

Z690I AORUS ULTRA

Z690I AORUS ULTRA DDR4 (Z690I A ULTRA DDR4)

User's Manual

Rev. 1002



For more product details, please visit GIGABYTE's website.

<https://www.gigabyte.com/Motherboard/Z690I-AORUS-ULTRA-rev-10?m=ma#kf>

<https://www.gigabyte.com/Motherboard/Z690I-AORUS-ULTRA-DDR4-rev-10?m=ma#kf>

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- For detailed product information, carefully read the User's Manual.
- For quick set-up of the product, refer to the Quick Installation Guide on GIGABYTE's website.

https://download.gigabyte.com/FileList/Manual/mb_manual_quick-guide_am5.pdf?m=sw

For product-related information, check on our website at: <https://www.gigabyte.com>

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:

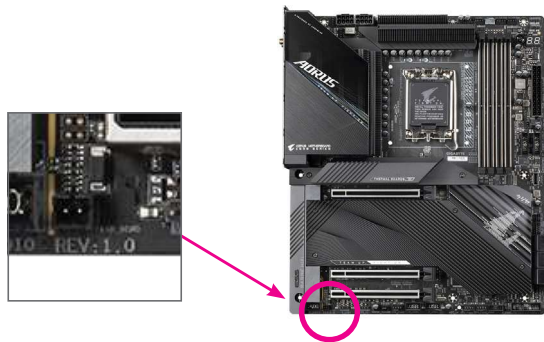
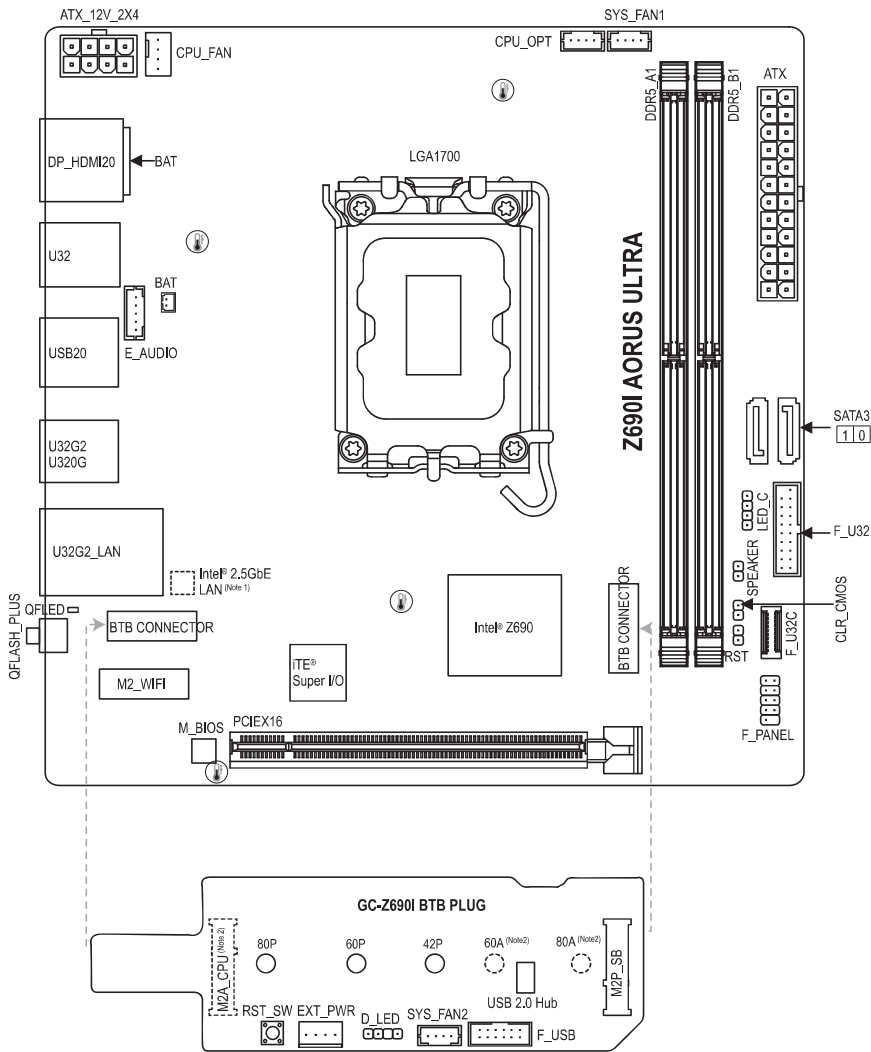


Table of Contents

Chapter 1 Product Introduction	4
1-1 Motherboard Layout	4
1-2 Motherboard Block Diagram	6
Chapter 2 Hardware Installation	7
2-1 Installation Precautions	7
2-2 Product Specifications.....	8
2-3 Installing the CPU and CPU Cooler	11
2-4 Installing the Memory	14
2-5 Installing an Expansion Card	15
2-6 Back Panel Connectors.....	16
2-7 Internal Connectors.....	18
Chapter 3 BIOS Setup	29
Chapter 4 Installing the Operating System and Drivers.....	31
4-1 Operating System Installation	31
4-2 Drivers Installation.....	32
Chapter 5 Appendix	33
5-1 Configuring a RAID Set.....	33
Regulatory Notices.....	34
Contact Us	37

