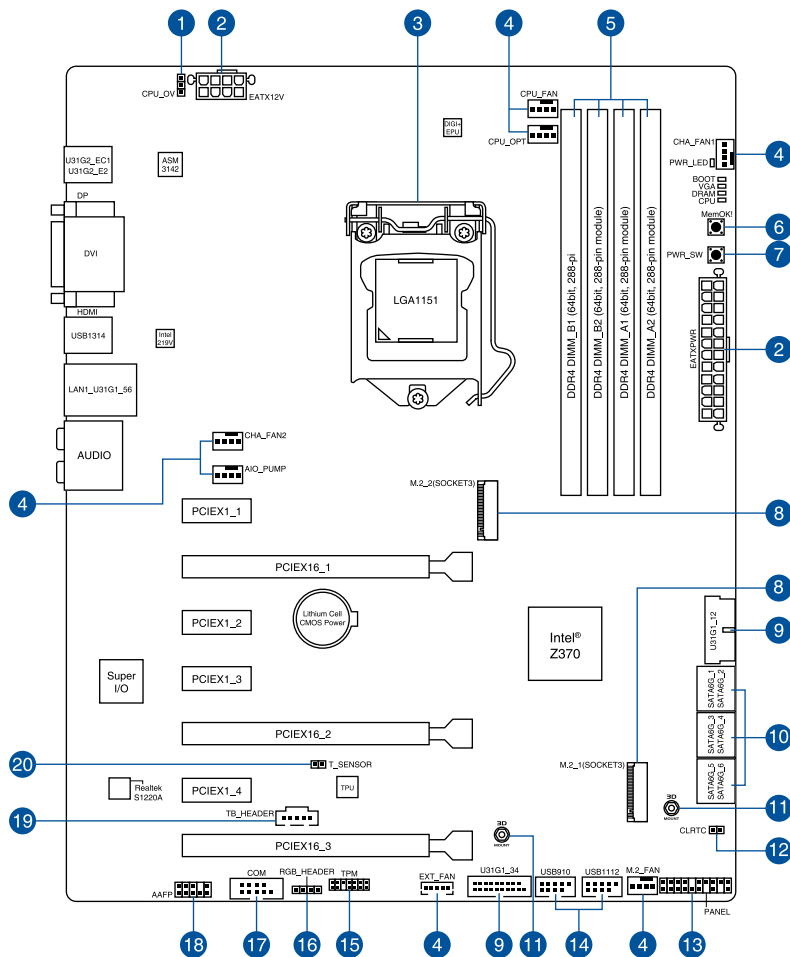
1.1.1 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.



-
- Unplug the power cord from the wall socket before touching any component.
 - Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
 - Hold components by the edges to avoid touching the ICs on them.
 - Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
 - Before you install or remove any component, ensure that the ATX 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.
-

1.1.2 Motherboard layout



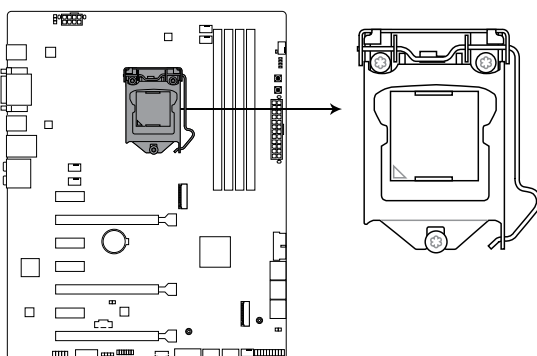
Refer to **1.1.9 Internal connectors** and **2.2.1 Rear I/O connection** for more information about rear panel connectors and internal connectors.

Layout contents

Connectors/Jumpers/Buttons and switches/Slots	Page
1. CPU Over Voltage jumper (3-pin CPU_OV)	1-12
2. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)	1-19
3. LGA1151 CPU socket	1-4
4. CPU, CPU optional, M.2, AIO pump, extension, and chassis fan connectors (4-pin CPU_FAN; 4-pin CPU_OPT; 4-pin M.2_FAN; 4-pin AIO_PUMP; 5-pin EXT_FAN; 4-pin CHA_FAN1-2)	1-18
5. DDR4 DIMM slots	1-5
6. MemOK! button	1-10
7. Power-on button	1-9
8. M.2 sockets (M.2_1(Socket 3); M.2_2(Socket 3))	1-22
9. USB 3.1 Gen1 connector (20-1 pin U31G1_12; U31G1_34)	1-16
10. Intel® Serial ATA 6 Gb/s connectors (7-pin SATA6G_12; SATA 6G_34; SATA6G_56)	1-14
11. 3D Mount	1-12
12. Clear RTC RAM jumper (2-pin CLRTC)	1-11
13. System panel connector (20-3 pin PANEL)	1-20
14. USB 2.0 connectors (10-1 pin USB910; USB1112)	1-17
15. TPM connector (14-1 pin TPM)	1-21
16. RGB header (4-pin RGB_HEADER)	1-23
17. Serial port connector (10-1 pin COM)	1-24
18. Front panel audio connector (10-1 pin AAFP)	1-15
19. Thunderbolt header (5-pin TB_HEADER)	1-21
20. Thermal sensor connector (2-pin T_SENSOR)	1-24

1.1.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1151 socket designed for the 8th Generation Intel® Core™ processors.



CPU LGA1151



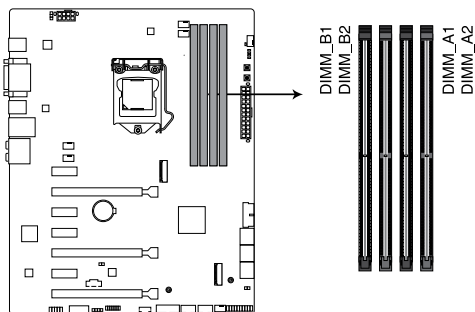
- Ensure that all power cables are unplugged before installing the CPU.
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1151 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.

1.1.4 System memory

The motherboard comes with four DDR4 (Double Data Rate 4) Dual Inline Memory Modules (DIMM) slots.

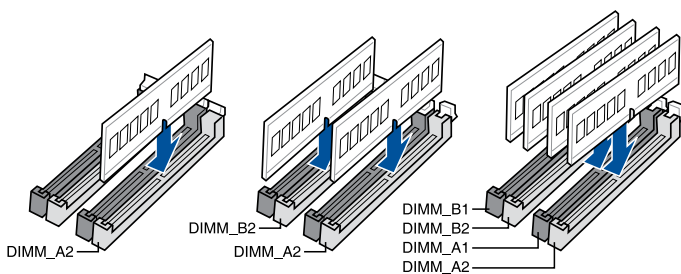


A DDR4 module is notched differently from a DDR, DDR2, or DDR3 module. DO NOT install a DDR, DDR2, or DDR3 memory module to the DDR4 slot.



288-pin DDR4 DIMM socket

Recommended memory configurations



Memory configurations

You may install 2 GB, 4 GB, 8 GB and 16 GB unbuffered and non-ECC DDR4 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.
 - Due to the memory address limitation on 32-bit Windows® OS, when you install 4 GB or more memory on the motherboard, the actual usable memory for the OS can be about 3 GB or less. For effective use of memory, we recommend that you do any of the following:
 - a) Use a maximum of 3GB system memory if you are using a 32-bit Windows® OS.
 - b) Install a 64-bit Windows® OS when you want to install 4 GB or more on the motherboard.
 - c) For more details, refer to the Microsoft® support site at <http://support.microsoft.com/kb/929605/en-us>.
 - This motherboard does not support DIMMs made up of 512 Mb (64 MB) chips or less (Memory chip capacity counts in Megabit, 8 Megabit/Mb = 1 Megabyte/MB).
-

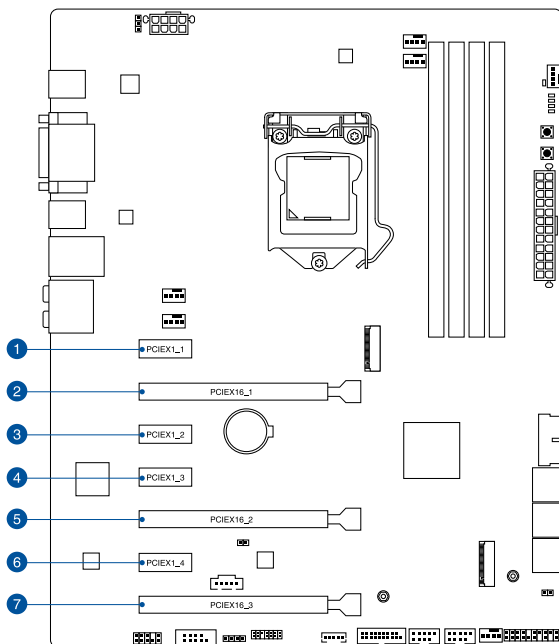


-
- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
 - For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) 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 website for the latest QVL.
-

1.1.5 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.



