V-Series P5G45

ASUS PC (Desktop Barebone)

Installation Manual
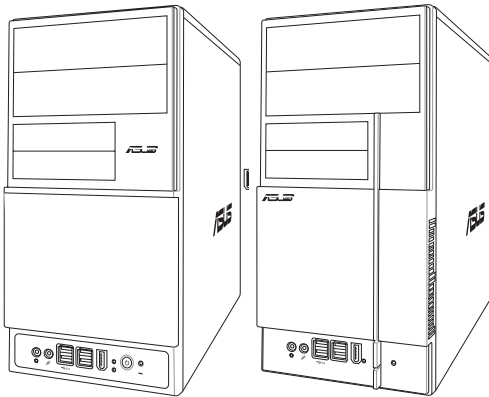
E4142

First Edition V1
October 2008

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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.

> **WARNING!** 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.

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

Operation safety

- Before installing devices into the system, carefully read all the documentation that came with the package.
- Before using the product, make sure 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. Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

VORSICHT: Explosionsgetahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einem vom Hersteller empfohlenem ähnljchen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

LASER PRODUCT WARNING

CLASS 1 LASER PRODUCT

About this guide

Audience

This guide provides general information and installation instructions about the ASUS Vintage V-Series P5G45 barebone system. This guide is intended for experienced users and integrators with hardware knowledge of personal computers.

How this guide is organized

This guide contains the following parts:

1. **Chapter 1: System introduction**

    This chapter gives a general description of the ASUS V-Series P5G45. The chapter lists the system features, including introduction on the front and rear panel, and internal components.

2. **Chapter 2: Basic installation**

    This chapter provides step-by-step instructions on how to install components in the system.

3. **Chapter 3: Starting up**

    This chapter helps you power up the system and install drivers and utilities from the support DVD.

4. **Chapter 4: Motherboard information**

    This chapter gives information about the motherboard that comes with the system. This chapter includes the motherboard layout, jumper settings, and connector locations.

5. **Chapter 5: BIOS information**

    This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

Conventions used in this guide

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 aid in completing a task.

Where to find more information

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

1. **ASUS Websites**

   The ASUS websites worldwide provide 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.

System package contents

Check your V-Series P5G45 system package for the following items.

If any of the items is damaged or missing, contact your retailer immediately.

Item description
1.   ASUS V-Series P5G45 barebone system with
• ASUS motherboatd
• Power supply unit
• ASUS chassis
2.   Cable
• AC power cable
3.   Support DVD
4.   User guide
5.   Telecom Adapter Card (Optional)

Chapter 1

This chapter gives a general description of the ASUS V-Series P5G45. The chapter lists the system features including introduction on the front and rear panel, and internal components.
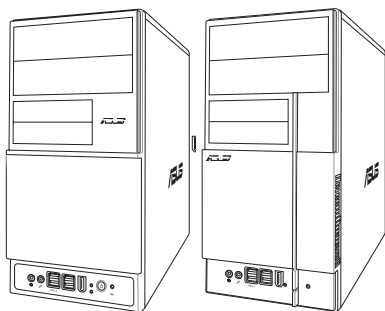
1.1   Welcome!

Thank you for choosing the ASUS V-Series P5G45!

The ASUS V-Series P5G45 is an all-in-one barebone system with a versatile home entertainment feature.

The system comes in a stylish casing and powered by the ASUS motherboard that supports the Intel® Core™2 Extreme / Core™2 Duo / Core™2 Quad / Pentium® dual-core / Celeron® processors in the 775-land package.

The system supports up to 8 GB of system memory using DDR2-1066/800/667 DIMMs. High-resolution graphics via integrated graphics controller or PCI Express x16 slot, Serial ATA, USB 2.0, and 8-channel audio feature the system and take you ahead in the world of power computing.

1.2   Front panel

The front panel includes the optical drive bays, floppy disk drive slot, power button, and several I/O ports are located at the front panel.
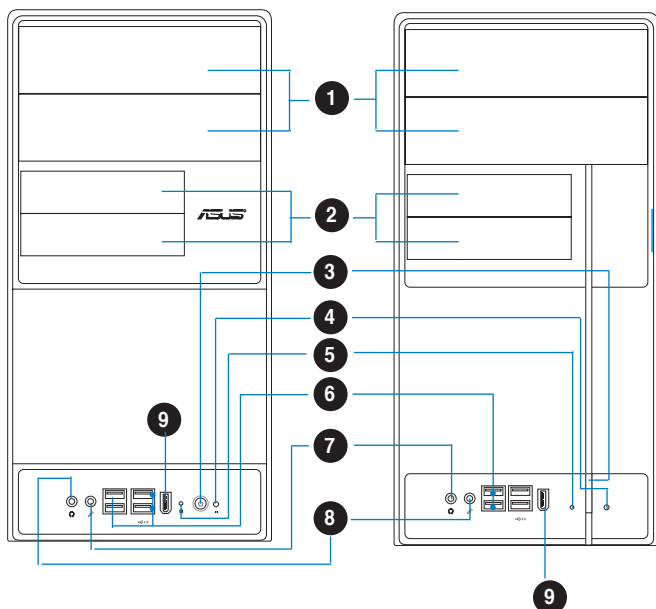
1. Two empty 5.25-inch bays. These bays are for IDE optical drives.
2. 3.5-inch drive bays. These slots are for 3.5-inch floppy or hard disk drives.
3. Power button. Press this button to turn the system on.
4. Reset button. Press this button to reboot the system without turning off the power.
5. HDD LED. This LED lights up when data is read from or written to the hard disk drive.
6. USB 2.0 ports. These Universal Serial Bus 2.0 (USB 2.0) ports are available for connecting USB 2.0 devices such as a mouse, printer, scanner, camera, PDA, and others.
7. Headphone port. This Line In (green) port connects a headphone with a stereo mini-plug.
8. Microphone port. This Mic (pink) port connects a microphone.
9. IEEE1394 port.

This V-series provide V2/V3 two types of front panel for users to choose, please refer to your product package for the front panel type you purchased.

1.3 Rear panel

The system rear panel includes the power connector and several I/O ports that allow convenient connection of devices.
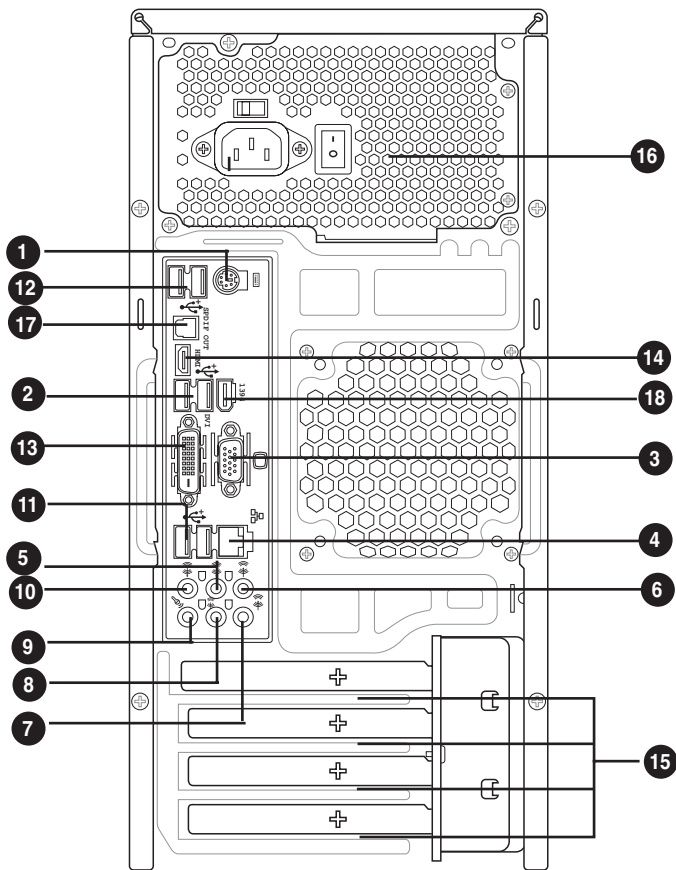
1. **PS/2 keyboard port (purple)**. This port is for a PS/2 keyboard.

2. **USB 2.0 ports 3 and 4**. These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

3. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.

4. **LAN (RJ-45) port.** Supported by Gigabit LAN controller, this port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

Activity/Link 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   SPEED
LED   LED

LAN port
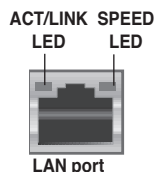
5. **Rear Speaker Out port (black).** This port connects the rear speakers in a 4-channel, 6-channel, or 8-channel audio configuration.

6. **Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.

7. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.

8. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.

9. **Microphone port (pink).** This port connects a microphone.

10. **Side Speaker Out port (gray).** This port connects the side speakers in an 8-channel audio configuration.

> Refer to the audio configuration table below for the function of the audio ports in 2, 4, 6, or 8-channel configuration.

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 Ou	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

11. **USB 2.0 ports 1 and 2.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

12. **USB 2.0 ports 5 and 6.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

13. **DVI-D Out port.** This port is for any DVI-D compatible device and is HDCP compliant allowing playback of HD DVD, Blu-Ray and other protected content.

- This motherboard comes with multiple VGA output that features desktop extension on two monitors. You can connect two monitors to any two of the onboard VGA, DVI-D, and HDMI ports. Note that DVI-D/HDMI dual output works in OS environment only and that during POST or BIOS setup, only DVI-D output is valid.

- DVI-D cannot be converted to output RGB Signal to CRT and is not compatible with DVI-I.

- To play HD DVD or Blu-Ray Disc, make sure to use an HDCP compliant monitor.

14. HDMI Out port. This port is for a high-definition multimedia interface (HDMI) connector.

- This motherboard comes with multiple VGA output that features desktop extension on two monitors. You can connect two monitors to any two of the onboard VGA, DVI-D, and HDMI ports. Note that DVI-D/HDMI dual output works in OS environment only and that during POST or BIOS setup, only DVI-D output is valid.

- Due to the Intel® VGA driver issue, the Windows® Display Settings menu may offer some resolution options that your monitor does not support. When you set a resolution not supported by your monitor, it will black out. If this happens, wait 15 seconds for the system to return to its original setting or restart the system and press F8 to enter Safe Mode. In Safe Mode, change the display setting to 800 x 600, and then restart the system to adjust the monitor resolution from the Windows® Display Settings menu.

- Due to the Intel® driver issue, some monitor resolution settings will lead to monitor overscan or underscan. Refer to the next page for the troubleshooting on monitor overscan/underscan problem

- Playback of HD DVD and Blu-Ray Discs
  The speed and bandwidth of the CPU/Memory, DVD player, and drivers will affect the playback quality. Following is a configuration example for your reference. Using the CPU/Memory of higher speed and bandwidth with the higher-version DVD player and drivers will upgrade the playback quality.

  CPU: Intel Core 2 Duo 2.4GHz
  DIMM: DDR2-800 1GB
  Playback software - CyberLink PowerDVD Ultra v8.0 1730.05

- To play HD DVD or Blu-Ray Disc, make sure to use an HDCP compliant monitor.

- You can only play HD DVD or Blu-Ray Disc under Windows® Vista™ OS.

15. **Expansion slot covers.** Remove these covers when installing expansion cards.

16. **Power supply unit fan vent.** This vent is for the PSU fan that provides ventilation inside the power supply unit.

17. **Optical S/PDIF Out port.** This port connects an external audio output device via an optical S/PDIF cable.

18. **IEEE 1394a port.** This 6-pin IEEE 1394a port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable devices.

Voltage selector

The PSU has a 115 V/230 V voltage selector switch located beside the power connector. Use this switch to select the appropriate system input voltage according to the voltage supply in your area.

If the voltage supply in your area is 100-127 V, set this switch to 115 V.

If the voltage supply in your area is 200-240 V, set this switch to 230 V.
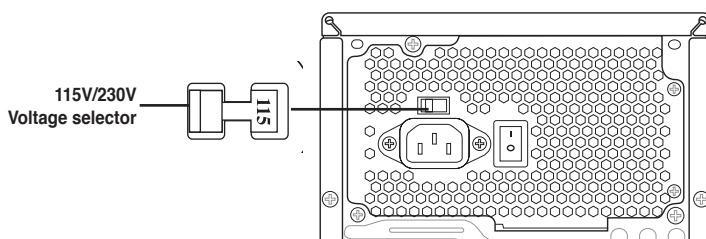
Setting the switch to 115V in a 230V environment or 230V in a 115V environment will seriously damage the system!

1.4   Internal components

The illustration below is the internal view of the system when you remove the top cover and the power supply unit. The installed components are labeled for your reference. Proceed to Chapter 2 for instructions on installing additional system components.
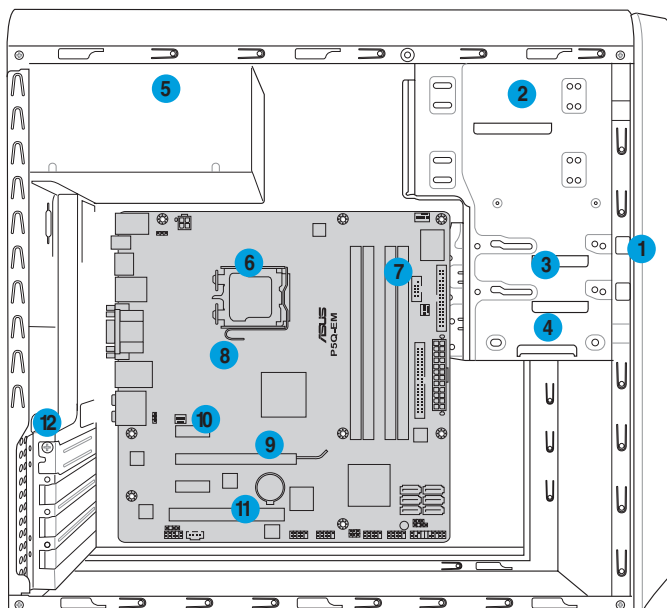
1.   Front panel cover
2.   5.25-inch optical drive bays
3.   Floppy disk drive bay
4.   Hard disk drive bay
5.   Power supply unit
6.   CPU socket
7.   DIMM sockets

8.   ASUS motherboard
9.   PCI Express x16 slot
10.   PCI Express x1 slot
11.   PCI slots
12.   Metal bracket lock

Chapter 2

This chapter provides step-by-step instructions on how to install components in the system.
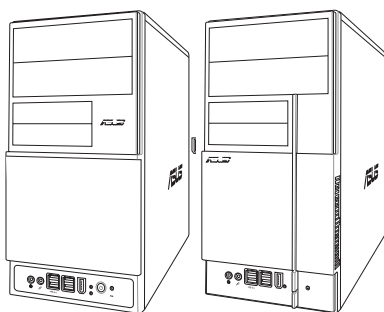
2.1   Preparation

Before you proceed, make sure that you have all the components you plan to install in the system.

Basic components to install

1. Central Processing Unit (CPU)
2. DDR2 Dual Inline Memory Module (DIMM)
3. Expansion card(s)
4. Hard disk drive
5. Optical drive
6. Floppy disk drive

Tool

Phillips (cross) screw driver

2.2   Before you proceed

Take note of the following precautions before you install components into the system.

- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components 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.

The motherboard comes with an onboard standby power LED. This LED lights up to indicate that the system is ON, in sleep mode or in soft-off mode, and not powered OFF. Unplug the power cable from the power outlet and make sure that the standby power LED is OFF before installing any system component.

SB_PWR

ON   OFF
Standy Power   Powered Off

P5Q-EM Onboard LED
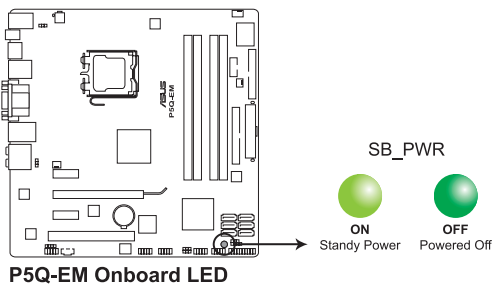
2.3   Removing the side cover and front panel assembly

1.   Remove the cover screws on the rear panel.
2.   Pull the side cover toward the rear panel until its hooks disengage from the chassis tab holes. Set the side cover aside.
3.   Locate the front panel assembly hooks, then lift them until they disengage from the chassis.
4.   Swing the front panel assembly to the right, until the hinge-like tabs on the right side of the assembly are exposed.
5.   Remove the front panel assembly, then set aside.

Air duct

Chassis tab holes
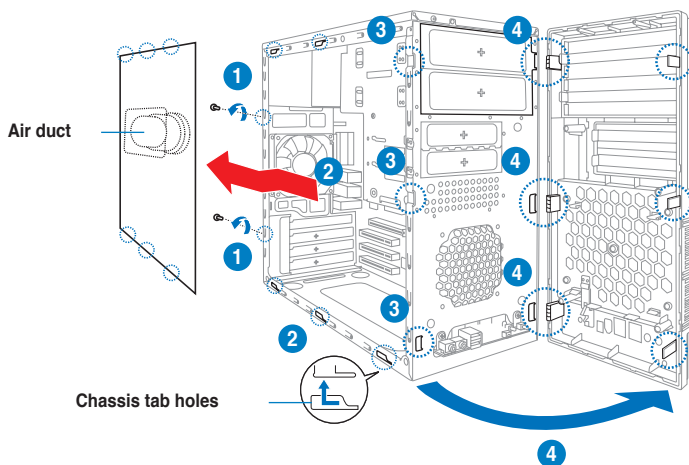
2.4 Central Processing Unit (CPU)

2.4.1 Overview

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

> • Make sure that all power cables are unplugged before installing the CPU.
>
> • Connect the chassis fan cable to the CHA_FAN1 connector to ensure system stability.

> • Upon purchase of the motherboard, make sure 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.

2.4.2 Installing CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

> Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.
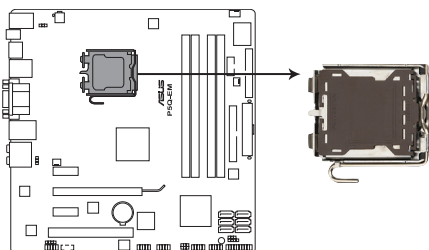
P5Q-EM CPU socket 775

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

Retention tab

A

B
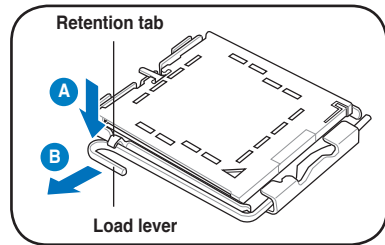
Load lever

⚠️   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.

