TUF Z270 MARK 2

Motherboard

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Contents

Chapter 3:   BIOS Setup

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) 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 (+).

TUF Z270 MARK 2 specifications summary

CPU	LGA1151 socket for 7th & 6th Generation Intel® Core™ i7 / i5 / i3 / Pentium® / Celeron® Processors Supports 14nm CPU Supports Intel® Turbo Boost Technology 2.0* *** The support of these features depends on the CPU types.** **** Refer to www.asus.com for the complete CPU support list.**
Chipset	Intel® Z270 Chipset
Memory	4 x DIMM, max. 64GB DDR4 3866(O.C.) / 3733(O.C.) / 3600(O.C.) / 3466(O.C.) / 3400(O.C.) / 3333(O.C.) / 3300(O.C.) / 3200(O.C.) / 3000(O.C.) / 2800(O.C.) / 2666(O.C.) / 2400(O.C.) / 2133 MHz Non-ECC, Un-buffered Memory Dual channel memory architecture Supports Intel® Extreme Memory Profile (XMP)* *** Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.** **** Refer to www.asus.com for the complete Memory QVL (Qualified Vendors List).**
Expansion slots	2 x PCI Express 3.0/2.0 x16 slots (single at x16 or dual at x8/x8 mode) 1 x PCI Express 3.0/2.0 x16 slot* (max. at x2 mode, compatible with PCIe x1, x2 devices) 3 x PCI Express 3.0/2.0 x1 slots
VGA	Integrated Graphics Processor- Intel® HD Graphics support Multi-VGA output support: DVI-D/HDMI port Supports DVI-D with max. resolution 1920 x 1200@60Hz Supports HDMI 1.4b with max. resolution 4096 x 2160@24Hz Supports Intel® InTru™ 3D/Quick Sync Video/Clear Video HD Technology/Insider™ Maximum shared memory of 1024MB
Multi-GPU support	Supports NVIDIA® 2-Way/Quad-GPU SLI® Technology Supports AMD® 2-Way/Quad-GPU CrossFireX™ Technology
LAN	Gigabit Intel LAN connection- 802.3az Energy Efficient Ethernet (EEE) appliance Intel® I219-V Gigabit LAN- Dual interconnect between the integrated Media Access Controller (MAC) and physical layer (PHY) TUF LANGuard ASUS Turbo LAN Utility

(continued on the next page)

TUF Z270 MARK 2 specifications summary

Storage	**Intel® Z270 Chipset with RAID 0, 1, 5, 10 and Intel Rapid Storage Technology 15 support**
	- 1 x M.2_1 Socket 3 with M Key, type 2242/2260/2280/22110 storage devices support (both SATA & PCIE 3.0 x4 mode)*
	- 1 x M.2_2 Socket 3 with M Key, type 2242/2260/2280 storage devices support (PCIE 3.0 x4 mode)
	- 6 x SATA 6.0 Gb/s ports
	- Ready for Intel® Optane Memory**
	- Supports Intel® Smart Response Technology
	* The M.2_1 socket shares SATA_1 port when use M.2 SATA mode device. Adjust BIOS settings to use a SATA device.
	** Intel® Optane Technology is only supported when using 7th Generation Intel® Processors. Before using Intel® Optane memory modules, ensure that you have updated your motherboard drivers and BIOS to the latest version from the ASUS support website.
Audio	**Realtek® ALC887 8-Channel High Definition Audio CODEC**
	- Audio shielding ensures precise analog/digital separation and greatly reduced multi-lateral interference
	- Separate layer for left and right track, ensuring both sound deliver equal quality
	- Top notch audio sensation delivers according to the audio configuration
	- Absolute Pitch 192kHz/24bit True BD Lossless Sound
	- BD Audio Layer Content Protection
	- Premium Japanese-made audio capacitors provide warm, natural, and immersive sound with exceptional clarity and fidelity
	- Supports jack-detection, multi-streaming, and front panel jack-retasking
	- Optical S/PDIF out port at back I/O
USB	**Intel® Z270 Chipset**
	- 8 x USB 3.0/2.0 ports (4 ports @mid-board, 4 ports @back panel, blue)
	- 6 x USB 2.0/1.1 ports (4 ports @mid-board, 2 ports @back panel, black)
	ASMedia® USB 3.1 controller supports 3A power output
	- 2 x USB 3.1/3.0/2.0 ports @back panel (teal blue, Type A)

(continued on the next page)

TUF Z270 MARK 2 specifications summary

Exclusive TUF Features	**"Ultimate COOL!" Thermal Solution** - TUF Thermal Radar Core+ **"TUF ENGINE!" Power Design** - 4+2 Digital Phase Power Design - TUF Components (TUF-Cap, TUF Chokes & MOSFET; certified by military-standard) - ASUS DIGI+ Power Control Utility **"Safe & Stable!" Guardian Angel** - TUF ESD Guards 2 - ASUS SafeSlot - MemOK!
ASUS Features	- ASUS UEFI BIOS EZ Mode featuring friendly graphics user interface - Turbo LAN to experience smooth online gaming with lower pings and less lags - AI Suite 3 - ASUS Q-Connector - ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) - ASUS Q-Slot - ASUS Q-DIMM - ASUS O.C. Profile - ASUS CrashFree BIOS 3 - EZ Update - ASUS EZ Flash 3 - Multi-language BIOS
Back Panel I/O Ports	1 x PS/2 combo port 1 x DVI-D port 1 x HDMI port 1 x Optical S/PDIF out 1 x LAN (RJ45) port 2 x USB 3.1/3.0/2.0 ports (teal blue, Type A) 4 x USB 3.0/2.0 ports 2 x USB 2.0/1.1 ports 8-channel Audio I/O ports

TUF Z270 MARK 2 specifications summary

Internal I/O Connectors	2 x USB 3.0/2.0 connectors support additional 4 USB ports (19-pin)
	2 x USB 2.0/1/1 connectors support additional 4 USB ports
	1 x M.2_1 Socket 3 (for M Key, type 2242/2260/2280/22110 devices)
	1 x M.2_2 Socket 3 (for M Key, type 2242/2260/2280 devices)
	6 x SATA 6.0Gb/s connectors
	1 x CPU Fan connector (4-pin) for both 3-pin (DC mode) and 4-pin (PWM mode) CPU coolers control with auto detection support
	1 x CPU OPT Fan connector (4-pin)
	1 x AIO_Pump header (4-pin)
	2 x Chassis Fan connectors (4-pin) for both 3-pin (DC mode) and 4-pin (PWM mode) coolers control
	1 x Front panel audio connector (AAFP)
	1 x TPM connector
	1 x 24-pin EATX Power connector
	1 x 8-pin EATX 12V Power connector
	1 x System Panel (Q-Connector)
	1 x COM port
	1 x MemOK! button
	1 x Clear CMOS jumper
BIOS Features	128 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI3.0, 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, DMI 3.0, WOL by PME, PXE
Support DVD	Drivers
	ASUS Utilities
	EZ Update
	Anti-virus software (OEM version)
Operating System Support	Windows® 10 64-bit
	Windows® 8.1 64-bit*
	Windows® 7*
	* **Windows® 8.1 64-bit and Windows® 7 32/64-bit are only supported when using 6th Generation Intel® Processors**
Form Factor	ATX Form Factor, 12"x 9.2" (30.5 cm x 23.4 cm)

Specifications are subject to change without notice.

Package contents

Check your motherboard package for the following items:
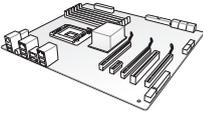
ASUS TUF Z270 MARK 2 motherboard

Technical documentations, certification and warranty card

Support DVD
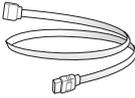
2 x Serial ATA 6.0 Gb/s cables
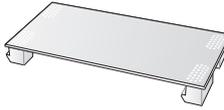
1 x SLI HB BRIDGE (2-WAY-M)
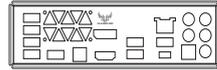
1 x ASUS Q-Shield
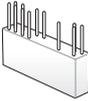
1 x Q-connector

1 x CPU Installation Tool

1 x M.2 screw package

1 x TUF Inside sticker

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

- The illustrated items above are for reference only. Actual product specifications may vary with different models.

Installation tools and components
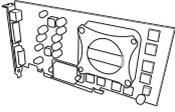
Graphics card (optional)

Phillips (cross) screwdriver

PC chassis

Power supply unit

Intel® LGA1151 CPU

Intel® LGA1151 compatible CPU Fan
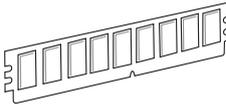
DIMM
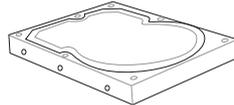
SATA hard disk drive
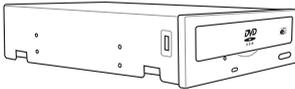
SATA optical disc drive (optional)

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

Product Introduction

1

1.1 Motherboard overview

1.1.1 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.

- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.

- Hold components by the edges to avoid touching the ICs on them.

- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

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

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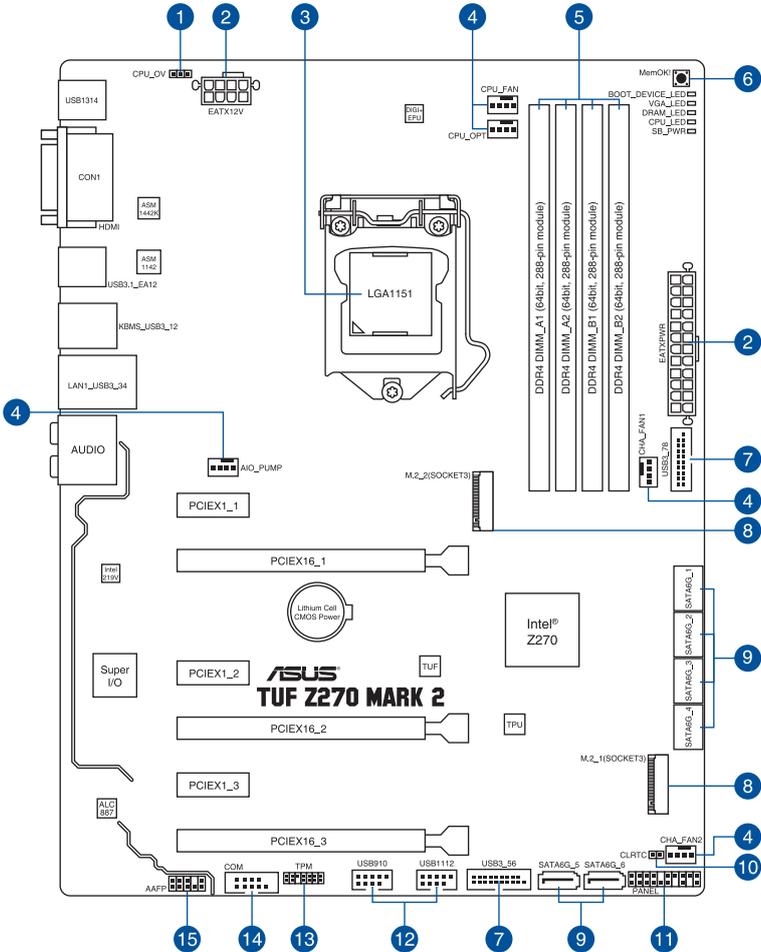
Refer to **1.1.9 Internal connectors** and **2.2.1 Rear I/O connection** for more information about rear panel connectors and internal connectors.

