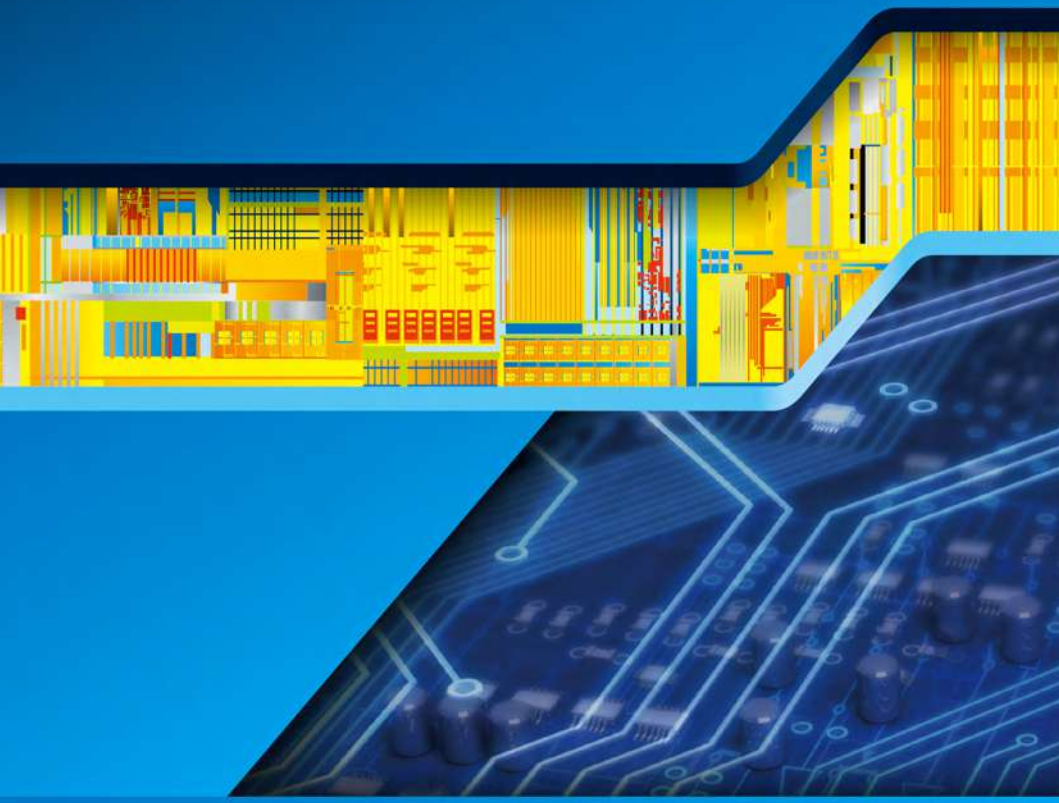
Z390M-STX MXM
B360M-STX MXM



User Manual

Version 1.0
Published September 2018

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.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

AUSTRALIA ONLY

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage caused by our goods. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Contents

Chapter 1 Introduction

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.

1.1 Package Contents

- Z390M-STX MXM / B360M-STX MXM Motherboard (Micro-STX Form Factor)
- Z390M-STX MXM / B360M-STX MXM Quick Installation Guide
- Z390M-STX MXM / B360M-STX MXM Support CD
- 1 x I/O Panel Shield
- 2 x Serial ATA (SATA) Data with Power Cables (Optional)
- 4 x Screws for M.2 Socket (Optional)
- 2 x Screws for MXM Slot (Optional)

1.2 Specifications

Platform	• Micro-STX Form Factor
CPU	**Z390M-STX MXM:** • Supports 9th and 8th Gen Intel® Core™ Processors (Socket 1151) • 5+1 Power Phase design • Supports Intel® Turbo Boost 2.0 Technology • Supports Intel® K-Series unlocked CPUs • Supports BCLK Full-range Overclocking **B360M-STX MXM:** • Supports 9th and 8th Gen Intel® Core™ Processors (Socket 1151) (Up to TDP 65W CPU) • 5+1 Power Phase design • Supports Intel® Turbo Boost 2.0 Technology
Chipset	• Intel® Z390 **(for Z390M-STX MXM)** • Intel® B360 **(for B360M-STX MXM)**
Memory	**Z390M-STX MXM:** • Dual Channel DDR4 Memory Technology • 2 x DDR4 SO-DIMM Slots • Supports DDR4 3200+(OC)*/2933(OC)/2800(OC)/2666/2400/2133 non-ECC, un-buffered memory • Max. capacity of system memory: 32GB • Supports Intel® Extreme Memory Profile (XMP) 2.0 **B360M-STX MXM:** • Dual Channel DDR4 Memory Technology • 2 x DDR4 SO-DIMM Slots • Supports DDR4 2666/2400/2133 non-ECC, un-buffered memory • Max. capacity of system memory: 32GB • Supports Intel® Extreme Memory Profile (XMP) 2.0
Expansion Slot	• 1 x Mobile PCI Express Module (MXM) Slot • 1 x M.2 Socket (Key E), supports type 2230 WiFi/BT module and Intel® CNVi (Integrated WiFi/BT)

Onboard Graphics	• Intel® UHD Graphics Built-in Visuals and the VGA outputs can be supported only with processors which are GPU integrated. • Supports Intel® UHD Graphics Built-in Visuals : Intel® Quick Sync Video with AVC, MVC (S3D) and MPEG-2 Full HW Encode1, Intel® InTru™ 3D, Intel® Clear Video HD Technology, Intel® Insider™, Intel® UHD Graphics • DirectX 12 • HWAEncode/Decode: AVC/H.264, HEVC/H.265 8-bit, HEVC/H.265 10-bit, VP8, VP9 8-bit, VP9 10-bit (Decode only), MPEG2, MJPEG, VC-1 (Decode only) • Supports HDMI with max. resolution up to 4K x 2K (4096x2160) @ 30Hz (on HDMI1) • 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
External Graphics	• Supports HDMI with max. resolution up to 4K x 2K (4096x2160) @ 60Hz (on HDMI)* • Supports DisplayPort 1.2 with max. resolution up to 4K x 2K (4096x2304) @ 60Hz* • Supports Mini DisplayPort 1.2 with max. resolution up to 4K x 2K (4096x2304) @ 60Hz* * The HDMI, DisplayPort and Mini DisplayPort ports are only available when a MXM graphics card is installed. * The resolution of HDMI, DisplayPort and Mini DisplayPort may vary based on different graphics cards.
Audio	• Realtek ALC233 Audio Codec • 1 x Headphone/Headset Jack • 1 x MIC-In
LAN	• Gigabit LAN 10/100/1000 Mb/s • Giga PHY Intel® I219V • Supports Wake-On-LAN • Supports Lightning/ESD Protection • Supports Energy Efficient Ethernet 802.3az • Supports PXE

Front Panel I/O	• 1 x Headphone/Headset Jack • 1 x USB 3.1 Gen2 Type-A Port (Supports ESD Protection) • 1 x USB 3.1 Gen2 Type-C Port (Supports ESD Protection) • 1 x Microphone Input Jack
Rear Panel I/O	• 1 x DC Power Din Jack (Compatible with the 19V power adapter) • 2 x HDMI Ports • 1 x DisplayPort • 1 x Mini DisplayPort • 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) **Z390M-STX MXM:** • 2 x USB 3.1 Gen1 Ports (Supports ESD Protection (Full Spike Protection)) • 2 x USB 3.1 Gen2 Ports (Supports ESD Protection (Full Spike Protection)) **B360M-STX MXM:** • 2 x USB 3.1 Gen1 Ports (Supports ESD Protection (Full Spike Protection)) • 2 x USB 2.0 Ports (Supports ESD Protection (Full Spike Protection))
Storage	**Z390M-STX MXM:** • 2 x SATA3 6.0 Gb/s with Power Connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10, Intel Rapid Storage Technology 16), NCQ, AHCI and Hot Plug* • 2 x Ultra M.2 Sockets (M2_1 and M2_3), supports M Key type 2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s)* • 1 x Ultra M.2 Socket (M2_2), supports M Key type 2242/2260/2280 M.2 PCI Express module up to Gen3 x4 (32 Gb/s)* * Supports Intel® Optane™ Technology * Supports NVMe SSD as boot disks **B360M-STX MXM:** • 2 x SATA3 6.0 Gb/s with Power Connectors, support NCQ, AHCI and Hot Plug* • 1 x Ultra M.2 Sockets (M2_1), supports M Key type 2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s)*

