P5QD Turbo

Motherboard

E4875

First Edition (V1)
July 2009

Contents

Contents

Contents

Contents

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

> The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

REACH

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at http://green.asus.com/english/REACH.htm.

> **DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

> **DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

- The optical S/PDIF is an optional component (may or may not be included in your motherboard) and is defined as a CLASS 1 LASER PRODUCT.

> INVISIBLE LASER RADIATION, AVOID EXPOSURE TO BEAM.

- Never dispose of the battery in fire. It could explode and release harmful substances into the environment.

- Never dispose of the battery with your regular household waste. Take it to a hazardous material collection point.

- Never replace the battery with an incorrect battery type.

> - RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
> - DISPOSE OF USED BATTERIES ACCORDING TO THE ABOVE BATTERY-RELATED INSTRUCTIONS.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

> This motherboard should only be used in environments with ambient temperatures between 5°C (41°F) and 40°C (104°F).

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

    This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

    This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: BIOS setup**

    This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

- **Chapter 4: Software support**

    This chapter describes the contents of the support DVD that comes with the motherboard package and the software.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

    The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

    Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
*Italic*s	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1> + <Key2> + <Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).
	Example: <Ctrl> + <Alt> + <Del>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.
	Example: At the DOS prompt, type the command line:
	`afudos /iP5QDT.ROM`

P5QD Turbo specifications summary

CPU	LGA775 socket for Intel® Core™2 Extreme / Core™2 Quad / Core™2 Duo / Pentium® dual-core / Celeron® dual-core / Celeron® processors Supports Intel® 45nm multi-core CPUs
Chipset	Intel® P45 / ICH10R with Intel® Fast Memory Access (FMA) Technology
System bus	1600 / 1333 / 1066 / 800 MHz
Memory	4 x DIMM, max. 16 GB, DDR2 1300 / 1200 / 1066 / 800 / 667 MHz, non-ECC, un-buffered memory Dual channel memory architecture * Refer to www.asus.com or user manual for the Memory QVL (Qualified Vendors Lists). ** When you install a total memory of 4 GB capacity or more, Windows® 32-bit operating system may only recognize less than 3 GB. We recommend using a maximum of 3 GB system memory if you are using a Windows® 32-bit OS.
Expansion slots	1 x PCI Express 2.0 x16 slot 3 x PCI Express x1 slots 2 x PCI slots
Storage	**Intel® ICH10R Southbridge:** - 5 x SATA 3.0 Gb/s ports - Intel® Matrix Storage Technology with RAID 0, 1, 5, and 10 support **JMicron® JMB361 SATA and PATA controller:** - 1 x UltraDMA 133 / 100 / 66 for up to 2 PATA devices - 1 x External SATA 3.0 Gb/s port (SATA On-the-Go) **Silicon Image® Sil5723 controller (Drive Xpert technology):** - 2 x SATA 3.0 Gb/s ports - Supports EZ Backup and Super Speed functions * Drive Xpert function is available only when the hard disk dirves are set as data drives.
LAN	Atheros® L1E Gigabit LAN controller featuring AI NET 2
Audio	VIA® VT1708S 8-channel High Definition Audio CODEC - Supports Jack-Detection and Multi-Streaming - Optical S/PDIF Out port at back I/O - ASUS Noise Filter
IEEE 1394	VIA® VT6315N controller supports 2 x IEEE 1394a ports (one at midboard; one at back panel)
USB	12 x USB 2.0/1.1 ports (6 ports at midboard; 6 ports at back panel)

(continued on the next page)

P5QD Turbo specifications summary

ASUS special features	**ASUS Exclusive Features:** - ASUS 8-Phase Power Design - ASUS Express Gate **ASUS Power Saving Solutions:** - ASUS EPU **ASUS Quiet Thermal Solutions:** - ASUS Fanless Design: Stylish heatsink solution - ASUS Fan Xpert **ASUS EZ DIY** - ASUS Drive Xpert - ASUS CrashFree BIOS 3 - ASUS Q-Shield - ASUS Q-Connector - ASUS O.C. Profile - ASUS EZ Flash 2
Other features	100% High-quality conductive polymer capacitors 2oz Copper PCB ASUS MyLogo 2™
ASUS exclusive overclocking features	**Intelligent overclocking tools:** - AI Overclocking (intelligent CPU frequency tuner) - TurboV - Turbo Key **Precision Tweaker 2:** - vCore: Adjustable CPU voltage at 0.00625V increment - vDIMM: 64-step DRAM voltage control - vChipset: 55-step chipset voltage control - vCPU PLL: 64-step CPU PLL voltage control - vFSB Termination: 35-step reference voltage control **SFS (Stepless Frequency Selection):** - FSB tuning from 200 MHz up to 800 MHz at 1 MHz increment - PCI Express frequency tuning from 100 MHz to 180 MHz at 1 MHz increment **Overclocking protection:** - ASUS C.P.R. (CPU Parameter Recall)
Back panel I/O ports	1 x PS/2 keyboard port (purple) 1 x PS/2 mouse port (green) 1 x Optical S/PDIF Out port 1 x IEEE 1394a port 1 x External SATA port 1 x LAN (RJ-45) port 6 x USB 2.0/1.1 ports 8-channel Audio I/O ports

P5QD Turbo specifications summary

Internal I/O connectors	3 x USB connectors support additional 6 USB ports 1 x IDE connector 1 x COM connector 5 x SATA connectors (red) 2 x Drive Xpert SATA connectors (orange and white) 1 x CPU Fan connector 2 x Chassis Fan connectors 1 x Power Fan connector 1 x IEEE1394a connector Front panel audio connector 1 x S/PDIF Out header Chassis Intrusion connector CD audio in 24-pin ATX Power connector 8-pin ATX 12V Power connector System Panel (Q-Connector)
BIOS features	8 Mb AMI BIOS, PnP, DMI 2.0, WfM 2.0, SM BIOS 2.5, ACPI 3.0, ASUS EZ Flash 2, ASUS CrashFree BIOS 3
Manageability	WOL by PME, WOR by PME, WOR by Ring, PXE
Support DVD contents	Drivers Express Gate ASUS PC Probe II ASUS Update ASUS AI Suite Anti-virus software (OEM version)
Form factor	ATX form factor: 12 in. x 9.2 in. (30.5 cm x 23.4 cm)

*Specifications are subject to change without notice.

Chapter 1

1.1　Welcome!
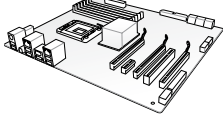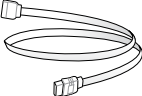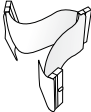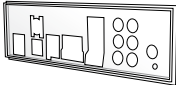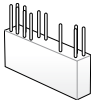
Thank you for buying an ASUS® P5QD Turbo motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2　Package contents

Check your motherboard package for the following items.

ASUS P5QD Turbo motherboard	User guide	Support DVD
4 x Serial ATA signal cables	1 x Ultra DMA 133/ 100/66 cable	1 x ASUS Q-Shield
1 x ASUS Q-Connector kit		

> • If any of the above items is damaged or missing, contact your retailer.
>
> • The illustrated items above are for reference only. Actual product specifications may vary with different models.

1.3 Special features

1.3.1 Product highlights

LGA775 Intel® Core™2 Processor Ready

This motherboard supports the latest Intel® Core™2 processors in the LGA775 package. It also supports Intel® 45nm multi-core CPUs. With the new Intel® Core™ microarchitecture and 1600 / 1333 / 1066 / 800 MHz FSB, Intel® Core™2 processor is one of the most powerful and energy efficient CPU in the world.

Intel® P45 Chipset

The Intel® P45 Chipset supports dual-channel DDR2 800/667 MHz memory architecture, 1333/1066/800 MHz FSB (Front Side Bus), PCIe 2.0, and multi-core CPUs. It especially includes Intel® Fast Memory Access technology that significantly optimizes the use of available memory bandwidth and reduces the latency of the memory accesses.

Dual-Channel DDR2 1300 support

The motherboard supports DDR2 memory that features data transfer rates of 1300 /1200 / 1066 / 800 / 667 MHz to meet the higher bandwidth requirements of the latest operation system, 3D graphics, multimedia, and Internet applications. The dual-channel DDR2 architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 20.8 GB/s.

100% high-quality conductive polymer capacitors

This motherboard uses all high-quality conductive polymer capacitors for durability, improved lifespan, and enhanced thermal capacity.

Green ASUS

This motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS). This is in line with the ASUS vision of creating environment-friendly and recyclable products/packaging to safeguard consumers' health while minimizing the impact on the environment.

1.3.2 ASUS special features

ASUS 8-Phase Power Design

With power efficiency so important to operating temperatures, ASUS 8-Phase VRM design leads the industry with its 96% power efficiency. High quality power components such as low RDS (on) MOSFETs for minimum switching loss & lower temperatures, Ferrite core chokes with lower hysteresis loss, and high quality Japanese-made conductive polymer capacitors all add up to ensure longer component life and lower power loss—creating more energy efficiency.

Express Gate

Taking only 5 seconds to bootup, Express Gate is the one-stop gateway to instant fun! It's a unique motherboard built-in OS. You can utilize the most popular Instant Messengers (IM) like MSN, Skype, Google talk, QQ, and Yahoo! Messenger to keep in touch with friends, or quickly check on the weather and e-mails just before leaving your house. What's more, the user-friendly picture manager lets you view your pictures without entering Windows at anytime!

The actual boot time is subject to hardware configurations and product models.

ASUS Power Saving Solution

ASUS Power Saving solution intelligently and automatically provides balanced computing power and energy consumption.

ASUS EPU

The ASUS EPU (Energy Processing Unit) provides total system power management by detecting current PC loadings and intelligently moderating power usage for critical PC components in real-time–helping save power and money!

ASUS Quiet Thermal Solutions

ASUS Quiet Thermal solutions make the system more stable and enhance the overclocking capability.

Fanless Design—Unique stylish heatsink

The brand new 2-color heatsink features 0-dB thermal solution that offers users a noiseless PC environment. The Paten Pending 2-color design within the beautifully curved fins upgrades the visual enjoyment for the motherboard users, and also effectively cools down hot airflows generated by the north bridge chipset. Combined with usability and aesthetics, the ASUS Patent 2-color Wing heatsink will give users an extremely silent and cooling experience with the elegant appearance!

Fan Xpert

ASUS Fan Xpert intelligently allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures caused by different climate conditions in different geographic regions and your PC's loading. The built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

ASUS EZ DIY

ASUS EZ DIY feature collection provides you with easy ways to install computer components, update the BIOS, or back up your favorite settings.

ASUS Drive Xpert

Without drivers or BIOS setups, the ASUS exclusive Drive Xpert is ideal for anyone who needs to secure data on their hard drives or enhance hard drive performances without the hassles of complicated configurations. With Drive Xpert's user-friendly graphical user interface, you can easily arrange hard drive backups or enhance their hard drive transfer rates - ensuring that data is looked after every moment, every day.

ASUS CrashFree BIOS 3

ASUS CrashFree BIOS 3 allows you to restore corrupted BIOS data from a USB flash disk containing the BIOS file. This protection eliminates the need to buy a replacement ROM chip.

ASUS Q-Shield

ASUS Q-Shield's special design makes it convenient and easy to install on your motherboard. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against Electronic Magnetic Interference (EMI).

ASUS Q-Connector

ASUS Q-Connector allows you to easily connect or disconnect the chassis front panel cables to the motherboard. This unique module eliminates the trouble of connecting the system panel cables one at a time and avoiding wrong cable connections.

ASUS EZ Flash 2

ASUS EZ Flash 2 is a user-friendly utility that allows you to update the BIOS without using a bootable floppy disk or an OS-based utility.

ASUS O.C. Profile

The motherboard features the ASUS O.C. Profile that allows you to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving you the freedom to share and distribute your favorite settings.

1.3.3   ASUS exclusive overclocking features

TurboV

Feel the adrenaline rush of real-time OC—now a reality with the ASUS TurboV. This easy OC tool allows you to overclock without exiting or rebooting the OS; and its user-friendly interface makes overclock with just a few clicks away. Moreover, the ASUS OC profiles in TurboV provides the best O.C. settings in different scenarios.

Turbo Key

ASUS Turbo Key allows you to turn the PC power button into a physical overclocking button. After the easy setup, Turbo Key can boost performances without interrupting ongoing work or games, simply through pressing the button

Precision Tweaker 2

Allows you to adjust the CPU voltage in 0.00625v steps and NB/DRAM voltage in 0.02v steps to fine-tune voltage to achieve the most precise setting for the ultimate overclocking configuration.

C.P.R. (CPU Parameter Recall)

The BIOS C.P.R. feature automatically restores the CPU default settings when the system hangs due to overclocking failure. C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and the BIOS automatically restores the CPU parameters to their default settings.

Chapter 2

2.1 Before you proceed

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

- Unplug the power cord from the wall socket before touching any component.
- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the ATX power supply 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, or components.

Onboard LED

The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

P5QD TURBO Onboard LED

SB_PWR

ON
Standy Power

OFF
Powered Off
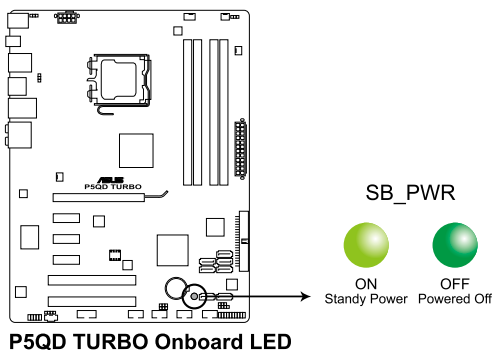
2.2 Motherboard overview

2.2.1 Motherboard layout
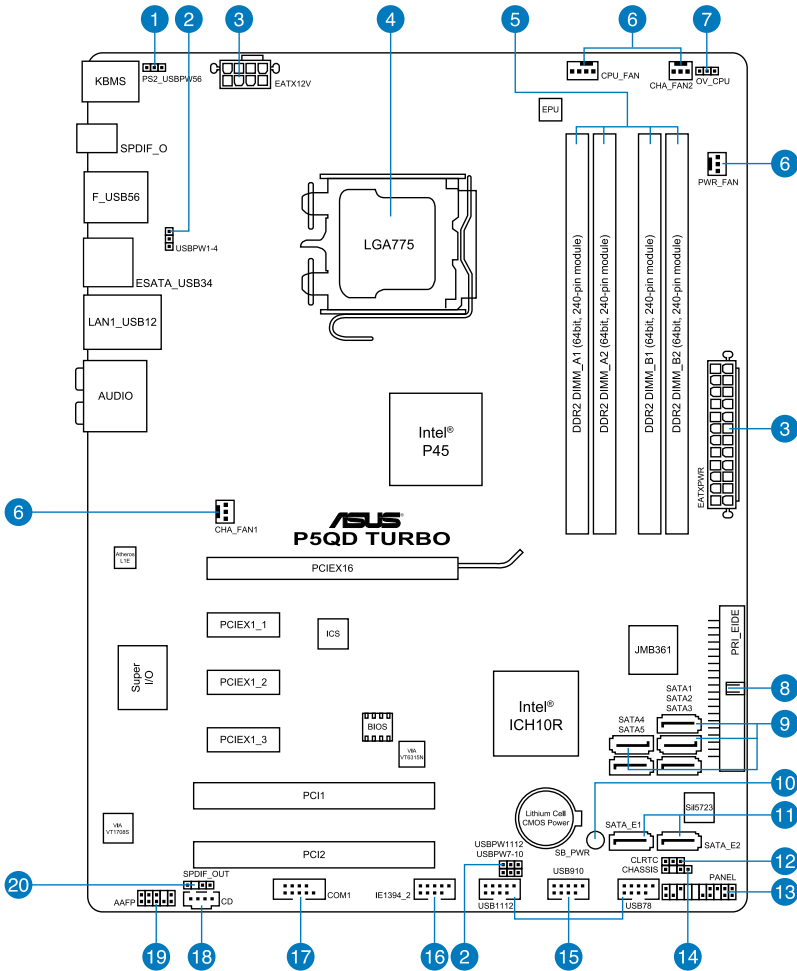
Chapter 2

2.2.2 Layout contents

Connectors/Jumpers/Slots		Page
1.	Keyboard/mouse power (3-pin PS2_USBPW56)	2-24
2.	USB device wake-up (3-pin USBPW1-4, USBPW7-10, USBPW1112)	2-24
3.	ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	2-35
4.	LGA775 CPU socket	2-5
5.	DDR2 DIMM slots	2-10
6.	CPU, chassis, and power fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1–2, 3-pin PWR_FAN)	2-33
7.	CPU overvoltage setting (3-pin OV_CPU)	2-22
8.	IDE connector (40-1 pin PRI_EIDE)	2-25
9.	ICH10R Serial ATA connectors (7-pin SATA1–5 [Red])	2-29
10.	Standby power LED (SB_PWR)	2-1
11.	Silicon Image® Sil5723 Serial ATA RAID connectors (7-pin SATA_E1 [orange, port 0], 7-pin SATA_E2 [white, port 1])	2-30
12.	Clear RTC RAM (3-pin CLRTC)	2-21
13.	System panel connector (20-8 pin PANEL)	2-37
14.	Chassis intrusion connector (4-1 pin CHASSIS)	2-34
15.	USB connectors (10-1 pin USB78, USB910, USB1112)	2-31
16.	IEEE 1394a port connector (10-1 pin IE1394_2)	2-32
17.	Serial port connector (10-1 pin COM1)	2-32
18.	Optical drive audio connector (4-pin CD)	2-31
19.	Front panel audio connector (10-1 pin AAFP)	2-36
20.	Digital audio connector (4-1 pin SPDIF_OUT)	2-34

Chapter 2

2.2.3 Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

2.2.4 Screw holes

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

DO NOT overtighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis
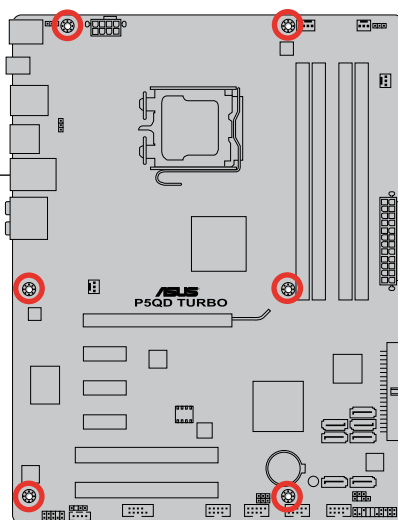
2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel®
Core™2 Extreme / Core™2 Quad / Core™2 Duo / Pentium® Dual-Core / Celeron® Dual-Core
/ Celeron® processors.

> • Ensure that all power cables are unplugged before installing the CPU.
>
> • If installing a dual-core CPU, connect the chassis fan cable to the CHA_FAN1 connector to ensure system stability.
>
> • Due to the chipset limitation, we recommend that you use FSB 800MHz CPU or above.

> • Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
>
> • Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.
>
> • The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.3.1   Installing the CPU

To install a CPU:

1.   Locate the CPU socket on the motherboard.
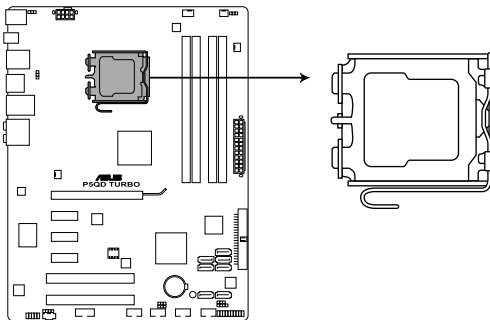
P5QD TURBO CPU socket 775

> Before installing the CPU, ensure that the cam box is facing towards you and the load lever is on your left.

2.   Press the load lever with your thumb
      (A), then move it to the left (B) until it is
      released from the retention tab.

      ⚠ To prevent damage to the socket pins,
         do not remove the PnP cap unless
         you are installing a CPU.
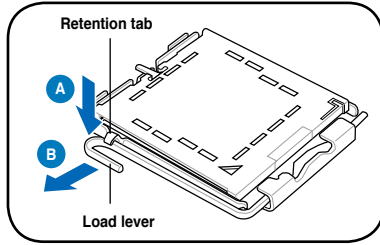
3.   Lift the load lever in the direction of the
      arrow to a 135º angle.

4.   Lift the load plate with your thumb and
      forefinger to a 100º angle (4A), then
      push the PnP cap from the load plate
      window to remove (4B).
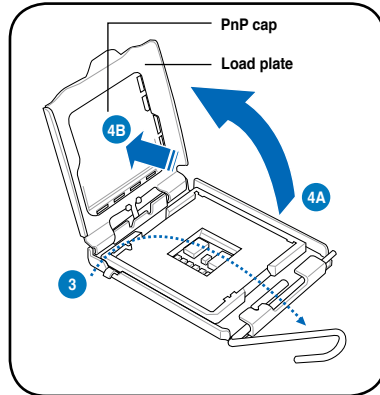
5.   Position the CPU over the socket,
      ensuring that the gold triangle is on the
      bottom-left corner of the socket, and then
      fit the socket alignment key into the CPU
      notch.

      ⚠ The CPU fits in only one correct
         orientation. DO NOT force the CPU
         into the socket to prevent bending
         the connectors on the socket and
         damaging the CPU!
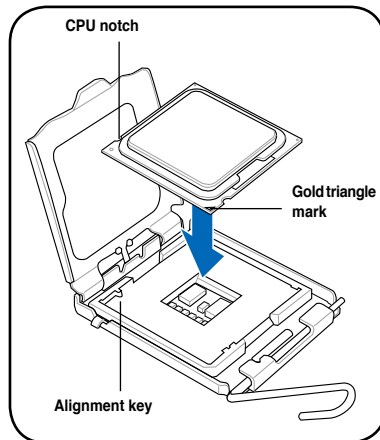
6. Apply some Thermal Interface Material to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.

Some heatsinks come with pre-applied thermal paste. If so, skip this step.
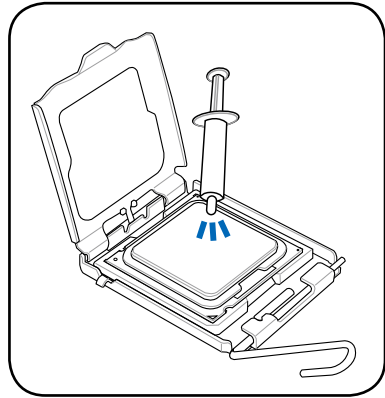
The Thermal Interface Material is toxic and inedible. DO NOT eat it. If it gets into your eyes or touches your skin, wash it off immediately, and seek professional medical help.

To prevent contaminating the paste, DO NOT spread the paste with your finger directly.

7. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.
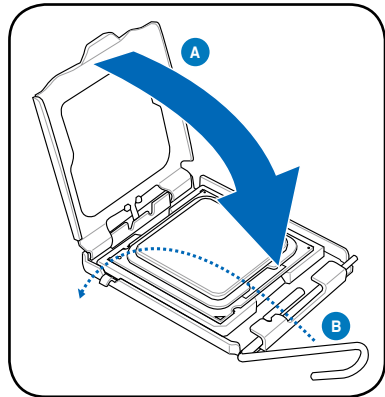
2.3.2 Installing the CPU heatsink and fan

The Intel® LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

> • When you buy a boxed Intel® processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, ensure that you use only Intel®-certified multi-directional heatsink and fan.
>
> • Your Intel® LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install.

> Ensure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.

> If you purchased a separate CPU heatsink and fan assembly, ensure that the Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, ensuring that the four fasteners match the holes on the motherboard.

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
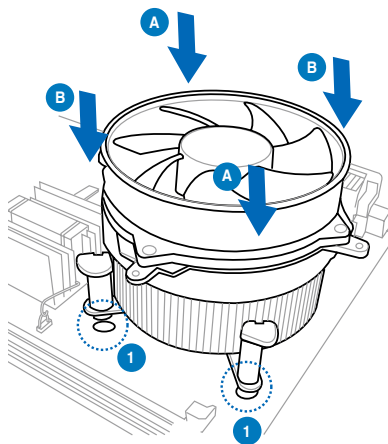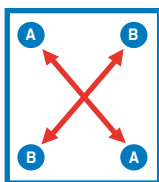
> Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

3. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.

CPU_FAN

CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND

P5QD TURBO CPU fan connector
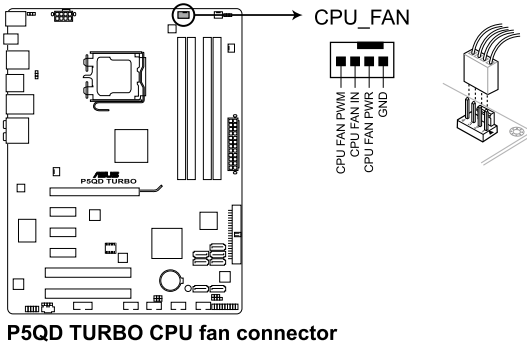
DO NOT forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

2.3.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise.
3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.

A   B

B   A
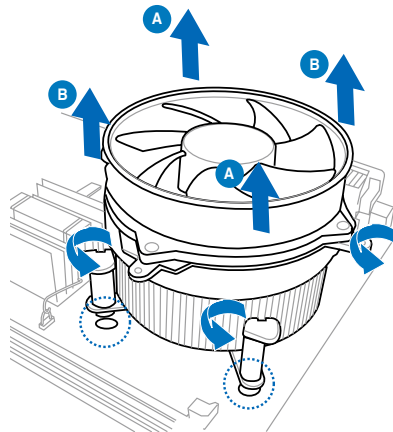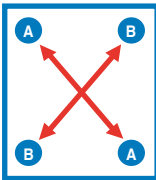
4. Carefully remove the heatsink and fan assembly from the motherboard.

2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:

P5QD TURBO 240-pin DDR2 DIMM sockets
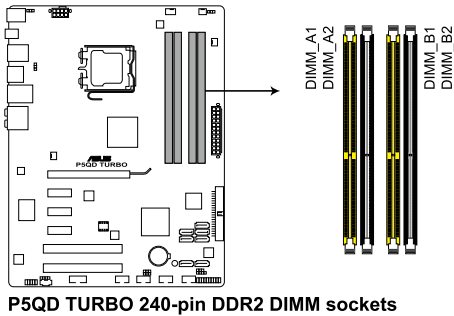
Recommended memory configurations

One DIMM:

You may install one memory module in any slot as a single-channel operation.

Two DIMMs (dual-channel operation):
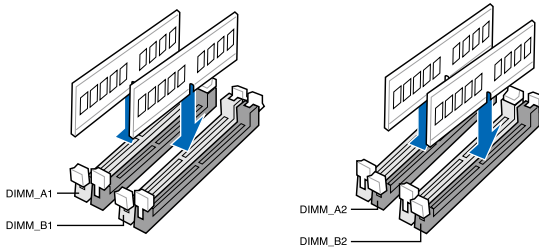
Four DIMMs (dual-channel operation):
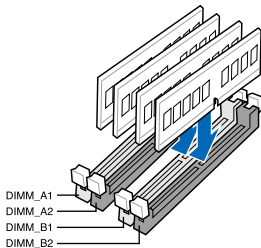
2.4.2 Memory configurations

You may install 512MB, 1GB, 2GB and 4GB unbuffered ECC and non-ECC DDR2 DIMMs into the DIMM sockets.

- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- We recommend that you install the memory modules from the yellow slots for better overclocking capability.

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.

- Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - Use a maximum of 3GB system memory if you are using a 32-bit Windows OS.
  - Install a 64-bit Windows OS when you want to install 4GB or more on the motherboard.

- This motherboard does not support DIMMs made up of 256 megabit (Mb) chips or less.

- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, see section **3.5 Ai Tweaker menu** for manual memory frequency adjustment.

- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-1300 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
Team	TXDD1024M1300HC6	1024MB	DS	N/A	Heat-Sink Package	6-6-6-18	2.35-2.45	V		

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-1200 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
KINGSTON	KHX9600D2K2/2G	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package		2.3-2.35	V		

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-1066 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
Apacer	BoxP/N:CH.02GAF.C0KK2 (78.0AG9S.9KF)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15		V	V	V
Apacer	BoxP/N:CH.04GAF.F0KK2 (78.AAGAL.9KF)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15		V	V	V
CORSAIR	BoxP/N:TWIN2X4096-8500C5DF (CM2X2048-8500C5D)(EPP)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.1	V	V	V
Crucial	BL12864AA106A.8FE5 (EPP)	1024MB	SS	N/A	Heat-Sink Package	5-5-5-15	2.0	V	V	V
Crucial	BL12864AA1065.16FD5 (EPP)	1024MB	DS	N/A	Heat-Sink Package	5		V	V	V
G.SKILL	F2-8500CL5S-1GBPK	1024MB	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	V	V	V
G.SKILL	F2-8500CL5D-2GBPK	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	V	V	V
G.SKILL	F2-8500CL5D-4GBPK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	V		
GEIL	GB22GB8500C5DC	2048MB(Kit of 2)	SS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	V	V	V
GEIL	GE22GB1066C5DC	2048MB(Kit of 2)	SS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	V	V	V
GEIL	GE24GB1066C5QC	4096MB(Kitof4)	SS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	V	V	V
GEIL	GB24GB8500C5DC	4096MB(Kit of 2)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	V	V	V
GEIL	GE24GB1066C5DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	V	V	V
GEIL	GX24GB8500C5UDC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.2-2.4	V	V	V
GEIL	GB24GB8500C5QC	4096MB(Kitof4)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	2.2-2.4	V	V	V
Hynix	HYMP564U64FP8-G7	512MB	SS	HYNIX	HY5PS12821FFP-G7	7		V	V	V
Hynix	HYMP 512U64FP8-G7	1024MB	DS	HYNIX	HY5PS12821FFP-G7	7-7-7-12		V	V	V
KINGMAX	KLED48F-A8KI5-EPA	1024MB	DS	KINGMAX	KKA8FEIBF-HJK-18A			V	V	V
KINGSTON	KHX8500D2/ 512	512MB	SS					V	V	V
KINGSTON	KHX8500D2K2/1G	1024MB(Kit of 2)	SS	N/A	Heat-Sink Package		2.2	V	V	V
KINGSTON	KHX8500D2/1G	1024MB	DS	N/A	Heat-Sink Package		2.2	V	V	V
KINGSTON	KVR1066D2N7/1G	1024MB	DS	ELPIDA	E5108AJBG-1J-E	1066-5-5-5-15	1.8	V	V	V
KINGSTON	KHX8500D2K2/2G	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package		2.2	V	V	V
KINGSTON	KHX8500D2K2/2GN (EPP)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package		2.2	V	V	V
MICRON	MT8HTF12864AY-1GAE1	1024MB	SS	MICRON	D9JKH	7		V	V	V
MICRON	MT16HTF25664AY-1GAE1	2048MB	DS	MICRON	D9JKH	7		V	V	V

Chapter 2

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-1066 MHz capability (cont.)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
OCZ	OCZ2N10662GK(EPP)	2048MB(Kit of 2)	DS		Heat-Sink Package			V	V	V
OCZ	OCZ2N1066SR2GK(EPP)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	2.10	V	V	V
OCZ	OCZ2RPR10664GK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	2.2	V	V	V
SAMSUNG	M378T2953GZ3-CF8	1024MB	DS	SAMSUNG	K4T51083QG	7		V	V	V
Transcend	TX1066QLU-2GK	2048MB(Kit of 2)	SS	ELPIDA	Heat-Sink Package	5		V	V	V
Transcend	TX1066QLU-4GK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5		V	V	V
Aeneon	BoxP/N:AXT760UD00-19D-K-2G (AXT760UD00-19D)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5		V	V	V
BUFFALO	FSX1066D2C-1G	1024MB	DS	N/A	Heat-Sink Package	5-5-5-15 (800-5-5-5-15)		V	V	V
BUFFALO	FSX1066D2C-K4G	2048MB	DS	N/A	Heat-Sink Package	5-5-5-15		V	V	V
Elixir	M2Y1G64TU8HC4B-BD	1024MB	DS	Elixir	N2TU 51280CE-BD	6		V	V	V
Kingbox	N/A	1024MB	DS	MICRON	7YDI2		1.8	V	V	V
Mushkin	996535	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-4-12		V	V	
Mushkin	996612	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.1		V	V
Mushkin	996619	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	2.0-2.1	V	V	V

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-800 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
A-DATA	M2OAD6H3J4171Q1E52	2048MB	DS	A-DATA	AD20908A8A-25EG			V	V	V
Apacer	78.91G9I.9K5	512MB	SS	APACER	AM4B5708JQJS8E	5		V	V	V
Apacer	78.01GA0.9K5	1024MB	SS	APACER	AM4B5808CQJS8E	5		V	V	V
Apacer	78.A1GA0.9K4	2048MB	DS	APACER	AM4B5808CQJS8E	5		V	V	
CORSAIR	CM2X1024-6400C4	1024MB	DS	N/A	Heat-Sink Package	4	1.9	V		V
CORSAIR	BoxP/N:TWIN2X4096-6400C4DHX (CM2X2048-6400C4DHX)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.10	V	V	V
CORSAIR	BoxP/N:TWIN2X4096-6400C5 (CM2X2048-6400C5)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-18	1.80	V	V	V
CORSAIR	BoxP/N:TWIN2X4096-6400C5DHX (CM2X2048-6400C5DHX)	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-18	1.80	V	V	V
Crucial	BL12864AA80A.8FE5(EPP)	1024MB	SS	N/A	Heat-Sink Package	4-4-4-12	2.0	V	V	V
Crucial	BL12864AA804.16FD3	1024MB	DS	N/A	Heat-Sink Package	4	2.2	V	V	V
Crucial	BL12864AA804.16FD	1024MB	DS	N/A	Heat-Sink Package	4	2.2	V	V	V
Crucial	BL12864AL804.16FD3	1024MB	DS	N/A	Heat-Sink Package	4	2.2	V	V	V
Crucial	BL25664AA80A.16FE5(EPP)	2048MB	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	V	V	V
ELPIDA	EBE10EE8ABFA-8E-E	1024MB	SS	ELPIDA	E1108AB-8E-E(ECC)	5	1.7-1.9	V		
G.SKILL	F2-6400CL5D-1GBNQ	1024MB(Kit of 2)	SS	N/A	Heat-Sink Package	5-5-5-15	1.8-2.0	V	V	V
G.SKILL	F2-6400CL4D-2GBPK	1024MB	DS		Heat-Sink Package	4		V	V	V
G.SKILL	F2-6400CL5D-2GBNQ	1024MB	DS		Heat-Sink Package	5		V	V	V
G.SKILL	F2-6400PHU2-2GBNR	1024MB	DS		Heat-Sink Package	5		V	V	V
G.SKILL	F2-6400CL4D-4GBPK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4	2.0-2.1	V	V	V
G.SKILL	F2-6400CL5D-4GBPQ	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	1.8-1.9	V	V	V
G.SKILL	F2-6400CL6D-4GBMQ	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	6	1.8-1.9	V	V	V
G.SKILL	F2-6400CL6D-8GBMQ	8192MB(Kit of 2)	DS	N/A	Heat-Sink Package	6-6-6-18	1.8	V	V	V
GEIL	GB22GB6400C4DC	2048MB(Kit of 2)	DS	GEIL	GL2L64M088BA30EB	4-4-4-12	2.0	V	V	V
GEIL	GB22GB6400C5DC	2048MB(Kit of 2)	DS	GEIL	GL2L64M088BA30EB	5	1.8	V	V	V
GEIL	GE22GB800C4DC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	V	V	V
GEIL	GE22GB800C5DC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V
GEIL	GX22GB6400DC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-800 MHz capability (cont.)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
GEIL	GX22GB6400UDC	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.1	V	V	V
GEIL	GX22GB6400C4USC	2048MB	DS	N/A	Heat-Sink Package			V	V	V
GEIL	GX22GB6400LX	2048MB	DS	N/A	Heat-Sink Package	5-5-5-15		V	V	V
GEIL	GB24GB6400C4DC	4096MB(Kit of 2)	DS	GEIL	GL2L128M88BA25AB	4-4-4-12	2.0	V	V	V
GEIL	GB24GB6400C5DC	4096MB(Kit of 2)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	1.8	V	V	V
GEIL	GB24GB6400C5QC	4096MB(Kit of 2)	DS	GEIL	GL2L64M088BA30EB	5-5-5-15	1.8	V	V	V
GEIL	GE24GB800C4DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	V	V	V
GEIL	GE24GB800C5DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V
GEIL	GX24GB6400DC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V
GEIL	GB24GB6400C4QC	4096MB(Kitof4)	DS	GEIL	GL2L64M088BA30EB	4-4-4-12	2.0	V	V	V
GEIL	GE24GB800C4QC	4096MB(Kitof4)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	V	V	V
GEIL	GE24GB800C5QC	4096MB(Kitof4)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V
GEIL	GB28GB6400C4QC	8192MB(Kitof4)	DS	GEIL	GL2L128M88BA25AB	4-4-4-12	2.0	V	V	V
GEIL	GB28GB6400C5QC	8192MB(Kitof4)	DS	GEIL	GL2L128M88BA25AB	5-5-5-15	1.8	V	V	V
GEIL	GE28GB800C4QC	8192MB(Kitof4)	DS	N/A	Heat-Sink Package	4-4-4-12	2.0	V	V	V
GEIL	GE28GB800C5QC	8192MB(Kitof4)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V
Hynix	HYMP564U64CP8-S5	512MB	SS	HYNIX	HY5PS12821CFP-S5	5	1.8	V	V	V
Hynix	HYMP112U64CP8-S6	1024MB	SS	HYNIX	HY5PS1G831CFP-S6	6		V	V	V
Hynix	HYMP 512U64CP8-S5	1024MB	DS		HY5PS12821CFP-S5	5		V		
KINGMAX	KLDC28F-A8KI5	512MB	SS	KINGMAX	KKA8FEIBF-HJK-25A			V	V	V
KINGMAX	KLDD48F-ABKI5	1024MB	DS	KINGMAX	KKA8FEIBF-HJK-25A			V	V	V
KINGMAX	KLDE88F-BBKB5	2048MB	DS	KINGMAX	KKB8FFBXF-CFA-25A			V	V	V
KINGSTON	KVR800D2N5/ 512	512MB	SS	ELPIDA	E5108AJBG-8E-E		1.8	V	V	V
KINGSTON	KVR800D2N6/ 512	512MB	SS	ELPIDA	E5108AJBG-8E-E		1.8	V	V	V
KINGSTON	KHX6400D2LLK2/1GN(EPP)	1024MB(Kit of 2)	SS	N/A	Heat-Sink Package	4	2.0	V	V	V
KINGSTON	KVR800D2N5/1G	1024MB	SS	KINGSTON	D1288TPFCGL25U	800-5-5-5-15	1.8	V	V	V
KINGSTON	KHX6400D2LL/1G	1024MB	DS	N/A	Heat-Sink Package	4	2.0	V	V	V
KINGSTON	KVR800D2N5/1G	1024MB	DS		V59C1 512804QBF25		1.8	V	V	V
KINGSTON	KVR800D2N6/1G	1024MB	DS	ELPIDA	E5108AJBG-8E-E		1.8	V	V	V
KINGSTON	KHX6400D2LLK2/2GN(EPP)	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package			V		
KINGSTON	KHX6400D2ULK2/2G	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package		2.3-2.35	V	V	
KINGSTON	KHX6400D2/2G	2048MB	DS	N/A	Heat-Sink Package		2.0	V	V	V
KINGSTON	KVR800D2N5/2G	2048MB	DS	ELPIDA	E1108ACBG-8E-E		1.8	V	V	V
KINGSTON	KVR800D2N6/4G	4096MB	DS	ELPIDA	E2108ABSE-8G-E			V	V	V
NANYA	NT 512T64U88B0BY-25C	512MB	SS		NT5TU64M8BE-25C	5		V	V	V
NANYA	NT1GT64U8HB0BY-25C	1024MB	DS		NT5TU64M8BE-25C	5		V	V	V
NANYA	NT1GT64U8HCOBY-25D	1024MB	DS	NANYA	NT5TU64M8CE-25D			V	V	V
NANYA	NT2GT64U8HC0BY-AC	2048MB	DS	NANYA	NT5TU128M8CE-AC	5		V	V	V
OCZ	OCZ2G8001G	1024MB	DS	N/A	Heat-Sink Package	5	1.8	V	V	
OCZ	OCZ2G8002GK	1024MB	DS		Heat-Sink Package	5		V	V	
OCZ	OCZ2T8002GK(EPP)	1024MB	DS	N/A	Heat-Sink Package	5	1.8	V	V	V
OCZ	OCZ2P800R22GK	2048MB(Kit of 2)	DS	N/A	Heat-Sink Package	4	1.8	V	V	V
OCZ	OCZ2P8004GK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-4-4	1.8	V	V	V
OCZ	OCZ2G8008GK	8192MB(Kit of 2)	DS	N/A	Heat-Sink Package	5	1.80	V	V	V
OCZ	OCZ2VU80016GQ	8192MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-6-6 (800-5-5-5-15)	1.8	V	V	V
PSC	AL8E8F73C-8E1	2048MB	DS	PSC	A3R1GE3CFF734MAA0E	5		V	V	V
Qimonda	HYS64T256020EU-2.5-C2	2048MB	DS	Qimonda	HYB18T1G800C2F-2.5	6		V	V	V
Qimonda	HYS64T256020EU-25F-C2	2048MB	DS	Qimonda	HYB18T1G800C2F-25F	5		V	V	V
Qimonda	HYS64T 512020EU-2.5-A	4096MB	DS	Qimonda	HYB18T2G800AF-2.5	6		V	V	V
Qimonda	HYS64T 512020EU-25F-A	4096MB	DS	Qimonda	HYB18T2G800AF-25F	5		V	V	V
SAMSUNG	M378T6553GZS-CF7	512MB	SS	SAMSUNG	K4T51083QG	6		V	V	V
SAMSUNG	M378T2863QZS-CF7	1024MB	SS	SAMSUNG	K4T1G084QQ	6		V	V	V
SAMSUNG	M391T2863QZ3-CF7	1024MB	SS	SAMSUNG	K4T1G084QQ(ECC)	6		V	V	V
SAMSUNG	M378T2953QZ3-CF7	1024MB	DS	SAMSUNG	K4T51083QG	6		V	V	V
SAMSUNG	M378T5663QZ3-CF7	2048MB	DS	SAMSUNG	K4T1G084QQ(ECC)	6		V	V	V

Chapter 2: Hardware information

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-800 MHz capability (cont.)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
SAMSUNG	M391T5663QZ3-CF7	2048MB	DS	SAMSUNG	K4T1G084QQ	6		V	V	V
SAMSUNG	M378T5263AZ3-CF7	4096MB	DS	SAMSUNG	K4T2G084QA-HCF7	6		V	V	V
Super Talent	T800UA12C4	512MB	SS		Heat-Sink Package			V	V	V
Super Talent	T800UB1GC4	1024MB	DS		Heat-Sink Package			V	V	V
Transcend	JM800QLU-1G	1024MB	SS	Transcend	TQ243ECF8	5		V	V	V
Transcend	TS128MLQ64V8U	1024MB	SS	ELPIDA	E1108ACBG-8E-E	5		V	V	V
Transcend	JM800QLU-2G	2048MB	DS	Transcend	TQ243PCF8	5		V	V	V
Transcend	TS256MLQ64V8P	2048MB	DS	ELPIDA	E1108ACBG-BE-E	6-6-6-(800-5-5-5-15)		V	V	V
Transcend	TS256MLQ64V8U	2048MB	DS	ELPIDA	E1108ACBG-8E-E	5		V	V	V
Transcend	TS256MLQ72V8U	2048MB	DS	ELPIDA	E1108ACBG-8E-E(ECC)	5		V	V	V
Aeneon	AET760UD00-25DC08X	1024MB	SS	AENEON	AET03R25DC	5		V	V	V
Aeneon	AET760UD00-25DB97X	1024MB	SS	AENEON	AET93R25DB	5	1.8	V	V	V
Aeneon	AET860UD00-25DC08X	2048MB	DS	AENEON	AET03R25DC	5		V	V	V
Asint	SLY2128M8-JGE	1024MB	SS	Asint	DDRII1208-GE			V	V	V
Asint	SLZ2128M8-JGE	2048MB	DS	Asint	DDRII1208-GE			V	V	V
CENTURY	28V2H8	512MB	SS	HYNIX	HY5PS12821BFP-S5			V	V	
CENTURY	28VOH8	1024MB	DS	HYNIX	HY5PS12821BFP-S5			V	V	
Elixir	M2Y1G64TU88D4B-AC	1024MB	SS	Elixir	N2TU1G80DE-AC	5		V	V	V
Elixir	M2Y1G64TU8HB0B-25C	1024MB	SS	Elixir	N2TU 51280BE-25C	5	1.8	V	V	V
Elixir	M2Y2G64TU8HD4B-AC	2048MB	DS	Elixir	N2TU1G80DE-AC	5		V	V	V
Kingbox	N/A	2048MB	DS	MICRON	D9HNL				V	V
Kingbox	N/A	2048MB	DS	KINGBOX	EPD2128082200E-3				V	V
Mushkin	XP2-6400	1024MB	SS		Heat-Sink Package	4		V	V	V
Oci	04701G16CZ5D2A	1024MB	DS	Jnfinity	64M8PC6400	5		V	V	V
Patriot	PSD2 51280081	512MB	SS	PATRIOT	PM64M8D2BU-25EC			V	V	V
Patriot	PSD21G8002	1024MB	DS	PATRIOT	PM64M8D2BU-25PAC	5			V	
Patriot	PSD22GB002	2048MB	DS	PATRIOT	PM128M8D2BU-25KC	5		V	V	V
Patriot	PDC24G6400LLK	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	4-4-4-12	2.2	V	V	V
Silicon Power	SP001GBLRU800S02	1024MB	SS	S-POWER	10YR9N3	5(5-5-5-15)		V	V	V
Silicon Power	SP002GBLRU800S02	2048MB	DS	S-POWER	10YR9N3	5(5-5-5-15)		V	V	V
UMAX	D48002GP1-73BEB	2048MB	DS	UMAX	U2S24D30TP-8E	800-5-5-5-15		V	V	V

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-667 MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
Apacer	78.91G92.9K5	512MB	SS	APACER	AM4B5708JQJS7E	5		V	V	V
Apacer	78.01G9O.9K5	1024MB	SS	APACER	AM4B5808CQJS7E	5		V	V	V
Apacer	78.A1G9O.9K4	2048MB	DS	APACER	AM4B5808CQJS7E	5		V	V	V
CORSAIR	VS 512MB667D2	512MB	SS	N/A	64M8CFEG	N/A	N/A	V		
CORSAIR	VS1GB667D2	1024MB	DS	N/A	64M8CFEG	N/A	N/A	V		
Crucial	BL6464AA663.8FD	512MB	SS	N/A	Heat-Sink Package	3	2.2	V	V	V
Crucial	BL12864AA663.16FD2	1024MB	DS	N/A	Heat-Sink Package	3	2.2	V	V	V
Crucial	BL12864AA663.16FD	1024MB	DS	N/A	Heat-Sink Package	3	2.2	V	V	V
Crucial	BL12864AL664.16FD	1024MB	DS	N/A	Heat-Sink Package	3	2.2	V	V	V
ELPIDA	EBE51UD8AEFA-6E-E	512MB	SS	ELPIDA	E5108AE-6E-E	5	1.7-1.9	V	V	V
G.SKILL	F2-5400PHU2-2GBNT	2048MB(Kit of 2)	DS	G.Skill	D264M8GCF	5-5-5-15	1.8	V	V	V
G.SKILL	F2-5300CL5D-4GBMQ	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8-1.9	V	V	V
GEIL	GX21GB5300SX	1024MB	DS	N/A	Heat-Sink Package			V	V	V

P5QD Turbo Motherboard Qualified Vendors Lists (QVL)
DDR2-667 MHz capability (cont.)