Layout contents

Connectors/Jumpers/Buttons and switches/Slots	Page
1. CPU Over Voltage jumper (3-pin CPU_OV)	1-11
2. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)	1-18
3. LGA1151 CPU socket	1-4
4. CPU, CPU optional, AIO pump, and chassis fan connectors (4-pin CPU_FAN; 4-pin CPU_OPT; 4-pin AIO_PUMP; 4-pin CHA_FAN1-2)	1-17
5. DDR4 DIMM slots	1-5
6. MemOK! button	1-9
7. USB 3.0 connector (20-1 pin USB3_56; USB3_78)	1-15
8. M.2 sockets (M.2_1; M.2_2)	1-21
9. Intel® Serial ATA 6 Gb/s connectors (7-pin SATA6G_12; SATA 6G_34; SATA 6G_56)	1-13
10. Clear RTC RAM jumper (2-pin CLRTC)	1-10
11. System panel connector (20-3 pin PANEL)	1-19
12. USB 2.0 connectors (10-1 pin USB910; USB1112)	1-16
13. TPM connector (14-1 pin TPM)	1-20
14. Serial port connector (10-1 pin COM)	1-20
15. Front panel audio connector (10-1 pin AAFP)	1-14

1.1.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1151 socket designed for the 7th & 6th Generation Intel® Core™ i7 / Intel® Core™ i5 / Intel® Core™ i3, Pentium®, and Celeron® processors.
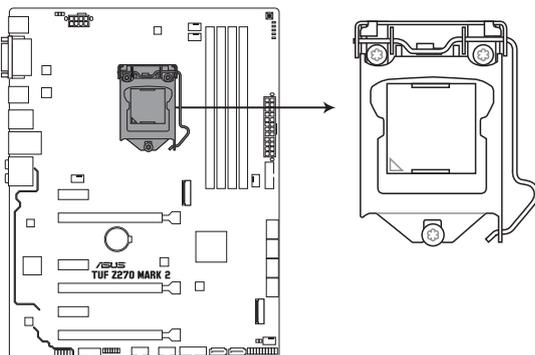
TUF Z270 MARK 2 CPU LGA1151

• Ensure that all power cables are unplugged before installing the CPU.

• Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. 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 LGA1151 socket.

• The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

1.1.4 System memory

The motherboard comes with four DDR4 (Double Data Rate 4) Quad 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.
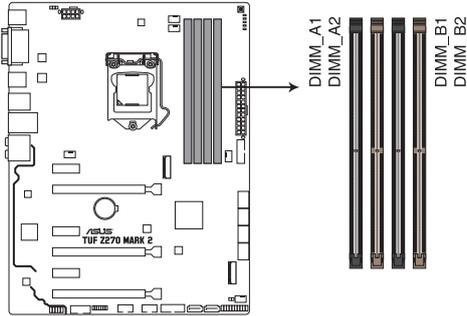
TUF Z270 MARK 2 288-pin DDR4 DIMM socket

Recommended memory configurations

DIMM_A2

DIMM_A2

DIMM_B2

DIMM_A1
DIMM_A2
DIMM_B1
DIMM_B2
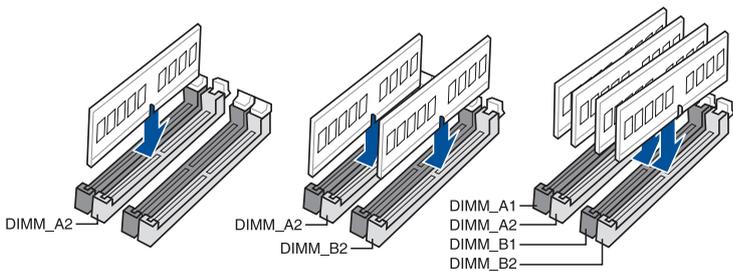
Memory configurations

You may install 4 GB, 8 GB, and 16 GB unbuffered and non-ECC DDR4 DIMMs into the DIMM sockets.

- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- Due to the memory address limitation on 32-bit Windows® OS, when you install 4 GB or more memory on the motherboard, the actual usable memory for the OS can be about 3 GB or less. For effective use of memory, we recommend that you do any of the following:

  a)   Use a maximum of 3 GB system memory if you are using a 32-bit Windows® OS.

  b)   Install a 64-bit Windows® OS when you want to install 4 GB or more on the motherboard.

  c)   For more details, refer to the Microsoft® support site at http://support.microsoft.com/kb/929605/en-us.

- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.

- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

- Always install the DIMMS with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.

1.1.5 Expansion slots

⚠️ Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.
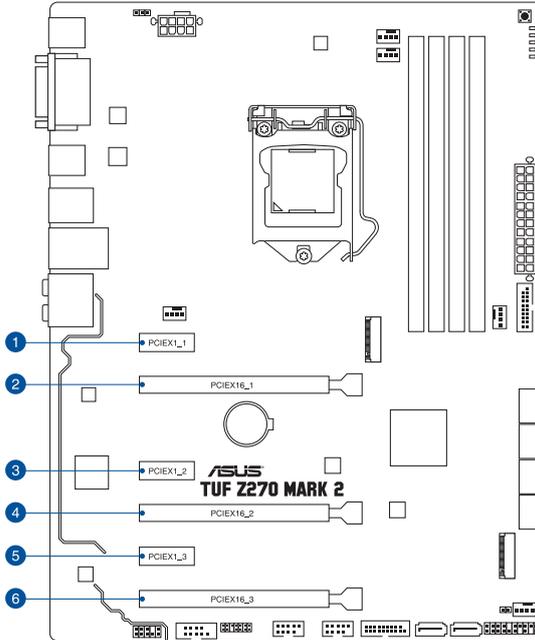
Slot No.	Slot Description
1	PCIE 3.0/2.0 x1_1 slot
2	PCIE 3.0/2.0 x16_1 slot
3	PCIE 3.0/2.0 x1_2 slot
4	PCIE 3.0/2.0 x16_2 slot
5	PCIE 3.0/2.0 x1_3 slot
6	PCIE 3.0/2.0 x16_3 slot

VGA configuration	PCI Express 3.0 operating mode		
	PCIe 3.0/2.0 x16_1	PCIe 3.0/2.0 x16_2	PCIe 3.0/2.0 x16_3
Single VGA/PCIe card	x16 (single VGA recommended)	N/A	x2
Dual VGA/PCIe card	x8	x8	x2

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIe X1_1			shared					
PCIe X16_1	shared							
PCIe X1_2			shared					
PCIe X1_3				shared				
PCIe X16_2		shared						
PCIe X16_3	shared							
XHCI Controller	shared							
SATA Controller	shared							
HD Audio	shared							
SMBus Controller	shared							
Intel LAN (I219V)				shared				
ASMedia USB Controller (1142)	shared							

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. MemOK! button

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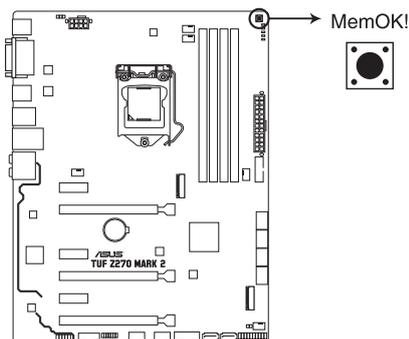
MemOK!

TUF Z270 MARK 2 MemOK! button

- Refer to section **1.1.8 Onboard LEDs** for the exact location of the DRAM_LED.

- The DRAM_LED also lights up when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! function.

- The MemOK! button does not function under Windows® OS environment.

- During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and tests the next set of failsafe settings. The blinking speed of the DRAM_LED increases, indicating different test processes.

- Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM_LED lights continuously. Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) at www.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 after using the MemOK! function.

1.1.7   Jumpers

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

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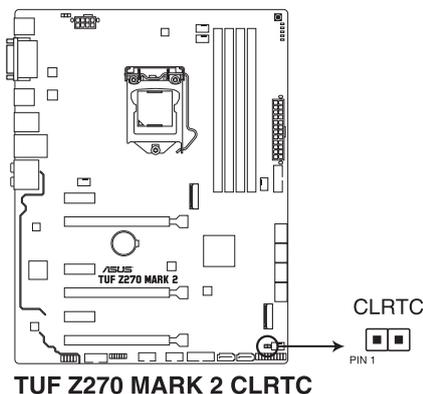
CLRTC

PIN 1

TUF Z270 MARK 2 CLRTC

To erase the RTC RAM:

1.   Turn OFF the computer and unplug the power cord.

2.   Short-circuit pin 1-2 with a metal object or jumper cap for about 5-10 seconds.

3.   Plug the power cord and turn ON the computer.

4.   Hold down the <Delete> key during the boot process and enter BIOS setup to re-enter data.

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

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

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

   The CPU Over Voltage jumper allows you to set a higher CPU voltage for a flexible overclocking system, depending on the type of the installed CPU. To gain more CPU voltage setting, insert the jumper to pins 2-3. To go back to its default CPU voltage setting, insert the jumper to pins 1-2.
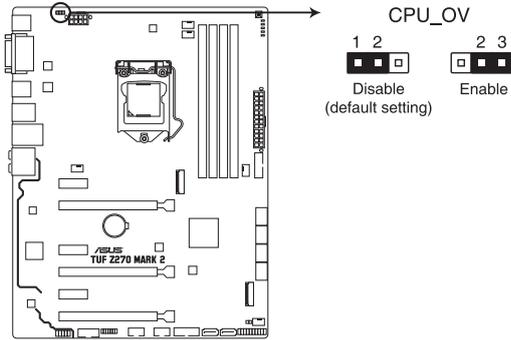
TUF Z270 MARK 2 CPU_OV setting

1.1.8   Onboard LEDs

1.   POST State LEDs

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

BOOT_DEVICE_LED (ORANGE)
VGA_LED (WHITE)
DRAM_LED (YELLOW)
CPU_LED (RED)
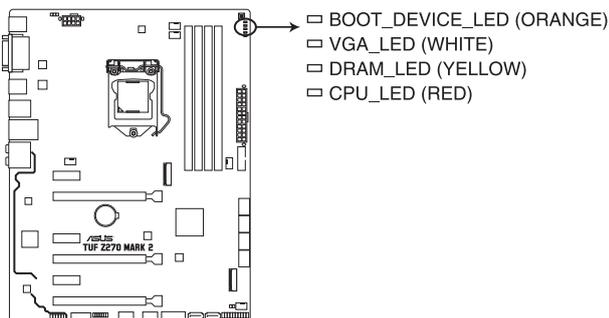
TUF Z270 MARK 2 CPU/ DRAM/ BOOT_DEVICE/ VGA LED

2.   Standby Power LED

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

SB_PWR

Blink
Standby Power

OFF
Powered Off
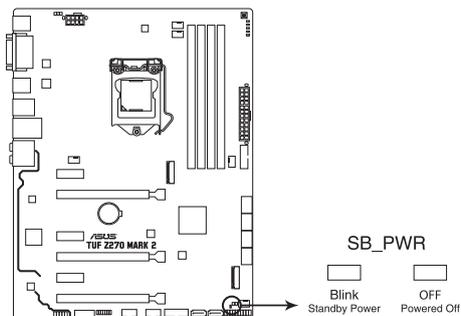
TUF Z270 MARK 2 Standby Power LED

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® Z270 chipset.

A SATA6G_1
GND
RSATA_TXP1
RSATA_TXN1
GND
RSATA_RXN1
RSATA_RXP1
GND

B SATA6G_3
GND
RSATA_TXP3
RSATA_TXN3
GND
RSATA_RXN3
RSATA_RXP3
GND

SATA6G_2
GND
RSATA_TXP2
RSATA_TXN2
GND
RSATA_RXN2
RSATA_RXP2
GND

SATA6G_4
GND
RSATA_TXP4
RSATA_TXN4
GND
RSATA_RXN4
RSATA_RXP4
GND

C SATA6G_5
GND
RSATA_RXP5
RSATA_RXN5
GND
RSATA_TXN5
RSATA_TXP5
GND

SATA6G_6
GND
RSATA_RXP6
RSATA_RXN6
GND
RSATA_TXN6
RSATA_TXP6
GND

TUF Z270 MARK 2 Intel® SATA 6 Gb/s connectors

right-angle side

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)]**.

- Before creating a RAID set, refer to the manual bundled in the motherboard support DVD.

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.