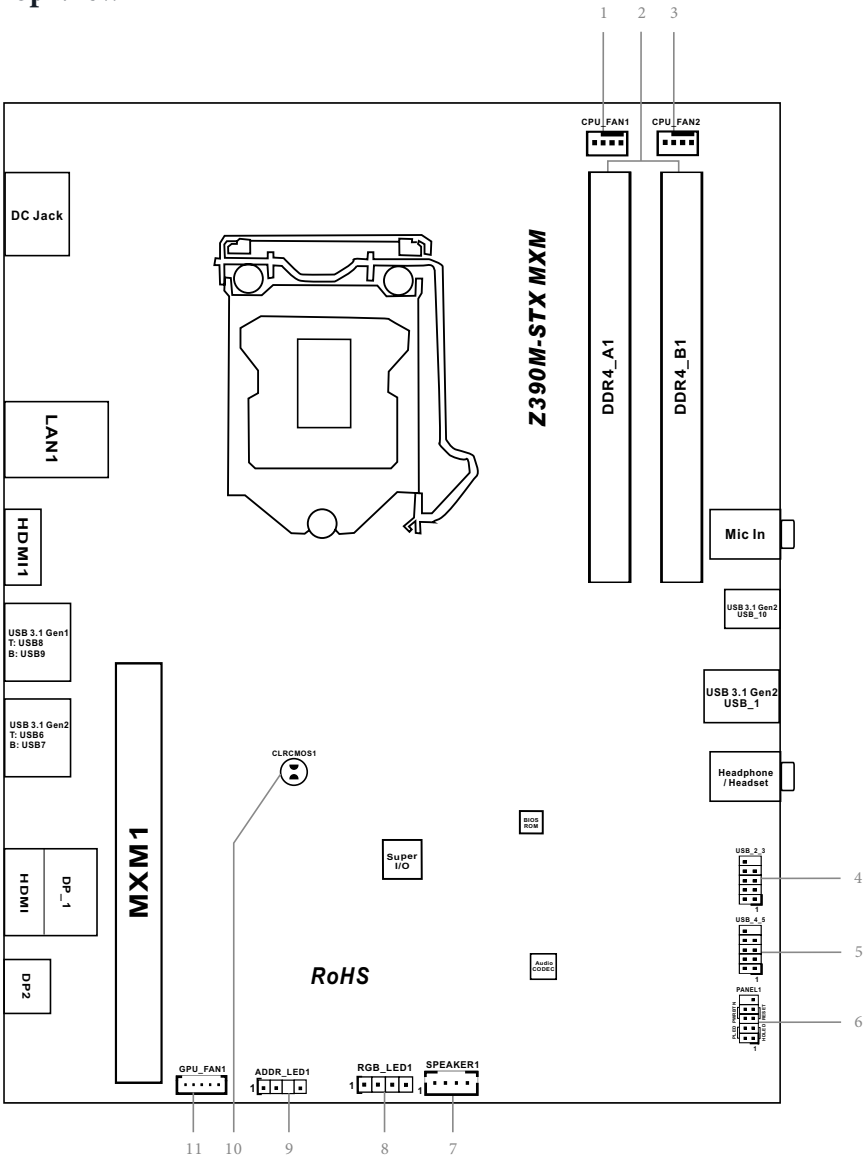
	• 1 x M.2 Socket (M2_3), supports M Key type 2260/2280 M.2 SATA3 6.0 Gb/s module* • 1 x Ultra M.2 Socket (M2_2), supports M Key type 2242/2260/2280 M.2 PCI Express module up to Gen3 x4 (32 Gb/s)* * Supports Intel® Optane™ Technology (on M2_2) * Supports NVMe SSD as boot disks
Connector	• 1 x RGB LED Header * Supports in total up to 12V/3A, 36W LED Strip • 1 x Addressable LED Header **(for Z390M-STX MXM only)** * Supports in total up to 5V/3A, 15W LED Strip • 2 x CPU Fan Connectors (4-pin) * The CPU Fan Connector supports the CPU fan of maximum 1A (12W) fan power. • 1 x GPU Fan Connector (5-pin) • 1 x 3W Audio AMP Output Wafer Header • 2 x USB 2.0 Headers (Support 4 USB 2.0 ports) (Supports ESD Protection)
BIOS Feature	• AMI UEFI Legal BIOS with multilingual GUI support • ACPI 6.0 Compliant wake up events • SMBIOS 2.7 Support • DRAM Voltage, VCORE Multi-adjustment
Hardware Monitor	• Temperature Sensing: CPU • Fan Tachometer: CPU • Quiet Fan (Auto adjust chassis fan speed by CPU temperature): CPU • Voltage monitoring: +12V, +5V, +3.3V, CPU Vcore, DRAM
OS	• Microsoft® Windows® 10 64-bit
Certifications	• FCC, CE • ErP/EuP ready (ErP/EuP ready power supply is required)

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

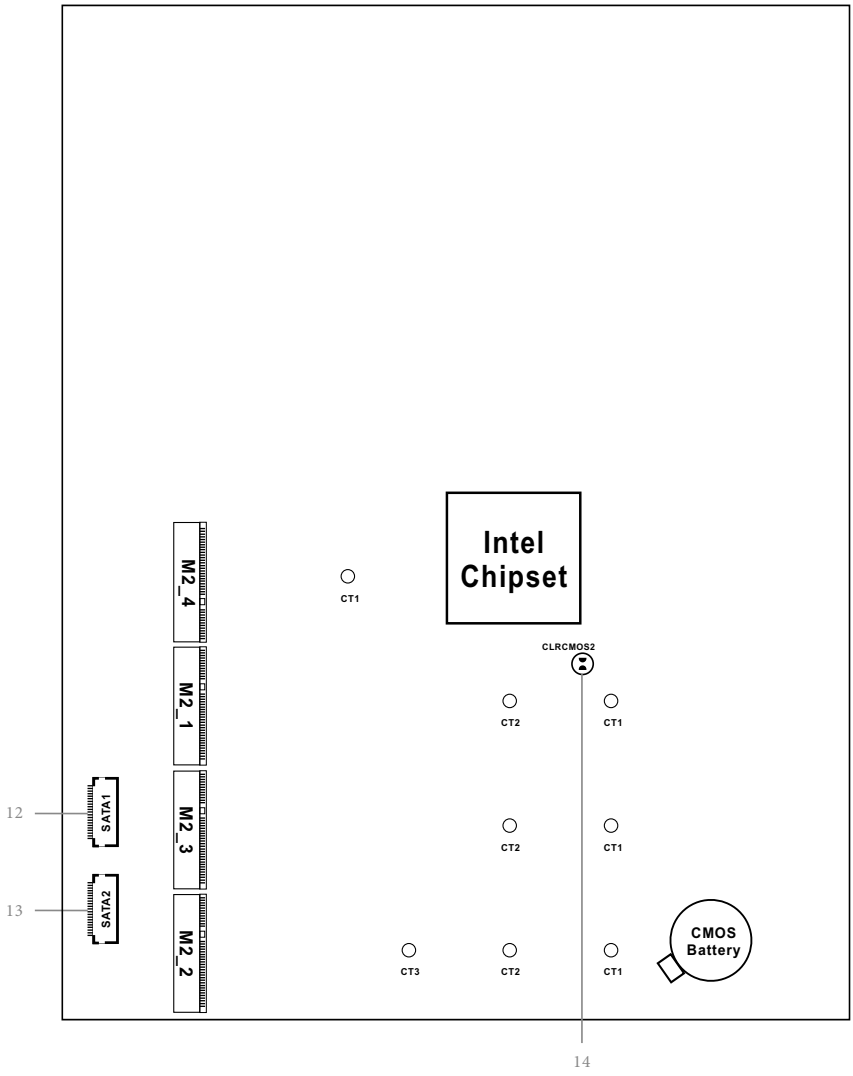
Z390M-STX MXM

Top View



English

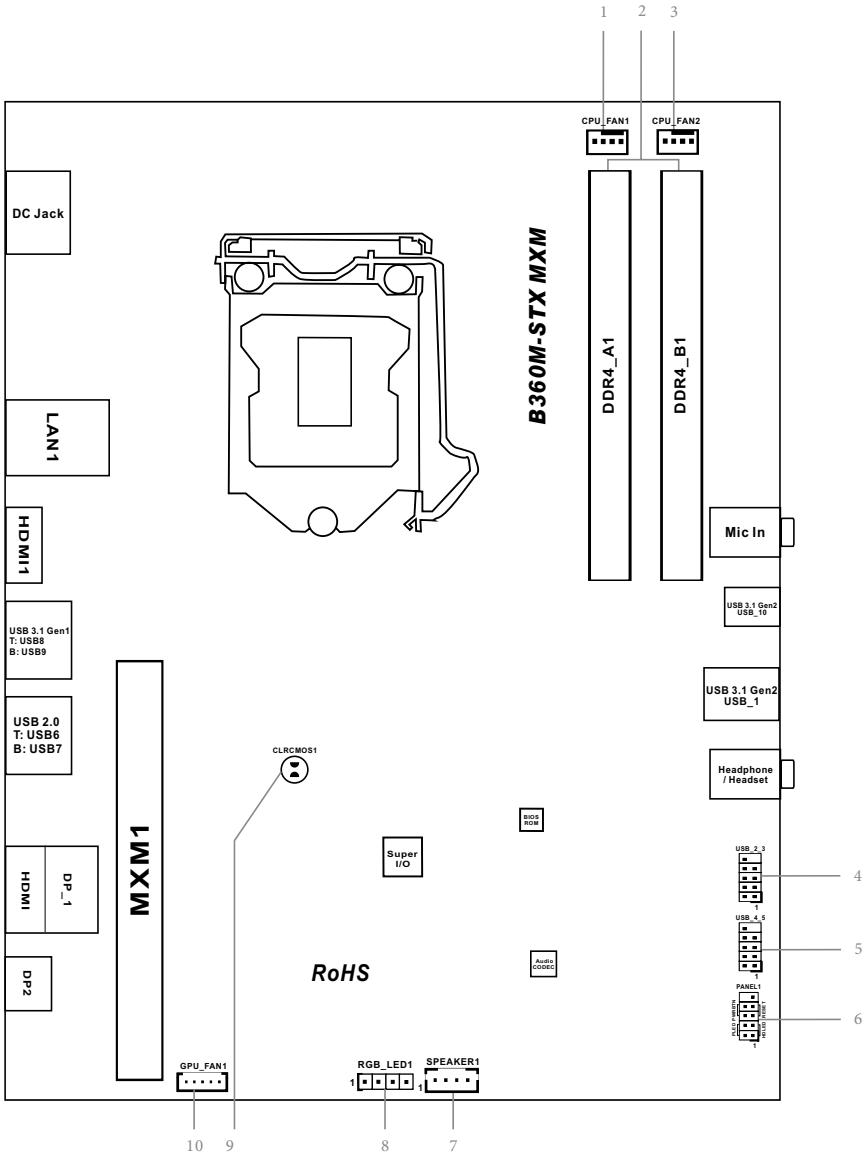
Bottom View


M2_4
M2_1
M2_3
M2_2
SATA1
SATA2
12
13
CT1
Intel Chipset
CLRCMOS2
CT2
CT1
CT2
CT1
CT3
CT2
CT1
CMOS Battery
14

No.	Description
1	CPU Fan Connector (CPU_FAN1)
2	2 x 260-pin DDR4 SO-DIMM Slots (DDR4_A1, DDR4_B1)
3	CPU Fan Connector (CPU_FAN2)
4	USB 2.0 Header (USB_2_3)
5	USB 2.0 Header (USB_4_5)
6	System Panel Header (PANEL1)
7	3W Audio AMP Output Wafer Header (SPEAKER1)
8	RGB LED Header (RGB_LED1)
9	Addressable LED Header (ADDR_LED1)
10	Clear CMOS Pad (CLRCMOS1)
11	5-Pin GPU Fan Connector (GPU_FAN1)
12	SATA3 Connector (SATA1)
13	SATA3 Connector (SATA2)
14	Clear CMOS Pad (CLRCMOS2)

