



4Core1333-FullHD

User Manual

Version 1.1

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- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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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"

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Contents

1. Introduction	5
1.1 Package Contents	5
1.2 Specifications	6
1.3 Minimum Hardware Requirement Table for Windows® Vista™ Premium 2007 and Basic Logo	9
1.4 Minimum Hardware Requirement for 1080p Blu-ray (BD) / HD-DVD Playback Support	10
1.5 1080p Blu-ray (BD) / HD-DVD Films Which Pass Our Lab Test	11
1.6 Motherboard Layout	12
1.7 ASRock DVI_1394 I/O	13
2. Installation	14
2.1 Screw Holes	14
2.2 Pre-installation Precautions	14
2.3 CPU Installation	15
2.4 Installation of Heatsink and CPU fan	17
2.5 Installation of Memory Modules (DIMM)	18
2.6 Expansion Slots	20
2.7 Dual Monitor and Surround Display Features	21
2.8 HDMI Audio Function Operation Guide	24
2.9 Jumpers Setup	25
2.10 Onboard Headers and Connectors	26
2.11 SATAII Hard Disk Setup Guide	30
2.12 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation	31
2.13 Hot Plug and Hot Swap Functions for SATA / SATAII HDDs	32
2.14 SATA / SATAII HDD Hot Plug Feature and Operation Guide	33
2.15 Driver Installation Guide	35
2.16 HDMR Card and Driver Installation	35
2.17 Installing Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit With RAID Functions	35
2.17.1 Installing Windows® 2000 / XP / XP 64-bit With RAID Functions	35
2.17.2 Installing Windows® Vista™ / Vista™ 64-bit With RAID Functions	37

2.18	Installing Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions	37
2.18.1	Installing Windows® 2000 / XP / XP 64-bit Without RAID Functions	38
2.18.2	Installing Windows® Vista™ / Vista™ 64-bit Without RAID Functions	39
2.19	Untied Overclocking Technology	40
3.	BIOS SETUP UTILITY	41
3.1	Introduction	41
3.1.1	BIOS Menu Bar	41
3.1.2	Navigation Keys	42
3.2	Main Screen	42
3.3	Advanced Screen	42
3.3.1	CPU Configuration	43
3.3.2	Chipset Configuration	46
3.3.3	ACPI Configuration	48
3.3.4	IDE Configuration	49
3.3.5	PCI/PnP Configuration	51
3.3.6	Floppy Configuration	51
3.3.7	Super IO Configuration	52
3.3.8	USB Configuration	53
3.4	Hardware Health Event Monitoring Screen	54
3.5	Boot Screen	55
3.5.1	Boot Settings Configuration	56
3.6	Security Screen	56
3.7	Exit Screen	57
4.	Software Support	58
4.1	Install Operating System	58
4.2	Support CD Information	58
4.2.1	Running Support CD	58
4.2.2	Drivers Menu	58
4.2.3	Utilities Menu	58
4.2.4	Contact Information	58

1. Introduction

Thank you for purchasing ASRock **4Core1333-FullHD** 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 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain 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>

1.1 Package Contents

- 1 x ASRock **4Core1333-FullHD** Motherboard
(Micro ATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x 24.4 cm)
- 1 x ASRock **4Core1333-FullHD** Quick Installation Guide
- 2 x ASRock **4Core1333-FullHD** Support CD
- 1 x 80-conductor Ultra ATA 66/100/133 IDE Ribbon Cable
- 1 x Ribbon Cable for a 3.5-in Floppy Drive
- 1 x Serial ATA (SATA) Cable (Optional)
- 1 x Serial ATA (SATA) HDD Power Cable (Optional)
- 1 x ASRock DVI_1394 I/O Shield
- 1 x COM Port Bracket

1.2 Specifications

Platform	<ul style="list-style-type: none">- Micro ATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x 24.4 cm
CPU	<ul style="list-style-type: none">- LGA 775 for Intel® Core™ 2 Quad / Core™ 2 Extreme / Core™ 2 Duo / Pentium® XE / Pentium® D / Pentium® Dual Core / Pentium® 4 / Celeron® / Celeron® D, supporting Quad Core Kentsfield processors- Compatible with all FSB1333/1066/800/533MHz CPUs (see CAUTION 1)- Supports Hyper-Threading Technology (see CAUTION 2)- Supports Untied Overclocking Technology (see CAUTION 3)- Supports EM64T CPU
Chipset	<ul style="list-style-type: none">- Northbridge: ATI™ RS600- Southbridge: ATI™ SB600
Memory	<ul style="list-style-type: none">- Dual Channel DDRII Memory Technology (see CAUTION 4)- 4 x DDRII DIMM slots- Support DDRII800/667/533- Max. capacity: 8GB (see CAUTION 5)
Hybrid Booster	<ul style="list-style-type: none">- CPU Frequency Stepless Control (see CAUTION 6)- ASRock U-COP (see CAUTION 7)- Boot Failure Guard (B.F.G.)
Expansion Slot	<ul style="list-style-type: none">- 1 x PCI Express x16 slot- 1 x PCI Express x1 slot- 2 x PCI slots- 1 x HDMR slot
Graphics	<ul style="list-style-type: none">- Integrated ATI™ X1250 graphics- DX9.0 VGA, Pixel Shader 2.0- Max. shared memory 512MB- Dual VGA Output: support DVI-D and D-Sub ports by independent display controllers- Supports HDCP function with DVI-D port- Supports 1080p Blu-ray (BD) / HD-DVD playback with DVI-D port (see CAUTION 8)
Audio	<ul style="list-style-type: none">- 7.1 CH Windows® Vista™ Premium Level HD Audio (ALC888 Audio Codec)- Chipset embedded HDMI Audio
LAN	<ul style="list-style-type: none">- PCIE x1 Gigabit LAN 10/100/1000 Mb/s- Realtek RTL8111B- Supports Wake-On-LAN

Rear Panel I/O	ASRock DVI_1394 I/O - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x VGA/D-Sub Port - 1 x VGA/DVI-D Port (see CAUTION 9) - 1 x Parallel Port (ECP/EPP Support) - 4 x Ready-to-Use USB 2.0 Ports - 1 x IEEE 1394 Port - 1 x RJ-45 Port - HD Audio Jack: Side Speaker/Rear Speaker/Central/Bass/Line in/Front Speaker/Microphone (see CAUTION 10)
Connector	- 4 x Serial ATAII 3.0Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 0+1, JBOD and RAID 10), NCQ, AHCI and "Hot Plug" functions (see CAUTION 11) - 1 x ATA133 IDE connector (supports 2 x IDE devices) - 1 x Floppy connector - 1 x IR header - 1 x COM port header - 1 x IEEE 1394 header - CPU/Chassis FAN connector - 20 pin ATX power connector - 4 pin 12V power connector - CD in header - Front panel audio connector - 3 x USB 2.0 headers (support 6 USB 2.0 ports) (see CAUTION 12)
BIOS Feature	- 4Mb AMI BIOS - AMI Legal BIOS - 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)
Hardware Monitor	- CPU Temperature Sensing - Chassis Temperature Sensing - CPU Fan Tachometer - Chassis Fan Tachometer - CPU Quiet Fan - Voltage Monitoring: +12V, +5V, +3.3V, Vcore
OS	- Microsoft® Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit compliant (see CAUTION 13)
Certifications	- FCC, CE, WHQL

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. FSB1333-CPU will operate in overclocking mode.
2. About the setting of "Hyper Threading Technology", please check page 44.
3. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 40 for details.
4. 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 18 for proper installation.
5. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® XP and Windows® Vista™. For Windows® XP 64-bit and Windows® Vista™ 64-bit with 64-bit CPU, there is no such limitation.
6. 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.
7. 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.
8. 1080p Blu-ray (BD) / HD-DVD playback support on this motherboard requires the proper hardware configuration. Please refer to page 10 and 11 for the minimum hardware requirement and the passed 1080p Blu-ray (BD) / HD-DVD films in our lab test.
9. This DVI-D port for the chipset adopted on this motherboard can support DVI/HDCP and HDMI format signal. You may use the DVI to HDMI adapter to convert this DVI-D port to HDMI interface. DVI to HDMI adapter is not bundled with our product, please refer to the adapter vendor for further information.
10. 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.
11. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 30 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.