Slot No.	Slot Description
1	PCIe 3.0/2.0 x1_1 slot
2	PCIe 3.0/2.0 x16_1 slot
3	PCIe 3.0/2.0 x1_2 slot
4	PCIe 3.0/2.0 x1_3 slot
5	PCIe 3.0/2.0 x16_2 slot
6	PCIe 3.0/2.0 x1_4 slot
7	PCIe 3.0/2.0 x16_3 slot

VGA configuration	PCI Express 3.0 operating mode	
	PCIe 3.0/2.0 x16_1	PCIe 3.0/2.0 x16_2
Single VGA/PCIe card	x16 (single VGA recommended)	N/A
Dual VGA/PCIe card	x8	x8



- We recommend that you provide sufficient power when running CrossFireX™ or SLI® mode.
- Connect chassis fans to the motherboard chassis fan connectors when using multiple graphics cards for better thermal environment.

Hyper M.2 X16 card configuration	PCI Express 3.0 operating mode	
	PCIe 3.0/2.0 x16_1	PCIe 3.0/2.0 x16_2
2 Intel® SSD on CPU support	x8	x4+x4
3 Intel® SSD on CPU support	x8+x4+x4	N/A



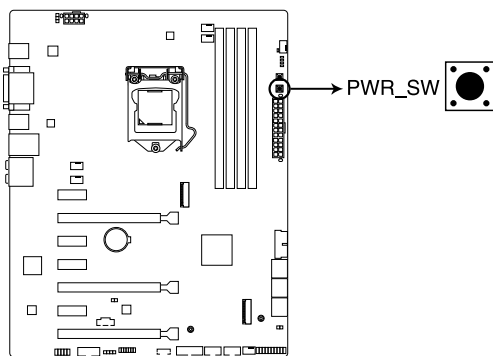
- Hyper M.2 X16 card is purchased separately.
- Enable the Hyper M.2 X16 card under BIOS settings.

1.1.6 Onboard buttons and switches

Onboard buttons and switches allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

1. Power-on button

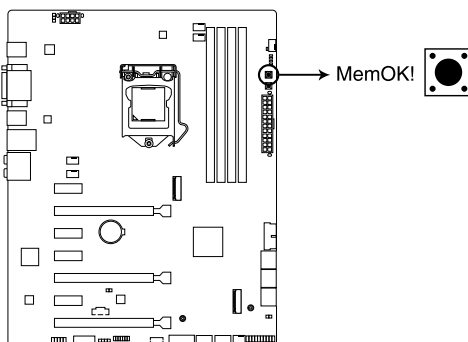
The motherboard comes with a power-on button that allows you to power up or wake up the system. The LED near the button also lights up when the system is plugged to a power source indicating that you should shut down the system and unplug the power cable before removing or installing any motherboard component.



Power on button

2. MemOK! button

Installing DIMMs that are not compatible with the motherboard may cause system boot failure. If the system fails to boot during POST stage and the DRAM_LED near the MemOK! button lights continuously, press the MemOK! button until the DRAM_LED starts blinking. System will begin automatic memory compatibility tuning and reboot for successful boot.



MemOK! button

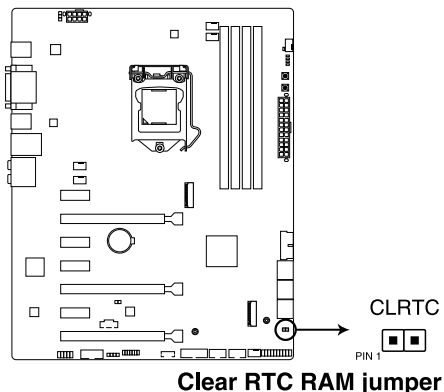


- Refer to section **1.1.8 Onboard LEDs** for the exact location of the DRAM LED.
- The DRAM_LED also lights up when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! function.
- The MemOK! button does not function under Windows® OS environment.
- During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and tests the next set of failsafe settings. The blinking speed of the DRAM LED increases, indicating different test processes.
- Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM LED lights continuously. Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) at www..com.
- If you turn off the computer and replace DIMMs during the tuning process, the system continues memory tuning after turning on the computer. To stop memory tuning, turn off the computer and unplug the power cord for about 5-10 seconds.
- If your system fails to boot up due to BIOS overclocking, press the MemOK! button to boot and load the BIOS default settings. A message will appear during POST reminding you that the BIOS has been restored to its default settings.
- We recommend that you download and update to the latest BIOS version from www..com after using the MemOK! function.

1.1.7 Jumpers and holes

1. Clear RTC RAM jumper (2-pin CLRTC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.



To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Short-circuit pin 1-2 with a metal object or jumper cap for about 5-10 seconds.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Delete> key during the boot process and enter BIOS setup to re-enter data.



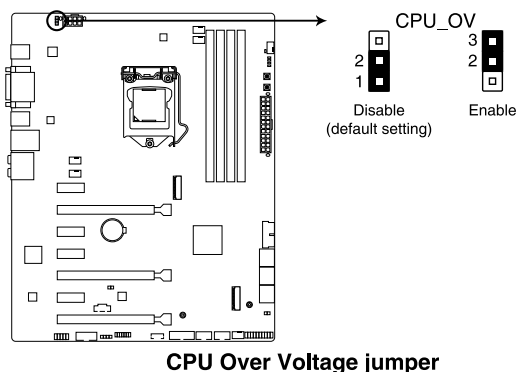
Except when clearing the RTC RAM, never place a metal object or jumper cap on the CLRTC jumper. Placing a metal object or jumper cap will cause system boot failure!



- If the steps above do not help, remove the onboard battery and place a metal object or jumper cap again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
- Due to the chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and turn on the power supply or unplug and plug the power cord before rebooting the system.

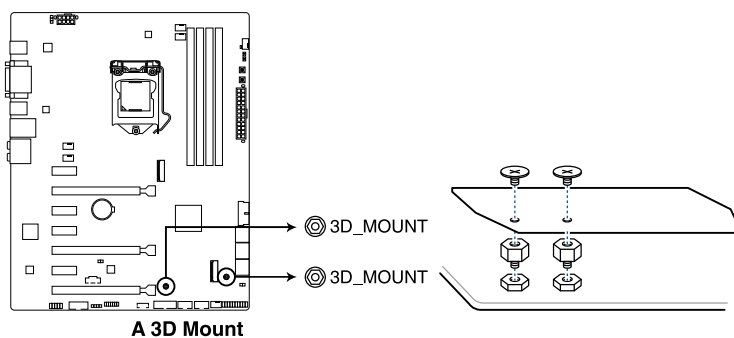
2. CPU Over Voltage jumper (3-pin CPU_OV)

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. To gain more CPU voltage setting, insert the jumper to pins 2-3. To go back to its default CPU voltage setting, insert the jumper to pins 1-2.



