# ASRock

# X79 Extreme3

## User Manual

**FC**

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"

**ASRock Website: http://www.asrock.com**

# Contents

# Chapter 1: Introduction

Thank you for purchasing ASRock **X79 Extreme3** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the Support CD.

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

## 1.1 Package Contents

ASRock **X79 Extreme3** Motherboard
    (ATX Form Factor: 12.0-in x 8.8-in, 30.5 cm x 22.4 cm)
ASRock **X79 Extreme3** Quick Installation Guide
ASRock **X79 Extreme3** Support CD
3 x Serial ATA (SATA) Data Cables (Optional)
1 x I/O Panel Shield
1 x ASRock SLI_Bridge_2S Card
1 x ASRock 3-Way SLI-2S1S Bridge Card

> ***ASRock Reminds You...***
> To get better performance in Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit, it is recommended to set the BIOS option in Storage Configuration to AHCI mode. For the BIOS setup, please refer to the "User Manual" in our support CD for details.

## 1.2 Specifications

| Platform | - ATX Form Factor: 12.0-in x 8.8-in, 30.5 cm x 22.4 cm |
|---|---|
| | - Premium Gold Capacitor design (100% Japan-made high-quality Conductive Polymer Capacitors) |
| **CPU** | - Supports Intel® Core™ i7 processor family for the LGA 2011 Socket |
| | - Digi Power Design |
| | - Advanced 5 + 1 Power Phase Design |
| | - Supports Intel® Turbo Boost 2.0 Technology |
| | - Supports Hyper-Threading Technology (see **CAUTION 1**) |
| | - Supports Untied Overclocking Technology |
| **Chipset** | - Intel® X79 |
| **Memory** | - Quad Channel DDR3 Memory Technology (see **CAUTION 2**) |
| | - 4 x DDR3 DIMM slots |
| | - Supports DDR3 2400+(OC)/2133(OC)/1866(OC)/1600/1333/1066 non-ECC, un-buffered memory |
| | - Supports DDR3 ECC, un-buffered memory with Intel® Workstation 1S Xeon® processors E5 16xx/26xx/46xx series in socket LGA 2011 |
| | - Max. capacity of system memory: 32GB (see **CAUTION 3**) |
| | - Supports Intel® Extreme Memory Profile (XMP)1.3/1.2 |
| **Expansion Slot** | - 3 x PCI Express 3.0 x16 slots (PCIE1/PCIE3: x16 mode; PCIE4: x8 mode) (see **CAUTION 4**) |
| | - 1 x PCI Express 2.0 x 1 slot |
| | - 2 x PCI slots |
| | - Supports AMD™ Quad CrossFireX™, 3-Way CrossFireX™ and CrossFireX™ |
| | - Supports NVIDIA® Quad SLI™, 3-Way SLI™ and SLI™ |
| **Audio** | - 7.1 CH HD Audio with Content Protection (Realtek ALC898 Audio Codec) |
| | - Premium Blu-ray audio support |
| **LAN** | - PCIE x1 Gigabit LAN 10/100/1000 Mb/s |
| | - Broadcom BCM57781 |
| | - Supports Wake-On-LAN |
| | - Supports Energy Efficient Ethernet 802.3az |
| | - Supports PXE |
| **Rear Panel I/O** | I/O Panel |
| | - 1 x PS/2 Mouse Port |
| | - 1 x PS/2 Keyboard Port |

| | |
|---|---|
| | - 1 x Coaxial SPDIF Out Port |
| | - 1 x Optical SPDIF Out Port |
| | - 6 x Ready-to-Use USB 2.0 Ports |
| | - 1 x eSATA3 Connector |
| | - 2 x Ready-to-Use USB 3.0 Ports |
| | - 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) |
| | - 1 x Clear CMOS Switch with LED |
| | - HD Audio Jack: Side Speaker/Rear Speaker/Central/Bass/ Line in/Front Speaker/Microphone (see **CAUTION 5**) |
| **SATA3** | - 2 x SATA3 6.0 Gb/s connectors by Intel® X79, support RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage3.0), NCQ, AHCI and "Hot Plug" functions |
| | - 1 x SATA3 6.0 Gb/s connector by ASMedia ASM1061, supports NCQ, AHCI and "Hot Plug" functions |
| **USB3.0** | - 2 x Rear USB 3.0 ports by Etron EJ168A, support USB 1.0/2.0/3.0 up to 5Gb/s |
| | - 1 x Front USB 3.0 header (supports 2 USB 3.0 ports) by Etron EJ168A, supports USB 1.0/2.0/3.0 up to 5Gb/s |
| **Connector** | - 4 x SATA2 3.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage3.0), NCQ, AHCI and Hot Plug functions |
| | - 3 x SATA3 6.0Gb/s connectors |
| | - 1 x IR header |
| | - 1 x CIR header |
| | - 1 x COM port header |
| | - 1 x HDMI_SPDIF header |
| | - 1 x Power LED header |
| | - CPU/Chassis/Power/SB FAN connector |
| | - 24 pin ATX power connector |
| | - 8 pin 12V power connector |
| | - SLI/XFire power connector |
| | - Front panel audio connector |
| | - 3 x USB 2.0 headers (support 6 USB 2.0 ports) |
| | - 1 x USB 3.0 header (supports 2 USB 3.0 ports) |
| **Smart Switch** | - 1 x Clear CMOS Switch with LED |
| **BIOS Feature** | - 64Mb AMI UEFI Legal BIOS with GUI support |
| | - Supports "Plug and Play" |
| | - ACPI 1.1 Compliance Wake Up Events |
| | - Supports jumperfree |
| | - SMBIOS 2.3.1 Support |

| | - CPU, VCCSA, DRAM, VTT, CPU PLL, PCH1.1V, PCH1.5V Voltage Multi-adjustment |
|---|---|
| **Support CD** | - Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial |
| **Unique Feature** | - ASRock Extreme Tuning Utility (AXTU) (see **CAUTION 6**)<br>- ASRock Instant Boot<br>- ASRock Instant Flash (see **CAUTION 7**)<br>- ASRock APP Charger (see **CAUTION 8**)<br>- ASRock XFast USB (see **CAUTION 9**)<br>- ASRock XFast LAN (see **CAUTION 10**)<br>- ASRock XFast Charger (see **CAUTION 11**)<br>- ASRock XFast RAM (see **CAUTION 12**)<br>- ASRock X-FAN (see **CAUTION 13**)<br>- ASRock Crashless BIOS (see **CAUTION 14**)<br>- Hybrid Booster:<br>  - CPU Frequency Stepless Control (see **CAUTION 15**)<br>  - ASRock U-COP (see **CAUTION 16**)<br>  - Boot Failure Guard (B.F.G.)<br>- Good Night LED |
| **Hardware Monitor** | - CPU Temperature Sensing<br>- Chassis Temperature Sensing<br>- CPU/Chassis/Power/SB Fan Tachometer<br>- CPU/Chassis Quiet Fan (Allows Chassis Fan Speed Auto-Adjust by CPU Temperature)<br>- CPU/Chassis/SB Fan Multi-Speed Control<br>- Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore |
| **OS** | - Microsoft® Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit compliant (see **CAUTION 17**) |
| **Certifications** | - FCC, CE, WHQL<br>- ErP/EuP Ready (ErP/EuP ready power supply is required) (see **CAUTION 18**) |

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

**WARNING**

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.

## *CAUTION!*

1. About the setting of "Hyper Threading Technology", please check page 55.
2. This motherboard supports Quad Channel Memory Technology. Before you implement Quad Channel Memory Technology, make sure to read the installation guide of memory modules on page 19 for proper installation.
3. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 7 / Vista™ / XP. For Windows® OS with 64-bit CPU, there is no such limitation. You can use ASRock XFast RAM to utilize the memory that Windows® cannot use.
4. Currently Intel® Socket 2011 Sandy Bridge-E Processor doesn't support PCIE 3.0, but this motherboard is already PCIE 3.0 hardware ready. It depends on Intel's CPU to enable PCIE 3.0. Please check Intel's website for information on future CPU updates and releases.
5. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 4-channel, 6-channel, and 8-channel modes. Please check the table on page 13 for proper connection.
6. ASRock Extreme Tuning Utility (AXTU) is an all-in-one tool to ne-tune different system functions in a user-friendly interface, which includes Hardware Monitor, Fan Control, Overclocking, OC DNA and IES. In Hardware Monitor, it shows the major readings of your system. In Fan Control, it shows the fan speed and temperature for you to adjust. In Overclocking, you are allowed to overclock CPU frequency for optimal system performance. In OC DNA, you can save your OC settings as a profile and share it with your friends. Your friends then can load the OC profile to their own system to get the same OC settings. In IES (Intelligent Energy Saver), the voltage regulator can reduce the number of output phases to improve efficiency when the CPU cores are idle without sacrificing computing performance. Please visit our website for the operation procedures of ASRock Extreme Tuning Utility (AXTU).
   ASRock website: http://www.asrock.com
7. ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press the <F6> key during the POST or the <F2> key

to enter into the BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

8.  If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPad/iPod Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply install the APP Charger driver, it makes your iPhone charge much quickly from your computer and up to 40% faster than before. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). With APP Charger driver installed, you can easily enjoy the marvelous charging experience. ASRock website: http://www.asrock.com/Feature/AppCharger/index.asp

9.  ASRock XFast USB can boost USB storage device performance. The performance may depend on the properties of the device.

10. ASRock XFast LAN provides a faster internet access, which includes the benefits listed below. LAN Application Prioritization: You can configure your application's priority ideally and/or add new programs. Lower Latency in Game: After setting online game's priority higher, it can lower the latency in games. Traffic Shaping: You can watch Youtube HD videos and download simultaneously. Real-Time Analysis of Your Data: With the status window, you can easily recognize which data streams you are transferring currently.

