
FATAL1TY
GAMING GEAR
ASRock
X470
Gaming K4
User Manual

Version 1.0
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"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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Fatal1ty Story

Who knew that at age 19, I would be a World Champion PC gamer. When I was 13, I actually played competitive billiards in professional tournaments and won four or five games off guys who played at the highest level. I actually thought of making a career of it, but at that young age situations change rapidly. Because I've been blessed with great hand-eye coordination and a grasp of mathematics (an important element in video gaming) I gravitated to that activity.

GOING PRO

I started professional gaming in 1999 when I entered the CPL (Cyberathlete Professional League) tournament in Dallas and won $4,000 for coming in third place. Emerging as one of the top players in the United States, a company interested in sponsoring me flew me to Sweden to compete against the top 12 players in the world. I won 18 straight games, lost none, and took first place, becoming the number one ranked Quake III player in the world in the process. Two months later I followed that success by traveling to Dallas and defending my title as the world's best Quake III player, winning the $40,000 grand prize. From there I entered competitions all over the world, including Singapore, Korea, Germany, Australia, Holland and Brazil in addition to Los Angeles, New York and St. Louis.

WINNING STREAK

I was excited to showcase my true gaming skills when defending my title as CPL Champion of the year at the CPL Winter 2001 because I would be competing in a totally different first person shooter (fps) game, Alien vs. Predator II. I won that competition and walked away with a new car. The next year I won the same title playing Unreal Tournament 2003, becoming the only three-time CPL champion of the year. And I did it playing a different game each year, something no one else has ever done and a feat of which I am extremely proud.

At QuakeCon 2002, I faced off against my rival ZeRo4 in one of the most highly anticipated matches of the year, winning in a 14 to (-1) killer victory. Competing at Quakecon 2004, I became the World's 1st Doom3 Champion by defeating Daler in a series of very challenging matches and earning $25,000 for the victory.

Since then Fatal1ty has traveled the globe to compete against the best in the world, winning prizes and acclaim, including the 2005 CPL World Tour Championship in New York City for a $150,000 first place triumph. In August 2007, Johnathan was awarded the first ever Lifetime Achievement Award in the four year history of the eSports-Award for "showing exceptional sportsmanship, taking part in shaping eSports into what it is today and for being the prime representative of this young sport. He has become the figurehead for eSports worldwide".

LIVIN' LARGE

Since my first big tournament wins, I have been a "Professional Cyberathlete", traveling the world and livin' large with lots of International media coverage on outlets such as MTV, ESPN and a 60 Minutes segment on CBS to name only a few. It's unreal - it's crazy. I'm living a dream by playing video games for a living. I've always been athletic and took sports like hockey and football very seriously, working out and training hard. This discipline helps me become a better gamer and my drive to be the best has opened the doors necessary to become a professional.

A DREAM

Now, another dream is being realized – building the ultimate gaming computer, made up of the best parts under my own brand. Quality hardware makes a huge difference in competitions…a couple more frames per second and everything gets really nice. It's all about getting the computer processing faster and allowing more fluid movement around the maps.

My vision for Fatal1ty hardware is to allow gamers to focus on the game without worrying about their equipment, something I've preached since I began competing. I don't want to worry about my equipment. I want to be there – over and done with - so I can focus on the game. I want it to be the fastest and most stable computer equipment on the face of the planet, so quality is what Fatal1ty Brand products represent.

Johnathan "Fatal1ty" Wendel

Contents

Chapter 1 Introduction

Thank you for purchasing ASRock Fatal1ty X470 Gaming K4 Series motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this documentation, Chapter 1 and 2 contains the introduction of the motherboard and step-by-step installation guides. Chapter 3 contains the operation guide of the software and utilities. Chapter 4 contains the configuration guide of the BIOS setup.

Because the motherboard specifications and the BIOS software might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock's website without further notice. If you require technical support related to this motherboard, please visit our website for specific information about the model you are using. You may find the latest VGA cards and CPU support list on ASRock's website as well. ASRock website http://www.asrock.com.

1.1 Package Contents

- ASRock Fatal1ty X470 Gaming K4 Series Motherboard (ATX Form Factor)
- ASRock Fatal1ty X470 Gaming K4 Series Quick Installation Guide
- ASRock Fatal1ty X470 Gaming K4 Series Support CD
- 1 x I/O Panel Shield
- 4 x Serial ATA (SATA) Data Cables (Optional)
- 1 x ASRock SLI_HB_Bridge_2S Card (Optional)
- 2 x Screws for M.2 Sockets (Optional)

1.2 Specifications

Platform	• ATX Form Factor • 2oz Copper PCB
CPU	• Supports AMD AM4 Socket Ryzen Series CPUs (Summit Ridge, Raven Ridge and Pinnacle Ridge) • Digi Power design • 12 Power Phase design • Supports 105W Water Cooling (Pinnacle Ridge); Supports 95W Water Cooling (Summit Ridge); Supports 65W Water Cooling (Raven Ridge)
Chipset	• AMD Promontory X470
Memory	• Dual Channel DDR4 Memory Technology • 4 x DDR4 DIMM Slots • AMD Ryzen series CPUs (Pinnacle Ridge) support DDR4 3466+(OC)/3200(OC)/2933/2667/2400/2133 ECC & non-ECC, un-buffered memory* • AMD Ryzen series CPUs (Summit Ridge) support DDR4 3466+(OC)/3200(OC)/2933(OC)/2667/2400/2133 ECC & non-ECC, un-buffered memory* • AMD Ryzen series CPUs (Raven Ridge) support DDR4 3466+(OC)/3200(OC)/2933(OC)/2667/2400/2133 non-ECC, un-buffered memory* * For Ryzen Series CPUs (Raven Ridge), ECC is only supported with PRO CPUs. * Please refer to Memory Support List on ASRock's website for more information. (http://www.asrock.com/) * Please refer to page 23 for DDR4 UDIMM maximum frequency support. • Max. capacity of system memory: 64GB • 15µ Gold Contact in DIMM Slots
Expansion Slot	• 2 x PCI Express 3.0 x16 Slots (single at x16 (PCIE1); dual at x8 (PCIE1) / x8 (PCIE4))* * Supports NVMe SSD as boot disks • 4 x PCI Express 2.0 x1 Slots

- Supports AMD Quad CrossFireX™ and CrossFireX™
- Supports NVIDIA® Quad SLI™ and SLI™
- 15µ Gold Contact in VGA PCIe Slot (PCIE1)

Graphics

- Integrated AMD Radeon™ Vega Series Graphics in Ryzen Series APU*

* Actual support may vary by CPU

- DirectX 12, Pixel Shader 5.0
- Max. shared memory 2GB
- Supports HDMI with max. resolution up to 4K x 2K (4096x2160) @ 30Hz
- Supports Auto Lip Sync, Deep Color (12bpc), xvYCC and HBR (High Bit Rate Audio) with HDMI Port (Compliant HDMI monitor is required)
- Supports HDCP with HDMI Port
- Supports 4K Ultra HD (UHD) playback with HDMI Port

Audio

- 7.1 CH HD Audio with Content Protection (Realtek ALC1220 Audio Codec)
- Premium Blu-ray Audio support
- Supports Surge Protection
- Nichicon Fine Gold Series Audio Caps
- 120dB SNR DAC with Differential Amplifier
- NE5532 Premium Headset Amplifier for Front Panel Audio Connector (Supports up to 600 Ohm headsets)
- Pure Power-In
- Direct Drive Technology
- PCB Isolate Shielding
- Impedance Sensing on Line Out port
- Individual PCB Layers for R/L Audio Channel
- Gold Audio Jacks
- Supports Creative SoundBlaster Cinema5

LAN

- Gigabit LAN 10/100/1000 Mb/s
- GigaLAN Intel® I211AT
- Supports Wake-On-LAN
- Supports Lightning/ESD Protection
- Supports Energy Efficient Ethernet 802.3az
- Supports PXE

Rear Panel I/O	• 1 x PS/2 Mouse/Keyboard Port • 1 x HDMI Port • 1 x Optical SPDIF Out Port • 1 x USB 3.1 Gen2 Type-A Port (10 Gb/s) (Supports ESD Protection) • 1 x USB 3.1 Gen2 Type-C Port (10 Gb/s) (Supports ESD Protection) • 6 x USB 3.1 Gen1 Ports (Supports ESD Protection) * 1 x Fatal1ty Mouse Port (USB 3.1 Gen1) is included • 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) • HD Audio Jacks: Rear Speaker / Central / Bass / Line in / Front Speaker / Microphone (Gold Audio Jacks)
Storage	• 6 x SATA3 6.0 Gb/s Connectors, support RAID (RAID 0, RAID 1 and RAID 10), NCQ, AHCI and Hot Plug • 1 x Ultra M.2 Socket (M2_1), supports M Key type 2230/2242/2260/2280/22110 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s)* • 1 x M.2 Socket (M2_2), supports M Key type 2230/2242/2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen2 x2 (10 Gb/s)* * Supports NVMe SSD as boot disks * Supports ASRock U.2 Kit
Connector	• 1 x COM Port Header • 1 x TPM Header • 1 x Power LED and Speaker Header • 1 x AMD Fan LED Header * The AMD Fan LED Header supports LED strips of maximum load of 3A (36W) and length up to 2.5M. • 1 x RGB LED Header * Supports in total up to 12V/3A, 36W LED Strip • 1 x Addressable LED Header * Supports in total up to 5V/3A, 15W LED Strip • 1 x CPU Fan Connector (4-pin) * The CPU Fan Connector supports the CPU fan of maximum 1A (12W) fan power. • 1 x CPU/Water Pump Fan Connector (4-pin) (Smart Fan Speed Control)

* The CPU/Water Pump Fan supports the water cooler fan of maximum 2A (24W) fan power.

- 3 x Chassis/Water Pump Fan Connectors (4-pin) (Smart Fan Speed Control)

* The Chassis/Water Pump Fan supports the water cooler fan of maximum 2A (24W) fan power.
* CPU_FAN2/WP, CHA_FAN1/WP, CHA_FAN2/WP and CHA_FAN3/WP can auto detect if 3-pin or 4-pin fan is in use.

- 1 x 24 pin ATX Power Connector (Hi-Density Power Connector)
- 1 x 8 pin 12V Power Connector (Hi-Density Power Connector)
- 1 x 4 pin 12V Power Connector (Hi-Density Power Connector)
- 1 x Front Panel Audio Connector
- 1 x AMD LED Fan USB Header
- 2 x USB 2.0 Headers (Support 4 USB 2.0 ports) (Supports ESD Protection)
- 2 x USB 3.1 Gen1 Headers (Support 4 USB 3.1 Gen1 ports) (Supports ESD Protection)
- 1 x Dr. Debug with LED

BIOS Feature

- AMI UEFI Legal BIOS with GUI support
- Supports “Plug and Play”
- ACPI 5.1 compliance wake up events
- Supports jumperfree
- SMBIOS 2.3 support
- CPU, VCORE_NB, DRAM, VPPM, PCH 1.05V, +1.8V, VDDP, PROM 2.5V, Voltage Multi-adjustment

Hardware Monitor

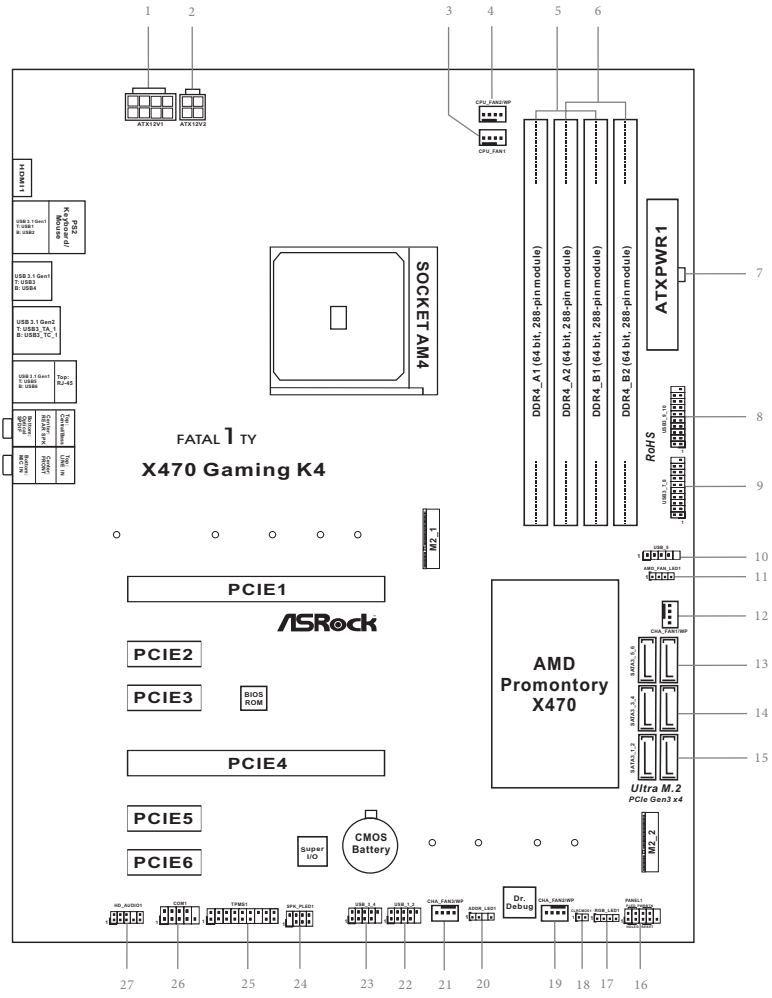
- Temperature Sensing: CPU, CPU/Water Pump, Chassis/Water Pump Fans
- Fan Tachometer: CPU, CPU/Water Pump, Chassis/Water Pump Fans
- Quiet Fan (Auto adjust chassis fan speed by CPU temperature): CPU, CPU/Water Pump, Chassis/Water Pump Fans
- Fan Multi-Speed Control: CPU, CPU/Water Pump, Chassis/Water Pump Fans
- Voltage monitoring: +12V, +5V, +3.3V, CPU Vcore, VCORE_NB, DRAM, PCH 1.05V, +1.8V, VDDP

