

ASRock®



DeskMini  
GTX / RX SERIES

User Manual

Version 1.0

Published November 2017

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](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)”



## AUSTRALIA ONLY

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# Chapter 1 Introduction

Thank you for purchasing DeskMini GTX/RX (Z370) Series, a reliable gaming barebone system.



*Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice.*

## 1.1 Package Contents

- DeskMini GTX/RX (Z370) Series Barebone System with:  
DeskMini GTX/RX (Z370) Series Chassis  
Motherboard (pre-installed)  
\*The barebone system does not include memory, hard drive, WiFi module and M.2 SSD.  
Power Adapter (Optional)
- SATA Cable
- Screws Package (M.2 screw x4, MXM screw x2, Rubber foot x4, Chassis screw : M3\*5 x4)
- Key Lock and Screw
- Support CD
- Quick Installation Guide



*If any items are missing or appear damaged, contact your authorized dealer.*

## 1.2 Specifications

### System Model

- DeskMini GTX1060
- DeskMini GTX1070
- DeskMini GTX1080

### Chassis

- 1.92L (155 x 155 x 80mm)

### CPU

- Supports 8<sup>th</sup> Generation Intel® Core™ Processors (Socket 1151)
- 3+1 Power Phase design
- Supports Intel® Turbo Boost 2.0 Technology
- Supports Intel® K-Series unlocked CPUs

### Chipset

- Intel® Z370

### Memory

- 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
- \* 8<sup>th</sup> Gen Intel® CPU supports DDR4 up to 2666.
- Max. capacity of system memory: 32GB
- Supports Intel® Extreme Memory Profile (XMP) 2.0

### Graphics Card (MXM Type)

- NVIDIA GeForce GTX1060 (6GB GDDR5)
- NVIDIA GeForce GTX1070 (8GB GDDR5)
- NVIDIA GeForce GTX1080 (8GB GDDR5X)
- Intel® HD Graphics

### Video Outputs

- Onboard Graphics:
  - 1 x HDMI (4K@30Hz)
- External MXM Graphics:
  - 1 x HDMI (4K@60Hz)
  - 1 x DisplayPort (4K@60Hz)
  - 1 x mini DisplayPort (4K@60Hz)

### WiFi

- 1 x M.2 (E key 2230) Slot for WiFi + BT Module

**Storage**

- 2 x SATA3 6.0 Gb/s with Power Connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10, Intel Rapid Storage Technology 15 and Intel Smart Response Technology), 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

**Audio**

- 1 x Headphone/Headset Jack
- 1 x MIC-In

**LAN**

- Intel Gigabit i219V LAN

**Onboard Connectors**

- 2 x USB 2.0 Headers
- 1 x Front Panel Header
- 2 x 4 Pin Fan Connectors
- 1 x GPU Fan connector
- 1 x RGB LED header
- 1 x DC Power DIN Jack (4 Pin)

**Power Adapter**

- 270W/19V (for DeskMini GTX1080)
- 220W/19V (for DeskMini GTX1070 /DeskMini GTX1060)

**Operation Temp.**

- 0~35°C

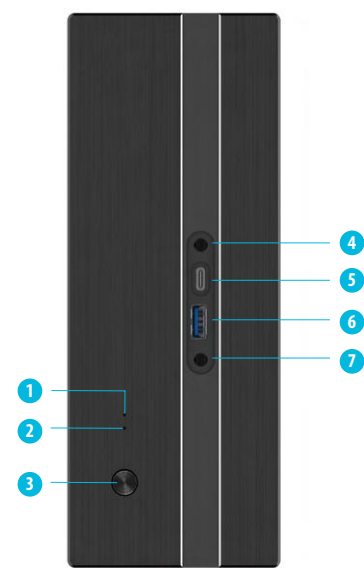


*Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using third-party overclocking tools. Overclocking may affect your system's stability, or even cause damage to the components and devices of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

# Chapter 2 Product Overview

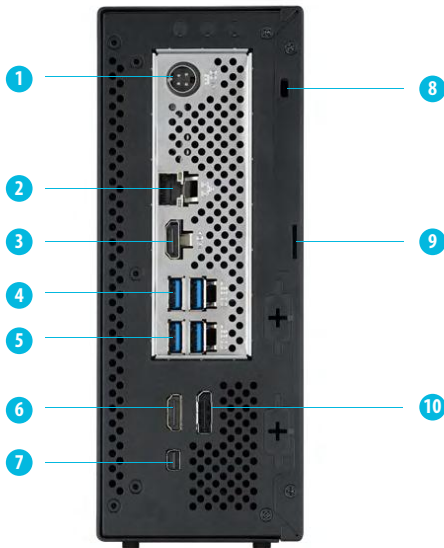
This chapter provides diagrams showing the location of important components of the Beebox series.

## 2.1 Front View



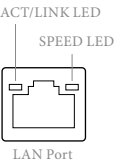
No.	Description
1	HDD LED
2	Power LED
3	Power Button
4	MIC-In
5	USB 3.0 Type-A Port
6	USB 3.0 Type-C Port
7	Headphone/Headset

## 2.2 Rear View



No.	Description
1	DC Power Din Jack
2	LAN RJ-45 Port*
3	HDMI Port
4	USB 3.1 Gen1 Ports
5	USB 3.1 Gen1 Ports
6	HDMI Port
7	Mini DisplayPort
8	Kensington Lock
9	Key Lock
10	DisplayPort

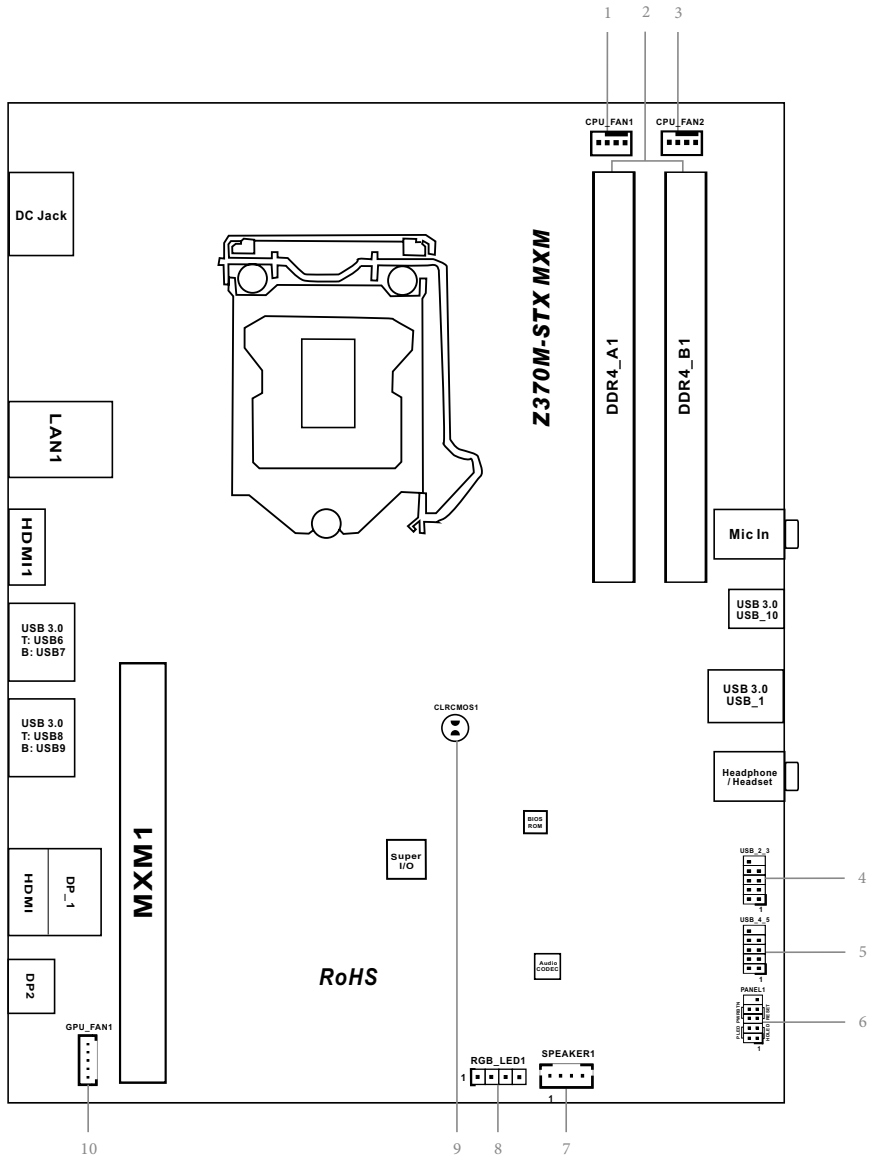
\* There are two LEDs on the LAN port. Please refer to the table below for the LAN port LED indications.



