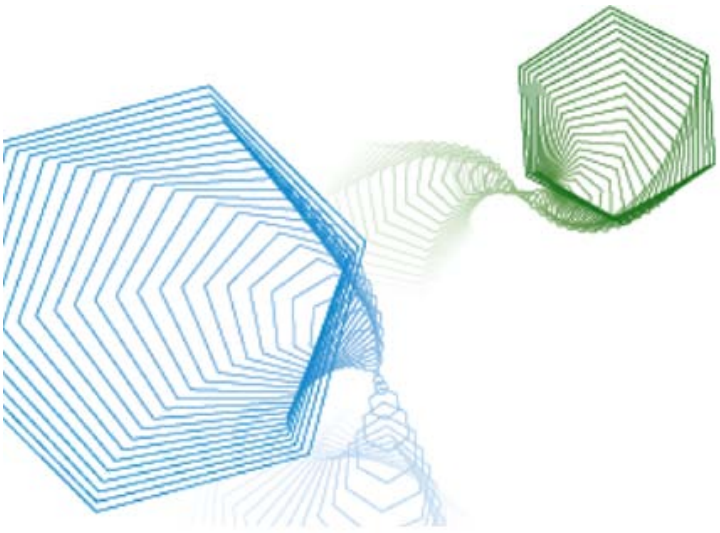
Welcome to Gemotech

GEMOTECH™
Limited in Space Unlimited in Application



User Manual

Beijing GEMOTECH Intelligent Technology Co., Ltd.

- No 306,Block E,Yingchuangdongli Plaza ,No1 ShangDi East Road,HaiDian District,BeiJing.
- P.C.: 100085
- TEL: 86-10-58858530/31/32/33
- FAX: 86-10-58858535
- Website: www.gemotech.cn www.jizhida.com
- E-mail: beijing@gemotech.cn Export@gemotech.cn

mATX
MAMB-945VLG

Intel® Pentium® D / Pentium® 4 / Celeron® mATX
Main Board

User's Manual

Ver. 1.00

Contents

Notices v
Safety information vi
About this guide vii
How this guide is organized vii
Where to find more information vii
Conventions used in this guide vii
Typography viii
MAMB-945VLG□□ specifications summary ix

Chapter 1: **Product introduction**

1.1 Welcome! 1-2
1.2 Package contents 1-2
1.3 Special features 1-2
1.3.1 Product highlights 1-2
1.4 Before you proceed 1-5
1.5 Motherboard overview 1-6
1.5.1 Placement direction 1-6
1.5.2 Screw holes 1-6
1.5.3 Motherboard layout 1-7
1.6 Central Processing Unit (CPU) 1-8
1.6.1 Installing the CPU 1-8
1.6.2 Installing the CPU heatsink and fan 1-11
1.6.3 Uninstalling the CPU heatsink and fan 1-13
1.7 System memory 1-15
1.7.1 Overview 1-15
1.7.2 Memory Configurations 1-15
1.7.3 DDR2 Qualified Vendors List 1-16
1.7.4 Installing a DIMM 1-18
1.7.5 Removing a DIMM 1-18
1.8 Expansion slots 1-19
1.8.1 Installing an expansion card 1-19
1.8.2 Configuring an expansion card 1-19
1.8.3 Interrupt assignments 1-20
1.8.4 PCI slots 1-21
1.8.6 PCI Express x1 1-21

Contents

1.8.5 PCI Express x16 1-21
1.9 Jumpers 1-22
1.10 Connectors 1-23
1.10.1 Rear panel connectors 1-23
1.10.2 Internal connectors 1-25

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.



The 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 manual contains the following parts:

- **Chapter 1: Product introduction**

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

Where to find more information

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

1. **Advansus websites**

   The Advansus website provides updated information on Advansus hardware and software products. Refer to the Advansus 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 linked with a plus sign (+) Example: <Ctrl>+<Alt>+<D>
`Command`	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets Example: At the DOS prompt, type the command line: **`afudos /i[filename]`** **`afudos /iP5P800VM.ROM`**

MAMB-945VLG specifications summary

CPU	LGA775 socket for Intel® Pentium® D/ Pentium® 4/ Celeron® processor Compatible with the Intel® 05B/05A and 04B/ 04A processors Supports Intel® Enhanced Memory 64 Technology (EM64T) Supports Enhanced Intel® SpeedStep® Technology (EIST) Supports Intel® Hyper-Threading Technology
Chipset	Northbridge: Intel® 945G Southbridge: Intel® ICH7
Front Side Bus	1066/800/533 MHz
Memory	Dual-channel memory architecture 4 x 240-pin DIMM sockets support up to 4GB of unbufferred non-ECC 667/533 MHz DDR2 DIMMs
Integrated Graphics	Integrated Intel® Graphics Media Accelerator 950
Expansion slots	1 x PCI Express x16 slot for discrete graphics cards 1 x PCI Express x1 2 x PCI slots
Storage	Intel(R) ICH7 South Bridge supports: - 1 x Ultra DMA 100/66/33 - 4 x Serial ATA 3Gb/s ports ITE IDE controller supoorts (optional): - 1 x UltraDMA 133/100
Audio	Realtek® ALC882 8-channel High-Definition aduio CODEC S/PDIF out interface support Universal Audio Jack (UAJ (R)) Sensing Technology support
LAN	Intel® Gigabit LAN controller
USB	Supports up to 8 USB 2.0 ports
Rear panel	1 x Parallel port 1 x IEEE1394a port (optional) 1 x LAN (RJ-45) port 4 x USB 2.0 ports 1 x Serial port (COM) 1 x VGA port 1 x PS/2 keyboard port 1 x PS/2 mouse port 8-channel high-definition Audio I/O ports

(*continued on the next page*)