-
12. Power Management for USB 2.0 works fine under Microsoft® Windows® Vista™ 64-bit / Vista™ / XP 64-bit / XP SP1 or SP2 / 2000 SP4.
 13. Microsoft® Windows® Vista™ / Vista™ 64-bit driver keeps on updating now. As long as we have the latest driver, we will update it to our website in the future. Please visit our website for Microsoft® Windows® Vista™ / Vista™ 64-bit driver and related information.
ASRock website <http://www.asrock.com>

1.3 Minimum Hardware Requirement Table for Windows® Vista™ Premium 2007 and Basic Logo

For system integrators and users who purchase this motherboard and plan to submit Windows® Vista™ Premium 2007 and Basic logo, please follow below table for minimum hardware requirements.

CPU	Celeron D 326
Memory	512MB x 2 Dual Channel (Premium)
	512MB Single Channel (Basic)
	256MB x 2 Dual Channel (Basic)
VGA	DX9.0 with WDDM Driver
	DVI with HDCP

* If you use onboard VGA with total system memory size 512MB and plan to submit Windows® Vista™ Basic logo, please adjust the shared memory size of onboard VGA to 64MB. If you use onboard VGA with total system memory size above 512MB and plan to submit Windows® Vista™ Premium or Basic logo, please adjust the shared memory size of onboard VGA to 128MB or above.

* If you plan to use external graphics card on this motherboard, please refer to Premium Discrete requirement at <http://www.asrock.com>

* If the onboard VGA supports DVI, it must also support HDCP function to qualify for Windows® Vista™ Premium 2007 logo.

* After June 1, 2007, all Windows® Vista™ systems are required to meet above minimum hardware requirements in order to qualify for Windows® Vista™ Premium 2007 logo.

1.4 Minimum Hardware Requirement for 1080p Blu-ray (BD) / HD-DVD Playback Support

1080p Blu-ray (BD) / HD-DVD playback support on this motherboard requires the proper hardware configuration. Please refer to below table for the minimum hardware requirement.

CPU	Intel® FSB1333 CPU (e.g. Intel® E6550)
VGA	Onboard VGA with DVI-D port
Memory	Dual Channel DDRII667, 1GB x 2
Suggested OS	Windows® Vista™

* If you need to use CyberLink PowerDVD Ultra, we suggest to disable Hardware Acceleration function for better playback performance and compatibility. After executing CyberLink PowerDVD Ultra program, please follow below steps to disable Hardware Acceleration function.

- A. Right-click the main page of CyberLink PowerDVD Ultra program.
- B. Click "Configuration".
- C. Select "Video".
- D. Click "Enable hardware acceleration (ATI Avivo)" to remove the "V" mark in this item.
- E. Click "OK" to save the change.

* If you use this motherboard to playback 1080p Blu-ray (BD) / HD-DVD under Windows® 2000 / XP / XP 64-bit OS, the film may pause sometimes. For Windows® Vista™ / Vista™ 64-bit OS, there is no this issue.

1.5 Passed 1080p Blu-ray (BD) / HD-DVD Films in Our Lab Test

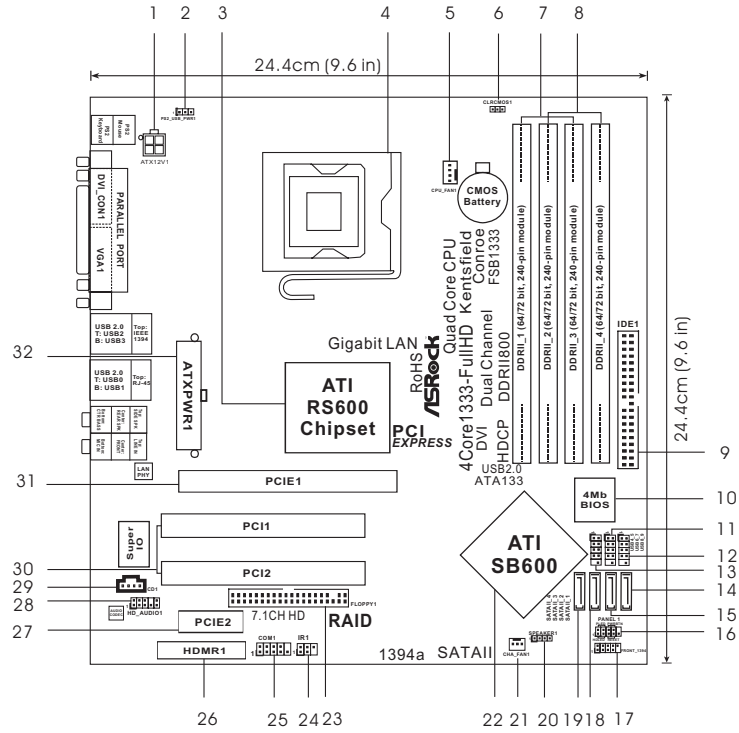
DVD Type	Film Name	Format	Producer
Blu-ray DVD	CASINO ROYALE	MPEG-4-AVC	SONY
	THE LAST STAND	MPEG-4-AVC	FOX
	SPEED	MPEG-4-AVC	FOX
	THE LEAGUE OF EXTRAORDINARY GENTLEMEN	MPEG-4-AVC	FOX
HD- DVD	KING KONG	VC-1	UNIVERSAL
	THE INTERPRETER	MPEG-4-AVC	UNIVERSAL
	ONE SIX RIGHT	MPEG-2	TERWILLIGER

* MPEG-4-AVC mentioned above refers to the same format of H.264.

* Above passed films are tested under below configuration. Please visit our website (<http://www.asrock.com>) for film updates in the future.

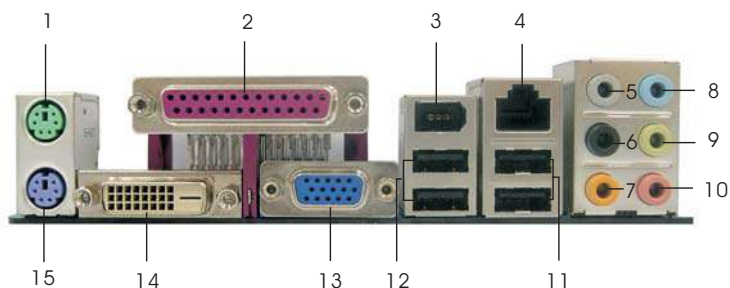
Items	Configurations
CPU	Intel® FSB1333 CPU (e.g. Intel® E6550)
VGA	Onboard VGA with DVI-D port
Memory	Dual Channel DDRII667, 1GB x 2
OS	Windows® Vista™
Playback Software	CyberLink PowerDVD Ultra
DVD Player	Pioneer BDR-101A / LG GBW-H10N (BD)
	HP HD100 (HD-DVD)

1.6 Motherboard Layout



- | | | | |
|----|--|----|---|
| 1 | ATX 12V Power Connector (ATX12V1) | 16 | System Panel Header (PANEL1) |
| 2 | PS2_USB_PWR1 Jumper | 17 | Front Panel IEEE 1394 Header (FRONT_1394) |
| 3 | North Bridge Controller | 18 | Third SATAII Connector (SATAII_3) |
| 4 | 775-Pin CPU Socket | 19 | Fourth SATAII Connector (SATAII_4) |
| 5 | CPU Fan Connector (CPU_FAN1) | 20 | Chassis Speaker Header (SPEAKER 1) |
| 6 | Clear CMOS Jumper (CLRCMOS1) | 21 | Chassis Fan Connector (CHA_FAN1) |
| 7 | 2 x 240-pin DDRII DIMM Slots
(Dual Channel A: DDRII_1, DDRII_3; Yellow) | 22 | South Bridge Controller |
| 8 | 2 x 240-pin DDRII DIMM Slots
(Dual Channel B: DDRII_2, DDRII_4; Orange) | 23 | Floppy Connector (FLOPPY1) |
| 9 | Primary IDE Connector (IDE1, Blue) | 24 | Infrared Module Header (IR1) |
| 10 | Flash Memory (4Mb) | 25 | Serial Port Connector (COM1) |
| 11 | USB 2.0 Header (USB6_7, Blue) | 26 | HDMR Slot (HDMR1) |
| 12 | USB 2.0 Header (USB8_8, Blue) | 27 | PCI Express x1 Slot (PCIE2) |
| 13 | USB 2.0 Header (USB4_5, Blue) | 28 | Front Panel Audio Header (HD_AUDIO1) |
| 14 | Primary SATAII Connector (SATAII_1) | 29 | Internal Audio Connector: CD1 (Black) |
| 15 | Secondary SATAII Connector (SATAII_2) | 30 | PCI Slots (PCI1-2) |
| | | 31 | PCI Express x16 Slot (PCIE1) |
| | | 32 | ATX Power Connector (ATXPWR1) |