AAFP

PORT1L
PORT1R
PORT2R
SENSE_SEND
PORT2L

GND
PRESENCE#
SENSE1_RETUR
SENSE2_RETUR

HD-audio-compliant pin definition

MIC2
MICPWR
Line out_R
NC
Line out_L

AGND
NC
NC
NC

Legacy AC'97 compliant definition

TUF Z270 MARK 2 Analog front panel connector
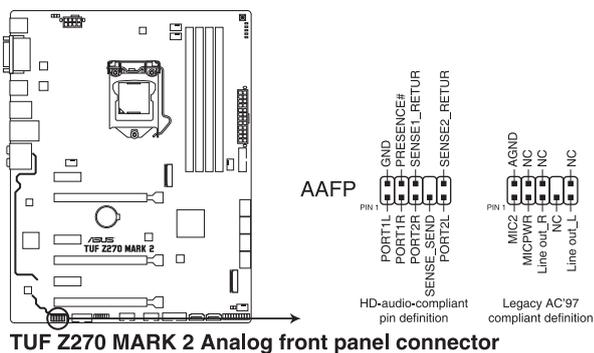
We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

3. USB 3.0 connector (20-1 pin USB3_34; USB3_56)

This connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 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.
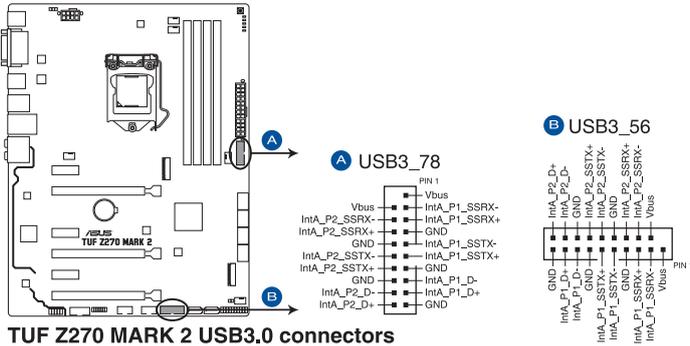
TUF Z270 MARK 2 USB3.0 connectors

The USB 3.0 module is purchased separately.

• Ensure to install the related driver to fully use the USB 3.0 ports under Windows® 7.

• The plugged USB 3.0 device may run on xHCI or EHCI mode depending on the operating system's setting.

Chapter 1

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

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

USB910   USB1112

USB+5V
USB_P10-
USB_P10+
GND
NC

USB+5V
USB_P12-
USB_P12+
GND
NC

PIN 1   PIN 1

USB+5V
USB_P9-
USB_P9+
GND

USB+5V
USB_P11-
USB_P11+
GND
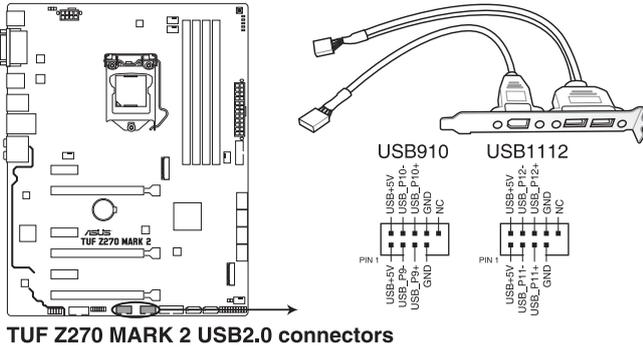
TUF Z270 MARK 2 USB2.0 connectors

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

The USB 2.0 module is purchased separately.

1-16   Chapter 1: Product Introduction

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

Connect the fan cables to the fan connectors on the motherboard.

A CPU_FAN   B CPU_OPT   C AIO_PUMP

CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND

CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND

AIO PUMP PWM
AIO PUMP IN
AIO PUMP PWR
GND

D CHA_FAN1   E CHA_FAN2

GND
CHA FAN PWR
CHA FAN IN
CHA FAN PWM

CHA FAN PWM
CHA FAN IN
CHA FAN PWR
GND

TUF Z270 MARK 2 Fan connectors
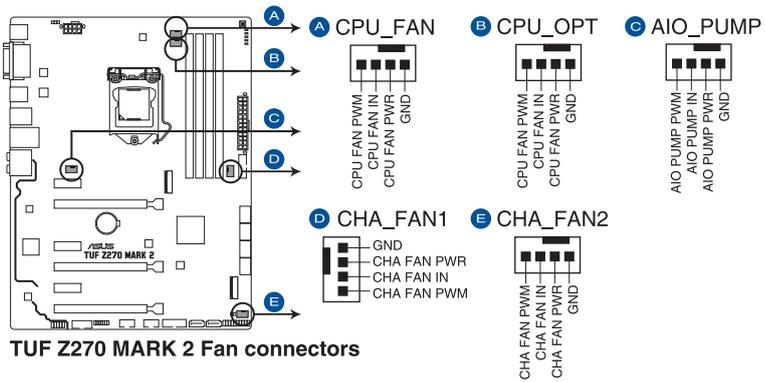
⚠
- DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!
- Ensure that the CPU FAN cable is securely installed to the CPU fan connector.

✎ The CPU_FAN connector supports the CPU fan of maximum 1A (12W) fan power.

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

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.
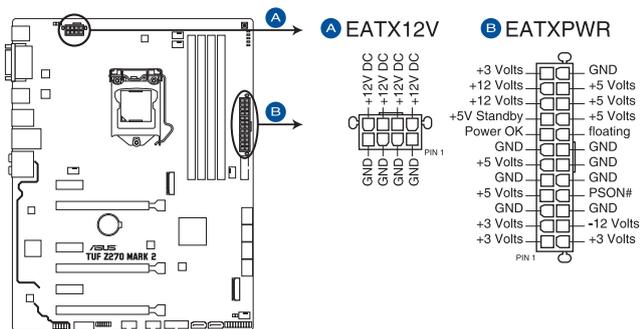
TUF Z270 MARK 2 ATX power connectors

• 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 350W.

• DO NOT forget to connect the 8-pin EATX12V power plug. Otherwise, the system will not boot.

• We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

• If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability.

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

This connector supports several chassis-mounted functions.
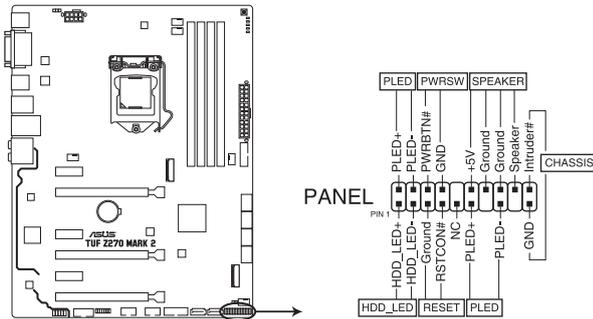
TUF Z270 MARK 2 System panel connector

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

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

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

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

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

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

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

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

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

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

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

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

8. TPM connector (14-1 pin TPM)

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

TUF Z270 MARK 2 TPM connector
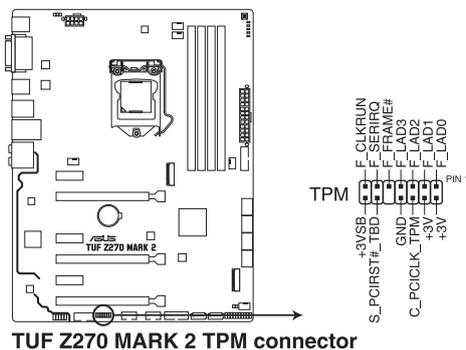
The TPM module is purchased separately.

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

These connectors are for the serial (COM) port. Connect the serial port module cable to one of these connectors, then install the module to a slot opening at the back of the system chassis.

TUF Z270 MARK 2 Serial port connector
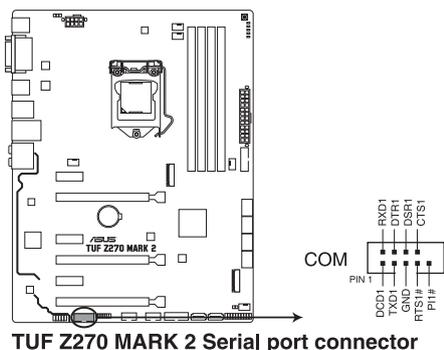
10. **M.2 sockets (M.2_1; M.2_2)**

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

Ⓐ M.2_2(SOCKET3) Ⓑ M.2_1(SOCKET3)

TUF Z270 MARK 2 M.2(SOCKET3)
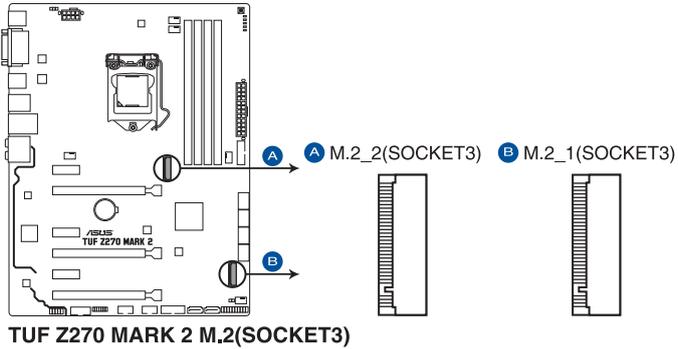
- M.2_1 socket supports PCIe 3.0 x4 and SATA mode M Key design and type 2242 / 2260 / 2280 / 22110 PCIe and SATA storage devices.

- M.2_2 socket supports PCIe 3.0 x4 M Key design and type 2242 / 2260 / 2280 PCIe storage devices.

- These sockets support IRST (Intel® Rapid Storage Technology).

The M.2 SSD module is purchased separately.

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 Motherboard installation

1. Install the ASUS Q-Shield to the chassis rear I/O panel.
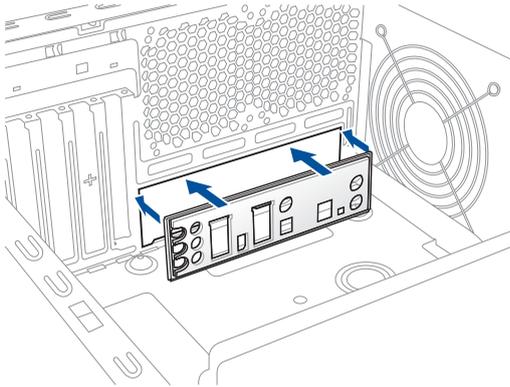
2. Place the motherboard into the chassis, ensuring that its rear I/O ports are aligned to the chassis' rear I/O panel.
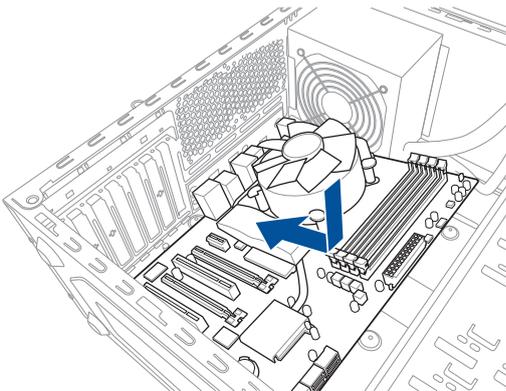
3.   Place nine screws into the holes indicated by circles to secure the motherboard to the chassis.
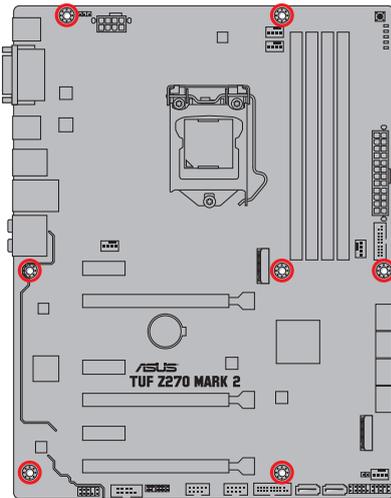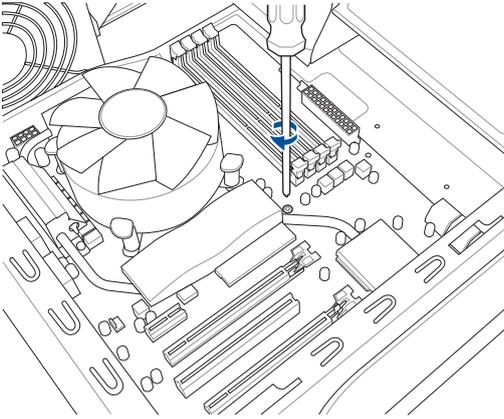
2.1.2　CPU installation

