

**P5Q-EM**

**ASUS<sup>®</sup>**

**Motherboard**

E3726

First Edition V1

July 2008

**Copyright © 2008 ASUSTeK COMPUTER INC. All Rights Reserved.**

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK COMPUTER INC. ("ASUS").

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification or alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

ASUS PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL ASUS, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF USE OR DATA, INTERRUPTION OF BUSINESS AND THE LIKE), EVEN IF ASUS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES ARISING FROM ANY DEFECT OR ERROR IN THIS MANUAL OR PRODUCT.

SPECIFICATIONS AND INFORMATION CONTAINED IN THIS MANUAL ARE FURNISHED FOR INFORMATIONAL USE ONLY, AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY ASUS. ASUS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS MANUAL, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

# Contents

|  |             |
|--|-------------|
| <b>Contents</b> .....  | <b>iii</b>  |
| <b>Notices</b> .....   | <b>vi</b>   |
| <b>Safety information</b> .....                                  | <b>vii</b>  |
| <b>About this guide</b> .....                                    | <b>viii</b> |
| <b>P5Q-EM specifications summary</b> .....                       | <b>x</b>    |
| <br>   |             |
| <b>Chapter 1: Product introduction</b>                           |             |
| <b>1.1 Welcome!</b> .....  | <b>1-2</b>  |
| <b>1.2 Package contents</b> .....                                | <b>1-2</b>  |
| <b>1.3 Special features</b> .....                                | <b>1-3</b>  |
| 1.3.1 Product highlights .....                                   | 1-3         |
| 1.3.2 ASUS unique features .....                                 | 1-5         |
| 1.3.3 ASUS Intelligent Performance & Overclocking features ..... | 1-7         |
| <b>1.4 Before you proceed</b> .....                              | <b>1-9</b>  |
| <b>1.5 Motherboard overview</b> .....                            | <b>1-10</b> |
| 1.5.1 Motherboard layout .....                                   | 1-10        |
| 1.5.2 Layout contents .....                                      | 1-11        |
| 1.5.3 Placement direction .....                                  | 1-12        |
| 1.5.4 Screw holes .....  | 1-12        |
| <b>1.6 Central Processing Unit (CPU)</b> .....                   | <b>1-13</b> |
| 1.6.1 Installing the CPU .....                                   | 1-14        |
| 1.6.2 Installing the CPU heatsink and fan .....                  | 1-17        |
| 1.6.3 Uninstalling the CPU heatsink and fan .....                | 1-18        |
| <b>1.7 System memory</b> .....                                   | <b>1-19</b> |
| 1.7.1 Overview .....   | 1-19        |
| 1.7.2 Memory configurations .....                                | 1-20        |
| 1.7.3 Installing a DIMM .....                                    | 1-24        |
| 1.7.4 Removing a DIMM .....                                      | 1-24        |
| <b>1.8 Expansion slots</b> .....                                 | <b>1-25</b> |
| 1.8.1 Installing an expansion card .....                         | 1-25        |
| 1.8.2 Configuring an expansion card .....                        | 1-25        |
| 1.8.3 Interrupt assignments .....                                | 1-26        |
| 1.8.4 PCI slot .....   | 1-27        |
| 1.8.5 PCI Express x1 slots .....                                 | 1-27        |
| 1.8.6 PCI Express 2.0 x16 slot .....                             | 1-27        |
| <b>1.9 Jumpers</b> .....   | <b>1-28</b> |

# Contents

- 1.10 Connectors ..... 1-30**
  - 1.10.1 Rear panel connectors..... 1-30
  - 1.10.2 Internal connectors ..... 1-34
- 1.11 Starting up for the first time..... 1-45**
- 1.12 Turning off the computer..... 1-46**
  - 1.12.1 Using the OS shut down function..... 1-46
  - 1.12.2 Using the dual function power switch..... 1-46
  
- Chapter 2: BIOS setup**
  - 2.1 Managing and updating your BIOS ..... 2-2**
    - 2.1.1 ASUS Update utility ..... 2-2
    - 2.1.2 Creating a bootable floppy disk..... 2-5
    - 2.1.3 ASUS EZ Flash 2 utility..... 2-6
    - 2.1.4 AFUDOS utility..... 2-7
    - 2.1.5 ASUS CrashFree BIOS 3 utility ..... 2-9
  - 2.2 BIOS setup program ..... 2-10**
    - 2.2.1 BIOS menu screen.....2-11
    - 2.2.2 Menu bar.....2-11
    - 2.2.3 Navigation keys.....2-11
    - 2.2.4 Menu items ..... 2-12
    - 2.2.5 Sub-menu items..... 2-12
    - 2.2.6 Configuration fields ..... 2-12
    - 2.2.7 Pop-up window ..... 2-12
    - 2.2.8 Scroll bar..... 2-12
    - 2.2.9 General help ..... 2-12
  - 2.3 Main menu ..... 2-13**
    - 2.3.1 System Time ..... 2-13
    - 2.3.2 System Date ..... 2-13
    - 2.3.3 Legacy Diskette A ..... 2-13
    - 2.3.4 SATA 1–6 ..... 2-14
    - 2.3.5 Storage Configuration ..... 2-15
    - 2.3.6 AHCI Configuration ..... 2-16
    - 2.3.7 System Information ..... 2-17
  - 2.4 Ai Tweaker menu ..... 2-18**
    - 2.4.1 Configure System performance Settings ..... 2-18
  - 2.5 Advanced menu ..... 2-25**

# Contents

|  |   |             |
|--|---|-------------|
| 2.5.1                                  | CPU Configuration .....                                 | 2-25        |
| 2.5.2                                  | Chipset .....   | 2-27        |
| 2.5.3                                  | Onboard Devices Configuration .....                     | 2-28        |
| 2.5.4                                  | USB Configuration .....                                 | 2-29        |
| 2.5.5                                  | PCIPnP .....  | 2-30        |
| <b>2.6</b>                             | <b>Power menu.....</b>                                  | <b>2-31</b> |
| 2.6.1                                  | Suspend Mode .....                                      | 2-31        |
| 2.6.2                                  | Repost Video on S3 Resume.....                          | 2-31        |
| 2.6.3                                  | ACPI 2.0 Support .....                                  | 2-31        |
| 2.6.4                                  | ACPI APIC Support.....                                  | 2-31        |
| 2.6.5                                  | APM Configuration.....                                  | 2-32        |
| 2.6.6                                  | Hardware Monitor .....                                  | 2-33        |
| <b>2.7</b>                             | <b>Boot menu .....</b>                                  | <b>2-35</b> |
| 2.7.1                                  | Boot Device Priority .....                              | 2-35        |
| 2.7.2                                  | Boot Settings Configuration .....                       | 2-36        |
| 2.7.3                                  | Security .....  | 2-37        |
| <b>2.8</b>                             | <b>Tools menu .....</b>                                 | <b>2-39</b> |
| 2.8.1                                  | ASUS EZ Flash 2.....                                    | 2-39        |
| 2.8.2                                  | Express Gate .....                                      | 2-40        |
| 2.8.3                                  | ASUS O.C. Profile.....                                  | 2-41        |
| 2.8.4                                  | AI Net 2 .....  | 2-42        |
| <b>2.9</b>                             | <b>Exit menu .....</b>                                  | <b>2-43</b> |
| <br><b>Chapter 3: Software support</b> |   |             |
| <b>3.1</b>                             | <b>Installing an operating system .....</b>             | <b>3-2</b>  |
| <b>3.2</b>                             | <b>Support DVD information .....</b>                    | <b>3-2</b>  |
| 3.2.1                                  | Running the support DVD .....                           | 3-2         |
| 3.2.2                                  | Drivers menu.....                                       | 3-3         |
| 3.2.3                                  | Utilities menu .....                                    | 3-4         |
| 3.2.4                                  | Make disk menu.....                                     | 3-6         |
| 3.2.5                                  | Manual menu .....                                       | 3-7         |
| 3.2.6                                  | ASUS Contact information .....                          | 3-7         |
| 3.2.7                                  | Other information .....                                 | 3-8         |
| <b>3.3</b>                             | <b>ASUS Express Gate .....</b>                          | <b>3-10</b> |
| <b>3.4</b>                             | <b>Creating a RAID driver disk.....</b>                 | <b>3-19</b> |
| 3.4.1                                  | Creating a RAID driver disk without entering the OS.... | 3-19        |
| 3.4.2                                  | Creating a RAID driver disk in Windows®.....            | 3-19        |

# Notices

## Federal Communications Commission Statement

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

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

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

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



---

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

---

## Canadian Department of Communications Statement

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

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

# Safety information

## Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

## Operation safety

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



---

This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

---

# About this guide

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

## How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**  
This chapter describes the features of the motherboard and the new technology it supports. It also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.
- **Chapter 2: BIOS setup**  
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.
- **Chapter 3: Software support**  
This chapter describes the contents of the support DVD that comes with the motherboard package.

## Where to find more information

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

1. **ASUS websites**  
The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.
2. **Optional documentation**  
Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.



## Conventions used in this guide

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



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



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



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



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

## Typography

**Bold text**

Indicates a menu or an item to select.

*Italics*

Used to emphasize a word or a phrase.

<Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.

Example: <Enter> means that you must press the Enter or Return key.

<Key1>+<Key2>+<Key3>

If you must press two or more keys simultaneously, the key names are connected with a plus sign (+).

Example: <Ctrl>+<Alt>+<D>

**Command**

Means that you must type the command exactly as shown.

Example: At the DOS prompt, type the command line:

```
a fudos /iP5QEM.ROM
```

## P5Q-EM specifications summary

|                        |   |
|------------------------|---|
| <b>CPU</b>             | LGA775 socket for Intel® Core™2 Extreme / Core™2 Quad / Core™2 Duo / Pentium® dual-core / Celeron® dual-core / Celeron® processors<br>Compatible with Intel® 05B/05A/06 processors<br>Supports Intel® 45nm multi-core CPUs  |
| <b>Chipset</b>         | Intel® G45 / ICH10R with Intel® Fast Memory Access Technology   |
| <b>System bus</b>      | 1600/1333/1066/800 MHz  |
| <b>Memory</b>          | Dual-channel memory architecture <ul style="list-style-type: none"> <li>- 4 x 240-pin DIMM sockets support unbuffered non-ECC DDR2 1066(O.C.)/800/667MHz memory modules</li> <li>- Supports up to 16 GB system memory</li> </ul> <p>*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.<br/>**Refer to <a href="http://www.asus.com">www.asus.com</a> or this user manual for the Memory QVL (Qualified Vendors Lists).</p> |
| <b>VGA</b>             | Intel® Graphics Media Accelerator X4500HD integrated Multi-VGA output support: HDMI, DVI-D, and RGB <ul style="list-style-type: none"> <li>- HDMI with max. resolution 1920 x 1080 @ 60 Hz</li> <li>- DVI with max. resolution 1920 x 1080 @ 60 Hz</li> <li>- RGB with max. resolution 2048 x 1536 @ 75 Hz</li> </ul> <p>Maximum shared memory of 1849 MB<br/>Supports Microsoft® DirectX®10, OpenGL®2.1, Pixel Shader 4.0</p>  |
| <b>Expansion slots</b> | 1 x PCIe 2.0 x16 slot<br>2 x PCIe x1 slot<br>1 x PCI slot   |
| <b>Storage</b>         | Southbridge <ul style="list-style-type: none"> <li>- 6 x Serial ATA 3 Gb/s ports</li> <li>- Intel® Matrix Storage Technology supports RAID 0, 1, 5, 10</li> </ul> <p>Marvell® 6102 controller <ul style="list-style-type: none"> <li>- 1 x Ultra DMA 133/100/66 for up to 2 PATA devices</li> </ul> </p>  |
| <b>LAN</b>             | Realtek® 8111C PCIe Gigabit LAN controller featuring AI NET2  |
| <b>Audio</b>           | Realtek® ALC1200 8-channel High-Definition Audio codec <ul style="list-style-type: none"> <li>- Supports Jack-detection, Multi-streaming</li> <li>- ASUS Noise Filtering</li> </ul>   |
| <b>IEEE 1394</b>       | Agere L-FW3227 controller supports 2 x IEEE 1394a ports (one at midboard; one at back panel)  |
| <b>USB</b>             | 12 x USB 2.0/1.1 ports (6 at mid-board, 6 at back panel)  |

*(continued on the next page)*

# P5Q-EM specifications summary

|   |  |
|---|--|
| <b>ASUS Unique features</b>                 | <b>ASUS Power Saving solution:</b> <ul style="list-style-type: none"><li>- ASUS EPU-4 Engine</li><li>- AI Nap</li></ul> <b>ASUS Express Gate</b><br><b>ASUS Quiet Thermal Solution:</b> <ul style="list-style-type: none"><li>- ASUS Fanless Design</li><li>- ASUS Fan Xpert</li></ul> <b>ASUS Crystal Sound:</b> <ul style="list-style-type: none"><li>- ASUS Noise Filtering</li></ul> <b>ASUS EZ DIY:</b> <ul style="list-style-type: none"><li>- ASUS Q-Connector</li><li>- ASUS O.C. Profile</li><li>- ASUS CrashFree BIOS 3</li><li>- ASUS EZ Flash 2</li></ul>  |
| <b>Other features</b>                       | ASUS MyLogo 2™   |
| <b>ASUS Exclusive Overclocking features</b> | <b>Precision Tweaker 2:</b> <ul style="list-style-type: none"><li>- vCore: Adjustable CPU voltage at 0.00625V increment</li><li>- vDIMM: 45-step DRAM voltage control</li><li>- vChipset (N.B.): 30-step chipset voltage control</li><li>- vCPU PLL: 35-step CPU PLL voltage control</li><li>- vFSB Termination: 25-step reference voltage control</li></ul> <b>SFS (Stepless Frequency Selection)</b> <ul style="list-style-type: none"><li>- FSB tuning from 200MHz up to 800MHz at 1MHz increment</li><li>- PCI Express frequency tuning from 100MHz up to 180MHz at 1MHz increment</li></ul> <b>Overclocking Protection:</b> <ul style="list-style-type: none"><li>- ASUS C.P.R.(CPU Parameter Recall)</li></ul> |
| <b>Rear panel connectors</b>                | 1 x PS/2 Keyboard/Mouse combo port<br>1 x Optical S/PDIF Out port<br>1 x D-Sub port<br>1 x DVI port<br>1 x HDMI port<br>1 x IEEE1394a<br>1 x LAN (RJ-45) port<br>6 x USB 2.0/1.1 ports<br>8-channel audio ports  |

*(continued on the next page)*

# P5Q-EM specifications summary

|                             |  |
|-----------------------------|--|
| <b>Internal connectors</b>  | 3 x USB connectors support 6 additional USB ports<br>1 x Floppy disk drive connector<br>1 x IDE connector<br>6 x SATA connectors<br>1 x CPU / 1 x Chassis / 1 x Power fan connectors<br>1 x IEEE1394a connector<br>1 x COM connector<br>1 x S/PDIF Out header<br>1 x Chassis intrusion connector<br>1 x Front panel audio connector<br>1 x CD audio in connector<br>24-pin ATX power connector<br>4-pin ATX 12 V power connector<br>System panel connector (Q-Connector) |
| <b>BIOS features</b>        | 8 Mb Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.4, ACPI 2.0a, ASUS CrashFree BIOS 3, ASUS EZ Flash 2  |
| <b>Manageability</b>        | WOL by PME, WOR by PME, WOR by Ring, Chassis Intrusion, PXE  |
| <b>Support DVD contents</b> | Drivers<br>ASUS Express Gate<br>ASUS PC Probe II<br>ASUS Update<br>ASUS AI Suite<br>Anti-virus software (OEM version)<br>Image-Editing Suite   |
| <b>Form factor</b>          | uATX form factor: 9.6 in x 9.6 in (24.4 cm x 24.4 cm)  |

\*Specifications are subject to change without notice.

