

**ROG  
RAMPAGE VI  
EXTREME**

**ASUS®**

**Motherboard**

E13932  
Revised Edition V2  
February 2018

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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.

## About this guide

This user guide contains the information you need when installing and configuring the motherboard.

## How this guide is organized

This guide contains the following parts:

### 1. **Chapter 1: Product Introduction**

This chapter describes the features of the motherboard and the new technology it supports. It includes description of the switches, jumpers, and connectors on the motherboard.

### 2. **Chapter 2: Basic Installation**

This chapter lists the hardware setup procedures that you have to perform when installing system components.

### 3. **Chapter 3: BIOS Setup**

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

### 4. **Chapter 4: RAID Support**

This chapter describes the RAID configurations.

## Where to find more information

Refer to the following sources for additional information and for product and software updates.

### 1. **ASUS website**

The ASUS website ([www.asus.com](http://www.asus.com)) provides updated information on ASUS hardware and software products.

### 2. **Optional documentation**

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

## 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 (+).

## ROG RAMPAGE VI EXTREME specifications summary

CPU	<p>Intel® Socket 2066 for Intel® Core™ X-Series Processor 79xx, 78xx Series</p> <p>Supports 14nm CPU</p> <p>Supports Intel® Virtual RAID on CPU (VROC)*</p> <p>Supports Intel® Turbo Boost Max Technology 3.0*</p> <p>* Support of these features depends on the CPU types.</p>
Chipset	Intel® X299 Chipset
Memory	<p>8 x DIMM, max. 128GB, DDR4 4200+(O.C.)* / 4000(O.C.)* / 3866(O.C.)* / 3600(O.C.)* / 3333(O.C.)* / 3300(O.C.)* / 3200(O.C.)* / 3000(O.C.)* / 2800(O.C.)* / 2666(O.C.)* / 2400(O.C.)* / 2133 MHz, non-ECC, unbuffered memory</p> <p>Quad 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>4 x PCIe 3.0 x16 slots (supports x16, x16/x0/x16, x16/x0/x16/x8, or x16/x8/x8/x8 mode with 44-LANE CPU; x16, x16/x8 or x8/x8/x8 mode with 28-LANE CPU)*</p> <p>1 x PCIe 3.0 x 4 slot</p> <p>* The PCIe_X8_4 slot shares bandwidth with M.2_2(DIMM.2). When M.2_2(DIMM.2) is populated, PCIe_X8_4 runs at x4 mode.</p>
Multi-GPU support	<p>Supports NVIDIA® 4-Way/3-Way/2-Way GPU SLI® Technology*</p> <p>Supports AMD® 4-Way/3-Way/2-Way GPU CrossFireX™ Technology*</p> <p>* 28-LANE CPUs can only support up to 3-Way SLI® / 3-Way CrossFireX™</p>
Storage	<p><b>Intel® Core™ X-Series Processor 79xx, 78xx Series</b></p> <p><b>1 x DIMM.2 Module supports</b></p> <ul style="list-style-type: none"> <li>- 1 x M.2_1(DIMM.2) Socket 3 with M key, type 2230/2242/2260/2280/22110 (PCIe 3.0 x 4 mode only from CPU or PCH)*</li> <li>- 1 x M.2_2(DIMM.2) Socket 3 with M key, type 2230/2242/2260/2280/22110 (PCIe 3.0 x 4 mode only from CPU)*</li> <li>- 1 x U.2 port (support PCIe 3.0 x4 NVMe Express storage)**</li> </ul> <p><b>Intel® X299 Chipset with RAID 0, 1, 5, 10 and Intel Rapid Storage Technology 15 support</b></p> <ul style="list-style-type: none"> <li>- 1 x M.2_1 PCIe 3.0 x4 Socket 3 with M Key, type 2242/2260/2280 (supports PCIe 3.0 x 4 and SATA modes)</li> <li>- 6 x SATA 6Gb/s ports</li> <li>- Supports Intel® Smart Response Technology</li> </ul> <p>* When M.2_1(DIMM.2) comes from CPU, it will be shared with U.2. When M.2_1(DIMM.2) comes from PCH, it will be shared with PCIe4 slot.</p> <p>** U.2 shares bandwidth with M.2_1(DIMM.2).</p>

(continued on the next page)

# ROG RAMPAGE VI EXTREME specifications summary

LAN	<p>Aquantia AQC-107 10G LAN</p> <p>Intel® I219-V Gigabit LAN- Dual interconnect between the integrated Media Access Controller (MAC) and physical layer (PHY)</p> <p>Anti-surge LANGuard</p> <p>ROG GameFirst Technology</p>
Wireless Data Network	<p>Wi-Fi 802.11ad(WiGig) supports frequency band 60GHz*</p> <p>Up to 4.6Gbps</p> <p>2x2 MU-MIMO 802.11 a/b/g/n/ac supports dual frequency band 2.4/5 GHz</p> <p>Up to 867Mbps transfer speed</p> <p>* 802.11ad(WiGig) is only available in certified countries.</p>
Bluetooth	<p>Bluetooth v4.1</p>
USB	<p>Intel® X299 Chipset</p> <ul style="list-style-type: none"><li>- 4 x USB 3.1 Gen 1 ports (at mid-board)</li><li>- 2 x USB 2.0 ports (at mid-board)*</li></ul> <p>ASMedia® USB 3.1 Gen 2 Controller</p> <ul style="list-style-type: none"><li>- 1 x USB 3.1 Gen 2 front panel connector</li><li>- 2 x USB 3.1 Gen 2 ports (1 x Type-A [red] and 1 x Type-C ports at back panel)</li></ul> <p>ASMedia® USB 3.1 Gen 1 Controller</p> <ul style="list-style-type: none"><li>- 8 x USB 3.1 Gen 1 ports (at back panel)</li></ul> <p>* 1 x USB 2.0 header supports an additional 2 x USB 2.0 ports [one connector via ROG_EXT header].</p>
Audio	<p>SupremeFX 8-Channel High Definition Audio S1220 CODEC:</p> <ul style="list-style-type: none"><li>- ESS® SABRE9018Q2C DAC/AMP</li><li>- High quality 120 dB SNR stereo playback output and 113 dB SNR recording input</li><li>- Supports up to 32-Bit/192kHz playback</li><li>- SupremeFX Shielding Technology</li><li>- Jack-detection, Multi-streaming, and Front Panel Jack-retasking</li><li>- Optical S/PDIF out port at back panel</li></ul> <p>Audio Features:</p> <ul style="list-style-type: none"><li>- Sonic Radar III</li><li>- Sonic Studio III + Sonic Studio Link</li></ul>

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# ROG RAMPAGE VI EXTREME specifications summary

Internal I/O connectors	1 x 4-pin VROC key
	1 x USB 3.1 Gen 2 front panel connector
	2 x USB 3.1 Gen 1 connectors support additional 4 USB 3.1 Gen 1 ports
	1 x USB connector supports 2 USB 2.0 ports [one connector via ROG_EXT header]
	6 x SATA 6Gb/s connectors
	1 x U.2 port
	1 x M.2 PCIe 3.0 x4 Socket 3 with M Key, type 2242/2260/2280 (supports PCIe3.0 x 4 and SATA modes)
	1 x ROG extension (ROG_EXT) header
	1 x 4-Pin CPU_FAN connector
	1 x 4-Pin CPU_OPT fan connector
	1 x 4-Pin H_AMP fan connector
	3 x 4-Pin CHA_FAN connectors
	1 x 4-pin W_PUMP+1 connector
	1 x 4-pin W_PUMP+2 connector
	1 x 2-pin W_IN connector
	1 x 2-pin W_OUT connector
	1 x 3-pin W_FLOW connector
	1 x 9-pin WB_SENSOR connector
	1 x 5-pin EXT_FAN (Extension Fan) connector
	2 x 2-pin T_SENSOR connectors
	1 x 24-pin EATX power connector
	1 x 8-pin EATX 12V power connector
	1 x 4-pin EATX 12V power connector
	1 x EZ Plug connector
	11 x Probelit Measurement Points
	1 x START button
	1 x Reset button
	1 x Safe Boot button
	1 x ReTry button
	1 x LN2 mode jumper
	1 x Slow mode switch
	1 x PCIe x16 lane switch
	1 x MemOK! button
	1 x BIOS Switch button
	1 x System panel connector
	1 x AURA addressable header
	2 x AURA RGB strip headers
	1 x TPM connector
	1 x Front panel audio connector (AAFP)
	1 x Thunderbolt header

(continued on the next page)

# ROG RAMPAGE VI EXTREME specifications summary

Back Panel I/O Ports	<div>1 x Clear CMOS button</div> <div>1 x BIOS Flashback button</div> <div>1 x ASUS Wi-Fi GO! module (1x1 802.11 ad Wi-Fi + 2x2 MU-MIMO 802.11 a/b/g/n/ac and Bluetooth v4.1)</div> <div>1 x Aquantia AQC-107 10G LAN</div> <div>1 x Anti-surge LAN (RJ45) port</div> <div>2 x USB 3.1 Gen 2 ports (1 x Type-C [black] and 1 x Type-A [red])</div> <div>8 x USB 3.1 Gen 1 ports [blue]</div> <div>1 x Optical S/PDIF out</div> <div>5 x Illuminated LED audio jacks</div>
Special Features	<div><b>ASUS Dual Intelligent Processors 5</b></div> <div>- 5-Way Optimization tuning key perfectly consolidates TPU, EPU, DIGI+ Power Control, Fan Xpert 4, and Turbo App</div> <div><b>ASUS Wi-Fi GO! Module</b></div> <div>- 1x1 802.11 ad Wi-Fi</div> <div>- 2x2 MU-MIMO 802.11 a/b/g/n/ac support dual frequency band 2.4/5 GHz</div> <div><b>ASUS Exclusive Features</b></div> <div>- AI Suite 3</div> <div>- USB 3.1 Boost</div> <div>- AI Charger</div> <div><b>ASUS EZ DIY</b></div> <div>- USB BIOS Flashback</div> <div>- ASUS CrashFree BIOS 3</div> <div>- ASUS EZ Flash 3</div> <div>- ASUS C.P.R.(CPU Parameter Recall)</div> <div>- MemOK!</div> <div><b>ASUS Q-Design</b></div> <div>- LiveDash OLED</div> <div>- ASUS integrated I/O shield</div> <div>- ASUS SafeSlot</div> <div>- ASUS Q-Connector</div> <div>- ASUS Q-DIMM</div> <div>* Contact your device vendor for supporting information.</div>

(continued on the next page)



# ROG RAMPAGE VI EXTREME specifications summary

ROG Exclusive Features	<b>ROG DIMM.2 module</b>
	<b>Extreme Engine Digi+</b>
	- MicroFine Alloy Choke
	- NexFET MOSFET
	- 10K Black Metallic Capacitors
	<b>OC Zone</b>
	- ReTry button
	- Safe Boot button
	- LN2 Mode header
	- Slow Mode switch
	- Start button
	- Reset button
	- Probelt
	- PCIe x16 lane switches
	<b>ROG CloneDrive</b>
	<b>ROG RAMCache II</b>
	<b>ROG RAMDisk</b>
	<b>AURA</b>
	<b>KeyBot II</b>
	- One-click overclocking
	- X.M.P.
	- DirectKey
	- CLr CMOS
	- Power On
	<b>UEFI BIOS features:</b>
	- Extreme Tweaker
	- Tweakers' Paradise
	- ROG SSD Secure Erase
	- GPU.DIMM Post
	- O.C. Profile
	- Graphics Card Information Preview

*(continued on the next page)*

# ROG RAMPAGE VI EXTREME specifications summary

BIOS Features	2 x 128 Mb Flash ROM, UEFI AMI BIOS, PnP, WfM2.0, SM BIOS 3.0, ACPI 6.0, Multi-language BIOS, ASUS EZ Flash 3, CrashFree BIOS 3, F11 EZ Tuning Wizard, F6 Qfan Control, F3 My Favorites, Last Modified log, F12 PrintScreen, and ASUS DRAM SPD (Serial Presence Detect) memory information.
Manageability	WfM 2.0, WOL by PME, PXE
Support DVD contents	LiveDash ROG GameFirst technology* ROG CloneDrive ROG RAMDisk ROG RAMCache II ROG CPU-Z ROG Keybot II ROG Mem TweakIt Fan Xpert4 AI Suite Kaspersky® Anti-Virus Overwolf Daemon Tools Software Winzip ASUS Utilities  * ROG GameFirst IV is only available for Windows® 10 64-bit.
Operating system support	Windows® 10*  * 64-bit supported only
Form factor	Extended ATX Form Factor, 12"x 10.9" (30.5cm x 27.7cm)



- Specifications are subject to change without notice.
- Visit the ASUS website for the software manual.

# Package contents

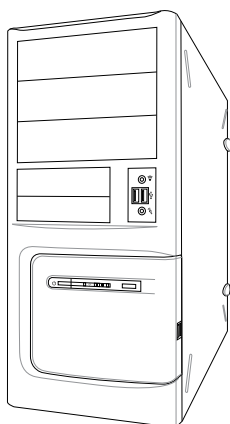
Check your motherboard package for the following items.

Motherboard	1 x ROG RAMPAGE VI EXTREME motherboard
Cables	3 x 2-in-1 SATA 6Gb/s cables
	1 x 3-in-1 thermistor cable
	1 x Cable for Fan Extension card
	1 x Extension cable for addressable RGB strip
	1 x Extension cable for RGB strip (80cm)
Accessories	1 x ASUS 2x2 dual band Wi-Fi antenna (Wi-Fi 802.11a/b/g/n/ac compliant)
	1 x ASUS Wi-Fi 802.11ad(WiGig) moving antenna (available in certified countries)
	1 x FAN_EXT card
	1 x Bracket for FAN_EXT card
	1 x Q-Connector Kit
	1 x ROG logo plate sticker
	1 x ROG coaster
	1 x ROG big sticker
	3 x M.2 screws kit
	1 x ROG DIMM.2
	1 x ROG DIMM.2 fan mount
	1 x ROG VGA holder pack
	1 x ROG Cable label 10-in-1
	1 x ROG R6E MOS fan bracket
	1 x 4-Way SLI® bridge
	1 x 3-Way SLI® bridge
	1 x 2-Way HB SLI® bridge
	1 x cablemod coupon
Application drive	1 x USB drive with utilities and drivers
Documentation	1 x User manual
	1 x Fan Extension Card user manual

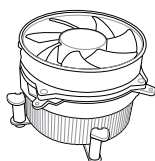


If any of the above items is damaged or missing, contact your retailer.

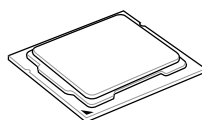
## Installation tools and components



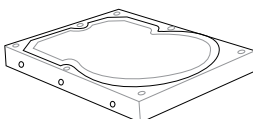
**PC chassis**



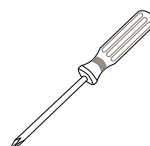
**Intel® LGA 2066 compatible CPU Fan**



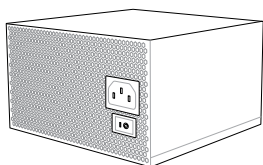
**Intel® LGA 2066 CPU**



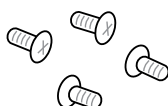
**SATA hard disk drive**



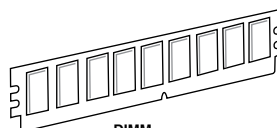
**Phillips (cross) screwdriver**



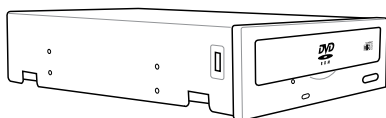
**Power supply unit**



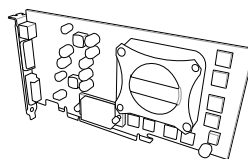
**1 bag of screws**



**DIMM**



**SATA optical disc drive (optional)**



**Graphics card**



**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

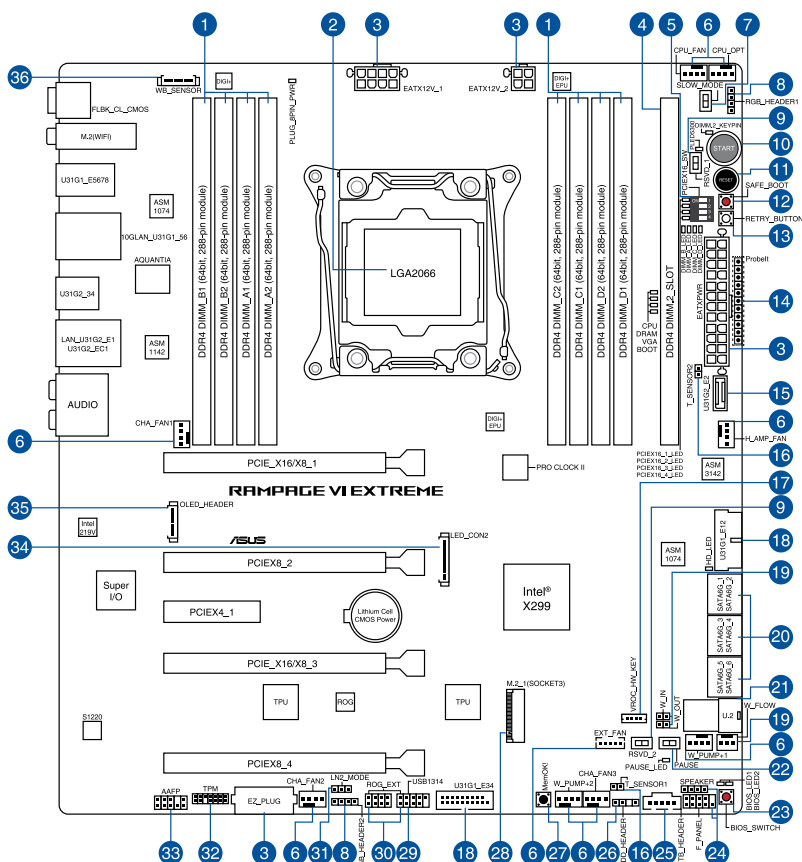
### 1.1.1 Before you proceed

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



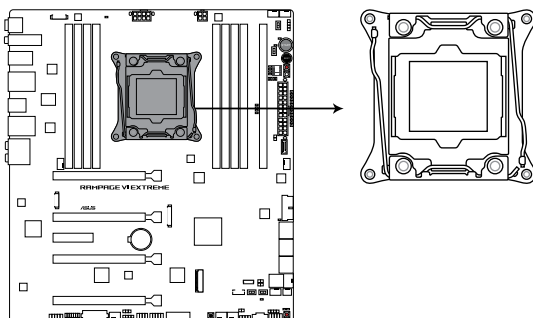
Refer to 1.1.9 Internal connectors and 2.3.1 Rear I/O connection for more information about rear panel connectors and internal connectors.

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### 1.1.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA2066 socket designed for the Intel® Core™ X-series Processor 79xx, 78xx Series.



**ROG RAMPAGE VI EXTREME LGA2066 Socket**



- 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. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA2066 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.

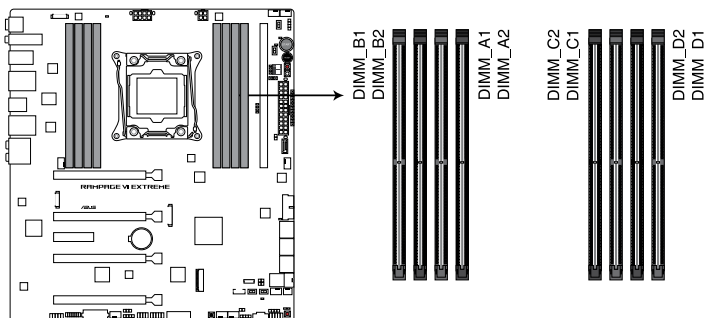


## 1.1.4 System memory

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

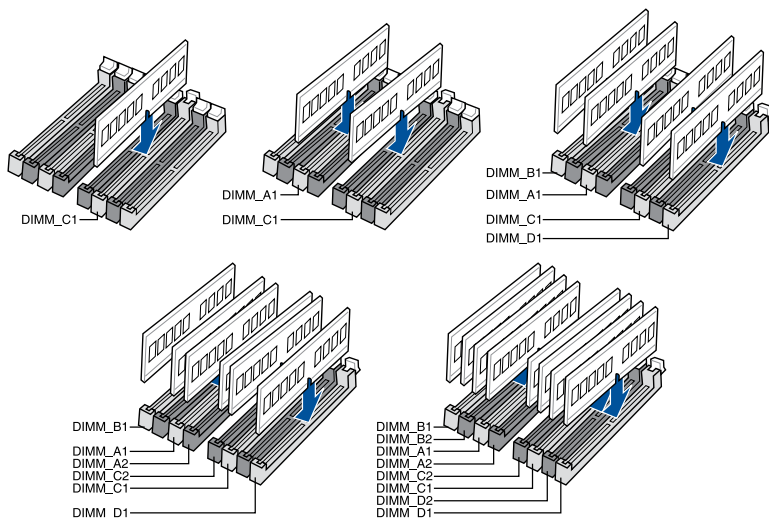


A DDR4 module is notched differently from a DDR, DDR2, or DDR3 module. DO NOT install a DDR, DDR2, or DDR3 memory module to the DDR4 slot.



**ROG RAMPAGE VI EXTREME 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.



---

For Intel® Core™ X-Series Processor 78xx, 79xx Series, you may install varying memory sizes in Channel A, Channel B, Channel C, and Channel D. The system maps the total size of the lower-sized channel for the quad-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

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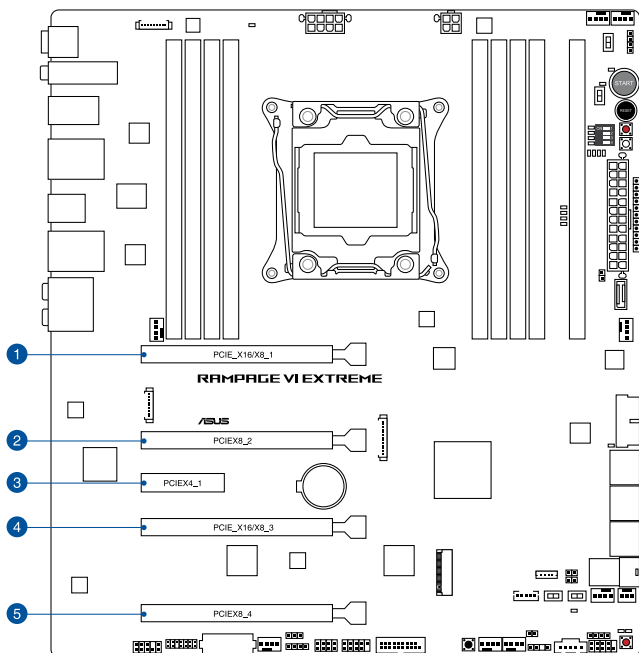


- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
  - For system stability, use a more efficient memory cooling system to support a full memory load (8 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 ASUS 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 x16/x8_1 slot
2	PCIe x8_2 slot
3	PCIe x4_1 slot
4	PCIe x16/x8_3 slot
5	PCIe x8_4 slot

## 44-Lane CPUs

VGA / PCIe configuration	PCI Express 3.0 operating mode				
	Single VGA / PCIe card	Dual VGA / PCIe cards	Triple VGA / PCIe cards*	Triple VGA / PCIe cards	Quad VGA / PCIe cards
PClex16/x8_1	x16	x16	x16	x16	x16
PClex8_2	x8	N/A	N/A	x8	x8
PClex16/x8_3	x8	x16	x16	x8	x8
PClex8_4	x4	x4	x8	x8	x8

\* Please use the bundled 4-way SLI® bridge to enable this configuration.

