ASRock

Z68M-ITX/HT

User Manual

Contents

Chapter 1: Introduction

Thank you for purchasing ASRock *Z68M-ITX/HT* motherboard, a reliable mother-board 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 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the con guration guide to BIOS setup and information of the Support CD.

> Because the motherboard speci cations and the BIOS software might be updated, the content of this manual will be subject to change without no-tice. In case any modi cations of this manual occur, the updated version will be available on ASRock website without further notice. You may nd 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 speci c information about the model you are using. www.asrock.com/support/index.asp

1.1 Package Contents

ASRock *Z68M-ITX/HT* Motherboard
    (Mini-ITX Form Factor: 6.7-in x 6.7-in, 17.0 cm x 17.0 cm)
ASRock *Z68M-ITX/HT* Quick Installation Guide
ASRock *Z68M-ITX/HT* Support CD
2 x Serial ATA (SATA) Data Cables (Optional)
1 x 3.5mm Audio Cable (Optional)
1 x I/O Panel Shield
1 x CIR Remote Receiver (Optional)
1 x MCE Remote Controller (Optional)

> ### *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 Con guration to AHCI mode. For the BIOS setup, please refer to the "User Manual" in our support CD for details.

1.2   Specifications

Platform	- Mini-ITX Form Factor: 6.7-in x 6.7-in, 17.0 cm x 17.0 cm - All Solid Capacitor design (100% Japan-made high-quality Conductive Polymer Capacitors)
CPU	- Supports 2nd Generation Intel® Core™ i7 / i5 / i3 in LGA1155 Package - Supports Intel® Turbo Boost 2.0 Technology - Supports K-Series unlocked CPU - Supports Hyper-Threading Technology (see **CAUTION 1**)
Chipset	- Intel® Z68
Memory	- Dual Channel DDR3 Memory Technology (see **CAUTION 2**) - 2 x DDR3 DIMM slots - Supports DDR3 2133(OC)/1866(OC)/1600/1333/1066 non-ECC, un-buffered memory - Max. capacity of system memory: 16GB (see **CAUTION 3**) - Supports Intel® Extreme Memory Pro le (XMP)
Expansion Slot	- 1 x PCI Express 2.0 x16 slot (blue @ x16 mode)

Graphics	- Supports Intel® HD Graphics Built-in Visuals: Intel® Quick
	  Sync Video, Intel® InTru™ 3D, Intel® Clear Video HD
	  Technology, Intel® HD Graphics 2000/3000, Intel® Advanced
	  Vector Extensions (AVX)
	- Pixel Shader 4.1, DirectX 11 with Intel® Ivy Bridge CPU,
	  DirectX 10.1 with Intel® Sandy Bridge CPU
	- Max. shared memory 1759MB (see **CAUTION 4**)
	- Three VGA Output options: D-Sub, DVI-D and HDMI
	  (see **CAUTION 5**)
	- Supports HDMI 1.4a Technology with max. resolution up to
	  1920x1200 @ 60Hz
	- Supports DVI with max. resolution up to 1920x1200 @ 60Hz
	- Supports D-Sub with max. resolution up to 2048x1536 @
	  75Hz
	- Supports Auto Lip Sync, xvYCC and HBR (High Bit Rate
	  Audio) with HDMI (Compliant HDMI monitor is required)
	  (see **CAUTION 6**)
	- Supports HDCP function with DVI and HDMI ports
	- Supports Full HD 1080p Blu-ray (BD) / HD-DVD playback
	  with DVI and HDMI ports

Audio	- 7.1 CH HD Audio with Content Protection (Realtek ALC892 Audio Codec) - Premium Blu-ray audio support

	- Supports THX TruStudio™
LAN	- PCIE x1 Gigabit LAN 10/100/1000 Mb/s
	- Realtek RTL8111E
	- Supports Wake-On-LAN
	- Supports LAN Cable Detection
	- Supports Energy Ef cient Ethernet 802.3az
	- Supports PXE
Rear Panel I/O	I/O Panel
	- 1 x PS/2 Keyboard Port
	- 1 x D-Sub Port
	- 1 x DVI-D Port
	- 1 x HDMI Port
	- 1 x Optical SPDIF Out Port
	- 4 x Ready-to-Use USB 2.0 Ports
	- 1 x eSATA2 Connector
	- 2 x Ready-to-Use USB 3.0 Ports
	- 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED)
	- HD Audio Jack: Rear Speaker/Central/Bass/Line in/Front Speaker/Microphone (see **CAUTION 7**)
SATA3	- 2 x SATA3 6.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 10, RAID 5, Intel Rapid Storage and Intel Smart Response Technology), NCQ, AHCI and Hot Plug functions
USB 3.0	- 2 x USB 3.0 ports by ASMedia ASM1042, support USB 1.0/2.0/3.0 up to 5Gb/s
Connector	- 2 x SATA2 3.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 10, RAID 5, Intel Rapid Storage and Intel Smart Response Technology), NCQ, AHCI and Hot Plug functions
	- 2 x SATA3 6.0 Gb/s connectors
	- 1 x CIR header
	- 1 x Power LED header
	- CPU/Chassis FAN connector
	- 24 pin ATX power connector
	- 4 pin 12V power connector
	- Front panel audio connector
	- 2 x USB 2.0 headers (support 4 USB 2.0 ports)
BIOS Feature	- 64Mb AMI BIOS
	- 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
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version),
	CyberLink MediaEspresso 6.5 Trial, ASRock Software Suite
	(CyberLink DVD Suite - OEM and Trial; ASRock MAGIX
	Multimedia Suite - OEM)
Unique Feature	- ASRock Extreme Tuning Utility (AXTU) (see **CAUTION 8**)
	- ASRock Instant Boot
	- ASRock Instant Flash (see **CAUTION 9**)
	- ASRock APP Charger (see **CAUTION 10**)
	- ASRock SmartView (see **CAUTION 11**)
	- ASRock XFast USB (see **CAUTION 12**)
	- ASRock XFast LAN (see **CAUTION 13**)
	- Lucid Virtu (see **CAUTION 14**)
	- ASRock On/Off Play Technology (see **CAUTION 15**)
	- Hybrid Booster:
	- CPU Frequency Stepless Control (see **CAUTION 16**)
	- ASRock U-COP (see **CAUTION 17**)
	- Boot Failure Guard (B.F.G.)
	- Good Night LED
Hardware Monitor	- CPU Temperature Sensing
	- Chassis Temperature Sensing
	- CPU/Chassis Fan Tachometer
	- CPU/Chassis Quiet Fan (Allow Chassis Fan Speed
	Auto-Adjust by CPU Temperature)
	- CPU/Chassis Fan Multi-Speed Control
	- Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore
OS	- Microsoft® Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit
	/ XP / XP 64-bit compliant
Certifications	- FCC, CE, WHQL
	- 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 the third-party overclocking tools. Overclocking may affect your system 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 41.