1.7 ASRock DVI_1394 I/O




- | | |
|---------------------------|--------------------------------|
| 1 PS/2 Mouse Port (Green) | * 9 Front Speaker (Lime) |
| 2 Parallel Port | 10 Microphone (Pink) |
| 3 IEEE 1394 Port | 11 USB 2.0 Ports (USB01) |
| 4 RJ-45 Port | 12 USB 2.0 Ports (USB23) |
| 5 Side Speaker (Gray) | 13 VGA/D-Sub Port |
| 6 Rear Speaker (Black) | 14 VGA/DVI-D Port |
| 7 Central / Bass (Orange) | 15 PS/2 Keyboard Port (Purple) |
| 8 Line In (Light Blue) | |

* 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	√	--	--	--
4	√	√	--	--
6	√	√	√	--
8	√	√	√	√

* 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.

Chapter 2 Installation

4Core1333-FullHD is a Micro ATX form factor (9.6" x 9.6", 24.4 x 24.4 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.

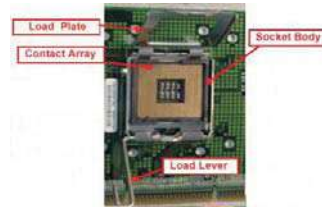
1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, **NEVER** place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before 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.

2.3 775-LAND CPU Installation

For the installation of Intel 775-LAND CPU, please follow the steps below.



775-Pin Socket Overview



Before you insert the 775-LAND 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.

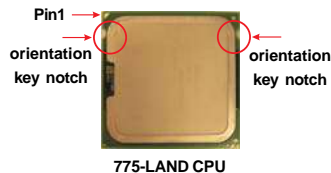


Step 2. Insert the 775-LAND CPU:

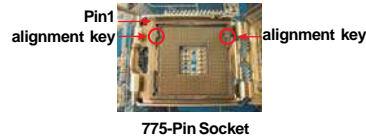
Step 2-1. Hold the CPU by the edges where are marked with black lines.



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



775-LAND CPU



775-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 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. Remove PnP Cap (Pick and Place Cap):

Use your left hand index finger and thumb to support the load plate edge, engage PnP cap with right hand thumb and peel the cap from the socket while pressing on center of PnP cap to assist in removal.



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 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.

Step 4-3. Secure load lever with load plate tab under retention tab of load lever.



2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with 775-Pin socket that supports Intel 775-LAND CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 775-LAND 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. 5).



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 775-LAND 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. 5).



Step 3. Align fasteners with the motherboard throughholes.

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)

4Core1333-FullHD motherboard provides four 240-pin DDRII (Double Data Rate II) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install **identical** (the same brand, speed, size and chip-type) DDRII DIMM pair in the slots of the same color. In other words, you have to install **identical** DDRII DIMM pair in **Dual Channel A** (DDRII_1 and DDRII_3; Yellow slots; see p.12 No.7) or **identical** DDRII DIMM pair in **Dual Channel B** (DDRII_2 and DDRII_4; Orange slots; see p.12 No.8), so that Dual Channel Memory Technology can be activated. This motherboard also allows you to install four DDRII DIMMs for dual channel configuration, and please install **identical** DDRII DIMMs in all four slots. You may refer to the Dual Channel Memory Configuration Table below.

Dual Channel Memory Configurations

	DDRII_1 (Yellow Slot)	DDRII_2 (Orange Slot)	DDRII_3 (Yellow Slot)	DDRII_4 (Orange Slot)
(1)	Populated	-	Populated	-
(2)	-	Populated	-	Populated
(3)*	Populated	Populated	Populated	Populated

* For the configuration (3), please install **identical** DDRII DIMMs in all four slots.



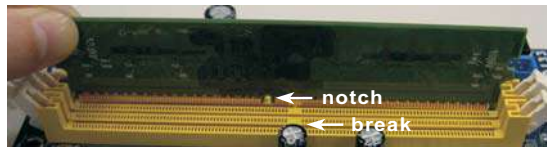
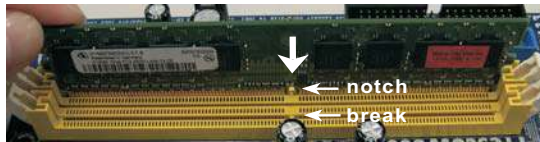
1. If you want to install two memory modules, for optimal compatibility and reliability, it is recommended to install them in the slots of the same color. In other words, install them either in the set of yellow slots (DDRII_1 and DDRII_3), or in the set of orange slots (DDRII_2 and DDRII_4).
2. If only one memory module or three memory modules are installed in the DDRII DIMM slots on this motherboard, it is unable to activate the Dual Channel Memory Technology.
3. If a pair of memory modules is NOT installed in the same Dual Channel, for example, installing a pair of memory modules in DDRII_1 and DDRII_2, it is unable to activate the Dual Channel Memory Technology .
4. It is not allowed to install a DDR memory module into DDRII 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 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 fits 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 Slots (PCI, HDMR and PCI Express Slots)

There are 2 PCI slots, 1 HDMR slot and 2 PCI Express slots on this motherboard.

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

HDMR slot: HDMR slot is used to insert a HDMR card with v.92 Modem functionality.

PCI Express Slots: PCIE1 (PCI Express x16 slot) is used for PCI Express cards with x16 lane width graphics cards.

PCIE2 (PCI Express x1 slot) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card, SATA2 card, etc.



If you install the add-on PCI Express VGA card to PCIE1 (PCI Express x16 slot), the onboard VGA will be disabled.

Installing an expansion card

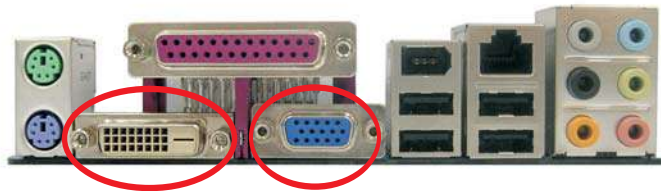
- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 4. Fasten the card to the chassis with screws.

2.7 Dual Monitor and Surround Display Features

Dual Monitor Feature

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

1. Connect the DVI-D monitor cable to the VGA/DVI-D port on the I/O panel of this motherboard. Connect the D-Sub monitor cable to the VGA/D-Sub port on the I/O panel of this motherboard.



VGA/DVI-D port **VGA/D-Sub port**

2. If you have installed onboard VGA driver from our support CD to your system already, you can freely enjoy the benefits of dual monitor function provided by VGA/DVI-D and VGA/D-Sub ports with this motherboard 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. Then you can start to use dual monitor function provided by VGA/DVI-D and VGA/D-Sub ports with this motherboard.



When you playback HDCP-protected video from Blu-ray (BD) or HD-DVD disc, the content will be displayed only in one of the two monitors instead of both monitors.

