Pro WS X570-ACE

E15611 Revised Edition V2 June 2019

Copyright © 2019 ASUSTeK COMPUTER INC. All Rights Reserved.

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK COMPUTER INC. ("ASUS").

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification of alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

ASUS PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ASUS, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF ASUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS MANUAL OR PRODUCT.

SPECIFICATIONS AND INFORMATION CONTAINED IN THIS MANUAL ARE FURNISHED FOR INFORMATIONAL USE ONLY, AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY ASUS. ASUS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS MANUAL, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

Offer to Provide Source Code of Certain Software

This product contains copyrighted software that is licensed under the General Public License ("GPL"), under the Lesser General Public License Version ("LGPL") and/or other Free Open Source Software Licenses. Such software in this product is distributed without any warranty to the extent permitted by the applicable law. Copies of these licenses are included in this product.

Where the applicable license entitles you to the source code of such software and/or other additional data, you may obtain it for a period of three years after our last shipment of the product, either

(1) for free by downloading it from https://www.asus.com/support/

or

(2) for the cost of reproduction and shipment, which is dependent on the preferred carrier and the location where you want to have it shipped to, by sending a request to:

ASUSTEK Computer Inc. Legal Compliance Dept. 15 Li Te Rd., Beitou, Taipei 112 Taiwan

In your request please provide the name, model number and version, as stated in the About Box of the product for which you wish to obtain the corresponding source code and your contact details so that we can coordinate the terms and cost of shipment with you.

The source code will be distributed WITHOUT ANY WARRANTY and licensed under the same license as the corresponding binary/object code.

This offer is valid to anyone in receipt of this information.

ASUSTeK is eager to duly provide complete source code as required under various Free Open Source Software licenses. If however you encounter any problems in obtaining the full corresponding source code we would be much obliged if you give us a notification to the email address gpl@asus.com, stating the product and describing the problem (please DO NOT send large attachments such as source code archives, etc. to this email address).

Contents

Safet	y informati	ion	iv
Abou	t this guid	e	iv
Pack	age conten	nts	v
ASUS	S Pro WS X	570-ACE specifications summary	v i
Chap	oter 1:	Product Introduction	
1.1	Before	you proceed	1-1
1.2	Motherl	board overview	1-1
1.3	3 Central Processing Unit (CPU)		1-11
1.4	System	memory	1-12
Chap	oter 2:	BIOS Information	
2.1	Managi	ng and updating your BIOS	2-1
2.2	BIOS se	etup program	2-4
2.3	Exit me	nu	2-9
Appe	endix		
Notic	es		A-1

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></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.</enter>
<key1> + <key2> + <key3></key3></key2></key1>	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		
	1 x ASUS Q-Shield	
Accessories	1 x M.2 Screw Package	
Accessories	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 3 rd and 2 rd Gen AMD Ryzen [™] / 2 rd and 1 st Gen AMD Ryzen [™] with Radeon [™] Vega Graphics Processors*			
	* Refer to www.asus.com for the AMD CPU support list.			
Chipset	AMD X570 Chipset			
	3 rd 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			
	2 nd Gen AMD Ryzen™ Processors			
Memory	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			
	2 nd and 1 st 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).			
	3 rd Gen AMD Ryzen™ Processors			
	- 2 x PCI Express 4.0 x16 slots (single at x16 or dual at x8/x8 mode)			
	2 nd Gen AMD Ryzen™ Processors			
	- 2 x PCI Express 3.0 x16 slots (single at x16 or dual at x8/x8 mode)			
Expansion slots	2 nd and 1 st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors			
31013	- 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)