OS	• Microsoft® Windows® 10 64-bit
Certifications	• FCC, CE • ErP/EuP ready (ErP/EuP ready power supply is required)

** For detailed product information, please visit our website: http://www.asrock.com*

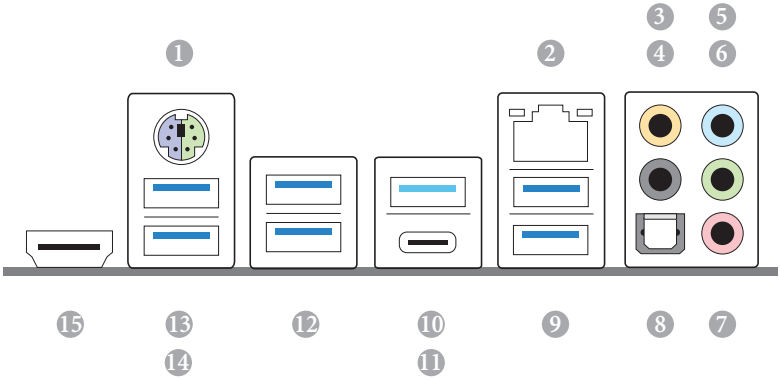
Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using third-party overclocking tools. Overclocking may affect your system's stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

1.3 Motherboard Layout



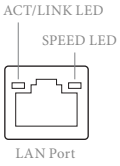
No.	Description
1	ATX 12V Power Connector (ATX12V1)
2	ATX 12V Power Connector (ATX12V2)
3	CPU Fan Connector (CPU_FAN1)
4	CPU/Water Pump Fan Connector (CPU_FAN2/WP)
5	2 x 288-pin DDR4 DIMM Slots (DDR4_A1, DDR4_B1)
6	2 x 288-pin DDR4 DIMM Slots (DDR4_A2, DDR4_B2)
7	ATX Power Connector (ATXPWR1)
8	USB 3.1 Gen1 Header (USB3_9_10)
9	USB 3.1 Gen1 Header (USB3_7_8)
10	AMD LED Fan USB Header (USB_5)
11	AMD Fan LED Header (AMD_FAN_LED1)
12	Chassis/Water Pump Fan Connector (CHA_FAN1/WP)
13	SATA3 Connectors (SATA3_5_6)
14	SATA3 Connectors (SATA3_3_4)
15	SATA3 Connectors (SATA3_1_2)
16	System Panel Header (PANEL1)
17	RGB LED Header (RGB_LED1)
18	Clear CMOS Jumper (CLRCMOS1)
19	Chassis/Water Pump Fan Connector (CHA_FAN2/WP)
20	Addressable LED Header (ADDR_LED1)
21	Chassis/Water Pump Fan Connector (CHA_FAN3/WP)
22	USB 2.0 Header (USB_1_2)
23	USB 2.0 Header (USB_3_4)
24	Power LED and Speaker Header (SPK_PLED1)
25	TPM Header (TPMS1)
26	COM Port Header (COM1)
27	Front Panel Audio Header (HD_AUDIO1)

1.4 I/O Panel



No.	Description	No.	Description
1	PS/2 Mouse/Keyboard Port	9	USB 3.1 Gen1 Ports (USB3_5_6)
2	LAN RJ-45 Port*	10	USB 3.1 Gen2 Type-A Port (USB3_TA_1)
3	Central / Bass (Orange)	11	USB 3.1 Gen2 Type-C Port (USB3_TC_1)
4	Rear Speaker (Black)	12	USB 3.1 Gen1 Ports (USB3_3_4)
5	Line In (Light Blue)	13	Fatal1ty Mouse Port (USB3_1)
6	Front Speaker (Lime)**	14	USB 3.1 Gen1 Port (USB3_2)
7	Microphone (Pink)	15	HDMI Port (HDMI1)
8	Optical SPDIF Out Port		

** There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.*



Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

English

*** If you use a 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.*

Audio Output Channels	Front Speaker (No. 6)	Rear Speaker (No. 4)	Central / Bass (No. 3)	Line In (No. 5)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

Chapter 2 Installation

This is an ATX form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

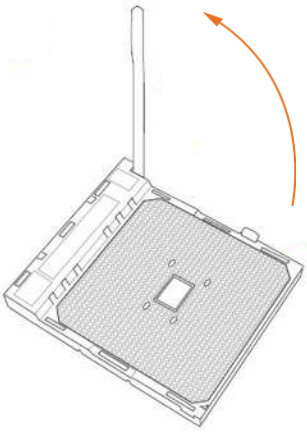
Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.
- In order to avoid damage from static electricity to the motherboard's components, NEVER place your motherboard directly on a carpet. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
- Hold components by the edges and do not touch the ICs.
- Whenever you uninstall any components, place them on a grounded anti-static pad or in the bag that comes with the components.
- When placing screws to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

2.1 Installing the CPU

Unplug all power cables before installing the CPU.

1



2

3

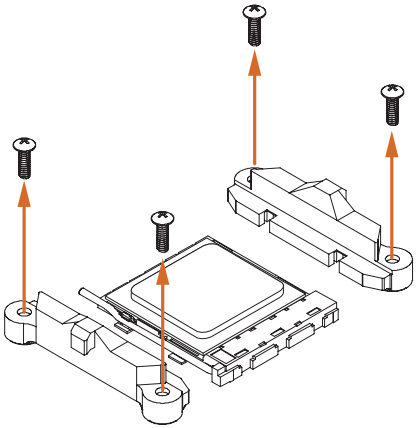
2.2 Installing the CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other.

Please turn off the power or remove the power cord before changing a CPU or heatsink.

Installing the CPU Box Cooler SR1

1



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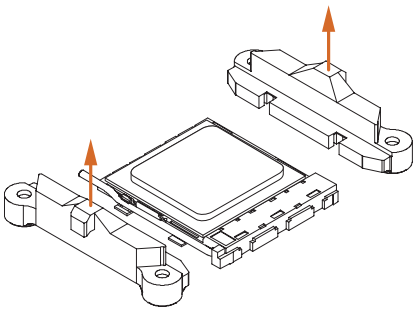

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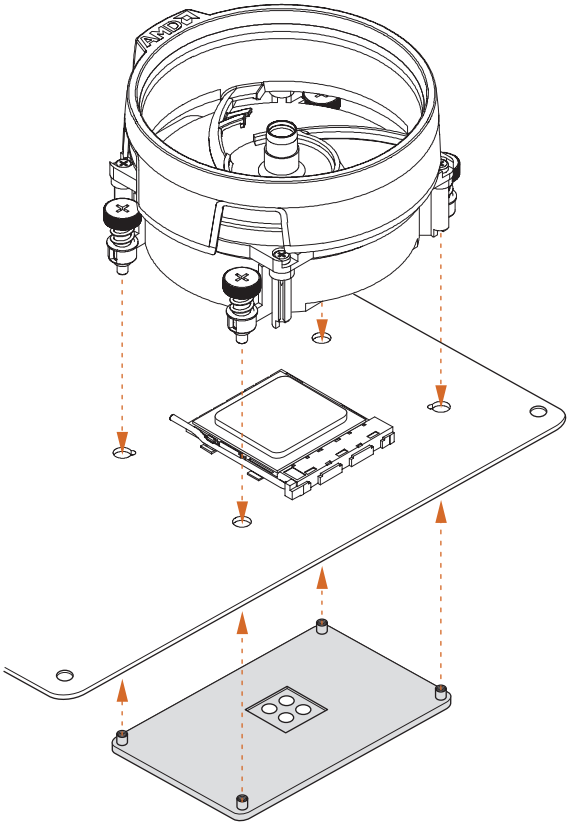

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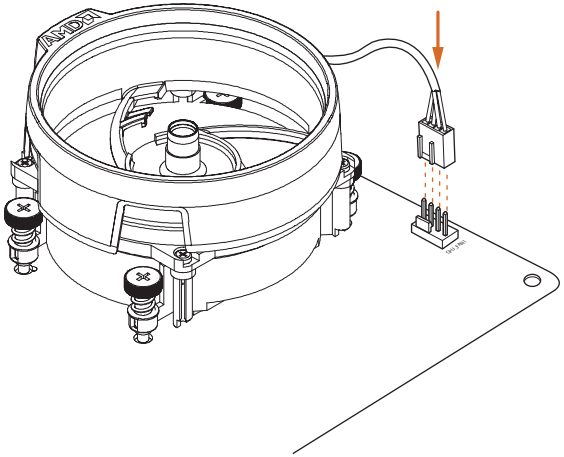
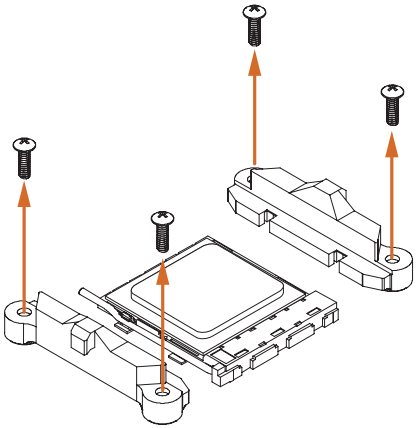
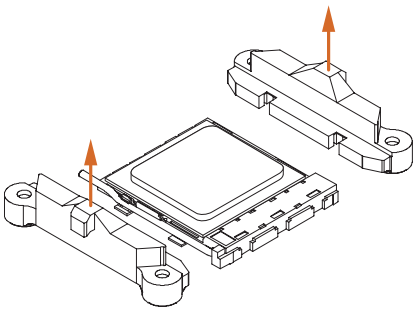


Installing the AM4 Box Cooler SR2

1



2



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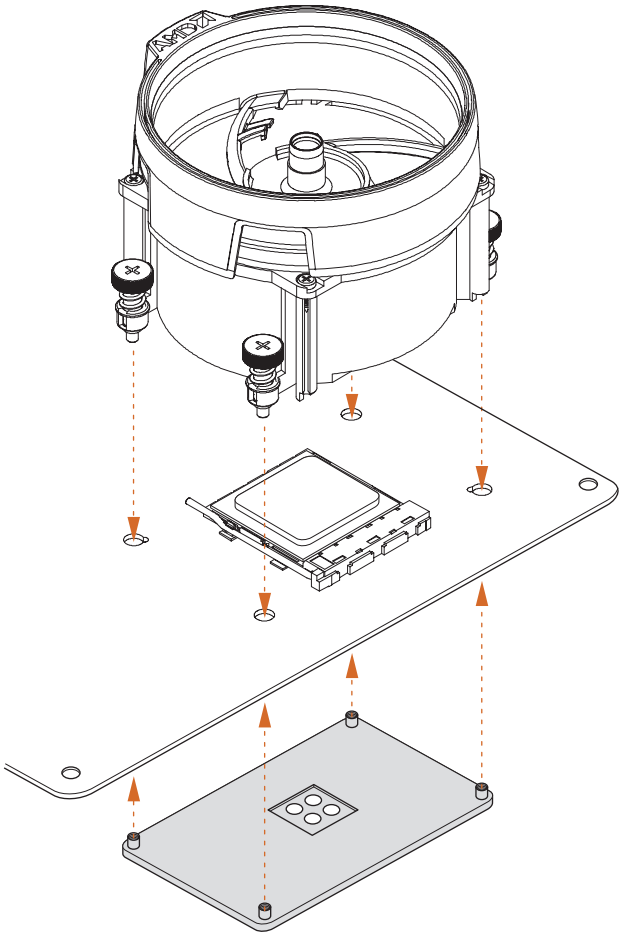
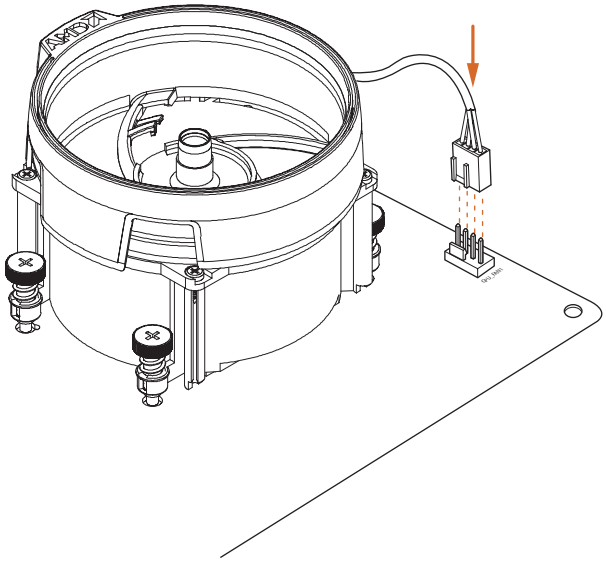