11. ASRock XFast Charger is the best and fastest technology to charge your mobile devices via PC. With the superb XFast Charger USB port, users are assured to enjoy the quick charging experience anytime. In addition to Apple devices, it is also capable of Charging the BC 1.1 standard smart devices. Please refer to page 33 for details.

12. ASRock XFast RAM is a new function that is included into ASRock Extreme Tuning Utility (AXTU). It fully utilizes the memory space that cannot be used under Windows® OS 32-bit CPU. ASRock XFast RAM shortens the loading time of previously visited websites, making web surfing faster than ever. And it also boosts the speed of Adobe Photoshop 5 times faster. Another advantage of ASRock XFast RAM is that it reduces the

frequency of accessing your SSDs or HDDs in order to extend their lifespan.

13. ASRock X-FAN will be automatically activated only when the system rises to a certain temperature under heavy-loading or overclocking. Normally, ASRock X-FAN will remain deactivated to give users the quietest computing experience. The target temperature and fan speed settings can be configured in the UEFI setup utility.

14. ASRock Crashless BIOS allows users to update their BIOS without fear of failing. If power loss occurs during the BIOS update process, ASRock Crashless BIOS will automatically finish the BIOS update procedure after regaining power. Please note that BIOS files need to be placed in the root directory of your USB disk. Only USB2.0 ports support this feature.

15. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause instability of the system or damage the CPU.

16. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.

17. Intel Rapid Storage Technology enterprise 3.0 and ASRock XFast RAM are not supported by Microsoft® Windows® XP / XP 64-bit.

18. EuP stands for Energy Using Product, was a provision regulated by the European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system should be under 1.00W in off mode condition. To meet EuP standards, an EuP ready motherboard and an EuP ready power supply are required. According to Intel's suggestion, the EuP ready power supply must meet the standard of 5v, and the standby power efficiency should be higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you to check with the power supply manufacturer for more details.

## 1.3 Motherboard Layout
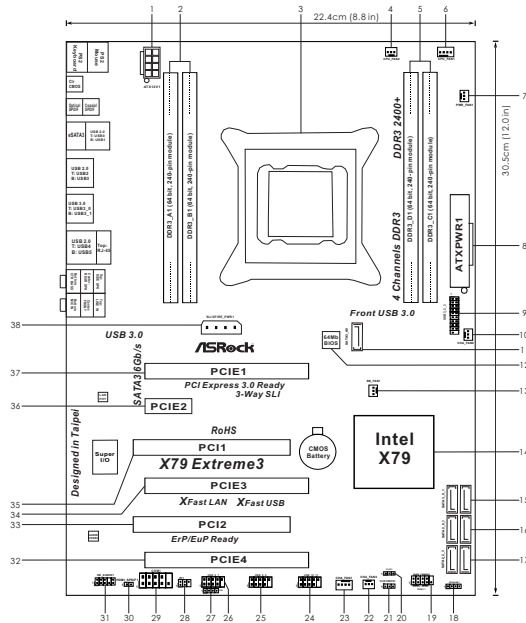


| | |
|---|---|
| 1 | ATX 12V Power Connector (ATX12V1) |
| 2 | 2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1, Black) |
| 3 | 2011-Pin CPU Socket |
| 4 | CPU Fan Connector (CPU_FAN2) |
| 5 | 2 x 240-pin DDR3 DIMM Slots (DDR3_D1, DDR3_C1, Black) |
| 6 | CPU Fan Connector (CPU_FAN1) |
| 7 | Power Fan Connector (PWR_FAN1) |
| 8 | ATX Power Connector (ATXPWR1) |
| 9 | USB 3.0 Header (USB3_2_3, Black) |
| 10 | Chassis Fan Connector (CHA_FAN2) |
| 11 | SATA3 Connector (SATA3_A0, Gray) |
| 12 | SPI Flash Memory (64Mb) |
| 13 | SB Fan Connector (SB_FAN1) |
| 14 | Intel X79 Chipset |
| 15 | SATA3 Connectors (SATA3_0_1, Gray) |
| 16 | SATA2 Connectors (SATA2_0_1, Black) |
| 17 | SATA2 Connectors (SATA2_2_3, Black) |
| 18 | Chassis Speaker Header (SPEAKER1, Black) |
| 19 | System Panel Header (PANEL1, Black) |
| 20 | Power LED Header (PLED1) |
| 21 | Clear CMOS Jumper (CLRCMOS1) |
| 22 | Chassis Fan Connector (CHA_FAN3) |
| 23 | Chassis Fan Connector (CHA_FAN1) |
| 24 | USB 2.0 Header (USB_10_11, Black) |
| 25 | USB 2.0 Header (USB_8_9, Black) |
| 26 | USB 2.0 Header (USB_6_7, Black) |
| 27 | Consumer Infrared Module Header (CIR1, Gray) |
| 28 | Infrared Module Header (IR1) |
| 29 | COM Port Header (COM1) |
| 30 | HDMI_SPDIF Header (HDMI_SPDIF1, Black) |
| 31 | Front Panel Audio Header (HD_AUDIO1, Black) |
| 32 | PCI Express 3.0 x16 Slot (PCIE4, Black) |
| 33 | PCI Slot (PCI2, Black) |
| 34 | PCI Express 3.0 x16 Slot (PCIE3, Black) |
| 35 | PCI Slot (PCI1, Black) |
| 36 | PCI Express 2.0 x1 Slot (PCIE2, Black) |
| 37 | PCI Express 3.0 x16 Slot (PCIE1, Black) |
| 38 | SLI / XFIRE Power Connector |

## 1.4 I/O Panel



| | | | |
|---|---|---|---|
| **1** | **PS/2 Mouse Port (Green)** | **10** | **Microphone (Pink)** |
| **2** | **Coaxial SPDIF Out Port** | **11** | **USB 2.0 Ports (USB45)** |
| **3** | **USB 2.0 Ports (USB01)** | **12** | **USB 3.0 Ports (USB3_0_1)** |
| **\* 4** | **LAN RJ-45 Port** | **13** | **USB 2.0 Ports (USB23)** |
| **5** | **Side Speaker (Gray)** | **\*\*\* 14** | **eSATA3 Connector** |
| **6** | **Rear Speaker (Black)** | **15** | **Optical SPDIF Out Port** |
| **7** | **Central / Bass (Orange)** | **16** | **Clear CMOS Switch (CLRCBTN)** |
| **8** | **Line In (Light Blue)** | **17** | **PS/2 Keyboard Port (Purple)** |
| **\*\* 9** | **Front Speaker (Lime)** | | |

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

### 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 |

ACT/LINK  SPEED
LED     LED



**LAN Port**

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

### TABLE for Audio Output Connection

| Audio Output Channels | Front Speaker (No. 9) | Rear Speaker (No. 6) | Central / Bass (No. 7) | Side Speaker (No. 5) |
|---|---|---|---|---|
| 2 | V | -- | -- | -- |
| 4 | V | V | -- | -- |
| 6 | V | V | V | -- |
| 8 | V | V | V | V |

13

To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find "Mixer" tool on your system. Please select "Mixer ToolBox"  , click "Enable playback multi-streaming", and click

"ok". Choose "2CH", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio.

\*\*\* eSATA3 connector supports SATA Gen3 in cable 1M.

# Chapter 2: Installation

This is an ATX form factor (12.0" x 8.8", 30.5 x 22.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

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

## 2.1  Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

> Do not over-tighten the screws!  Doing so may damage the motherboard.

## 2.2  Pre-installation Precautions

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

1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the mother-board to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

> Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply.
> Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

## 2.3 CPU Installation

For the installation of Intel 2011-Pin CPU, please follow the steps below.
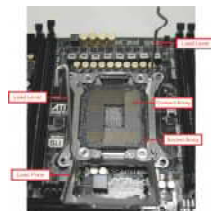


2011-Pin Socket Overview



Before you insert the 2011-Pin CPU into the socket, please check 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.

Step 1. Open the socket:

Step 1-1. Disengage the left lever by pressing it down and sliding it out of the hook.



Step 1-2. Disengage the right lever by pressing it down and sliding it out of the hook.



Step 1-3. Keep the right lever positioned at about 90 degrees in order to flip up the load plate.



Step 2. Insert the 2011-Pin CPU:

Step 2-1. Hold the CPU by the edge with the triangle mark(Pin 1) on your upper right corner.

**Pin1**

Step 2-2. Locate Pin1 and the two orientation key notches.



**orientation key notch**       **alignment key**

**Pin1**

**orientation key notch**       **alignment key**

**2011-Pin CPU**              **2011-Pin Socket**
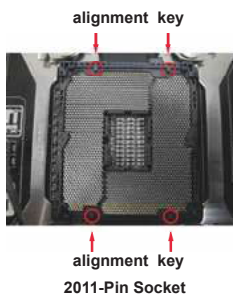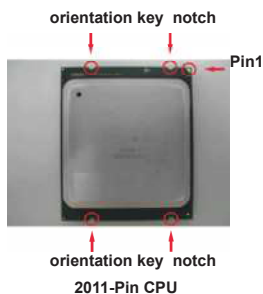
For proper inserting, please ensure to match the four orientation key notches of the CPU with the four alignment keys of the socket.

Step 2-3. Carefully place the CPU into the socket by using a purely vertical motion.

Step 2-4. Verify that the CPU is within the socket and properly mated to the orient keys.

Step 3. Close the socket:

Step 3-1. Flip the load plate onto the IHS, then the cover will automatically come off by itself.

The cover must be placed if returning the motherboard for after service.

Step 3-2. Press down the right load lever, and secure it with the load plate tab under the retention tab.

Step 3-3. Press down the left load lever, and secure it with the load plate tab under the retention tab.

## 2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with 2011-Pin socket that supports Intel 2011-Pin CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 2011-Pin CPU to dissipate heat. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU_FAN connector (CPU_FAN1, see page 12, No. 6).

**For proper installation, please kindly refer to the instruction manuals of your CPU fan and heatsink.**

Below is an example to illustrate the installation of the heatsink for 2011-Pin CPU.