## 28-Lane CPUs

VGA / PCIe configuration	PCI Express 3.0 operating mode		
	Single VGA / PCIe card	Dual VGA / PCIe cards	Triple VGA / PCIe cards
PClex16/x8_1	x16	x16	x8
PClex8_2	N/A	N/A	x8
PClex16/x8_3	x16	x16	x8
PClex8_4	N/A	N/A	N/A



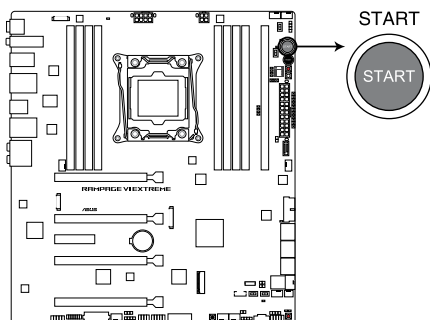
We recommend that you provide sufficient power when running CrossFireX™ or SLI® mode.

## 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

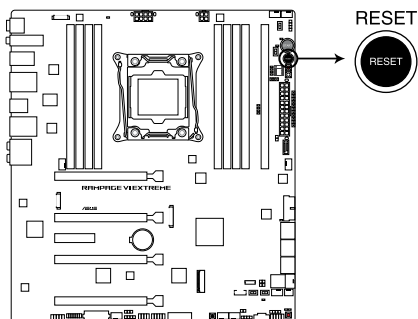
The motherboard comes with a power-on button that allows you to power up or wake up the system. The button also lights up when the system is plugged to a power source indicating that you should shut down the system and unplug the power cable before removing or installing any motherboard component.



**ROG RAMPAGE VI EXTREME Power on button**

### 2. Reset button

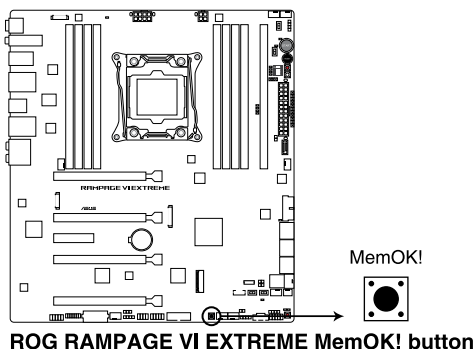
Press the reset button to reboot the system.



**ROG RAMPAGE VI EXTREME Reset button**

### 3. MemOK! button

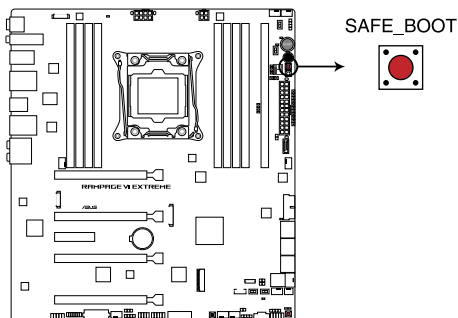
Installing DIMMs that are not compatible with the motherboard may cause system boot failure. If the system fails to boot during POST stage and the DRAM\_LED lights continuously, press the MemOK! button until the DRAM\_LED starts blinking. System will begin automatic memory compatibility tuning and reboot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



- 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.asus.com](http://www.asus.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.asus.com](http://www.asus.com) after using the MemOK! function.

#### 4. Safe Boot button (SAFE\_BOOT)

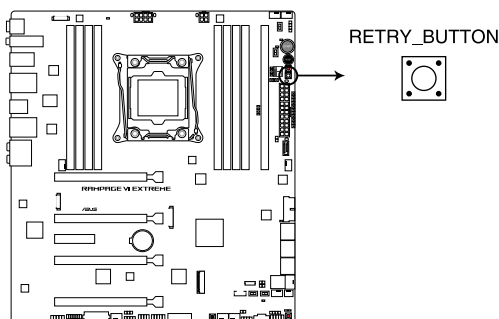
The Safe Boot button can be pressed anytime to force the system to reboot into the BIOS safe mode. This button temporarily applies safe settings to the BIOS while retaining any overlocked settings allowing you to modify the settings causing boot failure. Use this button when overclocking or tweaking the settings of your system.



**ROG RAMPAGE VI EXTREME Safe Boot button**

#### 5. ReTry button (RETRY\_BUTTON)

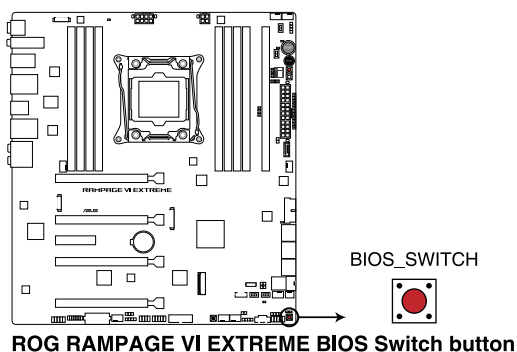
The ReTry button is specially designed for overclockers and is most useful during the booting process where the Reset button is rendered useless. When pressed, it forces the system to reboot while retaining the same settings to be retried in quick succession to achieve a successful POST.



**ROG RAMPAGE VI EXTREME RETRY button**

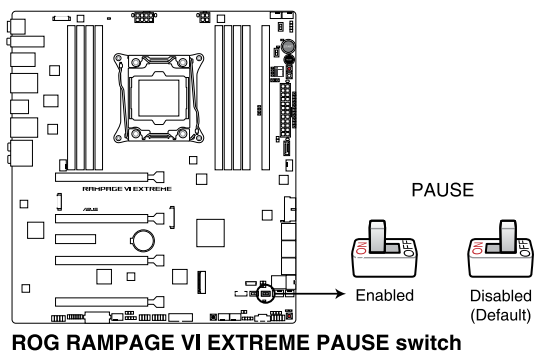
## 6. BIOS Switch button (BIOS\_SWITCH)

The motherboard comes with two BIOS chips. Press the BIOS button to switch BIOS and load different BIOS settings. The nearby BIOS\_LEDs indicate the currently selected BIOS.



## 7. Pause switch (PAUSE)

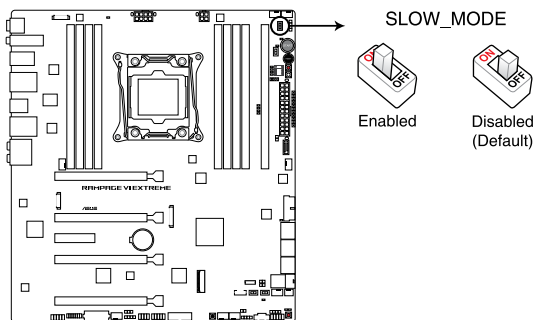
The pause switch allows you to freeze the cooling system at a hardware level, thus allowing you to adjust your system settings under heavy overclocking.





## 8. Slow Mode switch (SLOW\_MODE)

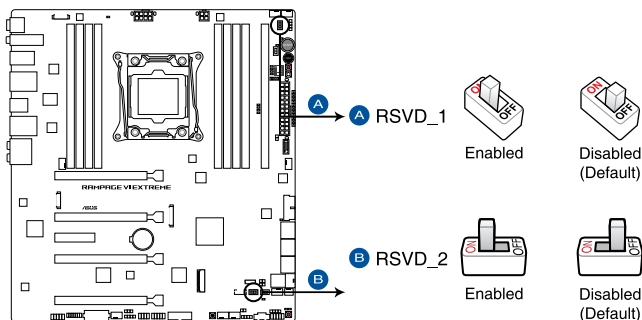
Slow Mode Switch is employed during LN2 benching. The system may crash due to the CPU being unstable when using extreme overclocking, enabling slow mode will decrease the processor frequency and stabilize the system, allowing overclockers to keep track of their overclocking data.



**ROG RAMPAGE VI EXTREME Slow Mode switch**

## 9. RSVD switch (RSVD\_1-2)

This switch is reserved for ASUS-authorized technicians only.



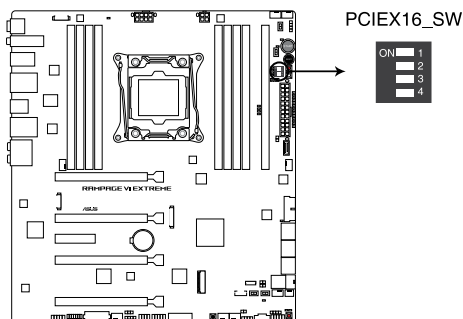
**ROG RAMPAGE VI EXTREME RSVD switch**



Ensure to set this switch to disabled, enabling this switch may cause system failure.

## 10. PCIe x16 Lane switch (PCIEX16\_SW)

These slide switches allows you to enable and disable the corresponding PCIe x16 slots. When one of the installed PCIe x16 cards is out of order, you can use the slide switch to find the faulty one without removing the cards.

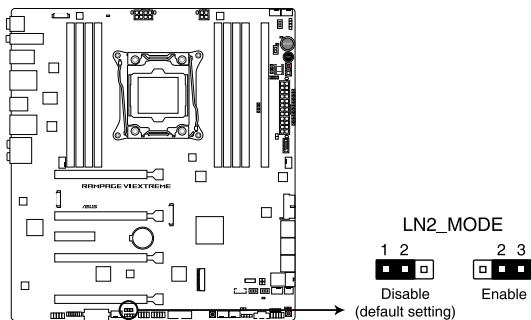


**ROG RAMPAGE VI EXTREME PCIe x16 Lane switch**

## 1.1.7 Jumpers

### 1. LN2 Mode jumper (3-pin LN2\_MODE)

With LN2 mode activated, the ROG motherboard is optimized to remedy the cold-boot bug during POST and help the system boot successfully.

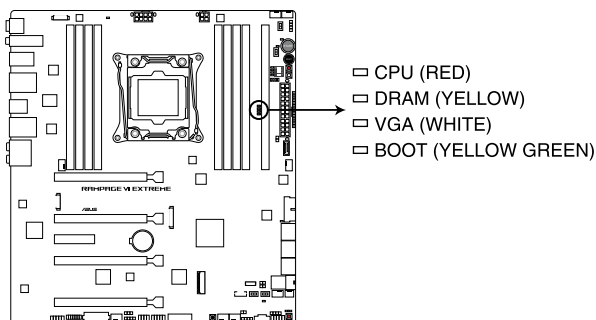


**ROG RAMPAGE VI EXTREME LN2 Mode jumper**

## 1.1.8 Onboard LEDs

### 1. Q LEDs (CPU, DRAM, VGA, BOOT)

Q LEDs check key components (CPU, DRAM, VGA card, and booting devices) in sequence during motherboard booting process. If an error is found, the corresponding LED remains lit until the problem is solved. This user-friendly design provides an intuitive way to locate the root problem within seconds.



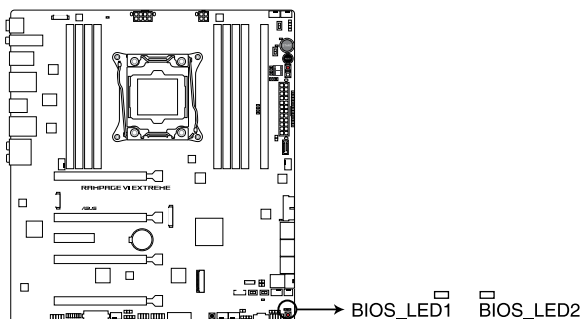
**ROG RAMPAGE VI EXTREME CPU/ DRAM/  
 BOOT\_DEVICE/ VGA LED**



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

### 2. BIOS LEDs (BIOS\_LED1-2)

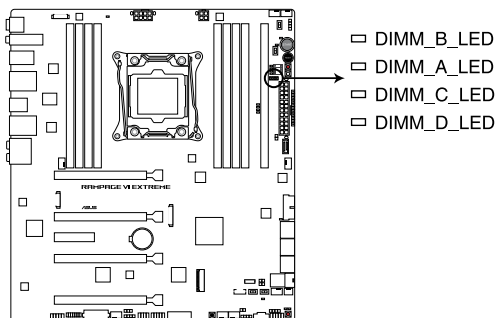
The BIOS LEDs help indicate the BIOS activity. Press the BIOS button to switch between BIOS1 and BIOS2 and the LED lights up when the corresponding BIOS is in use.



**ROG RAMPAGE VI EXTREME BIOS LEDs**

### 3. DIMM LED (DIMM\_A\_LED; DIMM\_B\_LED; DIMM\_C\_LED; DIMM\_D\_LED)

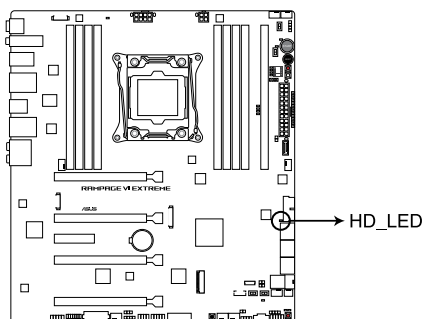
The DIMM LED indicates when the corresponding memory channel is enabled.



**ROG RAMPAGE VI EXTREME DIMM LED**

### 4. Hard Disk LED (HD\_LED)

The Hard Disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function.



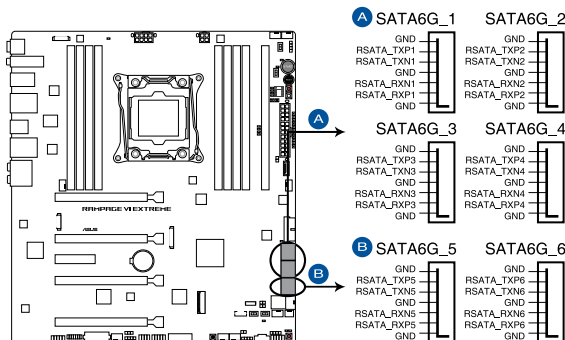
**ROG RAMPAGE VI EXTREME Hard Disk LED**

## 1.1.9 Internal connectors

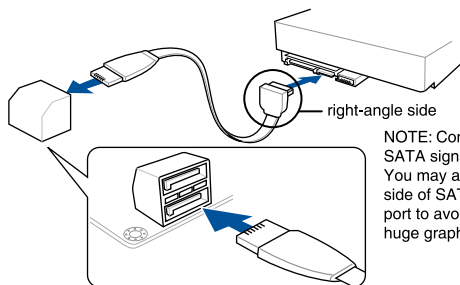
### 1. Intel® Serial ATA 6 Gb/s connectors (7-pin SATA6G\_12; SATA 6G\_34; SATA 6G\_56)

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® X299 chipset.



**ROG RAMPAGE VI EXTREME Intel® Serial ATA 6 Gb/s connectors**



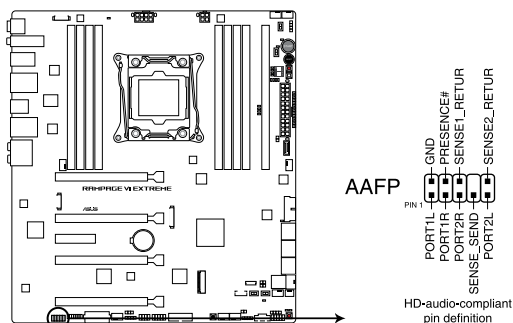
NOTE: Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.



- 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)]**.
- Due to the way Intel reads drive numbers based on the PCH pinout, the SATA drive naming on the IRST driver will be shifted by 2 (i.e. SATA\_1 will be reported as internal empty port 3).

## 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.



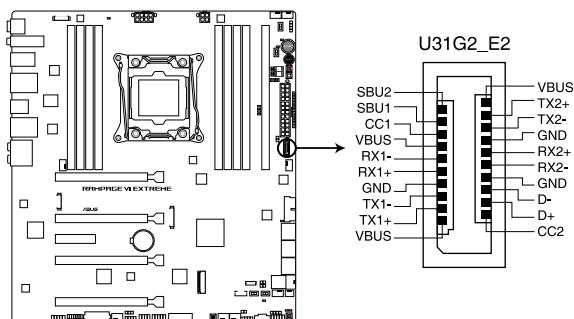
**ROG RAMPAGE VI EXTREME Front panel audio connector**



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 2 front panel connector (U31G2\_E2)

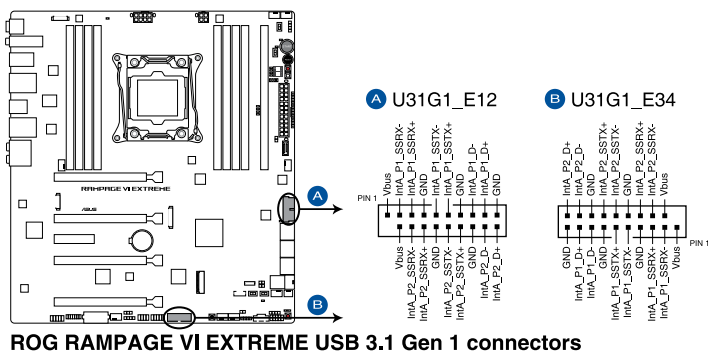
This connector allows you to connect a USB 3.1 Gen 2 module for additional USB 3.1 Gen 2 ports. The latest USB 3.1 Gen 2 connectivity provides data transfer speeds of up to 10 Gbps.



**ROG RAMPAGE VI EXTREME USB 3.1 Gen 2 front panel connector**

#### 4. USB 3.1 Gen 1 connector (20-pin U31G1\_E12; 20-pin U31G1\_E34)

These connectors allow 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 Gen 1 including faster data transfer speeds of up to 5 Gb/s, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.



The USB 3.1 Gen 1 module is purchased separately.

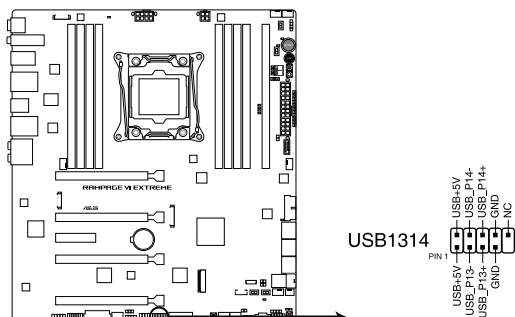


The plugged USB 3.1 Gen 1 device may run on xHCI or EHCI mode depending on the operating system's setting.



## 5. USB 2.0 connector (10-1 pin USB1314)

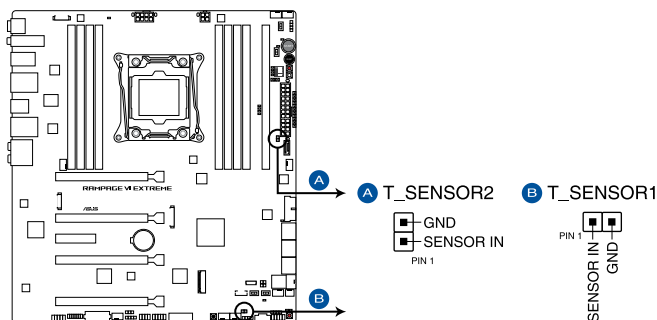
This connector is for USB 2.0 ports. Connect the USB module cable to this connector, then install the module to a slot opening at the back of the system chassis. This USB connector complies with USB 2.0 specification that supports up to 480 Mb/s connection speed.



**ROG RAMPAGE VI EXTREME USB 2.0 connector**

## 6. Thermal sensor connectors (2-pin T\_SENSOR1-2)

These connectors are for the thermistor cables that monitor 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.

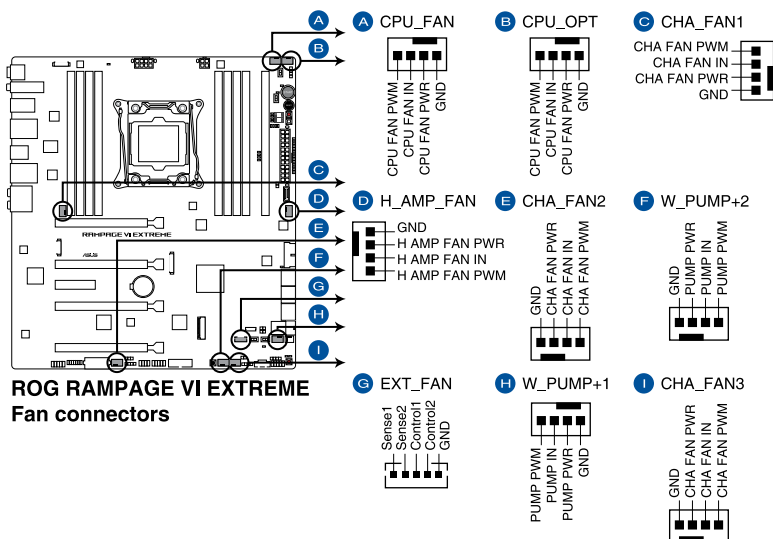


**ROG RAMPAGE VI EXTREME Thermal sensor connectors**

## 7. Fan and pump connectors (4-pin CPU\_FAN; 4-pin CPU\_OPT; 4-pin H\_AMP\_FAN; 4-pin W\_PUMP+1; 4-pin W\_PUMP+2; 5-pin EXT\_FAN; 4-pin CHA\_FAN1-3)

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.

The EXT\_FAN connector is only for the fan extension card. For more details on the fan extension card, please refer to the **To install Fan Extension Card** section in this guide.



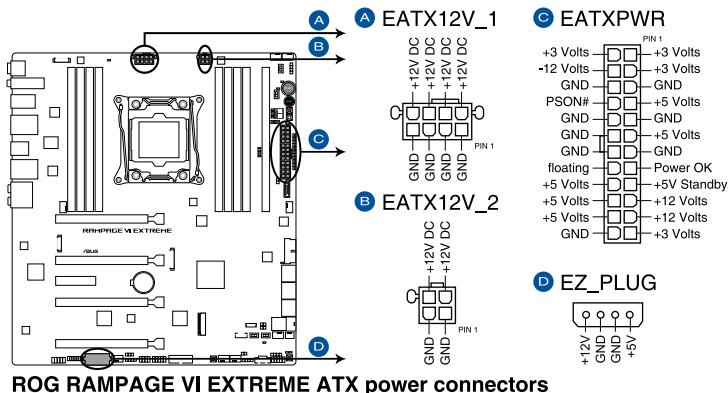
- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!
- Ensure that the CPU fan cable is securely installed to the CPU fan connector.



- The CPU\_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.
- The EXT\_FAN connector supports 2 of 5 thermal sensor sources.
- W\_PUMP+ function support depends on water cooling device.
- Connect the fan of your water cooling kit to the W\_PUMP+1/2 connector.

## 8. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V1; 4-pin EATX12V2; 4-pin EZ\_PLUG)

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.