This chapter describes the motherboard features and the new technologies it supports.

# 1 Product introduction

## 1.1 Welcome!

Thank you for buying an ASUS® P5Q-EM motherboard!

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

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

## 1.2 Package contents

Check your motherboard package for the following items.

|                 |  |
|-----------------|--|
| Motherboard     | ASUS P5Q-EM  |
| Cables          | 3 x SATA signal cables<br>2 x SATA power cables for 3 devices<br>1 x Ultra DMA 133/100/66 cable<br>1 x Floppy disk drive cable |
| Accessories     | 1 x I/O Shield<br>1 x eSATA module<br>1 x ASUS Q-Connector Kit (USB, 1394, system panel; Retail version only)                  |
| Application DVD | ASUS motherboard support DVD   |
| Documentation   | User guide   |



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

## 1.3 Special features

### 1.3.1 Product highlights

#### Green ASUS



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

#### Intel® Core™2 Extreme / Core™2 Quad / Core™2 Duo Processor Support



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



#### Intel G45 Chipset

The Intel® G45 Express Chipset is the latest chipset designed to support dual-channel DDR2 800/667 architecture, 1333/1066/800 FSB (Front Side Bus), PCIe 2.0, and multi-core CPUs. It provides digital home entertainment of full 1080p high-definition video playback, including Blu-ray disc movies, with the next-generation Intel® Graphics Media Accelerator X4500HD. The Intel® G45 Express Chipset delivers optimized 3D graphics performance and support for Microsoft DirectX 10, Shader Model 4.0 and OpenGL 2.1. It especially includes Intel® Fast Memory Access technology that significantly optimizes the use of available memory bandwidth and reduces the latency of the memory accesses.



#### PCIe 2.0

This motherboard supports the latest PCIe 2.0 device for twice the current speed and bandwidth. This enhances system performance while still providing backward compatibility to PCIe 1.0 devices. See page 1-27 for details.

#### Serial ATA 3 Gb/s technology



This motherboard supports hard drives based on the Serial ATA (SATA) 3 Gb/s storage specification, delivering enhanced scalability and doubling the bus bandwidth for high-speed data retrieval and saves. The onboard Intel® ICH10R allows RAID 0, RAID 1, RAID 5, and RAID 10 configurations for six SATA connectors. See page 1-36 for details.

## HDMI/DVI/D-Sub Interface



HDMI (High-Definition Multimedia Interface) is a set of digital video standards that delivers multi-channel audio and uncompressed digital video through a single cable for full HD 1080p visuals. Supporting HDCP copy protection such as HD DVD and Blu-ray Discs, HDMI provides you with the highest-quality home theater experience. DVI (Digital Visual Interface) provides high quality visuals for digital display devices like LCD monitors. See page 1-31 for details.

## IEEE 1394a support



The IEEE 1394a interface provides high speed digital interface for audio/video appliances such as digital television, digital video camcorders, storage peripherals & other PC portable devices. See pages 1-30 and 1-38 for details.

## High Definition Audio



Enjoy high-end sound quality on your PC! The onboard 8-channel HD audio (High Definition Audio, previously codenamed Azalia) CODEC enables high-quality 192KHz/24-bit audio output that simultaneously sends different audio streams to different destinations. You can now talk to your partners on the headphone while playing multi-channel network games. See page 1-30 for details.

## S/PDIF digital sound ready



This motherboard provides convenient connectivity to external home theater audio systems via the coaxial (mid-board) and optical S/PDIF (SONY-PHILIPS Digital Interface) Out interface. It allows digital audio transferring without converting it to analog format, and therefore well preserves signal quality. See pages 1-32 and 1-40 for details.



## 1.3.2 ASUS unique features

### ASUS Express Gate



Taking only 5 seconds to go online from bootup, Express Gate is the one-stop gateway to instant fun! It's a unique motherboard built-in OS. You can utilize the most popular Instant Messengers (IM) like MSN, Skype, Google talk, QQ, and Yahoo! Messenger to keep in touch with friends, or quickly check on the weather and e-mails just before leaving your house. What's more, the user-friendly picture manager lets you view your pictures without entering Windows at any time! See pages 3-10 to 3-18 for details.



---

The actual boot time depends on the system configuration.

---

### ASUS Power Saving Solution

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

#### ASUS EPU-4 Engine



The new ASUS EPU—the world's first power saving engine, has been upgraded to a new 4-engine version, which provides total system power savings by detecting current PC loadings and intelligently moderating power in real-time. With auto phase switching for components (which includes the CPU, VGA card, hard drives, and CPU cooler/system fan), the EPU automatically provides the most appropriate power usage via intelligent acceleration and overclocking—helping save power and money.

#### AI Nap



With AI Nap, the system can continue running at minimum power and noise when you are temporarily away. To wake the system and return to the OS environment, simply click the mouse or press a key.

### ASUS Quiet Thermal Solution

ASUS Quiet Thermal solution makes system more stable and enhances the overclocking capability.

## Fan Xpert

ASUS Fan Xpert intelligently allows users to adjust both the CPU and chassis fan speed according to different ambient temperature, which is caused by different climate conditions in different geographic regions and system loading. Built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

## ASUS Crystal Sound

This feature can enhance speech-centric applications like Skype, online game, video conference and recording.

## Noise Filtering

This feature detects repetitive and stationary noises (non-voice signals) like computer fans, air conditioners, and other background noises then eliminates it in the incoming audio stream while recording.

## ASUS EZ DIY

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

## ASUS Q-Connector

ASUS Q-Connector allows you to easily connect or disconnect the chassis front panel cables to the motherboard. This unique module eliminates the trouble of connecting the system panel cables one at a time and avoiding wrong cable connections. See page 1-44 for details.

## ASUS O.C. Profile

The motherboard features the ASUS O.C. Profile that allows users to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving users freedom to share and distribute their favorite settings. See page 2-41 for details.

## ASUS EZ Flash 2

EZ Flash 2 is a user-friendly BIOS update utility. Simply press the predefined hotkey to launch the utility and update the BIOS without entering the OS. Update your BIOS easily without preparing a bootable diskette or using an OS-based flash utility. See pages 2-6 and 2-39 for details.

### ASUS CrashFree BIOS 3



ASUS CrashFree BIOS 3 allows users to restore corrupted BIOS data from a USB flash disk containing the BIOS file. See page 2-9 for details.

### ASUS MyLogo 2™



This feature allows you to convert your favorite photo into a 256-color boot logo for a more colorful and vivid image on your screen.

## 1.3.3 ASUS Intelligent Performance & Overclocking features

### AI Booster

The ASUS AI Booster allows you to overclock the CPU speed in Windows environment without the hassle of booting the BIOS.



### Precision Tweaker 2

Allows the user to adjust the NB Voltage, FSB termination Voltage, CPU PLL Voltage and the DRAM Voltage in 0.02v steps to finetune voltages to achieve the most precise setting for the ultimate customized overclocking configuration.

### C.P.R. (CPU Parameter Recall)



The C.P.R. feature of the motherboard BIOS allows automatic re-setting to the BIOS default settings in case the system hangs due to overclocking. When the system hangs due to overclocking, C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and the BIOS automatically restores the CPU default setting for each parameter.



## 1.4 Before you proceed

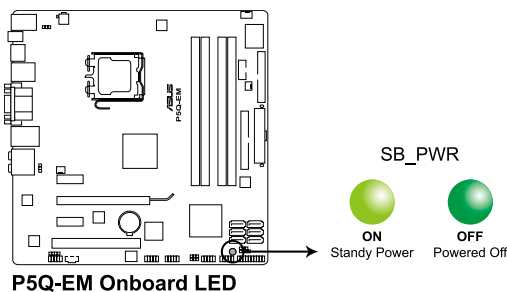
Take note of the following precautions before you install motherboard components or change any motherboard settings.



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

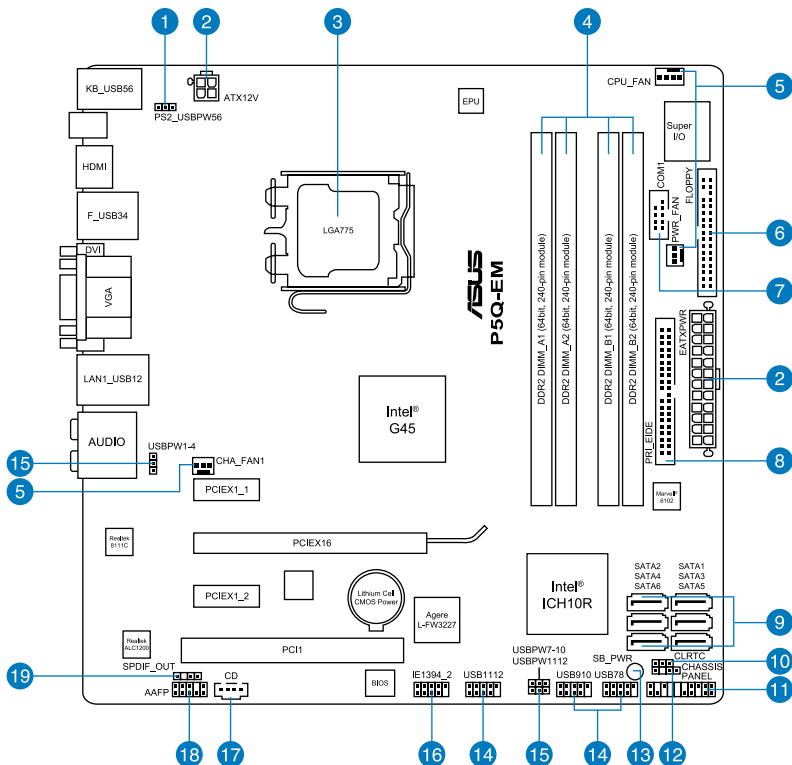
### Onboard LED

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



# 1.5 Motherboard overview

## 1.5.1 Motherboard layout



Refer to **1.10 Connectors** for more information about rear panel connectors and internal connectors.

## 1.5.2 Layout contents

| Connectors/Jumpers/Slots |  | Page |
|--------------------------|--|------|
| 1.                       | Keyboard power (3-pin PS2_USBPW56)   | 1-29 |
| 2.                       | ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)                                      | 1-42 |
| 3.                       | LGA775 CPU Socket  | 1-14 |
| 4.                       | DDR2 DIMM slots  | 1-19 |
| 5.                       | CPU, chassis, and power fan connectors (4-pin CPU_FAN;<br>3-pin CHA_FAN1; 3-pin PWR_FAN) | 1-39 |
| 6.                       | Floppy disk drive connector (34-1 pin FLOPPY)  | 1-34 |
| 7.                       | Serial port connector (10-1 pin COM1)  | 1-38 |
| 8.                       | IDE connector (40-1 pin PRI_EIDE)  | 1-35 |
| 9.                       | ICH10R Serial ATA connectors [red] (7-pin SATA1-6)                                       | 1-36 |
| 10.                      | Clear RTC RAM (3-pin CLRTC)  | 1-28 |
| 11.                      | System panel connector (20-8 pin PANEL)  | 1-43 |
| 12.                      | Chassis intrusion connector (4-1 pin CHASSIS)  | 1-40 |
| 13.                      | Onboard LED (SB_PWR)   | 1-9  |
| 14.                      | USB connectors (10-1 pin USB78; USB910; USB1112)   | 1-37 |
| 15.                      | USB device wake-up (3-pin USBPW1-4; USB7-10; USB1112)                                    | 1-29 |
| 16.                      | IEEE 1394a port connector (10-1 pin IE1394_2)  | 1-38 |
| 17.                      | Optical drive audio connector (4-pin CD)   | 1-41 |
| 18.                      | Front panel audio connector (10-1 pin AAFP)  | 1-41 |
| 19.                      | Digital audio connector (4-1 pin SPDIF_OUT)  | 1-40 |

### 1.5.3 Placement direction

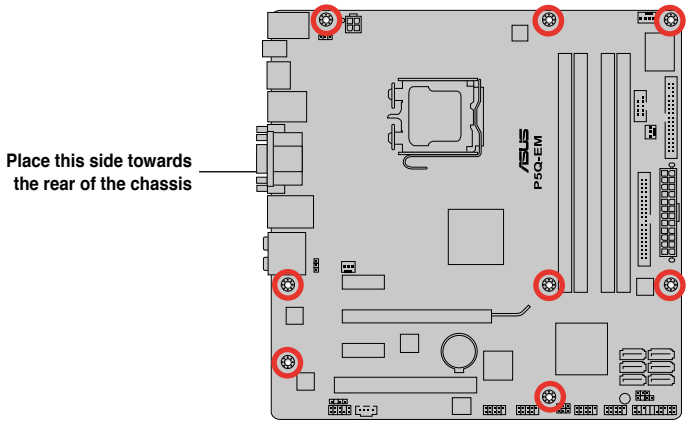
When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

### 1.5.4 Screw holes

Place eight (8) screws into the holes indicated by circles to secure the motherboard to the chassis.