MAMB-945VLG specifications summary

BIOS features	4 Mb Flash ROM, AMI BIOS, PnP, WfM2.0, DMI2.0, SM BIOS 2.3
Industry standard	PCI 2.2, USB 2.0
Manageability	WfM 2.0, DMI 2.0, WOL by PME, WOR by PME, Chassis Intrusion
Internal connectors	2 x USB 2.0 connectors for 4 additional USB 2.0 ports 1 x CPU fan connector 1 x Chassis fan connector 1 x Power fan connector 1 x 24-pin EATX power connector 1 x 4-pin ATX 12 V power connector 1 x CD in connector 1 x Front panel high-definition audio connector 1 x S/PDIF out connector 1 x TPM connector 1 x COM port (COM2) 1 x 3-pin Power LED connector (PLED) 1 x IEEE 1394a connector (optional)
Power Requirement	ATX power supply (with 20-pin and 4-pin 12 V plugs)
Form Factor	Micro-ATX form factor: 9.6 in x 9.6 in
Support CD contents	Device drivers

Specifications are subject to change without notice.* **MAMB-945VLG

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

1 Product introduction

1.1 Welcome!

Thank you for buying an ® MAMB-945VLG motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of 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	MAMB-945VLG□□ motherboard
Cables	1 x Serial ATA signal cable 1 x Serial ATA power cable 1 x Ultra DMA 133 cable 1 x Floppy disk drive cable
Accessories	I/O shield
Application CDs	motherboard support CD
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

Latest processor technology

The motherboard comes with a 775-pin surface mount Land Grid Array (LGA) socket designed for the Intel® Pentium® D, Intel® Pentium® 4 or Intel® Celeron® processor in the 775-land package. The motherboard supports the Intel® Pentium ® 4 or Intel® Pentium® D processor with 1066/800/533 MHz Front Side Bus (FSB). The motherboard also supports the Intel® Hyper-Threading Technology and is fully compatible with Intel® PCG
04B/04A and 05B/05A processors. See page 1-9 for details.

Intel® 65nm Dual-Core Technology CPU support

This motherboard supports Intel® Pentium® D/Pentium® 4/Celeron® dual-core processors built on the 65-nanometer (nm) process technology with copper interconnect.

Dual-core processors contain two physical CPU cores with dedicated L2 caches to meet demands for more powerful processing. Intel®'s 65nm process is the most advanced chip manufacturing technology, delivering breakthrough performance, enhanced media experience, and low power consumption. Intel® 65nm dual-core processors utilize the latest package technologies for a thinner, lighter design without compromising performance.

Intel® 945G chipset

The Intel® 945G graphics memory controller hub (GMCH) and the ICH7 DH I/O controller hub provide the vital interfaces for the motherboard. The GMCH features the Intel® Graphics Media Accelerator 950, an integrated graphics engine for enhanced 3D, 2D, and video capabilities. The GMCH provides the interface for a processor in the 775-land package with 533/800/1066 MHz front side bus (FSB), dual channel DDR2 at speeds of up to 667 MHz, and PCI Express x16 graphics card.

The Intel® ICH7 DH Southbridge represents the seventh generation I/O controller hub that provides the interface for PCI Express and 8-channel high definition audio.

Intel® Viiv™ Technology support

Intel® Viiv™ Technology transforms your PC into an entertainment center, allowing you to enjoy and share digital multi-media content like never before. With Intel® Viiv™ Technology-based computers, you can record, playback, organize, and edit digital media content easily. Enjoy the entertainment experience even more with sharp graphics, flawless video playback, and support for up to 7.1 channel surround sound. To enable Intel® Viiv™ Technology, make sure you enable the Quick Resume function called **Energy Lake** in the BIOS. Refer to the BIOS screen on page 2-33. You also need to install the Intel® Viiv™ Technology driver and software. See pages 3-4 and 3-5 for details.

Enabling Intel Viiv platform also requires:

- Intel® Pentium® D processor or Intel® Pentium® processor Extreme Edition

- Native Command Queuing (NCQ) SATA hard drive

- Microsoft Windows XP Media Center Edition Update Rollup 2 Refer to www.Intel.com for more information.

DDR2 memory support

The motherboard supports DDR2 memory which features data transfer rates of 600 MHz (FSB 800) or 533 MHz (FSB 1066/800) to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR2 architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 8.5 GB/s. See pages 1-16 to 1-18 for details.

PCI Express™ interface

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 1-22 for details.

64-bit CPU support

The motherboard supports 64-bit processors that provides high-performance computing and faster memory access required for memory and data intensive applications.

Serial ATA technology

The motherboard supports the Serial ATA technology through the Serial ATA interfaces and the Intel® ICH7 DH chipset. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 300 MB/s data transfer rate.

8-channel high definition audio

The onboard Realtek® ALC882 8-channel high-definition audio CODEC provides 192 KHz/ 24-bit audio output, jack-sensing and restasking functions. With the 8-channel audio ports and S/PDIF interfaces, you can connect your computer to home theater decoders to produce crystal-clear digital audio.

S/PDIF digital sound ready

The motherboard supports the S/PDIF Out function through the S/PDIF interfaces at midboard. The S/PDIF technology turns your computer into a high-end entertainment system with digital connectivity to powerful audio and speaker systems. See page 1-31 for details.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC (integrated in the Winbond Super I/O) to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The ASIC monitors the voltage levels to ensure stable supply of current for critical components. See pages 2-32 and 2-33 for details.

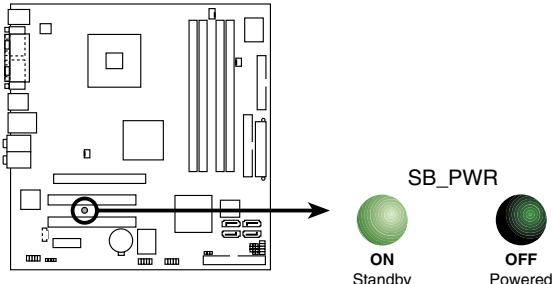
1.4 Before you proceed

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 that 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.