Surround Display Feature

This motherboard supports surround display upgrade. With the internal dual VGA output support (DVI-D and D-Sub) and the external add-on PCI Express VGA card, you can easily enjoy the benefits of surround display feature. Please refer to the following steps to set up a surround display environment:

1. Install the ATI™ PCI Express VGA card to PCI Express slot. Please refer to page 20 for proper expansion card installation procedures for details.
2. Connect the DVI-D monitor cable to the VGA/DVI-D port on the I/O panel of this motherboard. Connect the D-Sub monitor cable to the VGA/D-Sub port on the I/O panel of this motherboard.
3. Boot your system. Press <F2> to enter BIOS setup. Set the item "Primary Graphics Adapter" to [Onboard]. And set the item "Surround View Function" to [Enabled].
4. Install the onboard VGA driver and the add-on PCI Express VGA card driver to your system. If you have installed the onboard VGA driver and the add-on PCI Express VGA card driver already, there is no need to install them again.
5. Set up a multi-monitor display. 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. (The item names and operation procedures described in this step are under Windows® XP environment. If you install other Windows® OS, the item names and operation procedures may be similar.)
 - 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 identified 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 display icon identified by the number one, two, 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 with DVI-D Port

HDCP function is supported with DVI-D port 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 quantity with high-definition 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 specification 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 specification 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 HDMI Audio Function Operation Guide

The DVI-D port for the chipset adopted on this motherboard can support DVI/HDCP and HDMI format signal. You may use the DVI to HDMI adapter to convert the DVI-D port to HDMI interface. Please follow below steps to enable HDMI audio function according to the OS you install.



1. DVI to HDMI adapter is not bundled with this motherboard, please refer to the adapter vendor for further information.
2. If you install the DVI-D monitor instead of the HDMI monitor on this motherboard and enable HDMI audio function, the film you play may pause sometimes.

For Windows® XP / XP 64-bit OS

Step 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Chipset Configuration.
- B. Set the option “OnBoard HDMI HD Audio” to [Auto].

Step 2: Install HDMI audio driver to your system.

Install “Onboard HDMI HD Audio Driver” from ASRock Support CD to your system.

Step 3: Reboot your system.

After you reboot the system, the HDMI audio function is available.



After HDMI audio driver is installed, the OS default will output the audio signal through HDMI audio. Therefore, the onboard audio jack will not function.

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

Step 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → Chipset Configuration.
- B. Set the option “OnBoard HDMI HD Audio” to [Auto].

Step 2: Enter Windows® to set up your system manually.

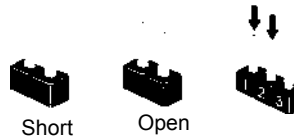
- A. Click “Start” button, select “Settings”, and then click “Control Panel”.
- B. Click “Hardware and Sound”, and click “Sound”.
- C. Change the default setting “Speaker” to “Digital Output Device (HDMI)”.
- D. Click “OK” to finish the setting.



Step 3: Reboot your system.

After you reboot the system, the HDMI audio function is available.


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	
PS2_USB_PWR1 (see p.12, No. 2)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1_2</p>  <p>+5V</p> </div> <div style="text-align: center;"> <p>2_3</p>  <p>+5VSB</p> </div> </div>	Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

Clear CMOS Jumper (CLR CMOS1) (see p.12, No. 6)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1_2</p>  <p>Default</p> </div> <div style="text-align: center;"> <p>2_3</p>  <p>Clear CMOS</p> </div> </div>
---	---

Note: CLR CMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. 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 CLR CMOS1 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.

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!

Floppy Connector

(33-pin FLOPPY1)
(see p.12 No. 23)



Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE connector (Blue)

(39-pin IDE1, see p.12 No. 9)



80-conductor ATA 66/100/133 cable

Note: Please refer to the instruction of your IDE device vendor for the details.

Serial ATAII Connectors

(SATAII_1: see p.12, No. 14)
(SATAII_2: see p.12, No. 15)
(SATAII_3: see p.12, No. 18)
(SATAII_4: see p.12, No. 19)



These four Serial ATAII (SATAII) connectors support SATAII or SATA hard disk for internal storage devices. The current SATAII interface allows up to 3.0 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 hard disk or the SATAII connector on the motherboard.

Serial ATA (SATA)

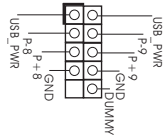
Power Cable
(Optional)



Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

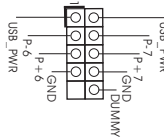
USB 2.0 Headers

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

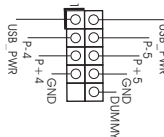


Besides four default USB 2.0 ports on the I/O panel, there are three USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

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

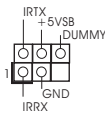


(9-pin USB4_5)
(see p.12 No. 13)



Infrared Module Header

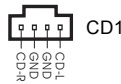
(5-pin IR1)
(see p.12, No. 24)



This header supports an optional wireless transmitting and receiving infrared module.

Internal Audio Connector

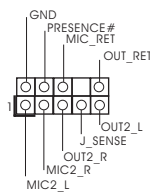
(4-pin CD1)
(CD1: see p.12, No. 29)



This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.



Front Panel Audio Header

(9-pin HD_AUDIO1)
(see p.12, No. 28)



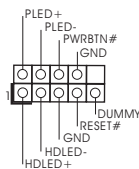
This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.



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.
 - E. Enter BIOS Setup Utility. Enter Advanced Settings, and then select Chipset Configuration. Set the Front Panel Control option from [Auto] to [Enabled].
 - F. Enter Windows system. Click the icon on the lower right hand taskbar to enter Realtek HD Audio Manager.
For Windows® 2000 / XP / XP 64-bit OS:
Click "Audio I/O", select "Connector Settings" , choose "Disable front panel jack detection", and save the change by clicking "OK".
For Windows® Vista™ / Vista™ 64-bit OS:
Click the right-top "Folder" icon , choose "Disable front panel jack detection", and save the change by clicking "OK".

System Panel Header

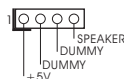
(9-pin PANEL1)
(see p.12, No. 16)



This header accommodates several system front panel functions.

Chassis Speaker Header

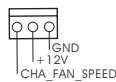
(4-pin SPEAKER 1)
(see p.12, No. 20)



Please connect the chassis speaker to this header.

Chassis Fan Connector

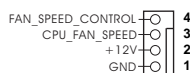
(3-pin CHA_FAN1)
(see p.12, No. 21)



Please connect the chassis fan cable to this connector and match the black wire to the ground pin.

CPU Fan Connector

(4-pin CPU_FAN1)
(see p.12, No. 5)

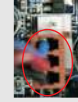


Please connect the CPU fan cable to this connector and match the black wire to the ground pin.



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



ATX Power Connector

(20-pin ATXPWR1)
(see p.12, No. 32)



Please connect an ATX power supply to this connector.

ATX 12V Connector

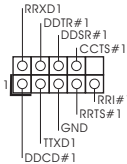
(4-pin ATX12V1)
(see p.12, No. 1)



Please note that it is necessary to connect a power supply with ATX 12V plug to this connector so that it can provides sufficient power. Failing to do so will cause the failure to power up.

Serial port Header

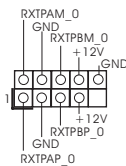
(9-pin COM1)
(see p.12 No.25)



This COM1 header supports a serial port module.

IEEE 1394 Header

(9-pin FRONT_1394)
(see p.12 No. 17)

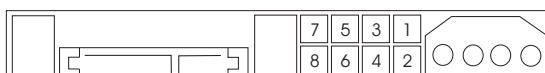


Besides one default IEEE 1394 port on the I/O panel, there is one IEEE 1394 header (FRONT_1394) on this motherboard. This IEEE 1394 header can support one IEEE 1394 port.

2.11 SATAII Hard Disk Setup Guide

Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different vendors to correctly adjust your SATAII hard disk to SATAII mode in advance; otherwise, your SATAII hard disk may fail to run at SATAII mode.

Western Digital



If pin 5 and pin 6 are shorted, SATA 1.5Gb/s will be enabled.
On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 5 and pin 6.

SAMSUNG



If pin 3 and pin 4 are shorted, SATA 1.5Gb/s will be enabled.
On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 3 and pin 4.

HITACHI

Please use the Feature Tool, a DOS-bootable tool, for changing various ATA features. Please visit HITACHI's website for details:

<http://www.hitachigst.com/hdd/support/download.htm>



The above examples are just for your reference. For different SATAII hard disk products of different vendors, the jumper pin setting methods may not be the same. Please visit the vendors' website for the updates.

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

This motherboard adopts ATI™ SB600 southbridge chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks and RAID (RAID 0, RAID 1, RAID 0+1, JBOD and RAID 10) 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.