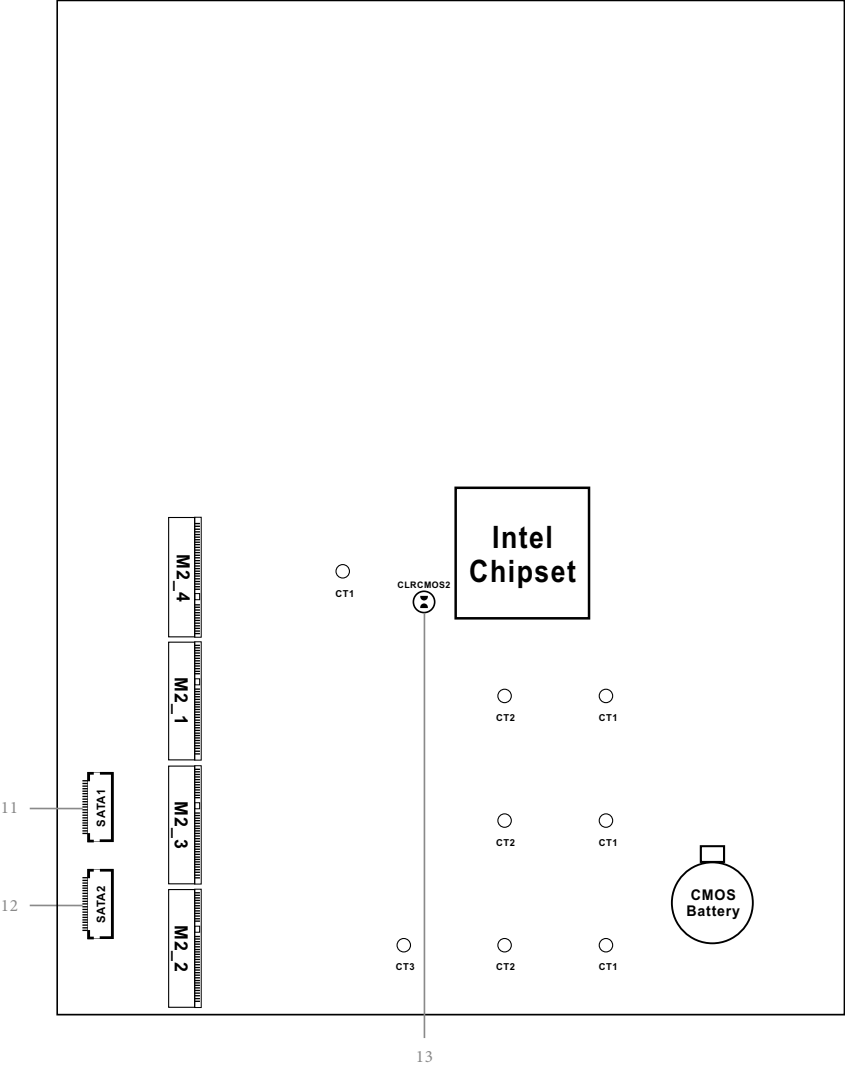
Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

## 2.3 Motherboard Layout

### Top View



Bottom View



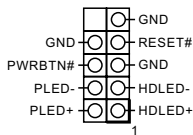
No.	Description
1	CPU Fan Connector (CPU_FAN1)
2	2 x 260-pin DDR4 SO-DIMM Slots (DDR4_A1, DDR4_B1)
3	CPU Fan Connector (CPU_FAN2)
4	USB 2.0 Header (USB_2_3)
5	USB 2.0 Header (USB_4_5)
6	System Panel Header (PANEL1)
7	3W Audio AMP Output Wafer Header (SPEAKER1)
8	RGB LED Header (RGB_LED1)
9	Clear CMOS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

# 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. 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.

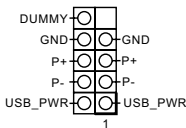
Serial ATA3 Connectors  
(see p.8, No. 11 and 12)



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)

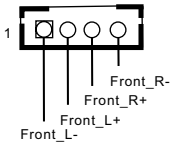
PIN	Signal Name	PIN	Signal Name
1	GND	11	N/A
2	LVDS_TX+	12	5V
3	LVDS_TX-	13	5V
4	GND	14	5V
5	GND	15	5V
6	LVDS_RX-	16	5V
7	LVDS_RX+	17	N/A
8	GND	18	GND
9	GND	19	GND
10	GND	20	GND

USB 2.0 Headers  
(9-pin USB\_2\_3)  
(see p.7, No. 4)  
(9-pin USB\_4\_5)  
(see p.7, No. 5)



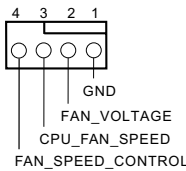
There are two USB 2.0 headers on this motherboard.

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



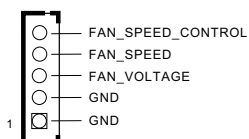
Please connect the chassis speaker to this header.

CPU Fan Connectors  
(4-pin CPU\_FAN1)  
(see p.7, No. 1)  
(4-pin CPU\_FAN2)  
(see p.7, 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.

GPU Fan Connector  
(5-pin GPU\_FAN1)  
(see p.7, 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.7, 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 44 for further instructions on these two headers.

Clear CMOS Pad  
(CLRCMOS1)  
(see p.7, No. 9)  
(CLRCMOS2)  
(see p.8, No. 13)

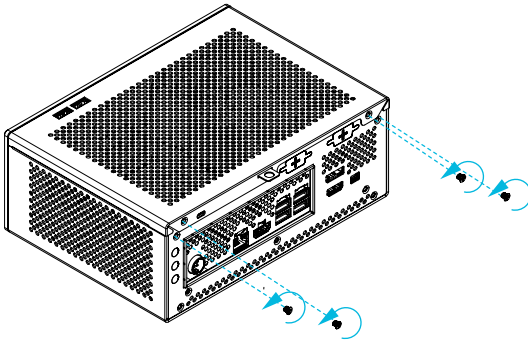


The Clear CMOS Pad allows you to clear the data in CMOS. To clear CMOS, take out the CMOS battery and short the Clear CMOS Pad.

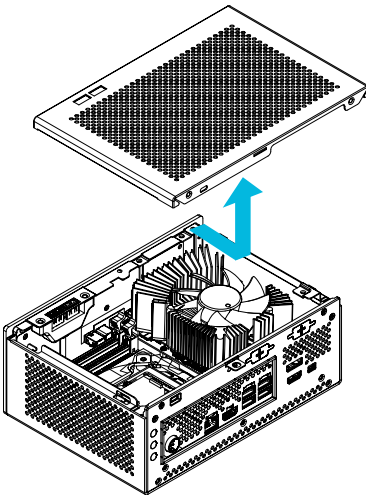
## Chapter 3 Hardware Installation

### 3.1 Begin Installation

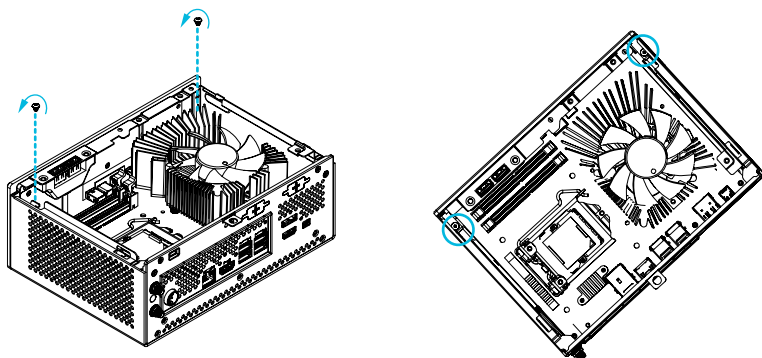
1. Unscrew the four screws of the back panel.



