

P5VDC-TVM



Motherboard

E2569

First Edition
April 2006

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Notices

Federal Communications Commission Statement

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

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

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

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



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

Canadian Department of Communications Statement

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

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

Safety information

Electrical safety

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

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.



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

P5VDC-TVM specifications summary

CPU	LGA775 socket for Intel® Pentium® 4/Celeron processor Compatible with Intel® Mainstream/Value FMB processors Supports Intel® Hyper-Threading Technology
Chipset	Northbridge: VIA P4M800 PRO Southbridge: VIA VT8237R Plus
Front Side Bus	800/533 MHz
Memory	2 x 240-pin DIMM sockets support unbuffered and non-ECC 533 MHz DDR memory modules
Expansion slots	3 x PCI slots
Storage	VIA VT8237R Plus Southbridge supports: <ul style="list-style-type: none">- 4 x Ultra ATA 133/100/66 hard disk drives- 2 x Serial ATA hard disk drives
Audio	Realtek® ALC655 6-channel CODEC
LAN	Realtek® RTL 8110C 10/100 Mbps LAN controller
USB	Supports up to 8 USB 2.0 ports
BIOS features	4 MB LPC Flash ROM, Award BIOS, Green, PnP, DMI, WfM 2.0, ACPI 2.0a, SM BIOS 2.3
Rear panel	1 x PS/2 mouse port 1 x Parallel port 1 x LAN (RJ-45) port 6-channel audio ports 4 x USB 2.0 ports 1 x VGA port 1 x Serial port 1 x PS/2 keyboard port

(continued on the next page)

P5VDC-TVM specifications summary

Internal connectors	1 x Floppy disk drive connector 2 x IDE connectors 2 x Serial ATA connectors 1 x CPU fan connector 1 x Chassis fan connector 4 x USB 2.0 connectors 1 x 20-pin ATX power connector 1 x 4-pin ATX 12 V power connector 1 x Front panel audio connector 1 x CD/AUX audio connector 1 x S/PDIF Out connector 1 x Serial port connector System panel connector
Power requirement	ATX power supply (with 20-pin and 4-pin 12 V plugs) ATX 12 V 2.0 compliant
Form factor	Micro ATX form factor: 9.6 in x 9.0 in (24.5 cm x 23.0 cm)

*Specifications are subject to change without notice.

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

1 Product introduction

1.1 Before you proceed

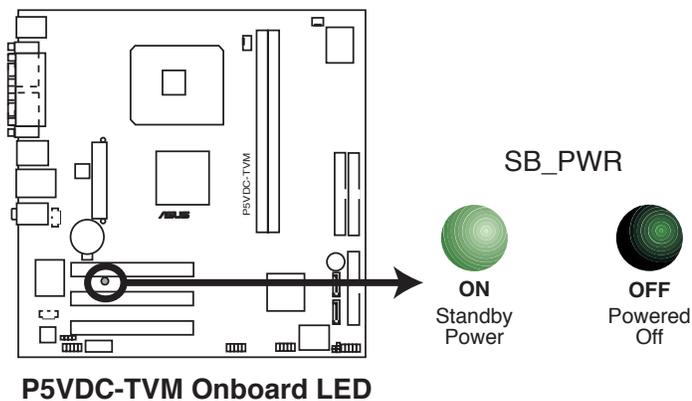
Take note of the following precautions before you install components into the system.



- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- **Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.** Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

Onboard LED

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



1.2 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.

1.2.1 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.

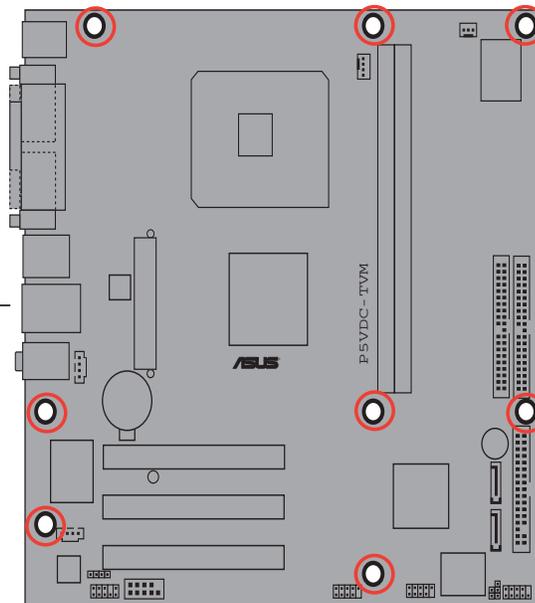
1.2.2 Screw holes

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



Do not overtighten the screws! Doing so can damage the motherboard.