4



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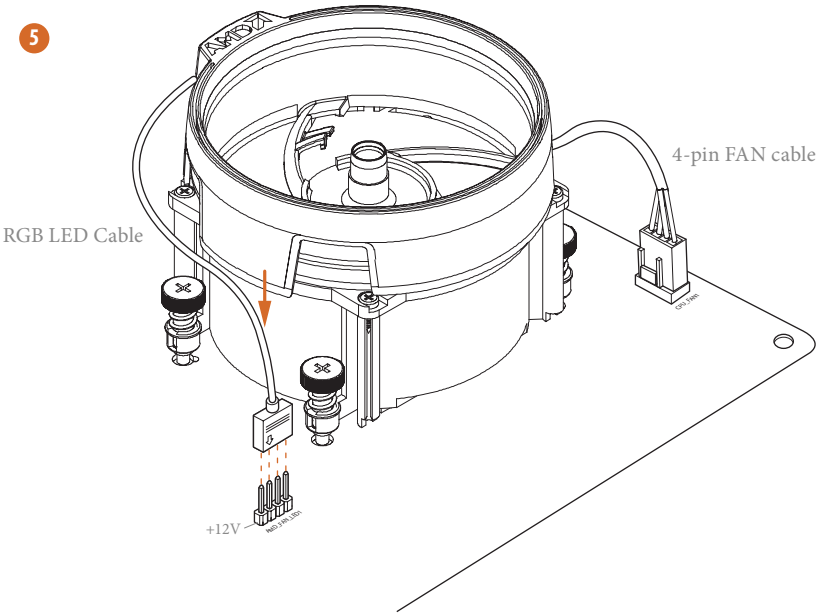
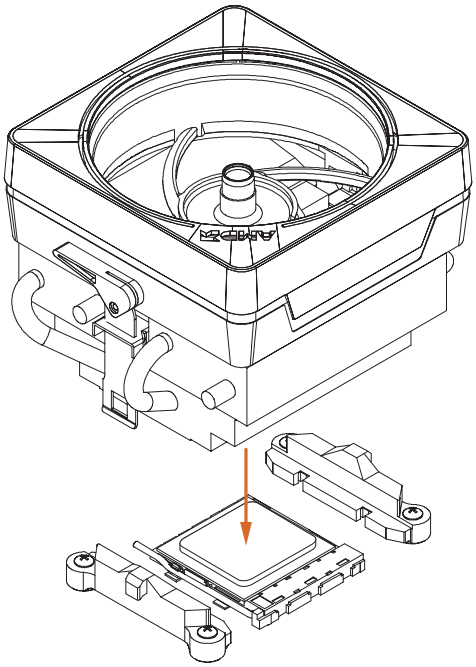


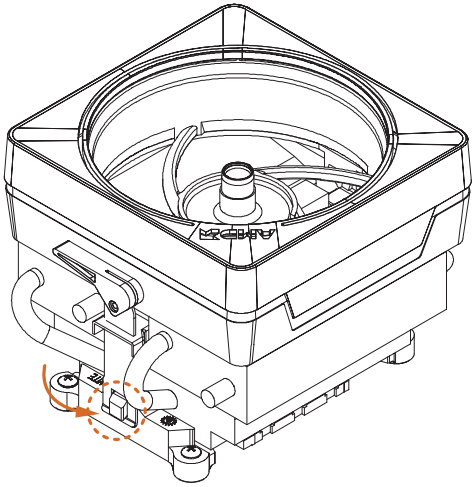
*The diagram shown here are for reference only. Please refer to page 32 for the orientation of AMD Fan LED Header (AMD_FAN_LED1).

Installing the AM4 Box Cooler SR3

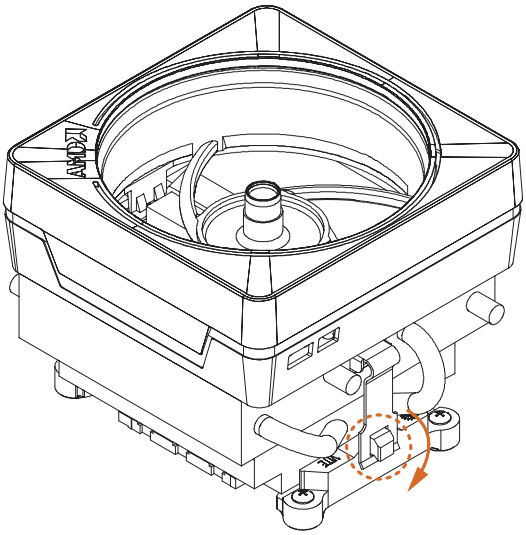
1



2



3



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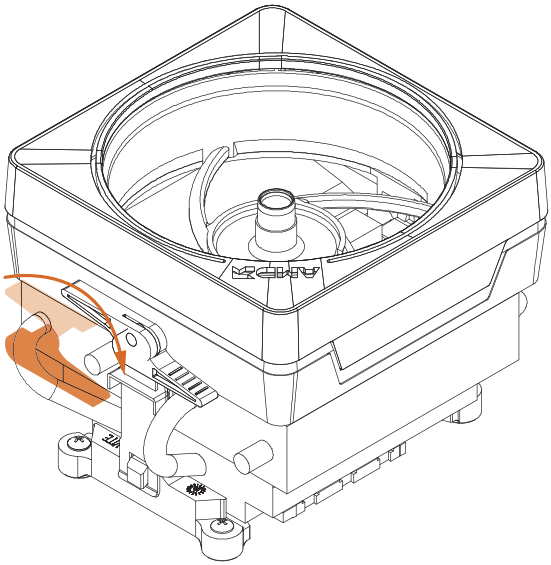

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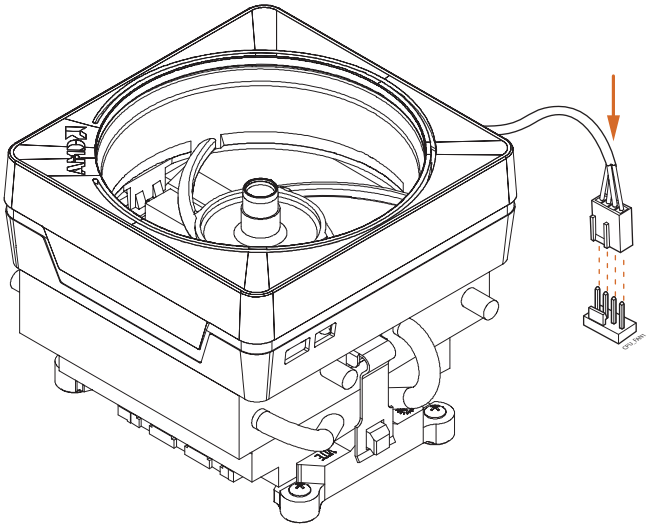
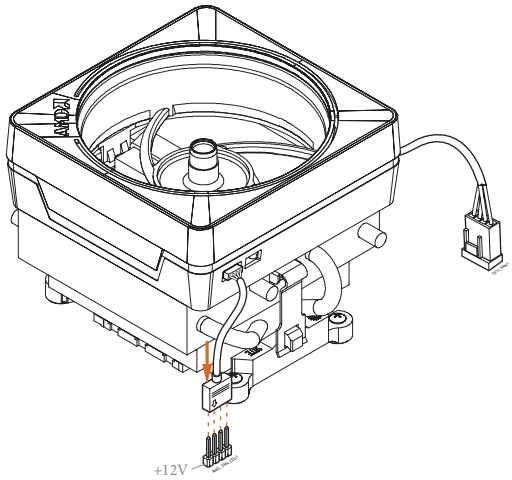
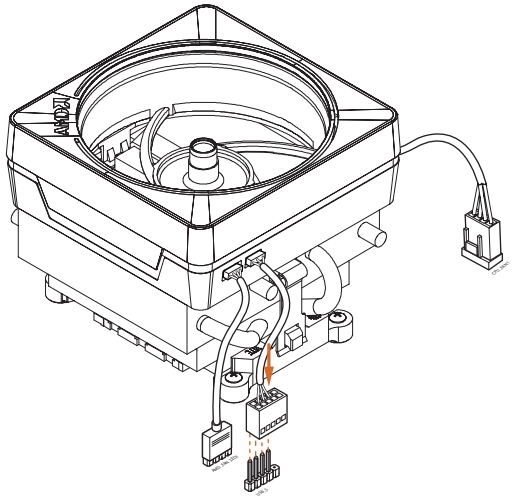


6



or

7



Please note that only one cable should be used at a time in this step.
If you select AMD_FAN_LED1, please install ASRock utility "ASRock Polychrome RGB".
If you select USB connector, please install AMD utility "SR3 Settings Software".

*The diagram shown here are for reference only. Please refer to page 32 for the orientation of AMD Fan LED Header (AMD_FAN_LED1) and page 29 for the orientation of AMD LED Fan USB Header (USB_5).

2.3 Installing Memory Modules (DIMM)

This motherboard provides four 288-pin DDR4 (Double Data Rate 4) DIMM slots, and supports Dual Channel Memory Technology.

1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.*
3. *It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and DIMM may be damaged.*

DDR4 UDIMM Maximum Frequency Support

Ryzen Series CPUs (Pinnacle Ridge):

UDIMM Memory Slot				Frequency (Mhz)
A1	A2	B1	B2	
-	SR	-	-	2933
-	DR	-	-	2400
-	SR	-	SR	2933
-	DR	-	DR	2400
SR	SR	SR	SR	2133
SR/DR	DR	SR/DR	DR	1866

Ryzen Series CPUs (Summit Ridge):

UDIMM Memory Slot				Frequency (Mhz)
A1	A2	B1	B2	
-	SR	-	-	2667
-	DR	-	-	2667
-	SR	-	SR	2667
-	DR	-	DR	2400-2667
SR	SR	SR	SR	2133-2400
SR/DR	DR	SR/DR	DR	1866-2133

Ryzen Series CPUs (Raven Ridge):

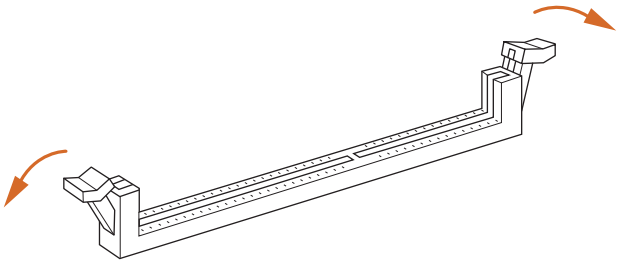
UDIMM Memory Slot				Frequency (Mhz)
A1	A2	B1	B2	
-	SR	-	-	2933
-	DR	-	-	2667
-	SR	-	SR	2667
-	DR	-	DR	2400
SR	SR	SR	SR	2133
SR/DR	DR	SR/DR	DR	1866

SR: Single rank DIMM, 1Rx4 or 1Rx8 on DIMM module label

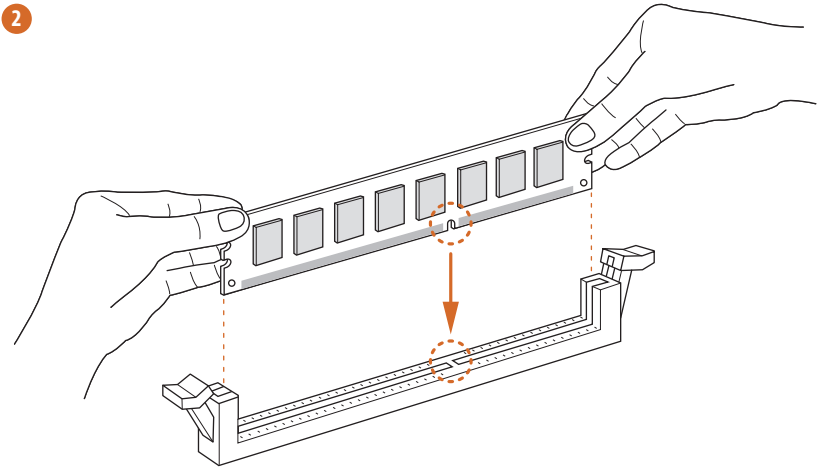
DR: Dual rank DIMM, 2Rx4 or 2Rx8 on DIMM module label

The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

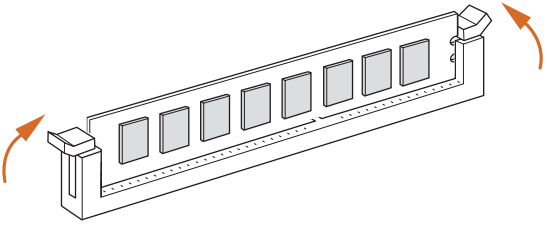
1



2



3



2.4 Expansion Slots (PCI Express Slots)

There are 6 PCI Express slots on the motherboard.

Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

PCIe slots:

PCIE1 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards.
PCIE2 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE3 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE4 (PCIe 3.0 x16 slot) is used for PCI Express x8 lane width graphics cards.
PCIE5 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards.
PCIE6 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards.

PCIe Slot Configurations

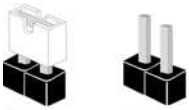
Ryzen series CPUs:

	PCIE1	PCIE4
Single Graphics Card	x16	N/A
Two Graphics Cards in CrossFireX™ or SLI™ Mode	x8	x8

For a better thermal environment, please connect a chassis fan to the motherboard's chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards.

2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is “Short”. If no jumper cap is placed on the pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when a jumper cap is placed on these 2 pins.



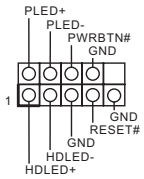
Clear CMOS Jumper (CLRCMOS1) (see p.7, No. 18)	 2-pin Jumper

CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short the pins on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, and user default profile will be cleared only if the CMOS battery is removed. Please remember toremove the jumper cap after clearing the CMOS.

2.6 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.

System Panel Header
(9-pin PANEL1)
(see p.7, No. 16)



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

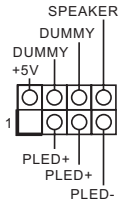
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

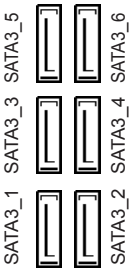
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Power LED and Speaker Header
(7-pin SPK_PLED1)
(see p.7, No. 24)



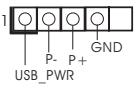
Please connect the chassis power LED and the chassis speaker to this header.

Serial ATA3 Connectors
(SATA3_1_2:
see p.7, No. 15)
(SATA3_3_4:
see p.7, No. 14)
(SATA3_5_6:
see p.7, No. 13)



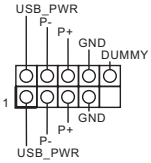
These six SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

AMD LED Fan USB Header
(4-pin USB_5)
(see p.7, No. 10)



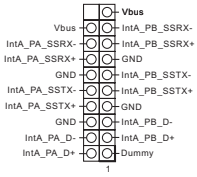
This header is used for connecting the USB connector on the AMD SR3 Heatsink.

USB 2.0 Headers
((9-pin USB_1_2)
(see p.7, No. 22)
(9-pin USB_3_4)
(see p.7, No. 23)



There are two headers on this motherboard. Each USB 2.0 header can support two ports.

