



990FXA GAMING  
Motherboard

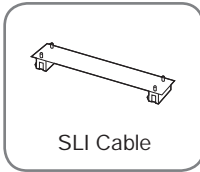
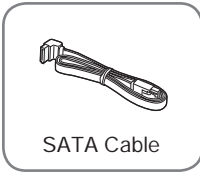
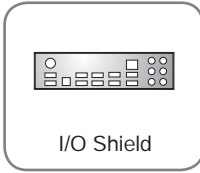
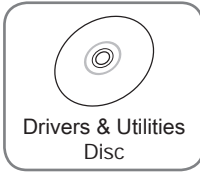
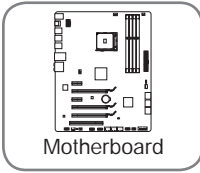
# Chapter 1

## Getting Started

Thank you for choosing the 990FXA GAMING Series (MS-7893 v1.X) ATX motherboard. The 990FXA GAMING Series motherboards are based on AMD® 990FX & SB950 chipset for optimal system efficiency. Designed to fit the advanced AMD® AM3/ AM3+ processor, the 990FXA GAMING Series motherboards deliver a high performance and professional desktop platform solution.

# Packing Contents

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- \* These pictures are for reference only and may vary without notice.
- \* The packing contents may vary according to the model you purchased.

## Assembly Precautions

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- The components included in this package are prone to damage from electrostatic discharge (ESD). Please adhere to the following instructions to ensure successful computer assembly.
- Always turn off the power supply and unplug the power cord from the power outlet before installing or removing any computer component.
- Ensure that all components are securely connected. Loose connections may cause the computer to not recognize a component or fail to start.
- Hold the motherboard by the edges to avoid touching sensitive components.
- It is recommended to wear an electrostatic discharge (ESD) wrist strap when handling the motherboard to prevent electrostatic damage. If an ESD wrist strap is not available, discharge yourself of static electricity by touching another metal object before handling the motherboard.
- Store the motherboard in an electrostatic shielding container or on an antistatic pad whenever the motherboard is not installed.
- Before turning on the computer, ensure that there are no loose screws or metal components on the motherboard or anywhere within the computer case.
- Do not use the computer in a high-temperature environment.
- Do not boot the computer before installation is completed. This could cause permanent damage to the components as well as injury to the user.
- If you need help during any installation step, please consult a certified computer technician.



### ***Important***

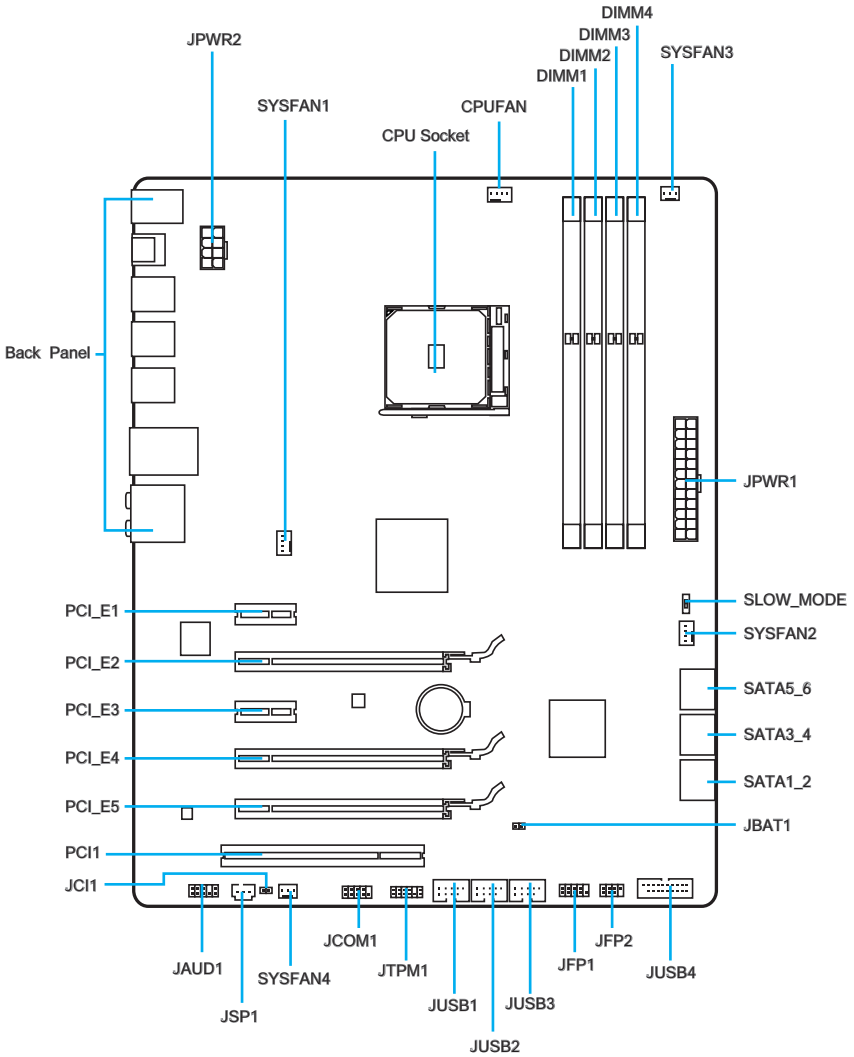
*A screwdriver (not included) may be required for computer assembly.*

# Motherboard Specifications

<b>CPU Support</b>	<ul style="list-style-type: none"> <li>■ Supports AMD® FX™/ Phenom™ II/ Athlon™ II and Sempron™ processors for the AM3/ AM3+ socket</li> </ul>
<b>Hypertransport</b>	<ul style="list-style-type: none"> <li>■ HyperTransport™ 3.0, supports up to 5.2 GT/s</li> </ul>
<b>Chipset</b>	<ul style="list-style-type: none"> <li>■ AMD® 990FX &amp; SB950</li> </ul>
<b>Memory Support</b>	<ul style="list-style-type: none"> <li>■ 4x DDR3 memory slots supporting up to 32GB</li> <li>■ Supports DDR3 2133(OC)/ 1866/ 1600/ 1333/ 1066 MHz</li> <li>■ Dual channel memory architecture</li> </ul>
<b>Expansion Slots</b>	<ul style="list-style-type: none"> <li>■ 3x PCIe 2.0 x16 slots                             <ul style="list-style-type: none"> <li>- PCI_E2, PCI_E5 support up to PCIe 2.0 x16 speed</li> <li>- PCI_E4 supports up to PCIe 2.0 x4 speed</li> </ul> </li> <li>■ 2x PCIe 2.0 x1 slots</li> <li>■ 1x PCI slot</li> </ul>
<b>Multi-GPU Support</b>	<ul style="list-style-type: none"> <li>■ Supports 3-Way AMD® CrossFire™ Technology*</li> <li>■ Supports 2-Way NVIDIA® SLI™ Technology</li> </ul> <p>* Supports Windows 7 and Windows 8/ 8.1.</p>
<b>Storage</b>	<ul style="list-style-type: none"> <li>■ AMD® SB950 Chipset                             <ul style="list-style-type: none"> <li>- 6x SATA 6Gb/s ports</li> <li>- Supports RAID 0, RAID1, RAID5 and RAID 10</li> </ul> </li> </ul>
<b>USB</b>	<ul style="list-style-type: none"> <li>■ AMD® SB950 Chipset                             <ul style="list-style-type: none"> <li>- 14x USB 2.0 ports (8 ports on the back panel, 6 ports available through the internal USB 2.0 connectors)</li> </ul> </li> <li>■ VIA® VL806 Chipset                             <ul style="list-style-type: none"> <li>- 2x USB 3.0 ports available through the internal USB 3.0 connector*</li> </ul> </li> <li>■ Asmedia® 1142 Chipset                             <ul style="list-style-type: none"> <li>- 2x USB 3.1 ports on the back panel</li> </ul> </li> </ul> <p>* These USB 3.0 ports do not support M-Flash recovery function.</p>
<b>Audio</b>	<ul style="list-style-type: none"> <li>■ Realtek® ALC1150 Codec                             <ul style="list-style-type: none"> <li>- 7.1-Channel High Definition Audio</li> <li>- Supports S/PDIF output</li> </ul> </li> </ul>
<b>LAN</b>	<ul style="list-style-type: none"> <li>■ Killer E2205 Gigabit LAN controller*                             <ul style="list-style-type: none"> <li>- 1x LAN port on the backpanel</li> </ul> </li> </ul> <p>* The Killer Network Manager is only available for Windows 7 and Windows 8/ 8.1 currently. The supported drivers for other operating systems would be available on the website if provided by vendor.</p>
<b>Back Panel Connectors</b>	<ul style="list-style-type: none"> <li>■ 1x PS/2 keyboard/ mouse combo port</li> <li>■ 8x USB 2.0 ports</li> <li>■ 2x USB 3.1 ports</li> <li>■ 1x Optical S/PDIF-Out connector</li> <li>■ 1x LAN (RJ45) port</li> <li>■ 6x OFC audio jacks</li> </ul>

<b>Internal Connectors</b>	<ul style="list-style-type: none"> <li>■ 1x 24-pin ATX main power connector</li> <li>■ 1x 8-pin ATX 12V power connector</li> <li>■ 6x SATA 6Gb/s connectors</li> <li>■ 3x USB 2.0 connectors (supports additional 6 USB 2.0 ports)</li> <li>■ 1x USB 3.0 connector (supports additional 2 USB 3.0 ports)</li> <li>■ 1x 4-pin CPU fan connector</li> <li>■ 2x 4-pin system fan connectors</li> <li>■ 2x 3-pin system fan connectors</li> <li>■ 1x Front panel audio connector</li> <li>■ 2x Front panel connectors</li> <li>■ 1x Chassis Intrusion connector</li> <li>■ 1x TPM module connector</li> <li>■ 1x Serial port connector</li> <li>■ 1x S/PDIF-Out connector</li> <li>■ 1x Clear CMOS jumper</li> <li>■ 1x Slow mode booting switch</li> </ul>
<b>I/O Controller</b>	<ul style="list-style-type: none"> <li>■ Fintek 71878 Controller Chip</li> </ul>
<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>■ CPU/System temperature detection</li> <li>■ CPU/System fan speed detection</li> <li>■ CPU/System fan speed control</li> </ul>
<b>BIOS Features</b>	<ul style="list-style-type: none"> <li>■ 64 Mb flash</li> <li>■ UEFI AMI BIOS</li> <li>■ ACPI 5.0, PnP 1.0a, SM BIOS 2.7, DMI 2.0</li> <li>■ Multi-language</li> </ul>
<b>Special Features</b>	<ul style="list-style-type: none"> <li>■ Military Class 4</li> <li>■ Military Class Essentials</li> <li>■ OC Genie 4</li> <li>■ CLICK BIOS 4</li> <li>■ AMD CrossFire</li> <li>■ NVIDIA SLI</li> <li>■ USB 3.1</li> <li>■ SATA 6Gb/s</li> <li>■ Command Center</li> <li>■ Fast Boot</li> <li>■ GAMING APP</li> <li>■ Super Charger</li> <li>■ Live Update 6</li> <li>■ M-Flash</li> </ul>
<b>Software</b>	<ul style="list-style-type: none"> <li>■ Drivers</li> <li>■ MSI <ul style="list-style-type: none"> <li>- Command Center</li> <li>- Live Update 6</li> <li>- Fast Boot</li> </ul> </li> <li>■ 7-ZIP</li> <li>■ Sound Blaster Cinema 2</li> <li>■ Killer Network Manager</li> <li>■ Norton Internet Security Solution</li> </ul>
<b>Form Factor</b>	<ul style="list-style-type: none"> <li>■ ATX Form Factor</li> <li>■ 12 in. x 9.6 in. (30.5 cm x 24.4 cm)</li> </ul>

# Connectors Quick Guide

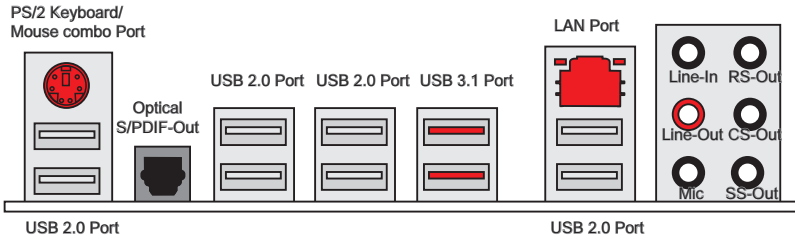


## Connectors Reference Guide

Port Name	Port Type
Back Panel	I/O Ports
CPU	AM3/ AM3+ Socket
CPUFAN,SYSFAN1~4	Fan Power Connectors
DIMM1~4	DDR3 Memory slots
JAUD1	Front Panel Audio Connector
JBAT1	Clear CMOS Jumper
JCI1	Chassis Intrusion Connector
JCOM1	Serial Port Connector
JFP1, JFP2	System Panel Connectors
JPWR1~2	ATX Power Connectors
JSP1	S/PDIF-Out Connector
JTPM1	TPM Module Connector
JUSB1 ~ 3	USB 2.0 Expansion Connectors
JUSB4	USB 3.0 Expansion Connector
PCI1	PCI Expansion Slot
PCI_E1~5	PCIe Expansion Slots
SATA1~6	SATA Connectors
SLOW_MODE	Slow Mode Booting Switch



# Back Panel Quick Guide



### ► PS/2 Keyboard/ Mouse combo Port

The PS/2® keyboard/ mouse DIN connector for PS/2® keyboard/ mouse.

### ► Optical S/PDIF-Out

This S/PDIF (Sony & Philips Digital Interconnect Format) connector is provided for digital audio transmission to external speakers through an optical fiber cable.

### ► USB 2.0 Port

The USB 2.0 port is for attaching USB 2.0 devices such as keyboard, mouse, or other USB 2.0-compatible devices.

### ► USB 3.1 Port

USB 3.1 port is backward-compatible with USB 3.0/ 2.0 devices. It supports data transfer rate up to 10 Gb/s (SuperSpeed USB 10 Gbps).



### **Important**

*In order to use USB 3.0/ 3.1 devices, you must connect to a USB 3.0/ 3.1 port. If a USB cable is used, it must be USB 3.0/ 3.1 compliant.*

### ► LAN Port

The standard RJ-45 LAN jack is for connecting to a Local Area Network (LAN).

	LED	LED Status	Description
	Link/ Activity LED	Off	No link
		Yellow	Linked
		Blinking	Data activity
	Speed LED	Off	10 Mbps connection
		Green	100 Mbps connection
		Orange	1 Gbps connection

### ► Audio Ports

These connectors are used for audio devices.

- Line in: Used for connecting external audio outputting devices.
- Line out: Used as a connector for speakers or headphone.
- Mic: Used as a connector for a microphone.
- RS-Out: Rear surround sound line out in 4/ 5.1/ 7.1 channel mode.
- CS-Out: Center/ subwoofer line out in 5.1/ 7.1 channel mode.
- SS-Out: Side surround sound line out in 7.1 channel mode.

# CPU (Central Processing Unit)

## Introduction to AM3/ AM3+ CPU

The surface of the CPU has a golden triangle to assist in correctly lining up the CPU for motherboard placement. The golden triangle is the Pin 1 indicator.



Golden triangle is the Pin 1 indicator



### **Important**

#### **Overheating**

Overheating can seriously damage the CPU and motherboard. Always make sure the cooling fans work properly to protect the CPU from overheating. Be sure to apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.

#### **Replacing the CPU**

When replacing the CPU, always turn off the system's power supply and unplug the power supply's power cord to ensure the safety of the CPU.