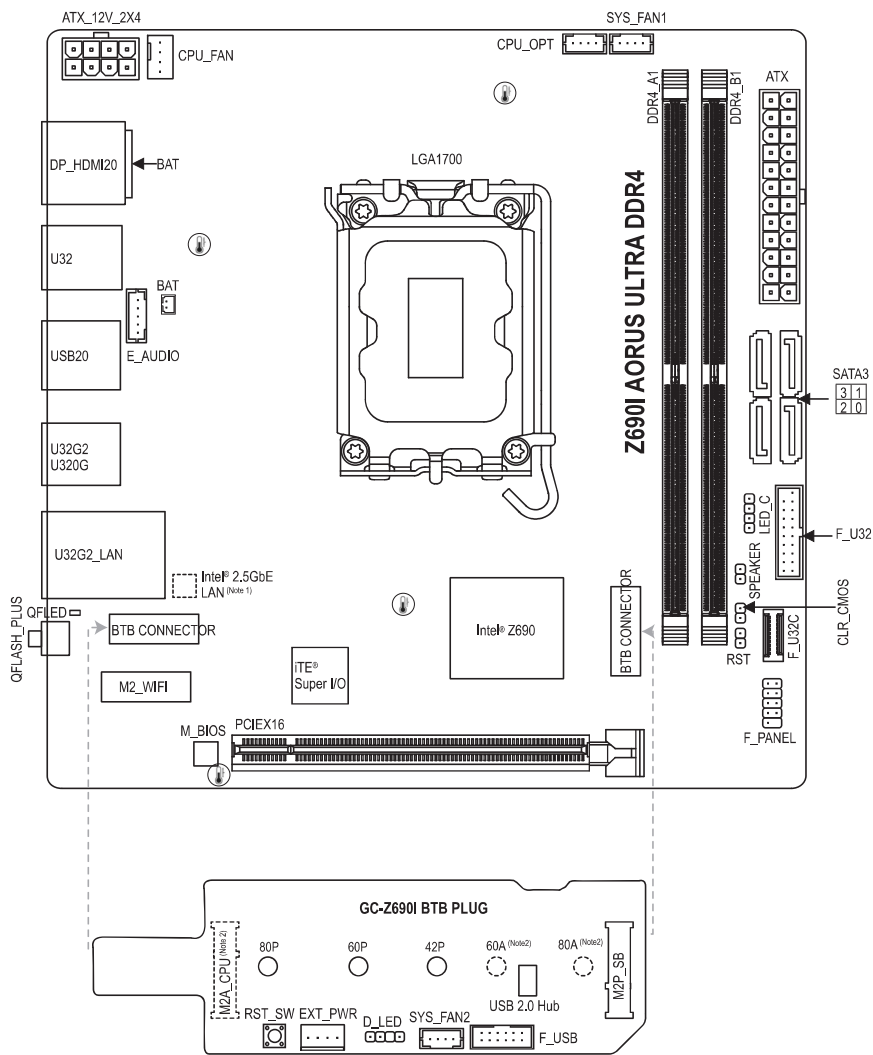
Chapter 1 Product Introduction

1-1 Motherboard Layout



Temperature sensor

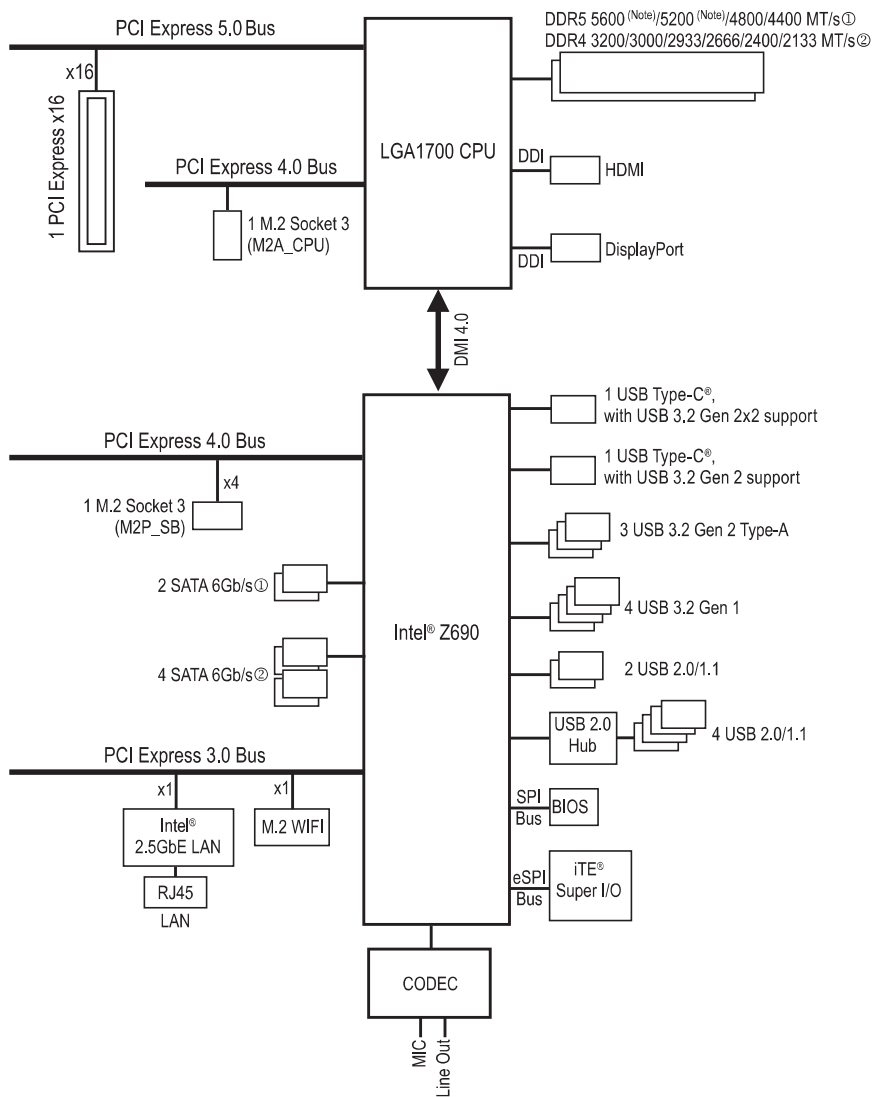
- (Note 1) The connector/chip is on the back of the motherboard.
- (Note 2) The connector is on the back of GC-Z690I BTB PLUG.



Temperature sensor

(Note 1) The connector/chip is on the back of the motherboard.
 (Note 2) The connector is on the back of GC-Z690I BTB PLUG.

1-2 Motherboard Block Diagram



(Note) Actual support may vary by CPU.

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2-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:




- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before connecting or unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature or wet environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.
- If you use an adapter, extension power cable, or power strip, ensure to consult with its installation and/or grounding instructions.

2-2 Product Specifications

	CPU	<ul style="list-style-type: none"> ◆ LGA1700 socket: Support for the 13th and 12th Generation Intel® Core™, Pentium® Gold and Celeron® Processors (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
	Chipset	<ul style="list-style-type: none"> ◆ Intel® Z690 Express Chipset
	Memory	<ul style="list-style-type: none"> ◆ 13th Generation Intel® Core™ i9/i7 Processors: <ul style="list-style-type: none"> - Support for DDR5 5600/5200/4800/4400 MT/s memory modules^① ◆ 13th Generation Intel® Core™ i5/i3 and 12th Generation Intel® Core™, Pentium® Gold and Celeron® Processors: <ul style="list-style-type: none"> - Support for DDR5 4800/4400 MT/s memory modules^① ◆ Support for DDR4 3200/3000/2933/2666/2400/2133 MT/s memory modules^② ◆ 2 x DDR5 DIMM sockets supporting up to 96 GB (48 GB single DIMM capacity) of system memory^① ◆ 2 x DDR4 DIMM sockets supporting up to 64 GB (32 GB single DIMM capacity) of system memory^② ◆ Dual channel memory architecture ◆ Support for ECC Un-buffered DIMM 1Rx8/2Rx8 memory modules (operate in non-ECC mode) ◆ Support for non-ECC Un-buffered DIMM 1Rx8/2Rx8/1Rx16 memory modules ◆ Support for Extreme Memory Profile (XMP) memory modules (The CPU and memory configuration may affect the supported memory types, data rate (speed), and number of DRAM modules, please refer to "Memory Support List" on GIGABYTE's website for more information.)
	Onboard Graphics	<ul style="list-style-type: none"> ◆ Integrated Graphics Processor-Intel® HD Graphics support: <ul style="list-style-type: none"> - 1 x HDMI port, supporting a maximum resolution of 4096x2160@60 Hz <ul style="list-style-type: none"> * Support for HDMI 2.0 version and HDCP 2.3. - 1 x DisplayPort port, supporting a maximum resolution of 5120x2160@60 Hz <ul style="list-style-type: none"> * Support for DisplayPort 1.4 version and HDCP 2.3 * The DisplayPort does not support HDMI connection by adapter. <p>(Graphics specifications may vary depending on CPU support.)</p>
	Audio	<ul style="list-style-type: none"> ◆ Realtek® ALC4080 CODEC ◆ Support for DTS:X® Ultra ◆ High Definition Audio ◆ 2-channel
	LAN	<ul style="list-style-type: none"> ◆ Intel® 2.5GbE LAN chip (2.5 Gbps/1 Gbps/100 Mbps)
	Wireless Communication Module	<ul style="list-style-type: none"> ◆ Intel® Wi-Fi 6 AX201 <ul style="list-style-type: none"> - WIFI a, b, g, n, ac, ax, supporting 2.4/5 GHz Dual-Band - BLUETOOTH 5.2 - Support for 11ax 160MHz wireless standard and up to 2.4 Gbps data rate <ul style="list-style-type: none"> * Actual data rate may vary depending on environment and equipment.
	Expansion Slots	<ul style="list-style-type: none"> ◆ 1 x PCI Express x16 slot, running at x16 (The PCI Express x16 slots conform to PCI Express 5.0 standard.)