2. This motherboard supports Dual Channel Memory Technology. Before you implement Dual 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.

4. The maximum shared memory size is de ned by the chipset vendor and is subject to change. Please check Intel® website for the latest information.

5. You can choose to use two of the four monitors only. D-Sub, DVI-D and HDMI monitors cannot be enabled at the same time. Besides, with the DVI-to-HDMI adapter, the DVI-D port can support the same features as HDMIport.

6. xvYCC is only supported under Windows® 7 64-bit / 7. HBR is supported under Windows® 7 64-bit / 7 / Vista™ 64-bit / Vista™.

7. 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.

8. ASRock Extreme Tuning Utility (AXTU) is an all-in-one tool to ne-tune different system functions in a user-friendly interface, which is including 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 pro le and share with your friends. Your friends then can load the OC pro le 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 ef ciency 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

9. ASRock Instant Flash is a BIOS ash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems rst like MS-DOS or Windows®. With this utility, you can press <F6> key during the POST or press <F2> key to BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS le to your USB ash drive, oppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional oppy diskette or other complicated ash utility. Please be noted that the USB ash drive or hard drive must use FAT32/16/12 le system.

10. If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPod/iPad Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply installing the APP Charger driver, it makes your iPhone charged 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 than ever.
    ASRock website: http://www.asrock.com/Feature/AppCharger/index.asp

11. SmartView, a new function of internet browser, is the smart start page for IE that combines your most visited web sites, your history, your Facebook friends and your real-time newsfeed into an enhanced view for a more personal Internet experience. ASRock motherboards are exclusively equipped with the SmartView utility that helps you keep in touch with friends on-the-go. To use SmartView feature, please make sure your OS version is Windows® 7 / 7 64 bit / Vista™ / Vista™ 64 bit, and your browser version is IE8. ASRock website: http://www.asrock.com/Feature/SmartView/index.asp

12. ASRock XFast USB can boost USB storage device performance. The performance may depend on the property of the device.

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

14. With Lucid Virtu technology, you can enjoy bene ts from both 3D performance of the discrete GPU and advanced media features of Intel® HD graphics.

15. ASRock On/Off Play Technology allows users to enjoy the great audio experience from the portable audio devices, such like MP3 player or mobile phone to your PC, even when the PC is turned off (or in ACPI S5 mode)! This motherboard also provides a free 3.5mm audio cable (optional) that ensures users the most convenient computing environment.

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

17. 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.

18. EuP, stands for Energy Using Product, was a provision regulated by European Union to de ne the power consumption for the completed system. According to EuP, the total AC power of the completed system shall be under 1.00W in off mode condition. To meet EuP standard, 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 standby power ef ciency is higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you checking with the power supply manufacturer for more details.

1.3 Motherboard Layout
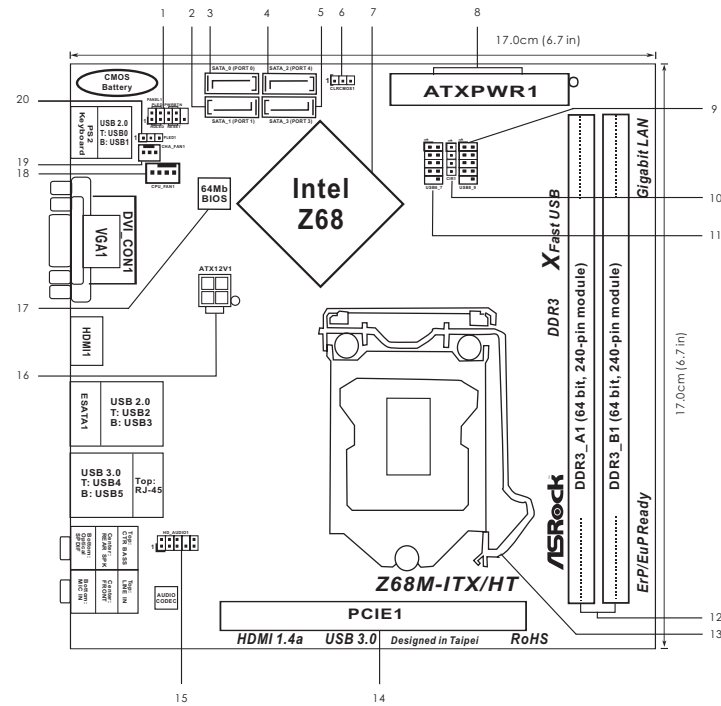
1	**System Panel Header (PANEL1, White)**	
2	**SATA3 Connector (SATA_1 (PORT 1), White)**	
3	**SATA3 Connector (SATA_0 (PORT 0), White)**	
4	**SATA2 Connector (SATA_2 (PORT 4), Blue)**	
5	**SATA2 Connector (SATA_3 (PORT 3), Blue)**	
6	**Clear CMOS Jumper (CLRCMOS1)**	
7	**Intel Z68 Chipset**	
8	**ATX Power Connector (ATXPWR1)**	
9	**USB 2.0 Header (USB8_9, Blue)**	
10	**Consumer Infrared Module Header (CIR1)**	
11	**USB 2.0 Header (USB6_7, Blue)**	