**ROG RAMPAGE VI EXTREME ATX power connectors**



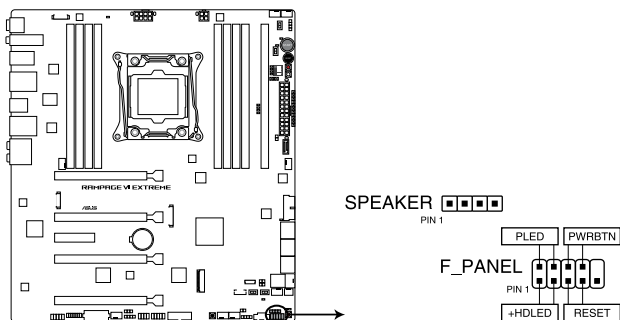
- DO NOT connect the 4-pin power plug only, the motherboard may overheat under heavy usage.
- Ensure to connect the 8-pin power plug, or connect both the 8-pin and 4-pin power plugs.



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

## 9. System panel connectors (10-1 pin F\_PANEL; 4-pin SPEAKER)

This connector supports several chassis-mounted functions.



**ROG RAMPAGE VI EXTREME System panel connector**

- **System power LED (2-pin PLED)**

The 2-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 HDLED)**

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 PWRBTN)**

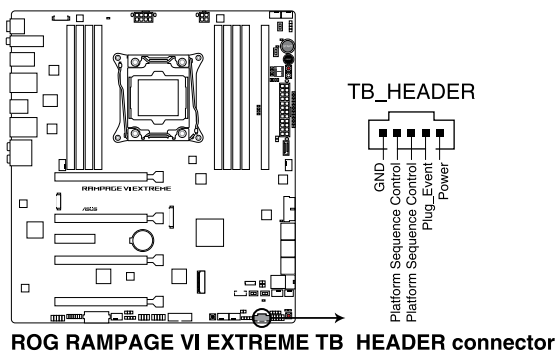
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the operating system settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **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.

## 10. Thunderbolt header (5-pin TB\_HEADER)

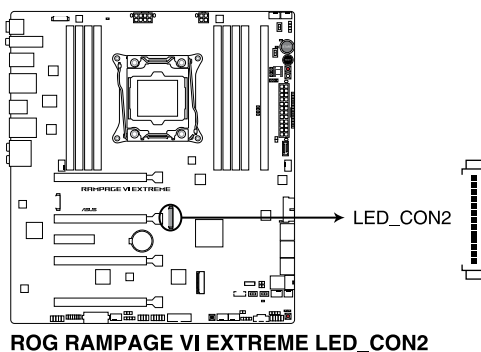
This connector is for the add-on Thunderbolt I/O card that supports Intel's Thunderbolt Technology, allowing you to connect up to six Thunderbolt-enabled devices and a DisplayPort-enabled display in a daisy-chain configuration.



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

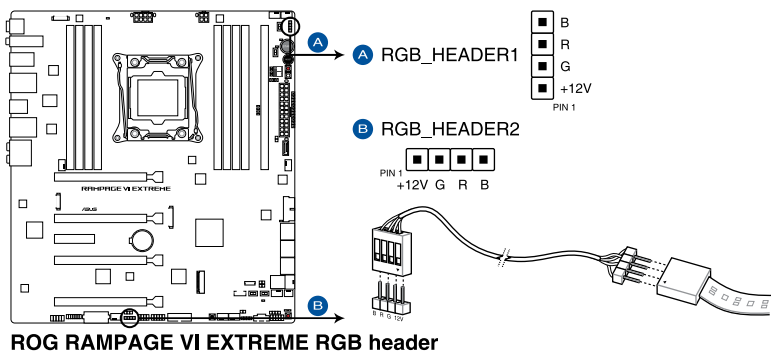
## 11. LED connector (13-pin LED\_CON2)

This connector is for connecting LED strips on your cover.



## 12. AURA RGB headers (4-pin RGB\_HEADER1-2)

These connectors are 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.



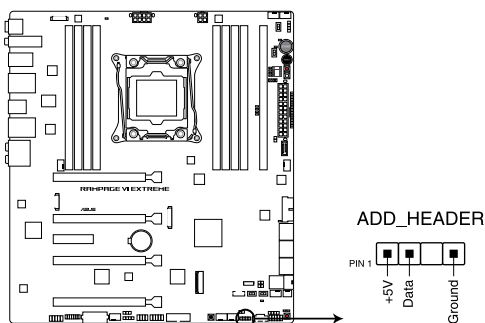
Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.



- 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 will only light up under the operating system.
- The LED strip is purchased separately.

### 13. Addressable RGB header (4-1 pin ADD\_HEADER)

This connector is for individually addressable RGB WS2812B LED strips or WS2812B based LED strips.



**ROG RAMPAGE VI EXTREME ADD header**



The addressable RGB header supports WS2812B addressable RGB LED strips (5V/Data/Ground), with a maximum power rating of 3A (5V) and a maximum of 60 LEDs.



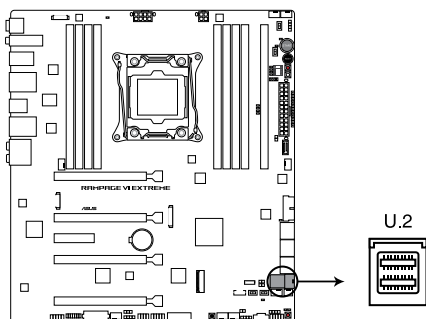
Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.



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

#### 14. U.2 connector (U.2)

This motherboard comes with a U.2 connector which supports PCIe 3.0 x4 NVM Express storage.



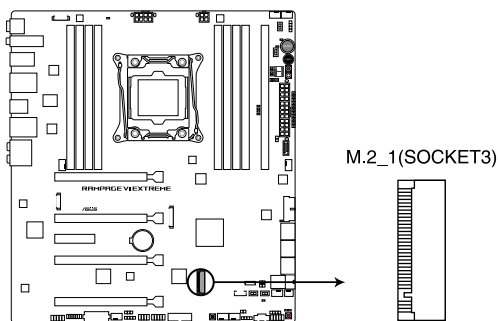
**ROG RAMPAGE VI EXTREME U.2 connector**



The U.2 connector shares bandwidth with the M.2\_1 socket . Adjust the BIOS settings to use U.2 devices.

#### 15. M.2 sockets (M.2\_1(Socket 3))

This socket allows you to install an M.2 SSD module.



**ROG RAMPAGE VI EXTREME M.2 socket**



- M.2\_1 socket supports PCIe 3.0 x4 and SATA mode M Key design and type 2242 / 2260 / 2280 / 22110 PCIe and SATA storage devices.
- These sockets support IRST (Intel® Rapid Storage Technology).

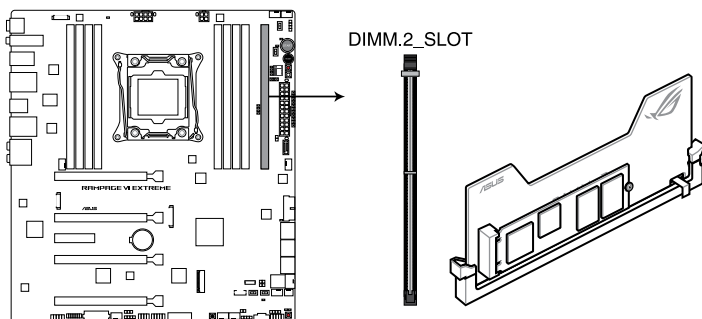


The M.2 SSD module is purchased separately.

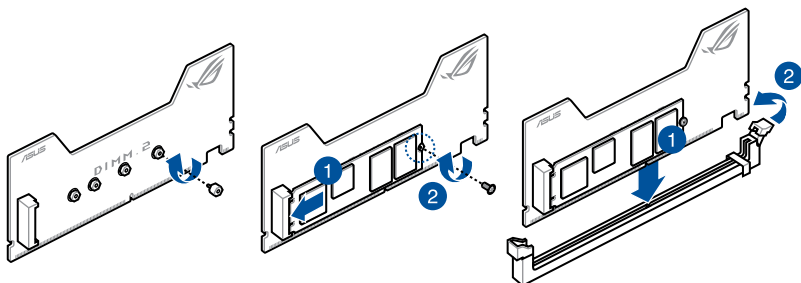


## 16. DIMM.2 slot (DIMM.2\_SLOT)

This socket allows you to install the bundled DIMM.2 card to connect M.2 SSD modules.



**ROG RAMPAGE VI EXTREME 288-pin DDR4 DIMM.2\_SLOT socket**



- Before you install or remove the DIMM.2 card, 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 or DIMM.2 card.
- The DIMM.2 card is notched to fit in only one orientation. Ensure that the notch on your card is aligned correctly with the DIMM.2 slot before inserting the card.



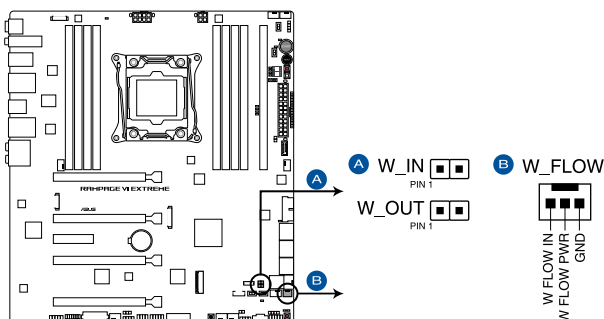
- M.2\_1 socket supports PCIe 3.0 x4 M Key design and type 2230 / 2242 / 2260 / 2280 / 22110 PCIe storage devices.
- M.2\_2 socket supports PCIe 3.0 x4 M Key design and type 2230 / 2242 / 2260 / 2280 / 22110 storage devices.
- Intel® Optane Technology is only supported by M.2\_1 and M.2\_1(DIMM.2) when sourced from the PCH. Before using Intel® Optane memory modules, ensure that you have updated your motherboard drivers and BIOS to the latest version from ASUS support website.



The M.2 SSD module is purchased separately.

## 17. Water in, water out, and water flow connectors (2-pin W\_IN; 2-pin W\_OUT; 3-pin W\_FLOW)

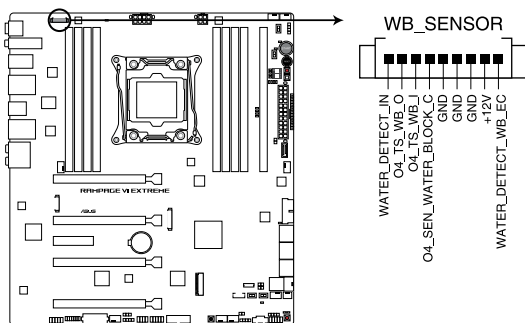
These connectors allow you to connect sensors to monitor the temperature and flow rate of your liquid cooling system. You can manually adjust the fans and water pump to optimize the thermal efficiency of your liquid cooling system.



**ROG RAMPAGE VI EXTREME W\_IN, W\_OUT & W\_Flow**

## 18. Water Block connector (9-pin WB\_SENSOR)

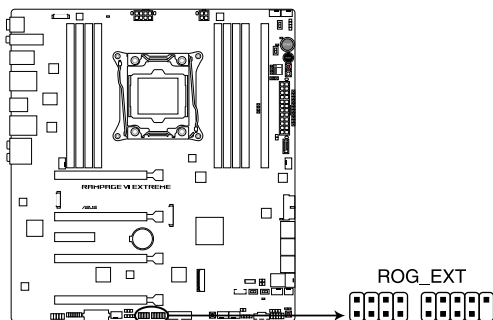
This connector allows you to connect a water block connector to monitor the temperature, flow rate, and water leak signals of your third party monoblocks. You can manually adjust the fans and water pump to optimize the thermal efficiency of your third party monoblocks.



**ROG RAMPAGE VI EXTREME Water Block connector**

## 19. ROG extension connector (18-1 pin ROG\_EXT)

This connector is for the OC Panel I/II.



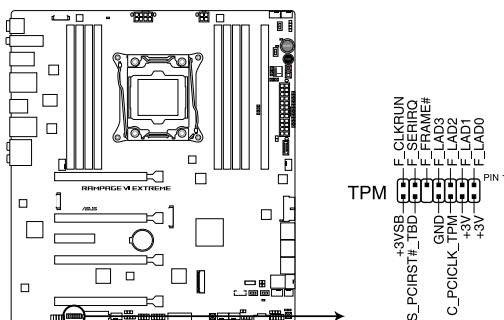
**ROG RAMPAGE VI EXTREME ROG extension connector**



- The OC Panel I/II is purchased separately.
- Support for OC Panel I/II varies over different platforms.
- Visit [www.asus.com](http://www.asus.com) for more information about the devices and the latest compatibility list.

## 20. 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.



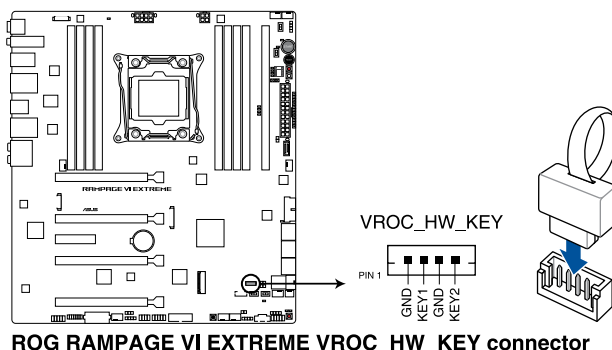
**ROG RAMPAGE VI EXTREME TPM connector**

TPM

1	2	3	4	5	6	7	8	9	10	11	12	13	14
+3VSB	S_PCRST#_TBD	GND	C_PCLK_TPM	+3V	+3V	E_LAD0	E_LAD1	E_LAD2	E_LAD3	E_FRAME#	E_SERIRQ	E_CLKRUN	PIN 1

## 21. VROC\_HW\_KEY connector (4-pin VROC\_HW\_KEY)

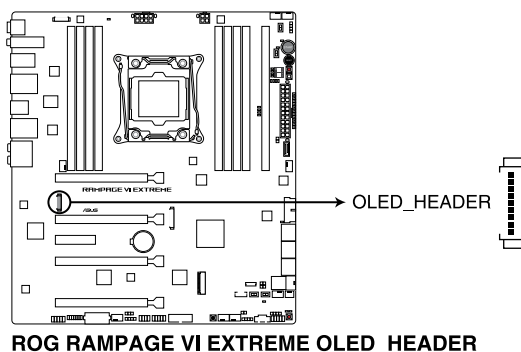
This connector allows you to connect a KEY module to enable CPU RAID functions with Intel® CPU RSTe.



- The KEY module is purchased separately.
- Due to CPU behavior, CPU RAID functions with Intel® CPU RSTe only supports Intel® Core™ X-series Processor 79xx, 78xx Series, and Intel® SSD modules.

## 22. OLED connector (9-pin OLED\_HEADER)

This connector is used to connect your LiveDash OLED panel. The OLED panel provides you a quick overview of the system temperature, power status, and fan speeds when your system boots up. You can also upload a .gif file for a customized look.

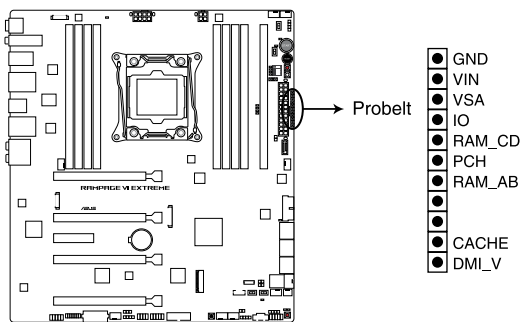


- Use the **ROG LiveDash Utility** to configure and customize the OLED panel.
- The LiveDash OLED provides the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.

## 1.1.10 Probel

The ROG Probel allows you to detect your system's current voltage and OC settings. Use a multimeter to measure the Probel points even during overlocking.

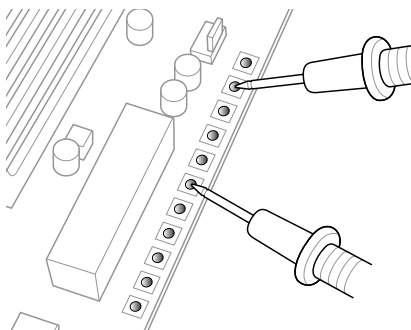
See the illustration below to locate the respective Probel points.



**ROG RAMPAGE VI EXTREME Probel**

### Using Probel

You can connect the multimeter to the motherboard as shown on the following figure.



The illustration above is for reference only, the actual motherboard layout and measure points may differ by model.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# Basic Installation

# 2

## 2.1 Building your PC system

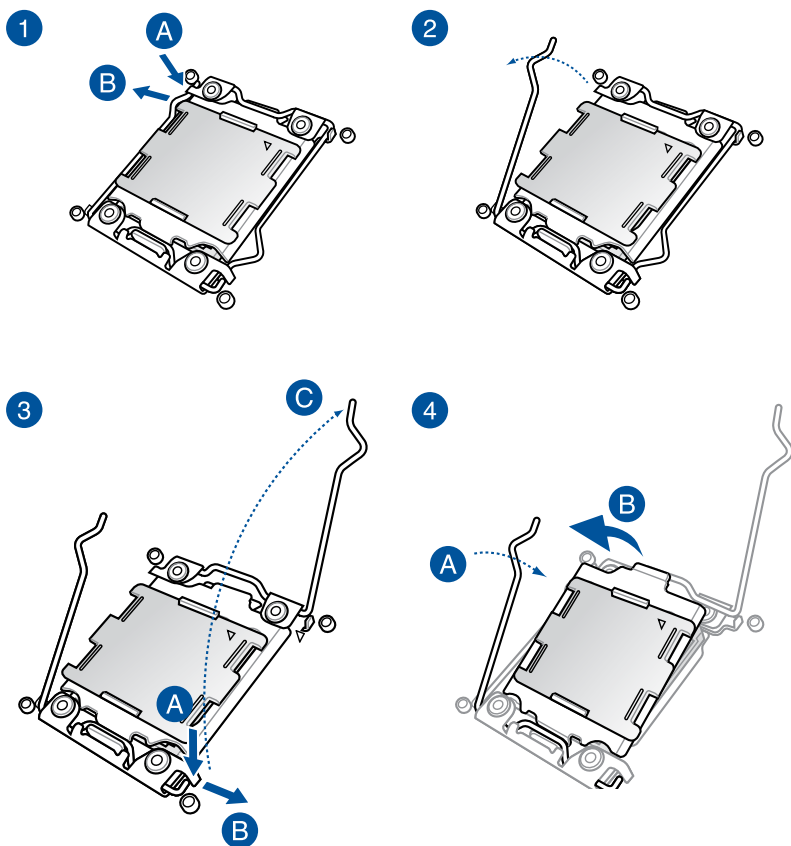


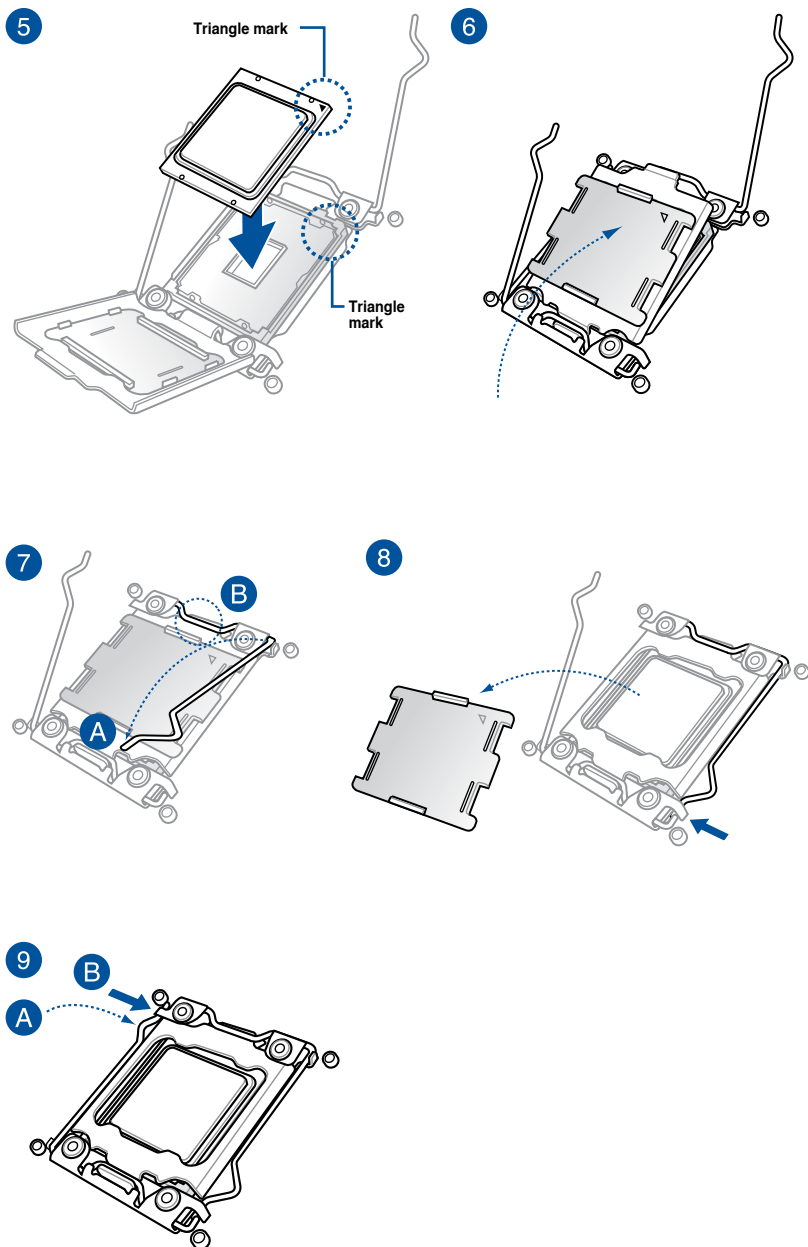
The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

### 2.1.1 CPU installation



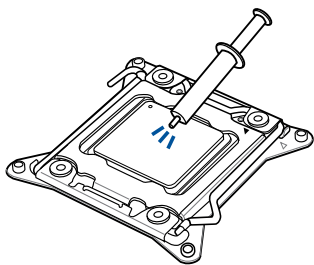
Please note the order in opening/ closing the double latch. Follow the instructions printed on the metal sealing hatch or the illustrations shown below in this manual. The plastic cap will pop up automatically once the CPU is in place and the hatch properly sealed down.





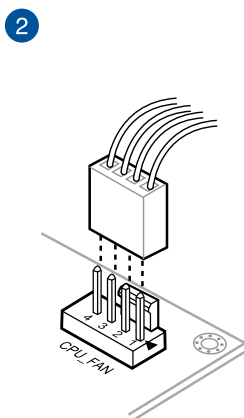
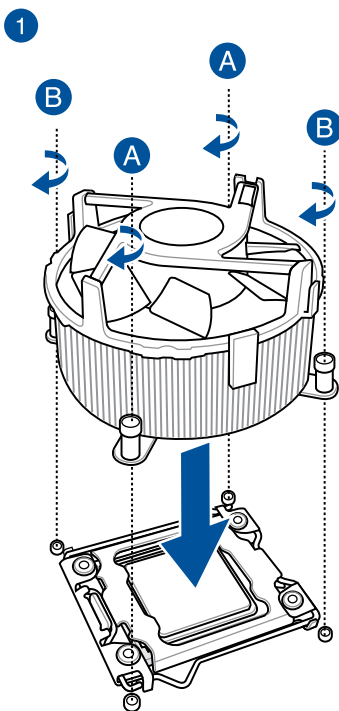


## 2.1.2 CPU heatsink and fan assembly installation



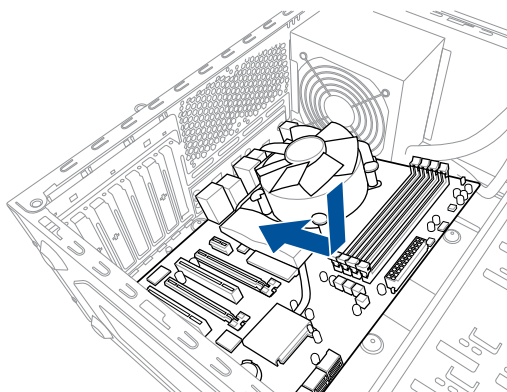
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan, if necessary.