Onboard LED

1.5 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

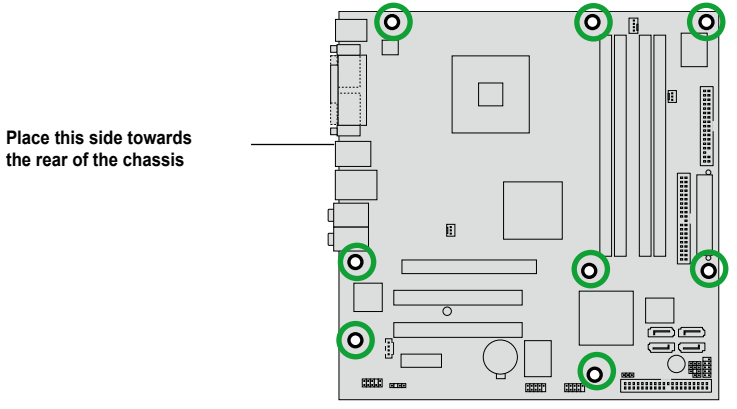
1.5.1 Placement direction

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.

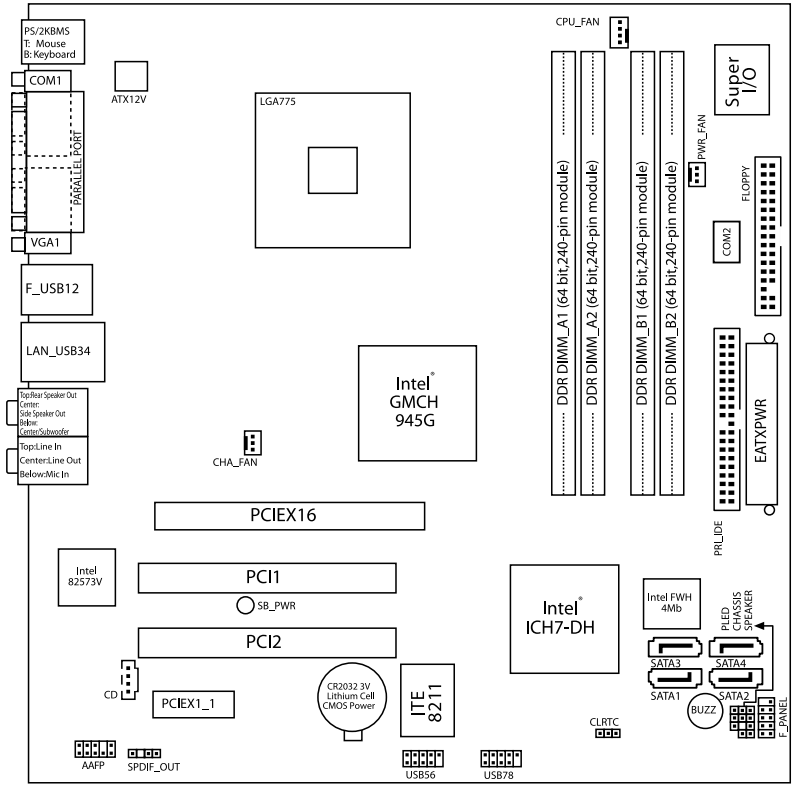
1.5.2 Screw holes

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.



1.5.3 Motherboard layout



1.6 Central Processing Unit (CPU)

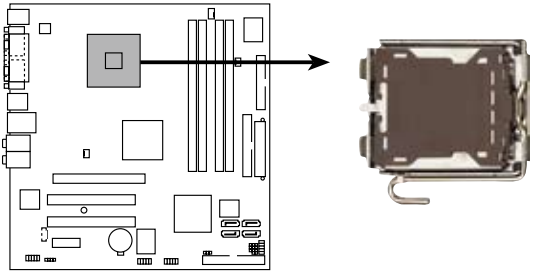
The motherboard comes with a surface mount LGA775 socket designed for the Intel® Pentium® 4 processor in the 775-land package.

- Your boxed Intel® Pentium® 4 LGA775 processor package should come with installation instructions for the CPU, fan and heatsink assembly. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket pins are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket pins/motherboard components. ADVANSUS will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ADVANSUS 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 pins 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:

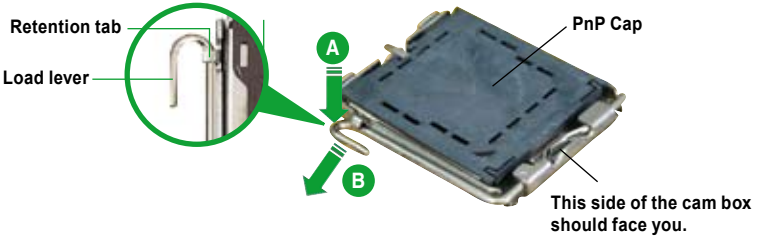
1. Locate the CPU socket on the motherboard.



CPU Socket 775

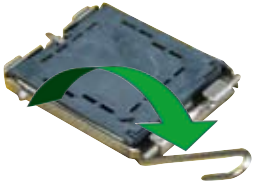
Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

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

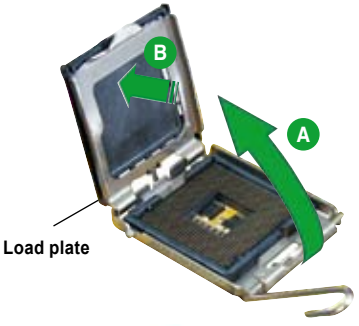


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

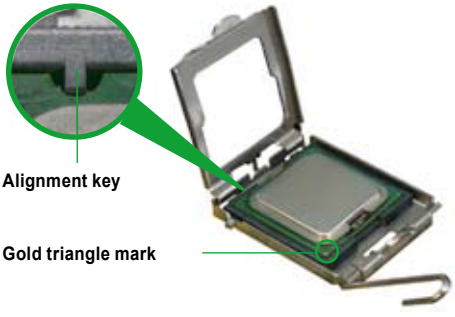
3. Lift the load lever in the direction of the arrow to a 135º angle.