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 Storage Interface	<ul style="list-style-type: none"> ◆ CPU: <ul style="list-style-type: none"> - 1 x M.2 connector on the back of the GC-Z690I BTB PLUG (Socket 3, M key, type 2260/2280 PCIe 4.0 x4/x2 SSD support) (M2A_CPU) ◆ Chipset: <ul style="list-style-type: none"> - 1 x M.2 connector on the front of GC-Z690I BTB PLUG (Socket 3, M key, type 2242/2260/2280 PCIe 4.0 x4/x2 SSD support) (M2P_SB) - 2 x SATA 6Gb/s connectors^① - 4 x SATA 6Gb/s connectors^② ◆ Support for RAID 0, RAID 1, RAID 5^②, and RAID 10^② ◆ Intel® Optane™ Memory Ready <ul style="list-style-type: none"> * System acceleration with Intel® Optane™ Memory can only be enabled on the M.2 connector supported by the Chipset.
 USB	<ul style="list-style-type: none"> ◆ Chipset: <ul style="list-style-type: none"> - 1 x USB Type-C® port on the back panel, with USB 3.2 Gen 2x2 support - 1 x USB Type-C® port with USB 3.2 Gen 2 support, available through the internal USB header - 3 x USB 3.2 Gen 2 Type-A ports (red) on the back panel - 4 x USB 3.2 Gen 1 ports (2 ports on the back panel, 2 ports available through the internal USB header) - 2 x USB 2.0/1.1 ports on the back panel ◆ Chipset+USB 2.0 Hub: <ul style="list-style-type: none"> - 4 x USB 2.0/1.1 ports available through the USB headers on the front of GC-Z690I BTB PLUG
 Internal Connectors	<ul style="list-style-type: none"> ◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 1 x external power connector^(Note 1) ◆ 1 x CPU fan header ◆ 1 x water cooling CPU fan header ◆ 2 x system fan headers(SYS_FAN1/SYS_FAN2^(Note 1)) ◆ 1 x addressable LED strip header^(Note 1) ◆ 1 x RGB LED strip header ◆ 2 x M.2 Socket 3 connectors(M2A_CPU^(Note 2)/M2P_SB^(Note 1)) ◆ 2 x SATA 6Gb/s connectors^① ◆ 4 x SATA 6Gb/s connectors^② ◆ 1 x front panel header ◆ 1 x front panel audio header(routed from the adapter card on the rear panel) ◆ 1 x speaker header ◆ 1 x USB Type-C® header, with USB 3.2 Gen 2 support ◆ 1 x USB 3.2 Gen 1 header ◆ 1 x USB 2.0/1.1 header^(Note 1) ◆ 1 x reset button^(Note 1) ◆ 1 x reset jumper ◆ 1 x Clear CMOS jumper

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(Note 1) The connector is on the front of GC-Z690I BTB PLUG.

(Note 2) The connector is on the back of GC-Z690I BTB PLUG.

 Back Panel Connectors	<ul style="list-style-type: none"> ◆ 2 x SMA antenna connectors (2T2R) ◆ 1 x DisplayPort ◆ 1 x HDMI port ◆ 1 x USB Type-C® port, with USB 3.2 Gen 2x2 support ◆ 3 x USB 3.2 Gen 2 Type-A ports (red) ◆ 2 x USB 3.2 Gen 1 ports ◆ 2 x USB 2.0/1.1 ports ◆ 1 x Q-Flash Plus button ◆ 1 x RJ-45 port ◆ 2 x audio jacks
 I/O Controller	<ul style="list-style-type: none"> ◆ iTE® I/O Controller Chip
 Hardware Monitor	<ul style="list-style-type: none"> ◆ Voltage detection ◆ Temperature detection ◆ Fan speed detection ◆ Water cooling flow rate detection ◆ Fan fail warning ◆ Fan speed control <p style="margin-left: 20px;">* Whether the fan speed control function is supported will depend on the cooler you install.</p>
 BIOS	<ul style="list-style-type: none"> ◆ 1 x 256 Mbit flash ◆ Use of licensed AMI UEFI BIOS ◆ PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0
 Unique Features	<ul style="list-style-type: none"> ◆ Support for APP Center <ul style="list-style-type: none"> * Available applications in APP Center may vary by motherboard model. Supported functions of each application may also vary depending on motherboard specifications. - @BIOS - EasyTune - RGB Fusion - Smart Backup - System Information Viewer ◆ Support for Q-Flash Plus ◆ Support for Q-Flash ◆ Support for Xpress Install
 Bundled Software	<ul style="list-style-type: none"> ◆ Norton® Internet Security (OEM version) ◆ LAN bandwidth management software
 Operating System	<ul style="list-style-type: none"> ◆ Support for Windows 11 64-bit ◆ Support for Windows 10 64-bit
 Form Factor	<ul style="list-style-type: none"> ◆ Mini-ITX Form Factor; 17.0cm x 17.0cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

☞ Please visit GIGABYTE's website for support lists of CPU, memory modules, SSDs, and M.2 devices.

<https://www.gigabyte.com/Motherboard/Z690I-AORUS-ULTRA-rev-10?m=dl#support-dl>

<https://www.gigabyte.com/Motherboard/Z690I-AORUS-ULTRA-DDR4-rev-10?m=dl#support-dl>

☞ Please visit the **SERVICE/SUPPORTUtility** page on GIGABYTE's website to download the latest version of apps.

<https://www.gigabyte.com/Support/Utility/Motherboard?m=ut>

2-3 Installing the CPU and CPU Cooler

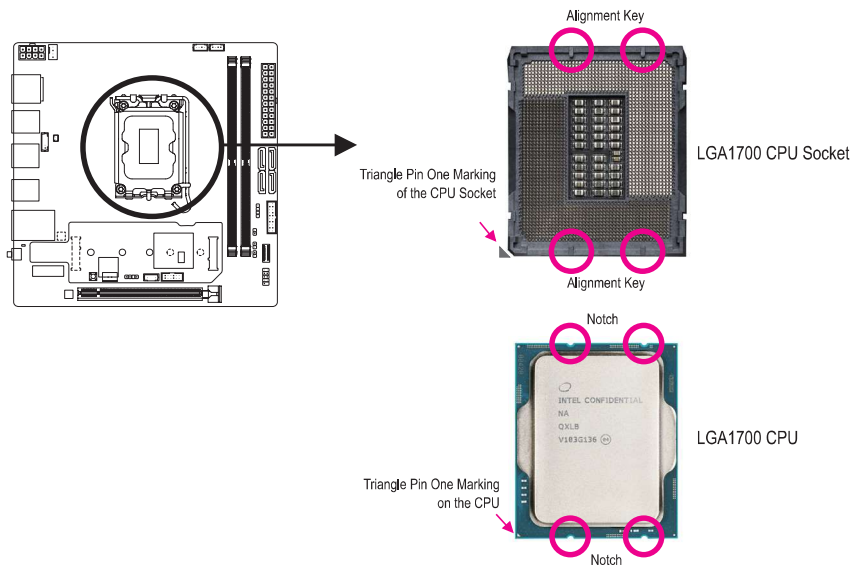


Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
(Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

A. Note the CPU Orientation

Note the alignment keys on the motherboard CPU socket and the notches on the CPU.