Step 1.    Apply thermal interface material onto center of IHS on the socket surface.

Step 2.    Place the heatsink onto the socket. Ensure fan cables are oriented on side closest to the CPU fan connector on the motherboard (CPU_FAN1, see page 12, No. 6).

Step 3.    Align screws with the motherboard's holes.

Step 4.    Use a screw driver to install the screws.

> If you don't fasten the screws, the heatsink cannot be secured on the motherboard.

Step 5.    Connect fan header with the CPU fan connector on the motherboard.

Step 6.    Secure excess cable with tie-wrap to ensure the cable does not interfere with fan operation or contact other components.

## 2.5 Installation of Memory Modules (DIMM)

This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Quad Channel Memory Technology. For quad channel configuration, you always need to install **identical** (the same brand, speed, size and chip-type) DDR3 DIMM in the slots: You have to install **identical** DDR3 DIMM in DDR3_A1, DDR3_B1, DDR3_D1 and DDR3_C1 (Black slots; see p.12 No.2 and No. 5), so that Quad Channel Memory Technology can be activated.

> 1. If only two memory modules are installed in the DDR3 DIMM slots, then Dual Channel Memory Technology is activated. If three memory modules are installed, then Triple Channel Memory Technology is activated. If four memory modules are installed in the DDR3 DIMM slots, then Quad Channel Memory Technology is activated.
> 2. It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and DIMM may be damaged.

## Installing a DIMM

> Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

Step 1.    Unlock the DIMM slot by pressing the retaining clips outward.

Step 2.    Align the DIMM on the slot such that the notch on the DIMM matches the break on the slot.
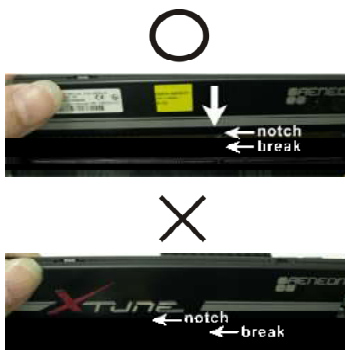


> The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot in incorrect orientation.

Step 3.    Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

## 2.6  Expansion Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 4 PCI Express slots on this motherboard.

**PCI slots:** PCI slots are used to install expansion cards that have the 32-bit PCI interface.

**PCIE slots:** PCIE1 / PCIE3 (PCIE 3.0 x16 slots) are used for PCI Express x16 lane width graphics cards, or used to install PCI Express graphics cards to support CrossFireX™ or SLI™ function.

PCIE2 (PCIE 2.0 x1 slot) is used for a PCI Express x1 lane width card, such as Gigabit LAN card or SATA2 card, etc.

PCIE4 (PCIE 3.0 x16 slot) is used to install a PCI Express graphics card to support 3-Way CrossFireX™, 3-Way SLI™ function or to install an AS-Rock Game Blaster card.

1. In single VGA card mode, it is recommended to install a PCI Express x16 graphics card on PCIE1 slot.
2. In CrossFireX™ mode or SLI™ mode, please install PCI Express x16 graphics cards on PCIE1 and PCIE3 slots. Therefore, both these two slots will work at x16 bandwidth.
3. In 3-Way CrossFireX™ or 3-Way SLI™ mode, please install PCI Express x16 graphics cards on PCIE1, PCIE3 and PCIE4 slots. Therefore, both PCIE1 and PCIE3 will work at x16 bandwidth, while PCIE4 works at x8 bandwidth.
4. Please connect a chassis fan to motherboard chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards for better thermal environment.
5. Currently Intel® Socket 2011 Sandy Bridge-E Processor doesn't support PCIE 3.0, but this motherboard is already PCIE 3.0 hardware ready. It depends on Intel's CPU to enable PCIE 3.0. Please check Intel's website for information on future CPU updates and releases.

### Installing an expansion card

Step 1.    Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2.    Remove the system unit cover (if your motherboard is already installed in a chassis).

Step 3.    Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 4.    Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5.    Fasten the card to the chassis with screws.

Step 6.    Replace the system cover.

## 2.7  SLI™, 3-Way SLI™ and Quad SLI™ Operation Guide

This motherboard supports NVIDIA® SLI™, 3-Way SLI™ and Quad SLI™ (Scalable Link Interface) technology that allows you to install up to three identical PCI Express x16 graphics cards. Currently, NVIDIA® SLI™ technology supports Windows® XP / XP 64-bit / Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS. NVIDIA® 3-Way SLI™ and Quad SLI™ technology support Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS only. Please follow the installation procedures in this section.

> **Requirements**
> 1. For SLI™ technology, you should have two identical SLI™-ready graphics cards that are NVIDIA® certified. For 3-Way SLI™ technology, you should have three identical 3-Way SLI™-ready graphics cards that are NVIDIA® certified. For Quad SLI™ technology, you should have two identical Quad SLI™-ready graphics cards that are NVIDIA® certified.
> 2. Make sure that your graphics card driver supports NVIDIA® SLI™ technology (driver version 280.41 and later). Download the driver from NVIDIA website (www.nvidia.com).
> 3. Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. It is recommended to use NVIDIA® certified PSU. Please refer to NVIDIA® website for details.

### 2.7.1  Graphics Card Setup

### 2.7.1.1  Installing Two SLI™-Ready Graphics Cards

Step 1.    Install the identical SLI™-ready graphics cards that are NVIDIA® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE1 slot and the other graphics card to PCIE3 slot. Make sure that the cards are properly seated on the slots.



Step2.    If required, connect the auxiliary power source to the PCI Express graphics cards.

Step3.   Align and insert the ASRock SLI_Bridge_2S Card to the goldfingers on each graphics card. Make sure the ASRock SLI_Bridge_2S Card is firmly in place.



**ASRock SLI_Bridge_2S Card**

Step4.   Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

## 2.7.1.2 Installing Three SLI™-Ready Graphics Cards

Step 1.   Install the identical 3-Way SLI™-ready graphics cards that are NVIDIA® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Each graphics card should have two goldfingers for the 3-Way SLI Bridge connector. Insert one graphics card into PCIE1 slot, another graphics card to PCIE3 slot, and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.



**Two Goldfingers**



Step2.   Connect the auxiliary power source to the PCI Express graphics card. Please make sure that both power connectors on the PCI Express graphics card are connected. Repeat this step on the three graphics cards.



Step3.   Align and insert ASRock 3-Way SLI-2S1S Bridge Card to the goldfingers on each graphics card. Make sure ASRock 3-Way SLI-2S1S Bridge Card is firmly in place.



**ASRock 3-Way SLI-2S1S Bridge Card**



Step4.   Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE1 slot.

### 2.7.2 Driver Installation and Setup

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

**For Windows® XP / XP 64-bit OS:**
**(For SLI™ mode only)**

A. Double-click **NVIDIA Settings icon** on your Windows® taskbar.



B. From the pop-up menu, select **Set SLI and PhysX configuration**. In **Set PhysX GPU acceleration** item, please select **Enabled**. In **Select an SLI configuration** item, please select **Enable SLI**. And click **Apply**.
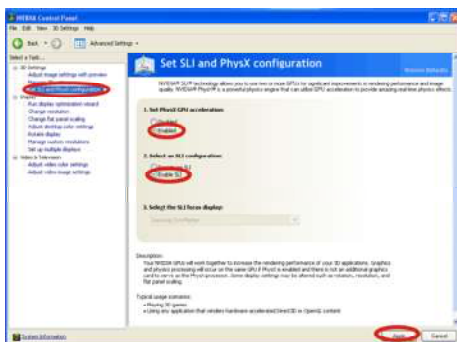


C. Reboot your system.

D. You can freely enjoy the benefit of SLI™ feature.

**For Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS:**
**(For SLI™ and Quad SLI™ mode)**

A. Click the **Start** icon on your Windows taskbar.
B. From the pop-up menu, select **All Programs**, and then click **NVIDIA Corporation**.
C. Select **NVIDIA Control Panel** tab.
D. Select **Control Panel** tab.
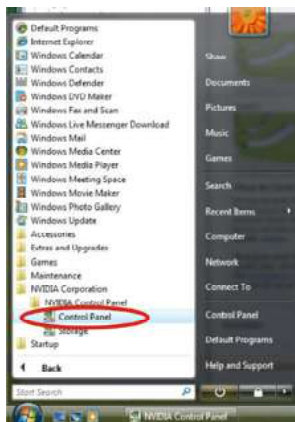


E. From the pop-up menu, select **Set SLI and PhysX configuration**. In **Set PhysX GPU acceleration** item, please select **Enabled**. In **Select an SLI configuration** item, please select **Enable SLI**. And click **Apply**.



F. Reboot your system.
G. You can freely enjoy the benefit of SLI™ or Quad SLI™ feature.

**For Windows® Vista™ / Vista™ 64-bit / 7 / 7 64-bit OS:**
**(For 3-Way SLI™ mode)**

A. Follow steps A to D on page 25.
B. From the pop-up menu, select **Set SLI and PhysX configuration**. In
   **Select a hardware acceleration setting for PhysX** item, please
   select **Enabled**. In **Select an SLI configuration** item, please select
   **Enable 3-way SLI**. And click **Apply**.
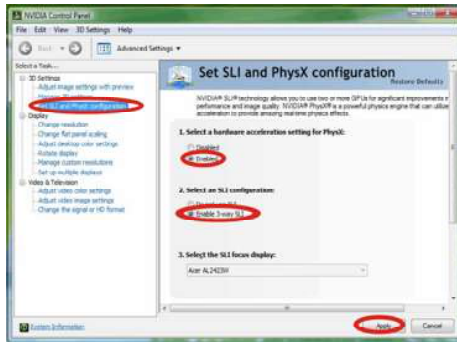


C. Reboot your system.
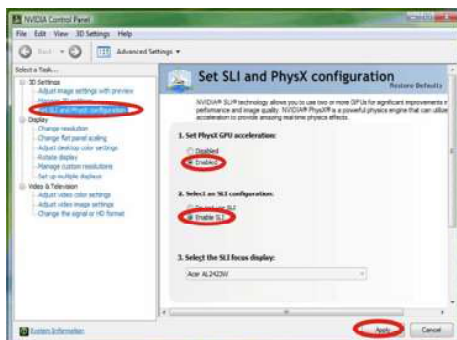D. You can freely enjoy the benefit of 3-Way SLI™ feature.

