Pro WS X570-ACE

Motherboard

E15611
Revised Edition V2
June 2019

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Contents

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:

- **Chapter 1: Product Introduction**

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

- **Chapter 2: BIOS Information**

  This chapter discusses changing system settings through the BIOS Setup menus.

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 (+).

Package contents

Check your motherboard package for the following items.

Motherboard	1 x ASUS Pro WS X570-ACE Motherboard
Cables	4 x Serial ATA 6.0Gb/s Cables
Accessories	1 x ASUS Q-Shield 1 x M.2 Screw Package 1 x VGA Holder (fan is purchased separately) 1 x ACC Activation Key Card
Application DVD	1 x Support DVD
Documentation	1 x User manual

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

ASUS Pro WS X570-ACE specifications summary

CPU	AMD AM4 Socket for 3rd and 2nd Gen AMD Ryzen™ / 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors* * **Refer to www.asus.com for the AMD CPU support list.**
Chipset	AMD X570 Chipset
Memory	**3rd Gen AMD Ryzen™ Processors** 4 x DIMM, max. 128GB, DDR4 4400(O.C.) / 4266(O.C.) / 4133(O.C.) / 4000(O.C.) / 3866(O.C.) / 3733(O.C.) / 3600(O.C.) / 3466(O.C.) / 3400(O.C.) / 3200 / 3000 / 2933 / 2800 / 2666 / 2400 / 2133 MHz, un-buffered memory **2nd Gen AMD Ryzen™ Processors** 4 x DIMM, max. 128GB, DDR4 3600(O.C.) / 3466(O.C.) / 3400(O.C.) / 3200(O.C.) / 3000(O.C.) / 2933 / 2800 / 2666 / 2400 / 2133 MHz, un-buffered memory **2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors** 4 x DIMM, max. 128GB, DDR4 3200(O.C.) / 3000(O.C.) / 2933 / 2800 / 2666 / 2400 / 2133 MHz, un-buffered memory **Dual channel memory architecture** * **Refer to www.asus.com for the Memory QVL (Qualified Vendors List).**
Expansion slots	**3rd Gen AMD Ryzen™ Processors** - 2 x PCI Express 4.0 x16 slots (single at x16 or dual at x8/x8 mode) **2nd Gen AMD Ryzen™ Processors** - 2 x PCI Express 3.0 x16 slots (single at x16 or dual at x8/x8 mode) **2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors** - 1 x PCI Express 3.0 x 16 slot (x8 mode) **AMD X570 chipset** - 1 x PCI Express 4.0 x 16 slots (max. at x8 mode) - 1 x PCI Express 4.0 x1 slot

(continued on the next page)

ASUS Pro WS X570-ACE specifications summary

Graphics	Integrated Graphics in the AMD Ryzen™ with Radeon™ Vega Graphics Processors Multi-VGA output support: DisplayPort/HDMI ports Supports DisplayPort 1.2 with max. resolution 4096 x 2160@ 60Hz Supports HDMI 2.0b with max. resolution 4096 x 2160 @24Hz / 2560 x 1600 @ 60Hz
Multi-GPU support	**3rd and 2nd Gen AMD Ryzen™ Processors** Supports NVIDIA® 2-Way SLI™ Technology Supports AMD® 3-Way CrossFireX™ Technology **2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors** Supports AMD® 2-Way CrossFireX™ Technology
Storage	**3rd Gen AMD Ryzen™ Processors** - 1 x M.2_1 socket 3 with M Key, Type 2242/2260/2280/22110 (PCIE 4.0 x 4 and SATA modes) storage devices support **2nd Gen AMD Ryzen™ / 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors** - 1 x M.2_1 socket 3 with M Key, Type 2242/2260/2280/22110 (PCIE 3.0 x 4 and SATA modes) storage devices support **AMD X570 chipset** - M.2_2 socket 3* with M Key, Type 2242/2260/2280 (PCIE 4.0 x 2) storage devices support - 4 x Serial ATA 6.0 Gb/s connectors with RAID 0, RAID 1 and RAID 10 support - 1 x U.2 connector (supports U.2 NVMe device) *** The M.2_2 socket shares PCIe lanes with PCIeX1_1; when PCIeX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1.**
LAN	Realtek® RTL8117 Intel® I211-AT Gigabit LAN
Audio	Realtek® S1220A 8-channel high definition audio CODEC featuring Crystal Sound 3 - Separate layer for left and right track, ensuring both sound deliver equal quality - Impedance sense for front and rear headphone outputs - Audio shielding ensures precise analog/digital separation and greatly reduced multi-lateral interference - EMI protection cover to prevent electrical noise to affect the amplifier quality - Premium Japan-made audio capacitors provides warm, natural, and immersive sound with exceptional clarity and fidelity - High quality 120dB SNR stereo playback output (Line-out@back) & 113dB SNR input (Line-in) support - Supports up to 32-Bit/192kHz playback* - Supports jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O *** Due to limitations in HDA bandwidth, 32-Bit/192kHz is not supported for 8-Channel audio.**