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

Top of CPU

Bottom of CPU

Bottom of CPU

6

Top of CPU

7

A

B

C

8
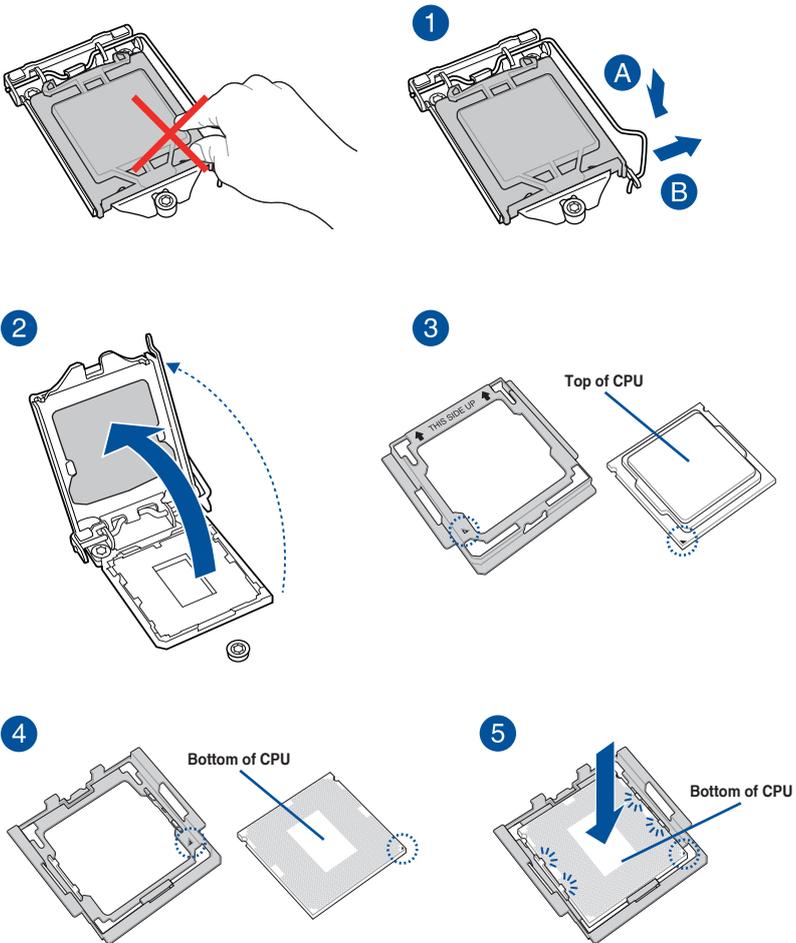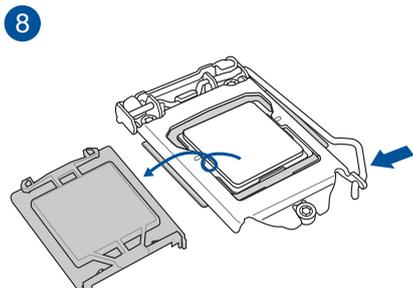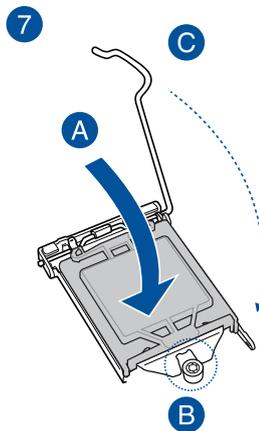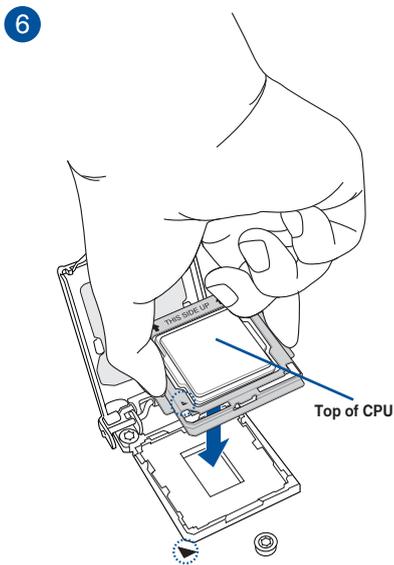
⚠️ • Ensure that the CPU is firmly clicked into place before installing it onto the CPU socket on the motherboard.

• Use the CPU Installation Tool for installing the CPU only. DO NOT damage or bend the CPU Installation Tool.

• Always firmly hold both sides of the CPU Installation Tool when installing, removing, or picking up the CPU Installation Tool.

• ASUS will not cover damages resulting from incorrect CPU installation/removal, incorrect CPU orientation/placement, or other damages resulting from negligence by the user.

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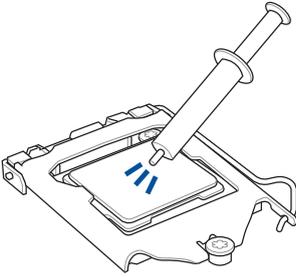
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan, if necessary.

To install the CPU heatsink and fan assembly
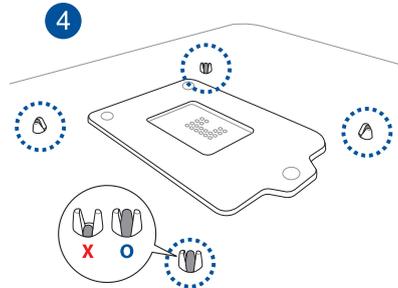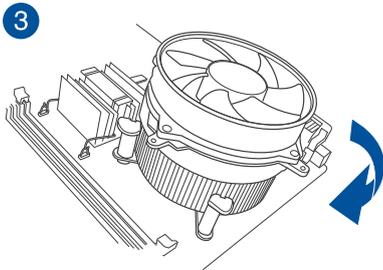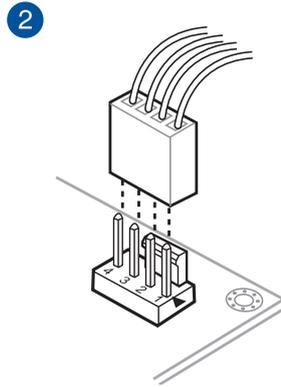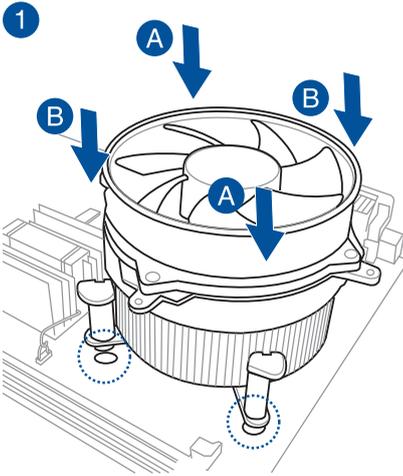
To uninstall the CPU heatsink and fan assembly
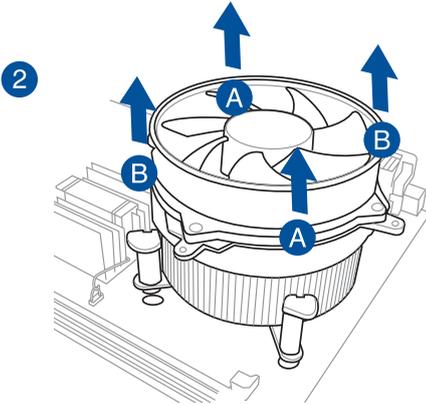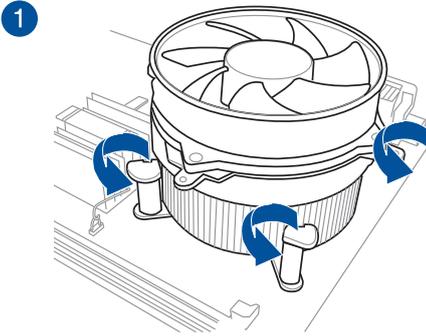
2.1.4 DIMM installation
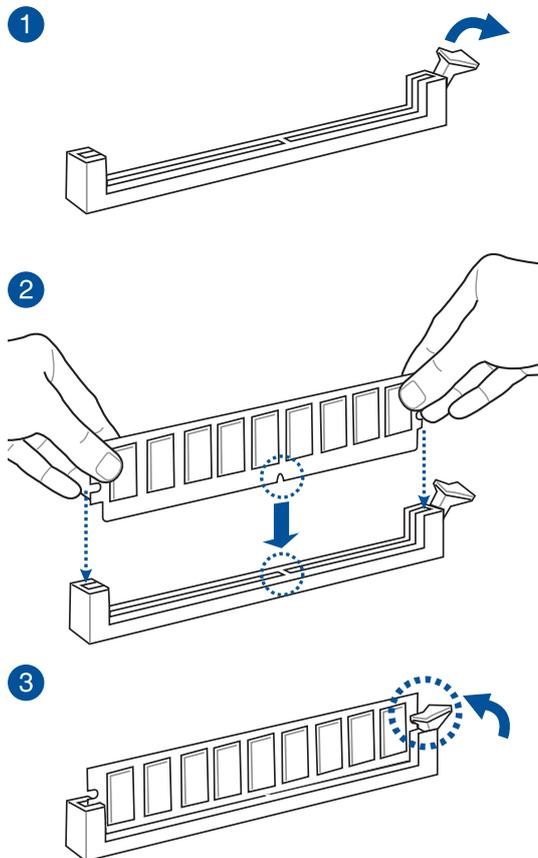
To remove a DIMM
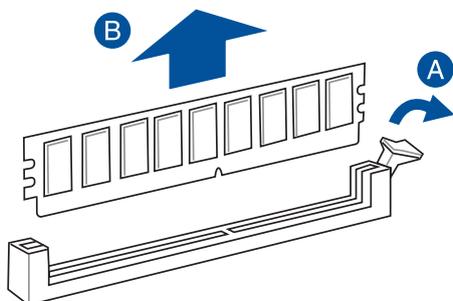
2.1.5 ATX power connection
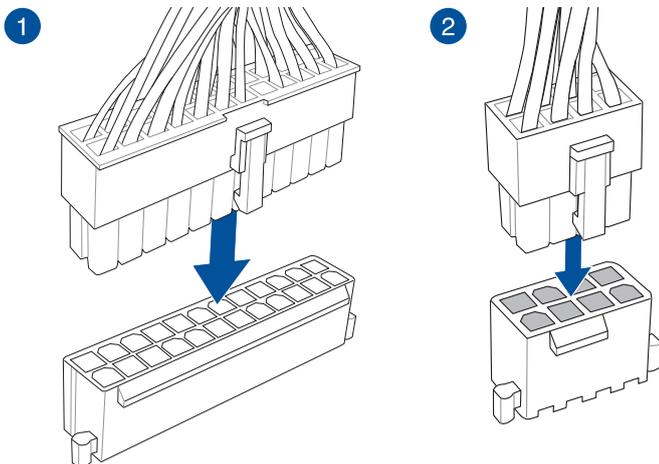
> ⚠️ Ensure to connect the 8-pin power plug.