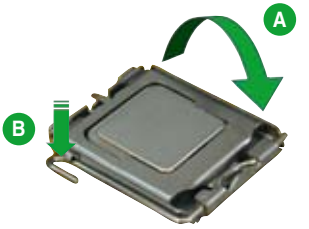
4. Lift the load plate with your thumb and forefinger to a 100º angle (A), then push the PnP cap from the load plate window to remove (B).



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



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



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!

The motherboard supports Intel® Pentium® D or Intel® Pentium® 4 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

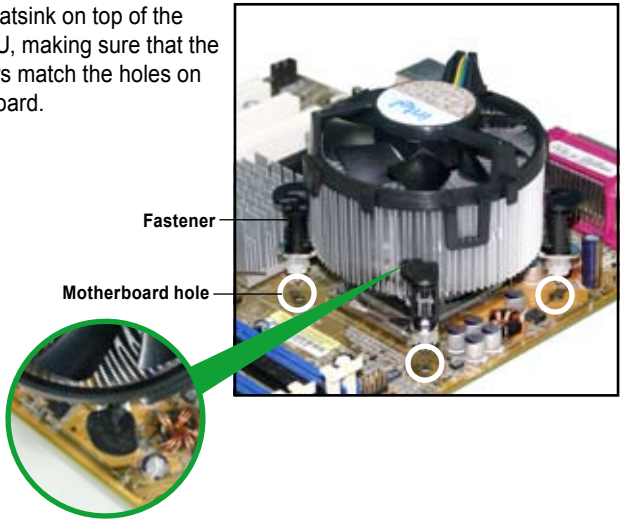
The Intel® Pentium® 4 LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

- Install the motherboard to the chassis before you install the CPU fan and heatsink assembly
- When you buy a boxed Intel® Pentium® 4 processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel®-certified multi-directional heatsink and fan.
- Your Intel® Pentium® 4 LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install.

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

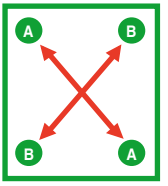
To install the CPU heatsink and fan:

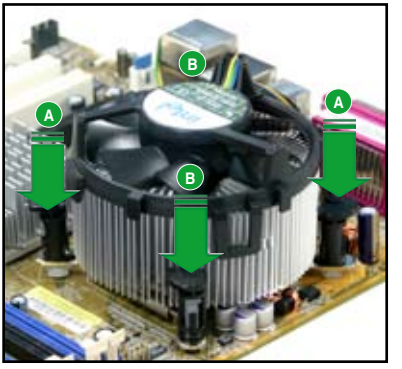
1. Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.



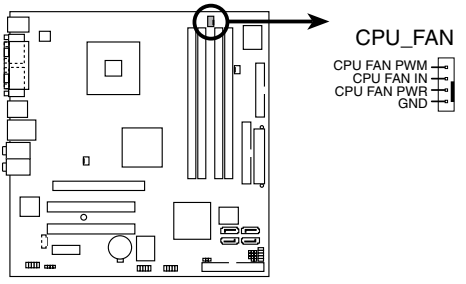
Make sure each fastener is oriented as shown, with the narrow groove directed outward.

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.





3. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.



CPU fan connector

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

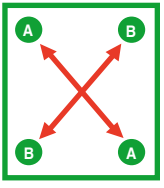
1.6.3 Uninstalling the CPU heatsink and fan

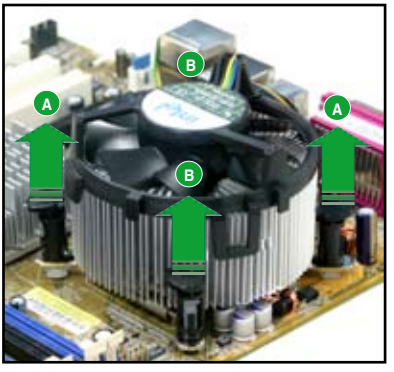
To uninstall the CPU heatsink and fan:

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.

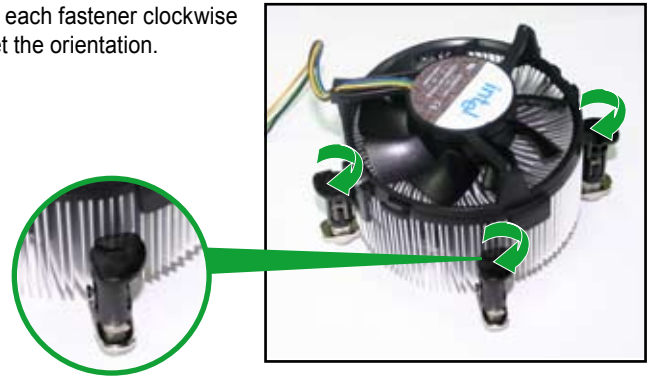




4. Remove the heatsink and fan assembly from the motherboard.



5. Rotate each fastener clockwise to reset the orientation.





The narrow end of the groove should point outward after resetting. (The photo shows the groove shaded for emphasis.)



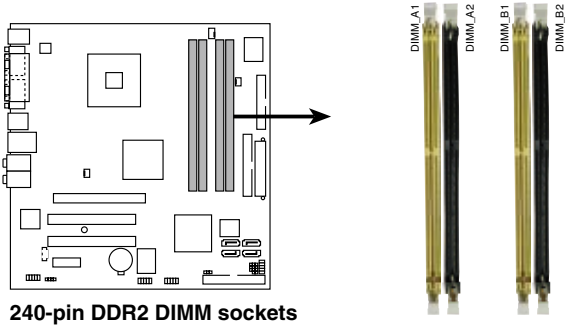
1.7 System memory

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:



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 64 MB, 128 MB, 256 MB, 512 MB and 1 GB unbuffered ECC or non-ECC DDR DIMMs into the DIMM sockets using the memory configurations in this section.