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ASUS Pro WS X570-ACE specifications summary

ASUS Exclusive Features	**5-Way Optimization by Dual Intelligent Processors 5** - 5-Way Optimization tuning key perfectly consolidates TPU, EPU, DIGI+ VRM, Fan Expert 4, and Turbo App - DIGI+ VRM: Digital power design with Dr. MOS - Fan Xpert 4: Fan Auto Tuning function and multiple thermistors selection for optimized system cooling control - TPU - EPU - Turbo App: system performance tuning, network priority, and audio scene configuration for selected applications. **Procool II Power connector design** **ASUS OptiMem** **UEFI BIOS** - CrashFree BIOS 3 - EZ Flash 3 - EZ Tuning Wizard **ASUS Exclusive Features** - ASUS NODE: hardware control interface - Turbo LAN - ASUS Ai Charger - ASUS AI Suite 3 - ASUS Server Management Application **ASUS SafeSlot** - Protect your graphics card Investment **ASUS 5X Protection III** - ASUS LANGuard: Protects against LAN surges, lightning strikes and static-electricity discharges! - ASUS Overvoltage Protection: World-class circuit-protecting power design - ASUS Stainless-Steel Back I/O: 3X corrosion-resistance for greater durability! - ASUS DRAM Overcurrent Protection: Enhanced DRAM overcurrent protection - ASUS ESD Guards - Enhanced ESD protection - DIGI+ VRM **Q-Design** - ASUS Q-Shield - ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) - ASUS Q-Slot - ASUS Q-DIMM **Out-of-band Management** - BIOS Update Indicator LED - LAN Initialization Indicator LED

(continued on the next page)

ASUS Pro WS X570-ACE specifications summary

USB	**3rd Gen AMD Ryzen™ Processors** - 3 x USB 3.2 Gen 1 ports (2 ports at back panel[blue], 1 port at mid-board) **2nd Gen AMD Ryzen™ / 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors** - 3 x USB 3.2 Gen 1 ports (2 ports at back panel[blue], 1 port at mid-board) **AMD X570 chipset:** - 5 x USB 3.2 Gen 2 ports (5 ports at back panel, 4 type A+ 1 type C) - 3 x USB 3.2 Gen 1 ports (3 ports at mid-board) - 4 x USB 2.0 ports at mid-board
ASUS Quiet Thermal Solution	**Quiet Thermal Design:** - ASUS Fan Xpert 4 - Chipset & MOS Heat-sink with heatpipe, M.2 Heat-sink, and built-in PCH fan solution
Back Panel I/O Ports	1 x DisplayPort 1 x HDMI port 1 x Intel LAN (RJ45) port 1 x Realtek LAN (RJ45) port 5 x USB 3.2 Gen 2 ports (teal blue, 4 x Type-A, 1 x Type-C) 2 x USB 3.2 Gen 1 ports (Type-A) 1 x Optical S/PDIF out 5 x Audio Jacks (Line in, Front Speaker Out, Mic in, Center/Subwoofer, Rear Speaker Out)

(continued on the next page)

ASUS Pro WS X570-ACE specifications summary

Internal I/O Connectors	2 x USB 3.2 Gen 1 connector supporting additional 4 USB ports 2 x USB 2.0 connectors support additional 4 USB ports 1 x M.2 Socket 3 for M Key, type 2242/2260/2280/22110 devices support, (both SATA & PCIE mode) 1 x M.2 Socket 3 for M Key, type 2242/2260/2280 devices support, (PCIE mode) 4 x SATA 6.0Gb/s connectors (gray) 1 x 4-pin CPU fan connector 1 x 4-pin CPU_OPT fan connector 1 x 4-pin AIO_PUMP connector 3 x 4-pin Chassis Fan connectors 1 x Front panel audio connector (AAFP) 1 x COM connector 1 x 24-pin EATX Power connector 1 x 8-pin EATX 12V Power connector 1 x System Panel 1 x Node connector 1 x Clear CMOS header 1 x RTL8117 reset password header 1 x T_Sensor Header 1 x Debug Header
BIOS	256 Mb Flash ROM, UEFI AMI BIOS, PnP, SMBIOS 3.2, ACPI 6.2, 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, F9 Search and ASUS DRAM SPD (Serial Presence Detect) memory information
Manageability	WOL by PME, PXE
Support DVD	Drivers ASUS Utilities EZ Update Anti-virus software (OEM version)
OS Support	Windows® 10 64-bit RHEL 7.4 Ubuntu
Form factor	ATX Form Factor, 12"x 9.6" (30.5 cm x 24.4 cm)

Specifications are subject to change without notice.