2.1.6 SATA device connection
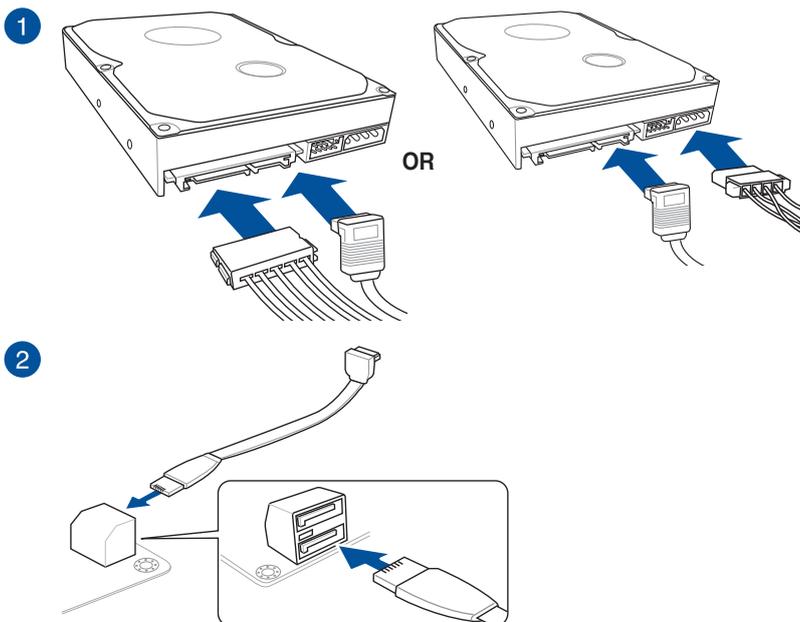
2.1.7 Front I/O connector

To install ASUS Q-Connector

HDD LED
RESET SW
PLED

HDD LED+
HDD LED-
Ground
Reset
+3V
PLED+
PLED-
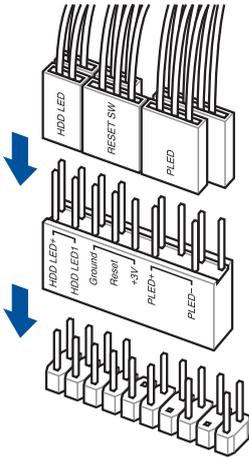
To install USB 2.0 connector

USB 2.0
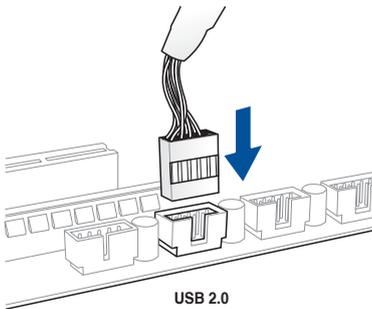
To install front panel audio connector

AAFP
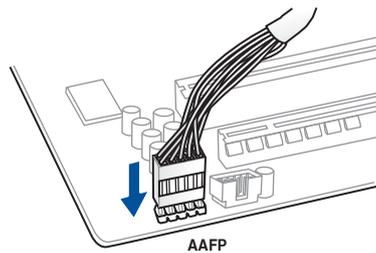
To install USB 3.0 connector

USB 3.0
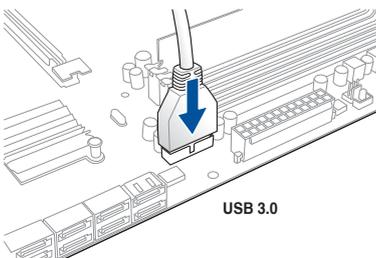
2.1.8   Expansion Card installation

To install PCIe x16 cards
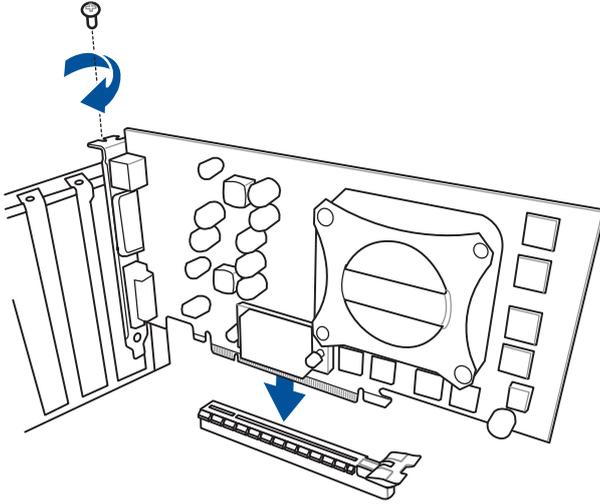
To install PCIe x1 cards
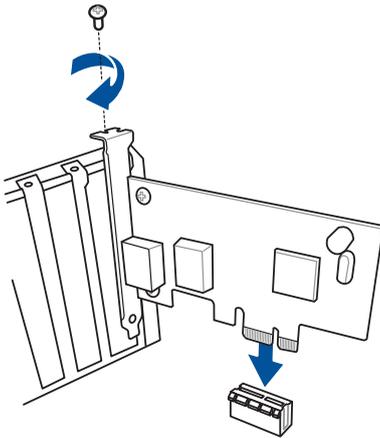
2.1.9 M.2 installation
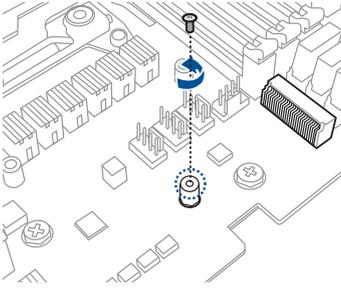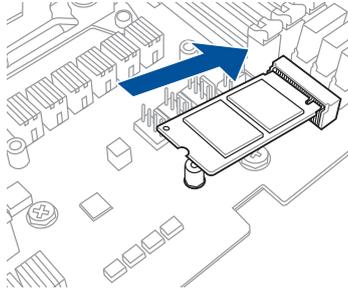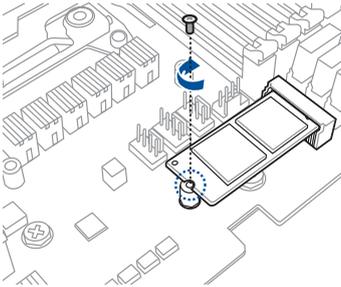
Supported M.2 type varies per motherboard.

2.2 Motherboard rear and audio connections

2.2.1 Rear I/O connection
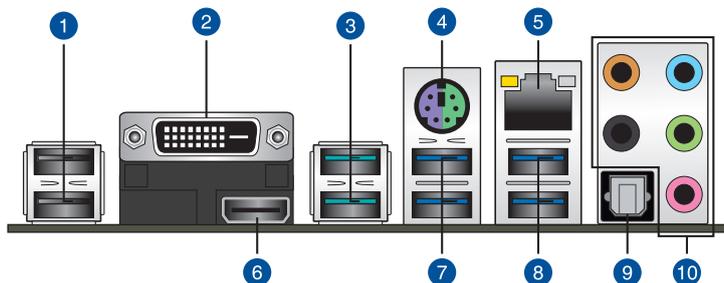
Rear panel connectors			
1.	USB 2.0 ports 1314	6.	HDMI port
2.	DVI-D port	7.	USB 3.0 ports 12
3.	USB 3.1 Type-A port EA12	8.	USB 3.0 ports 34
4.	PS/2 keyboard/mouse combo port	9.	Optical S/PDIF Out port
5.	Intel® LAN port (I219-V)*	10.	Audio I/O ports**

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

- USB 3.1/3.0 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 3.0 devices to USB 3.0 ports and your USB 3.1 devices to USB 3.1 ports for faster and better performance for your devices.

* LAN ports LED indications

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

ACT/LINK LED   **SPEED LED**

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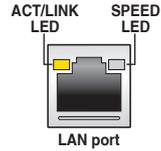
You can disable the LAN controllers in BIOS. Due to hardware design, the LAN1 port's LEDs may continue to blink even when disabled.

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

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

2.2.2 Audio I/O connections

Audio I/O ports

orange — light blue

black — lime

pink
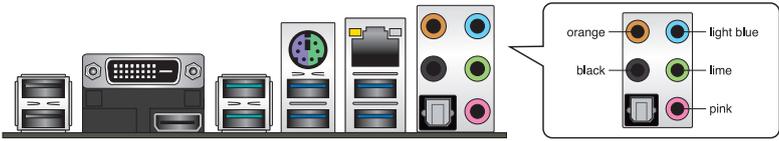
Connect to Headphone and Mic

Connect to Stereo Speakers

AUDIO INPUTS
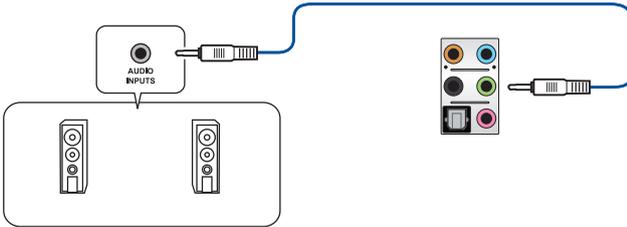
Connect to 2 Speakers

AUDIO INPUTS
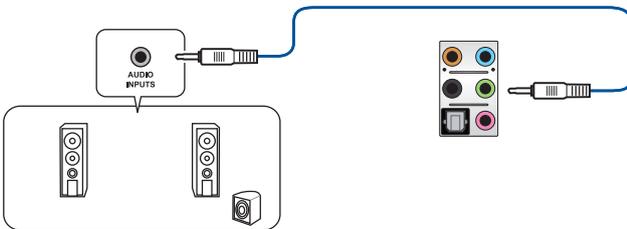
Connect to 4 Speakers
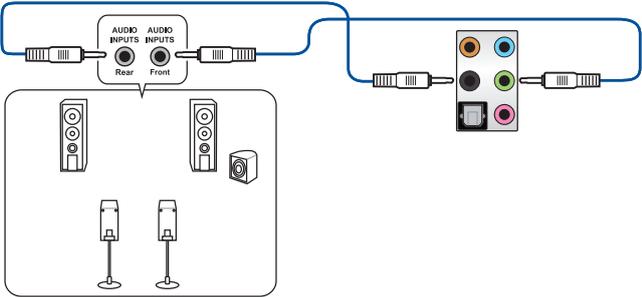
Connect to 6 Speakers
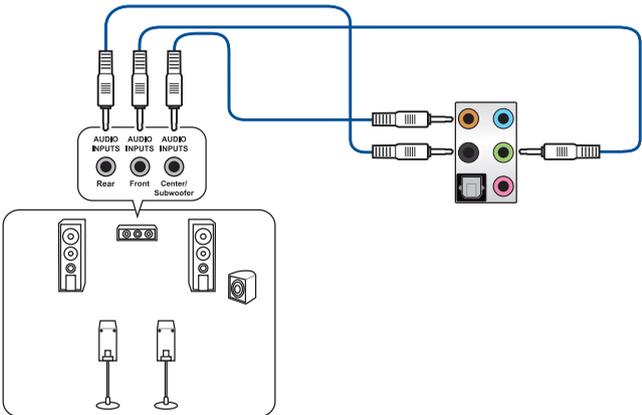
Connect to 8 Speakers
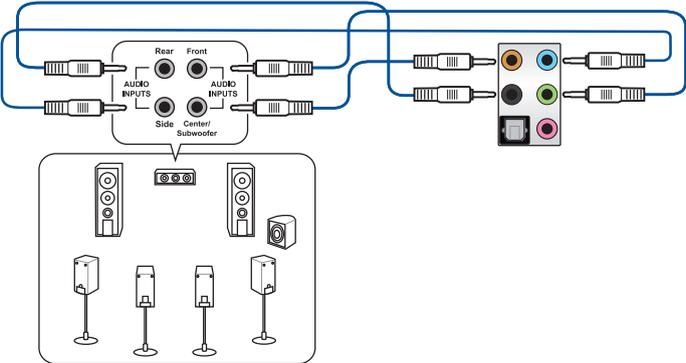
2.3   Starting up for the first time

1.   After making all the connections, replace the system case cover.

2.   Ensure that all switches are off.

3.   Connect the power cord to the power connector at the back of the system chassis.

4.   Connect the power cord to a power outlet that is equipped with a surge protector.

5.   Turn on the devices in the following order:

      a.   Monitor

      b.   External SCSI devices (starting with the last device on the chain)

      c.   System power

6.   After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to green after the system LED turns on.

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

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

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

2.4   Turning off the computer

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

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.

