P5VD1-X

User Guide

Motherboard

E2180

First Edition
July 2005

Contents

Contents

Contents

Notices

Federal Communications Commission Statement

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

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

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

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

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

Canadian Department of Communications Statement

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

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

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. Please 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.

- **Chapter 2: Hardware information**

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

- **Chapter 3: Powering up**

  This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

- **Chapter 4: 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 5: Software support**

  This chapter describes the contents of the support CD 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 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 /iP5VD1-X.ROM`**

P5VD1-X Specifications Summary

CPU	LGA775 socket for Intel® Pentium® D/Pentium® 4/Celeron CPU Supports Intel® Hyper-Threading Technology
Chipset	Northbridge: VIA PT880Ultra Southbridge: VT 8237R
Front Side Bus	1066/800/533 MHz
Memory	Dual-channel memory architecture 4 x 184-pin DIMM sockets support up to 4GB of unbuffered non-ECC 400/333 MHz DDR memory modules
Expansion slots	1 x AGP8X slot 1 x Universal PCI Express x16 slot (max. x4 mode) 3 x PCI slots
Storage/RAID	VT8237R South Bridge *2 x UltraDMA 133/100 *2 x Serial ATA with RAID 0, 1, JBOD
Audio	ADI AD1888 SoundMAX 6-channel CODEC S/PDIF out on back I/O port
LAN	Intel 82540EM Gigabit LAN Controller
Overclocking Features	ASUS C.P.R. (CPU Parameter Recall) CPU voltage adjustable SFS (Stepless Frequency Selection) from 133 MHz up to 400 MHz at 1 MHz increment Adjustable FSB/DDR ratio with fixed AGP8X/PCI or PCI/PCI Express frequencies
USB	Supports up to 8 USB 2.0 ports
Other ASUS Special Features	ASUS CrashFree BIOS 2 ASUS Q-Fan ASUS EZ Flash ASUS MyLogo2
BIOS features	4 MB Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, ACPI2.0a, SM BIOS 2.3

(continued next page)

P5VD1-X Specifications Summary

Rear panel I/O Ports	1 x Parallel port 1 x COM Port 1 x Coaxial S/PDIF out port 1 x PS/2 Keyboard port 1 x PS/2 Mouse port 1 x LAN (RJ-45) port 1 x Line In port 1 x Line Out port 1 x Microphone port 4 x USB 2.0/1.1 ports
Internal connectors	2 x USB 2.0 connectors for 4 additional USB 2.0 ports 1 x GAME/MIDI port connector 1 x CPU fan connector 1 x Chassis fan connector 1 x 24-pin ATX power connector 1 x 4-pin ATX 12V power connector System panel connector CD/AUX audio-in connectors Front panel Audio connector
Support CD contents	Drivers ASUS PC Probe ASUS Live Update Utility Anti-virus software (OEM version)
Accessories	1 x Serial ATA cable 1 x SATA power cable 1 x UltraDMA 133/100/66 cable 1 x FDD cable 1 x I/O Shield User's manual
Form Factor	ATX form factor: 12 in x 9 in (30.5 cm x 22.9 cm)

*Note: The specifications are subject to change without notice.

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

1 Product Introduction

Chapter Summary

1.1 Welcome!

Thank you for buying an ASUS® P5VD1-X 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 P5VD1-X motherboard
Cables	1 x Serial ATA signal cable 1 x Serial ATA power cable 1 x Ultra DMA 133/100/66 cable 1 x FDD cable
Accessories	I/O shield
Application CDs	ASUS 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

Intel LGA775 Pentium 4 CPU

This motherboard supports the latest Pentium 4 CPU from Intel in LGA775 package. With 1066/800/533MHz FSB, Hyper-Threading Technology and core-speeds up to 3.8GHz and beyond, Intel's LGA775 Pentium 4 is one of the fastest desktop processors to date.

Dual-channel DDR400 memory support

Dual-channel DDR technology doubles the bandwidth of your system memory and hence boost the system performance to out perform any memory existing solutions in the market. System bottlenecks are eliminated with balanced architecture and peak bandwidths up to 6.4GB/s.

PCI Express & AGP8X

This motherboard supports PCI Express x16 and AGP8X slots to provide ultimate flexibility for graphics card upgrade. The PCI Express x16 slot running at PCI Express x4 speed outperforms PCI interface with its exceptional high bandwidth up to 2GB/s.

Serial ATA RAID technology

Serial ATA is the next generation ATA specification that provides scalable performance for today and tomorrow. With up to 150MB/s data transfer rate, Serial ATA is faster than current Parallel ATA, while providing 100% software compatibility. The onboard VIA VT8237R southbridge allows RAID 0, RAID 1 and JBOD configuration for two SATA connectors.

6 Channel Audio & SoundMAX Digital Audio System

The SoundMAX Digital Audio System is the industry's highest performance and most reliable audio solution for business perfessionals, audiophiles, musicians, ,and gamers. SoundMAX Digital Audio System can output 5.1 channel surround sound and features state-of-the-art DLS2 MIDI synthesizer with Yamaha DLSbyXG sound set, 5.1 Virtual Theater and supports and major game audio technologies including Microsoft DirectX 8.0, Microsoft DirectSound 3D, A3D, MacroFX, ZoomFX, MultiDrive 5.1, A3D and FAX.

Dual-Core CPU

Enjoy the extraordinary CPU power from the latest dual-core CPU. The advanced processing technology contains two physical CPU cores with individually dedicated L2 cache to satisfy the rising demand for more powerful processing capability.

64-bit CPU support

64-bit computing, the next generation technology to replace current 32-bit architecture, delivers advanced system performance, faster memory access and increased productivity. This motherboard provides excellent compatibility and flexibility by supporting either 64-bit or 32-bit architecture.

S/PDIF-out on Back I/O Port

The motherboard supports the S/PDIF Out function through the S/PDIF interfaces on the rear panel. The S/PDIF technology turns your computer into a high-end entertainment system with digital connectivity to powerful audio and speaker systems. See page 2-22 for details.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1.

1.3.2 Innovative ASUS features

ASUS CrashFree BIOS 2

The CrashFree BIOS2 feature now includes the BIOS auto-recovery function in a support CD. Users can reboot their system through the support CD when a bootable disk is not available, and go through the simple BIOS auto-recovery process. ASUS motherboards now enable users to enjoy this protection feature without the need to pay for an optional ROM.

ASUS Q-Fan technology

ASUS Q-Fan technology intelligently and automatically adjusts CPU fan speeds according to system load and temperature, enabling users to work in a distraction-free environment with minimal noise.

ASUS MyLogo 2

You can convert your favorite photo into a 256-color boot logo for a more colorful and vivid image on your screen.

C.P.R. (CPU Parameter Recall)

When the system hangs due to overclocking failure, there is no need to open the case to clear CMOS data. Just simply resstart the system, the BIOS would show the previous setting and then users can amend the CPU setting again.

This chapter 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.

2 Hardware Information

Chapter Summary

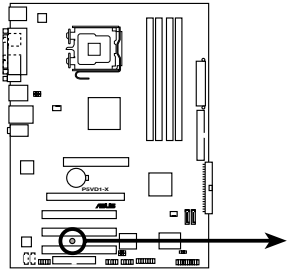
2.1 Before you proceed

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

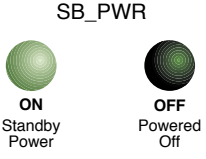
- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
- Hold components by the edges to 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.



P5VD1-X Onboard LED



2.2 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.

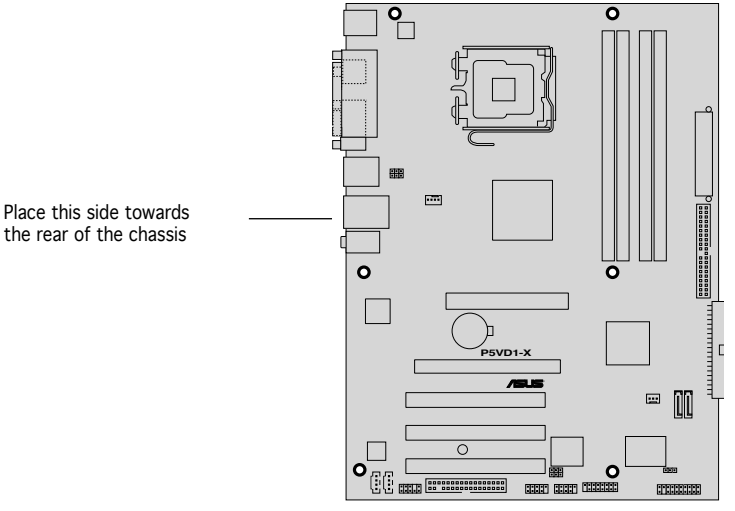
2.2.1 Placement direction

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.

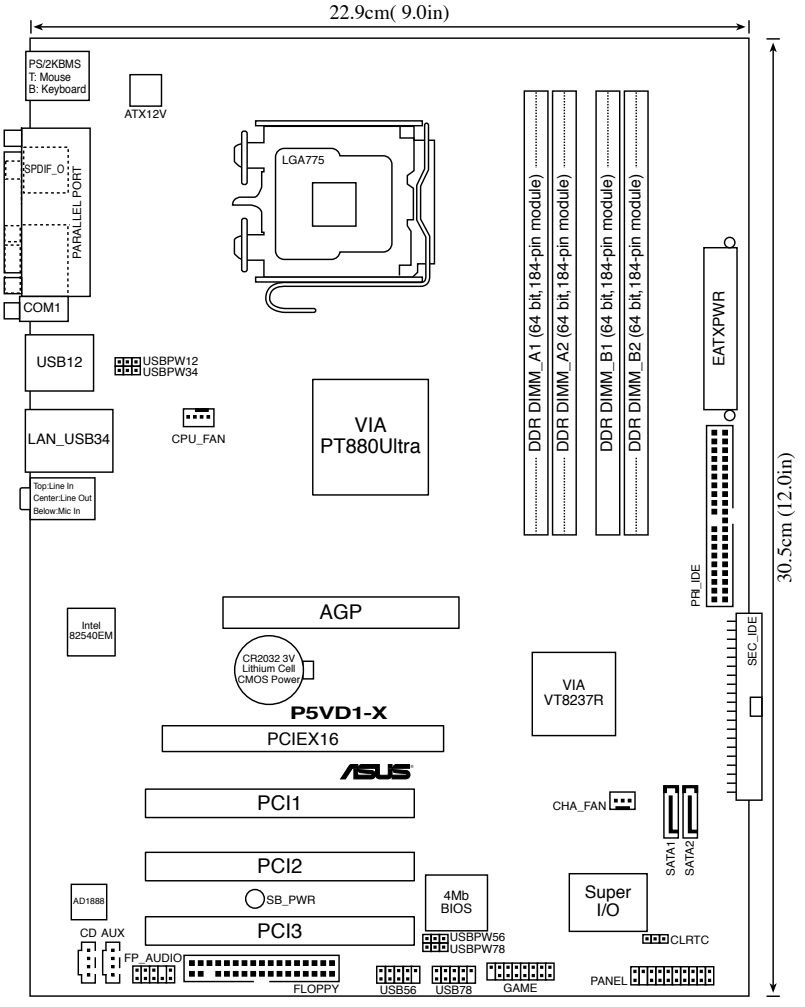
2.2.2 Screw holes

Place Six (6) 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.



2.2.3 Motherboard layout



2.3 Central Processing Unit (CPU)

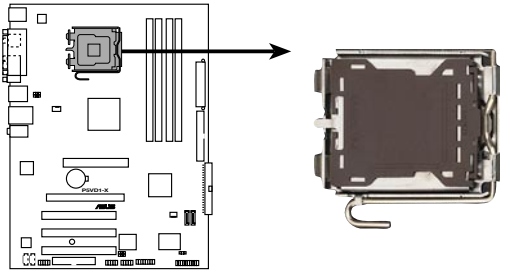
The motherboard comes with a surface mount LGA775 socket designed for the Intel® Pentium® 4 processor in the 775-land package.

- 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. 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 pins resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.3.1 Installing the CPU

To install a CPU:

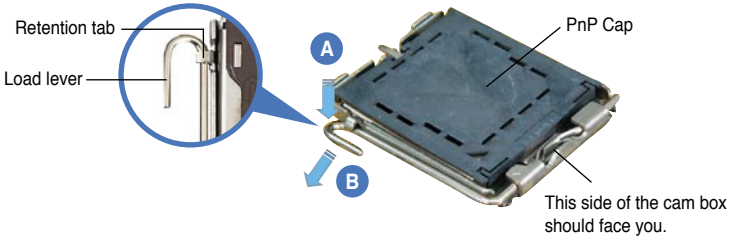
1. Locate the CPU socket on the motherboard.