Product Introduction

1

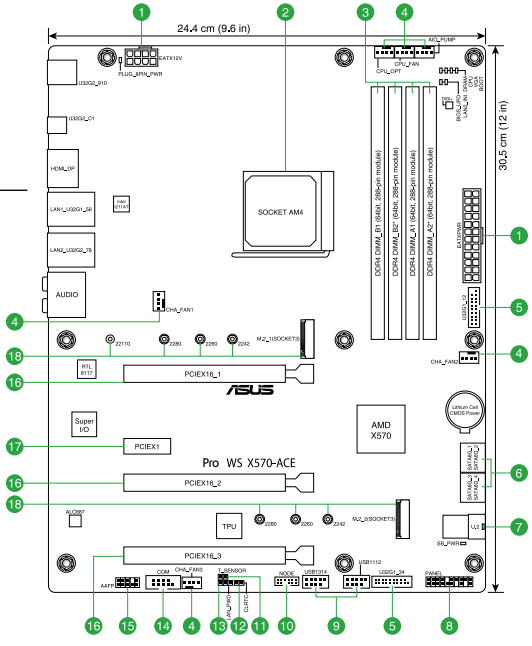
1.1 Before you proceed

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.
- 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.

1.2 Motherboard overview

Place this side towards the rear of the chassis



Unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

1.2.1 Layout contents

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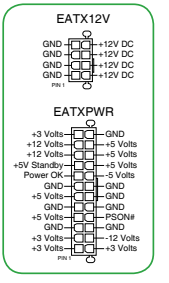
1 **ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)**

Correctly orient the ATX power supply plugs into these connectors and push down firmly until the connectors completely fit.



- The 8-pin Power Plug LED lights up to indicate that the 8-pin power plug is not connected.
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W. This PSU type has 24-pin and 8-pin power plugs.
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or may not boot up if the power is inadequate.

2 AMD AM4 CPU socket

The motherboard comes with an AM4 socket designed for AMD AM4 Socket for 3rd and 2nd Gen AMD Ryzen™ / 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors.

For more details, refer to **1.3 Central Processing Unit (CPU)**.

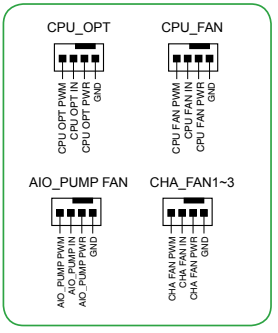
3 DDR4 DIMM slots

Install 2 GB, 4 GB, 8 GB, 16 GB, and 32 GB unbuffered DDR4 DIMMs into these DIMM sockets.

For more details, refer to **1.4 System memory**.

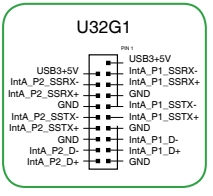
4 CPU, CPU optional, chassis, and AIO pump fan connectors (4-pin CPU_FAN, 4-pin CPU_OPT, 4-pin CHA_FAN1~3, 4-pin AIO_PUMP FAN)

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



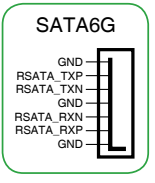
5 USB 3.2 Gen 1 connector (20-1 pin U32G1_12; U32G1_34)

Connect a USB 3.2 Gen 1 module to any of these connectors for additional USB 3.2 Gen 1 front or rear panel ports. These connectors comply with USB 3.2 Gen 1 specifications and provides faster data transfer speeds of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0



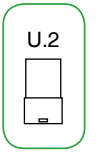
6 SATA 6Gb/s connector (7-pin SATA6G_1-4)

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.



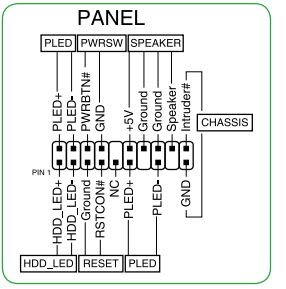
7 Mini-SAS HD connector (U.2)

The Mini-SAS HD connector allows you to connect a Mini-SAS HD cable to support configurations such as U.2 devices or four SATA devices.



8 System panel connector (20-3 pin PANEL)

This connector supports several chassis-mounted functions.



- **System power LED (4-pin PWR_LED)**

  This 4-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.

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

  The 2-pin or 3-1 pin connector is for the system power LED.