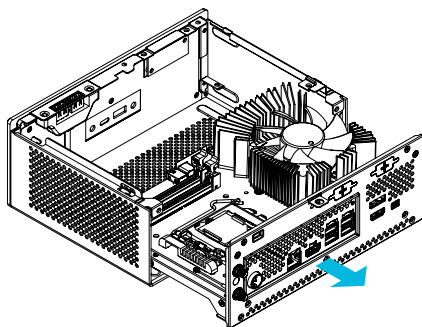
2. Slide the the top cover outward and then lift it off the chassis.



3. Unscrew the two screws in the chassis.

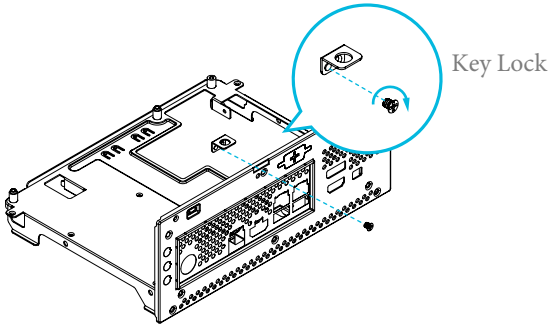


4. Pull out the motherboard tray.

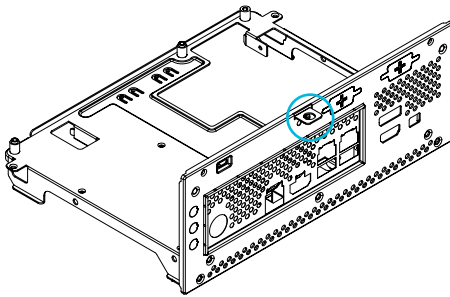


## How to install the Key Lock

1. Secure the Key Lock to the back panel.



2. Complete.

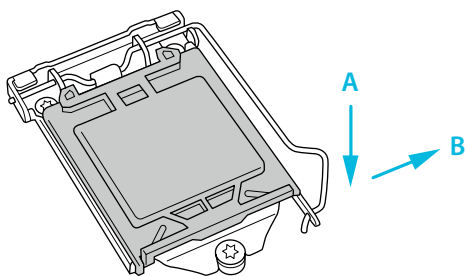


## 3.2 Installing the CPU

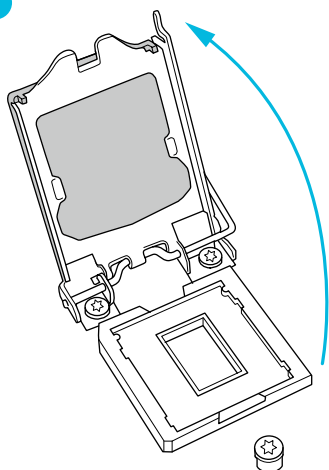


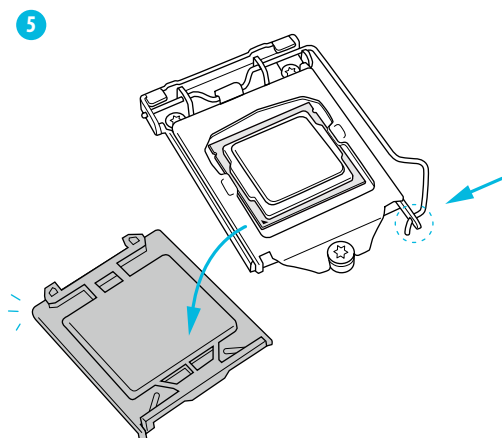
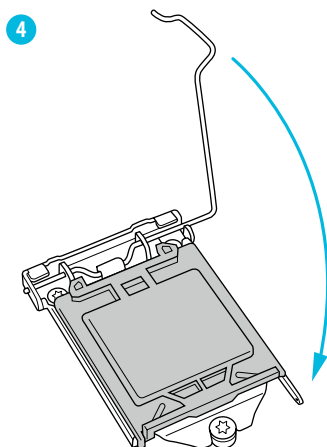
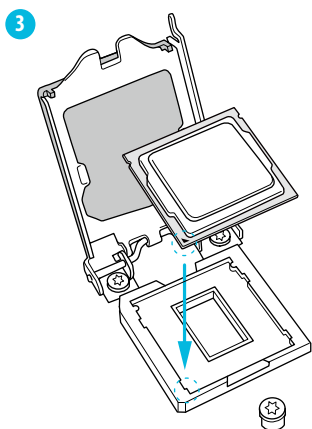
1. Before you insert the 1151-Pin CPU into the socket, please check if the **PnP cap** is on the socket, if the CPU surface is unclean, or if there are any **bent pins** in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.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

1



2





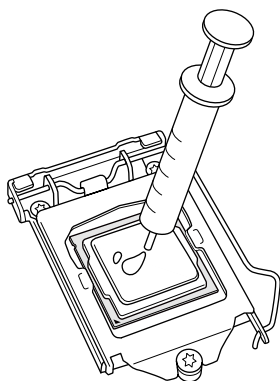
Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

### 3.3 Installing the CPU Fan and Heatsink

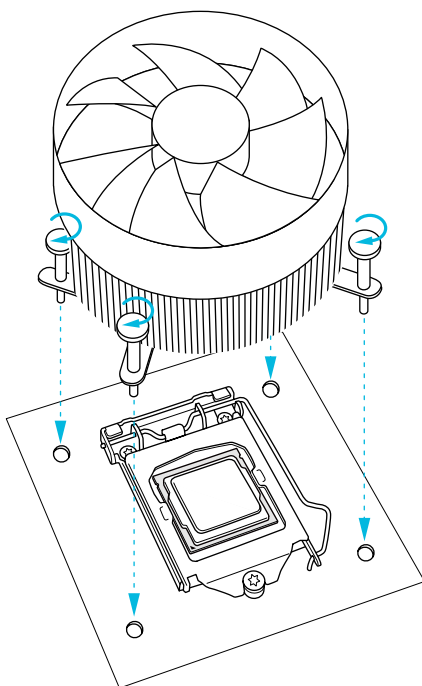


*DeskMini GTX/RX (Z370) series supports both Intel CPU Box Fan (65W) and third-party CPU fan cooler. Please note that the DeskMini GTX/RX (Z370) series chassis has 52mm height limitation for the CPU fan cooler.*

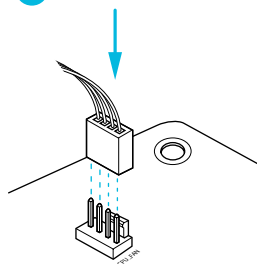
1



2



3



### 3.4 Installing Memory Modules (SO-DIMM)

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

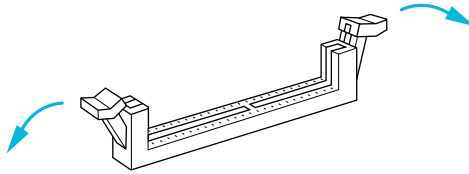


1. DeskMini GTX/RX (Z370) series requires DDR4 SO-DIMM.
2. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 SO-DIMM pairs.

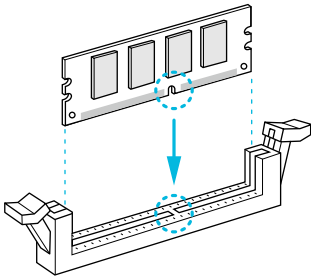


1. It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and SO-DIMM may be damaged.
2. The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the SO-DIMM if you force the SO-DIMM into the slot at incorrect orientation.