PnP cap

Load plate

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).

4B

4A

3
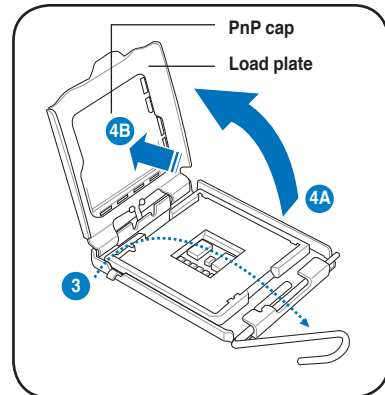
5.   Position the CPU over the socket,
      making sure that the gold triangle
      is on the bottom-left corner of the
      socket then fit the socket alignment
      key into the CPU notch.

CPU notch

**Gold
triangle
mark**

Alignment key
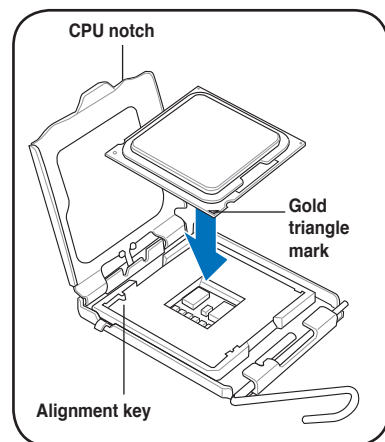
6.   Apply Thermal Interface Material
     on the CPU before closing the load
     plate.

⚠ **DO NOT** eat the Thermal
    Interface Material. If it gets
    into your eyes or touches
    your skin, make sure to wash
    it off immediately, and seek
    professional medical help.
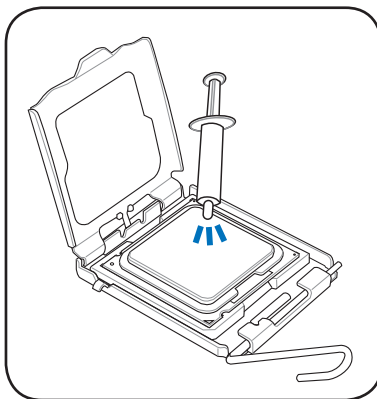
7.   Close the load plate (A), then push
     the load lever (B) until it snaps into
     the retention tab.
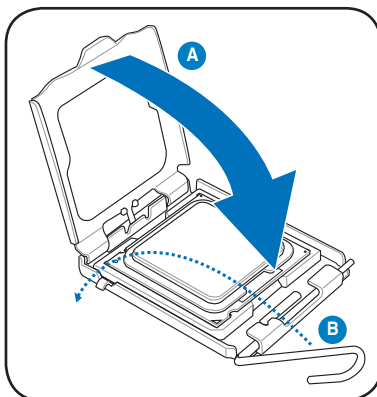
2.4.3   Installing the CPU fan and heatsink assembly

The Intel® Pentium® 4 LGA775 processor requires a specially designed heatsink
and fan assembly to ensure optimum thermal condition and performance.

✎ •   When you buy a boxed Intel® Pentium® 4 processor, the package
        includes the CPU fan and heatsink assembly. If you buy a CPU separately,
        make sure that you use only Intel®-certified multi-directional heatsink and
        fan.

    •   Your Intel® Pentium® 4 LGA775 heatsink and fan assembly comes in a
         push-pin design and requires no tool to install.

> If you purchased a separate CPU heatsink and fan assembly, make sure 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, making sure 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.
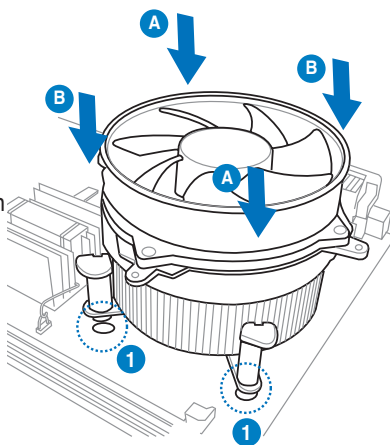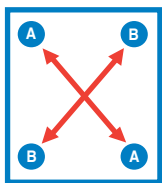
3.   When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard.

CPU_FAN

CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND
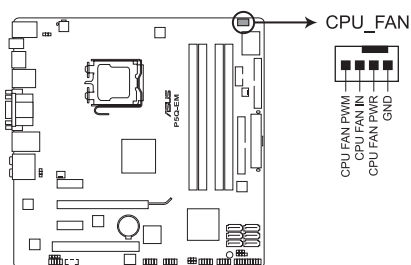
P5Q-EM CPU fan connector

> Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

2.5   Installing a DIMM

2.5.1   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:
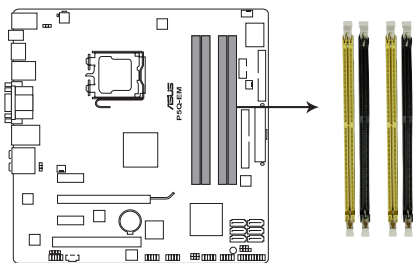
P5Q-EM 240-pin DDR2 DIMM sockets

Channel	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

2.5.2   Memory configurations

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

- Due to chipset behavior, to obtain memory frequency higher than DDR2 800, you can manually adjust DRAM Frequency in BIOS settings. Refer to 5.4 Ai Tweaker menu for details.

- 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.

- It is recommended to 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.

- When installing total memory of 4GB capacity or more, Windows® 32-bit operation system may only recognize less than 3GB. Hence, a total installed memory of less than 3 GB is recommended.

- This motherboard does not support memory modules made up of 256 Mb chips.

- Due to chipset limitation, this motherboard can only support up to 16 GB on the operating systems listed below. You may install a maximum of 4 GB DIMMs on each slot.

64-bit
Windows® XP Professional x64 Edition Windows® Vista x64 Edition

- The default memory operation frequency is dependent on its SPD. 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 5.4 Ai Tweaker menu for manual memory frequency adjustment.

- The memory modules may require a better cooling system to work stably under full loading (4 DIMMs) or overclocking setting.

P5Q-EM Motherboard Qualified Vendors Lists (QVL)
DDR2-1066MHz capability

Vendor	Part No.	Size	SS/DS	Chip No.	CL	DIMM support A*	B*	C*
A-DATA	ADQYE1B16	2048MB	DS	Heat-Sink Package	5	•		
Apacer	Box P/N:CH.02GAF.C0KK2 (78.0AG9S.9KF)	2048MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•		
Apacer	BoxP/N:CH.04GAF.F0KK2 (78.AAGAL.9KF)	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	
CORSAIR	Box P/N:TWIN2X2048-8500C5D (CM2X1024-8500C5D)(EPP)	1024MB	DS	Heat-Sink Package	N/A	•		
CORSAIR	Box P/N:TWIN2X4096-8500C5DF (CM2X2048-8500C5D)(EPP)	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•		
G.SKILL	F2-8500CL5D-2GBPK	2048MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•		
G.SKILL	F2-8500CL5S-1GBPK	1024MB	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GB22GB8500C5DC	1024MB	SS	GL2L128M88BA25AB	5-5-5-15	•		•
GEIL	GE24GB1066C5QC	4096MB(Kit of 4)	SS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GB24GB8500C5DC	4096MB(Kit of 2)	DS	GL2L128M88BA25AB	5-5-5-15	•		
GEIL	GB24GB8500C5QC	4096MB(Kit of 4)	DS	GL2L128M88BA25AB	5-5-5-15	•	•	
GEIL	GE24GB1066C5DC	4096MB(Kit of 2)	DS	Heat-Sink Package	N/A	•		
GEIL	GX24GB8500C5UDC	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	•
Hynix	HYMP564U64FP8-G7	512MB	SS	HY5PS12821FFP-G7	7			•
Hynix	HYMP 512U64FP8-G7	1024MB	DS	HY5PS12821FFP-G7	7			•
Kingston	KHX8500D2/ 512	512MB	SS	Heat-Sink Package	N/A	•	•	
Kingston	KHX8500D2K2/1G	1024MB(Kit of 2)	SS	Heat-Sink Package	N/A	•	•	
Kingston	KVR1066D2N7/ 512	512MB	SS	E5108AJBG -1J-E	N/A		•	
Kingston	KVR1066D2N7/1G	1024MB	DS	E5108AJBG -1J-E	N/A	•	•	
MICRON	MT8HTF12864AY-1GAE1	1024MB	SS	D9JKH	7	•		
OCZ	Box P/N:OCZ2N10662GK (OCZ2N10662GK)(EPP)	2048MB(Kit of 2)	DS	Heat-Sink Package	N/A	•		•
OCZ	OCZ2RPR10664GK	4096MB(Kit of 2)	DS	Heat-Sink Package	N/A	•		
Qimonda	HYS64T64000EU-19F-C	512MB	SS	HYB18T 512800CF19F	6			•
Qimonda	HYS64T128020EU-1.9-C	1024MB	DS	HYB18T 512800CF19	7	•		
Transcend	TX1066QLU-2GK	2048MB(Kit of 2)	SS	Heat-Sink Package	5	•	•	•

P5Q-EM Motherboard Qualified Vendors Lists (QVL)
DDR2-800MHz capability

Vendor	Part No.	Size	SS/DS	Chip No.	CL	DIMM support A*	B*	C*
A-DATA	M2OAD6H3J4171Q1E52	2048MB	DS	AD20908A8A-25EG	N/A	•	•	•
Apacer	78.01GA0.9K5	1024MB	SS	AM4B5808CQJS8E	N/A	•	•	•
Apacer	78.91G9I.9K5	512MB	SS	AM4B5708JQJS8E	N/A		•	•
Apacer	78.A1GA0.9K4	2048MB	DS	AM4B5808CQJS8E	5	•	•	
CORSAIR	Box P/N:TWIN2X4096-6400C5 (CM2X2048-6400C5)	4096MB(Kit of 2)	DS	Heat-Sink Package	N/A	•	•	•
CORSAIR	BoxP/N:TWIN2X4096-6400C4DHX (CM2X2048-6400C4DHX)	4096MB(Kit of 2)	DS	Heat-Sink Package	4-4-4-12	•	•	•
CORSAIR	BoxP/N:TWIN2X4096-6400C5DHX (CM2X2048-6400C5DHX)	4096MB(Kit of 2)	DS	Heat-Sink Package	N/A	•	•	
CORSAIR	CM2X1024-6400C4	1024MB	DS	Heat-Sink Package	4	•		
Crucial	BL12864AA804.16FD3	1024MB	DS	Heat-Sink Package	4	•	•	•
Crucial	BL12864AA804.16FD	1024MB	DS	Heat-Sink Package	4	•	•	
Crucial	BL12864AL804.16FD3	1024MB	DS	Heat-Sink Package	4	•	•	•
ELPIDA	EBE10EE8ABFA-8E-E	1024MB	SS	E1108AB-8E-E(ECC)	5	•	•	•
G.SKILL	F2-6400CL5D-1GBNQ	1024MB(Kit of 2)	SS	Heat-Sink Package	5-5-5-15		•	•
G.SKILL	F2-6400CL4D-2GBHK	1024MB	DS	Heat-Sink Package	N/A	•	•	•
G.SKILL	F2-6400CL4D-2GBPK	1024MB	DS	Heat-Sink Package	N/A	•	•	•
G.SKILL	F2-6400CL4D-4GBPK	4096MB(Kit of 2)	DS	Heat-Sink Package	4	•	•	•
G.SKILL	F2-6400CL5D-2GBNQ	1024MB	DS	Heat-Sink Package	N/A	•	•	
G.SKILL	F2-6400CL5D-4GBPQ	4096MB(Kit of 2)	DS	Heat-Sink Package	5	•	•	
G.SKILL	F2-6400CL6D-4GBMQ	4096MB(Kit of 2)	DS	Heat-Sink Package	6	•	•	
G.SKILL	F2-6400CL6D-8GBNQ	8192MB(Kit of 2)	DS	Heat-Sink Package	6-6-6-18	•	•	
G.SKILL	F2-6400PHU2-2GBNR	1024MB	DS	Heat-Sink Package	N/A	•	•	•
GEIL	GB22GB6400C4DC	2048MB(Kit of 2)	DS	GL2L64M088BA30EB	N/A	•	•	•
GEIL	GB22GB6400C5DC	2048MB(Kit of 2)	DS	GL2L64M088BA30EB	5-5-5-15	•	•	•
GEIL	GB24GB6400C4DC	4096MB(Kit of 2)	DS	GL2L128M88BA25AB	4-4-4-12	•	•	•
GEIL	GB24GB6400C4QC	4096MB(Kit of 4)	DS	GL2L64M088BA30EB	N/A	•	•	•
GEIL	GB24GB6400C5DC	4096MB(Kit of 2)	DS	GL2L128M88BA25AB	5-5-5-15	•	•	•
GEIL	GB24GB6400C5QC	4096MB(Kit of 2)	DS	GL2L64M088BA30EB	N/A	•	•	•
GEIL	GB28GB6400C4QC	8192MB(Kit of 4)	DS	GL2L128M88BA25AB	N/A	•	•	•
GEIL	GB28GB6400C5QC	8192MB(Kit of 4)	DS	GL2L128M88BA25AB	N/A	•	•	•
GEIL	GE22GB800C4DC	2048MB(Kit of 2)	DS	Heat-Sink Package	4-4-4-12	•	•	•
GEIL	GE22GB800C5DC	2048MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GE24GB800C4DC	DDR2 800 2048MB	DS	Heat-Sink Package	4-4-4-12	•	•	•

(continued on the next page)

Vendor	Part No.	Size	SS/DS	Chip No.	CL	DIMM support A*	B*	C*
GEIL	GE24GB800C4QC	4096MB(Kit of 4)	DS	Heat-Sink Package	N/A	•	•	•
GEIL	GE24GB800C5DC	2048MB	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GE24GB800C5QC	4096MB(Kit of 4)	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GE28GB800C4QC	2048MB	DS	Heat-Sink Package	4-4-4-12	•	•	•
GEIL	GE28GB800C5QC	2048MB	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GX22GB6400C4USC	2048MB	DS	Heat-Sink Package	4-4-4-12	•	•	•
GEIL	GX22GB6400DC	2048MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GX22GB6400LX	2048MB	DS	Heat-Sink Package	5-5-5-15	•	•	•
GEIL	GX22GB6400UDC	2048MB(Kit of 2)	DS	Heat-Sink Package	4-4-4-12	•	•	•
GEIL	GX24GB6400DC	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	•
Hynix	HYMP564U64CP8-S5	512MB	SS	HY5PS12821CFP-S5	5-5-5	•	•	•
Hynix	HYMP 512U64CP8-S5	1024MB	DS	HY5PS12821CFP-S5	5-5-5	•	•	•
KINGMAX	KLDC28F-A8KI5	512MB	SS	KKA8FEIBF-HJK-25A	N/A	•	•	•
KINGMAX	KLDD48F-ABKI5	1024MB	DS	KKA8FEIBF-HJK-25A	N/A	•	•	•
KINGMAX	KLDE88F-B8KB5	2048MB	DS	KKB8FFBXF-CFA-25A	N/A	•	•	•
KINGSTON	KHX6400D2/ 512	512MB	SS	Heat-Sink Package	N/A		•	•
KINGSTON	KHX6400D2ULK2/1G	1024MB(Kit of 2)	SS	Heat-Sink Package	N/A		•	
KINGSTON	KVR800D2N5/ 512	512MB	SS	E5108AJBG-8E-E	N/A		•	•
KINGSTON	KVR800D2N6/ 512	512MB	SS	E5108AJBG-8E-E	1.8		•	•
KINGSTON	KHX6400D2/2G	2048MB	DS	Heat-Sink Package	N/A	•		
KINGSTON	KHX6400D2LL/1G	1024MB	DS	Heat-Sink Package	4-4-4-12	•	•	•
KINGSTON	KVR800D2N5/1G	1024MB	DS	E5108AJBG-8E-E	N/A	•	•	•
KINGSTON	KVR800D2N5/1G	1024MB	DS	E5108AJBG-8E-E	N/A	•	•	•
KINGSTON	KVR800D2N5/1G	1024MB	DS	V59C1 512804QBF25	N/A	•	•	•
KINGSTON	KVR800D2N5/2G	2048MB	DS	E1108ACBG-8E-E	N/A	•	•	
KINGSTON	KVR800D2N6/1G	1024MB	DS	E5108AJBG-8E-E	1.8	•	•	•
KINGSTON	N/A	4096MB	DS	E2108ABSE-8G-E	N/A	•		
NANYA	NT 512T64U880BY-25C	512MB	SS	NT5TU64M8BE-25C	5	•	•	•
NANYA	NT1GT64U8HB0BY-25C	1024MB	DS	NT5TU64M8BE-25C	5	•	•	•
NANYA	NT1GT64U8HCOBY-25D	1024MB	DS	NT5TU64M8CE-25D	N/A	•	•	•
NANYA	NT2GT64U8HC0BY-AC	2048MB	DS	NT5TU128M8CE-AC	5	•	•	
OCZ	OCZ2FX800C32GK	1024MB	DS	Heat-Sink Package	N/A	•	•	•
OCZ	OCZ2G8002GK	1024MB	DS	Heat-Sink Package	N/A	•		
OCZ	OCZ2P8004GK	4096MB(Kit of 2)	DS	Heat-Sink Package	5-4-4	•	•	•
OCZ	OCZ2P800R22GK	2048MB(Kit of 2)	DS	Heat-Sink Package	4	•	•	•
OCZ	OCZ2T8002GK	1024MB	DS	Heat-Sink Package	N/A	•	•	•

(continued on the next page)