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing Dimm (Bios)	Voltage	DIMM socket support (Optional) A*	B*	C*
GEiL	GX22GB5300LX	2048MB	DS	N/A	Heat-Sink Package	5-5-5-15		V	V	V
GEiL	GX24GB5300LDC	4096MB(Kit of 2)	DS	N/A	Heat-Sink Package	5-5-5-15	1.8	V	V	V
Hynix	HYMP112U64CP8-Y5	1024MB	SS	HYNIX	HY5PS1G831CFP-Y5	5		V	V	V
Hynix	HYMP 512U64CP8-Y5	1024MB	DS	HYNIX	HY5PS12821CFP-Y5	5	1.8	V	V	V
KINGSTON	KVR667D2N5/ 512	512MB	SS	KINGSTON	D6408TEBGGL3U	5	1.7-1.9	V	V	V
KINGSTON	KVR667D2E5/1G	1024MB	DS	ELPIDA	E5108AGBG-6E-E(ECC)		1.8	V	V	V
KINGSTON	KVR667D2N5/1G	1024MB	DS	KINGSTON	E5108AGBG-6E-E		1.8	V	V	V
KINGSTON	KVR667D2N5/1G	1024MB	DS	ELPIDA	E5108AJBG-8E-E		1.8	V	V	
KINGSTON	KVR667D2N5/1G	1024MB	DS	HYNIX	HY5PS12821CFP-Y5		1.8	V	V	
KINGSTON	KVR667D2E5/2G	2048MB	DS	MICRON	D9HNL(ECC)		1.8	V	V	V
KINGSTON	KVR667D2N5/2G	2048MB	DS	KINGSTON	D1288TPFCGL25U	667-5-5-5-15	1.8	V	V	V
KINGSTON	KVR667D2N5/2G	2048MB	DS	HYNIX	HY5PS1G831CFP-Y5		1.8	V	V	V
NANYA	NT 512T64U88B0BY-3C	512MB	SS	NANYA	NT5TU64M8BE-3C	5	1.8	V	V	V
NANYA	NT2GT64U8HB0JY-3C	2048MB	DS		NT5TU128M8BJ-3C	5		V	V	V
OCZ	OCZ26671024V	1024MB	SS	Ramos	RC1GT084CA0-53EC	5	1.8	V	V	V
Qimonda	HYS64T256020EU-3S-C2	2048MB	DS	Qimonda	HYB18T1GB00C2F-3S	5		V	V	V
SAMSUNG	M378T6553EZS-CE6	512MB	SS	SAMSUNG	K4T51083QE	5		V	V	V
SAMSUNG	M378T2953EZ3-CE6	1024MB	DS	SAMSUNG	K4T51083QE	5		V	V	V
SAMSUNG	M378T5263AZ3-CE6	4096MB	DS	SAMSUNG	K4T2G084QA-HCE6	5		V	V	V
Super Talent	T6UA 512C5	512MB	SS	N/A	Heat-Sink Package	5	1.8	V	V	V
Super Talent	T6UB1GC5	1024MB	DS	N/A	Heat-Sink Package	5	1.8	V	V	V
TwinMOS	8D-23JK5M2ETP	512MB	SS	TwinMOS	TMM6208G8M30C	5	1.8	V	V	V
Aeneon	AET760UD00-30DB97X	1024MB	DS	AENEON	AET93R30DB	5	1.8	V	V	V
Aeneon	AET860UD00-30DB08X	2048MB	DS	AENEON	AET03F30DB	5		V	V	V
Asint	SLX264M8-J6E	512MB	SS	Asint	DDRII6408-6E			V	V	V
Asint	SLY2128M8-J6E	1024MB	SS	Asint	DDRII1208-6E			V	V	V
CENTURY	26V2H8	512MB	SS	HYNIX	HY5PS12821CFP-Y5	5	1.85	V	V	V
CENTURY	26VOH8	1024MB	DS	HYNIX	HY5PS12821CFP-Y5	5	1.85	V	V	V
Dynet	DNHM5U 512C8FE-A6	512MB	SS	Dynet	DN5HS82CFE-A6			V	V	
Kingbox	N/A	1024MB	SS	KINGBOX	EPD2128082200E-4			V	V	
Kingbox	N/A	1024MB	DS	KINGBOX	EPD264082200E-4		1.8	V	V	
Kingbox	N/A	1024MB	DS	KINGBOX	EPD264082200N-4			V	V	
MDT	M 512-667-8	512MB	SS	MDT	18D 51280D-30648	4	1.8	V	V	V
MDT	M924-667-16	1024MB	DS		18D 51280D-30646E	4		V	V	V
Patriot	PSD2 51266781	512MB	SS	PATRIOT	PM64M8D2BU-3KC			V	V	V
Patriot	PSD21G6672	1024MB	DS	PATRIOT	PM64M8D2BU-3PAC	5		V	V	V

SS - Single-sided   DS - Double-sided
DIMM support:

- **A*:** Supports one module inserted in any slot as single-channel memory configuration.

- **B*:** Supports one pair of modules inserted into either the yellow slots or the black slots as one pair of dual-channel memory configuration.

- **C*:** Supports four modules inserted into both the yellow and black slots as two pairs of dual-channel memory configuration.

Visit the ASUS website at www.asus.com for the latest QVL.

2.4.3 Installing a DIMM

Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

To install a DIMM:

1. Press the retaining clips outward to unlock a DIMM socket.

2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.

DIMM notch

Unlocked retaining clip
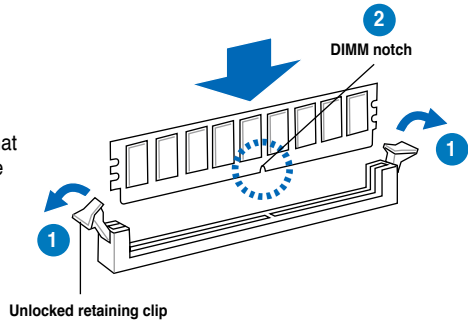
A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

Locked Retaining Clip
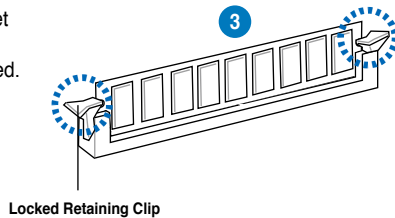
2.4.4 Removing a DIMM

To remove a DIMM:

1. Simultaneously press the retaining clips outward to unlock the DIMM.

DIMM notch
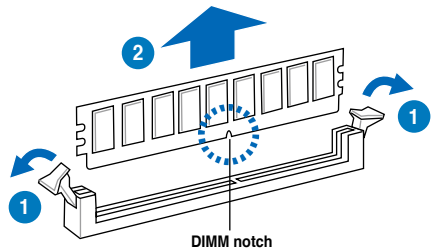
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.5 Expansion slots

In the future, you may need to install expansion cards. The following subsections describe the slots and the expansion cards that they support.

⚡ Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

2.5.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

2.5.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 3 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

✎ When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable. Refer to the table on the next page for details.

2.5.3 Interrupt assignments

Standard interrupt assignments

IRQ	Priority	Standard function
0	1	System timer
1	2	Keyboard controller
2	–	Re-direct to IRQ#9
3	11	IRQ holder for PCI steering*
4	12	Communications port (COM1)*
5	13	IRQ holder for PCI steering*
6	–	Reserved
7	–	Reserved
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI steering*
10	5	IRQ holder for PCI steering*
11	6	IRQ holder for PCI steering*
12	7	PS/2 compatible mouse port*
13	8	Numeric data processor
14	9	SATA Primary IDE (legacy mode)
15	10	SATA Secondary IDE (legacy mode)

* These IRQs are usually available for ISA or PCI devices.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	shared	–	–	–	–	–	–	–
PCI slot 2	–	shared	–	–	–	–	–	–
LAN (L1E)	–	–	shared	–	–	–	–	–
SATA (5723)	shared	–	–	–	–	–	–	–
PCIe x16_1	shared	–	–	–	–	–	–	–
PCIe x1_1	shared	–	–	–	–	–	–	–
PCIe x1_2	–	shared	–	–	–	–	–	–
PCIe x1_3	–	–	shared	–	–	–	–	–
USB controller 1	–	–	–	–	–	–	–	shared
USB controller 2	–	–	–	shared	–	–	–	–
USB controller 3	–	–	shared	–	–	–	–	–
USB controller 4	shared	–	–	–	–	–	–	–
USB controller 5	–	–	–	–	–	shared	–	–
USB controller 6	–	–	shared	–	–	–	–	–
USB 2.0 controller 1	–	–	–	–	–	–	–	shared
USB 2.0 controller 2	–	–	shared	–	–	–	–	–
SATA controller 1	–	–	–	shared	–	–	–	–
SATA controller 2	–	–	–	–	–	–	shared	–
IEEE 1394	–	–	–	shared	–	–	–	–

2.5.4   PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. Refer to the figure below for the location of the slots.

2.5.5   PCI Express x1 slots

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications. Refer to the figure below for the location of the slots.

2.5.6   PCI Express 2.0 x16 slot (blue)

This motherboard supports a PCI Express 2.0 x16 graphics card that comply with the PCI Express specifications. Refer to the figure below for the location of the slot.
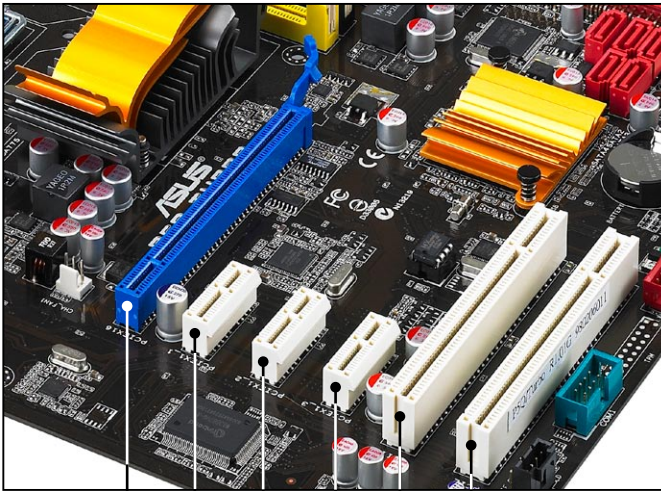
PCI Express 2.0 x16 slot (blue)
PCI Express x1 slot 1
PCI Express x1 slot 2
PCI Express x1 slot 3
PCI slot 1
PCI slot 2

2.6 Jumpers

1. **Clear RTC RAM (3-pin CLRTC)**

   This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

   CLRTC

1 2	2 3
Normal (Default)	Clear RTC
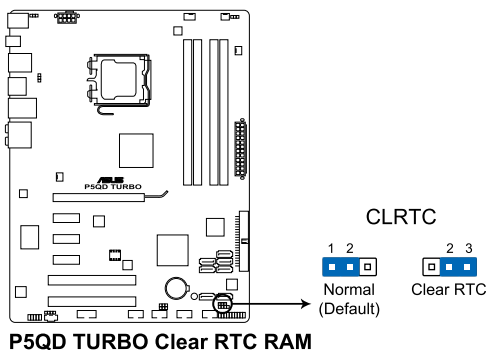
   P5QD TURBO Clear RTC RAM

   To erase the RTC RAM

   1. Turn OFF the computer and unplug the power cord.

   2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5–10 seconds, then move the cap back to pins 1-2.

   3. Plug the power cord and turn ON the computer.

   4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

   > Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

   > • If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
   >
   > • You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
   >
   > • Due to the chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before rebooting the system.

2.   CPU overvoltage setting (3-pin OV_CPU)

This jumper allows you to enable or disable the advanced CPU overvoltage setting in BIOS. Read the following information before you change the jumper setting. Set to pins 1-2 to activate the advanced CPU overvoltage feature.

OV_CPU

1 2   2 3

Enable OV   Normal
             (Default)
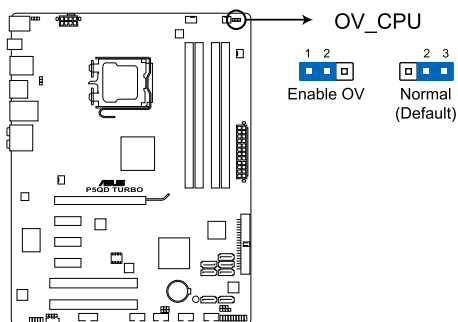
P5QD TURBO CPU overvoltage setting

OV_CPU	
Pins 2-3 (Default)	up to 1.70V
Pins 1-2 (OV Enabled)	up to 2.10V

- Before you change the jumper setting for extra-high overvoltage ability, use the BIOS items introduced in **3.5 Ai Tweaker menu** first to adjust the desired CPU performance. Ensure that your system functions well under the highest BIOS voltage setting before you change the setting of this jumper.

- Refer to **3.5 Ai Tweaker menu** for more information about the CPU overvoltage setting.

- DO NOT set the OV_CPU jumper to pins 1-2 when you install a new CPU and have not booted for the first time. Doing so may cause the system to halt. For system failure due to the wrong setting of the OV_CPU jumper, shut down the computer and move the cap back to pins 2-3.

- The system may need a better cooling system (for example, a water-cooling system) to work stably under high voltage settings.

3. **Keyboard/mouse power (3-pin PS2_USBPW56)**

This jumper allows you to enable or disable the keyboard/mouse and USB port 5-6 wake-up feature. When you set this jumper to pins 2-3 (+5VSB), you can wake up the computer by pressing a key on the keyboard (the default is the Space Bar), clicking the mouse or using a USB device. This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS. The USBPW56 jumper is for the rear USB ports.

PS2_USBPW56

1 2   2 3
+5V   +5VSB
           (Default)
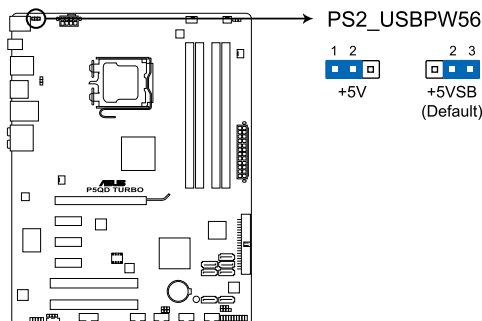
P5QD TURBO Keyboard / mouse power

4. **USB device wake-up (3-pin USBPW1-4, USBPW7-10, USBPW1112)**

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes.

The USBPW1-4 jumper is for the rear USB ports. The USBPW7-10/USBPW1112 jumpers are for the internal USB connectors that you can connect to additional USB ports.

USBPW1-4

2   3
1   2
+5V   +5VSB
           (Default)

USBPW1112
USBPW7-10

1 2   2 3
+5V   +5VSB
(Default)
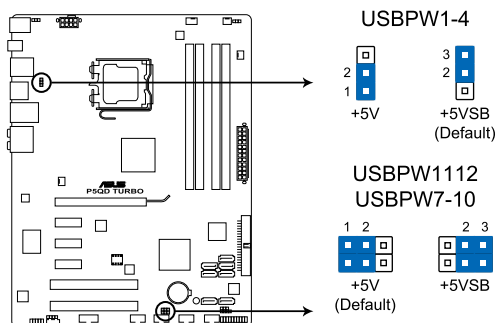
P5QD TURBO USB device wake-up

• The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system will not power up.

• The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

2.7 Connectors

2.7.1 Rear panel connectors
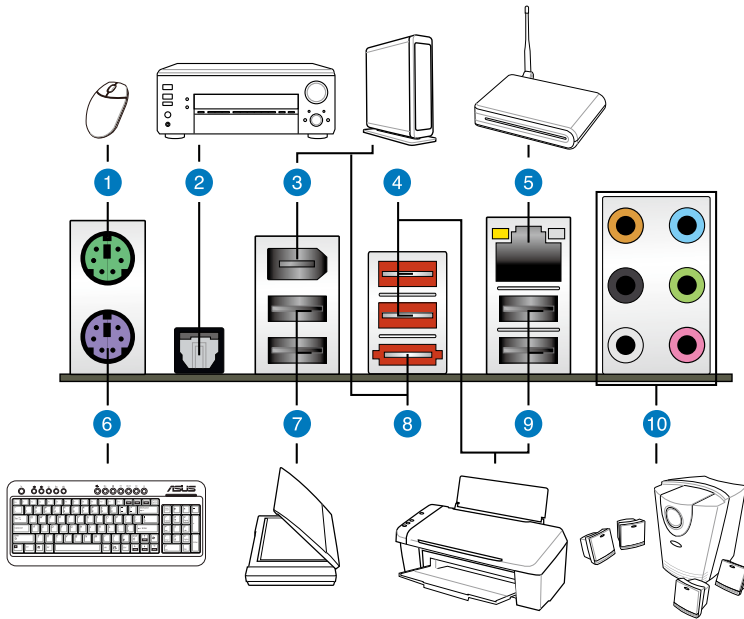
Rear panel connectors	
1. PS/2 mouse port (green)	6. PS/2 keyboard port (purple)
2. Optical S/PDIF Out port	7. USB 2.0 ports 5 and 6
3. IEEE 1394a port	8. External SATA port*
4. USB 2.0 ports 3 and 4	9. USB 2.0 ports 1 and 2
5. LAN (RJ-45) port**	10. Audio I/O ports***

* To use hot-plug, set the **Controller Mode** in the BIOS settings to [AHCI] mode. See section **3.6.3 Onboard Devices Configuration** for details.

** LAN port LED indications

Activity Link LED		Speed LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

ACT/LINK LED SPEED LED

LAN port
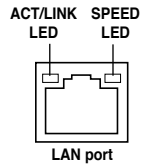
*** Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

2.7.2   Audio I/O connections

Audio I/O ports

orange — light blue

black — lime

gray — pink
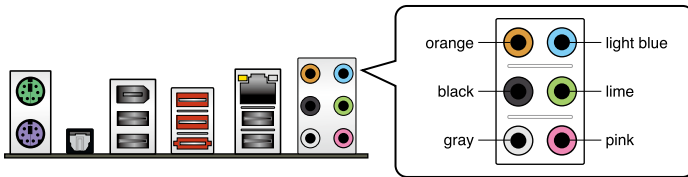
Connect to Headphone and Mic

Connect to Stereo Speakers
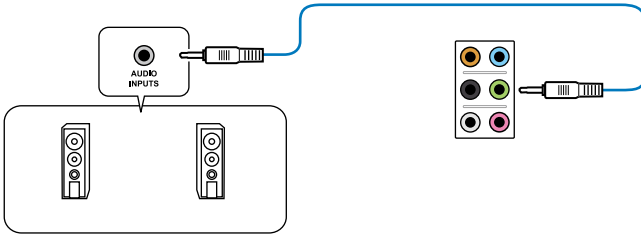
Connect to 2.1 channel Speakers
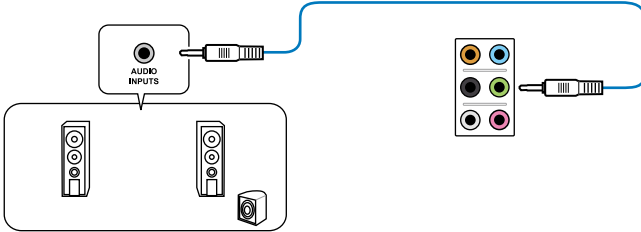
Connect to 4.1 channel Speakers
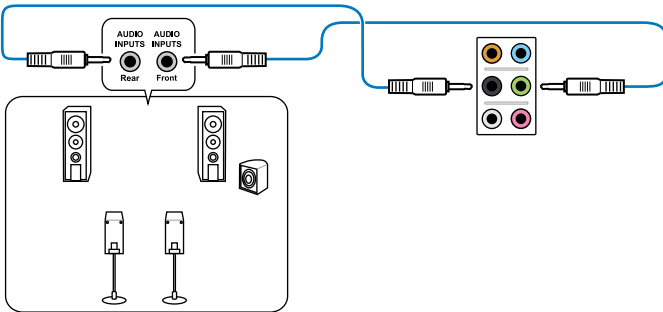
Connect to 5.1 channel Speakers
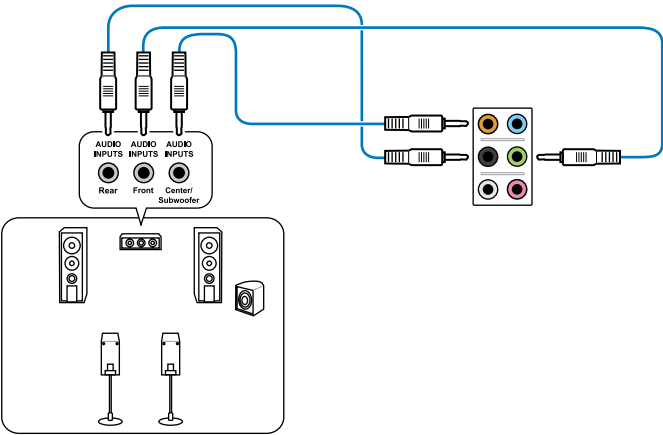
Connect to 7.1 channel Speakers

Chapter 2
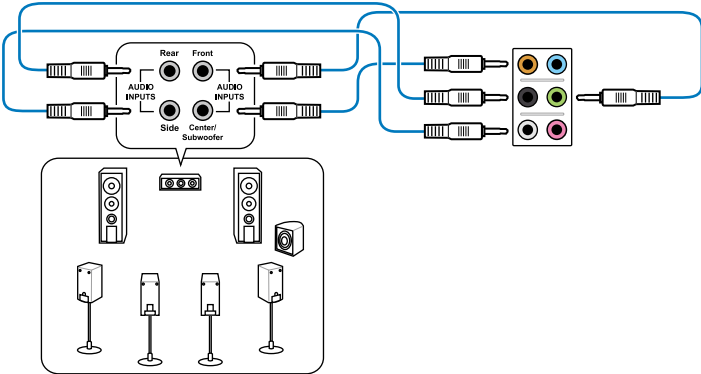
2.7.3   Internal connectors

1.   IDE connector (40-1 pin PRI_EIDE)

The onboard IDE connector is for the Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133/100/66 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your device.