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> during the Power-On Self Test (POST). If you do not press <Delete>, 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 the **<F5>** hotkey. 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 **1.1.7 Jumpers** for information on how to erase the RTC RAM.

• The BIOS setup program does not support Bluetooth devices.

BIOS menu screen

The BIOS Setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. You can change modes from the **Exit** menu or from the **Exit/Advanced Mode** screen.

3.2.1   EZ Mode

By default, the EZ Mode screen appears when you enter the BIOS setup program. 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.

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

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

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 overclocking

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.

3.2.2 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.

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

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:

My Favorites	For saving the frequently-used system settings and configuration.
Main	For changing the basic system configuration.
Ai Tweaker	For changing the overclocking settings.
Advanced	For changing the advanced system settings.
Monitor	For displaying the system temperature, power status, and changing the fan settings.
Boot	For changing the system boot configuration.
Tool	For configuring options for special functions.
Exit	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.

MyFavorites (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.

Qfan 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.

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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.

3.2.3 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.

Click to select a fan to be configured

Click to activate PWM Mode

Click to activate DC Mode

Q-Fan Control
Select your target fan and then move the slider to select any of these profiles: Standard, Silent, Turbo and Full Speed. You can also move the slider to Manual and manually configure the fan's operating speed.

PWM   DC

⊘Optimize All

CPU FAN
CHA1 FAN
CHA2 FAN
AIO PUMP

%
100

50

0   30   70   100   °C

Standard   Silent   Turbo   Full Speed   Manual

Undo   Apply   Exit (ESC)

Select a profile to apply to your fans

Click to apply the fan setting

Click to undo the changes

Click to go back to main menu

Select to manually configure your fans

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Configuring fans manually

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

Speed points   **Select to manually configure your fans**
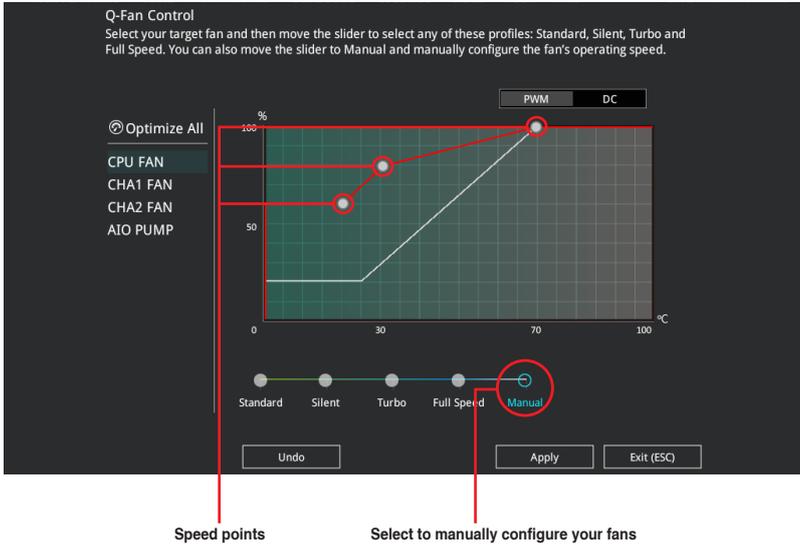
To configure your fans:

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 setup   RAID setup
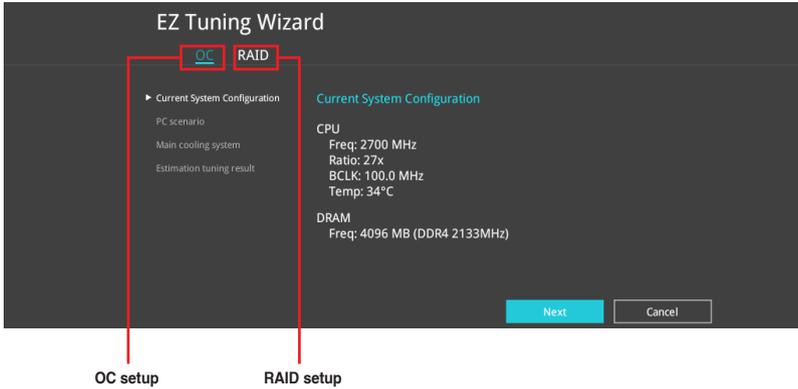
OC Tuning

To start OC Tuning:
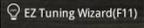
1.   Press <F11> on your keyboard or click [EZ Tuning Wizard(F11)] from the BIOS screen to open EZ Tuning Wizard screen.

2.   Click **OC** then click **Next**.

3.   Select a PC scenario **Daily Computing** or **Gaming/Media Editing,** then click **Next**.
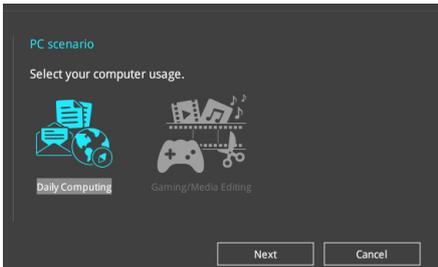
4.	Select a Main Cooling system **BOX cooler, Tower cooler, Water cooler,** or **I'm not sure,** then click **Next**.
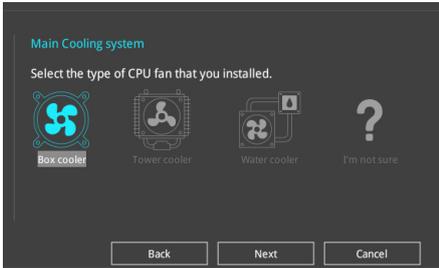
5.	After selecting the Main Cooling System, click **Next** then click **Yes** to start the OC Tuning.

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.	Check the available storage disk drives, then click **Next**.

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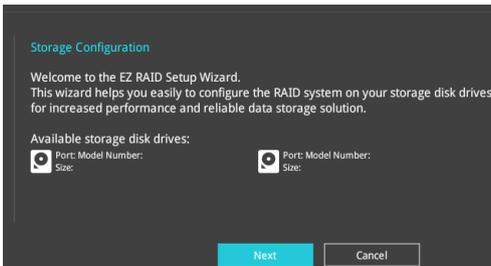
4. Select the type of storage for your RAID, **Easy Backup** or **Super Speed**, then click **Next**.
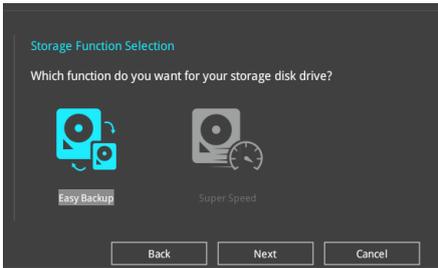
a. For Easy Backup, click **Next** then select from **Easy Backup (RAID 1)** or **Easy Backup (RAID 10)**.

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)**.
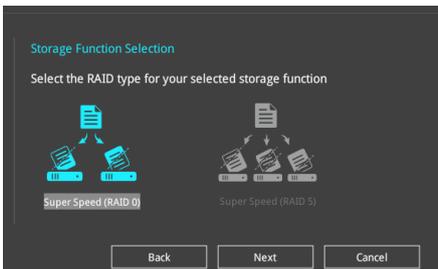
5. After selecting the type of RAID, click **Next** then click **Yes** to continue the RAID setup.

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.
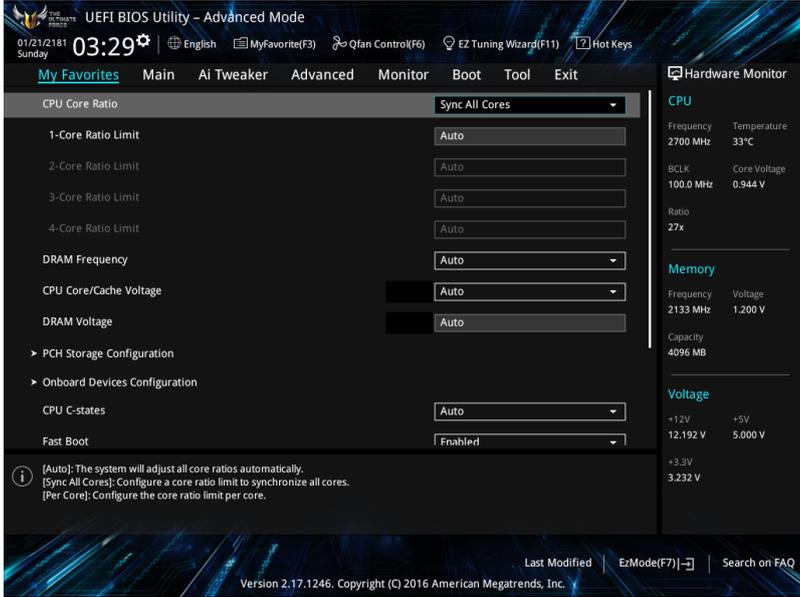
Adding items to My Favorites

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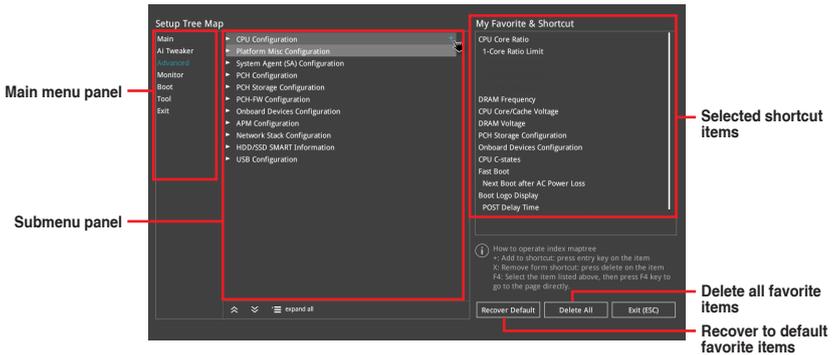
3. Select an item from main menu panel, then click the submenu that you want to save as favorite from the submenu panel and click [+] or press <Enter> on your keyboard.

> 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.

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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 **1.1.6 Onboard buttons and switches** for information on how to erase the RTC RAM via the Clear CMOS button.

- The Administrator or User Password items on the screen show the default **[Not Installed]**. After you set a password, these items show **[Installed]**.

3.5 Ai 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. Configuration options:

[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.

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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. The values range from 98.0 MHz to 538.25 MHz.

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 oveclocking 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] [Per Core]

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] - [DDR4-4266MHz]

Internal CPU Power Management

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

Intel(R) SpeedStep(tm)

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: [Auto] [Disabled] [Enabled]

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.

CPU - Power Management Control

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

Intel(R) SpeedStep(tm)

This item allows more than two frequency to be supported.
Configuration options: [Auto] [Disabled] [Enabled]

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: [Disabled] [Enabled]

CPU C-States

This item allows you to set the power saving of the CPU states.
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] [Gen2] [Gen3]

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: [Enabled] [Disabled]

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.

[RAID]   Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.

SMART Status Check

SMART (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(Gray) - SATA6G_6(Gray)

SATA6G_1(Gray) - SATA6G_6(Gray)

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   PCH-FW Configuration

This item allows you to configure the firmware TPM.

3.6.7   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]

M.2_1 Configuration: [Auto][SATA mode][PCIE mode]

[Auto]   Auto-detects the M.2 device mode. If a SATA device is detected, SATA6G_1 will be disabled.

[SATA mode]   Only supports M.2 SATA devices. Please note that SATA6G_1 port cannot be used in this mode.

[PCIE mode]   Only supports M.2 PCIE devices.