To install the CPU heatsink and fan assembly:

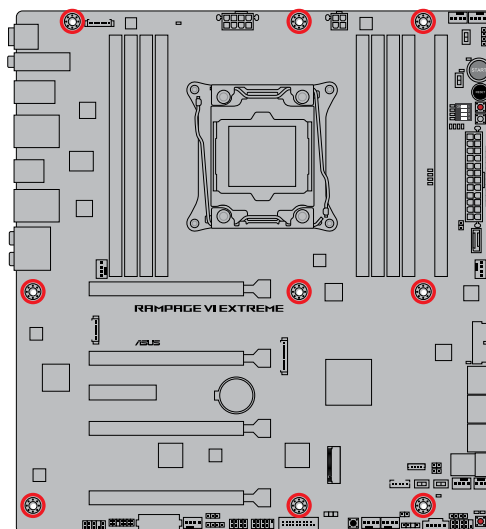
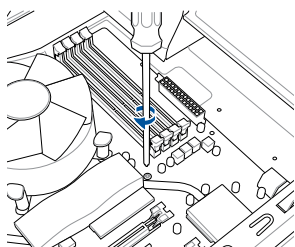


## 2.1.3 Motherboard installation

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

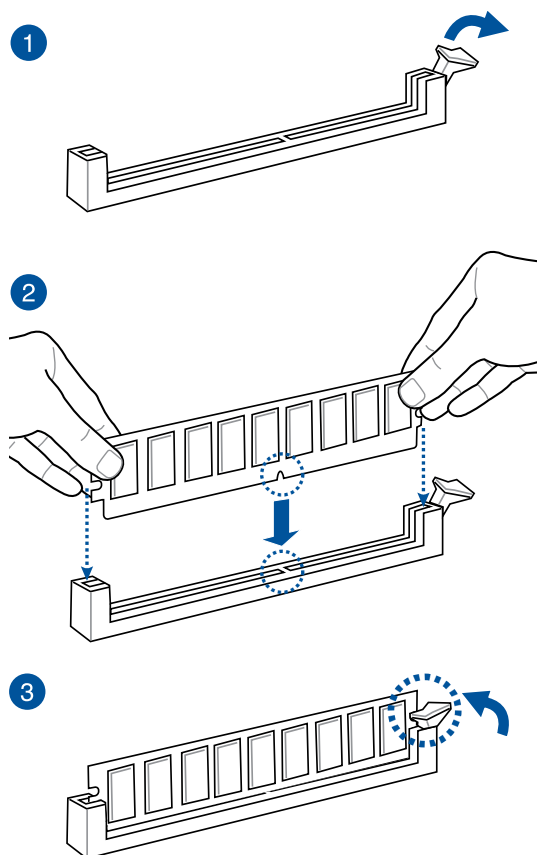


2. Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

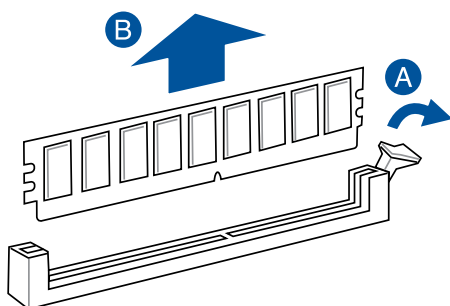


DO NOT overtighten the screws! Doing so can damage the motherboard.

## 2.1.4 DIMM installation

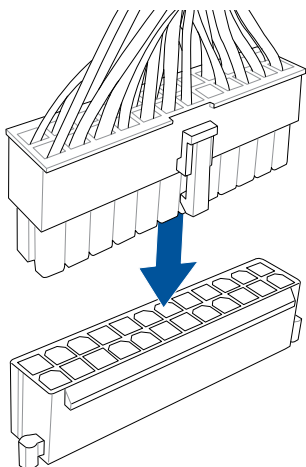


To remove a DIMM

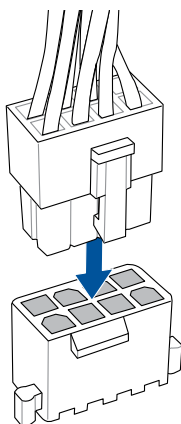


## 2.1.5 ATX power connection

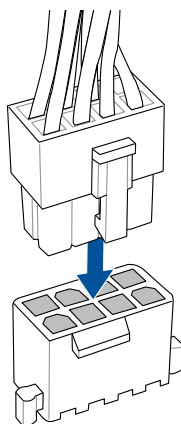
1



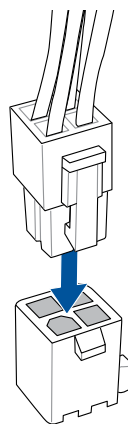
2



OR

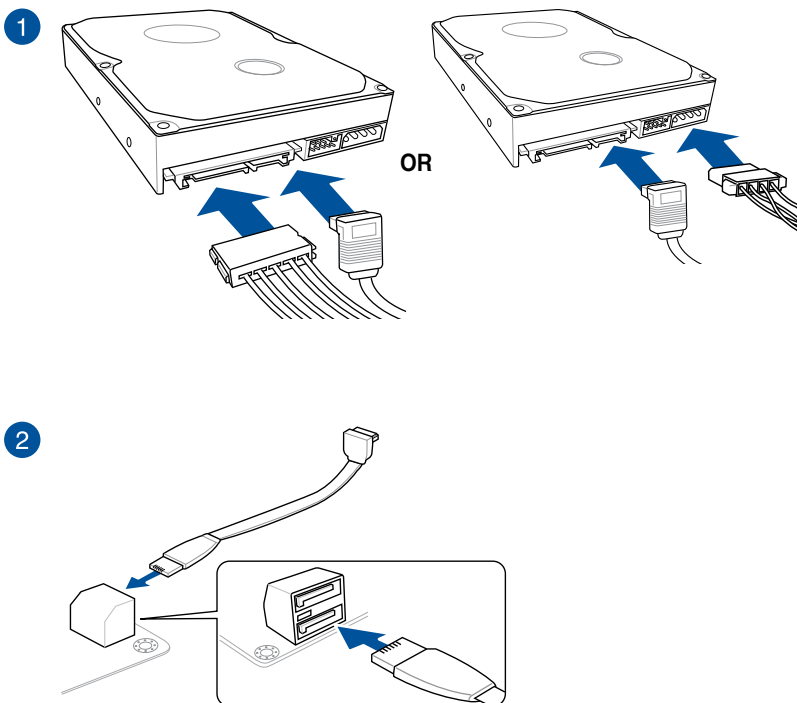


AND



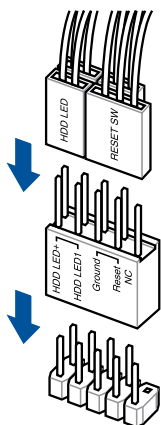
- DO NOT connect the 4-pin power plug only, the motherboard may overheat under heavy usage.
- Ensure to connect the 8-pin power plug, or connect both the 8-pin and 4-pin power plugs.

## 2.1.6 SATA device connection

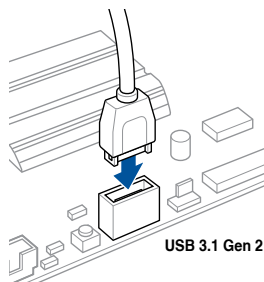


## 2.1.7 Front I/O connector

### To install ASUS Q-Connector

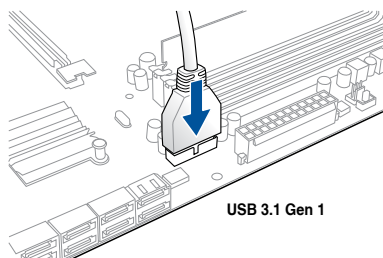


### To install USB 3.1 Gen 2 connector

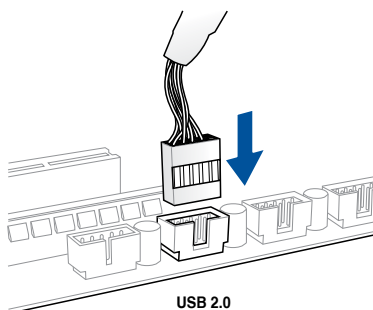


This connector will only fit in one orientation. Push the connector until it clicks into place.

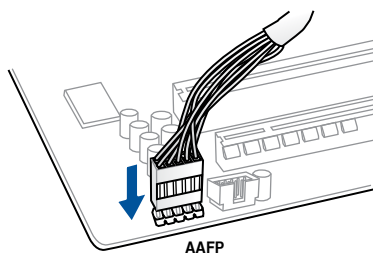
### To install USB 3.1 Gen 1 connector



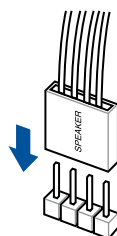
### To install USB 2.0 connector



### To install front panel audio connector

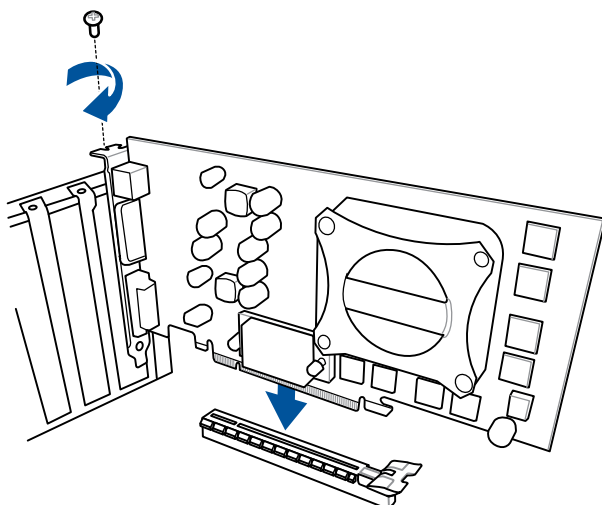


### To install system speaker connector

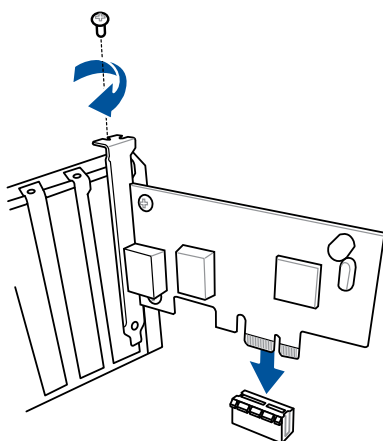


## 2.1.8 Expansion card installation

To install PCIe x16 cards

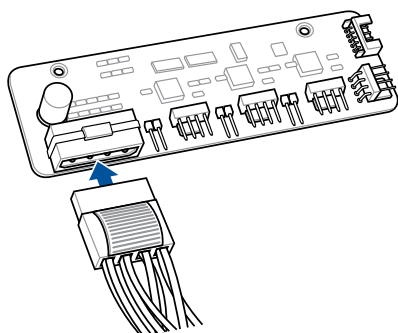


To install PCIe x1 cards

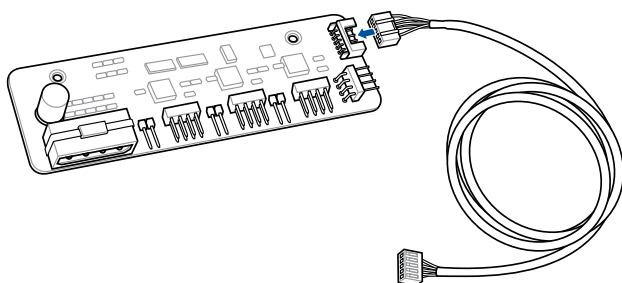


## To install FAN EXTENSION CARD

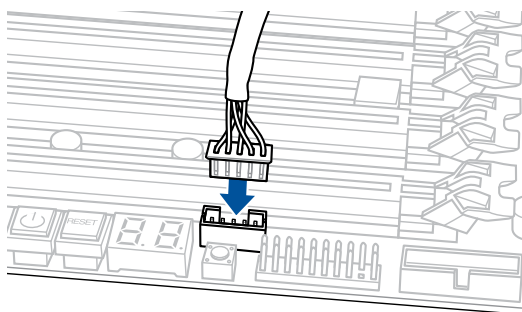
1



2



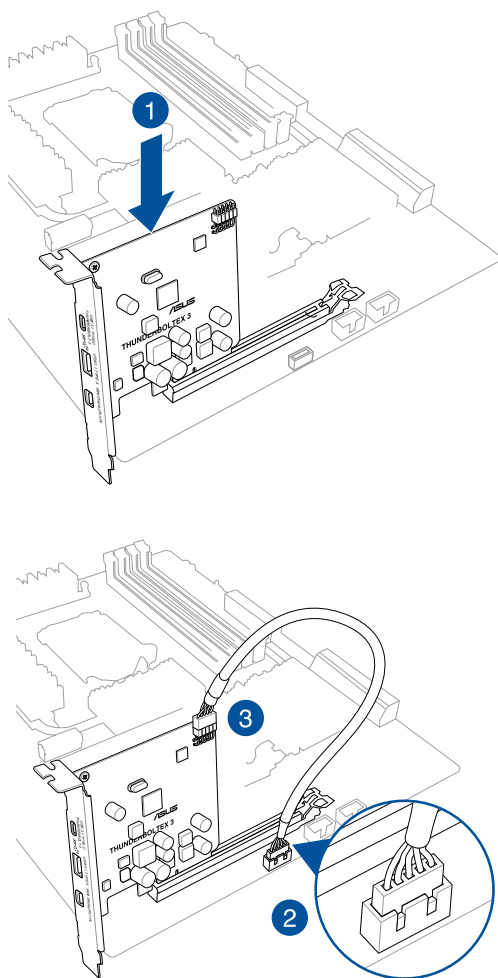
3



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



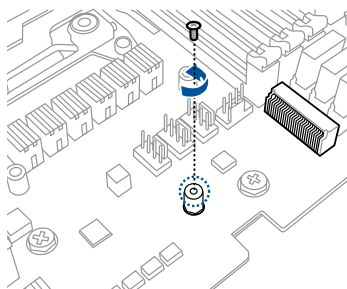
## To install ThunderboltEX 3 card



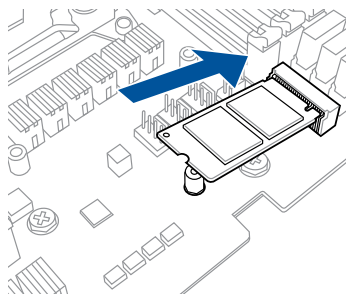
The illustrations in this section are for reference only. The motherboard layout may vary with models, but the installation steps are the same for all models.

## 2.1.9 M.2 installation

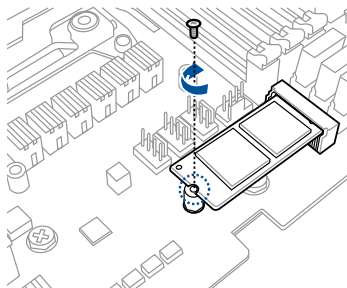
1



2



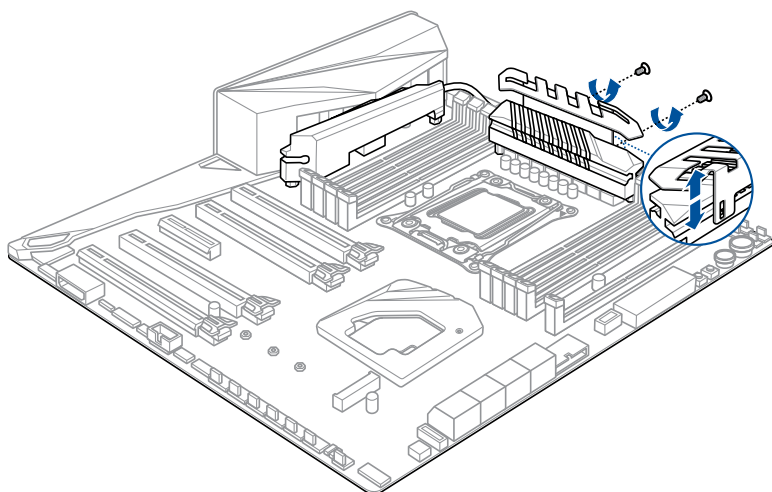
3



Supported M.2 type varies per motherboard.

## 2.1.10 Fan bracket installation

To install the MOS FAN bracket

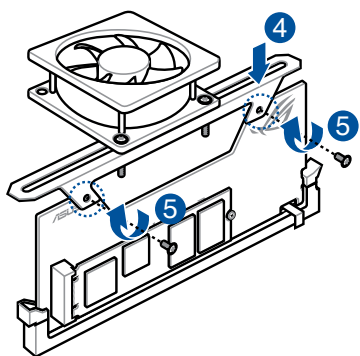
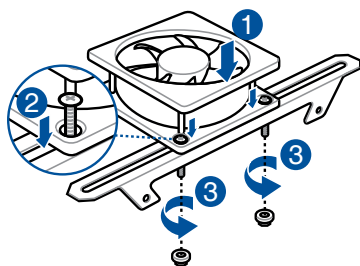


When using high performance settings whilst overclocking, ensure to install the MOS FAN bracket for additional fan(s).



Fans are purchased separately.

## To install the DIMM.2 FAN mount

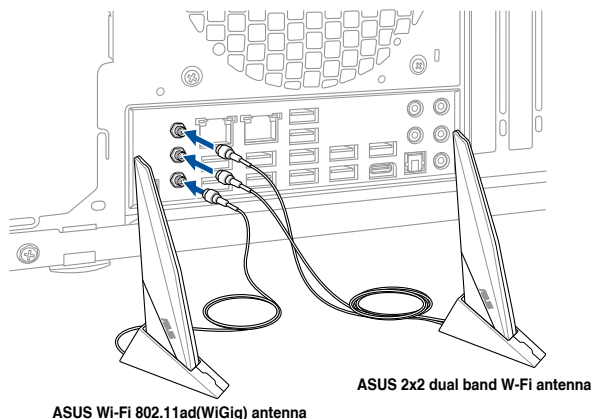


- You may install up to two 50mm x 50mm fans or a single 100mm x 100 mm fan.
- Fans are purchased separately.

## 2.1.11 Wi-Fi antenna installation

### Installing the ASUS 2x2 dual band W-Fi and ASUS Wi-Fi 802.11ad(WiGig) antenna

Connect the bundled ASUS 2x2 dual band Wi-Fi antenna connector to the top two Wi-Fi ports at the back of the chassis, then connect the Wi-Fi 802.11ad(WiGig) antenna to the bottom Wi-Fi port.



- Ensure that the ASUS 2x2 dual band W-Fi and ASUS Wi-Fi 802.11ad(WiGig) antenna is securely installed to the Wi-Fi ports.
- Ensure that the antenna is at least 20 cm away from all persons.
- Wi-Fi 802.11ad(WiGig) is only available in certified countries.
- For optimum performance, ensure that the ASUS 2x2 dual band W-Fi antenna is at least 10 cm away from the ASUS Wi-Fi 802.11ad(WiGig) antenna.



The illustration above is for reference only. The I/O port layout may vary with models, but the Wi-Fi antenna installation procedure is the same for all models.

## 2.2 BIOS update utility

### USB BIOS Flashback

USB BIOS Flashback allows you to easily update the BIOS without entering the existing BIOS or operating system. Simply insert a USB storage device to the USB port (the USB port hole marked in green on the I/O shield) then press the USB BIOS Flashback button for three seconds to automatically update the BIOS.

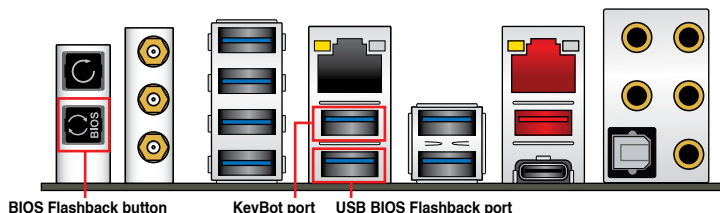
#### To use USB BIOS Flashback:

1. Insert a USB storage device to the USB Flashback port.



We recommend you to use a USB 2.0 storage device to save the latest BIOS version for better compatibility and stability.

2. Visit <https://www.asus.com/support/> and download the latest BIOS version for this motherboard.
3. Rename the file as **R6E.CAP**, then copy it to your USB storage device.
4. Shut down your computer.
5. Press the BIOS Flashback button for three seconds until the Flashback LED blinks three times, indicating that the BIOS Flashback function is enabled.



6. Wait until the light goes out, indicating that the BIOS updating process is completed.



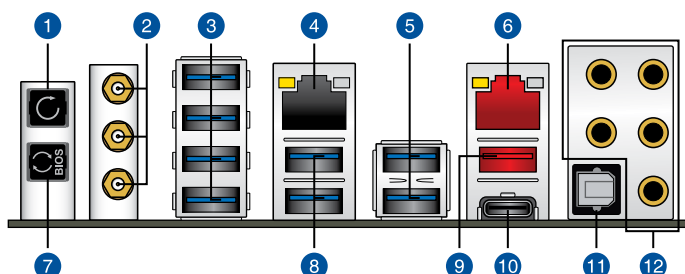
For more BIOS update utilities in BIOS setup, refer to the section **3.11 Updating BIOS** in Chapter 3.



- Do not unplug portable disk, power system, or press the CLR\_CMOS button while BIOS update is ongoing, otherwise update will be interrupted. In case of interruption, please follow the steps again.
- If the light flashes for five seconds and turns into a solid light, this means that the BIOS Flashback is not operating properly. This may be caused by improper installation of the USB storage device and filename/file format error. If this scenario happens, please restart the system to turn off the light.
- Updating BIOS may have risks. If the BIOS program is damaged during the process and results to the system's failure to boot up, please contact your local ASUS Service Center.

## 2.3 Motherboard rear and audio connections

### 2.3.1 Rear I/O connection



#### Rear panel connectors

1.	Clear CMOS button (CLR_CMOS). Press this button to clear the BIOS setup information only when the systems hangs due to overclocking.
2.	Wi-Fi 802.11 a/b/g/n/ac/ad, Bluetooth V4.2 ports
3.	USB 3.1 Gen 1 ports E5678
4.	Aquantia AQC-107 10G LAN port
5.	Intel® USB 3.1 Gen 1 ports 34
6.	LAN (RJ-45) port*
7.	USB BIOS Flashback button
8.	Intel® USB 3.1 Gen 1 ports 56. Upper port supports the KeyBot II feature, and lower port supports USB BIOS Flashback function.
9.	USB 3.1 Gen 2 Type-A port E1
10.	USB 3.1 Gen 2 Type-C™ port EC1
11.	Optical S/PDIF OUT port
12.	Color-coded LED Audio Jacks**

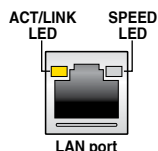
\* and \*\*: Refer to the tables on the next page for LAN port LEDs, and audio port definitions.