* SLI™ appearing here is a registered trademark of NVIDIA® Technologies Inc., and is used
  only for identification or explanation and to the owners' benefit, without intent to infringe.

## 2.8 CrossFireX™, 3-Way CrossFireX™ and Quad CrossFireX™ Operation Guide

This motherboard supports CrossFireX™, 3-way CrossFireX™ and Quad CrossFireX™ feature. CrossFireX™ technology offers the most advantageous means available of combining multiple high performance Graphics Processing Units (GPU) in a single PC. Combining a range of different operating modes with intelligent software design and an innovative interconnect mechanism, CrossFireX™ enables the highest possible level of performance and image quality in any 3D application. Currently CrossFireX™ feature is supported with Windows® XP with Service Pack 2 / Vista™ / 7 OS. 3-way CrossFireX™ and Quad CrossFireX™ feature are supported with Windows® Vista™ / 7 OS only. Please check AMD website for ATI™ CrossFireX™ driver updates.

> 1. If a customer incorrectly configures their system they will not see the performance benefits of CrossFireX™. All three CrossFireX™ components, a CrossFireX™ Ready graphics card, a CrossFireX™ Ready motherboard and a CrossFireX™ Edition co-processor graphics card, must be installed correctly to benefit from the CrossFireX™ multi-GPU platform.
> 2. If you pair a 12-pipe CrossFireX™ Edition card with a 16-pipe card, both cards will operate as 12-pipe cards while in CrossFireX™ mode.

### 2.8.1 Graphics Card Setup

### 2.8.1.1 Installing Two CrossFireX™-Ready Graphics Cards

> Different CrossFireX™ cards may require different methods to enable CrossFireX™ feature. In below procedures, we use Radeon HD 5770 as the example graphics card. For other CrossFireX™ cards that AMD has released or will release in the future, please refer to AMD graphics card manuals for detailed installation guide.

Step 1.    Insert one Radeon graphics card into PCIE1 slot and the other Radeon graphics card to PCIE3 slot. Make sure that the cards are properly seated on the slots.

Step 2.    Connect two Radeon graphics cards by installing CrossFire Bridge on CrossFire Bridge Interconnects on the top of Radeon graphics cards. (CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)



**CrossFire Bridge**



or



Step 3.    Connect the DVI monitor cable to the DVI connector on the Radeon graphics card on PCIE1 slot. (You may use the DVI to D-Sub adapter to convert the DVI connector to D-Sub interface, and then connect the D-Sub monitor cable to the DVI to D-Sub adapter.)

## 2.8.1.2 Installing Three CrossFireX™-Ready Graphics Cards

Step 1.    Install the identical 3-Way CrossFireX™-ready graphics cards that are AMD® certified because different types of graphics cards will not work together properly. (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE1 slot, another graphics card to PCIE3 slot, and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots.



Step 4.    Use one CrossFire™ Bridge to connect Radeon graphics cards on PCIE1 and PCIE3 slots, and use the other CrossFire™ Bridge to connect Radeon graphics cards on PCIE3 and PCIE4 slots. (CrossFire™ Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.)
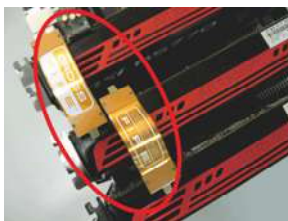


**CrossFire™ Bridge**



Step 5.    Connect the DVI monitor cable to the DVI connector on the Radeon graphics card on PCIE1 slot. (You may use the DVI to D-Sub adapter to convert the DVI connector to D-Sub interface, and then connect the D-Sub monitor cable to the DVI to D-Sub adapter.)

## 2.8.2 Driver Installation and Setup

Step 1.   Power on your computer and boot into OS.

Step 2.   Remove the AMD driver if you have any VGA driver installed in your
          system.

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

Step 3.   Install the required drivers to your system.

**For Windows® XP OS:**

A. AMD recommends Windows® XP Service Pack 2 or higher to be
   installed (If you have Windows® XP Service Pack 2 or higher installed
   in your system, there is no need to download it again):
   http://www.microsoft.com/windowsxp/sp2/default.mspx

B. You must have Microsoft .NET Framework installed prior to
   downloading and installing the CATALYST Control Center. Please
   check Microsoft website for details.

**For Windows® 7 / Vista™ OS:**

Install the CATALYST Control Center. Please check AMD website for de-
tails.

Step 4.   Restart your computer.

Step 5.   Install the VGA card drivers to your system, and restart your computer.
          Then you will find "ATI Catalyst Control Center" on your Windows® taskbar.



**ATI Catalyst Control Center**

Step 6.   Double-click "ATI Catalyst Control Center". Click "View", select "CrossFi-
          reX™", and then check the item "Enable CrossFireX™". Select "2 GPUs"
          and click "Apply" (if you install two Radeon graphics cards). Select "3
          GPUs" and click "OK" (if you install three Radeon graphics cards).

Although you have selected the option "Enable CrossFire™", the CrossFireX™ function may not work actually. Your computer will automatically reboot. After restarting your computer, please confirm whether the option "Enable CrossFire™" in "ATI Catalyst Control Center" is selected or not; if not, please select it again, and then you are able to enjoy the benefit of CrossFireX™ feature.

Step 7.   You can freely enjoy the benefit of CrossFireX™, 3-Way CrossFireX™ or Quad CrossFireX™ feature.

 * CrossFireX™ appearing here is a registered trademark of AMD Technologies Inc., and is
   used only for identification or explanation and to the owners' benefit, without intent to infringe.
 * For further information of AMD CrossFireX™ technology, please check AMD website for
   updates and details.


## 2.9  Surround Display Feature

This motherboard supports Surround Display upgrade. With the external add-on PCI Express VGA cards, you can easily enjoy the benefits of Surround Display feature. For detailed instructions, please refer to the document at the following path in the Support CD:

**..\ Surround Display Information**

## 2.10  ASRock Smart Remote Installation Guide

ASRock Smart Remote is only used for ASRock motherboard with CIR header. Please refer to below procedures for the quick installation and usage of ASRock Smart Remote.

Step1.    Find the CIR header located next to the USB 2.0 header on ASRock motherboard.

**USB 2.0 header (9-pin, black)**

**CIR header (4-pin, gray)**

Step2.    Connect the front USB cable to the USB 2.0 header (as below, pin 1-5) and the CIR header. Please make sure the wire assignments and the pin assignments are matched correctly.

USB_PWR

P-

P+

GND

DUMMY

GND

IRTX

IRRX

ATX+5VSB
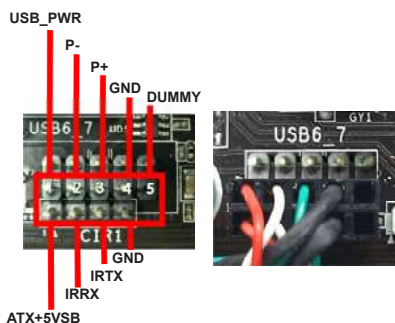
Step3.    Install Multi-Angle CIR Receiver to the front USB port. If Multi-Angle CIR Receiver cannot successfully receive the infrared signals from MCE Remote Controller, please try to install it to the other front USB port.

**3 CIR sensors in different angles**

1.    Only one of the front USB port can support CIR function. When the CIR function is enabled, the other port will remain USB function.

2.    Multi-Angle CIR Receiver is used for front USB only. Please do not use the rear USB bracket to connect it on the rear panel. Multi-Angle CIR Receiver can receive the multi-direction infrared signals (top, down and front), which is compatible with most of the chassis on the market.

3.    The Multi-Angle CIR Receiver does not support Hot-Plug function. Please install it before you boot the system.

\* ASRock Smart Remote is only supported by some of ASRock motherboards. Please refer to ASRock website for the motherboard support list: http://www.asrock.com

## 2.11 ASRock XFast Charger Operation Guide

ASRock XFast Charger is the best and fastest technology to charge your mobile devices via PC. With the superb XFast Charger USB port, users are assured to enjoy the quick charging experience anytime. In addition to Apple devices, it is also capable of Charging the BC 1.1 standard smart devices. Please refer to below instruction for proper operation.



This motherboard provides two USB ports for ASRock XFast Charger:

**1. USB 2.0 port (USB0) on the I/O panel**

**2. USB 2.0 port (USB6) header**
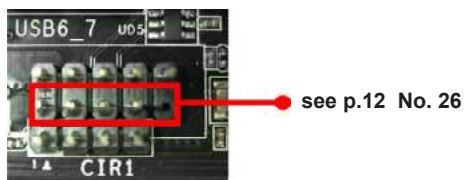
With ASRock XFast Charger feature, you can freely enjoy the quick charging convenience by installing the USB cable on these two ports.

## 2.12  Jumpers Setup

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



Short          Open
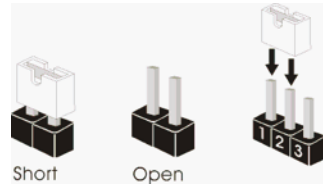
| Jumper | Setting | | Description |
|---|---|---|---|
| Clear CMOS Jumper (CLRCMOS1) (see p.12, No. 21) | 1_2 Default | 2_3 Clear CMOS | |

Note: CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile, 1394 GUID and MAC address will be cleared only if the CMOS battery is removed.

> The Clear CMOS Switch has the same function as the Clear CMOS jumper.