Place this side towards
the rear of the chassis



1.2.4 Layout contents

Slots	Page
1. PCI slots	1-20

Jumpers	Page
1. Clear RTC RAM (3-pin CLRTC)	1-21
2. Flash Write Protection (2-pin FWP)	1-22

Rear panel connectors	Page
1. PS/2 mouse port (green)	1-23
2. Parallel port	1-23
3. LAN (RJ-45) port	1-23
4. Line In port (light blue)	1-23
5. Line Out port (lime)	1-23
6. Microphone port (pink)	1-23
7. USB 2.0 ports 3 and 4	1-24
8. USB 2.0 ports 1 and 2	1-24
9. Video Graphics Adapter (VGA) port	1-24
10. Serial port	1-24
11. PS/2 keyboard port (purple)	1-24

Internal connectors	Page
1. Floppy disk drive connector (34-1 pin FLOPPY)	1-24
2. IDE connector (40-1 pin PRI_IDE, SEC_IDE)	1-25
3. Serial ATA connectors (7-pin SATA1, SATA2)	1-26
4. CPU and Chassis Fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN)	1-27
5. USB connectors (10-1 pin USB56, USB78)	1-28
6. ATX power connectors (20-pin ATXPWR, 4-pin ATX12V)	1-29
7. Front panel audio connector (10-1 pin FP_AUDIO)	1-30
8. Serial port connector (10-1 pin COM2)	1-30
9. Internal audio connector (4-pin CD, AUX)	1-31
10. Digital audio connector (4-1 pin SPDIF_OUT)	1-31
11. System panel connector (10-1 pin PANEL)	1-34
System power LED (2-pin PLED)	
Hard disk drive activity LED (2-pin IDE_LED)	
Power button/soft-off button (2-pin PWRSW)	
Reset button (2-pin RESET)	

1.3 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.

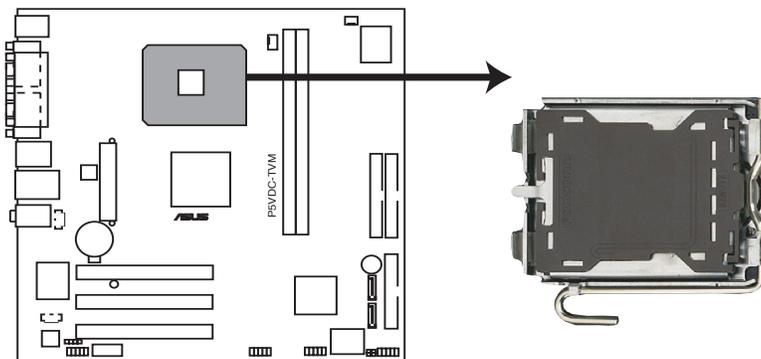


- Your boxed Intel® Pentium® 4 LGA775 processor package should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.
- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

1.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

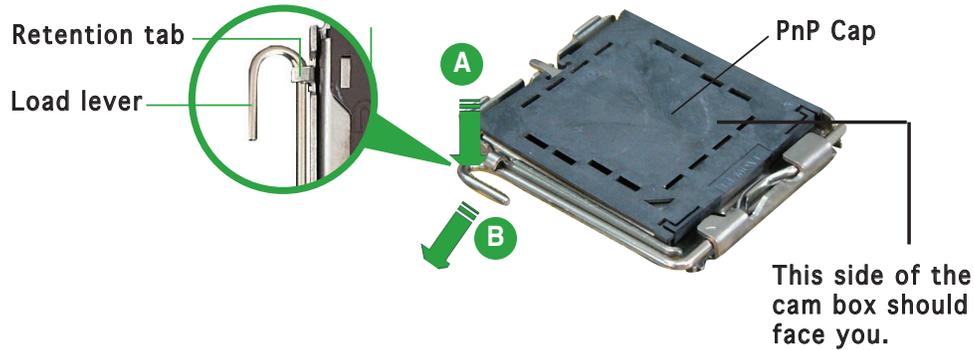


P5VDC-TVM CPU Socket 775



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.