1. If you plan to use RAID 0 or RAID 1 function, you need to install at least 2 SATA / SATAII hard disks. If you plan to use RAID 0+1, JBOD or RAID 10 function, you need to install 4 SATA / SATAII hard disks.
2. For OS installation on SATA / SATAII HDDs, please refer to page 35 to 40 for details. If you install a new SATA / SATAII HDD just for data storage purpose, and your SATA / SATAII mode is in RAID or AHCI mode, this empty SATA / SATAII HDD information will not appear in "Disk Management". You need to enter WebPAM to create JBOD first, which means, after you enter WebPAM, please click "Logical Drive View" → "Create" → "JBOD". After that, you can find the empty SATA / SATAII HDDs information in "Disk Management" and start to use it. (WebPAM is an utility for ATI™ Windows RAID. Please refer to RAID Installation Guide in our support CD for detailed operation procedures.)

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

This motherboard supports Hot Plug and Hot Swap functions for SATA / SATAII Devices in RAID / AHCI mode. ATI™ SB600 southbridge chipset provides hardware support for Advanced Host controller Interface (AHCI), a new operation interface for SATA host controllers developed thru a joint industry effort. AHCI also provides usability enhancements such as Hot Plug.



NOTE

What is Hot Plug Function?

If the SATA / SATAII HDDs are NOT set for RAID configuration, 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 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.

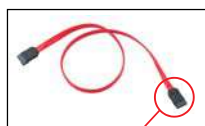
2.14 SATA / SATAII HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA / SATAII HDD. Please read below operation guide of SATA / SATAII HDD Hot Plug feature carefully. Before you process the SATA / SATAII 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)



SATA 7-pin connector

B. SATA power cable



The SATA 15-pin power connector (Black) connect to SATA / SATAII HDD

1x4-pin conventional power connector (White) connect to power supply

Caution

1. Without SATA 15-pin power connector interface, the SATA / SATAII Hot Plug cannot be processed.
2. Even some SATA / SATAII 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:

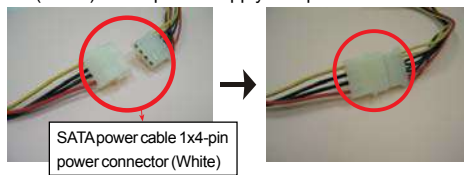
1. Below operation procedure is designed only for our motherboard, which supports SATA / SATAII HDD Hot Plug.
 - * The SATA / SATAII Hot Plug feature might not be supported by the chipset because of its limitation, the SATA / SATAII Hot Plug support information of our motherboard is indicated in the product spec on our website:
www.asrock.com
2. Make sure your SATA / SATAII HDD can support Hot Plug function from your dealer or HDD user manual. The SATA / SATAII HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA / SATAII driver is installed into system properly. The latest SATA / SATAII 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 HDD:

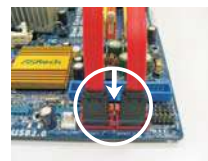
Points of attention, before you process the Hot Plug:

Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA / SATAII 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 connector.



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



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

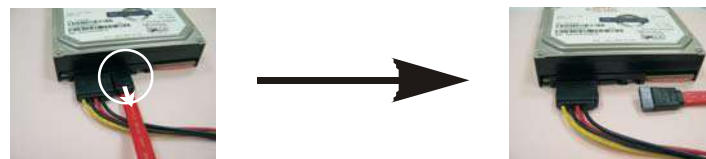


How to Hot Unplug a SATA / SATAII HDD:

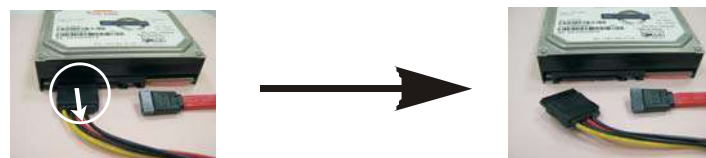
Points of attention, before you process the Hot Unplug:

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

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



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



2.15 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.

2.16 HDMR Card and Driver Installation

If you do not insert HDMR card to this motherboard, and you finish installing all drivers to your system now, but in the future, you plan to use HDMR card function on this motherboard, please follow the steps below then.

1. Insert HDMR card to HDMR slot on this motherboard. Please make sure that the HDMR card is completely seated on the slot.
2. Install HDMR card driver from our support CD to your system.
3. Reboot your system.

2.17 Installing Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit With RAID Functions

If you want to install Windows® 2000, Windows® XP, Windows® XP 64-bit, Windows® Vista™ or Windows® Vista™ 64-bit on a RAID disk composed of 2 or more SATA / SATAII HDDs with RAID functions, please follow below procedures according to the OS you install.



1. For Windows® Vista™ / Vista™ 64-bit OS, the SATA / SATAII RAID driver keeps on updating now. As long as we have the latest driver, we will update it to our website in the near future. Please visit our website for the latest version Windows® Vista™ / Vista™ 64-bit RAID driver and related information.
2. Before installing Windows® 2000 to your system, your Windows® 2000 optical disk is supposed to include SP4. If there is no SP4 included in your disk, please visit the below website for proper procedures of making a SP4 disk:
http://www.microsoft.com/Windows2000/downloads/servicepacks/sp4/spdeploy.htm#the_integrated_installation_fmay

2.17.1 Installing Windows® 2000 / XP / XP 64-bit With RAID Functions

If you want to install Windows® 2000, Windows® XP or Windows® XP 64-bit on a RAID disk composed of 2 or more SATA / SATAII HDDs with RAID functions, please follow below steps.

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the “SATA Operation Mode” option to [RAID].

STEP 2: Make a SATA / SATAII Driver Diskette.

- A. Insert the ASRock Support CD into your optical drive to boot your system. (There are two ASRock Support CD in the motherboard gift box pack, please choose the one for Windows® 2000 / XP / XP 64-bit.)
- B. During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.
- C. When you see the message on the screen, “Generate Serial ATA driver diskette [Y/N]?”, press <Y>.
- D. Then you will see these messages,
**Please insert a blank
formatted diskette into floppy
drive A:
press any key to start**
Please insert a floppy diskette into the floppy drive, and press any key.
- E. The system will start to format the floppy diskette and copy SATA / SATAII drivers into the floppy diskette.

STEP 3: Use “RAID Installation Guide” to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD: .. \RAID Installation Guide

STEP 4: Install Windows® 2000 / Windows® XP / Windows® XP 64-bit OS on your system.

After step 1, 2, 3, you can start to install Windows® 2000 / Windows® XP / Windows® XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party RAID driver. When prompted, insert the SATA / SATAII driver diskette containing the ATI™ RAID driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the OS you install. (Select “ATI AHCI Compatible RAID Controller-x86 platform” for Windows® 2000 and Windows® XP, or “ATI AHCI Compatible RAID Controller-x64 platform” for Windows® XP 64-bit.)

NOTE1. If you install Windows® 2000 / Windows® XP / Windows® XP 64-bit on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA / SATAII HDDs, you still need to set up “SATA Operation Mode” to [RAID] first. Then, please set the RAID configuration by using the Windows RAID installation guide in the following path in the Support CD:
.. \RAID Installation Guide

NOTE2. If your operating system is Windows® 2000, please install the graphics card driver before you install “SATA2 Utility” from our support CD to your system.

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

If you want to install Windows® Vista™ or Windows® Vista™ 64-bit on a RAID disk composed of 2 or more SATA / SATAII HDDs with RAID functions, please follow below steps.

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the “SATA Operation Mode” option to [RAID].

STEP 2: Use “RAID Installation Guide” to set RAID configuration.

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD: .. \ RAID Installation Guide

STEP 3: Install Windows® Vista™ / Vista™ 64-bit OS on your system.

Insert the Windows® Vista™ / Windows® Vista™ 64-bit optical disk into the optical drive to boot your system, and follow the instruction to install Windows® Vista™ / Windows® Vista™ 64-bit OS on your system. When you see “Where do you want to install Windows?” page, please insert the ASRock Support CD into your optical drive, and click the “Load Driver” button on the left on the bottom to load the ATI™ RAID drivers. ATI™ RAID drivers are in the following path in our Support CD:

(There are two ASRock Support CD in the motherboard gift box pack, please choose the one for Windows® Vista™ / Vista™ 64-bit.)