## 2.13  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 of the motherboard!

Serial ATA2 Connectors
(SATA2_0_1: see p.12, No. 16)
(SATA2_2_3: see p.12, No. 17)
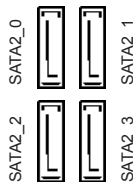
These four Serial ATA2 (SATA2) connectors support SATA data cables for internal storage devices. The current SATA2 interface allows up to 3.0 Gb/s data transfer rate.

Serial ATA3 Connectors
(SATA3_A0: see p.12, No. 11)
(SATA3_0_1: see p.12, No. 15)
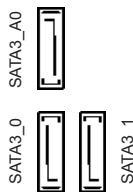
These three Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

Serial ATA (SATA)
Data Cable
(Optional)

Either end of the SATA data cable can be connected to the SATA / SATA2 / SATA3 hard disk or the SATA2 / SATA3 connector on this motherboard.

USB 2.0 Headers
(9-pin USB_6_7)
(see p.12  No. 26)
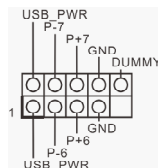
Besides six default USB 2.0 ports on the I/O panel, there are three USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

(9-pin USB_8_9)
(see p.12  No. 25)

35
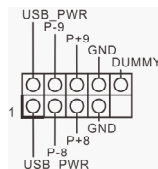
(9-pin USB_10_11)
(see p.12 No. 24)

USB_PWR
P-11
P+11
GND
DUMMY
1
GND
P+10
P-10
USB_PWR
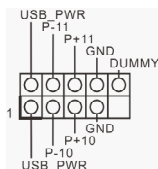
USB 3.0 Header

(19-pin USB3_2_3)

(see p.12 No. 9)

1
ID          IntA_P2_D+
IntA_P3_D-  IntA_P2_D-
IntA_P3_D+  GND
GND         IntA_P2_SSTX+
IntA_P3_SSTX+ IntA_P2_SSTX-
IntA_P3_SSTX- GND
GND         IntA_P2_SSRX+
IntA_P3_SSRX+ IntA_P2_SSRX-
IntA_P3_SSRX- Vbus
Vbus
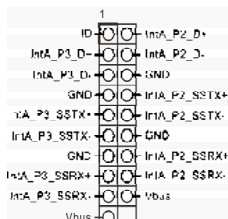
Besides two default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

Infrared Module Header

(5-pin IR1)

(see p.12 No. 28)

IRTX
+5VSB
DUMMY
1
GND
IRRX
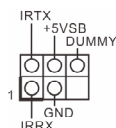
This header supports an optional wireless transmitting and receiving infrared module.

Consumer Infrared Module Header

(4-pin CIR1)

(see p.12 No. 27)

IRRX   GND
1
ATX+5VSB  IRTX
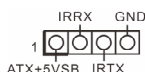
This header can be used to connect the remote controller receiver.

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p.12 No. 31)

GND
PRESENCE#
MIC_RET
OUT_RET
1
OUT2_L
J_SENSE
OUT2_R
MIC2_R
MIC2_L
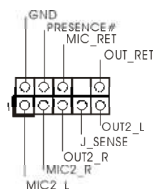
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
   A. Connect Mic_IN (MIC) to MIC2_L.
   B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
   C. Connect Ground (GND) to Ground (GND).
   D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
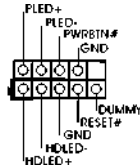
System Panel Header                    This header accommodates
(9-pin PANEL1)                         several system front panel
(see p.12  No. 19)                     functions.

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

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

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

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

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

The front panel design may differ by chassis. A front panel module mainly
consists of power switch, reset switch, power LED, hard drive activity LED,
speaker and etc. When connecting your chassis front panel module to this
header, make sure the wire assignments and the pin assign-ments are
matched correctly.
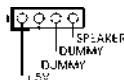
Chassis Speaker Header                 Please connect the chassis
(4-pin SPEAKER 1)                      speaker to this header.
(see p.12  No. 18)

37

Power LED Header
(3-pin PLED1)
(see p.12  No. 20)

PLED+
PLED+

Please connect the chassis power LED to this header to indicate system power status. The LED is on when the system is operating. The LED keeps blinking in S1 state. The LED is off in S3/S4 state or S5 state (power off).

Chassis, Power and SB Fan Connectors

(4-pin CHA_FAN1)
(see p.12  No. 23)

GND
+12V
CHA_FAN_SPEED
FAN_SPEED_CONTROL
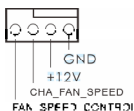
(3-pin CHA_FAN2)
(see p.12  No. 10)

GND
+12V
CHA_FAN_SPEED

(3-pin CHA_FAN3)
(see p.12  No. 22)

GND
+12V
CHA_FAN_SPEED
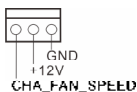
(3-pin PWR_FAN1)
(see p.12  No. 7)

GND
+12V
PWR_FAN_SPEED

(3-pin SB_FAN1)
(see p.12  No. 13)

SB_FAN_SPEED
+12V
GND

Please connect the fan cables to the fan connectors and match the black wire to the ground pin. CHA_FAN1, CHA_FAN2 and CHA_FAN3 support Fan Control. SB_FAN1 Supports Quiet Fan.

CPU Fan Connectors

(4-pin CPU_FAN1)
(see p.12  No. 6)

FAN_SPEED_CONTROL
CPU_FAN_SPEED
+12V
GND

1  2  3  4
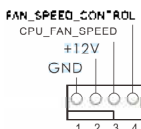
Please connect the CPU fan cable to the connector and match the black wire to the ground pin.

Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

**Pin 1-3 Connected** ←

3-Pin Fan Installation

(3-pin CPU_FAN2)
(see p.12  No. 4)

CPU_FAN_SPEED
+12V
GND
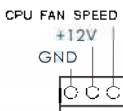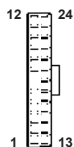
ATX Power Connector                                        Please connect an ATX power
(24-pin ATXPWR1)                                           supply to this connector.
(see p.12  No. 8)

**12** | **24**

**1** | **13**

Though this motherboard provides 24-pin ATX power connector,        **12**    **24**
it can still work if you adopt a traditional 20-pin ATX power supply.
To use the 20-pin ATX power supply, please plug your
power supply along with Pin 1 and Pin 13.
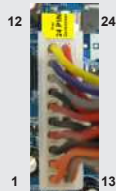
20-Pin ATX Power Supply Installation    **1**    **13**

ATX 12V Power Connector          **5**    **1**    Please connect an ATX 12V
(8-pin  ATX12V1)                 **8**    **4**    power supply to this connector.
(see p.12  No. 1)

Though this motherboard provides 8-pin ATX 12V power connector, it can still work
if you adopt a traditional 4-pin ATX 12V power supply. To use the 4-pin ATX power
supply, please plug your power supply along with Pin 1 and Pin 5.

                                                          **5**         **1**

4-Pin ATX 12V Power Supply Installation

                                                          **8**         **4**

SLI/XFIRE Power Connector                                 It is not necessary to use this
(4-pin  SLI/XFIRE_PWR1)                                   connector, but please connect it
(see p.12  No. 38)                                        with a hard disk power
                                                          connecor when two graphics
SLI/XFIRE_POWER1                                          cards are plugged to this
                                                          motherboard.
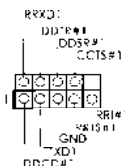
Serial port Header                RRXD:                   This COM1 header supports a
(9-pin COM1)                      DDTR#1                   serial port module.
                                  DD5R#:
(see p.12  No. 29)                CCTS#1

                                  RRI#'
                                  RRTSn I
                                  GND
                                  XD1
                                  DDCD#:

HDMI_SPDIF Header
(2-pin HDMI_SPDIF1)
(see p.12  No. 30)

HDMI_SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/ projector/LCD devices. Please connect the HDMI_SPDIF connector of HDMI VGA card to this header.

## 2.14  Smart Switches

The motherboard has a smart switch: Clear CMOS switch.

Clear CMOS Switch
(CLRCBTN)
(see p.13  No. 16)

Clear CMOS Switch is a smart switch, allowing users to quickly clear the CMOS values.

## 2.15  Serial ATA (SATA) / Serial ATA2 (SATA2) Hard Disks Installation

This motherboard adopts Intel® X79 chipset that supports Serial ATA (SATA) / Serial ATA2 (SATA2) hard disks and RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage3.0) functions. You may install SATA / SATA2 hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATA2 hard disks.

STEP 1:  Install the SATA / SATA2 hard disks into the drive bays of your chassis.

STEP 2:  Connect the SATA power cable to the SATA / SATA2 hard disk.

STEP 3:  Connect one end of the SATA data cable to the motherboard's SATA2 connector.

STEP 4:  Connect the other end of the SATA data cable to the SATA / SATA2 hard disk.


## 2.16  Serial ATA3 (SATA3) Hard Disks Installation

This motherboard adopts Intel® X79 chipset that supports Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1, RAID 5, RAID 10 and Intel Rapid Storage3.0) functions for SATA3_0 and SATA3_1 connectors. It also adopts ASMedia ASM1061 chipset that supports Serial ATA3 (SATA3) hard disks for SATA3_A0 connector. You may install SATA3 hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA3 hard disks.

STEP 1:  Install the SATA3 hard disks into the drive bays of your chassis.

STEP 2:  Connect the SATA power cable to the SATA3 hard disk.

STEP 3:  Connect one end of the SATA data cable to the motherboard's SATA3 connector.

STEP 4:  Connect the other end of the SATA data cable to the SATA3 hard disk.

> Please be noted that SATA3_A0 does not support RAID function. If you want to use RAID function on SATA3 connectors, please use SATA3_0 and SATA3_1 connectors.

## 2.17 Hot Plug and Hot Swap Functions for SATA / SATA2 HDDs

This motherboard supports Hot Plug and Hot Swap functions for SATA / SATA2 in RAID / AHCI mode. Intel® X79 chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed through a joint industry effort.