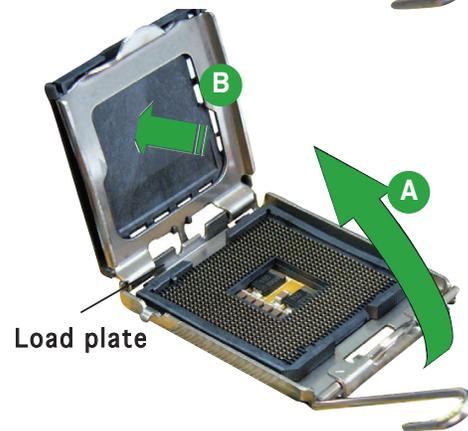


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

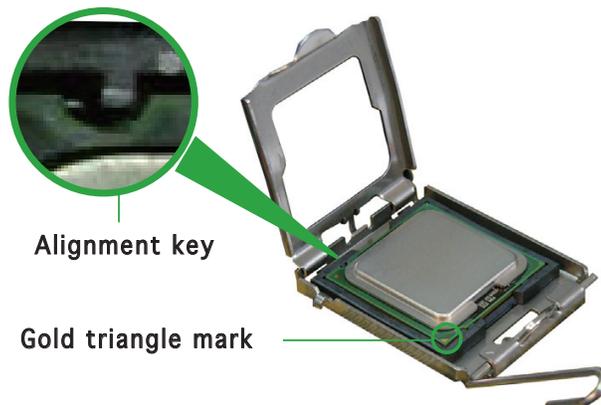
3. Lift the load lever in the direction of the arrow to a 135° angle.



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



5. Position the CPU on the socket, making sure that the gold triangle fixes on the bottom-left corner of the socket. The socket alignment keys should fit into the CPU notches.



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 2: BIOS setup). Under the Advanced BIOS Features 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.

1.3.2 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.
- Your Intel® Pentium® 4 LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install it.



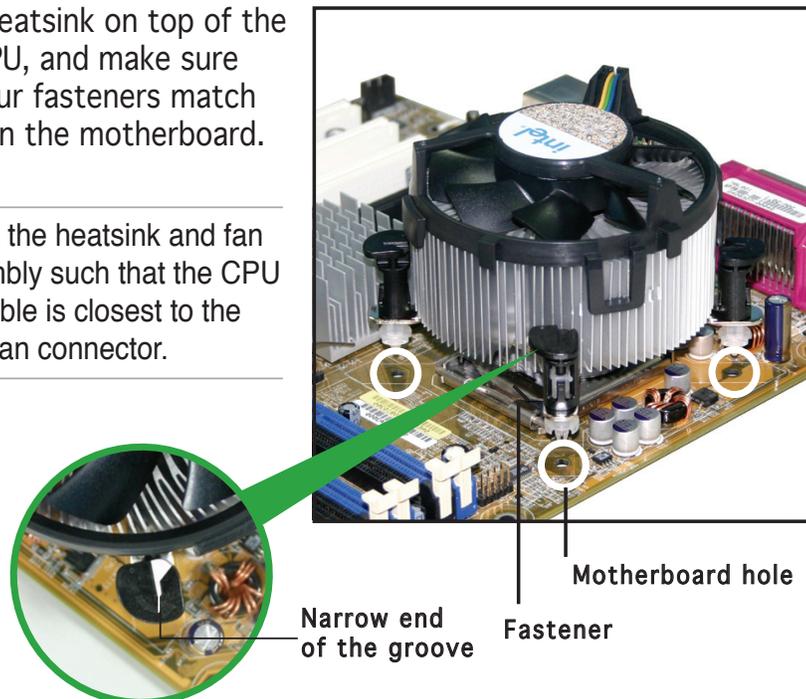
- Make sure that you use Intel®-certified multi-directional heatsink and fan only.
- Make sure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.

