# Features

### Operating system

Microsoft Windows 10 ML X64, Microsoft Windows 10 SL X64, Microsoft Windows 10 CN X64 and Endless

### Processor

The motherboard uses an LGA1200 type of socket that carries the following features:

- Accommodates the Intel® CML-S processor

### Chipset

The Intel® Z490 Chipset is a single-chip with proven reliability and performance.

- Support two PCI Express x16 slot
- Support two PCI Express x1 slot
- Three M.2 slots (1 x Key E M.2 2230 slot for WLAN co-lay with PCI-E,USB signal, supports Intel CNVi interface, and 2 x Key M M.2 2242/2280 slot for SSD and optane memory, supports PCIe or SATA signal)
- Integrated four SATA 6Gb/s Host Controllers
- Two USB 2.0 ports supported
- Two USB 3.2 Gen1 ports and two USB 3.2 Gen2 Type-A ports
- Three USB 3.2 Gen1 Type-A ports and one USB3.2 Gen1 Type-C port
- Serial Peripheral Interface (SPI) support
- Intel® High Definition Audio Controller

### PCB

- Form Factor : Micro-ATX Size
- Size (Max.) : 245mm x 241mm

### Memory

- Supports DDR4 2666/3200MHz DDR4 SDRAM with Dual-channel architecture
- Accommodates four un-buffered DIMMs
- Up to 16GB per DIMM with maximum memory size up to 64 GB

### Expansion Options

The motherboard comes with the following expansion options:

- Two PCI Express x16 slot for Graphic Interface
- Two PCI Express x1 slot
- 1 x Key E M.2 slot for 2230 and 2 x Key M M.2 slot for 2242/2280 supports PCIe or SATA signal
- Four Serial ATA 6Gb/s connectors

## LAN

The onboard LAN provides the following features:

- Controller: Giga PHY Intel i219V
- Support Wake up on LAN function, including from S3,S4,,power button off (non-ACPI OS)

## Audio

- 5.1 Channel High Definition Audio Codec
- Meets Microsoft Windows Logo Program and Lync audio requirements
- All DACs supports 44.1k/48k/96k/192kHz sample rate
- Software selectable 2.5V/3.2V/4.0V VREFOUT
- Direct Sound 3D$^{TM}$ compatible
- Power Support: Digital: 3.3V; Analog: 5.0V

## Integrated I/O

The motherboard has a full set of I/O ports and connectors:

Integrated I/O

- One PS/2 port
- Two USB 2.0 ports
- Two USB 3.2 Gen1 Type-A ports
- Two USB 3.2 Gen2 Type-A ports
- One LAN port
- Audio jacks for microphone, line-in and line-out

## BIOS Firmware

This motherboard uses AMI BIOS that enables users to configure many system features including the following:

- Power management
- Wake-up alarms
- CPU parameters
- CPU and memory timing
- Graphic parameters

The firmware can also be used to set parameters for different processor clock speeds.

1. Some hardware specifications and software items are subject to change without prior notice.
2. Due to chipset limitation, we recommend that motherboard be operated in the ambiance between 0 and 50 ° C.

| | LED | S0 | S3 | S4 | S5 |
|---|---|---|---|---|---|
| Front Side | Power LED | Always ON | Blinking | OFF | OFF |
| Rear Side [only LAN LED, built in RJ45] | LAN LED-ACTIVE | Access: Blink | OFF | OFF | OFF |
| | LAN LED-SPEED (Dual Color) | Disconnected: OFF | OFF | OFF | OFF |
| | | 1000 : ON with A color: Green 100 : ON with B color: Amber 10: OFF | | | |

**Dimensions and weight**

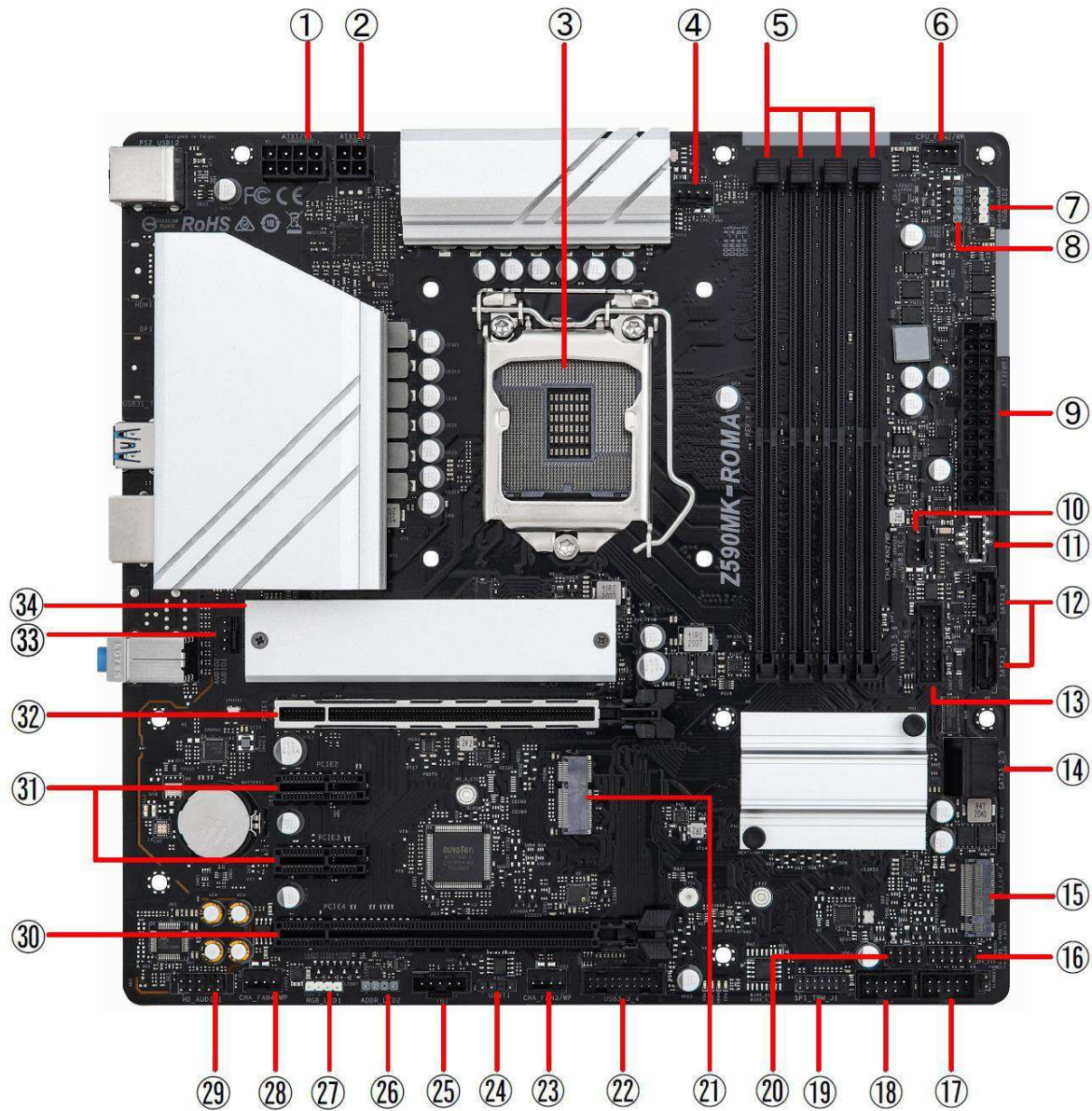- 460.0(L)x197.0(W)x440.0(H)mm (with bezel)
- 13.2 Kg

**Environment**

**Temperature:**

- Operating: 0ºC to 40ºC (32ºF to 104ºF)
- Non-operating: -20ºC to 65ºC (-4ºF to 149ºF)