B360M-STX MXM

Top View



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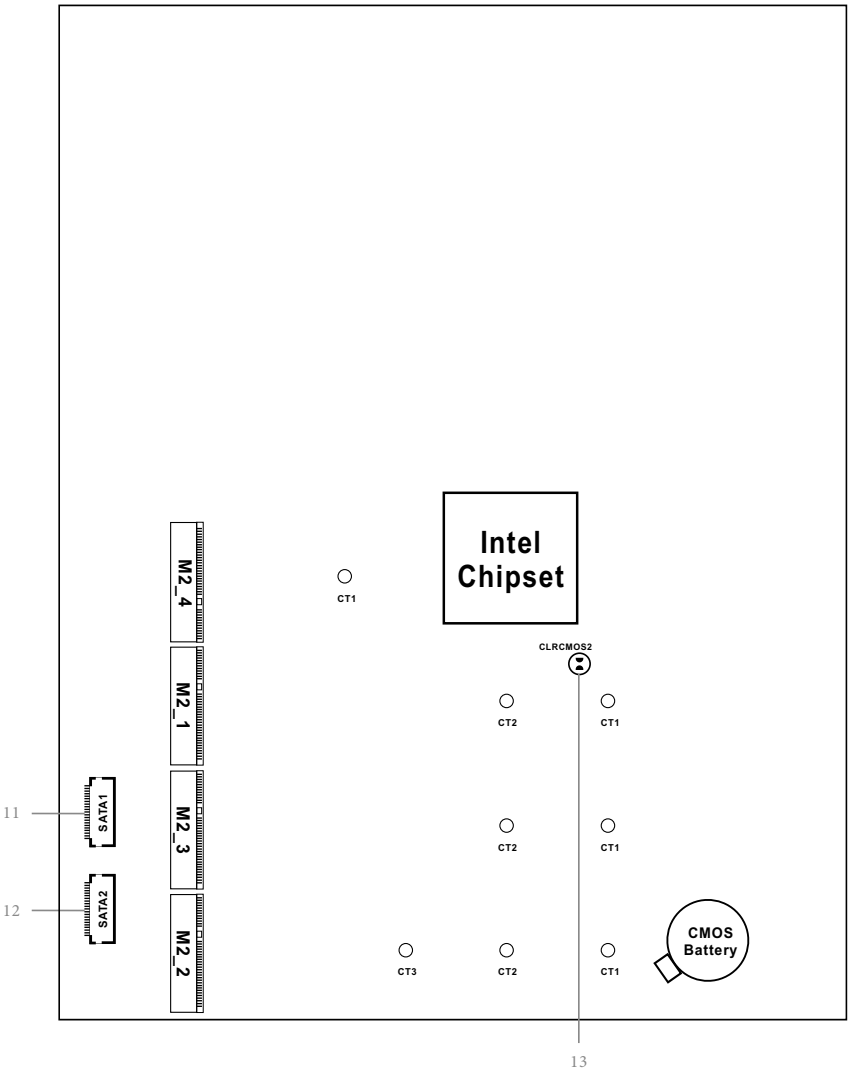
Intel
Chipset
M2_4
M2_1
M2_3
M2_2
SATA1
SATA2
CT1
CT2
CT3
CLRCMOS2
CMOS
Battery
11
12
13

No.	Description
1	CPU Fan Connector (CPU_FAN1)
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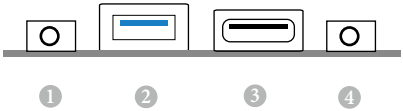
7	3W Audio AMP Output Wafer Header (SPEAKER1)
8	RGB LED Header (RGB_LED1)
9	Clear CMOS Pad (CLRCMOS1)
10	5-Pin GPU Fan Connector (GPU_FAN1)
11	SATA3 Connector (SATA1)
12	SATA3 Connector (SATA2)
13	Clear CMOS Pad (CLRCMOS2)

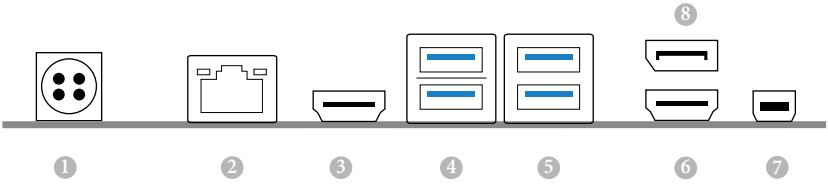
1.4 Front Panel



No.	Description	No.	Description
1	Headphone/Headset Jack (AUDIO1)	3	USB 3.1 Gen1 Type-C Port (USB_10)
2	USB 3.1 Gen2 Type-A Port (USB_1)	4	Microphone Input (AUDIO2)

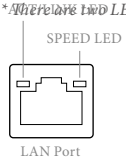
1.5 Rear Panel

Z390M-STX MXM



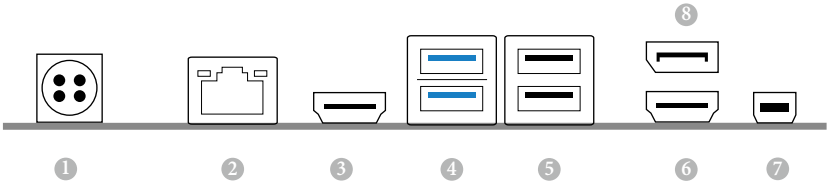
No.	Description	No.	Description
1	DC Power Din Jack (Supports 19V Power Adapters)	5	USB 3.1 Gen2 Ports (USB_6_7)
2	LAN RJ-45 Port*	6	HDMI Port (HDMI)
3	HDMI Port (HDMI1)	7	Mini DisplayPort (DP2)
4	USB 3.1 Gen1 Ports (USB_8_9)	8	DisplayPort (DP_1)

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



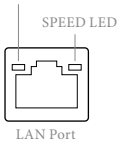
Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

B360M-STX MXM:



No.	Description	No.	Description
1	DC Power Din Jack	5	USB 2.0 Ports (USB_6_7)
	(Supports 19V Power Adapters)	6	HDMI Port (HDMI)
2	LAN RJ-45 Port*	7	Mini DisplayPort (DP2)
3	HDMI Port (HDMI1)	8	DisplayPort (DP_1)
4	USB 3.1 Gen1 Ports (USB_8_9)		

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

Chapter 2 Installation

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

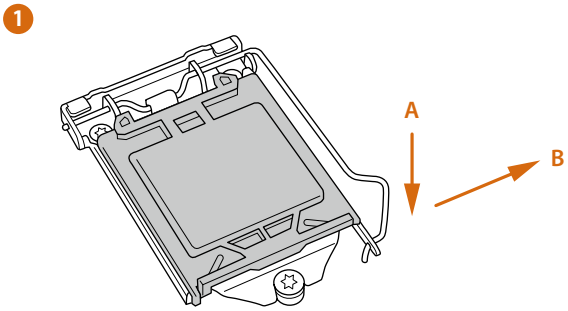
Pre-installation Precautions

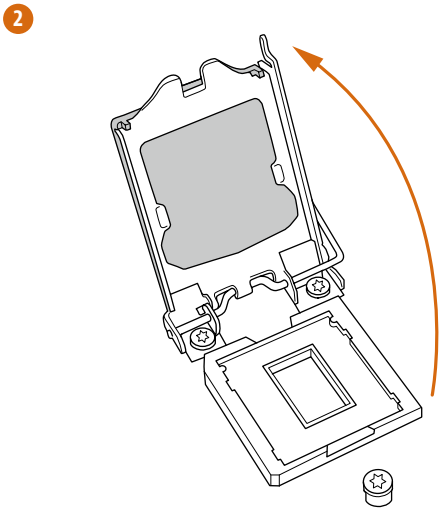
Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Make sure to unplug the power cord before installing or removing the motherboard components. Failure to do so may cause physical injuries 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

1. *Before you insert the 1151-Pin CPU into the socket, please check if the **PnP cap** is on the socket, if the CPU surface is unclean, or if there are any **bent pins** in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.*
2. *Unplug all power cables before installing the CPU.*





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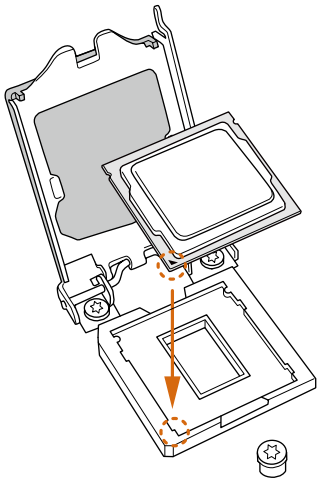

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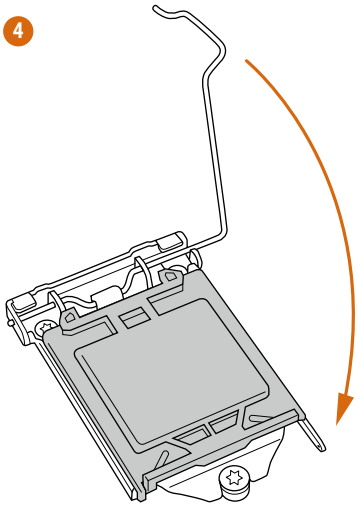