3. 3D Mount

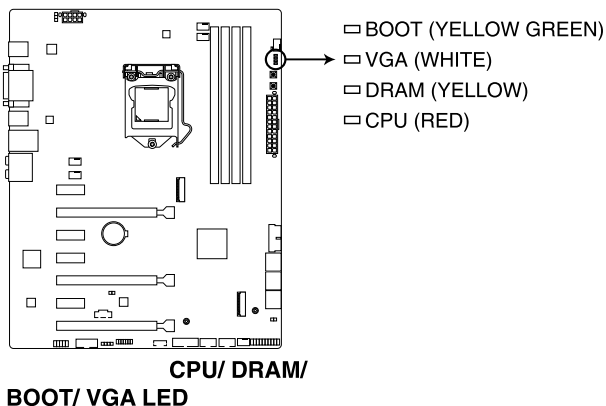
Secure 3D printed parts to these 3D Mount holes for a personalized motherboard.



1.1.8 Onboard LEDs

1. POST State LEDs

The POST State LEDs provide the status of these key components during POST (Power-On Self-Test): CPU, memory modules, VGA card, and hard disk drives. If an error is found, the critical component's LED stays lit up until the problem is solved.



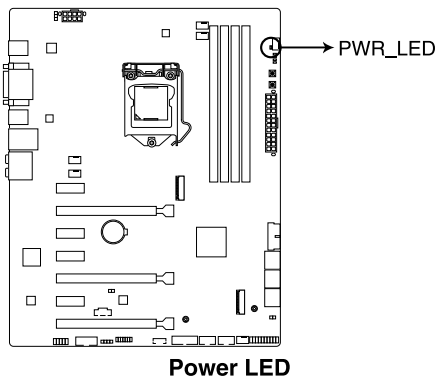
The order which the LEDs light up may vary per CPU.



The POST State 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.

2. Standby Power LED

The motherboard comes with a standby power LED. The LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

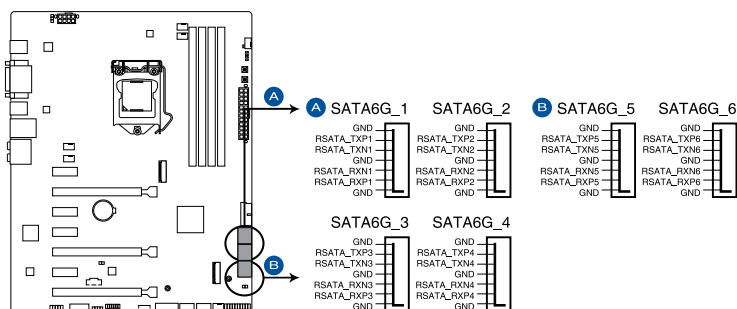


1.1.9 Internal connectors

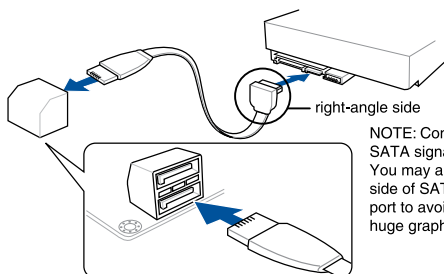
1. Intel® Serial ATA 6 Gb/s connectors (7-pin SATA6G_12; SATA 6G_34; SATA6G_56)

These connectors connect to Serial ATA 6 Gb/s hard disk drives via Serial ATA 6 Gb/s signal cables.

If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z370 chipset.



Intel® Serial ATA 6 Gb/s connectors



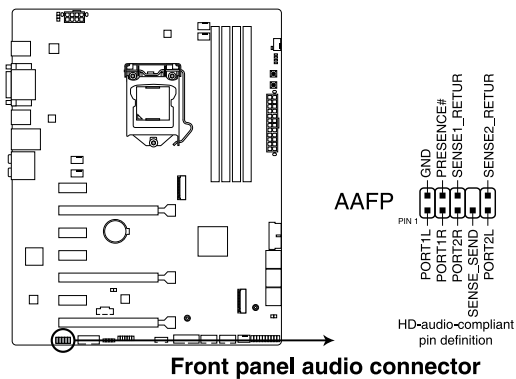
NOTE: Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.



These connectors are set to **[AHCI Mode]** by default. If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to **[Intel RST Premium With Intel Optane System Acceleration (RAID)]**.

2. Front panel audio connector (10-1 pin AAFP)

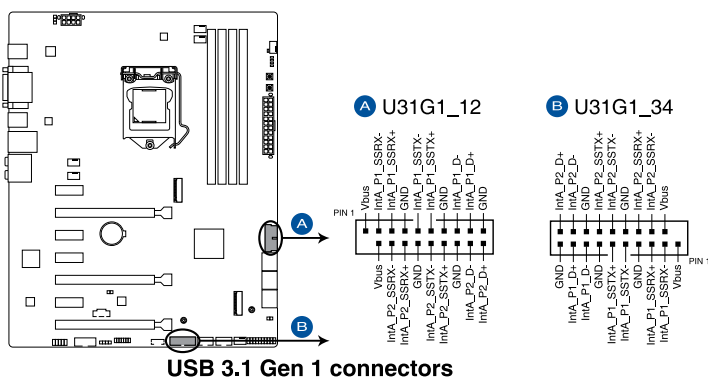
This connector is for a chassis-mounted front panel audio I/O module that supports HD Audio. Connect one end of the front panel audio I/O module cable to this connector.



We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

3. USB 3.1 Gen 1 connectors (20-pin U31G1_12; U31G1_34)

This connector allows you to connect a USB 3.1 Gen 1 module for additional USB 3.1 Gen 1 front or rear panel ports. With an installed USB 3.1 Gen 1 module, you can enjoy all the benefits of USB 3.1 including faster data transfer speeds of up to 5 Gb/s, faster charging time for USB-chargable devices, optimized power efficiency, and backward compatibility with USB 2.0.



USB 3.1 Gen 1 connectors



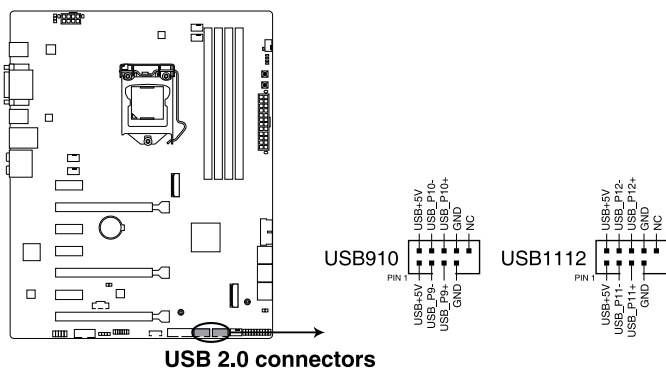
The USB 3.1 Gen 1 module is purchased separately.



The plugged USB 3.1 Gen 1 device may run on xHCI or EHCI mode depending on the operating system's setting.

4. USB 2.0 connectors (10-1 pin USB910; USB1112)

These connectors are for USB 2.0 ports. Connect the USB module cable to these connectors, then install the module to a slot opening at the back of the system chassis. This USB connector complies with USB 2.0 specification that supports up to 480 Mb/s connection speed.



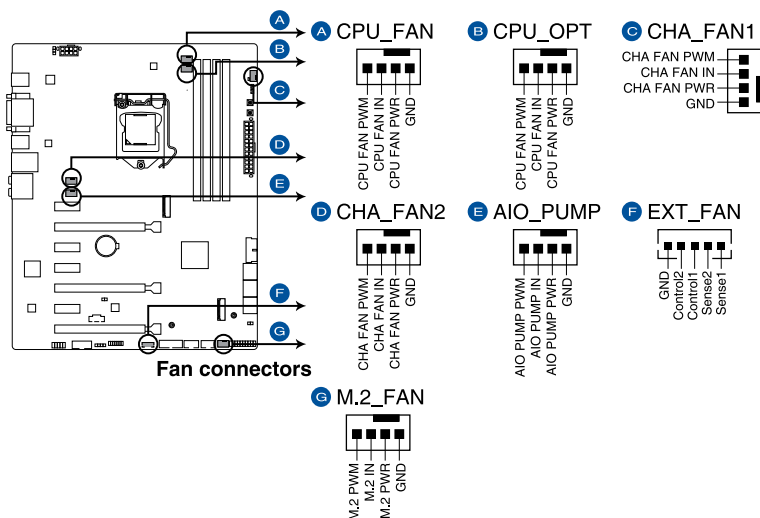
DO NOT connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



The USB 2.0 module is purchased separately.