Vendor	Part No.	Size	SS/DS	Chip No.	CL	DIMM support		
						A*	B*	C*
PSC	AL8E8F73C-8E1	2048MB	DS		5	•	•	•
Qimonda	HYS64T256020EU-2.5-C2	2048MB	DS	HYB18T1G800C2F-2.5	6	•	•	•
Qimonda	HYS64T256020EU-25F-C2	2048MB	DS	HYB18T1G800C2F-25F	5	•	•	
SAMSUNG	M378T2863QZS-CF7	1024MB	SS	K4T1G084QQ	6	•	•	•
SAMSUNG	M378T6553GZS-CF7	512MB	SS	K4T51083QG	6	•	•	•
SAMSUNG	M391T2863QZ3-CF7	1024MB	SS	K4T1G084QQ(ECC)	6	•	•	•
SAMSUNG	M378T2953GZ3-CF7	1024MB	DS	K4T51083QG	6	•	•	•
SAMSUNG	M378T5263AZ3-CF7	4096MB	DS	K4T2G084QA-HCF7	6	•	•	•
SAMSUNG	M378T5663QZ3-CF7	2048MB	DS	K4T1G084QQ(ECC)	6	•	•	•
SAMSUNG	M391T5663QZ3-CF7	2048MB	DS	K4T1G084QQ	6	•	•	•
Super Talent	T800UA12C4	512MB	SS	Heat-Sink Package	N/A	•	•	•
Super Talent	T800UB1GC4	1024MB	DS	Heat-Sink Package	N/A	•	•	•
Transcend	JM800QLU-1G	1024MB	SS	TQ243ECF8	5	•	•	•
Transcend	JM800QLJ-1G	1024MB	DS	TQ123PJF8	5	•		
Transcend	JM800QLU-2G	2048MB	DS	TQ243PCF8	5	•	•	•

P5Q-EM Motherboard Qualified Vendors Lists (QVL) DDR2-667MHz capability

Vendor	Part No.	Size	SS/DS	Chip No.	CL	DIMM support		
						A*	B*	C*
Apacer	78.01G9O.9K5	1024MB	SS	AM4B5808CQJS7E	N/A	•	•	•
Apacer	78.91G92.9K5	512MB	SS	AM4B5708JQJS7E	N/A	•	•	•
Apacer	78.A1G9O.9K4	2048MB	DS	AM4B5808CQJS7E	N/A	•	•	•
CORSAIR	VS 512MB667D2	512MB	SS	64M8CFEG	N/A			•
CORSAIR	VS1GB667D2	1024MB	DS	64M8CFEG	N/A	•	•	•
crucial	BL6464AA663.8FD	512MB	SS	Heat-Sink Package	3		•	•
crucial	BL12864AA663.16FD2	1024MB	DS	Heat-Sink Package	3	•	•	•
crucial	BL12864AA663.16FD	1024MB	DS	Heat-Sink Package	3	•	•	•
crucial	BL12864AL664.16FD	1024MB	DS	Heat-Sink Package	3	•		
ELPIDA	EBE51UD8AEFA-6E-E	512MB	SS	E5108AE-6E-E	5		•	•
G.SKILL	F2-5300CL5D-4GBMQ	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	•
G.SKILL	F2-5400PHU2-2GBNT	2048MB(Kit of 2)	DS	D264M8GCF	5-5-5-15	•	•	•
GEIL	GX21GB5300SX	1024MB	DS	Heat-Sink Package	3-4-4-8			•
GEIL	GX22GB5300LX	2048MB	DS	Heat-Sink Package	5-5-5-15	•	•	•

(continued on the next page)

Vendor	Part No.	Size	SS/DS	Chip No.	CL	DIMM support A*	B*	C*
GEIL	GX24GB5300LDC	4096MB(Kit of 2)	DS	Heat-Sink Package	5-5-5-15	•	•	•
Hynix	HYMP112U64CP8-Y5	1024MB	SS	HY5PS1G831CFP-Y5	5	•	•	•
Hynix	HYMP 512U64CP8-Y5	1024MB	DS	HY5PS12821CFP-Y5	5	•		
KINGSTON	KVR667D2N5/ 512	512MB	SS	D6408TEBGGL3U	5		•	•
KINGSTON	KVR667D2E5/1G	1024MB	DS	E5108AGBG-6E-E(ECC)	N/A	•		•
KINGSTON	KVR667D2E5/2G	2048MB	DS	D9HNL(ECC)	N/A	•	•	•
KINGSTON	KVR667D2N5/1G	1024MB	DS	E5108AGBG-6E-E	N/A	•	•	•
KINGSTON	KVR667D2N5/1G	1024MB	DS	E5108AJBG-8E-E	N/A	•	•	•
KINGSTON	KVR667D2N5/1G	1024MB	DS	HY5PS12821CFP-Y5	N/A	•	•	•
KINGSTON	KVR667D2N5/2G	2048MB	DS	E1108AB-6E-E	N/A	•		•
KINGSTON	KVR667D2N5/2G	2048MB	DS	HY5PS1G831CFP-Y5	N/A	•	•	•
NANYA	NT 512T64U88B0BY-3C	512MB	SS	NT5TU64M8BE-3C	5	•	•	
NANYA	NT2GT64U8HB0JY-3C	2048MB	DS	NT5TU128M8BJ-3C	5	•	•	•
PSC	AL7E8E63J-6E1	1024MB	DS	A3R12E3JFF719A9T02	5	•	•	•
Qimonda	HYS64T256020EU-3S-C2	2048MB	DS	HYB18T1GB00C2F-3S	555-12	•	•	•
SAMSUNG	M378T6553EZS-CE6	512MB	SS	K4T51083QE	5	•	•	•
SAMSUNG	M378T2953EZ3-CE6	1024MB	DS	K4T51083QE	5	•	•	•
SAMSUNG	M378T5263AZ3-CE6	4096MB	DS	K4T2G084QA-HCE6	5	•	•	•
Super Talent	T6UA 512C5	512MB	SS	Heat-Sink Package	5	•	•	•
Super Talent	T6UB1GC5	1024MB	DS	Heat-Sink Package	5	•	•	•
Transcend	JM667QLU-1G	1024MB	SS	TQ243ECF8	5	•	•	
Transcend	JM667QLU-2G	2048MB	DS	TQ243ECF8	5	•	•	•
TwinMOS	8D-23JK5M2ETP	512MB	SS	TMM6208G8M30C	5		•	•

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 for the latest DDR2-1066/800/667MHz QVL.

Visit the ASUS website for the latest DDR2-1066/800/667MHz QVL.

2.5.3 Installing a DDR2 DIMM

Make sure 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.

1. Unlock a DDR2 DIMM socket by pressing the retaining clips outward.

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

DDR2 DIMM notch

Unlocked retaining clip
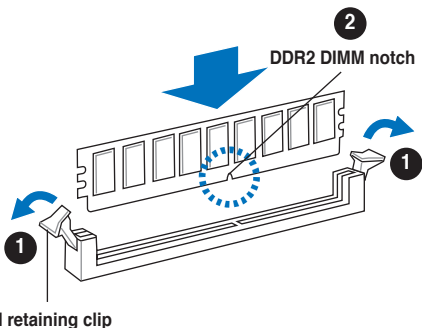
A DDR2 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

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
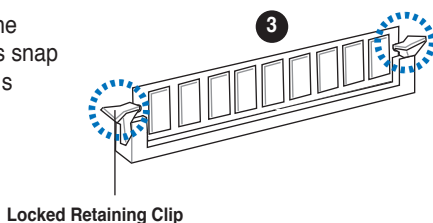
2.5.4 Removing a DDR2 DIMM

Follow these steps to remove a DIMM.

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

DDR2 DIMM notch
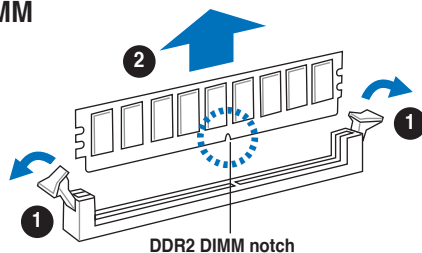
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.6   Expansion slots

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

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

2.6.1   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.

2.6.2   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 5 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.

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	14	Floppy disk controller
7	15	IRQ holder for PCI steering*
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	IRQ holder for PCI steering*
15	10	IRQ holder for PCI steering*

* These IRQs are usually available for PCI devices.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
1394 (FW3227)	–	–	–	shared	–	–	–	–
LAN (8111C)	–	shared	–	–	–	–	–	–
Marvell 6102	shared	–	–	–	–	–	–	–
PCIEX16_1	shared	–	–	–	–	–	–	–
PCIEX1_1	shared	–	–	–	–	–	–	–
PCIEX1_2	–	shared	–	–	–	–	–	–
PCI1	shared	–	–	–	–	–	–	–
USB controller 1	–	–	–	–	–	–	–	used
USB controller 2	–	–	–	shared	–	–	–	–
USB controller 3	–	–	shared	–	–	–	–	–
USB controller 4	shared	–	–	–	–	–	–	–
USB controller 5	shared	–	–	–	–	–	–	–
USB controller 6	–	–	–	–	–	used	–	–
USB 2.0 controller 1	–	–	–	–	–	–	–	shared
USB 2.0 controller 2	–	–	shared	–	–	–	–	–
SATA controller 1	–	–	shared	–	–	–	–	–
SATA controller 2	–	–	–	shared	–	–	–	–

2.6.3   PCI slots

The PCI slots support cards such as
a LAN card, SCSI card, USB card,
and other cards that comply with PCI
specifications. The figure shows a LAN
card installed on a PCI slot.
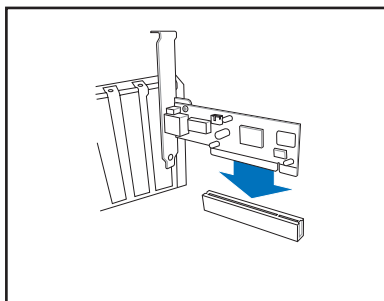
2.6.4   PCI Express x1 slot

This motherboard supports PCI Express
x1 network cards, SCSI cards and
other cards that comply with the PCI
Express specifications. The figure shows
a network card installed on the PCI
Express x1 slot.
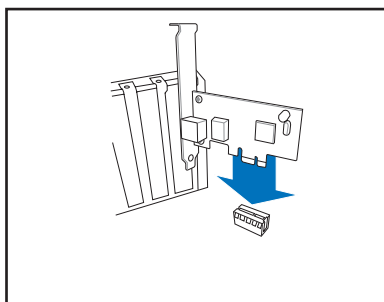
2.6.5   PCI Express x16 slot

This motherboard supports PCI Express
x16 graphic cards that comply with the
PCI Express specifications. The figure
shows a graphics card installed on the
PCI Express x16 slot.
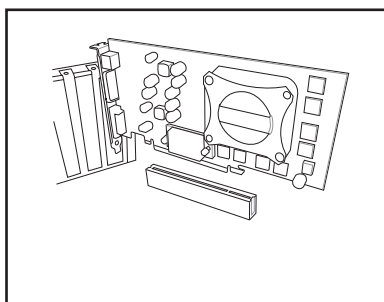
2.7   Installing an optical drive

Refer to the instructions in this section if you wish to install a new optical drive.

Follow these steps to install an optical drive:

1.   Place the chassis upright.
2.   Remove the drive slot metal plate cover.
3.   Insert the optical drive into the upper 5.25-inch drive bay and carefully push the optical drive into the bay until its screw holes align with the holes on the bay as shown.
4.   Secure the optical drive with two screws on both sides of the bay.
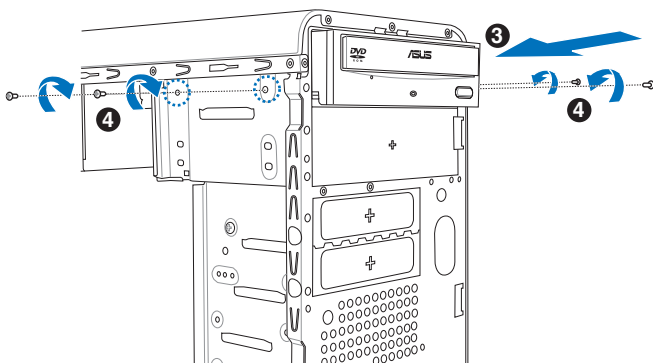
5.   Connect a power cable from the power supply to the power connector at the back of the optical drive.
6.   Connect one end of the IDE ribbon cable to the IDE interface at the back of the optical drive, matching the red stripe on the cable with Pin 1 on the IDE interface.

IDE ribbon cable

Power cable
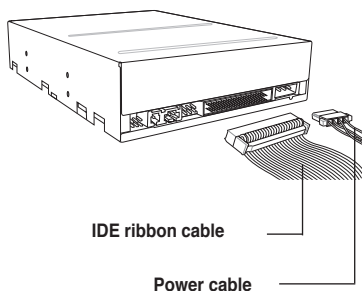
7. Connect the other end of the IDE ribbon cable to the secondary IDE connector (labeled SEC_IDE) on the motherboard. See page 4-7 for the location of this connector.

8. Remove the dummy drive slot cover from the front panel.

9. Replace the front panel.

2.8 Installing a hard disk drive

To install a Serial ATA hard disk drive:

1. Carefully place the hard disk into the the lowest 3.5-inch drive slot (without the metal plate cover).

2. Fasten the screws to secure the hard disk to the drive slot.

the lowest 3.5-inch drive slot without the metal plate cover
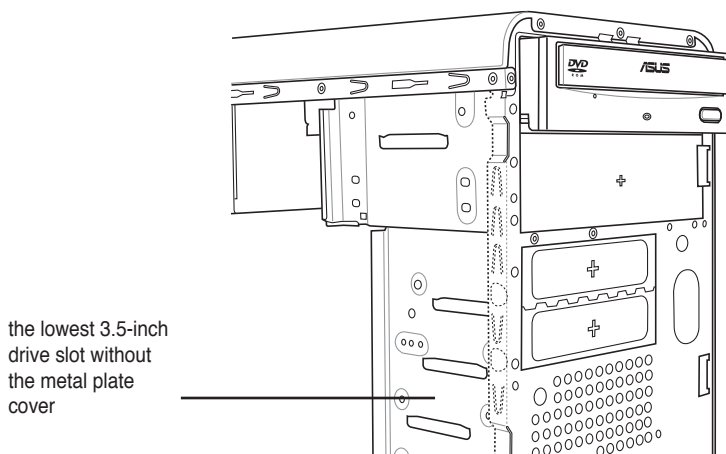
If you do not need to install the optional card reader into your system, you can install the HDD in the one of the 3.5-inch external bay (with the metal plate cover).

3. Connect one end of the Serial ATA cable to the SATA connector at the back of the drive, then connect the other end to a Serial ATA connector on the motherboard. See page 4-6 for the location of the Serial ATA connectors.

4. Connect a 15-pin Serial ATA power plug from the power supply unit to the 15-pin power connector at the back of the drive.

- OR -

Connect a 4-pin (female) power plug from the power supply unit to the 4-pin (male) power connector at the back of the drive.

Serial ATA power cable **Serial ATA cable**
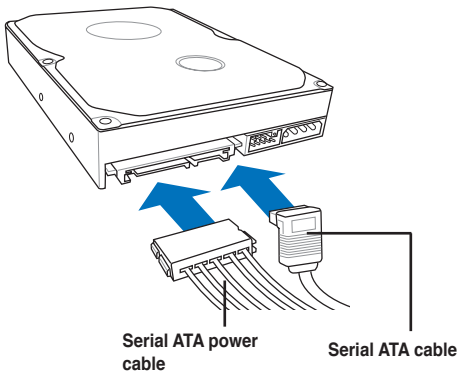
If your Serial ATA HDD has both 4-pin and 15-pin connectors at the back, use either the 15-pin SATA power adapter plug **OR** the legacy 4-pin power connector. **DO NOT** use both to prevent damage to components and to keep the system from becoming unstable.

To install an IDE hard disk drive:

1. Follow steps 1-2 of the previous section.
2. Connect the blue interface of the IDE ribbon cable to the primary IDE connector (blue connector labeled PRI_IDE) on the motherboard. See page 4-7 for the location of the connector.
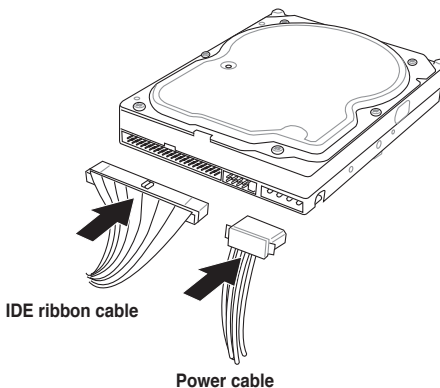
IDE ribbon cable

Power cable

3. Connect the gray interface of the IDE ribbon cable to the IDE connector on the drive.
4. If you install two IDE hard disk drives, connect the black interface of the IDE ribbon cable to the IDE connector on the second (Slave) IDE hard disk drive.
5. Connect a 4-pin power plug from the power supply unit to the power connector at the back of the drive(s).

2.9   Installing the card reader

An optional card reader module (see the figure below) is available with the system. If you want to install the card reader into your system, follow the steps on the next page.

Note: the card reader is optional and users need to purchase separately.

To install the card reader module:

1.   Remove the drive slot metal plate cover.

2.   Carefully insert the card reader module into the 3.5-inch bay until the screw
      holes align with the holes on the bay.

3.   Secure the card reader module with two screws on both sides.

remove the metal
plate cover and
install the card
reader module here
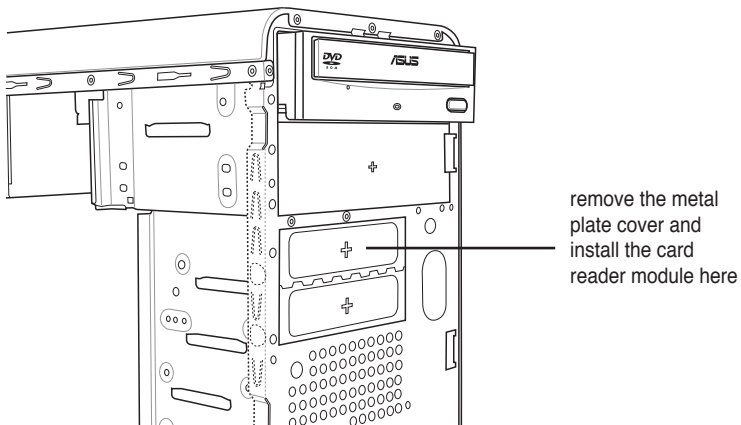
4.   Connect the USB cable of the card reader to the USB connector on the
      motherboard.