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





## 1.6 Central Processing Unit (CPU)

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



- 
- Make sure that all power cables are unplugged before installing the CPU.
  - If installing a dual-core CPU, connect the chassis fan cable to the CHA\_FAN1 connector to ensure system stability.
  - Due to the chipset limitation, we recommend you use FSB 800MHz CPU or above.
- 

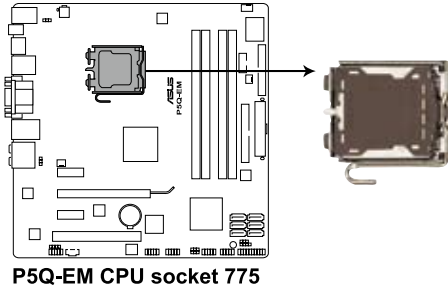


- 
- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only 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.
-

## 1.6.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

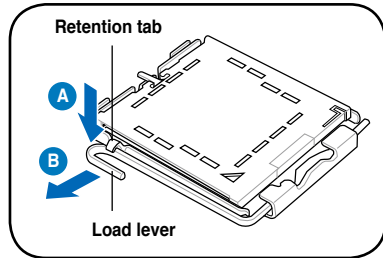


Before installing the CPU, make sure that the cam box is facing towards you and the load lever is on your left.

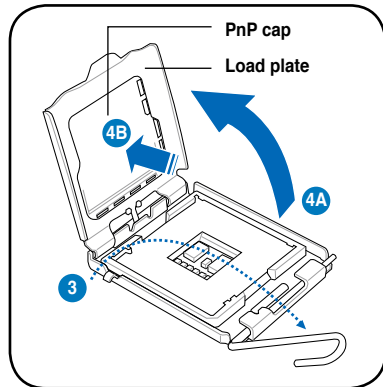
2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.



To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.



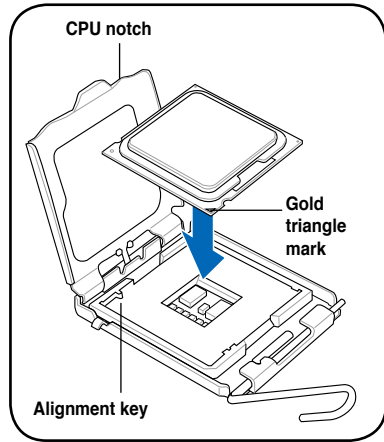
3. Lift the load lever in the direction of the arrow to a 135° angle.
4. Lift the load plate with your thumb and forefinger to a 100° angle (4A), then push the PnP cap from the load plate window to remove (4B).



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.



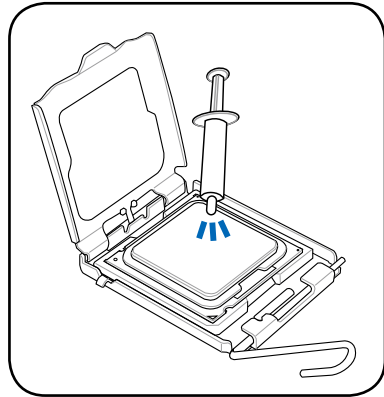
The CPU fits in only one correct orientation. **DO NOT** force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!



6. Apply several drops of thermal paste to the exposed area of the CPU that the heatsink will be in contact with, ensuring that it is spread in an even thin layer.



Some heatsinks come with pre-applied thermal paste. If so, skip this step.

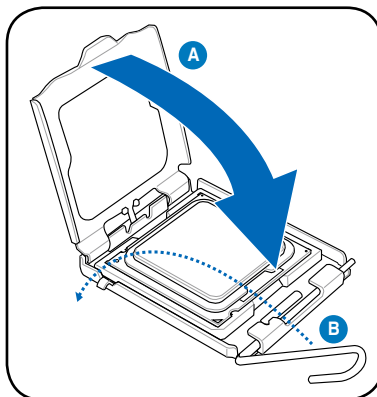


The Thermal Interface Material is toxic and inedible. If it gets into your eyes or touches your skin, ensure to wash it off immediately, and seek professional medical help.



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

7. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.



---

The motherboard supports Intel® LGA775 processors with the Intel® Enhanced Memory 64 Technology (EM64T), Enhanced Intel SpeedStep® Technology (EIST), and Hyper-Threading Technology. Refer to the Appendix for more information on these CPU features.

---

## 1.6.2 Installing the CPU heatsink and fan

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



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



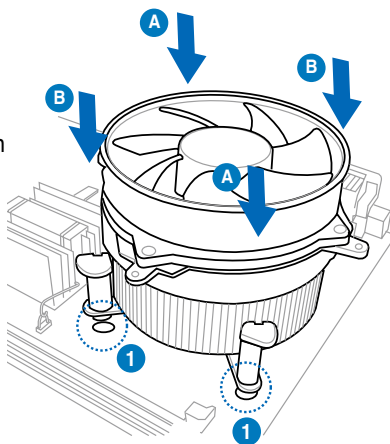
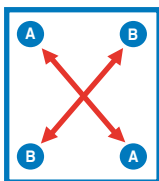
Make sure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.



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

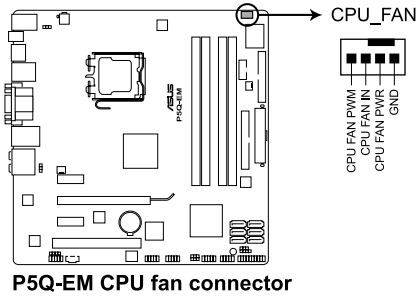
To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, 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.



Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

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

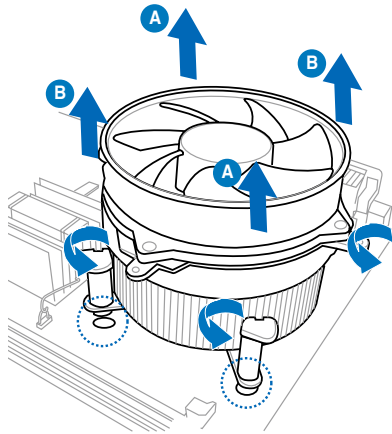
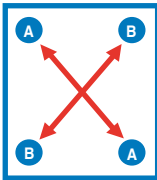


DO NOT forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

### 1.6.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

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



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

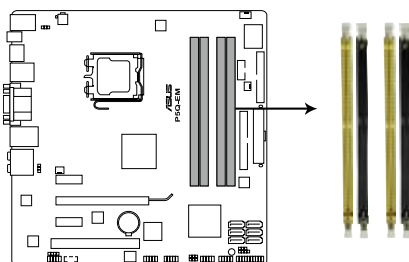
# 1.7 System memory

## 1.7.1 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 |

## 1.7.2 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 **2.4 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 **2.4 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/<br>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<br>(78.AAG9S.9KF)               | 2048MB(Kit of 2) | DS        | Heat-Sink Package  | 5-5-5-15 | .            | .  | .  |
| Apacer    | BoxP/N:CH.04GAF.F0KK2<br>(78.AAGAL.9KF)                | 4096MB(Kit of 2) | DS        | Heat-Sink Package  | 5-5-5-15 | .            | .  | .  |
| CORSAIR   | Box P/N:TWIN2X2048-8500C5D<br>(CM2X1024-8500C5D)(EPP)  | 1024MB           | DS        | Heat-Sink Package  | N/A      | .            | .  | .  |
| CORSAIR   | Box P/N:TWIN2X4096-8500C5DF<br>(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        | H5YPS12821FFP-G7   | 7        | .            | .  | .  |
| Hynix     | HYMP 512U64FP8-G7                                      | 1024MB           | DS        | H5YPS12821FFP-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    | MT8HTF1 12864AY-1GAE1                                  | 1024MB           | SS        | DSJKH              | 7        | .            | .  | .  |
| OCZ       | Box P/N:OCZ2N10662GK<br>(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/<br>DS | Chip No.          | CL       | DIMM support |    |    |
|---------|---|------------------|-----------|-------------------|----------|--------------|----|----|
|         |   |                  |           |                   |          | A*           | B* | C* |
| A-DATA  | M20AD6H3J4171Q1E52                                  | 2048MB           | DS        | AD20908A8A-25EG   | N/A      | .            | .  | .  |
| Apacer  | 78.01GA0.9K5  | 1024MB           | SS        | AM4B5808CQJS8E    | N/A      | .            | .  | .  |
| Apacer  | 78.91G91.9K5  | 512MB            | SS        | AM4B5708JQJS8E    | N/A      | .            | .  | .  |
| Apacer  | 78.A1GA0.9K4  | 2048MB           | DS        | AM4B5808CQJS8E    | 5        | .            | .  | .  |
| CORSAIR | Box P/N:TWIN2X4096-6400C5<br>(CM2X2048-6400C5)      | 4096MB(Kit of 2) | DS        | Heat-Sink Package | N/A      | .            | .  | .  |
| CORSAIR | BoxP/N:TWIN2X4096-6400C4DHX<br>(CM2X2048-6400C4DHX) | 4096MB(Kit of 2) | DS        | Heat-Sink Package | 4-4-4-12 | .            | .  | .  |
| CORSAIR | BoxP/N:TWIN2X4096-6400C5DHX<br>(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        | GL2L64M088BA30BE  | N/A      | .            | .  | .  |

(continued on the next page)

|              |                       |                  |    |                    |          |   |   |   |
|--------------|-----------------------|------------------|----|--------------------|----------|---|---|---|
| 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         | GB24GB6400C4DC        | 4096MB(Kit of 4) | DS | GL2L64M088BA30EB   | N/A      | * | * | * |
| GEIL         | GB24GB6400C5DC        | 4096MB(Kit of 2) | DS | GL2L128M88BA25AB   | 5-5-5-15 | * | * | * |
| GEIL         | GB24GB6400C5DC        | 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 | * | * | * |
| 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        | HYP564U64CP8-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     | KHX6400D2LK2/1G       | 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     | KHX6400D2LL1/1G       | 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 512B04QBF25  | 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        | NT1GT64U8HBOBY-25C    | 1024MB           | DS | NT5TU64M8BE-25C    | 5        | * | * | * |
| NANYA        | NT1GT64U8HCOBY-25D    | 1024MB           | DS | NT5TU64M8CE-25D    | N/A      | * | * | * |
| NANYA        | NT2GT64U8HCOBY-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      | * | * | * |
| PSC          | AL8E8F73C-8E1         | 2048MB           | DS | A3R1GE3CFF734MAA0E | 5        | * | * | * |
| Qimonda      | HYS64T256020EU-2.5-C2 | 2048MB           | DS | HYB18T1G800C2F-2.5 | 6        | * | * | * |
| Qimonda      | HYS64T256020EU-25F-C2 | 2048MB           | DS | HYB18T1G800C2F-25F | 5        | * | * | * |
| SAMSUNG      | M378T2863QZ3-CF7      | 1024MB           | SS | K4T1G084QQ         | 6        | * | * | * |
| SAMSUNG      | M378T6553GZ3-CF7      | 512MB            | SS | K4T510830G         | 6        | * | * | * |
| SAMSUNG      | M391T2863QZ3-CF7      | 1024MB           | SS | K4T1G084QQ(ECC)    | 6        | * | * | * |
| SAMSUNG      | M378T2953GZ3-CF7      | 1024MB           | DS | K4T510830G         | 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 | TQ243CF8           | 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/<br>DS | Chip No.            | CL       | DIMM support |    |    |
|--------------|----------------------|------------------|-----------|---------------------|----------|--------------|----|----|
|              |                      |                  |           |                     |          | A*           | B* | C* |
| Apacer       | 78.01G90.9K5         | 1024MB           | SS        | AM4B5808CQJS7E      | N/A      | *            | *  | *  |
| Apacer       | 78.91G92.9K5         | 512MB            | SS        | AM4B5708JQJS7E      | N/A      | *            | *  | *  |
| Apacer       | 78.A1G90.9K4         | 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 | *            | *  | *  |
| 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        | D6408TEBGL3U        | 5        | *            | *  | *  |
| KINGSTON     | KVR667D2E5/1G        | 1024MB           | DS        | E5108AGB6-6E-E(ECC) | N/A      | *            | *  | *  |
| KINGSTON     | KVR667D2E5/2G        | 2048MB           | DS        | D9HNL(ECC)          | N/A      | *            | *  | *  |
| KINGSTON     | KVR667D2N5/1G        | 1024MB           | DS        | E5108AGB6-6E-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.

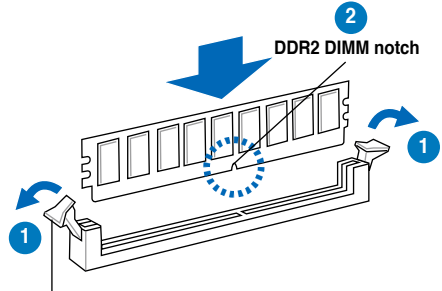
### 1.7.3 Installing a DIMM



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.

To install a DIMM

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.

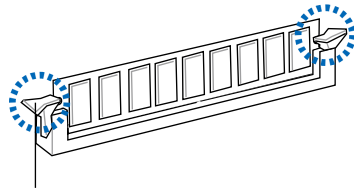


Unlocked retaining clip



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.