- IF you installed four 1GB memory modules, the system may detect less than 3GB of total memory because of address space allocation for other critical functions. This limitation applies to Windows XP 32-bit version operating system since it does not support PAE (Physical Address Extension) mode.
- IF you install Windows XP 32-bit version operating system, we recommend that you install less than 3GB of total memory.
- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same for better performance (DIMM_A1 +DIMM_A2=DIMM_B1+DIMM_B2).
- When using one DDR DIMM module, install into DIMM_B1 slot only.
- When using two DDR DIMM modules, install into DIMM_A1 and DIMM_B1 slots only.

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Refer to the memory Qualified Vendors List on the next page for details.
- Due to CPU limitation, DIMM modules with 128 Mb memory chips or double-sided x16 memory chips are not supported in this motherboard.
- When using one DDR DIMM module, install into DIMM_B1 slot only.
- When using two DDR DIMM modules, install into DIMM_A1 and DIMM_B1 slots only.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Refer to the memory Qualified Vendors List on the next page for details.
- Due to CPU limitation, DIMM modules with 128 Mb memory chips or double-sided x16 memory chips are not supported in this motherboard.

1.7.3 DDR2 Qualified Vendors List

The following table lists the memory modules that have been tested and qualified for use with this motherboard. Visit the website for the latest DDR2 DIMM modules for this motherboard.

DDR2 533 Qualified Vendors List

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support A	B	C
512MB	SAMSUNG	M378T6553BG0-CD5	N/A	SS	K4T51083QB-GCD5	•	•	•
256MB	SAMSUNG	M378T3253FG0-CD5	N/A	SS	K4T56083QF-GCD5	•	•	•
512MB	SAMSUNG	M378T6453FG0-CD5	N/A	DS	K4T56083QF-GCD5	•	•	•
512MB	Infineon	HYS64T64000GU-3.7-A	Infineon	SS	HYB18T512800AC37		•	•
256MB	Infineon	HYS64T32000HU-3.7-A	Infineon	SS	HYB18T512160AF-3.7	•	•	•
1024MB	Infineon	HYS64T128020HU-3.7-A	Infineon	DS	HYB18T512800AF37	•	•	•
512MB	Infineon	HYS64T64000HU-3.7-A	Infineon	SS	HYB18T512800AF37	•	•	•
512MB	CORSAIR	CM2X512-4200	N/A	DS	N/A	•	•	•
512MB	MICRON	MT16HTF6464AG-53EB2	MICRON	DS	4FBIID9BQM	•	•	
1024MB	MICRON	MT16HTF12864AY-53EA1	MICRON	DS	4JAIID9CRZ	•	•	•
256MB	MICRON	MT8HTF3264AY-53EB3	MICRON	SS	4FBIID9CHM	•		•
512MB	MICRON	MT16HTF6464AY-53EB2	MICRON	DS	4FBIID9CHM	•	•	•
1024MB	Kingston	D6408TE7BL-37	N/A	DS	E5108AB-5C-E	•	•	•
256MB	Kingston	E5116AB-5C-E	N/A	SS	HYB18T512160AC-3.7	•	•	•
512MB	Kingston	HY5PS56821F-C4	ELPIDA	SS	E5108AB-5C-E	•	•	•
512MB	Hynix	HYMP564U648-C4	N/A	SS	HY5PS12821F-C4	•	•	•
512MB	Hynix	HY5PS1282AFP-C3	N/A	SS	HYMP564U64AP8-C3	•	•	•
1024MB	Hynix	HYMP512U648-C4	N/A	DS	HY5PS12821FP-C4	•	•	•
512MB	ELPIDA	EBE51UD8ABFA-5C	ELPIDA	DS	E5108AB-5C-E	•	•	•
1024MB	ELPIDA	EBE11UD8ABFA-5C-E	ELPIDA	DS	E5108AB-5C-E	•	•	•

DDR2 667 Qualified Vendors List

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support A	B	C
512MB	Hynix	HYMP564U64AP8-Y5	Hynix	SS	HY5PS12821AFP-Y5	•	•	•
1024MB	Hynix	HYMP512U64AP8-Y4	Hynix	DS	HY5PS12821AFP-Y4	•	•	•
512MB	Hynix	HYMP564U64AP8-Y4	Hynix	SS	HY5PS12821AFP-Y4	•	•	•
256MB	MICRON	MT8HTF3264AY-667B5	MICRON	SS	4SB42D9CZM	•	•	•
256MB	MICRON	MT8HTF3264AY-667B6	MICRON	SS	5FB42D9DPN	•	•	•
512MB	Infineon	HYS64T64000HU-3S-A	Infineon	SS	HYB18T512800AF3S	•	•	•
256MB	Infineon	HYS64T32000HU-3S-A	Infineon	SS	HYB18T512160AF-3S	•	•	•
1024MB	Infineon	HYS64T128020HU-3S-A	Infineon	DS	HYB18T512800AF3S	•	•	•
256MB	ELPIDA	EBE25UC8ABFA-6E-E	ELPIDA	SS	E2508AB-GE-E	•	•	•
512MB	ELPIDA	EBE51UD8AEFA-6E-E	ELPIDA	SS	E5108AE-GE-E	•	•	•
1024MB	ELPIDA	EBE11UD8AEFA-6E-E	N/A	DS	N/A	•	•	•

Side(s): SS - Single Sided **DS -** Double Sided

DIMM Support:

A - supports one module inserted into either slot, in a Single-channel memory configuration.

B - supports on pair of modules inserted into either the yellow slots or the black slots as one pair of Dual-channel memory configuration.