**Humidity (non-condensing)**

- Operating: 20% to 80%
- Non-operating: 20% to 80%

# Main-board Placement



| No | Label | Component |
|----|-------|-----------|
| 1 | ATX12V1 | ATX 12V Power Connector (ATX12V1) |
| 2 | ATX12V2 | ATX 12V Power Connector (ATX12V2) |
| 3 | CPU | CPU Socket |
| 4 | CPUFAN1 | CPU Fan Connector (CPU_FAN1) |
| 5 | DIMM1~4 | 2 x 288-pin DDR4 DIMM Slots |
| 6 | CPU_FAN2/WP | CPU/Water Pump Fan Connector(CPU_FAN2/WP) |
| 7 | RGBLED2 | RGB LED Header (RGB_LED2) |
| 8 | ADDR_LED1 | Addressable LED Header(ADDR_LED1) |
| 9 | ATXPWR1 | ATX Power Connector (ATXPWR1) |
| 10 | CHA_FAN2/WP | Chassis/Water Pump Fan Connector (CHA_FAN2/WP) |
| 11 | USB3_TC_1 | Front Panel Type C USB 3.2 Gen1 Header (USB3_TC_1) |
| 12 | SATA1~2 | SATA3 Connector |
| 13 | USB3_5_6 | USB 3.2 Gen1 Header (USB3_5_6) |

| No | Label | Component |
|---|---|---|
| 14 | SATA3~4 | SATA3 Connector |
| 15 | M2_2_2 | M.2 2242/2280 slot for SSD |
| 16 | PANEL1 | System Panel Header (PANEL1) |
| 17 | USB5_6 | USB 2.0 Header |
| 18 | USB3_4 | USB 2.0 Header |
| 19 | SPI_TPM_J1 | SPI TPM Header |
| 20 | SPK_CI1 | Chassis Intrusion and Speaker Header (SPK_CI1) |
| 21 | M2_3 | M.2 slot for 2230 |
| 22 | USB3_3_4 | USB 3.2 Gen1 Header (USB3_3_4) |
| 23 | CHA_FAN3/WP | Chassis/Water Pump Fan Connector (CHA_FAN3/WP) |
| 24 | UART1 | UART Port |
| 25 | TB1 | Thunderbolt AIC Connector (TB1) |
| 26 | ADDR_LED2 | Addressable LED Header (ADDR_LED2) |
| 27 | RGB_LED1 | RGB LED Header(RGB_LED1) |
| 28 | CHA_FAN4/WP | Chassis/Water Pump Fan Connector (CHA_FAN4/WP) |
| 29 | HD_AUDIO1 | Front Panel Audio Header(HD_AUDIO1) |
| 30 | PCIE4 | PCIEx16 slot |
| 3 | PCIE2~3 | PCIEx1 slot |
| 32 | PCIE1 | PCIEx16 slot |
| 33 | CHA_FAN1/WP | Chassis/Water Pump Fan Connector (CHA_FAN1/WP) |
| 34 | M2_1_1 | M.2 2242/2280 slot for SSD |

## PO5-625s

The computer front panel consists of the following:

### Front view
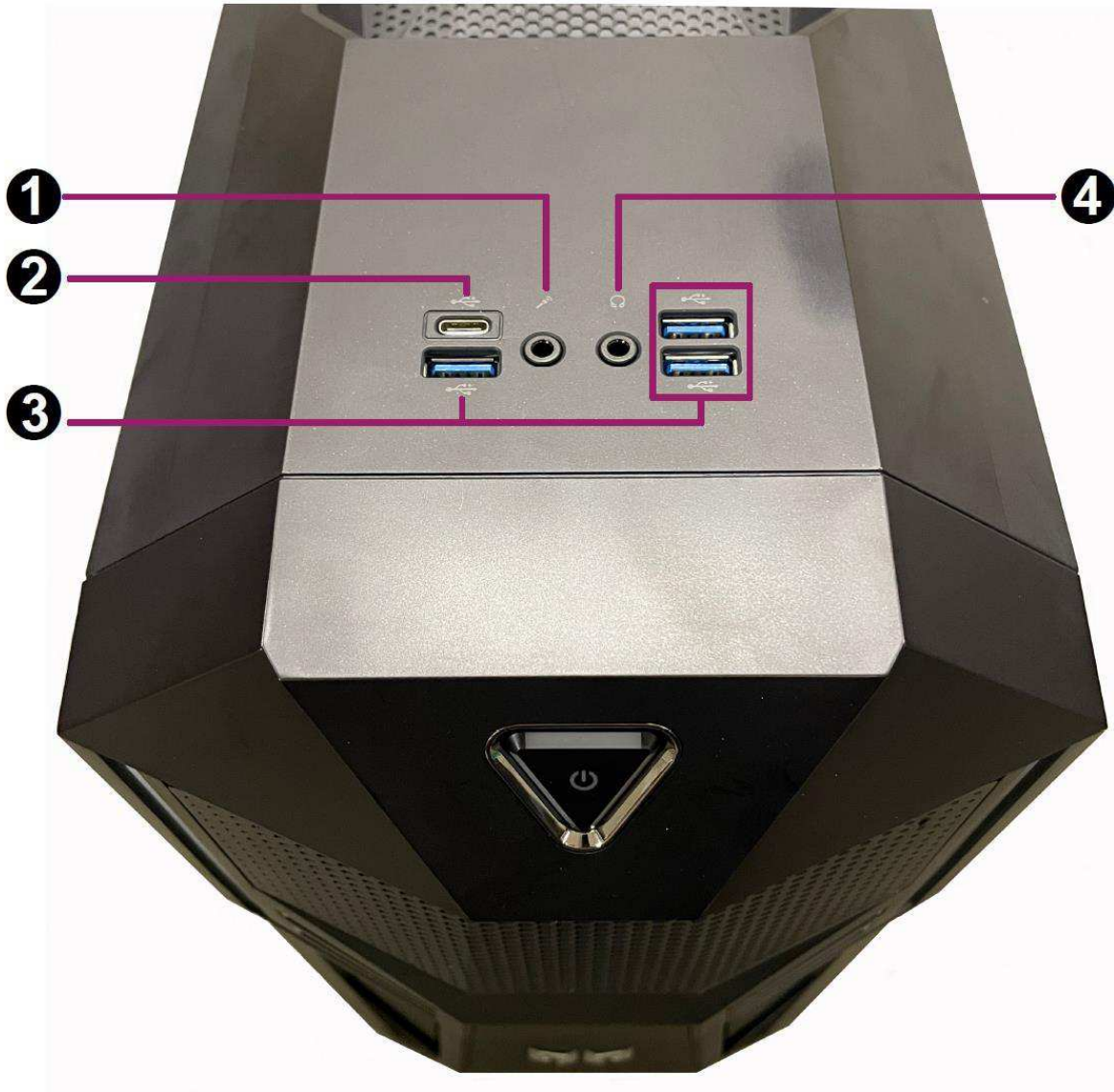


| No | Icon | Component | Description |
|---|---|---|---|
| 1 | | Microphone-in jack | Accepts input from external microphones. |
| 2 | | USB 3.2 Gen1 type C ports. | Connects to USB 3.2 type C devices (e.g., USB Disk). |
| 3 | | USB 3.2 Gen1 type A ports | Connects to USB 3.2 devices (e.g., USB mouse, USB camera, USB Disk). |
| 4 | | Headphone/Speaker-out/Line-out port. | Connects to audio line-out devices (e.g., speakers, headphones). |