Do not remove the CPU socket cover before inserting the CPU. It may pop off from the load plate automatically after you insert the CPU and close the load plate.

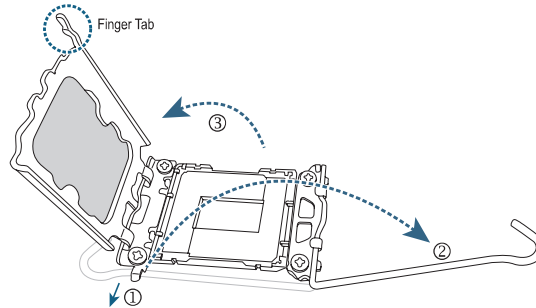
Please visit GIGABYTE's website for details on hardware installation.
<http://www.gigabyte.com/WebPage/210/quick-guide.html?m=sw>

B. Installing the CPU

Follow the steps below to correctly install the CPU into the motherboard CPU socket.

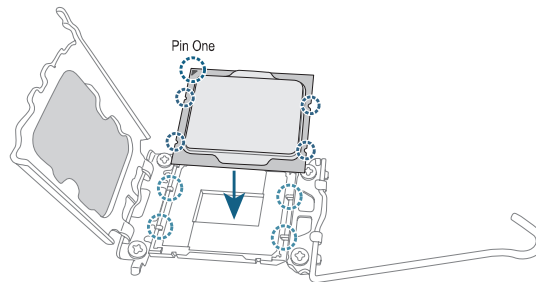
1

- 1 Gently press the CPU socket lever handle down and away from the socket.
- 2 Completely lift up the CPU socket locking lever.
- 3 Use the finger tab on the side of the metal load plate to lift open the metal load plate with the plastic protective cover attached to it.



2

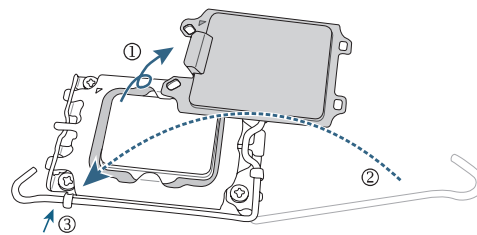
Hold the CPU with your fingers by the edges. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys) and gently insert the CPU into position.



3

Make sure the CPU is properly installed and then close the load plate. The plastic protective cover will pop off, just remove it. Secure the lever under its retention tab to complete the installation of the CPU.

* Always replace the plastic protective cover when the CPU is not installed to protect the CPU socket.



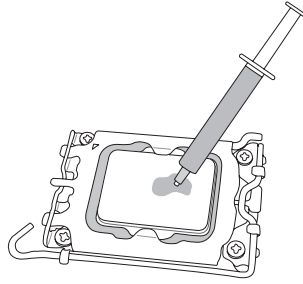
Do not force to engage the CPU socket locking lever when the CPU is not installed correctly as this would damage the CPU and CPU socket.

C. Installing the CPU Cooler

Be sure to install the CPU cooler after installing the CPU. (Actual installation process may differ depending the CPU cooler to be used. Refer to the user's manual for your CPU cooler.)

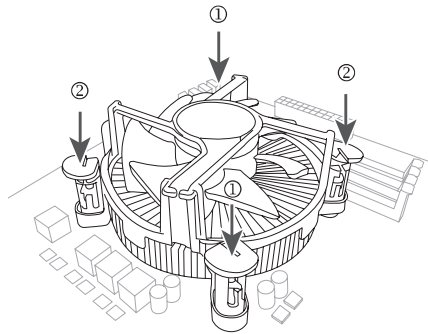
①

Apply an even and thin layer of thermal grease on the surface of the installed CPU.



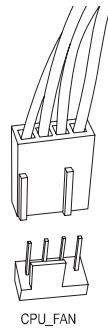
②

Place the cooler atop the CPU, aligning the four push pins through the pin holes on the motherboard. Push down on the push pins diagonally.



③

Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.



2-4 Installing the Memory



Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used. (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

Dual Channel Memory Configuration

This motherboard provides two memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

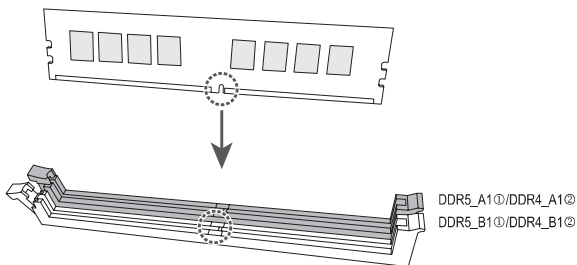
The two memory sockets are divided into two channels and each channel has one memory socket as following:

▶▶ Channel A: DDR5_A1①,DDR4_A1②

▶▶ Channel B: DDR5_B1①,DDR4_B1②

Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode.

1. Dual Channel mode cannot be enabled if only one memory module is installed.
2. When enabling Dual Channel mode with two memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used.



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2-5 Installing an Expansion Card

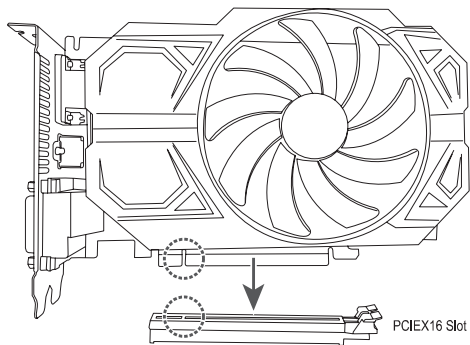


Read the following guidelines before you begin to install an expansion card:

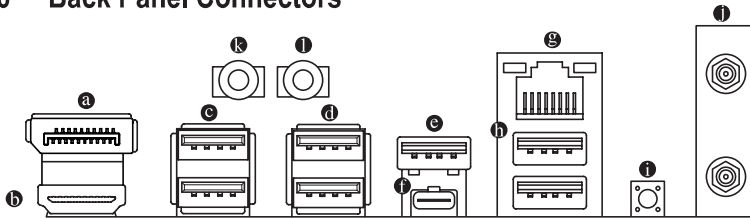
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.

Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover(s).
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.



2-6 Back Panel Connectors




a DisplayPort ^(Note 1)

DisplayPort delivers high quality digital imaging and audio, supporting bi-directional audio transmission. DisplayPort can support HDCP 2.3 content protection mechanisms. You can use this port to connect your DisplayPort-supported monitor. Note: The DisplayPort Technology can support a maximum resolution of 5120x2160@60 Hz but the actual resolutions supported

b HDMI Port

HDMI™ The HDMI port supports HDCP 2.3 and Dolby TrueHD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 7.1-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 4096x2160@60 Hz, but the actual resolutions supported are dependent on the monitor being used.