.. \ I386 (For Windows® Vista™ OS)

.. \ AMD64 (For Windows® Vista™ 64-bit OS)

After that, please insert Windows® Vista™ / Windows® Vista™ 64-bit optical disk into the optical drive again to continue the installation.

NOTE. If you install Windows® Vista™ / Windows® Vista™ 64-bit on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA / SATAII HDDs, you still need to set up “SATA Operation Mode” to [RAID] in BIOS first. Then, please set the RAID configuration by using the Windows RAID installation guide in the following path in the Support CD:

.. \ RAID Installation Guide

2.18 Installing Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit Without RAID Functions

If you want to install Windows® 2000, Windows® XP, Windows® XP 64-bit, Windows® Vista™ or Windows® Vista™ 64-bit OS on your SATA / SATAII HDDs without RAID functions, please follow below procedures according to the OS you install.



Before installing Windows® 2000 to your system, your Windows® 2000 optical disk is supposed to include SP4. If there is no SP4 included in your disk, please visit the below website for proper procedures of making a SP4 disk:
http://www.microsoft.com/Windows2000/downloads/servicepacks/sp4/spdeploy.htm#the_integrated_installation_fmaj

2.18.1 Installing Windows® 2000 / XP / XP 64-bit Without RAID Functions

If you want to install Windows® 2000, Windows® XP or Windows® XP 64-bit on your SATA / SATAII HDDs without RAID functions, please follow below steps.

NOTE1. If you install single or multiple SATA / SATAII HDDs on this motherboard and plan to install Windows® 2000 / XP / XP 64-bit on SATA / SATAII HDDs, it is still suggested to use RAID mode even you don't plan to use RAID functions. Please follow the steps of "Using SATA / SATAII HDDs with NCQ and Hot Plug functions" below.

NOTE2. AHCI mode is only recommended for Windows® Vista™ / Vista™ 64-bit users. If you install Windows® 2000 / XP / XP 64-bit, it is not suggested to use AHCI mode.

Using SATA / SATAII HDDs with NCQ and Hot Plug functions

STEP 1: Set Up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the "SATA Operation Mode" option to [RAID].

STEP 2: Make a SATA / SATAII driver diskette.

Make a SATA / SATAII driver diskette by following section 2.17.1 step 2 on page 36.

STEP 3: Enter BIOS RAID utility (FastBuild Utility) to create JBOD on SATA / SATAII HDD.

Restart your system. Press <Ctrl+F> to enter BIOS RAID utility (FastBuild Utility) to create JBOD on SATA / SATAII HDD. For the proper operating procedures of creating JBOD, please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD:

.. \ RAID Installation Guide



JBOD function on this motherboard is only supported with single SATA / SATAII HDD.

STEP 4: Install Windows® 2000 / Windows® XP / Windows® XP 64-bit OS on your system.

After step 1, 2, 3, you can start to install Windows® 2000 / Windows® XP / Windows® XP 64-bit OS on your system. At the beginning of Windows® setup, press F6 to install a third-party RAID driver. When prompted, insert the SATA / SATAII driver diskette containing the ATI™ RAID driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the OS you install. (Select “ATI AHCI Compatible RAID Controller-x86 platform” for Windows® 2000 and Windows® XP, or “ATI AHCI Compatible RAID Controller-x64 platform” for Windows® XP 64-bit.)

Using SATA / SATAII HDDs without NCQ and Hot Plug functions

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the “SATA Operation Mode” option to [non-RAID].

STEP 2: Install Windows® 2000 / Windows® XP / Windows® XP 64-bit OS on your system.

2.18.2 Installing Windows® Vista™ / Vista™ 64-bit Without RAID Functions

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

Using SATA / SATAII HDDs NCQ and Hot Plug functions

STEP 1: Set Up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the “SATA Operation Mode” option to [AHCI].

STEP 2: Make a SATA / SATAII driver diskette.

Make a SATA / SATAII driver diskette by following section 2.17.1 step 2 on page 36.

STEP 3: Install Windows® Vista™ / Vista™ 64-bit OS on your system.

Insert the Windows® Vista™ / Windows® Vista™ 64-bit optical disk into the optical drive to boot your system, and follow the instruction to install Windows® Vista™ / Windows® Vista™ 64-bit OS on your system. When you see “Where do you want to install Windows?” page, please insert the ASRock Support CD into your optical drive,

and click the “Load Driver” button on the left on the bottom to load the ATI™ AHCI drivers. ATI™ AHCI drivers are in the following path in our Support CD:
(There are two ASRock Support CD in the motherboard gift box pack, please choose the one for Windows® Vista™ / Vista™ 64-bit.)

.. \I386 (For Windows® Vista™ OS)

.. \AMD64 (For Windows® Vista™ 64-bit OS)

After that, please insert Windows® Vista™ / Windows® Vista™ 64-bit optical disk into the optical drive again to continue the installation.

Using SATA / SATAII HDDs without NCQ and Hot Plug functions

STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the “SATA Operation Mode” option to [non-RAID].

STEP 2: Install Windows® Vista™ / Vista™ 64-bit OS on your system.

2.19 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 BIOS setup to set the selection from [Auto] to [CPU, PCIE, Async.]. 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 8 for the possible overclocking risk before you apply Untied Overclocking Technology.

3. BIOS SETUP UTILITY

3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The Flash Memory on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS 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 BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 BIOS Menu Bar

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

- Main** To set up the system time/date information
- Advanced** To set up the advanced BIOS 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 BIOS 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.

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 BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

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

BIOS SETUP UTILITY					
Main	Advanced	H/W Monitor	Boot	Security	Exit
System Overview				Use [Enter], [TAB] or [SHIFT-TAB] to select a field.	
System Time	[17:00:09]			Use [+] or [-] to configure system Time.	
System Date	[Thu 05/31/2007]				
BIOS Version	: 4Core1333-FullHD BIOS P1.00				
Processor Type	: Intel (R) Core (TM) 2 CPU 6400 @ 2.13GHz (64bit)				
Processor Speed	: 2133MHz				
Microcode Update	: 6F5/0				
Cache Size	: 2048KB				
Total Memory	: 2048MB with 256MB shared memory			--> Select Screen	
	Dual-Channel Memory Mode			↑↓ Select Item	
DDR11	: 1024MB/333MHz (DDR11667)			+/- Change Field	
DDR12	: None			Tab Select Field	
DDR13	: 1024MB/333MHz (DDR11667)			F1 General Help	
DDR14	: None			F9 Load Defaults	
				F10 Save and Exit	
				ESC Exit	
v02.54 (C) Copyright 1985-2003, American Megatrends, Inc.					

System Time [Hour:Minute:Second]

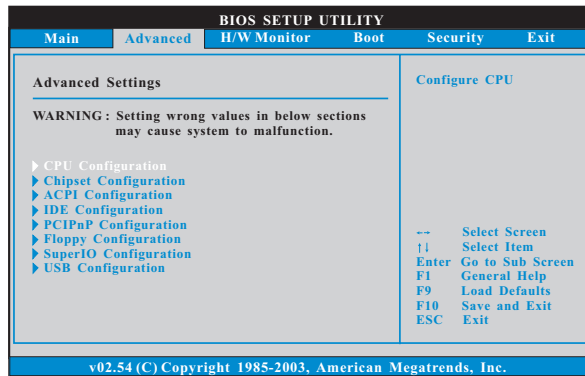
Use this item to specify the system time.

System Date [Day Month/Date/Year]

Use this item to specify the system date.

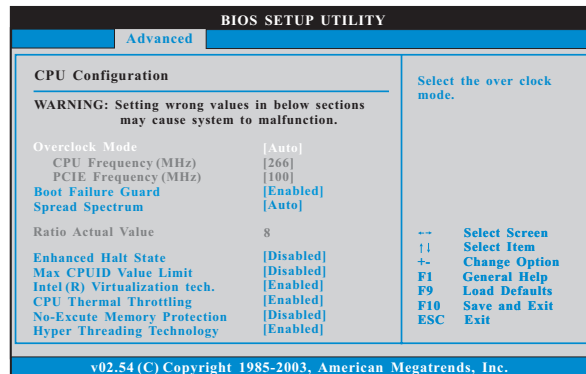
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, IDE Configuration, PCIPnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.