P5QD TURBO IDE connector
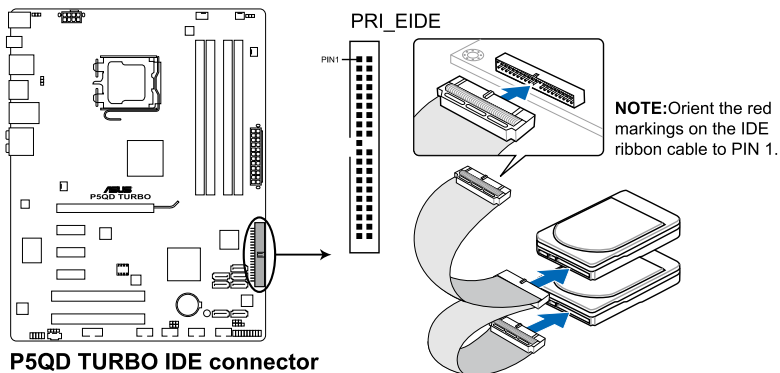
	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	

•   Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.

•   Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

If any device jumper is set as "Cable-Select", ensure that all other device jumpers have the same setting.

2. ICH10R Serial ATA connectors (7-pin SATA 1-5)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives and optical disc drives.

If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Matrix Storage Technology through the onboard Intel® ICH10R RAID controller.

P5QD TURBO SATA connectors
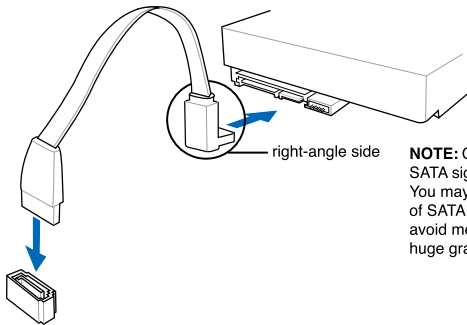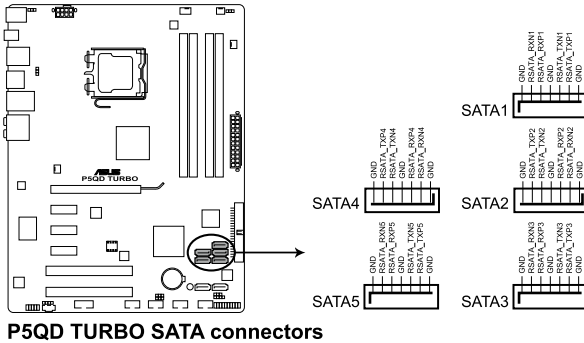
right-angle side

NOTE: Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

• These connectors are set to Standard IDE mode by default. In Standard IDE mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA as** item in the BIOS to [RAID]. See section **3.4.2 Storage Configuration** for details.

• Before creating a RAID set, refer to section **4.4 RAID configurations** or the manual bundled in the motherboard support DVD.

• You must install Windows® XP Service Pack 2 or later version before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0, 1, 5, and 10) is available only if you are using Windows® XP SP2 or later version.

• When using hot-plug and NCQ, set the **Configure SATA as** in the BIOS to [AHCI]. See section **3.4.2 Storage Configuration** for details.

3. **Silicon Image® Sil5723 Serial ATA connectors**
   (7-pin SATA_E1 [orange, port 0], SATA_E2 [white, port 1])

   These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives. If you installed Serial ATA hard disk drives, you can create an **EZ Backup** or a **Super Speed** configuration with the Drive Xpert Technology through the onboard Silicon Image® Sil5723 controller.
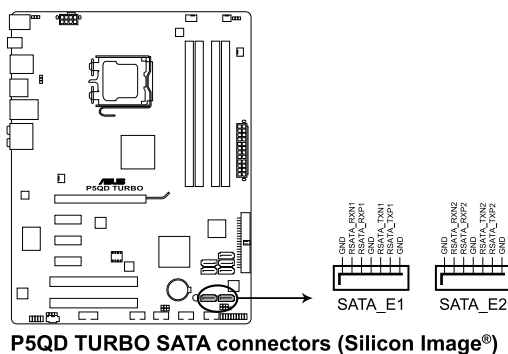
P5QD TURBO SATA connectors (Silicon Image®)

Before using the Drive Xpert function, ensure that you have back up all your data in your hard disks.

- **EZ Backup** erases all original data/partitions in the hard disk connected to the SATA_E2 (white, port 1) connector on the motherboard.

- **Super Speed** erases all original data/partitions in both hard disks.

- The SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) ports are for SATA hard drives only. ATAPI device is not supported.

- Before using the Drive Xpert function, ensure that you have connected the SATA signal cables and installed SATA hard disk drives.

- Drive Xpert function is available only when the hard disk drives connected to SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors are set as data drives.

- When using one hard disk in **Normal Mode**, connect the hard disk to the SATA_E1 (orange, port 0) connector on the motherboard.

- Use the Drive Xpert utility to see both the status of the hard disks connected to the SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors on the motherboard. In the BIOS **Main** menu and the **Device Manager** in OS, only the hard disk connected to the SATA_E1 connector (orange, port 0) can be detected.

- Clear all previous partitions in the hard disks before you proceed with any mode changes.

Refer to **4.3.7 ASUS Drive Xpert** for detailed application instructions.

4. USB connectors (10-1 pin USB78; USB910; USB1112)

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.

P5QD TURBO USB2.0 connectors
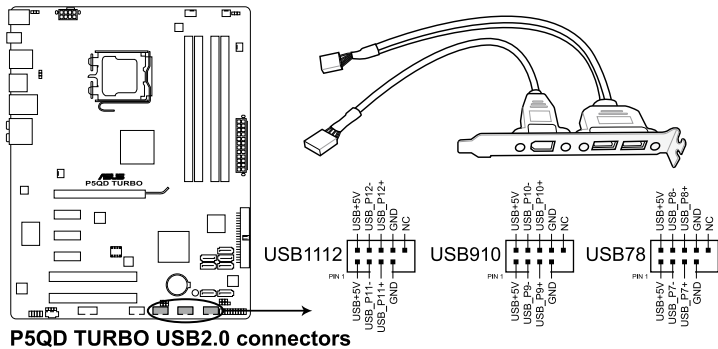
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

You can connect the front panel USB cable to the ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard if your chassis supports front panel USB ports.

The USB module cable is purchased separately.

5. Optical drive audio connector (4-pin CD)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

P5QD TURBO Internal audio connector
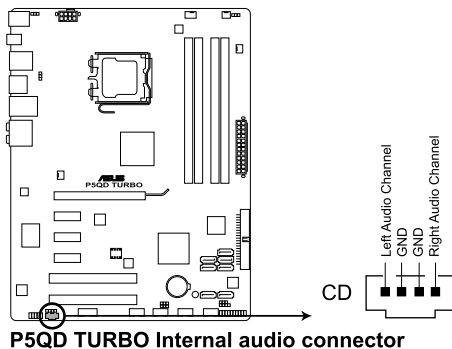
6. **IEEE 1394a port connector (10-1 pin IE1394_2)**

This connector is for an IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.

P5QD TURBO IEEE 1394 connector
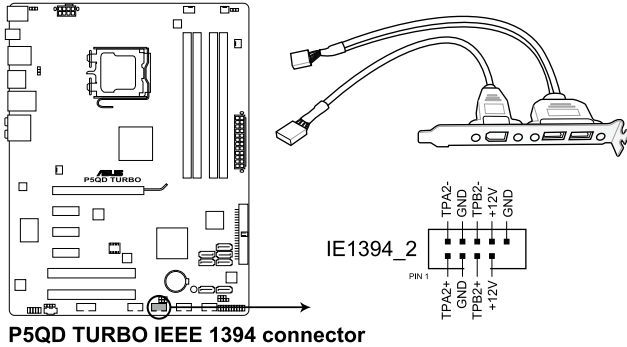
Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard!

The IEEE 1394a module cable is purchased separately.

7. **Serial port connector (10-1 pin COM1)**

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.

P5QD TURBO Serial port (COM1) connector
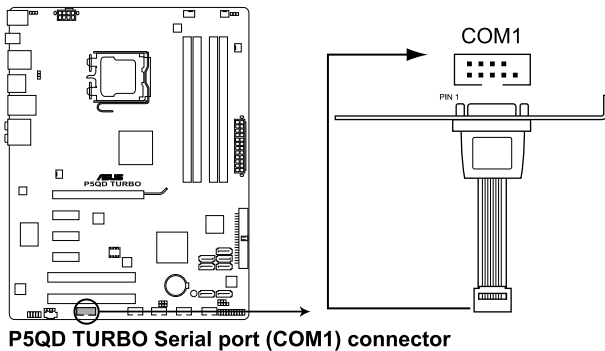
The COM module is purchased separately.

8. **CPU, chassis, and power fan connectors**
   (4-pin CPU_FAN; 3-pin CHA_FAN1; 3-pin CHA_FAN2; 3-pin PWR_FAN)

The fan connectors support cooling fans of 350 mA~2000 mA (24 W max.) or a total of 1 A~7 A (84 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

P5QD TURBO Fan connectors
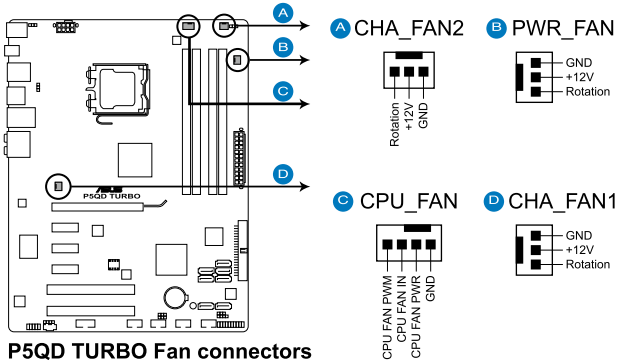
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

Only the CPU_FAN, CHA_FAN 1 and CHA_FAN 2 connectors support the ASUS Fan Xpert feature.

9. **Chassis intrusion connector (4-1 pin CHASSIS)**

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

By default , the pin labeled "Chassis Signal" and "Ground" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.
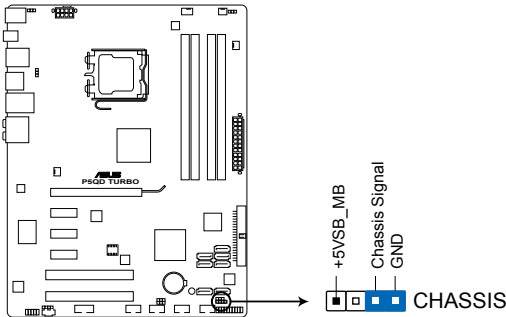
P5QD TURBO Chassis intrusion connector

10. **Digital audio connector (4-1 pin SPDIF_OUT)**

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port. Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.
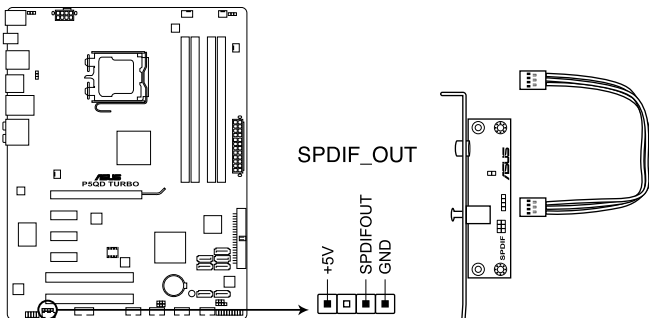
P5QD TURBO Digital audio connector

The S/PDIF module is purchased separately.

11. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.
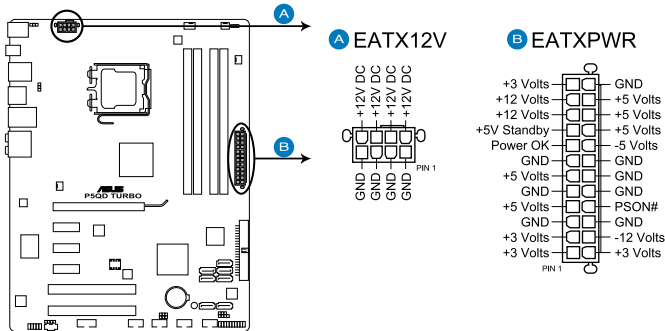
P5QD TURBO ATX power connectors

• For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.

• Do not forget to connect the 8-pin EATX +12 V power plug. Otherwise, the system will not boot.

• We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

• If you are uncertain about the minimum power supply requirement for your system, refer to the **Recommended Power Supply Wattage Calculator** at http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us for details.

12. Front panel audio connector (10-1 pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.
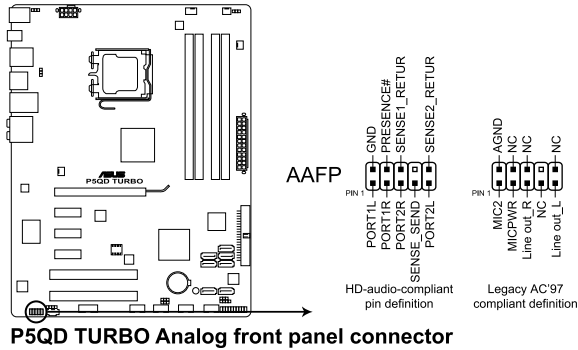
P5QD TURBO Analog front panel connector

- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, set the **Front Panel Type** item in the BIOS setup to **[HD Audio];** if you want to connect an AC'97 front panel audio module to this connector, set the item to **[AC97]**. By default, this connector is set to **[HD Audio]**.

13. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.

P5QD TURBO System panel connector
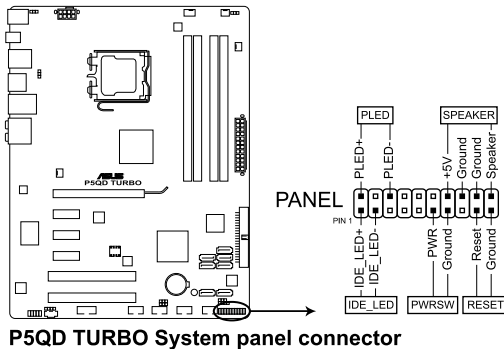
- **System power LED (2-pin PLED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin IDE_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker (4-pin SPEAKER)**

  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **ATX power button/soft-off button (2-pin PWRSW)**

  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

14. ASUS Q-Connector (system panel)

Use the ASUS Q-Connector to connect/disconnect the chassis front panel cables.

To install the ASUS Q-Connector:

1. Connect the front panel cables to the ASUS Q-Connector.

    Refer to the labels on the Q-Connector to know the detailed pin definitions, and then match them to their respective front panel cable labels.

    The labels on the front panel cables may vary depending on the chassis model.
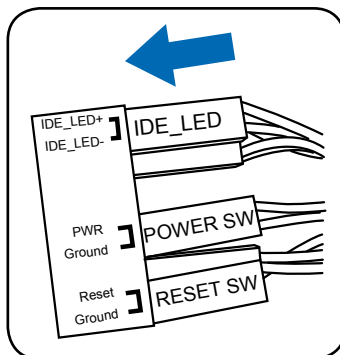
2. Install the ASUS Q-Connector to the system panel connector, ensuring the orientation matches the labels on the motherboard.
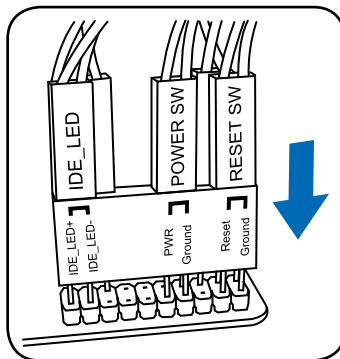
3. The front panel functions are now enabled. The figure shows the Q-Connector is properly installed on the motherboard.
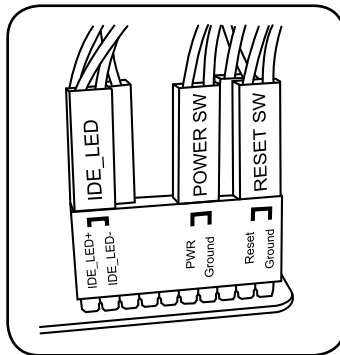
2.8   Starting up for the first time

1.   After making all the connections, replace the system case cover.

2.   Be sure that all switches are off.

3.   Connect the power cord to the power connector at the back of the system chassis.

4.   Connect the power cord to a power outlet that is equipped with a surge protector.

5.   Turn on the devices in the following order:

    a.   Monitor

    b.   External SCSI devices (starting with the last device on the chain)

    c.   System power

6.   After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to green after the system LED turns on.

The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (see the BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

BIOS Beep	Description
One short beep	VGA detected Quick boot set to disabled No keyboard detected
One continuous beep followed by two short beeps then a pause (repeated)	No memory detected
One continuous beep followed by three short beeps	No VGA detected
One continuous beep followed by four short beeps	Hardware component failure

7.   At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 3.

2.9   Turning off the computer

While the system is ON, pressing the power switch for less than four seconds puts the system on sleep mode or soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section **3.7 Power menu** in Chapter 3 for details.

Chapter 2

Chapter 3

3.1   Knowing BIOS

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimum performance. **We recommend that you not change the default BIOS settings** except in the following circumstances:

•	An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.

•	You have installed a new system component that requires further BIOS settings or update.

> Inappropriate settings of the BIOS may result to instability or failure to boot. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel**.

3.2   Updating BIOS

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility, or performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, **DO NOT manually update the BIOS**. Inappropriate BIOS updating may result in the system's failure to boot. Carefully follow the instructions of this chapter to update your BIOS if necessary.

> Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

The following utilities allow you to manage and update the motherboard BIOS setup program.

1.	**ASUS Update:** Updates the BIOS in Windows® environment.
2.	**ASUS EZ Flash 2:** Updates the BIOS using a floppy disk or USB flash disk.
3.	**ASUS CrashFree BIOS utility:** Restores the BIOS using the motherboard support DVD or a USB flash drive when the BIOS file fails or gets corrupted.

Refer to the corresponding sections for details on these utilities.

> Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update utility.

3.2.1   ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

*   Save the current BIOS file
*   Download the latest BIOS file from the Internet
*   Update the BIOS from an updated BIOS file
*   Update the BIOS directly from the Internet
*   View the BIOS version information

This utility is available in the support DVD that comes with the motherboard package.

> ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:
1.   Place the support DVD in the optical drive.
2.   From the Main menu, click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**.
3.   The ASUS Update utility is copied to your system.

> Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1.   From the Windows® desktop, click **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate.** The ASUS Update main window appears.

2.   Select **Update BIOS from the Internet** from the drop-down menu, and then click **Next**.
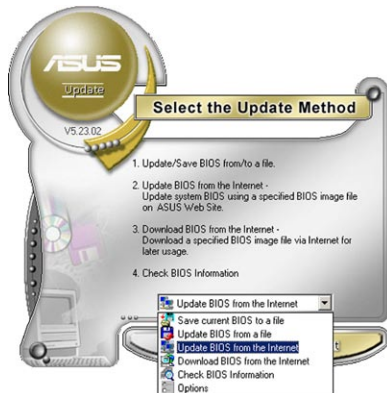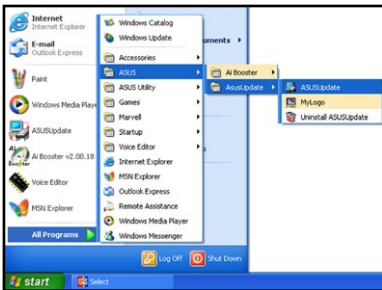
3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click **Next**.

5. Follow the onscreen instructions to complete the update process.

✎ The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Fom the Windows® desktop, click **Start** > **Programs** > **ASUS** > **ASUSUpdate** > **ASUSUpdate**. The ASUS Update main window appears.

2. Select **Update BIOS from a file** from the dropdown menu, then click **Next**.

3. Locate the BIOS file from the Open window, then click **Open**.

4. Follow the onscreen instructions to complete the update process.
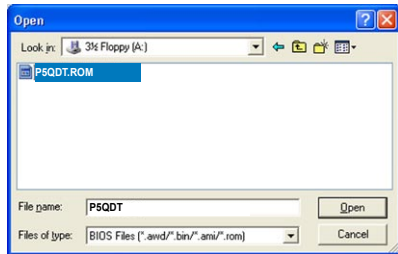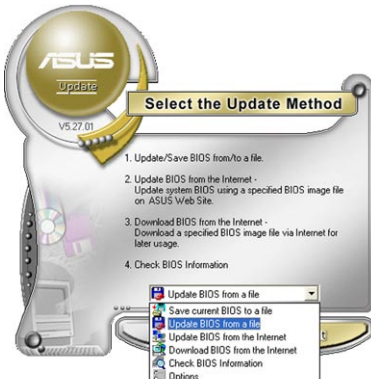
☝ Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit menu. See section **3.10 Exit Menu** for details.

3.2.2   ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to use a bootable floppy disk or an OS-based utility.

Before you start using this utility, download the latest BIOS from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash 2:

1.   Insert the USB flash disk that contains the latest BIOS file to the USB port, and then launch EZ Flash 2 in any of these two ways:

   •   Press <Alt> + <F2> during POST to display the following.