P5VD1-X CPU Socket 775

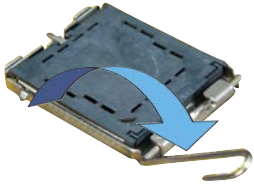
Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

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

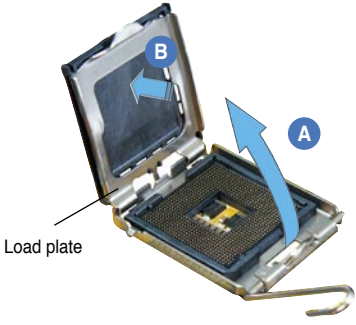


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

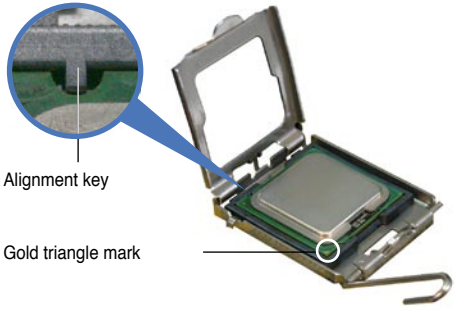
3. Lift the load lever in the direction of the arrow to a 135º angle.



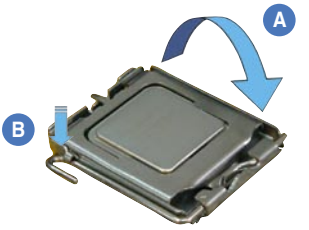
4. Lift the load plate with your thumb and forefinger to a 100º angle (A), then push the PnP cap from the load plate window to remove (B).



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!

Notes on Intel® Hyper-Threading Technology

- This motherboard supports Intel® Pentium® 4 CPUs in the 775-land package with Hyper-Threading Technology.
- Hyper-Threading Technology is supported under Windows® XP/2003 Server and Linux 2.4.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in the BIOS to ensure system stability and performance.
- Installing Windows® XP Service Pack 1 or later version is recommended.
- Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.
- For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.

To use the Hyper-Threading Technology on this motherboard:

1. Install an Intel® Pentium® 4 CPU that supports Hyper-Threading Technology.
2. Power up the system and enter the BIOS Setup (see Chapter 4: BIOS setup). Under the Advanced Menu, make sure that the item Hyper-Threading Technology is set to Enabled. The item appears only if you installed a CPU that supports Hyper-Threading Technology.
3. Reboot the computer.

2.3.2 Installing the CPU heatsink and fan

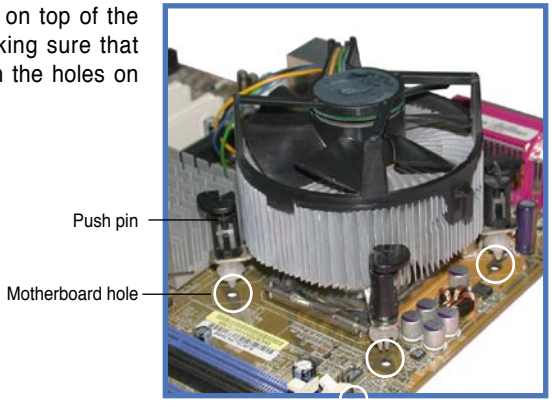
The Intel® Pentium® 4 LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

- 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.

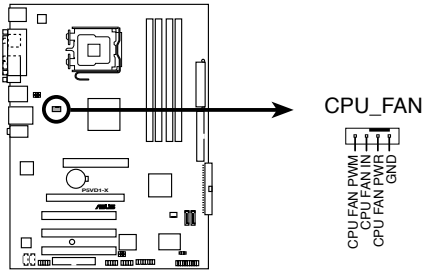
Follow these steps to install the CPU heatsink and fan.

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



2. Push each of the pins downward 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.



P5VD1-X CPU Fan connector

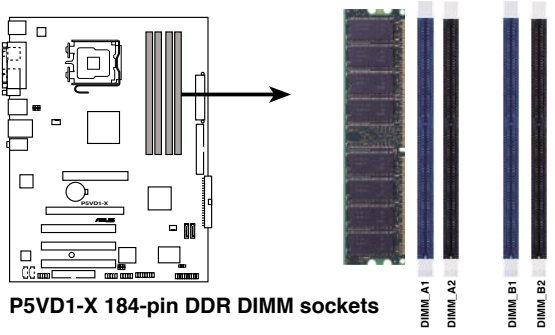
Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

2.4 System memory

2.4.1 Overview

The motherboard comes with four 184-pin Double Data Rate (DDR) Dual Inline Memory Modules (DIMM) sockets.

The following figure illustrates the location of the sockets:



P5VD1-X 184-pin DDR DIMM sockets

2.4.2 Memory Configurations

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

- Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations in Table 1.
- In dual-channel configurations, install only identical (the same type and size) DDR DIMM pairs for each channel.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Due to chipset resource allocation, the system may detect less than 4 GB system memory whne you installed four 1 GB DDR memory modules.
- Due to chipset limitation, DIMM modules with 128 Mb memory chips or double-sided x16 memory chips are not supported in this motherboard.

DDR400 Qualified Vendors List

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support A*	B*	C*
256MB	KINGSTON	KVR400X64C3A/256	Hynix	SS	HY5DU56822BT-D43	•	•	•
512MB	KINGSTON	KVR400X64C3A/512	Hynix	DS	HY5DU56822BT-D43	•	•	•
256MB	KINGSTON	KVR400X64C3A/256	PSC	SS	A2S56D30BTP	•	•	•
512MB	KINGSTON	KVR400X64C3A/512	KINGSTON	SS	HY5DU12822BT-D43	•	•	•
256MB	KINGSTON	KVR400X64C3A/256	KINGSTON	SS	D3208DL3T-5A	•	•	•
512MB	KINGSTON	KVR400X64C3A/512	KINGSTON	DS	D3208DH1T-5	•	•	•
256MB	KINGSTON	KVR333X64C25/256	KINGSTON	SS	D3208DH1T-6	•	•	•
512MB	KINGSTON	KVR333X64C25/512	KINGSTON	DS	D3208DH1T-6	•	•	•
256MB	KINGSTON	KVR333X64C25/256	Hynix	DS	HY5DU56822BT-D43	•	•	•
1GB	KINGSTON	KVR400X64C3A/1G	Infineon	DS	HYB25D512800BE-5B	•	•	•
256MB	Infineon	HYS64D32300GU-5-C	Infineon	SS	HYB25D256800CE-5C	•	•	•
512MB	Infineon	HYS64D64320GU-5-C	Infineon	DS	HYB25D256800CE-5C	•	•	•
256MB	Infineon	HYS64D32300GU-5-C	Infineon	SS	HYB25D256800CE-5C	•	•	•
512MB	Infineon	HYS64D64320GU-5-C	Infineon	DS	HYB25D256800CE-6C	•	•	•
256MB	HY	HYMD232646D8J-D43	Hynix	SS	HY5DU56822BT-D43	•	•	•
512MB	HY	HYMD264646D8J-D43	Hynix	DS	HY5DU56822BT-D43	•	•	•
256MB	HY	HYMD232646D8J-J	Hynix	SS	HY5DU56822BT-J	•	•	•
512MB	HY	HYMD264646D8J-J	Hynix	DS	HY5DU56822BT-J	•	•	•
256MB	CORSAIR	VS256MB400	Value select	SS	VS32M8-5 2B0409	•	•	•
256MB	CORSAIR	XMS3202v3.1	Infineon	SS	HYB25D256807BT-5B	•	•	•
512MB	CORSAIR	XMS3205v1.2	Winbond	DS	W942508CH-5	•	•	•
512MB	CORSAIR	VS512MB400	Value select	DS	VS32M8-5 2B0402	•	•	•
256MB	CORSAIR	VS256MB333	SAMSUNG	SS	K4H5608380-TCB3	•	•	•
512MB	CORSAIR	XMS2702v3.1	Mosel	DS	V58C2256804SAT6	•	•	
512MB	CORSAIR	VS512MB333	Value select	DS	VS32M8-6 2B0412	•	•	•
512MB	MICRON	MT16VDDT6464AG-335GB	MICRON	DS	MT46V32M8TG-6TG	•	•	•
256MB	MICRON	MT8VDDT3264AG-335GB	MICRON	SS	MT46V32M8TG-6TG	•	•	•
256MB	MICRON	MT8VDDT3264AG-40BGB	MICRON	SS	MT46V32M8TG-5BG	•	•	•
512MB	MICRON	MT16VDDT6464AG-40BCB	MICRON	DS	MT46V32M8TG-5BC	•	•	•
256MB	SAMSUNG	M368L3223FTN-CCC	SAMSUNG	SS	K4H560838F-TCCC	•	•	•
512MB	SAMSUNG	M368L6423FTN-CCC	SAMSUNG	DS	K4H560838F-TCCC	•	•	•
256MB	SAMSUNG	M368L3223FTN-CB3	SAMSUNG	SS	K4H560838F-TCB3	•	•	•
512MB	SAMSUNG	M368L6423FTN-CB3	SAMSUNG	DS	K4H560838F-TCB3	•	•	•
256MB	Winbond	U24256ADWBG6H20	Winbond	SS	W942508CH-5	•	•	•
256MB	Winbond	U24256AAWBG6H20	Winbond	SS	W942508CH-6	•	•	•
512MB	Winbond	DDR333-512	Winbond	DS	W942508BH-6	•	•	•
512MB	Winbond	U24512ADWBG6H20	Winbond	DS	W942508CH-5	•	•	•
256MB	Elpida	U24256ADEPG6H20	Elpida	SS	DD2508AKTA-5C	•	•	•
512MB	Elpida	U24512ADEPG6H20	Elpida	DS	DD2508AMTA	•	•	
256MB	Transcend	DDR400-256	SAMSUNG	SS	K4H560838F-TCCC	•	•	•
256MB	Transcend	DDR400-256	Mosel	SS	V58C2256804SAT5B	•	•	•
512MB	Transcend	102709-0001	PSC	DS	A2S56D30ATP	•	•	•
512MB	Transcend	DDR400-512	Mosel	DS	V58C2256804SAT5B	•	•	
512MB	Transcend	DDR400-512	SAMSUNG	DS	K4H560838F-TCCC	•	•	•
256MB	Transcend	111448-0214	PSC	SS	A2S56D30BTP	•	•	•
512MB	Transcend	DDR333-512	Hynix	DS	HY5DU56822CT-J	•	•	•
256MB	Pmi	3208GATA07-04A7	Pmi	SS	PM4D328D50406EU	•	•	•
512MB	Pmi	3208GATA01-04A4	Pmi	DS	PM4D328S50403DU	•	•	
256MB	KINGMAX	MPMB62D-38LT3R	Mosel	SS	V58C2256804SAT6	•	•	•
512MB	KINGMAX	MPMC22D-38HT3R	Hynix	DS	HY5DU56822BT-J	•	•	•
256MB	KINGMAX	MPXB62D-38KT3R	KINGMAX	SS	KDL388P4LA-50	•	•	•
512MB	KINGMAX	MPXC22D-38KT3R	KINGMAX	DS	KDL388P4EA-50	•	•	•
256MB	Mosel	V826632K24SATG-D3	Mosel	SS	V58C2256804SAT5	•	•	•
512MB	Mosel	V826664K24SATG-D3	Mosel	DS	V58C2256804SAT5	•	•	
256MB	NANYA	NT256D64S88B1G-5T	NANYA	SS	NT5DS32M8BT-5T	•	•	•
512MB	NANYA	NT512D64S8HB1G-5T	NANYA	DS	NT5DS32M8BT-5T	•	•	•

(Continued on the next page)

DDR400 Qualified Vendors List

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support A*	B*	C*
256MB	Apacer	77.10636.46G	SAMSUNG	SS	K4H560838E-TCCC	•	•	•
512MB	Apacer	77.90728.U1G	Apacer	DS	AM3A568AJT-6B	•	•	•
256MB	Apacer	77.10636.56G	Mosel	SS	V58C2256804Sat5B	•	•	•
512MB	Apacer	77.10736.11G	Infineon	DS	HYB25D256800BT-5B	•	•	
256MB	Smart	U24256ADSRG6H20	Smart	SS	D32M8XS50H3X4AMV	•	•	•
256MB	Smart	U24256ADSRG6H20	Smart	SS	D32M8XS60HBX4AMV	•	•	•
512MB	Smart	U24512ADSRG6H20	Smart	DS	D32M8XS50H3X4AMV	•	•	
512MB	Smart	U24512ADSRG6H20	Smart	DS	D32M8XS60HBX4AMV	•	•	•
256MB	TwinMOS	DDR333-256	TwinMOS	SS	TMD7608F8E60B	•	•	•
256MB	TwinMOS	M2G9I08A-TT	TwinMOS	SS	TMD7608F8E501	•	•	
512MB	TwinMOS	M2G9J16A-TT	TwinMOS	DS	TMD7608F8E501	•	•	
256MB	Promos	V826632K24SCTG-D0	Promos	SS	V58C2256804SCT5B	•	•	•
512MB	Promos	V826664K24SCTG-D0	Promos	DS	V58C2256804SCT5B	•	•	•
512MB	BiaoXing	BXXC22D-38KT3B	BiaoXing	DS	VM256D328BT-5	•	•	•
512MB	Patriot	PDC1G3200+XBLK		DS	Heat-Sink Package	•		
256MB	Vdata	MDYVD6F4G2880B1E0H	Vdata	SS	VDD9616A8A-5C	•	•	•

Legend:

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

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

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

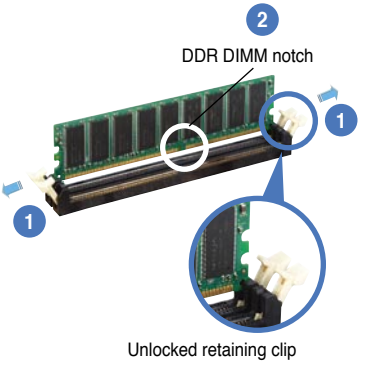
SS - Single-sided

DS - Double-sided

2.4.3 Installing a DIMM

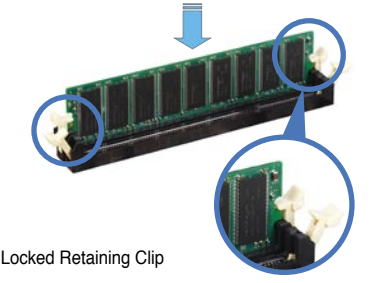
Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

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.