## Rear view
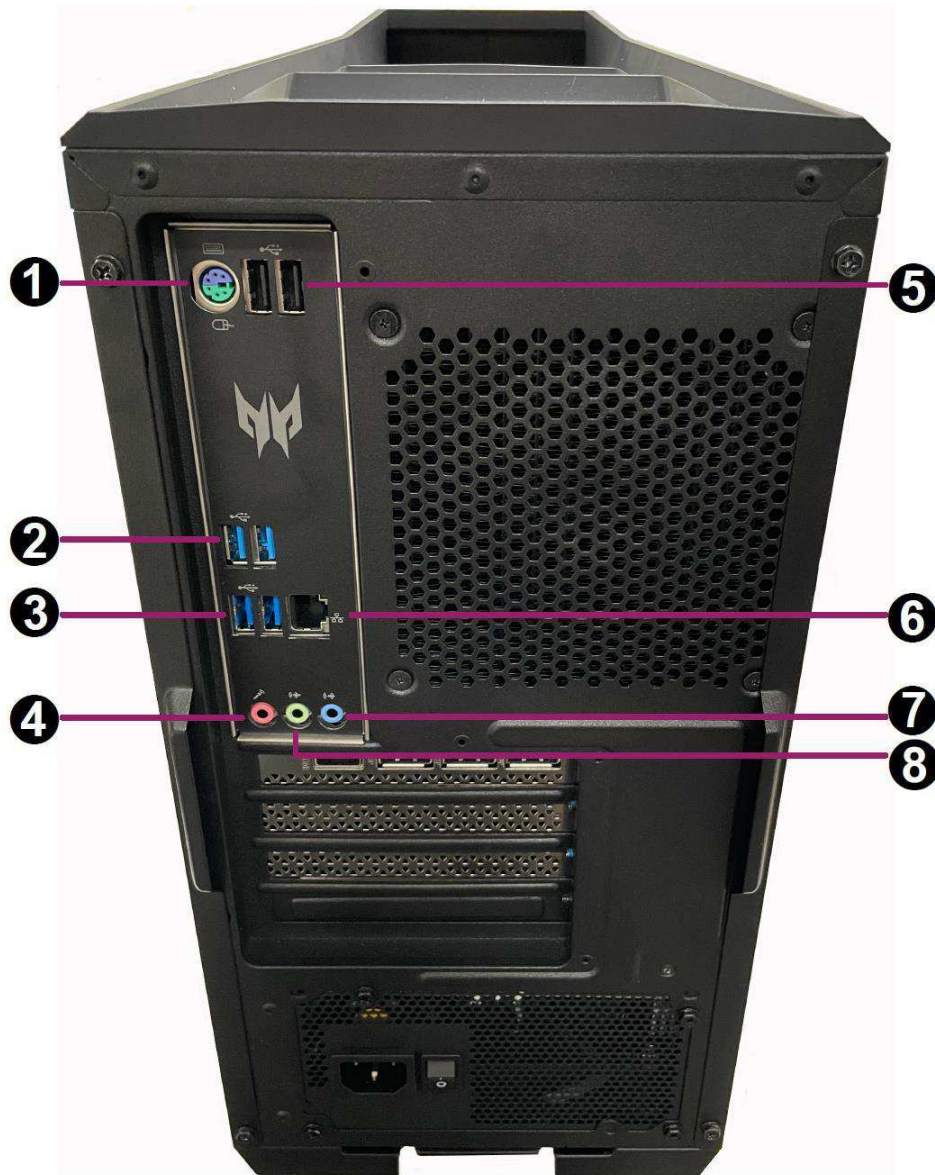


| No | Icon | Component | Description |
|---|---|---|---|
| 1 | | PS/2 port | Connects to PS/2 KB and mouse devices (e.g., USB mouse, USB camera, USB Disk). |
| 2 | | USB 3.2 Gen2 type A ports | Connects to USB 3.2 devices (e.g., USB mouse, USB camera, USB Disk). |
| 3 | | USB 3.2 Gen1 type A ports | Connects to USB 3.2 devices (e.g., USB mouse, USB camera, USB Disk). |
| 4 | | Microphone jack | Accepts input from external microphones. |

| No | Icon | Component | Description |
|----|------|-----------|-------------|
| 5 | | USB 2.0 port | Connects to USB 2.0 devices<br>(e.g., USB mouse, USB camera, USB Disk). |
| 6 | | Network port. | Lights to indicate the status of wire LAN communications. |
| 7 | | Line-in jack | Accepts audio line-in devices |
| 8 | | Line-out jack | Accepts audio line-out devices |

## Audio Jack Function Table

| Color/Use | Headphone | 2CH | 4CH | 5.1CH |
|-----------|-----------|-----|-----|-------|
| Blue | Line-in | Line-in | Rear Speaker | Rear Speaker |
| Green | Headphone | Front speaker | Front speaker | Front speaker |
| Pink | Mic-in | Mic-in | Mic-in | Center & bass |

# I/O Port Introduction

The backplane of the motherboard has the following I/O ports:
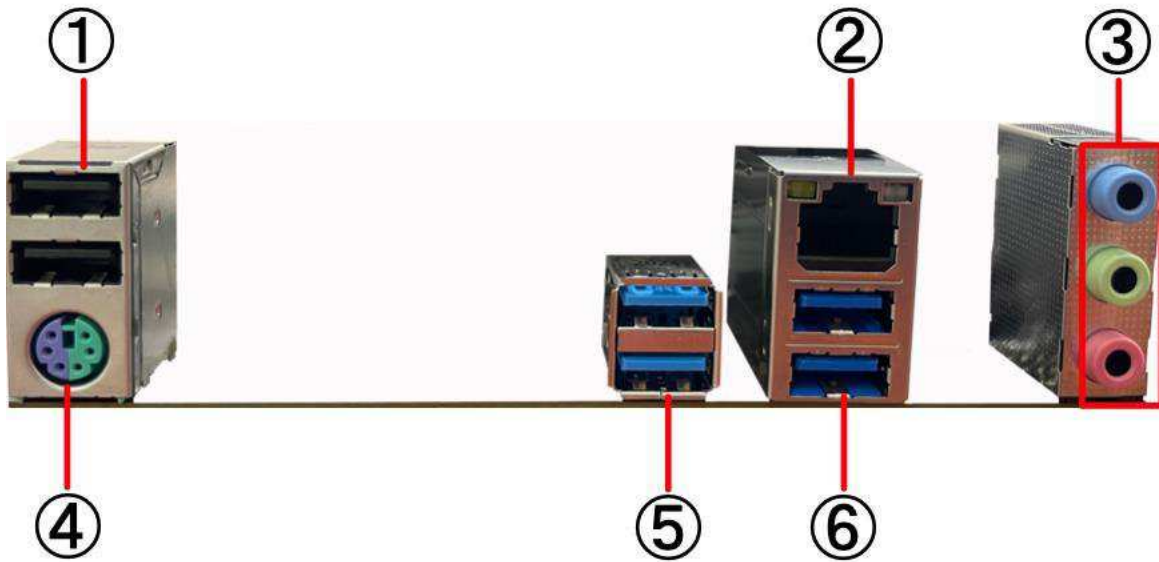


| No | Component | Description |
|----|-----------|-------------|
| 1 | USB 2.0 Ports | Use the USB 2.0 ports to connect USB 2.0 devices. |
| 2 | LAN Port | Connect an RJ-45 jack to the LAN port to connect your computer to the Network. |
| 3 | Audio Ports | Use the three audio ports to connect audio devices. The first jack is for stereo line-in signal. The second jack is for stereo line-out signal. The third jack is for microphone. |
| 4 | PS/2 Port | Use the PS/2 ports to connect KB and mouse devices. |
| 5 | USB 3.2 Gen2 type A ports | Use the USB 3.2 ports to connect USB 3.2 devices. |
| 6 | USB 3.2 Gen1 type A ports | Use the USB 3.2 ports to connect USB 3.2 devices. |

# Hardware Specifications and Configurations

## Processor

| Item | Specification |
|------|---------------|
| Type | Intel$^®$ CML-S CPU |
| Socket | Intel LGA1200 socket |
| Speed | Depends on CPU which is configured |

## BIOS

| Item | Specification |
|------|---------------|
| BIOS code programmer | AMI |
| BIOS version | R01-A0 or newer |
| BIOS ROM type | SPI-ROM |
| BIOS ROM size | 128Mb |
| BIOS ROM package | 8-pin SMD package |
| Support protocol | Supports Plug and Play, STR (S3) / STD (S4) , Hardware monitor . Supports ACPI & DMI. Audio, LAN can be disabled in BIOS |
| Boot from ODD feature | Yes |

NOTE: The BIOS can be overwritten/upgraded by using the flash utility.

## BIOS Hotkey List

| Item | Specification | Specification |
|------|---------------|---------------|
| Delete | Enter BIOS Setup Utility | Press while the system is booting to enter BIOS setup Utility. |
| F12 | Enter Boot Menu | Press while the system is booting to enter Boot Menu. |

## Main Board Major Chips

| Item | Specification |
|------|---------------|
| Chipset | Intel$^®$ Z590 Chipset |
| AGP controller | Intel$^®$ CML-S CPU |
| Super I/O controller | ITE IT8733 |
| Audio controller | Realtek ALC897   5.1-Ch HD audio CODEC |
| LAN controller | Giga PHY Intel$^®$ I219V |
| HDD controller | Intel$^®$ Z590 Chipset |
| Keyboard controller | ITE IT8733 |

## System Memory

| Item | Specification |
|---|---|
| Memory slot number | 4 slots |
| Support memory size per socket | 2GB/ 4GB / 8GB / 16GB |
| Support maximum memory size | 64 GB |
| Support memory type | DDR4 SDRAM |
| Support memory interface | DDR4 2666/3200MHZ |
| Support memory module package | 288-pin DIMM |
| Support parity check feature | Yes |
| Memory module combinations | You can install memory modules in any combination as long as they match the specifications. |

**NOTE:** Dual channel should be enabled always when plug-in 2 same memory size DDR4 memory module.

## Cache Memory

| Item | Specification |
|---|---|
| **First-Level Cache Configurations** | |
| Cache function control | Always enabled |
| **First-Level Cache Configurations** | |
| L1 Cache RAM size | Up to 384KB per core (exclusive) |
| L1 Cache RAM speed | One-half the processor core clock frequency |
| **Second -Level Cache Configurations** | |
| L2 Cache RAM size | Up to 1536KB per core (exclusive) |
| L2 Cache RAM speed | One-half the processor core clock frequency |
| **Third -Level Cache Configurations** | |
| L3 Cache RAM size | Up to 12288KB per core (exclusive) |
| L3 Cache RAM speed | One-half the processor core clock frequency |

## Video Interface

| Item | Specification |
|---|---|
| Video controller | Intel® CML-S CPU |
| Video controller resident bus | PCI |
| Video Interface | PCI-E x16 |

## SATA Interface

| Item | Specification |
|---|---|
| SATA controller | Intel® Z590 Chipset |
| SATA controller resident bus | Gen3 6Gb/s |
| Number of SATA connector | 4 |
| Support bootable ODD | Yes |

## Audio Interface

| Item | Specification |
|---|---|
| Audio controller | Realtek |
| Audio controller Type | High Definition, ALC897 |
| Audio Channel | 5.1-Ch HD audio CODEC |
| Audio function control | Enable/Disabled by BIOS Setup |
| Mono or stereo | Direct Sound 3D$^{TM}$ compatible |
| Sampling rate | DACs: 44.1k/48k/96k/192kHz |
| VREFOUT | Software selectable 2.5V/3.2V/4.0V VREFOUT |
| Power Support | Digital 3.3V ; Analog 5.0v |
| Microphone jack | Supported |
| Headphone jack | Supported |