Multi-VGA output support: DisplayPort/HDMI ports Supports DisplayPort 1.2 with max. resolution 4096 x 2160 @ 60Hz Supports HDMI 2.0 b with max. resolution 4096 x 2160 @ 24Hz / 2560 x 1600 @ 60Hz Multi- GPU Support Supports NVIDIA® 2-Way SLI™ Technology Supports AMD® 3-Way CrossFireX™ Technology 2 nd and 1 nd Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors Supports AMD® 2-Way CrossFireX™ Technology 3 nd 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 2 nd Gen AMD Ryzen™ / 2 nd and 1 nd 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 PCle lanes with PCIeX1_1; when PCIeX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		
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 3rd and 2rd Gen AMD Ryzen™ Processors Supports NVIDIA® 2-Way SLI™ Technology Supports AMD® 3-Way CrossFireX™ Technology Supports AMD® 3-Way CrossFireX™ Technology 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 2rd 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 -2rd Gen AMD Ryzen™ 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 -4 x MD X570 chipset -M.2_2 socket 3r with M Key, Type 2242/2260/2280/2210 (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) -1 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® RTLB117 Intel® 1211-AT Gigabit LAN 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 multilateral 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 jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		Integrated Graphics in the AMD Ryzen™ with Radeon™ Vega Graphics Processors
Supports DisplayPort 1.2 with max. resolution 4096 x 2160 @ 24Hz / 2560 x 1600 @ 60Hz Supports AMDMI 2.0b with max. resolution 4096 x 2160 @ 24Hz / 2560 x 1600 @ 60Hz 3rd and 2rd Gen AMD RyzenTM Processors Supports NVIDIA® 2-Way SLITM Technology Supports AMD® 3-Way CrossFireXTM Technology 2rd and 1rd Gen AMD RyzenTM With RadeonTM Vega Graphics Processors Supports AMD® 2-Way CrossFireXTM Technology 3rd Gen AMD RyzenTM 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 2rd Gen AMD RyzenTM / 2rd and 1st Gen AMD RyzenTM with RadeonTM 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 PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. 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 multilateral 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 jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O	Graphics	,
Supports NVIDIA® 2-Way SLI™ Technology Supports AMD® 3-Way CrossFireX™ Technology Supports AMD® 3-Way CrossFireX™ Technology 2nd and 1nd Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors Supports AMD® 2-Way CrossFireX™ Technology 3nd 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 1nd 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. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 32-8it/192kHz playback* - Supports jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		'' '
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 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 - 1 x J.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 J.2 connector (supports U.2 NVMe device) 1 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. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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 jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		
Supports AMD® 3-Way CrossFireX™ Technology 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors Supports AMD® 2-Way CrossFireX™ Technology 3nd 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. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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 - 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		·
Support 2nd and 1st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors Supports AMD® 2-Way CrossFireX™ Technology 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 PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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 ip to 32-Bit/192kHz playback* - Supports jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O	Multi-	Supports NVIDIA® 2-Way SLI™ Technology
Supports AMD® 2-Way CrossFireXTM Technology 3rd Gen AMD RyzenTM 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 2rd Gen AMD RyzenTM / 2rd and 1st Gen AMD RyzenTM with RadeonTM 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 PCle lanes with PCIeX1_1; when PCIeX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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		**
Storage 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 2rd Gen AMD Ryzen™ / 2rd 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) ¹ The M.2_2 socket shares PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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	support	2 nd and 1 st Gen AMD Ryzen™ with Radeon™ Vega Graphics Processors
Storage Storage 1.1 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 1.1 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. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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		Supports AMD® 2-Way CrossFireX™ Technology
(PCIE 4.0 x 4 and SATA modes) storage devices support 2 nd Gen AMD Ryzen™ / 2 nd and 1 st 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. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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		3 rd Gen AMD Ryzen™ Processors
Storage Storage 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 PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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		
Storage Storage 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 PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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		, · · · · · · · · · · · · · · · · · · ·
Storage (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. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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 jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		
Storage (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. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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 jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		- 1 x M.2 1 socket 3 with M Key, Type 2242/2260/2280/22110
AMD X5/0 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. Realtek® RTL8117 Intel® 1211-AT Gigabit LAN 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 multilateral 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	Storogo	
(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 PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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	Storage	AMD X570 chipset
- 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 PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PCIE 4.0 x 1. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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		
- 1 x U.2 connector (supports U.2 NVMe device) * The M.2 2 socket shares PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PClE 4.0 x 1. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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		, , , , , , , , , , , , , , , , , , , ,
* The M.2_2 socket shares PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PClE 4.0 x 1. Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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		· · · · · · · · · · · · · · · · · · ·
Realtek® RTL8117 Intel® I211-AT Gigabit LAN 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 multilateral 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		* The M.2_2 socket shares PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2
Intel® I211-AT Gigabit LAN 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 multilateral 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		
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	LAN	
- 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		-
- 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		· · · · · · · · · · · · · · · · · · ·
- 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		
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		· · ·
- 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		
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		- EMI protection cover to prevent electrical noise to affect the amplifier quality
 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 	Audio	
- Supports jack-detection, multi-streaming, front panel jack-retasking (MIC) - Optical S/PDIF out port at back I/O		
- Optical S/PDIF out port at back I/O		- Supports up to 32-Bit/192kHz playback*
		- Supports jack-detection, multi-streaming, front panel jack-retasking (MIC)
* Due to limitations in HDA bandwidth. 32-Bit/192kHz is not supported for 8-Channel audio.		- Optical S/PDIF out port at back I/O
11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		* Due to limitations in HDA bandwidth, 32-Bit/192kHz is not supported for 8-Channel audio.