A DDR 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.

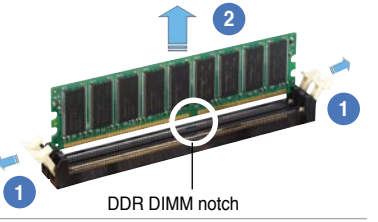
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.4.4 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.

2.5 Expansion slots

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

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

2.5.1 Installing an expansion card

To install an expansion card:

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

2.5.2 Configuring an expansion card

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

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 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.

2.5.3 Interrupt assignments

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	•	Re-direct to IRQ#9
3	11	Communications Port (COM2)*
4	12	IRQ holder for PCI steering*
5	13	IRQ holder for PCI steering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT1)*
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	Primary IDE Channel
15	10	Secondary IDE Channel

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

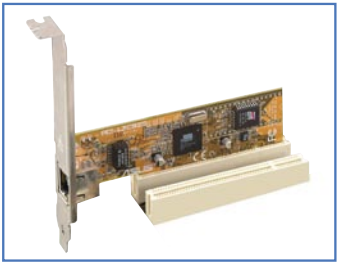
IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	used	—	—	—	—	—	—	—
PCI slot 2	—	used	—	—	—	—	—	—
PCI slot 3	—	—	used	—	—	—	—	—
PCI E x 16 slot (max. 4X mode)	—	—	—	—	—	—	—	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 LAN	—	—	—	—	shared	—	—	—
Onboard AC'97 audio	—	—	—	—	—	—	used	—

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.

2.5.4 PCI slots

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

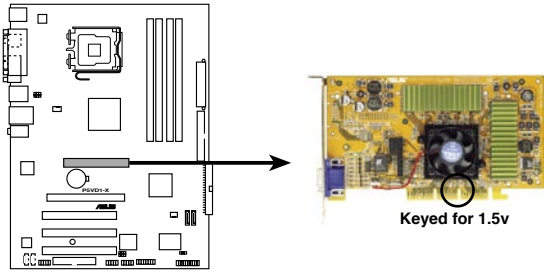


2.5.5 AGP slot

The Accelerated Graphics Port (AGP) slot supports AGP 8X/4X (+1.5V) cards. When you buy an AGP card, make sure that you ask for one with +1.5V specification.

Note the notches on the card golden fingers to ensure that they fit the AGP slot on the motherboard.

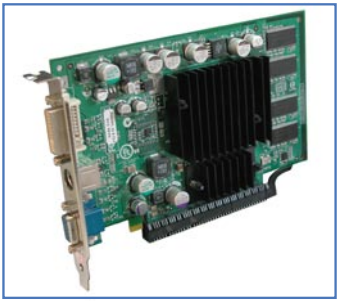
Install only +1.5V or +0.8V AGP cards.



P5VD1-X Accelerated Graphics Port (AGP)

2.5.6 Universal PCI Express x16 slot

This motherboard supports universal PCI Express x16 graphic cards that comply with the PCI Express specifications. The figure shows a graphics card installed on the universal PCI Express x16 slot.



VGA Qualified Vender List

PCIe X 16 VGA Card	PCIe _ 4X	PCIe X 16 VGA Card	PCIe _ 4X
Abit RX300SE-PCIE Rev. V1.0 (BIOS: V008.015)	Pass	ASUS EN6200GE Rev V1.00A (BIOS: V5.43.02.27.AS07)	Pass
ASUS EN5750/128 Rev. 1.01 (BIOS: V04.32.20.38.00)	Pass	ASUS EN6800LE Rev. V1.00 (BIOS: V5.41.02.34.AS01)	Pass
ASUS EN6600GT Rev. V1.00 (BIOS: V5.43.02.16.AS27)	Pass	ELSA Gladiac 660GT 128MB3 Rev: 2B (BIOS: V5.43.02.46.E1)	Pass
ELSA Gladiac PCX 935 Rev. W01-46W53 (BIOS: V4.35.20.45.E0)	Pass	Leadtek WinFast PX6200 TD Rev. A1 (BIOS: V5.43.02.36.68)	Pass
Gigabyte GV-NX68T256D-B Rev: B (BIOS: V5.40.02.36.09)	Pass	MSI RX600XT-TD128 Rev.V2.00 (BIOS: V8.015)	Pass
Abit RX600XT-PCIE Rev. B (BIOS: V008.015)	Pass	ASUS EAX800XT Rev. V1.00 (BIOS: V5D57.9.4.1.8.AS)	Pass
ASUS EAX800PRO Rev. V1.00 (BIOS: V5549.9.4.1.10.AS)	Pass	ASUS EN6200TC128/T/16M Rev V1.01 (BIOS: V5.44.02.11)	Pass
ASUS EN5900 Rev. 1.01 (BIOS: V04.35.20.45)	Pass	ASUS EN6800GT Rev. V1.02 (BIOS: V5.40.02.26.AS05)	Pass
ASUS EN6800 Rev. V1.00 (BIOS: V5.41.02.17.AS01)	Pass	Gigabyte GV-NX57128D Rev. V1.0 (BIOS: V4.36.20.38.00)	Pass
ELSA Gladiac 660 128T Rev: 1.B (BIOS: V5.43.02.16.E1)	Pass	Leadtek WinFast PX6600 TDH Rev. A1 (BIOS: V5.43.02.16)	Pass
Gigabyte GV-RX70P128D Rev: 1.1 (BIOS: V009.004.001.032)	Pass	MSI RX700PRO-TD128E Rev.V2.00 (BIOS: V009.004.001.032)	Pass

VGA Qualified Vender List

PCIe X 16 VGA Card	PCIe _ 4X	PCIe X 16 VGA Card	PCIe _ 4X
MSI NX6600GT-TD128E Rev.V200 (BIOS: V5.43.02.16)	Pass	ASUS EN6600 Rev V1.00A (BIOS: V5.43.02.16.AS11)	Pass
ASUS EAX600XT Rev. V1.02 (BIOS:V113-AA20306-100-AS)	Pass	Leadtek WinFast PX6600GT TDH Rev. A (BIOS: V5.43.02.16)	Pass
Gigabyte GV-NX66T128D (BIOS: V5.43.02.16)	Pass	Albatron PC6200 (BIOS: V5.43.02.27)	Pass
ASUS EN6800ULTRA (BIOS: V5.40.02.32.AS07)	Pass	ASUS EAX700 (BIOS: V5E4D.9.7.1.3. A901)	Pass
Albatron PCX5750 (BIOS: V4.36.20.38)	Pass	Albatron PC6600GT (BIOS: V5.43.02.16)	Pass
PowerColor R43-TVD3B Rev. PN:109-A31900-00 (BIOS: V5d57.9.3.1.20)	Pass	ASUS EAX850PRO (BIOS: V5D4F.9.7.1.4.AS02)	Pass

*Note: Some PCI Express graphics cards cannot operate on PCI-E x4 mode.

2.6 Jumpers

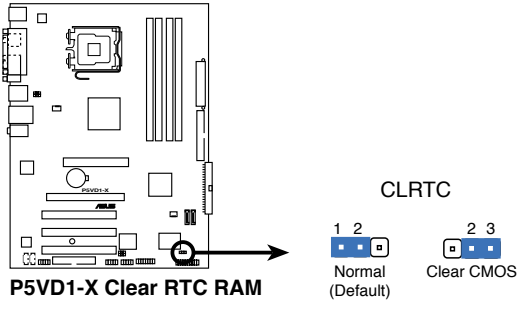
1. Clear RTC RAM (CLRTC)

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!



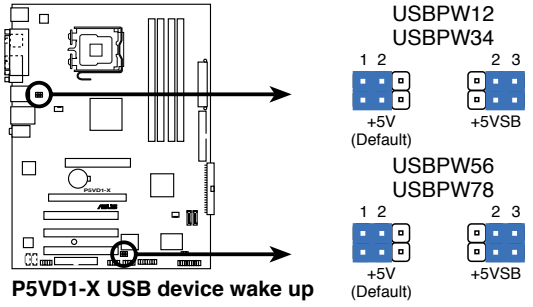
P5VD1-X Clear RTC RAM

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.

2. USB device wake-up (3-pin USBPW12, USBPW34, USBPW56, USBPW78)

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 USBPWR12 and USBPWR34 jumpers are for the rear USB ports. The USBPWR56 and USBPWR78 jumper is for the internal USB connectors that you can connect to additional USB ports.

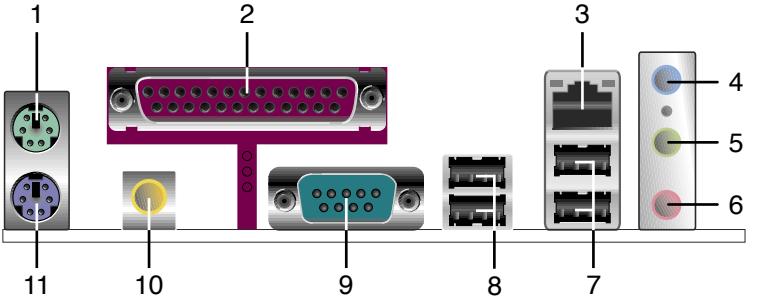


P5VD1-X USB device wake up

- 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.

2.7 Connectors

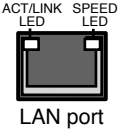
2.7.1 Rear panel connectors



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



4. **Line In jack.** This Line In (light blue) jack connects a tape player or other audio sources. In 6-channel mode, the function of this jack becomes Bass/Center.
5. **Line Out jack.** This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.
6. **Microphone jack.** This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Rear Speaker Out.

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

Audio 2, 4, or 6-channel configuration

Port	Headset 2-channel	4-channel	6-channel
Light Blue	Line In	Line In	Bass/Center
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Rear Speaker Out	Rear Speaker Out

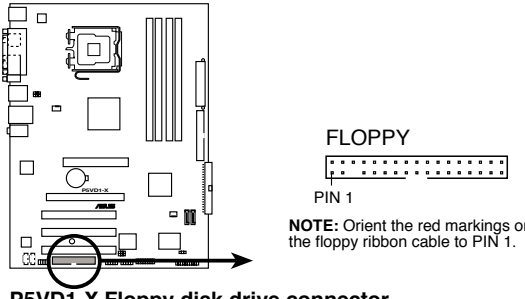
7. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
8. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
9. **Serial connector.** This 9-pin COM1 port is for serial devices.
10. **Coaxial S/PDIF Out port.** This port connects an external audio output device via a coaxial S/PDIF cable.
11. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

2.7.2 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.

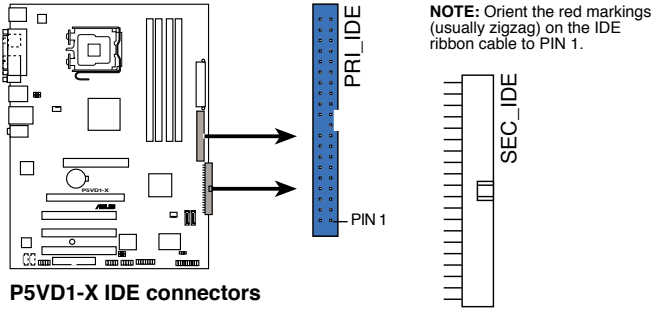


P5VD1-X Floppy disk drive connector

2. Primary/Secondary IDE connector (40-1 pin PRI_IDE, SEC_IDE)

This connector supports the provided UltraATA133 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, the black connector for the UltraATA133 master device.

1. Follow the hard disk drive documentation when setting the device in master or slave mode.
2. Pin 20 on each IDE connector is removed to match the covered hole on the UltraATA cable connector. This prevents incorrect orientation when you connect the cables.
3. The hole near the blue connector on the UltraATA cable is intentional.



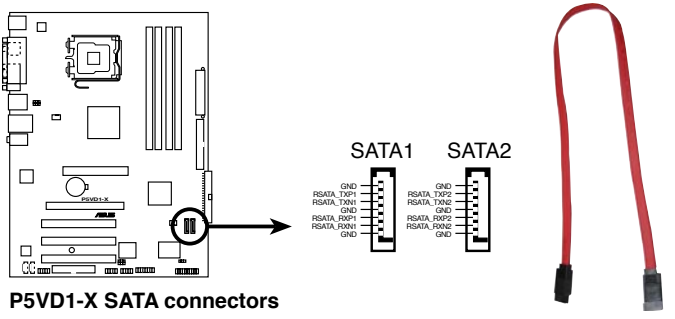
P5VD1-X IDE connectors

3. Serial ATA connectors (7-pin SATA1, SATA2)

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

If you installed Serial ATA hard disk drives, you can create a RAID 0 or RAID 1 configuration through the onboard VIA® VT8237R RAID controller. Please refer to Chapter 5 for information on creating a RAID configuration.