5. **CPU, CPU optional, M.2, AIO pump, extension, and chassis fan connectors (4-pin CPU_FAN; 4-pin CPU_OPT; 4-pin M.2_FAN; 4-pin AIO_PUMP; 5-pin EXT_FAN; 4-pin CHA_FAN1-2)**

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



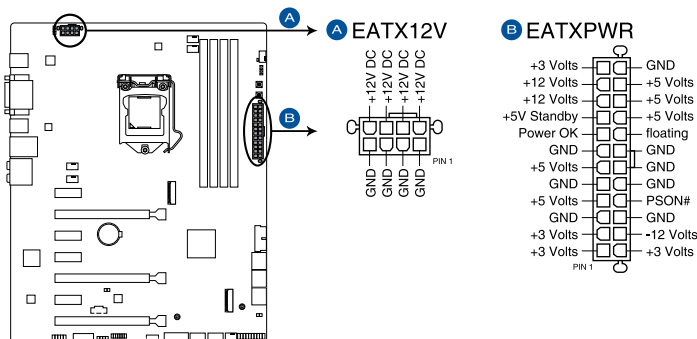
- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!
- Ensure that the CPU fan cable is securely installed to the CPU fan connector.



- The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.
- Connect the fan of your water cooling kit to the AIO_PUMP connector.

6. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



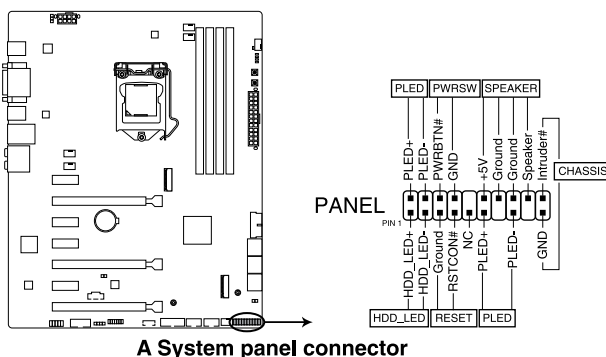
ATX power connectors



- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.
- DO NOT forget to connect the 8-pin EATX12V power plug. Otherwise, the system will not boot.
- 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.

7. System panel connector (20-3 pin PANEL)

This connector supports several chassis-mounted functions.



- **System power LED (2-pin or 3-1 pin PLED)**

The 2-pin or 3-1 pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin HDD_LED)**

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker (4-pin SPEAKER)**

This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **ATX power button/soft-off button (2-pin PWRSW)**

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the operating system settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin RESET)**

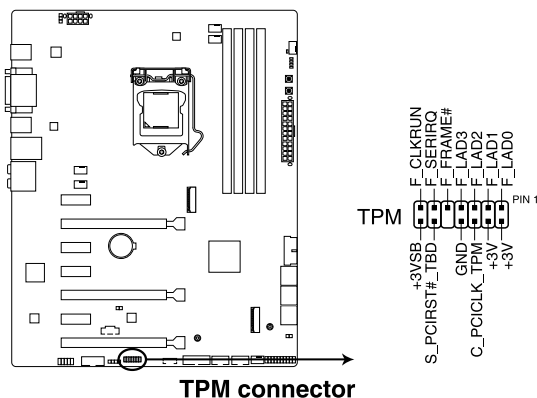
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

- **Chassis intrusion connector (2-pin CHASSIS)**

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

8. TPM connector (14-1 pin TPM)

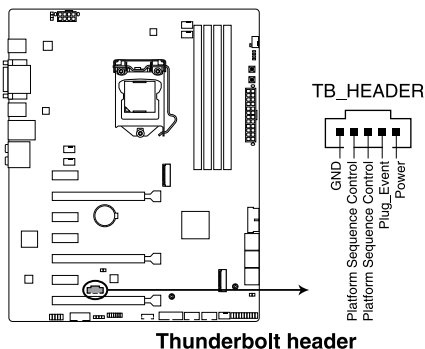
This connector supports a Trusted Platform Module (TPM) system, which securely stores keys, digital certificates, passwords and data. A TPM system also helps enhance network security, protect digital identities, and ensures platform integrity.



The TPM module is purchased separately.

9. Thunderbolt header (5-pin TB_HEADER)

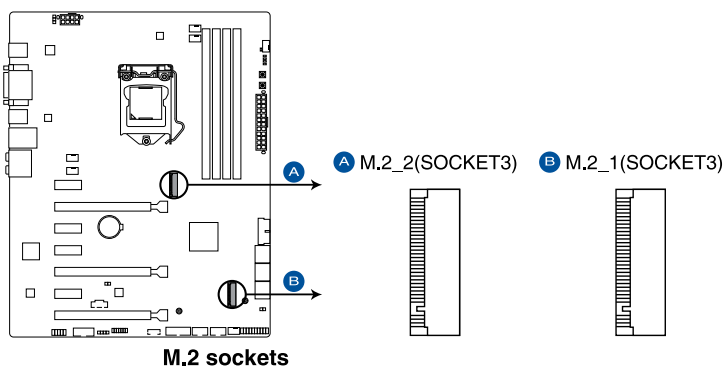
This connector is for the add-on Thunderbolt I/O card that supports Intel's Thunderbolt Technology, allowing you to connect up to six Thunderbolt-enabled devices and a DisplayPort-enabled display in a daisy-chain configuration.



The add-on Thunderbolt I/O card and Thunderbolt cables are purchased separately.

10. M.2 sockets (M.2_1(Socket 3); M.2_2(Socket 3))

These sockets allow you to install M.2 SSD modules.



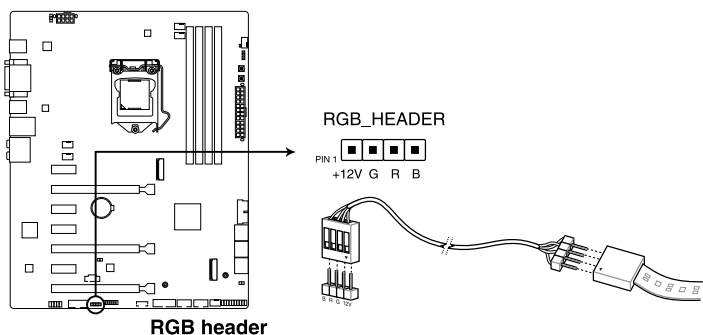
- M.2_1 socket supports PCIe 3.0 x4 and SATA mode M Key design and type 2242 / 2260 / 2280 PCIe and SATA storage devices.
- M.2_2 socket supports PCIe 3.0 x4 M Key design and type 2242 / 2260 / 2280 PCIe storage devices.
- These sockets support IRST (Intel® Rapid Storage Technology).



The M.2 SSD module is purchased separately.

11. RGB header (4-pin RGB_HEADER)

This connector is for RGB LED strips.



The RGB header supports 5050 RGB multi-color LED strips (12V/G/R/B), with a maximum power rating of 2A (12V), and no longer than 2 m.



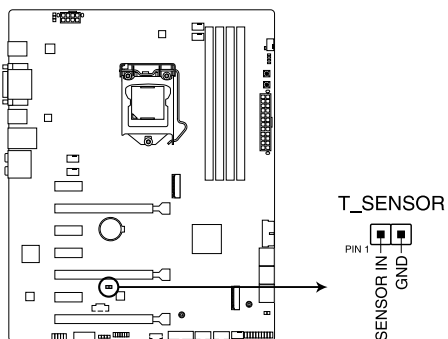
Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.