## USB Port

| Item | Specification |
|---|---|
| Universal HCI | USB 2.0 (480Mbps) |
| USB Class | Support legacy and UEFI keyboard for legacy and UEFI mode |
| USB Number | support up to 2 ports |
| Universal HCI | USB 3.2 GEN1 (5Gbps) |
| USB Class | Support legacy and UEFI keyboard for legacy and UEFI mode |
| USB Number | support up to 5 ports |
| Universal HCI | USB 3.2 GEN2 (10Gbps) |
| USB Class | Support legacy and UEFI keyboard for legacy and UEFI mode |
| USB Number | support up to 1 port |
| Universal HCI | USB 3.2 GEN1 (Type C) (5Gbps) |
| USB Class | Support legacy and UEFI keyboard for legacy and UEFI mode |
| USB Number | support up to 1 port |

## Power Management

| Devices | S3 (Suspend to RAM) | S4 (Suspend to Disk) | S5 (Shut Down) |
|---|---|---|---|
| Power Button | Enabled | Enabled | Enabled |
| USB Keyboard | Enabled | Disabled | Disabled |
| Onboard LAN | Enabled | Enabled | Enabled |
| RTC | Enabled | Enabled | Enabled |

## Power Management Function (ACPI support function)

### Device Standby Mode

- Independent power management timer for hard disk drive devices
- (0-15 minutes, time step=1 minute).
- Hard disk drive goes into Standby mode (for ATA standard interface).
- Disable V-sync to control the VESA DPMS monitor.
- Resume method: device activated (Keyboard for Free-DOS, keyboard & mouse for Windows).
- Resume recovery time: 3-5 sec.

### Global Standby Mode

- Global power management timer (2-120 minutes, time step=10 minute).
- Hard disk drive goes into Standby mode (for ATA standard interface).
- Disable H-sync and V-sync signals to control the VESA DPMS monitor.
- Resume method: Return to original state by pushing external switch button, modem ring in, keyboard and mouse for APM mode.
- Resume recovery time: 7-10 sec.

### Suspend Mode

- Independent power management timer (2-120 minutes, time step=10 minutes) or pushing external
- switch button.
- CPU goes into SMM.
- CPU asserts STPCLK# and goes into the Stop Grant State.
- LED on the panel turns amber color.
- Hard disk drive goes into SLEEP mode (for ATA standard interface).
- Disable H-sync and V-sync signals to control the VESA DPMS monitor.
- Ultra I/O and VGA chip go into power saving mode.
- Resume method: Return to original state by pushing external switch button, modem ring in, keyboard and mouse for APM mode.
- Return to original state by pushing external switch button, modem ring in and USB keyboard for ACPI mode.

### ACPI

- ACPI specification 2.0.
- S0, S1, S3 and S5 sleep state support.
- On board device power management support.
- On board device configuration support.
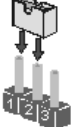
## Checking Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.
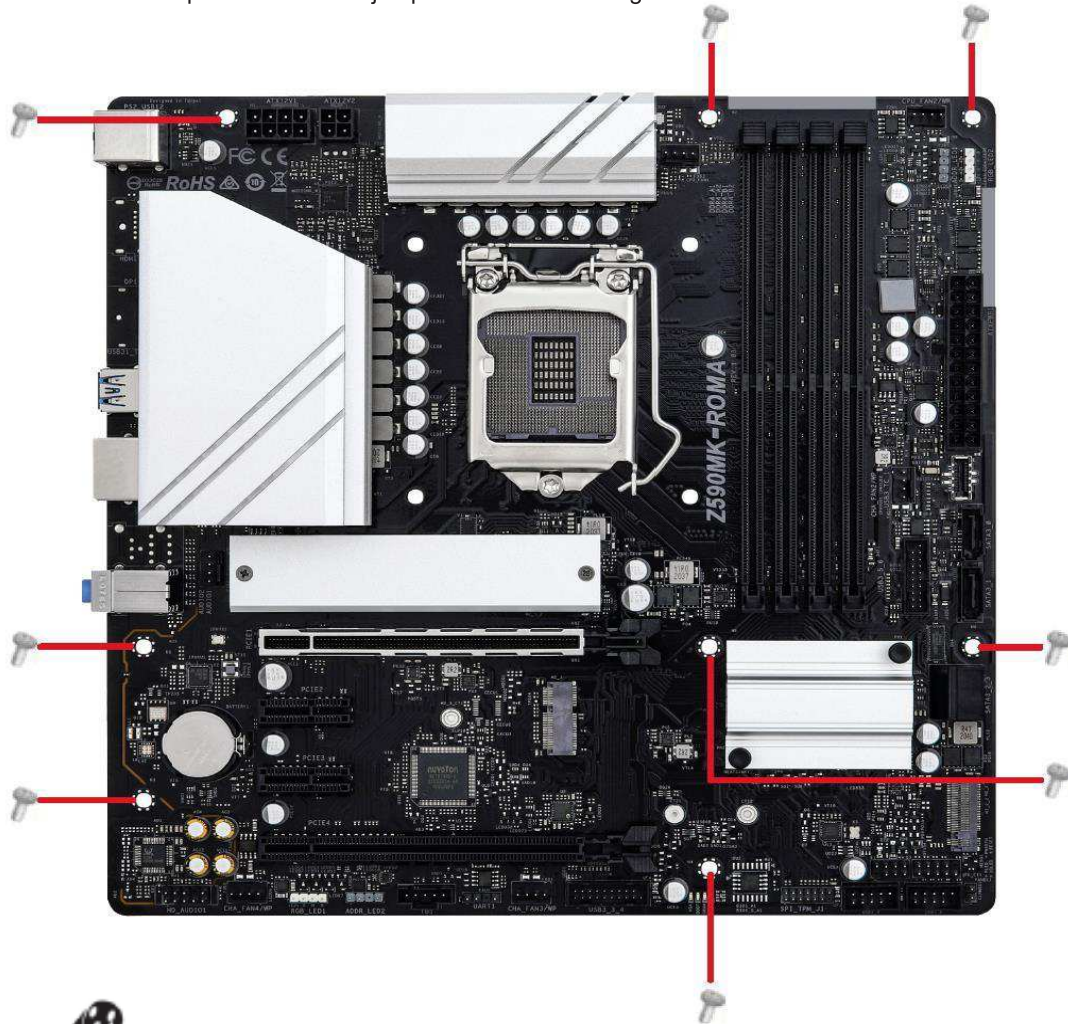


🚫 *Do not over-tighten the screws as this can stress the motherboard.*
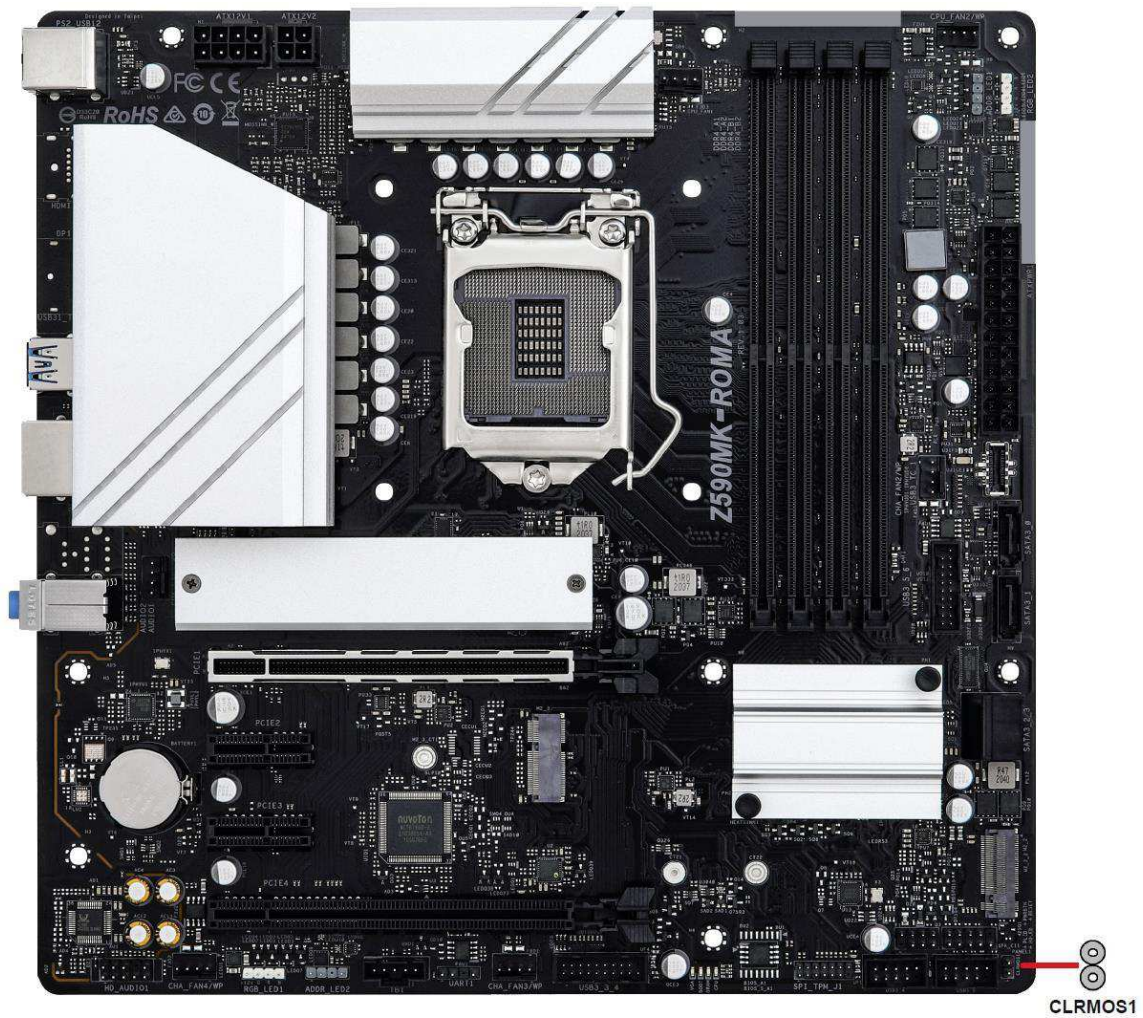
### Setting Jumpers