**NOTE**

**What is Hot Plug Function?**

If the SATA / SATA2 HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA / SATA2 HDDs while the system is still power-on and in working condition.
However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA / SATA2 HDD.

**What is Hot Swap Function?**

If SATA / SATA2 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SATA / SATA2 HDDs while the system is still power-on and in working condition.

## 2.18 Hot Plug and Hot Swap Functions for SATA3 HDDs

This motherboard supports Hot Plug and Hot Swap functions for SATA3 in RAID / AHCI mode. Intel® X79 and ASMedia ASM1061 chipsets provide hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed through a joint industry effort.

**NOTE**

**What is Hot Plug Function?**

If the SATA3 HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA3 HDDs while the system is still power-on and in working condition.
However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA3 HDD.

**What is Hot Swap Function?**

If SATA3 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SATA3 HDDs while the system is still power-on and in working condition.

## 2.19  SATA / SATA2 / SATA3 HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA / SATA2 / SATA3 HDD in RAID / AHCI mode. Please read below operation guide of Hot Plug feature carefully. Before you process the SATA / SATA2 / SATA3 HDD Hot Plug, please check below cable accessories from the motherboard gift box pack.

A. 7-pin SATA data cable

B. SATA power cable with SATA 15-pin power connector interface

A. SATA data cable (Red)          B. SATA  power cable
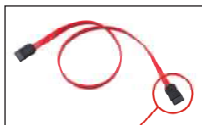


| SATA 7-pin connector | The SATA 15-pin power connector (Black) connect to SATA / SATA2 / SATA3 HDD | 1x4-pin conventional power connector (White) connect to power supply |

### Caution

1. Without SATA 15-pin power connector interface, the SATA / SATA2 / SATA3 Hot Plug cannot be processed.
2. Even some SATA / SATA2 / SATA3 HDDs provide both SATA 15-pin power connector and IDE 1x4-pin conventional power connector interfaces, the IDE 1x4-pin conventional power connector interface is definitely not able to support Hot Plug and will cause the HDD damage and data loss.

### Points of attention, before you process the Hot Plug:

1. Below operation procedure is designed only for our motherboard, which supports SATA / SATA2 / SATA3 HDD Hot Plug.
   * The SATA / SATA2 / SATA3 Hot Plug feature might not be supported by the chipset because of its limitation, the SATA / SATA2 / SATA3 Hot Plug support information of our motherboard is indicated in the product spec on our website: www.asrock.com
2. Make sure your SATA / SATA2 / SATA3 HDD can support Hot Plug function from your dealer or HDD user manual. The SATA / SATA2 / SATA3 HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA / SATA2 / SATA3 driver is installed into system properly. The latest SATA / SATA2 / SATA3 driver is available on our support website: www.asrock.com
4. Make sure to use the SATA power cable & data cable, which are from our motherboard package.
5. Please follow below instructions step by step to reduce the risk of HDD crash or data loss.

## How to Hot Plug a SATA / SATA2 / SATA3 HDD:

Points of attention, before you process the Hot Plug:

Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA / SATA2 / SATA3 HDD damage and data loss.

Step *1* Please connect SATA power cable 1x4-pin end (White) to the power supply 1x4-pin cable.
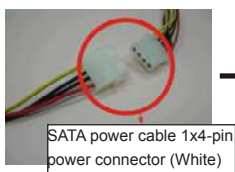
Step *2* Connect SATA data cable to the motherboard's SATA2 / SATA3 connector.



SATA power cable 1x4-pin power connector (White)

Step *3* Connect SATA 15-pin power cable connector (Black) end to SATA / SATA2 / SATA3 HDD.

Step *4* Connect SATA data cable to the SATA / SATA2 / SATA3 HDD.



## How to Hot Unplug a SATA / SATA2 / SATA3 HDD:

Points of attention, before you process the Hot Unplug:

Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA / SATA2 / SATA3 HDD damage and data loss.

Step *1* Unplug SATA data cable from SATA / SATA2 / SATA3 HDD side.



Step *2* Unplug SATA 15-pin power cable connector (Black) from SATA / SATA2 / SATA3 HDD side.

## 2.20 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

## 2.21 Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

RAID mode is not supported under Windows® XP / XP 64-bit.

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on Intel® SATA2 / SATA3 ports with RAID functions, please follow the steps below.

**STEP 1: Set up UEFI.**
A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.
B. Set the option "SATA Mode" to [RAID] for Intel® SATA2 / SATA3 ports.
   Set the option "ASMedia SATA3 Bootable" to [Yes] for ASMedia SATA3 ports.
**STEP 2: Use "RAID Installation Guide" to set RAID configuration.**
Before you start to configure the RAID function, you need to check the installation guide in the Support CD for proper configuration. Please refer to the document in the Support CD, "Guide to SATA Hard Disks Installation and RAID Configuration", which is located in the folder at the following path:
**.. \ RAID Installation Guide**
**STEP 3: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your**
             **system. The optical drive should be installed on an non Intel® SATA2**
             **/ SATA3 port (SATA3_A0).**
Insert the Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit optical disk into the optical drive to boot your system, and follow the instruction to install OS on your system. When you see "Where do you want to install Windows?" page, please insert our Support CD to your system, and click the "Load Driver" button to load Intel® RAID drivers. Intel® RAID drivers are located in the following path of our Support CD:
**32 bit: ..\i386\Win7_Vista_Intel_v3.0.0.1112**
**64-bit: ..\AMD64\Win7-64_Vista64_Intel_v3.0.0.1112**
After that, please insert Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit optical disk into the optical drive again to continue the OS installation.

After the installation of Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS, if you want to manage RAID functions, you are allowed to use both "RAID Installation Guide" and "Intel Rapid Storage Information" for RAID configuration. Please refer to the document in the Support CD, "Guide to SATA Hard Disks Installation and RAID Configuration", which is located in the folder at the following path: **.. \ RAID Installation Guide** and the document in the support CD, "Guide to Intel Rapid Storage", which is located in the folder at the following path: **.. \ Intel Rapid Storage Information**

> If you want to make the USB flash driver disk, please copy above Intel® RAID drivers from our Support CD to your USB flash, and then load drivers from the USB flash disk.

## 2.22  Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit Without RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit OS on your SATA / SATA2 / SATA3 HDDs without RAID functions, please follow below procedures according to the OS you install.

### 2.22.1  Installing Windows® XP / XP 64-bit Without RAID Functions

If you want to install Windows® XP / XP 64-bit OS on your SATA / SATA2 / SATA3 HDDs without RAID functions, please follow below steps.

> AHCI mode is not supported under Windows® XP / XP 64-bit.

**Using SATA / SATA2 / SATA3 HDDs without NCQ function**

**STEP 1: Set Up UEFI.**
A. Enter UEFI SETUP UTILITY  →  Advanced screen  →  Storage Configuration.
B. Set the option "SATA Mode" to [IDE]. (For SATA2_0 to SATA2_3, SATA3_0 and SATA3_1 ports.)
   Set the option "ASMedia SATA3 Operation Mode" to [IDE]. (For SATA3_A0 port.)
**STEP 2: Install Windows® XP / XP 64-bit OS on your system.**

## 2.22.2  Installing Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your SATA / SATA2 / SATA3 HDDs without RAID functions, please follow below steps.

**Using SATA / SATA2 / SATA3 HDDs with NCQ function**

**STEP 1: Set Up UEFI.**
A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.
B. Set the option "SATA Mode" to [AHCI]. (For SATA2_0 to SATA2_3, SATA3_0 and SATA3_1 ports.)

Set the option "ASMedia SATA3 Operation Mode" to [AHCI]. (For SATA3_A0 port.)
**STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.**

**Using SATA / SATA2 / SATA3 HDDs without NCQ function**

**STEP 1: Set Up UEFI.**
A. Enter UEFI SETUP UTILITY → Advanced screen → Storage Configuration.
B. Set the option "SATA Mode" to [IDE]. (For SATA2_0 to SATA2_3, SATA3_0 and SATA3_1 ports.)

Set the option "ASMedia SATA3 Operation Mode" to [IDE]. (For SATA3_A0 port.)
**STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.**

## 2.23  Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE buses. Before you enable Untied Overclocking function, please enter "Overclock Mode" option of UEFI setup to set the selection from [Auto] to [Manual]. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE buses are in the fixed mode so that FSB can operate under a more stable overclocking environment.

> Please refer to the warning on page 9 for the possible overclocking risk before you apply Untied Overclocking Technology.

# Chapter 3: UEFI SETUP UTILITY

## 3.1  Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, 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.

### 3.1.1  UEFI Menu Bar

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

| | |
|---|---|
| **Main** | To set up the system time/date information |
| **OC Tweaker** | To set up overclocking features |
| **Advanced** | To set up the advanced UEFI features |
| **H/W Monitor** | To display current hardware status |
| **Boot** | To set up the default system device to locate and load the Operating System |
| **Security** | To set up the security features |
| **Exit** | To exit the current screen or the UEFI SETUP UTILITY |

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

### 3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

| Navigation Key(s) | Function Description |
| --- | --- |
| ← / → | Moves cursor left or right to select Screens |
| ↑ / ↓ | Moves cursor up or down to select items |
| + / - | To change option for the selected items |
| <Enter> | To bring up the selected screen |
| <F1> | To display the General Help Screen |
| <F9> | To load optimal default values for all the settings |
| <F10> | To save changes and exit the UEFI SETUP UTILITY |
| <ESC> | To jump to the Exit Screen or exit the current screen |

### 3.2 Main Screen

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



**System Browser**

System Browser can let you easily check your current system configuration in UEFI setup.

## 3.3 OC Tweaker Screen

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



**Load CPU EZ OC Setting**

You can use this option to load CPU EZ overclocking settings. Please note that overclocking may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

**CPU Control**

**CPU Ratio Setting**

Use this item to change the ratio value of this motherboard.

**Internal PLL Overvoltage**

Use this item to enable/disable CPU Internal PLL Overvoltage Function.