12	**2 x 240-pin DDR3 DIMM Slots**
	(Dual Channel: DDR3_A1, DDR3_B1, Blue)
13	**1155-Pin CPU Socket**
14	**PCI Express 2.0 x16 Slot (PCIE1, Blue)**
15	**Front Panel Audio Header**
	(HD_AUDIO1, White)
16	**ATX 12V Power Connector (ATX12V1)**
17	**64Mb SPI Flash**
18	**CPU Fan Connector (CPU_FAN1)**
19	**Chassis Fan Connector (CHA_FAN1)**
20	**Power LED Header (PLED1)**

1.4 I/O Panel

1	USB 2.0 Ports (USB01)	** 9	Front Speaker (Lime)
2	D-Sub Port	10	Microphone (Pink)
3	USB 2.0 Ports (USB23)	11	USB 3.0 Ports (USB45)
* 4	LAN RJ-45 Port	12	eSATA2 Port
5	Central / Bass (Orange)	13	HDMI Port
6	Rear Speaker (Black)	14	DVI-D Port
7	Optical SPDIF Out Port	15	PS/2 Keyboard Port (Purple)
8	Line In (Light Blue)		
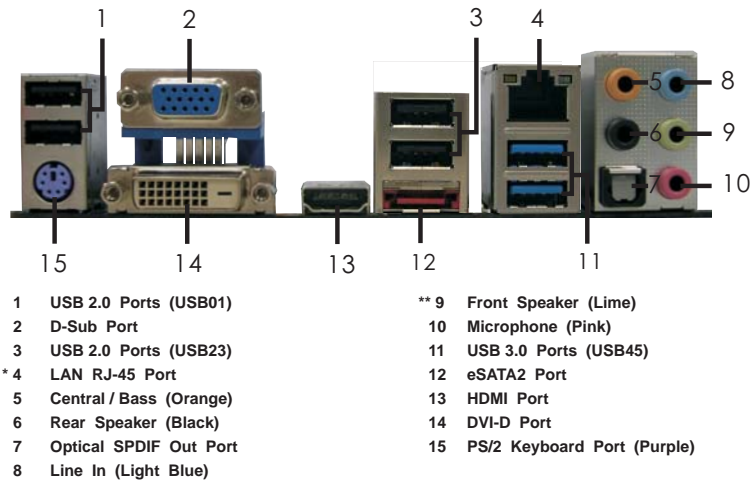
* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

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. 5)	Line In or Side Speaker (No. 8)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

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 nd "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.

1.5 CIR Remote Receiver and CIR Remote Controller

This motherboard is bundled with one CIR Remote Receiver and one CIR Remote Controller. You can enjoy more of your favorite entertainment by MCE (Media Center Edition) Remote Controller. The MCE features the entertainment center which allows you to enjoy a more convenient way of power on/off the system, watching DVDs, TV, listening to music, and so on by the easy-operate Remote Controller. The Remote Receiver is able to receive the multi-direction infrared signals from the Remote Controller (top, down and front), which is compatible with most of the chassis on the market. For the installation guide, please refe to page 24 for details.

* OS support: Windows® Vista™ / 7 (above Home Premium)

CIR Remote Receiver

CIR Remote Controller

Remote Controller Introduction

NAVIGATION BUTTONS

START	OK	BACK	Information

UP	DOWN	LEFT	RIGHT

SHORTCUT BUTTONS

GUIDE	ZOOM

AV AND POWER BUTTONS

POWER	VOLUME UP/DOWN	CHANNEL UP/DOWN	MUTE

PLAYBACK BUTTONS

RECORD	PAUSE	STOP

REWIND	PLAY	FAST	SKIP BACK	SKIP FORWARD

NUMERIC KEYPAD
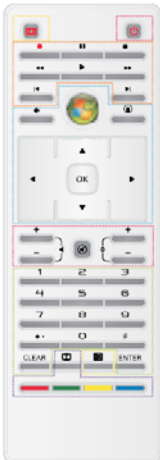
1	2	3	4	5	6	CLEAR
7	8	9	*	0	#	ENTER

The numeric keyboard consists of numbers from 0 through 9 and two other keys: ENTER and CLEAR.

TELETEXT BUTTONS

Media Center supports Teletext when it is available. The colored Fastext buttons on the remote control for Media Center PC work much like the Teletext buttons on a standard Teletext-enabled TV.

Some remote controller functions listed above are only available with the relative hardware equipments. If the hardware equipments you adopt are not compatible with the system, you are not allowed to use these functions. This product is designed to meet MCE standards.

Chapter 2: Installation

This is a Mini-ITX form factor (6.7" x 6.7", 17.0 x 17.0 cm) motherboard. Before you install the motherboard, study the con guration of your chassis to ensure that the motherboard ts 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 component.
2. To avoid damaging the motherboard 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 components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.