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

  This 2-pin connector is for the HDD Activity LED.

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

  This 4-pin connector is for the chassis-mounted system warning speaker.

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

  This connector is for the system power button.

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

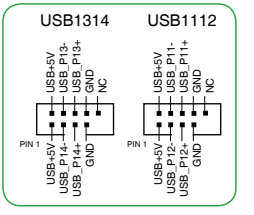
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

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

  This connector is for a chassis-mounted intrusion detection sensor or switch.

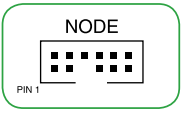
9 USB 2.0 connector (10-1 pin USB1112; USB1314)

Connect a USB module cable to this connector, then install the module to a slot opening at the back of the system chassis. This USB connectors comply with USB 2.0 specifications and supports up to 480Mbps connection speed.



10 Node connector (12-1 pin NODE)

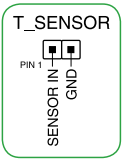
The Node connector allows you to connect a compatible PSU or control a compatible fan extension card.



Visit www.asus.com for more information about the devices and the latest compatibility list.

11 Thermal Sensor connector (2-pin T_SENSOR)

The Thermal Sensor connector allows you to connect a sensor to monitor the temperature of the devices and the critical components inside the motherboard. Connect the thermal sensor and place it on the device or the motherboard's component to detect its temperature.

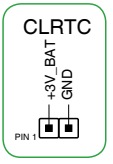


12 Clear RTC RAM (2-pin CLRTC)

This header allows you to clear the CMOS RTC RAM data of the system setup information such as date, time, and system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Use a metal object such as a screwdriver to short the two pins.
3. Plug the power cord and turn ON the computer.
4. Hold down the <**Del**> key during the boot process and enter BIOS setup to re-enter data.



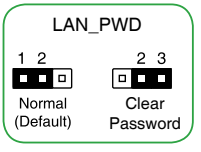
If the steps above do not help, remove the onboard battery and short the two pins again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

13 Clear LAN Password (3-pin LAN_PWD)

This jumper allows you to clear the LAN password.

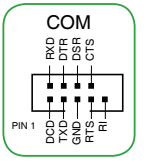
To erase the LAN Password:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5-10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.



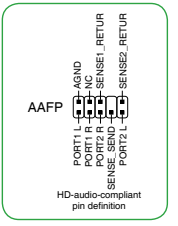
14 Serial port connector (10-1 pin COM)

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



15 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 standard. Connect one end of the front panel audio I/O module cable to this connector.



16 PCI Express 3.0/2.0 x16 slots

This motherboard supports three PCI Express 3.0/2.0 x16 graphic cards that comply with the PCI Express specifications. Actual PCI Express speeds varies per BIOS settings.

17 PCI Express 3.0/2.0 x1 slots

This motherboard has two PCI Express 3.0/2.0 x1 slots that support PCI Express x1 network cards, SCSI cards, and other cards that comply with the PCI Express specifications.

PCIe operating mode

3rd Gen AMD Ryzen™ Processors

Slot Description	PCIe operating mode		
	Single VGA / PCIe card	Dual VGA / PCIe card	Triple VGA / PCIe card
PCIe x16_1	x16 (PCIe 4.0)	x8 (PCIe 4.0)	x8 (PCIe 4.0)
PCIe x16_2	N/A	x8 (PCIe 4.0)	x8 (PCIe 4.0)
PCIe x16_3	N/A	N/A	x8 (PCIe 4.0)
M.2_1 (PCIe Mode)	x4 (PCIe 4.0)	x4 (PCIe 4.0)	x4 (PCIe 4.0)
M.2_1 (SATA Mode)	Support	Support	Support
M.2_2 (PCIe Mode)	x2 (PCIe 4.0)	x2 (PCIe 4.0)	x2 (PCIe 4.0)
M.2_2 (SATA Mode)	N/A	N/A	N/A

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2nd Gen AMD Ryzen™ Processors

Slot Description	PCIe operating mode		
	Single VGA / PCIe card	Dual VGA / PCIe card	Triple VGA / PCIe card
PCIe x16_1	x16 (PCIe 3.0)	x8 (PCIe 3.0)	x8 (PCIe 3.0)
PCIe x16_2	N/A	x8 (PCIe 3.0)	x8 (PCIe 3.0)
PCIe x16_3	N/A	N/A	x8 (PCIe 4.0)
M.2_1 (PCIe Mode)	x4 (PCIe 3.0)	x4 (PCIe 3.0)	x4 (PCIe 3.0)
M.2_1 (SATA Mode)	Support	Support	Support
M.2_2 (PCIe Mode)	x2 (PCIe 4.0)	x2 (PCIe 4.0)	x2 (PCIe 4.0)
M.2_2 (SATA Mode)	N/A	N/A	N/A