 After installing the DisplayPort/HDMI device, make sure to set the default sound playback device to DisplayPort/HDMI. (The item name may differ depending on your operating system.)

c USB 3.2 Gen 1 Port

The USB 3.2 Gen 1 port supports the USB 3.2 Gen 1 specification and is compatible to the USB 2.0 specification. Use this port for USB devices.

d USB 2.0/1.1 Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices.

e USB 3.2 Gen 2 Type-A Port (Q-Flash Plus Port)

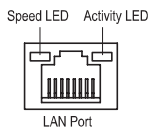
The USB 3.2 Gen 2 port supports the USB 3.2 Gen 2 specification and is compatible to the USB 3.1 Gen 1 and USB 2.0 specification. Use this port for USB devices. Before using Q-Flash Plus ^(Note 2), make sure to insert the USB flash drive into this port first.

f USB Type-C® Port

The reversible USB port supports the USB 3.2 Gen 2x2 specification and is compatible to the USB 3.2 Gen 2, USB 3.2 Gen 1, and USB 2.0 specifications. Use this port for USB devices.

g RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 2.5 Gbps data rate. The following describes the states of the LAN port LEDs.



Speed LED:	
State	Description
Green	2.5 Gbps data rate
Orange	1 Gbps data rate
Off	100 Mbps data rate

Activity LED:	
State	Description
Blinking	Data transmission or receiving is occurring
On	No data transmission or receiving is occurring



- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

① **USB 3.2 Gen 2 Type-A Port (Red)**

The USB 3.2 Gen 2 port supports the USB 3.2 Gen 2 specification and is compatible to the USB 3.1 Gen 1 and USB 2.0 specification. Use this port for USB devices.

① **Q-Flash Plus Button** (Note 2)

Q-Flash Plus allows you to update the BIOS when your system is off (S5 shutdown state). Save the latest BIOS on a USB thumb drive and plug it into the dedicated port, and then you can now flash the BIOS automatically by simply pressing the Q-Flash Plus button. The QFLED will flash when the BIOS matching and flashing activities start and will stop flashing when the main BIOS flashing is complete.

① **SMA Antenna Connectors (2T2R)**

Use this connector to connect an antenna.



Tighten the antennas to the antenna connectors and then aim the antennas correctly for better signal reception.

① **Line Out**

The line out jack. For better sound quality, it is recommended that you connect your headphone/speaker to this jack (actual effects may vary by the device being used).

① **Mic In**

The Mic in jack.

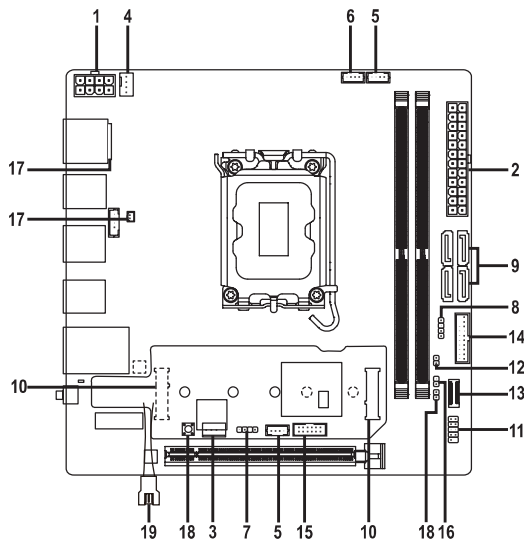
☞ Please visit GIGABYTE's website for details on configuring the audio software.

<https://www.gigabyte.com/WebPage/699/realtek4080-audio.html>

(Note 1) The DisplayPort does not support HDMI connection by adapter.

(Note 2) To enable the Q-Flash Plus function, please navigate to the "Unique Features" page of GIGABYTE's website for more information.

2-7 Internal Connectors



1) ATX_12V_2X4	11) F_PANEL
2) ATX	12) SPEAKER
3) EXT_PWR (Note 1)	13) F_U32C
4) CPU_FAN	14) F_U32
5) SYS_FAN1/SYS_FAN2 (Note1)	15) F_USB (Note 1)
6) CPU_OPT	16) CLR_CMOS
7) D_LED (Note1)	17) BAT
8) LED_C	18) RST_SW (Note 1)/RST
9) SATA3 0/1 ①, SATA3 0/1/2/3 ②	19) F_AUDIO
10) M2A_CPU (Note 2)/M2P_SB (Note1)	

① Only for Z690I AORUS ULTRA.

② Only for Z690I AORUS ULTRA DDR4.

(Note 1) The connector is on the front of GC-Z690I BTB PLUG.

(Note 2) The connector is on the back of GC-Z690I BTB PLUG.



Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

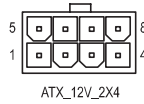
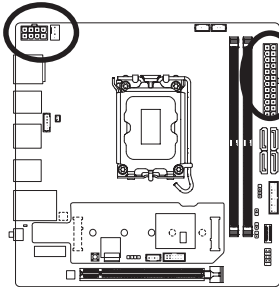
1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

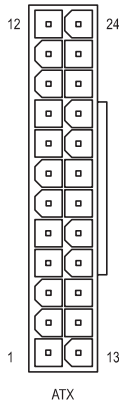


To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.



ATX_12V_2X4:

Pin No.	Definition
1	GND (Only for 2x4-pin 12V)
2	GND (Only for 2x4-pin 12V)
3	GND
4	GND
5	+12V (Only for 2x4-pin 12V)
6	+12V (Only for 2x4-pin 12V)
7	+12V
8	+12V

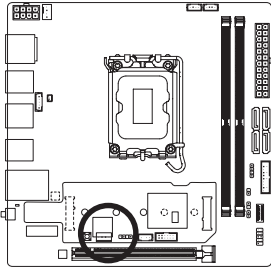


ATX:

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON (soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	NC
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12-pin ATX)	23	+5V (Only for 2x12-pin ATX)
12	3.3V (Only for 2x12-pin ATX)	24	GND (Only for 2x12-pin ATX)

3) EXT_PWR ^(Note) (External Power Connector)

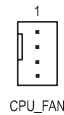
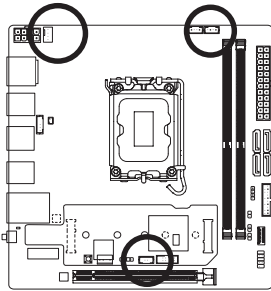
Connect one end of the EXT_PWR cable to this connector and the other end to your power supply.