> 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 1155-Pin CPU, please follow the steps below.
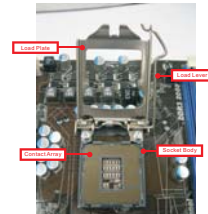
1155-Pin Socket Overview

Before you insert the 1155-Pin CPU into the socket, please check if the CPU surface is unclean or if there is any bent pin on 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. Disengaging the lever by depressing down and out on the hook to clear retention tab.
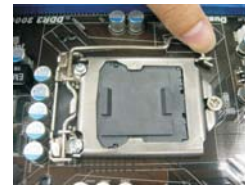
Step 1-2. Rotate the load lever to fully open position at approximately 135 degrees.

Step 1-3. Rotate the load plate to fully open position at approximately 100 degrees.

Step 2.   Remove PnP Cap (Pick and Place Cap).

1. It is recommended to use the cap tab to handle and avoid kicking off the PnP cap.
2. This cap must be placed if returning the motherboard for after service.

Step 3. Insert the 1155-Pin CPU:

Step 3-1. Hold the CPU by the edge where is marked with black line.

black line

Step 3-2. Orient the CPU with IHS (Integrated Heat Sink) up. Locate Pin1 and the two orientation key notches.

orientation key notch

Pin1 →

orientation key notch

1155-Pin CPU

alignment key

Pin1

alignment key

1155-Pin Socket
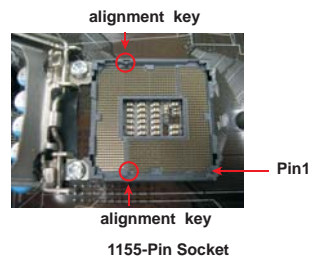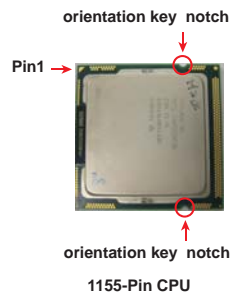
> For proper inserting, please ensure to match the two orientation key notches of the CPU with the two alignment keys of the socket.

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

Step 3-4. Verify that the CPU is within the socket and properly mated to the orient keys.

Step 4. Close the socket:

Step 4-1. Rotate the load plate onto the IHS.

Step 4-2. While pressing down lightly on load plate, engage the load lever.

2.4   Installation of CPU Fan and Heatsink

This motherboard is equipped with 1155-Pin socket that supports Intel 1155-Pin CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 1155-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. 18).

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 1155-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. 18).

Step 3.   Align fasteners with the motherboard through-holes.

Step 4.   Rotate the fastener clockwise, then press down on fastener caps with thumb to install and lock. Repeat with remaining fasteners.

> If you press down the fasteners without rotating them clockwise, 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 cable does not interfere with fan operation or contact other components.

2.5 Installation of Memory Modules (DIMM)

This motherboard provides two 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install two identical (the same brand, speed, size and chip-type) memory modules in the DDR3 DIMM slots to activate Dual Channel Memory Technology. Otherwise, it will operate at single channel mode.

> 1. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot;otherwise, this motherboard and DIMM may be damaged.
> 2. If you install only one memory module or two non-identical memory modules, it is unable to activate the Dual Channel Memory Technology.
> 3. Some DDR3 1GB double-sided DIMMs with 16 chips may not work on this motherboard. It is not recommended to install them on this motherboard.

Installing a DIMM

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

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

Step 2.   Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.
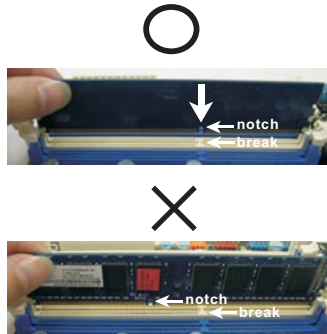
> The DIMM only ts in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

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 Slot (PCI Express Slot)

There is 1 PCI Express slot on this motherboard.

PCIE slots:

> PCIE1 (PCIE x16 slot; Blue) is used for PCI Express x16 lane width graphics cards.

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 rmly 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 Dual Monitor and Surround Display Features

Dual Monitor Feature

This motherboard supports dual monitor feature. With the internal VGA output sup-
port (DVI-D, D-Sub and HDMI), you can easily enjoy the bene ts of dual monitor
feature without installing any add-on VGA card to this motherboard. This mother-
board also provides independent display controllers for DVI-D, D-Sub and HDMI to
support dual VGA output so that DVI-D, D-sub and HDMI can drive same or different
display contents.
To enable dual monitor feature, please follow the below steps:

1. Connect DVI-D monitor cable to DVI-D port on the I/O panel, connect D-Sub
   monitor cable to D-Sub port on the I/O panel, or connect HDMI monitor
   cable to HDMI port on the I/O panel.

D-Sub port

DVI-D port   **HDMI port**
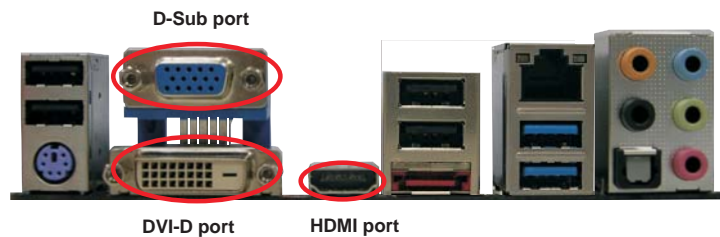
2. If you have installed onboard VGA driver from our support CD to your system
   already, you can freely enjoy the bene ts of dual monitor function after your
   system boots. If you haven't installed onboard VGA driver yet, please install
   onboard VGA driver from our support CD to your system and restart your
   computer.