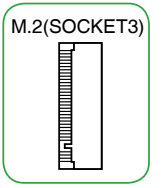
2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics

Slot Description	PCIe operating mode		
	Single VGA / PCIe card	Dual VGA / PCIe card	Triple VGA / PCIe card
PCIe x16_1	x8 (PCIe 3.0)	x8 (PCIe 3.0)	N/A
PCIe x16_2	N/A	N/A	N/A
PCIe x16_3	N/A	x8 (PCIe 4.0)	N/A
M.2_1 (PCIe Mode)	x4 (PCIe 3.0)	x4 (PCIe 3.0)	x4 (PCIe 3.0)
M.2_1 (SATA Mode)	Support	Support	Support
M.2_2 (PCIe Mode)	x2 (PCIe 4.0)	x2 (PCIe 4.0)	x2 (PCIe 4.0)
M.2_2 (SATA Mode)	N/A	N/A	N/A

- We recommend that you provide sufficient power when running CrossFireX™ or SLI® mode.
- Ensure to connect the 8-pin and 4-pin power plugs when running CrossFireX™ or SLI® mode.
- Connect a chassis fan to the chassis fan connectors when using multiple graphics cards for better thermal environment.

18 M.2 sockets (M.2_1(SOCKET3); M.2_2 (SOCKET3))

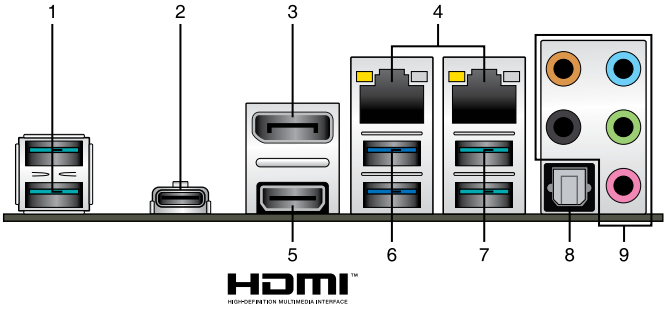
These sockets allow you to install M.2 (NGFF) SSD modules.



- For 3rd Gen AMD Ryzen™ Processors, the M.2_1 supports PCIe 4.0 x4 and SATA modes M key design and type 2242/2260/2280/22110 storage devices.
- For 2nd and 1st Gen AMD Ryzen™ / 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors, the M.2_1 supports PCIe 3.0 x4 and SATA modes M key design and type 2242/2260/2280/22110 storage devices.
- For AMD X570 chipset, the M.2_2 supports PCIe 4.0 x2 mode M key design and type 2242/2260/2280 storage devices.
- The M.2_2 socket shares PCIe lanes with PCIeX1_1; when PCIeX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1.

The M.2 SSD module is purchased separately.

1.2.2 Rear panel connectors



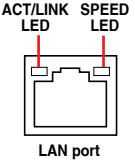
1. **USB 3.2 Gen 2 Type-A ports**. These 9-pin Universal Serial Bus 3.2 (USB 3.2) ports are for USB 3.2 Gen 2 devices.

- USB 3.2 Gen 1/Gen 2 devices can only be used as data storage only.
- We strongly recommend that you connect your devices to ports with matching data transfer rate. Please connect your USB 3.2 Gen 1 devices to USB 3.2 Gen 1 ports and your USB 3.2 Gen 2 devices to USB 3.2 Gen 2 ports for faster and better performance for your devices.

2. **USB 3.2 Gen 2 Type-C™ port**. This 24-pin Universal Serial Bus (USB) port is for USB (Type C) devices.
3. **DisplayPort.** This port allows you to connect your motherboard to an external display.
4. **LAN (RJ-45) port.** These ports allow Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

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



5. **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-ray, and other protected content.

6. **USB 3.2 Gen 1 Type-A port**. These 9-pin Universal Serial Bus (USB) ports are for USB 3.2 Gen 1 devices.

- USB 3.2 Gen 1 devices can only be used for data storage.
- We strongly recommend that you connect USB 3.2 Gen 1 devices to USB 3.2 Gen 1 ports for faster and better performance from your USB 3.2 Gen 1 devices.

7. **USB 3.2 Gen 2 Type-A ports**. These 9-pin Universal Serial Bus 3.2 (USB 3.2) ports are for USB 3.2 Gen 2 devices.

- USB 3.2 Gen 1/Gen 2 devices can only be used as data storage only.
- We strongly recommend that you connect your devices to ports with matching data transfer rate. Please connect your USB 3.2 Gen 1 devices to USB 3.2 Gen 1 ports and your USB 3.2 Gen 2 devices to USB 3.2 Gen 2 ports for faster and better performance for your devices.