- 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 is purchased separately.

12. Thermal sensor connector (2-pin T_SENSOR)

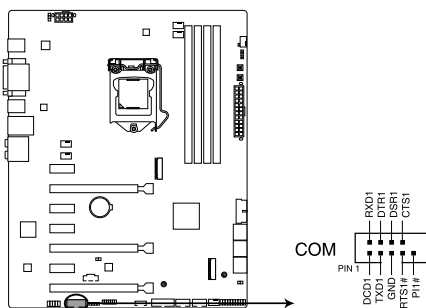
This connector is for the thermistor cable that monitors the temperature of the devices and the critical components inside the motherboard. Connect the thermistor cable and place the sensor on the device or the motherboard's component to detect its temperature.



A Thermal sensor connector

13. Serial port connector (10-1 pin COM)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



Serial port connector



The COM module is purchased separately.

Basic Installation

2

2.1 Building your PC system

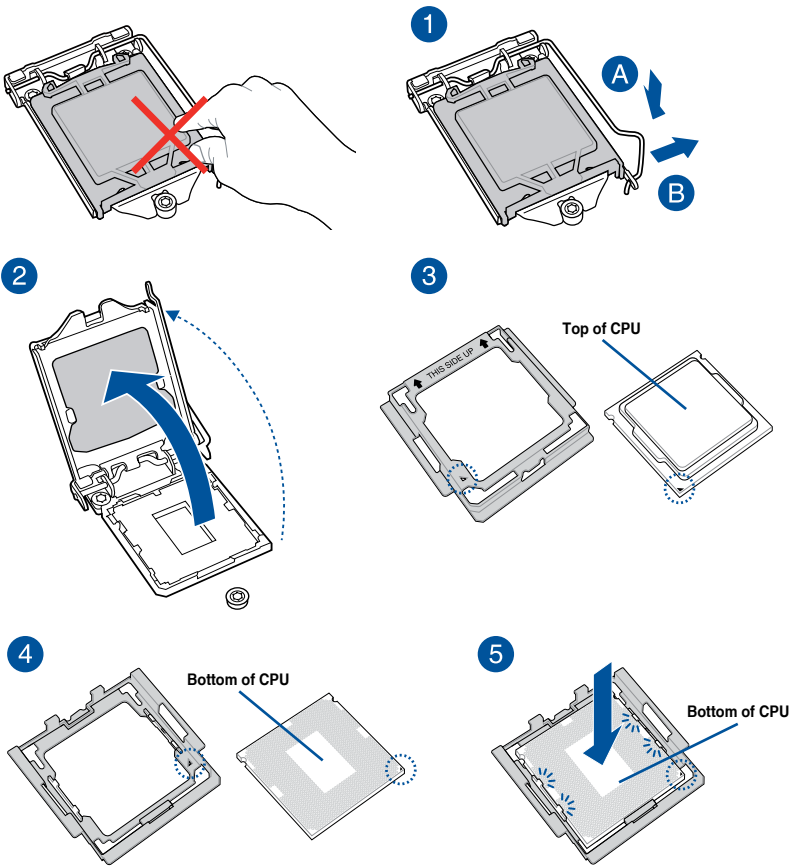


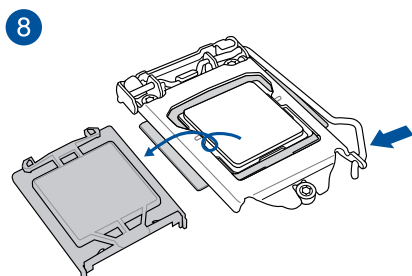
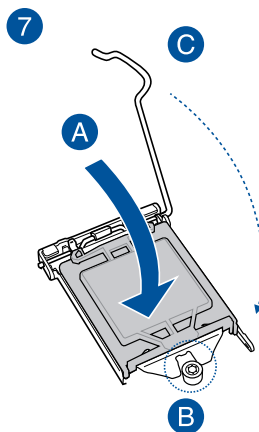
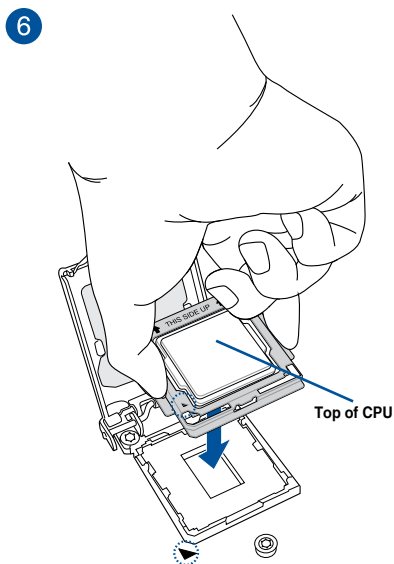
The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

2.1.1 CPU installation



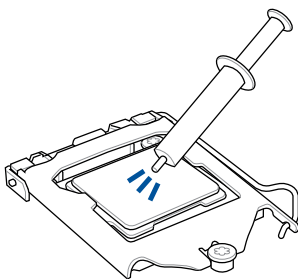
Ensure that you install the correct CPU designed for LGA1151 socket only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1151 socket.





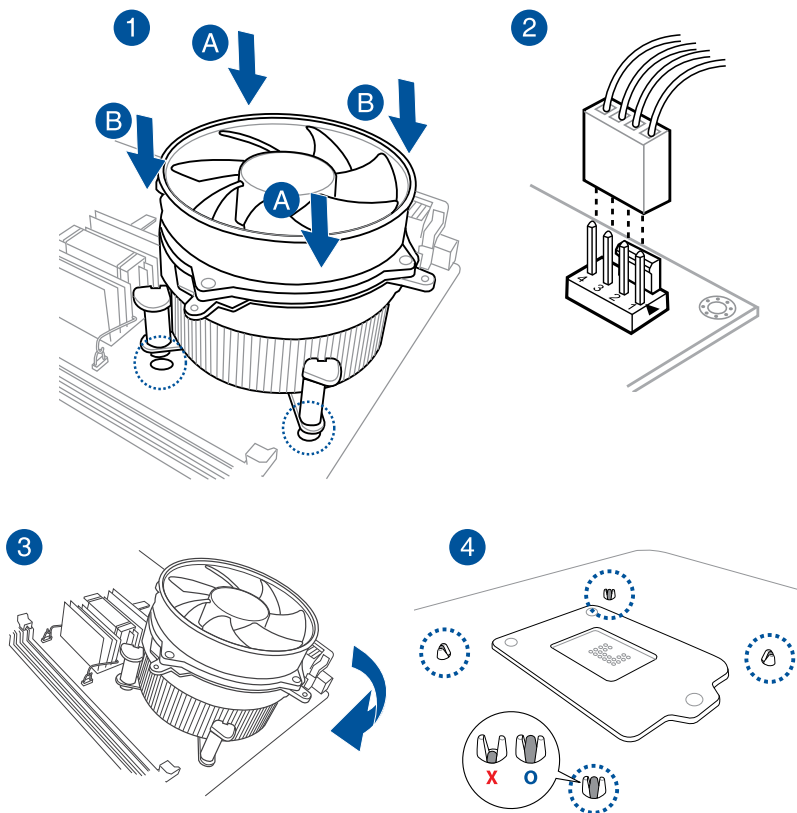
- The CPU Installation Tool is only compatible on motherboards with a Intel® LGA1151 socket.
- Ensure that the CPU is firmly clicked into place before installing it onto the CPU socket on the motherboard.
- Use the CPU Installation Tool for installing the CPU only. DO NOT damage or bend the CPU Installation Tool.
- Always firmly hold both sides of the CPU Installation Tool when installing, removing, or picking up the CPU Installation Tool.
- Ensure to use a soft stable surface when installing the CPU to the CPU Installation Tool to prevent CPU damage.
- will not cover damages resulting from incorrect CPU installation/removal, incorrect CPU orientation/placement, or other damages resulting from negligence by the user.