- 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.
- Due to the design of the Intel chipset, all USB devices connected to the USB 3.1 Gen 1 ports are controlled by the xHCI controller. Some legacy USB devices must update their firmware for better compatibility.
- When KeyBot II is activated, USB hot plug function of the KeyBot port (USB 3.1 Gen 1 port 5) will be temporarily disabled.

## \* LAN port LED indications

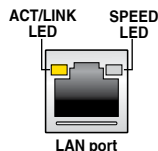
Activity Link LED		Speed LED	
Status	Description	Status	Description
Off	No link	Off	10 Mbps connection
Orange	Linked	Orange	100 Mbps connection
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode		



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

## Aquantia AQC-107 10G LAN port LED indications

Activity Link LED		Speed LED	
Status	Description	Status	Description
OFF	No Link	OFF	100 Mbps connection
Blinking	Link	ORANGE	5 Gbps / 2.5 Gbps / 1 Gbps connection
		GREEN	10 Gbps connection



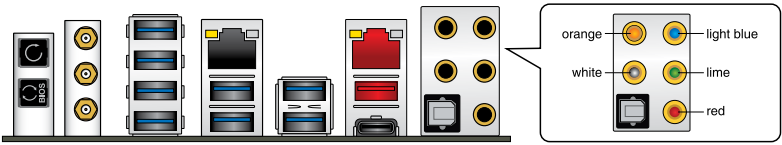
## \*\* Audio 2, 4, 5.1 or 7.1-channel configuration

Port	Headset 2-channel	4-channel	5.1-channel	7.1-channel
Light Blue	Line In	Line In	Line In	Side Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Red	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Sub woofer	Center/Sub woofer
White	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out



### 2.3.2 Audio I/O connections

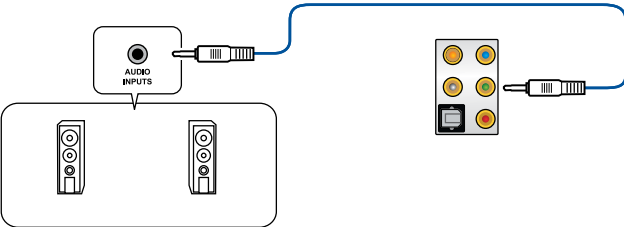
#### Audio I/O ports



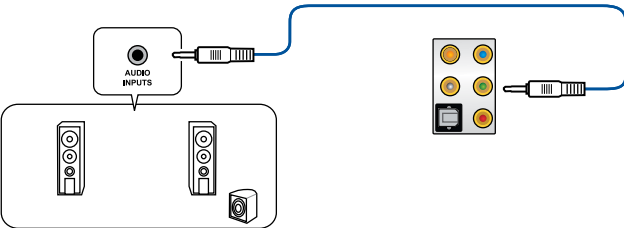
#### Connect to Headphone and Mic



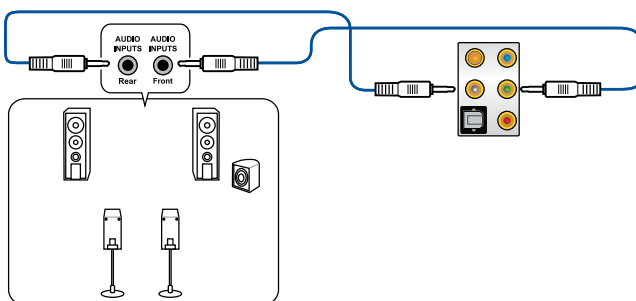
#### Connect to Stereo Speakers



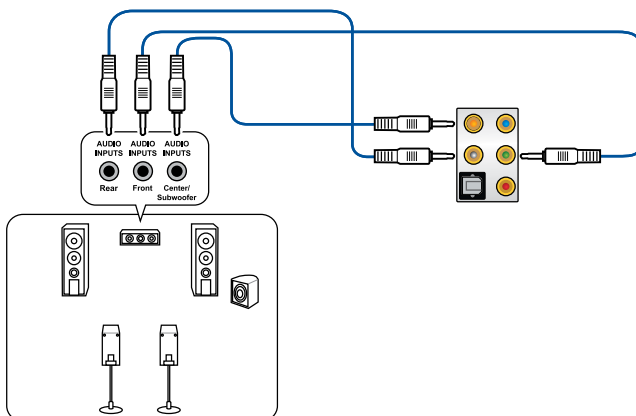
#### Connect to 2-channel Speakers



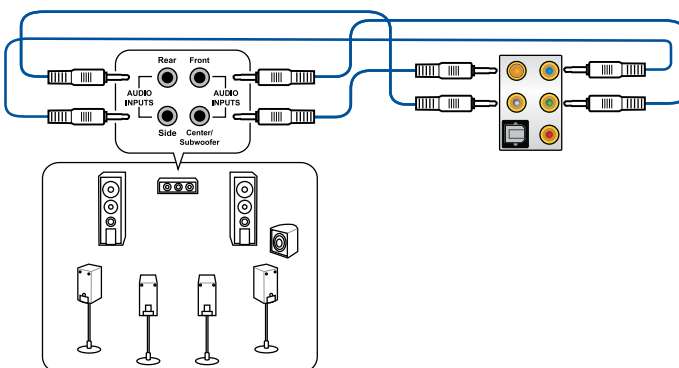
## Connect to 4-channel Speakers



## Connect to 5.1-channel Speakers



## Connect to 7.1-channel Speakers



## 2.4 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.

## 2.5 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.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# BIOS Setup

# 3

## 3.1 Knowing BIOS



---

The new ASUS UEFI BIOS is a Unified Extensible Interface that complies with UEFI architecture, offering a user-friendly interface that goes beyond the traditional keyboard-only BIOS controls to enable a more flexible and convenient mouse input. You can easily navigate the new UEFI BIOS with the same smoothness as your operating system. The term "BIOS" in this user manual refers to "UEFI BIOS" unless otherwise specified.

---

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimal performance. **DO NOT change the default BIOS settings** except in the following circumstances:

- An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.
- You have installed a new system component that requires further BIOS settings or update.



---

Inappropriate BIOS settings may result to instability or boot failure. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel.**

---



- 
- When downloading or updating the BIOS file, rename it as **R6E.CAP** for this motherboard.
  - BIOS settings and options may vary due to different BIOS release versions. Please refer to the latest BIOS version for settings and options.
-

## 3.2 BIOS setup program

Use the BIOS Setup to update the BIOS or configure its parameters. The BIOS screen include navigation keys and brief onscreen help to guide you in using the BIOS Setup program.

### Entering BIOS at startup

To enter BIOS Setup at startup, press <Delete> or <F2> during the Power-On Self Test (POST). If you do not press <Delete> or <F2>, POST continues with its routines.

### Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+<Delete> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.

After doing either of the three options, press <Delete> key to enter BIOS.



- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.
- If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu or press hotkey <F5>. See section 3.10 Exit Menu for details.
- If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section 1.1.6 Onboard buttons and switches for information on how to erase the RTC RAM via the Clear CMOS button.
- The BIOS setup program does not support the Bluetooth devices.



Please visit ASUS website for the detailed BIOS content manual.

### BIOS menu screen

The BIOS Setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from **Setup Mode** in **Boot menu** or by pressing the <F7> hotkey.

### 3.2.1 Advanced Mode

The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the Advanced Mode. Refer to the following sections for the detailed configurations.



The default screen for entering the BIOS setup program can be changed. Refer to the **Setup Mode** item in section **Boot menu** for details.

The screenshot displays the BIOS Advanced Mode interface. The top menu bar includes 'My Favorites', 'Main', 'Extreme Tweaker' (highlighted), 'Advanced', 'Monitor', 'Boot', 'Tool', and 'Exit'. The left sidebar lists 'LN2 Mode', 'Target CPU Turbo-Mode Frequency : 3200MHz', 'Target CPU @ AVX Frequency : 3200MHz', 'Target CPU @ AVX-512 Frequency : 3200MHz', 'Target DRAM Frequency : 2133MHz', 'Target Cache Frequency : 2000MHz', and 'Overclocking Presets'. The main area shows 'Ai Overclock Tuner' set to 'Auto', 'ASUS MultiCore Enhancement', 'AVX Instruction Core Ratio Negative Offset', 'AVX-512 Instruction Core Ratio Negative Offset', 'CPU Core Ratio' set to 'By Core Usage', and 'Turbo Ratio Limit 0'. A scroll bar is visible on the right. The bottom status bar shows 'Version 2.17.1246, Copyright (C) 2017 American Megatrends, Inc.', 'Last Modified', 'EZMode(F7) - [F7]', and 'Search on FAQ'. A 'Hardware Monitor' panel on the right displays CPU and memory status.

**Configuration fields**

**Pop-up Menu**

**Menu bar**

**Language**

**MyFavorite(F3)**

**Qfan Control(F6)**

**EZ Tuning Wizard(F11)**

**Hot Keys**

**Scroll bar**

**Menu Items**

**General help**

**Last modified settings**

**Go back to EZ Mode**

**Search on the FAQ**

**Displays the CPU temperature, CPU, and memory voltage output**

## Menu bar

The menu bar on top of the screen has the following main items:

<b>My Favorites</b>	For saving the frequently-used system settings and configuration.
<b>Main</b>	For changing the basic system configuration
<b>Extreme Tweaker</b>	For changing the overclocking settings
<b>Advanced</b>	For changing the advanced system settings
<b>Monitor</b>	For displaying the system temperature, power status, and changing the fan settings.
<b>Boot</b>	For changing the system boot configuration
<b>Tool</b>	For configuring options for special functions
<b>Exit</b>	For selecting the exit options and loading default settings

## Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (My Favorites, Ai Tweaker, Advanced, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items.

## Submenu items

A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

## Language

This button above the menu bar contains the languages that you can select for your BIOS. Click this button to select the language that you want to display in your BIOS screen.

## My Favorites (F3)

This button above the menu bar shows all BIOS items in a Tree Map setup. Select frequently-used BIOS settings and save it to MyFavorites menu.



Refer to section 3.3 **My Favorites** for more information.

## Q-Fan Control (F6)

This button above the menu bar displays the current settings of your fans. Use this button to manually tweak the fans to your desired settings.



Refer to section 3.2.3 **Q-Fan Control** for more information.

## EZ Tuning Wizard (F11)

This button above the menu bar allows you to view and tweak the overclocking settings of your system. It also allows you to change the motherboard's SATA mode from AHCI to RAID mode.



Refer to section 3.2.4 **EZ Tuning Wizard** for more information.



## Search on FAQ

Move your mouse over this button to show a QR code, scan this QR code on your mobile device to connect to the BIOS FAQ web page of the ASUS support website. You can also scan the following QR code:



## Hot keys

This button above the menu bar contains the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

## Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

## General help

At the bottom of the menu screen is a brief description of the selected item. Use <F12> key to capture the BIOS screen and save it to the removable storage device.

## Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

## Last Modified button

This button shows the items that you last modified and saved in BIOS Setup.

## 3.2.2 EZ Mode

The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance, mode and boot device priority. To access the Advanced Mode, select **Advanced Mode** or press the <F7> hotkey for the advanced BIOS settings.



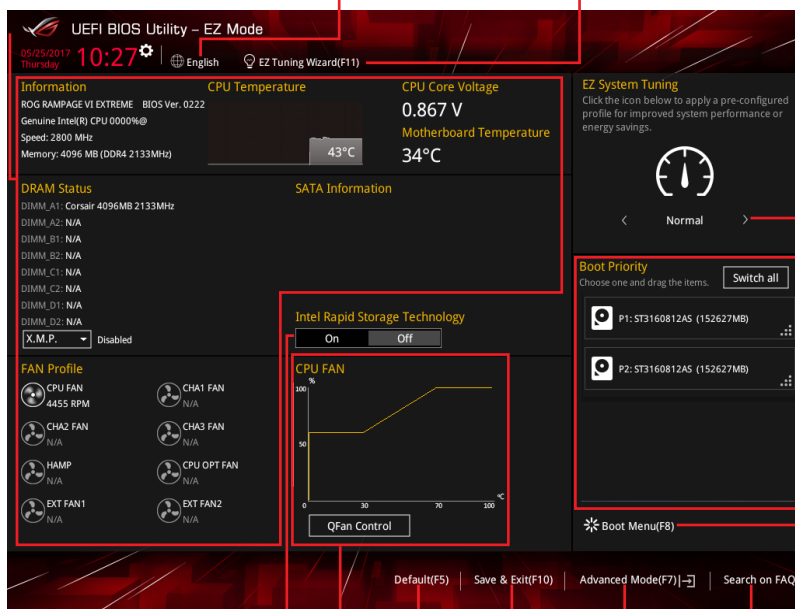
To switch from Advanced Mode to EZ Mode, click **EZ Mode(F7)** or press the <F7> hotkey.

Displays the CPU/motherboard temperature, CPU voltage output, CPU/chassis/power fan speed, and SATA information

Selects the display language of the BIOS setup program

Creates storage RAID and configures system overlocking

Displays the system properties of the selected mode.  
Click < or > to switch EZ System Tuning modes



Enables or disables the SATA RAID mode for Intel Rapid Storage Technology

Displays the CPU Fan's speed. Click the button to manually tune the fans

Loads optimized default settings

Saves the changes and resets the system

Click to go to Advanced mode

Search on the FAQ

Click to display boot devices

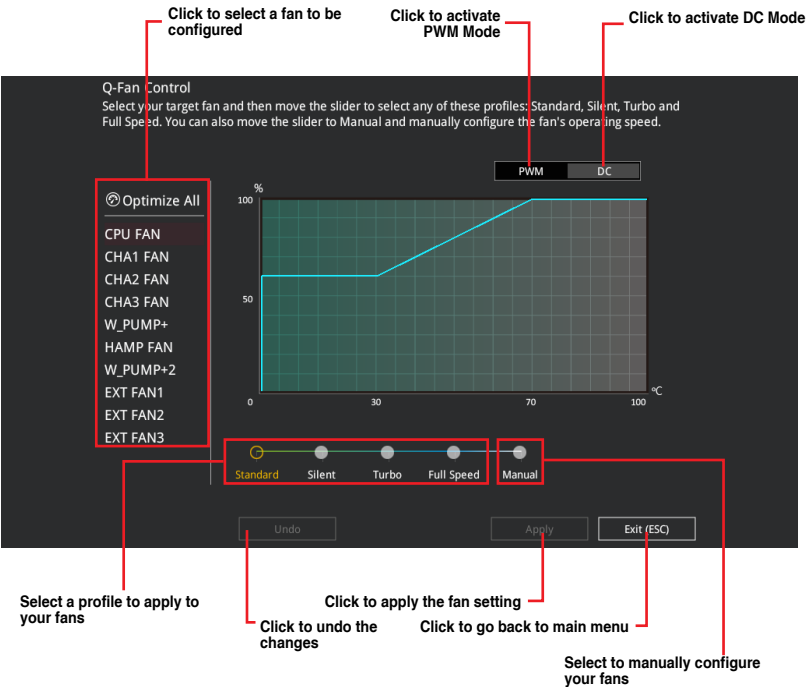
Selects the boot device priority



The boot device options vary depending on the devices you installed to the system.

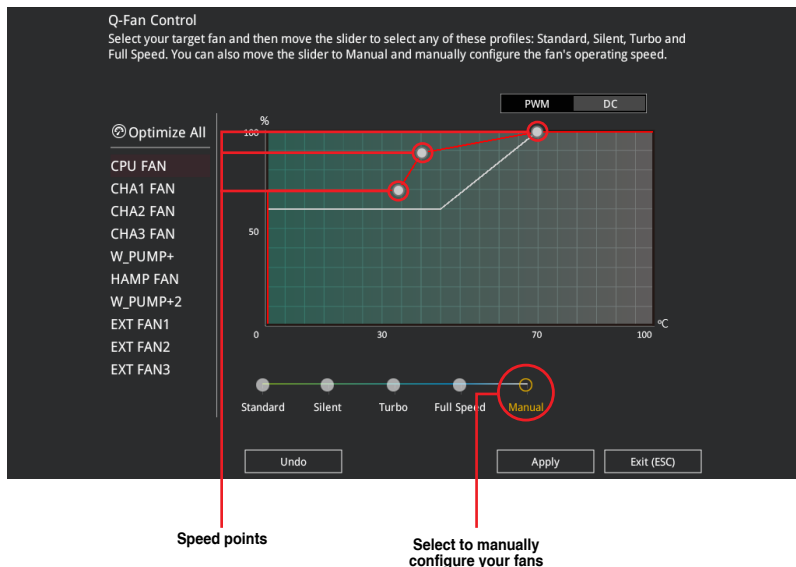
### 3.2.3 Q-Fan Control

The Q-Fan Control allows you to set a fan profile or manually configure the operating speed of your CPU and chassis fans.



## Configuring fans manually

Select **Manual** from the list of profiles to manually configure your fans' operating speed.

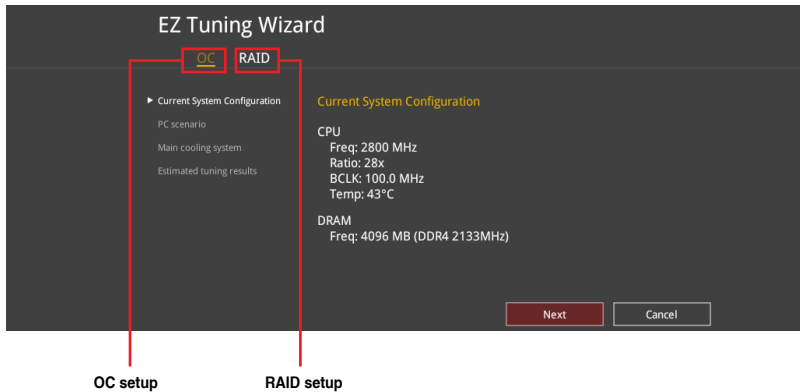


To configure your fans:

1. Select the fan that you want to configure and to view its current status.
2. Click and drag the speed points to adjust the fans' operating speed.
3. Click **Apply** to save the changes then click **Exit (ESC)**.

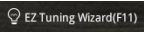
### 3.2.4 EZ Tuning Wizard

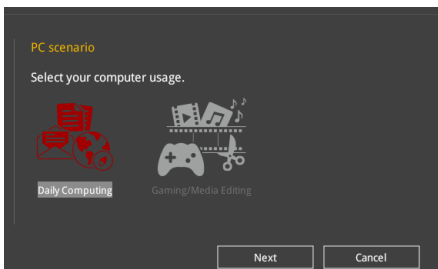
EZ Tuning Wizard allows you to easily overclock your CPU and DRAM, computer usage, and CPU fan to their best settings. You can also set RAID in your system using this feature.



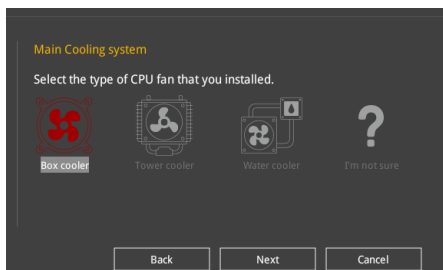
#### OC Tuning

To start OC Tuning:

1. Press <F11> on your keyboard or click  from the BIOS screen to open EZ Tuning Wizard screen.
2. Click **OC** then click **Next**.
3. Select a PC scenario **Daily Computing** or **Gaming/Media Editing**, then click **Next**.



4. Select a Main Cooling System **BOX cooler**, **Tower cooler**, **Water cooler**, or **I'm not sure**, then click **Next**.



5. After selecting the Main Cooling System, click **Next** then click **Yes** to start the OC Tuning.

## Creating RAID

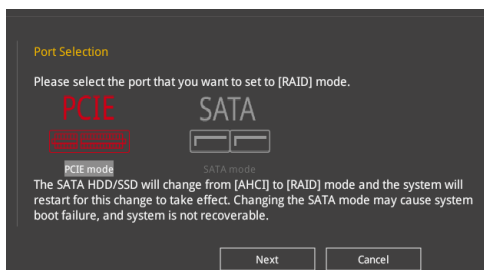
To create RAID:

1. Press <F11> on your keyboard or click **EZ Tuning Wizard(F11)** from the BIOS screen to open EZ Tuning Wizard screen.
2. Click **RAID** then click **Next**.

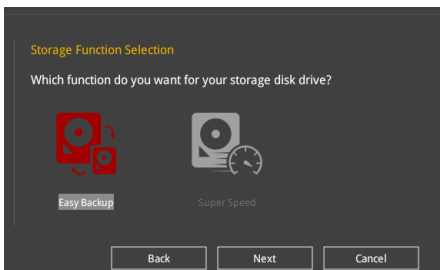


- Ensure that your HDDs have no existing RAID volumes.
- Ensure to connect your HDDs to Intel® SATA connectors.

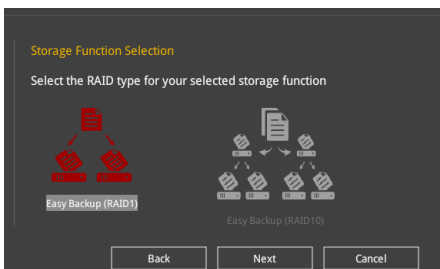
3. Select the port that you want to set to [RAID] mode, **PCIe** or **SATA**, then click **Next**.



4. Select the type of storage for your RAID, **Easy Backup** or **Super Speed**, then click **Next**.

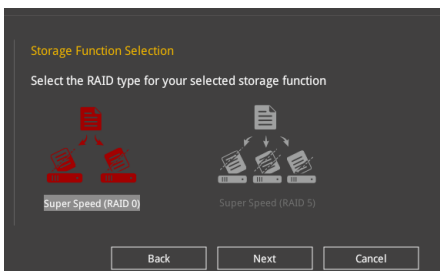


- a. For Easy Backup, click **Next** then select from **Easy Backup (RAID 1)** or **Easy Backup (RAID 10)**.



You can only select Easy Backup (RAID 10) if you connect four (4) HDDs.

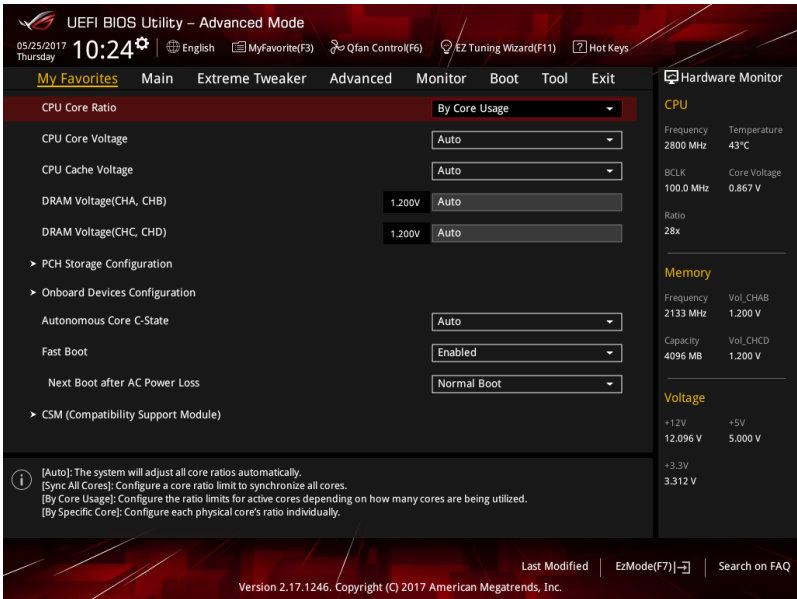
- b. For Super Speed, click **Next** then select from **Super Speed (RAID 0)** or **Super Speed (RAID 5)**.