8. **Optical S/PDIF OUT port.** This port allows you to connect amplified speakers, headphones, or Sony/Phillips Digital Interconnect Format (S/PDIF) compliant devices.

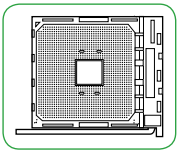
9. **Audio I/O ports.** Refer to the audio configuration table below for the function of the audio ports in 2, 4, 5.1, or 7.1-channel configuration.

Audio 2, 4, 5.1, or 7.1-channel configuration

Port	Headset 2-channel	4-channel	5.1-channel	7.1-channel
Light Blue	Line In	Line In	Line In	Side Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
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

1.3 Central Processing Unit (CPU)

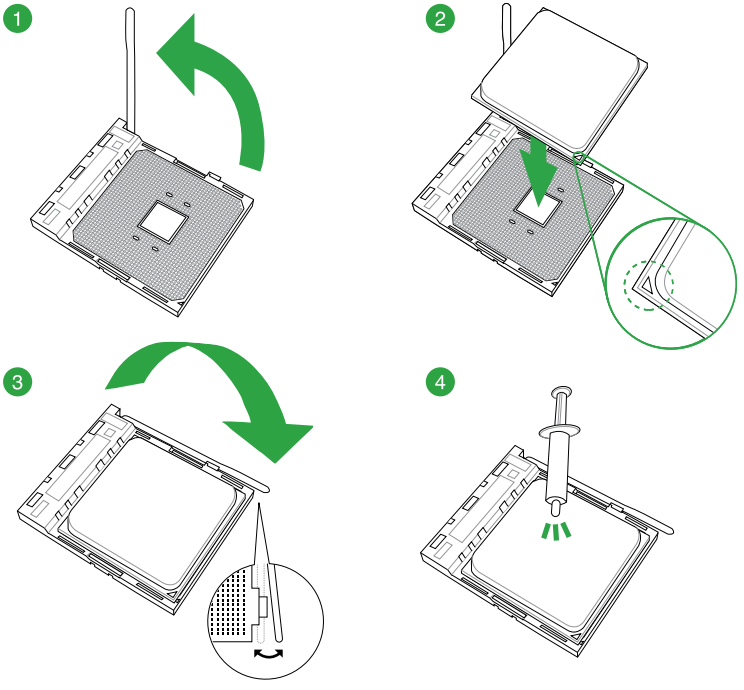
The motherboard comes with an AM4 socket designed for AMD AM4 Socket for 3rd and 2nd Gen AMD Ryzen™ / 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors.



Unplug all power cables before installing the CPU.

- The AM4 socket has a different pinout design. Ensure that you use a CPU designed for the AM4 socket.
- The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the CPU and damaging the CPU.
- Ensure that all power cables are unplugged before installing the CPU.

Installing the CPU

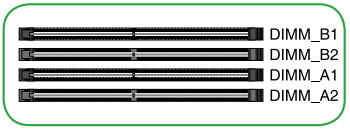


Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

1.4 System memory

Overview

This motherboard comes with four Double Data Rate 4 (DDR4) Dual Inline Memory Module (DIMM) sockets. The figure illustrates the location of the DDR4 DIMM sockets:

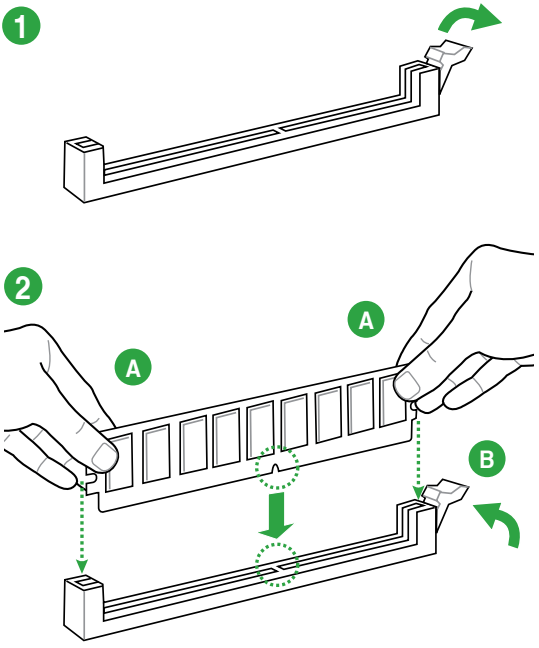


Channel	Sockets
Channel A	DIMM_A1 & DIMM_A2
Channel B	DIMM_B1 & DIMM_B2

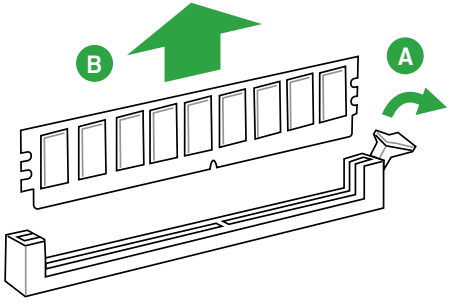
- Start installing the DIMMs in slots A2 and B2.
- Always install DIMMs with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.