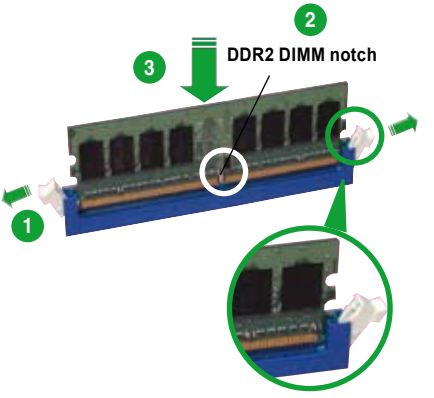
C - support for 4 modules inserted into the yellow and black slots as two pairs of Dual-channel memory configuration.

1.7.4 Installing a DIMM

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

To install a DIMM:

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



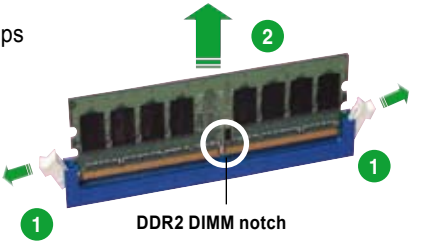
- A DDR2 DIMM is keyed with a notch so that it fits in only one direction. Do not force a DIMM into a socket to avoid damaging the DIMM.
- The DDR2 DIMM sockets do not support DDR DIMMs. DO not install DDR DIMMs to the DDR2 DIMM sockets.

1.7.5 Removing a DIMM

Follow these steps 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 2 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.

1.8.3 Interrupt assignments

Standard interrupt assignments

IRQ	Standard Function
0	System Timer
1	Keyboard Controller
2	Re-direct to IRQ#9
4	Communications Port (COM1)*
5	IRQ holder for PCI steering*
6	Floppy Disk Controller
7	Printer Port (LPT1)*
8	System CMOS/Real Time Clock
9	IRQ holder for PCI steering*
10	IRQ holder for PCI steering*
11	IRQ holder for PCI steering*
12	PS/2 Compatible Mouse Port*
13	Numeric Data Processor
14	Primary IDE Channel

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

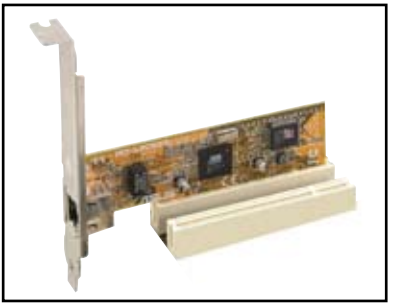
IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	—	—	—	—	—	shared	—	—
PCI slot 2	—	—	—	—	—	—	shared	—
PCI Express x16 slot	shared	—	—	—	—	—	—	—
PCI Express x1 slot	shared	—	—	—	—	—	—	—
Onboard USB controller 1	—	—	—	—	shared	—	—	—
Onboard USB controller 2	—	shared	—	—	—	—	—	—
Onboard USB controller 3	—	—	shared	—	—	—	—	—
Onboard USB controller 4	—	—	—	shared	—	—	—	—
Onboard USB 2.0 controller	—	—	—	—	shared	—	—	—
Onboard IDE port	—	—	—	shared	—	—	—	—
Onboard HD audio	—	—	—	shared	—	—	—	—
Onboard LAN	—	shared	—	—	—	—	—	—

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.

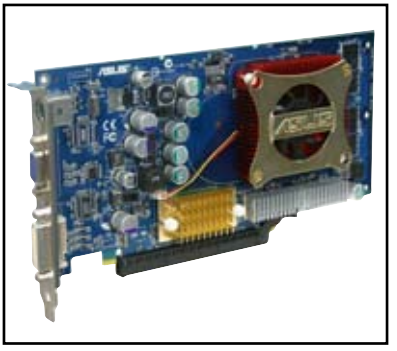
1.8.4 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The figure shows the type of LAN card that can be installed on a PCI slot.



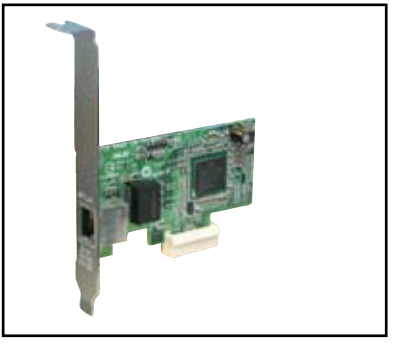
1.8.5 PCI Express x16

This motherboard supports one PCI Express x16 graphics card. The figure shows a typical graphics card that can be installed on the PCI Express x16 slot.



1.8.6 PCI Express x1

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications. The figure shows the type of network card that can be installed on the PCI Express x1 slot.



1.9 Jumpers

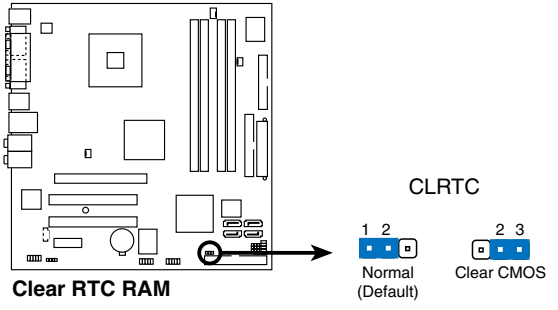
1. Clear RTC RAM (CLRTC)

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

To erase the RTC RAM:

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

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

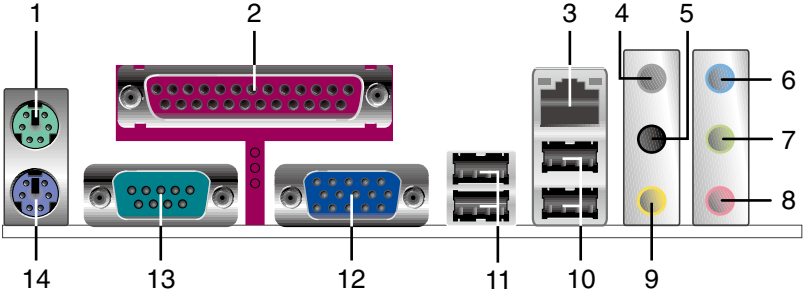


Clear RTC RAM

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.