   •   Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press <Enter> to enable it.

```
            ASUSTek EZ Flash 2 BIOS ROM Utility V3.34
 FLASH TYPE: MXIC 25L8005
        ┌─── Current ROM ───┐          ┌─── Update ROM ───┐
        │ BOARD: P5QD Turbo  │          │ BOARD: Unknown    │
        │ VER: 0206          │          │ VER: Unknown      │
        │ DATE: 02/13/2009   │          │ DATE: Unknown     │
        └────────────────────┘          └───────────────────┘
 PATH: A:\

 ┌── A: ──┐ ┌──────────────────────────────────────────────┐
 │        │ │                                                │
 │        │ │                                                │
 │        │ │                                                │
 │        │ │                                                │
 │        │ │                                                │
 │        │ │                                                │
 │        │ │                                                │
 └────────┘ └──────────────────────────────────────────────┘
 ┌─ Note ─────────────────────────────────────────────────┐
 │ [Enter] Select or Load    [Tab] Switch    [V] Drive Info│
 │ [Up/Down/Home/End] Move   [B] Backup       [Esc] Exit   │
 └─────────────────────────────────────────────────────────┘
```
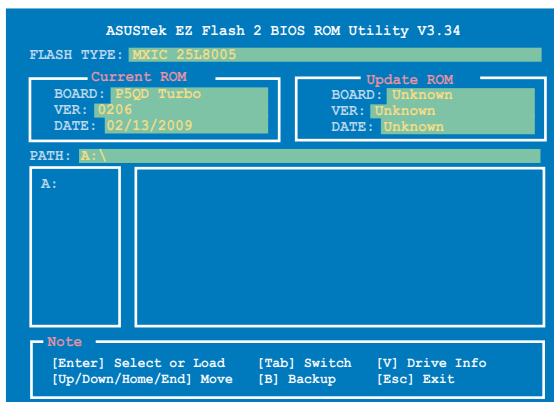
2.   Press <Tab> to switch between drives until the correct BIOS file is found. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.

   •   This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.

   •   DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit menu. See section **3.10 Exit Menu** for details.

3.2.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 utility is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support DVD or a USB flash drive that contains the BIOS file.

> The BIOS file in the motherboard support DVD may be older than the BIOS file published on the ASUS official website. If you want to use the newer BIOS file, download the file at support.asus.com and save it to a USB flash drive.

Recovering the BIOS

To recover the BIOS:

1.   Turn on the system.

2.   Insert the motherboard support DVD to the optical drive, or the USB flash drive containing the BIOS file to the USB port.

3.   The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

4.   Turn off the system after the utility completes the updating process and power on again.

5.   The system requires you to enter BIOS Setup to recover BIOS setting. To ensure system compatibility and stability, we recommend that you press <F2> to load default BIOS values.

> DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

3.3 BIOS setup program

A BIOS Setup program is provided for BIOS item modification. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various submenus and select from the available options using the navigation keys.

> • The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
>
> • If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section **3.10 Exit Menu** for details.
>
> • If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section **2.6 Jumpers** for details.

3.3.1 BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                          BIOS SETUP UTILITY
 Main      Ai Tweaker    Advanced     Power      Boot     Tools     Exit

 System Time            [13:51:25]             Use [ENTER], [TAB]
 System Date            [Fri 02/13/2009]       or [SHIFT-TAB] to
 Language               [English]              select a field.

 ▶ SATA1                [HDT722516DLA380]      Use [+] or [-] to
 ▶ SATA2                [Not Detected]         configure the System
 ▶ SATA3                [Not Detected]         Time.
 ▶ SATA4                [Not Detected]
 ▶ SATA5                [Not Detected]
 ▶ SATA_E1              [Not Detected]
                                               ←→   Select Screen
 ▶ Storage Configuration                       ↑↓   Select Item
 ▶ System Information                           +-    Change Field
                                               Tab   Select Field
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit

       v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

Submenu items   Navigation keys

3.3.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Tools	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

3.3.3   Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

The navigation keys may differ from one screen to another.

3.3.4   Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.

3.3.5   Submenu items

A solid triangle before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

3.3.6   Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to **3.3.7 Pop-up window.**

3.3.7   Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

3.3.8   Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.
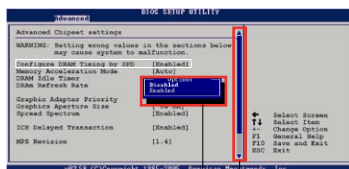
Pop-up window

Scroll bar

3.3.9   General help

At the top right corner of the menu screen is a brief description of the selected item.

3.4 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information. Select an item and press <Enter> to display the submenu.

Refer to **3.3.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

```
                             BIOS SETUP UTILITY
 Main      Ai Tweaker      Advanced      Power      Boot      Tools      Exit

 System Time             [10:55:25]                  Use [ENTER], [TAB]
 System Date             [Fri 02/13/2009]            or [SHIFT-TAB] to
 Language                [English]                   select a field.

►  SATA1                 [HDT722516DLA380]           Use [+] or [-] to
►  SATA2                 [Not Detected]              configure System Time.
►  SATA3                 [Not Detected]
►  SATA4                 [Not Detected]
►  SATA5                 [Not Detected]
►  SATA_E1               [Not Detected]
                                                          Select  Screen
►  Storage Configuration                             ↑↓       Select  Item
►  System Information                                +-       Change  Field
                                                     Tab      Select  Field
                                                     F1       General Help
                                                     F10      Save and Exit
                                                     ESC      Exit

       v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

3.4.1 SATA 1-5; SATA_E1

While entering Setup, the BIOS automatically detects the presence of SATA devices. There is a separate submenu for each SATA device. Select a device item then press <Enter> to display the SATA device information.

SATA_E1 menu displays the status of the hard disk connected to the SATA_E1 (ornage, port 0) connector on the motherboard.

When using one hard disk in **Normal Mode**, connect the hard disk to the SATA_E1 (orange, port 0) connector on the motherboard.

```
                             BIOS SETUP UTILITY
 Main

 SATA 1                                              Select  the type of
                                                     device  connected to
 Device       : Hard Disk                            the system.
 Vendor       : WDC WD800JD-00LSA0
 Size         : 80.0GB
 LBA Mode     : Supported
 Block Mode   : 16 Sectors
 PIO Mode     : 4
 Async DMA    : MultiWord DMA-2
 Ultra DMA    : Ultra DMA-5
 SMART Monitoring: Supported

 Type                        [Auto]
 LBA/Large Mode              [Auto]                  ←→      Select  Screen
 Block(Multi-sector Transfer) M[Auto]                ↑↓      Select  Item
 PIO Mode                    [Auto]                  +-      Change  Option
 DMA Mode                    [Auto]                  F1      General Help
 SMART Monitoring            [Auto]                  F10     Save and Exit
 32Bit Data Transfer         [Enabled]               ESC     Exit

       v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show **N/A** if no IDE device is installed in the system.

Type [Auto]

Allows you to select the type of device installed.

[Not Installed]   Select this option if no device is installed.

[Auto]   Allows automatic selection of the appropriate device type.

[CDROM]   Select this option if you are specifically configuring a CD-ROM drive.

[ARMD]   Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.

> This item appears in **SATA1-5** only.

LBA/Large Mode [Auto]

Enables or disables the LBA (Logical Block Addressing) mode.

[Auto]   Select [Auto] to enable the LBA mode (Logical Block Addressing mode) if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.

[Disabled]   Disables this function.

Block (Multi-Sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers.

[Auto]   When set to [Auto], the data transfer from and to the device occurs in multiple sectors at a time if the device supports multi-sector transfer feature.

[Disabled]   When set to [Disabled], the data transfer from and to the device occurs one sector at a time.

PIO Mode [Auto]

[Auto]   Allows automatic selection of the PIO (Programmed input/output) modes, which correspond to different data transfer rates.

[0] [1] [2] [3] [4]   Sets the PIO mode to Mode 0, 1, 2, 3, or 4.

DMA Mode [Auto]

DMA (Direct Memory Access) allows your computer to transfer data to and from the hardware devices installed with much less CPU overhead.

The DMA mode consists of SDMA (single-word DMA), MDMA (multi-word DMA), and UDMA (Ultra DMA). Setting to [Auto] allows automatic selection of the DMA mode.

SMART Monitoring [Auto]

[Auto]   Allows automatic selection of the S.M.A.R.T (Smart Monitoring, Analysis, and Reporting Technology).

[Enabled]   Enables the S.M.A.R.T feature.

[Disabled]   Disables the S.M.A.R.T feature.

32Bit Data Transfer [Enabled]

[Enabled]   Sets the IDE controller to combine two 16-bit reads from the hard disk into a single 32-bit double word transfer to the processor. This makes more efficient use of the PCI bus as fewer transactions are needed for the transfer of a particular amount of data.

[Disabled]   Disables this function.

3.4.2   Storage Configuration

The Storage Configuration menu allows you to configure your storage devices. Select an item then press <Enter> to display the submenu.

```
                        BIOS SETUP UTILITY
 Main

 Storage Configuration                              Options

 SATA Configuration          [Enhanced]      Disabled
  OnChip SATA Type           [IDE]           Compatible
                                             Enhanced
 Hard Disk Write Protect     [Disabled]
 IDE Detect Time Out (Sec)   [35]
```
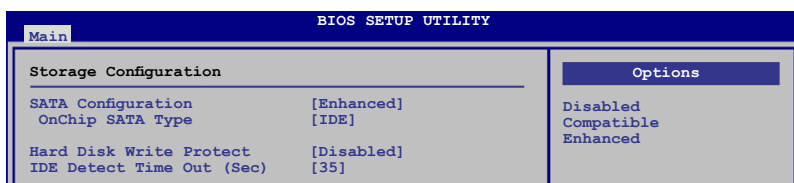
SATA Configuration [Enhanced]

Configuration options: [Disabled] [Compatible] [Enhanced]

> #### _Configure SATA as [IDE]_
> Allows you to set the SATA configuration. This item appears only when you set the **SATA Configuratio**n item to [Enhanced] or [Compatible].
>
> [IDE]   Set to [IDE] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.
>
> [RAID]   Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.
>
> [AHCI]   Set to [AHCI] mode when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

Hard Disk Write Protect [Disabled]

[Enabled]   Enables device write protection. This function will be effective only if the device is accessed through BIOS.

[Disabled]   Disables this function.

SATA Detect Time Out (Sec) [35]

Selects the time out value for detecting ATA/ATAPI devices from the following options: [0] [5] [10] [15] [20] [25] [30] [35]

3.4.3 AHCI Configuration

This menu is the section for AHCI configuration. It appears only when you set the item **Configure SATA as** from the submenu of **SATA Configuration** to [AHCI].

```
                          BIOS SETUP UTILITY
   Main

   AHCI Settings                                    Some SATA CD/DVD in
                                                    AHCI mode need to
   AHCI CD/DVD Boot Time out     [35]               wait ready longer.

 ▶ SATA Port1 [Not Detected]
 ▶ SATA Port2 [Not Detected]
 ▶ SATA Port3 [Not Detected]
 ▶ SATA Port4 [Not Detected]
 ▶ SATA Port5 [Not Detected]
 ▶ SATA Port6 [Not Detected]
```
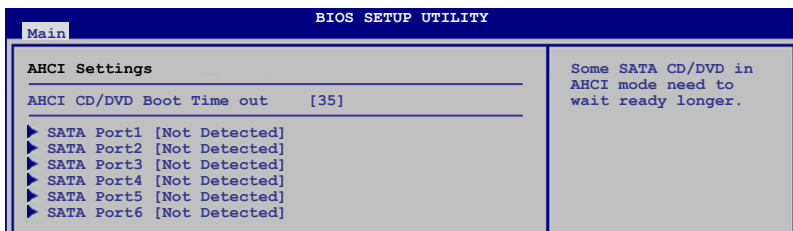
AHCI CD/DVD Boot Time out [35]

Selects the boot time out value for SATA CD/DVD devices in AHCI mode from the following options: [0] [5] [10] [15] [20] [25] [30] [35]

SATA Port1-6 [XXXX]

Displays the status of auto-detection of SATA devices.

SATA Port1-6 [Auto]

[Auto]   Allows automatic selection of the device type connected to the system.

[Not Installed]   Selects this option if no SATA devices are installed.

SMART Monitoring [Enabled]

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitor system. When read/write of your hard disk errors occur, this feature allows the hard disk to report warning messages during the POST.

[Enabled]   Enables the SMART monitoring feature.

[Disabled]   Disables the SMART monitoring feature.

3.4.4 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the BIOS information, CPU specification, and system memory in this menu.

```
                          BIOS SETUP UTILITY
   Main

   BIOS Information
   Version   : 0206
   Build Date: 02/13/09

   Processor
   Type      : Intel(R) Core(TM)2 Duo CPU @ 3.00GHz
   Speed     : 3000MHz

   System Memory
   Usable Size    : 512MB
```
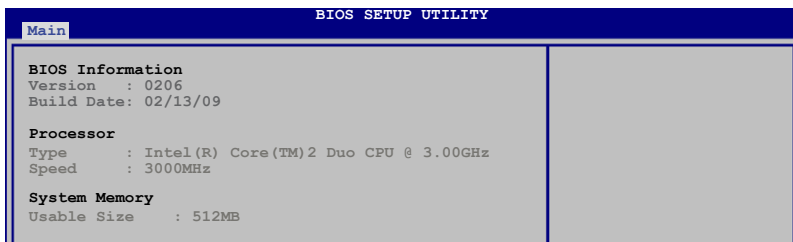
3.5 Ai Tweaker menu

The Ai Tweaker menu items allow you to configure overclocking-related items.

⚠ Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.

✎ The configuration options for this chapter vary depending on the CPU and DIMM model you installed on the motherboard.

```
                        BIOS SETUP UTILITY
   Main    Ai Tweaker   Advanced    Power    Boot    Tools    Exit
  ┌──────────────────────────────────────────┬─────────────────────────┐
  │ Configure System Performance Settings    │ Select the target CPU   │
  │                                          │ frequency, and the      │
  │ Ai Overclock Tuner        [Auto]         │ relevant parameters     │
  │ CPU Ratio Setting         [Auto]         │ will be auto-adjusted.  │
  │ FSB Strap to North Bridge [Auto]         │ Frequencies higher      │
  │ DRAM Frequency            [Auto]         │ than CPU manufacturer   │
  │ DRAM Timing Control       [Auto]         │ recommends are not      │
  │  1st Information : 5-5-5-15-3-36-5-3      │ guaranteed to be        │
  │  2nd Information : 8-3-5-4-6-4-7          │ stable. If the system   │
  │  3rd Information : 13-5-1-5-5             │ becomes unstable,       │
  │ DRAM Statice Read Control [Auto]         │ return to the default.  │
  │ DRAM Read Training        [Auto]         │                         │
  │ MEM. OC Charger           [Auto]         │                         │
  │ Ai Clock Twister          [Auto]         │  ⟷   Select Screen      │
  │ Ai Transaction Booster    [Auto]         │  ↑↓   Select Item       │
  │  C/P : A1 A2 A3 A4                        │  +-   Change Option     │
  │  LVL : 12 12 12 12                        │  F1   General Help      │
  │                                          │  F10  Save and Exit     │
  │ ******* Please key in numbers directly! *******  │  ESC  Exit      │
  │ CPU Voltage               [Auto]         │                         │
  └──────────────────────────────────────────┴─────────────────────────┘
      v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

Scroll down to display the following items:

```
  ┌──────────────────────────────────────────┬─────────────────────────┐
  │ CPU GTL Reference         [Auto]         │                         │
  │ CPU PLL Voltage           [Auto]         │                         │
  │ FSB Termination Voltage   [Auto]         │                         │
  │ DRAM Voltage              [Auto]         │                         │
  │ NB Voltage                [Auto]         │                         │
  │ SB Voltage                [Auto]         │                         │
  │ PCIE SATA Voltage         [Auto]         │  ⟷   Select Screen      │
  │ ************************************************  │  ↑↓   Select Item  │
  │ Load-Line Calibration     [Auto]         │  +-   Change Option     │
  │ CPU Spread Spectrum       [Auto]         │  F1   General Help      │
  │ PCIE Spread Spectrum      [Auto]         │  F10  Save and Exit     │
  │ CPU Clock Skew            [Auto]         │  ESC  Exit              │
  │ NB Clock Skew             [Auto]         │                         │
  │ CPU Margin Enhancement    [Optimized]    │                         │
  └──────────────────────────────────────────┴─────────────────────────┘
      v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

3.5.1 Ai Overclock Tuner [Auto]

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Select any of these preset overclocking configuration options:

Manual	Allows you to individually set overclocking parameters.
Auto	Loads the optimal settings for the system.

3.5.2 CPU Ratio Setting [Auto]

Allows you to set the ratio between the CPU Core Clock and the FSB Frequency. Use <+> and <-> to adjust the ratio. The valid value ranges vary according to your CPU model.

The following two items appear only when you set the **Ai Overclock Tuner** item to [Manual].

3.5.3 FSB Frequency [XXX]

Displays the frequency sent by the clock generator to the system bus and PCI bus. Use the <+> and <-> keys to adjust the FSB frequency. You can also key in the desired FSB frequency using the numeric keypad. The values range from 200 to 800.

3.5.4 PCIE Frequency [XXX]

Allows you to set the PCI Express frequency. Use the <+> and <-> keys to adjust the PCIE frequency. You can also key in the desired value using the numeric keypad. The values range from 100 to 180.

3.5.5 FSB Strap to North Bridge [Auto]

When set to [Auto], the FSB Strap will be adjusted automatically by FSB Frequency and DRAM Frequency. Congifuration options: [Auto] [200 MHz] [266 MHz] [333 MHz] [400 MHz]

3.5.6 DRAM Frequency [Auto]

Allows you to set the DDR2 operating frequency. The configuration options vary with the **FSB Frequency** item settings.

Selecting a very high DRAM frequency may cause the system to become unstable! If this happens, revert to the default setting.

3.5.7 DRAM Timing Control [Auto]

Configuration options: [Auto] [Manual]

- The following sub-items appear only when you set the **DRAM Timing Control** item to [Manual].
- The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.

1st Information: 5-5-5-15-3-36-5-3

The values vary depending on your settings of the following sub-items:

CAS# Latency [5 DRAM Clocks]
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks] – [11 DRAM Clocks]

DRAM RAS# to CAS# Delay [5 DRAM Clocks]
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks] – [18 DRAM Clocks]

DRAM RAS# Precharge [5 DRAM Clocks]
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks] – [18 DRAM Clocks]

DRAM RAS# Activate to Precharge Time [15 DRAM Clocks]
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks] – [34 DRAM Clocks]

RAS# to RAS# Delay [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

Row Refresh Cycle Time [Auto]
Configuration options: [Auto] [20 DRAM Clocks] [25 DRAM Clocks]
[30 DRAM Clocks] [35 DRAM Clocks] [40 DRAM Clocks] [45 DRAM Clocks]
[50 DRAM Clocks] [55 DRAM Clocks] [60 DRAM Clocks] [65 DRAM Clocks]
[70 DRAM Clocks] [80 DRAM Clocks] [85 DRAM Clocks] [105 DRAM Clocks]
[132 DRAM Clocks]

Write Recovery Time [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

Read to Precharge Time [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

2nd Information: 8-3-5-4-6-4-7

The values vary depending on your settings of the following sub-items:

READ to WRITE Delay(S/D) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

WRITE to READ Delay(S) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

WRITE to READ Delay(D) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

READ To READ Delay(S) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

READ To READ Delay(D) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

WRITE To WRITE Delay(S) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

WRITE To WRITE Delay(D) [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

3rd Information: 15-5-1-5-5

The values vary depending on your settings of the following sub-items:

WRITE to PRE Delay [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [31 DRAM Clocks]

READ to PRE Delay [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

PRE to PRE Delay [Auto]
Configuration options: [Auto] [1 DRAM Clocks] [2 DRAM Clocks] [3 DRAM Clocks]

ALL PRE to ACT Delay [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

ALL PRE to REF Delay [Auto]
Configuration options: [Auto] [1 DRAM Clocks] – [15 DRAM Clocks]

3.5.8   DRAM Static Read Control [Auto]

Configuration options: [Auto] [Disabled] [Enabled]

3.5.9   DRAM Read Training [Auto]

Configuration options: [Auto] [Disabled] [Enabled]

3.5.10   MEM. OC Charger [Auto]

Configuration options: [Auto] [Disabled] [Enabled]

3.5.11   Ai Clock Twister [Auto]

Allows you to set the DRAM performance. Set this item to [Light] or [Lighter] to enhance
DRAM compatibility, or [Strong] or [Stronger] to accelerate DRAM performance.
Configuration options: [Auto] [Lighter] [Light] [Moderate] [Strong] [Stronger]

3.5.12   Ai Transaction Booster [Auto]

Allows you to set the system performance.
Configuration options: [Auto] [Manual]

C/P : A1 A2 A3 A4 (These values are auto-detected)
LVL : 12 12 12 12 (These values are auto-detected)

> The following sub-items appear only when you set the **Ai Transaction Booster** item to
> [Manual].

Common Performance Level [05]
Use the <+> and <-> keys or the numeric keypad to enter the desired value. The
values range from 0 to 31. Setting a low level leads to better system performance.

Pull-In of CHA/B PH1/2/3/4 [Disabled]
Set this item to [Enabled] to apply enhancement on DRAM Channel A and B, Phase
1 to 4. The number of phases is determined by DRAM frequency and FSB strap.
Configuration options: [Disabled] [Enabled]

3.5.13   CPU Voltage [Auto]

Allows you to set the CPU VCore voltage. Use the <+> and <-> keys or the numeric keypad to enter the desired value. The values range from 0.85000V to 2.10000V* with a 0.00625V interval.

> •   Refer to the CPU documentation before setting the CPU Vcore voltage. Setting a high VCore voltage may damage the CPU permanently, and setting a low VCore voltage may make the system unstable.
>
> •   The value [2.10000V] of the CPU Voltage item is supported only if the **OV_CPU** jumper is enabled, otherwise the maximum voltage supported is [1.70000V]. See **2. CPU overvoltage setting** on page 2-22 for details.

3.5.14   CPU GTL Reference [Auto]

Allows you to set the CPU GTL reference voltage. Different ratio might enhance CPU overclocking ability. Configuration options: [Auto] [0.65x] [0.63x] [0.61x]

> The following six (6) items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

3.5.15   CPU PLL Voltage [Auto]

Allows you to set the CPU PLL voltage. The values range from 1.50V to 2.78V with a 0.02V interval.

3.5.16   FSB Termination Voltage [Auto]

Allows you to set the front side bus termination voltage. The values range from 1.20V* to 1.90V with a 0.02V interval.

> The minimum value of this item becomes 1.10V when a 45nm CPU is installed.

3.5.17   DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.80V to 3.08V with a 0.02V interval.

3.5.18   NB Voltage [Auto]

Allows you to set the North Bridge voltage. The values range from 1.10V to 1.90V with a 0.02V interval.

> •   Setting the **CPU PLL Voltage**, **FSB Termination Voltage**, **DRAM Voltage** and **NB Voltage** items to a high level may damage the chipset, memory module and CPU permanently. Proceed with caution.
>
> •   Some values of the **CPU Voltage**, **CPU PLL Voltage**, **FSB Termination Voltage**, **DRAM Voltage** and **NB Voltage** items are labeled in different color, indicating the risk levels of high voltage settings. Refer to the table on the next page for details.
>
> •   The system may need a better cooling system to work stably under high voltage settings.