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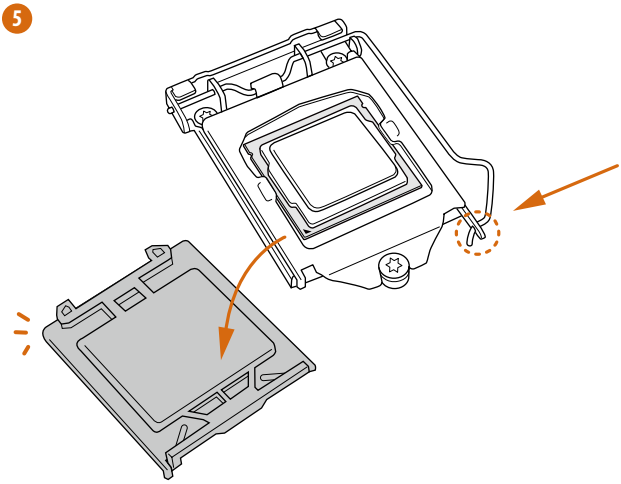
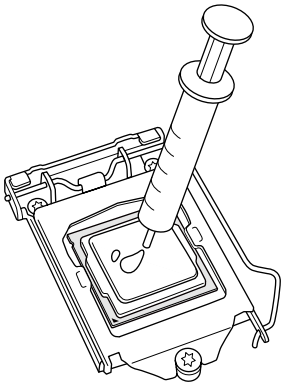
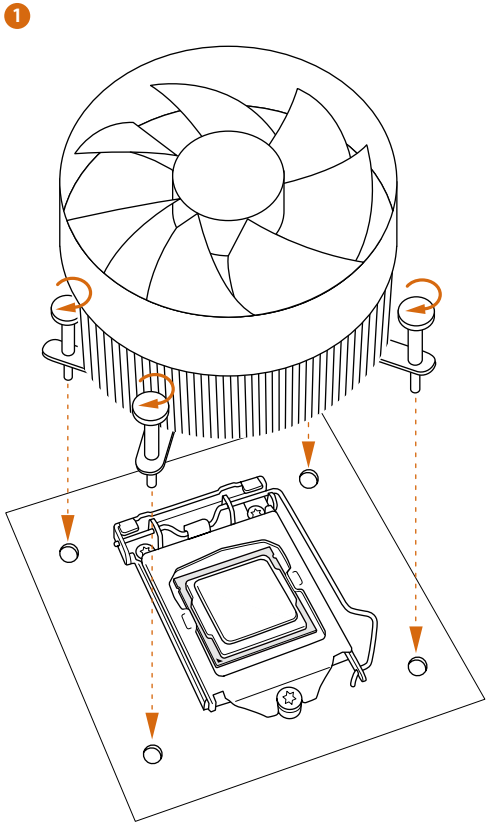
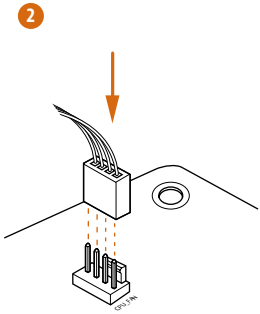


Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

2.2 Installing the CPU Fan and Heatsink







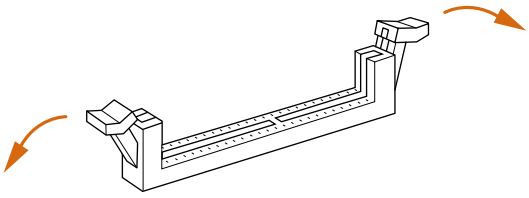
2.3 Installing Memory Modules (SO-DIMM)

This motherboard provides two 260-pin DDR4 (Double Data Rate 4) SO-DIMM slots.

It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and SO-DIMM may be damaged.

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

1



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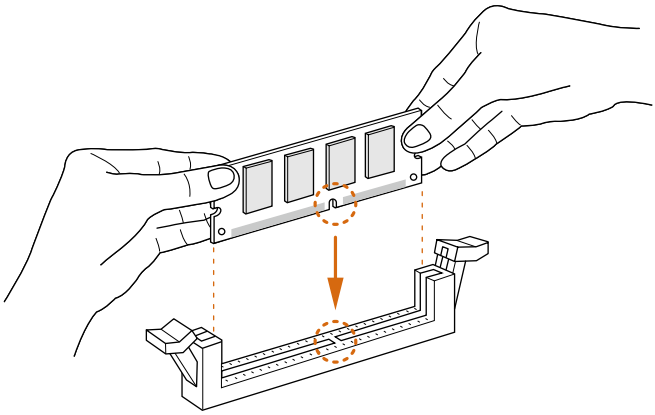

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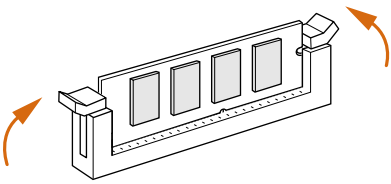
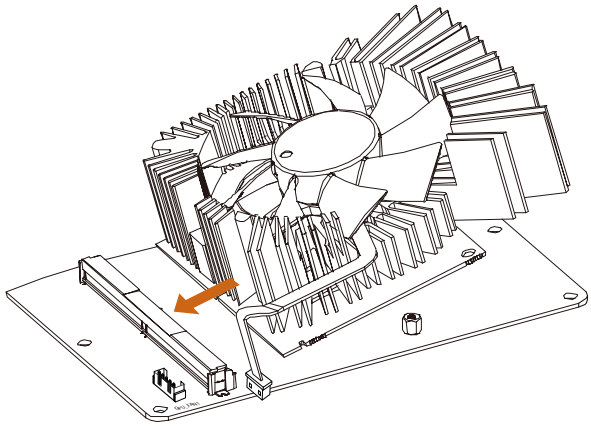


2.4 Installing Mobile PCI Express Module (MXM)

This motherboard provides a Mobile PCI Express Module (MXM) Slot.

Installing a Type A MXM Card (70mm)

1



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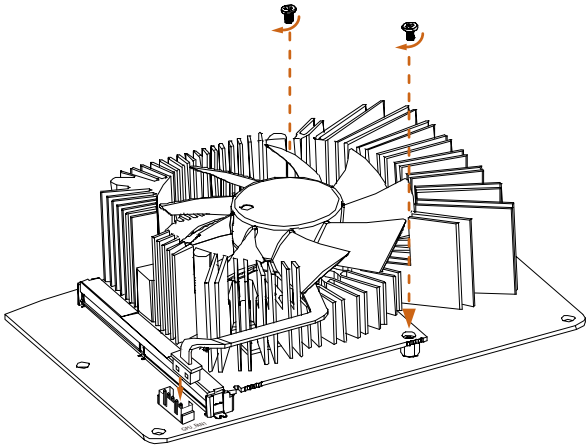

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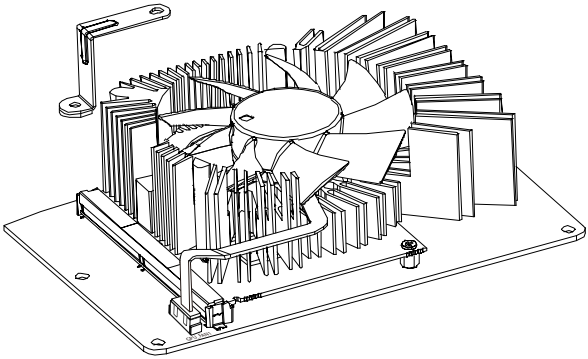

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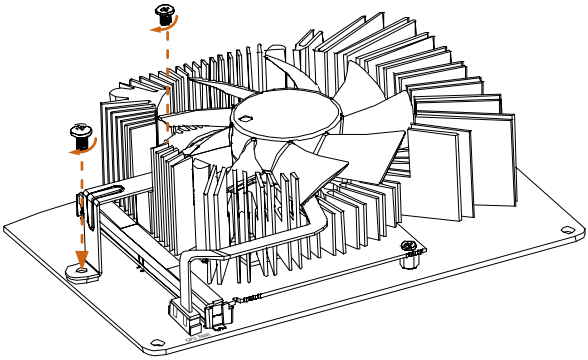

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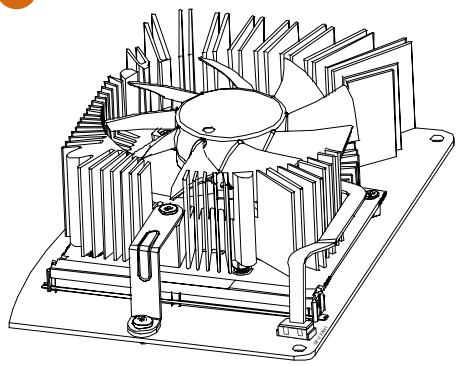

Installing a Type B MXM Card (105mm)

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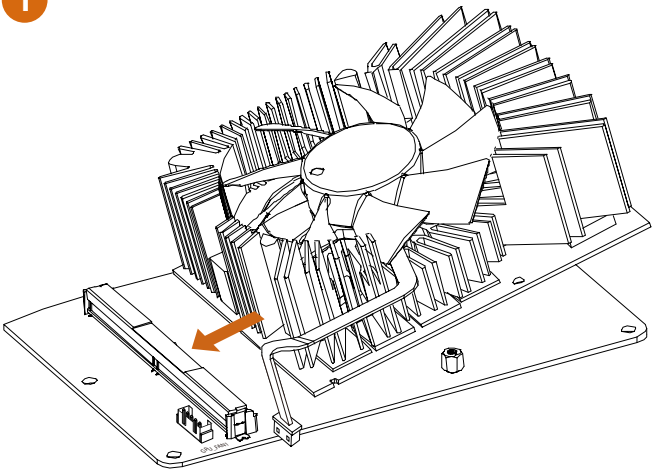

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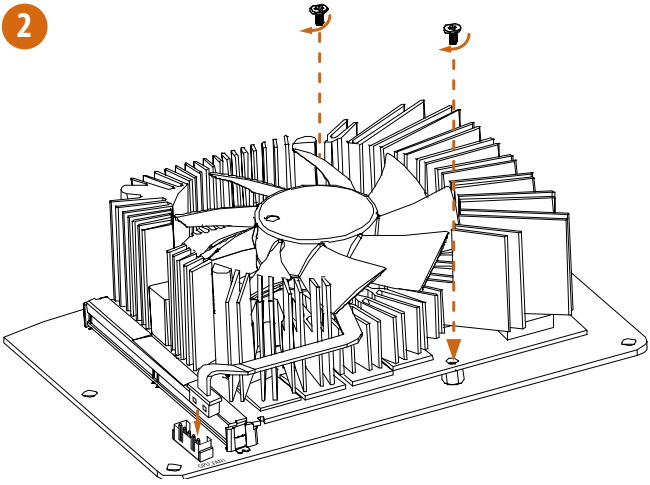

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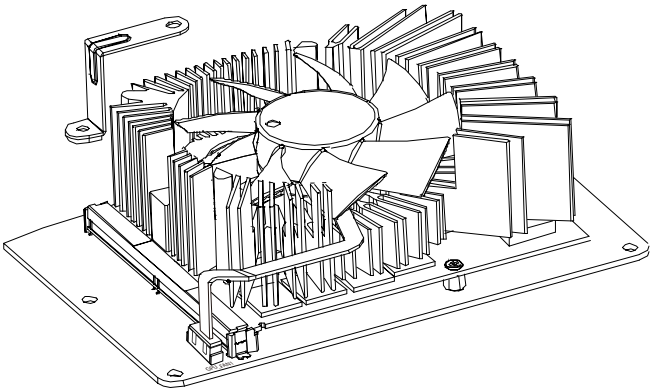