5. After selecting the type of RAID, click **Next** then click **Yes** to continue the RAID setup.
6. After the RAID setup is done, click **Yes** to exit the setup then click **OK** to reset your system.

### 3.3 My Favorites


My Favorites is your personal space where you can easily save and access your favorite BIOS items. My Favorites comes with several performance, power saving, and fast boot related items by default. You can personalize this screen by adding or removing items.

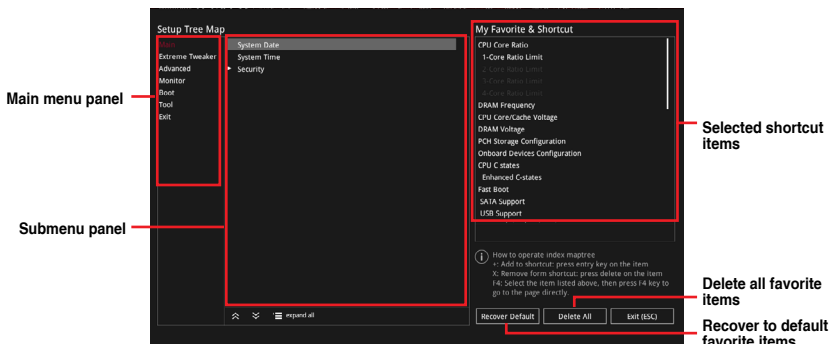





## Adding items to My Favorites

To add BIOS items:

1. Press <F3> on your keyboard or click  (F3)MyFavorite from the BIOS screen to open Setup Tree Map screen.
2. On the Setup Tree Map screen, select the BIOS items that you want to save in My Favorites screen.



3. Select an item from main menu panel, then click the submenu that you want to save as favorite from the submenu panel and click  or press <Enter> on your keyboard.



You cannot add the following items to My Favorite items:

- Items with submenu options
- User-managed items such as language and boot order
- Configuration items such as Memory SPD Information, system time and date.

4. Click **Exit (ESC)** or press <Esc> key to close Setup Tree Map screen.
5. Go to My Favorites menu to view the saved BIOS items.

## 3.4 Main menu

The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

### Security

The Security menu items allow you to change the system security settings.



- If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. See section 2.3.1 **Rear I/O connection** for the location of the Clear CMOS button to clear RTC RAM.
- The Administrator or User Password items on top of the screen show the default **[Not Installed]**. After you set a password, these items show **[Installed]**.

## 3.5 Extreme Tweaker menu

The Extreme Tweaker menu items allow you to configure overclocking-related items.



Be cautious when changing the settings of the Extreme Tweaker menu items. Incorrect field values can cause the system to malfunction



The configuration options for this section vary depending on the CPU and DIMM model you installed on the motherboard.

### Ai Overclock Tuner

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency.

- |          |   |
|----------|---|
| [Auto]   | Loads the optimal settings for the system.  |
| [Manual] | Allows you to individually set overclocking parameters.   |
| [X.M.P.] | If you install memory modules supporting the eXtreme Memory Profile (X.M.P.) Technology, choose this item to set the profiles supported by your memory modules for optimizing the system performance. |



The [X.M.P.] configuration option appears only when you install memory modules supporting the eXtreme Memory Profile(X.M.P.) Technology.



The following item appears only when you set the Ai Overclocking Tuner to **[Manual]**.

### BCLK Frequency

This item allows you to set the BCLK (base clock) frequency to enhance the system performance. Use the <+> or <-> to adjust the value.



We recommend you to set the value based on the CPU specification, as high BCLK frequencies may damage the CPU permanently.

## ASUS MultiCore Enhancement

- [Auto] This item allows you to maximize the overclocking performance optimized by ASUS core ratio settings.
- [Disabled] This item allows you to set to default core ratio settings.

## CPU Core Ratio

This item allows you to set the CPU core ratios.

Configuration options: [Auto] [Sync All Cores] [By Core Usage] [By Specific Core]

## BCLK Frequency : DRAM Frequency Ratio

- [Auto] The BCLK frequency to DRAM frequency ratio will be set to the optimized setting.
- [100:133] The BCLK frequency to DRAM frequency ratio will be set to 100:133.
- [100:100] The BCLK frequency to DRAM frequency ratio will be set to 100:100.

## DRAM Frequency

This item allows you to set the memory operating frequency. The configurable options vary with the BCLK (base clock) frequency setting. Select the auto mode to apply the optimized setting.

Configuration options: [Auto] [DDR4-800MHz] - [DDR4-4400MHz]

## TPU

This item allows you to automatically overclock the CPU and DRAM frequencies and voltage for an enhanced system performance.

- [Keep Current Settings] Keep the current settings without changing anything.
- [TPU I] Applies air cooling overclocking conditions.
- [TPU II] Applies water cooling overclocking conditions.




---

Ensure to use water cooling device before selecting [TPU II].

---

## Internal CPU Power Management

The subitems in this menu allow you to set the CPU ratio and features.

### Enhanced Intel SpeedStep Technology

Allows the operating system to dynamically adjust the processor voltage and cores frequency to decrease the average power consumption and decrease average heat production.

Configuration options: [Enabled] [Disabled]

### Turbo Mode

Allows you to enable your processor cores to run faster than the base operating frequency when it is below power, current and specification limit.

Configuration options: [Disabled] [Enabled]

## 3.6 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.



---

Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

---

### 3.6.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.



---

The items in this menu may vary based on the CPU installed.

---

#### Hyper-threading[ALL]

This item allows a hyper-threading processor to appear as two logical processors, allowing the operating system to schedule two threads or processors simultaneously.

Configuration options: [Disabled] [Enabled]

#### CPU Power Management Configuration

This item allows you to manage and configure the CPU's power.

##### Enhanced Intel SpeedStep Technology

This item allows more than two frequency to be supported.

Configuration options: [Enabled] [Disabled]

##### Turbo Mode

This item allows you to automatically set the CPU cores to run faster than the base operating frequency when it is below the operating power, current and temperature specification limit.

Configuration options: [Enabled] [Disabled]

##### Autonomous Core C-State

This item allows you to enable or disable Autonomous Core C-State Control.

Configuration options: [Auto] [Disabled] [Enabled]

### 3.6.2 Platform Misc Configuration

The items in this menu allow you to change the ASPM for PCH and SA PCI Express.

### 3.6.3 System Agent (SA) Configuration

The items in this menu allow you to adjust the Link Speed for PEG Port and Multi-Monitor.

### 3.6.4 PCH Configuration

The items in this menu allow you to adjust the PCH PCI Express speed.

#### PCI Express Configuration

This item allows you to configure the PCI Express slots.

##### PCIe Speed

This item allows your system to automatically select the PCI Express port speed.

Configuration options: [Auto] [Gen1 (2.5 GT/s)] [Gen2 (5 GT/s)] [Gen3 (8 GT/s)]

### 3.6.5 PCH Storage Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Present** if no SATA device is installed to the corresponding SATA port.

#### SATA Controller(s)

This item allows you to enable or disable the SATA Device.

Configuration options: [Disabled] [Enabled]

#### SATA Mode Selection

This item allows you to set the SATA configuration.

[AHCI] Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

[Intel RST Premium (RAID)] Set to [Intel RST Premium(RAID)] when you want to create a RAID configuration from the SATA hard disk drives.

#### S.M.A.R.T. Status Test

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitoring system that shows a warning message during POST (Power-on Self Test) when an error occurs in the hard disks.

Configuration options: [On] [Off]

#### SATA6G\_1 - SATA6G\_6

##### SATA6G\_1 - SATA6G\_6

This item allows you to enable or disable the selected SATA port.

Configuration options: [Disabled] [Enabled]

##### Hot Plug

These items appears only when the SATA Mode Selection is set to [AHCI] and allows you to enable or disable SATA Hot Plug Support.

Configuration options: [Disabled] [Enabled]

## 3.6.6 ROG Effects

The items in this menu allow you to configure the LEDs on your motherboard.

### Onboard LED

This item allows you to enable all the onboard LEDs.

Configuration options: [Enabled] [Disabled]

## 3.6.7 CPU Storage Configuration

The items in this menu allow you to configure CPU storage configurations.



---

Due to CPU behavior, CPU RAID functions with Intel® CPU RSTe only supports Intel® Core™ X-series Processor 79xx, 78xx Series and Intel® SSD modules.

---

## 3.6.8 Onboard Devices Configuration

The items in this menu allow you to switch between PCIe Lanes and configure onboard devices.

### HD Audio Controller

This item allows you to use the Azalia High Definition Audio Controller

Configuration options: [Disabled] [Enabled]

### M2\_1(DIMM.2) source selection

[from CPU] The bandwidth of M.2\_1(DIMM.2) comes from the CPU, and is shared with U.2. If M.2\_1(DIMM.2) is populated, U.2 will be disabled.

[from PCH] The bandwidth of M.2\_1(DIMM.2) comes from the PCH, and the PCIe4 will be disabled.

### PCIEx8\_4 bandwidth configuration

[Auto] PCIe8\_4 by default runs at x8 mode and M.2\_2(DIMM.2) is disabled. When M.2\_2(DIMM.2) is populated, PCIe8\_4 runs at x4 mode.

[x8 mode] PCIe8\_4 runs at x8 mode, and M.2\_2(DIMM.2) is disabled.



---

28 Lane CPUs do not support PCIe8\_4 and M.2\_2(DIMM.2) due to CPU limitations.

---

### USB Type C Power Switch

[Auto] The system will automatically detect your USB Type C devices and provide suitable power if needed.

[Enabled] The USB Type C port will always provide power to your devices.

## RGB LED lighting

### When system is in working state

This item allows you to turn the RGB LED lighting on or off when the system is in the working state.

Configuration options: [On] [Off]

### When system is in sleep, hibernate or soft off states

This item allows you to turn the RGB LED lighting on or off when the system is in the sleep, hibernate or soft off states.

Configuration options: [On] [Off]

## Wi-Fi 802.11ac / Wi-Fi 802.11ad Controller

This item allows you to enable or disable the Intel Wi-Fi 802.11ac / Wi-Fi 802.11ad controllers.

Configuration options: [Disabled] [Enabled]

## Bluetooth Controller

This item allows you to enable or disable the Intel Bluetooth controller.

Configuration options: [Disabled] [Enabled]

## Intel LAN Controller

This item allows you to enable or disable the Intel LAN controller.

Configuration options: [Disabled] [Enabled]

## 10G LAN Card

This item allows you to enable or disable the 10G LAN card.

Configuration options: [Disabled] [Enabled]

## 3.6.9 APM Configuration

The items in this menu allow you to set system wake and sleep settings.

### ErP Ready

This item allows you to switch off some power at S4+S5 or S5 to get the system ready for ErP requirement. When set to **[Enabled]**, all other PME options are switched off.

Configuration options: [Disabled] [Enable(S4+S5)] [Enable(S5)]

## 3.6.10 Network Stack Configuration

The items in this menu allow you to configure Ipv4 / Ipv6 PXE support.

## 3.6.11 HDD/SSD SMART Information

This menu displays the SMART information of the connected devices.




---

NVM Express devices do not support SMART information.

---

### 3.6.12 USB Configuration

The items in this menu allow you to change the USB-related features.



---

The **Mass Storage Devices** item shows the auto-detected values. If no USB device is detected, the item shows **None**.

---

#### USB Single Port Control

This item allows you to enable or disable the individual USB ports.



---

Refer to section 1.1.2 **Motherboard layout** for the location of the USB ports.

---

### 3.6.13 Thunderbolt(TM) Configuration

The items in this menu allow you to configure Thunderbolt settings.

#### TBT Root port Selector

This item allows you to select the thunder root port.

Configuration options: [Thunderbolt Disabled] [PCIe16/8\_1] [PCIe8\_2] [PCIe4\_1]  
[PCIe16/8\_3] [PCIe8\_4]

### 3.6.14 PCH-FW Configuration

This item allows you to configure the firmware TPM.

## 3.7 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.

#### Q-fan Configuration

##### Q-fan Tuning

Click this item to automatically detect the lowest speed and configure the minimum duty cycle for each fan.

##### W\_PUMP+ 1 / W\_PUMP + 2 Control

- |            |  |
|------------|--|
| [Disabled] | Disable the Water Pump control feature.  |
| [Auto]     | Detects the type of water pump installed and automatically switches the control modes. |
| [DC mode]  | Enable the Water Pump control in DC mode for 3-pin chassis fan.                        |
| [PWM mode] | Enable the Water Pump control in PWM mode for 4-pin chassis fan.                       |



## 3.8 Boot menu

The Boot menu items allow you to change the system boot options.

### Fast Boot

- [Disabled] Allows your system to go back to its normal boot speed.
- [Enabled] Allows your system to accelerate the boot speed.




---

The following item appears only when you set the Fast Boot to **[Enabled]**.

---

### Next Boot after AC Power Loss

- [Normal Boot] Returns to normal boot on the next boot after an AC power loss.
- [Fast Boot] Accelerates the boot speed on the next boot after an AC power loss.

## Boot Configuration

### Setup Mode

- [Advanced Mode] This item allows you to go to Advanced Mode of the BIOS after POST.
- [EZ Mode] This item allows you to go to EZ Mode of the BIOS after POST.

## CSM (Compatibility Support Module)

This item allows you to configure the CSM (Compatibility Support Module) items to fully support the various VGA, bootable devices and add-on devices for better compatibility.

### Launch CSM

- [Auto] The system automatically detects the bootable devices and the add-on devices.
- [Enabled] For better compatibility, enable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode.
- [Disabled] Disable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode.




---

The following items appear only when you set the Launch CSM to **[Enabled]**.

---

### Boot Devices Control

This item allows you to select the type of devices that you want to boot.  
Configuration options: [UEFI and Legacy OPROM] [Legacy OPROM only] [UEFI only]

### Boot from Network Devices

This item allows you to select the type of network devices that you want to launch.

Configuration options: [Ignore] [Legacy only] [UEFI driver first]

**Boot from Storage Devices**

This item allows you to select the type of storage devices that you want to launch.

Configuration options: [Ignore] [Legacy only] [UEFI driver first]

**Boot from PCI-E/PCI Expansion Devices**

This item allows you to select the type of PCI-E/PCI expansion devices that you want to launch.

Configuration options: [Legacy only] [UEFI driver first]

**Secure Boot**

This item allows you to configure the Windows® Secure Boot settings and manage its keys to protect the system from unauthorized access and malwares during POST.

**Boot Option Priorities**

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.



- To access Windows® OS in Safe Mode, press <F8> after POST (Windows® 8 not supported).
- To select the boot device during system startup, press <F8> when the ASUS Logo appears.

**Boot Override**

These items displays the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

**3.9 Tool menu**

The Tool menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.

**Setup Animator**

This item allows you to enable or disable the Setup animator.

Configuration options: [Disabled] [Enabled]

**3.9.1 ASUS EZ Flash 3 Utility**

This item allows you to run ASUS EZ Flash 3. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice.



For more details, refer to section **3.11.2 ASUS EZ Flash 3**.

### 3.9.2 Secure Erase

SSD speeds may lower over time as with any storage medium due to data processing. Secure Erase completely and safely cleans your SSD, restoring it to factory performance levels.



Secure Erase is only available in AHCI mode. Ensure to set the SATA mode to AHCI. Click **Advanced > PCH Storage Configuration > SATA Mode Selection > AHCI**.

To launch Secure Erase, click **Tool > Secure Erase** on the Advanced mode menu.



Check the ASUS support site for a full list of SSDs tested with Secure Erase. The drive may become unstable if you run Secure Erase on an incompatible SSD.



- The time to erase the contents of your SSD may take a while depending on its size. Do not turn off the system during the process.
- Secure Erase is only supported on Intel SATA port. For more information about Intel SATA ports, refer to section **1.1.2 Motherboard layout** of this manual.

Displays the available SSDs

Port #	SSD Name	Status	Total Capacity
P2	ADATA S596 Turbo	Frozen	64.0GB

SSD speed performance may degrade over time due to accumulated files and frequent data-writing. Secure Erase completely cleans your SSD and restores it to its factory settings.  
 (Warning!) Ensure that you run Secure Erase on a compatible SSD. Running Secure Erase on an incompatible SSD will render the SSD totally unusable.  
 NOTE: For the list of Secure Erase compatible SSDs, visit the ASUS Support site at [www.asus.com/support](http://www.asus.com/support)



#### Status definition:

- **Frozen.** The frozen state is the result of a BIOS protective measure. The BIOS guards drives that do not have password protection by freezing them prior to booting. If the drive is frozen, a power off or hard reset of your PC must be performed to proceed with the Secure Erase.
- **Locked.** SSDs might be locked if the Secure Erase process is either incomplete or was stopped. This may be due to a third party software that uses a different password defined by ASUS. You have to unlock the SSD in the software before proceeding with Secure Erase.

### 3.9.3 ASUS Overclocking Profile

This item allows you to store or load multiple BIOS settings.

#### Load from Profile

This item allows you to load the previous BIOS settings saved in the BIOS Flash. Key in the profile number that saved your BIOS settings, press <Enter>, and then select **Yes**.



- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
- We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.

#### Profile Name

This item allows you to key in a profile name.

#### Save to Profile

This item allows you to save the current BIOS settings to the BIOS Flash, and create a profile. Key in a profile number from one to eight, press <Enter>, and then select **Yes**.

#### Load/Save Profile from/to USB Drive

This item allows you to load or save profile from your USB drive, load and save profile to your USB drive.

### 3.9.4 BIOS FlashBack

This item allows you to manage BIOS settings between BIOS chips.

### 3.9.5 ROG OC Panel H-Key Configure

The ROG OC Panel H-Key Configure allows you to input and save values on the CPU core voltage, VCCSA voltage, BCLK Frequency, CPU ratio, and Cache ratio in the UEFI BIOS. The saved values can be synchronized to a compatible OC Panel device and these values can be tweaked or configured using the OC Panel without going to the BIOS menu.

#### Load Default

This item allows you to load the default values of the CPU Core Voltage, VCCSA Voltage, BCLK Frequency, CPU ratio, and Cache ratio.

#### Save Above Settings

This item allows you to save the new values of the CPU Core Voltage, VCCSA Voltage, BCLK Frequency, CPU ratio, and Cache ratio.

#### Load from profile

This item allows you to load the previous values of the CPU Core Voltage, VCCSA Voltage, BCLK Frequency, CPU ratio, and Cache ratio.

### 3.9.6 ASUS SPD Information

This item allows you to view the DRAM SPD information.

### 3.9.7 Graphics Card Information

This item displays the information about the graphics card installed in your system.

#### GPU Post

This item displays the information and recommended configuration for the PCIe slots that the graphics card is installed in your system.




---

This feature is only supported on selected ASUS graphics cards.

---

#### Bus Interface

This item allows you to select the bus interface.

Configuration options: [PCIEX16/X8\_1] [PCIEX16/X8\_1]

## 3.10 Exit menu

The Exit menu items allow you to load the optimal default values for the BIOS items, and save or discard your changes to the BIOS items.

#### Load Optimized Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **OK** to load the default values.

#### Save Changes & Reset

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved. When you select this option or if you press <F10>, a confirmation window appears. Select **OK** to save changes and exit.

#### Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select **Yes** to discard changes and exit.

#### Launch EFI Shell from USB drives

This item allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.

## 3.11 Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility, and performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, DO NOT manually update the BIOS. Inappropriate BIOS updating may result to system's failure to boot. Carefully follow the instructions in this chapter to update your BIOS when necessary.



---

Visit <http://www.asus.com> to download the latest BIOS file for this motherboard.

---

The following utilities allow you to manage and update the motherboard BIOS setup program.

1. EZ Update: Updates the BIOS in Windows® environment.
2. ASUS EZ Flash 3: Updates the BIOS using a USB flash drive.
3. ASUS CrashFree BIOS 3: Restores the BIOS using the motherboard support USB drive when the BIOS file fails or gets corrupted.

### 3.11.1 EZ Update

The EZ Update is a utility that allows you to update the motherboard BIOS in Windows® environment.



- EZ Update requires an Internet connection either through a network or an ISP (Internet Service Provider).
  - This utility is available in the support USB drive that comes with the motherboard package.
-

### 3.11.2 ASUS EZ Flash 3

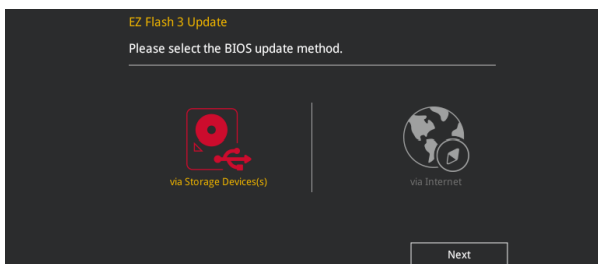
ASUS EZ Flash 3 allows you to download and update to the latest BIOS through the Internet without having to use a bootable floppy disk or an OS-based utility.



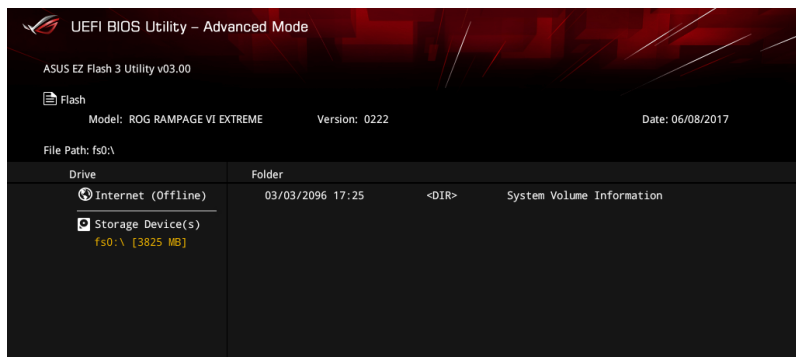
Updating through the Internet varies per region and Internet conditions. Check your local Internet connection before updating through the Internet.

#### To update the BIOS by USB:

1. Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select **ASUS EZ Flash 3 Utility** and press <Enter>.
2. Insert the USB flash disk that contains the latest BIOS file to the USB port.
3. Select **via Storage Device(s)**.



4. Press <Tab> to switch to the Drive field.
5. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
6. Press <Tab> to switch to the Folder Info field.
7. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.