	Blue	Yellow	Purple	Red
CPU Voltage (OV_CPU jumper is disabled)	0.85000V–1.59375V	1.60V–1.70V	N/A	N/A
CPU Voltage (OV_CPU jumper is enabled)	1.25000V–1.99375V	2.00V–2.10V	N/A	N/A
CPU PLL Voltage	1.50V–1.78V	1.80V–2.00V	2.02V–2.20V	2.22V–2.78V
FSB Termination Voltage	1.20V–1.38V	1.40V–1.90V	N/A	N/A
DRAM Voltage	1.80V–1.98V	2.00V–2.20V	2.22V–2.40V	2.42V–3.08V
NB Voltage	1.10V–1.26V	1.28V–1.40V	1.42V–1.58V	1.60V–1.90V

3.5.19   SB Voltage [Auto]

Allows you to set the South Bridge voltage. The values range from 1.10V to 1.40V with a 0.10V interval.

3.5.20   PCIE SATA Voltage [Auto]

Allows you to set the PCI Express SATA voltage. The values range from 1.50V to 1.80V with a 0.10V interval.

3.5.21   Load-Line Calibration [Auto]

Allows you to select the CPU Load-Line mode. Set to [Disabled] to follow Intel specifications, or to [Enabled] to improve CPU VDroop directly.
Configuration options: [Auto] [Disabled] [Enabled]

3.5.22   CPU Spread Spectrum [Auto]

[Disabled]   Enhances the CPU overclocking ability.
[Auto]   Sets to [Auto] for EMI control.

3.5.23   PCIE Spread Spectrum [Auto]

[Disabled]   Enhances the PCIE overclocking ability.
[Auto]   Sets to [Auto] for EMI control.

3.5.24   CPU Clock Skew [Auto]

Adjusting this item may help enhancing CPU overclocking ability. You may need to adjust the **NB Clock Skew** item at the same time.
Configuration options: [Auto] [Normal] [Delay 100ps]–[Delay 1500ps]

3.5.25   NB Clock Skew [Auto]

Configuration options: [Auto] [Normal] [Delay 100ps]–[Delay 1500ps]

3.5.26   CPU Margin Enhancement [Optimized]

Configuration options: [Optimized] [Compatible] [Performance Mode]

3.6 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

⚠ Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

```
                            BIOS SETUP UTILITY
   Main    Ai Tweaker    Advanced    Power    Boot    Tools    Exit

 ▶ CPU Configuration                              Configure CPU.
 ▶ Chipset
 ▶ Onboard Devices Configuration
 ▶ USB Configuration
 ▶ PCIPnP




                                                 ←→   Select Screen
                                                 ↑↓   Select Item
                                                 Enter Go to Sub Screen
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit

        v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```
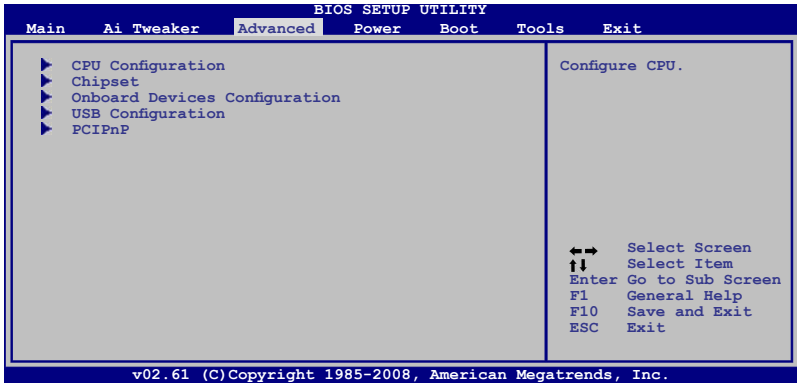
3.6.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

✎ The items shown in this screen may be different due to the CPU you installed.

```
                            BIOS SETUP UTILITY
                  Advanced

 Configure advanced CPU settings                 Sets the ratio between
                                                 CPU Core Clock and the
 Manufacturer:Intel                              FSB Frequency.
 Brand String:Intel(R) Core(TM) Duo CPU 3.00GHz  NOTE: If an invalid
 Frequency   :3.00GHz                            ratio is set in CMOS
 FSB Speed   :1333MHz                            then actual and
 Cache L1    :64 KB                               setpoint values may
 Cache L2    :4096 KB                             differ.
 Ratio Status:Unlocked (Min:06, Max:09)
 Ratio Actual Value :9
 CPUID       :6F9

 Ratio Ratio Setting         [Auto]
 C1E Support                 [Enabled]            ←→   Select Screen
 Max CPUID Value Limit       [Disabled]           ↑↓   Select Item
 Intel(R) Virtualization Tech [Enabled]           Enter Go to Sub Screen
 CPU TM Function             [Enabled]            F1   General Help
 Execute Disable Bit         [Enabled]            F10  Save and Exit
 Intel(R) SpeedStep(TM) Tech [Enabled]            ESC  Exit
 Intel(R) C-State Tech       [Disabled]

        v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

CPU Ratio Setting [Auto]

Allows you to set the ratio between the CPU Core Clock and the FSB Frequency. Use <+> and <-> to adjust the ratio. The valid value ranges vary according to your CPU model.

C1E Support [Enabled]

[Enabled]   Enables the C1E support function. This item should be enabled in order to enable the Enhanced Halt Sate.

[Disabled]   Disables this function.

Max CPUID Value Limit [Disabled]

[Enabled]   Allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.

[Disabled]   Disables this function.

Intel(R) Virtualization Tech [Enabled]

The Intel® Virtualization Technology allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems. Configuration options: [Disabled] [Enabled]

CPU TM function [Enabled]

[Enabled]   Enables the overheated CPU to throttle its clock speed to cool down.

[Disabled]   Disables this function.

Execute Disable Bit [Enabled]

[Enabled]   Enables the No-Execution Page Protection Technology.

[Disabled]   Forces the XD feature flag to always return to zero (0).

Intel(R) SpeedStep (TM) Tech. [Enabled]

Allows you to use the Enhanced Intel SpeedStep® Technology (EIST).

[Enabled]   Enables the EIST function.

[Disabled]   Disables this function.

Intel(R) C-STATE Tech [Disabled]

The Intel® C-State Technology allows the CPU to save more power under idle mode. Enable this item only when you install a C-State Technology-supported CPU.
Configuration options: [Disabled] [Enabled]

Chapter 3

3.6.2   Chipset

The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the submenu.

```
                          BIOS SETUP UTILITY
              Advanced
  ────────────────────────────────────────────      ───────────────────────────
  Advanced Chipset Settings                          Configure North Bridge
                                                     features.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.


  ▶  North Bridge  Configuration
```

North Bridge Chipset Configuration

```
                          BIOS SETUP UTILITY
              Advanced
  ────────────────────────────────────────────      ───────────────────────────
  North Bridge Chipset Configuration                 Enabled: Allow
                                                     remapping of
  Memory Remap Feature          [Enabled]            overlapped PCI memory
    PCI MMIO Allocation: 4GB To 3328MB               above the total
                                                     physical memory.
  Memory Hole                   [Disabled]
                                                     DISABLE: Do not allow
  Initiate Graphic Adapter      [PEG/PCI]            remapping of memory.
```

Memory Remap Feature [Enabled]

[Enabled]   Enables the remapping of the overlapped PCI memory above the total
             physical memory. Enable this option only when you install 64-bit operating
             system.

[Disabled]   Disables this function.

Memory Hole [Disabled]

Allows you to set the memory hole mode.
Configuration options: [Disabled] [15MB-16MB]

Initiate Graphic Adapter [PEG/PCI]

Allows you to decide which graphics controller to use as the primary boot device.
Configuration options: [PCI/PEG] [PEG/PCI]

3.6.3   Onboard Devices Configuration

```
                        BIOS SETUP UTILITY
            Advanced

 Onboard Devices Configuration                       Enable or Disable
                                                     High Definition Audio
 High Definition Audio              [Enabled]        Controller
   Front Panel Type                 [HD Audio]
 J-Micron eSATA/PATA Controller     [Enabled]
   Controller Mode                  [IDE]
 Atheros GigaBit LAN                [Enabled]
   LAN Boot ROM                     [Disabled]
 Onboard 1394 Controller            [Enabled]

 Serial Port1 Address               [3F8/IRQ4]
```

High Definition Audio [Enabled]

[Enabled]   Enables the High Definition Audio Controller.

[Disabled]   Disables the controller.

The following item appears only when you set the **High Definition Audio** item to [Enabled].

Front Panel Type [HD Audio]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports.

[AC97]   Sets the front panel audio connector (AAFP) mode to legacy AC'97

[HD Audio] Sets the front panel audio connector (AAFP) mode to high definition audio.

J-Micron eSATA/PATA Controller [Enabled]

[Enabled]   Enables the onboard J-Micron eSATA/PATA controller.

[Disabled]   Disables the controller.

Controller Mode [IDE]

This item appears only when you set the previous item to [Enabled], and allows you to select the J-Micron controller mode. Configuration options: [RAID] [IDE] [AHCI]

Atheros GigaBit LAN [Enabled]

[Enabled]   Enables the Atheros Gigabit LAN controller.

[Disabled]   Disables the controller.

LAN Boot ROM [Disabled]

This item appears only when you set the previous item to [Enabled].

[Enabled]   Enables the Atheros Gigabit LAN Boot ROM.

[Disabled]   Disables the LAN Boot ROM.

Onboard 1394 Controller [Enabled]

[Enabled]   Enables the onboard IEEE 1394a controller.

[Disabled]   Disables the controller.

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

3.6.4   USB Configuration

The items in this menu allow you to change the USB-related features. Select an item then press <Enter> to display the configuration options.

```
                          BIOS SETUP UTILITY
                  Advanced

  USB Configuration                                    Options

  USB Devices Enabled:                            Disabled
          None                                    Enabled

  USB Functions            [Enabled]
  USB 2.0 Controller       [Enabled]
  USB 2.0 Controller Mode  [HiSpeed]
  BIOS EHCI Hand-off       [Enabled]
  Legacy USB Support       [Auto]
```
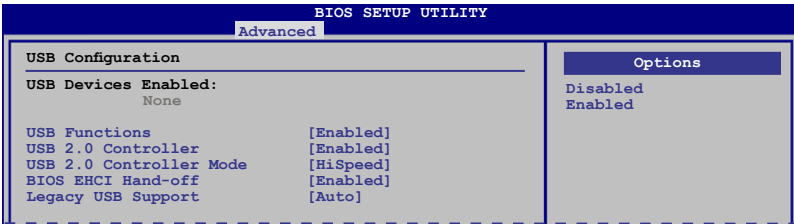
The **USB Devices Enabled** item shows the auto-detected values. If no USB device is detected, the item shows **None**.

USB Functions [Enabled]

[Enabled]   Enables the USB Host Controllers.

[Disabled]   Disables the controllers.

The following two items appear only when you set **USB Functions** to [Enabled].

USB 2.0 Controller [Enabled]

[Enabled]   Enables the USB 2.0 controller.

[Disabled]   Disables the controller.

USB 2.0 Controller Mode [HiSpeed]

[FullSpeed]   Sets the USB 2.0 controller mode to FullSpeed (12 Mbps).

[HiSpeed]   Sets the USB 2.0 controller mode to HiSpeed (480 Mbps).

BIOS EHCI Hand-off [Enabled]

[Enabled]   Enables the support for operating systems without an EHCI hand-off feature.

[Disabled]   Disables the function.

The following item appears only when you set **USB Functions** to [Enabled].

Legacy USB Support [Auto]

[Auto]   Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

[Enabled]   Enables the support for USB devices on legacy operating systems (OS).

[Disabled]   Disables the function.

Chapter 3

3.6.5   PCIPnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices.

```
                        BIOS SETUP UTILITY
                 Advanced

  Advanced PCI/PnP Settings                      NO: lets the BIOS
                                                 configure all the
                                                 devices in the system.
  WARNING: Setting wrong values in below sections YES: lets the
           may cause system to malfunction.      operating system
                                                 configure Plug and
  Plug And Play O/S              [No]             Play (PnP) devices not
                                                 required for boot if
                                                 your system has a Plug
                                                 and Play operating
                                                 system.
```
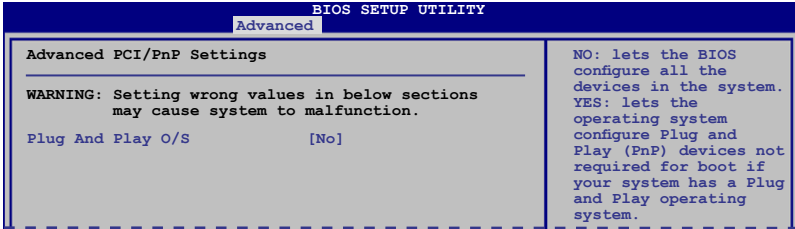
Plug And Play O/S [No]

[Yes]   When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

[No]   When set to [No], BIOS configures all the devices in the system.

3.7 Power menu

The Power menu items allow you to change the settings for the Advanced Power Management (APM). Select an item then press <Enter> to display the configuration options.

```
                            BIOS SETUP UTILITY
    Main      Ai Tweaker     Advanced     Power      Boot     Tools     Exit

                                                        Select the ACPI state
    Suspend Mode                  [Auto]                used for System
    Repost Video on S3 Resume     [No]                  Suspend.
    ACPI 2.0 Support              [Disabled]
    ACPI APIC Support             [Enabled]

    ▶ APM Configuration
    ▶ Hardware Monitor




                                                   ←→    Select Screen
                                                   ↑↓    Select Item
                                                   +-    Change Option
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

         v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```
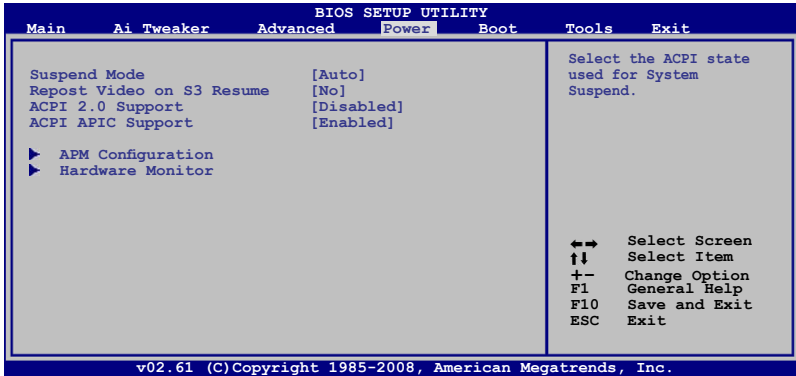
3.7.1 Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.

[Auto]   The system automatically configures the ACPI suspend mode.

[S1 (POS) only] Sets the ACPI suspend mode to S1/POS (Power On Suspend).

[S3 only]   Sets the ACPI suspend mode to S3/STR (Suspend To RAM).

3.7.2 Repost Video on S3 Resume [No]

Determines whether to invoke VGA BIOS POST on S3/STR resume.

[No]   When set to [No], the system will not invoke VGA BIOS POST on S3/STR resume.

[Yes]   When set to [Yes], the system invokes VGA BIOS POST on S3/STR resume.

3.7.3 ACPI 2.0 Support [Disabled]

[Disabled]   When set to [Disabled], the system will not add additional tables as per ACPI 2.0 specifications.

[Enabled]   When set to [Enabled], the system adds additional tables as per ACPI 2.0 specifications.

3.7.4 ACPI APIC Support [Enabled]

[Disabled]   When set to [Disabled], the system disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC).

[Enabled]   When set to [Enabled], the ACPI APIC table pointer is included in the RSDT pointer list.

3.7.5 APM Configuration

```
                    BIOS SETUP UTILITY
                         Power

 APM Configuration                              <Enter> to select
                                                whether or not to
 Restore on AC Power Loss      [Power Off]      restart the system
                                                after AC power loss.
 Power On By RTC Alarm         [Disabled]
 Power On By External Modem    [Disabled]
 Power On By PCI Devices       [Disabled]
 Power On By PCIE Devices      [Disabled]
 Power On By PS/2 Keyboard     [Disabled]
 Power On By PS/2 Mouse        [Disabled]
```
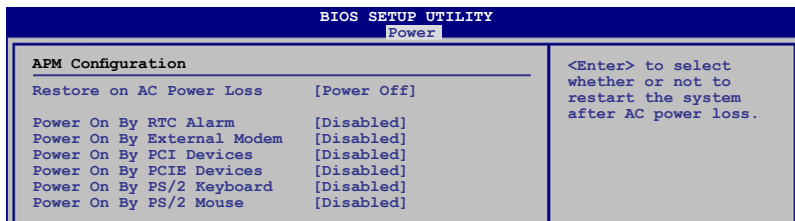
Restore On AC Power Loss [Power Off]

[Power On]   The system goes into on state after an AC power loss.

[Power Off]   The system goes into off state after an AC power loss.

[Last State]   The system goes into either off or on state, whatever the system state was before the AC power loss.

Power On By RTC Alarm [Disabled]

[Disabled]   Disables RTC to generate a wake event.

[Enabled]   When set to [Enabled], the items **RTC Alarm Date/RTC Alarm Hour/ RTC Alarm Minute/ RTC Alarm Second** will become user-configurable with set values.

Power On By External Modems [Disabled]

[Disabled]   Disables to power up the computer when the external modem receives a call while the computer is in Soft-off mode.

[Enabled]   The computer could be powered up when the external modem receives a call while the computer is in Soft-off mode.

> The computer cannot receive or transmit data until the computer and applications are fully running. Thus, connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that turns the system power on.

Power On By PCI Devices [Disabled]

[Disabled]   Disables the PME to wake up from S5 by PCI devices.

[Enabled]   Allows you to turn on the system through a PCI LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Power On By PS/2 Keyboard [Disabled]

[Disabled]   Disables the Power On by a PS/2 keyboard.

[Enabled]   Sets specific keys on the PS/2 keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Power On By PS/2 Mouse [Disabled]

[Disabled]   Disables the Power On by a PS/2 mouse.

[Enabled]   Enables the Power On by a PS/2 mouse. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

3.7.6 Hardware Monitor

```
                      BIOS SETUP UTILITY
                           Power
 ┌─────────────────────────────────────────────┬──────────────────┐
 │ Hardware Monitor                             │ CPU Temperature  │
 │                                              │                  │
 │ CPU Temperature          [42°C/107.5°F]      │                  │
 │ MB Temperature           [33°C/91°F]         │                  │
 │                                              │                  │
 │ CPU Fan Speed            [4856RPM]           │                  │
 │ CPU Q-Fan Control        [Disabled]          │                  │
 │                                              │                  │
 │ Chassis Fan 1 Speed      [N/A]               │                  │
 │ Chassis Fan 2 Speed      [N/A]               │                  │
 │ Chassis Q-Fan Control    [Disabled]          │                  │
 │                                              │                  │
 │ Power Fan Speed          [N/A]               │                  │
 │                                              │                  │
 │ CPU Voltage              [ 1.234V]           │                  │
 │ 3.3V Voltage             [ 3.320V]           │                  │
 │ 5V Voltage               [ 5.026V]           │                  │
 │ 12V Voltage              [11.787V]           │                  │
 └─────────────────────────────────────────────┴──────────────────┘
```

CPU/MB Temperature [xxxºC/xxxºF]

The onboard hardware monitor automatically detects and displays the CPU and motherboard temperatures. Select **Ignored** if you do not wish to display the detected temperatures.

CPU Fan Speed [xxxxRPM] or [Ignored] / [N/A]
Chassis Fan 1/2 Speed [xxxxRPM] or [Ignored] / [N/A]
Power Fan Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the CPU, chassis, and power fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows **N/A**. Select **Ignored** if you do not wish to display the detected speed.

CPU Q-Fan Control [Disabled]

[Disabled]   Disables the CPU Q-Fan control feature.

[Enabled]   Enables the CPU Q-Fan control feature.

CPU Fan Profile [Standard]

This item appears only when you enable the **CPU Q-Fan Control** feature and allows you to set the appropriate performance level of the CPU fan.

[Standard]   Sets to [Standard] to make the CPU fan automatically adjust depending on the CPU temperature.

[Silent]   Sets to [Silent] to minimize the fan speed for quiet CPU fan operation.

[Turbo]   Sets to [Turbo] to achieve maximum CPU fan speed.

Chassis Q-Fan Control [Disabled]

[Disabled]   Disables the Chassis Q-Fan control feature.

[Enabled]   Enables the Chassis Q-Fan control feature.

Chassis Fan Profile [Standard]

This item appears only when you enable the **Chassis Q-Fan Control** feature and allows you to set the appropriate performance level of the chassis fan.

[Standard] Sets to [Standard] to make the chassis fan automatically adjust depending on the chassis temperature.

[Silent]   Sets to [Silent] to minimize the fan speed for quiet chassis fan operation.

[Turbo]   Sets to [Turbo] to achieve maximum chassis fan speed.

CPU Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select **Ignored** if you do not want to detect this item.

3.8   Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the submenu.

```
                        BIOS SETUP UTILITY
   Main      Ai Tweaker    Advanced     Power     Boot      Tools     Exit

   Boot Settings                                  Specifies the Boot
                                                  Device Boot Priority
 ▶ Boot Device Priority                           sequence.

 ▶ Boot Settings Configuration                    A virtual floppy disk
 ▶ Security                                        drive (Floppy Drive B:
                                                  ) may appear when you
                                                  set the CD-ROM drive
                                                  as the first boot
                                                  device.

                                                  ←→   Select Screen
                                                  ↑↓   Select Item
                                                  Enter Go to Sub Screen
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit

         v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

3.8.1   Boot Device Priority

```
                        BIOS SETUP UTILITY
                                                  Boot

   Boot Device Priority

   1st Boot Device              [Removable Dev.]
   2nd Boot Device              [Hard Drive]
   3rd Boot Device              [ATAPI CD-ROM]
```

1st ~ xxth Boot Device [Removable Dev.]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [Removable Dev.] [Hard Drive] [ATAPI CD-ROM] [Disabled]

3.8.2 Boot Settings Configuration

```
                        BIOS SETUP UTILITY
                                    ┌──────┐
                                    │ Boot │
┌─────────────────────────────────────────┐  ┌──────────────────────┐
│ Boot Settings Configuration             │  │ Allows BIOS to skip  │
│                                         │  │ certain tests while  │
│ Quick Boot              [Enabled]       │  │ booting. This will   │
│ Full Screen Logo        [Enabled]       │  │ decrease the time    │
│ AddOn ROM Display Mode   [Force BIOS]   │  │ needed to boot the   │
│ Bootup Num-Lock         [On]            │  │ system.              │
│ Wait For 'F1' If Error   [Enabled]      │  │                      │
│ Hit 'DEL' Message Display [Enabled]     │  │                      │
└─────────────────────────────────────────┘  └──────────────────────┘
```
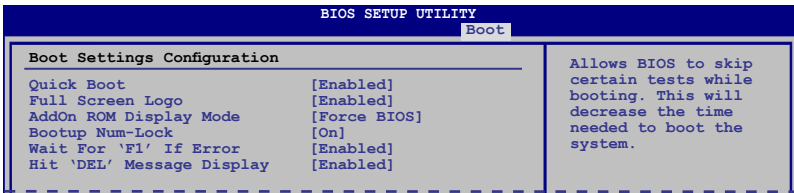
Quick Boot [Enabled]

[Disabled]   When set to [Disabled], BIOS performs all the POST items.