> D-Sub, DVI-D and HDMI monitors cannot be enabled at the same time.
> You can only choose the combination: DVI-D + HDMI, DVI-D + D-Sub,
> or HDMI + D-Sub.

Surround Display Feature

This motherboard supports surround display upgrade. With the internal VGA output support (DVI-D, D-Sub and HDMI) and external add-on PCI Express VGA cards, you can easily enjoy the bene ts of surround display feature.

Please refer to the following steps to set up a surround display environment:

1. Install the PCI Express VGA card on PCIE1 slot. Please refer to page 20 for proper expansion card installation procedures for details.
2. Connect DVI-D monitor cable to DVI-D port on the I/O panel, connect D-Sub monitor cable to D-Sub port on the I/O panel, or connect HDMI monitor cable to HDMI port on the I/O panel. Then connect other monitor cables to the corresponding connectors of the add-on PCI Express VGA card on PCIE1 slot.
3. Boot your system. Press <F2> or <Del> to enter UEFI setup. Enter "Share Memory" option to adjust the memory capability to [32MB], [64MB], [128MB], [256MB] or [512MB] to enable the function of D-sub. Please make sure that the value you select is less than the total capability of the system memory. If you do not adjust the UEFI setup, the default value of "Share Memory", [Auto], will disable D-Sub function when the add-on VGA card is inserted to this motherboard.
4. Install the onboard VGA driver and the add-on PCI Express VGA card driver to your system. If you have installed the drivers already, there is no need to install them again.
5. Set up a multi-monitor display.

For Windows® XP / XP 64-bit OS:

Right click the desktop, choose "Properties", and select the "Settings" tab so that you can adjust the parameters of the multi-monitor according to the steps below.

A. Click the "Identify" button to display a large number on each monitor.
B. Right-click the display icon in the Display Properties dialog that you wish to be your primary monitor, and then select "Primary". When you use multiple monitors with your card, one monitor will always be Primary, and all additional monitors will be designated as Secondary.
C. Select the display icon identi ed by the number 2.
D. Click "Extend my Windows desktop onto this monitor".
E. Right-click the display icon and select "Attached", if necessary.
F. Set the "Screen Resolution" and "Color Quality" as appropriate for the second monitor. Click "Apply" or "OK" to apply these new values.
G. Repeat steps C through E for the diaplay icon identi ed by the number one, two, three and four.

For Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:

      Right click the desktop, choose "Personalize", and select the "Display Settings" tab so that you can adjust the parameters of the multi-monitor according to the steps below.

      A. Click the number "2" icon.

      B. Click the items "This is my main monitor" and "Extend the desktop onto this monitor".

      C. Click "OK" to save your change.

      D. Repeat steps A through C for the display icon identi ed by the number three and four.

6. Use Surround Display. Click and drag the display icons to positions representing the physical setup of your monitors that you would like to use. The placement of display icons determines how you move items from one monitor to another.

HDCP Function

HDCP function is supported on this motherboard. To use HDCP function with this motherboard, you need to adopt the monitor that supports HDCP function as well. Therefore, you can enjoy the superior display quality with high-de nition HDCP encryption contents. Please refer to below instruction for more details about HDCP function.

What is HDCP?

HDCP stands for High-Bandwidth Digital Content Protection, a speci cation developed by Intel® for protecting digital entertainment content that uses the DVI interface. HDCP is a copy protection scheme to eliminate the possibility of intercepting digital data midstream between the video source, or transmitter - such as a computer, DVD player or set-top box - and the digital display, or receiver - such as a monitor, television or projector. In other words, HDCP speci cation is designed to protect the integrity of content as it is being transmitted.

Products compatible with the HDCP scheme such as DVD players, satellite and cable HDTV set-top-boxes, as well as few entertainment PCs requires a secure connection to a compliant display. Due to the increase in manufacturers employing HDCP in their equipment, it is highly recommended that the HDTV or LCD monitor you purchase is compatible.

2.8 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, blue)
CIR header (4-pin, white)

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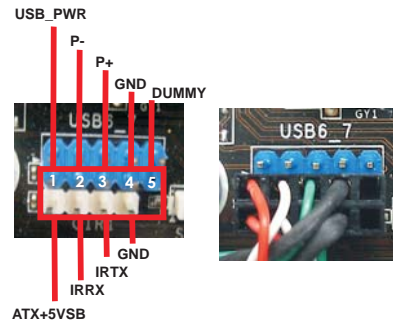
Step3.   Install Multi-Angle CIR Receiver to the front USB port. If Multi-Angle CIR Receiver cannot successfully receive the infrared signals from MCE Remote Controller, please try to install it to the other front USB port.

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

2.9 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.
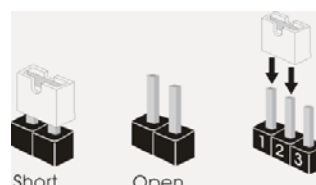
Jumper	Setting		Description
Clear CMOS Jumper	1_2	2_3	
(CLRCMOS1)			
(see p.12, No. 6)	Default	Clear CMOS	

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 nish updating the BIOS, you must boot up
      the system rst, and then shut it down before you do the clear-CMOS action.
      Please be noted that the password, date, time and user default pro le will be
      cleared only if the CMOS battery is removed.

2.10 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 ATAII Connectors   These two Serial ATAII
(SATA_2 (PORT 4):   SATA_2 (PORT 4)   (SATAII) connectors support
see p.12, No. 4)   SATA data cables for internal
(SATA_3 (PORT 3):   storage devices. The current
see p.12, No. 5)   SATA_3 (PORT 3)   SATAII interface allows up to
                                                3.0 Gb/s data transfer rate.