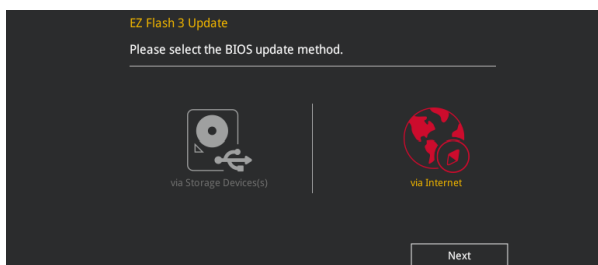
- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!



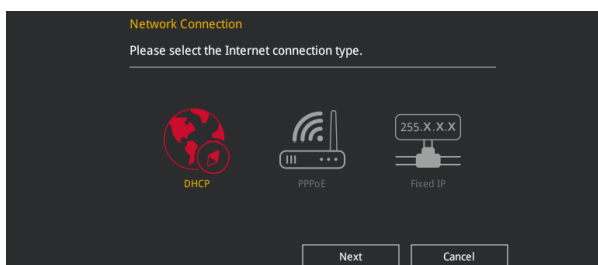
Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu. See section 3.10 **Exit Menu** for details.

### To update the BIOS by Internet:

1. Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select **ASUS EZ Flash 3 Utility** and press <Enter>.
2. Select **via Internet**.



3. Press the Left/Right arrow keys to select an Internet connection method, and then press <Enter>.



4. Follow the onscreen instructions to complete the update.
5. Reboot the system when the update process is done.



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu. See section 3.10 **Exit Menu** for details.



### 3.11.3 ASUS CrashFree BIOS 3

The ASUS CrashFree BIOS 3 utility is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support USB drive that contains the BIOS file.



The BIOS file in the motherboard support USB drive may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at <https://www.asus.com/support/> and save it to a USB flash drive.

#### Recovering the BIOS

##### To recover the BIOS:

1. Turn on the system.
2. Insert the motherboard support USB drive, or the USB flash drive containing the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and enters ASUS EZ Flash 3 automatically.
4. The system requires you to enter BIOS Setup to recover the BIOS setting. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.



DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!



# RAID Support

## 4.1 RAID configurations

The motherboard supports Intel® Rapid Storage Technology with RAID 0, RAID 1, RAID 5, and RAID 10 solution.



If you want to install a Windows® operating system to a hard disk drive included in a RAID set, you have to create a RAID driver disk and load the RAID driver during OS installation. Refer to section **4.2 Creating a RAID driver disk** for details.

### 4.1.1 RAID definitions

**RAID 0 (Data striping)** optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

**RAID 1 (Data mirroring)** copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

**RAID 5** strips both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

**RAID 10** is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

## 4.1.2 Installing storage devices

The motherboard supports Serial ATA hard disk drives and PCIe SSD storage devices. For optimal performance, install identical drives of the same model and capacity when creating a disk array.



Refer to Chapter 2 for details on installing storage devices to your motherboard.

## 4.1.3 Intel® Rapid Storage Technology in UEFI BIOS

To enter the Intel® Rapid Storage Technology in UEFI BIOS:

1. Enter the BIOS Setup during POST.
2. Go to the **Advanced** menu > **PCH Storage Configuration**, then press <Enter>.
3. Set the SATA Mode Selection item to **[Intel RST Premium(RAID)]**.



If you are using PCIe storage devices, ensure to enable all the **PCIe Storage RAID Support** items.

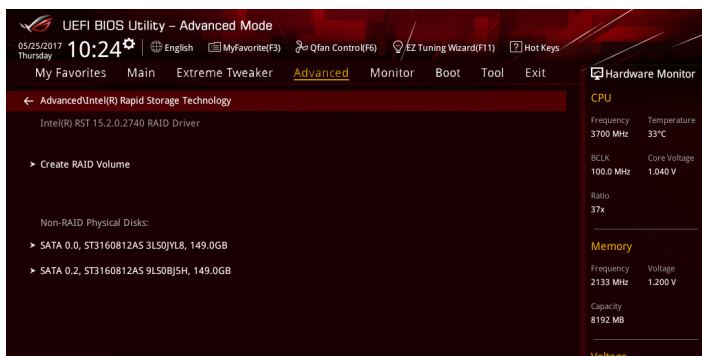
4. Go to the **Boot** menu > **CSM (Compatibility Support Module)** > **Launch CSM**, then set the item to **[Disabled]**.
5. Save your changes and exit the BIOS Setup, then enter the BIOS Setup again.
6. Go to the **Advanced** menu > **Intel(R) Rapid Storage Technology**, then press <Enter> to display the Intel® Rapid Storage Technology menu.



Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.



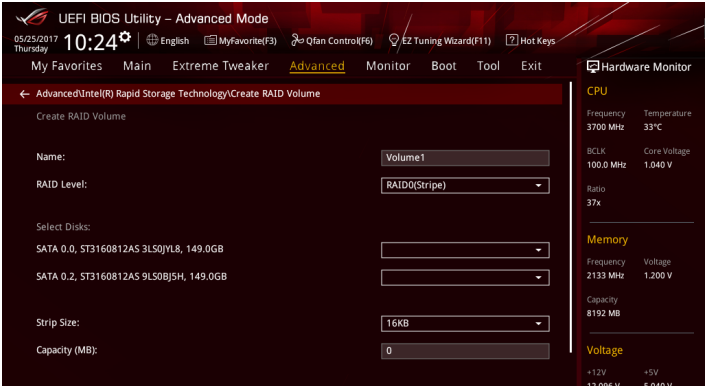
Due to chipset limitation, when SATA ports are set to RAID mode, all SATA ports run at RAID mode together.



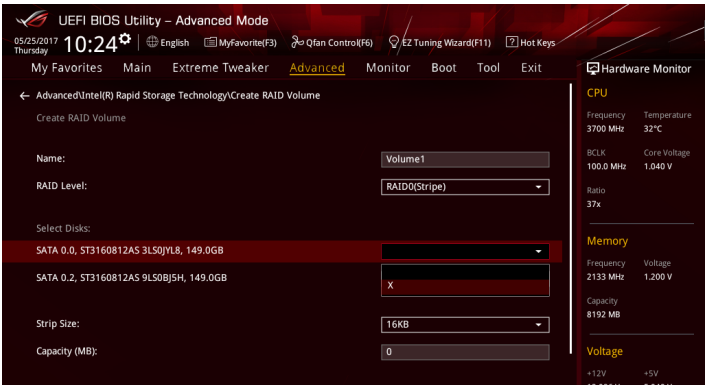
## Creating a RAID set

To create a RAID set:

1. From the Intel® Rapid Storage Technology menu, select **Create RAID Volume** and press <Enter>. The following screen appears:



2. When the **Name** item is selected, enter a name for the RAID set and press <Enter>.
3. When the **RAID Level** item is selected, press <Enter> to select the RAID level to create, and then press <Enter>.
4. Under **Select Disks**, press <Enter> and select **X** for the disks you want to include in the RAID set.

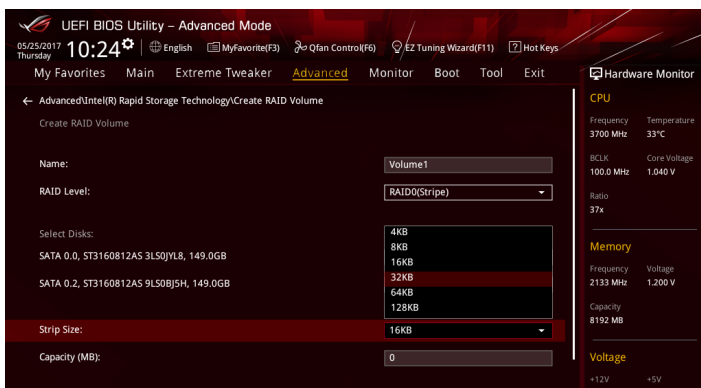


5. When the **Strip Size** item is selected, press <Enter> to select strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:

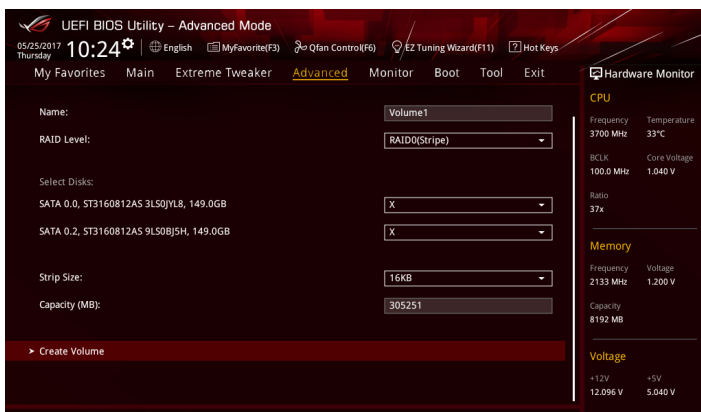
- RAID 0: 128 KB
- RAID 10: 64 KB
- RAID 5: 64 KB



We recommend a lower strip size for server systems, and a higher strip size for multimedia computer systems used mainly for audio and video editing.



6. When the **Capacity (MB)** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
7. When the **Create Volume** item is selected, press <Enter> to create the RAID volume and return to the Intel® Rapid Storage Technology menu.



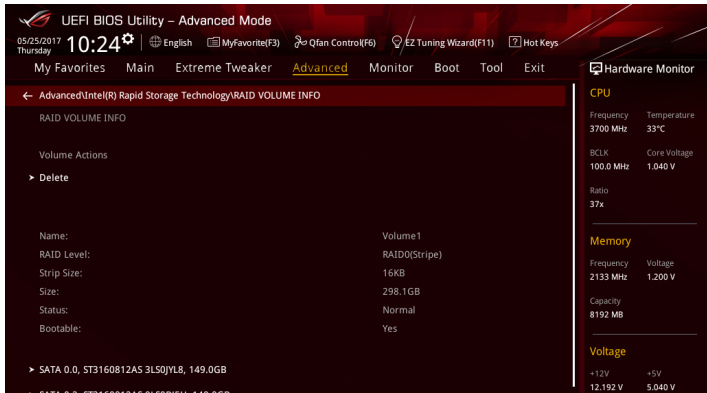
## Deleting a RAID set



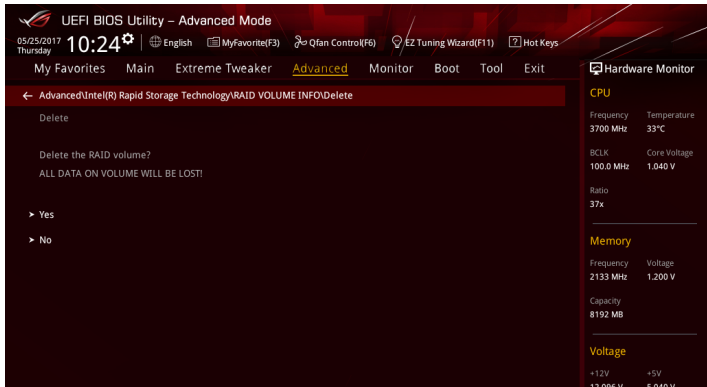
Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the Intel® Rapid Storage Technology menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:



2. When the **Delete** item is selected, press <Enter>, then select **Yes** to delete the RAID volume and return to the Intel® Rapid Storage Technology menu, or select **No** to cancel.



### 4.1.4 Intel® Virtual Raid on CPU in UEFI BIOS

The CPU RAID functions of RAID 1, RAID 5, and RAID 10 require a KEY module and Intel® CPU RSTe to be enabled.



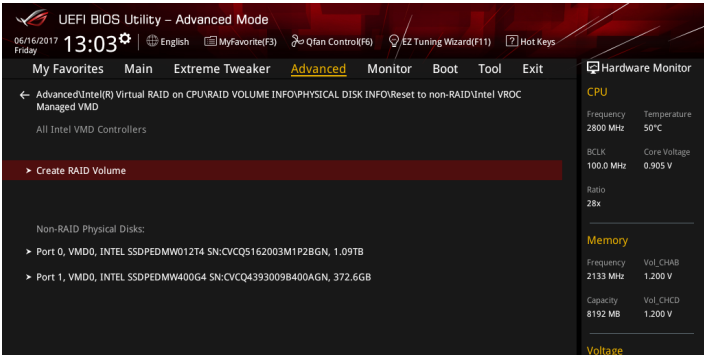
- The KEY module is purchased separately.
- The HYPER M.2 X16 Card is purchased separately.
- Due to CPU behavior, CPU RAID functions with Intel® CPU RSTe only supports Intel® Core™ X-series Processors (6-core or above) and Intel® SSD modules.
- Refer to section 1.1.9 Internal connectors for the location of the VROC\_HW\_KEY connector.

To enter the Intel® Virtual Raid on CPU in UEFI BIOS:

1. Enter the BIOS Setup during POST.
2. Go to the **Boot** menu > **CSM (Compatibility Support Module)** > **Launch CSM**, then set the item to **[Disabled]**.
3. Go to the **Advanced** menu > **CPU Storage Configuration**, then set the PCIE slot(s) that you have installed the Hyper M.2 X16 Card(s) or PCIE X4 SSD Card(s) to **Hyper M.2 X16** or **PCIE X4 SSD Card** correspondingly.
4. Save your changes and exit the BIOS Setup, then enter the BIOS Setup again.
5. Go to the **Advanced** menu > **Intel(R) Virtual Raid on CPU** > **All Intel VMD Controllers**, then press <Enter> to display the Intel® Virtual Raid on CPU menu.



Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

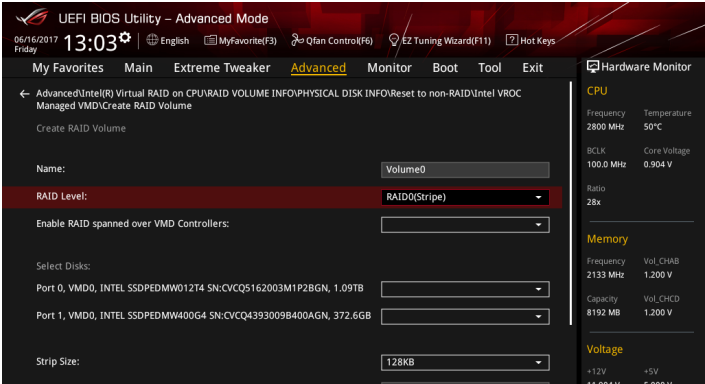




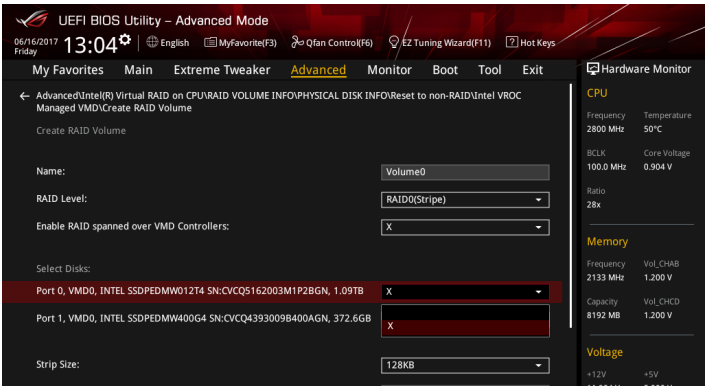
## Creating a RAID set

To create a RAID set:

1. From the Intel® Virtual Raid on CPU menu, select **Create RAID Volume** and press <Enter>. The following screen appears:



2. When the **Name** item is selected, enter a name for the RAID set and press <Enter>.
3. When the **RAID Level** item is selected, press <Enter> to select the RAID level to create, and then press <Enter>.
4. When the **Enable RAID spanned over VMD Controllers** item is selected, press <Enter> and select **X** to enable this function.
5. Under **Select Disks**, press <Enter> and select **X** for the disks you want to include in the RAID set.

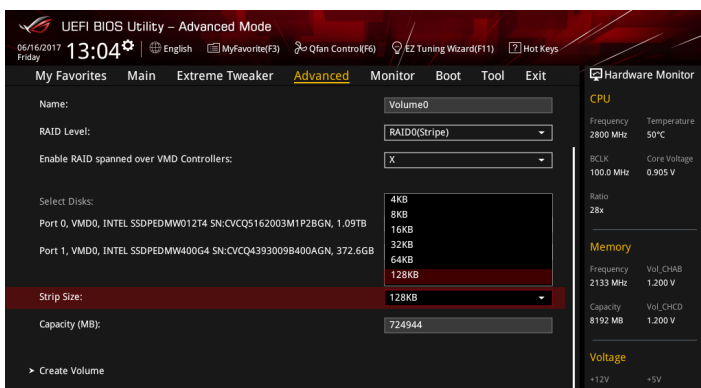


6. When the **Strip Size** item is selected, press <Enter> to select strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:

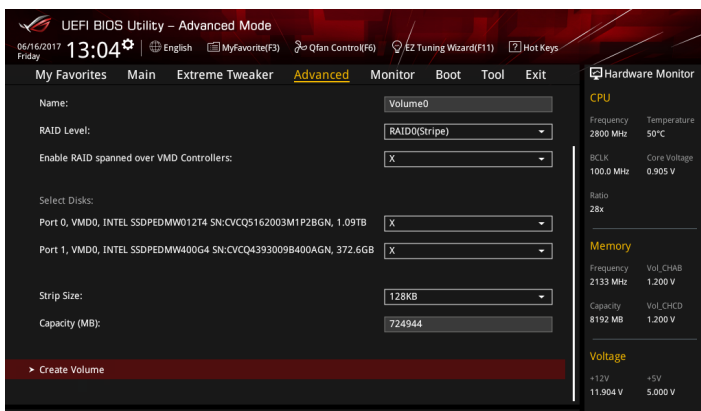
- RAID 0: 128 KB
- RAID 10: 64 KB
- RAID 5: 64 KB



We recommend a lower strip size for server systems, and a higher strip size for multimedia computer systems used mainly for audio and video editing.



7. When the **Capacity (MB)** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
8. When the **Create Volume** item is selected, press <Enter> to create the RAID volume and return to the Intel® Rapid Storage Technology menu.



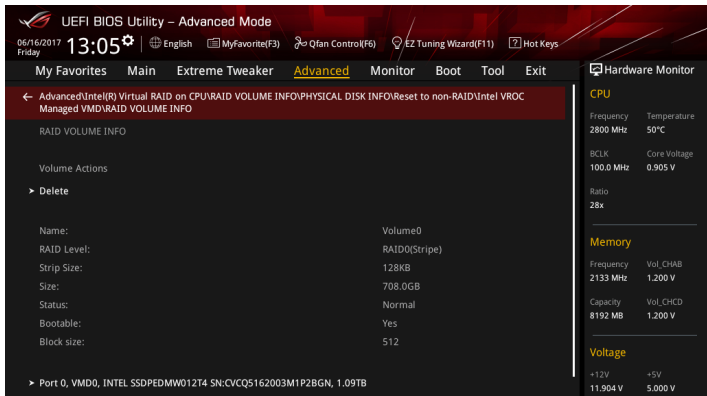
## Deleting a RAID set



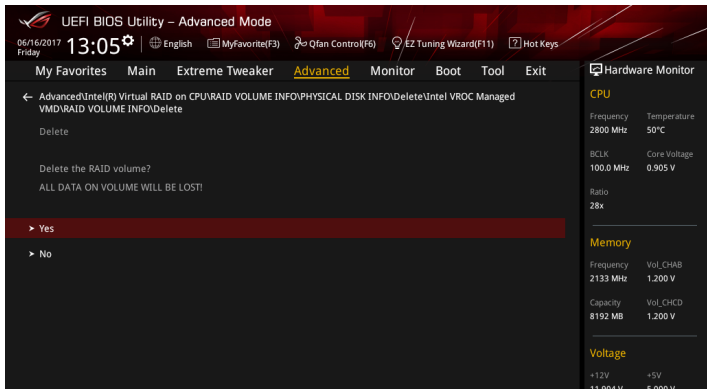
Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the Intel® Virtual Raid on CPU menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:



2. When the **Delete** item is selected, press <Enter>, then select **Yes** to delete the RAID volume and return to the Intel® Virtual Raid on CPU menu, or select **No** to cancel.



## Installing the RAID controller driver during Windows® 10 OS installation

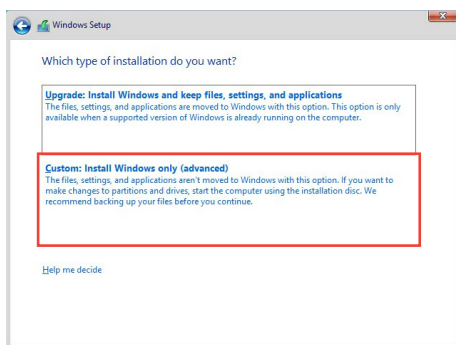
After creating the RAID sets, you are now ready to install an operating system to the independent drives or bootable array. This part provides the instructions on how to install the RAID controller drivers during OS installation.



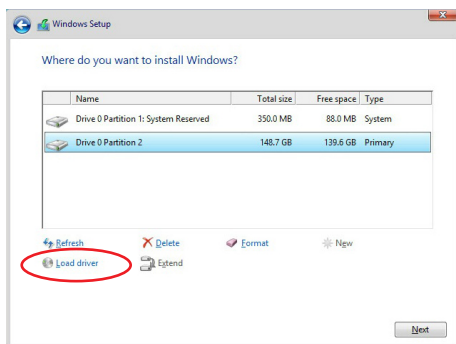
If you plan on using the CPU RAID configuration spanned across different PCIE slots as OS drives, please install the Hyper M.2 X16 Cards to PCIE slots.

To install the RAID controller driver when installing Windows® 10 OS:

1. Boot the computer using the Windows® 10 OS installation disc. Follow the screen instructions to start installing Windows® 10.
2. When prompted to choose a type of installation, click **Custom: Install Windows only (advanced)**.



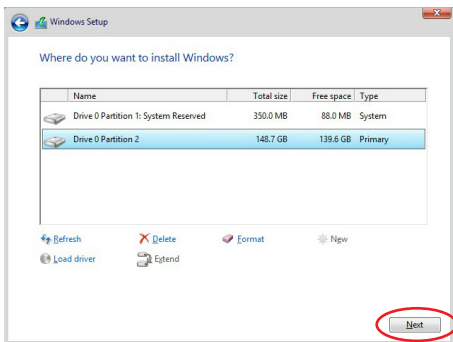
3. Click **Load Driver**.



4. A message appears, reminding you to insert the installation media containing the driver of the RAID controller driver. Insert the support USB drive with the RAID driver into the USB port. Click **Browse** to continue.



5. Locate the driver in the corresponding folder of the support USB drive then click **OK** to continue.
6. Select the RAID controller driver you need from the list and click **Next**.
7. When the system finishes loading the RAID driver, select the drive to install Windows and click **Next**.