Use the motherboard jumpers to set system configuration options. Jumpers with more than one pin are numbered. When setting the jumpers, ensure that the jumper caps are placed on the correct pins.

| Description | illustration |
|---|---|
| The illustrations show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN. | SHORT        OPEN |
| This illustration shows a 3-pin jumper. Pins 1 and 2 are SHORT | |

## Checking Jumper Settings

The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.



### Jumper Settings

| Jumper | Type | Description | Setting (Default) | Illustration |
|---|---|---|---|---|
| **CLRMOS1** | 2-pin | Clear CMOS | CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short the pins on CLRMOS1 for 5 seconds. | CLEAR_CMOS |

*To avoid the system instability after clearing CMOS, we recommend users to enter the main BIOS setting page to "Load Default Settings" and then "Save and Exit Setup".*

## Connecting Case Components

After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:

1. Connect the CPU cooling fan cable to **CPU_FAN**.
2. Connect the CPU cooling pump cable to **CPU_FAN1/WP**
3. Connect the standard power supply connector to **ATXPWR1**
4. Connect the auxiliary case power supply connector to **ATX12V1**.
5. Connect the system cooling fan connector to **CHA_FAN2/WP and CHA_FAN3/WP**
6. Connect the case switches and indicator LEDs to **PANEL1**.
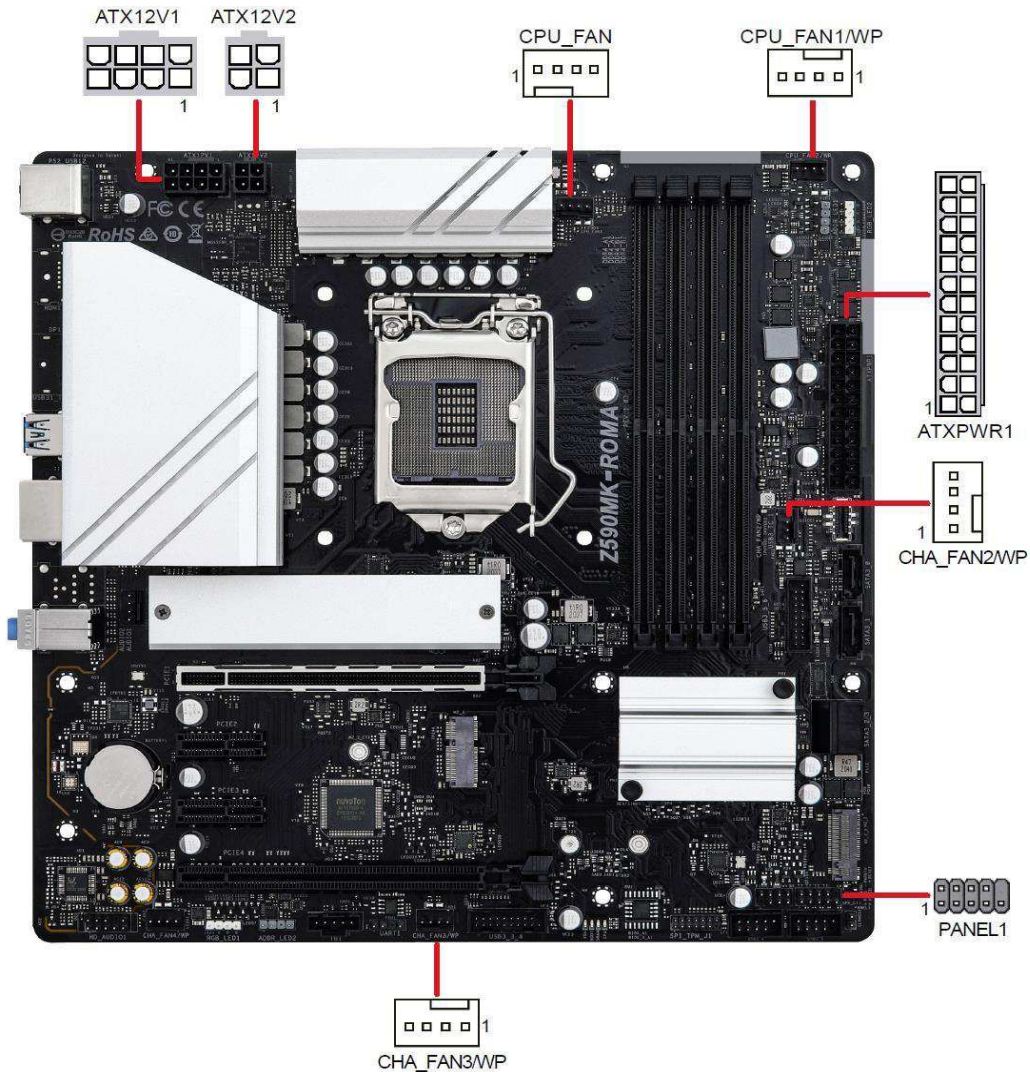


**Connecting 24-pin power cable**

The ATX 24-pin connector allows you to connect to ATX v2.x power supply.
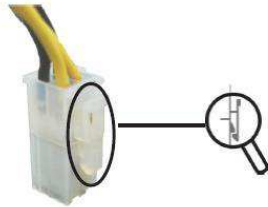
*With ATX v2.x power supply, users please note that when installing 24-pin power cable, the latches of power cable and the ATX POWER match perfectly.*

**Connecting 4-pin power cable**

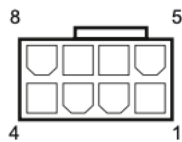The ATX12V2 power connector is used to provide power to the CPU.

*When installing 4-pin power cable, the latches of power cable and the ATX_12V match perfectly.*

*4-pin power cable*

**Connecting 4+4-pin power cable**

The ATX12V1 power connector is used to provide power to the CPU.

*This motherboard provides a 8-pin ATX 12V power connector. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5.*

**CPU_FAN: CPU cooling FAN Connectors**

| Pin | Signal Name | Function |
|-----|-------------|----------|
| 1 | GND | System Ground |
| 2 | +12V | Power +12V |
| 3 | Sense | Sensor |
| 4 | CONTROL | CONTROL |

*Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.*

**CHA_FAN2/WP: System Cooling FAN Connector**

| Pin | Signal Name | Function |
|-----|-------------|----------|
| 1 | GND | System Ground |
| 2 | +12V | Power +12V |
| 3 | Sense | Sensor |
| 4 | CONTROL | CONTROL |

**CHA_FAN3/WP: System Cooling FAN Connector**

| Pin | Signal Name | Function |
|-----|-------------|----------|
| 1 | GND | System Ground |
| 2 | +12V | Power +12V |
| 3 | Sense | Sensor |
| 4 | CONTROL | CONTROL |

**ATXPWR1: ATX 24-pin Power Connector**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | +3.3V | 13 | +3.3V |
| 2 | +3.3V | 14 | -12V |
| 3 | GND | 15 | GND |
| 4 | +5V | 16 | PS_ON |
| 5 | GND | 17 | GND |
| 6 | +5V | 18 | GND |
| 7 | GND | 19 | GND |
| 8 | PWROK | 20 | -5V |
| 9 | +5VSB | 21 | +5V |
| 10 | +12V | 22 | +5V |
| 11 | +12V | 23 | +5V |
| 12 | +3.3V | 24 | GND |

**ATX12V1: ATX 12V Power Connector**

| Pin | Signal Name |
|-----|-------------|
| 1 | Ground |
| 2 | Ground |
| 3 | Ground |
| 4 | Ground |
| 5 | +12V |
| 6 | +12V |
| 7 | +12V |
| 8 | +12V |