Serial ATA3 Connectors

(SATA_0 (PORT 0):
see p.12, No. 3)
(SATA_1 (PORT 1):
see p.12, No. 2)

SATA_0 (PORT 0)

SATA_1 (PORT 1)

These two 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 / SATAII / SATA3 hard disk or the SATAII / SATA3 connector on this motherboard.

3.5mm Audio Cable
(Optional)

Either end of the 3.5mm audio cable can be connected to the portable audio devices, such as MP3 player and mobile phone or the Line-in port of your PC.

USB 2.0 Headers

(9-pin USB6_7)
(see p.12 No. 11)

USB_PWR
P-7
P+7
GND
DUMMY
GND
P+6
P-6
USB_PWR

(9-pin USB8_9)
(see p.12 No. 9)

USB_PWR
P-9
P+9
GND
DUMMY
GND
P+8
P-8
USB_PWR
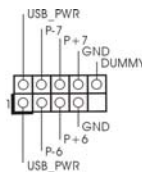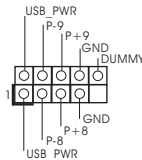
Besides four default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

Consumer Infrared Module Header

(4-pin CIR1)
(see p.12 No. 10)

GND
IRTX
IRRX
ATX+5VSB

This header can be used to connect the remote controller receiver.

Front Panel Audio Header

(9-pin HD_AUDIO1)
(see p.12 No. 15)

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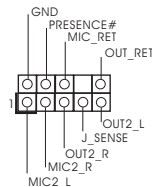
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

26

1. High De nition 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.
   E. To activate the front mic.
       For Windows® XP / XP 64-bit OS:
       Select "Mixer". Select "Recorder". Then click "FrontMic".
       For Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS:
       Go to the "FrontMic" Tab in the Realtek Control panel. Adjust "Recording Volume".
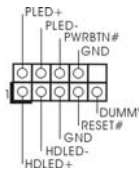
System Panel Header		This header accommodates
(9-pin PANEL1)		several system front panel
(see p.12 No. 1)		functions.

PLED+
PLED-
PWRBTN#
GND
DUMMY
RESET#
GND
HDLED-
HDLED+

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 con gure the way to turn off your system using the power switch.

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

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1 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.

Power LED Header		Please connect the chassis
(3-pin PLED1)	PLED- PLED+ PLED+	power LED to this header to
(see p.12 No. 20)		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).
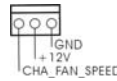
Chassis Fan Connector		Please connect the fan cables
(3-pin CHA_FAN1)	GND +12V CHA_FAN_SPEED	to the fan connectors and
(see p.12 No. 19)		match the black wire to the
		ground pin.

CPU Fan Connectors	4 3 2 1	Please connect the CPU fan
(4-pin CPU_FAN1)		cable to the connector and
(see p.12 No. 18)	GND +12V CPU_FAN_SPEED FAN_SPEED_CONTROL	match the black wire to the
		ground pin.
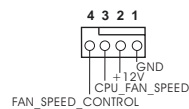
Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

Pin 1-3 Connected ⟵

3-Pin Fan Installation

ATX Power Connector	24 13	Please connect an ATX power
(24-pin ATXPWR1)		supply to this connector.
(see p.12 No. 8)	12 1	
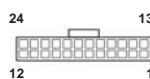
Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.

24   13

20-Pin ATX Power Supply Installation

12   1
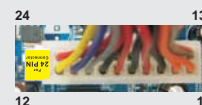
ATX 12V Power Connector		Please connect an ATX 12V
(4-pin ATX12V1)		power supply to this connector.
(see p.12 No. 16)		

2.11 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation

This motherboard adopts Intel® Z68 chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks and RAID (RAID 0, RAID 1, RAID 10, RAID 5, Intel Rapid Storage and Intel Smart Response Technology) functions. You may install SATA / SATAII hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATAII hard disks.

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

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

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

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

2.12 Serial ATA3 (SATA3) Hard Disks Installation

This motherboard adopts Intel® Z68 chipset that supports Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1, RAID 10, RAID 5, Intel Rapid Storage and Intel Smart Response Technology) functions. 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.

2.13 Hot Plug and Hot Swap Functions for SATA / SATAII HDDs

This motherboard supports Hot Plug and Hot Swap functions for SATA / SATAII in RAID / AHCI mode. Intel® Z68 chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed thru a joint industry effort.

NOTE

What is Hot Plug Function?

If the SATA / SATAII HDDs are NOT set for RAID con guration, it is called "Hot Plug" for the action to insert and remove the SATA / SATAII 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 / SATAII HDD.

What is Hot Swap Function?

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

2.14 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® Z68 chipset provide hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed thru a joint industry effort.

NOTE

What is Hot Plug Function?

If the SATA3 HDDs are NOT set for RAID con guration, 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.

2.15   SATA / SATAII / SATA3 HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA / SATAII / SATA3 HDD in RAID / AHCI mode. Please read below operation guide of Hot Plug feature carefully. Before you process the SATA / SATAII / 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
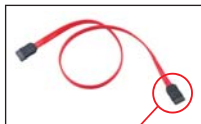
SATA 7-pin connector	The SATA 15-pin power connector (Black) connect to SATA / SATAII / SATA3 HDD	1x4-pin conventional power connector (White) connect to power supply

Caution

1. Without SATA 15-pin power connector interface, the SATA / SATAII / SATA3 Hot Plug cannot be processed.
2. Even some SATA / SATAII / 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 de nitely 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 / SATAII / SATA3 HDD Hot Plug.
   * The SATA / SATAII / SATA3 Hot Plug feature might not be supported by the chipset because of its limitation, the SATA / SATAII / 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 / SATAII / SATA3 HDD can support Hot Plug function from your dealer or HDD user manual. The SATA / SATAII / SATA3 HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA / SATAII / SATA3 driver is installed into system properly. The latest SATA / SATAII / 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 / SATAII / 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 / SATAII / 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 SATAII / SATA3 connector.