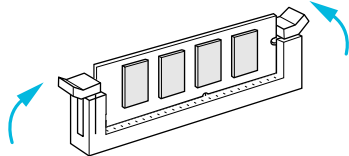
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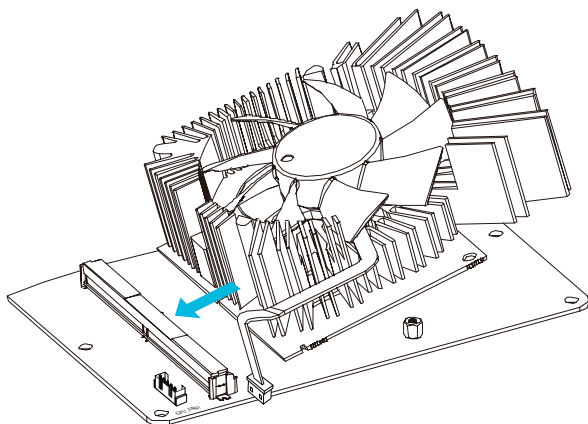


### 3.5 Installing Mobile PCI Express Module (MXM)

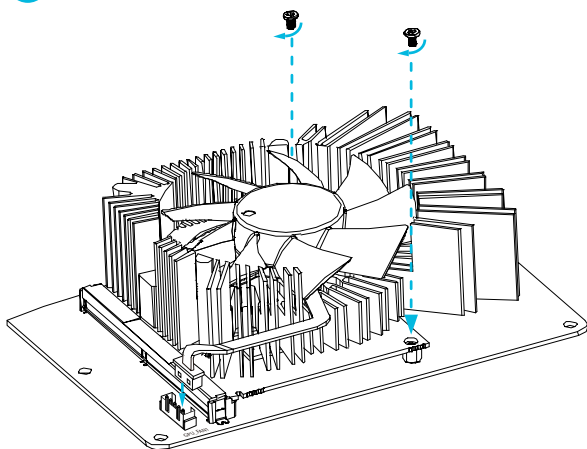
This motherboard provides a Mobile PCI Express Module (MXM) Slot.

#### Installing a Type A MXM Card (70mm)

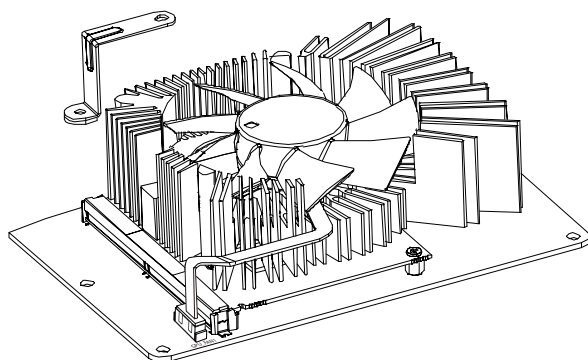
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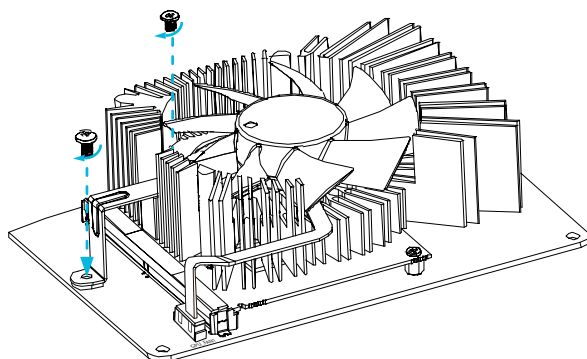
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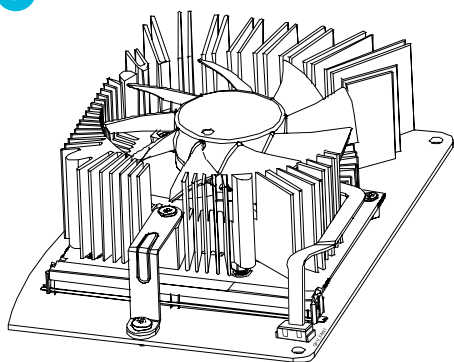
3



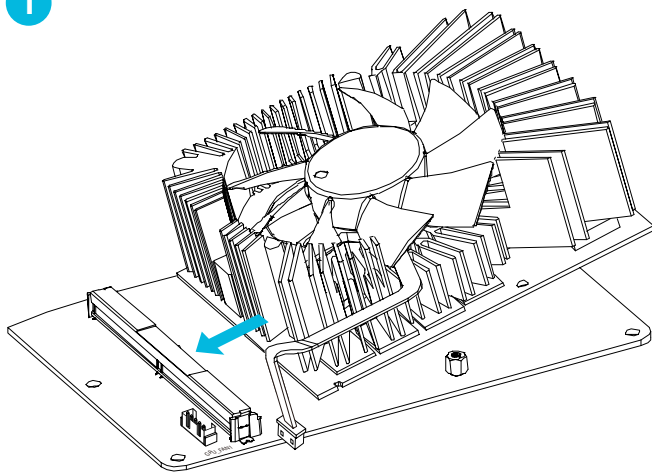
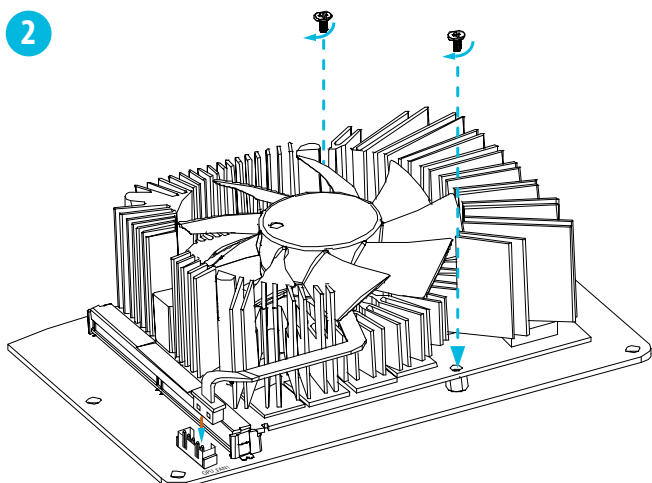
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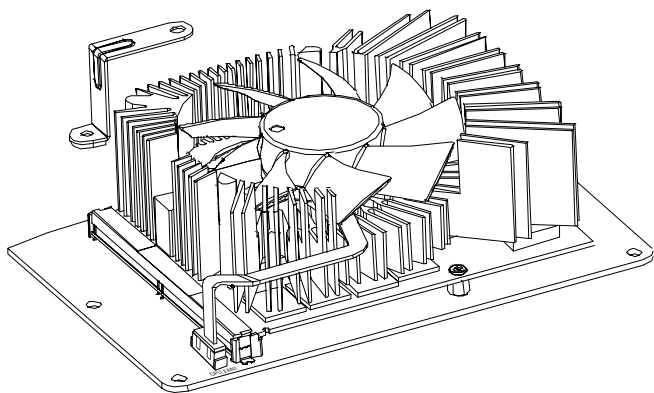
5



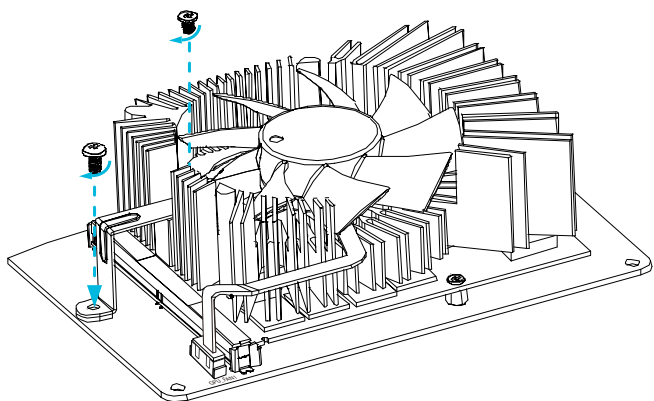
## Installing a Type B MXM Card (105mm)