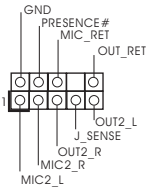
USB 3.1 Gen1 Header
(19-pin USB3_7_8)
(see p.7, No. 9)
(19-pin USB3_9_10)
(see p.7, No. 8)



There are two headers on this motherboard. Each USB 3.1 Gen1 header can support two ports.

English

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.7, No. 27)

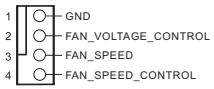


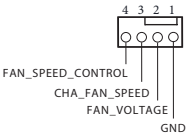
This header is for connecting audio devices to the front audio panel.

1. *High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instructions in our manual and chassis manual to install your system.*
2. *If you use an AC'97 audio panel, please install it to the front panel audio header by the steps below:*
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for the HD audio panel only. You don't need to connect them for the AC'97 audio panel.
   E. To activate the front mic, go to the "FrontMic" Tab in the Realtek Control panel and adjust "Recording Volume".

Chassis /Water Pump Fan Connectors
(4-pin CHA_FAN1/WP)
(see p.7, No. 12)

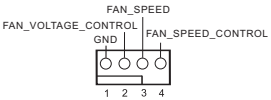
(4-pin CHA_FAN2/WP)
(see p.7, No. 19)
(4-pin CHA_FAN3/WP)
(see p.7, No. 21)





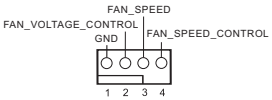
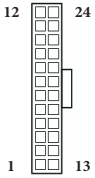
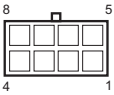
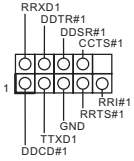
This motherboard provides three 4-Pin water cooling chassis fan connectors. If you plan to connect a 3-Pin chassis water cooler fan, please connect it to Pin 1-3.

CPU Fan Connector
(4-pin CPU_FAN1)
(see p.7, No. 3)

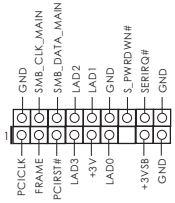


This motherboard provides a 4-Pin CPU fan (Quiet Fan) connector. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

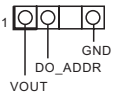
English

CPU/Water Pump Fan Connector (4-pin CPU_FAN2/WP) (see p.7, No. 4)		This motherboard provides a 4-Pin water cooling CPU fan connector. If you plan to connect a 3-Pin CPU water cooler fan, please connect it to Pin 1-3.
ATX Power Connector (24-pin ATXPWR1) (see p.7, No. 7)		This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.
ATX 12V Power Connector (8-pin ATX12V1) (see p.7, No. 1)		This motherboard provides an 8-pin ATX 12V power connector. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5.
ATX 12V Power Connector (4-pin ATX12V2) (see p.7, No. 2)		This motherboard provides an 4-pin ATX 12V power connector.
Serial Port Header (9-pin COM1) (see p.7, No. 26)		This COM1 header supports a serial port module.

English

TPM Header (17-pin TPMS1) (see p.7, No. 25)		This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.
AMD FAN LED Header (4-pin AMD_FAN_ LED1) (see p.7, No. 11)		AMD FAN LED Header is used to connect RGB LED extension cable that comes with AMD heatsink. The cable connection allows users to choose from various LED lighting effects. **Caution: Never install the FAN LED cable in the wrong orientation; otherwise, the cable may be damaged.**
RGB LED Header (4-pin RGB_LED1) (see p.7, No. 17)		This header is used to connect RGB LED extension cable which allows users to choose from various LED lighting effects. **Caution: Never install the RGB LED cable in the wrong orientation; otherwise, the cable may be damaged.** *Please refer to page 59 for further instructions on this header.

Addressable LED Header
(3-pin ADDR_LED1)
(see p.7, No. 20)



This header is used to connect Addressable LED extension cable which allows users to choose from various LED lighting effects.

Caution: Never install the Addressable LED cable in the wrong orientation; otherwise, the cable may be damaged.

*Please refer to page 60 for further instructions on this header.

2.7 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
00	Please check if the CPU is installed correctly and then clear CMOS.
0d	Problem related to memory, VGA card or other devices. Please clear CMOS, re-install the memory and VGA card, and remove other USB, PCI devices.
01 - 54 (except 0d), 5A- 60	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
55	The Memory could not be detected. Please re-install the memory and CPU. If the problem still exists, please install only one memory module or try using other memory modules.
61 - 91	Chipset initialization error. Please press reset or clear CMOS.
92 - 99	Problem related to PCI-E devices. Please re-install PCI-E devices or try installing them in other slots. If the problem still exists, please remove all PCI-E devices or try using another VGA card.
A0 - A7	Problem related to IDE or SATA devices. Please re-install IDE and SATA devices. If the problem still exists, please clear CMOS and try removing all SATA devices.
b0	Problem related to memory. Please re-install the CPU and memory. If the problem still exists, please install only one memory module or try using other memory modules.

b4	Problem related to USB devices. Please try removing all USB devices.
b7	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
d6	The VGA could not be recognized. Please clear CMOS and try re-installing the VGA card. If the problem still exists, please try installing the VGA card in other slots or use other VGA cards.
d7	The Keyboard and mouse could not be recognized. Please try re-installing the keyboard and mouse.
d8	Invalid Password.
FF	Please check if the CPU is installed correctly and then clear CMOS.

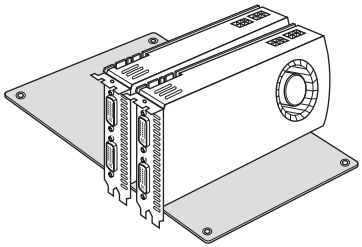
2.8 SLI™ and Quad SLI™ Operation Guide

This motherboard supports NVIDIA® SLI™ and Quad SLI™ (Scalable Link Interface) technology that allows you to install up to two identical PCI Express x16 graphics cards.

Requirements

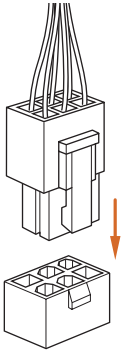
1. *You should only use identical SLI™-ready graphics cards that are NVIDIA® certified.*
2. *Make sure that your graphics card driver supports NVIDIA® SLI™ technology. Download the drivers from the NVIDIA® website: www.nvidia.com*
3. *Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a NVIDIA® certified PSU. Please refer to the NVIDIA® website for details.*

2.8.1 Installing Two SLI™-Ready Graphics Cards



Step 1

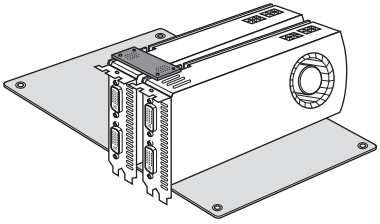
Insert one graphics card into PCIE1 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.



Step 2

If required, connect the auxiliary power source to the PCI Express graphics cards.

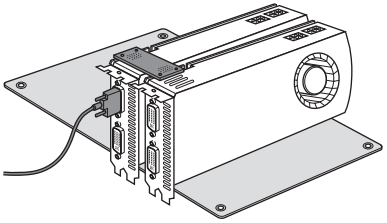
English



Step 3

Align and insert the ASRock SLI_HB_Bridge_2S Card to the goldfingers on each graphics card. Make sure the ASRock SLI_HB_Bridge_2S Card is firmly in place.

ASRock SLI_HB_Bridge_2S Card



Step 4

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

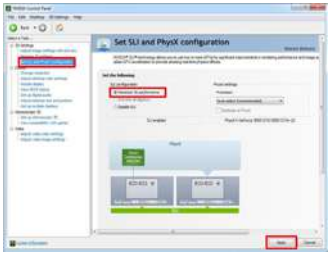
2.8.2 Driver Installation and Setup

Install the graphics card drivers to your system. After that, you can enable the Multi-Graphics Processing Unit (GPU) in the NVIDIA® nView system tray utility. Please follow the below procedures to enable the multi-GPU.

For SLI™ and Quad SLI™ mode

Step 1

Double-click the **NVIDIA Control Panel** icon in the Windows® system tray.



Step 2

In the left pane, click **Set SLI and PhysX configuration**. Then select **Maximize 3D performance** and click **Apply**.

Step 3

Reboot your system.

Step 4

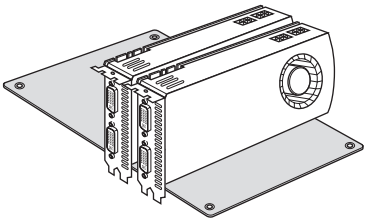
You can freely enjoy the benefits of SLI™ or Quad SLI™.

2.9 CrossFireX™ and Quad CrossFireX™ Operation Guide

This motherboard supports CrossFireX™ and Quad CrossFireX™ that allows you to install up to two identical PCI Express x16 graphics cards.

1. *You should only use identical CrossFireX™-ready graphics cards that are AMD certified.*
2. *Make sure that your graphics card driver supports AMD CrossFireX™ technology. Download the drivers from the AMD's website: www.amd.com*
3. *Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a AMD certified PSU. Please refer to the AMD's website for details.*
4. *If you pair a 12-pipe CrossFireX™ Edition card with a 16-pipe card, both cards will operate as 12-pipe cards while in CrossFireX™ mode.*
5. *Different CrossFireX™ cards may require different methods to enable CrossFireX™. Please refer to AMD graphics card manuals for detailed installation guide.*

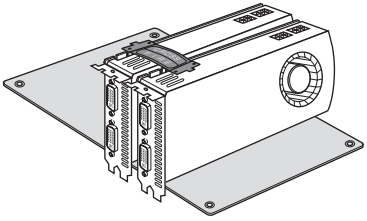
2.9.1 Installing Two CrossFireX™-Ready Graphics Cards



Step 1

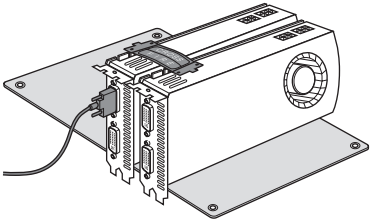
Insert one graphics card into PCIE1 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.

CrossFire Bridge



Step 2

Connect two graphics cards by installing a CrossFire Bridge on the CrossFire Bridge Interconnects on the top of the graphics cards. (The CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)



Step 3

Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

2.9.2 Driver Installation and Setup

Step 1

Power on your computer and boot into OS.

Step 2

Remove the AMD drivers if you have any VGA drivers installed in your system.

The Catalyst Uninstaller is an optional download. We recommend using this utility to uninstall any previously installed Catalyst drivers prior to installation. Please check AMD's website for AMD driver updates.

Step 3

Install the required drivers and CATALYST Control Center then restart your computer. Please check AMD's website for details.

AMD Catalyst Control Center

Step 4

Double-click the **AMD Catalyst Control Center** icon in the Windows® system tray.

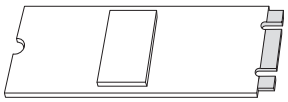
Step 5

In the left pane, click **Performance** and then **AMD CrossFireX™**. Then select **Enable AMD CrossFireX** and click **Apply**. Select the GPU number according to your graphics card and click **Apply**.

2.10 M.2_SSD (NGFF) Module Installation Guide (M2_1)

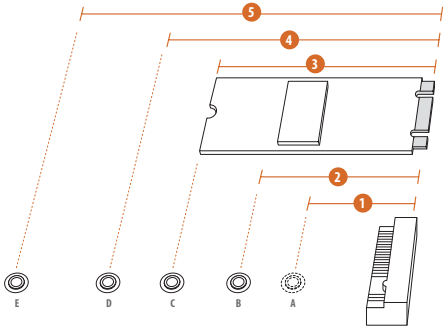
The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The Ultra M.2 Socket (M2_1) supports M Key type 2230/2242/2260/2280/22110 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

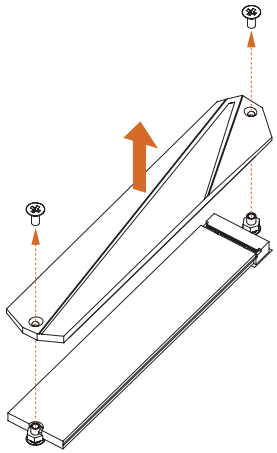
Prepare a M.2_SSD (NGFF) module and the screw.



Step 2

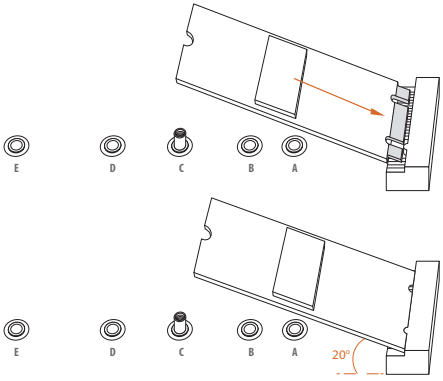
Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

No.	1	2	3	4	5
Nut Location	A	B	C	D	E
PCB Length	3cm	4.2cm	6cm	8cm	11cm
Module Type	Type2230	Type 2242	Type2260	Type 2280	Type 22110



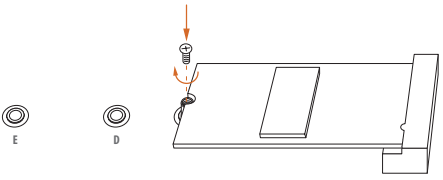
Step 3

Before installing a M.2 (NGFF) SSD module, please loosen the screws to remove the M.2 heatsink.



Step 4

Gently insert the M.2 (NGFF) SSD module into the M.2 slot. Please be aware that the M.2 (NGFF) SSD module only fits in one orientation.
*If you insert Type 22110 M.2 SSD, please make sure that there is no standoff being placed at the nut location A, B, C or D.