**ATX12V2: ATX 12V Power Connector**

| Pin | Signal Name |
|-----|-------------|
| 1 | Ground |
| 2 | Ground |
| 3 | +12V |
| 4 | +12V |

## Front Panel Header

The front panel header (PANEL1) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases. Refer to the table below for information:
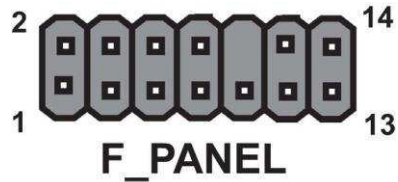


| Pin | Signal | Function | Pin | Signal | Function |
|-----|--------|----------|-----|--------|----------|
| 1 | VCC | 5V | 2 | GLED0 | MSG LED |
| 3 | HDD_LED | Hard disk LED | 4 | GLED1 | MSG LED |
| 5 | GND | Ground | 6 | PWRSW | POWER SWITCH |
| 7 | HWRST_L | Reset | 8 | GND | GROUND |
| 9 | F_PANEL_DET | FRONT PANEL DETECT | 10 | KEY | NO PIN |
| 11 | +5VSB | 5V | 12 | VCC | 5V |
| 13 | NC | Reserved | 14 | F_PANEL_LED | FRONT PANEL LED |

*MSG LED (dual color or single color)

**The following for integration plug structure connector.**

**Hard Drive Activity LED**

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. For the LED to function properly, an IDE drive should be connected to the onboard IDE interface. The LED will also show activity for devices connected to the SCSI (hard drive activity LED) connector.

**Power/Sleep/Message waiting LED**

Connecting pins 2 and 4 to a single or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

**Reset Switch**

Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

**Power Switch**

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

**LAN LED**

Connecting pins 12 and 14 to a LAN LED provides visual indication that data is being read from or written to the LAN drive.
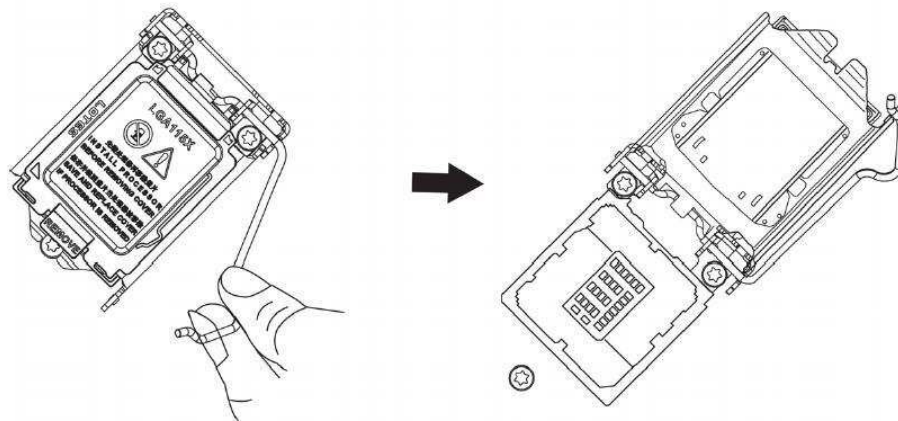
## CPU Installation Procedure

The following illustration shows CPU installation components.

A.    Press the hook of lever down with your thumb and pull it to the right side to release it from retention tab.



B.    Lift the tail of the load lever and rotate the load plate to fully open position.



C.    Grasp the edge of the package substrate. Make sure pin 1 indicator is on your bottom-left side. Aim at the socket and place the package
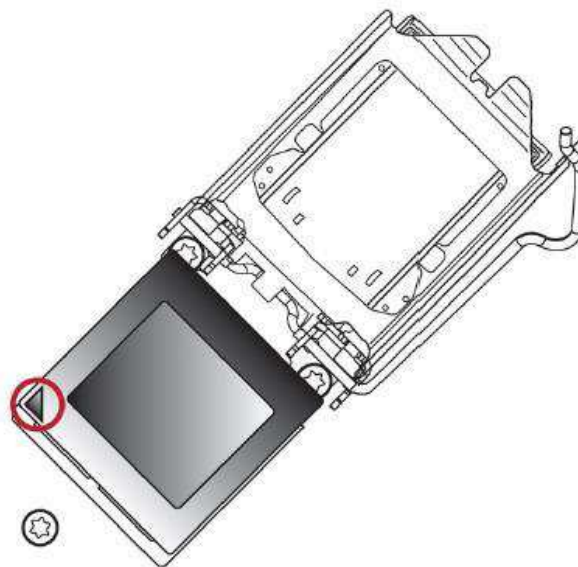
D.  Rotate the load plate onto the package IHS (Intergraded Heat Spreader). Engage the load lever while pressing down lightly onto the load plate. Secure the load lever with the hook under retention tab. Then the cover will flick automatically.
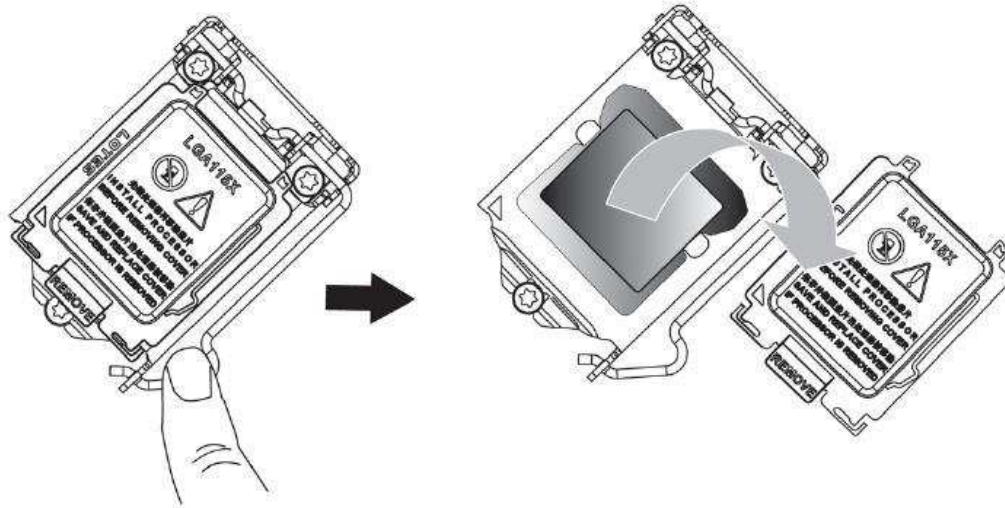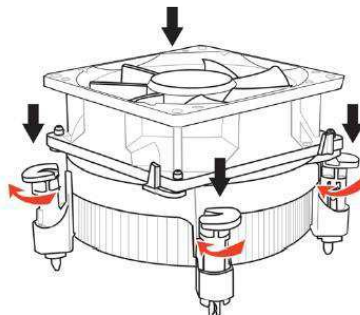


*Please save and replace the cover onto the CPU socket if processor is removed.*
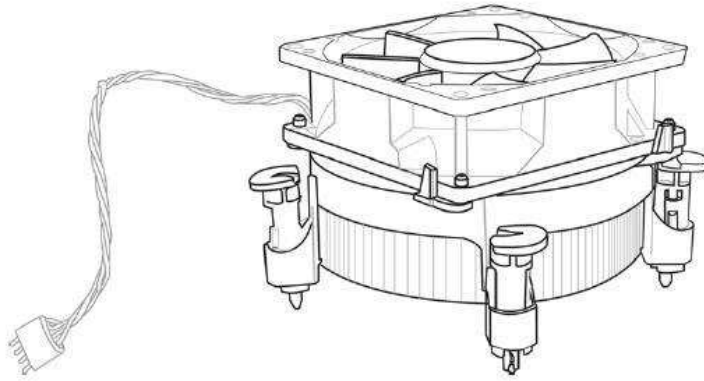
E.  Apply some thermal grease onto the contacted area between the heat sink and the CPU, and make it to be a thin layer
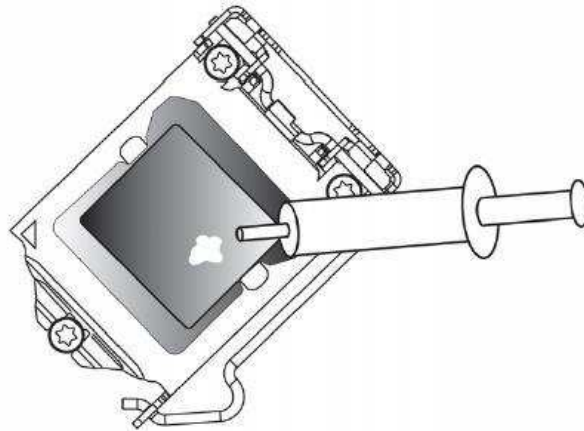


F.  Fasten the cooling fan supporting base onto the CPU socket on the motherboard. And make sure the CPU fan is plugged to the CPU fan connector.