(continued on the next page)

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
- FPU
- 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 Al 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 staticelectricity 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 Exclusive Features

	3rd Gen AMD Ryzen™ Processors
	·
	- 3 x USB 3.2 Gen 1 ports (2 ports at back panel[blue], 1 port at mid-board)
	2 nd Gen AMD Ryzen™ / 2 nd and 1 st Gen AMD Ryzen™ with Radeon™ Vega
	Graphics Processors
USB	- 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	Quiet Thermal Design:
Thermal	- ASUS Fan Xpert 4
Solution	- Chipset & MOS Heat-sink with heatpipe, M.2 Heat-sink, and built-in PCH fan solution
	1 x DisplayPort
	1 x HDMI port
	1 x Intel LAN (RJ45) port
	1 x Realtek LAN (RJ45) port
Back Panel I/O Ports	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)

	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
Internal I/O	3 x 4-pin Chassis Fan connectors
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
	Drivers
Comment DVD	ASUS Utilities
Support DVD	EZ Update
	Anti-virus software (OEM version)
	Windows® 10 64-bit
OS Support	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

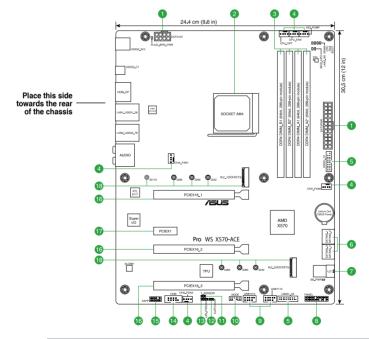
1.1 Before you proceed

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





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

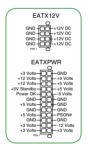
1.2.1 Layout contents

Connectors/Jumpers/Slots				
1.	ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	1-2		
2.	AMD AM4 CPU socket	1-3		
3.	DDR4 DIMM slots	1-3		
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)	1-3		
5.	USB 3.2 Gen 1 connector (20-1 pin U32G1_12; U32G1_34)	1-3		
6.	SATA 6Gb/s connector (7-pin SATA6G_1-4)	1-3		
7.	Mini-SAS HD connector (U.2)	1-4		
8.	System panel connector (20-3 pin PANEL)	1-4		
9.	USB 2.0 connector (10-1 pin USB1112; USB1314)	1-5		
10.	Node connector (12-1 pin NODE)	1-5		
11.	Thermal Sensor connector (2-pin T_SENSOR)	1-5		
12.	Clear RTC RAM (2-pin CLRTC)	1-5		
13.	Clear LAN Password (3-pin LAN_PWD)	1-5		
14.	Serial port connector (10-1 pin COM)	1-6		
15.	Front panel audio connector (10-1 pin AAFP)	1-6		
16.	PCI Express 4.0/3.0 x16 slots	1-6		
17.	PCI Express 3.0/2.0 x1 slots	1-6		
18.	M.2 sockets (M.2_1(SOCKET3); M.2_2 (SOCKET3))	1-8		



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.



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).

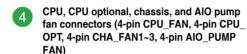


DDR4 DIMM slots

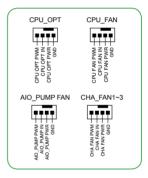
Install 2 GB, 4 GB, 8 GB, 16 GB, and 32 GB unbuffered DDR4 DIMMs into these DIMM sockets.



For more details, refer to 1.4 System memory.