[Enabled]   When set to [Enabled], BIOS skips some power on self tests (POST) while booting to decrease the time needed to boot the system.

Full Screen Logo [Enabled]

[Enabled]   Enables the full screen logo display feature.

[Disabled]   Disables the full screen logo display feature.

Set this item to [Enabled] to use the ASUS MyLogo 2™ feature.

AddOn ROM Display Mode [Force BIOS]

[Force BIOS]   The third-party ROM messages will be forced to display during the boot sequence.

[Keep Current]   The third-party ROM messages will be displayed only if the third-party manufacturer had set the add-on device to do so.

Bootup Num-Lock [On]

[Off]   Sets the power-on state of the NumLock to [Off].

[On]   Sets the power-on state of the NumLock to [On].

Wait For 'F1' If Error [Enabled]

[Disabled]   Disables this function.

[Enabled]   The system waits for the <F1> key to be pressed when error occurs.
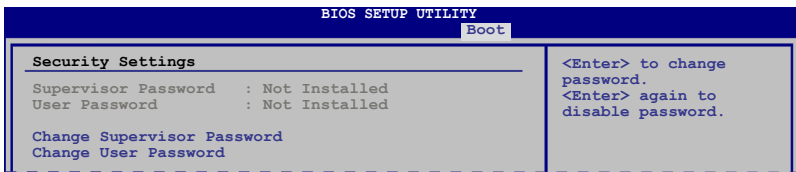
Hit 'DEL' Message Display [Enabled]

[Disabled]   Disables this function.

[Enabled]   The system displays the message "Press DEL to run Setup" during POST.

3.8.3   Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.

```
                          BIOS SETUP UTILITY
                                        Boot

   Security Settings                              <Enter> to change
                                                  password.
   Supervisor Password    : Not Installed         <Enter> again to
   User Password          : Not Installed         disable password.

   Change Supervisor Password
   Change User Password
```

Change Supervisor Password

Select this item to set or change the supervisor password. The **Supervisor Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1.   Select the **Change Supervisor Password** item and press <Enter>.

2.   From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.

3.   Confirm the password when prompted.

The message **Password Installed** appears after you successfully set your password.

To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the **Change Supervisor Password** then press <Enter>. The message **Password Uninstalled** appears.

> If you have forgotten your BIOS password, you can clear clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **2.6 Jumpers** for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.

Chapter 3

```
                              BIOS SETUP UTILITY
                                        ┌────┐
                                        │Boot│
                                        └────┘
 ┌─────────────────────────────────────────────┐ ┌─────────────────────────┐
 │ Security Settings                           │ │ <Enter> to change       │
 │                                             │ │ password.               │
 │ Supervisor Password   : Installed          │ │ <Enter> again to        │
 │ User Password         : Installed          │ │ disabled password.      │
 │                                             │ │                         │
 │ Change Supervisor Password                  │ │                         │
 │ User Access Level          [Full Access]   │ │                         │
 │ Change User Password                        │ │                         │
 │ Clear User Password                         │ │                         │
 │ Password Check             [Setup]          │ │                         │
 └─────────────────────────────────────────────┘ └─────────────────────────┘
```

User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items.

[No Access]   Prevents user access to the Setup utility.

[View Only]   Allows access but does not allow change to any field.

[Limited]   Allows changes only to selected fields, such as Date and Time.

[Full Access]   Allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows Installed.

To set a User Password:

1.   Select the **Change User Password** item and press <Enter>.
2.   On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3.   Confirm the password when prompted.

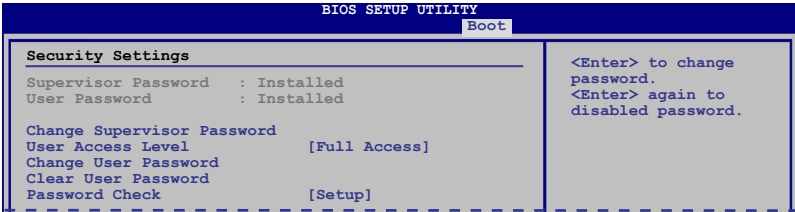The message **Password Installed** appears after you set your password successfully.

To change the user password, follow the same steps as in setting a user password.

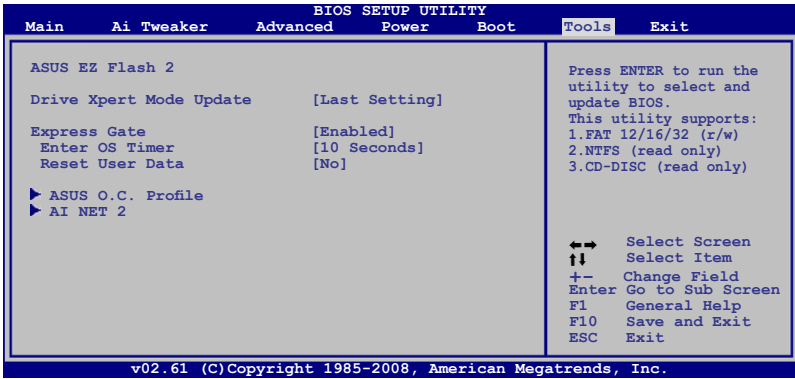## Clear User Password

Select this item to clear the user password.

Password Check [Setup]

[Setup]   BIOS checks for user password when accessing the Setup utility.

[Always]   BIOS checks for user password both when accessing Setup and booting the system.

3.9 Tools menu

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.

```
                            BIOS SETUP UTILITY
    Main      Ai Tweaker     Advanced      Power     Boot     Tools     Exit
  ┌──────────────────────────────────────────────────────────────────────────┐
  │                                                      Press ENTER to run the │
  │   ASUS EZ Flash 2                                    utility to select and  │
  │                                                      update BIOS.           │
  │   Drive Xpert Mode Update        [Last Setting]      This utility supports: │
  │                                                      1.FAT 12/16/32 (r/w)   │
  │   Express Gate               [Enabled]               2.NTFS (read only)     │
  │    Enter OS Timer            [10 Seconds]            3.CD-DISC (read only)   │
  │    Reset User Data           [No]                                           │
  │                                                                             │
  │ ▶ ASUS O.C. Profile                                                         │
  │ ▶ AI NET 2                                                                  │
  │                                                    ←→    Select Screen       │
  │                                                    ↑↓    Select Item         │
  │                                                    +-    Change Field        │
  │                                                    Enter Go to Sub Screen    │
  │                                                    F1    General Help        │
  │                                                    F10   Save and Exit       │
  │                                                    ESC   Exit                │
  └──────────────────────────────────────────────────────────────────────────┘
         v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```
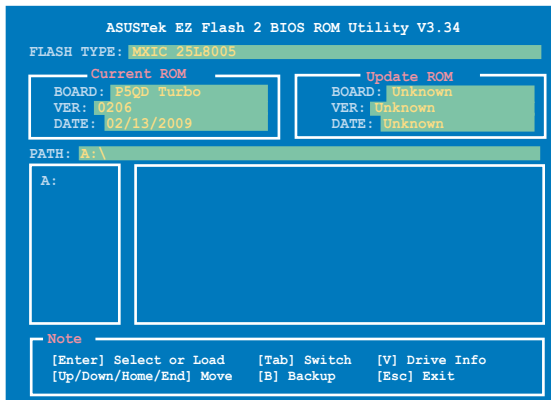
3.9.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice.

> For more details, refer to **section 3.2.2 ASUS EZ Flash 2 utility**.

```
            ASUSTek EZ Flash 2 BIOS ROM Utility V3.34
  FLASH TYPE: MXIC 25L8005

        ── Current ROM ──                 ── Update ROM ──
    BOARD: P5QD Turbo                  BOARD: Unknown
    VER: 0206                          VER: Unknown
    DATE: 02/13/2009                   DATE: Unknown

  PATH: A:\

    A:

    ── Note ─────────────────────────────────────────────────
    [Enter] Select or Load    [Tab] Switch    [V] Drive Info
    [Up/Down/Home/End] Move    [B] Backup      [Esc] Exit
```

3.9.2 Drive Xpert Mode Update [Last Setting]

Set this item to [Mode Change] to show further settings of the Drive Xpert function.
Configuration options: [Last Setting] [Mode Change]

The following items appear only when you set **Drive Xpert Mode Update** to [Mode Change].

Before using the Drive Xpert function, ensure that you have back up all your data in your hard disks.

- **EZ Backup** erases all original data/partition in the hard disk connected to the SATA_E2 (white, port 1) connector on the motherboard.
- **Super Speed** erases all original data/partition in both hard disks.

Update To Super Speed [Press Enter]
This item allows you to use **Super Speed** function. Plug two identical SATA hard drives in the SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors on the motherboard and press the <Enter> key.

Update To EZ Backup [Press Enter]
This item allows you to use **EZ Backup** function. Plug two identical SATA hard drives in the SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors on the motherboard and press the <Enter> key.

Update To Normal Mode [Press Enter]
This item allows you to use the SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors as normal SATA connectors.

- When using one hard disk in **Normal Mode**, connect the hard disk to the SATA_E1 (orange, port 0) connector on the motherboard.
- Use the Drive Xpert utility to see both the status of the hard disks connected to the SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors on the motherboard. In the BIOS **Main** menu and the **Device Manager** in OS, only the hard disk connected to the SATA_E1 connector (orange, port 0) can be detected.
- Clear all previous partitions in the hard disks before you proceed with any mode changes.

3.9.3 Express Gate [Enabled]

Allows you to enable or disable the ASUS Express Gate feature. The ASUS Express Gate feature is a unique instant-on environment that provides quick access to the Internet browser and Skype. Configuration options: [Enabled] [Disabled]

Enter OS Timer [10 Seconds]
Sets countdown duration that the system waits at the Express Gate's first screen before starting Windows or other installed OS. Choose [Prompt User] to stay at the first screen of Express Gate for user action.
Configuration options: [Prompt User] [1 second] [3 seconds] [5 seconds] [10 seconds] [15 seconds] [20 seconds] [30 seconds]

Reset User Data [No]
Allows you to clear Express Gate's user data.

[Reset]   When setting this item to [Reset], ensure that you save the setting to the BIOS so that the user data will be cleared the next time you enter the Express Gate. User data includes the Express Gate's settings as well as any personal information stored by the web browser such as bookmarks, cookies, browsing history. This is useful in the rare case where corrupt settings prevent the Express Gate environment from launching properly.

[No]   Set to [No] to disable the Reset User Data function when entering the Express Gate.

The first time wizard will run again when you enter the Express Gate environment after clearing its settings.

Chapter 3

3.9.4 ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.

```
                          BIOS SETUP UTILITY
                                                    Tools

O.C. PROFILE Configuration                     Save BIOS settings to
                                               Profile 1
O.C. Profile 1 Status   : Not Installed
O.C. Profile 2 Status   : Not Installed

Save to Profile 1
Load from Profile 1

Save to Profile 2
Load from Profile 2

Start O.C. Profile
```
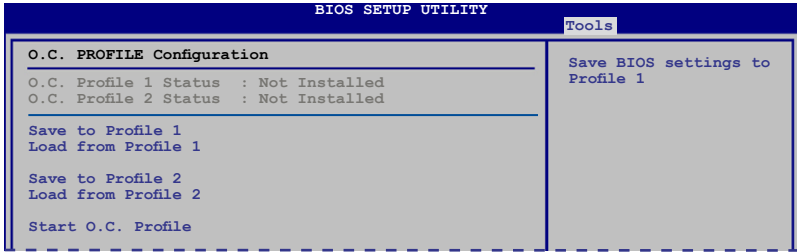
Save to Profle 1/2

Allows you to save the current BIOS file to the BIOS Flash. Press <Enter> to save the file.

Load from Profile 1/2

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press <Enter> to load the file.

Start O.C. Profile

Allows you to run the utility to save and load CMOS. Press <Enter> to run the utility.
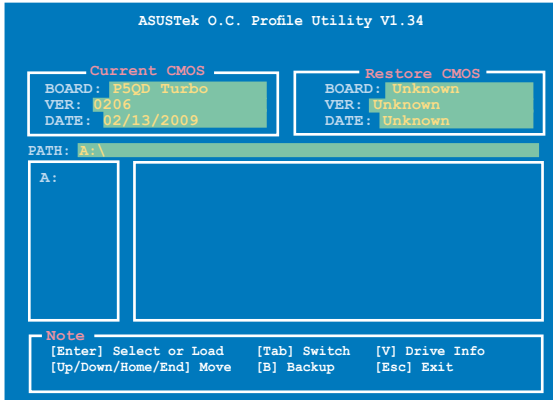
```
                ASUSTek O.C. Profile Utility V1.34


         Current CMOS                    Restore CMOS
      BOARD: P5QD Turbo             BOARD: Unknown
      VER:  0206                    VER:  Unknown
      DATE: 02/13/2009              DATE: Unknown

      PATH: A:\

      A:




        Note
        [Enter] Select or Load    [Tab] Switch    [V] Drive Info
        [Up/Down/Home/End] Move   [B] Backup      [Esc] Exit
```

> • This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
>
> • DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
>
> • We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.
>
> • Only the CMO file can be loaded.

3.9.5   AI NET 2

```
                        BIOS SETUP UTILITY
                                                Tools
  AI NET 2                                 Check Atheros LAN
                                           cable during POST.
  Pair   Status   Length


  Check Atheros LAN cable       [Disabled]

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```
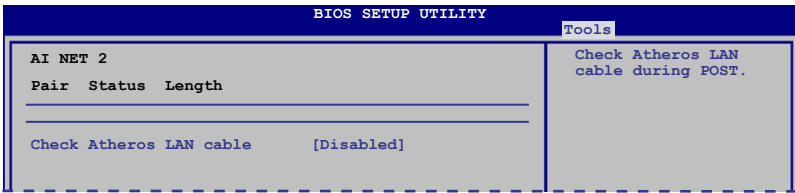
Check Atheros LAN Cable [Disabled]

[Disabled]   BIOS will not check the Atheros LAN cable during the Power-On Self-Test
                  (POST).

[Enabled]   BIOS checks the Atheros LAN cable during the Power-On Self-Test
                  (POST).

Chapter 3

3.10 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.

```
                          BIOS SETUP UTILITY
  Main      Ai Tweaker     Advanced    Power     Boot     Tools    Exit

   Exit & Save Changes                              Exit system setup
   Exit & Discard Changes                           after saving the
   Discard Changes                                  changes.

   Load Setup Defaults                              F10 key can be used
                                                    for this operation.




                                                  ← →    Select Screen
                                                  ↑↓     Select Item
                                                  Enter Go to Sub Screen
                                                  F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit

        v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.
```

🖉 Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **Ok** to save changes and exit.

🖉 If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **Ok** to discard any changes and load the previously saved values.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **Ok** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

Chapter 4

4.1   Installing an operating system

This motherboard supports Windows® XP/ 64-bit XP/ Vista™ operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

> • Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
>
> • Ensure that you install the Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

4.2   Support DVD information

The support DVD that comes with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

> The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website at www.asus.com for updates.

4.2.1   Running the support DVD

Place the support DVD into the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer. Click each menu tab and select the items you want to install.

The Drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to use the devices.

The Make Disk menu contains items to create the RAID/AHCI driver disk.

The Manual menu contains the list of supplementary user manuals. Click an item to open the folder of the user manual.

The Utilities menu shows the applications and other software that the motherboard supports.
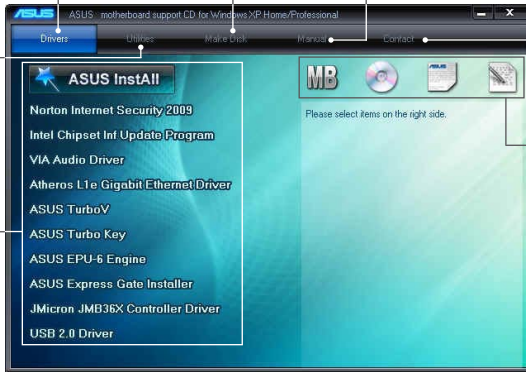
Click the Contact tab to display the ASUS contact information.

Click an icon to display DVD/ motherboard information

Click an item to install

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

4.2.2 Obtaining the software manuals

The software manuals are included in the support DVD. Follow the instructions below to get the necessary software manuals.

The software manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening the files.

1. Click the support DVD icon.
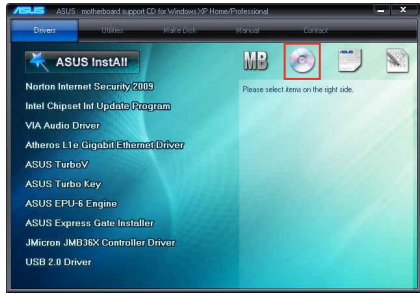
2. The support DVD contents are displayed in graphical format. Double-click the **Manual** folder.
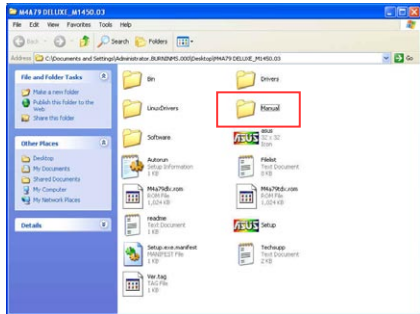
3. Double-click the folder of your selected manual.
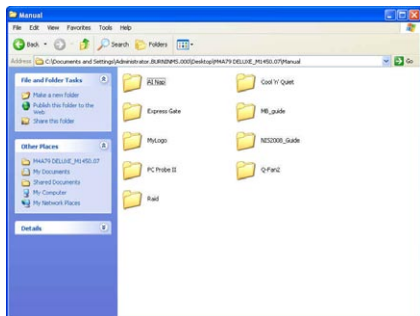
The screenshots in this section are for reference only. The actual software manuals containing in the support DVD vary by models.

4.3 Software information

Most of the applications in the support DVD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software application for more information.

4.3.1 ASUS PC Probe II

PC Probe II is a utility that monitors the computer's vital components, and detects and alerts you of any problem with these components. PC Probe II senses fan rotations, CPU temperature, and system voltages, among others. Because PC Probe II is software-based, you can start monitoring your computer the moment you turn it on. With this utility, you are assured that your computer is always at a healthy operating condition.

Launching PC Probe II

1. Install PC Probe II from the motherboard support DVD.
2. Launch PC Probe II by clicking **Start > All Programs > ASUS > PC Probe II > PC Probe II v1.xx.xx**. The PC Probe II main window appears.
3. The PC Probe II icon appears in the Windows® notification area. Click this icon to close or restore the application.

PC Probe II main window

Button	Function
CONFIG	Opens the Configuration window
	Opens the Report window
DMI	Opens the Desktop Management Interface window
PCI	Opens the Peripheral Component Interconnect window
WMI	Opens the Windows Management Instrumentation window
USAGE	Opens the hard disk drive, memory, CPU usage window
◀▷	Shows/Hides the Preference section
⊖	Minimizes the application
⊗	Closes the application

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

Chapter 4

4.3.2 ASUS AI Suite

ASUS AI Suite allows you to launch several ASUS utilities easily.

Launching AI Suite

1. Install AI Suite from the motherboard support DVD.

2. Launch AI Suite by clicking **Start** > **All Programs** > **ASUS** > **AI Suite** > **AI Suite v1.xx. xx**. The AI Suite main window appears.

3. The AI Suite icon ![icon] appears in the Windows® notification area. If you minimize the application main window, click this icon to restore the window.

Using AI Suite

Click each utility button to launch the utility, or click the **Normal** button to restore system default settings.

Click to open the monitor window that displays system information such as CPU temperature, CPU voltage, fan speed, and CPU/FSB frequency

Click to restore default settings

Click to launch each utility
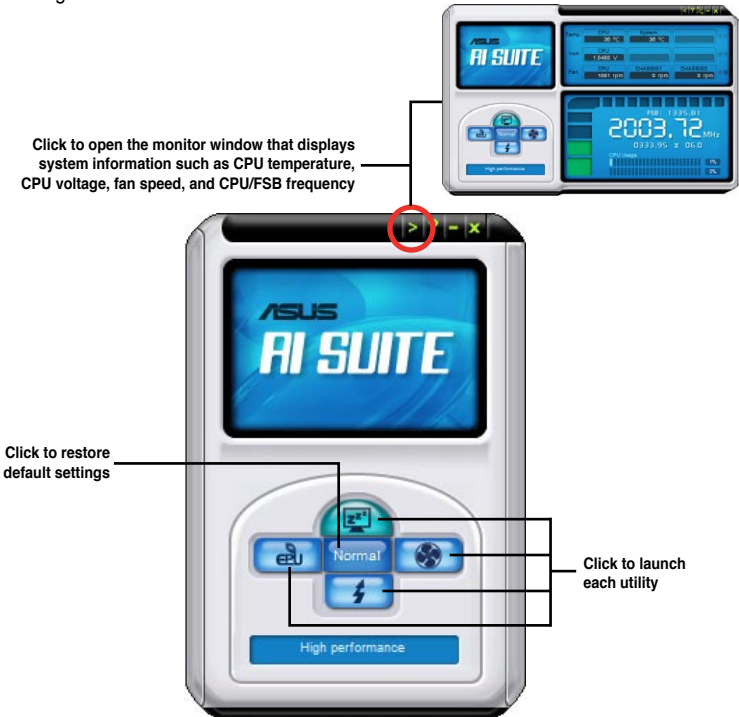
> • The screenshots in this section are for reference only. The actual utility buttons vary by models.
>
> • Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.3   ASUS EPU

ASUS EPU is an energy-efficient tool that provides you with a total system power-saving solution. It detects the current computer loading and intelligently adjusts the power in real-time. With auto phase switching for components, the EPU automatically provides the most appropriate power usage via intelligent acceleration and overclocking.

ASUS EPU provides you with these modes to choose from:

· **Turbo Mode**   · **Medium Power Saving Mode**

· **High Performance Mode**   · **Max. Power Saving Mode**

When you select Auto Mode **Auto**, the system shifts modes automatically according to the current system status. You can also configure advanced settings for each mode.

Launching EPU

After installing EPU from the motherboard support DVD, double-click the EPU tray icon to launch the program.

The first time you launch EPU, the following message will appear, asking you to run Calibration first. Running calibration allows the system to detect CPU properties to optimize power management.

Click **Run Calibration** and wait for a few seconds. Then, the EPU main menu appears.

EPU main menu

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.4 ASUS Fan Xpert

Asus Fan Xpert allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures and your PC's system loading. The various fan profiles offer flexible controls of fan speeds to achieve a quiet and cool system environment.

Launching Fan Xpert

After installing AI Suite from the motherboard support DVD, launch Fan Xpert by double-clicking the **AI Suite** tray icon and then clicking the **Fan Xpert** button [icon] on the AI Suite main window.