These connectors are set to Standard IDE configuration 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 "4.3.6 IDE Configuration" for details.



P5VD1-X SATA connectors

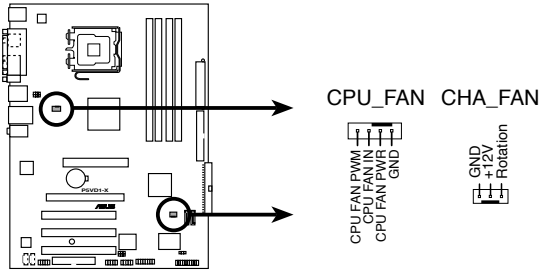
Important notes on Serial ATA

- The Serial ATA RAID feature (RAID 0, RAID 1) is available only if you are using Windows® 2000/XP.
- Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 or later version before using Serial ATA.
- VIA 8237/8237R Southbridge chipsets do not provide forwards compatibility with SATA-II hard disk drives at 300MB/s. The HDDs might not be detected at POST. To install a SATA-II hard drive, users need to lock the drive at 150MB/s data transfer rate by hard drive jumper setting. Refer to HDDs manufactures' website for more information.

4. CPU and Chassis fan connectors (4-pin CPU_FAN, 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.

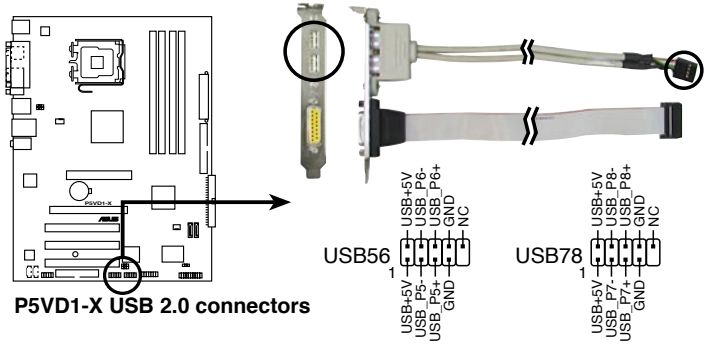
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.



P5VD1-X Fan connectors

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

These connectors are for USB 2.0 ports. Connect the USB/GAME 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.



P5VD1-X USB 2.0 connectors

1. Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!
2. The USB module is purchased separately.

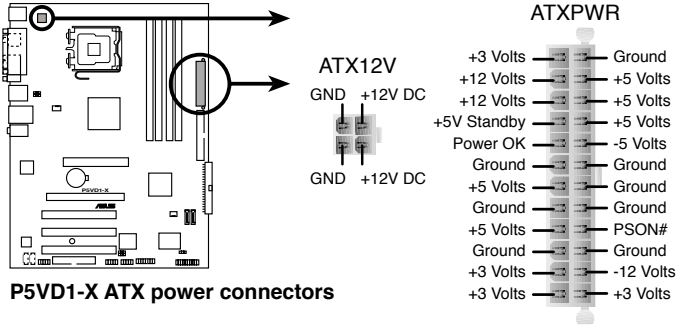
6. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

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

- It is recommended that you use an ATX 12 V Specification 2.0-compliant power supply unit (PSU) with a minimum of 300 W power rating. This PSU type has 24-pin and 4-pin power plugs.
- If you intent to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 15A on +12V and that the PSU has a minimum power rating of 300 W. The system may become unstable or may not boot up if the power is inadequate.
- Do not forget to connect the 4-pin ATX +12 V power plug; otherwise, the system will not boot up.
- 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.
- The ATX 12 V Specification 2.0-compliant PSU passed the motherboard power requirement test with the following configuration:

CPU	:	Intel® Pentium® 4 3.6 GHz
Memory	:	512 MB DDR (x 4)
Graphics card	:	PCI Express x16 Nvidia EN5900
Parallel ATA devices	:	IDE hard disk drive (x 2)
Serial ATA device	:	SATA hard disk drive
Optical drives	:	CD-ROM (x 2)
SCSI devices	:	SCSI card and SCSI hard disk drive

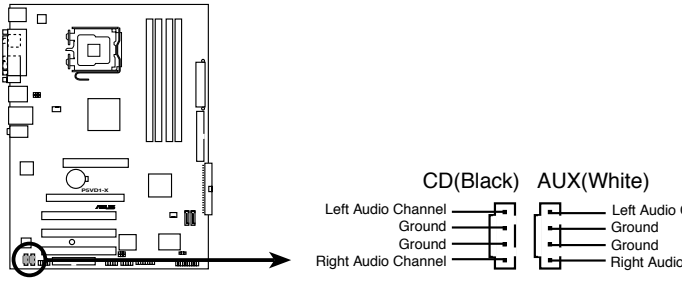
- You must install a PSU with a higher power rating if you intend to install additional devices.



P5VD1-X ATX power connectors

7. Internal audio connectors (4-pin CD, AUX)

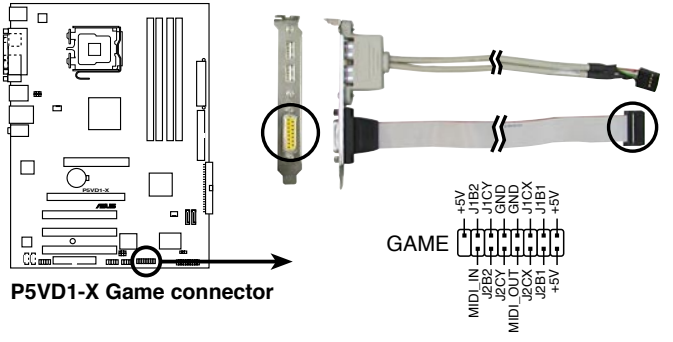
These connector allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.



P5VD1-X Internal audio connectors

8. GAME port connector (16-1 pin GAME)

This connector is for a GAME/MIDI port. Connect the USB/GAME module cable to this connector, then install the module to a slot opening at the back of the system chassis. The GAME/MIDI port connects a joystick or game pad for playing games, and MIDI devices for playing or editing audio files.

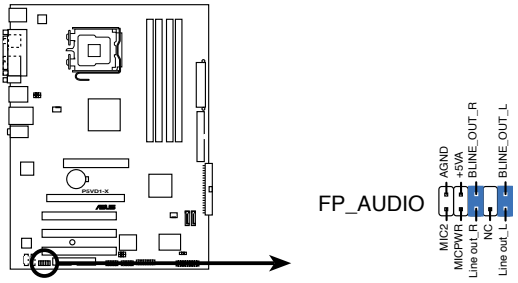


P5VD1-X Game connector

The GAME/MIDI port module isi purchased separately.

9. Front panel audio connector (10-1 pin FP_AUDIO)

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

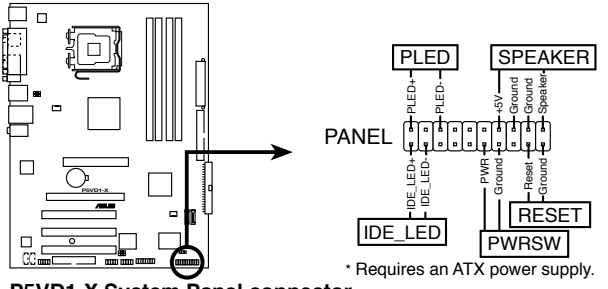


P5VD1-X Front panel audio connector

Be default, the pins labeled LINE OUT_R/BLINE_OUT_R and the pins LINE OUT_L/BLINE_OUT_L are shorted with jumper caps. Remove the caps only when you are connecting the front panel audio cable.

10. System panel connector (20-pin PANEL)

This connector supports several chassis-mounted functions.



P5VD1-X System Panel connector

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

- **System power LED (Green 3-pin PLED)**
  This 3-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 (Red 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 (Orange 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.
- **Power/Soft-off button (Yellow 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 (Blue 2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

3 Powering Up

Chapter Summary

3.1 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 withATX 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.

AMI BIOS beep codes

Beep Description	Error
One beep	Keyboard controller error Refresh Time error No master drive detected
Two continuous beeps followed by two short beeps	Floppy controller failure
Two continuous beeps 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 4.

3.2 Powering off the computer

3.2.1 Using the OS shut down function

If you are using Windows® 2000:

1. Click the Start button then click Shut Down.
2. Make sure that the Shut Down option button is selected, then click the OK button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

If you are using Windows® XP:

1. Click the Start button 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.

3.2.2 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 "4.5 Power Menu" in Chapter 4 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.

4 BIOS Setup

Chapter Summary

4.1 Managing and updating your BIOS

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

1. ASUS AFUDOS (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. ASUS EZ Flash (Updates the BIOS using a floppy disk during POST.)
3. ASUS CrashFree BIOS 2 (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
4. ASUS Update (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

4.1.1 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® 2000 environment

   To create a set of boot disks for Windows® 2000:

   a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
   b. Insert the Windows® 2000 CD to the optical drive.
   c. Click Start, then select Run.

d. From the Open field, type

D:\bootdisk\makeboot a:

assuming that D: is your optical drive.

e. Press <Enter>, then follow screen instructions to continue.

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

4.1.2 ASUS EZ Flash utility

The ASUS EZ Flash 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 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:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard and rename the same to P5VD1-X.ROM.
2. Save the BIOS file to a floppy disk, then restart the system.
3. Press <Alt> + <F2> during POST to display the following.

```
EZFlash starting BIOS update
Checking for floppy...
```

4. Insert the floppy disk that contains the BIOS file to the floppy disk drive. When the correct BIOS file is found, EZ Flash performs the BIOS update process and automatically reboots the system when done.

```
EZFlash starting BIOS update
Checking for floppy...
Floppy found!
Reading file "P5VD1-X.ROM". Completed.
Start erasing.......|
Start programming...|
Flashed successfully. Rebooting.
```

- Do not shutdown or reset the system while updating the BIOS to prevent system boot failure!
- A "Floppy not found!" error message appears if there is no floppy disk in the drive. A "P5VD1-X.ROM not found!" error message appears if the correct BIOS file is not found in the floppy disk. Make sure that you rename the BIOS file to P5VD1-X.ROM.

4.1.3 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

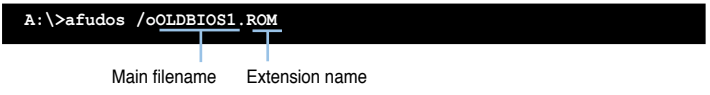
To copy the current BIOS file using the AFUDOS utility:

- Make sure that the floppy disk is not write-protected and has at least 600 KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be exactly the same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD 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.



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

```
A:\>afudos /oOLDBIOS1.ROM
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
   Reading flash ..... done
A:\>
```

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

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

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

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

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

   afudos /i[filename]

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

```
A:\>afudos /iP5VD1-X.ROM
```

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

```
A:\>afudos /iP5VD1-X.ROM
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
   Reading file ..... done
   Erasing flash .... done
   Writing flash .... 0x0008CC00 (9%)
```

Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

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

```
A:\>afudos /iP5VD1-X.ROM
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
   Reading file ..... done
   Erasing flash .... done
   Writing flash .... 0x0008CC00 (9%)
   Verifying flash .. done
A:\>
```

4.1.4 ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 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 CD or the floppy disk that contains the updated BIOS file.

- Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
- Make sure that you rename the original or updated BIOS file in the floppy disk to P5VD1-X.ROM.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated 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 "P5VD1-X.ROM". Completed.
Start flashing...
```

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

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

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to the optical drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

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

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "P5VD1-X.ROM". Completed.
Start flashing...
```

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

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

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website (www.asus.com) to download the latest BIOS file.

4.1.5 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 CD 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:

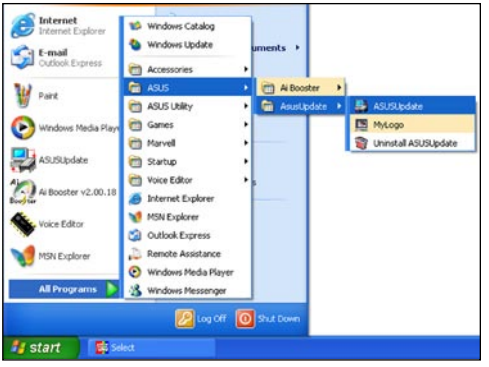
1. Place the support CD in the optical drive. The Drivers menu appears.
2. Click the Utilities tab, then click Install ASUS Update VX.XX.XX. See page 5-3 for the Utilities screen menu.
3. The ASUS Update utility is copied to your system.