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

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

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

How to Hot Unplug a SATA / SATAII / SATA3 HDD:
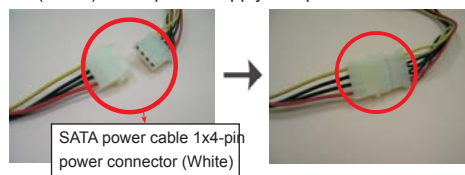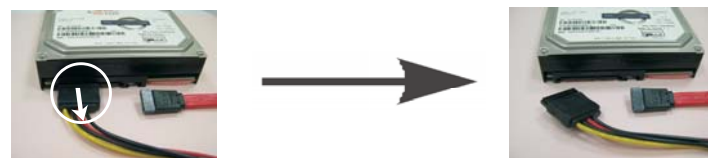
Points of attention, before you process the Hot Unplug:
Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA / SATAII / SATA3 HDD damage and data loss.

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

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

2.16 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.

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

If you want to install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your SATA / SATAII / SATA3 HDDs with RAID functions, please follow below procedures according to the OS you install.

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

STEP 1: Set up UEFI.
A. Enter UEFI SETUP UTILITY → Advanced screen → SATA Conﬁguration.
B. Set the option "SATA Mode" to [RAID].
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.

> 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 use "Intel Rapid Storage" in Windows® environment, install "SATAII driver" from the Support CD again so that "Intel Rapid Storage" will be installed to your system as well.

2.18 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 / SATAII / SATA3 HDDs without RAID functions, please follow below procedures according to the OS you install.

2.18.1 Installing Windows® XP / XP 64-bit Without RAID Functions

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

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

Using SATA / SATAII / SATA3 HDDs without NCQ function

STEP 1: Set up UEFI.
A. Enter UEFI SETUP UTILITY → Advanced screen → SATA Con guration.
B. Set the option "SATA Mode" to [IDE].
STEP 2: Install Windows® XP / XP 64-bit OS on your system.

2.18.2 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 / SATAII / SATA3 HDDs without RAID functions, please follow below steps.

Using SATA / SATAII / SATA3 HDDs with NCQ function

STEP 1: Set Up UEFI.
A. Enter UEFI SETUP UTILITY → Advanced screen → SATA Con guration.
B. Set the option "SATA Mode" to [AHCI].
STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

Using SATA / SATAII / SATA3 HDDs without NCQ function

STEP 1: Set up UEFI.
A. Enter UEFI SETUP UTILITY → Advanced screen → SATA Con guration.
B. Set the option "SATA Mode" to [IDE].
STEP 2: Install Windows® 7 / 7 64-bit / Vista™ / Vista™ 64-bit OS on your system.

Chapter 3: UEFI SETUP UTILITY

3.1   Introduction

This section explains how to use the UEFI SETUP UTILITY to con gure 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.

3.3 OC Tweaker Screen

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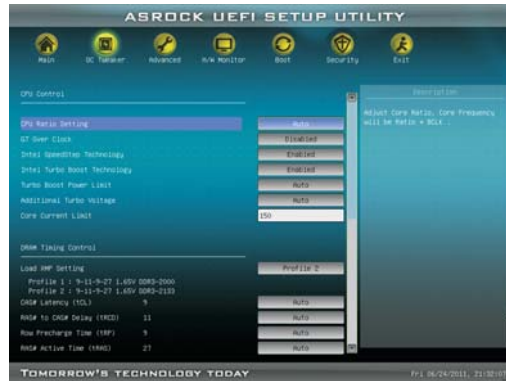
CPU Control

CPU Ratio Setting

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

GT Over Clock

> Use this to enable or disable GT Over Clock by Internal Graphics
> Device. The default value is [Disabled].

Intel SpeedStep Technology

> Intel SpeedStep technology is Intel's new power saving technology. Pro-
> cessor can switch between multiple frequency and voltage points to en-
> able power savings. The default value is [Enabled]. Con guration options:
> [Auto], [Enabled] and [Disabled]. If you install Windows® XP and select
> [Auto], you need to set the "Power Schemes" as "Portable/Laptop" to en-
> able this function. 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 issue with some power supplies. Please set this item to
> [Disable] if above issue occurs.

Intel Turbo Boost Technology

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

Turbo Boost Power Limit

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

Additional Turbo Voltage

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

Core Current Limit

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

DRAM Timing Control

Load XMP Setting

Use this to load XMP setting. Con guration options: [Auto], [Pro le 1] and [Pro le 2]. The default value is [Auto].

CAS# Latency (tCL)

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

RAS# to CAS# Delay (tRCD)

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

Row Precharge Time (tRP)

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

RAS# Active Time (tRAS)

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

Command Rate (CR)

Use this item to change Command Rate (CR) Auto/Manual setting. Min: 1N. Max: 2N. The default is [Auto].

Write Recovery Time (tWR)

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

Refresh Cyle Time (tRFC)

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

RAS to RAS Delay (tRRD)

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

Write to Read Delay (tWTR)

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

Read to Precharge (tRTP)

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

Four Activate Window (tFAW)

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

Voltage Control
DRAM Voltage

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

User Default

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 con gurations for the following items: CPU Con gu-
ration, North Bridge Con guration, South Bridge Con guration, Storage Con gura-
tion, Super IO Con guration, ACPI Con guration and USB Con guration.