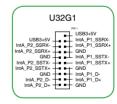


Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



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.



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

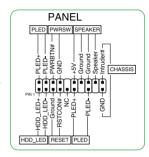


System panel connector (20-3 pin PANEL)

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)

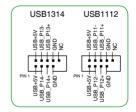
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

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.





Node connector (12-1 pin NODE)

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





Visit <u>www.asus.com</u> for more information about the devices and the latest compatibility list.



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.





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.
- Use a metal object such as a screwdriver to short the two pins.
- 3. Plug the power cord and turn ON the computer.
- 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.

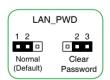


Clear LAN Password (3-pin LAN_PWD)

This jumper allows you to clear the LAN password.

To erase the LAN Password:

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



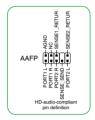
Serial port connector (10-1 pin COM)

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.



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.



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.

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

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

(continued on the next page)

2nd Gen AMD Ryzen™ Processors

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

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



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

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



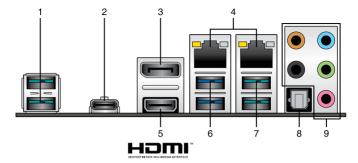


- For 3rd Gen AMD Ryzen[™] Processors, the M.2_1 supports PCle 4.0 x4 and SATA modes M key design and type 2242/2260/2280/22110 storage devices.
- For 2nd and 1st Gen AMD RyzenTM / 2nd and 1st Gen AMD RyzenTM with RadeonTM Vega Graphics Processors, the M.2_1 supports PCle 3.0 x4 and SATA modes M key design and type 2242/2260/2280/22110 storage devices.
- For AMD X570 chipset, the M.2_2 supports PCle 4.0 x2 mode M key design and type 2242/2260/2280 storage devices.
- The M.2_2 socket shares PCle lanes with PCleX1_1; when PCleX1_1 is occupied, M.2_2 only can only run at PClE 4.0 x 1.



The M.2 SSD module is purchased separately.

1.2.2 Rear panel connectors



 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.
- 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.
- 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		ACT
Status	Description		Description	L
Off	No link	OFF	10Mbps connection	l
Orange	Linked	ORANGE	100Mbps connection	
Orange (Blinking)	Data activity	GREEN	1Gbps connection	
Orange (Blinking then steady)	Ready to wake Wake up from S5 mode			'



 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. 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.
- 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.
- 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 RyzenTM / 2nd and 1st Gen AMD RyzenTM with RadeonTM Vega Graphics Processors.



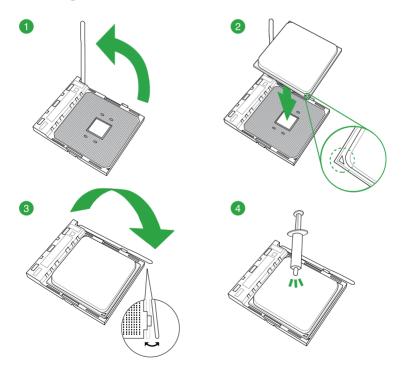


Unplug all power cables before installing the CPU.



- 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

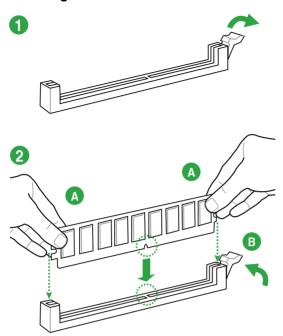


- Start installing the DIMMs in slots A2 and B2.
- Always install DIMMs with the same CAS Latency. For an optimum compatibility, we
 recommend that you install memory modules of the same version or data code (D/C)
 from the same vendor. Check with the vendor to get the correct memory modules.

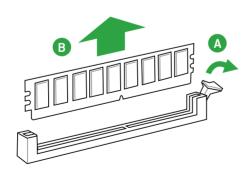


- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module.
 Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
- For system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



2.1 Managing and updating your BIOS

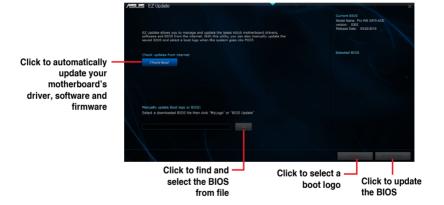


Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update utility.