Step 5

Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

M.2_SSD (NGFF) Module Support List

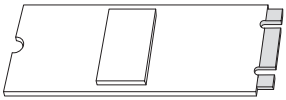
Vendor	Interface	P/N
ADATA	PCIe	ASX8000NP-512GM-C
ADATA	PCIe	ASX7000NP-512GT-C
Intel	PCIe	INTEL 6000P-SSDPEKKF256G7 (nvme)
Intel	PCIe	SSDPEKKF512G7 NVME
Kingston	PCIe	Kingston SHPM2280P2 / 240G (Gen2 x4)
Kingston	PCIe	SKC1000/480G
Kingston	PCIe	SKC1000/960GB NVME
Plextor	PCIe	PX-512M8PeG
Samsung	PCIe	SM951 (NVME)
Samsung	PCIe	SM951 (MZHPV512HDGL)
Samsung	PCIe	Samsung XP941-MZHPU512HCGL(Gen2x4)
SanDisk	PCIe	SanDisk-SD6PP4M-128G(Gen2 x2)
WD	PCIe	WDS512G1X0C-00ENX0 (NVME)
ADATA	SATA	ADATA - AXNS381E-128GM-B
ADATA	SATA	ASU800NS38-512GT-C
Kingston	SATA	Kingston-RBU-SNS8400S3 / 180GD
Crucial	SATA	Crucial-CT240M500SSD4-240GB
SanDisk	SATA	SanDisk-SD6SN1M-128G
Intel	SATA	INTEL 540S-SSDSCKKW240H6-240GB
Intel	SATA	540S-SSDSCKKW240H6
ezlink	SATA	ezlink P51B-80-120GB
Kingston	SATA	Kingston SM2280S3G2/120G - Win8.1
SanDisk	SATA	SanDisk X400-SD8SN8U-128G
Transcend	SATA	Transcend TS256GMTS800-256GB
Transcend	SATA	TS512GMTS800
LITEON	SATA	LITEON LJH-256V2G-256GB (2260)
PLEXTOR	SATA	PLEXTOR PX-128M7VG-128GB
PLEXTOR	SATA	PLEXTOR PX-128M6G-2260-128GB
V-Color	SATA	V-Color 120G
V-Color	SATA	V-Color 240G
SanDisk	SATA	Sandisk Z400s-SD8SNAT-128G-1122
Transcend	SATA	Transcend TS64GMTS400-64GB
WD	SATA	WD BLUE WDS100T1B0B-00AS40
WD	SATA	WD GREEN WDS240G1G0B-00RC30

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details: http://www.asrock.com

2.11 M.2_SSD (NGFF) Module Installation Guide (M2_2)

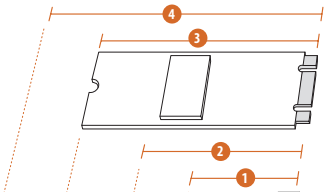
The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The M.2 Socket (M2_2) supports M Key type 2230/2242/2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen2 x2 (10 Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

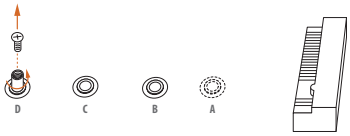
Prepare a M.2_SSD (NGFF) module and the screw.



Step 2

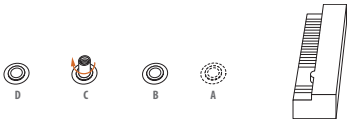
Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

No.	1	2	3	4
Nut Location	A	B	C	D
PCB Length	3cm	4.2cm	6cm	8cm
Module Type	Type2230	Type 2242	Type2260	Type 2280



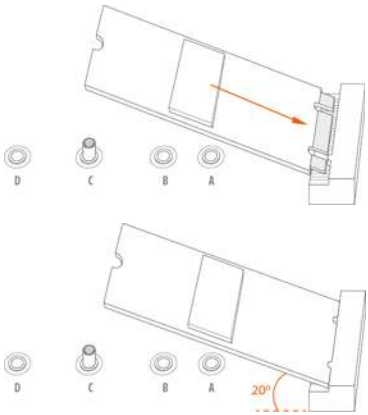
Step 3

Move the standoff based on the module type and length.
The standoff is placed at the nut location D by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.



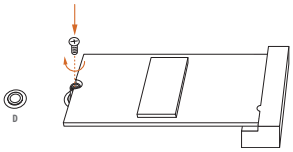
Step 4

Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.



Step 5

Gently insert the M.2 (NGFF) SSD module into the M.2 slot. Please be aware that the M.2 (NGFF) SSD module only fits in one orientation.



Step 6

Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

M.2_SSD (NGFF) Module Support List

Vendor	Interface	P/N
Intel	PCIe	INTEL 6000P-SSDPEKKF256G7 (nvme)
Intel	PCIe	INTEL 6000P-SSDPEKKF512G7 (nvme)
Kingston	PCIe	Kingston SHPM2280P2 / 240G (Gen2 x4)
Samsung	PCIe	Samsung XP941-MZHPU512HCGL(Gen2x4)
SanDisk	PCIe	SanDisk-SD6PP4M-128G(Gen2 x2)
ADATA	SATA	ADATA - AXNS381E-128GM-B
ADATA	SATA	ASU800NS38-512GT-C
Crucial	SATA	Crucial-CT240M500SSD4-240GB
ezlink	SATA	ezlink P51B-80-120GB
Intel	SATA	INTEL 540S-SSDSCKKW240H6-240GB
Intel	SATA	540S-SSDSCKKW240H6
Kingston	SATA	Kingston SM2280S3G2/120G - Win8.1
Kingston	SATA	Kingston-RBU-SNS8400S3 / 180GD
LITEON	SATA	LITEON LJH-256V2G-256GB (2260)
PLEXTOR	SATA	PLEXTOR PX-128M6G-2260-128GB
PLEXTOR	SATA	PLEXTOR PX-128M7VG-128GB
Sandisk	SATA	Sandisk Z400s-SD8SNAT-128G-1122
Sandisk	SATA	SanDisk-SD6SN1M-128G
Transcend	SATA	Transcend TS256GMTS800-256GB
Transcend	SATA	Transcend TS64GMTS400-64GB
Transcend	SATA	TS512GMTS800
V-Color	SATA	V-Color 120G
V-Color	SATA	V-Color 240G
WD	SATA	WD BLUE WDS100T1B0B-00AS40
WD	SATA	WD GREEN WDS240G1G0B-00RC30
WD	SATA	WD GREEN WDS240G1G0B-00RC30

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details: http://www.asrock.com

Chapter 3 Software and Utilities Operation

3.1 Installing Drivers

The Support CD that comes with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSETUP.EXE" in the Support CD to display the menu.

Drivers Menu

The drivers compatible to your system will be auto-detected and listed on the support CD driver page. Please click **Install All** or follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

3.2 F-Stream

F-Stream is ASRock's multi purpose software suite with a new interface, more new features and improved utilities.

3.2.1 Installing F-Stream

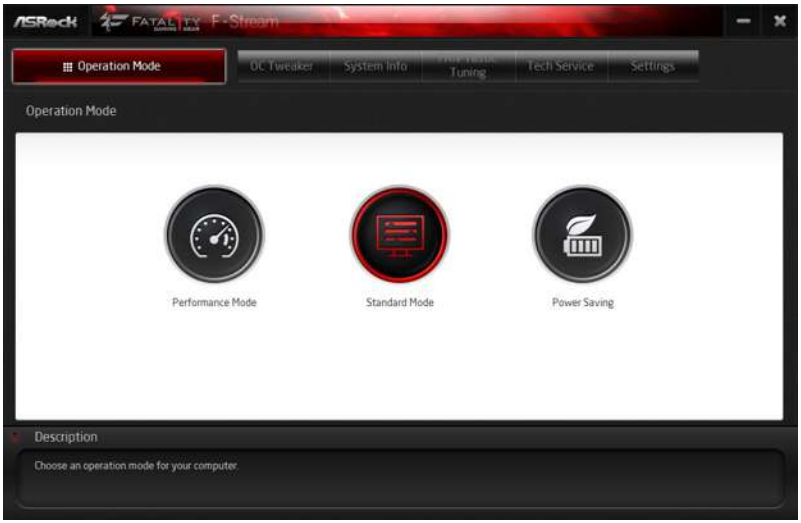
F-Stream can be downloaded from ASRock Live Update & APP Shop. After the installation, you will find the icon "F-Stream" on your desktop. Double-click the "F-Stream"  icon, F-Stream main menu will pop up.

3.2.2 Using F-Stream

There are five sections in F-Stream main menu: Operation Mode, OC Tweaker, System Info, FAN-Tastic Tuning and Settings.

Operation Mode

Choose an operation mode for your computer.



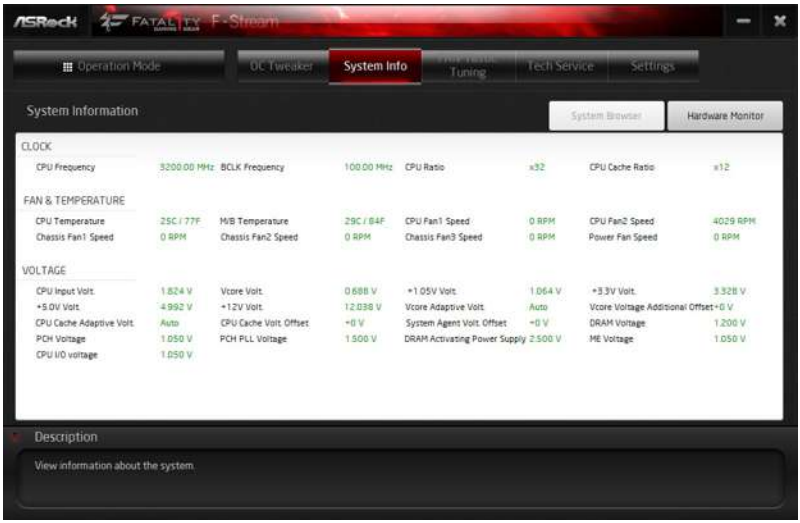
OC Tweaker

Configurations for overclocking the system.

System Info

View information about the system.

*The System Browser tab may not appear for certain models.



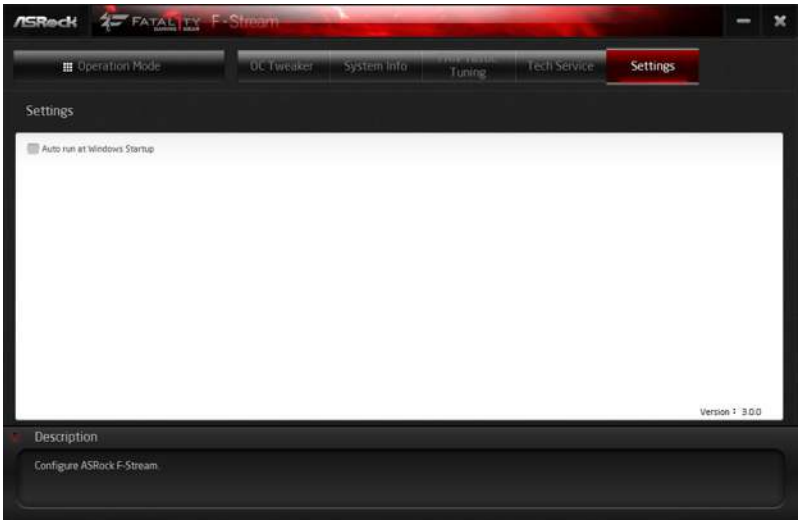
English

FAN-Tastic Tuning

Configure up to five different fan speeds using the graph. The fans will automatically shift to the next speed level when the assigned temperature is met.

Settings

Configure ASRock F-Stream. Click to select "Auto run at Windows Startup" if you want F-Stream to be launched when you start up the Windows operating system.



English

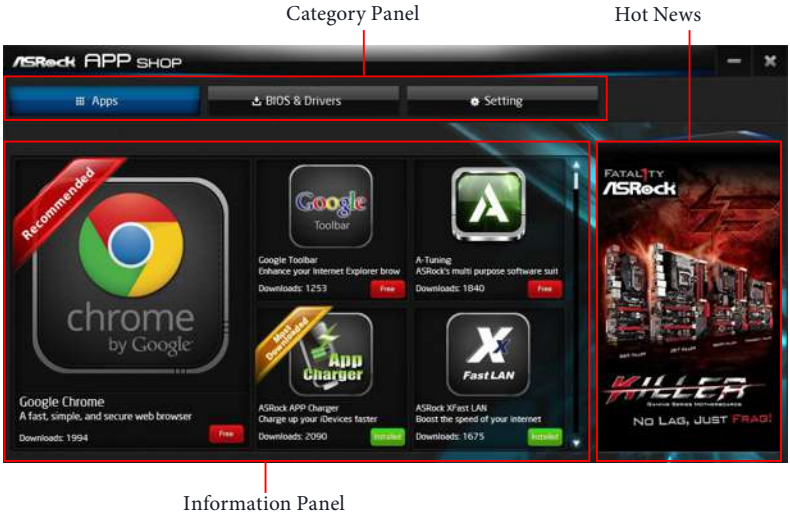
3.3 ASRock Live Update & APP Shop

The ASRock Live Update & APP Shop is an online store for purchasing and downloading software applications for your ASRock computer. You can quickly and easily install various apps and support utilities. With ASRock Live Update & APP Shop, you can optimize your system and keep your motherboard up to date simply with a few clicks.

Double-click on your desktop to access ASRock Live Update & APP Shop utility.

**You need to be connected to the Internet to download apps from the ASRock Live Update & APP Shop.*

3.3.1 UI Overview



Category Panel: The category panel contains several category tabs or buttons that when selected the information panel below displays the relative information.

Information Panel: The information panel in the center displays data about the currently selected category and allows users to perform job-related tasks.

Hot News: The hot news section displays the various latest news. Click on the image to visit the website of the selected news and know more.

3.3.2 Apps

When the "Apps" tab is selected, you will see all the available apps on screen for you to download.

Installing an App

Step 1

Find the app you want to install.

The most recommended app appears on the left side of the screen. The other various apps are shown on the right. Please scroll up and down to see more apps listed.

You can check the price of the app and whether you have already intalled it or not.

Free - The red icon displays the price or "Free" if the app is free of charge.

Installed - The green "Installed" icon means the app is installed on your computer.

Step 2

Click on the app icon to see more details about the selected app.

English

Step 3

If you want to install the app, click on the red icon Free to start downloading.