1.10 Connectors

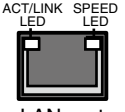
1.10.1 Rear panel connectors



1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
3. **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

ACT/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



LAN port

4. **Rear Speaker Out port (orange).** This port connects the rear speakers on a 4-channel, 6-channel, or 8-channel audio configuration.
5. **Side Speaker Out port (black).** This port connects the side speakers in an 8-channel audio configuration.
6. **Line In port (light blue).** This port connects a tape, CD, DVD player, or other audio sources.
7. **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.

8. **Microphone port (pink).** This port connects a microphone.
9. **Center/Subwoofer port (gray).** This port connects the center/subwoofer speakers.

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	2-channel (Headset)	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	—	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Black	—	—	—	Side Speaker Out
Gray	—	—	Center/Subwoofer	Center/Subwoofer

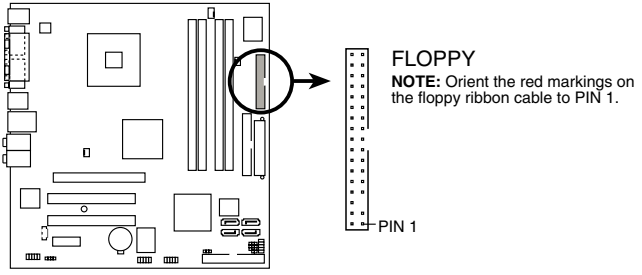
10. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
11. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
12. **VGA port.** This 15-pin VGA port connects to a VGA monitor.
13. **Serial connector.** This 9-pin COM1 port is for serial devices.
14. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

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.

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



Floppy disk drive connector

2. Primary IDE connector (40-1 pin PRI_IDE)

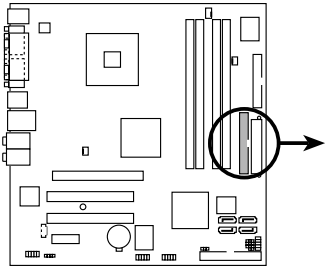
These connectors are for Ultra DMA 133/100/66 signal cables. There are three interfaces on each Ultra DMA 133/100/66 signal cable: blue, black, and gray. Connect the blue interface into the motherboard's IDE connector, then select one of the following modes to configure your hard disk drive(s).

Cable Select Mode - use this mode to select the operating mode by cable connectors.

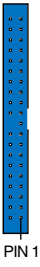
No. of drives	Drive type	Drive jumper	Cable connector
1	With OS	Cable select	black
2	With OS		black
	Without OS		gray

Jumper Select Mode - use this mode to select the operating mode by hard disk drive jumper.

No. of drives	Drive type	Drive jumper	Cable connector
1	With OS	Master	black or gray
2	With OS	Master	
	Without OS	Slave	



IDE connector

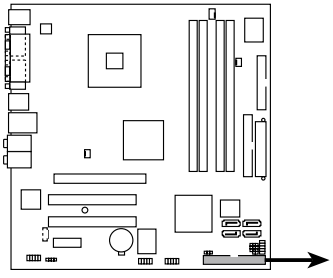


PRI_IDE

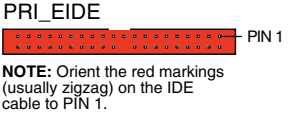
NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

3. ITE IDE connector (40-1 pin PRI_EIDE [red])

Supported by the ITE8211F controller, this connector is for Ultra ATA 133/100/66 signal cables. This connector supports two IDE hard disk drives for easier data storage.



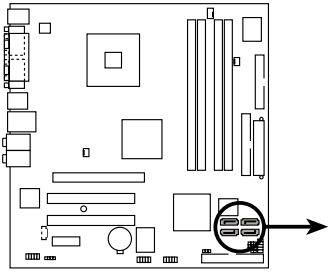
PRI_EIDE connector



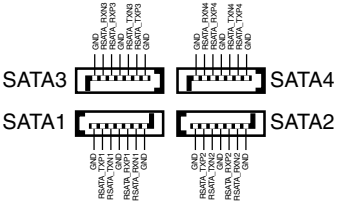
NOTE: Orient the red markings (usually zigzag) on the IDE cable to PIN 1.

4. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)

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



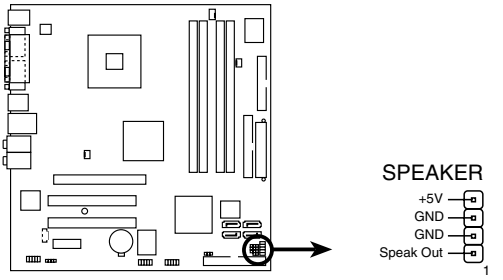
SATA connectors



Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 or later before using Serial ATA.

5. Speaker connector (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.

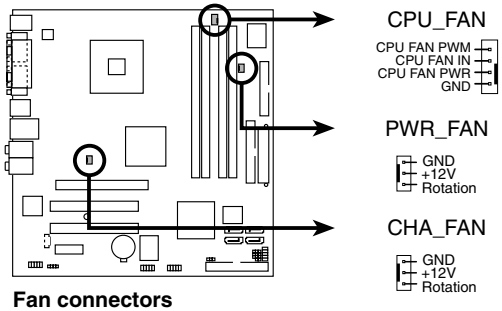


Speaker out connector

6. CPU, Power and Chassis fan connectors (4-pin CPU_FAN, 3-pin PWR_RAN, 3-pin CHA_FAN)

The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W 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.

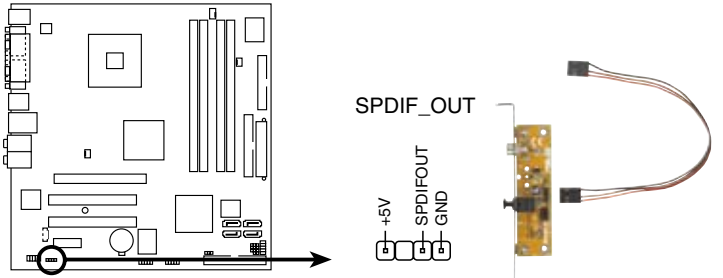
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.