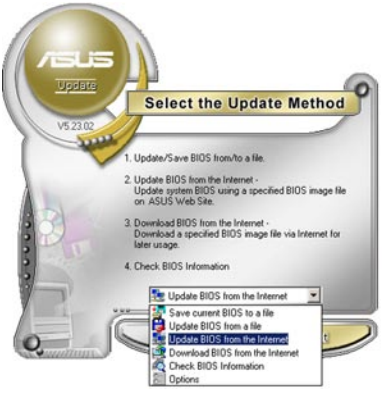
Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

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

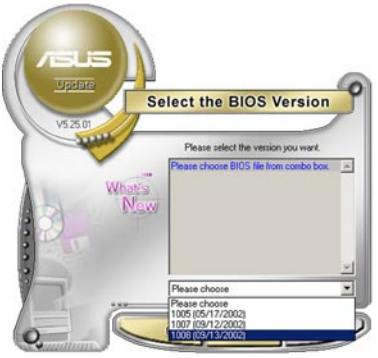




2. Select Update BIOS from the Internet option from the drop-down menu, then click Next.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click Auto Select. Click Next.

4. From the FTP site, select the BIOS version that you wish to download. Click Next.
5. Follow the screen instructions to complete the update process.



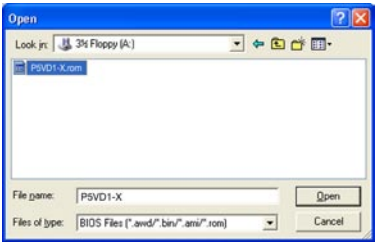
> The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

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

2. Select Update BIOS from a file option from the drop-down menu, then click Next.
3. Locate the BIOS file from the Open window, then click Save.
4. Follow the screen instructions to complete the update process.



4.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "4.1 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 firmware hub.

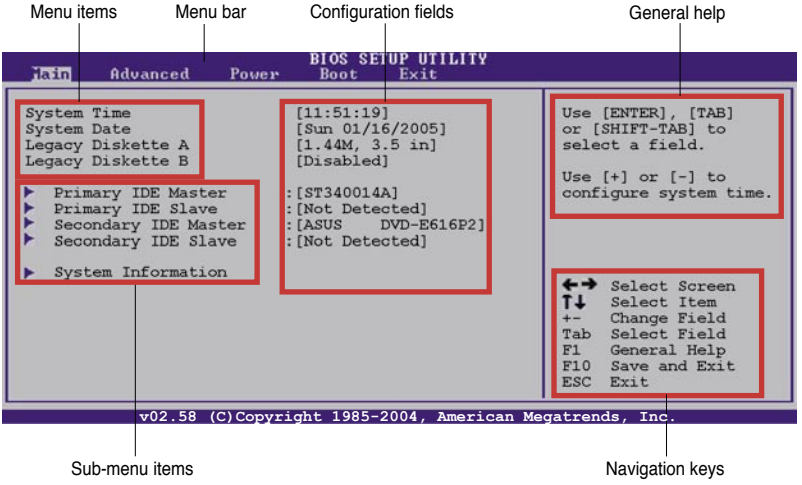
The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

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 Default Settings item under the Exit Menu. See section "4.7 Exit Menu."
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

4.2.1 BIOS menu screen



4.2.2 Menu bar

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

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Exit	For selecting the exit options and loading default settings

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

4.2.3 Navigation keys

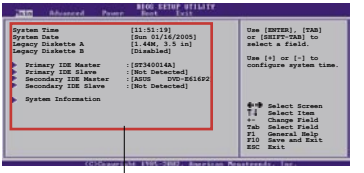
At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

4.2.4 Menu items

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

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



4.2.5 Sub-menu items

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

4.2.6 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.

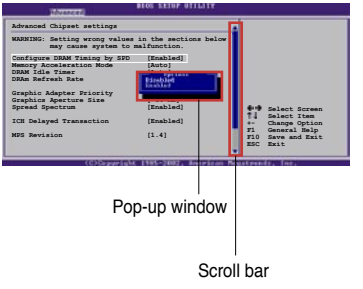
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to "4.2.7 Pop-up window."

4.2.7 Pop-up window

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

4.2.8 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.



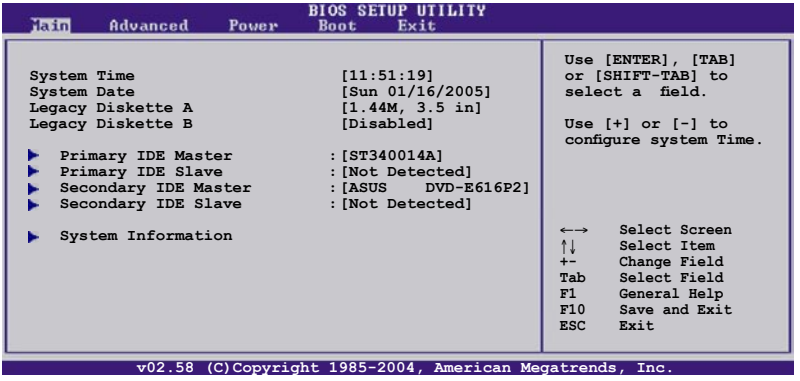
4.2.9 General help

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

4.3 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 "4.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.



4.3.1 System Time [xx:xx:xxxx]

Allows you to set the system time.

4.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

4.3.3 Legacy Diskette A [1.44M, 3.5 in.]

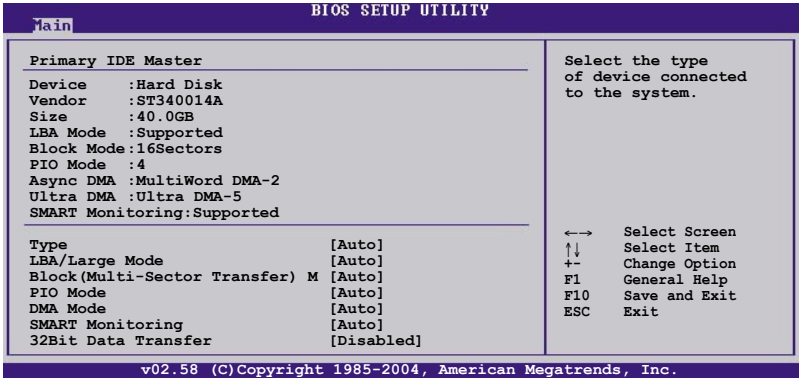
Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

4.3.4 Legacy Diskette B [Disabled]

Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

4.3.5 Primary and Secondary IDE Master/Slave

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

Selects the PIO 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]

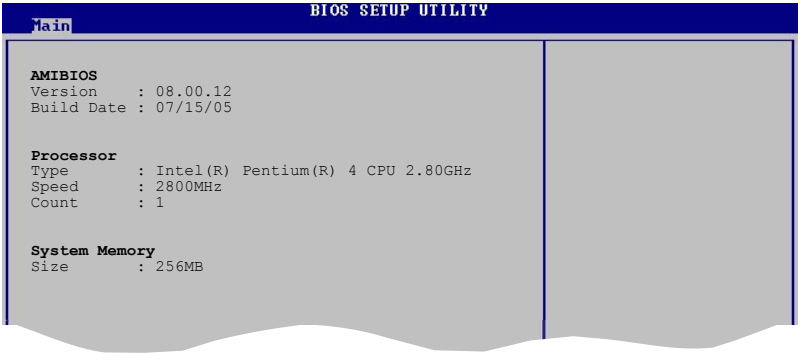
Sets the Smart Monitoring, Analysis, and Reporting Technology. Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Disabled]

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

4.3.6 System Information

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



AMI BIOS

Displays the auto-detected BIOS information

Processor

Displays the auto-detected CPU specification

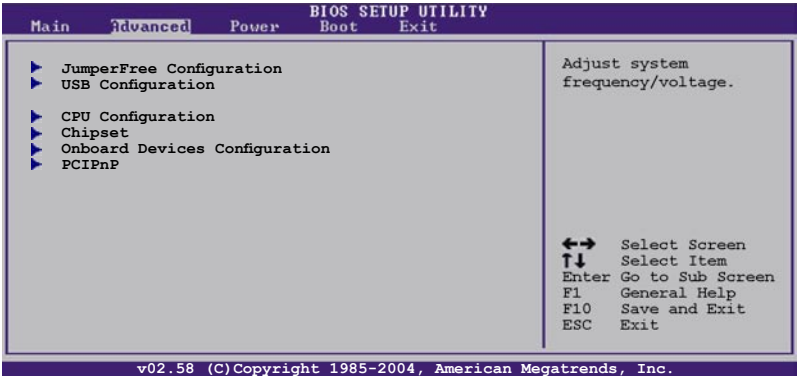
System Memory

Displays the auto-detected system memory

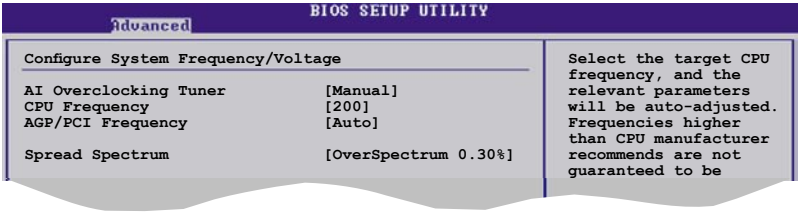
4.4 Advanced menu

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.



4.4.1 JumperFree Configuration



AI Overclocking Tuner [Manual]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking configuration options. Configuration options: [Manual] [Standard] [Overclock 5%] [Overclock 10%] [Overclock 20%] [Overclock 30%]

CPU Frequency [200]

When you select [Manual] option in AI Overclocking Tuner, the CPU frequency is 200 which is fixed.

AGP/PCI Frequency [Auto]

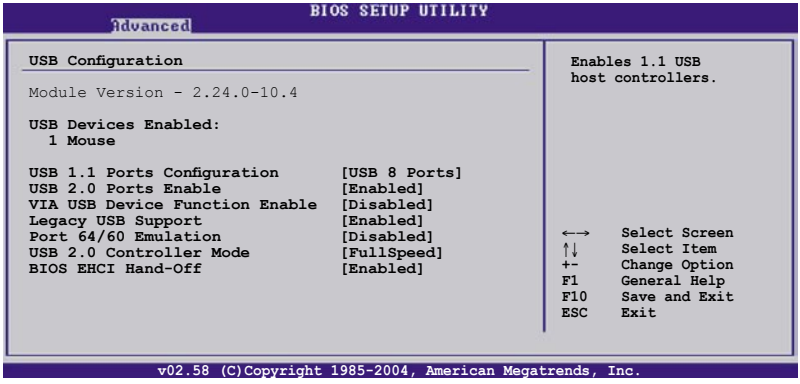
Allows you to select AGP/PCI Frequency. Configuration options: [Auto] [66.6/33.3] [75.0/37.5] [88.0/44.0]

Spread Spectrum [OverSpectrum 0.30%]

Allows you to enable or disable the clock generator spread spectrum. Configuration options: [Disabled] [OverSpectrum 0.20%] [OverSpectrum 0.30%] [OverSpectrum 0.40%] [OverSpectrum 0.50%]

4.4.2 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 Module Version and USB Devices Enabled items show the auto-detected values. If no USB device is detected, the item shows None.

USB 1.1 Ports Configuration [USB 8 Ports]

Allows you to enable or disable the USB 1.1 function. Configuration options: [Disabled] [USB 2 Ports] [USB 4 Ports] [USB 6 Ports] [USB 8 Ports]

USB 2.0 Ports Enable [Enabled]

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

VIA USB Device Function Enable [Disabled]

Configuration options: [Enabled] [Disabled]

Legacy USB Support [Enabled]

Allows you to enable or disable support for USB devices on legacy operating systems (OS). 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]

Port 64/60 Emulation [Disabled]

Configuration options: [Disabled] [Enabled]

USB 2.0 Controller Mode [FullSpeed]

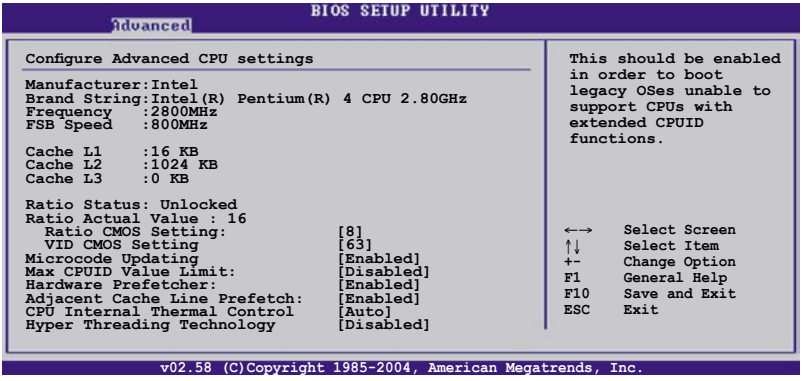
Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps). Configuration options: [Full Speed] [HiSpeed]

BIOS EHCI Hand-Off [Enabled]

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

4.4.3 CPU Configuration

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



Raitio CMOS Setting [8]

Sets the ratio between the CPU cor clock and the Front Side Bus frequency. The BIOS auto-detects the default value of this item. Use the <+> <-> keys to adjust the values. Configuration options:

You can only adjust the Ratio CMOS if you installed an unlocked CPU. Refer to the CPU documentation for details.

VID CMOS Setting [45]

Allows you to set the VID CMOS setting at which the processor is to run. The default value of this item is auto-detected by BIOS. Use the <+> or <-> keys to adjust the values.