G. Connect the CPU cooler power connector to the CPU_FAN connector.



1. To achieve better airflow rates and heat dissipation, we suggest that you use a high quality fan with 3800 rpm at least. CPU fan and heat sink installation procedures may vary with the type of CPU fan/heat sink supplied. The form and size of fan/heat sink may also vary.
2. DO NOT remove the CPU cap from the socket before installing a CPU.
3. Return Material Authorization (RMA) requests will be accepted only if the motherboard comes with the cap on the LGA1200 socket.

## Installing Memory Modules

This motherboard accommodates four memory modules. It can support four 288-pin DDR4 2400/2666MHz. The total memory capacity is 64GB.

## DDR4 SDRAM memory module table

| Memory module | Frequency |
|---------------|-----------|
| DDR4 | 2666 MHz |
| DDR4 | 3200 MHz |

You must install at least one module in any of the four slots.

*Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.*

## Installation Procedure

Refer to the following to install the memory modules.

1. This motherboard supports un-buffered DDR4 SDRAM.
2. Push the latches on each side of the DIMM slot down.
3. Align the memory module with the slot. The DIMM slots are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
4. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.
5. Install the DIMM module into the slot and press it firmly down until it seats correctly. The slot latches are levered upwards and latch on to the edges of the DIMM.
6. Install any remaining DIMM modules.
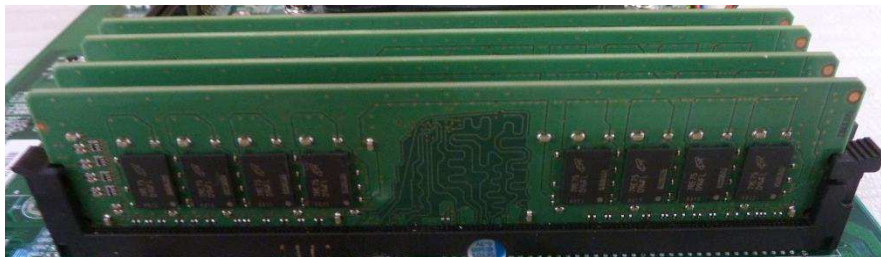


*\* For reference only*

### Installing a SATA Hard Drive

This section describes how to install a SATA Hard Drive.

### About SATA Connectors

Your motherboard features three SATA connectors supporting a total of three drives.SATA refers to Serial ATA (Advanced Technology Attachment) is the standard interface for the IDE hard drives which are currently used in most PCs. These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the SATA hard drives.

### Installing Serial ATA Hard Drives

To install the Serial ATA (SATA) hard drives, use the SATA cable that supports the Serial ATA protocol. This SATA cable comes with a SATA power cable. You can connect either end of the SATA cable to the SATA hard drive or the connector on the motherboard.



**SATA cable (optional)**

Refer to the illustration below for proper installation:

1. Attach either cable end to the connector on the motherboard.
2. Attach the other cable end to the SATA hard drive.
3. Attach the SATA power cable to the SATA hard drive and connect the other end to the power supply.
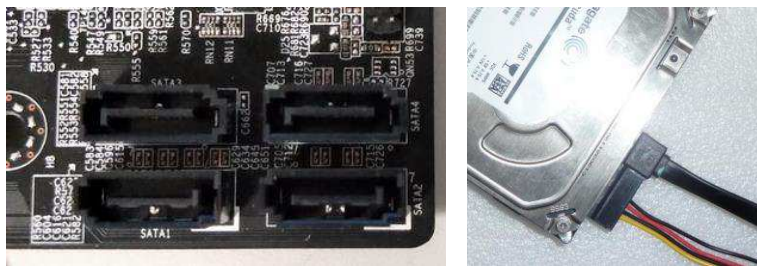


*\* For reference only*

This motherboard support the "Hot-Plug" function.

## Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.
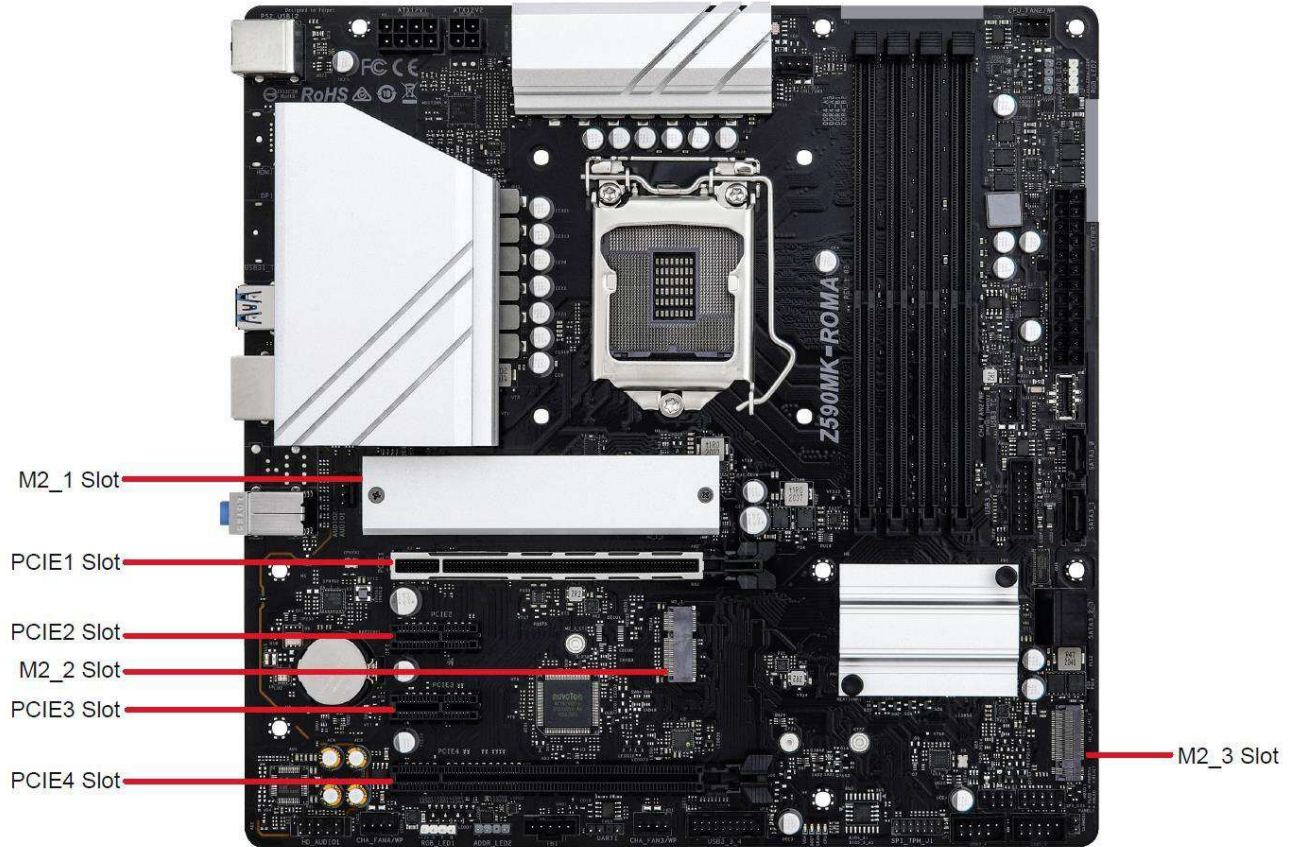


**M2_1 and M2_3 Slot**   This is Key M M.2 slot for 2242/2280 supports PCIe or SATA signal.

**M2_2 Slot**                This is Key E M.2 slot for 2230.

**PCIE1 and PCIE4 Slot**  The PCI Express x16 slot is used to install an external PCI Express graphics card that is fully compliant to the PCI Express Base Specification revision 3.0.

**PCIE2 and PCIE3 Slot**   The PCI Express x1 slot is fully compliant to the PCI Express Base Specification revision 3.0.

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*Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.*

Follow these instructions to install an add-on card:

1.    Remove a blanking plate from the system case corresponding to the slot you are going to use.
2.    Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.
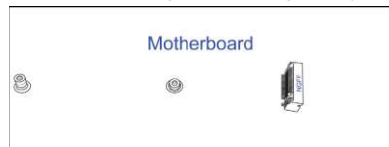3.    Secure the metal bracket of the card to the system case with a screw.
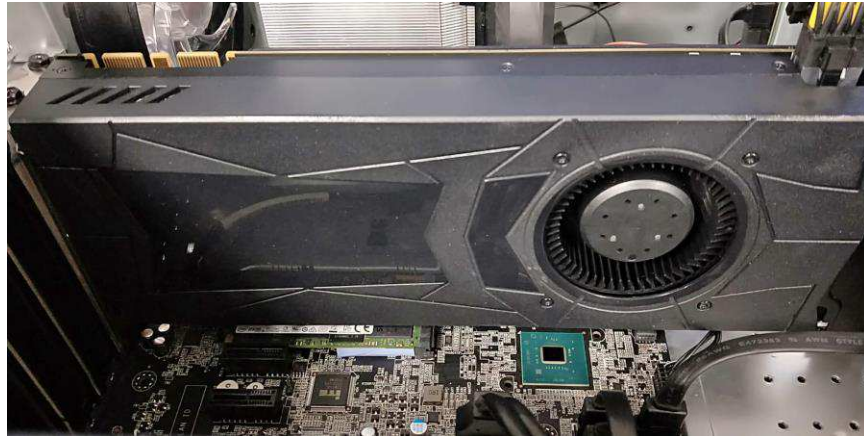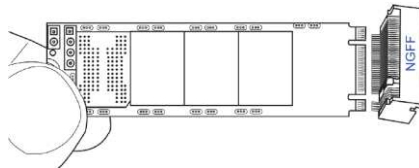


*For reference only*

 *For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.*

Follow these instructions to install the M.2 SSD card:
1.    Demount the screw not used according to the length of your M.2 SSD card.