#### **Overclocking**

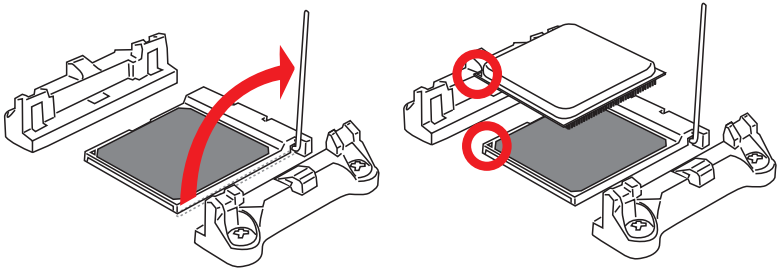
This motherboard is designed to support overclocking. Before attempting to overclock, please make sure that all other system components can tolerate overclocking. Any attempt to operate beyond product specifications is not recommend. MSI does not guarantee the damages or risks caused by inadequate operation beyond product specifications.

## CPU & Cooler Installation

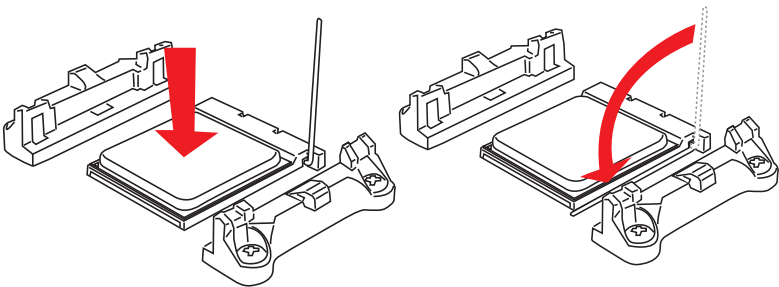
When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating**. Meanwhile, do not forget to apply some thermal paste on CPU before installing the heat sink/cooler fan for better heat dispersion.

Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & motherboard.

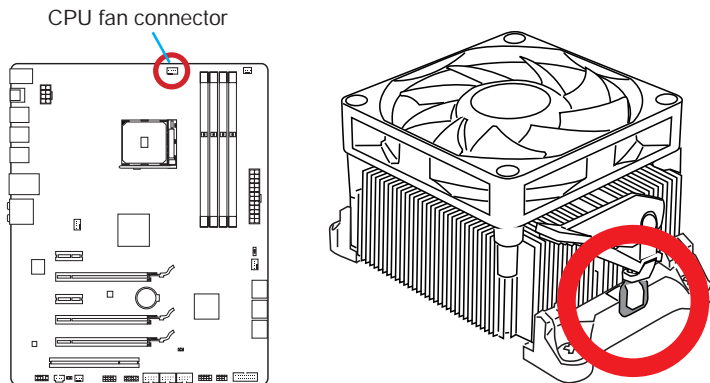
1. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.
2. Look for the gold arrow of the CPU. The gold arrow should point as shown in the picture. The CPU can only fit in the correct orientation.



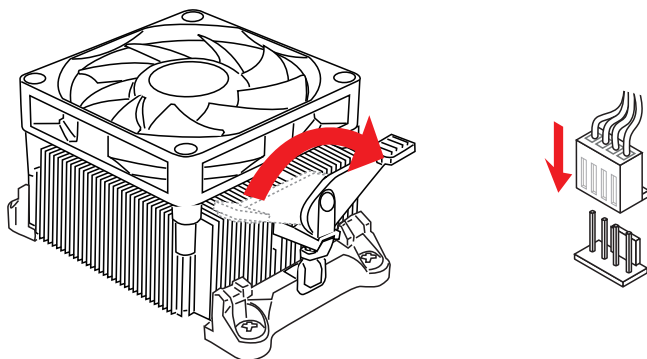
3. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your motherboard.
4. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



5. Locate the CPU fan connector on the motherboard.
6. Position the cooling set onto the retention mechanism. Hook one end of the clip to hook first.



7. Then press down the other end of the clip to fasten the cooling set on the top of the retention mechanism. Locate the Fix Lever and lift up it.
8. Fasten down the lever.
9. Attach the CPU Fan cable to the CPU fan connector on the motherboard.

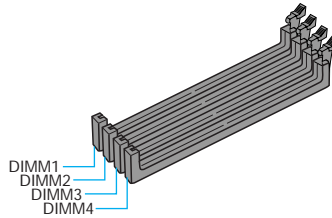
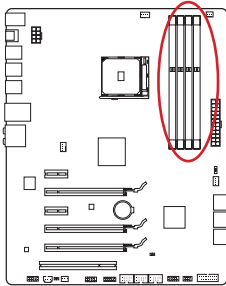


### **Important**

- While disconnecting the Safety Hook from the fixed bolt, it is necessary to keep an eye on your fingers, because once the Safety Hook is disconnected from the fixed bolt, the fixed lever will spring back instantly.
- Confirm that the CPU cooler has formed a tight seal with the CPU before booting your system.
- Please refer to the documentation in the APU cooler package for more details about CPU cooler installation.

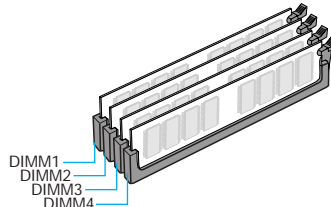
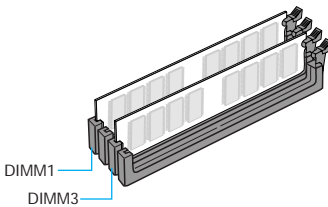
# Memory

These DIMM slots are used for installing memory modules.



## Dual-Channel mode Population Rule

In Dual-Channel mode, the memory modules can transmit and receive data with two data bus channels simultaneously. Enabling Dual-Channel mode can enhance system performance. The following illustrations explain the population rules for Dual-Channel mode.

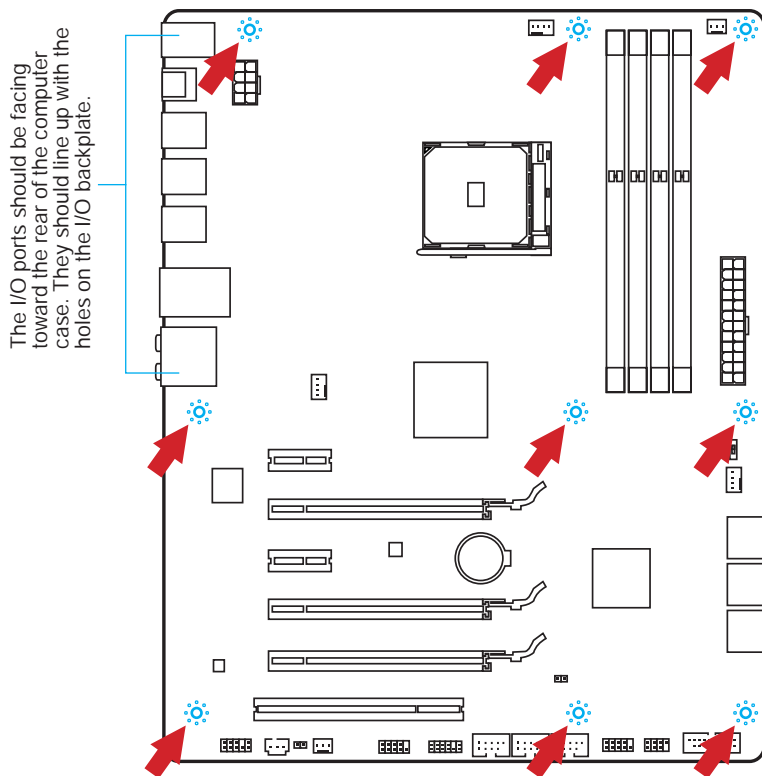


### **Important**

- *DDR3 memory modules are not interchangeable with DDR2, and the DDR3 standard is not backward compatible. Always install DDR3 memory modules in DDR3 DIMM slots.*
- *To ensure system stability, memory modules must be of the same type and density in Dual-Channel mode.*
- *Due to chipset resource usage, the system will only detect up to 31+ GB of memory (not full 32 GB) when all DIMM slots have 8GB memory modules installed.*

## Mounting Screw Holes

When installing the motherboard, first install the necessary mounting stands required for an motherboard on the mounting plate in your computer case. If there is an I/O back plate that came with the computer case, please replace it with the I/O backplate that came with the motherboard package. The I/O backplate should snap easily into the computer case without the need for any screws. Align the mounting plate's mounting stands with the screw holes on the motherboard and secure the motherboard with the screws provided with your computer case. The locations of the screw holes on the motherboard are shown below. For more information, please refer to the manual that came with the computer case.

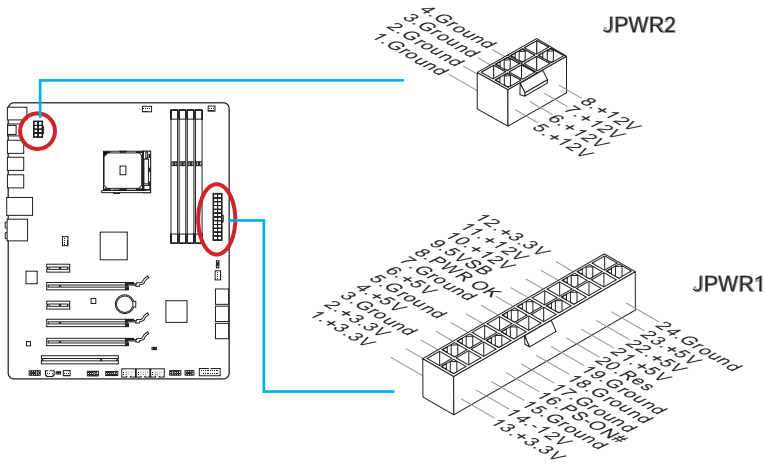


### **Important**

- Install the motherboard on a flat surface free from unnecessary debris.
- To prevent damage to the motherboard, any contact between the motherboard circuitry and the computer case, except for the mounting stands, is prohibited.
- Please make sure there are no loose metal components on the motherboard or within the computer case that may cause a short circuit of the motherboard.

## JPWR1~2: ATX Power Connectors

These connectors allow you to connect an ATX power supply. To connect the ATX power supply, align the power supply cable with the connector and firmly press the cable into the connector. If done correctly, the clip on the power cable should be hooked on the motherboard's power connector.



### **Important**

Make sure that all the power cables are securely connected to a proper ATX power supply to ensure stable operation of the motherboard.



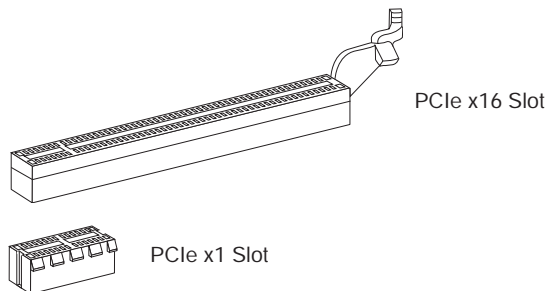
## Expansion Slots

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This motherboard contains numerous slots for expansion cards, such as discrete graphics or audio cards.

### PCI\_E1~5: PCIe Expansion Slots

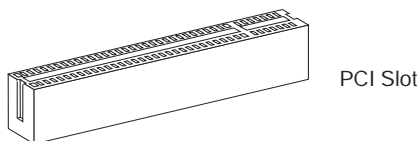
The PCIe slot supports the PCIe interface expansion card.



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### PCI1: PCI Expansion Slot

The PCI slot supports additional LAN, SCSI, USB, and other add-on cards that comply with PCI specifications.



### ***Important***

*When adding or removing expansion cards, always turn off the power supply and unplug the power supply power cable from the power outlet. Read the expansion card's documentation to check for any necessary additional hardware or software changes.*

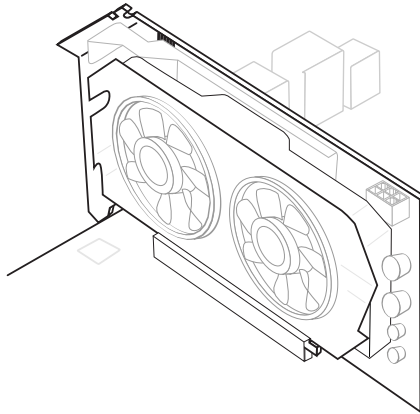
## Video/ Graphics Cards

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If available, this motherboard takes advantage of the CPU's integrate graphics processor, but discrete video cards can be installed by way of the motherboard's expansion slots. Adding on one or more discrete video cards will significantly boost the system's graphics performance. For best compatibility, MSI graphics cards are recommended.

### Single Video Card Installation

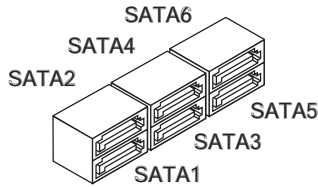
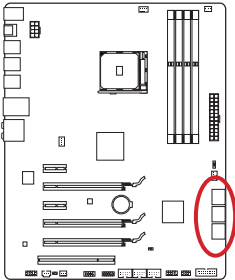
1. Determine what type of expansion slot(s) the video card will use. Locate the expansion slot(s) on the motherboard. Remove any protective expansion slot covers from the computer case.
2. Line up the video card on top of the expansion slot(s) with the display ports facing out of the computer case. For a single video card installation, using the PCI\_E2 slot is recommended.
3. Push the video card into its expansion slot(s). Depending on the expansion slot(s) used, there should be clip(s) on the expansion slot(s) that will lock in place.
4. If needed, screw the edge of the graphics card to the computer case. Some video cards might require a power cable directly from the power supply.
5. Please consult your video card's manual for further instructions regarding driver installation or other special settings.



# Internal Connectors

## SATA1~6: SATA Connectors

This connector is a high-speed SATA interface port. Each connector can connect to one SATA device. SATA devices include disk drives (HDD), solid state drives (SSD), and optical drives (CD/ DVD/ Blu-Ray).

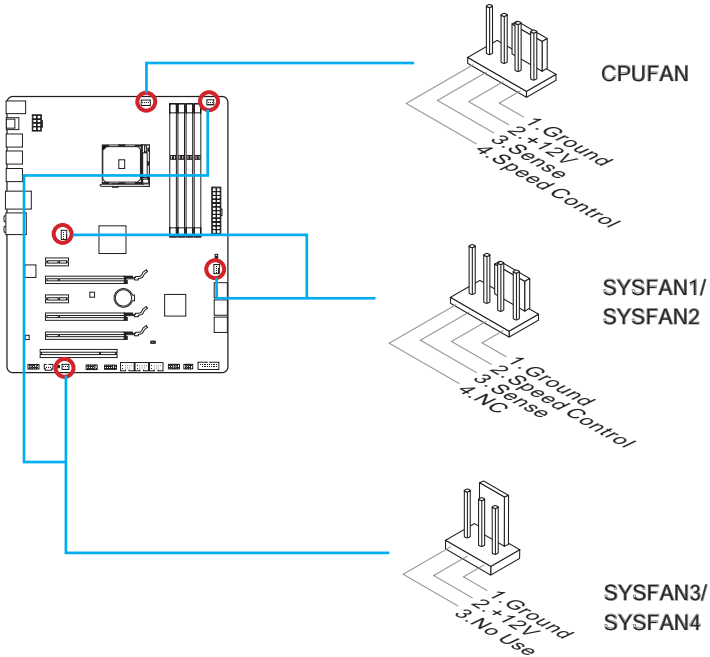


### **Important**

- Many SATA devices also need a power cable from the power supply. Such devices include disk drives (HDD), solid state drives (SSD), and optical drives (CD / DVD / Blu-Ray). Please refer to the device's manual for further information.
- Many computer cases also require that large SATA devices, such as HDDs, SSDs, and optical drives, be screwed down into the case. Refer to the manual that came with your computer case or your SATA device for further installation instructions.
- Please do not fold the SATA cable at a 90-degree angle. Data loss may result during transmission otherwise.
- SATA cables have identical plugs on either sides of the cable. However, it is recommended that the flat connector be connected to the motherboard for space saving purposes.