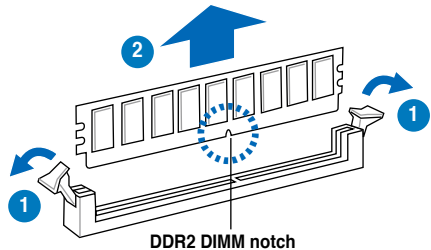


Locked Retaining Clip

### 1.7.4 Removing a DIMM

To remove a DIMM

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



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.

## 1.8 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.

---

### 1.8.1 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.

### 1.8.2 Configuring an expansion card

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

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



---

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

---

### 1.8.3 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 | – | –    | – | –      |

## 1.8.4 PCI slot

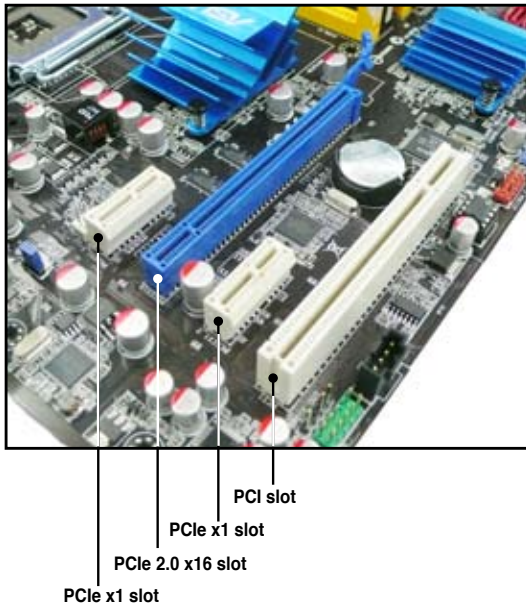
The PCI slot supports cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. Refer to the figure below for the location of the slot.

## 1.8.5 PCI Express x1 slots

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

## 1.8.6 PCI Express 2.0 x16 slot

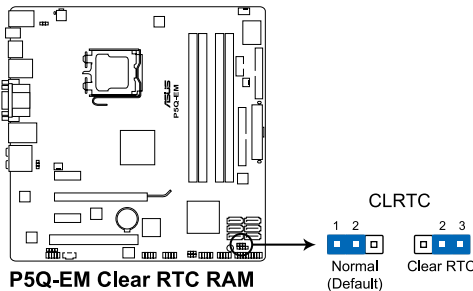
This motherboard has a PCI Express 2.0 x16 slot that supports PCI Express 2.0 x16 graphics cards complying with the PCI Express specifications. Refer to the figure below for the location of the slot.



# 1.9 Jumpers

## 1. Clear RTC RAM (3-pin CLRRTC)

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. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5–10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.



---

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

---

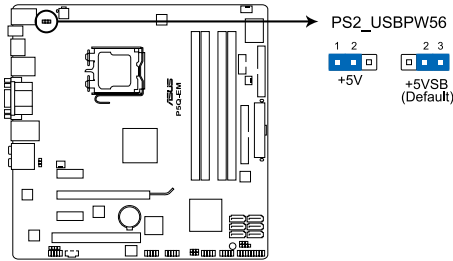


- If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.
  - You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (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. 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.

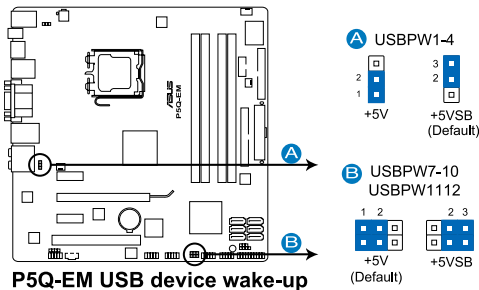


**P5Q-EM Keyboard/Mouse power**

## 3. 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.



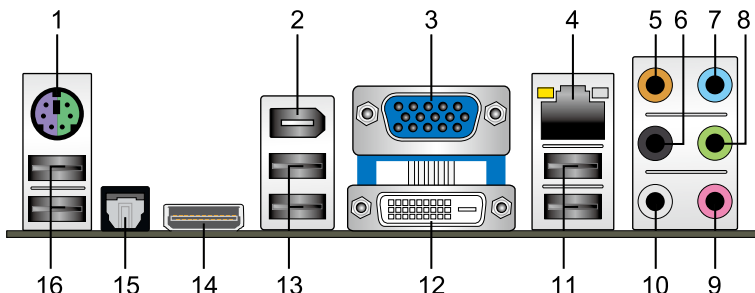
**P5Q-EM USB device wake-up**



- 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.

# 1.10 Connectors

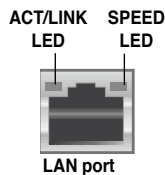
## 1.10.1 Rear panel connectors



1. **PS/2 keyboard / mouse combo port.** This port is for a PS/2 keyboard or mouse.
2. **IEEE 1394a port.** This 6-pin IEEE 1394a port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable 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.** 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 LED |               | Speed LED |                     |
|-------------------|---------------|-----------|---------------------|
| Status            | Description   | Status    | Description         |
| OFF               | No link       | OFF       | 10 Mbps connection  |
| GREEN             | Linked        | ORANGE    | 100 Mbps connection |
| BLINKING          | Data activity | GREEN     | 1 Gbps connection   |



5. **Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.
6. **Rear Speaker Out port (black).** This port connects the rear speakers in a 4-channel, 6-channel, or 8-channel audio configuration..
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 Out  | 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. 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.

- 13. USB 2.0 ports 3 and 4.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
- 14. HDMI Out port.** This port is for a high-definition multimedia interface (HDMI) connector.



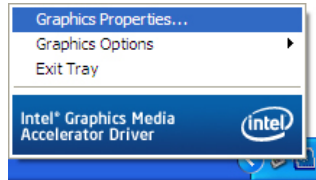
- This motherboard comes with multiple VGA output that features desktop extension on two monitors. You can connect two monitors to any two of the onboard VGA, DVI-D, and HDMI ports. Note that DVI-D/HDMI dual output works in OS environment only and that during POST or BIOS setup, only DVI-D output is 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. **Optical S/PDIF Out port.** This port connects an external audio output device via an optical S/PDIF cable.
16. **USB 2.0 ports 5 and 6.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

## Troubleshooting on monitor overscan/underscan problem

1. Install **Intel Graphics Accelerator Driver** from the motherboard support DVD.
2. From the Windows® notification area, double-click the **Intel(R) Graphics Media Accelerator Driver** icon and click **Graphics Properties**.



3. Click **Display Settings** and select a **Screen Resolution**. Click **Apply**.



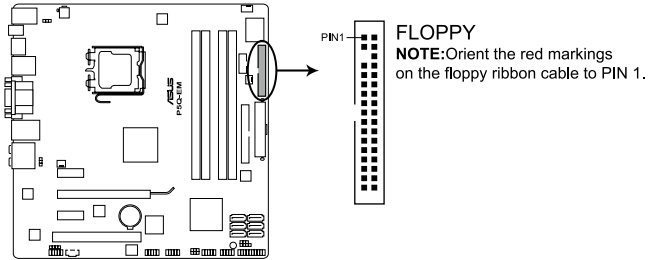
4. Or you can click **Aspect Ratio Options** (if available). Move the **Horizontal** and **Vertical** sliders and then click **Apply**.



## 1.10.2 Internal 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.



**P5Q-EM Floppy disk drive connector**



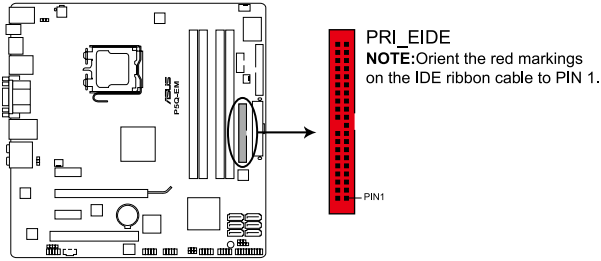
---

Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.

---

## 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.



**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.

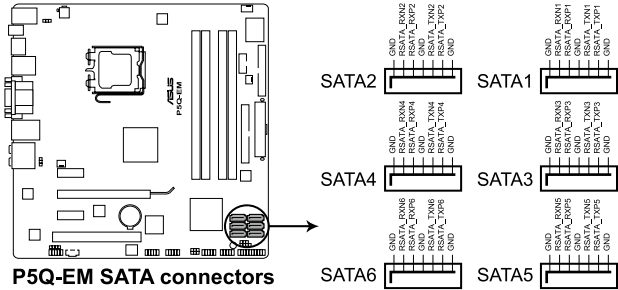


If any device jumper is set as "Cable-Select," make sure all other device jumpers have the same setting.

### 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.

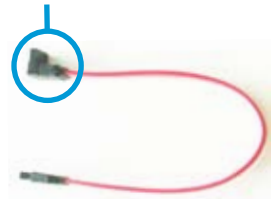


- These connectors are set to Standard IDE mode by default. In Standard IDE mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA as** item in the BIOS to [RAID]. See section **2.3.5 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.



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.

right angle side







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



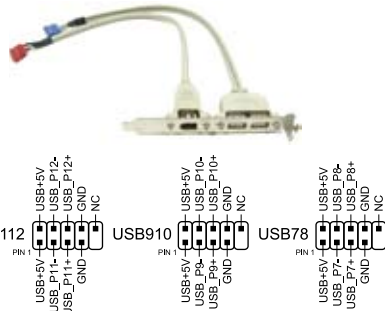
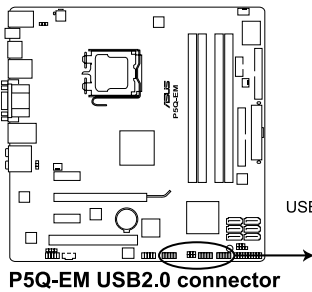
We highly recommend that you connect this eSATA port to an eSATA external hard disk drive using an **eSATA to eSATA cable**. DO NOT connect the eSATA port to a SATA hard disk drive using a eSATA to SATA cable.



eSATA cable connector

#### 4. USB connectors (10-1 pin USB78; USB910; USB112)

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.



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



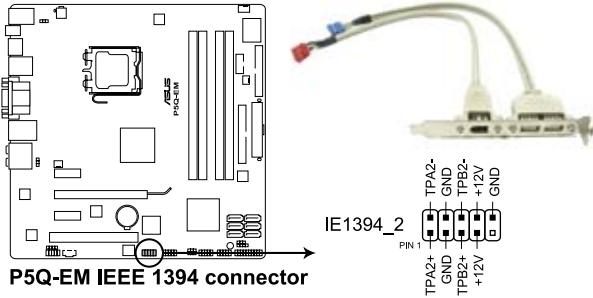
If your chassis supports front panel USB ports, you can attach a front panel USB cable to these connectors. Connect the USB cable to ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard.



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.



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



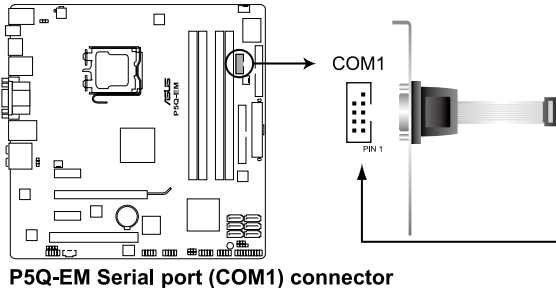
You can attach a FireWire/1394 cable to this connector if your chassis supports the front panel IEEE1394 port. Connect the 1394 cable to ASUS Q-Connector (1394, red) first, and then install the Q-Connector (1394) to the 1394 connector onboard.



The IEEE 1394a module cable is purchased separately.

### 6. Serial port connector (10-1 pin COM1)

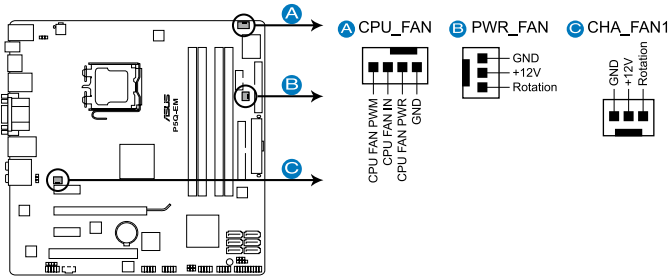
This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



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!

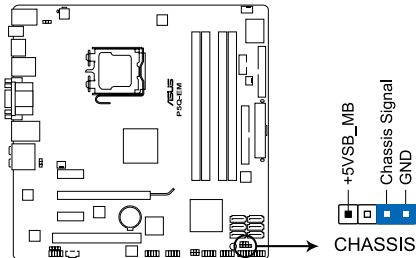


Only the CPU\_FAN and CHA\_FAN 1 connectors support the ASUS Fan Xpert feature.

**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.

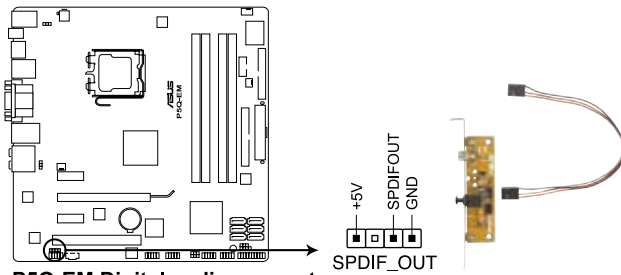
By default , the pin labeled “Chassis Signal” and “Ground” are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



**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**



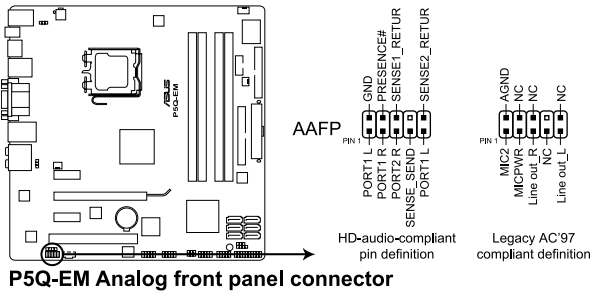
---

The S/PDIF out cable is purchased separately.