Step 4

When installation completes, you can find the green "Installed" icon appears on the upper right corner.

To uninstall it, simply click on the trash can icon .
*The trash icon may not appear for certain apps.

Upgrading an App

You can only upgrade the apps you have already installed. When there is an available new version for your app, you will find the mark of "New Version" New Version appears below the installed app icon.

Step 1

Click on the app icon to see more details.

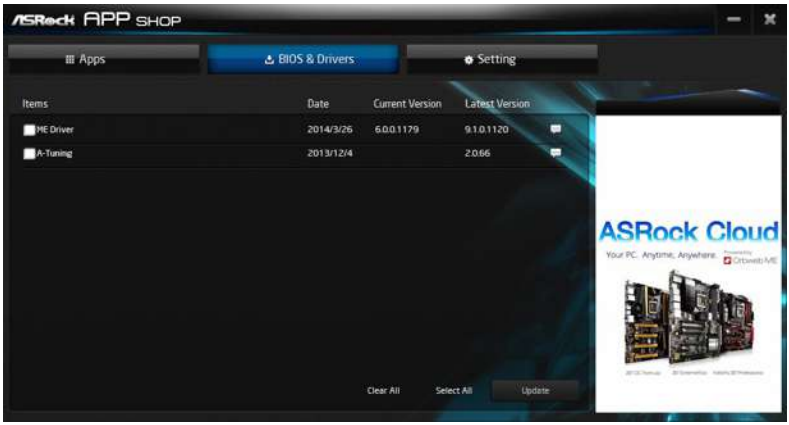
Step 2

Click on the yellow icon New Version to start upgrading.

3.3.3 BIOS & Drivers

Installing BIOS or Drivers

When the "BIOS & Drivers" tab is selected, you will see a list of recommended or critical updates for the BIOS or drivers. Please update them all soon.



Step 1

Please check the item information before update. Click on to see more details.

Step 2

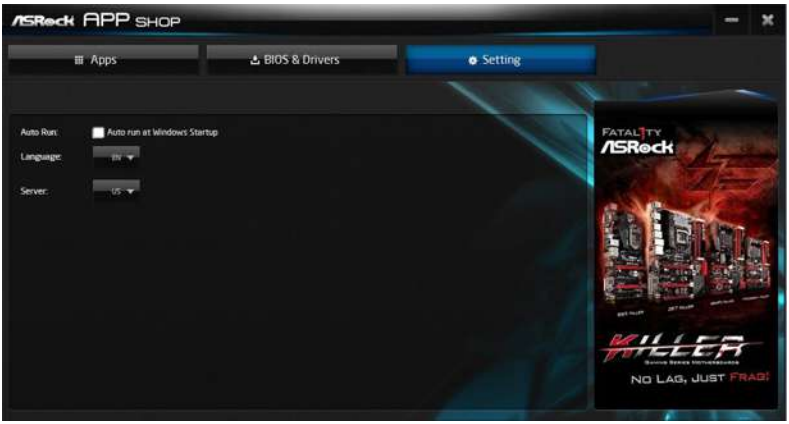
Click to select one or more items you want to update.

Step 3

Click Update to start the update process.

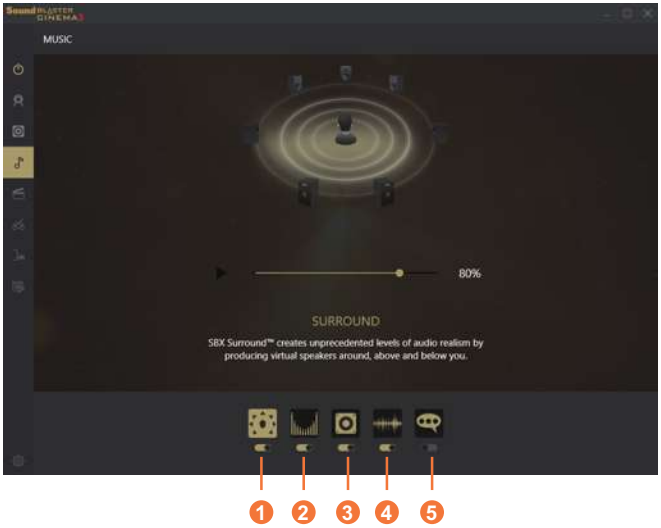
3.3.4 Setting

In the "Setting" page, you can change the language, select the server location, and determine if you want to automatically run the ASRock Live Update & APP Shop on Windows startup.



3.4 Creative SoundBlaster Cinema5

The SoundBlaster™ Cinema5, powered by the SBX Pro Studio technologies, is designed to bring the same great audio experience found in live performances, films, and recording studios to the PC. With this utility, you can easily enhance your audio environment in five modes, including Headphones, Speakers, Music, Movie, Game, Voice and Custom.



There are five functions in SoundBlaster™ Cinema5:

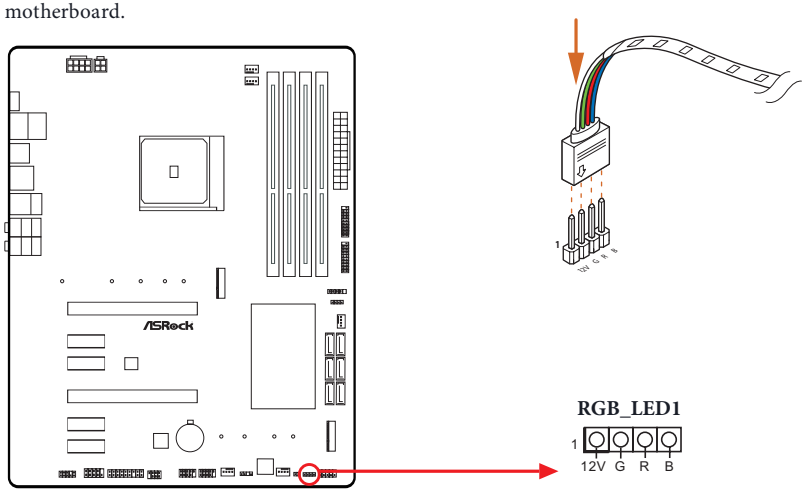
No.	Function	Description
1	Surround	Creating unprecedented levels of audio realism by producing virtual speakers around, above and below you.
2	Crystalizer	Making music sound as good as the artist originally intended by ensuring that every audio detail is heard.
3	Bass	Enhancing bass sound experience by expanding the low frequency tones.
4	Smart Volume	Minimizing abrupt volume changes by automatically adjusting the loudness of your audio playback.
5	Dialog Plus	Enhancing voices in music and movies for drastically clearer vocal range.

3.5 ASRock Polychrome RGB

ASRock Polychrome RGB is a lighting control utility specifically designed for unique individuals with sophisticated tastes to build their own stylish colorful lighting system. Simply by connecting the LED strip, you can customize various lighting schemes and patterns, including Static, Breathing, Strobe, Cycling, Music, Wave and more.

Connecting the LED Strip

Connect your RGB LED strips to the **RGB LED Header (RGB_LED1)** on the motherboard.

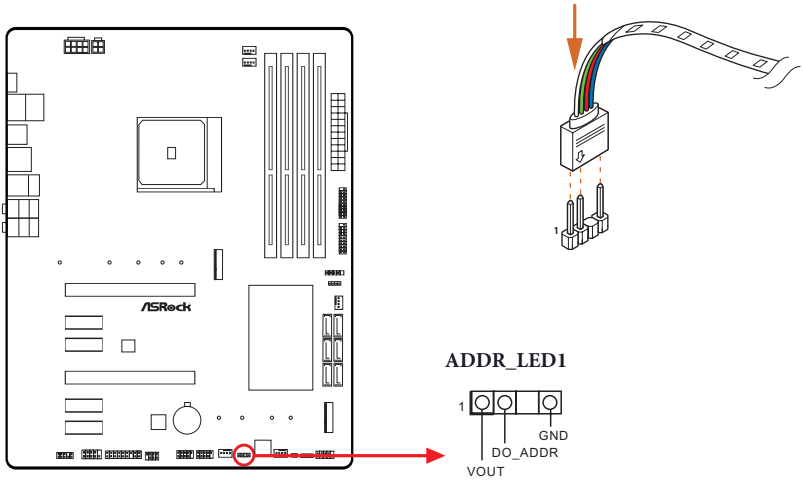


1. *Never install the RGB LED cable in the wrong orientation; otherwise, the cable may be damaged.*
2. *Before installing or removing your RGB LED cable, please power off your system and unplug the power cord from the power supply. Failure to do so may cause damages to motherboard components.*

1. *Please note that the RGB LED strips do not come with the package.*
2. *The RGB LED header supports standard 5050 RGB LED strip (12V/G/R/B), with a maximum power rating of 3A (12V) and length within 2 meters.*

Connecting the Addressable RGB LED Strip

Connect your Addressable RGB LED strip to the **Addressable LED Header (ADDR_LED1)** on the motherboard.



1. *Never install the RGB LED cable in the wrong orientation; otherwise, the cable may be damaged.*
2. *Before installing or removing your RGB LED cable, please power off your system and unplug the power cord from the power supply. Failure to do so may cause damages to motherboard components.*

1. *Please note that the RGB LED strips do not come with the package.*
2. *The RGB LED header supports WS2812B addressable RGB LED strip (5V/Data/GND), with a maximum power rating of 3A (5V) and length within 2 meters.*

ASRock Polychrome RGB Utility

Now you can adjust the RGB LED color through the ASRock Polychrome RGB utility. Download this utility from the ASRock Live Update & APP Shop and start coloring your PC style your way!

Drag the tab to customize your preference.

Toggle on/off the RGB LED switch

Select a RGB LED light effect from the drop-down menu.

Sync RGB LED effects for all LED regions of the motherboard

Chapter 4 UEFI SETUP UTILITY

4.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. You may run the UEFI SETUP UTILITY by pressing <F2> or <Del> right after you power on the computer, otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

4.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	For setting system time/date information
OC Tweaker	For overclocking configurations
Advanced	For advanced system configurations
Tool	Useful tools
H/W Monitor	Displays current hardware status
Security	For security settings
Boot	For configuring boot settings and boot priority
Exit	Exit the current screen or the UEFI Setup Utility

4.1.2 Navigation Keys

Use <←> key or <→> key to choose among the selections on the menu bar, and use < ↑ > key or < ↓ > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

Please check the following table for the descriptions of each navigation key.

Navigation Key(s)	Description
+ / -	To change option for the selected items
<Tab>	Switch to next function
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

4.2 Main Screen

When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.

4.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

CPU Configuration

OC Mode Change Switch

Select a setting for OC Mode.

Overclock Mode

Select the overclock mode.

CPU Frequency and Voltage Change

If this item is set to [Manual], the multiplier and voltage will be set based on user selection. Final result is depending on the CPU's capability.

SMT Mode

This item can be used to disable symmetric multithreading. To re-enable SMT, a power cycle is needed after selecting [Auto].
Warning: S3 is not supported on systems where SMT is disabled.

DRAM Timing Configuration

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

AM4 Advance Boot Training

Set TR4 Advance boot training to [Auto] to increase compatibility.

Voltage Configuration

DRAM Voltage

Use this to select DRAM Voltage. The default value is [Auto].

VTT_DDR

Configure the VTT DDR voltage. The default value is [Auto].

2.50V_PROM Voltage

Configure the voltage for the 2.50V PROM.

+1.8 Voltage

Use this to select +1.8 Voltage. The default value is [Auto].

VDDP

Configure the voltage for the VDDP.

1.05V_PROM Voltage

Use this to select 1.05V_PROM Voltage. The default value is [Auto].

VPPM

Configure the voltage for the VPPM.

Save User Default

Type a profile name and press enter to save your settings as user default.

Load User Default

Load previously saved user defaults.

Save User UEFI Setup Profile to Disk

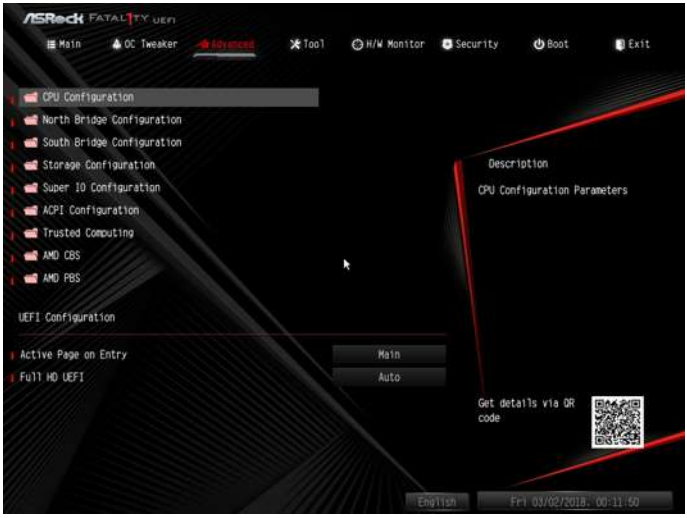
It helps you to save current UEFI settings as an user profile to disk.

Load User UEFI Setup Profile from Disk

You can load previous saved profile from the disk.

4.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, North Bridge Configuration, South Bridge Configuration, Storage-Configuration, Super IO Configuration, ACPI Configuration, Trusted Computing , AMD CBS and AMD PBS.



Setting wrong values in this section may cause the system to malfunction.

UEFI Configuration

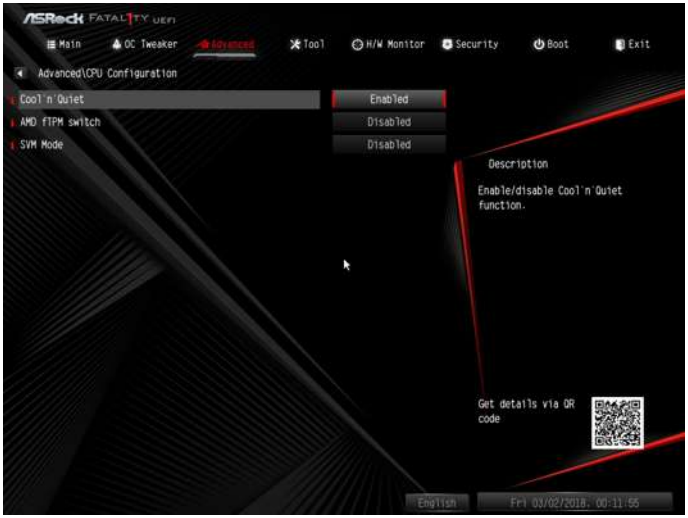
Active Page on Entry

Select the default page when entering the UEFI setup utility.