Microcode Updation [Enabled]

Disables or enables the microcode updation function. Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

Hardware Prefetcher: [Enabled]

Configuration options: [Disaabled] [Enabled]

Adjacent Cache Line Prefetch: [Enabled]

Configuration options: [Disabled] [Enabled]

CPU Internal Thermal Control [Auto]

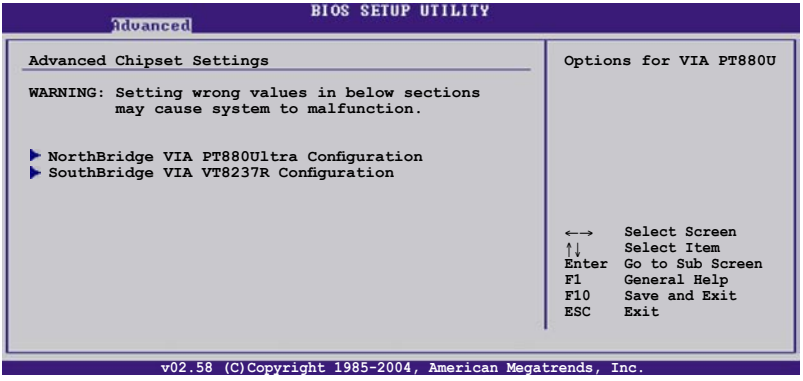
Disables or sets the CPU internal thermal control. Configuration options: [Auto] [Disabled]

Hyper-Threading Technology [Disabled]

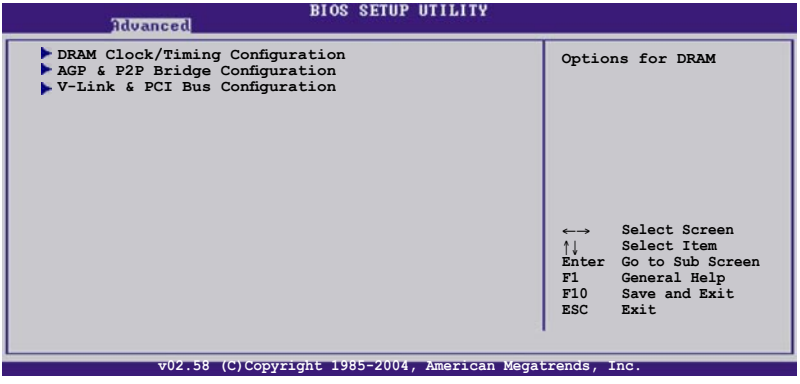
Allows you to enable or disable the processor Hyper-Threading Technology Configuration options: [Disabled] [Enabled]

4.4.4 Chipset

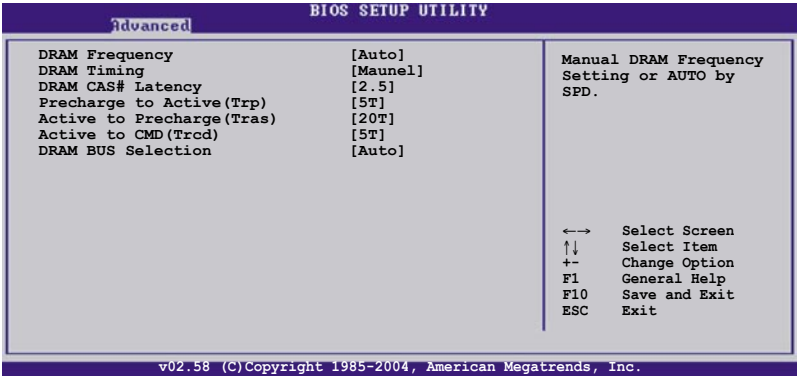
The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



NorthBrige VIA PT880Ultra Configuration



DRAM Frequency/Timing Configuration



DRAM Frequency [Auto]

Configuration options: [Auto] [200MHz] [266MHz] [333MHz] [400MHz] [533MHz] [666MHz]

DRAM Timing [Manual]

Configuration options: [Manual] [Auto] [Turbo] [Ultra]

DRAM CAS# Latency [2.5]

Configuration options: [1.5] [2.0] [2.5] [3.0]

Precharge to Active(Trp) [5T]

Configuration options: [2T] [3T] [4T] [5T]

Active to Precharge(Tras) [20T]

Configuration options: [5T] [6T] [7T] [8T] [9T] [10T] [11T] [12T] [13T] [14T] [15T] [16T] [17T] [18T] [19T] [20T]

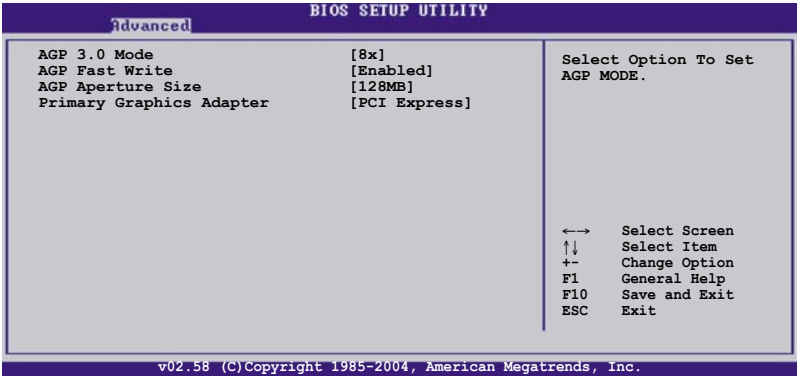
Active to CMD(Trcd) [5T]

Configuration options: [2T] [3T] [4T] [5T]

DRAM BUS Selection [Single Channel]

Configuration options: [Auto] [Single Channel] [Dual Channel]

AGP & P2P Bridge Configuration



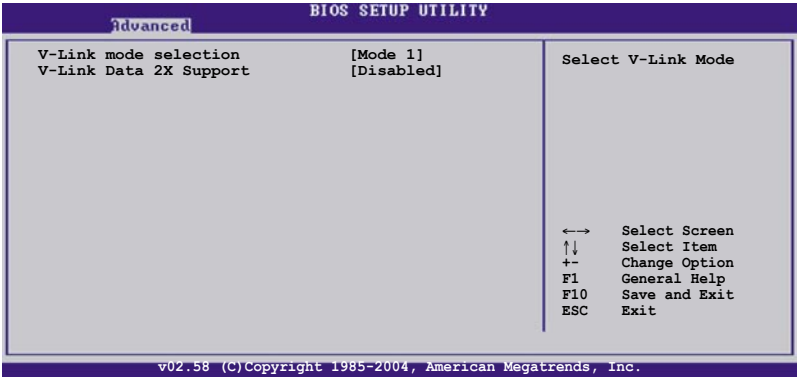
AGP 3.0 Mode [8x]
Configuration options: [8x] [4x]

AGP Fast Write [Enabled]
Configuration options: [Disabled] [Enabled]

AGP Aperture Size [128MB]
Configuration options: [32MB] [64MB] [128MB] [256MB] [1GB]

Primary Graphics Adapter [PCI Express]
Configuration options: [PCI] [AGP] [PCI Express]

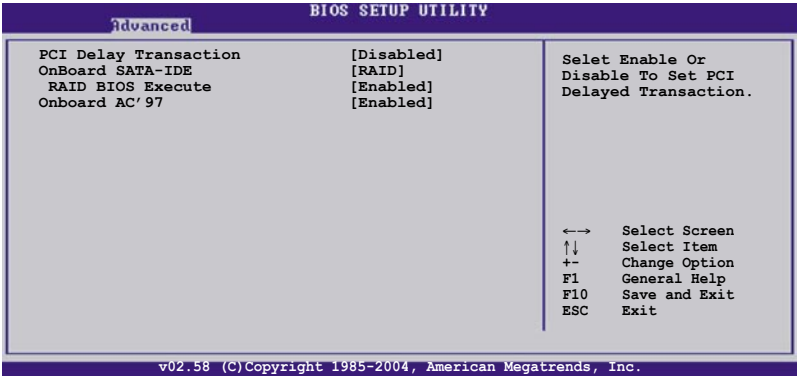
V-Link & PCI Bus Configuration



V-Link mode selection [Mode 1]
Configuration options: [Auto] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4]

V-Link Data 2X Support [Disabled]
Configuration options: [Disabled] [Enabled]

SouthBridge VIA VT8237R Configuration



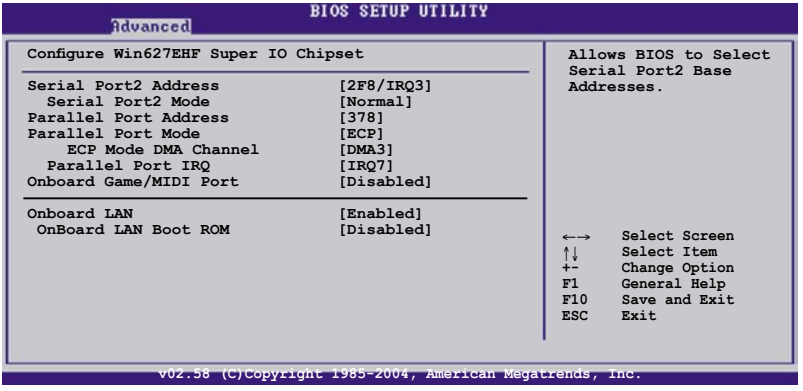
PCI Delay Transaction [Disabled]
Configuration options: [Disabled] [Enabled]

OnBoard SATA-IDE [RAID]
Configuration options: [Disabled] [SATA] [RAID]

RAID BIOS Execute [Enabled]
Configuration options: [Disabled] [Enabled]

OnBoard AC'97 Audio [Enabled]
Configuration options: [Enabled] [Disabled]

4.4.5 Onboard Devices Configuration



Serial Port2 Address [2F8/IRQ3]

Allows you to select the Serial Port2 base address. Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Serial Port2 Mode [Normal]

Allows you to select the Parallel Port2 mode. Configuration options: [Normal] [IrDA] [ASK IR]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [ECP]

Allows you to select the Parallel Port mode. Configuration options: [Normal] [Bi-Directional] [EPP] [ECP]

ECP Mode DMA Channel [DMA3]

Appears only when the Parallel Port Mode is set to [ECP]. This item allows you to set the Parallel Port ECP DMA.
Configuration options: [DMA0] [DMA1] [DMA3]

Parallel Port IRQ [IRQ7]
Configuration options: [IRQ5] [IRQ7]

Onboard Game/MIDI Port [Disabled]

Allows you to select the Game Port address or to disable the port. Configuration options: [Disabled] [200/300] [200/330] [208/300] [208/330]

OnBoard LAN [Enabled]

Allows you to enable or disable the onboard PCI Express Gigabit LAN controller. Configuration options: [Disabled] [Enabled]

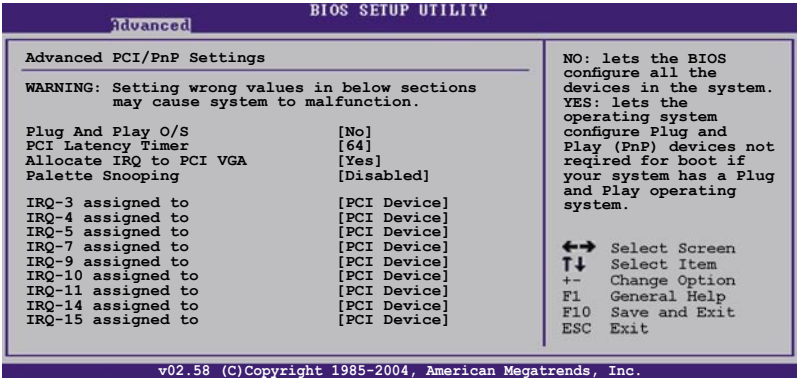
OnBoard LAN Boot ROM [Enabled]

Allows you to enable or disable the OnBoard LAN Boot ROM. Configuration options: [Enabled] [Disabled]

4.4.6 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.