**1****2**

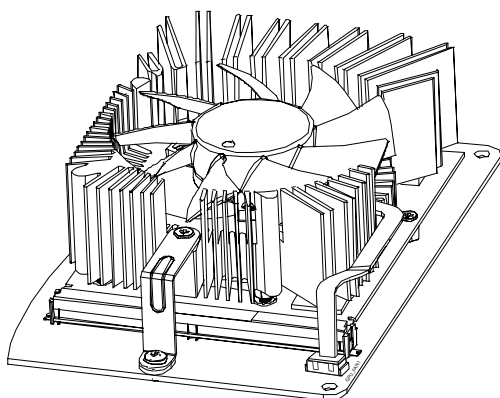
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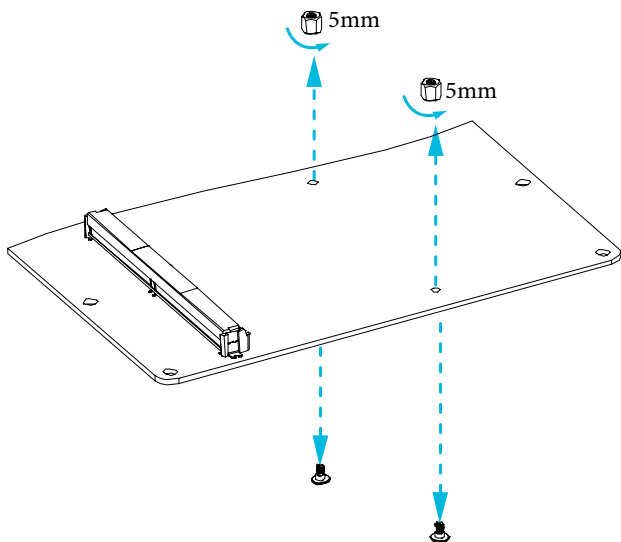


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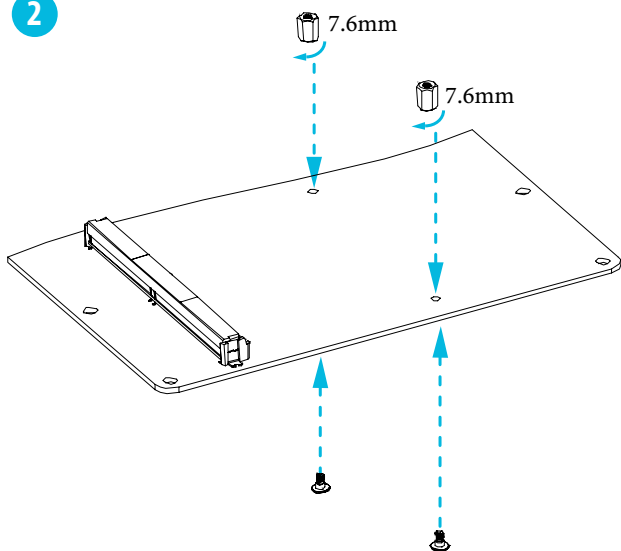


## Installing a Type B+ MXM Card (105mm-113mm)

1

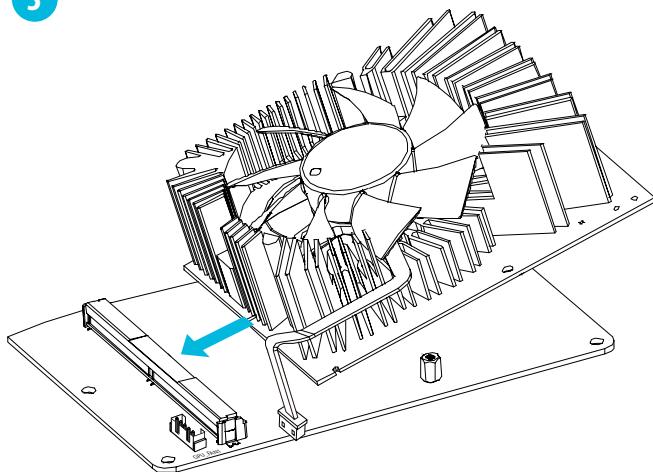


2

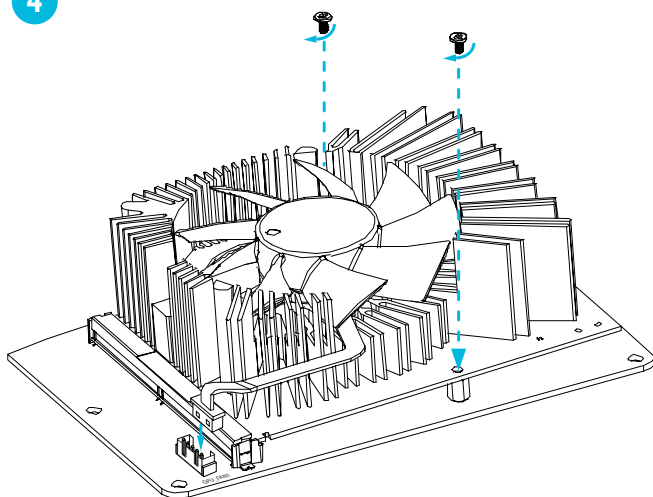


\*Before installing a Type B+ MXM card, please replace the 5mm standoffs with the 7.6mm standoffs.

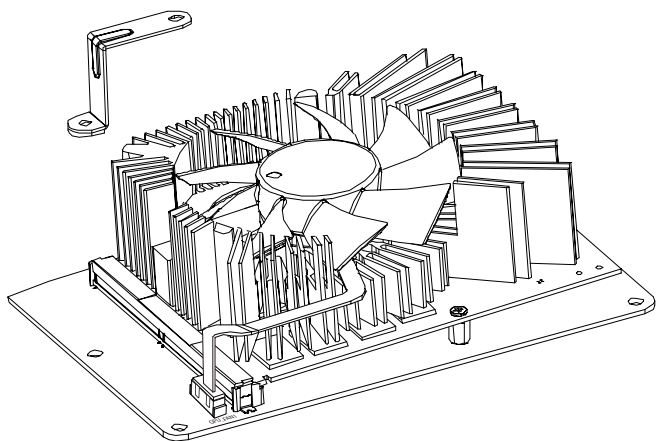
3



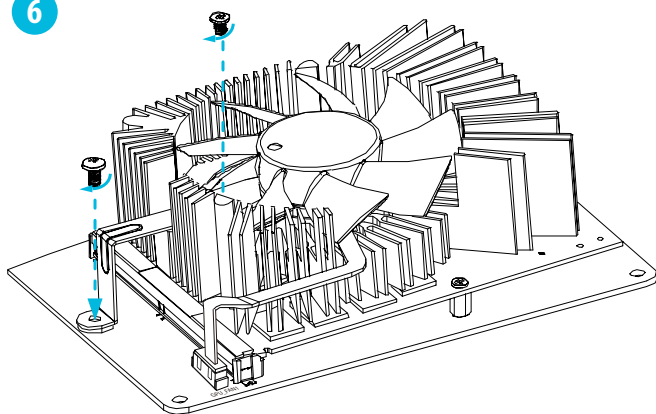
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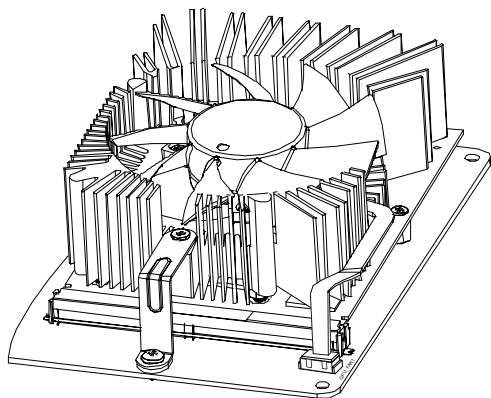
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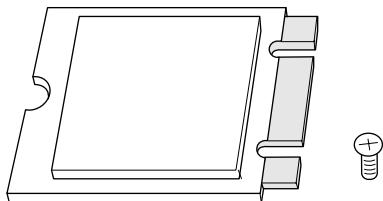


7

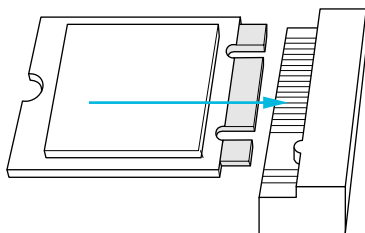


## 3.6 Installing the WiFi Module

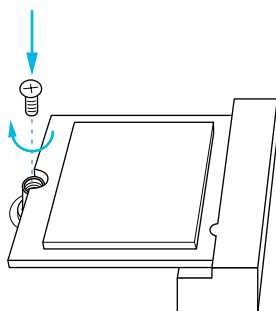
1. Prepare a type 2230 WiFi/BT module and the screw.