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 Al 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:

- 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.
- Insert the support DVD to the optical drive or the USB flash drive that contains the BIOS file to the USB port.
- 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.
- 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>+ 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>+ 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 <u>www.asus.com</u> 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

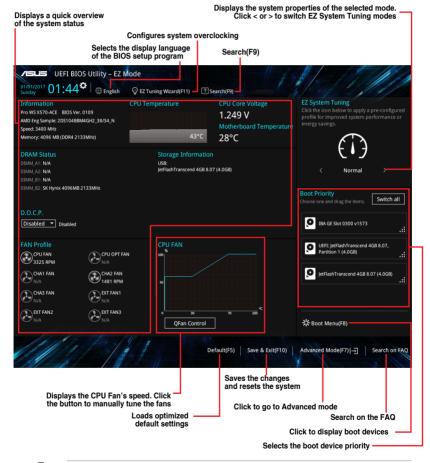
The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. Press <F7> to change between the two modes.

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**.





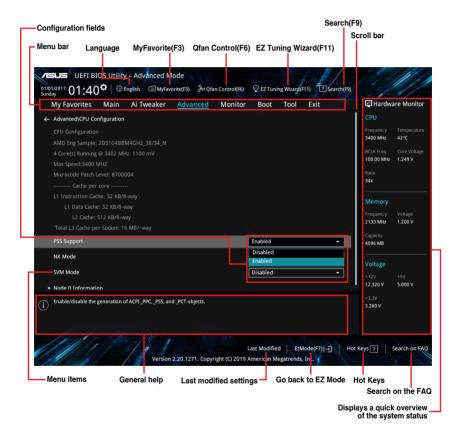
The boot device options vary depending on the devices you installed to the system.

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)

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

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.

A-2 Appendices

RFACH

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

Google™ License Terms

Copyright© 2019 Google Inc. All Rights Reserved.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at:

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

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

Deutsch ASUSTeK Computer Inc. erklärt hiermit, dass dieses Gerät mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der zugehörigen Richtlinien übereinstimmt. Der gesamte Text der EU-Konformitätserklärung ist verfügbar unter, www.asus.com/support

Italiano ASUSTeK Computer Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti con le direttive correlate. Il testo completo della dichiarazione di conformità UE è disponibile all'indirizzo: www.asus.com/support

Русский Компания ASUS заявляет, что это устройство соответствует основным требованиям и другим соответствующим условиям соответствующих директив. Подробную информацию, пожалуйста, смотрите на <u>www.asus.com/support</u>

Български С настоящото ASUSTEK Computer Inc. декларира, че това устройство е в съответствие със съществените изисквания и другите приложими постановления на свързаните директиви. Пълният текст на декларацията за съответствие на ЕС е достъпна на адрес: www.asus.com/support

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:

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: <u>www.asus.com/support</u>

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 συσκεινή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Το πλήρες κείμενο της δήλωσης συμβατότητας είναι διαθέσιμο στη διεύθυνση: <u>www.asus.com/support</u>

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 letőlthető: 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: <u>www.asus.com/support</u>

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. Pelny tekst deklaracji zgodności UE jest dostępny pod adresem: <u>www.asus.com/support</u>

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 ie 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 из: 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: <u>www.asus.com/support</u>

A-4 Appendices

ASUS contact information

ASUSTEK COMPUTER INC.

Address 4F, No. 150, Li-Te Road, Peitou, Taipei 112, Taiwan

Telephone +886-2-2894-3447 Fax +886-2-2890-7798 Web site www.asus.com

Technical Support

Telephone +86-21-38429911

Fax +86-21-5866-8722, ext. 9101# Online support http://qr.asus.com/techsery

ASUS COMPUTER INTERNATIONAL (America)

Address 48720 Kato Rd., Fremont, CA 94538, USA

Telephone +1-510-739-3777
Fax +1-510-608-4555
Web site http://www.asus.com/us/

Technical Support

Support fax +1-812-284-0883 Telephone +1-812-282-2787

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

ASUS COMPUTER GmbH (Germany and Austria)

Address Harkort Str. 21-23, 40880 Ratingen, Germany

Fax +49-2102-959931
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://gr.asus.com/techserv

·		

A-6 Appendices