2.1.2 CPU heatsink and fan assembly installation

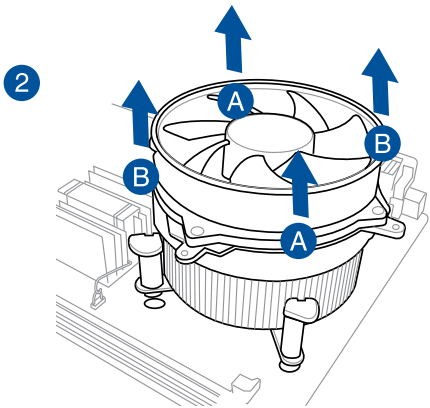
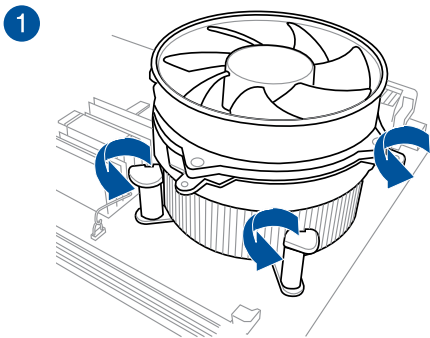


Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan, if necessary.

To install the CPU heatsink and fan assembly

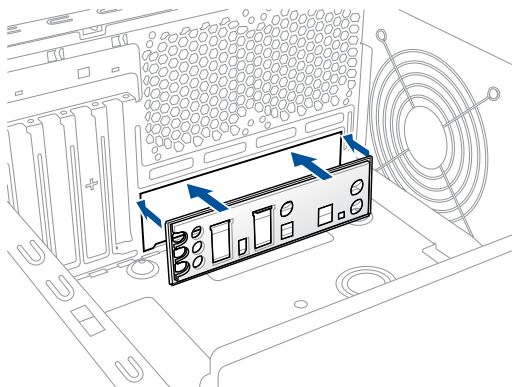


To uninstall the CPU heatsink and fan assembly

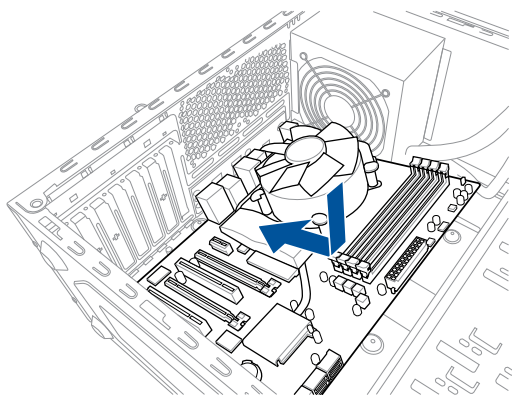


2.1.3 Motherboard installation

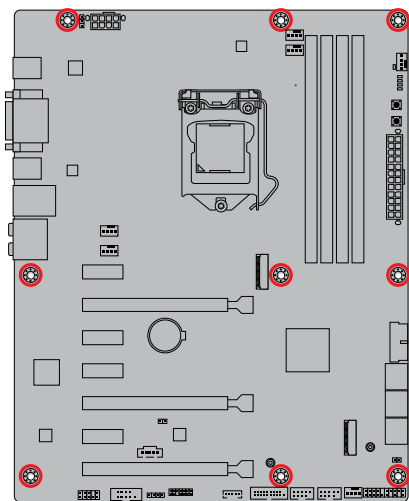
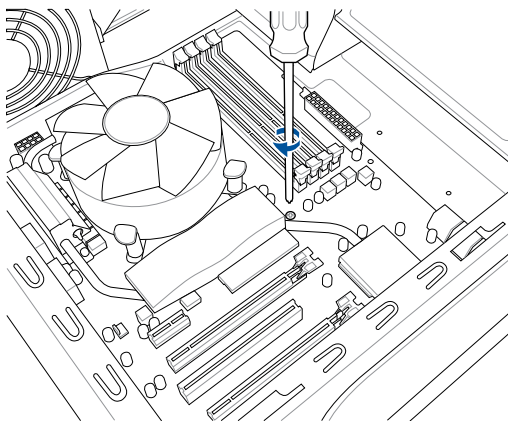
1. Install the Q-Shield to the chassis rear I/O panel.



2. Place the motherboard into the chassis, ensuring that its rear I/O ports are aligned to the chassis' rear I/O panel.

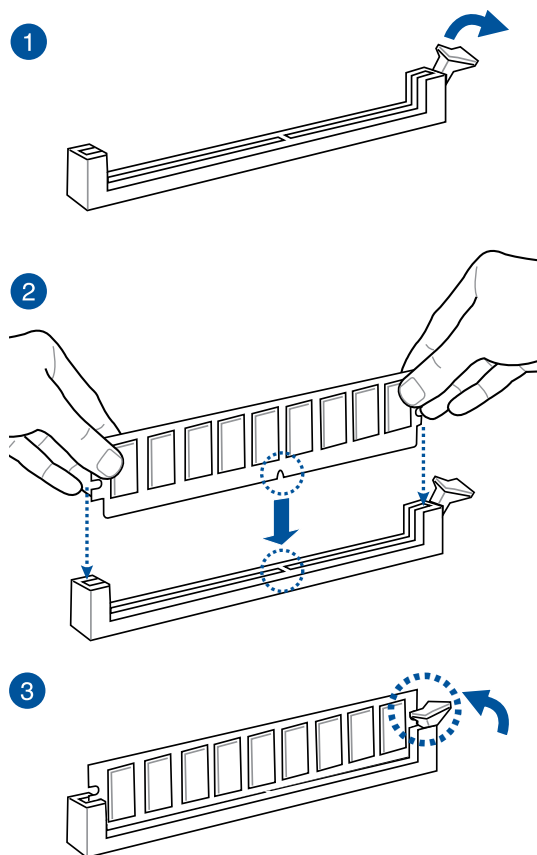


3. Place nine screws into the holes indicated by circles to secure the motherboard to the chassis.

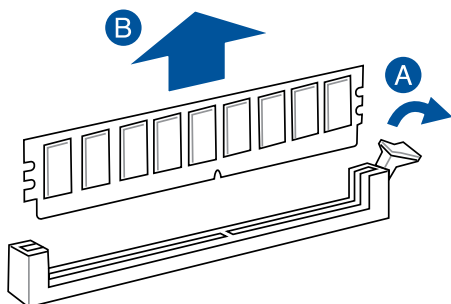


DO NOT overtighten the screws! Doing so can damage the motherboard.