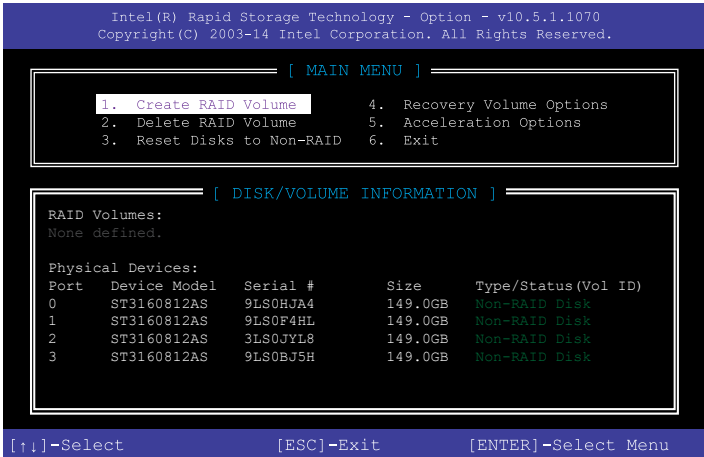


8. Setup then proceeds with the OS installation. Follow screen instructions to continue.

## 4.1.5 Intel® Rapid Storage Technology Option ROM utility

To enter the Intel® Rapid Storage Technology Option ROM utility:

1. Turn on the system.
2. During POST, press <Ctrl> + <I> to display the utility main menu.



The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.



The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

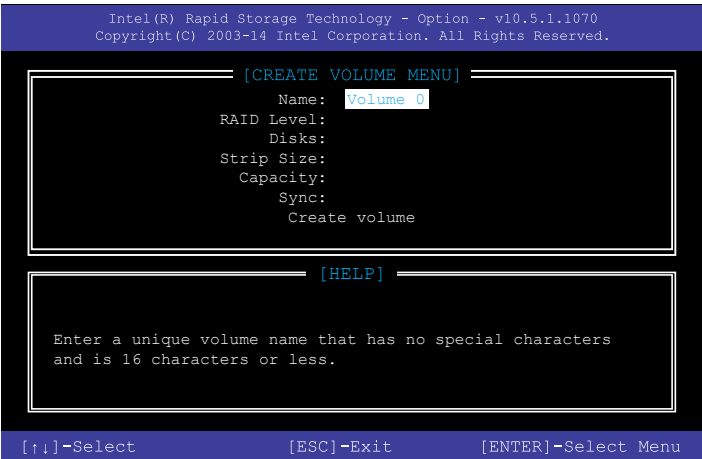


The utility supports maximum four hard disk drives for RAID configuration.

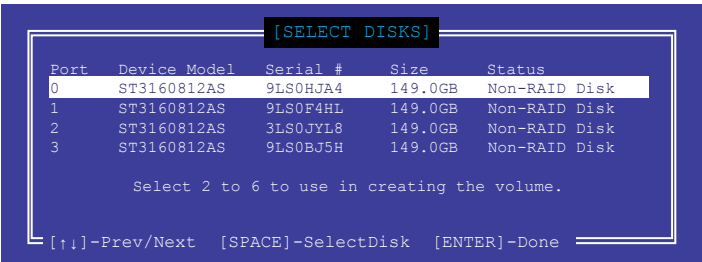
### Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:



2. Enter a name for the RAID set and press <Enter>.
3. When the RAID Level item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.
4. When the Disks item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The SELECT DISKS screen appears:



5. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.
6. Use the up/down arrow key to select the strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:
  - RAID 0: 128 KB
  - RAID 10: 64 KB
  - RAID 5: 64 KB



---

We recommend a lower strip size for server systems, and a higher strip size for multimedia computer systems used mainly for audio and video editing.

---

7. When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.
8. When the **Create Volume** item is selected, press <Enter>. The following warning message appears:

**WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.**  
Are you sure you want to create this volume? (Y/N)

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the CREATE VOLUME menu.



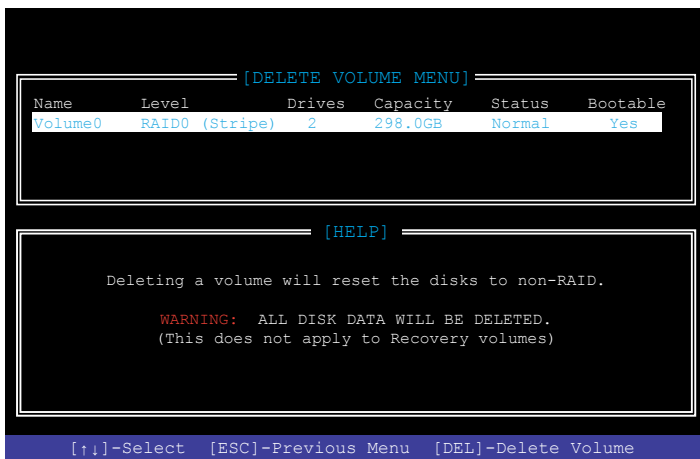
## Deleting a RAID set



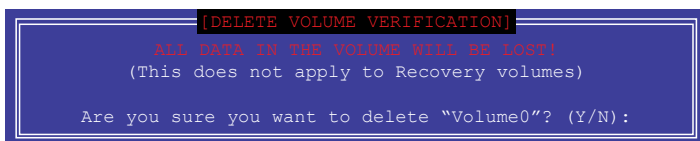
Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears:



2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Delete>. The following warning message appears:

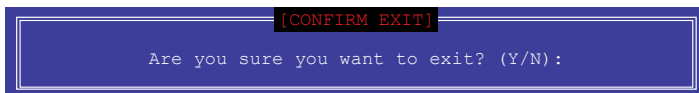


3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the DELETE VOLUME menu.

## Exiting the Intel® Rapid Storage Technology Option ROM utility

To exit the utility:

1. From the utility main menu, select **6. Exit**, then press <Enter>. The following warning message appears:



2. Press <Y> to exit or press <N> to return to the utility main menu.

## 4.2 Creating a RAID driver disk

### 4.2.1 Creating a RAID driver disk in Windows®

To install the RAID driver for Windows® OS:

1. During the OS installation, click **Load Driver** to allow you to select the installation media containing the RAID driver.
2. Insert the support USB drive with RAID driver into the USB port, and then click **Browse**.
3. Click the name of the device you've inserted, go to **Drivers > RAID**, and then select the RAID driver for the corresponding OS version. Click **OK**.
4. Follow the succeeding screen instructions to complete the installation.



---

To set up a Windows® UEFI operating system under RAID mode, ensure to load the UEFI driver for your optical drive.

---

# Appendix

## Q-Code table

Code	Description
00	Not used
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	System Agent initialization before microcode loading
04	PCH initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	System Agent initialization after microcode loading
09	PCH initialization after microcode loading
0B	Cache initialization
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded
10	PEI Core is started
11 – 14	Pre-memory CPU initialization is started
15 – 18	Pre-memory System Agent initialization is started
19 – 1C	Pre-memory PCH initialization is started
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started
3B – 3E	Post-Memory PCH initialization is started
4F	DXE IPL is started
50 – 53	Memory initialization error. Invalid memory type or incompatible memory speed
54	Unspecified memory initialization error
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	Reset PPI is not available
5C – 5F	Reserved for future AMI error codes

## Q-Code table

Code	Description
E0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4 – E7	Reserved for future AMI progress codes
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC – EF	Reserved for future AMI error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5 – F7	Reserved for future AMI progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes
60	DXE Core is started
61	NVRAM initialization
62	Installation of the PCH Runtime Services
63 – 67	CPU DXE initialization is started
68	PCI host bridge initialization
69	System Agent DXE initialization is started
6A	System Agent DXE SMM initialization is started
6B – 6F	System Agent DXE initialization (System Agent module specific)
70	PCH DXE initialization is started
71	PCH DXE SMM initialization is started
72	PCH devices initialization
73 – 77	PCH DXE Initialization (PCH module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes

(continued on the next page)

## Q-Code table

Code	Description
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset

*(continued on the next page)*

## Q-Code table

Code	Description
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8– BF	Reserved for future AML codes
D0	CPU initialization error
D1	System Agent initialization error
D2	PCH initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available

## ACPI/ASL Checkpoints

Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

## Notices

### Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

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

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



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The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

---

## Compliance Statement of Innovation, Science and Economic Development Canada (ISED)

This Class B digital apparatus complies with Canadian ICES-003, RSS-210, and CAN ICES-3(B)/NMB-3(B).

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

## Déclaration de conformité de Innovation, Sciences et Développement économique Canada (ISED)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003, RSS-210 et CAN ICES-3(B)/NMB-3(B).

Le présent appareil est conforme aux normes CNR d'Industrie Canada applicables aux appareils radio exempts de licence. Son utilisation est sujette aux deux conditions suivantes : (1) cet appareil ne doit pas créer d'interférences et (2) cet appareil doit tolérer tout type d'interférences, y compris celles susceptibles de provoquer un fonctionnement non souhaité de l'appareil.

## VCCI: Japan Compliance Statement Class B ITE

この装置は、クラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

## KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

\*당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다.



## REACH

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at <http://csr.asus.com/english/REACH.htm>.



DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.



DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

## ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to <http://csr.asus.com/english/Takeback.htm> for detailed recycling information in different regions.

## Regional notice for California



### WARNING

Cancer and Reproductive Harm -  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

## FCC Bluetooth Wireless Compliance

The antenna used with this transmitter must not be co-located or operated in conjunction with any other antenna or transmitter subject to the conditions of the FCC Grant.

## Bluetooth Industry Canada Statement

This Class B device meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## NCC: Taiwan Wireless Statement

### 無線設備の警告聲明

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更射頻、加大功率或變更原設計之特性及功能。低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信指依電信法規定作業之無線通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

於 5.25GHz 至 5.35GHz 區域內操作之  
無線設備的警告聲明

工作頻率 5.250 ~ 5.350GHz 該頻段限於室內使用。

## Japan RF Equipment Statement

### 屋外での使用について

本製品は、5GHz帯域での通信に対応しています。電波法の定めにより5.2GHz、5.3GHz帯域の電波は屋外で使用が禁じられています。

### 法律および規制遵守

本製品は電波法及びこれに基づく命令の定めるところに従い使用してください。日本国外では、その国の法律または規制により、本製品の使用ができないことがあります。このような国では、本製品を運用した結果、罰せられることがあります。当社は一切責任を負いかねますのでご了承ください。

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## צהררת תאימות רגולטורית מקוצרת עבור האיחוד אירופי

ASUSTek Computer Inc. מצהירה בזאת כי מכשיר זה תואם לדרישות החינויות ולשאר הסעיפים הרלוונטיים של תקנה 2014/53/EU. ניתן לקרוא את הנוסח המלא של הצהרת התאימות הרגולטורית עבור האיחוד האירופי בכתובת: <https://www.asus.com/support/>

יש להבדיל רשתות Wi-Fi מפועלות ברצועת התדרים 5150-5350MHz לשימוש בתוך מבנים מגורים בצורות המפורטות ברשימה הבאה:  
Wi-Fi - פועל בתחום התדרים 57-66GHz ולא יכול להתחרבב לאנטנת חיוניות במידות שמפיעות בטבלה שלהלן:

### Egyeszerüstített EU megfeleléségi nyilatkozat

Az ASUSTek Computer Inc. ezennel kijelenti, hogy ez az eszköz megfelel az 2014/53/EU sz. irányelv alapvető követelményeinek és egyéb vonatkozó rendelkezéseinek. Az EU megfeleléségi nyilatkozat teljes szövegét a következő weboldalon tekintheti meg: <https://www.asus.com/support/>

Az 5150-5350 MHz-es sávban működő Wi-Fi-t beltéri használatra kell korlátozni az alábbi táblázatban felsorolt országokban:

Az 57-66 GHz-es sávban működő WiGig-et korlátozni kell a rögzített kültéri üzembekapcsolást illetően az alábbi táblázatban lévő országokban:

### Pernyataan Kesesuaian UE yang Disederhanakan

ASUSTek Computer Inc. dengan ini menyatakan bahwa perangkat ini memenuhi persyaratan utama dan ketentuan relevan lainnya yang terdapat pada Peraturan 2014/53/EU. Teks lengkap pernyataan kesesuaian UE tersedia di: <https://www.asus.com/support/>

WiFi yang Beroperasi pada 5150-5350 MHz akan terbatas untuk penggunaan dalam ruangan di negara yang tercantum dalam tabel

Pengoperasian WiGig pada pita 57-66GHz akan dibatasi dari pemasangan luar ruangan tetap untuk negara yang tercantum dalam tabel di bawah ini:

### Vienkāršota ES atbilstības paziņojums

ASUSTek Computer Inc. ar šo paziņo, ka šī ierīce atbilst Direktīvas 2014/53/ES būtiskajiem prasībām un citiem citiem saistajiem nosacījumiem. Pilns ES atbilstības paziņojuma teksts pieejams šeit: <https://www.asus.com/support/>

Wi-Fi darbība 5150-5350 MHz ir jāierobežo lietošanai telpās valstīs, kuras norādītas tālāk.

WiGig, kas darbojas 57-66 GHz joslā, nav atļauts pastāvīgi uzstādīt ārpus telpām valstīs, kas norādītas tālākajā tabulā.

### Supaprostátna ES atitikties deklaracija

Šiame dokumente bendrovė „ASUSTek Computer Inc.“ pareiškia, kad šis prietaisas atitinka pagrindinius reikalavimus ir kitas susijusias Direktyvos 2014/53/ES nuostatas. Visas ES atitikties deklaracijos tekstas pateikiama čia: <https://www.asus.com/support/>

Toliau nurodytose šalyse „Wi-Fi“ ryšiu, veikiančiu 5 150-5 350 MHz dažnio juostoje, galima naudotis tik patalpose:

Toliau lenteleje nurodytose šalyse yra ribojamos 57–66 GHz dažnių juostoje veikiančių „WiGig“ fiksuoats įrengimas lubos:

### Forenklet EU-samsvarserklæring

ASUSTek Computer Inc. erklærer herved at denne enhet er i samsvar med hovedsaklige krav og andre relevante forskrifter i direktivet 2014/53/EU. Fullstendig tekst for EU-samsvarserklæringen finnes på: <https://www.asus.com/support/>

Wi-Fi-området 5150–5350 MHz skal begrenses til innendørs bruk for landene som er oppført i tabellen:

Bruk i Wi-Gig-båndet 57–66 GHz skal begrenses til fast utendørs installasjon i landene som er oppført i følgende tabell:

### Uproszczona deklaracja zgodności UE

Firma ASUSTek Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami dyrektywy 2014/53/EU. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem <https://www.asus.com/support/>

W krajach wymienionych w tabeli działanie sieci Wi-Fi w paśmie 5150–5350 MHz powinno być ograniczone wyłącznie do pomieszczeń:

WiGig-enheden, der burger båndbredden 57-66 GHz på ikke bruges i fastspændte udendørsinstallationer i landene, der er anført på listen nedenfor:

### Declaração de Conformidade Simplificada da UE

A ASUSTek Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes da Diretiva 2014/53/UE. O texto integral da declaração de conformidade da UE está disponível em <https://www.asus.com/support/>

A utilização das frequências WiFi de 5150 a 5350MHz está restrita a ambientes interiores nos países apresentados na tabela:

A utilização do WiGig na banda de 57 a 66GHz está restrita a ambientes interiores nos países apresentados na tabela seguinte:

## Declarație de conformitate UE, versiune simplificată

Prin prezenta, ASUSTek Computer Inc. declară că acest dispozitiv este în conformitate cu regulamentele esențiale și cu celelalte prevederi relevante ale Directivei 2014/53/UE. Textul complet al declarației de conformitate UE este disponibil la adresa <https://www.asus.com/support/>

Pentru țările listate în tabelul de mai jos, rețelele WiFi care funcționează în banda de frecvență de 5.150-5.350 MHz trebuie utilizate doar în interior: Funcționarea dispozitivului WiGig în banda de 57 – 66 GHz va fi restricționată pentru instalațiile fixe exterioare în țările din tabelul de mai jos:

### Pojednostavljena Deklaracija o usaglašenosti EU

ASUSTek Computer Inc. ovim izjavljuju da je ovaj uređaj usaglašen sa osnovnim zahtevima i drugim relevantnim odredbama Direktive 2014/53/EU. Ceo tekst Deklaracije o usaglašenosti EU dostupan je na lokaciji <https://www.asus.com/support/>

WiFi koji radi u frekventnom opsegu od 5150 MHz do 5350 MHz ograničen je isključivo na upotrebu u zatvorenom prostoru za zemlje navedene u tabeli ispod:

WiGig koji radi u opsegu od 57-66GHz biće ograničen od fiksiranih spoljašnjih instalacija za države navedene u tabeli ispod:

### Zjednodušené vyhlásenie o zhode platné pre EÚ

Spoločnosť ASUSTek Computer Inc. týmto vyhlasuje, že toto zariadenie je v súlade so základnými požiadavkami a ďalšími príslušnými ustanoveniami smernice č. 2014/53/EÚ. Plné znenie vyhlásenia o zhode pre EÚ je k dispozícii na lokalite <https://www.asus.com/support/>

Činnosť WiFi v pásme 5150 – 5350 MHz bude obmedzená na použitie vo vnútornom prostredí pre krajiny uvedené v tabuľke nižšie:

WiGig, ktorý sa v krajinách uvedených v tabuľke nižšie, prevádzkuje v pásme 57 až 66 GHz, musí byť umiestnený ďalej od pevných vonkajších zariadení.

### Poenostavljena izjava EU o skladnosti

ASUSTek Computer Inc. tukaj izjavlja, da je ta naprava skladna s temeljnimi zahtevami in drugimi relevantnimi določili Direktive 2014/53/EU. Polno besedilo izjave EU o skladnosti je na voljo na <https://www.asus.com/support/>

WiFi, ki deluje v pasovnem območju 5150–5350 MHz, mora biti v državah, navedenih v spodnjem seznamu, omejen na notranjo uporabo:

V državah, ki so navedene v spodnji tabeli, naprave WiGig, ki deluje v 57–66 GHz pasu, ne smete uporabljati kot fiksne namestitve na prostoru:

### Declaração de conformidã simplificada para la UE

Por la presente, ASUSTek Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de la directiva 2014/53/UE. En <https://www.asus.com/support/> está disponible el texto completo de la declaración de conformidad para la UE.

La conexión WiFi con una frecuencia de funcionamiento de 5150-5350 MHz se restringirá al uso en interiores para los países enumerados en la tabla:

El funcionamiento de WiGig en la banda de 57-66 GHz se restringirá al uso en interiores para los países enumerados en la tabla siguiente:

### Förenklad EU-försäkran om överensstämmelse

ASUSTek Computer Inc. deklarerar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta bestämmelser i direktiv 2014/53/EU. Fullständig text av EU-försäkran om överensstämmelse finns på <https://www.asus.com/support/>

WiFi som används 5150-5350 MHz kommer att begränsas för användning inomhus i de länder som anges i tabellen:

WiGig som används på frekvensbanden 57-66 GHz ska begränsas från fasta installationer utomhus i länder som finns upptagna i nedanstående tabell:

### ประกาศเกี่ยวกับความสอดคล้องของสภาพอุปกรณ์แบบย่อ

ASUSTek Computer Inc.

ขอประกาศในที่นี้ว่าอุปกรณ์นี้มีความสอดคล้องกับความต้องการที่จำเป็นและเงื่อนไขที่เกี่ยวข้องอื่น ๆ ของกฎหมายที่เกี่ยวข้องทางศกศ 2014/53/UE. เนื้อหาที่สมบูรณ์ของประกาศความสอดคล้องกับ EU มีอยู่ที่ <https://www.asus.com/support/>

การทำงานขอ WiFi ที่ 5150-5350MHz ถูกจำกัดให้ใช้ในเวลาสำหรับประเทศที่แสดงในตาราง

WiGig ที่ใช้งานในย่านความถี่ 57-66GHz จะถูกจำกัดให้ติดตั้งภายนอกอาคารแบบถาวรสำหรับประเทศที่ระบุไว้ในตารางด้านล่าง:

### Basitleştirilmiş AB Uyumluluk Bildirimi

ASUSTek Computer Inc., bu aygıtın 2014/53/UE Yönergesinin temel gereksinimlerine ve diğer ilgili hükümlerine uygun olduğunu bildirir. AB uyumluluk bildiriminin tam metni şu adreste bulunabilir: <https://www.asus.com/support/>

5150-5350 MHz aralındaki WiFi kullanımı, tabloda listelenen ülkeler için iç mekân kullanımıyla kısıtlanacaktır.

57-66 GHz bantındaki pasif WiGig, aşağıdaki tabloda listelenen ülkelere sabit dış mekân kurulumlarından hariç tutulacaktır:

**Спрощена декларація про відповідність нормам ЄС**

ASUSTek Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним вимогам Директиви 2014 / 53 / EU. Повний текст декларації відповідності нормам ЄС доступний на <https://www.asus.com/support/>

Робота Wi-Fi на частоті 5150-5350 МГц обмежується використанням у приміщенні для країн, поданих у таблиці нижче:

Робота WiGig на частоті 57-66 ГГц обмежується фіксованою інсталяцією просто неба для країн, поданих у таблиці нижче.



AT	BE	BG	CZ	DK	EE	FR
DE	IS	IE	IT	EL	ES	CY
LV	LI	LT	LU	HU	MT	NL
NO	PL	PT	RO	SI	SK	TR
FI	SE	CH	UK	HR		

**QCA9008-TBD1 output power table:**

Function	Frequency	Maximum Output Power (EIRP)
WiFi	2412-2472 MHz	18 dBm
	5150-5350 MHz	21 dBm
	5470-5725 MHz	19 dBm
WiGig	58.32-62.64 GHz	27 dBm
Bluetooth	2402-2480 MHz	8 dBm

## ASUS contact information

### ASUSTeK COMPUTER INC.

Address	4F, No. 150, Li-Te Road, Peitou, Taipei 112, Taiwan
Telephone	+886-2-2894-3447
Fax	+886-2-2890-7798
Web site	<a href="http://www.asus.com">www.asus.com</a>

#### **Technical Support**

Telephone	+86-21-38429911
Fax	+86-21-5866-8722, ext. 9101#
Online support	<a href="http://qr.asus.com/techserv">http://qr.asus.com/techserv</a>

### ASUS COMPUTER INTERNATIONAL (America)

Address	800 Corporate Way, Fremont, CA 94539, USA
Telephone	+1-510-739-3777
Fax	+1-510-608-4555
Web site	<a href="http://www.asus.com/us/">http://www.asus.com/us/</a>

#### **Technical Support**

Support fax	+1-812-284-0883
Telephone	+1-812-282-2787
Online support	<a href="http://qr.asus.com/techserv">http://qr.asus.com/techserv</a>

### ASUS COMPUTER GmbH (Germany and Austria)

Address	Harkort Str. 21-23, 40880 Ratingen, Germany
Fax	+49-2102-959931
Web site	<a href="http://www.asus.com/de">http://www.asus.com/de</a>
Online contact	<a href="http://eu-rma.asus.com/sales">http://eu-rma.asus.com/sales</a>

#### **Technical Support**

Telephone	+49-2102-5789555
Support Fax	+49-2102-959911
Online support	<a href="http://qr.asus.com/techserv">http://qr.asus.com/techserv</a>

## DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)



**Responsible Party Name:** Asus Computer International

**Address:** 800 Corporate Way, Fremont, CA 94539.

**Phone/Fax No:** (510)739-3777/(510)608-4555

hereby declares that the product

**Product Name :** Motherboard

**Model Number :** ROG RAMPAGE VI EXTREME

Conforms to the following specifications:

☒ FCC Part 15, Subpart B, Unintentional Radiators

### Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person's Name : Steve Chang / President

A handwritten signature in blue ink that reads "Steve Chang".

Signature :

Date : Jun. 22, 2017

Ver. 170324

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.