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

3.3.1 CPU Configuration



Overclock Mode

Use this to select Overclock Mode. The default value is [Auto].

Configuration options: [Auto], [CPU, PCIE, Sync.] and [CPU, PCIE, Async.].

CPU Frequency (MHz)

Use this option to adjust CPU frequency.

PCIE Frequency (MHz)

Use this option to adjust PCIE frequency.

Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

Spread Spectrum

Select [Auto] for the spread spectrum feature.

Ratio Actual Value

This is a read-only item, which displays the ratio actual value of this motherboard.

Enhance Halt State

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.

Max CPUID Value Limit

For Prescott CPU only, some OSes (ex. NT4.0) cannot handle the function with disable. This should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.

Intel (R) Virtualization tech.

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 (R) Virtualization Technology.

CPU Thermal Throttling

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated. This option will be hidden if the current CPU does not support CPU Thermal Throttling.

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

Hyper Threading Technology

To enable this feature, it requires a computer system with an Intel Pentium® 4 processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP. Set to [Enabled] if using Microsoft® Windows® XP, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

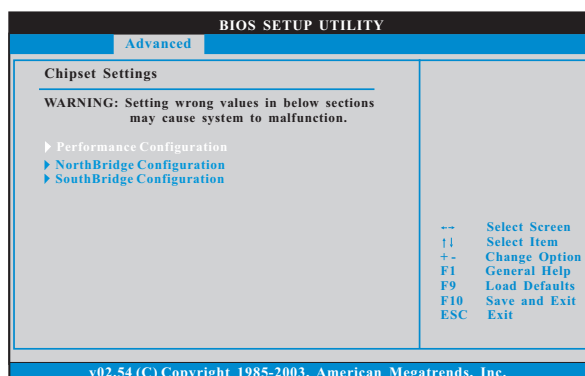
Intel (R) SpeedStep(tm) tech.

Intel (R) SpeedStep(tm) tech. is Intel's new power saving technology. Processor can switch between multiple frequency and voltage points to enable power savings. The default value is [Auto]. Configuration options: [Auto], [Enabled] and [Disabled]. If you install Windows® XP and select [Auto], you need to set the "Power Schemes" as "Portable/Laptop" to enable this function. If you install Windows® Vista™ 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 (R) SpeedStep(tm) tech..



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.

3.3.2 Chipset Configuration



Performance Configuration

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may also select other value as operating frequency: [Sync with CPU], [200MHz (DDRII400)], [266MHz (DDRII533)], [333MHz (DDRII667)], [400MHz (DDRII800)] and [533MHz (DDRII1066)].

Memory Overclocking

Use this item to enable or disable the memory overclocking feature. The default value is [Disabled].

Flexibility Option

The default value of this option is [Disabled]. It will allow better tolerance for memory compatibility when it is set to [Enabled].

MA Timing

Use this to adjust values for MA timing. Configuration options: [Auto], [2T] and [1T]. The default value is [Auto].

Memory Timing

Use this to adjust values for Memory timing. Configuration options: [Auto] and [Manual]. The default value is [Auto].

Early Read Data Transfer

Use this item to enable or disable the early read data transfer feature. The default value is [Disabled].

DRAM Voltage

Use this to select DRAM voltage. Configuration options: [Auto], [1.8V], [1.88V], [1.96V] and [2.04V]. The default value is [Auto].

NBCORE Voltage

Use this to select NBCORE voltage. Configuration options: [Auto], [1.25V], [1.3V], [1.35V] and [1.4V]. The default value is [Auto].

NorthBridge Configuration

Share Memory

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

Primary Graphics Adapter

This item will switch the PCI Bus scanning order while searching for video card. It allows you to select the type of Primary VGA in case of multiple video controllers. The default value of this feature is [PCI]. Configuration options: [PCI], [Onboard] and [PCI Express].

Surround View Function

This allows you to disable or enable surround view function. The default value is [Disabled]. This option is not selectable if there is no external PCIE VGA card inserted or the PCIE VGA card you install is not ATI™ production. If you install the PCIE VGA card and select [Enabled], the onboard VGA will be enabled automatically.

OnBoard HDMI HD Audio

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

SouthBridge Configuration

OnBoard Lan

This allows you to enable or disable the onboard Lan feature.

OnBoard 1394

This allows you to enable or disable the onboard 1394 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.

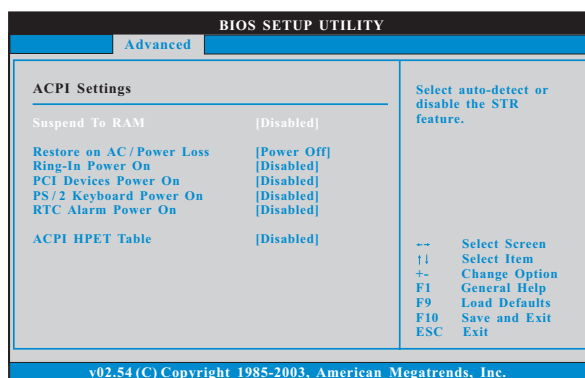
Front Panel

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

CD-In

Use this item to enable or disable CD-In of OnBoard HD Audio. If you plan to use this motherboard to submit Windows® Vista™ logo test, please disable this option.

3.3.3 ACPI Configuration



Suspend to RAM

This field allows you to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the system supports it.

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.

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.

PCI Devices Power On

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

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.

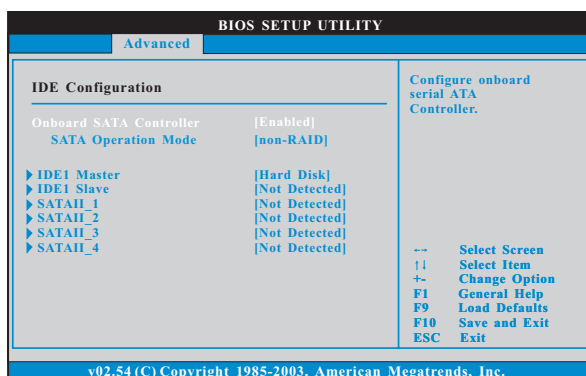
RTC Alarm Power On

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

ACPI HPET Table

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

3.3.4 IDE Configuration



OnBoard SATA Controller

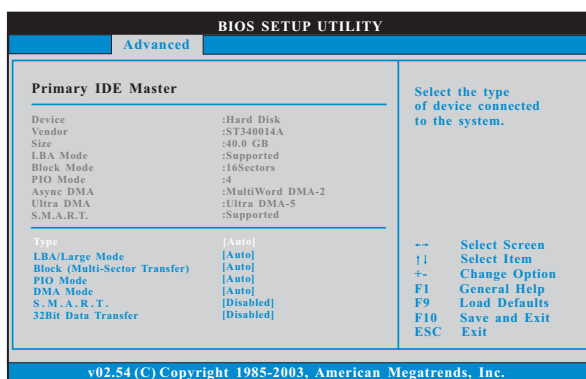
Use this item to enable or disable the "OnBoard SATA Controller" feature.

SATA Operation Mode

Use this item to adjust SATA Operation Mode. The default value of this option is [non-RAID]. If you want to operate RAID function on SATA / SATAII HDDs, please select [RAID]. Configuration options: [RAID], [non-RAID], [AHCI].

IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the "Primary IDE Master" as the example in the following instruction, which can be applied to the configurations of "Primary IDE Slave" as well.



TYPE

Use this item to configure the type of the IDE device that you specify. Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

[Not Installed]: Select [Not Installed] to disable the use of IDE device.

[Auto]: Select [Auto] to automatically detect the hard disk drive.



After selecting the hard disk information into BIOS, use a disk utility, such as FDISK, to partition and format the new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

[CD/DVD]: This is used for IDE CD/DVD drives.

[ARMD]: This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

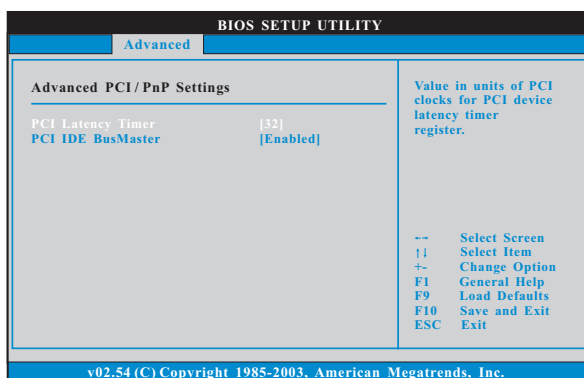
S.M.A.R.T.