---

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

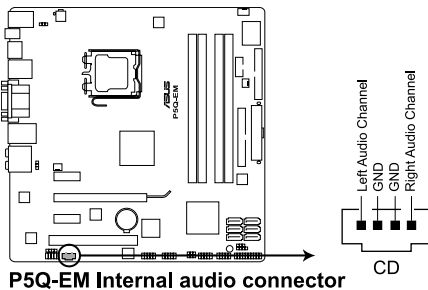
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



- 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 **2.5.3 Onboard Devices Configuration** for details.

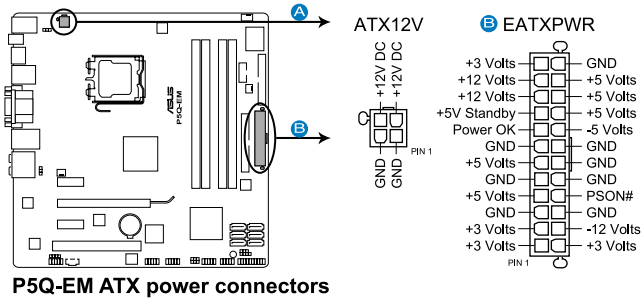
## 11. Optical drive audio connector (4-pin CD)

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



## 12. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

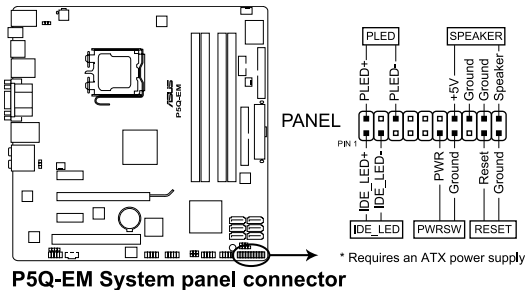
These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



- 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-pin PANEL)

This connector supports several chassis-mounted functions.



- **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)**

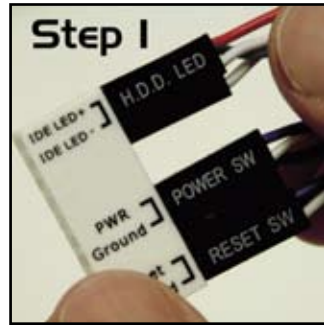
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

## ASUS Q-Connector (system panel)

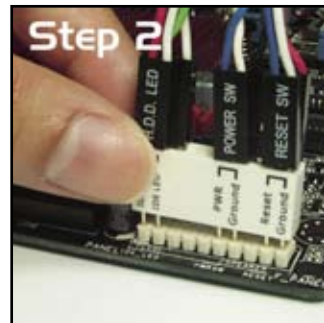
You can use the ASUS Q-Connector to connect/disconnect chassis front panel cables in a few steps. Refer to the instructions below to install the ASUS Q-Connector.

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

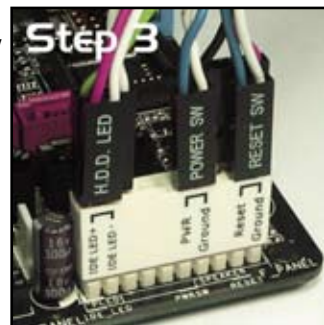
Refer to the labels on the Q-Connector to know the detailed pin definitions, then match them to the respective front panel cable labels.



2. Install the ASUS Q-Connector to the system panel connector, making sure the orientation matches the labels on the motherboard.



3. The front panel functions are now enabled. The figure shows the Q-Connector properly installed on the motherboard.





## 1.11 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
  - a. Monitor
  - b. External SCSI devices (starting with the last device on the chain)
  - c. System power
6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with “green” standards or if it has a “power standby” feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

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

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

7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 2.

## 1.12 Turning off the computer

### 1.12.1 Using the OS shut down function

If you are using Windows® Vista:

1. Click the **Start** button and then select **Shut Down**.
2. The power supply should turn off after Windows® shuts down.

If you are using Windows® XP:

1. Click the **Start** button and then select **Turn Off Computer**.
2. Click the **Turn Off** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

### 1.12.2 Using the dual function power switch

While the system is ON, pressing the power switch for less than four seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting.

Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section **2.6 Power Menu** for details.

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

# BIOS setup **2**

## 2.1 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.

---

### 2.1.1 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 VX.XX.XX.
3. The ASUS Update utility is copied to your system.

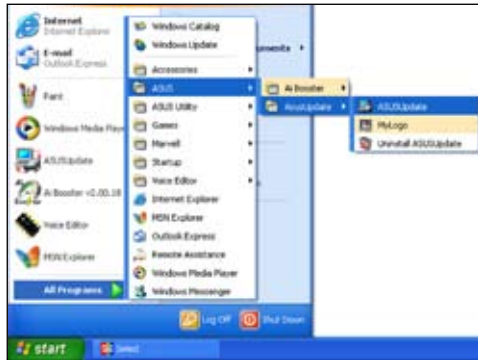


Quit all Windows® applications before you update the BIOS using this utility.

## Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. 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**.

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



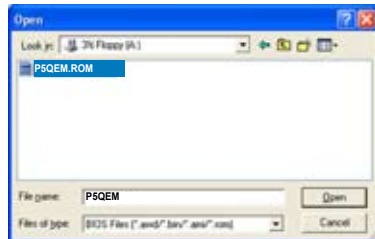
## Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

- Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
- Select **Update BIOS** from a file option from the drop-down menu, then click **Next**.



- Locate the BIOS file from the Open window, then click **Open**.
- Follow the screen instructions to complete the update process.



## 2.1.2 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 **Start** 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.

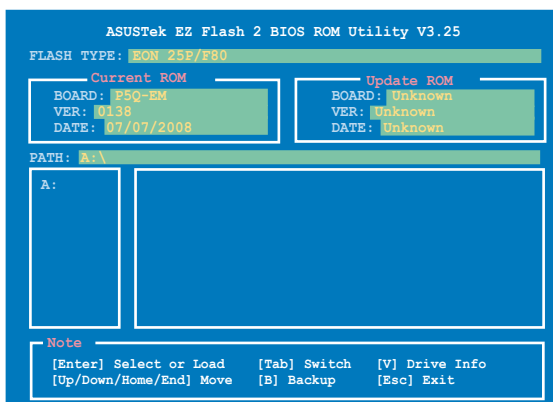
### 2.1.3 ASUS EZ Flash 2 utility

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.



- (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 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 system boot failure!



## 2.1.4 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](http://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.

---

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

- 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!