Pin No.	Definition
1	VCC
2	GND
3	GND
4	+12V

4/5) CPU_FAN/SYS_FAN1/SYS_FAN2 ^(Note) (Fan Headers)

All fan headers on this motherboard are 4-pin. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



CPU_FAN



Fan power extension cable
SYS_FAN1/2

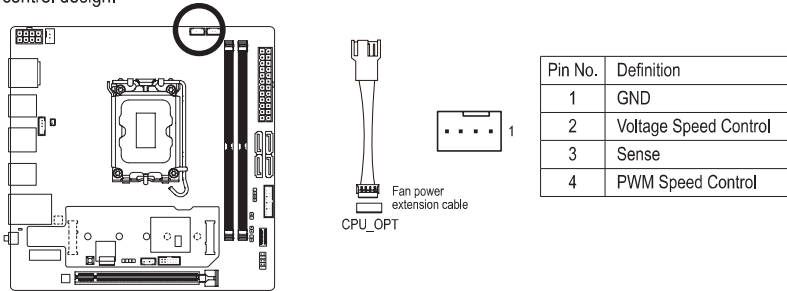


Pin No.	Definition
1	GND
2	Voltage Speed Control
3	Sense
4	PWM Speed Control

(Note) The connector is on the front of GC-Z690I BTB PLUG.

6) CPU_OPT (Water Cooling CPU Fan Header)

The fan header is 4-pin and possesses a foolproof insertion design. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design.



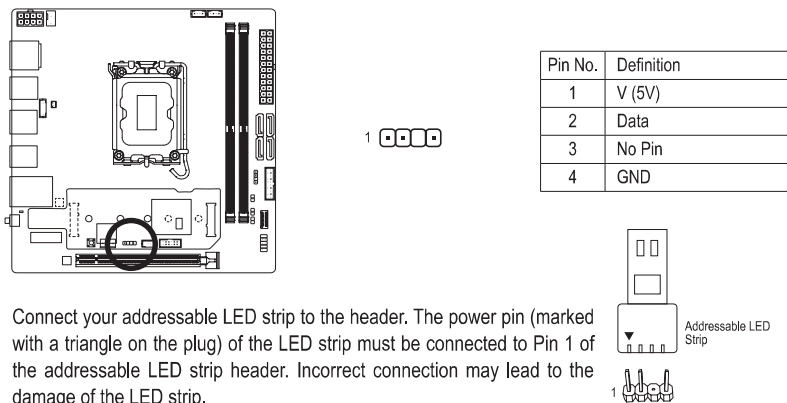
Connector	CPU_FAN	SYS_FAN1	SYS_FAN2	CPU_OPT
Maximum Current	2A	2A	2A	2A
Maximum Power	24W	24W	24W	24W



- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

7) D_LED (Note) (Addressable LED Strip Header)

The header can be used to connect a standard 5050 addressable LED strip, with maximum power rating of 5A (5V) and maximum number of 1000 LEDs.

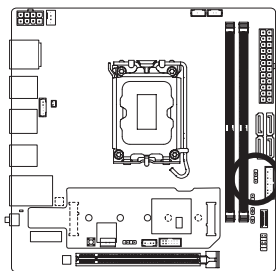


Connect your addressable LED strip to the header. The power pin (marked with a triangle on the plug) of the LED strip must be connected to Pin 1 of the addressable LED strip header. Incorrect connection may lead to the damage of the LED strip.

(Note) The connector is on the front of GC-Z690I BTB PLUG.

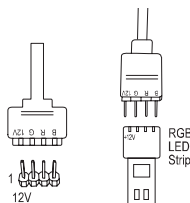
8) LED_C (RGB LED Strip Header)

The header can be used to connect a standard 5050 RGB LED strip (12V/G/R/B), with maximum power rating of 2A (12V) and maximum length of 2m.



Pin No.	Definition
1	12V
2	G
3	R
4	B

Connect one end of the RGB LED strip extension cable to the header and the other end to your RGB LED strip. The black wire (marked with a triangle on the plug) of the extension cable must be connected to Pin 1 (12V) of this header. The 12V pin (marked with an arrow) on the other end of the extension cable must be lined up with the 12V of the LED strip. Be careful with the connection orientation of the LED strip; incorrect connection may lead to the damage of the LED strip.



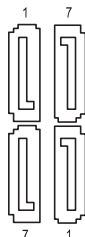
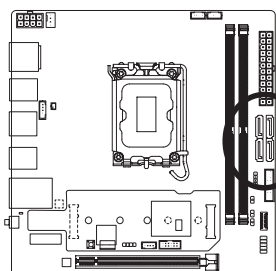
For how to turn on/off the lights of the LED strip, please navigate to the "Unique Features" page of GIGABYTE's website.



Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.

9) SATA3 0/1①, SATA3 0/1/2/3② (SATA 6Gb/s Connectors)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Intel® Chipset supports RAID 0, RAID 1, RAID 5②, and RAID 10②. Please navigate to the "Configuring a RAID Set" page of GIGABYTE's website for instructions on configuring a RAID array.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



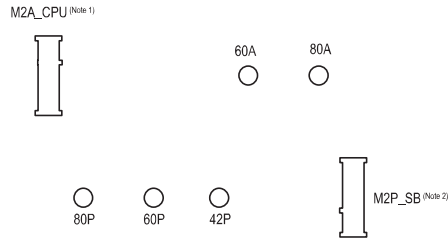
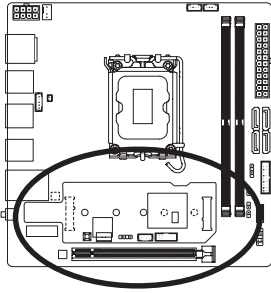
To enable hot-plugging for the SATA ports, please visit the "BIOS Setup," "SATA And RST Configuration," webpage of GIGABYTE's website for more information.

① Only for Z690I AORUS ULTRA.

② Only for Z690I AORUS ULTRA DDR4.

10) M2A_CPU (Note 1) / M2P_SB (Note 2) (M.2 Socket 3 Connectors)

There are two types of M.2 SSDs: M.2 SATA SSDs and M.2 PCIe SSDs. This motherboard only supports M.2 PCIe SSDs. Be sure to verify the type of M.2 SSDs you want to use. Please note that an M.2 PCIe SSD cannot be used to create a RAID set with a SATA hard drive. Please navigate to the "Configuring a RAID Set" page of GIGABYTE's website for instructions on configuring a RAID array.



Follow the steps below to correctly install an M.2 SSD in the M.2 connector on GC-Z690I BTB PLUG.

Step 1:

Use a screwdriver to unfasten the screw on the heatsink and then remove the heatsink.

Step 2:

M2A_CPU:

● To use the M2A_CPU connector, you have to remove GC-Z690I BTB PLUG from the motherboard first. Use a screwdriver to remove the screw from GC-Z690I BTB PLUG. Lift GC-Z690I BTB PLUG upwards and remove it.

● Remove protective film C.

M2P_SB:

Remove protective films A and B.

Step 3:

Locate the proper mounting hole based on the length of your M.2 SSD drive. If needed, move the standoff to the desired mounting hole. Insert the M.2 SSD into the M.2 connector at an angle. Press the M.2 SSD down and then use the included screw to secure it in the connector.

Step 4:

M2A_CPU:

Insert GC-Z690I BTB PLUG vertically into the BTB connectors and secure it with the screw. Then screw the heatsink back on.

M2P_SB:

Screw the heatsink back on.