2.    Insert the M.2 SSD card into NGFF slot in the fool-proof way.



3.    Lock the screw as the following picture shows to make sure the M.2 SSD card is installed in place.



 *For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.*

## Connecting Optional Devices

Refer to the following for information on connecting the motherboard's optional devices:
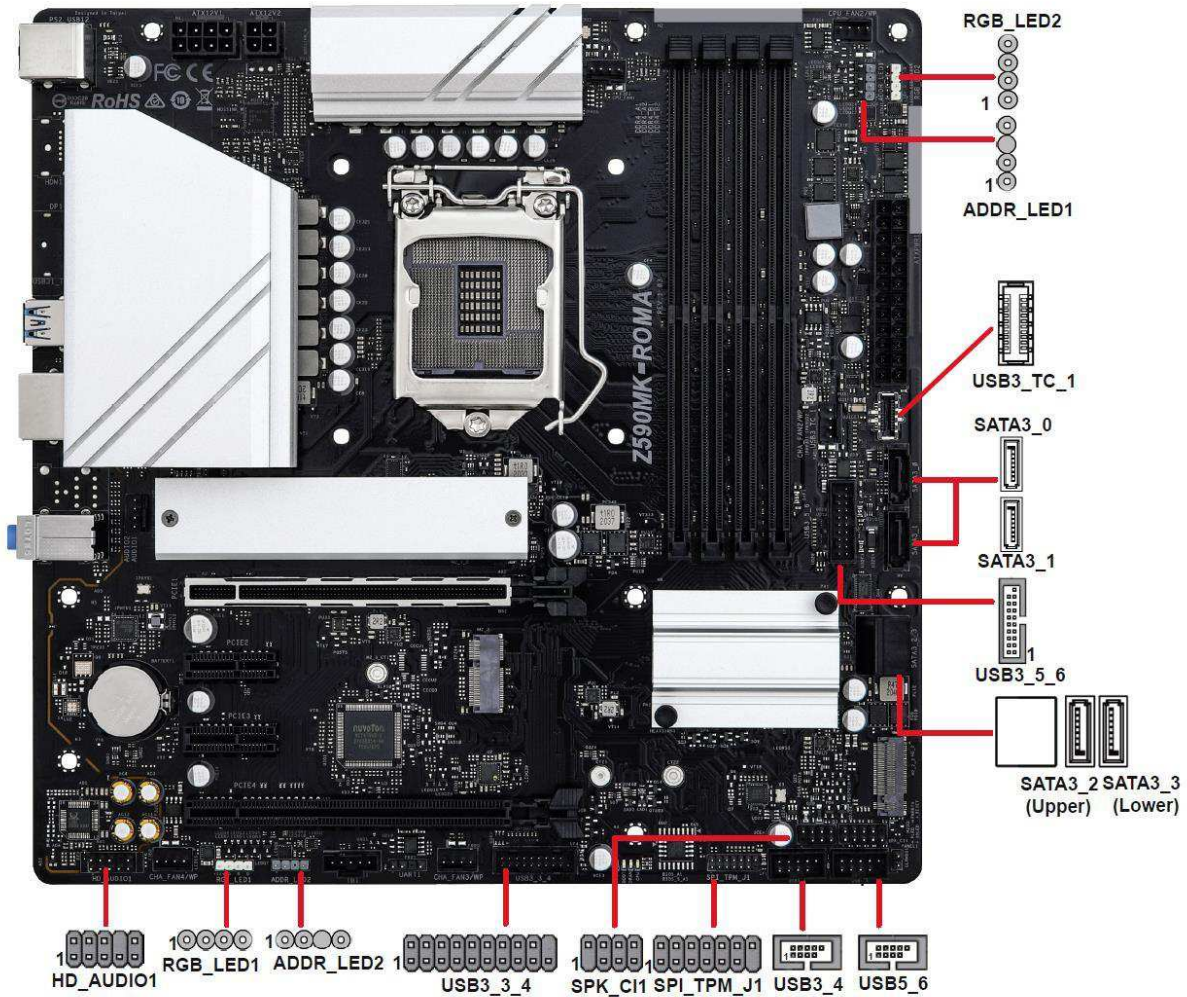


**SATA3 0~3: Serial ATA connectors**

SATA1~4 connectors are used to support the Serial ATA 6Gb/s devices, simpler disk drive cabling and easier PC assembly.

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | Ground | 2 | TX+ |
| 3 | TX- | 4 | Ground |
| 5 | RX- | 6 | RX+ |
| 7 | Ground | - | - |

**A1~2: 2-pin GPIO Headers**

| Pin | Signal Name |
|-----|-------------|
| 1 | GPIO |
| 2 | GND |

**USB3_4/5_6: Front Panel USB 2.0 Header**

The onboard F_USB2 header delegate for card reader, it supports add optional one USB 2.0 port.

| Pin | Signal Name | Function |
|-----|-------------|----------|
| 1 | USBPWR | Front Panel USB Power |
| 2 | DATA9- | USB Port9 Negative Signal |
| 3 | DATA9+ | USB Port9 Positive Signal |
| 4 | GND | Ground |
| 5 | NC | No connected |

*Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.*

**USB3_3_4/_5_6: Front Panel USB 3.0 Headers**

This Motherboard implements two USB 3.0 header supporting extra 4 front USB 3.0 ports, which delivers 5Gb/s transfer rate.

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | 5V | 2 | USB3_RX(-) |
| 3 | USB3_RX(+) | 4 | GND |
| 5 | USB3_TX(-) | 6 | USB3_TX(+) |
| 7 | GND | 8 | USB2_DATA(-) |
| 9 | USB2_DATA(+) | 10 | NC |
| 11 | USB2_DATA(+) | 12 | USB2_DATA(-) |
| 13 | GND | 14 | USB3_TX(+) |
| 15 | USB3_TX(-) | 16 | GND |
| 17 | USB3_RX(+) | 18 | USB3_RX(-) |
| 19 | 5V | 20 | KEY |
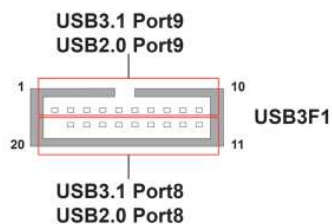
**HD_AUDIO1: Front Panel Audio Header**

The front panel audio header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access. This header supports HD audio by default.
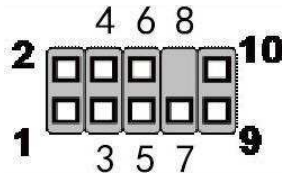


**For HD Front Audio**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | Left channel microphone input signal | 2 | Analog groud |
| 3 | Right channel microphone input signal | 4 | HD Panel sensor detect |
| 5 | Right channel to front panel | 6 | Microphone sensor detect |
| 7 | Analog ground | 8 | No pin |
| 9 | Left channel to front panel | 10 | Line-in sensor detect |

**RGB_LED1/2: LED pin headers**

RGB LED headers are used to connect RGB LED extension cables which allow users to choose from various LED lighting effects.Caution



| Pin | Signal Name |
|-----|-------------|
| 1 | LED_B |
| 2 | LED_R |
| 3 | LED_G |
| 4 | 12V |

**USB3_TC_1:**

There is one Front Panel Type C USB 3.2 Gen1 Header on this motherboard. This header is used for connecting a USB 3.2 Gen1 module for additional USB 3.2 Gen1 ports.



USB Type-C Cable
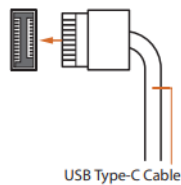
**SPI_TPM_J1:**

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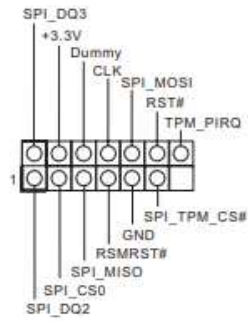


**ADDR_LED1/2:**

The headers are used to connect Addressable LED extension ca bles which allow users to choose from various LED lighting effects.
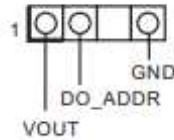


**SPK_CI1:**

Please connect the chassis intrusion and the chassis speaker to this header.