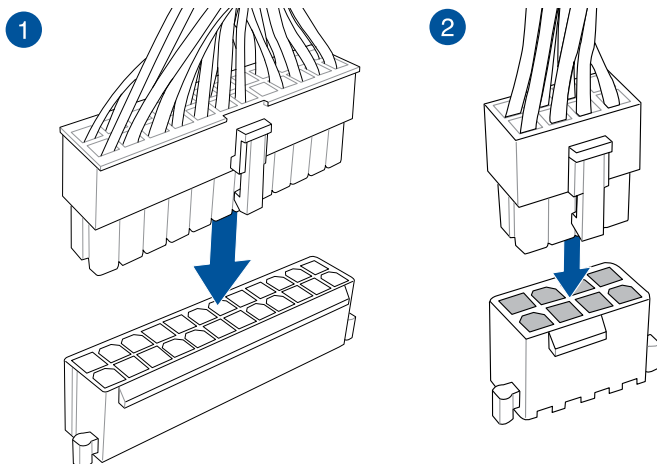
2.1.4 DIMM installation



To remove a DIMM

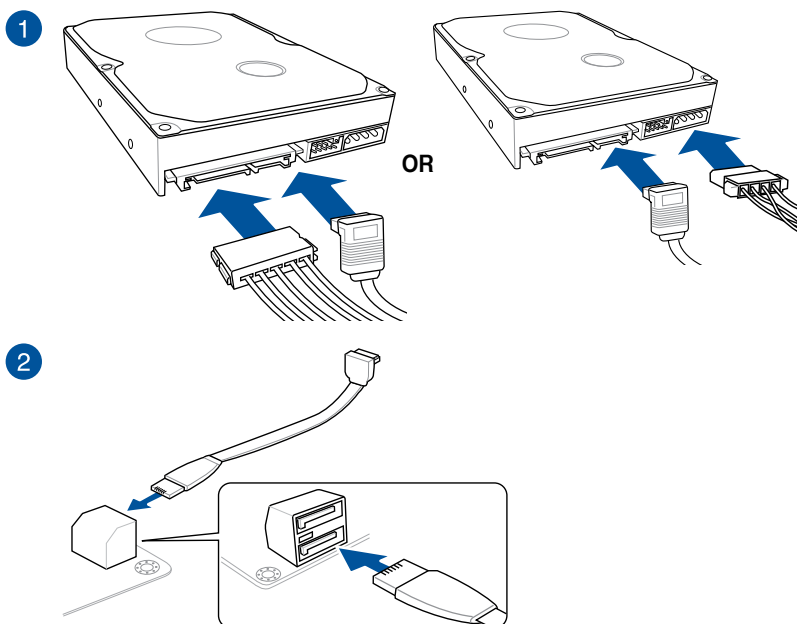


2.1.5 ATX power connection



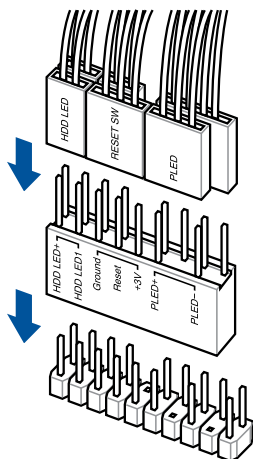
Ensure to connect the 8-pin power plug.

2.1.6 SATA device connection

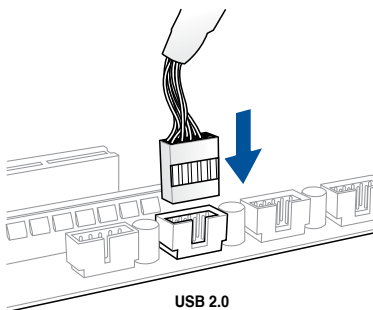


2.1.7 Front I/O connector

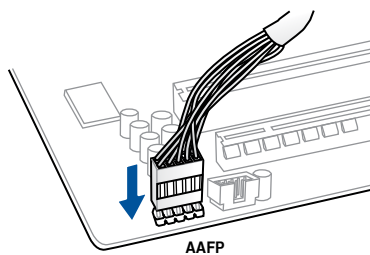
To install Q-Connector



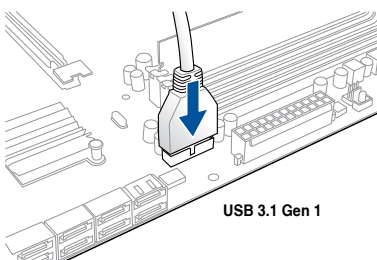
To install USB 2.0 connector



To install front panel audio connector

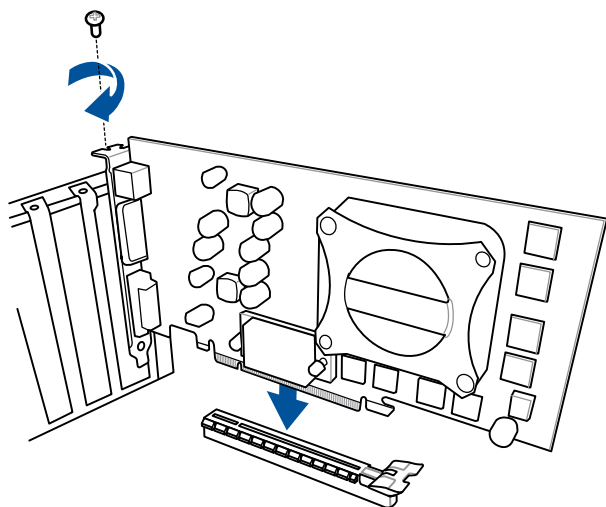


To install USB 3.1 Gen 1 connector

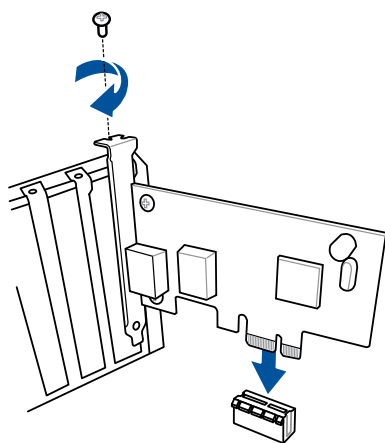


2.1.8 Expansion card installation

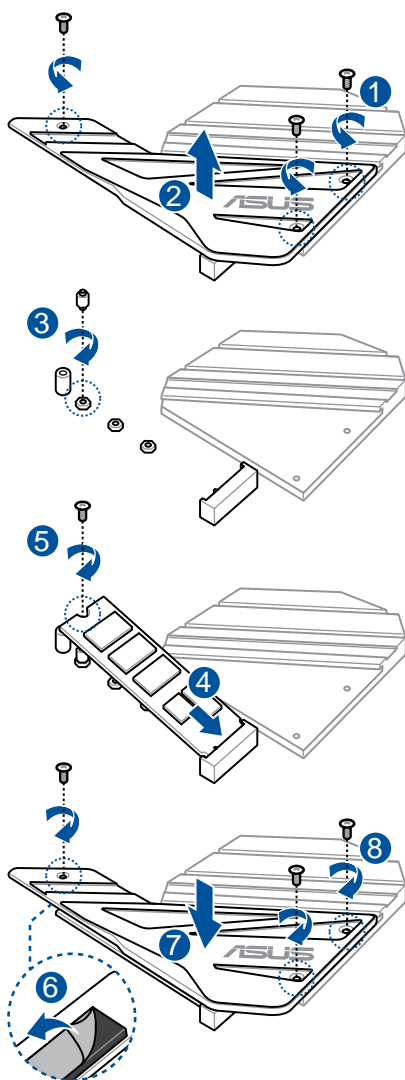
To install PCIe x16 cards



To install PCIe x1 cards



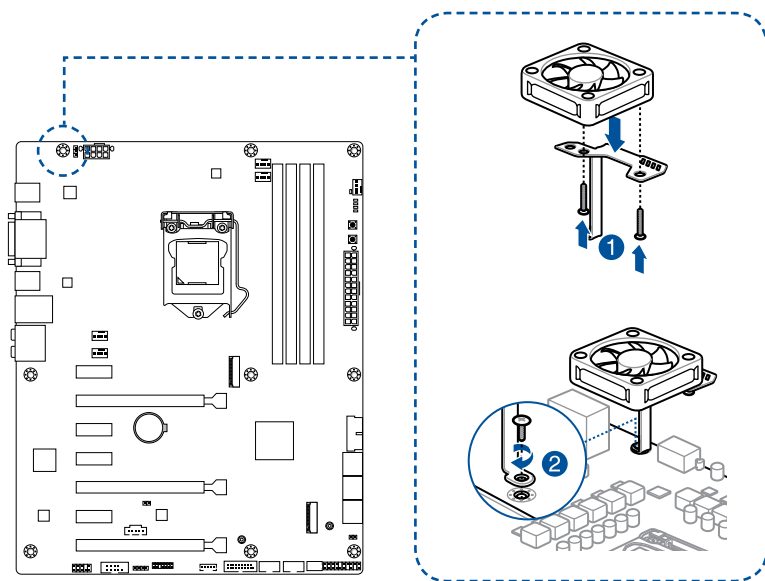
2.1.9 M.2 installation



Supported M.2 type varies per motherboard.