---

- 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:\>
```

## 2.1.5 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!

## 2.2 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.

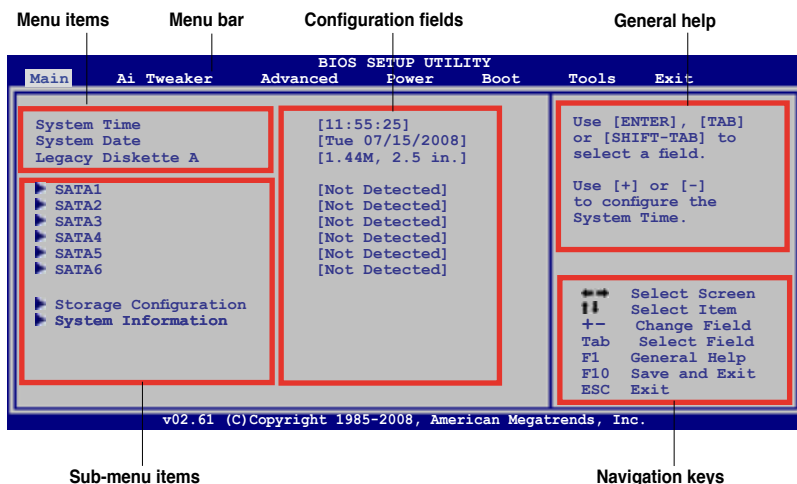
If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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](http://www.asus.com)) to download the latest BIOS file for this motherboard.
-

## 2.2.1 BIOS menu screen



## 2.2.2 Menu bar

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

|                   |  |
|-------------------|--|
| <b>Main</b>       | For changing the basic system configuration                    |
| <b>Ai Tweaker</b> | For changing the overclocking settings                         |
| <b>Advanced</b>   | For changing the advanced system settings                      |
| <b>Power</b>      | For changing the advanced power management (APM) configuration |
| <b>Boot</b>       | For changing the system boot configuration                     |
| <b>Tools</b>      | For configuring options for special functions                  |
| <b>Exit</b>       | 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.

## 2.2.3 Navigation keys

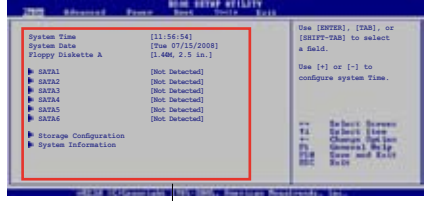
At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.



The navigation keys may differ from one screen to another.

### 2.2.4 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.



Main menu items

### 2.2.5 Sub-menu items

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

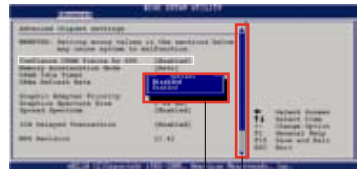
### 2.2.6 Configuration fields

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.

### 2.2.7 Pop-up window

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



Pop-up window

Scroll bar

### 2.2.8 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.

### 2.2.9 General help

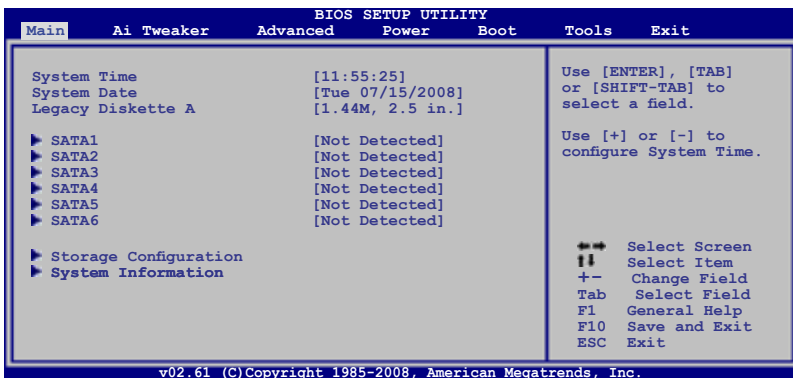
At the top right corner of the menu screen is a brief description of the selected item.

## 2.3 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.



### 2.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

### 2.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

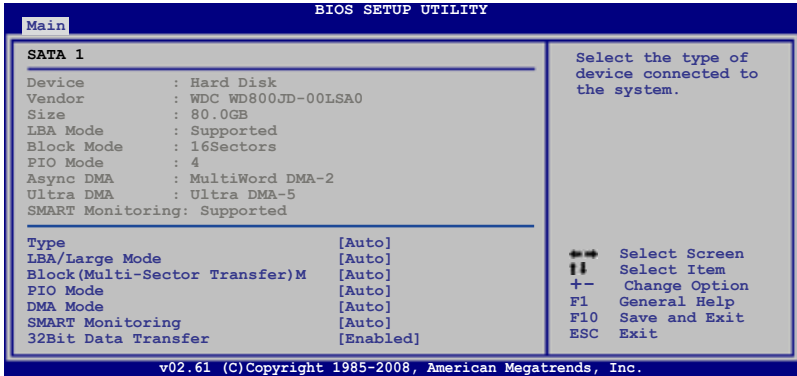
### 2.3.3 Legacy Diskette A [1.44M, 2.5 in.]

Sets the type of floppy drive installed.

Configuration options: [Disabled] [720K , 2.5 in.] [1.44M, 2.5 in.]

### 2.3.4 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.



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]

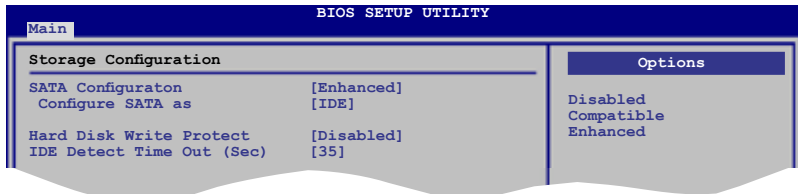
## 32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

## 2.3.5 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.



## 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]

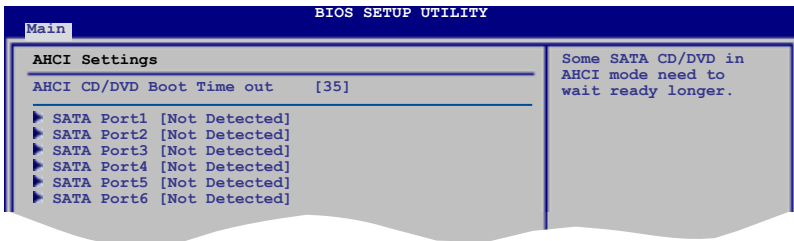
### IDE Detect Time Out (Sec) [35]

Selects the time out value for detecting ATA/ATAPI devices.

Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

## 2.3.6 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].



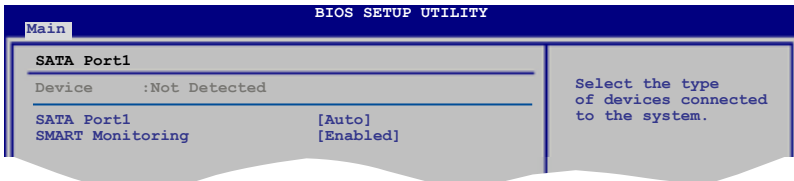
### AHCI CD/DVD Boot Time out [35]

Selects the boot time out value for AHCI CD/DVD devices.

Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

### SATA Port1–6 [XXXX]

Displays the status of auto-detection of SATA devices.



#### SATA Port1 [Auto]

Allows you to select the type of device connected to the system.

Configuration options: [Auto] [Not Installed]

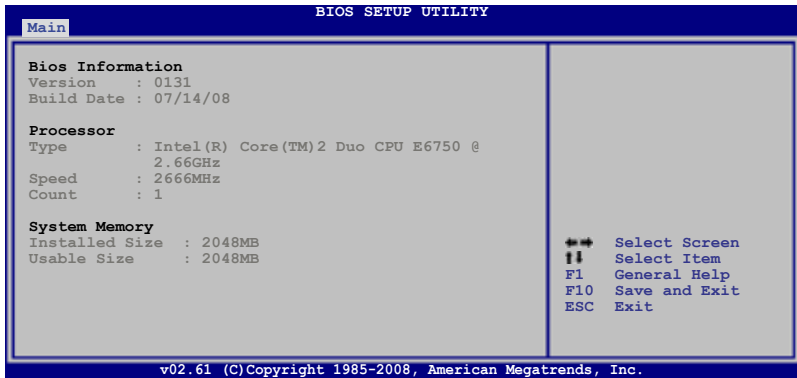
#### SMART Monitoring [Enabled]

Allows you to set the Self-Monitoring, Analysis and Reporting Technology.

Configuration options: [Disabled] [Enabled]

## 2.3.7 System Information

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



### Bios Information

Displays the auto-detected BIOS information.

### Processor

Displays the auto-detected CPU specification.

### System Memory

Displays the auto-detected system memory.

## 2.4 Ai Tweaker menu

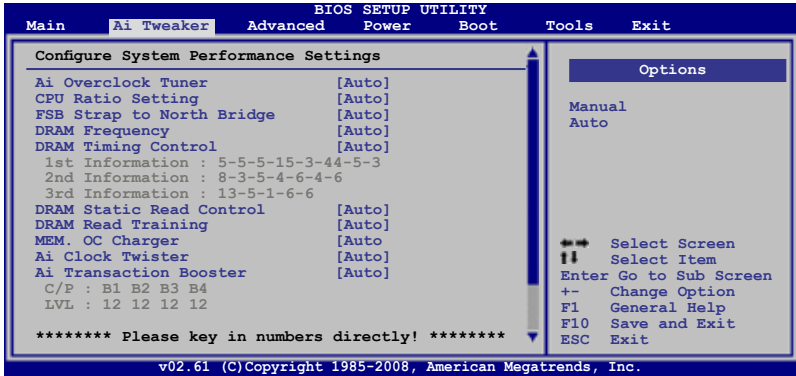
The Ai Tweaker menu items allow you to configure overclocking-related items.



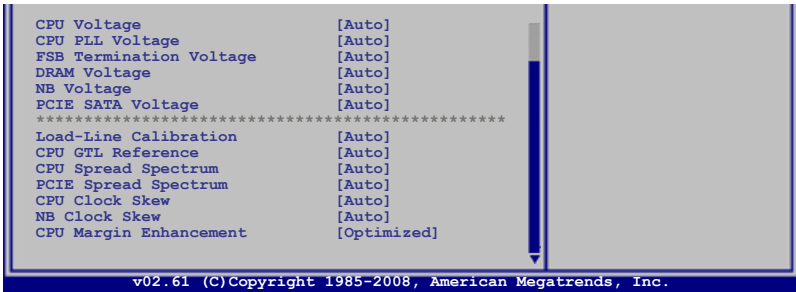
Take caution when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.



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



Scroll down to display the following items:



### 2.4.1 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:

|               |   |
|---------------|---|
| <b>Manual</b> | Allows you to individually set overclocking parameters. |
| <b>Auto</b>   | 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.  
Configuration 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 appear only when you set the **DRAM Timing Control** item to [Manual].
  - The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.
- 

*1st Information : 5-5-5-15-3-44-5-3 (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]**

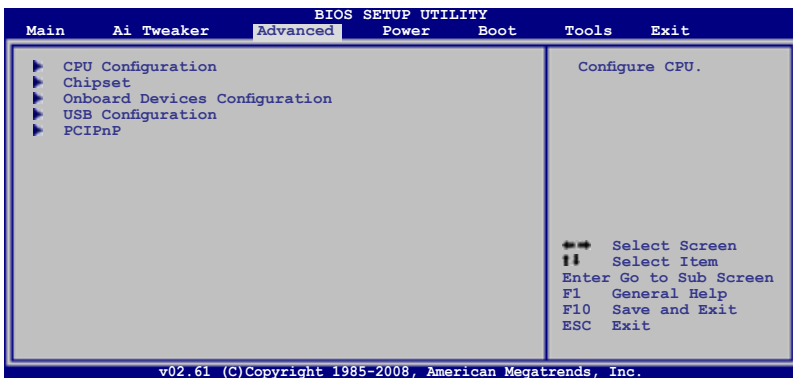
Configuration options: [Optimized] [Compatible] [Performance Mode]

## 2.5 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.

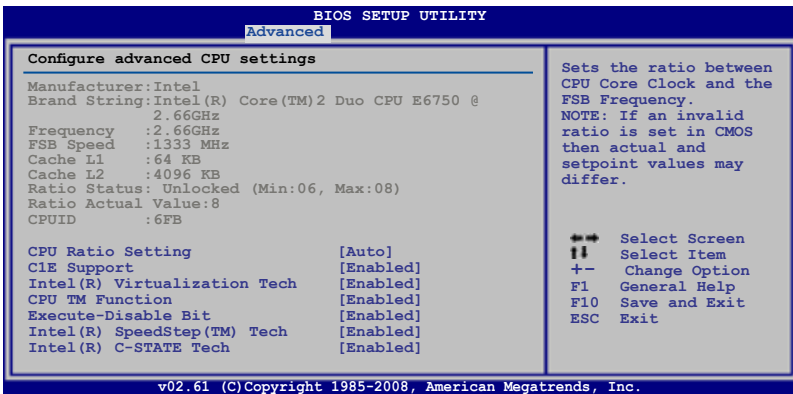


### 2.5.1 CPU Configuration

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.



### **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]

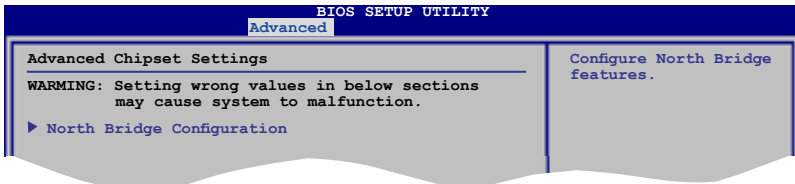
### **Intel(R) C-STATE Tech [Enabled]**

Allows you enable or disable the Intel® C-STATE Technology. When enabled, the CPU idle is set to C2/C3/C4.

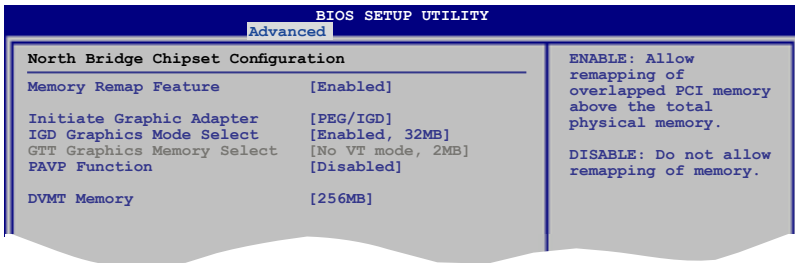
Configuration options: [Disabled] [Enabled]

## 2.5.2 Chipset

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



### North Bridge Configuration



#### 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]



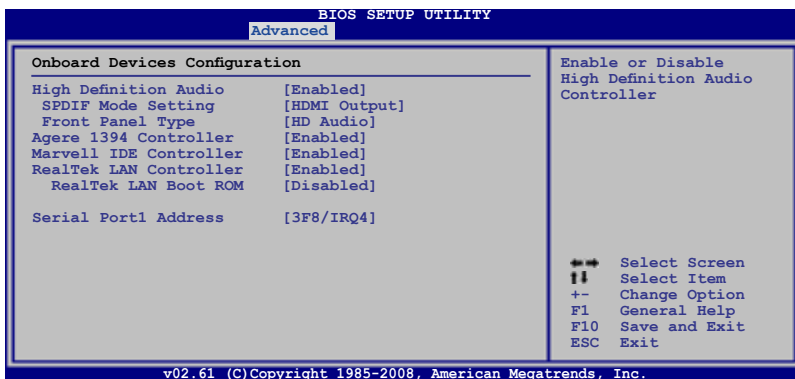
The [Maximum DVMT] option appears only when you install DIMM modules more than 1 GB.



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          |

## 2.5.3 Onboard Devices Configuration



### 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]

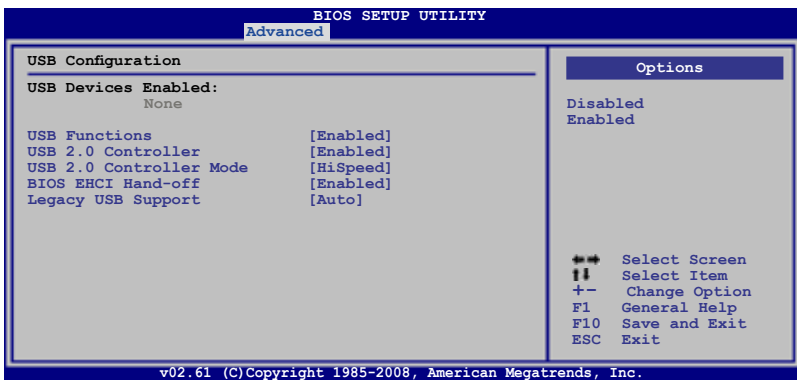
### Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.

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

## 2.5.4 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.



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]

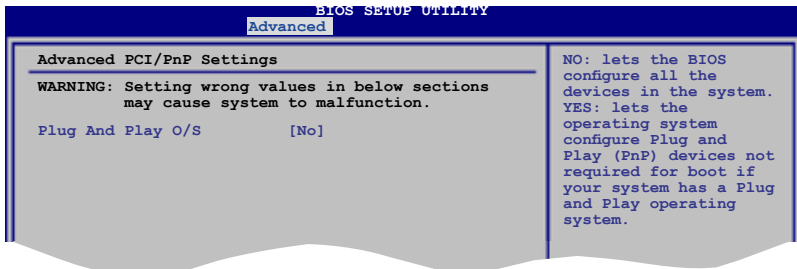
### Legacy USB Support [Auto]

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]

## 2.5.5 PCIPnP

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



### Plug And Play O/S [No]

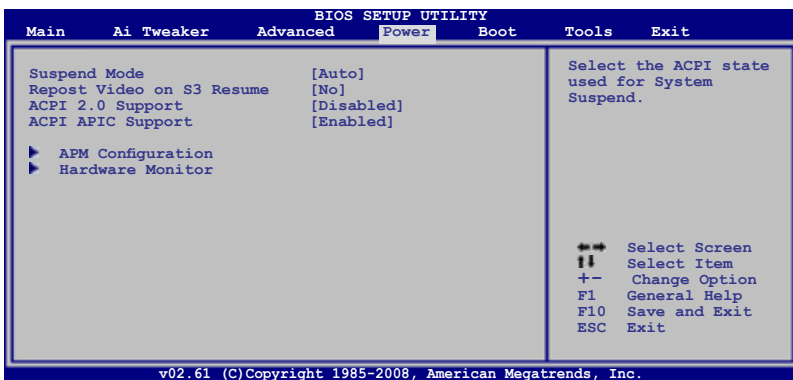
When set to [NO], BIOS configures all the devices in the system. When set to [YES] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.

Configuration options: [No] [Yes]



## 2.6 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.



### 2.6.1 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]

### 2.6.2 Repost Video on S3 Resume [No]

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

Configuration options: [No] [Yes]

### 2.6.3 ACPI 2.0 Support [Disabled]

Add additional tables as per ACPI 2.0 specifications.

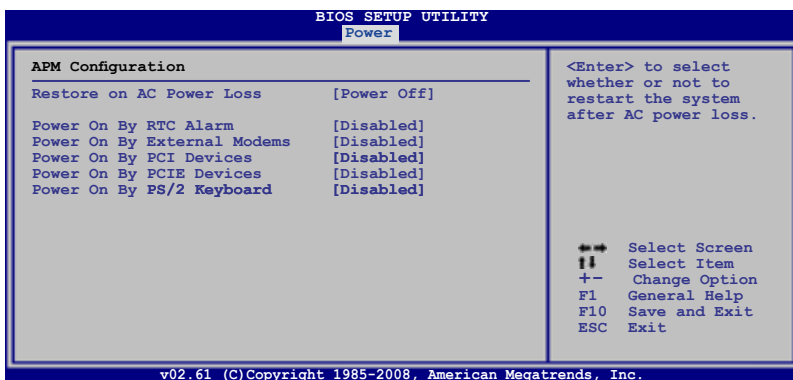
Configuration options: [Disabled] [Enabled]

### 2.6.4 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]

## 2.6.5 APM Configuration



### 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]

## 2.6.6 Hardware Monitor

| BIOS SETUP UTILITY      |                |
|-------------------------|----------------|
| Power                   |                |
| <b>Hardware Monitor</b> |                |
| 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]          |
| Chassis Q-Fan Control   | [Disabled]     |
| Power Fan Speed         | [N/A]          |
| CPU Voltage             | [ 1.304V]      |
| 3.3V Voltage            | [ 2.248V]      |
| 5V Voltage              | [ 5.112V]      |
| 12V Voltage             | [12.096V]      |
| <b>CPU Temperature</b>  |                |
| →→                      | Select Screen  |
| ↑↓                      | Select Item    |
| + -                     | Change Field   |
| F1                      | General Help   |
| F10                     | Save and Exit  |
| ESC                     | Exit           |

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

### CPU Temperature [xxx°C/xxx°F]

### MB Temperature [xxx°C/xxx°F]

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]**

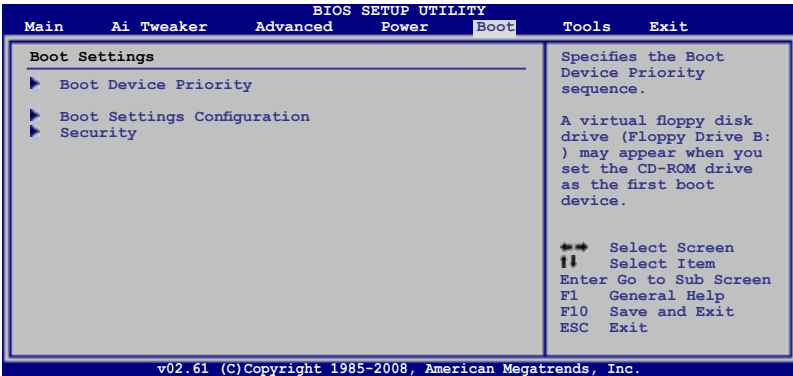
The onboard hardware monitor automatically detects and displays the power fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows [N/A].

### **CPU Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage**

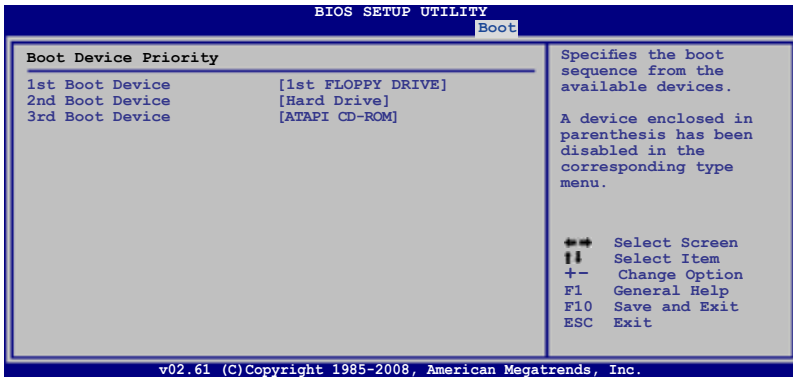
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select [Ignored] if you do not want to detect this item.

## 2.7 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.



### 2.7.1 Boot Device Priority

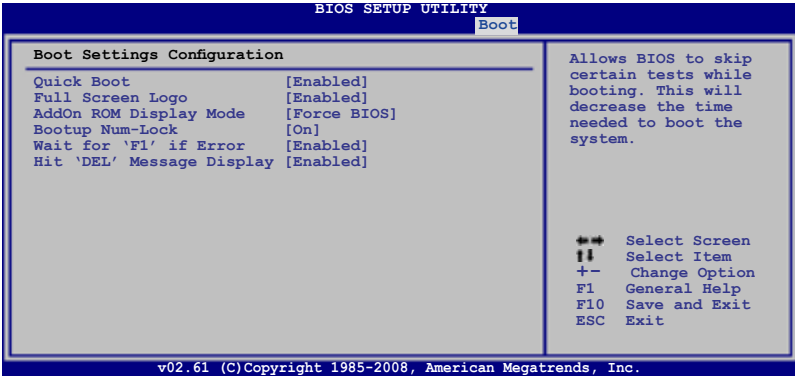


#### 1st ~ xxth Boot Device [xxx Drive]

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]

## 2.7.2 Boot Settings Configuration



### 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]

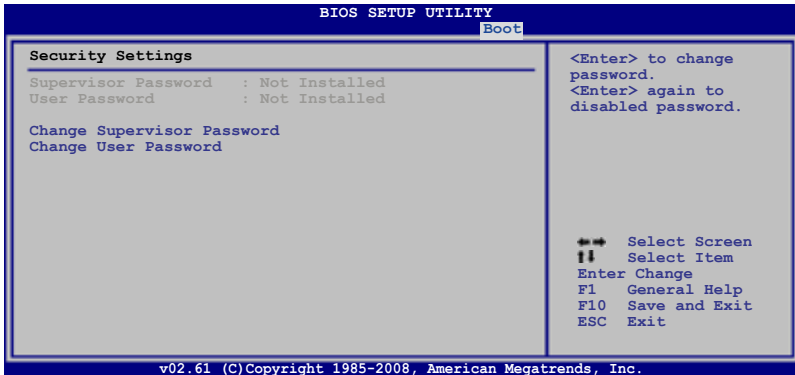
When set to [Enabled], the system waits for the <F1> key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