- 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 or overclocking condition.
- Visit the ASUS website for the latest QVL.

Installing a DIMM



To remove a DIMM



BIOS Information

2

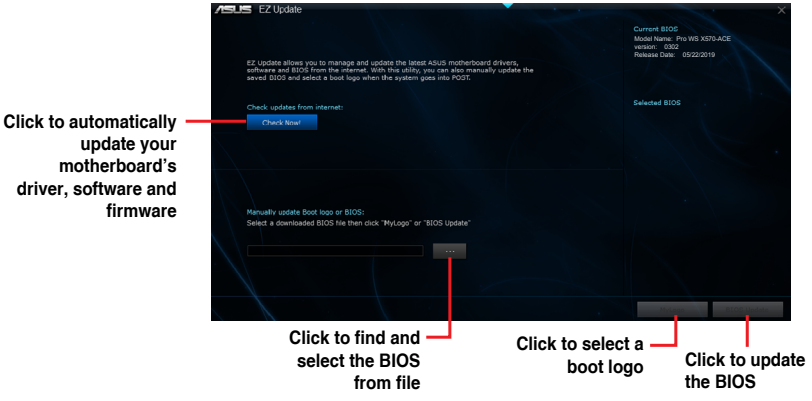
2.1 Managing and updating your BIOS

Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update utility.

2.1.1 EZ Update

EZ Update is a utility that allows you to automatically update your motherboard's softwares, drivers and the BIOS version easily. With this utility, you can also manually update the saved BIOS and select a boot logo when the system goes into POST.

To launch EZ Update, click **EZ Update** on the AI Suite 3 main menu bar.

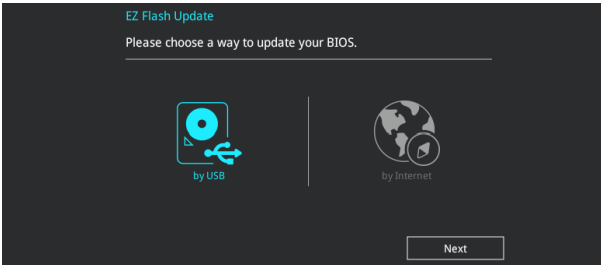


EZ Update requires an Internet connection either through a network or an ISP (Internet Service Provider).

2.1.2 ASUS EZ Flash 3

The 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.

- 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 **2.3 Exit Menu** for details.
- Check your local Internet connection before updating through the Internet.



To update the BIOS using EZ Flash 3:

1. Enter the **Advanced Mode** of the BIOS setup program. Go to the **Tool** menu to select ASUS EZ Flash 3 and press <Enter> to enable it.
2. Follow the steps below to update the BIOS via USB or Internet.

   Via USB

   a) Insert the USB flash disk that contains the latest BIOS file to the USB port, then select **by USB**.

   b) Press <Tab> to switch to the **Drive** field.

   c) Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.

   d) Press <Tab> to switch to the **Folder** field.

   e) Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process.

   Via the Internet

   a) Select **by Internet**.

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

   c) Follow the onscreen instructions to complete the update.

3. Reboot the system when the update process is done.

- ASUS EZ Flash 3 supports USB 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!

2.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 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 updated BIOS file.

- Before using this utility, rename the BIOS file in the removable device into **PROX570.CAP**.
- The BIOS file in the support DVD may not be the latest version. Download the latest BIOS file from the ASUS website at www.asus.com.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the support DVD to the optical drive or the USB flash drive that contains 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 utility automatically.
4. The system requires you to enter BIOS Setup to recover BIOS settings. 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!

2.2 BIOS setup program

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

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

Press <Delete> or <F2> during the Power-On Self Test (POST). If you do not press <Delete> or <F2>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

Press <Ctrl>+<Alt>+<Del> 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.

Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to force reset from a running operating system can cause damage to your data or system. We recommend you always shut down the system properly from the operating system.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website at **www.asus.com** to download the latest BIOS file for this motherboard.
- Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.
- If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the Exit menu or press hotkey F5. See section **2.3 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 **1.2 Motherboard overview** for information on how to erase the RTC RAM.