**OS Real-Time Adjust CPU Ratio**

Use this item to enable/disable Real-Time Adjust CPU Ratio in OS level.

**Intel SpeedStep Technology**

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® Vista™ / 7 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

**Intel Turbo Mode Technology**

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

**Turbo Boost Power Limit**

Use this item to adjust Turbo Boost power limit. Configuration options: [Auto] and [Manual]. The default value is [Auto].

**Core Current Limit**

Use this item to add voltage when CPU is in Turbo mode.

**Additional Turbo Voltage**

Use this item to add voltage when CPU is in Turbo mode.

**Active Processor Cores**

Use this item to select the number of cores to enable in each processor package. The default value is [All].

**Host Clock Override (BCLK)**

Use this to adjust the host clock (BCLK) frequency. The default value is [100MHz].

**DRAM Timing Control**

**Load XMP Setting**

Use this to load XMP setting. Configuration options: [Auto], [Default], [Profile 1] and [Profile 2]. The default value is [Auto].

**DRAM Frequency**

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

**DRAM Timing Control**



**DRAM tCL**

Use this item to change CAS# Latency (tCL) Auto/Manual setting. The default is [Auto].

**DRAM tRCD**

Use this item to change RAS# to CAS# Delay (tRCD) Auto/Manual setting.

The default is [Auto].

**DRAM tRP**

Use this item to change Row Precharge Time (tRP) Auto/Manual setting.
The default is [Auto].

**DRAM tRAS**

Use this item to change RAS# Active Time (tRAS) Auto/Manual setting.
The default is [Auto].

**DRAM tRFC**

Use this item to change Refresh Cyle Time (tRFC) Auto/Manual setting.
The default is [Auto].

**DRAM tWR**

Use this item to change Write Recovery Time (tWR) Auto/Manual setting.
The default is [Auto].

**DRAM tWTR**

Use this item to change Write to Read Delay (tWTR) Auto/Manual setting.
The default is [Auto].

**DRAM tRRD**

Use this item to change RAS to RAS Delay (tRRD) Auto/Manual setting.
The default is [Auto].

**DRAM tRTP**

Use this item to change Read to Precharge (tRTP) Auto/Manual setting.
The default is [Auto].

**DRAM tFAW**

Use this item to change Four Activate Window (tFAW) Auto/Manual set-
ting. The default is [Auto].

**DRAM tCWL**

Use this item to change CAS# Write Latency (tCWL) Auto/Manual setting.
The default is [Auto].

**Command Rate (CR)**

Use this item to change Command Rate (CR) Auto/Manual setting. The
default is [Auto].

**DRAM Power Down Mode**

Use this item to adjust DDR power down mode. Configuration options:
[Auto], [Slow] and [Fast]. The default value is [Fast].

**ODT WR (CH A)**

Use this item to change ODT WR (CH A) setting. The default is [Auto].

**ODT NOM (CH A)**

Use this item to change ODT NOM (CH A) setting. The default is [Auto].

**ODT WR (CH B)**

Use this item to change ODT WR (CH B) setting. The default is [Auto].

**ODT NOM (CH B)**

Use this item to change ODT NOM (CH B) setting. The default is [Auto].

**ODT WR (CH C)**

Use this item to change ODT WR (CH C) setting. The default is [Auto].

**ODT NOM (CH C)**

Use this item to change ODT NOM (CH C) setting. The default is [Auto].

**ODT WR (CH D)**

Use this item to change ODT WR (CH D) setting. The default is [Auto].

**ODT NOM (CH D)**

Use this item to change ODT NOM (CH D) setting. The default is [Auto].

**Voltage Control**

**CPU Core Voltage**

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

**CPU Load-Line Calibration**

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

**VCCSA Voltage**

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

**DRAM Voltage**

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

**VTT Voltage**

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

**CPU PLL Voltage**

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

**PCH 1.1V Voltage**

Use this to select PCH 1.1V Voltage. The default value is [Auto].

**PCH 1.5V Voltage**

Use this to select PCH 1.5V Voltage. The default value is [Auto].

**Load Power Saving Mode**

Use this option to load Power Saving Mode settings.

**User Defaults**

In this option, you are allowed to load and save three user defaults according to your own requirements.

### 3.4 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, North Bridge Configuration, South Bridge Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration, USB Configuration and ME Subsystem.



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

**Instant Flash**

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

### 3.4.1 CPU Configuration



**CPU Ratio Setting**

Use this item to change the ratio value of this motherboard.

**Intel Hyper Threading Technology**

To enable this feature, a computer system with an Intel processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP / Vista™ / 7 is required. Set to [Enabled] if using Microsoft® Windows® XP, Vista™, 7, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

**Active Processor Cores**

Use this item to select the number of cores to enable in each processor package. The default value is [All].

**No-Execute Memory Protection**

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with "No Execute (NX) Memory Protection" can prevent data pages from being used by malicious software to execute codes. This option will be hidden if the current CPU does not support No-Excute Memory Protection.

**Hardware Prefetcher**

Use this item to turn on/off the MLC streamer prefetcher.

**Adjacent Cache Line Prefetch**

Use this item to turn on/off prefetching of adjacent cache lines.

**Intel Virtualization Technology**

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

**CPU Power Management Configuration**
**Intel SpeedStep Technology**

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® Vista™ / 7 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

**Intel Turbo Mode Technology**

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

**CPU Thermal Throttling**

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

**Enhance Halt State (C1E)**

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

**CPU C3 State Support**

Use this to enable or disable CPU C3 (ACPI C2) report to OS.

**CPU C6 State Support**

Use this to enable or disable CPU C6 (ACPI C3) report to OS.

**Package C State Support**

Selected option will program into C State package limit register. The default value is [Disabled].

**Internal PLL Overvoltage**

Use this item to enable/disable CPU Internal PLL Overvoltage Function.

**OS Real-Time Adjust CPU Ratio**

Use this item to enable/disable Real-Time Adjust CPU Ratio in OS level.

**Turbo Boost Power Limit**

Use this item to adjust Turbo Boost power limit. Configuration options: [Auto] and [Manual]. The default value is [Auto].

**Core Current Limit**

Use this item to add voltage when CPU is in Turbo mode.

### 3.4.2 North Bridge Configuration



**Primary Graphics Adapter**

This allows you to select [PCI] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI Express].

**PCIE 1 Link Speed**

This allows you to select PCIE 1 Link Speed. The default value is [GEN2].

**PCIE 3 Link Speed**

This allows you to select PCIE 3 Link Speed. The default value is [GEN2].

**PCIE 4 Link Speed**

This allows you to select PCIE 4 Link Speed. The default value is [GEN2].

**PCIE 4 Link Width**

This allows you to select PCIE 4 Link Width. The default value is [x8].

**Intel(R) VT for Directed I/O Configuration**
**Intel(R) VT-d**

Use this item to enable/disable Intel(R) Virtualization Technology for Directed I/O.

### 3.4.3 South Bridge Configuration



**Restore on AC/Power Loss**

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers.

**Deep Sx**

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. Configuration options: [Disabled], [Enabled in S5] and [Enabled in S4 and S5]. The default value is [Disabled].

**Onboard LAN 1**

This allows you to enable or disable the "Onboard LAN" feature.

**Onboard HD Audio**

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

**Front Panel**

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

**ACPI HPET Table**

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® Vista™ certification.

**Good Night LED**

Use this item to enable or disable Power LED and Lan LED.

### 3.4.4  Storage Configuration



**SATA Mode**

This item is for SATA3_0, SATA3_1 and SATA2_0 to SATA2_3 ports. Use this to select SATA mode. Configuration options: [IDE Mode], [AHCI Mode], [RAID Mode] and [Disabled]. The default value is [AHCI Mode].

AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

**Aggressive Link Power Management**

Use this item to configure Aggressive Link Power Management.

**ASMedia SATA3 Operation Mode**

This item is for SATA3_A0 port. Use this to select ASMedia SATA3 operation mode. Configuration options: [IDE Mode], [AHCI Mode] and [Disabled]. The default value is [AHCI Mode].

**ASMedia SATA3 Bootable**

Use this to enable or disable Onboard ASMedia SATA3 Option ROM. If Option ROM is disabled, UEFI cannot use the SATA device to connect to ASMedia SATA3 controller as Boot Device.

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

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

We recommend to use Intel® X79 SATA ports (SATA3_0, SATA3_1 and SATA2_0 to SATA2_3) for your bootable devices. This will minimum your boot time and get the best performance. But if you still want to boot from ASMedia SATA3 controller, you can still enable this in UEFI.

### 3.4.5 Super IO Configuration



**Serial Port**

Use this item to enable or disable the onboard serial port.

**Serial Port Address**

Use this item to set the address for the onboard serial port. Configuration options: [3F8h / IRQ4] and [3E8h / IRQ4].

**Infrared Port**

Use this item to enable or disable the onboard infrared port.

### 3.4.6 ACPI Configuration



**Suspend to RAM**

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

**Check Ready Bit**

Use this item to enable or disable the feature Check Ready Bit.

**PS/2 Keyboard Power On**

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

**PCI Devices Power On**

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

**Ring-In Power On**

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

**RTC Alarm Power On**

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

**USB Keyboard/Remote Power On**

Use this item to enable or disable USB Keyboard/Remote to turn on the system from the power-soft-off mode.

**USB Mouse Power On**

Use this item to enable or disable USB Mouse to turn on the system from the power-soft-off mode.

### 3.4.7 USB Configuration



**USB 2.0 Controller**

Use this item to enable or disable the use of USB 2.0 controller.

**USB 3.0 Controller**

Use this item to enable or disable the use of USB 3.0 controller.

**Legacy USB Support**

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [UEFI Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

[Auto] - Enables legacy support if USB devices are connected.

[Disabled] - USB devices are not allowed to use under legacy OS and UEFI setup when [Disabled] is selected. If you have USB compatibility issues, it is recommended to select [Disabled] to enter OS.