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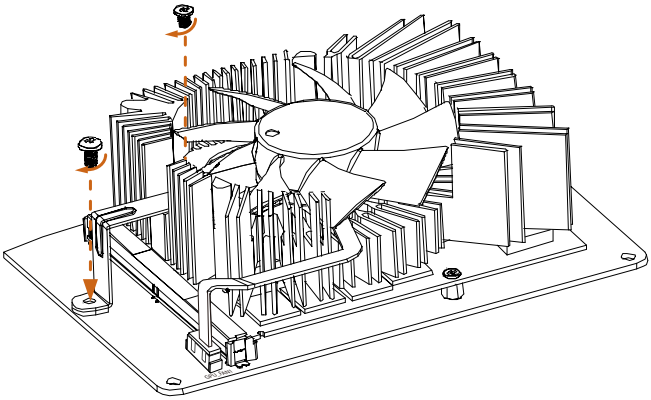
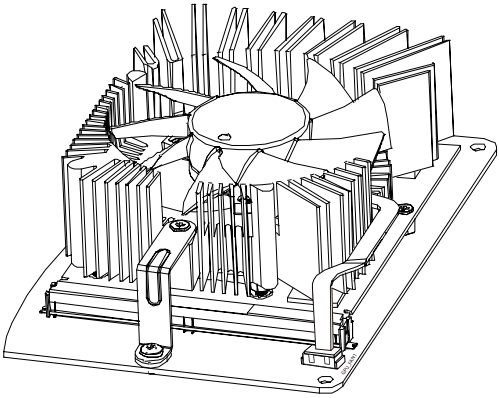
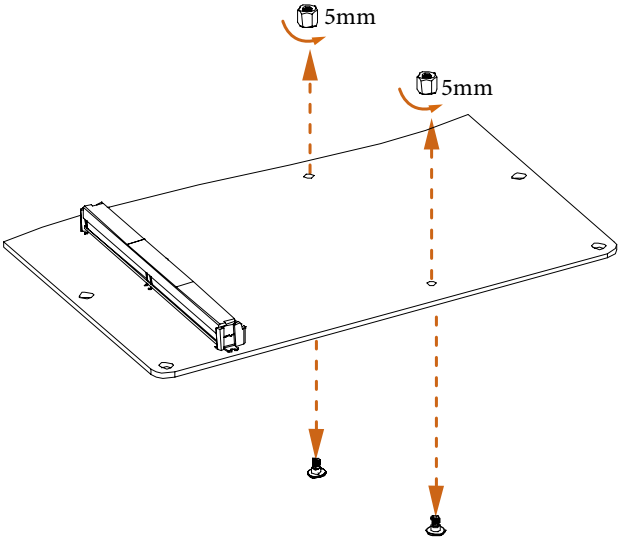


5

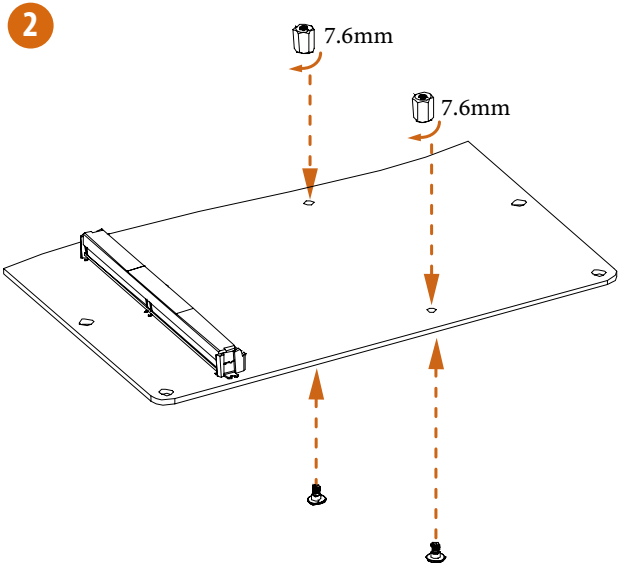


Installing a Type B+ MXM Card (105mm-113mm)

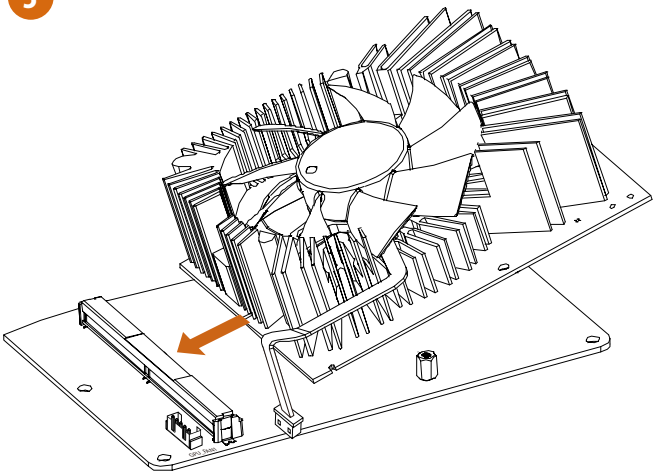
1



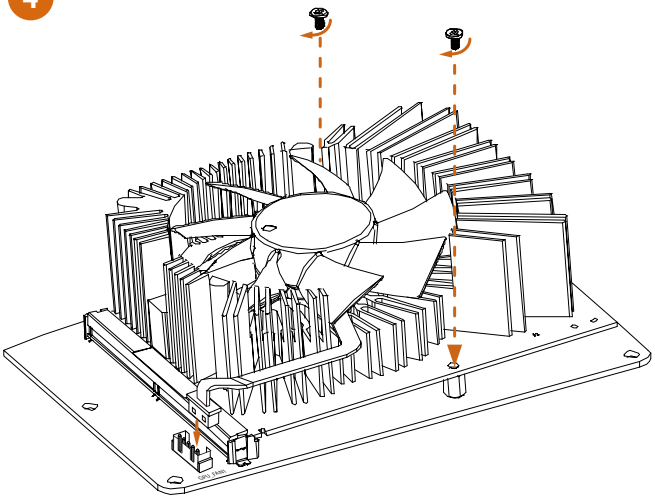
2



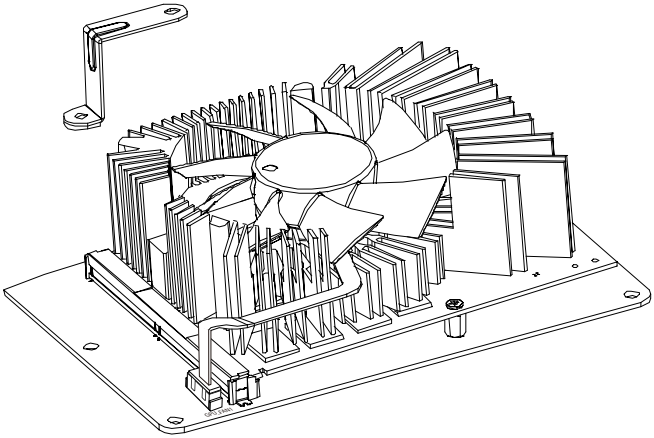
3



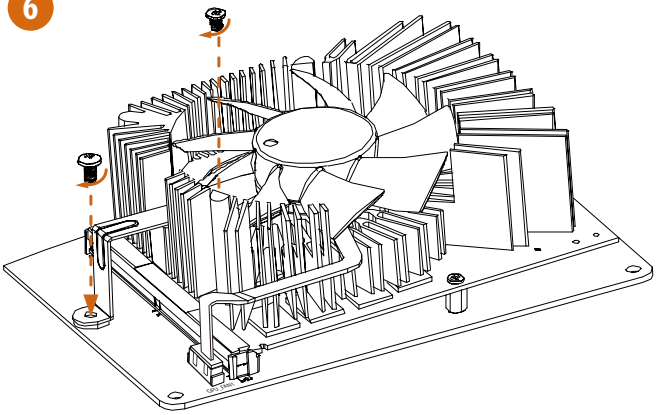
4



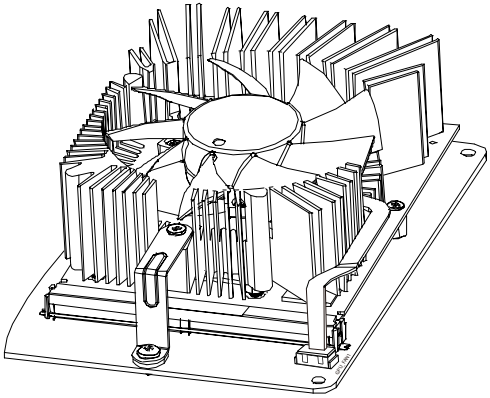
5



6



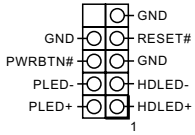
7



2.5 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.6 or p.9, No. 6)



Connect the power button, reset button 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 Button):
Connect to the power button on the chassis front panel. You may configure the way to turn off your system using the power button.

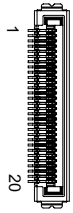
RESET (Reset Button):
Connect to the reset button on the chassis front panel. Press the reset button to restart the computer if the computer freezes and fails to perform a normal restart.

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 button, reset button, 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.

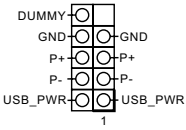
Serial ATA3 Connectors
(see p.7, No. 12 and 13)
(see p.10, No. 11 and 12)



These two SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate. *The SATA3 connectors support 2.5-inch hard drive (+5V) and do not support 3.5-inch hard drive (+12V)

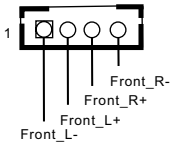
PIN	Signal Name	PIN	Signal Name
1	GND	**11**	N/A
2	LVDS_TX+	**12**	5V
3	LVDS_TX-	**13**	5V
4	GND	**14**	5V
5	GND	**15**	5V
6	LVDS_RX-	**16**	5V
7	LVDS_RX+	**17**	N/A
8	GND	**18**	GND
9	GND	**19**	GND
10	GND	**20**	GND

USB 2.0 Headers
(9-pin USB_2_3)
(see p.6 or p.9, No. 4)
(9-pin USB_4_5)
(see p.6 or p.9, No. 5)



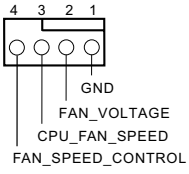
There are two USB 2.0 headers on this motherboard.

3W Audio AMP Output Wafer Header
(4-pin SPEAKER1)
(see p.6 or p.9, No. 7)



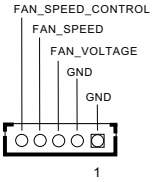
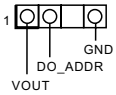
Please connect the chassis speaker to this header.