Full HD UEFI

When [Auto] is selected, the resolution will be set to 1920 x 1080 if the monitor supports Full HD resolution. If the monitor does not support Full HD resolution, then the resolution will be set to 1024 x 768. When [Disable] is selected, the resolution will be set to 1024 x 768 directly.

4.4.1 CPU Configuration



Cool 'n' Quiet

Use this item to enable or disable AMD's Cool 'n' Quiet™ technology. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® OS and want to enable this function, please set this item to [Enabled]. Please note that enabling this function may reduce CPU voltage and memory frequency, and lead to system stability or compatibility issue with some memory modules or power supplies. Please set this item to [Disable] if above issue occurs.

AMD fTPM Switch

Use this to enable or disable AMD CPU fTPM.

SVM Mode

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by AMD-V. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled].

4.4.2 North Bridge Configuration

SR-IOV Support

Enable/disable the SR-IOV (Single Root IO Virtualization Support) if the system has SR-IOV capable PCIe devices.

4.4.3 South Bridge Configuration

Onboard HD Audio

Enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed.

Front Panel

Enable/disable front panel HD audio.

Deep Sleep

Configure deep sleep mode for power saving when the computer is shut down.

Restore on AC/Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

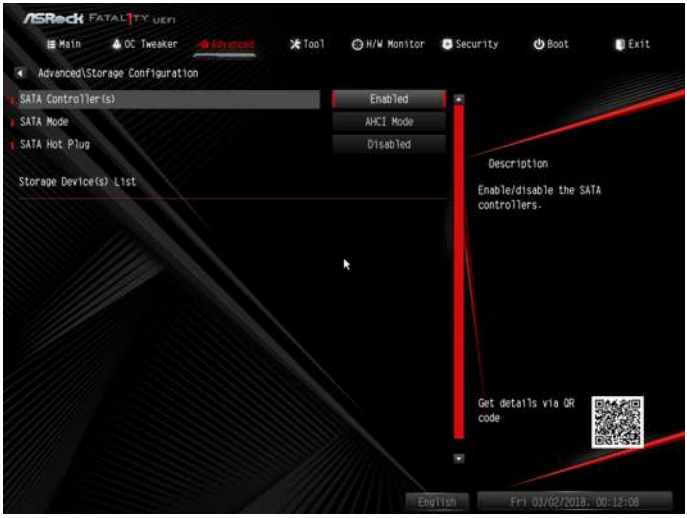
WAN Radio

Configure the WiFi module's connectivity.

Onboard Debug Port LED

Enable/disable the onboard Dr. Debug LED.

4.4.4 Storage Configuration



SATA Controller(s)

Enable/disable the SATA controllers.

SATA Mode

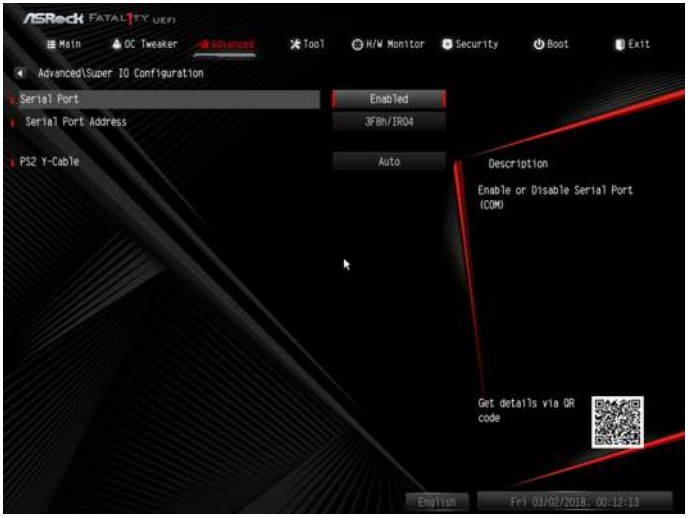
AHCI: Supports new features that improve performance.

RAID: Combine multiple disk drives into a logical unit.

SATA Hot Plug

Enable/disable the SATA Hot Plug function.

4.4.5 Super IO Configuration



Serial Port

Enable or disable the Serial port.

Serial Port Address

Select the address of the Serial port.

PS2 Y-Cable

Enable the PS2 Y-Cable or set this option to Auto.

4.4.6 ACPI Configuration

Suspend to RAM

It is recommended to select auto for ACPI S3 power saving.

ACPI HPET Table

Enable the High Precision Event Timer for better performance and to pass WHQL tests.

PS/2 Keyboard Power On

Allow the system to be waked up by a PS/2 Keyboard.

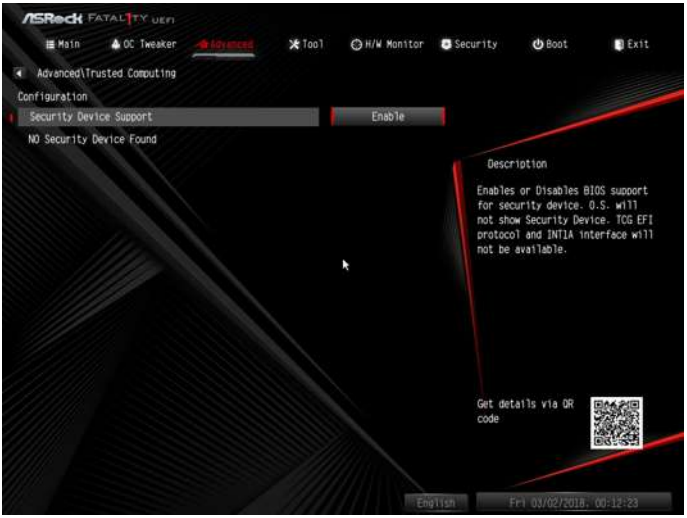
PCIE Devices Power On

Allow the system to be waked up by a PCIE device and enable wake on LAN.

RTC Alarm Power On

Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

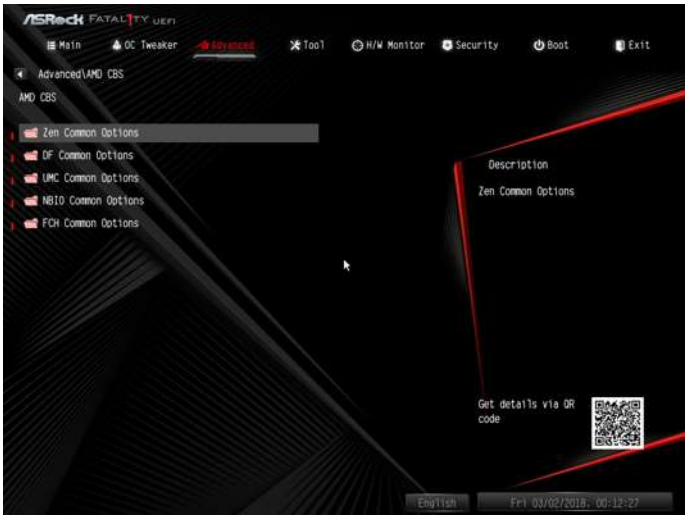
4.4.7 Trusted Computing



Security Device Support

Enable or disable BIOS support for security device.

4.4.8 AMD CBS



Zen Common Options

RedirectForReturnDis

From a workaround for GCC/C000005 issue for XV Core on CZ A0, setting MSRC001_1029 Decode Configuration (DE_CFG) bit 14 [DecfgNoRdrctForReturns] to 1.

L2 TLB Associativity

0 - L2 TLB ways [11:8] are fully associative. 1 - =L2 TLB ways [11:8] are 4K-only.

Platform first Error Handling

Enable/disable PFEH, cloak individual banks, and mask deferred error interrupts from each bank.

Core Performance Boost

Disable CPB.

Enable IBS

Enables IBS through MSRC001_1005[42] and disables SpecLockMap through MSRC001_1020[54].

Global C-state Control

Controls IO based C-state generation and DF C-states.

Opcache Control

Enables or disables the Opcache.

OC Mode

OC1 - 16 cores/3.6GHz on 1.3375V
OC2 - 8 cores/3.7GHz on 1.369V
OC3 - 4 cores/3.75GHz on 1.374V\nMax Stress - 16 cores/3.8GHz on 1.400V

SEV-ES ASID Space Limit

SEV VMs using ASIDs below the SEV-ES ASID Space Limit must enable the SEV-ES feature. The valid values for this field are from 0x1 (1) - 0x10 (16).

Core/Thread Enablement

Downcore control

Sets the number of cores to be used. Once this option has been used to remove any cores, a POWER CYCLE is required in order for future selections to take effect.

SMTEN

This item can be used to disable symmetric multithreading. To re-enable SMT, a POWER CYCLE is needed after selecting the 'Auto' option.
Warning: S3 is NOT SUPPORTED on systems where SMT is disabled.

Streaming Stores Control

Enables or disables the streaming stores functionality.

DF Common Options

DRAM scrub time

Provide a value that is the number of hours to scrub memory.

Redirect scrubber control

Control DF::RedirScrubCtrl[EnRedirScrub]

Disable DF sync flood propagation

Control DF::PIEConfig[DisSyncFloodProp].

Freeze DF module queues on error

Controls DF::PIEConfig[DisImmSyncFloodOnFatalError]
Disabling this option sets DF:PIEConfig[DisImmSyncFloodOnFatalError].

GMI encryption control

GMI encryption control

Control GMI link encryption

xGMI encryption control

Control xGMI link encryption

CC6 memory region encryption

Control whether or not the CC6 save/restore memory is encrypted

Location of private memory regions

Controls whether or not the private memory regions (PSP, SMU and CC6) are at the top of DRAM or distributed. Note that distributed requires memory on all dies. Note that it will always be at the top of DRAM if some dies don't have memory regardless of this option's setting.

System probe filter

Controls whether or not the probe filter is enabled. Has no effect on parts where the probe filter is fuse disabled.

Memory interleaving

Controls fabric level memory interleaving (AUTO, none, channel, die, socket). Note that channel, die, and socket has requirements on memory populations and it will be ignored if the memory doesn't support the selected option.

Memory interleaving size

Controls the memory interleaving size. The valid values are AUTO, 256 bytes, 512 bytes, 1 Kbytes or 2Kbytes. This determines the starting address of the interleave (bit 8, 9, 10 or 11).

Channel interleaving hash

Controls whether or not the address bits are hashed during channel interleave mode. This field should not be used unless the interleaving is set to channel and the interleaving size is 256 or 512 bytes.

Memory Clear

When this feature is disabled, BIOS does not implement MemClear after memory training (only if non-ECC DIMMs are used).

UMC Common Options

DDR4 Common Options

DRAM Controller Configuration

DRAM Controller Configuration

DRAM Power Options

Cmd2T

Select between 1T and 2T mode on ADDR/CMD

Gear Down Mode

Configure the Gear Down Mode.

CAD Bus Configuration

CAD Bus Timing User Controls

Setup time on CAD bus signals to Auto or Manual

CAD Bus Drive Strength User Controls

Drive Strength on CAD bus signals to Auto or Manual

Data Bus Configuration

Data Bus Configuration User Controls

Specify the mode for drive strength to Auto or Manual

Common RAS

Data Poisoning

Enable/disable data poisoning: UMC_CH::EccCtrl[UcFatalEn] UMC_CH::EccCtrl[WrEccEn]
Should be enabled/disabled together.

Security

TSME

Transparent SME: AddrTweakEn = 1; ForceEncrEn =1; DataEncrEn = 0

Data Scramble

Data scrambling: DataScrambleEn

DRAM Memory Mapping

Chipselect Interleaving

Interleave memory blocks across the DRAM chip selects for node 0.

BankGroupSwap

Configure the BankGroupSwap.

BankGroupSwapAlt

Configure BankGroupSwapAlt.

Address Hash Bank

Configure the bank address hashing.

Address Hash CS

Configure the CS address hashing.

NVDIMM

Memory MBIST

MBIST Enable

Configure the Memory MBIST.

MBIST SubType Test

Select MBIST Subtest - Single Chipselect, Multi Chipselect, Address Line Test or execute All test

MBIST Aggressors

Enable or disable MBIST Aggressor test.

MBIST Per Bit Slave Die Reporting

Enable or disable MBIST per bit slave die result report.

NBIO Common Options

NB Configuration

IOMMU

Use this to enable or disable IOMMU. The default value of this feature is [Disabled].

Determinism Slider

[Auto]

Use default performance determinism settings

cTDP Control

[Auto]

Use the fused cTDP.

[Manual]

User can set customized cTDP.

Fan Control

[Auto]

Use the default fan controller settings.

[Manual]

User can set customized fan controller settings.

PSI

Disable PSI.

ACS Enable

Enable ACS.

PCIe ARI Support

Enables Alternative Routing-ID Interpretation

CLDO_VDDP Control

[Manual]

If this option is selected, user can set customized CLDO_VDDP voltage.

HD Audio Enable

Enable HD Audio.

FCH Common Options

SATA Configuration Options

SATA Controller

Disable or enable OnChip SATA controller

Sata RAS Support

Disable or enable Sata RAS Support

Sata Disabled AHCI Prefetch Function

Configure the Sata Disabled AHCI Prefetch function.

Aggresive SATA Device Sleep Port 0

Configure the Aggresive SATA Device Sleep Port 0.

Aggresive SATA Device Sleep Port 1

Configure the Aggresive SATA Device Sleep Port 1.

USB Configuration Options

XHCI controller enable

Configure the USB3 controller.

SD (Secure Digital) Options

SD Configuration Mode

Select SD Mode.

Ac Power Loss Options

Select Ac Loss Control Method.