2. Align and gently insert the WiFi/BT module into the M.2 Socket (Key E) (M2\_4).  
\*Please be aware that the module only fits in one orientation.



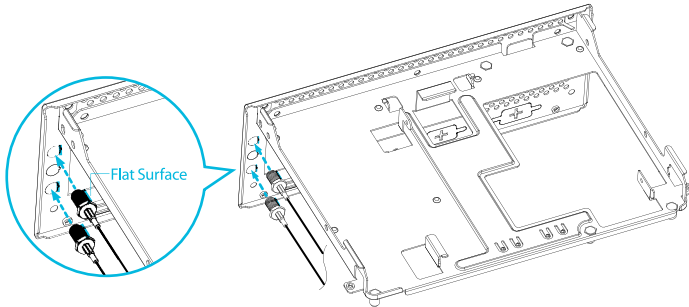
3. Tighten the screw to secure the WiFi module to the motherboard.



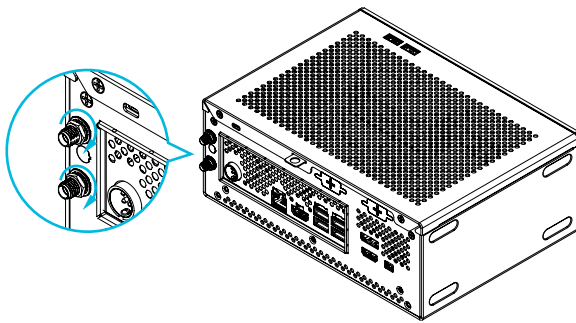
### 3.7 Installing the WiFi Antennas

1. Insert the Wi-Fi Antenna Connectors to the antenna ports on the rear panel of the DeskMini GTX/RX (Z370) Series.

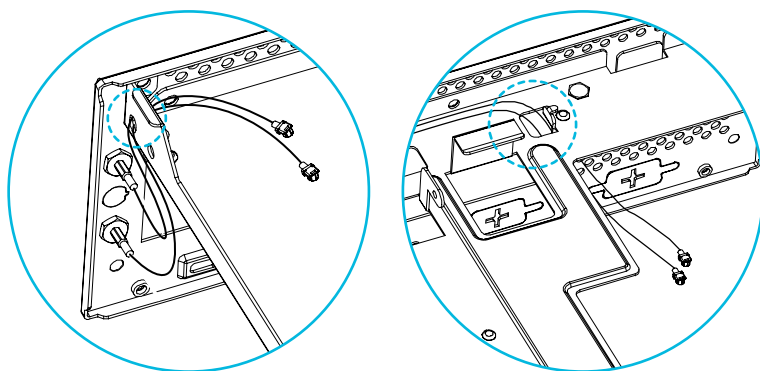
\*Please make sure to align the flat surface of Wi-Fi Antenna Connectors with the side of holes when inserting the connectors.



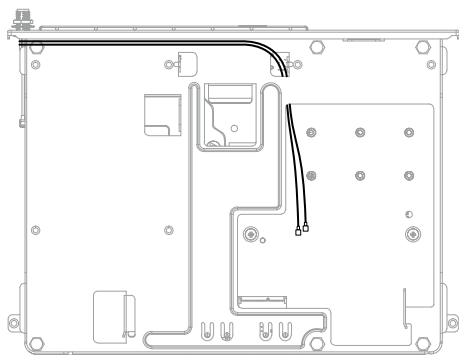
2. Fasten the screw nuts to secure the antenna connectors.



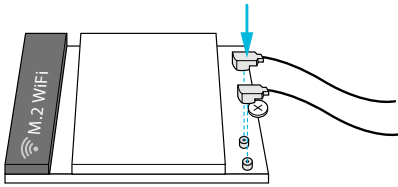
3. Insert the SMA Wi-Fi Antenna Cables to the designated hole on the drive mounting tray. Route the cables rightward as shown in the illustration below.



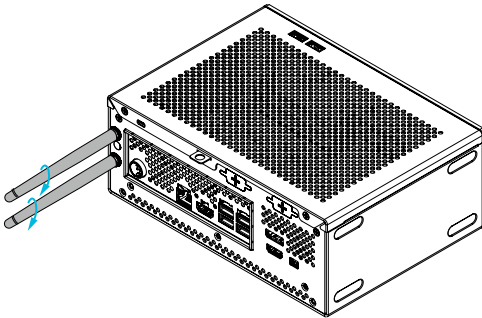
4. Make sure that the cable routing is organized as shown in the illustration below.



5. Attach the SMA Wi-Fi Antenna Cables to the WiFi Module.

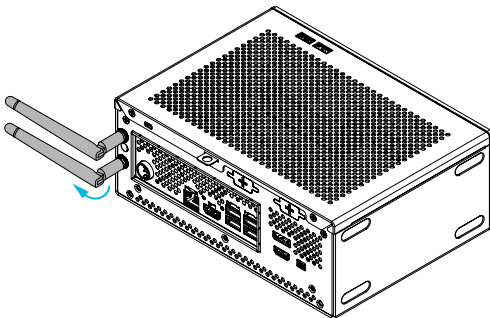


6. Connect the two WiFi 2.4/5 GHz Antennas to the antenna connectors.



7. Turn the antenna clockwise until it is securely connected. Set the WiFi 2.4/5 GHz Antenna at 90-degree angle.

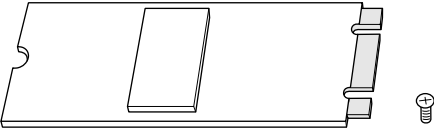
\*You may need to adjust the direction of the antenna for a stronger signal.



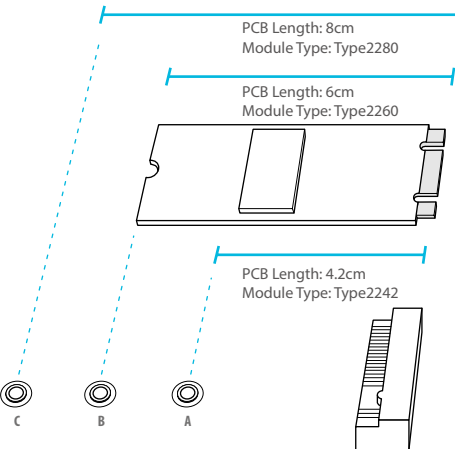
### 3.8 Installing the M.2 SSD

The following is an example of installing M.2\_SSD (NGFF) module into the M2\_2.

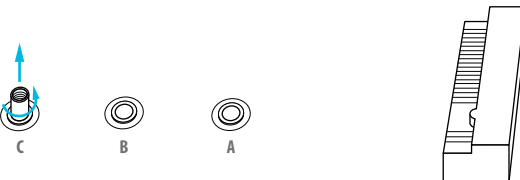
1. Prepare a M.2\_SSD (NGFF) module and the screw.



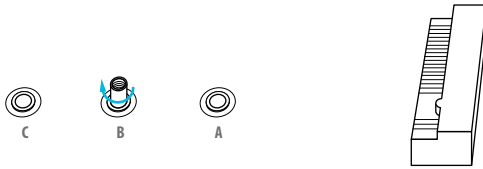
2. Depending on the PCB type and length of your M.2\_SSD (NGFF) module, and the corresponding nut location to be used.



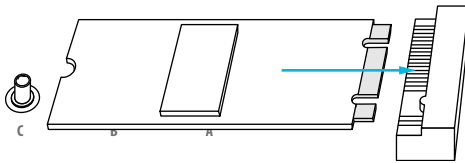
3. Move the stando based on the module type and length. The standoffs is placed at the nut location D by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the stando by hand.