2.10 Installing a floppy disk drive

The system comes with one 3.25-inch drive bay for a floppy disk drive.

To install a floppy disk drive:

1. Remove the drive slot metal plate cover.

remove the metal plate cover and install the card reader module here
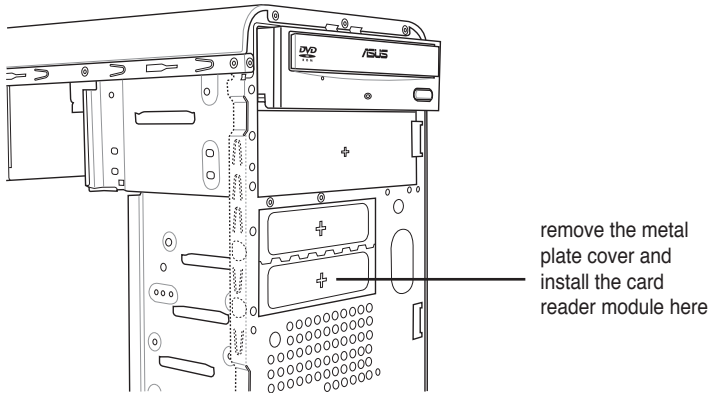
2. Carefully insert the floppy disk drive into the floppy drive bay until the screw holes align with the holes on the bay.
3. Secure the floppy disk drive with two screws on both sides.
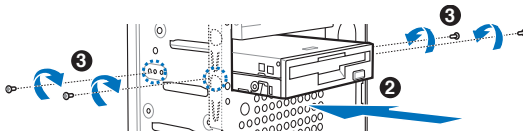
4. Connect the floppy disk drive signal cable to the signal connector at the back of the drive.

Power cable

Floppy ribbon cable
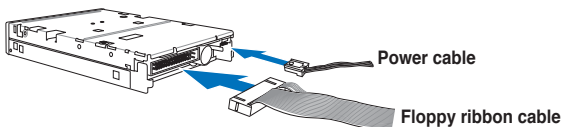
5. Connect the other end of the signal cable to the floppy disk drive connector on the motherboard. See page 4-6 for the location of the floppy disk drive connector.
6. Connect a 4-pin power cable from the power supply unit to the power connector at the back of the floppy disk drive.

2.11 Re-connecting cables

You may have disconnected some cables when you were installing components. You must re-connect these cables before you replace the chassis cover.

LED cables

P5Q-EM System panel connector
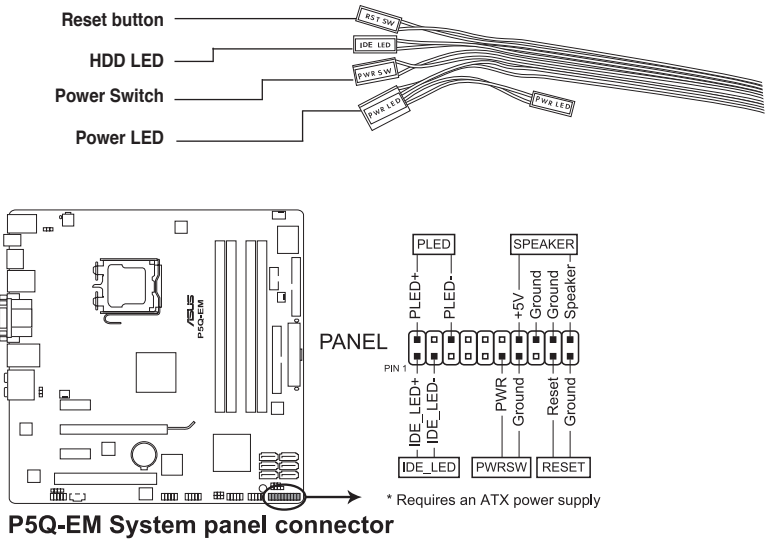
Connect the reset button, power switch, power LED, and HDD LED cables to their respective leads in the system panel connector on the motherboard.

2.12   Reinstalling the cover

If you installed an optical and/or floppy disk drive, remove the bay cover(s) on the front panel assembly before reinstalling it to the chassis. To do this:

1.   Locate the bay cover locks.
2.   Press the locks outward to release the bay cover.
3.   Push the bay cover inward, then set it aside.
4.   Follow the same instructions to remove the 3.5" drive bay cover.
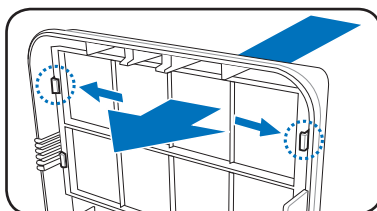
To reinstall the front panel assembly and side cover:

1.   Insert the front panel assembly hinge-like tabs to the holes on the right side of the chassis.
2.   Swing the front panel assembly to the left, then insert the hooks to the chassis until the front panel assembly fits in place.
3.   Insert the six side cover hooks into the chassis tab holes .
4.   Push the side cover to the direction of the front panel until it fits in place.
5.   Secure the cover with two screws you removed earlier.

If the air duct interferes with the CPU fan, adjust the air duct accordingly.

Air duct

Chassis tab holes
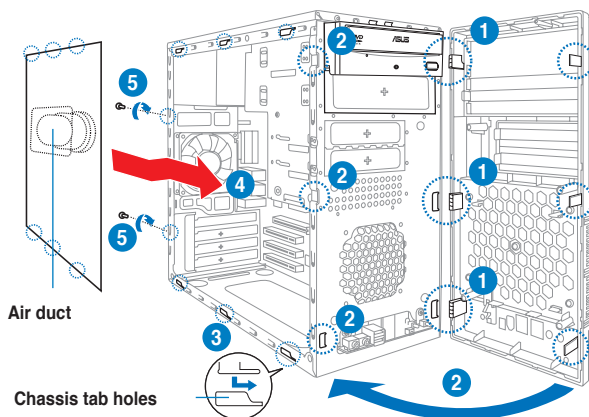
Chapter 3

This chapter helps you power up the system and install drivers and utilities from the support DVD.
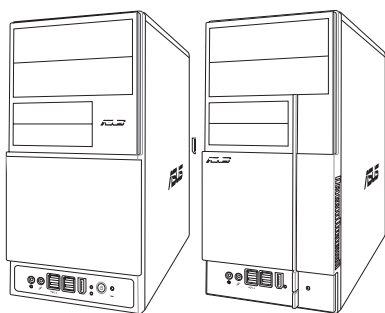
Starting up

3.1 Installing an operating system

The barebone system supports Windows® XP/Vista operating systems (OS). Always install the latest OS version and corresponding updates so you can maximize the features of your hardware.

Because motherboard settings and hardware options vary, use the setup procedures presented in this chapter for general reference only. Refer to your OS documentation for more information.

• Windows XP OS setup cannot recognize Serial ATA hard drives without the necessary drivers. Use the bundled floppy disk when installing Windows XP OS to a Serial ATA hard drive.

• From the Windows XP setup screen, press F6 when prompted then follow succeeding screen instructions to install the SATA drivers.

3.2 Powering up

Press the system power button (⏻) to enter the OS.

Press to turn ON the system
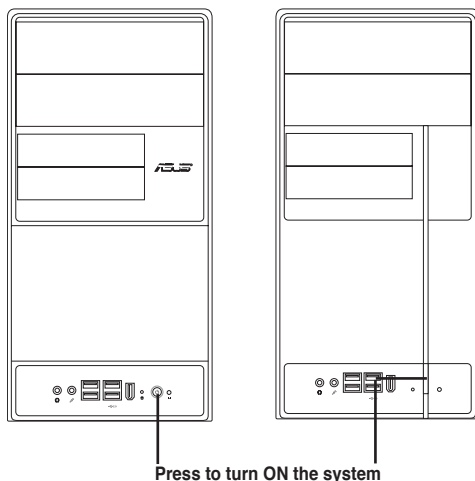
3.3 Support DVD information

The support DVD that came with the system contains useful software and several utility drivers that enhance the system features.

• Screen display and driver options may not be the same for different operating system versions.

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

3.3.1 Running the support DVD

To begin using the support DVD, place the DVD in your optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.

Click an icon to display support 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.

ASUS InstAll-Installation Wizard for Anti-Virus and Drivers Utility

Launches the ASUS InstAll driver installation wizard.

Norton Internet Security 2008

Installs the Norton Internet Security 2008.

Intel Chipset Inf Update Program

Installs the Intel® chipset Inf update program.

Realtek Audio Driver

Installs the Realtek® ALC1200 audio driver and application.

Intel Graphics Accelerator Driver

Installs the Intel® Graphics accerlerator driver.

Realtek RTL8111B/C LAN Driver

Installs the Realtek® RTL8111B/C LAN Driver.

ASUS EPU-4 Engine

Installs the ASUS EPU-4 Engine.

USB 2.0 Driver

Installs USB 2.0 driver.

3.3.2 Utilities menu

The Utilities menu shows the applications and other software that the motherboard supports.

ASUS InstAll-Installation Wizard for Utilities

Installs all of the utilities through the Installation Wizard.

ASUS Update

Allows you to download the latest version of the BIOS from the ASUS website.

Before using the ASUS Update, make sure that you have an Internet connection so you can connect to the ASUS website.

ASUS PC Probe II

This smart utility monitors the fan speed, CPU temperature, and system voltages, and alerts you of any detected problems. This utility helps you keep your computer in healthy operating condition.

ASUS AI Suite

The ASUS AI Suite is an innovative application to do overclocking, fan control, power saving and quiet therman control.

ASUS Express Gate Installer

Installs the ASUS Express Gate Installer.

Adobe Acrobat Reader 8

Installs the Adobe® Acrobat® Reader that allows you to open, view, and print documents in Portable Document Format (PDF).

Microsoft DirectX 9.0c

Installs the Microsoft® DirectX 9.0c driver. The Microsoft DirectX® 9.0c is a multimedia technology that enhances computer graphics and sound. DirectX® improves the multimedia features of you computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer. Visit the Microsoft website (www.microsoft.com) for updates.

Ulead Burn. Now

Installs the Ulead Burn. Now application for Audio DVD,CD and data disc creation.

Corel MediaOne Starter

Installs the Corel MediaOne Starter application to easily manage, edit share and protect your multimedia data.

CyberLink PowerBackup

Installs CyberLink PowerBackup to back up and restore your data easily.

You can also install the following utilities from the ASUS Superb Software Library DVD.

Ulead PhotoImpact 12 SE

Installs the PhotoImpact image editing software.

WinZip 11

Installs the Winzip utility for easy file-compression and protection.

Norton Internet Security 2008

Installs the Norton Internet Security 2008.

ASUS Screen Saver

Installs the ASUS Screen saver.

3.3.3   Manual menu

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

> Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the ASUS Superb Software Library DVD before opening a user manual file.
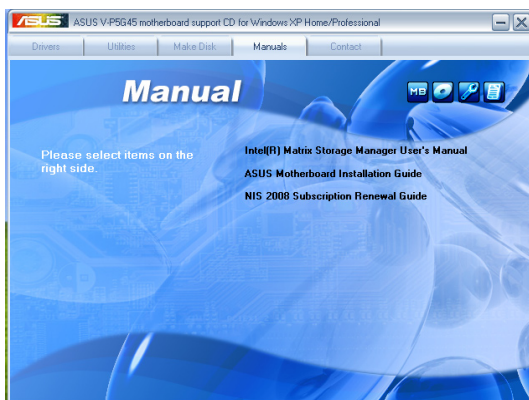
ASUS Motherboard Installation Guide

Allows you to open the ASUS Motherboard Installation Guide.

NIS 2008 Subscription Renewal Guide

Allows you to open the NIS 2008 Subscription Renewal Guide.

Intel® Matrix Storage Manager User's Manual

Allows you to open the Intel® Matrix storage manager user's manual.

3.3.4   Make Disk menu

The Make Disk menu allows you to make a RAID/AHCI driver disk.

Intel® ICH 10R 32/64bit RAID/ACHI Driver Disk

Allows you to create Intel ICH 10R 32/64bit RAID/ACHI driver disk.

3.3.5   ASUS Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.

3.3.6 Other information

The icons on the top right corner of the screen give additional information on the motherboard and the contents of the support DVD. Click an icon to display the specified information.

Motherboard Info

Displays the general specifications of the motherboard.

Browse this DVD

Displays the support DVD contents in graphical format.
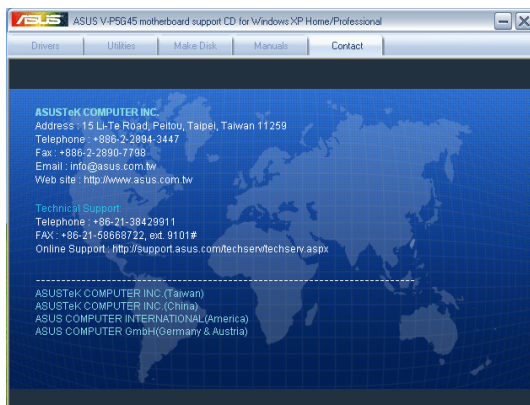
Technical support Form

Displays the ASUS Technical Support Request Form that you have to fill out when requesting technical support.

Filelist

Displays the contents of the support DVD and a brief description of each in text format.

3.4   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 for more information.

ASUS PC Probe II

PC Probe II is a utility that monitors the computer's vital components and alerts you of any problem with these components. PC Probe II senses fan rotations, CPU temperature, and system voltages, among others. PC Probe II is software-based, allowing you to 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.

Installing PC Probe II

To install PC Probe II on your computer:

1.   Place the support DVD to the optical drive. The Drivers installation tab appears if your computer has an enabled Autorun feature.

> If Autorun is not enabled in your computer, browse the contents of the support CD to locate the setup.exe file from the ASUS PC Probe II folder. Double-click the setup.exe file to start installation.

2.   Click the **Utilities** tab, then click **ASUS PC Probe II**.

3.   Follow the screen instructions to complete installation.

Launching PC Probe II

You can launch the PC Probe II right after installation or anytime from the Windows® desktop.

To launch the PC Probe II from the Windows® desktop, click **Start > All Programs > ASUS > PC Probe II**. The PC Probe II main window appears.

After launching the application, the PC Probe II icon appears in the Windows® taskbar. Click this icon to close or restore the application.

Using PC Probe II

Click to close the Preference panel

Main window

The PC Probe II main window allows you to view the current status of your system and change the utility configuration. By default, the main window displays the **Preference** section. You can close or restore the **Preference** section by clicking on the triangle on the main window right handle.

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

Sensor alert
When a system sensor detects a problem, the main window right handle turns red, as the illustrations below show.

When displayed, the monitor panel for that sensor also turns red. Refer to the **Monitor panels** section for details.

Preferences

You can customize the application using the Preference section in the main window. Click the box before each preference to activate or deactivate.
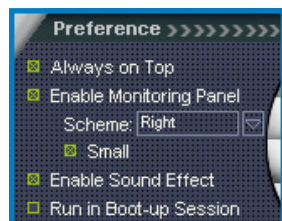
Hardware monitor panels

The hardware monitor panels display the current value of a system sensor such as fan rotation, CPU temperature, and voltages.

The hardware monitor panels come in two display modes: hexagonal (large) and rectangular (small). When you check the **Enable Monitoring Panel** option from the **Preference** section, the monitor panels appear on your computer's desktop.

Large display
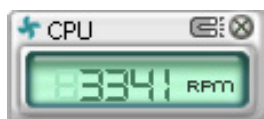
Small display

Changing the monitor panels position
To change the position of the monitor panels on the desktop, click the arrow down button of the **Scheme** options, then select another position from the list box. Click **OK** when finished.

Moving the monitor panels
All monitor panels move together using a magnetic effect. If you want to detach a monitor panel from the group, click the horseshoe magnet icon. You can now move or reposition the panel independently.
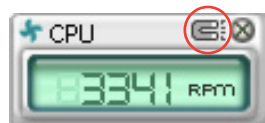
Adjusting the sensor threshold value
You can adjust the sensor threshold value in the monitor panel by clicking the arrow buttons. You can also adjust the threshold values using the **Config** window.

You cannot adjust the sensor threshold values in a small monitoring panel.

Click to increase value

Click to decrease value
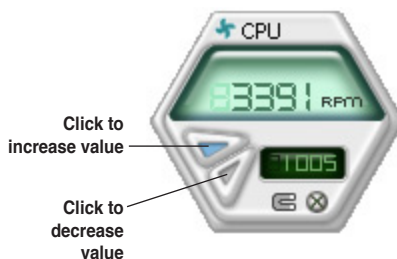
Monitoring sensor alert

The monitor panel turns red when a component value exceeds or is lower than the threshold value. Refer to the illustrations below.

Large display
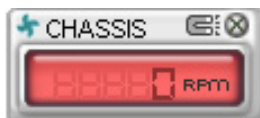
Small display

WMI browser

Click ![WMI] to display the WMI (Windows Management Instrumentation) browser. This browser displays various Windows® management information. Click an item from the left panel to display on the right panel. Click the plus sign (+) before **WMI Information** to display the available information.
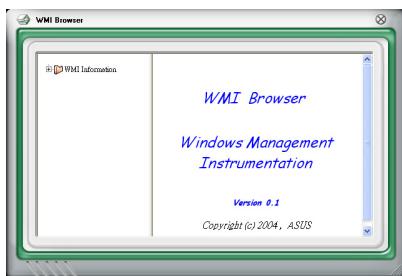
You can enlarge or reduce the browser size by dragging the bottom right corner of the browser.

DMI browser

Click ![DMI] to display the DMI (Desktop Management Interface) browser. This browser displays various desktop and system information. Click the plus sign (+) before **DMI Information** to display the available information.
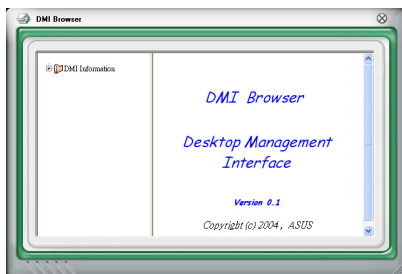
PCI browser

Click **PCI** to display the PCI (Peripheral Component Interconnect) browser. This browser provides information on the PCI devices installed on your system. Click the plus sign (+) before the **PCI Information** item to display available information.
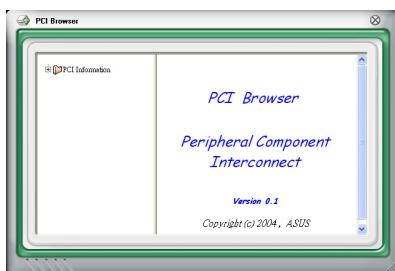
Usage

The **Usage** browser displays real-time information on the CPU, hard disk drive space, and memory usage. Click **USAGE** to display the Usage browser.