[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

**Legacy USB 3.0 Support**

Use this option to enable or disable legacy support for USB 3.0 devices. The default value is [Enabled].

### 3.4.8 ME Subsystem
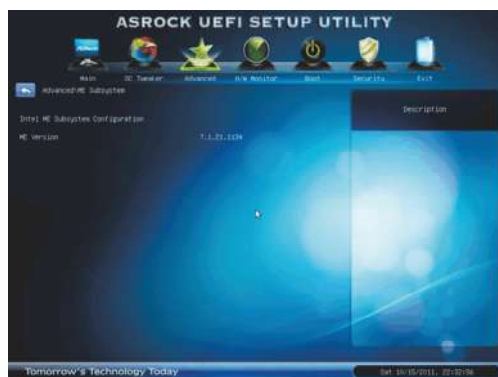


**Intel ME Subsystem Configuration**
**ME Version**

### 3.5 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



**CPU Fan 1 & 2 Setting**

> This allows you to set CPU fan 1 & 2's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

**Chassis Fan 1 Setting**

> This allows you to set chassis fan 1's speed. Configuration options: [Full On], [Automatic Mode] and [Manual]. The default value is [Full On].

**Chassis Fan 2 Setting**

> This allows you to set chassis fan 2's speed. Configuration options: [Level 1] to [Level 4]. The default value is [Level 4].

**Chassis Fan 3 Setting**

> This allows you to set chassis fan 3's speed. Configuration options: [Level 1] to [Level 4]. The default value is [Level 4].

**SB Fan 1 Setting**

> This allows you to set SB fan 1's speed. Configuration options: [Full On] and [Automatic mode]. The default value is [Automatic mode].

> **Target SB Temperature**

>> This allows you to set the target temperature to activate ASRock X-FAN. The default value is [50°C/122°F].

> **Target Fan Speed**

>> This allows you to set target fan's speed. The default value is [Level 1] (ASRock X-FAN deactivated).

**Over Temperature Protection**

> Use this to enable or disable Over Temperature Protection. The default value is [Enabled].

## 3.6  Boot Screen

In this section, it will display the available devices on your system for you to config-
ure the boot settings and the boot priority.



**Setup Prompt Timeout**

This shows the number of seconds to wait for setup activation key.
65535(0XFFFF) means indefinite waiting.

**Bootup Num-Lock**

If this item is set to [On], it will automatically activate the Numeric Lock
function after boot-up.

**PCI ROM Priority**

Use this item to adjust PCI ROM Priority. The default value is [Legacy
ROM].

**Full Screen Logo**

Use this item to enable or disable OEM Logo. The default value is
[Enabled].

**AddOn ROM Display**

Use this option to adjust AddOn ROM Display. If you enable the option
"Full Screen Logo" but you want to see the AddOn ROM information
when the system boots, please select [Enabled]. Configuration options:
[Enabled] and [Disabled]. The default value is [Enabled].

**Boot From Onboard LAN**

Use this item to enable or disable the Boot From Onboard LAN feature.

**Boot Failure Guard**

Enable or disable the feature of Boot Failure Guard.

**Boot Failure Guard Count**

Enable or disable the feature of Boot Failure Guard Count.

## 3.7  Security Screen

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

## 3.8 Exit Screen



**Save Changes and Exit**

When you select this option, the following message "Save configuration changes and exit setup?" will pop-out. Select [Yes] to save the 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 [Yes] 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 [Yes] to discard all changes.

**Load UEFI Defaults**

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

**Launch EFI Shell from filesystem device**

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.

# Chapter 4: Software Support

### 4.1  Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 7 / 7 64-bit / Vista™ / Vista™ 64-bit / XP / XP 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

### 4.2  Support CD Information

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

#### 4.2.1  Running The Support CD

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

#### 4.2.2  Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

#### 4.2.3  Utilities Menu

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

#### 4.2.4  Contact Information

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information.

## Installing OS on a HDD Larger Than 2TB in AHCI Mode

This motherboard adopts UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow the procedures below to install the operating system.

1. Please make sure to use **Windows® Vista™ 64-bit (with SP1 or above)** or **Windows® 7 64-bit**.
2. Press <F2> or <Delete> at system POST. Set **AHCI Mode** in UEFI Setup Utility > Advanced > Storage Configuration > SATA Mode.
3. Choose the item **"UEFI:xxx"** to boot in UEFI Setup Utility > Boot > Boot Option #1. ("xxx" is the device which contains your Windows® installation files. Normally it is an optical drive.) You can also press <F11> to launch boot menu at system POST and choose the item **"UEFI:xxx"** to boot.
4. Start Windows® installation.

## Installing OS on a HDD Larger Than 2TB in RAID Mode

This motherboard adopts UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow the procedures below to install the operating system.

1. Please make sure to use **Windows® Vista™ 64-bit (with SP1 or above)** or **Windows® 7 64-bit**.
2. Copy Intel® RAID drivers into a USB flash disk. You can download the driver from ASRock's website and unzip the file into a USB flash disk **OR** copy the file from ASRock motherboard support CD. (please copy the files under following directory:
   **32 bit: ..\i386\Win7_Vista_Intel_v3.0.0.1112**
   **64-bit: ..\AMD64\Win7-64_Vista64_Intel_v3.0.0.1112**
3. Create RAID array for you system. Please refer to "Intel RAID Installation Guide" file for details.
4. Install Windows® Vista™ 64-bit / 7 64-bit:
   A. Insert your Windows® Vista™ 64-bit / 7 64-bit installation disc to the optical drive.
   B. Press <F11> to launch boot menu at system POST and choose the item "UEFI:xxx" to boot.
   C. Start Windows® Installation. When you see "Where do you want to install Windows?" page, please click "Load Driver".



   D. Plug the USB flash disk into your USB port; select "Browse" to find the RAID driver. Then choose the directory (xx\AMD64\) you have copied in the first step.
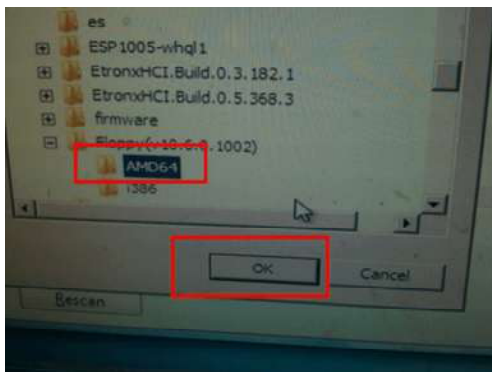
E. Please keep the USB flash disk installed until the system's first reboot.

F. Continue to install OS by following the Windows® instructions.

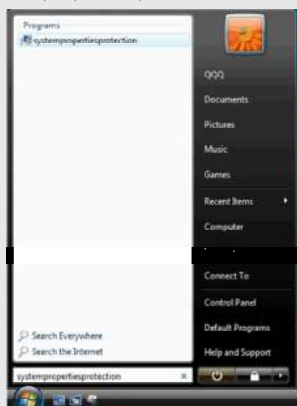5. Follow Windows® Installation Guide to install OS.

> If you install Windows® 7 64-bit / Vista™ 64-bit on a large hard disk (ex. Disk volume > 2TB), it may take more time to boot into Windows® or install driver/utilities. If you encounter this problem, you will need to follow the instructions below to fix this problem.
>
> **Windows® Vista™ 64-bit:**
> Microsoft® does not provide hotfix for this problem. The steps listed below are Microsoft®'s suggested solution:
>
> A. Disable System Restore.
>
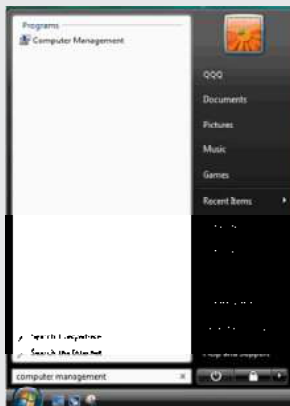>   a. Type "systempropertiesprotection" in the Start Menu. Then press "Enter".
>
>   
>
>   b. De-select Local Disks for System Restore. Then Click "Turn System Restore Off" to confirm. Then Press "Ok".
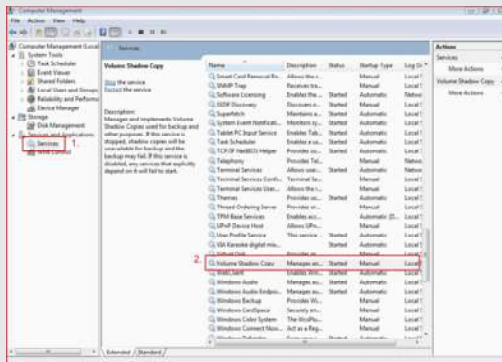
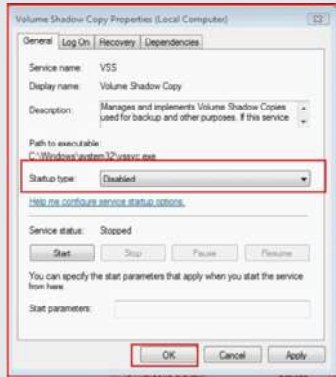B. Disable "Volume Shadow Copy" service.

  a. Type "computer management" in the Start Menu, then press "Enter".



  b. Go to "Services and Applications>Services"; Then double click "Volume Shadow Copy".

c. Set "Startup type" to "Disable" then Click "OK".



C. Reboot your system.

D. After reboot, please start to install motherboard drivers and utilities.

**Windows® 7 64-bit:**

A. Please request the hotfix KB2505454 through this link:
   http://support.microsoft.com/kb/2505454/

B. After installing Windows® 7 64-bit, install the hotfix kb2505454.
   (This may take a long time; >30 mins.)

C. Reboot your system. (It may take about 5 minutes to reboot.)

D. Windows® will install this hotfix then reboot by itself.

E. Please start to install motherboard drivers and utilities.

6. Finish.