## CPUFAN, SYSFAN1~4: Fan Power Connectors

The fan power connectors support system cooling fans with +12V. If the motherboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with a speed sensor to take advantage of the CPU fan control. Remember to connect all system fans. Some system fans may not connect to the motherboard and will instead connect to the power supply directly. A system fan can be plugged into any available system fan connector.

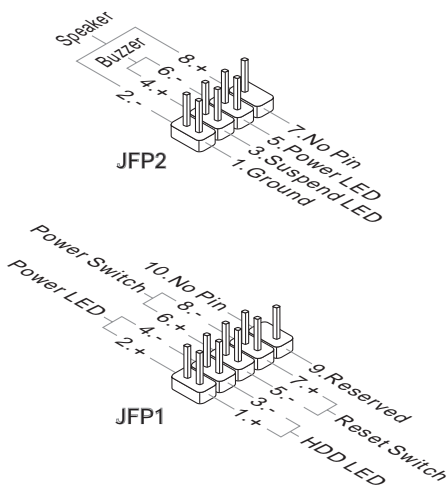
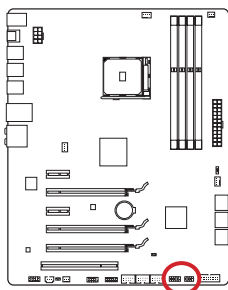


### **Important**

- Please refer to your processor's official website or consult your vendor to find recommended CPU heatsink.
- These connectors support Smart Fan Control with liner mode. The Command Center utility can be installed to automatically control the fan speeds according to the CPU's and system's temperature.
- If there are not enough ports on the motherboard to connect all system fans, adapters are available to connect a fan directly to a power supply.
- Before first boot up, ensure that there are no cables impeding any fan blades.

## JFP1, JFP2: System Panel Connectors

These connectors connect to the front panel switches and LEDs. When installing the front panel connectors, please use the optional M-Connector to simplify installation. Plug all the wires from the computer case into the M-Connector and then plug the M-Connector into the motherboard.

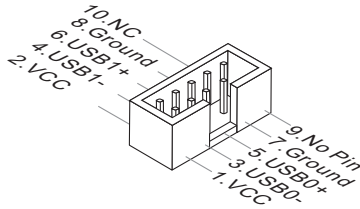
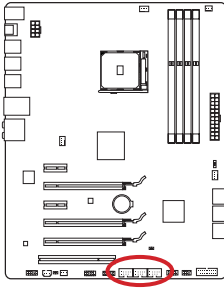


### **Important**

- On the connectors coming from the case, pins marked by small triangles are positive wires. Please use the diagrams above and the writing on the optional M-Connectors to determine correct connector orientation and placement.
- The majority of the computer case's front panel connectors will primarily be plugged into JFP1.

## JUSB1 ~ 3: USB 2.0 Expansion Connectors

This connector is designed for connecting high-speed USB peripherals such as USB HDDs, digital cameras, MP3 players, printers, modems, and many others.

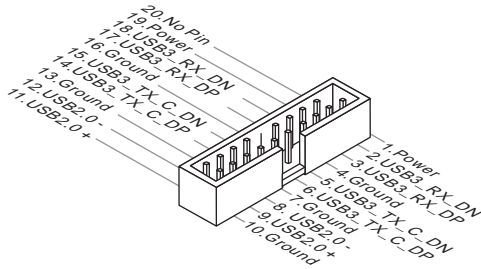
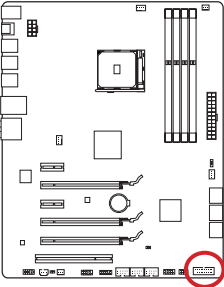


### **Important**

Note that the VCC and GND pins must be connected correctly to avoid possible damage.

## JUSB4: USB 3.0 Expansion Connector

The USB 3.0 port is backwards compatible with USB 2.0 devices. It supports data transfer rates up to 5Gbits/s (SuperSpeed).

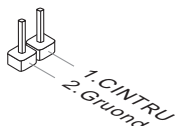
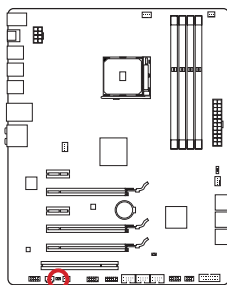


### **Important**

- Note that the VCC and GND pins must be connected correctly to avoid possible damage.
- To use a USB 3.0 device, you must connect the device to a USB 3.0 port through an optional USB 3.0 compliant cable.

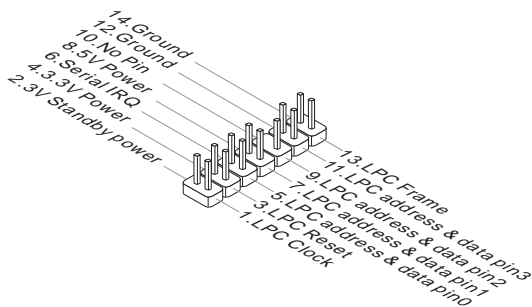
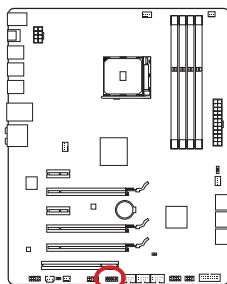
## JCI1: Chassis Intrusion Connector

This connector connects to the chassis intrusion switch cable. If the computer case is opened, the chassis intrusion mechanism will be activated. The system will record this intrusion and a warning message will flash on screen. To clear the warning, you must enter the BIOS utility and clear the record.



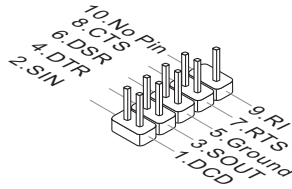
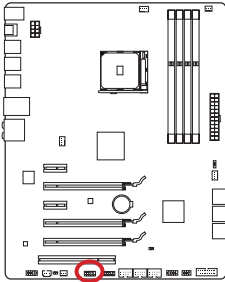
## JTPM1: TPM Module Connector

This connector connects to a TPM (Trusted Platform Module). Please refer to the TPM security platform manual for more details and usages.



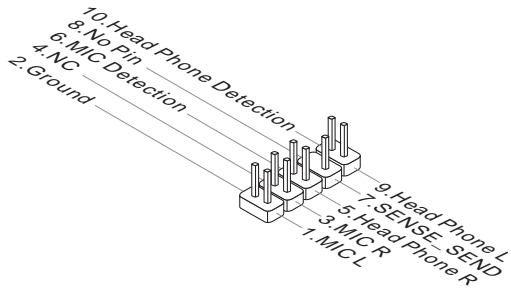
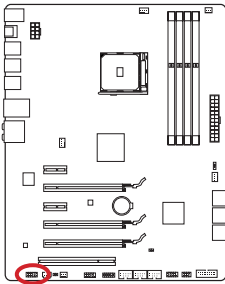
## JCOM1: Serial Port Connector

This connector is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial device.



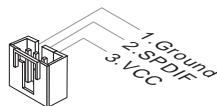
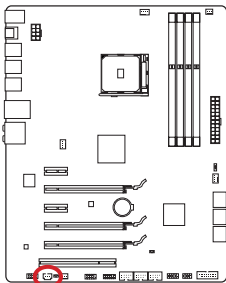
## JAUD1: Front Panel Audio Connector

This connector allows you to connect the front audio panel located on your computer case.



## JSP1: S/PDIF-Out Connector

This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



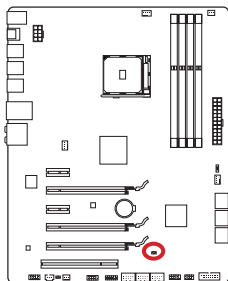


# Jumper

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## JBAT1: Clear CMOS Jumper

There is CMOS RAM onboard that is external powered from a battery located on the motherboard to save system configuration data. With the CMOS RAM, the system can automatically boot into the operating system (OS) every time it is turned on. If you want to clear the system configuration, set the jumpers to clear the CMOS RAM.



Keep Data



Clear Data



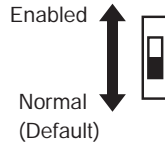
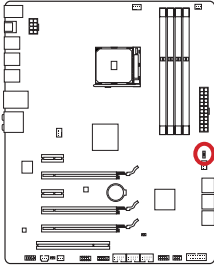
### ***Important***

*You can clear the CMOS RAM by shorting this jumper while the system is off. Afterwards, open the jumper . Do not clear the CMOS RAM while the system is on because it will damage the motherboard.*

## Switch

### SLOW\_MODE: Slow Mode Booting Switch

This switch is used for LN2 cooling solution, that provides the extreme overclocking conditions, to boot at a stable processor frequency and to prevent the system from crashing.



### **Important**

*Users will try extreme low temperature overclocking at their own risks. The overclocking results will vary according to the CPU version.*

# Drivers and Utilities

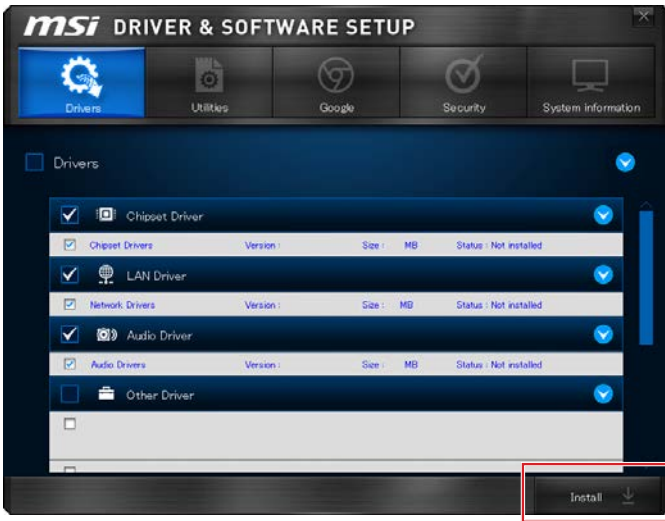
After you install the operating system you will need to install drivers to maximize the performance of the new computer you just built. MSI motherboard comes with a Driver Disc. Drivers allow the computer to utilize your motherboard more efficiently and take advantage of any special features we provide.

You can protect your computer from viruses by installing the bundled security program. The bundle also includes a variety of powerful and creative utilities.

## Driver/ Utilities Installation

Please follow the steps below to install drivers and utilities for your new computer.

1. Insert MSI Driver Disc into the optical drive. The installer will automatically appear if autorun is enabled in OS.
2. Installer will automatically find and list all necessary drivers.
3. Click **Install** button.



Click here

4. The software installation will then be in progress, after it has finished it will prompt you to restart.
5. Click **OK** button to finish.
6. Restart your computer.

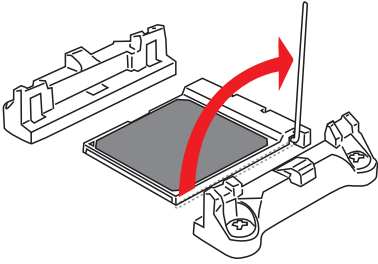
You can also use the same method to install the utilities.

# Chapter 2

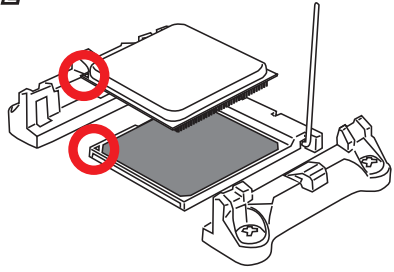
Quick Installation

# CPU Installation

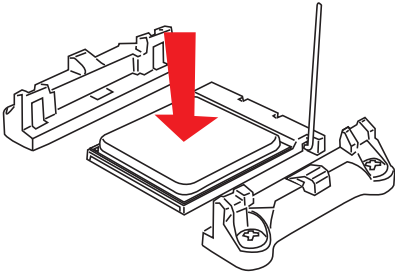
1



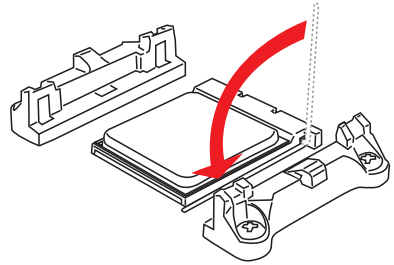
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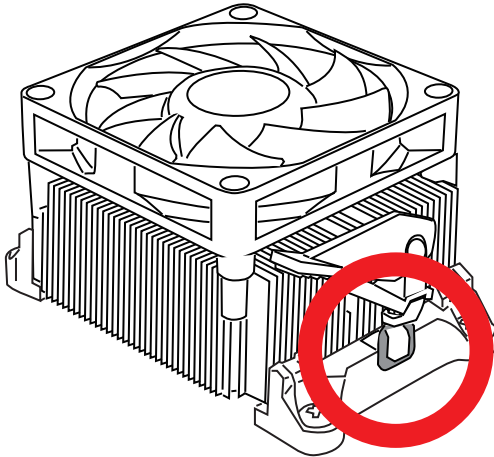
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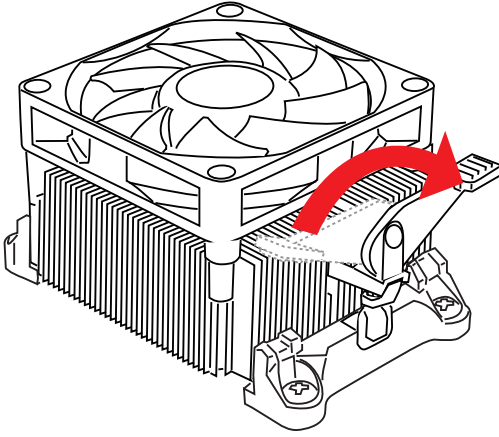
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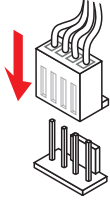
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6