CPU usage
The **CPU** tab displays real-time CPU usage in line graph representation. If the CPU has an enabled Hyper-Threading, two separate line graphs display the operation of the two logical processors.
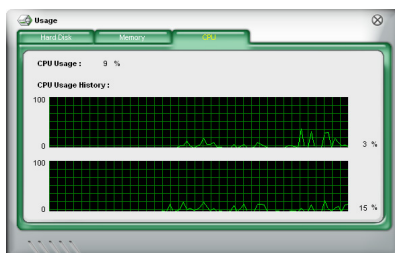
Hard disk drive space usage
The **Hard Disk** tab displays the used and available hard disk drive space. The left panel of the tab lists all logical drives. Click a hard disk drive to display the information on the right panel. The pie chart at the bottom of the window represents the used (blue) and the available HDD space.
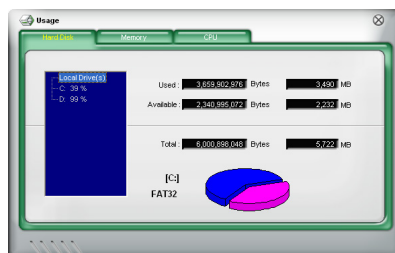
Memory usage

The **Memory** tab shows both used and available physical memory. The pie chart at the bottom of the window represents the used (blue) and the available physical memory.
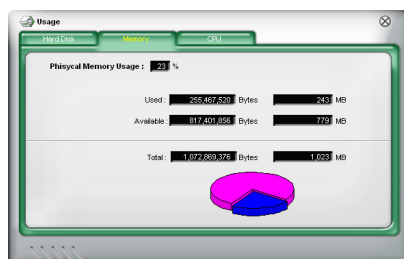
Configuring PC Probe II

Click [CONFIG] to view and adjust the sensor threshold values.

The **Config** window has two tabs: **Sensor/Threshold** and **Preference**. The **Sensor/Threshold** tab enables you to activate the sensors or to adjust the sensor threshold values. The **Preference** tab allows you to customize sensor alerts, change temperature scale, or enable the Q-Fan feature.

Loads the default threshold values for each sensor

Applies your changes

Cancels or ignores your changes

Loads your saved configuration

Saves your configuration
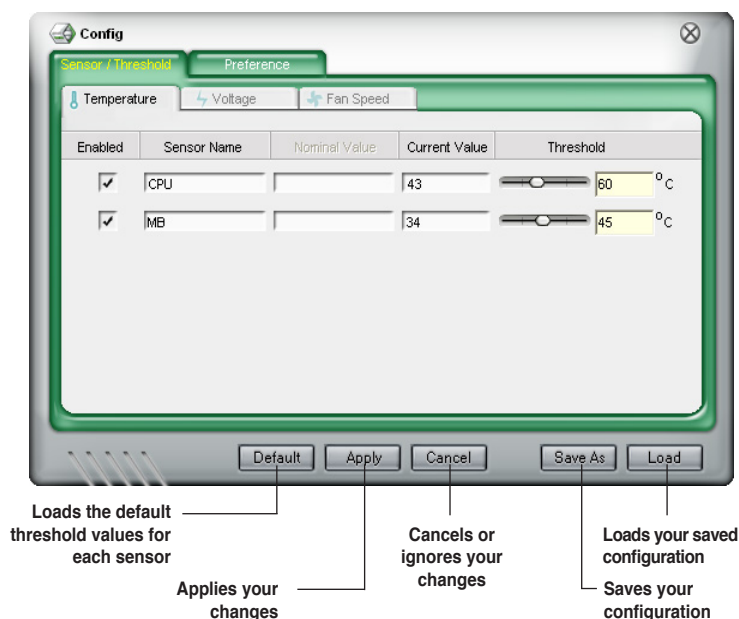
Chapter 4

This chapter gives information about he motherboard that comes with the system. This chapter includes the motherboard layout, jumper settings, and connector locations.
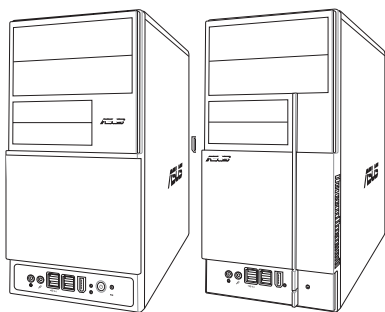
4.1   Introduction

The Vintage V-Series P5G45 barebone system comes with an ASUS motherboard. This chapter provides technical information about the motherboard for future upgrades or system reconfiguration.

4.2   Motherboard layout
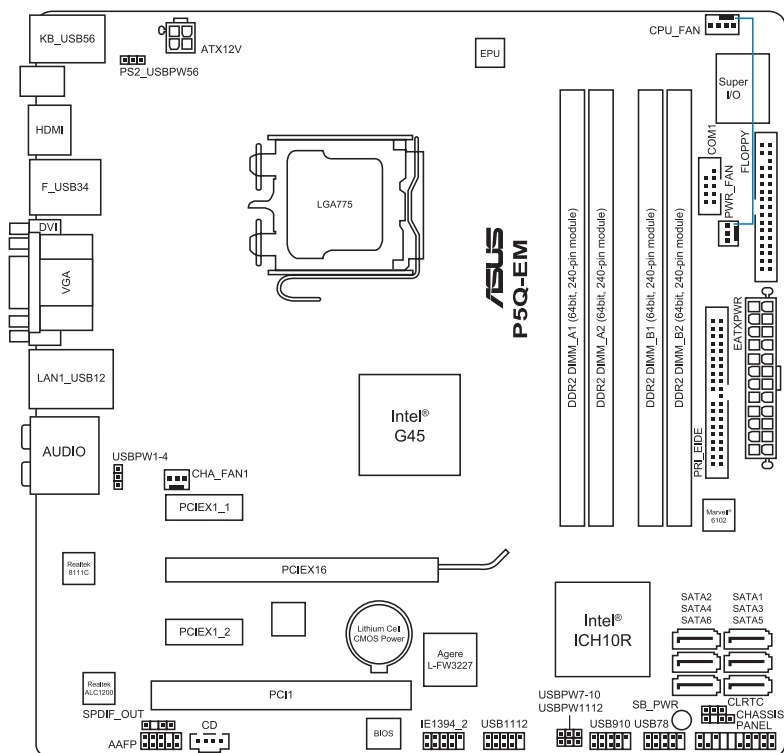
4.3   Jumpers

1.   **Clear RTC RAM (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.

To erase the RTC RAM:

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

2.   Remove the onboard battery.

3.   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.

4.   Re-install the battery.

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

6.   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!

CLRTC

P5Q-EM Clear RTC RAM

1 2   2 3

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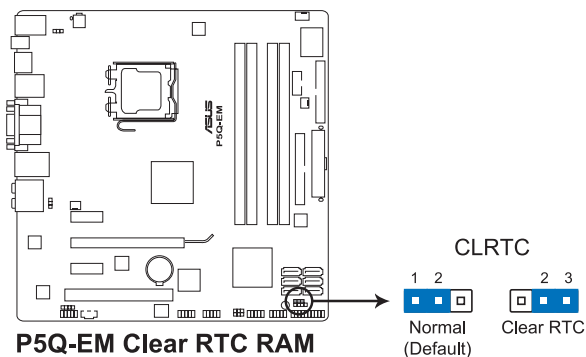
> ⚠ Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

•   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.   **USB device wake-up (3-pin USBPW1-4; USB7-10; USB1112)**

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 (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).

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

P5Q-EM USB device wake-up
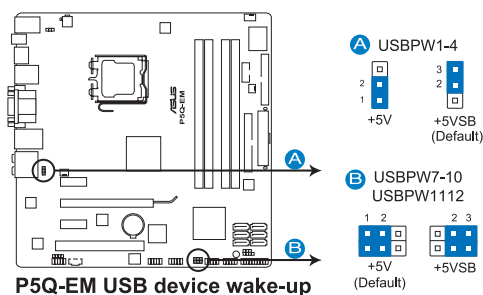
•   The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.

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

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

This jumper allows you to enable or disable the keyboard 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) 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 internal USB connectors that you can connect to additional USB ports.
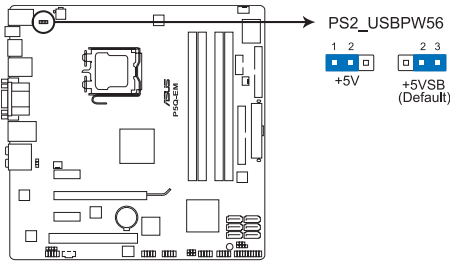
P5Q-EM Keyboard/Mouse power

4.3 Connectors

1. **Floppy disk drive connector (34-1 pin FLOPPY)**

   This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.

   > Pin 5 on the connector is removed to prevent incorrect cable connection when using an FDD cable with a covered Pin 5.
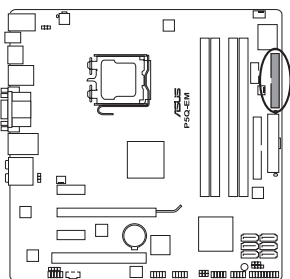
FLOPPY
PIN1
NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

P5Q-EM Floppy disk drive connector

2. 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.

PRI_EIDE
NOTE:Orient the red markings on the IDE ribbon cable to PIN 1.

PIN1

P5Q-EM EIDE connector
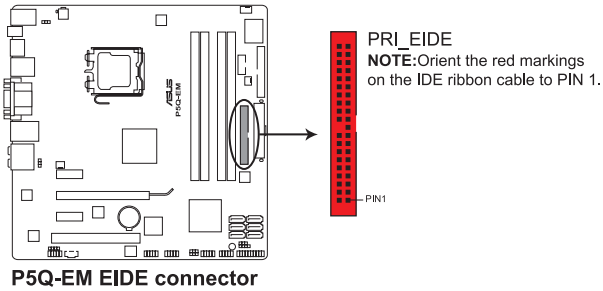
	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	

• 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," make sure all other device jumpers have the same setting.

3. ICH10R Serial ATA connectors [red] (7-pin SATA1-6)

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.

P5Q-EM SATA connectors

SATA2   SATA1

SATA4   SATA3

SATA6   SATA5
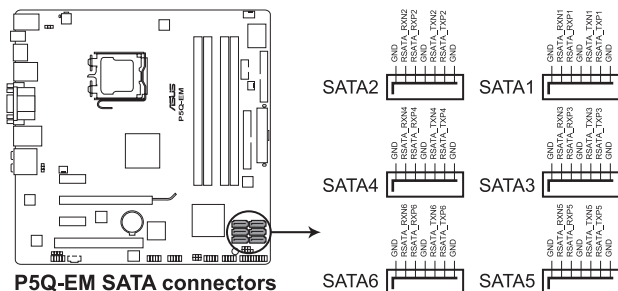
•   These connectors are set to Standard IDE mode by default. In Standard IDE mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA as** item in the BIOS to [RAID]. See section **5.3.5 Storage Configuration** for details.

•   Before creating a RAID set, refer to the manual bundled in the motherboard support DVD.

•   You must install the Windows® XP/Vista Service Pack 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/Vista.

•   When using hot-plug and NCQ, set the **Configure SATA as** in the BIOS to [AHCI]. See section **2.3.5 Storage Configuration** for details.

right angle side

Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.
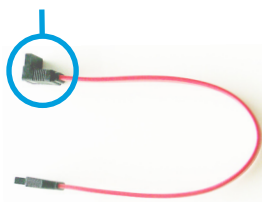
The bundled eSATA module allows you to add an eSATA port on the back of your chassis. To install the eSATA module, connect the SATA cable connector to any of the onboard SATA 1–6 connectors and then screw the bracket to the chassis.

SATA cable connector
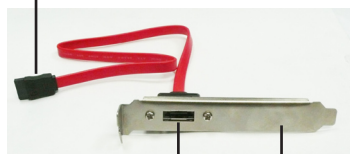
eSATA port   **Bracket**

We highly recommend that you connect this eSATA port to an eSATA external hard disk drive using an **eSATA to eSATA cable**. DO NOT connect the eSATA port to a SATA hard disk drive using a eSATA to SATA cable.

eSATA cable connector

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.
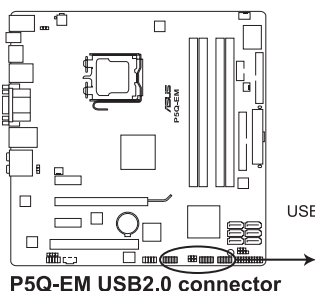
P5Q-EM USB2.0 connector

USB1112   USB910   USB78

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

If your chassis supports front panel USB ports, you can attach a front panel USB cable to these connectors. Connect the USB cable to ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard.

The USB module cable is purchased separately.

5. IEEE 1394a port connector (10-1 pin IE1394_2)

This connector is for a 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.

IE1394_2

TPA2-
GND
TPB2-
+12V
GND

PIN 1

TPA2+
GND
TPB2+
+12V

P5Q-EM IEEE 1394 connector
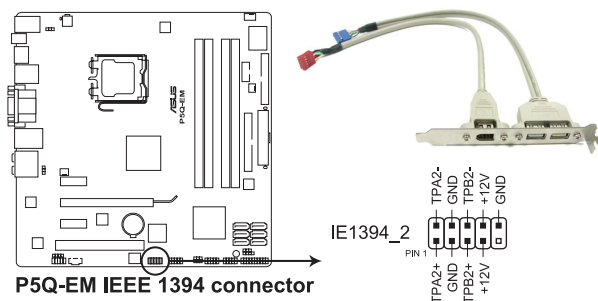
Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard!

You can attach a FireWire/1394 cable to this connector if your chassis suppots the front panel IEEE1394 port. Connect the 1394 cable to ASUS Q-Connector (1394, red) first, and then install the Q-Connector (1394) to the 1394 connector onboard.

The IEEE 1394a module cable is purchased separately.

6. 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.

COM1

PIN 1

P5Q-EM Serial port (COM1) connector
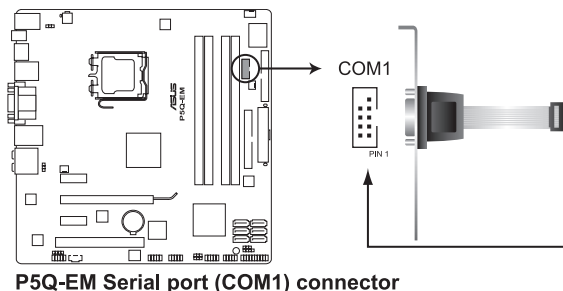
The serial port module is purchased separately.

7. **CPU, chassis and power fan connectors**
   (4-pin CPU_FAN, 3-pin CHA_FAN1, 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, making sure that the black wire of each cable matches the ground pin of the connector.

P5Q-EM Fan connectors
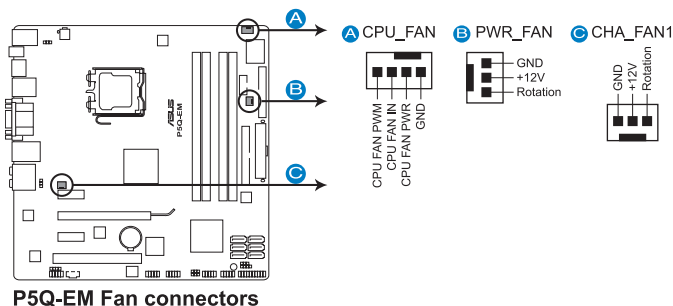
DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

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

8.   **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.

P5Q-EM Chassis intrusion connector
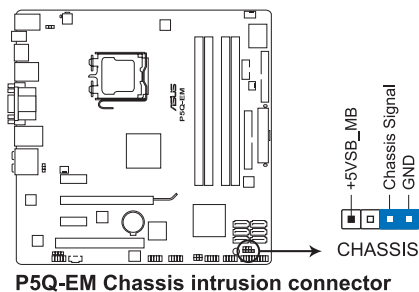
9.   **Digital audio connector (4-1 pin SPDIF_OUT)**

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s).

P5Q-EM Digital audio connector
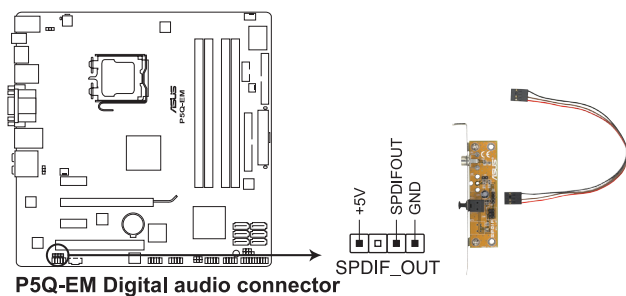
The S/PDIF out cable is purchased separately.

10. **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.

P5Q-EM Analog front panel connector
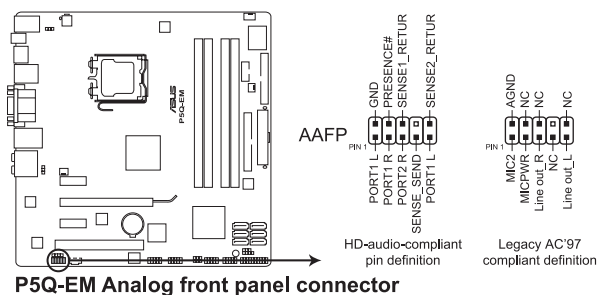
• We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

• If you want to connect a high-definition front panel audio module to this connector, make sure that the **Front Panel Type** item in the BIOS is set to [HD Audio]. If you want to connect an AC' 97 front panel audio module to this connector, set the item to [AC97]. Refer to **5.5.3 Onboard Devices Configuration** for details.