BIOS menu screen

The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. Press <F7> to change between the two modes.

2.2.1 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, fan profile and boot device priority. To access the Advanced Mode, click **Advanced Mode(F7)** or press <F7>.

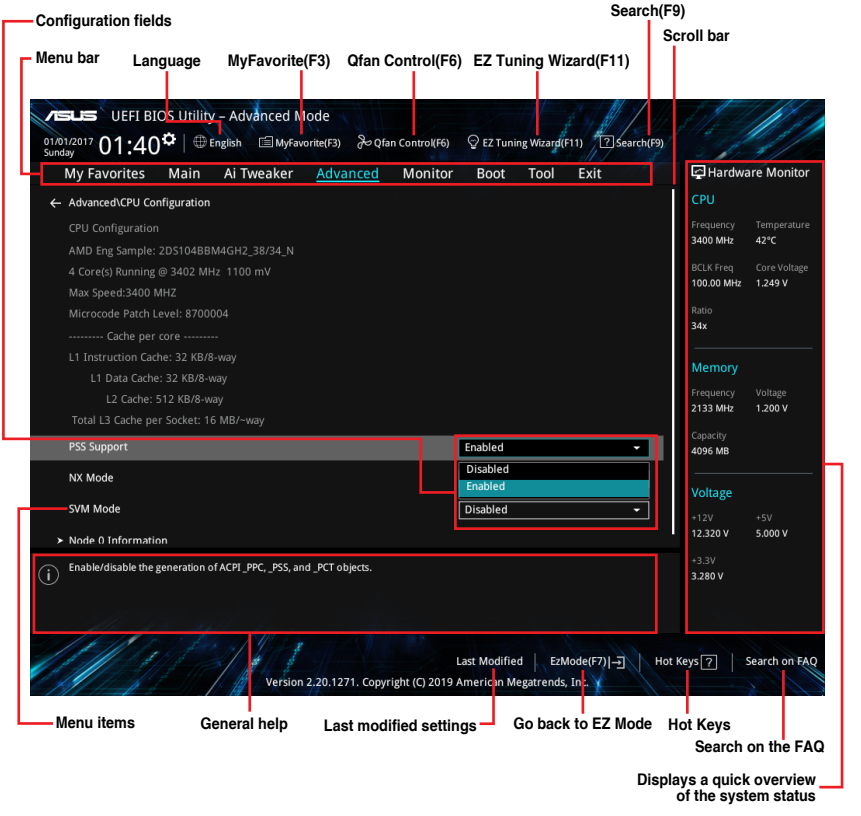
The default screen for entering the BIOS setup program can be changed. Go to the **Setup Mode** item in the **Boot menu**.

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

2.2.2 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 access the EZ Mode, click **EzMode(F7)** or press <F7>.



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.

My Favorites (F3)

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

Q-Fan Control (F6)

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

Search (F9)

This button allows you to search for BIOS items by entering its name, enter the item name to find the related item listing.

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:

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.

Hot keys

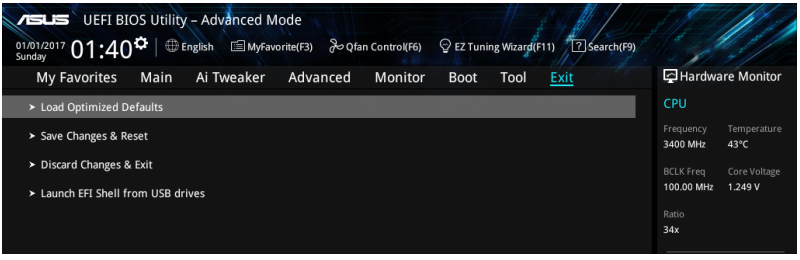
This button contains the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

Last Modified button

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

2.3 Exit menu

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



Load Optimized Defaults

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

Save Changes & Reset

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

Discard Changes and 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 option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available USB devices.

Appendix

Notices

FCC Compliance Information

Responsible Party:	Asus Computer International
Address:	48720 Kato Rd., Fremont, CA 94538, USA
Phone / Fax No:	(510)739-3777 / (510)608-4555

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.

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 the 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 into 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.

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

This device complies with Innovation, Science and Economic Development Canada licence 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.

CAN ICES-3(B)/NMB-3(B)

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

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CAN ICES-3(B)/NMB-3(B)

VCCI: Japan Compliance Statement

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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

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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

Cancer and Reproductive Harm -
www.P65Warnings.ca.gov

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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 cerinţelor esenţiale şi altor prevederi relevante ale directivelor conexe. Textul complet al declaraţiei de conformitate a Uniunii Europene se găseşte 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

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