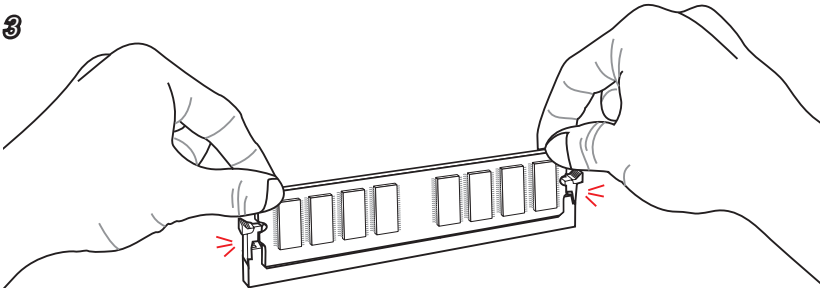
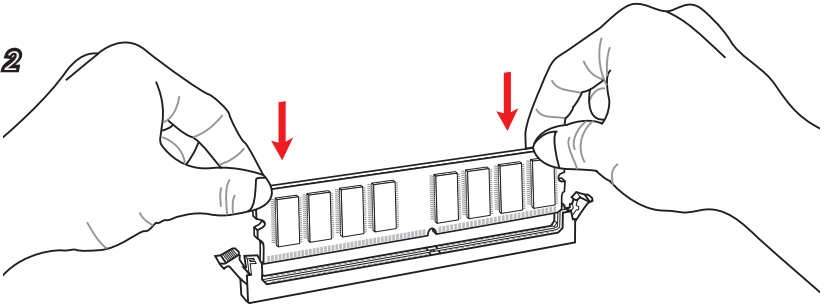
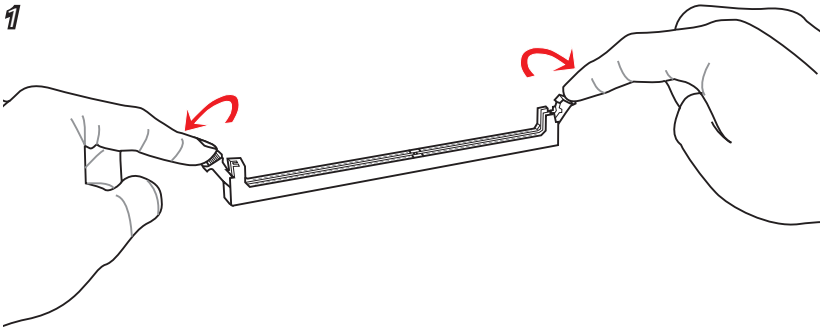


7



# Memory Installation

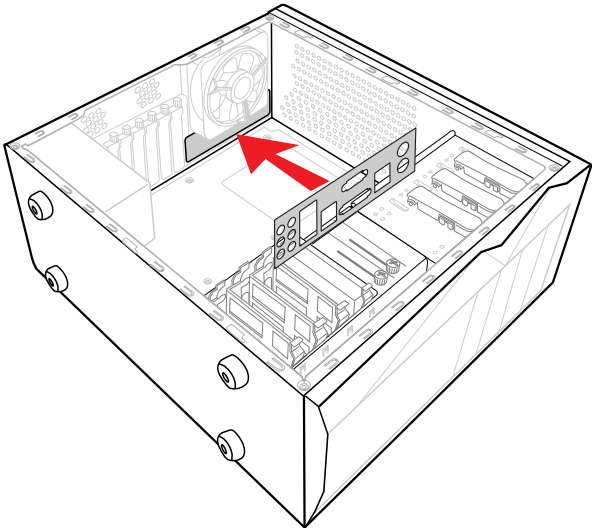
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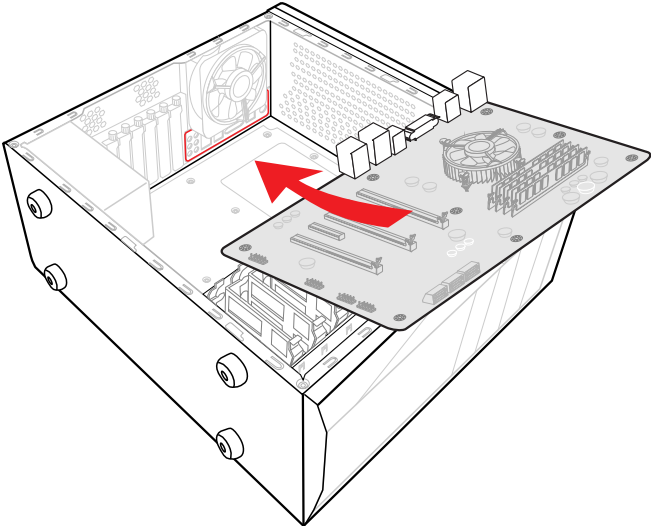
# Motherboard Installation

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1

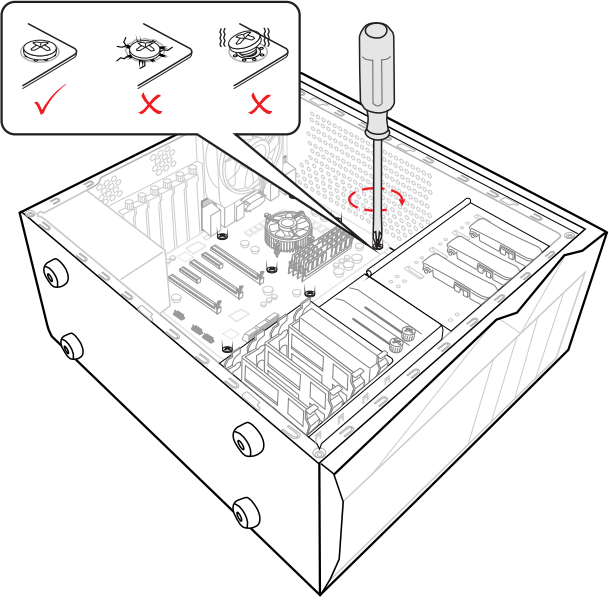


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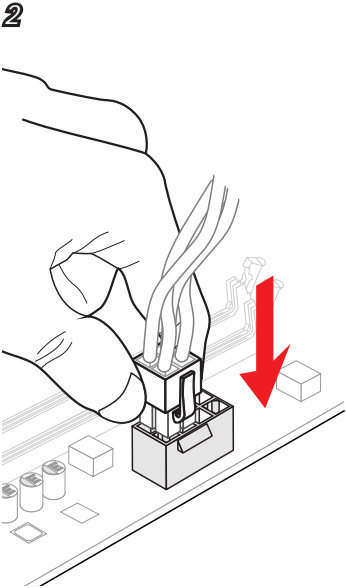
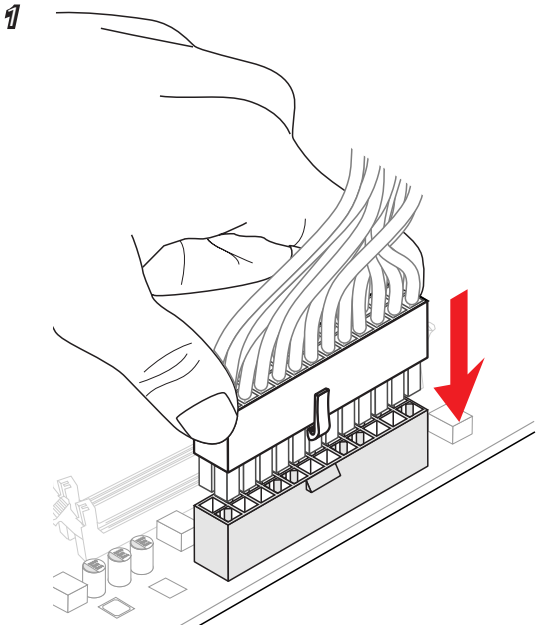


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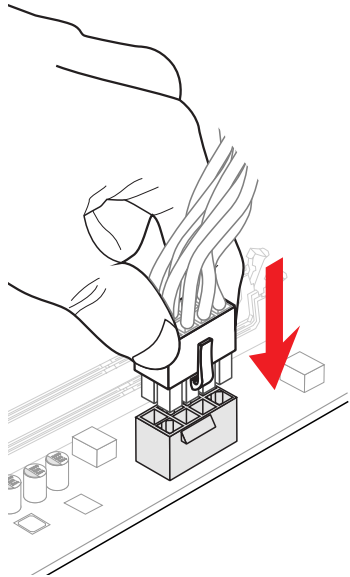


# Power Connectors Installation

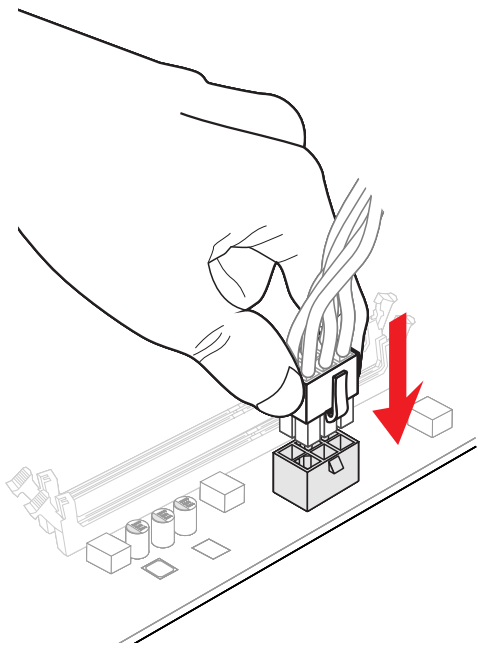
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or



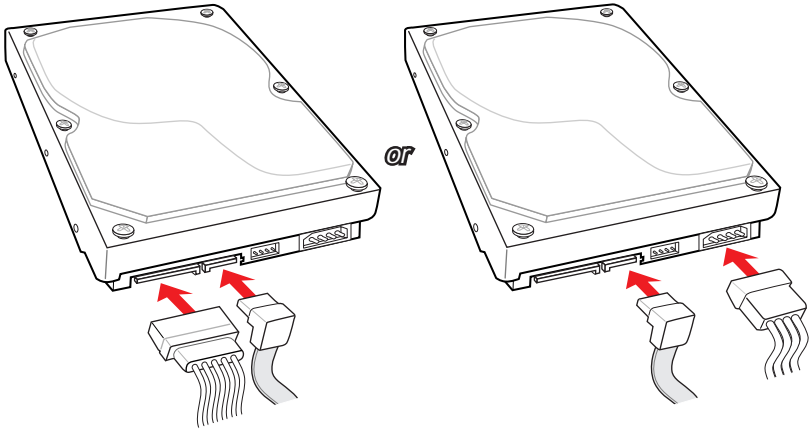
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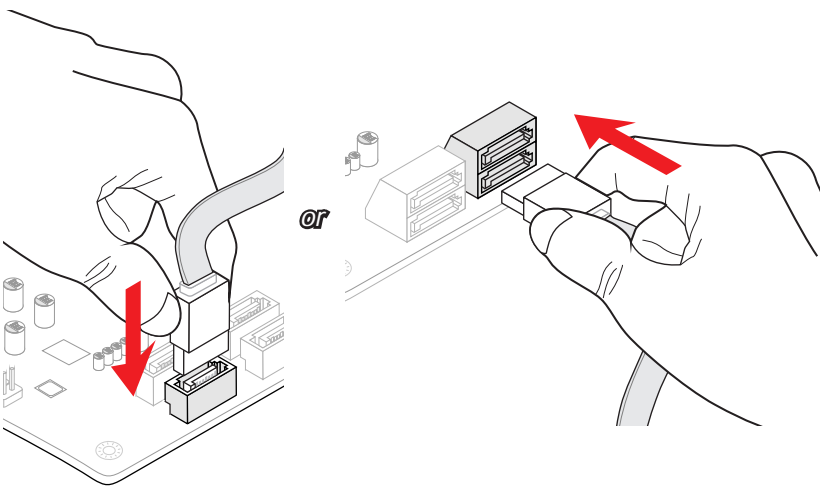
# SATA HDD Installation

---

1

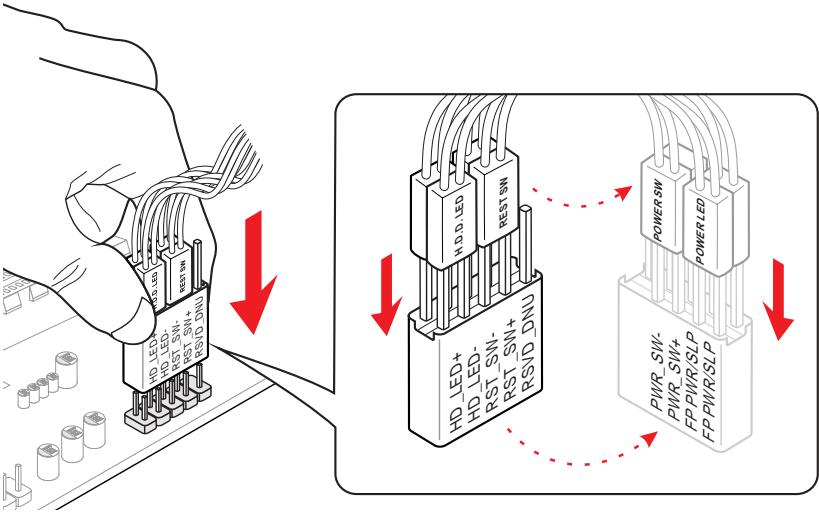


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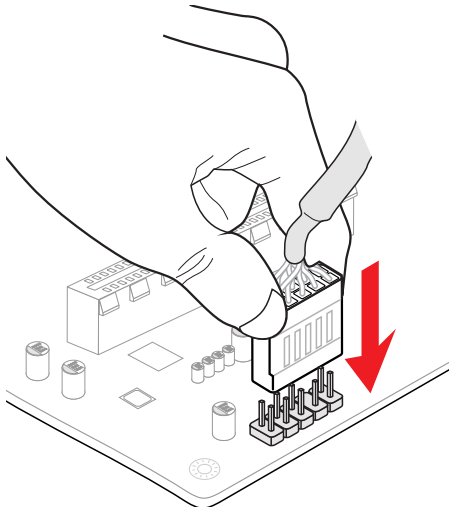