Using Fan Xpert

Click to open the Calibration window

Click to select a fan

Click to select a fan profile

Click to display the current CPU temperature and the fan speed ratio

Click to apply the settings

Click to cancel the settings

Fan profiles

- **Disable:** disables the **Fan Xpert** function.
- **Standard:** adjusts fan speed in a moderate pattern.
- **Silent:** minimizes fan speed for quiet fan operation.
- **Turbo:** maximizes the fan speed for the best cooling effect.
- **Intelligent:** automatically adjusts the CPU fan speed according to the ambient temperature.
- **Stable:** fixes the CPU fan speed to avoid noise caused by the unsteady fan rotation. The fan will speed up when the temperature exceeds 70ºC.
- **User:** Allows you to configure the CPU fan profile under certain limitations.

4.3.5 ASUS TurboV

ASUS TurboV allows you to easily overclock without exiting or rebooting the OS, and set up the best O.C. settings for different scenarios.

> Refer to the CPU documentation before adjusting CPU voltage settings. Setting a high voltage may damage the CPU permanently, and setting a low voltage may make the system unstable.

> • For system stability, all changes made in ASUS TurboV will not be saved to BIOS settings and will not be kept on the next system boot. Use the **Save Profile** function to save your customized overclocking settings and manually load the profile after Windows starts.
>
> • For system stability, set ASUS EPU to High Performance Mode while using ASUS TurboV.

Launching ASUS TurboV

1. Install the ASUS TurboV utility from the motherboard support DVD.

2. Click **Start > All Programs** > **ASUS** > **TurboV** > **TurboV**.

Save the current settings as a new profile

Target settings

Default settings

Click to show more settings

Advanced CPU and chipset voltage settings

Voltage Adjustment bars

Applies all changes immediately   Undoes all changes without applying

> • For advanced overclock ability, adjust first the BIOS items, and then proceed more detailed adjustments using TurboV.
>
> • Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.6 ASUS Turbo Key

ASUS Turbo Key allows the user to turn the PC power button into a physical overclocking button. After the easy setup, Turbo Key can boost performances without interrupting ongoing work or games—with just one touch!

Launching ASUS Turbo Key

1. Install ASUS Turbo Key from the motherboard support DVD.
2. Restart your computer. ASUS Turbo Key automatically starts after Windows® start-up.
3. Double-click the ASUS Turbo Key icon in the Windows® notification area to launch the Turbo Key user interface.

Configuring ASUS Turbo Key
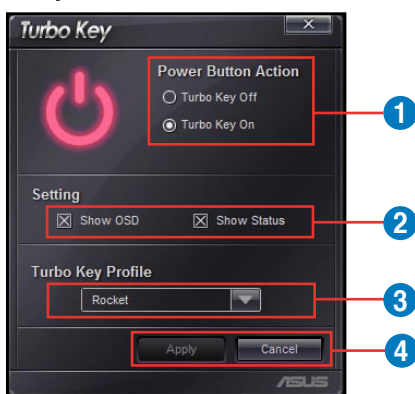
1. Select your desired power button action. Select **Turbo Key Off** to keep the power button as a common switch. Select **Turbo Key On** to boost system performance after pressing the power button.
2. You can choose whether to show Turbo Key OSD and status by clicking the check boxes in the **Setting** section.
3. You can decide the performance boost level by selecting **Turbo Key Profile**. You can also load personal profiles saved in the ASUS TurboV utility. The default is "Rocket Mode". For detailed ASUS TurboV configurations, refer to the software manual in the support DVD or visit the ASUS website at www.asus.com.
4. Click **Apply** for all settings to take effect.

Using ASUS Turbo Key

Press the power button on your computer chassis to use the Turbo Key function defined in the Turbo Key user interface. Press the power button again to turn off the Turbo Key function.

> Press and hold the power button for 4 seconds will turn off your computer.

> Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.7 ASUS Drive Xpert

Drive Xpert, an ASUS exclusive technology, secures the data on your hard disk and enhances hard drive performance without the hassles of complicated configurations. With its user-friendly graphical user interface, you can easily arrange hard drive backups or enhance the hard drive's transfer rate.

Drive Xpert provides you with three modes to choose from:

- **EZ Backup** allows one hard disk to backup the other hard disk automatically. This helps you to save your vital data even if one hard disk is damaged.
- **Super Speed** allows two hard disks to access data simultaneously. The dual channel design largely enhances hard disk transfer rate.
- **Normal Mode** allows you to disable the **Drive Xpert** function and use the two SATA connectors as onboard SATA connectors.

- For using Drive Xpert in Windows® operating system, we recommend that you prepare three hard disks: one hard disk with operating system already installed, and two hard disks for Drive Xpert configuration.

- Before using the Drive Xpert function, ensure that you have connected the SATA signal cables and installed SATA hard disk drives.

- When using one hard disk in **Normal Mode**, connect the hard disk to the SATA_E1 (orange, port 0) connector on the motherboard.

- Use the Drive Xpert utility to see both the status of the hard disks connected to the SATA_E1 (orange, port 0) and SATA_E2 (white, port 1) connectors on the motherboard. In the BIOS **Main** menu and the **Device Manager** in OS, only the hard disk connected to the SATA_E1 connector (orange, port 0) can be detected.

- Clear all previous partitions in the hard disks before you proceed with any mode changes.

Launching Drive Xpert in Windows® OS

After installing Drive Xpert from the bundled support DVD, double-click the **Drive Xpert** icon on the Windows® notification area. The main screen as shown on the right hand side appears.

Before using the Drive Xpert function, ensure that you have back up all your data in your hard disks.

- **EZ Backup** erases all original data/partitions in the hard disk connected to the SATA_E2 (white, port 1) connector on the motherboard.
- **Super Speed** erases all original data/partitions in both hard disks.

You may use Drive Xpert function in Express Gate and BIOS setup environments. Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.3.8 ASUS Express Gate

ASUS Express Gate is an instant-on environment that gives you quick access to the Internet, Skype, and viewing your pictures. Within a few seconds of powering on your computer, you will be at the Express Gate menu where you can start the web browser, Skype, or other Express Gate applications.

Notices about ASUS Express Gate

- Ensure to install ASUS Express Gate from the motherboard support DVD before use.
- ASUS Express Gate supports SATA devices in IDE mode only. See chapter 3 for BIOS setup details.
- ASUS Express Gate supports SATA devices connected to **motherboard chipset-controlled onboard SATA ports** only. All onboard extended SATA ports and external SATA ports are NOT supported. See chapter 2 for the exact location of onboard SATA ports.
- ASUS Express Gate supports file uploading from ODD and USB drives and downloading to USB drives only.
- ASUS Express Gate supports installation on SATA HDDs, USB HDDs and Flash drives with at least 1.2GB of available disk space. When installed on USB HDDs and Flash drives, connect the drives to the motherboard USB port before turning on the computer.
- Your monitor must support the screen resolution of **1024 x 768**, or ASUS Express Gate will be skipped during the booting process, and the existing OS will be launched directly.
- Installation of at least 1GB system memory is recommended for better performance.

The First Screen

Express Gate's first screen appears within a few seconds after you power on the computer.

Click any of the application icons to enter Express Gate environment and launch the selected application

Turn off the computer

Continue booting to existing OS when the timer above the Exit icon counts down to zero (0); click to immediately enter existing OS

- To enter the motherboard BIOS setup program, click **Exit** on the Express Gate First Screen, and then press the <Del> key during POST.
- Refer to the software manual in the support DVD or click in the Express Gate environment for detailed software instructions.
- Express Gate complies with the OpenGL standard. Refer to http://support.asus.com for Express Gate source codes.

4.3.9   Audio configurations

The VIA® High Definition Audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your computer. The software provides Jack-Detection,Multi-Streaming, Front Panel Jack-Retasking and S/PDIF Out support.
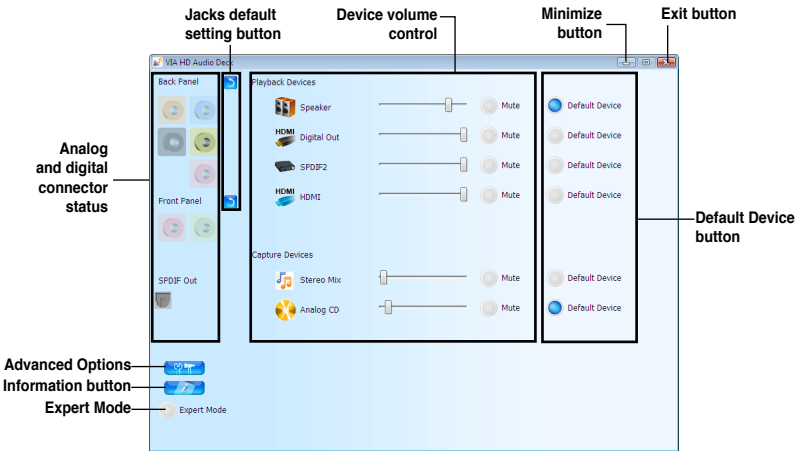
Follow the installation wizard to install the VIA® Audio Driver from the support CD/DVD that came with the motherboard package.

If the VIA audio software is correctly installed, you will find the **VIA HD Audio Deck** icon on the taskbar. Double-click on the icon to display the VIA HD Audio Deck.

VIA HD Audio Deck

A.   VIA HD Audio Deck for Windows® Vista™

Jacks default setting button

Device volume control

Minimize button

Exit button

Analog and digital connector status

Default Device button

Advanced Options

Information button

Expert Mode

B.   VIA HD Audio Deck for Windows XP

Display panel and volume control

Minimize button

Configuration options

Control settings window

Refer to the software manual in the support DVD or visit the ASUS website at www.asus.com for detailed software configuration.

4.4 RAID configurations

The motherboard comes with the Intel® ICH10R Southbridge controller that supports RAID 0, RAID 1, RAID 10, and RAID 5 for six independent Serial ATA channels.

4.4.1 RAID definitions

RAID 0 (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

Intel® Matrix Storage. The Intel® Matrix Storage technology supported by the ICH10R chip allows you to create a RAID 0, RAID 1, RAID 5, and RAID 10 functions to improve both system performance and data safety. You can also combine two RAID sets to get higher performance, capacity, or fault tolerance provided by the difference RAID function. For example, RAID 0 and RAID 1 set can be created by using only two identical hard disk drives.

> For Windows XP, if you want to install the system to a hard disk drive included in a RAID set, first copy the RAID driver from the support DVD to a USB floppy disk before installing the operating system. Refer to section **4.5 Creating a RAID driver disk** for details.

4.4.2 Installing Serial ATA hard disks

The motherboard supports Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1. Install the SATA hard disks into the drive bays.
2. Connect the SATA signal cables.
3. Connect a SATA power cable to the power connector on each drive.

4.4.3 Setting the RAID item in BIOS

You must enable the RAID function in the BIOS Setup before creating RAID set(s) using SATA HDDs. To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Main** menu > **Storage Configuration**, and then press <Enter>.
3. Set the **Configure SATA as** item to [RAID].
4. Save your changes, and then exit the BIOS Setup.

> Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

4.4.4 Intel® Matrix Storage Manager option ROM utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 0+1), and RAID 5 sets from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Matrix Storage Manager option ROM utility:

1. Turn on the system.
2. During POST, press <Ctrl> + <I> to display the utility main menu.

```
     Intel(R) Matrix Storage Manager option ROM v8.0.0.1038 ICH10R wRAID5
         Copyright(C) 2003-08 Intel Corporation.  All Rights Reserved.

    ==========================[ MAIN MENU ]==========================
         1. Create RAID Volume            3. Reset Disks to Non-RAID
         2. Delete RAID Volume            4. Exit


    ===================[ DISK/VOLUME INFORMATION ]===================
      RAID Volumes:
      None defined.

      Physical Disks:
      Port Drive Model     Serial #          Size      Type/Status(Vol ID)
      0    ST3160812AS     9LS0HJA4          149.0GB   Non-RAID Disk
      1    ST3160812AS     9LS0F4HL          149.0GB   Non-RAID Disk
      2    ST3160812AS     3LS0JYL8          149.0GB   Non-RAID Disk
      3    ST3160812AS     9LS0BJ5H          149.0GB   Non-RAID Disk




      [↑↓]-Select          [ESC]-Exit          [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

> The utility supports maximum four hard disk drives for RAID configuration.

Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Matrix Storage Manager option ROM v8.0.0.1038 ICH10R wRAID5
             Copyright(C) 2003-08 Intel Corporation.  All Rights Reserved.
    ============================[ CREATE VOLUME MENU ]============================
                         Name:   Volume0
                   RAID Level:   RAID0(Stripe)
                        Disks:   Select Disks
                   Strip Size:   128KB
                     Capacity:   0.0   GB

                                 Create Volume

    ==================================[ HELP ]===================================



          Enter a unique volume name that has no special characters and is
                             16 characters or less.



        [↑↓]Change     [TAB]-Next    [ESC]-Previous Menu    [ENTER]-Select
```

2. Enter a name for the RAID set and press <Enter>.

3. When the **RAID Level** item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.

4. When the **Disks** item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The **SELECT DISKS** screen appears:

```
    ===============================[ SELECT DISKS ]===============================
    Port Drive Model       Serial #        Size        Status
    0    ST3160812AS       9LS0HJA4        149.0GB     Non-RAID Disk
    1    ST3160812AS       9LS0F4HL        149.0GB     Non-RAID Disk
    2    ST3160812AS       3LS0JYL8        149.0GB     Non-RAID Disk
    3    ST3160812AS       9LS0BJ5H        149.0GB     Non-RAID Disk


          Select 2 to 6 disks to use in creating the volume.

    =[↑↓]-Prev/Next [SPACE]-SelectDisk [ENTER]-Done =============================
```

5. Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6. Use the up/down arrow key to select the stripe size for the RAID array (for RAID 0, 10 and 5 only), then press <Enter>. The available stripe size values range from 4KB to 128KB. The following are typical values:
    RAID 0: 128KB
    RAID 10: 64KB
    RAID 5: 64KB

    We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

7. When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

8. When the **Create Volume** item is selected, press <Enter>. The following warning message appears:

```
            WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
        Are you sure you want to create this volume? (Y/N):
```

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the **CREATE VOLUME** menu.
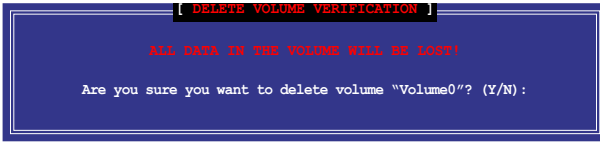
Deleting a RAID set

⚠️ Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Matrix Storage Manager option ROM v8.0.0.1038 ICH10R wRAID5
            Copyright(C) 2003-08 Intel Corporation.  All Rights Reserved.
    ════════════════════════[ DELETE VOLUME MENU ]════════════════════
      Name          Level        Drives      Capacity     Status       Bootable
      Volume0       RAID0(Stripe)    2        298.0GB      Normal          Yes



    ════════════════════════════[ HELP ]════════════════════════════



            Deleting a volume will reset the disks to non-RAID.

                  WARNING: ALL DISK DATA WILL BE DELETED.



         [↑↓]-Select        [ESC]-Previous Menu     [DEL]-Delete Volume
```
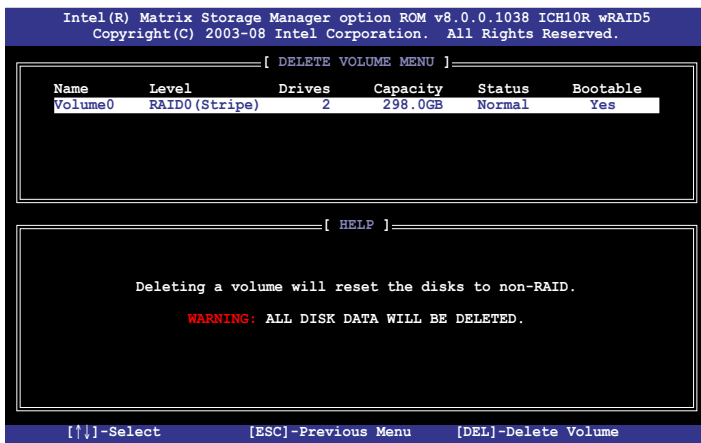
2.   Use the up/down arrow key to select the RAID set you want to delete, and then press
      <Del>. The following warning message appears:

[DELETE VOLUME VERIFICATION]

ALL DATA IN THE VOLUME WILL BE LOST!

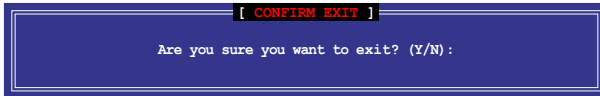Are you sure you want to delete volume "Volume0"? (Y/N):

3.   Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to
      return to the **DELETE VOLUME** menu.

Exiting the Intel® Matrix Storage Manager

To exit the utility:

1.   From the utility main menu, select **4. Exit**, and then press <Enter>. The following
      warning message appears:

[CONFIRM EXIT]

Are you sure you want to exit? (Y/N):

2.   Press <Y> to exit or press <N> to return to the utility main menu.

4.5   Creating a RAID driver disk

The motherboard comes with the Intel® ICH10R Southbridge controller that allows you to configure Serial ATA hard disk drives as RAID sets. The motherboard supports the following RAID configurations: RAID 0, RAID 1, RAID 10 and RAID 5.

> • **The motherboard does not provide a floppy drive connector.** You have to use a USB floppy disk drive when creating a **SATA** RAID driver disk.
>
> • Windows® XP may not recognize the USB floppy disk drive due to Windows® XP limitation. To work around this OS limitation, refer to section **4.5.3 Using a USB floppy disk drive**.

4.5.1   Creating a RAID driver disk without entering the OS

To create a RAID/SATA driver disk without entering the OS:

1.   Boot your computer.
2.   Press <Del> during POST to enter the BIOS setup utility.
3.   Set the optical drive as the primary boot device.
4.   Insert the support DVD into the optical drive.
5.   Save changes and exit BIOS.
6.   When the **Make Disk** menu appears, press <a> or <b> to create a 32/64bit **Intel ICH10R RAID driver disk**.
7.   Insert a formatted floppy disk into the USB floppy disk drive, then press <Enter>.
8.   Follow the succeeding screen instructions to complete the process.

4.5.2   Creating a RAID driver disk in Windows®

To create a RAID driver disk in Windows®:

1.   Start Windows®.
2.   Plug the USB floppy disk drive and insert a floppy disk.
3.   Place the motherboard support DVD into the optical drive.
4.   Go to the **Make Disk** menu, and then click **Intel ICH10R 32/64 bit RAID Driver Disk** to create an Intel® ICH10R RAID driver disk.
5.   Select USB floppy disk drive as the destination disk.
6.   Follow the succeeding screen instructions to complete the process.

> Write-protect the floppy disk to avoid a computer virus infection.

To install the RAID driver in Windows® XP:

1.   During the OS installation, the system prompts you to press the F6 key to install third-party SCSI or RAID driver.

2.   Press <F6>, and then insert the floppy disk with RAID driver into the USB floppy disk drive.

3.   When prompted to select the SCSI adapter to install, ensure that you select **Intel(R) SATA RAID Controller (Desktop ICH10R)**.

4.   Follow the succeeding screen instructions to complete the installation.

To install the RAID driver in Windows® Vista™:

1.   Insert the floppy disk/USB device with RAID driver into the USB floppy disk drive/USB port.

2.   During the OS installation, select **Intel(R) SATA RAID Controller (Desktop ICH10R)**.

3.   Follow the succeeding screen instructions to complete the installation.

Chapter 4

4.5.3 Using a USB floppy disk drive

Due to OS limitation, Windows® XP may not recognize the USB floppy disk drive when you install the RAID driver from a floppy disk during the OS installation.

To solve this issue, add the USB floppy disk drive's Vendor ID (VID) and Product ID (PID) to the floppy disk containing the RAID driver. Refer to the steps below:

1. Using another computer, plug the USB floppy disk drive, and insert the floppy disk containing the RAID driver.

2. Right-click **My Computer** on the Windows® desktop or **start** menu, and then select **Manage** from the pop-up window.
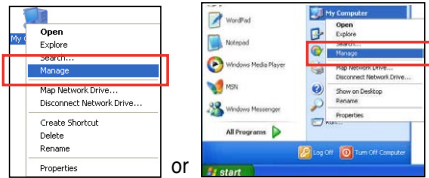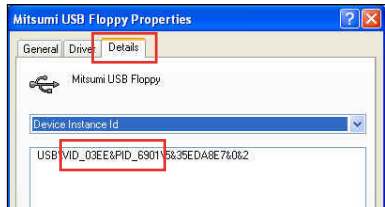
3. Select **Device Manager**. From the **Universal Serial Bus controllers**, right-click **xxxxxx USB Floppy**, and then select **Properties** from the pop-up window.
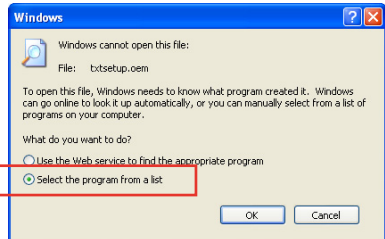
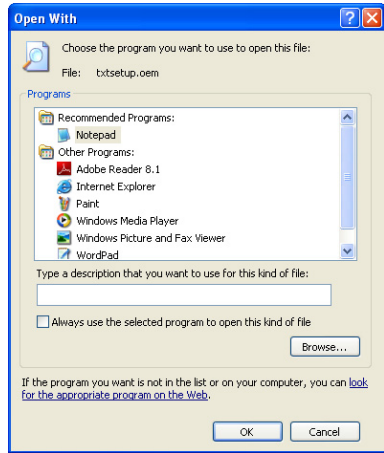   The name of the USB floppy disk drive varies with different vendors.
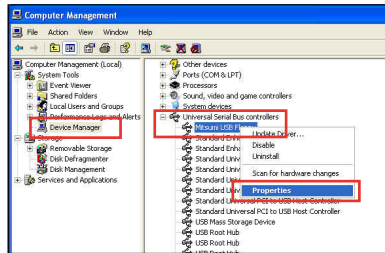
4. Click **Details** tab. The Vendor ID (VID) and Product ID (PID) are displayed.

5. Browse the contents of the RAID driver disk to locate the file **txtsetup.oem**.

6. Double-click the file. A window appears, allowing you to select the program for opening the oem file.

7.   Use Notepad to open the file.

8.   Find the **[HardwareIds.scsi.iaAHCI_ICH10R]** and **[HardwareIds.scsi.iastor_ICH8RICH9RICH10RDO]** sections in the **txtsetup.oem** file.

9.   Type the following line to the bottom of the two sections:
      id = "USB\VID_xxxx&PID_xxxx", "usbstor"

```
[HardwareIds.scsi.iaAHCI_ICH10R]
id = "PCI\VEN_8086&DEV_3A22&CC_0106","iaStor"
id = "USB\VID 03EE&PID 6901", "usbstor" #--Mitsumi

[HardwareIds.scsi.iaStor_ICH8RICH9RICH10RDO]
id = "PCI\VEN_8086&DEV_2822&CC_0104","iaStor"
id = "USB\VID_03EE&PID_6901", "usbstor" #--Mitsumi
```

Add the same line to both sections.

The VID and PID vary with different vendors.

10.   Save and exit the file.

Chapter 4