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



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]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [Yes][No]

Palette Snooping [Disabled]

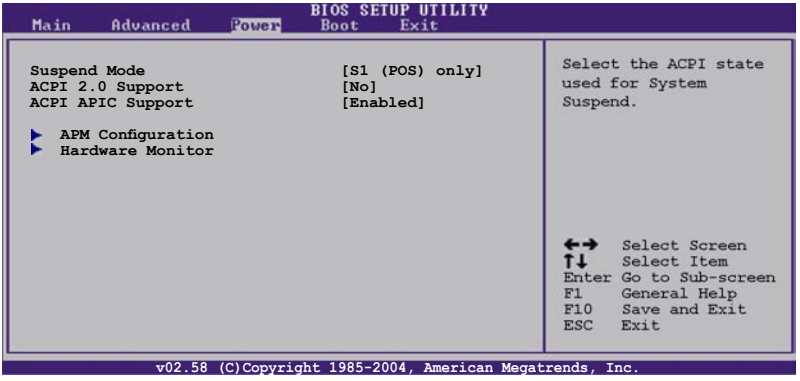
When set to [Enabled], the pallete snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

IRQ-xx assigned to [PCI Device]

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

4.5 Power menu

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



4.5.1 Suspend Mode [S1 (POS) Only]

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]

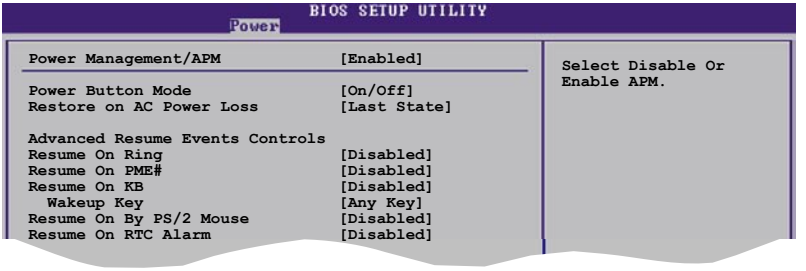
4.5.2 ACPI 2.0 Support [No]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [No] [Yes]

4.5.3 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

4.5.4 APM Configuration



Power Management/APM [Enabled]

Allows you to enable or disable the Power Management/APM function. Configuration options: [Disabled] [Enabled]

Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed. Configuration options: [On/Off] [Standby] [Suspend]

Restore on AC Power Loss [Last State]

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]

Resume On Ring [Disabled]

Configuration options: [Disabled] [Enabled]

Resume On PME# [Disabled]

Configuration options: [Disabled] [Enabled]

Resume On KB [Disabled]

Allows you to use specific keys on the 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] [Enabled]

Wake-Up Key [Any Key]

Allows you to use any key to generate a wake event.

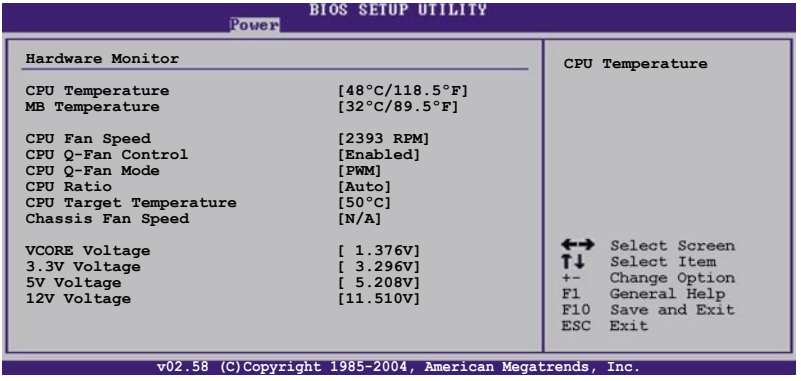
Resume On By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Resume 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, and RTC Alarm Second appear with set values. Configuration options: [Disabled] [Enabled]

4.5.5 Hardware Monitor



CPU Temperature [xxxC/xxxF]
MB Temperature [xxxC/xxxF]

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

CPU Fan Speed [xxxxRPM] or [Ignored]

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 Ingnored.

CPU Q-Fan Control [Disabled]

Allows you to enable or disable the ASUS Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]

The CPU Q-Fan Mode, CPU Fan Ratio, CPU Target Temperature, and Chassis Q-Fan Control items appear when you enable the CPU Q-Fan Control feature.

CPU Q-Fan Mode [PWM]

Allows you to select the type of CPU fan cable connected to the CPU fan connector. Set to [PWM] when using a 4-pin CPU fan cable. Set to [DC] when using a 3-pin CPU fan cable. Configuration options: [PWM] [DC]

Some CPU fans with a 4-pin cable do not comply with Intel's PWM fan specification. When using this type of CPU fan , you can not reduce the CPU fan speed even if you set the CPU Q-Fan Mode to [PWM].

CPU Fan Ratio [AUTO]

Allows you to select the appropriate CPU fan speed ratio for the system. The defaault [Auto] automatically selects the fan speed ratio when operating a low CPU temperaturue. Select a higher ratio if you installed additional devices and the system requires more ventilation. Configuration options: [Auto] [90%] [80%] [70%] [60%] [50%] [40%] [30%] [20%]

CPU Target Temperature [xxºC]

Allows you to set the CPU temperature threshold when the CPU fan speed is increased to lower the CPU temperature. This item appears only when the CPU Q-Fan Control item is Enabled. The configuration options vary depending on the CPU installed. Configuration options: [35ºC] [38ºC] [41ºC] [44ºC] [47ºC] [50ºC] [53ºC] [56ºC] [59ºC] [62ºC] [65ºC]

Chassis Fan Speed [xxxxRPM] or [N/A] ([Ingnored] [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 chassis, the specific field shows N/A.

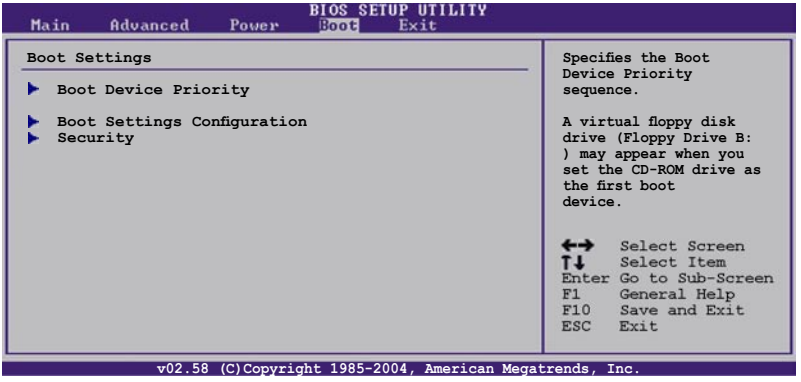
Some CPU fans with a 4-pin cable do not comply with Intel®'s PWM fan specification. When using this type of CPU fan, you can not reduce the CPU fan speed even if you set the CPU Q-Fan Mode to [PWM].

VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

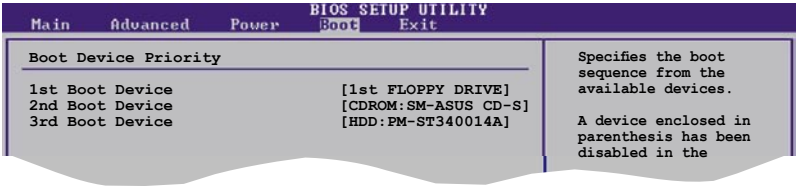
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

4.6 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.



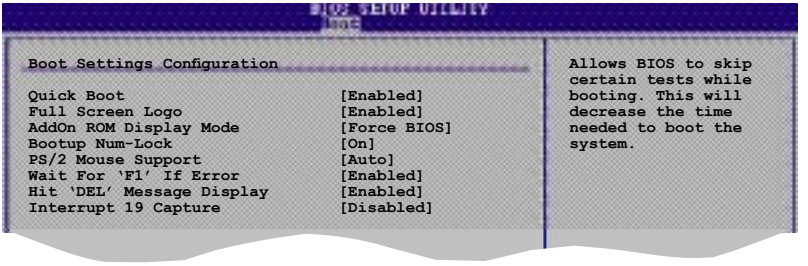
4.6.1 Boot Device Priority



1st ~ xxth Boot Device [1st Floppy 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: [xxxxx Drive] [Disabled]

4.6.2 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 MyLogo2™ 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]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.
Configuration options: [Disabled] [Enabled] [Auto]

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]

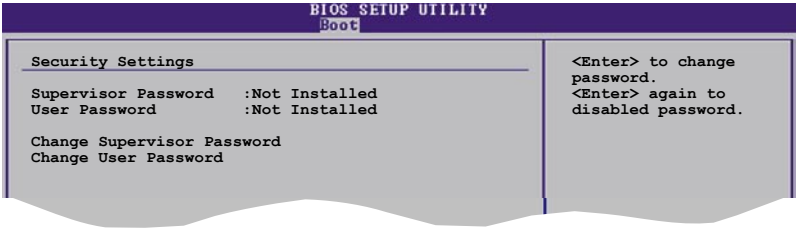
When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.
Configuration options: [Disabled] [Enabled]

4.6.3 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 have set a password, this item shows **Installed**.

To set a Supervisor Password:

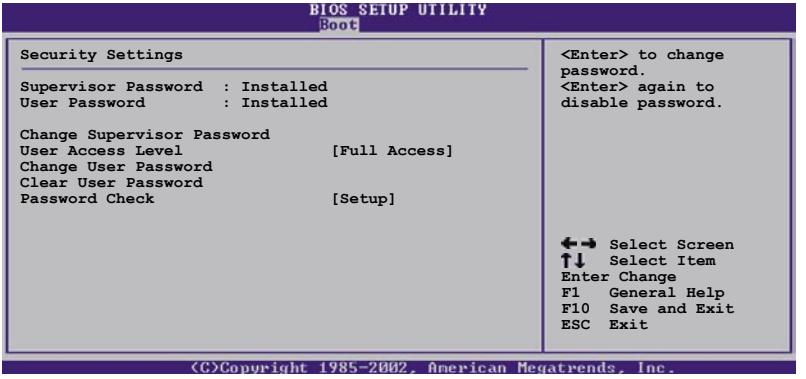
1. Select the Change Supervisor Password item and press **<Enter>**.
2. From the password box, type a password combination of at least six (6) letters and/or numbers, then press **<Enter>**.
3. Confirm the password when prompted. The message "Password Installed" appears after you have successfully set your password. The Supervisor Password item now shows **Installed.**

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 clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section "2.6 Jumpers" for information on how to erase the RTC RAM.

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



User Access Level [Full Access]

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 change 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 have 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 combination of at least six (6) letters and/or numbers, then press **<Enter>**.
3. Confirm the password when prompted. The message "Password Installed" appears after you have successfully set your password. The User Password item now shows **Installed**.

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

Clear User Password

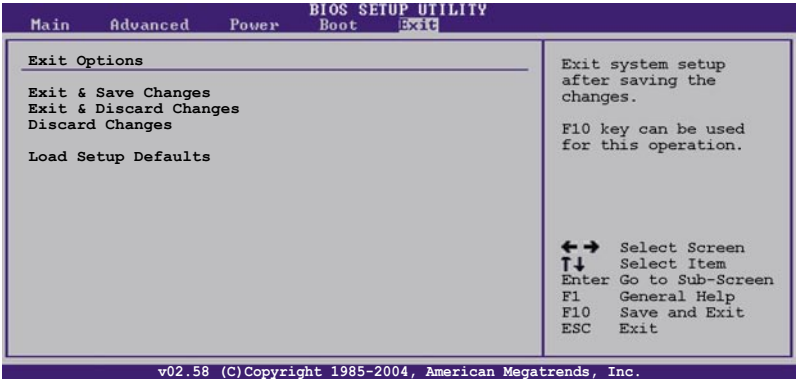
Select this item if you wish to clear the user password.

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]

4.7 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 Yes 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 Yes 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 Yes 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 CD that comes with the motherboard package.

5 Software Support

Chapter summary

5.1 Installing an operating system

This motherboard supports Windows® 2000/2003 Server/XP 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® 2000 Service Pack 4 or the Windows® XP Service Pack 1 or later versions before installing the drivers for better compatibility and system stability.

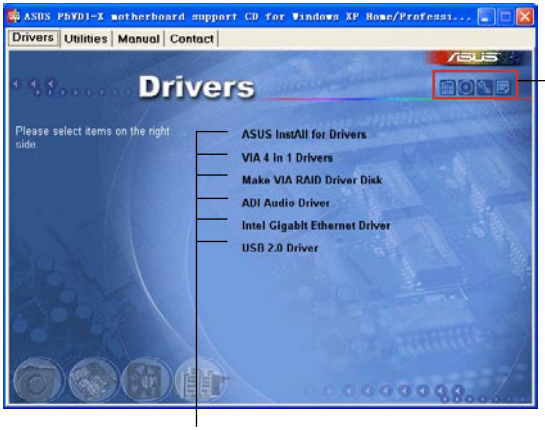
5.2 Support CD information

The support CD 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 CD are subject to change at any time without notice. Visit the ASUS website(www.asus.com) for updates.

5.2.1 Running the support CD

Place the support CD to the optical drive. The CD automatically displays the Drivers menu if Autorun is enabled in your computer.



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

5.2.2 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 for Drivers

InstAll for Drivers.

VIA 4 in 1 Drivers

Install VIA 4 in 1 Drivers.

Make VIA RAID Driver Disk

Make VIA RAID Driver Disk. Allow you to browse the path \Drivers\Chipset\DrvDisk to refer the uncompressed files.

ADI Audio Driver

Installl ADI Audio Driver.

Intel Gigabit Ethernet Driver

Install Intel Gigabit Ethernet Driver

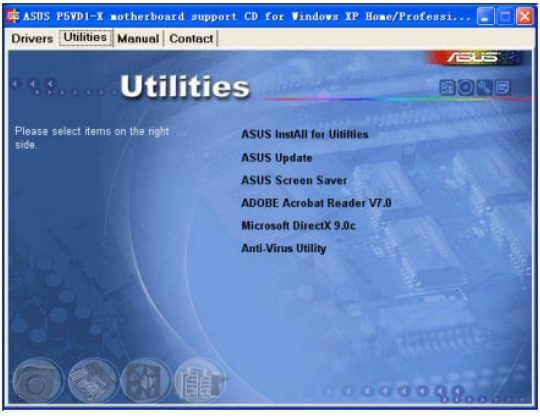
USB 2.0 Driver

Installl the USB 2.0 driver..