# Front Panel Connector Installation

## JFP1 Connector Installation

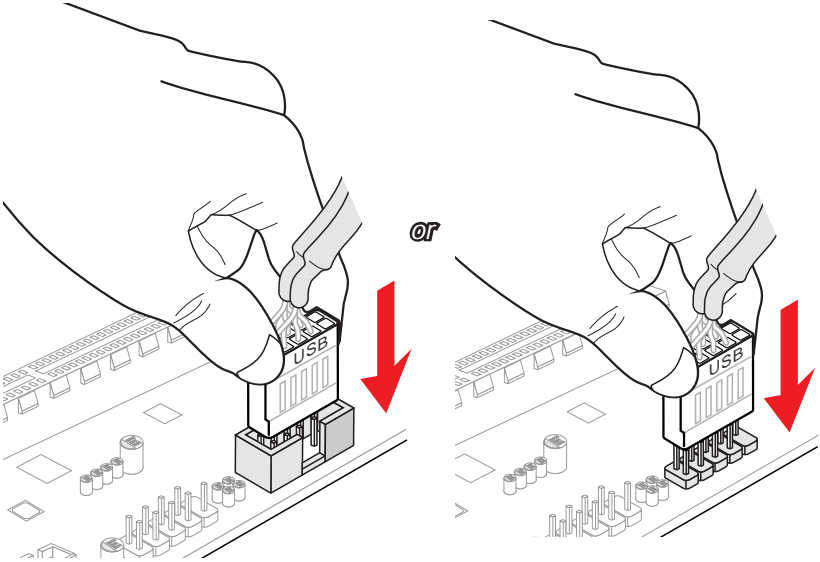


## Front Panel Audio Connector Installation

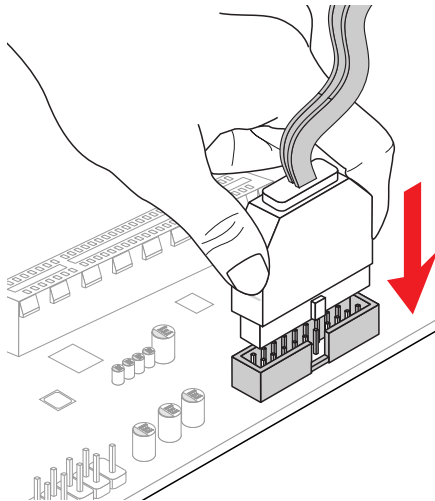


# Peripheral Connector Installation

## USB2.0 Connector Installation

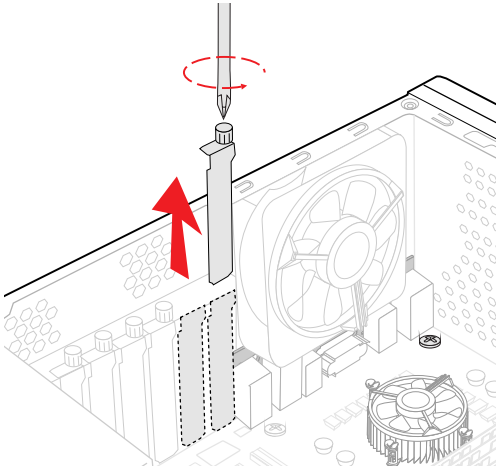


## USB3.0 Connector Installation

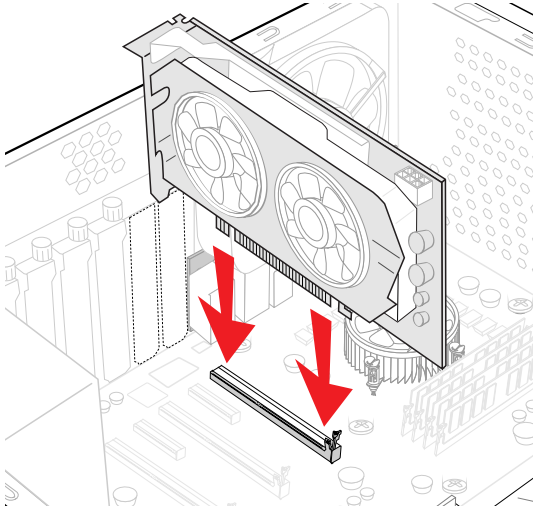


# Graphics Card Installation

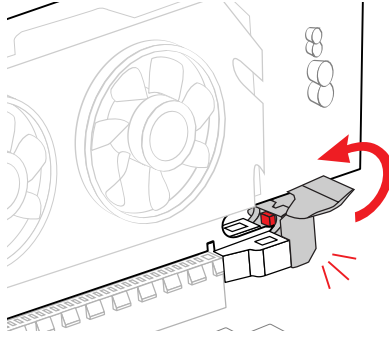
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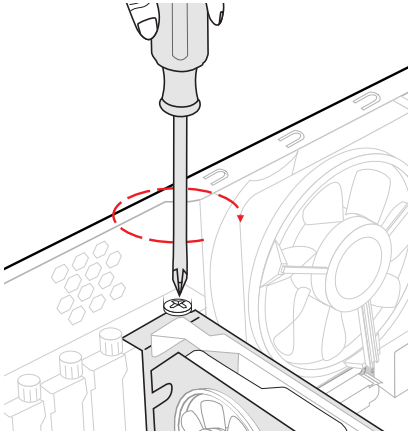
2



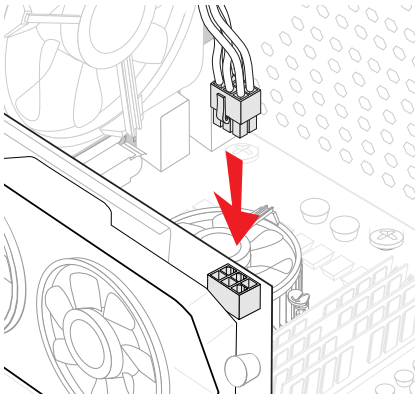
3



4



5





# Chapter 3

## BIOS Setup

CLICK BIOS is a revolutionary UEFI interface that allows you to setup and configure your system for optimum use. Using your mouse and keyboard, users can change BIOS settings, monitor CPU temperature, select the boot device priority and view system information such as the CPU name, DRAM capacity, the OS version and the BIOS version. Users can import and export parameter data for backup or for sharing with friends.



### ***Important***

- *The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*
- *The pictures in this chapter are for reference only and may vary from the product you purchased. Please refer to the actual screens of your system for detailed information.*
- *Please clear the CMOS data and restore the default settings if the system becomes unbootable after changing BIOS settings. (Refer to the Clear CMOS jumper/ button section to clear the CMOS data, select the "Restore Defaults" and press <Enter> in BIOS to load the default settings.)*

## Entering Setup

The default settings offer the optimal performance for system stability in normal conditions. You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

### **Important**

- Please load the default settings to restore the optimal system performance and stability if the system becomes unstable after changing BIOS settings. Select the "Restore Defaults" and press <Enter> in BIOS to load the default settings.
- Please clear the CMOS data and restore the default settings if the system becomes unbootable after changing BIOS settings. (Refer to the Clear CMOS jumper/ button section to clear the CMOS data, select the "Restore Defaults" and press <Enter> in BIOS to load the default settings.)
- If you are unfamiliar with the BIOS settings, we recommend that you keep the default settings to avoid possible system damage or failure booting due to inappropriate BIOS configuration.

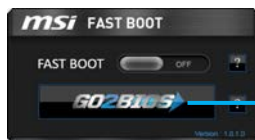
## Entering BIOS Setup

Power on the computer and the system will start the Power On Self Test (POST) process. When the message below appears on the screen, please press <Del> key to enter BIOS:

### Press <Del> to run BIOS setup, or <F11> to run boot menu

If the message disappears before you respond and you still need to enter BIOS, restart the system by turning the computer OFF then back ON or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

MSI additionally provides two methods to enter the BIOS setup. You can click the "GO2BIOS" tab on "MSI Fast Boot" utility screen or press the physical "GO2BIOS" button (optional) on the motherboard to enable the system going to BIOS setup directly at next boot.



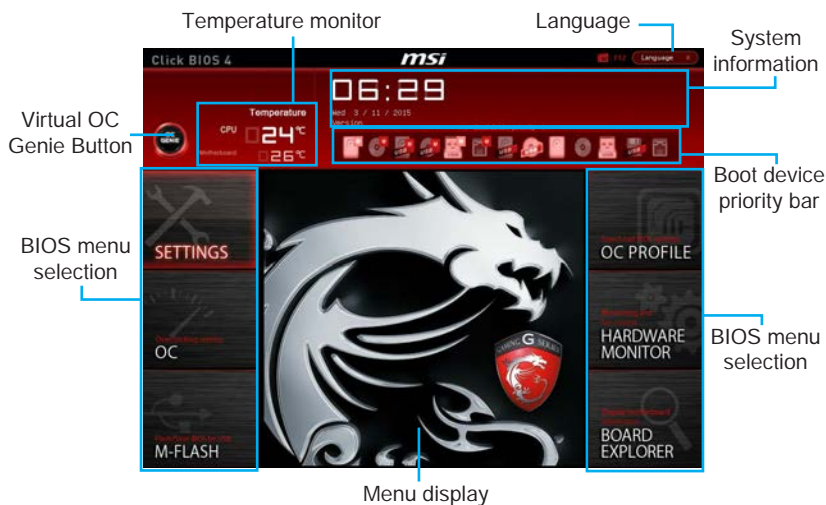
Click "GO2BIOS" tab on "MSI Fast Boot" utility screen.

### **Important**

Please be sure to install the "MSI Fast Boot" utility before using it to enter the BIOS setup.

## Overview

After entering BIOS, the following screen is displayed.



### ► BIOS menu selection

The following options are available:

- **SETTINGS** - Uses this menu to specify the parameters for chipset and boot devices.
- **OC** - This menu contains the frequency and voltage adjustments. Increasing the frequency can get better performance, however high frequency and heat can cause instability, we do not recommend general users to overclock.
- **M-FLASH** - This menu provides the way to update BIOS with a USB flash disk.
- **OC PROFILE** - This menu is used to set various overclocking profiles.
- **HARDWARE MONITOR** - This menu is used to set the speeds of fans and monitor voltages of system.
- **BOARD EXPLORER** - It provides the information of the installed devices on the motherboard.

► **Virtual OC Genie Button**

Enables or disables the OC Genie function by clicking on this button. When enabled, this button will be light. Enabling OC Genie function can automatically overclock with MSI optimized overclocking profile.



*We recommend that you do not to make any modification in OC menu mode and do not to load defaults after enabling the OC Genie function.*

► **Menu display**

This area provides BIOS setting items and information to be configured.

► **Boot device priority bar**

You can move the device icons to change the boot priority.



High priority —————> Low priority

► **System information**

Shows the time, date, CPU name, CPU frequency, DRAM frequency, DRAM capacity and the BIOS version.

► **Language**


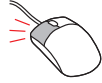

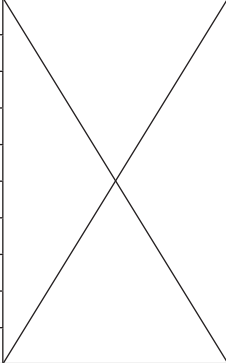
Allows you to select the language of the BIOS setup.

► **Temperature monitor**

Shows the temperatures of the processor and the motherboard.

## Operation

You can control BIOS settings with the mouse and the keyboard. The following table lists and describes the hot keys and the mouse operations.

Hot key	Mouse	Description
<↑↓→←>	 Move the cursor	Select Item
<Enter>	 Click/ Double-click the left button	Select Icon/ Field
<Esc>	 Click the right button	Jump to the Exit menu or return to the previous from a submenu
<+>		Increase the numeric value or make changes
<->		Decrease the numeric value or make changes
<F1>		General Help
<F4>		CPU Specifications
<F5>		Enter Memory-Z
<F6>		Load optimized defaults
<F8>		OC Profile Load From USB
<F9>		OC Profile Save to USB
<F10>		Save Change and Reset
<F12>		Save a screenshot to a FAT/FAT32 USB drive

# SETTINGS



## System Status

### ► System Date

Sets the system date. Use tab key to switch between date elements.

The format is <day> <month> <date> <year>.

<day> Day of the week, from Sun to Sat, determined by BIOS. Read-only.

<month> The month from Jan. through Dec.

<date> The date from 1 to 31 can be keyed by numeric function keys.

<year> The year can be adjusted by users.

### ► System Time

Sets the system time. Use tab key to switch between time elements.

The time format is <hour> <minute> <second>.

### ► SATA Portx

Show the information of connected SATA device.



### **Important**

*If the connected SATA device is not displayed, turn off computer and re-check SATA cable and power cable connections of the device and motherboard.*

### ► System Information

Shows detailed system information, including CPU type, BIOS version, and Memory (read only).

### ► DMI Information

Shows system information, desktop Board Information and chassis Information. (Read only).

## Advanced

### ► PCI Subsystem Settings

Sets PCI Express interface protocol and latency timer. Press <Enter> to enter the sub-menu.

#### ► PCI Latency Timer [32]

Sets latency timer of PCI interface device.

[Options: 32, 64, 96, 128, 160, 192, 224, 248 PCI Bus clocks]

### ► ACPI Settings

Sets ACPI parameters of onboard power LED behaviors. Press <Enter> to enter the sub-menu.

#### ► ACPI Standby State

Specifies the power saving mode for ACPI function

[S1] Sleep Mode. Hardware remains on.

[S3] Suspend to RAM. Turns off hardware. (Recommended)

#### ► Power LED [Blinking]

Sets shining behaviors of the onboard Power LED.

[Dual Color] The power LED turns to another color to indicate the S3 state.

[Blinking] The power LED blinks to indicate the S3 state.

### ► Integrated Peripherals

Sets integrated peripherals' parameters, such as LAN, HDD, USB and audio. Press <Enter> to enter the sub-menu.

#### ► Onboard LAN Controller [Enabled]

Enables or disables the onboard LAN controller.

#### ► LAN Option ROM [Disabled]

Enables or disables the legacy network Boot Option ROM for detailed settings.

This item will appear when "Onboard LAN Controller" is enabled.

[Enabled] Enables the onboard LAN Boot ROM.

[Disabled] Disables the onboard LAN Boot ROM.

#### ► Network Stack [Disabled]

Sets UEFI network stack for optimizing IPv4 / IPv6 function.

[Enabled] Enables UEFI network stack.

[Disabled] Disables UEFI network stack.

#### ► Ipv4 PXE Support [Enabled]

When "Enabled", the system UEFI network stack will support Ipv4 protocol. This item will appear when "Network Stack" is enabled.

[Enabled] Enables the Ipv4 PXE boot support.

[Disabled] Disables the Ipv4 PXE boot support.

#### ► Ipv6 PXE Support [Enabled]

When "Enabled", the system UEFI network stack will support Ipv6 protocol. This item will appear when "Network Stack" is enabled.

[Enabled] Enables the Ipv6 PXE boot support.

[Disabled] Disables the Ipv6 PXE boot support.

### ► SATA Mode [AHCI Mode]

Sets the operation mode of the onboard SATA controller. The default mode is AHCI.

[Disabled] Disables the SATA function.

[IDE Mode] Specify the IDE mode for SATA storage devices.

[AHCI Mode] Specify the AHCI mode for SATA storage devices. AHCI (Advanced Host Controller Interface) offers some advanced features to enhance the speed and performance of SATA storage device, such as Native Command Queuing (NCQ) and hot-plugging.

[RAID Mode] Enables RAID function for SATA storage devices.

### ► SATAx Hot Plug [Disabled]

Allows user to enable or disable the SATA hot plug support. This item will appear when the "SATA Mode" set to [AHCI].

[Enabled] Enables hot plug support for the SATA ports.

[Disabled] Disables hot plug support for the SATA ports.

### ► HD Audio Controller [Enabled]

Enables or disables the onboard High Definition Audio controller.

### ► HPET [Enabled]

Enables or disables the HPET (High Precision Event Timers) support.

## ► USB Configuration

Sets the onboard USB controller and device function. Press <Enter> to enter the sub-menu.

### ► USB Controller [Enabled]

Enables or disables the onboard USB controller.

### ► XHCI Hand-off [Enabled]

Enables or disables XHCI hand-off support for the operating system without XHCI hand-off feature.

### ► EHCI Hand-off [Enabled]

Enables or disables EHCI hand-off support for the operating system without EHCI hand-off feature.

### ► Legacy USB Support [Enabled]

Sets Legacy USB function support.

[Auto] The system will automatically detect if any USB device is connected and enables or disables the legacy USB support.

[Enabled] Enable the USB support for legacy operating systems that do not support USB.

[Disabled] The USB devices are available only for UEFI applications.

### ► Onboard USB3.0 Controller [Enabled]

Enables or disables the external USB 3.0 controller.

## ► Super IO Configuration

Sets system Super I/O chip parameters for COM port. Press <Enter> to enter the sub-menu.



### ► Serial (COM) Port 0 Configuration

Sets detailed configuration of serial(COM) port 0. Press <Enter> to enter the sub-menu.

#### ► Serial (COM) Port 0 [Enabled]

Enables or disables serial (COM) port 0.

#### ► Serial (COM) Port 0 Settings [Auto]

Sets serial port 0 (COM). If set to "Auto", BIOS will optimize the IRQ automatically or you can set it manually.

### ► Power Management Setup

Sets system Power Management of EuP2013 and AC Power Loss behaviors. Press <Enter> to enter the sub-menu.

#### ► EuP 2013 [Disabled]

Enables or disables the system power consumption according to EuP2013 regulation.

[Enabled] Optimize the system power consumption according to EuP 2013 regulation.

[Disabled] Disables this function.

Note: When enabled, the system will not support RTC wake up event functions.

#### ► Restore after AC Power Loss [Power Off]

Sets the system behaviors while encountering the AC power loss.

[Power Off] Leaves the system in power off state after restoring AC power.

[Power On] Boot up the system after restoring AC power.

[Last State] Restores the system to the previous state (power on/ power off) before AC power loss.