* Types of M.2 SSDs supported by each M.2 connector:

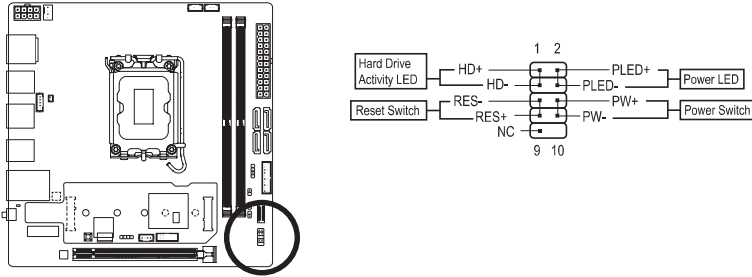
	M.2 PCIe x4 SSD	M.2 PCIe x2 SSD	M.2 SATA SSD
M2A_CPU	✓	✓	✗
M2P_SB	✓	✓	✗

(Note 1) The connector is on the back of GC-Z690I BTB PLUG.

(Note 2) The connector is on the front of GC-Z690I BTB PLUG.

11) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.



- **PLED (Power LED):**

System Status	LED
S0	On
S3/S4/S5	Off

Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

- **PW (Power Switch):**

Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (please visit the "BIOS Setup," "Settings\Platform Power," webpage of GIGABYTE's website for more information).

- **HD (Hard Drive Activity LED):**

Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

- **RES (Reset Switch):**

Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

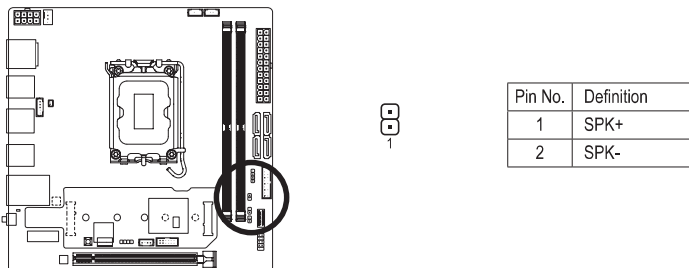
- **NC: No connection.**



The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

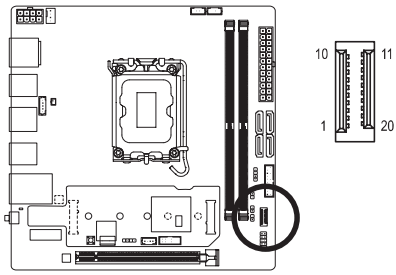
12) SPEAKER (Speaker Header)

The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup. This header can also provide audio output in the operating system.



13) F_U32C (USB Type-C® Header with USB 3.2 Gen 2 Support)

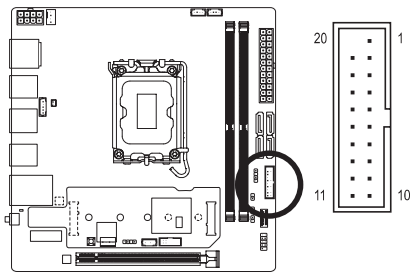
The header conforms to USB 3.2 Gen 2 specification and can provide one USB port.



Pin No.	Definition	Pin No.	Definition
1	VBUS	11	VBUS
2	TX1+	12	TX2+
3	TX1-	13	TX2-
4	GND	14	GND
5	RX1+	15	RX2+
6	RX1-	16	RX2-
7	VBUS	17	GND
8	CC1	18	D-
9	SBU1	19	D+
10	SBU2	20	CC2

14) F_U32 (USB 3.2 Gen 1 Header)

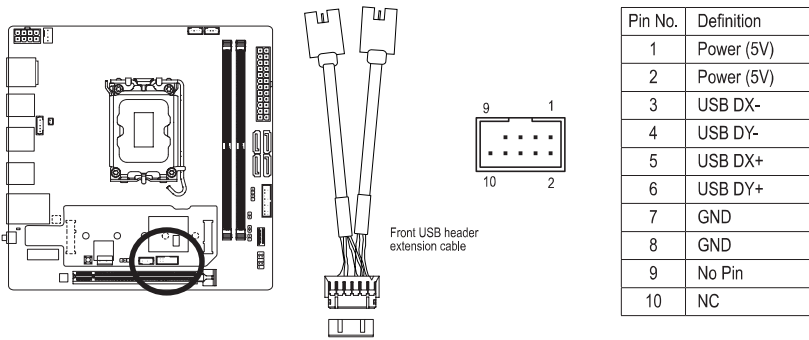
The header conforms to USB 3.2 Gen 1 and USB 2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.2 Gen 1 ports, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

15) F_USB (Note) (USB 2.0/1.1 Header)

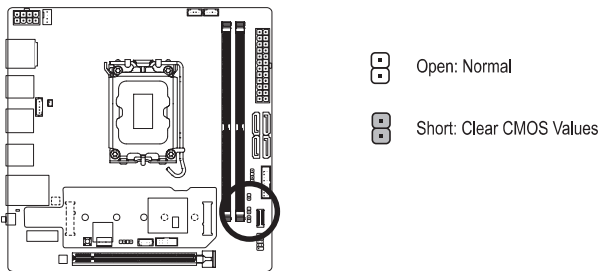
Connect one end of the front USB header extension cable to this header and the other ends to two USB brackets. The header conforms to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

16) CLR_CMOS (Clear CMOS Jumper)

Use this jumper to clear the BIOS configuration and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.

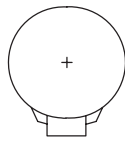
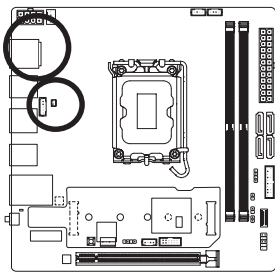


- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (please navigate to the "BIOS Setup" page of GIGABYTE's website for more information).

(Note) The connector is on the front of GC-Z690I BTB PLUG.

17) BAT (Battery)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.



1 (+)
2 (-)

You may clear the CMOS values by removing the battery:

1. Turn off your computer and unplug the power cord.
2. Unplug the the battery cable from the battery cable header and wait for one minute.
3. Plug in the battery cable.
4. Plug in the power cord and restart your computer.

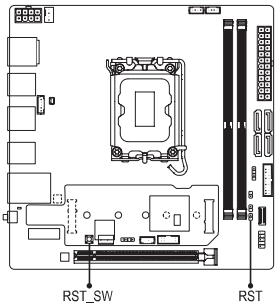
Pin No.	Definition
1 (+)	RTC Power
2 (-)	GND



- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Damage to your devices may occur if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- Used batteries must be handled in accordance with local environmental regulations.

18) RST_SW ^(Note) /RST (Reset Button/Reset Jumper)

The reset button (RST_SW) allows users to quickly turn on/off the computer in an open-case environment when they want to change hardware components or conduct hardware testing. The reset jumper (RST) can connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.



1
RST

RST_SW

Pin No.	Definition
1	Reset
2	GND



The reset button (RST_SW)/rest jumper (RST) provides you with several functions to use. To remap the button to perform different tasks, please navigate to the "BIOS Setup" page of GIGABYTE's website and search for "RST_SW (MULTIKEY)" for more information.

(Note) The connector is on the front of GC-Z690I BTB PLUG.

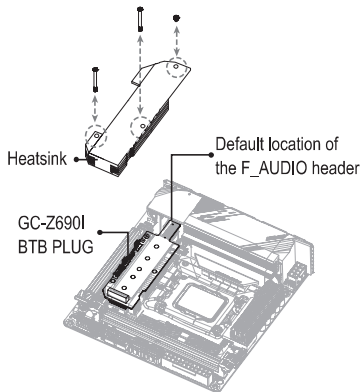
19) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports High Definition audio (HD). You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.