The screen display and drivers option may not be the same for different operating system versions.

5.2.3 Utilities menu

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



ASUS InstAll for Utiliities

Auto Install All Utilities.

ASUS Update

ASUS Update can help user to download and flash BIOS. Please install Network Card and TCP/IP network driver first, otherwise ASUS Update can not work properly.

ASUS Screen Saver

Installs the ASUS screen saver.

ADOBE Acrobat Reader V7.0

Installs the Adobe® Acrobat® Reader V7.0.

Microsoft DirectX 9.0c

Installs the Microsoft® DirectX 9.0c driver.

Anti-virus Utility

Installs the anti-virus program. View the online help for detailed information.

The screen display and utilities option may not be the same for different operating system versions.

5.2.4 Manuals menu

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

Install the Adobe® Acrobat® Reader from the Utilities menu before opening the manual files.

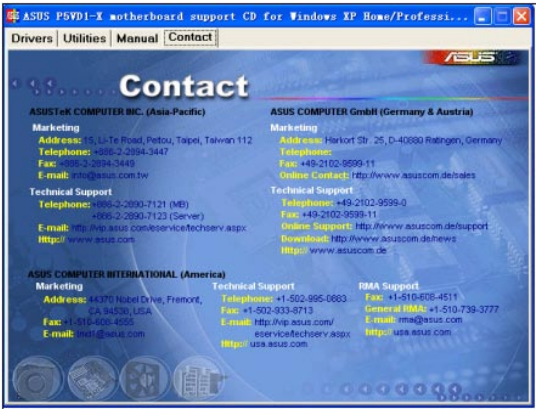
Intel LGA775 CPU Install User's Manual

Allows you to open the Intel® LGA775 CPU installation user's manual.

The screen display and manuals option may not be the same for different operating system versions.

5.2.5 ASUS Contact information

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

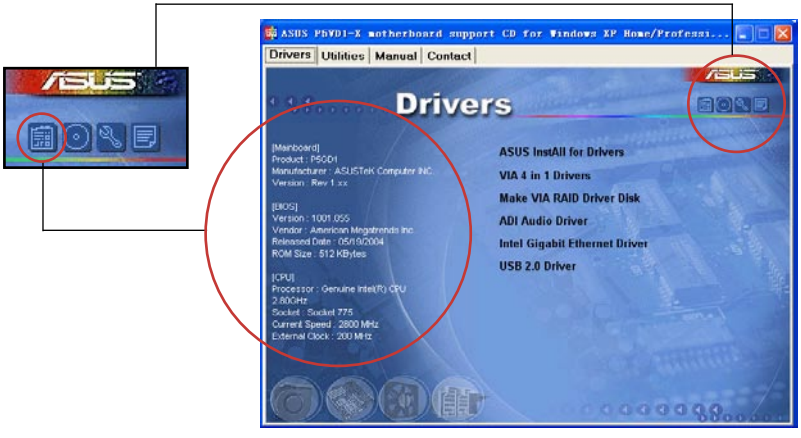


5.2.6 Other information

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

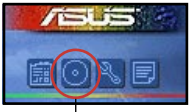
Motherboard Info

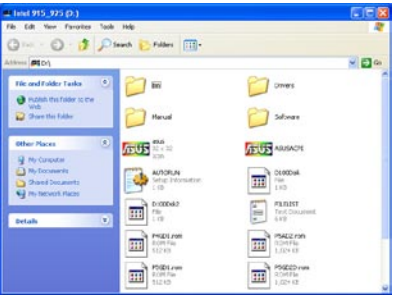
Displays the general specifications of the motherboard.



Browse this CD

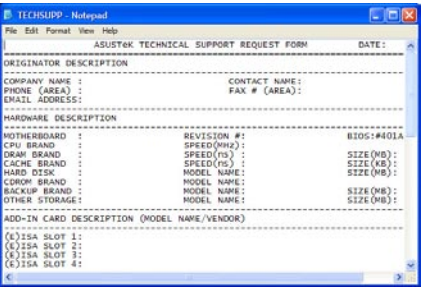
Displays the support CD contents in graphical format.





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 CD and a brief description of each in text format.

5.3 Software information

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

ASUS MyLogo2™

The ASUS MyLogo2™ utility lets you customize the boot logo. The boot logo is the image that appears on screen during the Power-On-Self-Tests (POST). The ASUS MyLogo2™ is automatically installed when you install the ASUS Update utility from the support CD. See section "5.2.3 Utilities menu" for details.

- Before using the ASUS MyLogo2™, use the AFUDOS utility to make a copy of your original BIOS file, or obtain the latest BIOS version from the ASUS website. See section "4.1.2 AFUDOS utility".
- Make sure that the BIOS item Full Screen Logo is set to [Enabled] if you wish to use ASUS MyLogo2™. See section "4.6.2 Boot Settings Configuration".
- You can create your own boot logo image in GIF, JPG, or BMP file formats.

To launch the ASUS MyLogo2™:

1. Launch the ASUS Update utility. Refer to section "4.1.4 ASUS Update utility" for details.
2. Select Options from the drop down menu, then click Next.
3. Check the option Launch MyLogo2 to replace system boot logo before flashing BIOS, then click Next.
4. Select Update BIOS from a file from the drop down menu, then click Next.
5. When prompted, locate the new BIOS file, then click Next. The ASUS MyLogo2 window appears.
6. From the left window pane, select the folder that contains the image you intend to use as your boot logo.

7. When the logo images appear on the right window pane, select an image to enlarge by clicking on it.

8. Adjust the boot image to your desired size by selecting a value on the Ratio box.

9. When the screen returns to the ASUS Update utility, flash the original BIOS to load the new boot logo.
10. After flashing the BIOS, restart the computer to display the new boot logo during POST.

5.4 VIA RAID configurations

The motherboard includes a high performance IDE RAID controller integrated in the VIA VT8237R southbridge chipset. It supports RAID 0, RAID 1 and JBOD with two independent Serial ATA channels.

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

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

JBOD (Spanning) stands for Just a Bunch of Disks and refers to hard disk drives that are not yet configured as a RAID set. This configuration stores the same data redundantly on multiple disks that appear as a single disk on the operating system. Spanning does not deliver any advantage over using separate disks independently and does not provide fault tolerance or other RAID performance benefits.

If you use either Windows® XP or Windows® 2000 operating system (OS), copy first the RAID driver from the support CD to a floppy disk before creating RAID configurations. Refer to section “5.5 Creating a RAID driver disk” for details.

5.4.1 Installing hard disks

The VIA VT8237 southbridge supports Ultra DMA 133/100 and Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

Installing Serial ATA (SATA) hard disks

To install the SATA hard disks for a RAID configuration:

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

5.4.2 VIA RAID configurations

The motherboard includes a high performance IDE RAID controller integrated in the VIA VT8237R southbridge chipset. It supports RAID 0 and RAID 1 with two independent Serial ATA channels.

Setting the BIOS RAID items

After installing the hard disk drives, make sure to set the necessary RAID items in the BIOS before setting your RAID configuration.

To set the BIOS RAID items:

1. Boot the system and press <Del> during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.
2. From the Advanced > I/O Device Configuration menu in the BIOS, then Set the OnBoard ATA Boot ROM item as Enabled.
3. Save your changes and exit Setup.

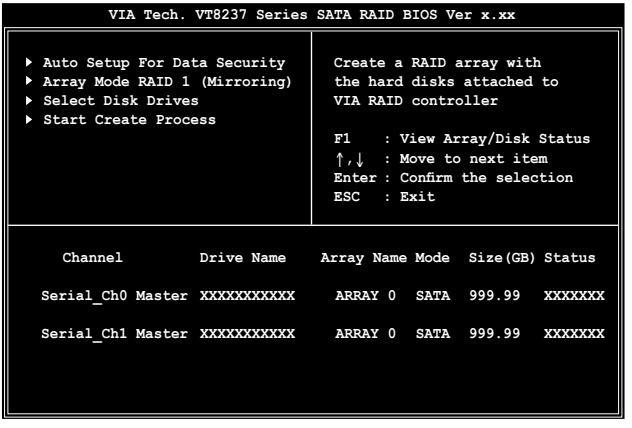
Entering the VIA Tech RAID BIOS Utility

1. Boot up your computer.
2. During POST, press <Tab> to enter VIA RAID configuration utility. The following menu options will appear.

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

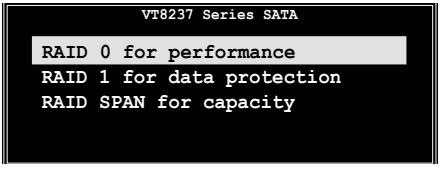
Create Array

From the VIA RAID BIOS utility main menu, select Create Array then press <Enter>. The main menu items on the upper-left corner of the screen are replaced with create array menu options.



RAID 0 for performance

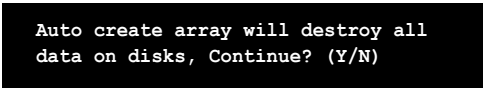
1. From the create array menu, select Array Mode, then press <Enter>. The supported RAID configurations appear on a pop-up menu.



2. Select RAID 0 for performance then press <Enter>.

   From this point, you may choose to auto-configure the RAID array by selecting Auto Setup for Performance or manually configure the RAID array for stripped sets. If you want to auto-configure, proceed to the next step, otherwise, skip to step 5.

3. Select Auto Setup for Performance and press <Enter>. The following confirmation message appears.

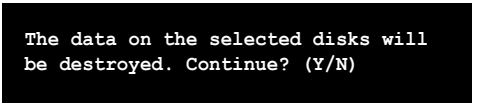


4. Press <Y> to confirm or <N> to return to the configuration options. If you selected <Y>, proceed to step 9.
5. Select Select Disk Drives, then press <Enter>. Use arrow keys to select disk drive, then press <Enter> to mark selected drive. An asterisk appears before a selected drive.
6. Select Block Size, then press <Enter> to set array block size. A list of valid array block sizes are displayed on a pop-up menu.

TIP: For server systems, use of a lower array block size is recommended. For multimedia computer systems used mainly for audio and video editing, a higher array block size is recommended for optimum performance.

   Use arrow keys to move selection bar on items and press <Enter> to select.

7. Select Start Create Process and press <Enter> to set up hard disk for RAID system. The following confirmation message appears:

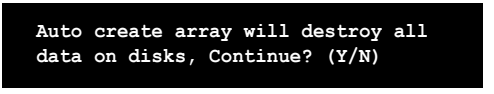


8. Press <Y> to confirm or <N> to return to the configuration options.
9. Press <Esc> to go back to main menu.

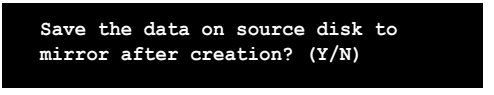
RAID 1 for data protection

1. From the create array menu, select Array Mode, then press <Enter>. The supported RAID configurations appear on a pop-up menu.

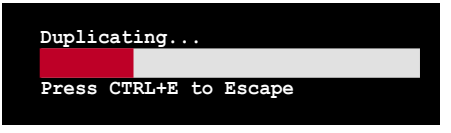
2. Select RAID 1 for data protection then press <Enter>.
3. From this point, you can auto-configure the RAID array by selecting Auto Setup for Data Security or manually configure the RAID array for mirrored sets. If you want to auto-configure, proceed to the next step, otherwise, skip to step 6.
4. Select Auto Setup for Data Security and press <Enter>. The following confirmation message appears.



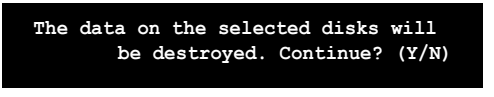
5. Press <Y> to confirm or <N> to return to the configuration options. If you selected <Y>, proceed to step 11.
6. Select Select Disk Drives, then press <Enter>. Use arrow keys to select disk drive/s, then press <Enter>. An asterisk appears before a selected drive.
7. Select Start Create Process and press <Enter> to setup hard disk for RAID system. The following inquiry appears:



8. If you select <Y> the utility will duplicate your data. Press <Y> anytime if you want to exit the duplication process.



9. If you select <N>, the following confirmation message appears.



10. Press <Y> to confirm or <N> to return to the configuration options.
11. Press <Esc> to go back to main menu.

5.5 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® 2000/XP operating system. on a hard disk drive that is included in a RAID set. You can create a RAID driver disk using your motherboard support CD.

To create a RAID driver disk:

1. Insert the motherboard support CD into the CD-ROM drive.
2. When the Drivers menu appears, click MakeDisk to creat a VIA 8237 RAID Driver Disk

   Or

   Browse the contents of the support CD to locate the driver disk utility and go to \Drivers\MakeDisk\MakeDisk for the VIA RAID driver disk utility.

Refer to section "5.2.2 Drivers menu" for details.

3. Insert floppy disk to floppy disk drive.
4. Follow succeeding screen information to complete process.
5. Write-protect the floppy disk to avoid computer virus infection.

To install the RAID driver:

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. Follow the succeeding screen instructions to complete the installation.