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

32-Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

3.3.5 PCIPnP Configuration



PCI Latency Timer

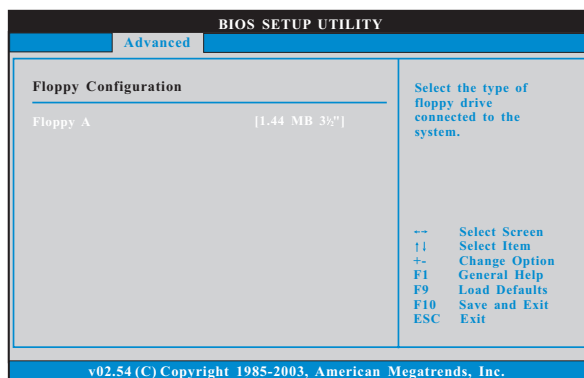
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

PCI IDE BusMaster

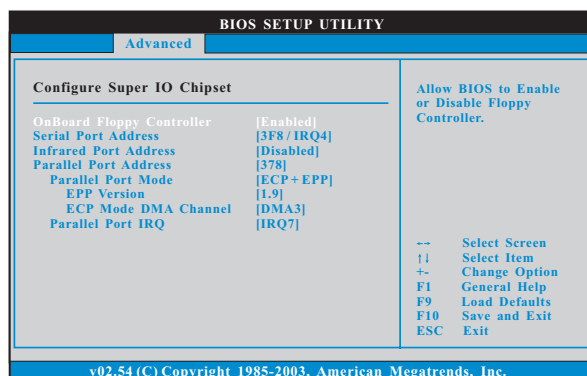
Use this item to enable or disable the PCI IDE BusMaster feature.

3.3.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



3.3.7 Super IO Configuration



OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

Serial Port Address

Use this item to set the address for the onboard serial port or disable it.

Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it.

Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].

Parallel Port Address

Use this item to set the address for the onboard parallel port or disable it.

Configuration options: [Disabled], [378], and [278].

Parallel Port Mode

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

EPP Version

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

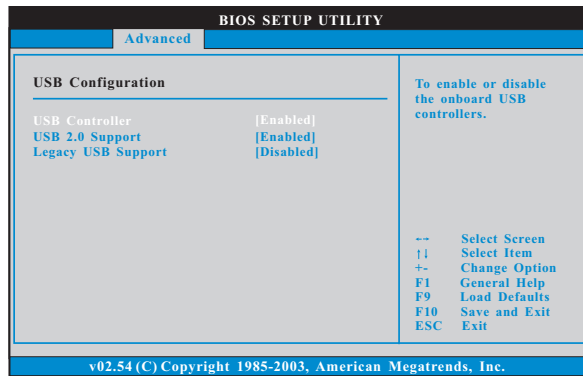
ECP Mode DMA Channel

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

Parallel Port IRQ

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

3.3.8 USB Configuration



USB Controller

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

USB 2.0 Support

Use this item to enable or disable the USB 2.0 support.

Legacy USB Support

Use this item to enable or disable the support to emulate legacy I/O devices such as mouse, keyboard,... etc. Or you may select [Auto] so that the system will start to auto-detect; if there is no USB device connected, "Auto" option will disable the legacy USB support.

3.4 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.

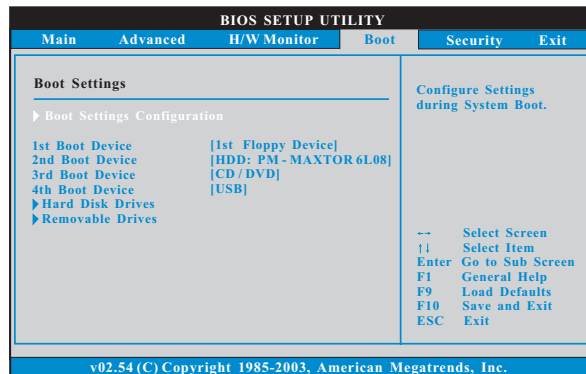
BIOS SETUP UTILITY					
Main	Advanced	H/W Monitor	Boot	Security	Exit
Hardware Health Event Monitoring			Target Fan Speed		
CPU Temperature	:	37°C / 98°F	Fast		
M/B Temperature	:	31°C / 87°F	Middle		
CPU Fan Speed	:	3400 RPM	Slow		
Chassis Fan Speed	:	N/A			
Vcore	:	1.629V	--	Select Screen	
+ 3.30V	:	3.306V	F1	Select Item	
+ 5.00V	:	5.067V	F1	General Help	
+ 12.00V	:	11.890V	F9	Load Defaults	
CPU Quiet Fan	:	[Disabled]	F10	Save and Exit	
			ESC	Exit	

CPU Quiet Fan

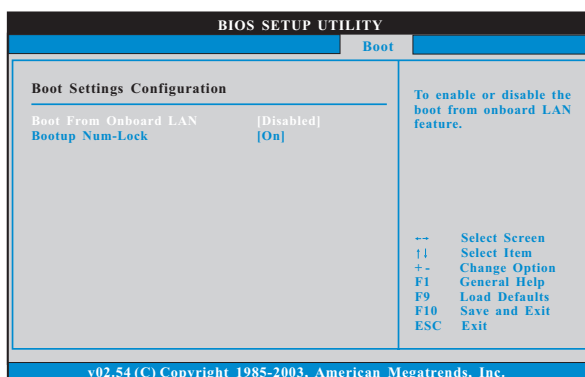
This item allows you to identify the temperature of CPU fan. Configuration options: [Disabled] and [Enabled]. The default value is [Disabled]. You are allowed to enable this function only when you install 4-pin CPU fan.

3.5 Boot Screen

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



3.5.1 Boot Settings Configuration



Boot From Onboard LAN

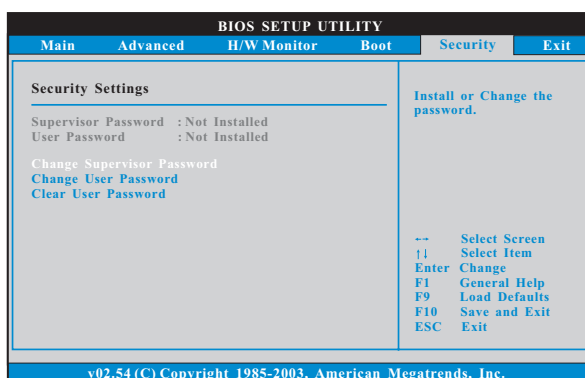
Use this item to enable or disable the Boot From Onboard LAN feature.

Boot Up Num-Lock

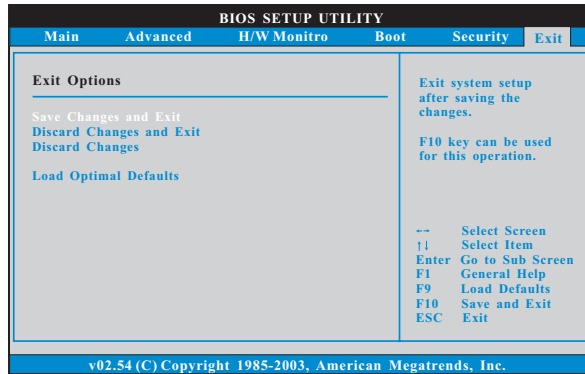
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

3.6 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.



3.7 Exit Screen



Save Changes and Exit

When you select this option, it will pop-out the following message, “Save configuration changes and exit setup?” Select [OK] to save the changes and exit the BIOS 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 BIOS 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 Optimal Defaults

When you select this option, it will pop-out the following message, “Load optimal defaults?” Select [OK] to load the default values for all the setup configurations.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 2000 / XP / XP 64-bit / Vista™ / Vista™ 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 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 file "ASSETUP.EXE" from the BIN folder in the Support CD to display 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 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.