11. **Optical drive audio connector (4-pin CD)**

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

P5Q-EM Internal audio connector
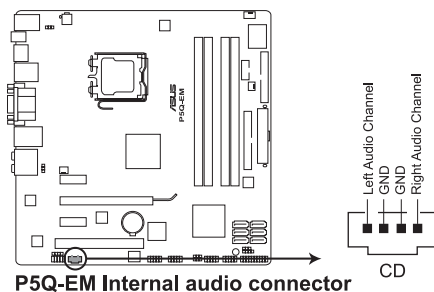
12. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

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.

ATX12V   **B** EATXPWR

ATX12V	EATXPWR	
+12V DC	+3 Volts	GND
+12V DC	+12 Volts	+5 Volts
	+12 Volts	+5 Volts
	+5V Standby	+5 Volts
	Power OK	-5 Volts
	GND	GND
GND	+5 Volts	GND
GND	GND	GND
	+5 Volts	PSON#
	GND	GND
	+3 Volts	-12 Volts
	+3 Volts	+3 Volts

PIN 1   PIN 1
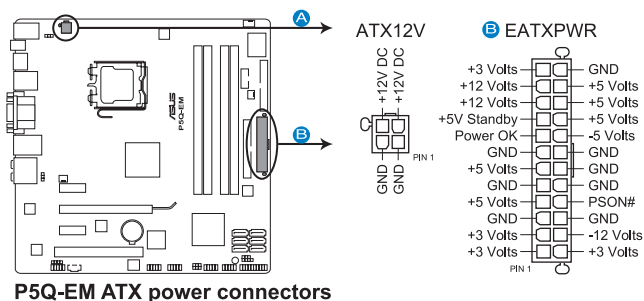
P5Q-EM ATX power connectors

- 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 4-pin ATX12V power plug; otherwise, the system will not boot.

- Use of a PSU with a higher power output is recommended 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.

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

This connector supports several chassis-mounted functions.

PANEL

PLED

SPEAKER

PLED+

PLED-

+5V

Ground

Ground

Speaker

PIN 1

IDE_LED+

IDE_LED-

PWR

Ground

Reset

Ground

IDE_LED   PWRSW   RESET

* Requires an ATX power supply

P5Q-EM System panel connector
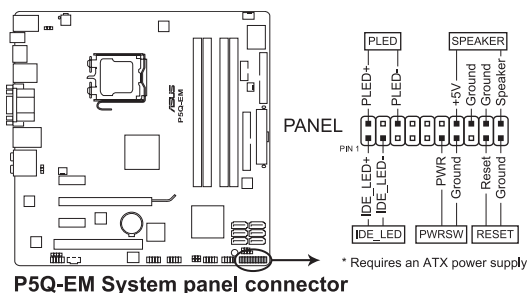
- **System power LED (2-pin PLED)**

  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.

Chapter 5

This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.
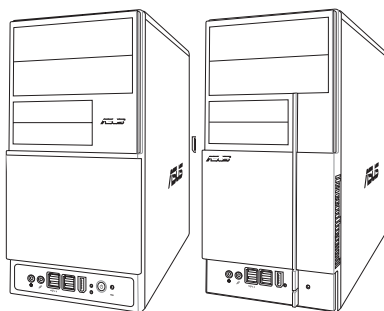
BIOS setup

5.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

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 AFUDOS** (Updates the BIOS using a bootable floppy disk.)
4. **ASUS CrashFree BIOS 3** (Updates the BIOS using a bootable floppy disk, USB flash disk or the motherboard support DVD 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 bootable floppy disk or USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

5.1.1 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, and
- 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. The Drivers menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update**.
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.   Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
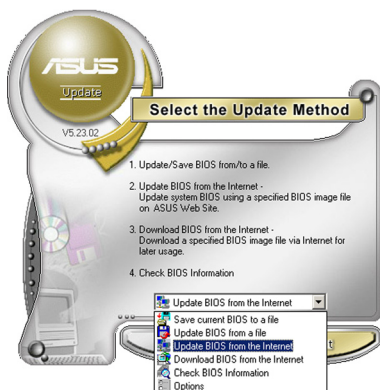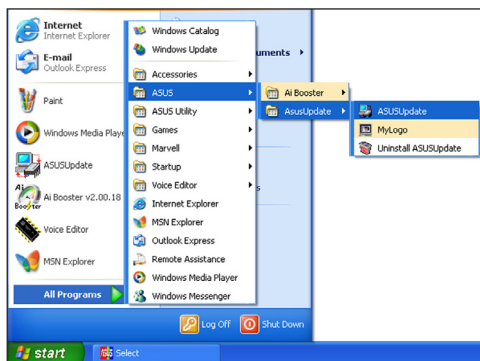
2.   Select **Update BIOS** from the Internet option from the drop-down menu, then click **Next**.

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 screen 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.
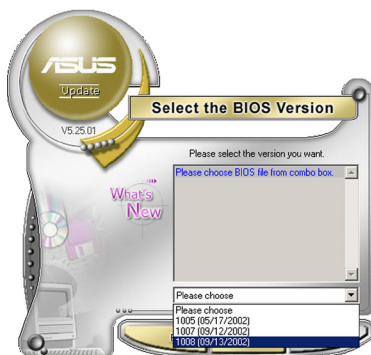
Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.

2. Select Update BIOS from a file option from the drop-down menu, then click **Next**.
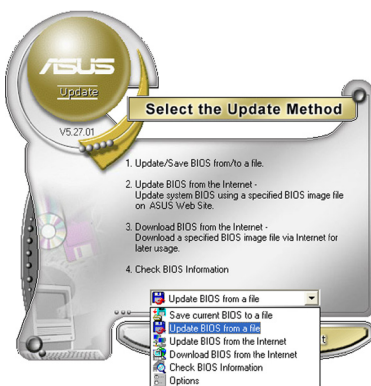
3. Locate the BIOS file from the Open window, then click **Open**.

4. Follow the screen instructions to complete the update process.
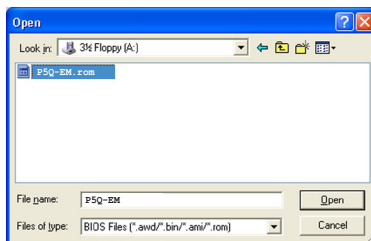
5.1.2 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.

   DOS environment

   a. Insert a 1.44MB floppy disk into the drive.

   b. At the DOS prompt, type *format* **A:/S** then press <Enter>.

   Windows® XP environment

   a. Insert a 1.44 MB floppy disk to the floppy disk drive.

   b. Click **Start** from the Windows® desktop, then select **My Computer**.

   c. Select the 3 1/2 Floppy Drive icon.

   d. Click File from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.

   e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

   Windows® Vista environment

   a. Insert a formatted, high density 1.44 MB floppy disk to the floppy disk drive.

   b. Click [icon] from the Windows® desktop, then select **Computer**.

   c. Right-click Floppy Disk Drive then click **Format** to display the Format 3 1/2 Floppy dialog box.

   d. Select the **Create an MS-DOS startup disk** check box.

   e. Click **Start**.

2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

5.1.3 ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash 2 utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).

To update the BIOS using EZ Flash 2:

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

2. Save the BIOS file to a floppy disk or a USB flash disk, then restart the system.

3. You can launch the EZ Flash 2 by two methods.

    (1) Insert the floppy disk / USB flash disk that contains the BIOS file to the floppy disk drive or the USB port.

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

```
            ASUSTek EZ Flash 2 BIOS ROM Utility V3.25
   FLASH TYPE: MXIC 25L8005
   ┌──── Current ROM ────┐        ┌──── Update ROM ────┐
    BOARD: P5QL-EM V-P5G43         BOARD: Unknown
    VER:   0302 (H:00 B:00)        VER:   Unknown
    DATE:  08/01/08                DATE:  Unknown
   PATH: C:\
   ┌──────────┐  ┌───────────────────────────────────┐
    A:
    C:



   ┌─ Note ─
    [Enter] Select or Load       [B] Backup    [ESC] Exit

    [Tab] Switch                 [Up/Down/Home/End] Move
```
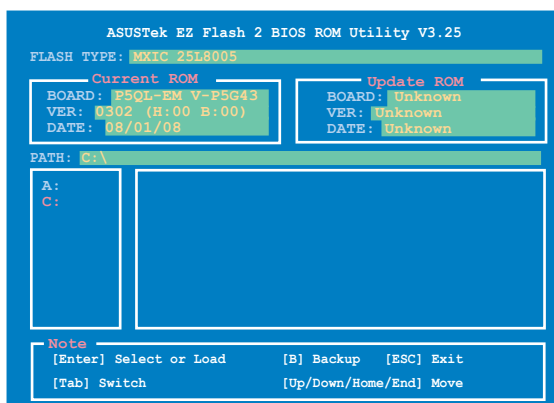
    (2) Enter BIOS setup program. Go to the **Tools** menu to select **EZ Flash2** and press <Enter> to enable it.

    You can switch between drives by pressing <Tab> before the correct file is found. Then press <Enter>.

4. 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 USB flash disk, or floppy 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!

5.1.4   AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility

> • Make sure that the floppy disk is not write-protected and has at least 1024KB free space to save the file.
>
> • The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support DVD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

    afudos /o[filename]

    where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

    ```
    A:\>afudos /oOLDBIOS1.rom
    ```

    Main filename   Extension name

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

    ```
    A:\>afudos /oOLDBIOS1.rom
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(02.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
       Reading flash ..... done
       Write to file...... ok
    A:\>
    ```

    The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support DVD to the bootable floppy disk you created earlier.

3. Boot the system in DOS mode, then at the prompt type:

    afudos /i[filename]

    where [filename] is the latest or the original BIOS file on the bootable floppy disk.

    ```
    A:\>afudos /iP5QEM.ROM
    ```

4. The utility verifies the file and starts updating the BIOS.

    ```
    A:\>afudos /iP5QEM.ROM
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(02.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

        WARNING!! Do not turn off power during flash BIOS
        Reading file ....... done
        Reading flash ...... done

        Advance Check ......
        Erasing flash ...... done
        Writing flash ...... 0x0008CC00 (9%)
    ```

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

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

    ```
    A:\>afudos /iP5QEM.ROM
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(02.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

        WARNING!! Do not turn off power during flash BIOS
        Reading file ....... done
        Reading flash ...... done

        Advance Check ......
        Erasing flash ...... done
        Writing flash ...... done
        Verifying flash .... done

        Please restart your computer

    A:\>
    ```

5.1.5 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 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 update a corrupted BIOS file using the motherboard support DVD, the floppy disk, or the USB flash disk that contains the updated BIOS file.

- Prepare the motherboard support DVD, the floppy disk or the USB flash disk containing the updated motherboard BIOS before using this utility.
- If you use a SATA optical drive, always connect the SATA cable to the SATA1/2/3/4 connector; otherwise, the utility will not function.
- Ensure that you rename the original or updated BIOS file in the floppy disk or USB flash disk to **P5QEM.ROM**.
- If you connect your display to the onboard HDMI connector, the monitor will not show and the system will beep twice while CrashFree BIOS 3 is working. Wait for a few minutes and then reboot the system. The display will show after the system restarts.

Recovering the BIOS from the support DVD

To recover the BIOS from the support DVD:
1. Turn on the system.
2. Insert the motherboard support DVD to the optical drive.
3. The utility displays the following message and automatically checks the DVD for the BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "P5QVM.ROM". Completed.
Start flashing...
```

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the USB flash disk

To recover the BIOS from the USB flash disk:

1. Insert the USB flash disk that contains BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Restart the system after the utility completes the updating process.

- Only the USB flash disk with FAT 32/16 format and single partition can support ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.
- DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

5.2   BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **2.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the SPI chip.

The firmware chip on the motherboard stores the Setup utility. 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 sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section **2.9 Exit Menu**.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

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

5.2.1 BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

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

 System Time              [11:55:25]              Use [ENTER], [TAB]
 System Date              [Tue 07/15/2008]        or [SHIFT-TAB] to
 Legacy Diskette A        [1.44M, 2.5 in.]        select a field.

 ▶ SATA1                  [Not Detected]          Use [+] or [-]
 ▶ SATA2                  [Not Detected]          to configure the
 ▶ SATA3                  [Not Detected]          System Time.
 ▶ SATA4                  [Not Detected]
 ▶ SATA5                  [Not Detected]
 ▶ SATA6                  [Not Detected]
                                                  ←→   Select Screen
 ▶ Storage Configuration                          ↑↓   Select Item
 ▶ System Information                             +-    Change Field
                                                  Tab   Select Field
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

Sub-menu items   Navigation keys

5.2.2 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

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

5.2.3 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.

5.2.4   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.
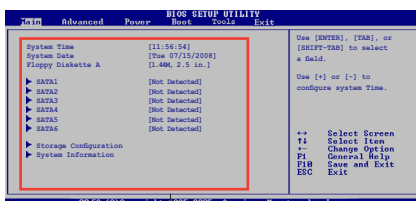
Main menu items

5.2.5   Sub-menu items

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

5.2.6   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 **2.2.7 Pop-up window**.

5.2.7   Pop-up window

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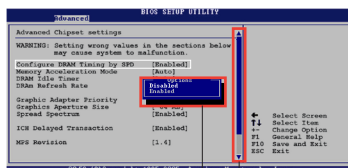
5.2.8   Scroll bar

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

5.2.9   General help

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

5.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information.

Refer to section **2.2.1 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             [11:55:25]              Use [ENTER], [TAB]
  System Date             [Tue 07/15/2008]        or [SHIFT-TAB] to
  Legacy Diskette A       [1.44M, 2.5 in.]        select a field.

►   SATA1                 [Not Detected]          Use [+] or [-] to
►   SATA2                 [Not Detected]          configure System Time.
►   SATA3                 [Not Detected]
►   SATA4                 [Not Detected]
►   SATA5                 [Not Detected]
►   SATA6                 [Not Detected]
                                                  ←→   Select Screen
►  Storage Configuration                          ↑↓   Select Item
►  System Information                             +-    Change Field
                                                  Tab    Select Field
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

5.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

5.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.3 Legacy Diskette A [1.44M, 2.5 in.]

Sets the type of floppy drive installed.
Configuration options: [Disabled] [720K , 2.5 in.] [1.44M, 2.5 in.]

5.3.4 SATA 1–6

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

```
                          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    : 16Sectors
  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

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```

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]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.
Configuration options: [Disabled] [Auto]

Block (Multi-Sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Allows you to select the data transfer mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode.
Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0]
[MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

5.3.5   Storage Configuration

The items in this menu allow you to set or change the configurations for the SATA
devices installed in the system. Select an item then press <Enter> if you want to
configure the item.

```
                            BIOS SETUP UTILITY
    Main

    Storage Configuration                            Options

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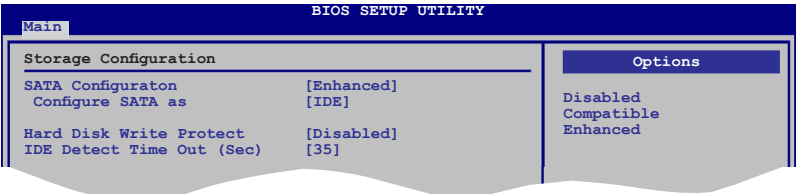
SATA Configuration [Enhanced]

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

> *Configure SATA as [IDE]*
> Sets the configuration for the Serial ATA connectors supported by the
> Southbridge chip. Configuration options: [IDE] [RAID] [AHCI]

- If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, keep the default setting [IDE].

- If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI]. 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.

- If you want to create a RAID 0, RAID 1, RAID 5, RAID 10, or the Intel® Matrix Storage Technology configuration from the Serial ATA hard disk drives, set this item to [RAID].

Hard Disk Write Protect [Disabled]

Disables or enables device write protection. This will be effective only if the device is accessed through BIOS.
Configuration option: [Disabled] [Enabled]

IDE Detect Time Out (Sec) [35]

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

5.3.6   AHCI Configuration

This menu is the section for AHCI configuration. It appears only when you set the item **Configure SATA as** from the sub-menu 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]
```
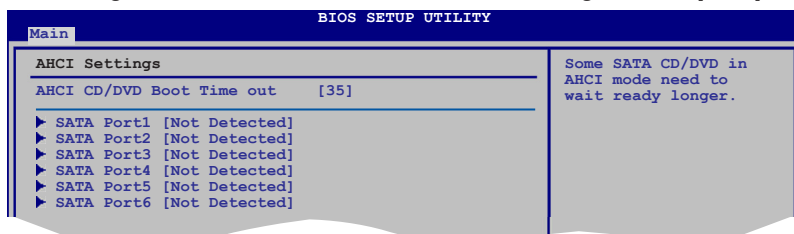
AHCI CD/DVD Boot Time out [35]

Selects the boot time out value for ACHI CD/DVD devices.
Congifuration options: [0] [5] [10] [15] [20] [25] [30] [35]

SATA Port1–6 [XXXX]

Displays the status of auto-detection of SATA devices.

```
                        BIOS SETUP UTILITY
  Main

  SATA Port1

  Device      :Not Detected                  Select the type
                                             of devices connected
  SATA Port1                   [Auto]        to the system.
  SMART Monitoring             [Enabled]
```
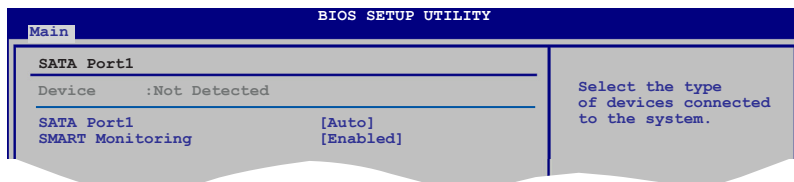
SATA Port1 [Auto]
Allows you to select the type of device connected to the system.
Configuration options: [Auto] [Not Installed]

SMART Monitoring [Enabled]
Allows you to set the Self-Monitoring, Analysis and Reporting Technology.
Configration options: [Disabled] [Enabled]

5.3.7 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.

```
                          BIOS SETUP UTILITY
  Main

  Bios Information
  Version    : 0131
  Build Date : 07/14/08

  Processor
  Type       : Intel(R) Core(TM)2 Duo CPU E6750 @
               2.66GHz
  Speed      : 2666MHz
  Count      : 1

  System Memory
  Installed Size  : 2048MB
  Usable Size     : 2048MB              ←→   Select Screen
                                        ↑↓   Select Item
                                        F1   General Help
                                        F10  Save and Exit
                                        ESC  Exit

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```
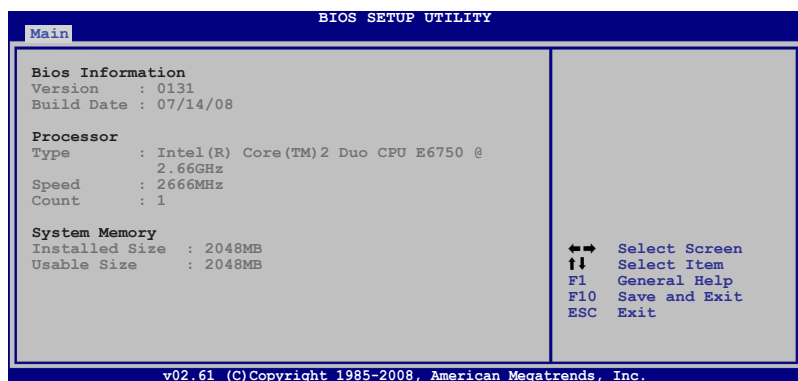
Bios Information

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

Displays the auto-detected system memory.

5.4 Ai Tweaker menu

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

> ⚠️ Take caution when changing the settings of the Ai Tweaker menu items.
> Incorrect field values can cause the system to malfunction.

> 📝 The default values of the following items vary depending on the CPU and
> memory modules you install on the motherboard.