Fan connectors

7. Digital Audio connector (4-1 pin SPDIF_OUT)

This connector is for the S/PDIF audio module to allow digital sound output. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.

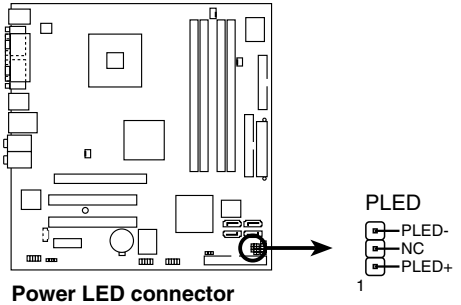


Digital audio connector

The S/PDIF out module is purchased separately.

8. Power LED connector (3-pin PLED)

This 3-pin connector is for the system power LED. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

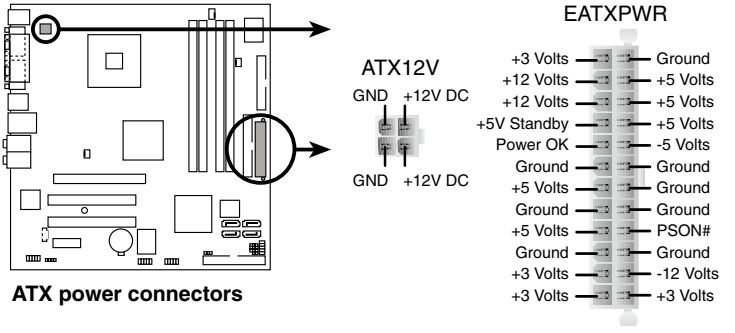


Power LED connector

9. ATX power connectors
(24-pin EATXPWR and 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.

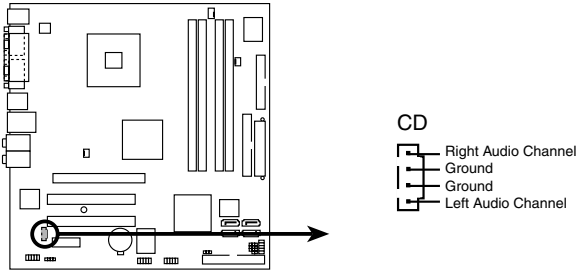
- Do not forget to connect the 4-pin ATX +12 V power plug; otherwise, the system will not boot.
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See the table below for details.



ATX power connectors

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

This connector is for the 4-pin audio cable that connects to the audio connector at the back of the optical drive.

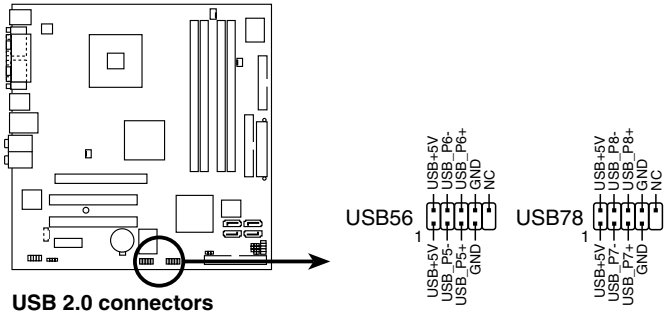


CD audio connector

Enable the CD-IN function in the audio utility when using this connector.

11. USB connectors (10-1 pin USB56, USB78)

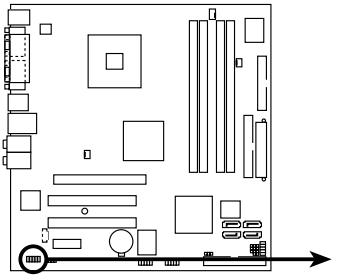
These connectors are for USB 2.0 ports. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



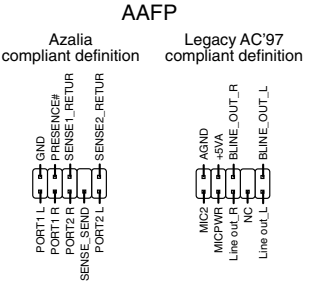
USB 2.0 connectors

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

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard.



Analog front panel connector

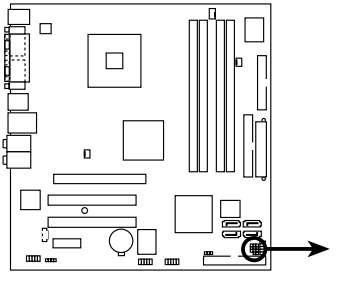


It is recommended that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

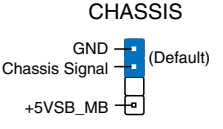
13. Chassis intrusion connector (4-1 pin CHASSIS)

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 pins 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.

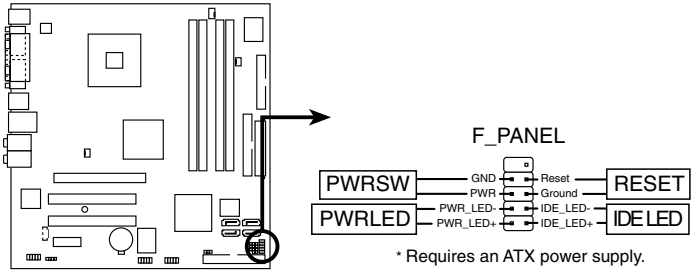


Chassis intrusion connector



14. System panel connector (10-1 pin F_PANEL)

This connector supports several chassis-mounted functions.



System panel connector

The sytem panel connector is color-coded for easy connection. Refer to the connector description below for details.

- **Power/Soft-off button (Black 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.
- **System Power LED connector (2-pin PWRLED)**
  This 2-pin connector is for the system power LED. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Reset button (Blue 2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.
- **Hard disk drive activity (Red 2-pin IDELED)**
  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.