CPU Fan Connectors
(4-pin CPU_FAN1)
(see p.6 or p.9, No. 1)
(4-pin CPU_FAN2)
(see p.6 or p.9, No. 3)



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

English

GPU Fan Connector (5-pin GPU_FAN1) (see p.6, No. 11) (see p.9, No. 10)		This motherboard provides a 5-Pin GPU fan connector for connecting your GPU fan.
RGB LED Header (4-pin RGB_LED1) (see p.6 or p.9, No. 8)		The RGB 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 46 for further instructions on these two headers.
Addressable LED Header (3-pin ADDR_LED1) (see p.6, No. 9) **(for Z390M-STX MXM only)**		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 47 for further instructions on this header.
Clear CMOS Pads (CLRCMOS1) (see p.6, No. 10) (see p.9, No. 9) (CLRCMOS2) (see p.7, No. 14) (see p.10, No. 13)		The Clear CMOS Pad allows you to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.

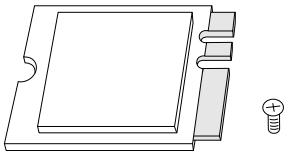
2.6 M.2 WiFi/BT Module and Intel® CNVi (Integrated WiFi/BT) Installation Guide

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 (Key E) supports type 2230 WiFi/BT module and Intel® CNVi (Integrated WiFi/BT).

* The M.2 socket does not support SATA M.2 SSDs.

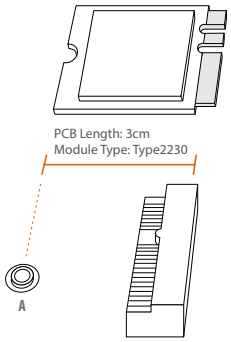
Before you install Intel® Integrated Connectivity (CNVi) module, be sure to turn off the AC power.

Installing the WiFi/BT module or Intel® CNVi (Integrated WiFi/BT)



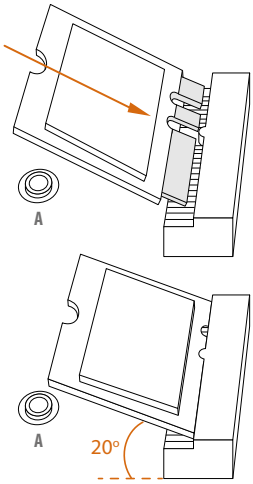
Step 1

Prepare a type 2230 WiFi/BT module or Intel® CNVi (Integrated WiFi/BT) and the screw.



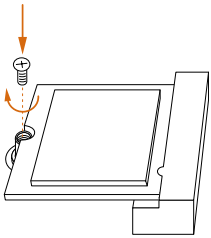
Step 2

Find the nut location to be used.



Step 3

Gently insert the WiFi/BT module or Intel® CNVi (Integrated WiFi/ BT) into the M.2 slot. Please be aware that the module only fits in one orientation.



Step 4

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

2.7 M.2_SSD (NGFF) Module Installation Guide (M2_1, M2_3)

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.

Z390M-STX MXM:

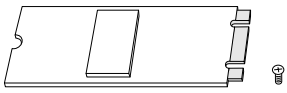
The Ultra M.2 Sockets (M2_1 and M2_3) support M Key type 2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s)

B360M-STX MXM:

The Ultra M.2 Socket (M2_1) supports M Key type 2260/2280 M.2 SATA3 6.0 Gb/s module and M.2 PCI Express module up to Gen3 x4 (32 Gb/s)

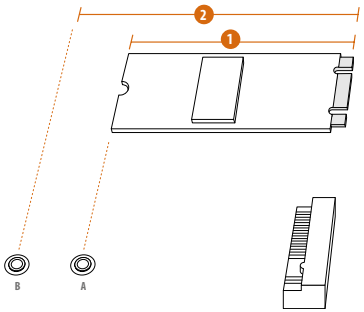
The M.2 Socket (M2_3) supports type 2260/2280 M.2 SATA3 6.0 Gb/s module.

Installing the M.2_SSD (NGFF) Module



Step 1

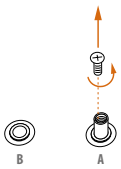
Prepare a M.2_SSD (NGFF) module and the screw.

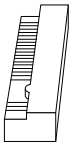


Step 2

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

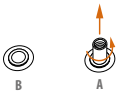
No.	1	2
Nut Location	A	B
PCB Length	6cm	8cm
Module Type	Type2260	Type 2280

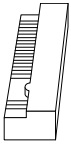




Step 3

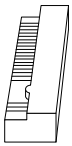
Remove the screw on the standoff and keep this screw for later use.





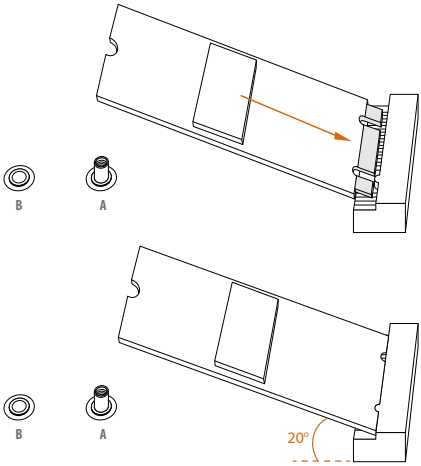
Step 4

Move the standoff based on the module type and length.
The standoff is placed at the nut location A by default. Skip Step 4 and 5 and go straight to Step 6 if you are going to use the default nut. Otherwise, release the standoff by hand.



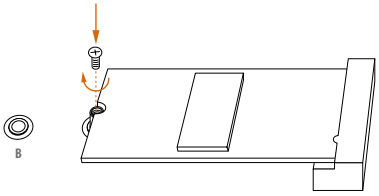
Step 5

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 6

Align and 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 7

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

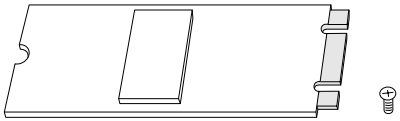
Vendor	Interface	P/N
ADATA	SATA3	AXNS381E-128GM-B
ADATA	SATA3	AXNS381E-256GM-B
ADATA	SATA3	ASU800NS38-256GT-C
ADATA	SATA3	ASU800NS38-512GT-C
ADATA	PCIe3 x4	ASX7000NP-128GT-C
ADATA	PCIe3 x4	ASX8000NP-256GM-C
ADATA	PCIe3 x4	ASX7000NP-256GT-C
ADATA	PCIe3 x4	ASX8000NP-512GM-C
ADATA	PCIe3 x4	ASX7000NP-512GT-C
Apacer	PCIe3 x4	AP240GZ280
Corsair	PCIe3 x4	CSSD-F240GBMP500
Crucial	SATA3	CT120M500SSD4
Crucial	SATA3	CT240M500SSD4
Intel	SATA3	Intel SSDSCKGW080A401/80G
Intel	PCIe3 x4	SSDPEKKF256G7
Intel	PCIe3 x4	SSDPEKKF512G7
Kingston	SATA3	SM2280S3
Kingston	PCIe3 x4	SKC1000/480G
Kingston	PCIe2 x4	SH2280S3/480G
OCZ	PCIe3 x4	RVD400 -M2280-512G (NVME)
PATRIOT	PCIe3 x4	PH240GPM280SSDR NVME
Plextor	PCIe3 x4	PX-128M8PeG
Plextor	PCIe3 x4	PX-1TM8PeG
Plextor	PCIe3 x4	PX-256M8PeG
Plextor	PCIe3 x4	PX-512M8PeG
Plextor	PCIe	PX-G256M6e
Plextor	PCIe	PX-G512M6e
Samsung	PCIe3 x4	SM961 MZVPW128HEGM (NVM)
Samsung	PCIe3 x4	PM961 MZVLW128HEGR (NVME)
Samsung	PCIe3 x4	960 EVO (MZ-V6E250) (NVME)
Samsung	PCIe3 x4	960 EVO (MZ-V6E250BW) (NVME)
Samsung	PCIe3 x4	SM951 (NVME)
Samsung	PCIe3 x4	SM951 (MZHPV256HDGL)
Samsung	PCIe3 x4	SM951 (MZHPV512HDGL)
Samsung	PCIe3 x4	SM951 (NVME)
Samsung	PCIe x4	XP941-512G (MZHPU512HCGL)
SanDisk	PCIe	SD6PP4M-128G
SanDisk	PCIe	SD6PP4M-256G
Team	SATA3	TM8PS4128GMC105
Team	SATA3	TM8PS4256GMC105

TEAM	PCIe3 x4	TM8FP2240G0C101
TEAM	PCIe3 x4	TM8FP2480GC110
Transcend	SATA3	TS512GMTS600
Transcend	SATA3	TS512GMTS800
V-Color	SATA3	VLM100-120G-2280B-RD
V-Color	SATA3	VLM100-240G-2280RGB
V-Color	SATA3	VSM100-240G-2280
V-Color	SATA3	VLM100-240G-2280B-RD
WD	SATA3	WDS100T1B0B-00AS40
WD	SATA3	WDS240G1G0B-00RC30
WD	PCIe3 x4	WDS256G1X0C-00ENX0 (NVME)
WD	PCIe3 x4	WDS512G1X0C-00ENX0 (NVME)

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

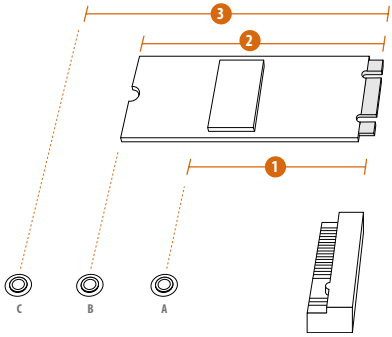
The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The Ultra M.2 Socket (M2_2) supports 2242/2260/2280 M.2 PCI Express module up to Gen3 x4 (32 Gb/s).

Installing the M.2_SSD (NGFF) Module



Step 1

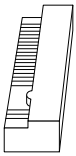
Prepare a M.2_SSD (NGFF) module and the screw.