I2C Configuration Options

Uart Configuration Options

ESPI Configuration Options

XGBE Configuration Options

eMMC Options

NTB Common Options

DRAM Memory Mapping

Chipselect Interleaving

Interleave memory blocks across the DRAM chip selects for node 0.

BankGroupSwap

Configure the BankGroupSwap.

BankGroupSwapAlt

Configure the BankGroupSwapAlt.

Address Hash Bank

Configure the bank address hashing.

Address Hash CS

Configure the CS address hashing.

NVDIMM

Memory MBIST

MBIST Enable

Configure the Memory MBIST.

MBIST SubType Test

Select MBIST Subtest - Single Chipselect, Multi Chipselect, Address Line Test or execute all test.

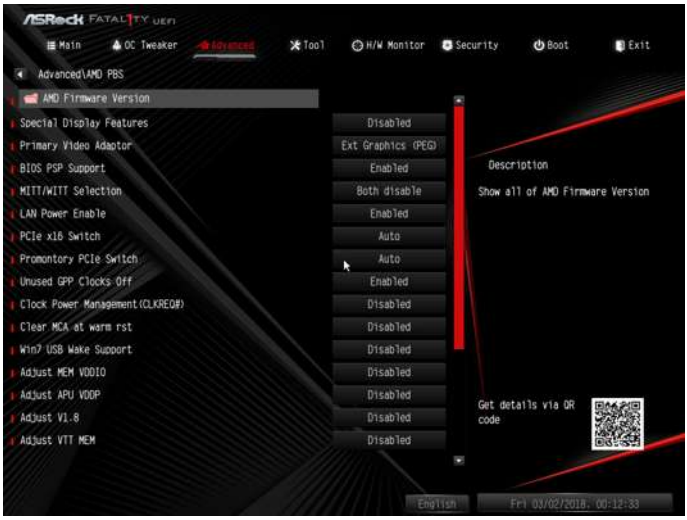
MBIST Aggressors

Configure the MBIST Aggressor test.

MBIST Per Bit Slave Die Reporting

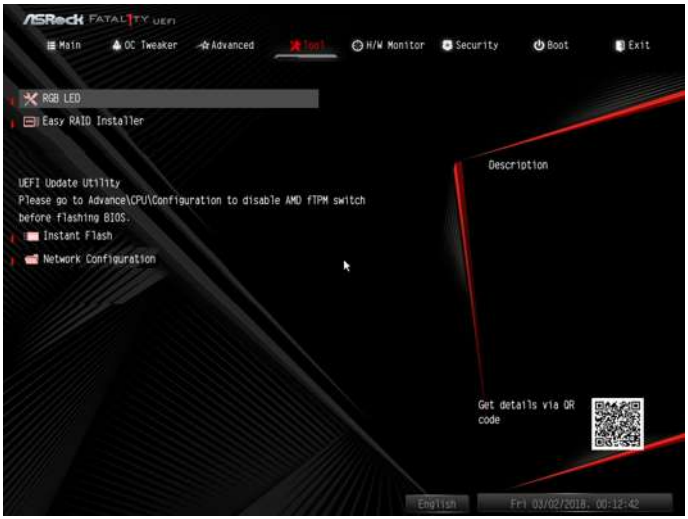
Configure the MBIST per bit slave die result report.

4.4.9 AMD PBS



The AMD PBS menu accesses AMD specific features.

4.5 Tools



RGB LED

ASRock RGB LED allows you to adjust the RGB LED color to your liking.

Easy RAID Installer

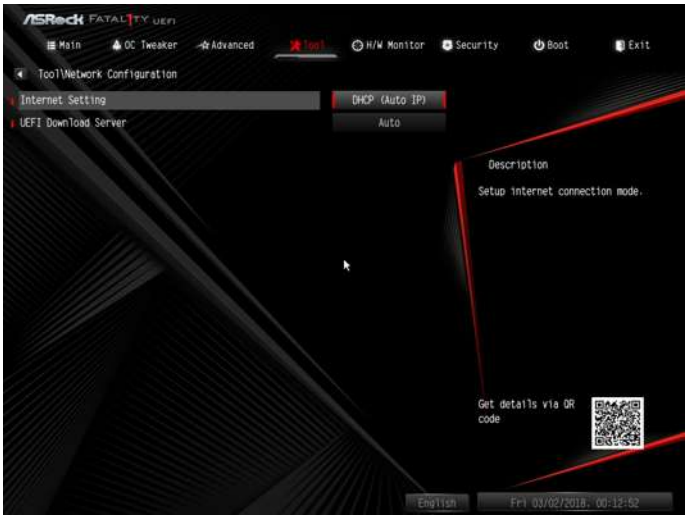
Easy RAID Installer helps you to copy the RAID driver from the support CD to your USB storage device. After copying the drivers please change the SATA mode to RAID, then you can start installing the operating system in RAID mode.

Instant Flash

Save UEFI files in your USB storage device and run Instant Flash to update your UEFI.

Network Configuration

Use this to configure internet connection settings for Internet Flash.



Internet Setting

Enable or disable sound effects in the setup utility.

UEFI Download Server

Select a server to download the UEFI firmware.

4.6 Hardware Health Event Monitoring Screen

This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, fan speed and voltage.

Fan Tuning

Measure Fan Min Duty Cycle.

Fan-Tastic Tuning

Select a fan mode for CPU Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Fan 1 Setting

Select a fan mode for CPU Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Fan 1 Temp Source

Select a fan temperature source for CPU Fan 1.

CPU_FAN2 / W_Pump Switch

Select CPU Water Pump mode.

CPU Optional Fan Control Mode

Select PWM mode or DC mode for CPU Optional fan.

CPU Optional Fan Setting

Select a fan mode for CPU Optional fan, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Optional Fan Temp Source

Select a fan temperature source for CPU Optional fan.

CHA_FAN1 / W_Pump Switch

Select CHA_FAN1 or Water Pump mode.

Chassis Fan 1 Control Mode

Select PWM mode or DC mode for Chassis Fan 1.

Chassis Fan 1 Setting

Select a fan mode for Chassis Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 1 Temp Source

Select a fan temperature source for Chassis Fan 1.

CHA_FAN2 / W_Pump Switch

Select CHA_FAN2 or Water Pump mode.

Chassis Fan 2 Control Mode

Select PWM mode or DC mode for Chassis Fan 2.

Chassis Fan 2 Setting

Select a fan mode for Chassis Fan 2, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 2 Temp Source

Select a fan temperature source for Chassis Fan 2.

CHA_FAN3 / W_Pump Switch

Select CHA_FAN3 or Water Pump mode.

Chassis Fan 3 Control Mode

Select PWM mode or DC mode for Chassis Fan 3.

Chassis Fan 3 Setting

Select a fan mode for Chassis Fan 3, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 3 Temp Source

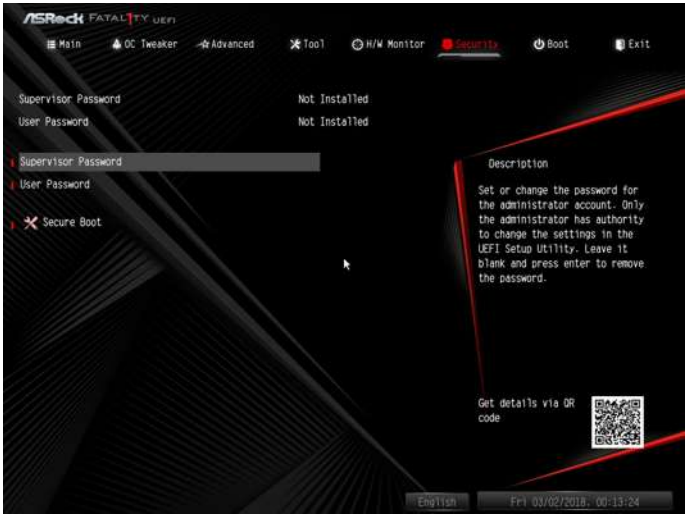
Select a fan temperature source for Chassis Fan 3.

Over Temperature Protection

When Over Temperature Protection is enabled, the system automatically shuts down when the motherboard is overheated.

4.7 Security Screen

In this section you may set or change the supervisor/user password for the system. You may also clear the user password.



Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

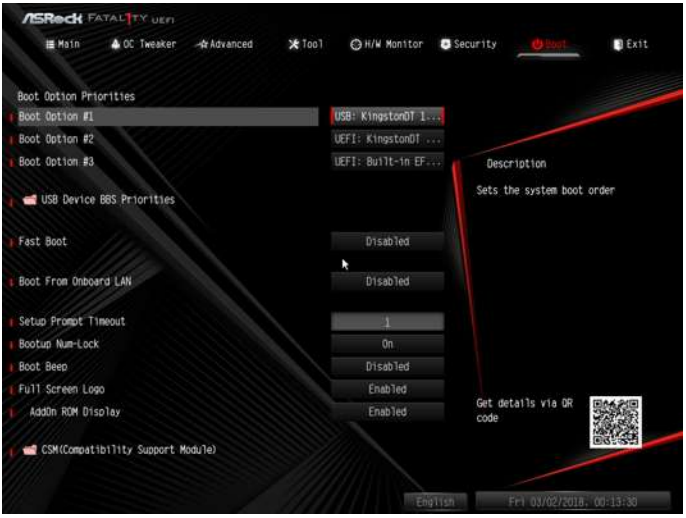
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Enable to support Secure Boot.

4.8 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.



Fast Boot

Fast Boot minimizes your computer's boot time. In fast mode you may not boot from an USB storage device.

Boot From Onboard LAN

Allow the system to be waked up by the onboard LAN.

Setup Prompt Timeout

Configure the number of seconds to wait for the setup hot key.

Bootup Num-Lock

Select whether Num Lock should be turned on or off when the system boots up.

Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

Full Screen Logo

Enable to display the boot logo or disable to show normal POST messages.

AddOn ROM Display

Enable AddOn ROM Display to see the AddOn ROM messages or configure the AddOn ROM if you've enabled Full Screen Logo. Disable for faster boot speed.

CSM (Compatibility Support Module)

CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test.

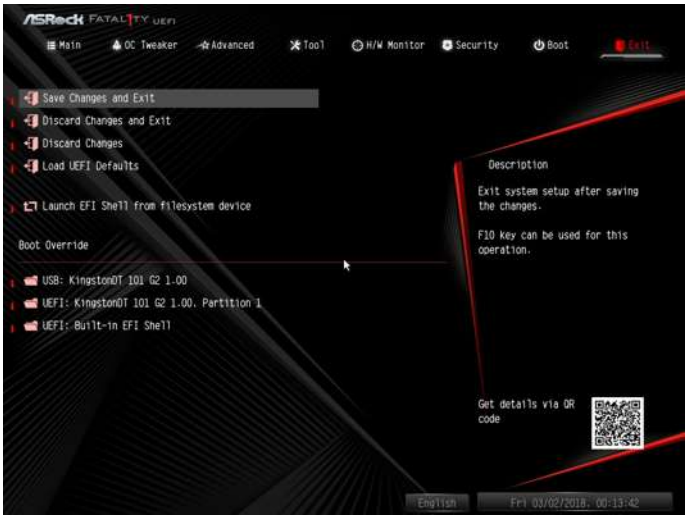
Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

Launch Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

4.9 Exit Screen



Save Changes and Exit

When you select this option the following message, "Save configuration changes and exit setup?" will pop out. Select [OK] to save changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option the following message, "Discard changes and exit setup?" will pop out. Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option the following message, "Discard changes?" will pop out. Select [OK] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all options. The F9 key can be used for this operation.

Launch EFI Shell from filesystem device

Copy shellx64.efi to the root directory to launch EFI Shell.

Contact Information

If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information. For technical questions, please submit a support request form at https://event.asrock.com/tsd.asp

ASRock Incorporation

2F., No.37, Sec. 2, Jhongyang S. Rd., Beitou District,

Taipei City 112, Taiwan (R.O.C.)

ASRock EUROPE B.V.

Bijsterhuizen 11-11

6546 AR Nijmegen

The Netherlands

Phone: +31-24-345-44-33

Fax: +31-24-345-44-38

ASRock America, Inc.

13848 Magnolia Ave, Chino, CA91710

U.S.A.

Phone: +1-909-590-8308

Fax: +1-909-590-1026

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

Responsible Party Name: ASRock Incorporation

Address: 13848 Magnolia Ave, Chino, CA91710

Phone/Fax No: +1-909-590-8308/+1-909-590-1026

hereby declares that the product

Product Name : Motherboard

Model Number : Fatal1ty X470 Gaming K4 Series

Conforms to the following specifications:

☒ FCC Part 15, Subpart B, Unintentional Radiators

Supplementary Information:

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

Representative Person's Name: **James**

Signature : 

Date : **May 12, 2017**

EU Declaration of Conformity

For the following equipment:

Motherboard

(Product Name)

Fatal1ty X470 Gaming K4 Series / ASRock

(Model Designation / Trade Name)

ASRock Incorporation

(Manufacturer Name)

2F., No.37, Sec. 2, Jhongyang S. Rd., Beitou District, Taipei City 112, Taiwan (R.O.C.)

(Manufacturer Address)

☒ **EMC —Directive 2014/30/EU (from April 20th, 2016)**

☐ EN 55022:2010/AC:2011 Class B
☒ EN 55024:2010/A1:2015
☒ EN 55032:2012+AC:2013 Class B
☒ EN 61000-3-3:2013
☒ EN 61000-3-2:2014

☐ **LVD —Directive 2014/35/EU (from April 20th, 2016)**

☐ EN 60950-1 : 2011+ A2: 2013
☐ EN 60950-1 : 2006/A12: 2011

☒ RoHS — Directive 2011/65/EU
☒ CE marking

(EU conformity marking)

CE

ASRock EUROPE B.V.

(Company Name)

Bijsterhuizen 1111 6546 AR Nijmegen The Netherlands

(Company Address)

Person responsible for making this declaration:

(Name, Surname)

A.V.P

(Position / Title)

April 13, 2018

(Date)

P/N: 15G062091000AK V1.0