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

Instant Flash

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

3.4.1 CPU Configuration

Intel Hyper Threading Technology

To enable this feature, it requires 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. 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. Con guration options: [All], [1] and [2]. The default value is [All].

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.

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 [Auto].

CPU Thermal Throttling

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

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.

No-Excute 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 code. This option will be hidden if the current CPU does not support No-Excute Memory Protection.

Local x2APIC

Use this to enable or disable Local x2APIC. The default value is [Disabled]. Please be noted that some OS do not support this function.

3.4.2 North Bridge Configuration

Low MMIO Align

Low MMIO resources align at 64MB/1024MB. The default value is [64MB].

VT-d

Use this to enable or disable Intel® VT-d technology (Intel® Virtualization Technology for Directed I/O). The default value of this feature is [Disabled].

Primary Graphics Adapter

This allows you to select the boot graphic adapter priority. Con guration options: [Onboard] and [PCI Express]. The default value is [PCI Express].

Onboard VGA Share Memory

This allows you to set onboard VGA share memory feature. The default value is [Auto]. Con guration options: [Auto], [32MB], [64MB], [128MB], [256MB] and [512MB].

Render Standby

Use this to enable or disable Render Standby by Internal Graphics Device. The default value is [Enabled].

IGD Multi-Monitor

Use this to enable or disable IGD Multi-Monitor by Internal Graphics Device. The default value is [Disabled]. For Windows® XP / XP 64-bit / Vista™ / Vista™ 64-bit users, if you plan to install the PCI Express graphics card for video output, please set this item to [Disabled] to disable the onboard VGA in advance.

DVMT Mode Select

Use this option to adjust DVMT mode. The default value is [DVMT Mode]. DVMT (Dynamic Video Memory Technology) is an architecture that offers breakthrough performance for the motherboard through ef cient memory utilization. In DVMT mode, the graphics driver allocates memory as needed for running graphics applications and is cooperatively using this memory with other system components. This item will not be used under Windows® VistaTM / 7 OS because the driver will intelligently detect physical memory available and allocate necessary video memory.

DVMT Memory

You are allowed to adjust the shared memory size in this item. Configuration options: [128MB], [256MB] and [Maximum]. The option [Maximum] only appears when you adopt the memory module with 1024MB or above.

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. Con guration options: [Disabled], [Enabled in S5] and [Enabled in S4 and S5]. The default value is [Disabled].

Onboard LAN

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.

On/Off Play

Use this item to enable or disable On/Off Play Technology. The defaultvalue is [Enabled]. When On/Off Play is enabled, Deep Sx will be disabled. If you want to enable Deep Sx, please disable On/Off Play rst.

Onboard HDMI HD Audio

This allows you to enable or disable the "Onboard HDMI HD Audio" feature.

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™ certi cation.

Good Night LED

Enable this option to turn off Power LED and Port80 LED when the system is power on. The keyboard LED will also be turned off in S1, S3 and S4 state. The default value is [Auto].

3.4.4 Storage Configuration

SATA Mode

Use this to select SATA mode. Con guration 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.

SATA Controller 0

This item appears only when you set "SATA Mode" to [IDE Mode]. Please select [**Compatible**] when you install legacy OS. If native OS (Windows®XP / Vista™ / 7) is installed, please select [**Enhanced**].

SATA Controller 1

This item appears only when you set "SATA Mode" to [IDE Mode]. Please select [**Compatible**] when you install legacy OS. If native OS (Windows®XP / Vista™ / 7) is installed, please select [**Enhanced**].

SATA Aggressive Link Power Management

This item appears only when you set "SATA Mode" to [AHCI Mode]. Use this item to enable or disable the SATA Aggressive Link Power Management support.

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. Con guration options: [Disabled] and [Enabled].

3.4.5 Super IO Configuration

CIR Controller

Use this item to enable or disable CIR controller.

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.

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 power on the system.

USB Mouse Power On

Use this item to enable or disable USB Mouse to power on the system.

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
con guration 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 is-
sue, 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 [Disabled].

> To use Instant Flash, USB Keyboard/Remote Power On and
> USB Mouse Power On functions on USB 3.0 devices, please
> enable the item "Legacy USB 3.0 Support".

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 Setting

> This allows you to set the CPU fan speed. Con guration options: [Full On] and [Automatic Mode]. The default is value [Full On].

Chassis Fan 1 Setting

> This allows you to set the chassis fan 1 speed. Con guration options: [Full On] and [Automatic Mode]. The default is value [Full On].

3.6 Boot Screen

In this section, it will display the available devices on your system for you to con g-
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 inde nite waiting.

Bootup Num-Lock

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

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]. Con guration 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.

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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, it will pop-out the following message, "Save con guration changes and exit setup?" Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

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

Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] 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 lesystem 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 refer-ence 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 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 did not appear automatically, locate and double click on the   le "ASSETUP.EXE" from the BIN folder in the Support CD to dis-play the menus.

4.2.2   Drivers Menu

The Drivers Menu shows the available devices 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 applications software that the motherboard sup-ports. Click on a speci c 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

This motherboard is adopting UEFI BIOS that allows Windows® OS to be installed on a large size HDD (>2TB). Please follow below procedure 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 Con guration > 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 les. 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.
5. If you install **Windows® 7 64-bit** OS, OS will be formatted by GPT (GUID Partition Table). Please install the hot x le from Microsoft®:
   http://support.microsoft.com/kb/979903