Step 2

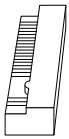
Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

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



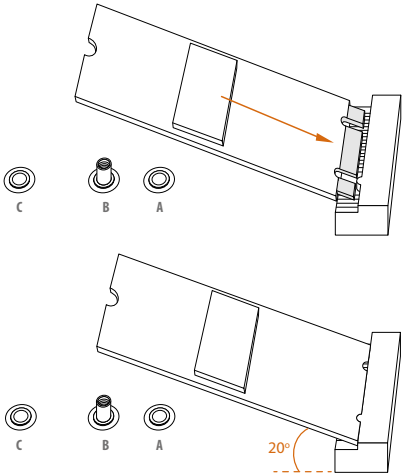
Step 3

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.



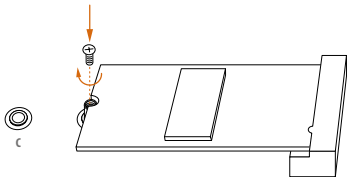
Step 4

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

Align and 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
ADATA	SATA3	AXNS381E-128GM-B
ADATA	SATA3	AXNS381E-256GM-B
ADATA	SATA3	ASU800NS38-256GT-C
ADATA	SATA3	ASU800NS38-512GT-C
ADATA	PCIe3 x4	ASX7000NP-128GT-C
ADATA	PCIe3 x4	ASX8000NP-256GM-C
ADATA	PCIe3 x4	ASX7000NP-256GT-C
ADATA	PCIe3 x4	ASX8000NP-512GM-C
ADATA	PCIe3 x4	ASX7000NP-512GT-C
Apacer	PCIe3 x4	AP240GZ280
Corsair	PCIe3 x4	CSSD-F240GBMP500
Crucial	SATA3	CT120M500SSD4
Crucial	SATA3	CT240M500SSD4
Intel	SATA3	Intel SSDSCKGW080A401/80G
Intel	PCIe3 x4	SSDPEKKF256G7
Intel	PCIe3 x4	SSDPEKKF512G7
Kingston	SATA3	SM2280S3
Kingston	PCIe3 x4	SKC1000/480G
Kingston	PCIe2 x4	SH2280S3/480G
OCZ	PCIe3 x4	RVD400 -M2280-512G (NVME)
PATRIOT	PCIe3 x4	PH240GPM280SSDR NVME
Plextor	PCIe3 x4	PX-128M8PeG
Plextor	PCIe3 x4	PX-1TM8PeG
Plextor	PCIe3 x4	PX-256M8PeG
Plextor	PCIe3 x4	PX-512M8PeG
Plextor	PCIe	PX-G256M6e
Plextor	PCIe	PX-G512M6e
Samsung	PCIe3 x4	SM961 MZVPW128HEGM (NVM)
Samsung	PCIe3 x4	PM961 MZVLW128HEGR (NVME)
Samsung	PCIe3 x4	960 EVO (MZ-V6E250) (NVME)
Samsung	PCIe3 x4	960 EVO (MZ-V6E250BW) (NVME)
Samsung	PCIe3 x4	SM951 (NVME)
Samsung	PCIe3 x4	SM951 (MZHPV256HDGL)
Samsung	PCIe3 x4	SM951 (MZHPV512HDGL)
Samsung	PCIe3 x4	SM951 (NVME)
Samsung	PCIe x4	XP941-512G (MZHPU512HCGL)
SanDisk	PCIe	SD6PP4M-128G
SanDisk	PCIe	SD6PP4M-256G
Team	SATA3	TM4PS4128GMC105
Team	SATA3	TM4PS4256GMC105
Team	SATA3	TM8PS4128GMC105
Team	SATA3	TM8PS4256GMC105

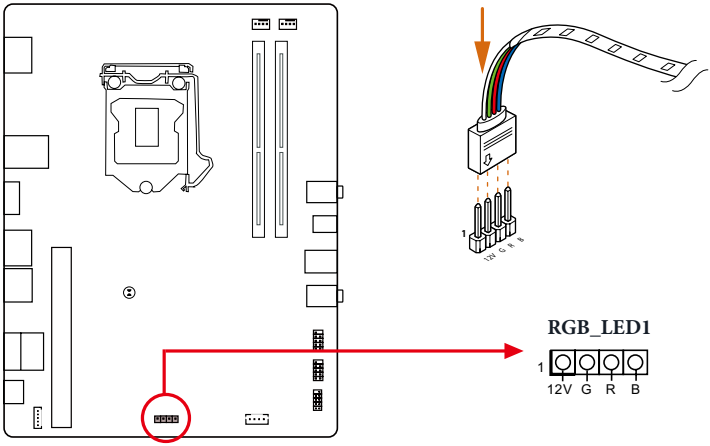
TEAM	PCIe3 x4	TM8FP2240G0C101
TEAM	PCIe3 x4	TM8FP2480GC110
Transcend	SATA3	TS256GMTS400
Transcend	SATA3	TS512GMTS600
Transcend	SATA3	TS512GMTS800
V-Color	SATA3	VLM100-120G-2280B-RD
V-Color	SATA3	VLM100-240G-2280RGB
V-Color	SATA3	VSM100-240G-2280
V-Color	SATA3	VLM100-240G-2280B-RD
WD	SATA3	WDS100T1B0B-00AS40
WD	SATA3	WDS240G1G0B-00RC30
WD	PCIe3 x4	WDS256G1X0C-00ENX0 (NVME)
WD	PCIe3 x4	WDS512G1X0C-00ENX0 (NVME)

2.9 Polychrome RGB

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 strip to the **RGB LED Header (RGB_LED1)** on the motherboard.

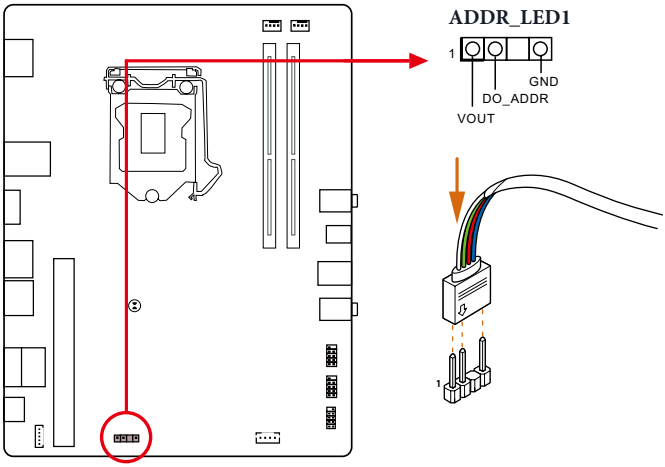


1. *Never install the RGB LED cable in the wrong orientation; otherwise, the cable may be damaged.*
2. *Before installing or removing your RGB LED cable, please power off your system and unplug the power cord from the power supply. Failure to do so may cause damages to motherboard components.*

1. *Please note that the RGB LED strip 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 (for Z390M-STX MXM only)

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.*

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.

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.

4.2 EZ Mode

The EZ Mode screen appears when you enter the BIOS setup program by default. EZ mode is a dashboard which contains multiple readings of the system's current status. You can check the most crucial information of your system, such as CPU speed, DRAM frequency, SATA information, fan speed, etc.

Press <F6> or click the "Advanced Mode" button at the upper right corner of the screen to switch to "Advanced Mode" for more options.

No.	Function
1	Help
2	Load UEFI Defaults
3	Save Changes and Exit
4	Discard Changes
5	Change Language
6	Switch to Advanced Mode

4.3 Advanced Mode

The Advanced Mode provides more options to configure the BIOS settings. Refer to the following sections for the detailed configurations.

To access the EZ Mode, press <F6> or click the "EZ Mode" button at the upper right corner of the screen.

4.3.1 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
Boot	For configuring boot settings and boot priority
Security	For security settings
Exit	Exit the current screen or the UEFI Setup Utility

4.3.2 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
<F5>	Add / Remove Favorite
<F6>	Toggle between Easy mode and Advanced mode
<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

4.4 Main Screen

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

Favorite

Display your collection of BIOS items. Press F5 to add/remove your favorite items.

4.5 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

Boot Performance Mode

Default is Max Non-Turbo performance mode. It will keep cpu Flex-ratio till OS handoff. Max Battery mode will set CPU ratio as x8 till OS handoff. This option is suggested for BCLK overclocking.

FCLK Frequency

Configure the FCLK Frequency.

AVX Ratio Offset

AVX Ratio Offset specifies a negative offset from the CPU Ratio for AVX workloads. AVX is a more stressful workload that lowers the AVX ratio to ensure maximum possible ratio for SSE workloads.

BCLK Aware Adaptive Voltage

BCLK Aware Adaptive Voltage enable/disable. When enabled, pcode will be aware of the BCLK frequency when calculating the CPU V/F curves. This is ideal for BCLK OC to avoid high voltage overrides.

Ring to Core Ratio Offset

Disable Ring to Core Ratio Offset so the ring and core can run at the same frequency.

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state.

Intel Speed Shift Technology

Enable/Disable Intel Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-sates.

Long Duration Power Limit

Configure Package Power Limit 1 in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Long Duration Maintained

Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded.

Short Duration Power Limit

Configure Package Power Limit 2 in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

CPU Core Current Limit

Configure the current limit of the CPU core. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

GT Current Limit

Configure the current limit of the GT slice. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

GT Frequency

Configure the frequency of the integrated GPU.

DRAM Configuration

DRAM Tweaker

Fine tune the DRAM settings by leaving marks in checkboxes. Click OK to confirm and apply your new settings.

DRAM Timing Configuration

Load XMP Setting

Load XMP settings to overclock the memory and perform beyond standard specifications.

DRAM Reference Clock

Select Auto for optimized settings.

DRAM Frequency

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

Primary Timing

CAS# Latency (tCL)

The time between sending a column address to the memory and the beginning of the data in response.

RAS# to CAS# Delay and Row Precharge (tRCDtRP)

RAS# to CAS# Delay : The number of clock cycles required between the opening of a row of memory and accessing columns within it.
Row Precharge: The number of clock cycles required between the issuing of the precharge command and opening the next row.

RAS# Active Time (tRAS)

The number of clock cycles required between a bank active command and issuing the precharge command.

Command Rate (CR)

The delay between when a memory chip is selected and when the first active command can be issued.

Secondary Timing

Write Recovery Time (tWR)

The amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged.

Refresh Cycle Time (tRFC)

The number of clocks from a Refresh command until the first Activate command to the same rank.

RAS to RAS Delay (tRRD_L)

The number of clocks between two rows activated in different banks of the same rank.

RAS to RAS Delay (tRRD_S)

The number of clocks between two rows activated in different banks of the same rank.