### ► Windows 8 Configuration

Sets Windows 8 detailed configuration and behaviors. Press <Enter> to enter the sub-menu.

#### ► Windows 8 Feature [Disabled]

Enables the supports for Windows 8 or disables for other operating systems. Before enabling this item, make sure all installed devices & utilities (hardware & software) should meet the Windows 8 requirements.

[Enabled] The system will switch to UEFI mode to meet the Windows 8 requirement.

[Disabled] Disables this function.

#### ► MSI Fast Boot [Disabled]

MSI Fast Boot is the fastest way to boot the system. It will disable more devices to speed up system boot time which is faster than the boot time of "Fast Boot" .

[Enabled] Enables the MSI Fast Boot function to speed up booting time. And the following "Fast Boot" will be disabled and fixed.

[Disabled] Disables MSI Fast Boot.

#### ► Fast Boot [Disabled]

Enables or disables the Windows 8 fast boot feature. This item will only be available when "MSI Fast Boot" is disabled.

[Enabled] Enables the Fast Boot configuration to accelerate system boot time.

[Disabled] Disables the Fast Boot configuration.



## **Important**

If you want to enter BIOS with enabled "MSI Fast Boot" mode or enabled "Fast Boot" mode, you have to click the "GO2BIOS" tab on MSI Fast Boot utility screen or press the "GO2BIOS" button (optional) on the motherboard. And then the system will enter to BIOS setup directly at next boot.

### ► Wake Up Event Setup

Sets system wake up behaviors for different sleep modes. Press <Enter> to enter the sub-menu.

#### ► Wake Up Event By [BIOS]

Selects the wake up event by BIOS or operating system.

[BIOS] Activates the following items, and use these items to set the wake up events.

[OS] The wake up events will be defined by OS.

#### ► Resume By RTC Alarm [Disabled]

Disables or enables the system wake up by RTC Alarm.

[Enabled] Enables the system to boot up on a scheduled time/ date.

[Disabled] Disables this function.

#### ► Date (of month) Alarm/ Time (hh:mm:ss) Alarm

Sets RTC alarm date/ Time. If Resume By RTC Alarm is set to [Enabled], the system will automatically resume (boot up) on a specified date/hour/minute/second in these fields (using the <+> and <-> to select the date & time settings).

#### ► Resume By PCI-E Device [Disabled]

Disables or enables the system wake up by PCI express device.

[Enabled] Enables the system to be awakened from the power saving modes when activity or input signal of PCIe device is detected.

[Disabled] Disables this function.

#### ► Resume From S3 by USB Device [Disabled]

Disables or enables the system wake up by USB devices.

[Enabled] Enables the system to be awakened from S3 (Suspend to RAM) sleep state when activity of USB device is detected.

[Disabled] Disables this function.

#### ► Resume From S3/S4/S5 by PS/2 Mouse [Disabled]

Disables or enables the system wake up by PS/2 mouse.

[Enabled] Enables the system to be awakened from S3/ S4/ S5 state when activity of PS/2 mouse is detected.

[Disabled] Disables this function.

▶ **Resume From S3/S4/S5 by PS/2 Keyboard [Disabled]**

Disables or enables the system wake up by PS/2 keyboard.

[Any Key] Enables the system to be awakened from S3/ S4/ S5 state when activity of any key on PS/2 keyboard is detected.

[Hot Key] Enables the system to be awakened from S3/ S4/ S5 state when activity of hot key on PS/2 keyboard is detected.

[Disabled] Disables this function.

## Boot

Sets the sequence of system boot devices.

▶ **Full Screen Logo Display [Enabled]**

Enables or disables to show the full screen logo while system POST.

[Enabled] The OS boots straight to the GUI without showing the POST screen.

[Disabled] Shows the POST messages at booting.

▶ **Boot Mode Select [LEGACY+UEFI]**

Sets the system boot mode from legacy or UEFI architecture depending on OS installation requirement. This item will become unselectable and will be configured automatically by BIOS when "Windows 8 Feature" is enabled.

[UEFI] Enables UEFI BIOS boot mode support only.

[LEGACY+UEFI] Enables both Legacy BIOS boot mode and UEFI BIOS boot.

▶ **FIXED BOOT ORDER Priorities**

Sets device priority for system boot.

▶ **Boot Option #1~N**

These items are used to prioritize the installed boot devices.

## Security

▶ **Administrator Password**

Sets administrator password for system security. Enters the administrator password if set; user has full rights to change the BIOS items.

▶ **User Password**

Sets User Password for system security. Enters the user password if set; but user might have limited rights to change the BIOS items.



### **Important**

*When selecting the Administrator / User Password items, a password box will appear on the screen. Type the password then press <Enter>. The password typed now will replace any previous set password from CMOS memory. You will be prompted to confirm the password. You may also press <Esc> to abort the selection.*

*To clear a set password, press <Enter> when you are prompted to enter a new password. A message will confirm the password is being disabled. Once the password is disabled, you can enter the setup and OS without authorization.*

### ►U-Key

Enable or disable USB driver device as key. This requires the USB device to be plugged in for access to the computer..

### ►Make U-Key at

When the "U-Key" as sets to [Enabled], this item is selectable. This item allows you to specify the USB drive.

### ►Chassis Intrusion Configuration

Press <Enter> to enter the sub-menu.

#### ►Chassis Intrusion [Disabled]

This function will be available if the chassis equips a chassis intrusion switch.

Once the chassis is opened, the system will record and issue a warning message.

To clear the warning message, set the item to [Reset], then it will return to [Enabled] later. [Options: Disabled, Enabled, Reset]

## Save & Exit

### ►Discard Changes and Exit

Exit BIOS setup without saving any change. This it is used to abandon all changes and exit BIOS setup.

### ►Save Changes and Reboot

This item is used to save all changes and reboot the system.

### ►Save Changes

This item is used to save current changes.

### ►Discard Changes

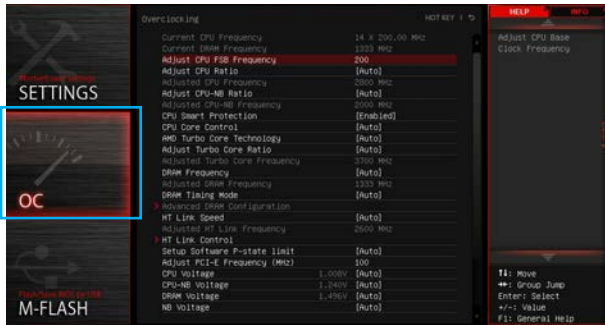
This item is used to discard current all changes and restore to the previous values.

### ►Restore Defaults

This item is used to restore/ load all default values by the BIOS vendor.

### ►Boot Override

The installed boot-able devices will appear on this menu, you can select one of them be a boot device to start booting.



**Important**

- *Overclocking your PC manually is only recommended for advanced users.*
- *Overclocking is not guaranteed, and if done improperly, can void your warranty or severely damage your hardware.*
- *If you are unfamiliar with overclocking, we advise you to use OC Genie for easy overclocking.*

► **Current CPU/ DRAM Frequency**

These items show the current frequencies of installed CPU and Memory. Read-only.

► **Adjust CPU FSB Frequency**

Allows you to set the CPU FSB frequency (in MHz). You may overclock the CPU by adjusting this value. Please note that overclocking behavior and stability is not guaranteed.

► **Adjust CPU Ratio [Auto]**

Sets the CPU ratio that is used to determine CPU clock speed. This item can only be changed if the processor supports this function.

► **Adjusted CPU Frequency**

Shows the adjusted CPU frequency. Read-only.

► **Adjust CPU-NB Ratio [Auto]**

Sets the CPU-NB ratio that is used to determine CPU-NB clock speed.

► **Adjusted CPU-NB Frequency**

Shows the adjusted CPU frequency. Read-only.

► **CPU Smart Protection**

CPU Smart Protection is a mechanism of CPU overheating protection. It will automatically reduce the clock when the CPU temperature gets too high.

► **CPU Core Control**

This item allows you to select the number of active processor cores. When set to [Auto], the CPU will operate under the default number of cores.

### ►AMD Turbo Core Technology [Auto]

Based on AMD Turbo Core Technology, part of CPU core ratio may pop down for providing more performance headroom for active CPU core, even AMD Cool'n'Quiet Technology is Disabled.

[Auto] Turbo Core Technology will linked to AMD Cool'n'Quiet Technology.

[Enabled] Enables this function.

[Disabled] Disables this function.

### ►Adjust Turbo Core Ratio [Auto]

Specifies the Turbo Core frequency multiplier.

### ►Adjusted Turbo Core Frequency

Shows the adjusted Turbo Core frequency. Read-only.

### ►DRAM Frequency [Auto]

Sets the DRAM frequency. Please note the overclocking behavior is not guaranteed.

### ►Adjusted DRAM Frequency

Shows the adjusted DRAM frequency. Read-only.

### ►Intel Extreme Memory Profile (X.M.P) [Disabled]

X.M.P. (Extreme Memory Profile) is the overclocking technology by memory module. This item will be available when you install the memory modules that support X.M.P. technology. When the Intel Extreme Memory Profile (XMP) is Enabled, the AMD Memory Profile (AMP) will be forced to be disabled.

[Disabled] Disables this function.

[Enabled] Choose to apply an Intel Extreme Memory Profile (XMP) to increase system performance.

### ►AMD Memory Profile (AMP) [Disabled]

AMP is the overclocking technology by memory module. This item will be available when you install the memory modules that support AMP technology. When AMP is Enabled, the XMP will be forced to be disabled.

[Disabled] Disables this function.

[Enabled] Choose to apply an AMD Memory Profile (AMP) to increase system performance.

### ►DRAM Timing Mode [Auto]

Selects the memory timing mode.

[Auto] DRAM timings will be determined based on SPD (Serial Presence Detect) of installed memory modules.

[Link] Allows user to configure the DRAM timing manually for all memory channel.

[UnLink] Allows user to configure the DRAM timing manually for respective memory channel.

### ►Advanced DRAM Configuration

Press <Enter> to enter the sub-menu. This sub-menu will be activated after setting [Link] or [Unlink] in "DRAM Timing Mode". User can set the memory timing for each memory channel. The system may become unstable or unbootable after changing memory timing. If it occurs, please clear the CMOS data and restore the default settings. (Refer to the Clear CMOS jumper/ button section to clear the CMOS data, and enter the BIOS to load the default settings.

### ►HT Link Speed

This item allows you to set the Hyper-Transport Link speed. Setting to [Auto], the system will detect the HT link speed automatically.

### ►Adjusted HT Link Frequency

It shows the adjusted HT Link frequency. Read-only.

### ►HT Link Control

Press <Enter> to enter the sub-menu.

#### ►HT Incoming/ Outgoing Link Width

These items allow you to set the Hyper-Transport Link width. Setting to [Auto], the system will detect the HT link width automatically.

### ►Setup Software P-state limit

Enables or disables P-state limit which is a ceiling on the amount of performance and power that a processor may utilize. Enabling this function will also decrease the processor temperature. If set to "Auto", BIOS will set it automatically.

### ►Adjust PCI-E Frequency (MHz)

Sets the PCI Express frequency.

### ►XXX Voltage [Auto] (optional)

Sets these voltages. If set to "Auto", BIOS will set these voltages automatically or you can set it manually.

### ►Spread Spectrum [Disabled]

This function reduces the EMI (Electromagnetic Interference) generated by modulating clock generator pulses.

[Enabled] Enables the spread spectrum function to reduce the EMI (Electromagnetic Interference) problem.

[Disabled] Enhances the overclocking ability of CPU Base clock.



### ***Important***

- *If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the value of Spread Spectrum for EMI reduction.*
- *The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.*
- *Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.*

### ►CPU Specifications

Press <Enter> to enter the sub-menu. This sub-menu displays the information of installed CPU. You can also access this information menu at any time by pressing [F4]. Read only.

#### ►CPU Technology Support

Press <Enter> to enter the sub-menu. The sub-menu shows what the key features does the installed CPU support. Read only.

## ► MEMORY-Z

Press <Enter> to enter the sub-menu. This sub-menu displays all the settings and timings of installed memory.

## ► CPU Features

Press <Enter> to enter the sub-menu.

### ► AMD Cool'n'Quiet [Auto]

Enabled or disabled AMD Cool'n'Quiet function.

[Auto] Depends on AMD Design.

[Enable] Enables AMD Cool'n'Quiet function. The Cool'n'Quiet technology can effectively and dynamically lower CPU speed and power consumption.

[Disabled] Disables this function.



### ***Important***

*When adjusting CPU Ratio, the Cool'n'Quiet function will be disabled automatically. For CPU which supports the Turbo Core Tech., please set AMD Turbo Core Technology and AMD Cool'n'Quiet as Disabled to retain the default CPU core speed.*

### ► C1E Support

Enables this item to reduce the CPU power consumption while idle. Not all processors support Enhanced Halt state (C1E).

### ► SVM Mode [Enabled]

Enables or disables CPU Virtualization.

[Enabled] Enables CPU Virtualization and allows a platform to run multiple operating systems in independent partitions. The system can function as multiple systems virtually.

[Disabled] Disables this function.

### ► IOMMU Mode

Enables/disables the IOMMU (I/O Memory Management Unit) for I/O Virtualization.

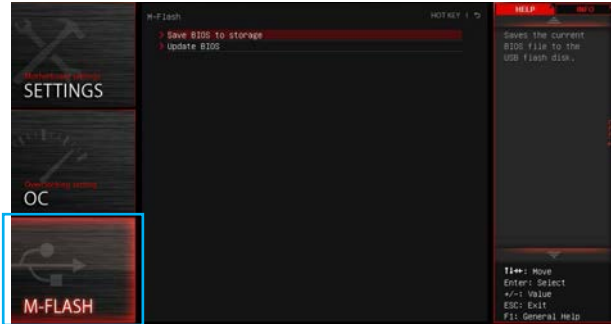
### ► Core C6 State

This item allows you to enable/ disable C6 state support. When the CPU enters C6 state, all cores will save architectural state and reduce core voltages to zero volts. Wake up the CPU from C6 state will take a lot longer.



# M-FLASH

---



## ***Important***

*M-Flash* function allows you to update BIOS from USB flash disk (FAT32/ NTFS format only).

### ► Save BIOS to storage

Saves the current BIOS file to the USB flash disk. The USB flash disk drive should be in FAT32 format.

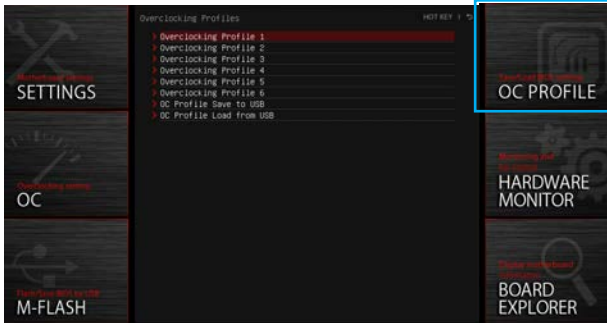
### ► Update BIOS

Selects a BIOS file in the USB flash disk (NTFS/ FAT32 format) to update the BIOS.

#### ► Select one file to update BIOS

Selects a BIOS file in the USB flash disk (NTFS/ FAT32 format) to update the BIOS. The system will reboot after updating.

# OC PROFILE



## ► Overclocking Profile 1/ 2/ 3/ 4/ 5/ 6

Overclocking Profile 1/ 2/ 3/ 4/ 5/ 6 management. Press <Enter> to enter the sub-menu.