2.1.10 fan holder installation

To install the fan holder and fan



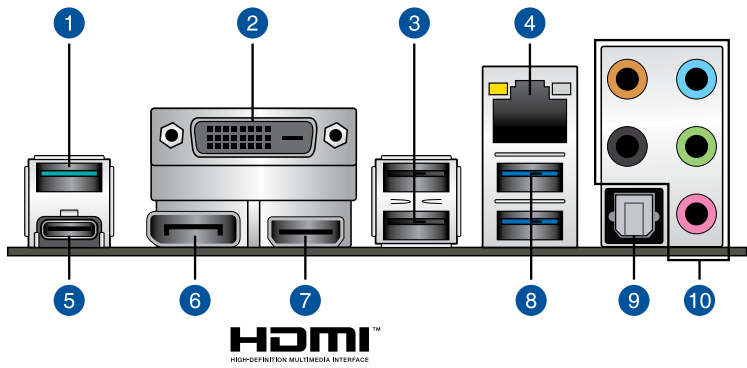
When using high performance settings whilst overclocking, ensure to install the fan holder for additional fan(s).



- You may install 12V (1A, 12W), 40mm x 40mm fans or 50mm x 50mm fans.
- Ensure to use the bundled screws that came with your fans.
- Fans are purchased separately.

2.2 Motherboard rear and audio connections

2.2.1 Rear I/O connection



Rear panel connectors	
1. USB 3.1 Gen 2 Type-A port	6. DisplayPort
2. DVI-D port	7. HDMI 1.4b port
3. USB 2.0 ports 13 and 14	8. USB 3.1 Gen 1 ports 5 and 6
4. Intel® LAN port*	9. Optical S/PDIF Out port
5. USB 3.1 Gen 2 Type-C™ port	10. Audio I/O ports**

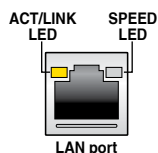
* and **: Refer to the tables on the next page for LAN port LEDs and audio port definitions.



- USB 3.1 Gen 1/Gen 2 devices can only be used as data storage only.
- We strongly recommend that you connect your devices to ports with matching data transfer rate. Please connect your USB 3.1 Gen 1 devices to USB 3.1 Gen 1 ports and your USB 3.1 Gen 2 devices to USB 3.1 Gen 2 ports for faster and better performance for your devices.

* LAN ports LED indications

Activity Link LED		Speed LED	
Status	Description	Status	Description
Off	No link	Off	10 Mbps connection
Orange	Linked	Orange	100 Mbps connection
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode		



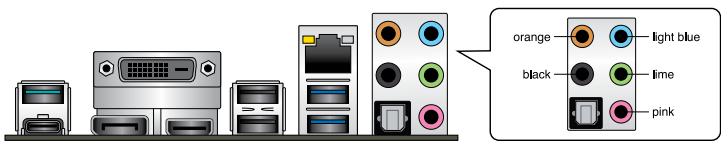
You can disable the LAN controllers in BIOS. Due to hardware design, the LAN1 port's LEDs may continue to blink even when disabled.

** Audio 2, 4, 6 or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Side Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Sub woofer	Center/Sub woofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out

2.2.2 Audio I/O connections

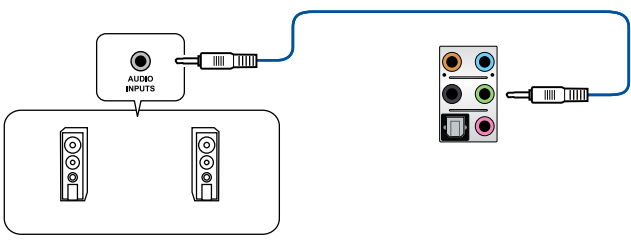
Audio I/O ports



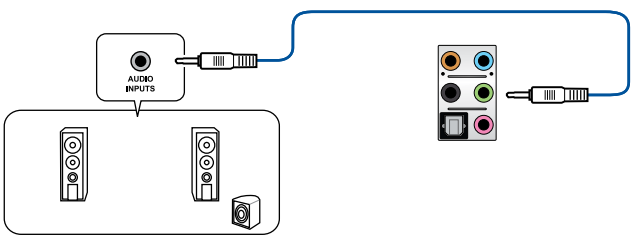
Connect to Headphone and Mic



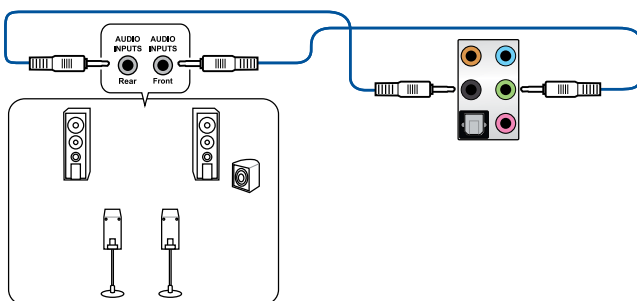
Connect to Stereo Speakers



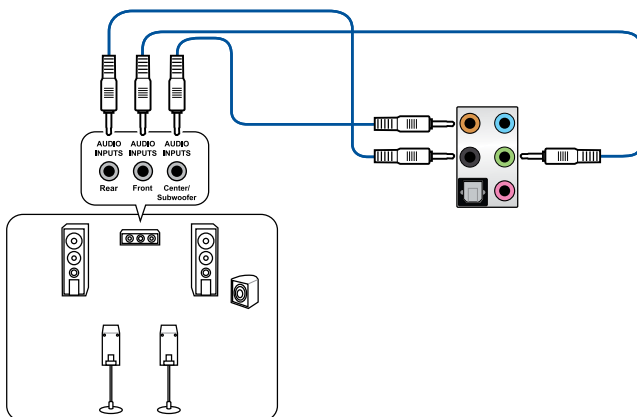
Connect to 2 Speakers



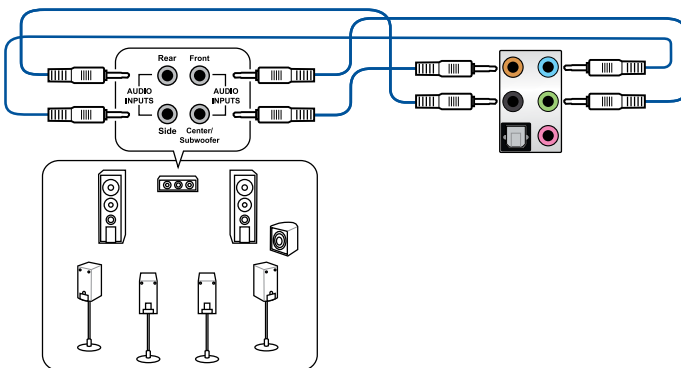
Connect to 4 Speakers



Connect to 6 Speakers



Connect to 8 Speakers



2.3 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Ensure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
 - a. Monitor
 - b. External SCSI devices (starting with the last device on the chain)
 - c. System power
6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the “green” standards or if it has a “power standby” feature, the monitor LED may light up or change from orange to green after the system LED turns on.

The system then runs the power-on self tests (POST). While the tests are running, the BIOS beeps (refer to the BIOS beep codes table) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

BIOS Beep	Description
One short beep	VGA detected Quick boot set to disabled No keyboard detected
One continuous beep followed by two short beeps then a pause (repeated)	No memory detected
One continuous beep followed by three short beeps	No VGA detected
One continuous beep followed by four short beeps	Hardware component failure

7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 3.

2.4 Turning off the computer

While the system is ON, press the power button for less than four seconds to put the system on sleep mode or soft-off mode, depending on the BIOS setting. Press the power switch for more than four seconds to let the system enter the soft-off mode regardless of the BIOS setting.