### 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]

## 2.7.3 Security

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



### 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.

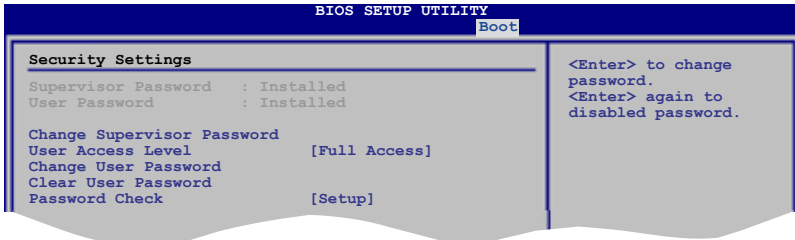
To change the supervisor password, follow the same steps as in setting a user password.

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.



## 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]

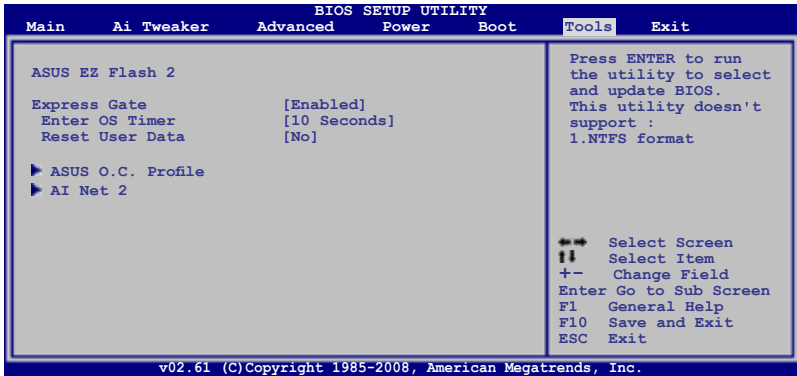
When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.

Configuration options: [Setup] [Always]



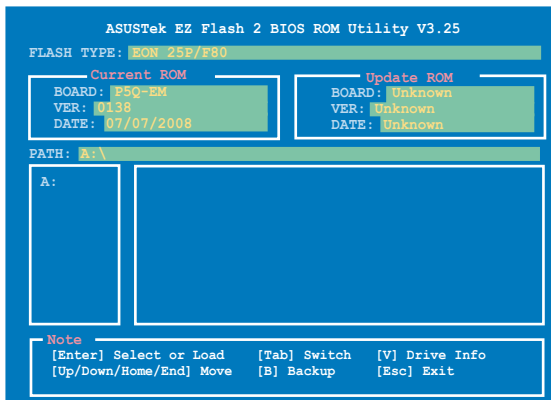
## 2.8 Tools menu

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



### 2.8.1 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.



## 2.8.2 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.



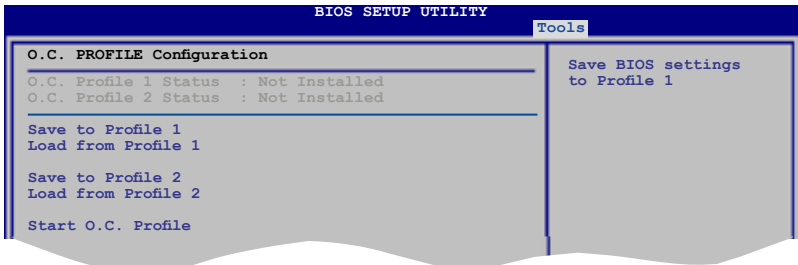
---

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

---

## 2.8.3 ASUS O.C. Profile

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



### Save to Profile 1/2

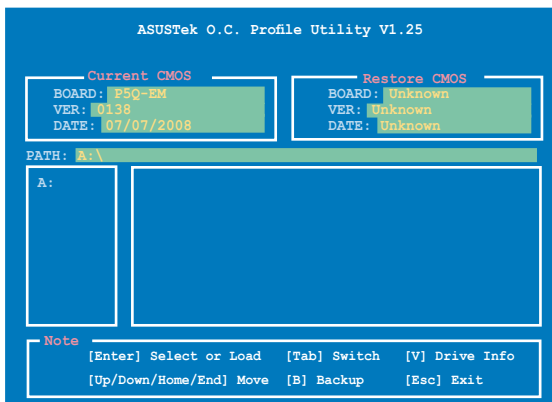
Allows you to save the current BIOS file to the BIOS Flash. Press <Enter> to save the file.

### Load from Profile 1/2

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

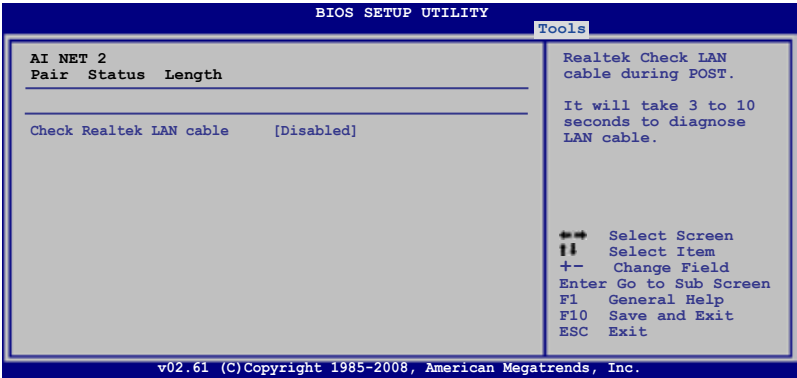
### Start O.C. Profile

Allows you to run the utility to save and load CMOS. Press <Enter> to run the utility.



- 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!

## 2.8.4 AI Net 2

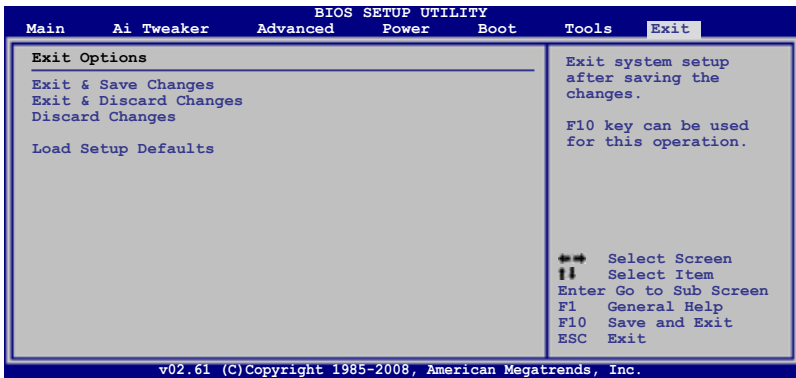


### Check Realtek LAN Cable [Disabled]

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

## 2.9 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.



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.



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

# 3 Software support

### 3.1 Installing an operating system

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



- Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
- Make sure that you install Windows® XP Service Pack2 or later versions before installing the drivers for better compatibility and system stability.

### 3.2 Support DVD information

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



The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website ([www.asus.com](http://www.asus.com)) for updates.

#### 3.2.1 Running the support DVD

Place the support DVD to the 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.



## 3.2.2 Drivers menu

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



### **ASUS InstAll-Drivers Installation Wizard**

Installs the ASUS InstAll-Drivers Installation Wizard.

### **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 accelerator driver.

### **Realtek RTL8111B/C LAN Driver**

Installs the Realtek 8111C LAN driver.

### **ASUS EPU-4 Engine**

Installs the ASUS EPU-4 Engine driver and utility.

### **USB 2.0 Driver**

Installs the Universal Serial Bus 2.0 (USB 2.0) driver.

### 3.2.3 Utilities menu

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



Click to display the next screen



Click to display the previous screen

#### **ASUS InstAll-Installation Wizard for Utilities**

Installs all of the utilities through the Installation Wizard.

#### **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**

Installs the ASUS AI Suite.

## **ASUS Update**

The ASUS Update utility allows you to update the motherboard BIOS in Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP).

## **ASUS Express Gate Installer**

Installs the ASUS Express Gate application.

## **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 your computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer. Visit the Microsoft website ([www.microsoft.com](http://www.microsoft.com)) for updates.

## **Ulead Burn.Now**

Installs the Ulead Burn.Now application for Audio CD, DVD 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 the CyberLink Powerbackup software.

## **Ulead PhotoImpact 12 SE**

Installs the Ulead PhotoImpact 12 SE software.

## **Winzip 11**

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

## **Norton Internet Security 2008**

Install the Norton Internet Security 2008 software to protect your computer from the latest online virus and spyware threats.

### 3.2.4 Make disk menu

The Make disk menu contains items to create the Intel ICH10R driver disk.



#### Intel ICH10R 32/64 bit RAID/AHCI Driver Disk

Allows you to create an ICH10R 32/64bit RAID/AHCI driver disk.

### 3.2.5 Manual menu

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

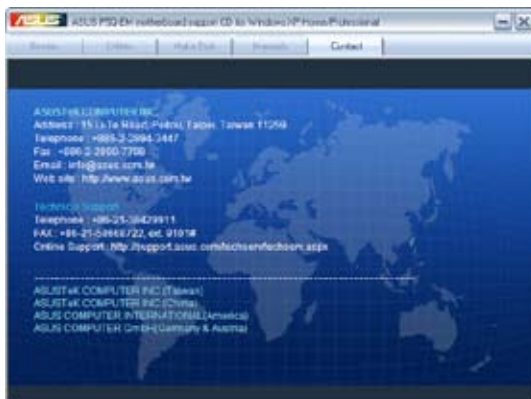


Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader before opening a user manual file.



### 3.2.6 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.



### 3.2.7 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.

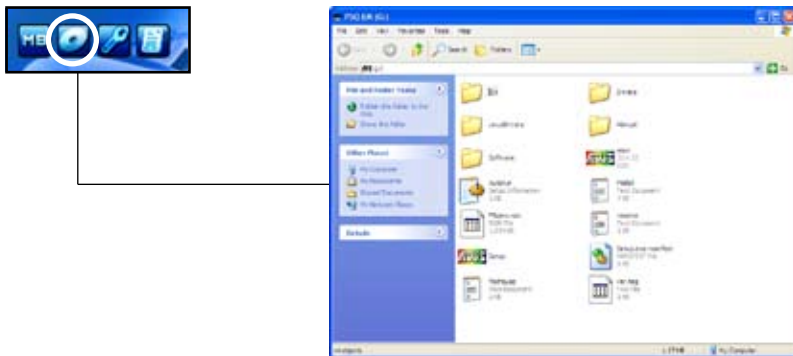
#### Motherboard Info

Displays the general specifications of the motherboard.



#### Browse this DVD

Displays the support DVD contents in graphical format.



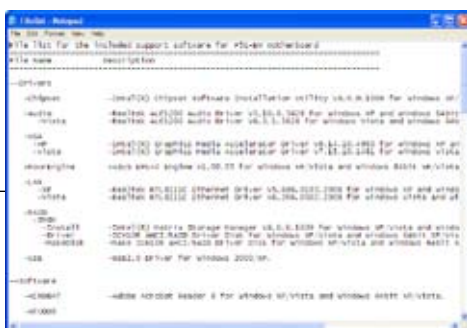
## Technical support Form

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.



### 3.3 ASUS Express Gate

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

#### Installing ASUS Express Gate



- ASUS Express Gate supports installation on SATA HDDs in **IDE mode** only.
- ASUS Express Gate supports HDDs connected to **motherboard chipset-controlled onboard SATA ports** only.
- ASUS Express Gate supports installation on USB HDDs and Flash drives, but the software performance may be slower than installed on SATA HDDs.

To install Express Gate on your computer

1. Place the support DVD to the optical drive. The **Drivers** installation tab appears if your computer has enabled Autorun feature.
2. Click the **Utilities** tab, then click **ASUS Express Gate Installer**.
3. Select the language for installation and click **OK**.



4. The InstallShield Wizard for Express Gate appears. Click **Next** to continue.





5. Select the target disk volume for you to install Express Gate. If you have multiple volumes and OS installed in your hard drive, it is recommended to install Express Gate in **Volume C**. Click **Next** to continue.
6. Follow the screen instructions to complete installation.



## The First Screen

Express Gate's first screen appears within a few seconds after you power on the computer. From here, you can immediately start the web browser or Skype.

You can also choose to continue booting normally (e.g. to your installed OS such as Windows), enter BIOS setup, or power off.



If you don't make any selection, Express Gate will automatically exit and boot to your normal OS after a certain amount of time. The timer countdown is shown on-screen inside the "boot to OS" button. As you move the mouse or type a key, the countdown stops and the timer disappears, so you can take your time to make a selection.

## The Express Gate Environment

The very first time you enter the Express Gate environment (by launching either web or Skype from the first screen), a first time wizard will guide you through basic Express Gate configurations. Basic configurations include language, date and time and screen resolution.



Once inside the Express Gate environment, click on the icons on the LaunchBar, by default at bottom of the screen, to launch or switch between softwares. You can re-arrange, re-size and move windows. Bring a window to the foreground by clicking within it or by clicking on its corresponding software icon. Re-size a window by dragging any of its four corners. Move a window by dragging its title bar.

Besides using the LaunchBar, you can also switch between softwares by pressing <Alt> +<Tab> on the keyboard. You can also right-click anywhere on the desktop to bring up a menu of softwares.

The red triangle on an software icon in the LaunchBar denotes that the software is already running. This means that you can switch to it without any delay. In the rare case where an software stops responding, right-click on its icon to force close it.

### Knowing the Express Gate hot-keys

Here is a list of common-used hot-keys for Express Gate.

In the First Screen:

| Key         | Function                    |
|-------------|-----------------------------|
| PAUSE/BREAK | Power-off                   |
| ESC         | Continue to boot OS         |
| DEL         | Enter BIOS setup            |
| F8          | Enter Boot selection pop-up |

In the Express Gate Environment:

| Key                             | Function                                |
|---------------------------------|---|
| <Alt> + <Tab>                   | Switch between softwares                |
| <Ctrl> + <Alt> + <Del>          | Bring up Power-Off dialog box           |
| <Ctrl> + <Alt> + <Print Screen> | Save screen snapshot as picture to file |

## Using the Configuration Panel

Use the configuration panel to change various Express Gate settings.



Click on an icon to open a particular configuration tool. The following tools are available:

- **Date and Time:** set current date and time as well as time zone.