### ► Set Name for Overclocking Profile 1/ 2/ 3/ 4/ 5/ 6

Names the current overclocking profile.

### ► Save Overclocking Profile 1/ 2/ 3/ 4/ 5/ 6

Saves the current overclocking profile.

### ► Load Overclocking Profile 1/ 2/ 3/ 4/ 5/ 6

Loads the current overclocking profile.

### ► Clear Overclocking Profile 1/ 2/ 3/ 4/ 5/ 6

Clears the current overclocking profile.

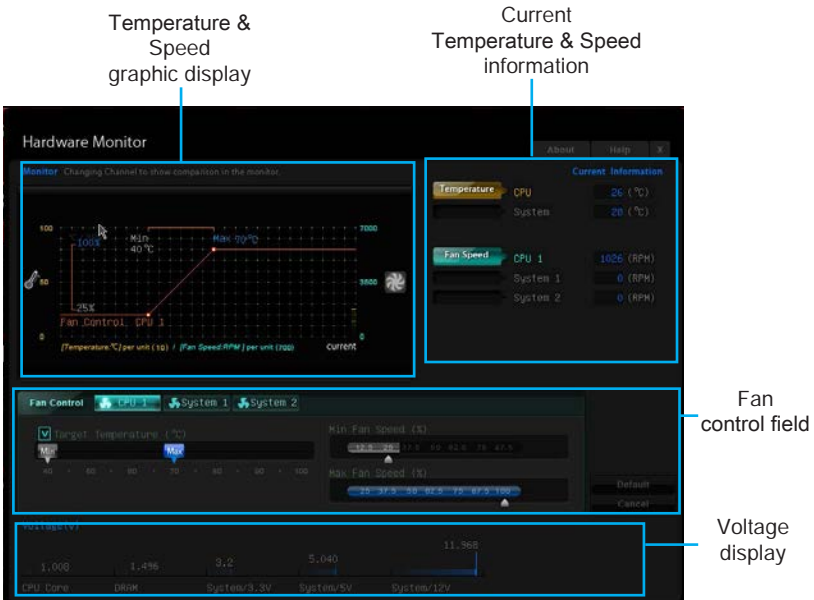
## ► OC Profile Save to USB

Saves OC profile to the USB flash disk drive. The USB flash disk should be FAT32 format only.

## ► OC Profile Load from USB

Loads OC profile from the USB flash disk drive. The USB flash disk should be FAT32 format only.

# HARDWARE MONITOR



## ► Current Temperature & Speed information

Shows the current CPU temperature, system temperature and fans' speeds.

## ► Temperature & Speed graphic display

The red graph shows the minimum and maximum temperatures that be set on the "Fan control field". The yellow graph shows current CPU/ system temperature. The green shows current CPU/ System fan speed.

## ► Fan control field

This motherboard provides a fan speed control feature call "Smart Fan Control". Smart Fan Control automatically controls fan speed depending on the current CPU temperature and to keep it with a specific operating speed. When the current CPU temperature is over the maximum temperature, the CPU/ system fan will run at the maximum speed. When the current CPU temperature is under the minimum temperature, the CPU/ system fan will run at the minimum speed. In this field, you can set the CPU and system fans' speeds and target temperatures.

Please follow the description below to set the temperatures and fan speeds.



- a - Selects a fan you want to specify the speed.
- b - Checks this item to activate the following items for changing default values.
- c - Slides the Min and Max tabs to set the minimum and maximum temperatures.
- d - Slides the arrow symbol to set the minimum fan speed in percentage.
- e - Slides the arrow symbol to set the maximum fan speed in percentage.
- f - Click the "Default" button to restore the default values. Or click the "Cancel" button to abandon all changes and restore to the previous values.



### ***Important***

- *The minimum values of temperature and speed can not be set larger then the maximum values.*
- *The changed settings will become effective after you save the changes and reboot the system.*

#### ► **Voltage display**

Shows the current voltages of CPU, system and memory.

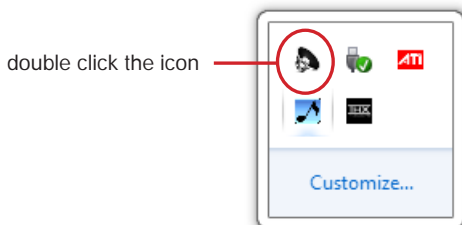
# Appendix A

## Realtek Audio

The Realtek audio provides 10-channel DAC that simultaneously supports 7.1 sound playback and 2 channels of independent stereo sound output (multiple streaming) through the Front-Out-Left and Front-Out-Right channels.

## Software Configuration

After installing the audio driver (see Chapter 1 - Driver and Utilities), the "Realtek HD Audio Manager" icon will appear at the notification area (lower right of the screen). You may double click the icon and the GUI will pop up accordingly.



It is also available to enable the audio driver by clicking the **Realtek HD Audio Manager** from the **Control Panel**.

### Software panel overview

The following figure describes the function of the Realtek HD Audio Manager panel.



#### ► Device Selection

Here you can select an audio output source to change the related options. The “check” sign indicates the devices as default.

#### ► Volume Adjustment

You can control the volume or balance the right/left side of the speakers that you plugged in front or rear panel by adjust the bar.

#### ► Application Enhancement

The array of options will provide you a complete guidance of anticipated sound effect for both output and input device.

#### ► Jack status panel

This panel depicts all render and capture devices currently connected with your computer.

## Auto popup dialog

When you plug into the device at the jack, a dialogue window will pop up asking you which device is current connected.

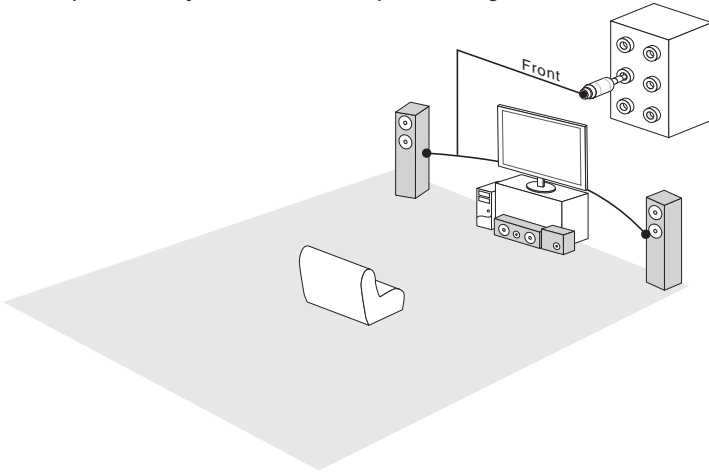


As you know, each jack corresponds to its default setting, you can refer to the next section “Hardware Default Setting”.

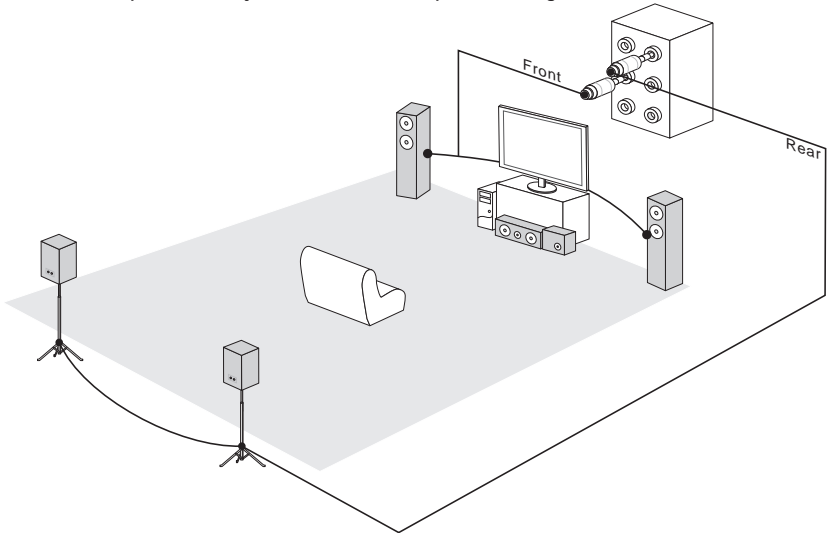
# Hardware Default Setting

The following diagrams are audio back panel default setting.

- Backpanel audio jacks to 2-channel speakers diagram

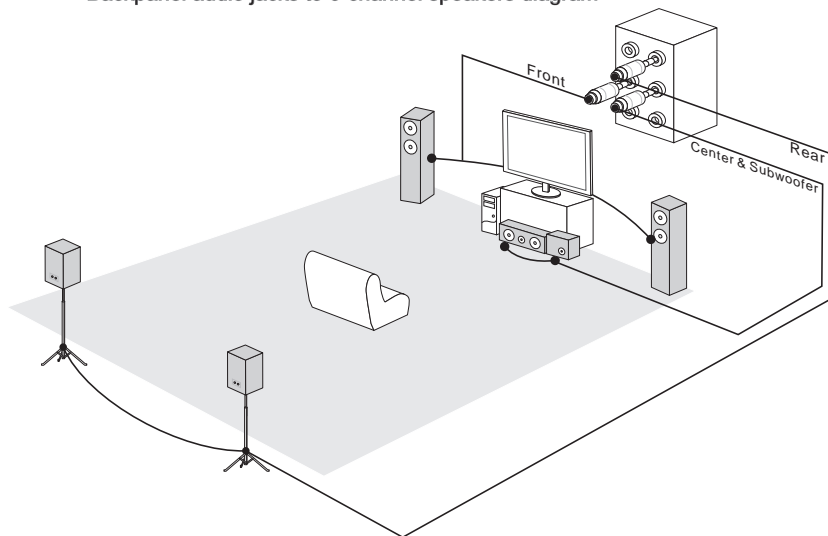


- Backpanel audio jacks to 4-channel speakers diagram

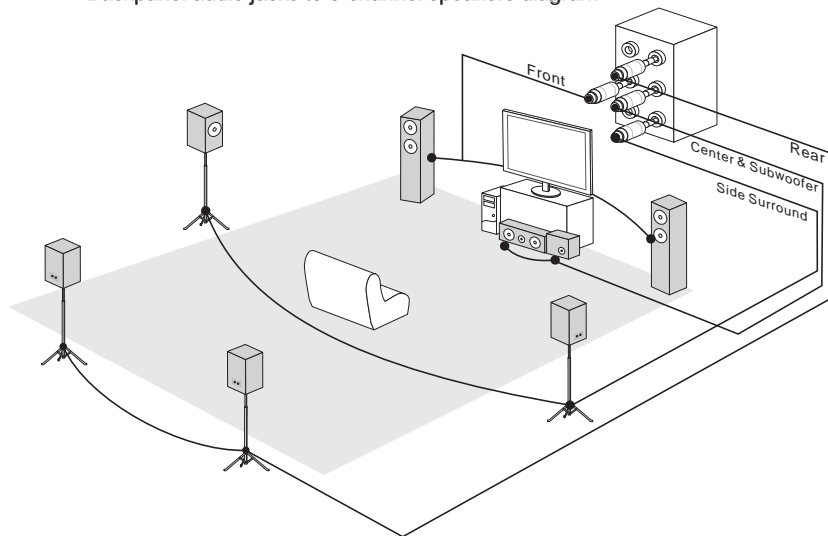




■ Backpanel audio jacks to 6-channel speakers diagram



■ Backpanel audio jacks to 8-channel speakers diagram



# Appendix B

## AMD RAID

This appendix will assist users in configuring and enabling RAID functionality.

# RAID Configuration

Creating and deleting RAID set and performing other RAID setting up operations are done in the RAID BIOS. During boot-up, a screen similar to the one below will appear for about few seconds. Press <Ctrl-F> to enter RAID Option ROM utility.

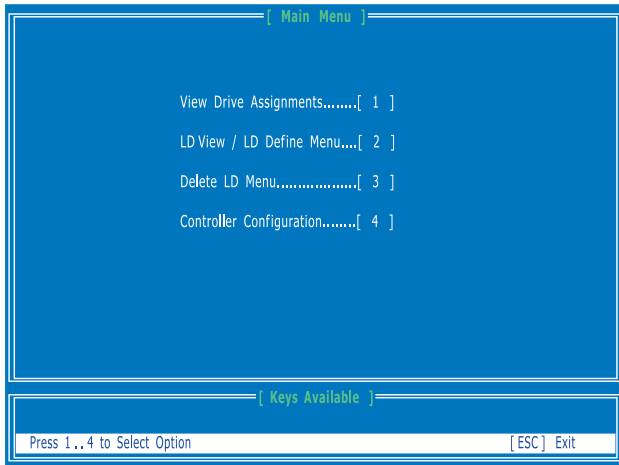
Press <Ctrl-F> to enter RAID Option ROM utility...



## ***Important***

*Be sure to enable the RAID function for SATA device in BIOS before configuring the RAID Option ROM Utility.*

The RAID Option ROM utility menu screen will appear. The Main Menu is used to choose the operation to be performed.



## View Drives Assignments

This window displays the model number, capacities and assignment of the drives physically attached to the SATA host adapter.

[ View Drives Assignments ]				
Port : ID	Drive Model	Capabilities	Capacity (GB)	Assignment
01 : 00	ST32000641AS	SATA 6G	2000.39	
	Extent 1		2000.39	<Single Disk>
02 : 00	ST32000641AS	SATA 6G	2000.39	
	Extent 1		2000.39	<Single Disk>

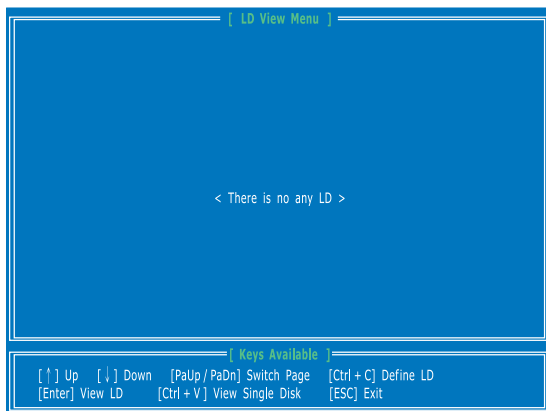
  

[ Keys Available ]							
[ ↑ ]	Up	[ ↓ ]	Down	[ PaUp / PaDn ]	Switch Page	[ Ctrl + H ]	Full Erase
[ ESC ]	Exit						

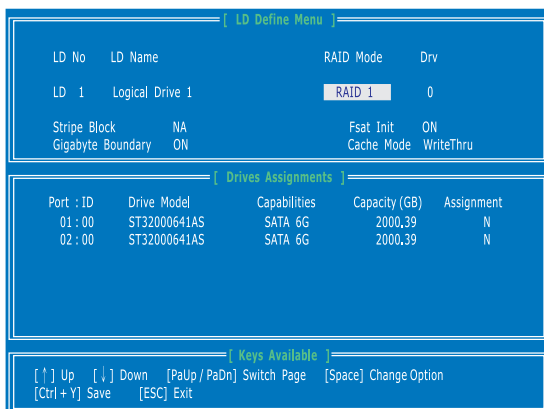
## LD View / LD Define Menu (Creating RAID)

The selection of the RAID configuration should be based upon factors including performance, data security, and the number of drives available. It is best to carefully consider the long-term role of the system and plan the data storage strategy. RAID sets can be created either automatically, or to allow the greatest flexibility, manually.