ASMedia Back USB 3.1 Controller

This item allows you to enable or disable the ASMedia Back USB 3.1 Controller.
Configuration options: [Disabled] [Enabled]

Intel LAN Controller

This item allows you to enable or disable the Intel LAN controllers.
Configuration options: [Disabled] [Enabled]

3.6.8 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)]

3.6.9 Network Stack Configuration

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

3.6.10 HDD/SSD SMART Information

This menu displays the SMART information of the connected devices.

> NVM Express devices do not support SMART information.

3.6.11 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.

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3.7   Monitor menu

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

CPU Temperature / MotherBoard Temperature / PCH Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the CPU, MotherBoard, and PCH temperatures. Select **[Ignore]** if you do not wish to display the detected temperatures.

Q-Fan Configuration

Q-fan Tuning

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

AIO PUMP Control

[Disabled]	Disable the AIO PUMP control feature.
[Auto]	Detects the type of AIO pump installed and automatically switches the control modes.
[DC mode]	Enable the AIO PUMP control in DC mode for 3-pin chassis fan.
[PWM mode]	Enable the AIO 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 items appear 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.

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 a 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 Windows secure update and secure boot.

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

Boot Devices Control [UEFI and Legacy OPROM]
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 [Legacy only]
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 [Legacy only]
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 [Legacy only]
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: [Enabled] [Disabled]

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
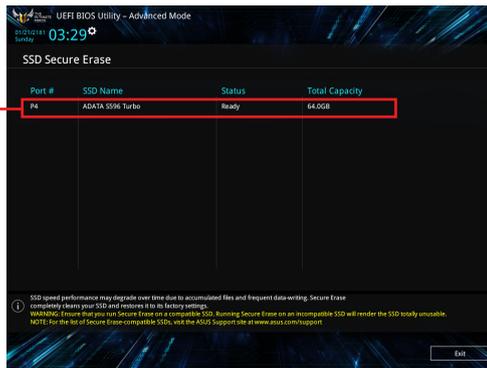
Status definition:

- **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/save profile from/to your USB drive.

3.9.4   ASUS SPD Information

This item allows you to view the DRAM SPD information.

3.9.5   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_1] [PCIEX16_2]

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. You can access the EZ Mode from the Exit menu.

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 **Ok** 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 DVD or a USB flash 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 DVD 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 Devices(s).**
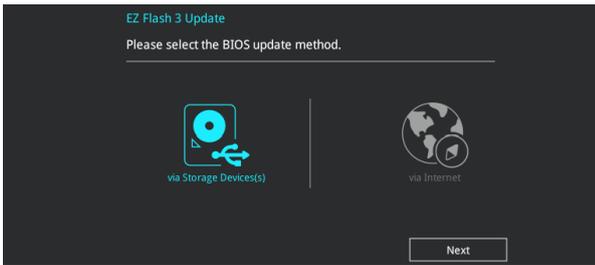
4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.

5. Press the Left/Right arrow keys to switch to the Folder field.

6. 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.
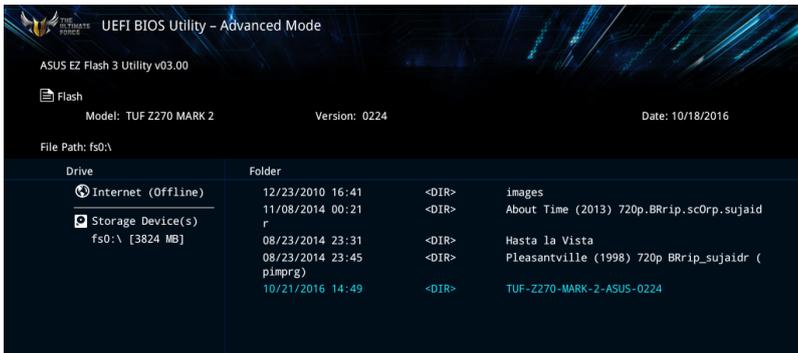
- • This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.

- • 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 DVD or a USB flash drive that contains the BIOS file.

The BIOS file in the motherboard support DVD 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 DVD to the optical 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!

Chapter 3

RAID Support

4

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 Serial ATA hard disks

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

To install the SATA hard disks for a RAID configuration:

1.   Install the SATA hard disks into the drive bays.

2.   Connect the SATA signal cables.

3.   Connect a SATA power cable to the power connector on each drive.

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 Controller Mode Selection item to **[RAID Mode]**.

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.
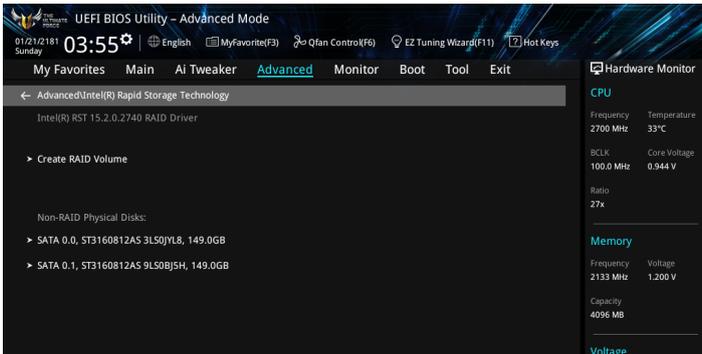
Creating a RAID set

To create a RAID set:

1. From the Intel(R) Rapid Storage Technology menu, select **Create RAID Volume** and press <Enter>. The following screen appears:
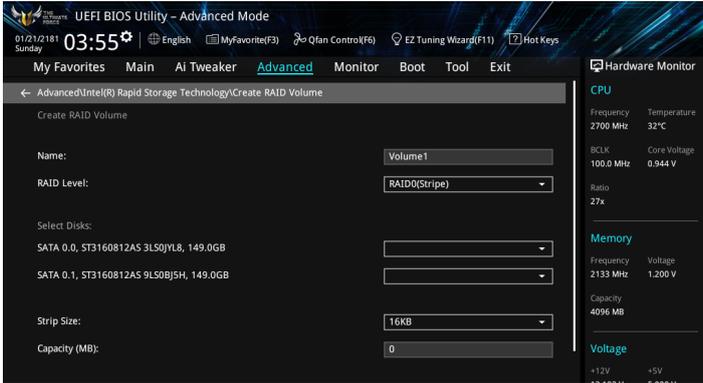
2. When the Name item is selected, enter a name for the RAID set and press <Enter>.

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.

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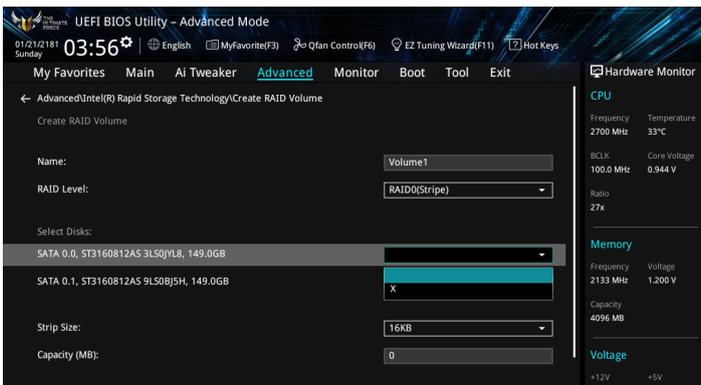
5.	When the Strip Size item is selected, press <Enter> to select strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:

-	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.
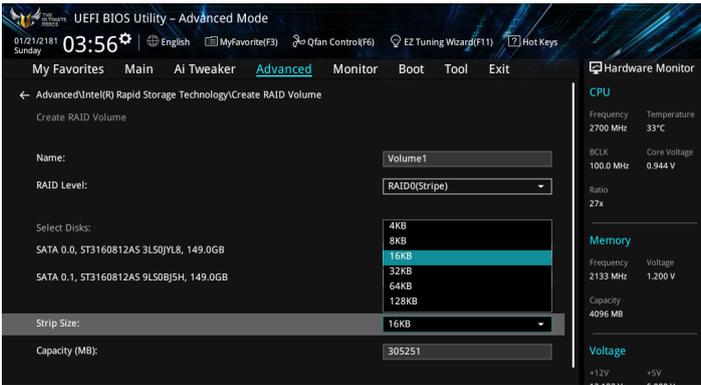
6.	When the **Capacity (MB)** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

7.	When the **Create Volume** item is selected, press <Enter> to create the RAID volume and return to the Intel(R) Rapid Storage Technology menu.
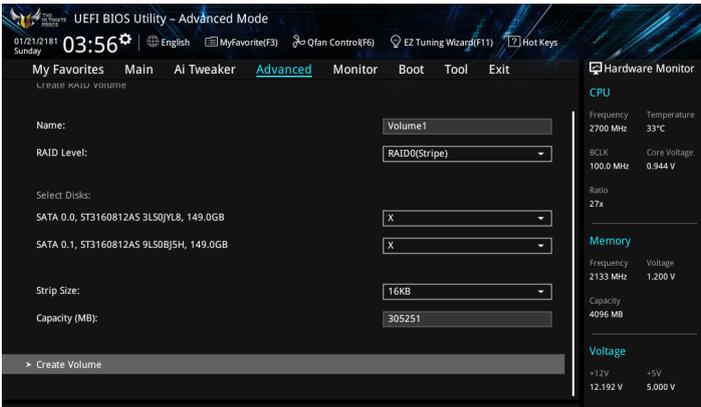
Deleting a RAID set

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(R) Rapid Storage Technology menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:
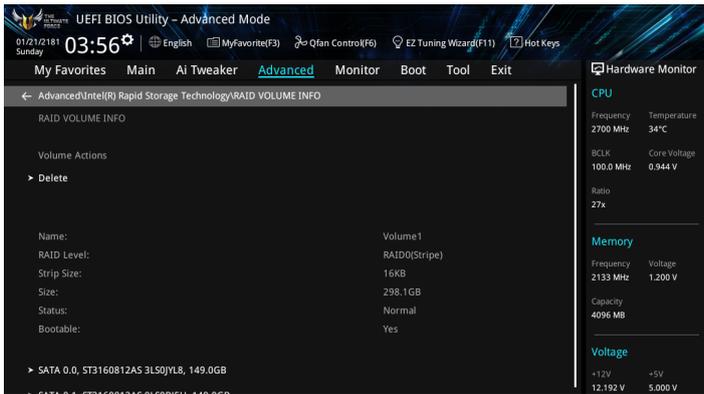
2. When the **Delete** item is selected, press <Enter>, then select **Yes** to delete the RAID volume and return to the Intel(R) Rapid Storage Technology menu, or select **No** to cancel.

Chapter 4
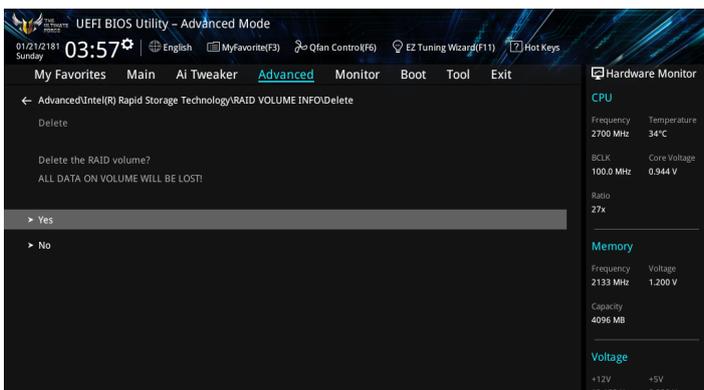
4.1.4　Intel® Rapid Storage Technology Option ROM utility

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.

```
        Intel(R) Rapid Storage Technology - Option - v10.5.1.1070
        Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.

=================================[ MAIN MENU ]=================================

        1.  Create RAID Volume          4.  Recovery Volume Options
        2.  Delete RAID Volume          5.  Acceleration Options
        3.  Reset Disks to Non-RAID     6.  Exit

========================[ DISK/VOLUME INFORMATION ]========================
  RAID Volumes:
  None defined.

  Physical Devices:
  Port   Device Model   Serial #        Size       Type/Status(Vol ID)
  0      ST3160812AS    9LS0HJA4        149.0GB    Non-RAID Disk
  1      ST3160812AS    9LS0F4HL        149.0GB    Non-RAID Disk
  2      ST3160812AS    3LS0JYL8        149.0GB    Non-RAID Disk
  3      ST3160812AS    9LS0BJ5H        149.0GB    Non-RAID Disk


[↑↓]-Select            [ESC]-Exit            [ENTER]-Select 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:

```
         Intel(R) Rapid Storage Technology - Option - v10.5.1.1070
         Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.