Write to Read Delay (tWTR_L)

The number of clocks between the last valid write operation and the next read command to the same internal bank.

Write to Read Delay (tWTR_S)

The number of clocks between the last valid write operation and the next read command to the same internal bank.

Read to Precharge (tRTP)

The number of clocks that are inserted between a read command to a row pre-charge command to the same rank.

Four Activate Window (tFAW)

The time window in which four activates are allowed the same rank.

CAS Write Latency (tCWL)

Configure CAS Write Latency.

Third Timing

tREFI

Configure refresh cycles at an average periodic interval.

tCKE

Configure the period of time the DDR4 initiates a minimum of one refresh command internally once it enters Self-Refresh mode.

Turn Around Timing

tRDRD_sg

Configure between module read to read delay.

tRDRD_dg

Configure between module read to read delay.

tRDRD_dr

Configure between module read to read delay.

tRDRD_dd

Configure between module read to read delay.

tRDWR_sg

Configure between module read to write delay.

tRDWR_dg

Configure between module read to write delay.

tRDWR_dr

Configure between module read to write delay.

tRDWR_dd

Configure between module read to write delay.

tWRRD_sg

Configure between module write to read delay.

tWRRD_dg

Configure between module write to read delay.

tWRRD_dr

Configure between module write to read delay.

tWRRD_dd

Configure between module write to read delay.

tWRWR_sg

Configure between module write to write delay.

tWRWR_dg

Configure between module write to write delay.

tWRWR_dr

Configure between module write to write delay.

tWRWR_dd

Configure between module write to write delay.

Round Trip Timing

RTL Init Value

Configure round trip latency init value for round trip latency training.

IOL Init Value

Configure IO latency init value for IO latency training.

RTL (CH A)

Configure round trip latency for channel A.

RTL (CH B)

Configure round trip latency for channel B.

IO-L (CH A)

Configure IO latency for channel A.

IO-L (CH B)

Configure IO latency for channel B.

IOL Offset (CH A)

Configure IO latency offset for channel A.

IOL Offset (CH B)

Configure IO latency offset for channel B.

RFR Delay (CH A)

Configure RFR Delay for Channel A.

RFR Delay (CH B)

Configure RFR Delay for Channel B.

ODT Setting

ODT WR (A1)

Configure the memory on die termination resistors' WR for channel A1.

ODT WR (B1)

Configure the memory on die termination resistors' WR for channel B1.

ODT NOM (A1)

Use this to change ODT (CH A1) Auto/Manual settings. The default is [Auto].

ODT NOM (B1)

Use this to change ODT (CH B1) Auto/Manual settings. The default is [Auto].

ODT PARK (A1)

Configure the memory on die termination resistors' PARK for channel A1.

ODT PARK (B1)

Configure the memory on die termination resistors' PARK for channel B1.

COMP Setting

RCOMP0: DQ ODT (Read)

Default is 121.

RCOMP1: DQ /CLK Ron (Drive Strength)

Default is 75.

RCOMP2: CMD/CTL Ron (Drive Strength)

Default is 100.

DQ ODT Driving

Adjust ODT Driving for better signal. Default is 60.

DQ Driving

Adjust DQ Driving for better signal. Default is 26.

Command Driving

Adjust Command Driving for better signal. Default is 20.

Control Driving

Adjust Control Driving for better signal. Default is 20.

Clock Driving

Adjust Clock Driving for better signal. Default is 26.

MRS Setting

MRS tCL

Configure the tCL for Memory MRS MR0.

MRS tWRtRTP

Configure the tWRtRTP for Memory MRS MRC.

MRS tCWL

Configure the tCWL for Memory MRS MR2.

MRS tCCD_L

Configure the tCL for Memory MRS MR6.

Advanced Setting

Timing Optimization

Configure the fast path through the MRC.

Realtime Memory Timing

Configure the realtime memory timings.

[Enabled] The system will allow performing realtime memory timing changes after MRC_DONE.

Command Tristate

Configure the Command Tristate Support.

Exit On Failure

Configure the Exit On Failure for MRC training steps.

Reset On Training Fail

Reset system if the MRC training fails.

MRC Fast Boot

Enable Memory Fast Boot to skip DRAM memory training for booting faster.

Voltage Configuration

CPU Core/Cache Voltage

Configure the voltage for the CPU Core/Cache.

CPU Load-Line Calibration

CPU Load-Line Calibration helps prevent CPU voltage droop when the system is under heavy load.

DRAM Voltage

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

PCH +1.0 Voltage

Configure the chipset voltage (1.0V).

VCCST Voltage

Configure the voltage for the VCCST.

VCCSA Voltage

Configure the voltage for the VCCSA.

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

Save current UEFI settings as an user default profile to disk.

Load User UEFI Setup Profile to Disk

Load previously saved user defaults from the disk.

4.6 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, ACPI Configuration, USB Configuration and Trusted Computing..

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

UEFI Configuration

UEFI Setup Style

Select the default mode when entering the UEFI setup utility.

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.

4.6.1 CPU Configuration

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor Cores

Select the number of cores to enable in each processor package.

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

CPU Thermal Throttling

Enable CPU internal thermal control mechanisms to keep the CPU from overheating.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

Software Guard Extensions (SGX)

Use this item to enable or disable Software Controlled Software Guard Extensions (SGX).

4.6.2 Chipset Configuration

Primary Graphics Adapter

Select a primary VGA.

Above 4G Decoding

Enable or disable 64bit capable Devices to be decoded in Above 4G Address Space (only if the system supports 64 bit PCI decoding).

VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

PCIE1 Link Speed

Select the link speed for PCIE1.

PCI Express Native Control

Select Enable for enhanced PCI Express power saving in OS.

PCIE ASPM Support

This option enables/disables the ASPM support for all CPU downstream devices.

PCH PCIE ASPM Support

This option enables/disables the ASPM support for all PCH PCIE devices.

DMI ASPM Support

This option enables/disables the control of ASPM on CPU side of the DMI Link.

PCH DMI ASPM Support

This option enables/disables the ASPM support for all PCH DMI devices.

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

IGPU Multi-Monitor

Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times.

Inte(R) Ethernet Connection I219-V

Enable or disable the onboard network interface controller (Intel® I219V).

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.

Onboard HDMI HD Audio

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

MXM Display Hardware IDs

Select among different MXM Display Hardware IDs.

Virtual Battery Control

Configure the virtual battery control.

Onboard WAN Device

Enable/disable the onboard WAN device.

WAN Radio

Enable/disable the WiFi module's connectivity.

Bluetooth

Enable/disable the BT module's connectivity.

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.

4.6.3 Storage Configuration

SATA Controller(s)

Enable/disable the SATA controllers.

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

SATA Mode Selection

[AHCI] Supports new features that improve performance.

[Intel RST Premium (RAID)] Combine multiple disk drives into a logical unit.

SATA Aggressive Link Power Management

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is only supported by AHCI mode.

Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

4.6.4 ACPI Configuration

Suspend to RAM

Select disable for ACPI suspend type S1. It is recommended to select auto for ACPI S3 power saving.

I219 LAN Power On

Allow the system to be waked up by I219 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.

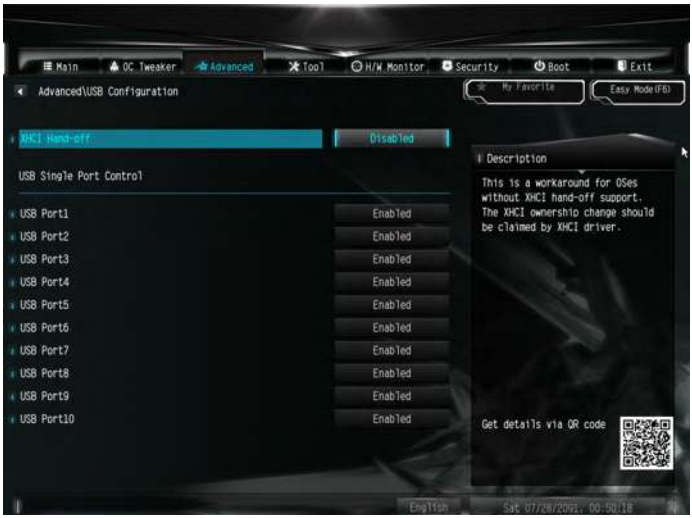
USB Keyboard/Remote Power On

Allow the system to be waked up by an USB keyboard or remote controller.

USB Mouse Power On

Allow the system to be waked up by an USB mouse.

4.6.5 USB Configuration



XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

4.6.6 Trusted Computing

Security Device Support

Enable or disable BIOS support for security device.

4.7 Tools

UEFI Tech Service

Contact ASRock Tech Service if you are having trouble with your PC. Please setup network configuration before using UEFI Tech Service.

SSD Secure Erase Tool

Use this tool to securely erase SSD.

Instant Flash

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

Internet Flash - DHCP (Auto IP), Auto

ASRock Internet Flash downloads and updates the latest UEFI firmware version from our servers for you. Please setup network configuration before using Internet Flash.

*For BIOS backup and recovery purpose, it is recommended to plug in your USB pen drive before using this function.

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.

4.8 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-Tastic Tuning

Select a fan mode for CPU Fans 1&2, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU Fan1 / WP Switch

Select CPU or Water Pump mode.

CPU Fan 1 Control Mode

Select PWM mode or DC mode for CPU_FAN1.

GPU Fan 1 Setting

Select a fan mode for GPU_FAN1, or choose Customize to set 5 GPU temperatures and assign a respective fan speed for each temperature.

GPU Fan1 / WP Switch

Select GPU or Water Pump mode.

GPU Fan1 Control Mode

Select PWM mode or DC mode for GPU_FAN1.

GPU Fan1 Setting

Select a fan mode for GPU_FAN1, or choose Customize to set 5 GPU temperatures and assign a respective fan speed for each temperature.

CPU Fan 2 Setting

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

4.9 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

Use this item to enable or disable support for Secure Boot.

Intel(R) Platform Trust Technology

Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.

4.10 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. The VBIOS must support UEFI GOP if you are using an external graphics card. Please notice that Ultra Fast mode will boot so fast that the only way to enter this UEFI Setup Utility is to Clear CMOS or run the Restart to UEFI utility in Windows.

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.

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.

Boot Failure Guard Message

If the computer fails to boot for a number of times the system automatically restores the default settings.

CSM (Compatibility Support Module)

CSM

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

4.11 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.