1. Press 2 on the Main Menu screen to enter the LD View Menu.

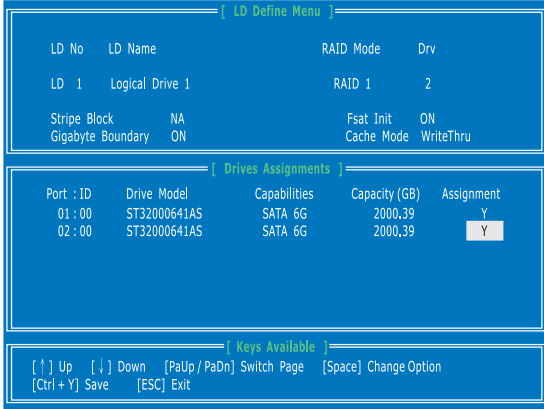


2. And then press [Ctrl + C] keys to enter the LD Define Menu. Use the space key to choose a RAID mode (RAID 0/ 1/ 10/ 5) and use the arrow key to move to the "Drives Assignments" window.

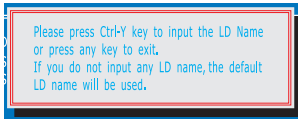


- Stripe Block Size, the default 64KB is best for most applications. RAID 0 or 10 only.
- Gigabyte Boundary, allows use of slightly smaller replacement drives.

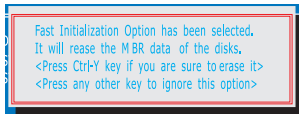
3. On the Drives Assignments window, use the arrow key to choose the hard drives which you want to make part of the LD, use the space key to change the assignment to “Y”. Then press [Ctrl+Y] to save the configuration.



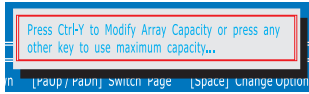
4. A message will show, press [Ctrl + Y] to input a LD name as your desire or press any key to save default LD name.



5. Another message will show, press [Ctrl-Y] if you are sure to erase the MBR data of the disk. Or press any key to ignore this option.

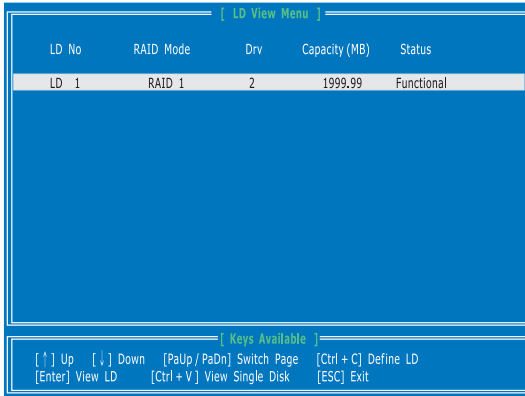


- 6. The message will show up on the bottom, press any key to use maximum capacity or press [Ctrl-Y] to modify array capacity manually.

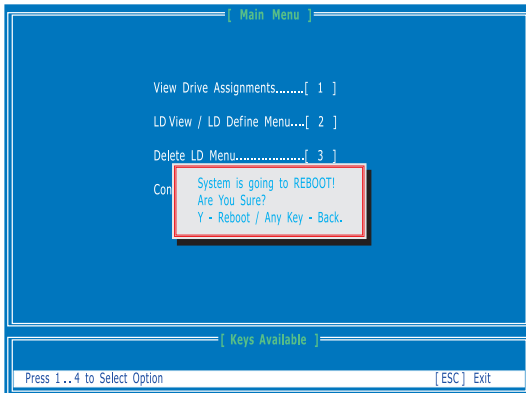


**Important**

- The default capacity is the full capacity of the selected hard drives.
  - If you allocate the first LD capacity manually, you can create second LD with remaining capacity of the selected hard drives.
7. The LD creation is done, the screen shows the LD information as below. Press ESC key to the main screen.



- 8. Press ESC key to exit the utility, a message "System is going to REBOOT! Are You Sure?" will display, answer "Y" to exit it and the system will reboot.



### Delete LD Menu (Deleting RAID)

1. Press "3" on the main to enter the Delete LD Menu.
2. Choose a LD No. you want to delete and press [Del] or [Alt+D] delete the RAID set.

LD No	RAID Mode	Drv	Capacity (MB)	Status
LD 1	RAID 1	2	1999.99	Functional

[ Keys Available ]

[↑] Up [↓] Down [PaUp/PaDn] Switch Page [Del/Alt+D] Delete LD

3. On the next screen, a message will display to inform you, press "Ctrl+Y" to delete the RAID set or other key to abort it. Press "Ctrl+Y" to complete the deletion.

LD No	LD Name	RAID Mode	Drv	Capacity (GB)
LD 1	Logical Drive 1	RAID 1	0	1999.99

Stripe Block NA Cache Mode WriteThru

Port : ID	Drive Model	Capabilities	Capacity (GB)	Assignment
01 : 00	ST32000641AS	SATA 6G	2000.39	N
02 : 00	ST32000641AS	SATA 6G	2000.39	N

Press Ctrl-Y to delete the data in the disk!  
Or press any other key to abort...



## Installing Driver

---

### ■ New Windows 7/ Windows 8/ Windows 8.1 Installation

The following details the installation of the drivers while installing operating system.

1. During the operating system installation, after selecting the location to install Windows 7/ 8/ 8.1 click on "Load Driver" button to install a third party RAID driver.
2. When prompted, insert the "AMD RAID Driver" disk (optical drive or USB) and press Enter.



### ***Important***

Please follow the instruction below to make an "AMD® RAID Driver" for yourself.

- Insert the MSI Driver Disc into the optical drive.
  - Click the "Browse CD" on the Setup screen.
  - Copy all the contents in
    - ChipSet\W7\_W8\Packages\Drivers\SBDrv\SB9xx\RAID
  - The driver diskette for AMD® RAID Controller is done.
3. You should be shown a list of available SCSI Adapters.
  4. Select the appropriate RAID controller and press ENTER.
  5. The next screen should confirm that you have selected the RAID controller. Press ENTER again to continue.
  6. You have successfully installed the RAID driver, and Windows setup should continue.
  7. Leave the disk /USB drive in the computer until the system reboots itself. Windows setup will need to copy the files after the RAID volume is formatted, and Windows setup starts copying files.

### ■ Existing Windows Driver Installation

1. Insert the MSI Driver Disc into the optical drive.
2. The Disc will auto-run and the setup screen will appear.
3. Under the Driver tab, click on AMD chipset drivers by your need. The AMD chipset drivers includes RAID Driver.
4. The drivers will be automatically installed.

### ■ Confirming Windows Driver Installation

1. From Windows, open the Control Panel from My Computer followed by the System icon.
2. Choose the Hardware tab, then click the Device Manager tab.
3. Click the "+" in front of the RAID Controllers hardware type. The driver AMD RAID Controller should appear.

# Installing OS on 2.2TB RAID

If you plan to install 64bit operating system on a RAID volume greater than 2.2TB, you can only manually create and load the RAID array in EFI shell.

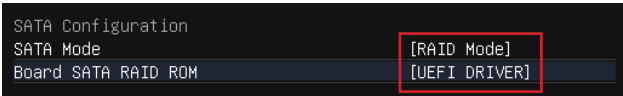


## WARNING

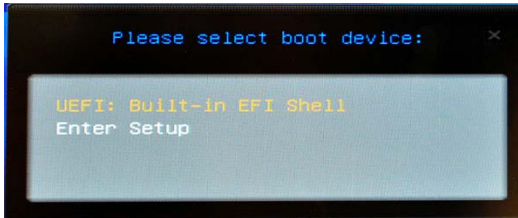
Create raid array will erase all the data stored on hard drives! Make sure to back up your files! There is no way to reverse the process!

The following describes an example of how to install Windows 7/ 8 64bit on a RAID 0 volume greater than 2.2TB.

1. Access BIOS → SETTING → Advanced → Integrated Peripherals submenu.
2. Set the "SATA Mode" option to "RAID Mode".
3. Set the "Board SATA RAID ROM" option to "UEFI DRIVER".



4. Save and then reboot. Press F11 while system booting to access boot device selecting menu.



5. Select "UEFI: Built-in EFI Shell" to access the EFI Shell environment.
6. Type "drvcfg" at the EFI shell prompt, it will show values of current configurable items.

```
Shell> drvcfg
Configurable Components
  Drv[40]  Ctrl[B2]  Lang[eng]
```

7. Refer to the value in [Drv] and [Ctrl], Type example "drvcfg -s 40 b2".

```
Shell> drvcfg -s 40 b2
```

8. The RAID ROM will be loaded.

9. Delete all logical drivers by selecting “Logical Driver Main Menu” → “Logical Driver Delete Menu”.

+ Logical Drive Main Menu

+ Logical Drive List Menu

+ Logical Drive Create Menu

+ Logical Drive Delete Menu

10. Make sure there are not any logical drivers (as shown below).

+ Logical Drive Delete Menu

- <Not Found Any Logical Drive>

11. Back to “Logical Driver Main Menu” and select “Logical Driver Create Menu”.

+ Logical Drive Main Menu

+ Logical Drive List Menu

+ Logical Drive Create Menu

+ Logical Drive Delete Menu

12. Select “Usable Physical Drive List”.

+ Logical Drive Create Menu

+ Usable Physical Drive List

+ Basic Setting

- Raid Mode : <RAID 0>

- Stripe Block (KB) : <64>

- Initialization : <Fast>

- Gigabyte Boundary : <Enable>

- Read Policy : <Read Ahead>

- Write Policy : <Write Back>

- Ld Name : -

+ Ld Size Setting

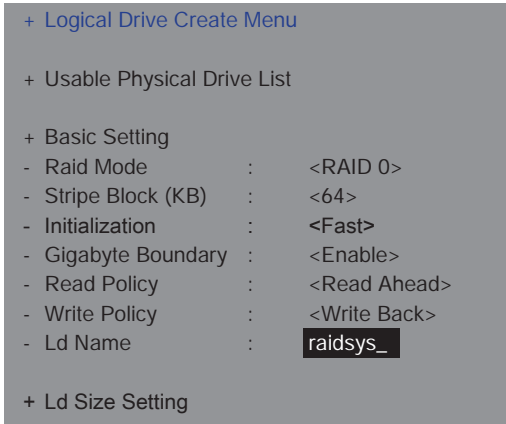
13. Choose RAID member disks by pressing arrow key and space key.

+ Logical Drive Create Menu

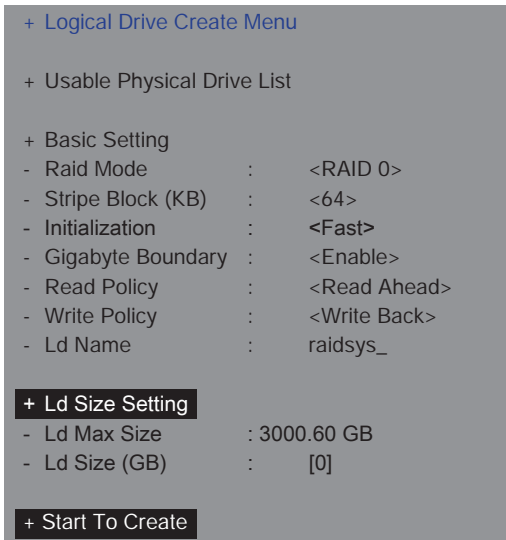
- Hxxxxxx HD12345678 | 1500.30 GB [x]

- Wxx HD34567890 | 3000.59 GB [x]

14. Back to “Logical Driver Main Menu” and fill “Ld Name”.



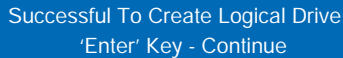
15. Select “Ld Size Setting” → “Start to Create”.



16. When prompt “Are You Sure To Create Logical Drive?” press Enter to confirm it.

Are You Sure To Create Logical Drive?  
'Enter' Key - YES / 'Esc' Key -NO

17. When prompt "Successful To Create Logical Drive" press Enter to continue.



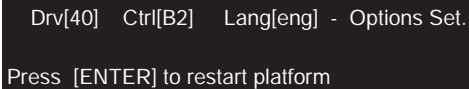
Successful To Create Logical Drive  
'Enter' Key - Continue

18. Exit RAID ROM by pressing F10. When prompt "Are you Sure To Exit" press Y.



Are You Sure To Exit? (y/n)

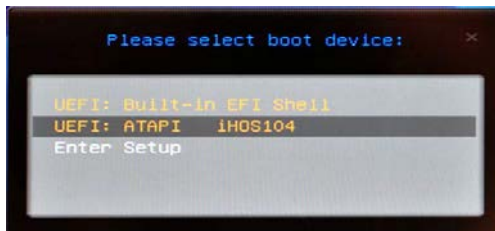
19. After exiting RAID ROM, system will prompt you to restart computer (shown as below). Insert Windows 7/ 8 64bit DVD into the DVD drive. Press Enter to reboot.



Drv[40] Ctrl[B2] Lang[eng] - Options Set.  
Press [ENTER] to restart platform

20. Press F11 while system booting to access boot device selecting menu.

21. Select DVD drive that contain Windows 7/ 8 64bit DVD. System will start the Windows 7/ 8 64bit installation by booting from the Windows 7/ 8 64bit DVD.

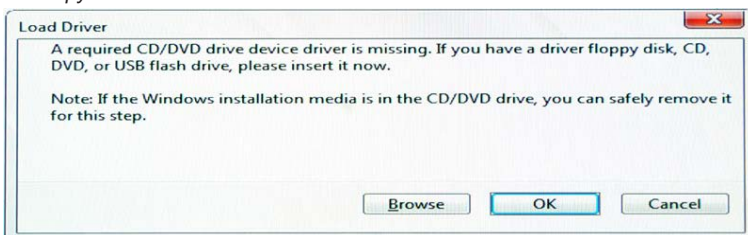


22. When require HDD driver, insert a USB flash drive that contain AMD RAID driver into a USB 2.0 port (not USB 3.0 port) and click Browse.

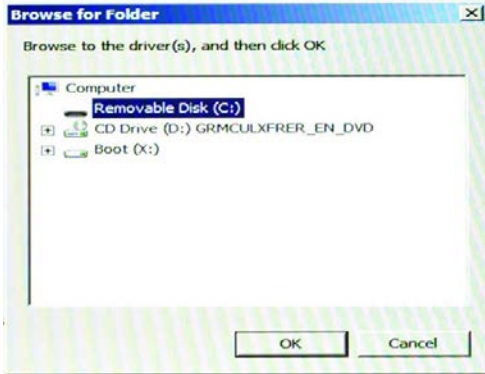


### **Important**

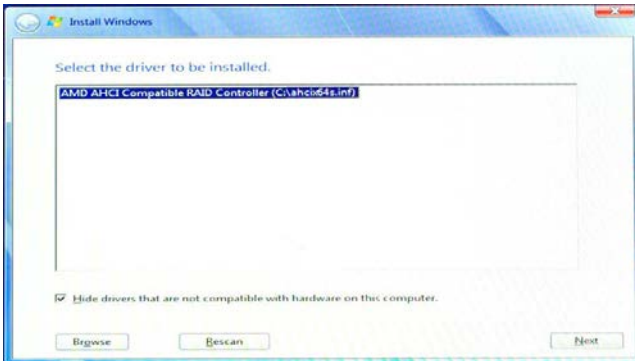
You can find the AMD RAID driver from MSI Driver Disc. The path is  
\\ChipSet\RICHLAND\_W7\_W8\Packages\Drivers\SBDrv\hseries\RAID  
Please copy all the files in the folder to a USB flash drive.



23. Select "Removable Disk" from Browse for Folder dialog then click OK.



24. Install "AMD AHCI Compatible RAID Controller".



25. Windows 7/ 8 64bit can find the RAID volume now. Please continue the installing procedure.