```
                         BIOS SETUP UTILITY
   Main    Ai Tweaker    Advanced    Power    Boot    Tools    Exit
  ┌─────────────────────────────────────────────────┬─────────────────────────┐
  │ Configure System Performance Settings            │                         │
  │                                                  │        Options          │
  │ Ai Overclock Tuner         [Auto]                │                         │
  │ CPU Ratio Setting          [Auto]                │ Manual                  │
  │ FSB Strap to North Bridge  [Auto]                │ Auto                    │
  │ DRAM Frequency             [Auto]                │                         │
  │ DRAM Timing Control         [Auto]               │                         │
  │  1st Information : 5-5-5-15-3-44-5-3             │                         │
  │  2nd Information : 8-3-5-4-6-4-6                 │                         │
  │  3rd Information : 13-5-1-6-6                    │                         │
  │ DRAM Static Read Control   [Auto]                │                         │
  │ DRAM Read Training         [Auto]                │                         │
  │ MEM. OC Charger            [Auto                 │ ←→   Select Screen      │
  │ Ai Clock Twister           [Auto]                │ ↑↓   Select Item        │
  │ Ai Transaction Booster     [Auto]                │ Enter Go to Sub Screen  │
  │  C/P : B1 B2 B3 B4                               │ +-   Change Option      │
  │  LVL : 12 12 12 12                               │ F1   General Help       │
  │                                                  │ F10  Save and Exit      │
  │ ******** Please key in numbers directly! ****** │ ESC  Exit               │
  └─────────────────────────────────────────────────┴─────────────────────────┘
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```

Scroll down to display the following items:

```
  ┌─────────────────────────────────────────────────────────────────────────┐
  │ CPU Voltage                  [Auto]                                       │
  │ CPU PLL Voltage              [Auto]                                       │
  │ FSB Termination Voltage      [Auto]                                       │
  │ DRAM Voltage                 [Auto]                                       │
  │ NB Voltage                   [Auto]                                       │
  │ PCIE SATA Voltage            [Auto]                                       │
  │ ************************************************                          │
  │ Load-Line Calibration        [Auto]                                       │
  │ CPU GTL Reference            [Auto]                                       │
  │ CPU Spread Spectrum          [Auto]                                       │
  │ PCIE Spread Spectrum         [Auto]                                       │
  │ CPU Clock Skew               [Auto]                                       │
  │ NB Clock Skew                [Auto]                                       │
  │ CPU Margin Enhancement       [Optimized]                                  │
  └─────────────────────────────────────────────────────────────────────────┘
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```
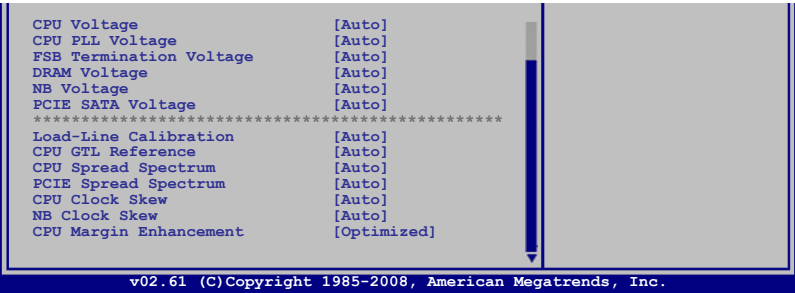
5.4.1 Configure System performance Settings

Ai Overclock Tuner [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal
frequency. Select either one of the preset overclocking configuration options:

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

CPU Ratio Setting [Auto]

Allows you to adjust the ratio between CPU Core Clock and FSB Frequency. Use the <+> and <-> keys to adjust the value. The values may vary depending on the CPU installed. Configuration options: [Auto] [06.0] [07.0]–[XX.X]

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

FSB Frequency [XXX]

Displays the frequency sent by the clock generator to the system bus and PCI bus. The value of this item is auto-detected by the BIOS. Use the <+> and <-> keys to adjust the frequency. You can also type the desired frequency using the numeric keypad. The values range from 200 to 800. Refer to the table below for the correct Front Side Bus and CPU External Frequency settings.

FSB/CPU External Frequency Synchronization

Front Side Bus	FSB 1600	FSB 1333	FSB 1066	FSB 800
CPU External Frequency	400 MHz	333 MHz	266 MHz	200 MHz

PCIE Frequency [Auto]

Allows you to set the PCI Express frequency. Use the <+> and <-> keys to adjust the frequency or type the desired frequency using the numeric keypad. The values range from 100 to 180.

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]

DRAM Frequency [Auto]

Allows you to set the DDR2 operating frequency.
Configuration options: [Auto] [DDR2-667 MHz] [DDR2-800 MHz] [DDR2-1002MHz] [DDR2-1111MHz]

> • Due to chipset behavior, to obtain memory frequency higher than DDR2 800, you can manually adjust **DRAM Frequency**.
>
> • The following table shows the variation of **DRAM Frequency** configuration options according to **FSB Frequency** settings.

FSB	DRAM Frequency (MHz)							
	Auto	667	800	960	1002	1064	1111	1200
1600	•		•	•	•			•
1333	•	•	•		•		•	
1066	•	•	•			•		
800	•	•	•					

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

DRAM Timing Control [Auto]

Configuration options: [Auto] [Manual]

✎ • The following sub-items apprear 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 : 5-5-5-15-3-44-5-3 (These values are auto-detected)

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]–[17 DRAM Clocks] [18 DRAM Clocks]

DRAM RAS# Precharge Time [5 DRAM Clocks]
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks]–[17 DRAM Clocks] [18 DRAM Clocks]

DRAM RAS# Activate to Precharge Time [15 DRAM Clocks]
Configuration options: [3 DRAM Clocks] [4 DRAM Clocks]–[17 DRAM Clocks] [18 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]–**[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 : 8-3-5-4-6-4-6 (These values are auto-detected)

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 : 13-5-1-6-6 (These values are auto-detected)

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]–[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]

DRAM Static Read Control [Auto]

Adjusting this item might enhance DRAM overclocking ability.
Configuration options: [Auto] [Disabled] [Enabled]

DRAM Read Training [Auto]

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

MEM. OC Charger [Auto]

Enable this item to increase DRAM overclockability.
Configuration options: [Auto] [Disabled] [Enabled]

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]

Ai Transaction Booster [Auto]

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

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

Common Performance Level [05]
Set this item to a higher level for better compatibility or a lower level for better performance. Use the <+> and <-> keys to adjust the value or type the desired value using the numeric keypad. The values range from 1 to 31.

Pull-In of CHA/B PH1–5 [Disabled]
Set this item to [Enabled] to apply enhancement on DRAM Channel A and B, Phase 1 to 5. The number of phases is determined by DRAM frequency and FSB strap. Configuration options: [Disabled] [Enabled]

> The following six 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.

CPU Voltage [Auto]

Allows you to set the CPU VCore voltage. The values range from 0.85000V to 1.60000V with a 0.00625V interval.

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

CPU PLL Voltage [Auto]

Allows you to set the CPU PLL voltage. The values range from 1.50V to 2.20V with a 0.02V interval.

FSB Termination Voltage [Auto]

Allows you to set the front side bus termination voltage. The values range from 1.20V to 1.70V with a 0.02V interval.

DRAM Voltage [Auto]

Allows you to set the memory voltage. The values range from 1.80V to 2.70V with a 0.02V interval.

NB Voltage [Auto]

Allows you to set the North Bridge voltage. The values range from 1.10V to 1.70V 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.
>
> • Values of the **CPU PLL Voltage**, **FSB Termination Voltage**, **DRAM Voltage** and **NB Voltage** items are labeled in different colors, indicating the risk levels of high voltage settings. Refer to the table below for details.
>
> • The system may need better cooling system to work stably under high voltage settings.

	Blue	Yellow	Purple	Red
CPU PLL Voltage	1.50V–1.78V	1.80V–2.00V	2.02V–2.20V	N/A
FSB Termination Voltage	1.20V–1.38V	1.40V–1.70V	N/A	N/A
DRAM Voltage	1.80V–1.98V	2.00V–2.20V	2.22V–2.40V	2.42V–2.70V
NB Voltage	1.10V–1.26V	1.28V–1.40V	1.42V–1.58V	1.60V–1.70V

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.

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]

CPU GTL Reference [Auto]

Allows you to enable or set the CPU GTL voltage reference. Setting a high CPU voltage may damage the components permanently, and setting a low voltage may make the system unstable.
Configuration options: [Auto] [0.65x] [0.63x] [0.61x]

CPU Spread Spectrum [Auto]

Set to [Disabled] to enhance FSB overclocking ability or [Auto] for EMI control.
Configuration options: [Auto] [Disabled]

PCIE Spread Spectrum [Auto]

Set to [Disabled] to enhance PCIE overclocking ability or [Auto] for EMI control.
Configuration options: [Auto] [Disabled]

CPU Clock Skew [Auto]

Configuration options: [Auto] [Normal] [Delay 100ps] [Delay 200ps]–[Delay 1500ps]

NB Clock Skew [Auto]

Configuration options: [Auto] [Normal] [Delay 100ps] [Delay 200ps]–[Delay 1500ps]

CPU Margin Enhancement [Optimized]

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

5.5 Advanced menu

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

⚠️ Take caution 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

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```
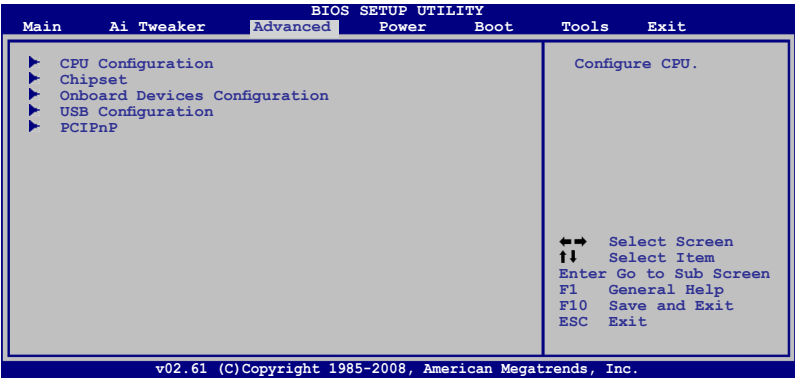
5.5.1 CPU Configuration

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

✏️ The items shown in this screen may vary with CPU model.

```
                              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)2 Duo CPU E6750 @ NOTE: If an invalid
                 2.66GHz                            ratio is set in CMOS
    Frequency   :2.66GHz                            then actual and
    FSB Speed   :1333 MHz                           setpoint values may
    Cache L1    :64 KB                              differ.
    Cache L2    :4096 KB
    Ratio Status: Unlocked (Min:06, Max:08)
    Ratio Actual Value:8
    CPUID       :6FB

                                              ←→   Select Screen
    CPU Ratio Setting           [Auto]        ↑↓   Select Item
    C1E Support                 [Enabled]      +-   Change Option
    Intel(R) Virtualization Tech [Enabled]    F1   General Help
    CPU TM Function             [Enabled]      F10  Save and Exit
    Execute-Disable Bit         [Enabled]      ESC  Exit
    Intel(R) SpeedStep(TM) Tech [Enabled]
    Intel(R) C-STATE Tech       [Enabled]

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```

CPU Ratio Setting [Auto]

Allows you to adjust the ratio between CPU Core Clock and FSB Frequency. Use the <+> and <-> keys to adjust the value. The values may vary depending on the CPU installed. Configuration options: [Auto] [06.0] [07.0]–[XX.X]

C1E Support [Enabled]

Allows you to enable or disable Enhanced Halt State support.
Configuration options: [Disabled] [Enabled]

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]

This function enables the overheated CPU to throttle the clock speed to cool down.
Configuration options: [Disabled] [Enabled]

Execute-Disable Bit [Enabled]

Allows you to enable or disable the No-Execution Page Protection Technology. Setting this item to [Disabled] forces the XD feature flag to always return to zero (0). Configuration options: [Disabled] [Enabled]

The following items appear only when you set the **CPU Ratio Setting** item to [Auto].

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

When set to [Disabled], the CPU runs at its default speed. When set to [Enabled], the CPU speed is controlled by the operating system.
Configuration options: [Disabled] [Enabled]

Intel(R) C-STATE Tech [Enabled]

Allows you enable or disable the Intel® C-STATE Technology. When enabled, the CPU idle is set to C2/C3/C4.
Configuration options: [Disabled] [Enabled]

5.5.2   Chipset

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

```
                          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 Configuration

```
                          BIOS SETUP UTILITY
            Advanced

 North Bridge Chipset Configuration               ENABLE: Allow
                                                  remapping of
 Memory Remap Feature          [Enabled]          overlapped PCI memory
                                                  above the total
 Initiate Graphic Adapter      [PEG/IGD]          physical memory.
 IGD Graphics Mode Select      [Enabled, 32MB]
 GTT Graphics Memory Select    [No VT mode, 2MB]  DISABLE: Do not allow
 PAVP Function                 [Disabled]         remapping of memory.

 DVMT Memory                   [256MB]
```

Memory Remap Feature [Enabled]
Allows you to enable or disable the remapping of the overlapped PCI memory above the total physical memory. Enable this option only when you install 64-bit operating system. Configuration options: [Disabled] [Enabled]

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

IGD Graphics Mode Select [Enabled, 32MB]
Allows you to select the amount of system memory used by the internal graphics device.
Configuration options: [Enabled, 32MB] [Enabled, 64MB] [Enabled, 128MB]

GTT Graphics Memory Size [No VT mode, 2MB]
This item is not available.

PAVP Function [Disabled]
Allows you to set the GMCH Protected Audio Video Path (PAVP) BIOS support. Configuration options: [Disabled] [Lite Mode] [Paranoid]

DVMT Memory [256MB]
Configuration options: [128MB] [256MB] [Maximum DVMT]

> The [Maximum DVMT] option appears only when you install DIMM modules more than 1 GB.

| This motherboard supports Intel® DVMT 5.0 Technology whose maximum graphics memory size in total varies with the system memory size in total and the operating system. Refer to the following table for details. |

System Memory	Maximum Total Graphics Memory	
	Windows® XP	Windows® Vista™
1GB to < 1.5GB	512MB	552MB
1GB to < 2GB	768MB	808MB
2GB to < 3GB	1024MB	1320MB
3GB to < 4GB	—	1832MB
4GB and above	—	1849MB

5.5.3   Onboard Devices Configuration

```
                        BIOS SETUP UTILITY
          Advanced

    Onboard Devices Configuration              Enable or Disable
                                               High Definition Audio
    High Definition Audio      [Enabled]       Controller
     SPDIF Mode Setting        [HDMI Output]
     Front Panel Type          [HD Audio]
    Agere 1394 Controller      [Enabled]
    Marvell IDE Controller     [Enabled]
    RealTek LAN Controller     [Enabled]
      RealTek LAN Boot ROM     [Disabled]

    Serial Port1 Address       [3F8/IRQ4]


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

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```

High Definition Audio [Enabled]

Allows you to enable or disable the High Definition Audio controller. The following two items appear only when you set this item to [Enabled].
Configuration options: [Enabled] [Disabled]

SPDIF Mode Setting [HDMI Output]
Allows you to set the digital audio connector (SPDIF) mode to SPDIF or HDMI depending on the device you use.
Configuration options: [HDMI Output] [SPDIF Output]

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. Configuration options: [AC97] [HD Audio]

Agere 1394 Controller [Enabled]

Configuration options: [Enabled] [Disabled]

Marvell IDE Controller [Enabled]

Allows you to enable or disable the onboard Marvell IDE controller.
Configuration options: [Enabled] [Disabled]

RealTek LAN Controller [Enabled]

Allows you to enable or disable the onboard RealTek LAN port.
Configuration options: [Enabled] [Disabled]

> *RealTek LAN Boot ROM [Disabled]*
> This item appears only when you enable the previous item.
> Configuration options: [Disabled] [Enabled]

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]

5.5.4   USB Configuration

The items in this menu allows 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:
           None                              Disabled
                                             Enabled
 USB Functions            [Enabled]
 USB 2.0 Controller       [Enabled]
 USB 2.0 Controller Mode  [HiSpeed]
 BIOS EHCI Hand-off       [Enabled]
 Legacy USB Support       [Auto]

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

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```
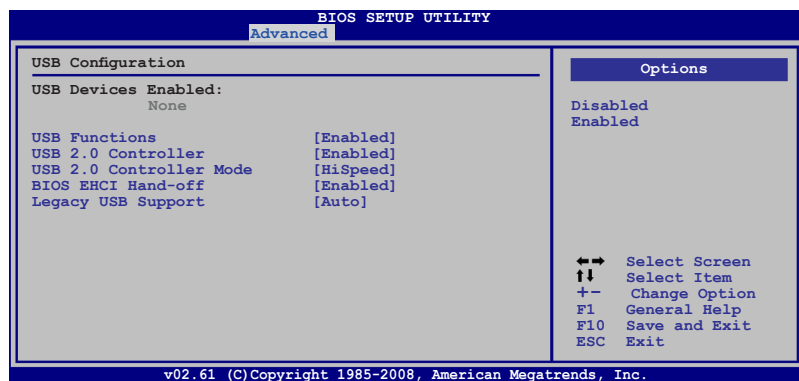
> The **USB Devices Enabled** item shows the auto-detected values. If no USB device is detected, the item shows **None**.