                        [CREATE VOLUME MENU]
                              Name:   Volume 0
                        RAID Level:
                             Disks:
                        Strip Size:
                          Capacity:
                              Sync:
                              Create volume

                              [HELP]

     Enter a unique volume name that has no special characters
     and is 16 characters or less.


     [↑↓]-Select          [ESC]-Exit          [ENTER]-Select Menu
```
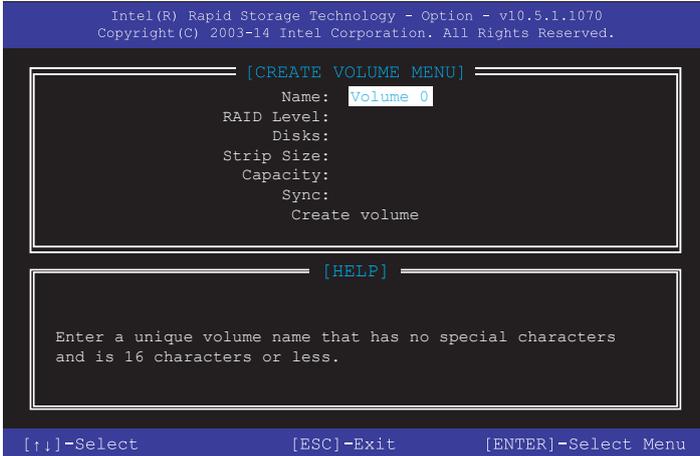
2. Enter a name for the RAID set and press <Enter>.

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:

```
                              [SELECT DISKS]

     Port    Device Model    Serial #      Size     Status
     0       ST3160812AS     9LS0HJA4      149.0GB   Non-RAID Disk
     1       ST3160812AS     9LS0F4HL      149.0GB   Non-RAID Disk
     2       ST3160812AS     3LS0JYL8      149.0GB   Non-RAID Disk
     3       ST3160812AS     9LS0BJ5H      149.0GB   Non-RAID Disk

          Select 2 to 6 to use in creating the volume.


     [↑↓]-Prev/Next   [SPACE]-SelectDisk   [ENTER]-Done
```

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

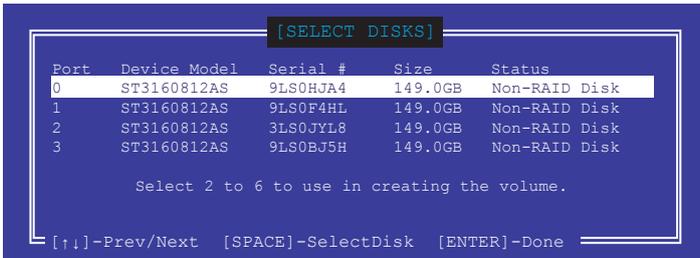⚠️ Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

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

```
                        ═══════[DELETE VOLUME MENU]═══════
Name         Level          Drives   Capacity   Status    Bootable
Volume0      RAID0 (Stripe)   2       298.0GB    Normal      Yes




                        ═══════[HELP]═══════

        Deleting a volume will reset the disks to non-RAID.

             WARNING:  ALL DISK DATA WILL BE DELETED.
             (This does not apply to Recovery volumes)




   [↑↓]-Select   [ESC]-Previous Menu   [DEL]-Delete Volume
```
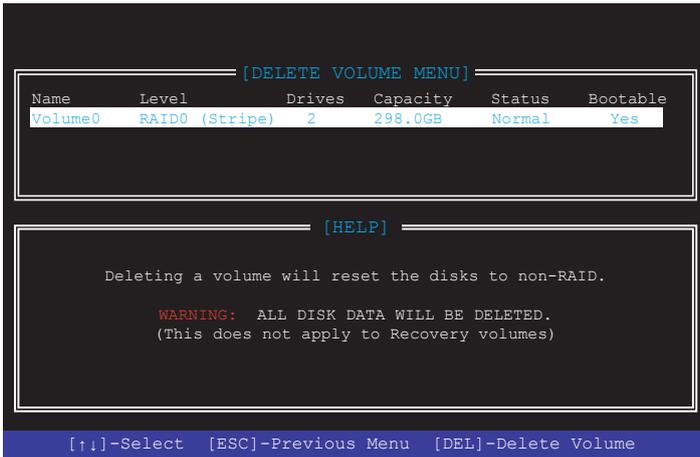
2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Delete>. The following warning message appears:

```
              ═══════[DELETE VOLUME VERIFICATION]═══════
               ALL DATA IN THE VOLUME WILL BE LOST!
            (This does not apply to Recovery volumes)

        Are you sure you want to delete "Volume0"? (Y/N):
```

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:

```
┌─────────────────────────[CONFIRM EXIT]─────────────────────────┐
│                                                                │
│             Are you sure you want to exit? (Y/N):              │
│                                                                │
└────────────────────────────────────────────────────────────────┘
```
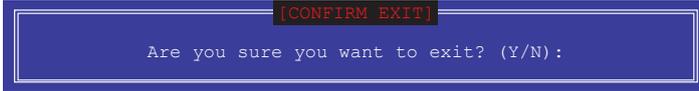
2. Press <Y> to exit or press <N> to return to the utility main menu.

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 USB flash drive with RAID driver into the USB port or the support DVD into the optical drive, 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.

> Before loading the RAID driver from a USB flash drive, you have to use another computer to copy the RAID driver from the support DVD to the USB flash drive.

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

Appendix

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.

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.

IC: Canadian Compliance Statement

Complies with the Canadian ICES-003 Class B specifications. This device complies with RSS 210 of Industry Canada. This Class B device meets all the requirements of the Canadian interference-causing equipment regulations.

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.

Cet appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada. Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Cet appareil est conforme aux normes CNR exemptes de licence d'Industrie Canada. Le fonctionnement est soumis aux deux conditions suivantes:

(1) cet appareil ne doit pas provoquer d'interférences et

(2) cet appareil doit accepter toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité de l'appareil.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

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.

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! This product may contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.

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English ASUSTeK Computer Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Directives. Full text of EU declaration of conformity is available at: www.asus.com/support

Français AsusTek Computer Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres clauses pertinentes des directives concernées. La déclaration de conformité de l'UE peut être téléchargée à partir du site Internet suivant : www.asus.com/support.

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Hrvatski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj sukladan s bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o sukladnosti dostupan je na: www.asus.com/support

Čeština Společnost ASUSTeK Computer Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení souvisejících směrnic. Plné znění prohlášení o shodě EU je k dispozici na adrese: www.asus.com/support

Dansk ASUSTeK Computer Inc. erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene og andre relevante bestemmelser i de relaterede direktiver. Hele EU-overensstemmelseserklæringen kan findes på: www.asus.com/support

Nederlands ASUSTeK Computer Inc. verklaart hierbij dat dit apparaat voldoet aan de essentiële vereisten en andere relevante bepalingen van de verwante richtlijnen. De volledige tekst van de EU-verklaring van conformiteit is beschikbaar op: www.asus.com/support

Eesti Käesolevaga kinnitab ASUSTeK Computer Inc, et see seade vastab asjakohaste direktiivide oluliste nõuetele ja teistele asjassepuutuvatele sätetele. EL vastavusdeklaratsiooni täielik tekst on saadaval järgmisel aadressil: www.asus.com/support

Suomi ASUSTeK Computer Inc. ilmoittaa täten, että tämä laite on asiaankuuluvien direktiivien olennaisten vaatimusten ja muiden tätä koskevien säädösten mukainen. EU-yhdenmukaisuusilmoituksen koko teksti on luettavissa osoitteessa: www.asus.com/support

Ελληνικά Με το παρόν, η AsusTek Computer Inc. δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Το πλήρες κείμενο της δήλωσης συμβατότητας είναι διαθέσιμο στη διεύθυνση: www.asus.com/support

Magyar Az ASUSTeK Computer Inc. ezennel kijelenti, hogy ez az eszköz megfelel a kapcsolódó Irányelvek lényeges követelményeinek és egyéb vonatkozó rendelkezéseinek. Az EU megfelelőségi nyilatkozat teljes szövege innen letölthető: www.asus.com/support

Latviski ASUSTeK Computer Inc. ar šo paziņo, ka šī ierīce atbilst saistīto Direktīvu būtiskajām prasībām un citiem citiem saistošajiem nosacījumiem. Pilns ES atbilstības paziņojuma teksts pieejams šeit: www.asus.com/support

Lietuvių „ASUSTeK Computer Inc." šiuo tvirtina, kad šis įrenginys atitinka pagrindinius reikalavimus ir kitas svarbias susijusių direktyvų nuostatas. Visą ES atitikties deklaracijos tekstą galima rasti: www.asus.com/support

Norsk ASUSTeK Computer Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i relaterte direktiver. Fullstendig tekst for EU-samsvarserklæringen finnes på: www.asus.com/support

Polski Firma ASUSTeK Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami powiązanych dyrektyw. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem: www.asus.com/support

Português A ASUSTeK Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas relacionadas. Texto integral da declaração da UE disponível em: www.asus.com/support

Română ASUSTeK Computer Inc. declară că acest dispozitiv se conformează cerințelor esențiale și altor prevederi relevante ale directivelor conexe. Textul complet al declarației de conformitate a Uniunii Europene se găsește la: www.asus.com/support

Srpski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa osnovnim zahtevima i drugim relevantnim odredbama povezanih Direktiva. Pun tekst EU deklaracije o usaglašenosti je dostupan da adresi: www.asus.com/support

Slovensky Spoločnosť ASUSTeK Computer Inc. týmto vyhlasuje, že toto zariadenie vyhovuje základným požiadavkám a ostatým príslušným ustanoveniam príslušných smerníc. Celý text vyhlásenia o zhode pre štáty EÚ je dostupný na adrese: www.asus.com/support

Slovenščina ASUSTeK Computer Inc. izjavlja, da je ta naprava skladna z bistvenimi zahtevami in drugimi ustreznimi določbami povezanih direktiv. Celotno besedilo EU-izjave o skladnosti je na voljo na spletnem mestu: www.asus.com/support

Español Por la presente, ASUSTeK Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de las directivas relacionadas. El texto completo de la declaración de la UE de conformidad está disponible en: www.asus.com/support

Svenska ASUSTeK Computer Inc. förklarar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta föreskrifter i relaterade direktiv. Fulltext av EU-försäkran om överensstämmelse finns på: www.asus.com/support

Українська ASUSTeK Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним положенням відповідних Директив. Повний текст декларації відповідності стандартам ЄС доступний на: www.asus.com/support

Türkçe AsusTek Computer Inc., bu aygıtın temel gereksinimlerle ve ilişkili Yönergelerin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. AB uygunluk bildiriminin tam metni şu adreste bulunabilir: www.asus.com/support

Bosanski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj usklađen sa bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o usklađenosti dostupan je na: www.asus.com/support

ASUS contact information

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Technical Support

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Online support	http://qr.asus.com/techserv

ASUS COMPUTER INTERNATIONAL (America)

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Technical Support

Support fax	+1-812-284-0883
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ASUS COMPUTER GmbH (Germany and Austria)

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Web site	http://www.asus.com/de
Online contact	http://eu-rma.asus.com/sales

Technical Support

Telephone	+49-2102-5789555
Support Fax	+49-2102-959911
Online support	http://qr.asus.com/techserv

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

FC

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 : TUF Z270 MARK 2

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__

Signature : *Steve Chang*

Date : __Oct. 31, 2016__

Ver. 140331