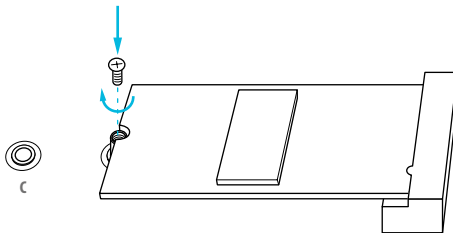
4. Peel off the yellow protective film on the nut to be used. Hand tighten the standoffs into the desired nut location on the motherboard.



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.

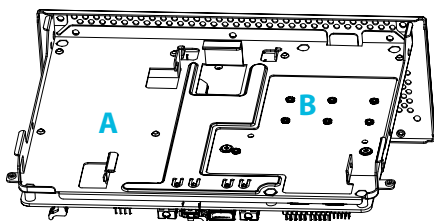


6. Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

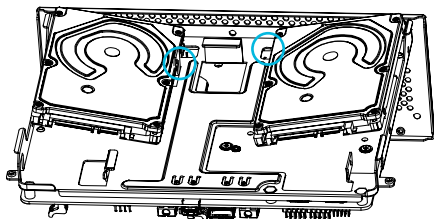


## 3.9 Installing the 2.5-inch HDD/SSD

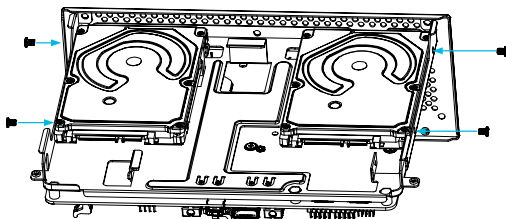
1. Locate the drive mounting trays.



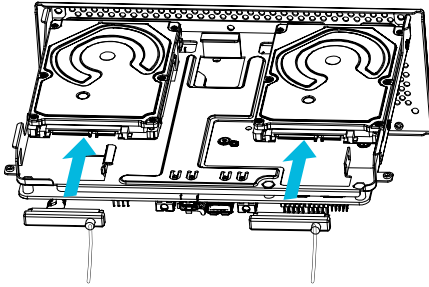
2. Engage the HDDs/SSDs with the latches in the drive mounting trays.



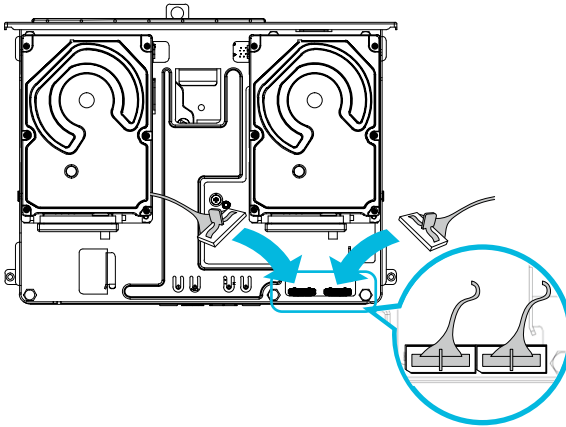
3. Place the HDDs/SSDs on the trays. Align the drive screw holes with those in the drive mounting trays. Then secure the HDDs/SSDs with four screws.



4. Connect the SATA Data and Power Cable to the HDDs/SSDs.

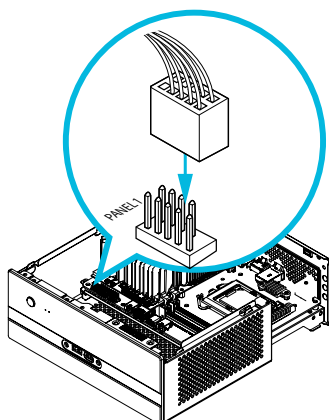


5. Connect the other end of the SAT Cables to the SATA Connectors on the motherboard.

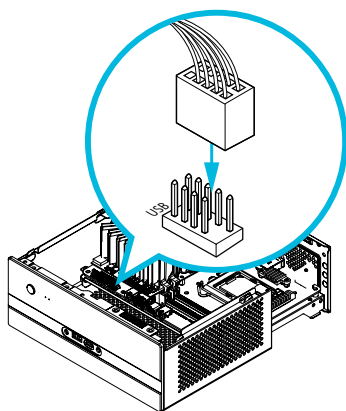


## 3.10 Complete

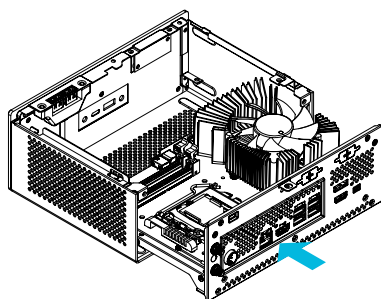
1. Connect the power button cable to the System Panel Header on the motherboard.



2. Connect the USB cable to the USB Header on the motherboard.

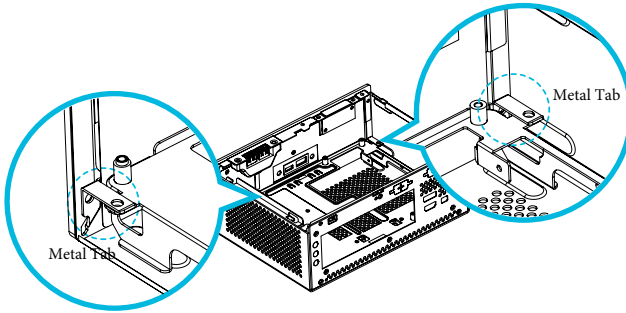


3. Install the motherboard tray.

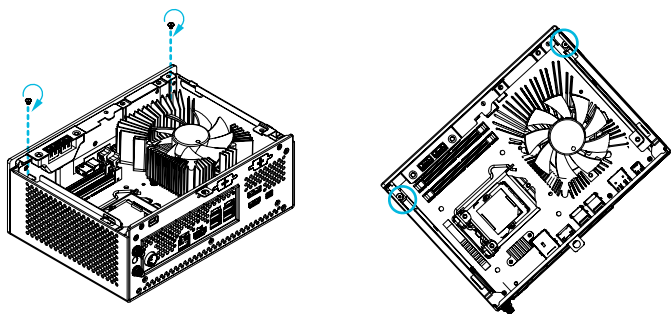


**Note:**

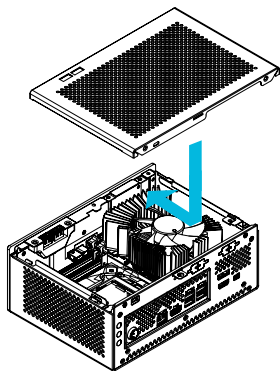
Before re-installing the motherboard tray, be sure to place the tray below the side chassis's metal tab.



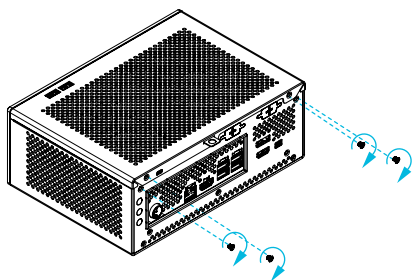
4. Refasten the two screws in the chassis.



5. Replace the top cover.



6. Refasten the four screws of the back panel.



## 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.

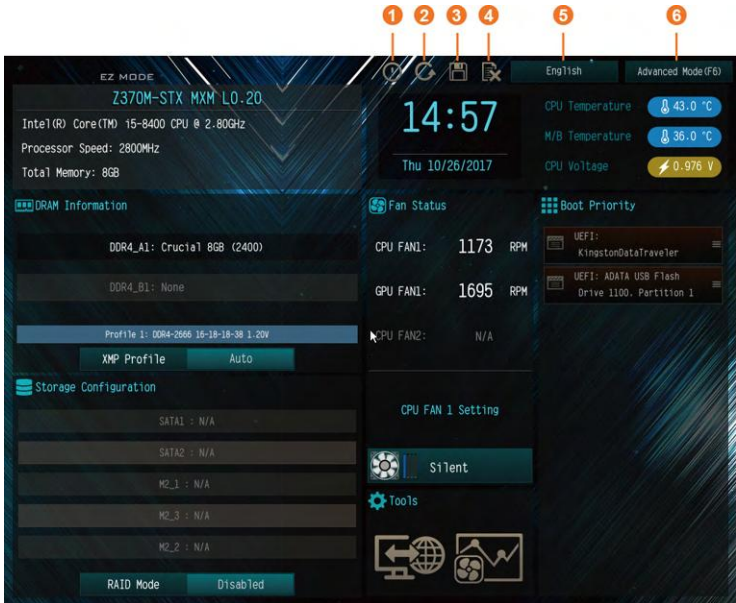


*Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.*

## 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:

<b>Main</b>	For setting system time/date information
<b>OC Tweaker</b>	For overclocking configurations
<b>Advanced</b>	For advanced system configurations
<b>Tool</b>	Useful tools
<b>H/W Monitor</b>	Displays current hardware status
<b>Boot</b>	For configuring boot settings and boot priority
<b>Security</b>	For security settings
<b>Exit</b>	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.