USB Functions [Enabled]

Allows you to enable or disable the USB Host Controllers.
Configuration options: [Disabled] [Enabled]

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

USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Enabled] [Disabled]

USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or
FullSpeed (12 Mbps). Configuration options: [FullSpeed] [HiSpeed]

The **USB 2.0 Controller Mode** item appears only when you enable the **USB 2.0 Controller**.

BIOS EHCI Hand-off [Enabled]

Allows you to enable the support for operating systems without an EHCI hand-off
feature. Configuration options: [Disabled] [Enabled]

Legacy USB Support [Auto]

Allows you to enable or disable the support for legacy USB devices. Setting to
[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.
Configuration options: [Disabled] [Enabled] [Auto]

5.5.5   PCIPnP

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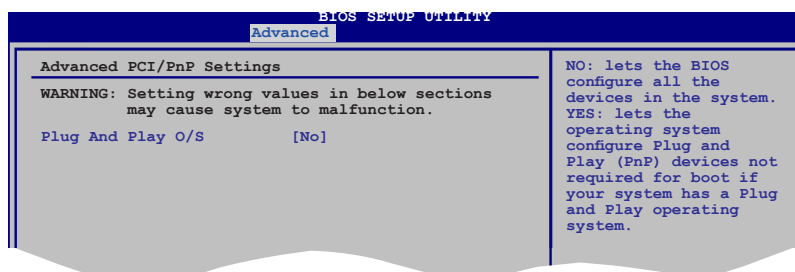
Plug And Play O/S [No]

When set to [NO], BIOS configures all the devices in the system. 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.
Configuration options: [No] [Yes]

5.6   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

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

  ▶  APM Configuration
  ▶  Hardware Monitor



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

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```
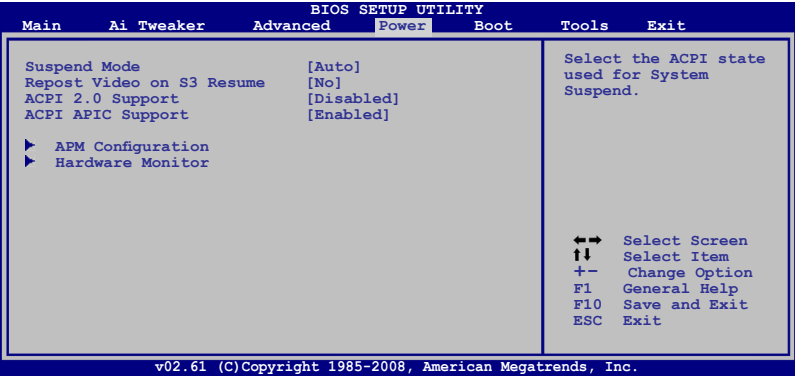
5.6.1   Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.
Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

5.6.2   Repost Video on S3 Resume [No]

Determines whether to invoke VGA BIOS POST on S3/STR resume.
Configuration options: [No] [Yes]

5.6.3   ACPI 2.0 Support [Disabled]

Add additional tables as per ACPI 2.0 specifications.
Configuration options: [Disabled] [Enabled]

5.6.4   ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to [Enabled], the ACPI APIC table pointer is included in the RSDT pointer list.
Configuration options: [Disabled] [Enabled]

5.6.5 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 Modems     [Disabled]
  Power On By PCI Devices         [Disabled]
  Power On By PCIE Devices        [Disabled]
  Power On By PS/2 Keyboard       [Disabled]


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

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```

Restore On AC Power Loss [Power Off]

When set to [Power Off], the system goes into off state after an AC power loss.
When set to [Power On], the system goes on after an AC power loss. When set to
[Last State], the system goes into either off or on state, whatever the system state
was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item
is set to [Enabled], the items **RTC Alarm Date/ RTC Alarm Hour/ RTC Alarm
Minute/ RTC Alarm Second** will become user-configurable with set values.
Configuration options: [Disabled] [Enabled]

Power On By External Modems [Disabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer
when the external modem receives a call while the computer is in Soft-off mode.
Configuration options: [Disabled] [Enabled]

> 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]

Allows you to enable or disable the PME to wake up from S5 by PCI devices.
Configuration options: [Disabled] [Enabled]

Power On By PCIE Devices [Disabled]

Allows you to enable or disable the PCIE devices to generate a wake event.
Configuration options: [Disabled] [Enabled]

Power On By PS/2 Keyboard [Disabled]

Allows you to disable the Power On by PS/2 keyboard function or set 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.
Configuration options: [Disabled] [Space Bar] [Ctrl-Esc] [Power Key]

5.6.6   Hardware Monitor

```
                          BIOS SETUP UTILITY
                             Power

   Hardware Monitor                                    CPU Temperature

   CPU Temperature           [47°C/116.5°F]
   MB Temperature            [32°C/89.5°F]

   CPU Fan Speed             [4500RPM]
   CPU Q-Fan Control         [Enabled]
    CPU Fan Profile          [Standard]

   Chassis Fan 1 Speed       [N/A]                    ←→   Select Screen
   Chassis Q-Fan Control     [Disabled]               ↑↓   Select Item
                                                      +-    Change Field
   Power Fan Speed           [N/A]                    F1    General Help
                                                      F10   Save and Exit
   CPU   Voltage             [ 1.304V]                ESC   Exit
   3.3V  Voltage             [ 2.248V]
   5V    Voltage             [ 5.112V]
   12V   Voltage             [12.096V]

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```

CPU Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

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

CPU Fan Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the CPU fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows [N/A].

CPU Q-Fan Control [Enabled]

Allows you to enable or disable the CPU Q-fan control feature.
Configuration options: [Disabled] [Enabled]

The following item appears only when you enable the **CPU Q-Fan Control** item.

CPU Fan Profile [Standard]

Allows you to set the appropriate performance level of the ASUS Q-Fan.
When set to [Standard], the CPU fan automatically adjusts depending on
the CPU temperature. Set this item to [Silent] to minimize fan speed for
quiet CPU fan operation, or [Turbo] to achieve maximum CPU fan speed.
Configuration options: [Standard] [Silent] [Turbo]

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

The onboard hardware monitor automatically detects and displays the chassis
fan speed in rotations per minute (RPM). If the fan is not connected to the
motherboard, the field shows [N/A].

Chassis Q-Fan Control [Disabled]

Allows you to enable or disable the Chassis Q-fan control feature.
Configuration options: [Disabled] [Enabled]

> The following item appears only when you enable the **Chassis Q-Fan Control**
> item.

Chassis Fan Profile [Standard]

Allows you to set the appropriate performance level of the ASUS Q-Fan.
When set to [Standard], the chassis fan automatically adjusts depending
on the chassis temperature. Set this item to [Silent] to minimize fan speed
for quiet chassis fan operation, or [Turbo] to achieve maximum chassis fan
speed. Configuration options: [Standard] [Silent] [Turbo]

Power Fan Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the power
fan speed in rotations per minute (RPM). If the fan is not connected to the
motherboard, the field shows [N/A].

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.

5.7 Boot menu

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

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

   Boot Settings                                   Specifies the Boot
                                                   Device 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

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```

5.7.1 Boot Device Priority

```
                          BIOS SETUP UTILITY
                                 Boot

   Boot Device Priority                            Specifies the boot
                                                   sequence from the
   1st Boot Device        [1st FLOPPY DRIVE]       available devices.
   2nd Boot Device        [Hard Drive]
   3rd Boot Device        [ATAPI CD-ROM]           A device enclosed in
                                                   parenthesis has been
                                                   disabled in the
                                                   corresponding type
                                                   menu.

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

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```

1st ~ xxth Boot Device [xxx Drive]

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: [1st FLOPPY DRIVE] [Hard Drive] [ATAPI CD-ROM] [Disabled]

5.7.2 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]



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

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```

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items. Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]

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

AddOn ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

Wait for 'F1' If Error [Enabled]

When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to [Enabled], the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

5.7.3 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     disabled password.

    Change Supervisor Password
    Change User Password




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

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```
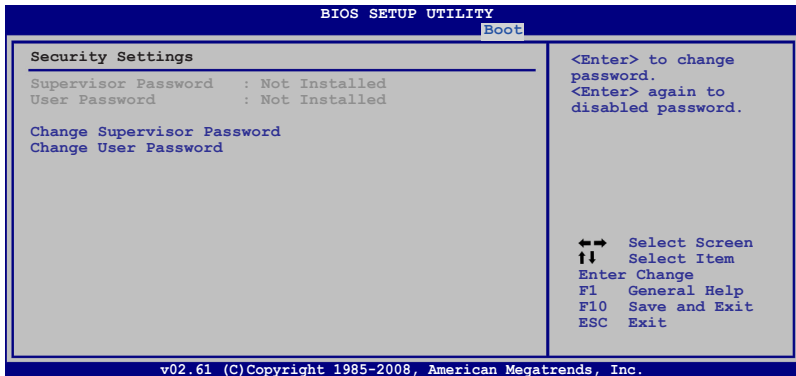
Change Supervisor Password

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 forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **1.9 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.

```
                              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]
```
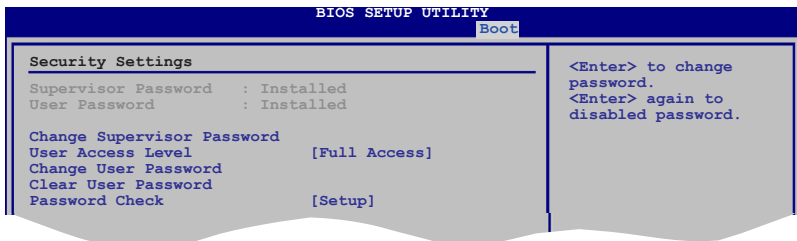
User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items.
Configuration options: [No Access] [View Only] [Limited] [Full Access]

> [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]

When set to [Setup], BIOS checks for user password when accessing the Setup
utility. When set to [Always], BIOS checks for user password both when accessing
Setup and booting the system.
Configuration options: [Setup] [Always]

5.8 Tools menu

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

```
                        BIOS SETUP UTILITY
   Main      Ai Tweaker    Advanced    Power    Boot    Tools    Exit
 ┌──────────────────────────────────────────────┬──────────────────────────┐
 │                                               │ Press ENTER to run       │
 │  ASUS EZ Flash 2                              │ the utility to select    │
 │                                               │ and update BIOS.         │
 │  Express Gate            [Enabled]            │ This utility doesn't     │
 │   Enter OS Timer         [10 Seconds]         │ support :                │
 │   Reset User Data        [No]                 │ 1.NTFS format            │
 │                                               │                          │
 │ ▶ 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               │
 └──────────────────────────────────────────────┴──────────────────────────┘
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```

5.8.1 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. Please see section **2.1.3 ASUS EZ Flash 2 utility** for details.

```
            ASUSTek EZ Flash 2 BIOS ROM Utility V3.25
    FLASH TYPE: EON 25P/F80
    ┌──── Current ROM ────┐        ┌──── Update ROM ────┐
    │ BOARD: P5Q-EM       │        │ BOARD: Unknown     │
    │ VER: 0138           │        │ VER: Unknown       │
    │ DATE: 07/07/2008    │        │ DATE: Unknown      │
    └─────────────────────┘        └────────────────────┘
    PATH: A:\

    ┌───────┐ ┌──────────────────────────────────────┐
    │ A:    │ │                                      │
    │       │ │                                      │
    │       │ │                                      │
    │       │ │                                      │
    └───────┘ └──────────────────────────────────────┘

    ┌─ Note ──────────────────────────────────────────┐
    │  [Enter] Select or Load    [Tab] Switch    [V] Drive Info │
    │  [Up/Down/Home/End] Move    [B] Backup     [Esc] Exit     │
    └──────────────────────────────────────────────────────────┘
```
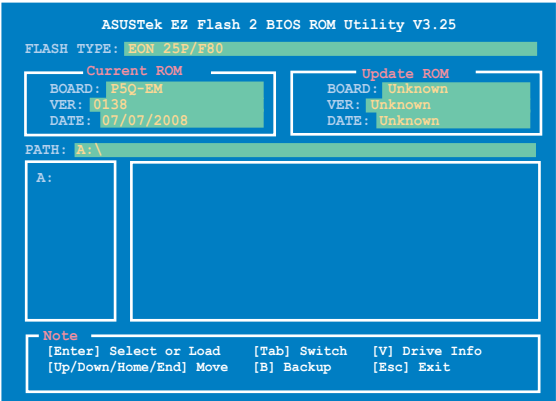
5.8.2 Express Gate

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: [Disabled] **[Enabled]**

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.
Configuration options: [No] [Reset]

When setting this item to [Reset], make sure to 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 (bookmarks, cookies, browsing history, etc.). This is useful in the rare case where corrupt settings prevent the Express Gate environment from launching properly.

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

5.8.3 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
O.C. Profile 1 Status  : Not Installed     to Profile 1
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
```
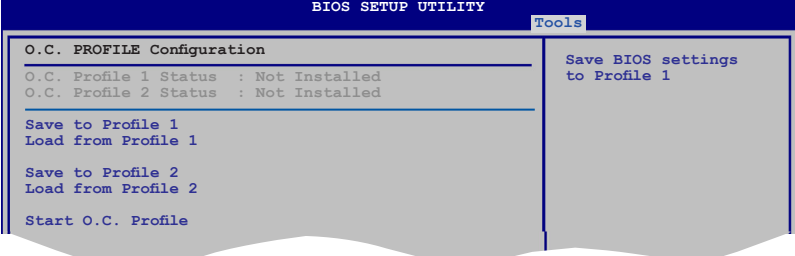
Save to Profile 1/2

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 V1.25

        Current CMOS                  Restore CMOS
     BOARD: P5Q-EM V-P5G45        BOARD: Unknown
     VER: 0138                    VER: Unknown
     DATE: 07/07/2008             DATE: Unknown

   PATH: A:\

   A:




      Note
        [Enter] Select or Load   [Tab] Switch    [V] Drive Info
        [Up/Down/Home/End] Move   [B] Backup      [Esc] Exit
```
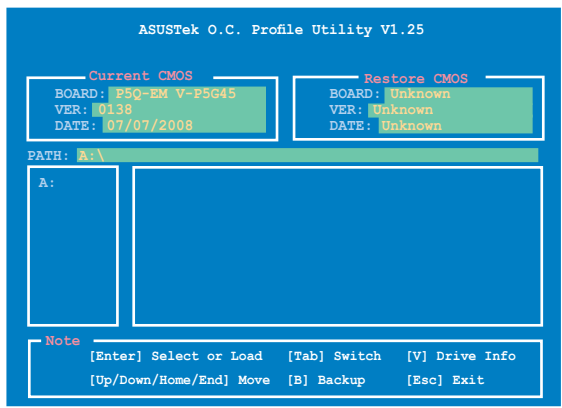
> •   This function can support devices such as a USB flash disk or a floppy disk with FAT 32/16 format and single partition only.
>
> •   DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!

5.8.4   AI Net 2

```
                    BIOS SETUP UTILITY
                                              Tools

   AI NET 2                              Realtek Check LAN
   Pair  Status  Length                  cable during POST.

                                         It will take 3 to 10
   Check Realtek LAN cable    [Disabled]  seconds to diagnose
                                         LAN cable.



                                         ←→   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.
```
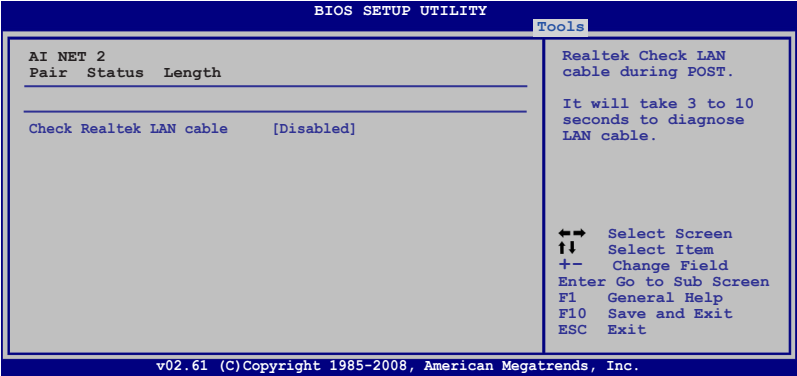
Check Realtek LAN Cable [Disabled]

Enables or disables checking of the Marvell LAN cable during the Power-On Self-Test (POST). Configuration options: [Disabled] [Enabled]

5.9   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 Options                               │   Exit system setup          │
 │                                              │   after saving the           │
 │   Exit & Save Changes                        │   changes.                   │
 │   Exit & Discard Changes                     │                              │
 │   Discard Changes                            │   F10 key can be used        │
 │                                              │   for this operation.        │
 │   Load Setup Defaults                        │                              │
 │                                              │                              │
 │                                              │                              │
 │                                              │                              │
 │                                              │                              │
 │                                              │   ←→   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.
```
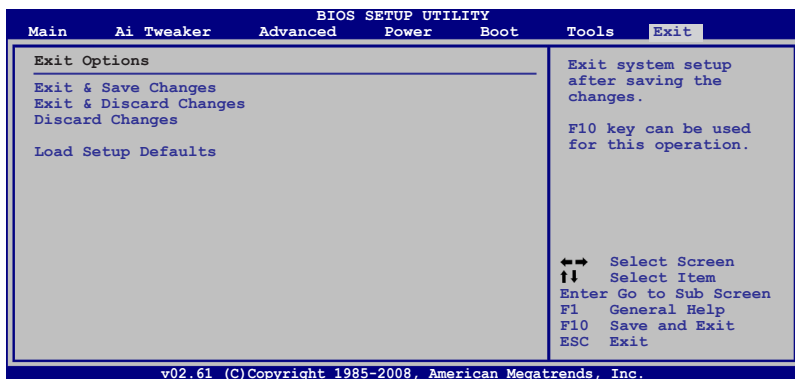
Pressing <Esc> does not immediately exit this menu. Select one of the options
from this menu or <F10> from the legend bar to exit.

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.