Suggested F_AUDIO header routing:

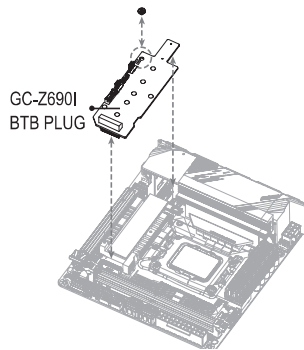
Step 1:

Use a screwdriver to unfasten the screw on the heatsink and then remove the heatsink.



Step 2:

Use a screwdriver to remove the screw from GC-Z690I BTB PLUG. Lift the GC-Z690I BTB PLUG upwards and remove it.

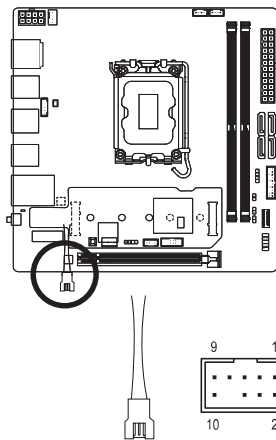


Step 3:

Move the F_AUDIO header out of its default location and route it via the BTB connector to the bottom edge of the motherboard as shown on the left.

Step 4:

Insert GC-Z690I BTB PLUG vertically into the BTB connectors and secure it with the screw. Then screw the heatsink back on.



Pin No.	Definition	Pin No.	Definition
1	MIC L	6	MIC Detection
2	GND	7	SENSE_SEND
3	MIC R	8	No Pin
4	NC	9	Head Phone L
5	Head Phone R	10	Head Phone Detection



Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

Please visit GIGABYTE's website for details on using the front panel audio header.

<https://www.gigabyte.com/WebPage/876/Z690I-AORUS-ULTRA-DDR4-audio.html>

Chapter 3 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility.

- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.

For instructions on using the Q-Flash and @BIOS utilities, please navigate to the "Unique Features" page of GIGABYTE's website and search for "BIOS Update Utilities."

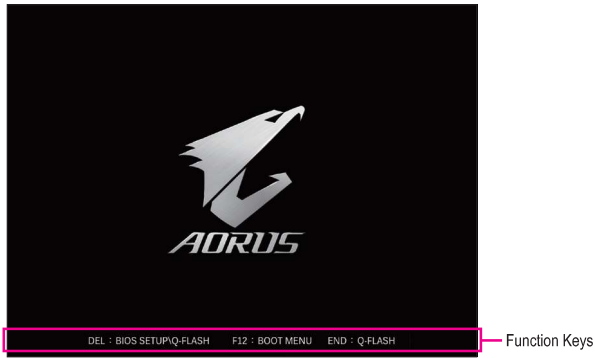


- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values.
- Refer to the introductions of the battery/clear CMOS jumper in Chapter 2 or navigate to the "BIOS Setup" page of GIGABYTE's website and search for "Load Optimized Defaults" for how to clear the CMOS values.

☞ Please visit GIGABYTE's website for details on configuring BIOS Setup.
<https://www.gigabyte.com/WebPage/819/z690-bios.html>

Startup Screen:

The following startup Logo screen will appear when the computer boots.



Function Keys:

: BIOS SETUP|Q-FLASH

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F12>: BOOT MENU

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings.

<END>: Q-FLASH

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

Chapter 4 Installing the Operating System and Drivers

4-1 Operating System Installation

With the correct BIOS settings, you are ready to install the operating system.

If you want to install an operating system on a RAID volume, you need to install the Intel® RST VMD Controller driver first during the OS installation process. Refer to the steps below:

Step 1:

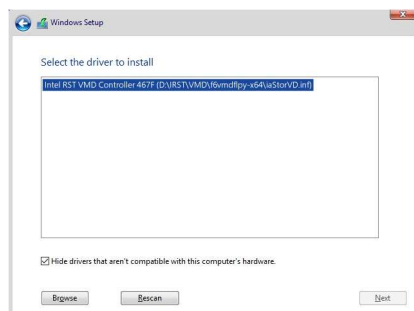
Go to GIGABYTE's website, browse to the motherboard model's web page, download the **Intel SATA Preinstall driver** file on the **Support\Download\SATA RAID/AHCI** page, unzip the file and copy the files to your USB thumb drive.

Step 2:

Boot from the Windows setup disc and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

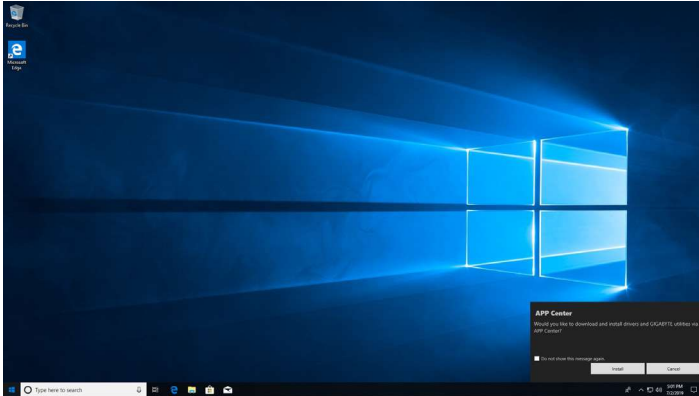
Step 3:

Insert the USB thumb drive and then browse to the location of the driver. When a screen as shown below appears, select **Intel RST VMD Controller 467F** and click **Next** to load the driver and continue the OS installation.

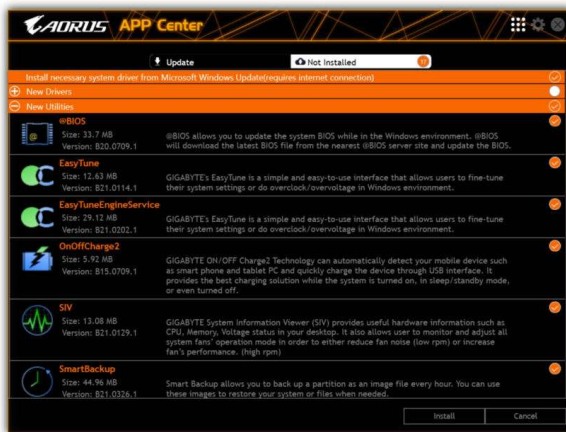


4-2 Drivers Installation

After you install the operating system, a dialog box will appear on the bottom-right corner of the desktop asking if you want to download and install the drivers and GIGABYTE applications via APP Center. Click **Install** to proceed with the installation. (In BIOS Setup, make sure Settings\IO Ports\APP Center Download & Install Configuration\APP Center Download & Install is set to **Enabled**.)



When the End User License Agreement dialog box appears, press <Accept> to install APP Center. On the APP Center screen, select the drivers and applications you want to install and click **Install**.



Before the installation, make sure the system is connected to the Internet.

- ☞ Please visit GIGABYTE's website for more software information.
<https://www.gigabyte.com/WebPage/817/z690-app.html>
- ☞ Please visit GIGABYTE's website for more troubleshooting information.
<https://www.gigabyte.com/WebPage/351/faq.html>