- **Input Method:** choose your preferred input language and method.
- **Language and Keyboard:** choose your language and keyboard preferences.
- **LaunchBar Settings:** customize your LaunchBar (where it docks, whether it auto-hides, etc.)
- **Network:** Specify how your computer connects to the Internet. Enable the network port. LAN1 refers to the RJ-45 network port on your computer. Also specify whether to use DHCP (most common) or static IP. For PPPoE and wireless (optional), set the login credentials (user name, password, SSID, etc.) as well.
- **Environment Settings:** This function allows you to clear the Express Gate settings, as well as any personal information stored by the web browser (Bookmarks, Cookies, History, etc.). The user data will be reset to the original default configuration.

After you click **Restore System**, a confirmation dialog box will open. If you click "Yes" in the confirmation dialog box, your system will immediately restart and then re-enter Express Gate to finish clearing the settings. This is also useful in the rare case where settings might become corrupted.



---

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

---

- **Screen Settings:** Choose the most optimal screen resolution for your display.
- **Volume Control:** Control the volume for your speaker output, microphone input, etc.

## Using the LaunchBar

The LaunchBar has several system icons that show you various system statuses and let you configure individual Express Gate settings. The LaunchBar can be configured to auto-hide, if you want more screen space for the softwares. It can also be configured to dock on any of the four sides of the screen.



Starts the **Web Browser** for quick access to the World Wide Web.



Opens the **Online Games** web page.



Starts the **Photo Manager** album / organizer tool.



Starts the **Chat** instant messaging tool.



Start the **Skype** software, which lets you call other people on Skype for free, as well as offering affordable, high quality voice communications to phones all over the world.



Opens **Configuration Panel**, which lets you specify network settings and other preferences.

In the rare case that one of the above softwares stops responding, you can right-click on its icon and then select **Close** to force it to close.

The smaller icons on the right side of the LaunchBar are:



Click on this icon to open the **File Manager** window, which lets you conveniently access the files on a USB drive. If a USB device is detected, the icon contains a green arrow.



ASUS Express Gate supports file uploading from SATA HDDs, ODDs and USB drive and downloading to USB drives only.



Shows network status; click to configure network.



Shows mute status; click to change volume.



Click to choose input language and method as well as keyboard shortcuts (Ctrl-Space by default).



Click to change LaunchBar options (auto-hide, docking position, etc).



Click to show the “ASUS Utility” panel (if supported).



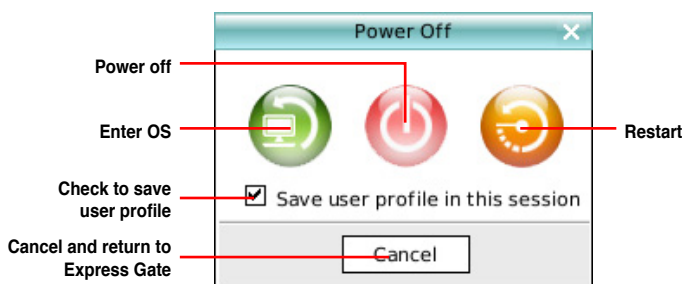
Click to show “About Express Gate.”



Click to open Express Gate Help.



Click to bring up power options window to boot to OS, restart or power down. This window is also shown when you press **Ctrl-Alt-Del** on the keyboard.



## How Do I Get on to the Internet

If Internet doesn't seem to be working in the Express Gate environment, check the following:

### 1. Open the Configuration Panel.



Open Configuration Panel

### 2. Open Network.



Network

### 3. Make the proper network configurations.

Each network interface is enabled immediately when you check the box next to it.



- If you use a network cable connected to a home router (which is then connected to your DSL/cable modem), enable LAN1.
- The most common scenario is for your computer to automatically obtain network settings (i.e. DHCP). If this is the case, you don't need to click **Setup** for any LAN port. If this is not the case, click **Setup** to configure the static IP settings manually.
- If you use a network cable connected directly to your DSL/cable modem (no router in between), click **Setup** for xDSL/cable dial-up. This method is also referred to as PPPoE. Choose whether the DSL/cable modem is connected to your computer's LAN port. Then enter the username and password for your dial-up account.

Click **OK** to enable xDSL/cable dial-up and establish the PPPoE connection. When PPPoE is enabled, the port it uses will automatically be unchecked and grayed out.

## Using the Online Games

Express Gate introduces a **Splashtop Gaming** portal site, which provides many interesting games in different categories. The game titles are updated from time to time. Enjoying these great games is just as easy as it gets!

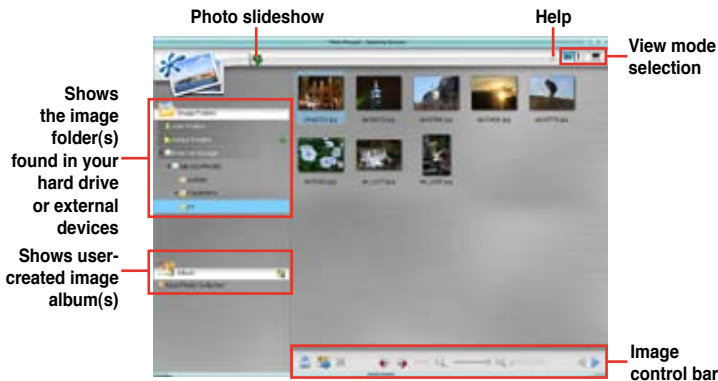


You have to enable the network connection to run the Online Games feature.



## Using the Photo Manager

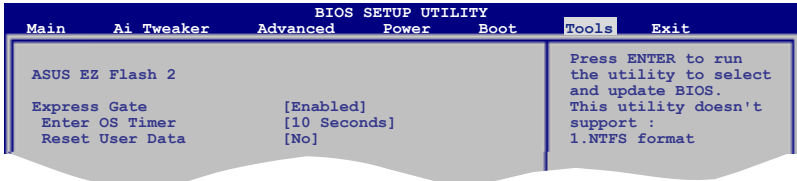
Express Gate provides a easy-to-use **Photo Manager** that allows you to view pictures stored in your hard drive or external storage devices (such as USB dongles, card readers, or optical disks). You can view pictures in thumbnail view; in an enlarged view individually; in a filename/data list view; or play them in a slideshow with background music and fancy transition effects. JPEG, GIF, BMP, and PNG formats are supported. Refer to the on-line Help for detailed software operation.



ASUS Express Gate supports HDDs connected to **motherboard chipset-controlled onboard SATA ports** only. All onboard extended SATA ports and external SATA ports are NOT supported.

## Configuring Express Gate in BIOS Setup

Enter BIOS setup by pressing DEL key after powering on or by clicking on the BIOS setup icon on Express Gate's first screen. Express Gate configuration options are under the **Tools** menu. Refer to section **2.8.2 Express Gate** for details.

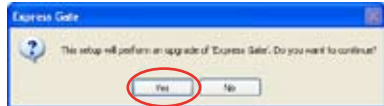


## Updating Express Gate

You may update your existing Express Gate software to new versions. New versions of the Express Gate software will be released regularly, adding refinements or new applications. You can find original version of the software on the support DVD or download new versions from the ASUS support website.

To update Express Gate

1. Double-click the Express Gate setup file to start software update.
2. A software update confirmation dialog box appears. Click **Yes** to continue.
3. The InstallShield Wizard for Express Gate appears. Click **Next** to continue.
4. Follow the screen instructions to complete installation.



## Repairing Express Gate

In case Express Gate cannot start normally, you can repair Express Gate by reinstalling the software or using the repairing utility.

To repair Express Gate

- Click **Start > All Programs > Express Gate > Express Gate Installer > Repair this software.**
- OR
- Double click the Express Gate setup file, choose **Repair**, and click **Next** to continue.





## 3.4 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® XP/Vista and later operating system on a hard disk drive that is included in a RAID set. For Windows Vista user, you can create a RAID driver disk with a floppy disk drive or a USB flash disk drive.

### 3.4.1 Creating a RAID driver disk without entering the OS

To create a RAID driver disk without entering the OS:

1. Boot your computer.
2. Press <Del> during POST to enter the BIOS setup utility.
3. Set the optical drive as the primary boot device.
4. Insert the support DVD into the optical drive.
5. Save changes and exit BIOS.
6. Press any key when the system prompts “Press any key to boot from the optical drive.”
7. When the menu appears, press <1> to create a RAID driver disk.
8. Insert a formatted floppy disk into the floppy drive then press <Enter>.
9. Follow succeeding screen instructions to complete the process.

### 3.4.2 Creating a RAID driver disk in Windows®

To create a RAID driver disk in Windows®:

1. Start Windows®.
2. Place the motherboard support DVD into the optical drive.
3. Go to the Make disk menu, and then click **Intel ICH10R 32/64 bit RAID Driver Disk** to create an Intel® ICH10R RAID driver disk.
4. Insert a floppy disk into the floppy disk drive or connect a USB flash disk if you are using Windows Vista OS.
5. Follow succeeding screen instructions to complete the process.



---

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

---

To install the RAID driver in Windows XP:

1. During the OS installation, the system prompts you to press the <F6> key to install third-party SCSI or RAID driver.
2. Press <F6> then insert the floppy disk with RAID driver into the floppy disk drive.
3. When prompted to select the SCSI adapter to install, make sure you select **Intel(R) SATA RAID Controller (Desktop ICH10R)**.
4. Follow the succeeding screen instructions to complete the installation.

To install the RAID driver in Windows® Vista:

1. Insert the floppy disk/USB device with RAID driver into the floppy disk drive/USB port.
2. During the OS installation, select **Intel(R) SATA RAID Controller (Desktop ICH10R)**.
3. Follow the succeeding screen instructions to complete the installation.