#### 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-states.

## 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 Slice 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.

## 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 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.

#### 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.

## **Fourth Timing**

### **RTL Init Value**

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

### **IO-L 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.

**IO-L Offset (CH A)**

Configure IO latency offset for channel A.

**IO-L 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.

**Advanced Setting****ODT WR (CH A)**

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

**ODT WR (CH B)**

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

**ODT PARK (CH A)**

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

**ODT PARK (CH B)**

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

**ODT NOM (CH A)**

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

## ODT NOM (CH B)

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

## Dll Bandwidth 0

Configure the Dll Bandwidth 0.

## Dll Bandwidth 1

Configure the Dll Bandwidth 1.

## Dll Bandwidth 2

Configure the Dll Bandwidth 2.

## Dll Bandwidth 3

Configure the Dll Bandwidth 3.

## Command Tristate

Configure the Command Tristate Support.

## Realtime Memory Timing

Configure the realtime memory timings.

[Enabled] The system will allow performing realtime memory timing changes after MRC\_DONE.

## MRC Fast Boot

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

## Voltage Configuration

### DRAM Voltage

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

## 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 and USB Configuration.



*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.

### Top of Lower Usable Dram

Set the maximum value of TOLUD. Set this item to Dynamic to allow TOLUD to adjust automatically based on the largest MMIO length of the installed graphic controller.

### 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.

## IOAPIC 24-119 Entries

Enables/Disables IOAPIC 24-119 Entries. IRQ24-119 may be used by PCH devices. Disabling those interrupts may cause certain devices failure.

## 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.

## Onboard LAN

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

## 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.

## HDA ID Switch

Configure the HDA ID Switch.

## WAN Radio

Enable/disable the WiFi module's connectivity.

## BT Control

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.

### ACPI HEPT Table

Enable the High Precision Event Timer for better performance.

### 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.

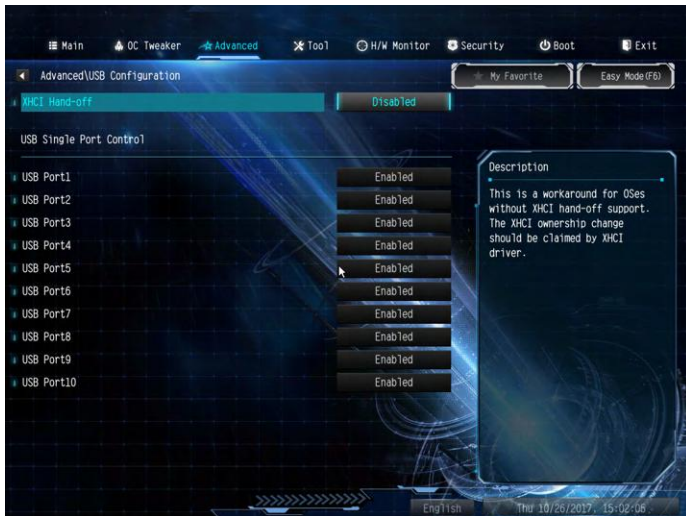
### USB Keyboard/Remote Power On

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.

## 4.7 Tools



### RGB LED

RGB LED and header allows users to connect LED strip and create their unique PC style easily.

### UEFI Tech Service

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

### 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.

## Boot Manager

Boot Manager is specifically designed for the dual OS platform/multi-OS platform users to easily customize and manage the boot menu.

\*Please connect more than one boot devices to use this tool.



## Boot Manager

Enable/disable the Boot Manager.

## Boot Manager Timeout

Enable/disable the Boot Manager Timeout.

## Timeout Seconds

Configure the number of seconds to wait for the Boot Manager.

## Instant Flash

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

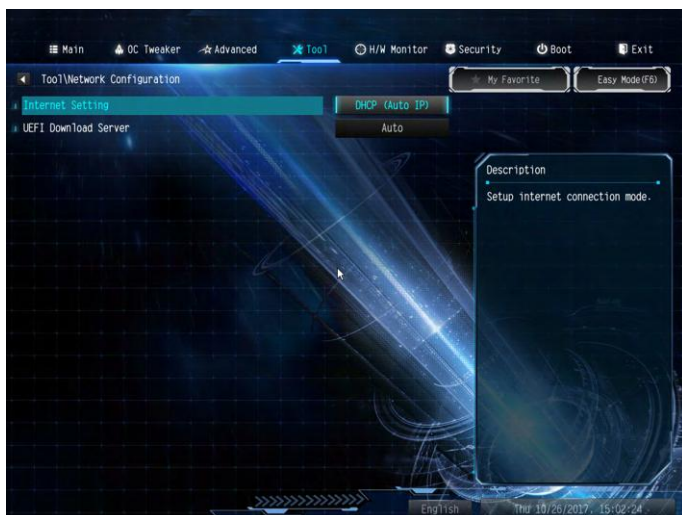
## Internet Flash - DHCP (Auto IP), Auto

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 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.

### GPU Fan 1 Setting

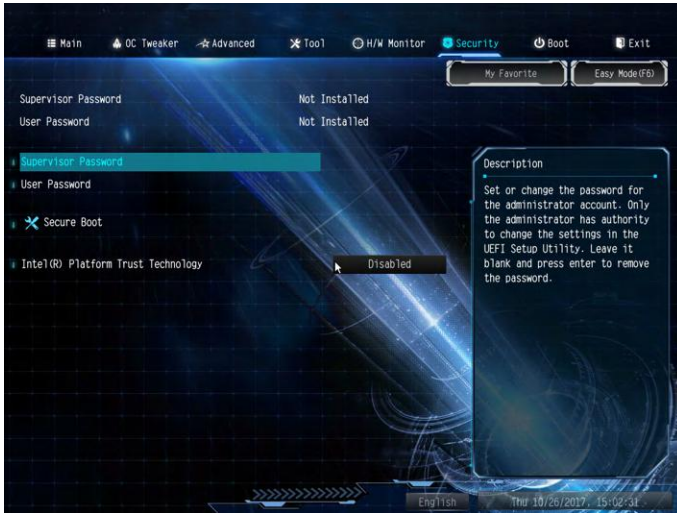
Select a fan mode for GPU Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

### 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.

### Boot Failure Guard Message

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

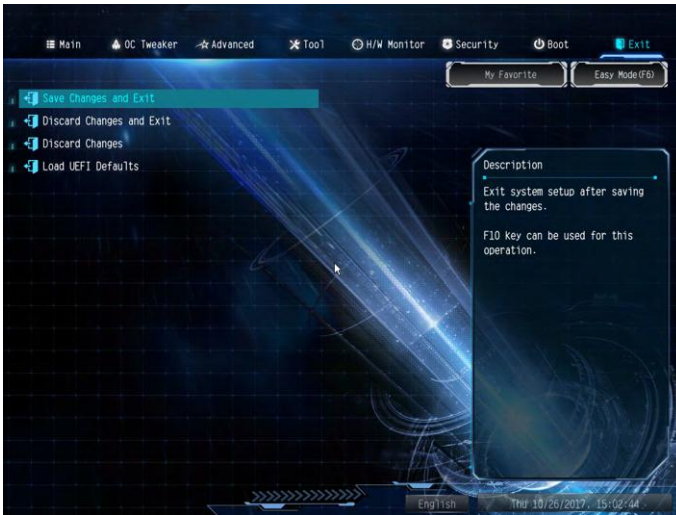
## CSM (Compatibility Support Module)



### 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.