To install the CPU heatsink and fan:

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

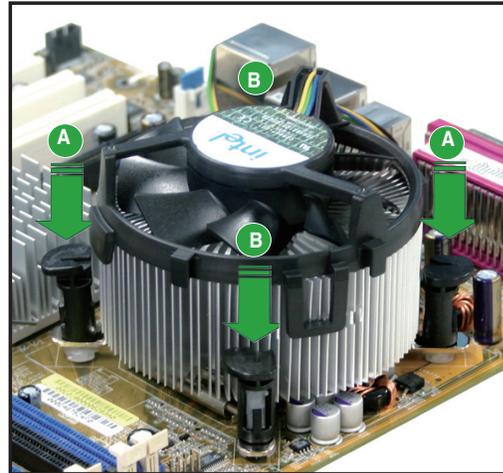
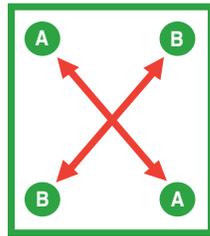


Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

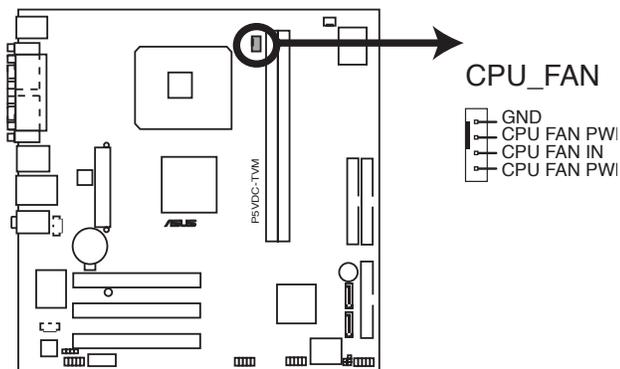


Make sure to orient each fastener with the narrow end of the groove pointing outward. (The photo shows the groove shaded for emphasis.)

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



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



P5VDC-TVM CPU FAN Connector



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

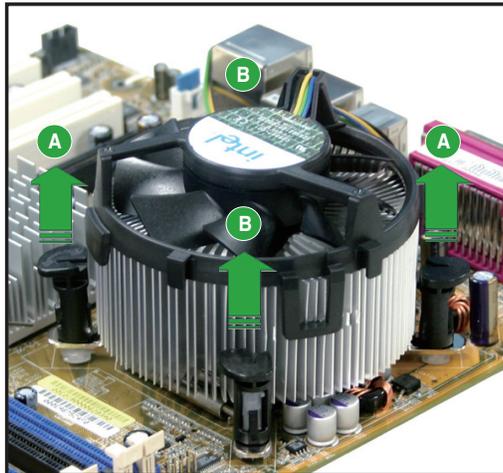
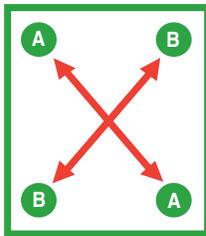
1.3.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

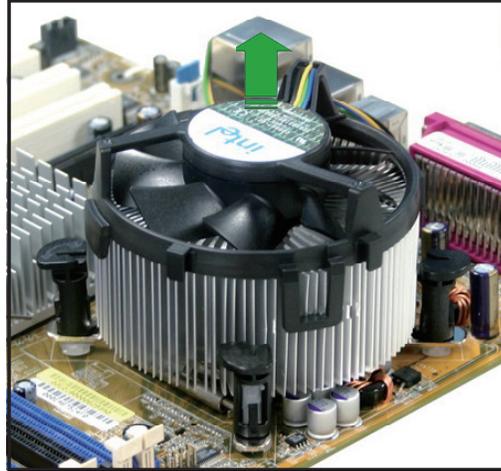
1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise.



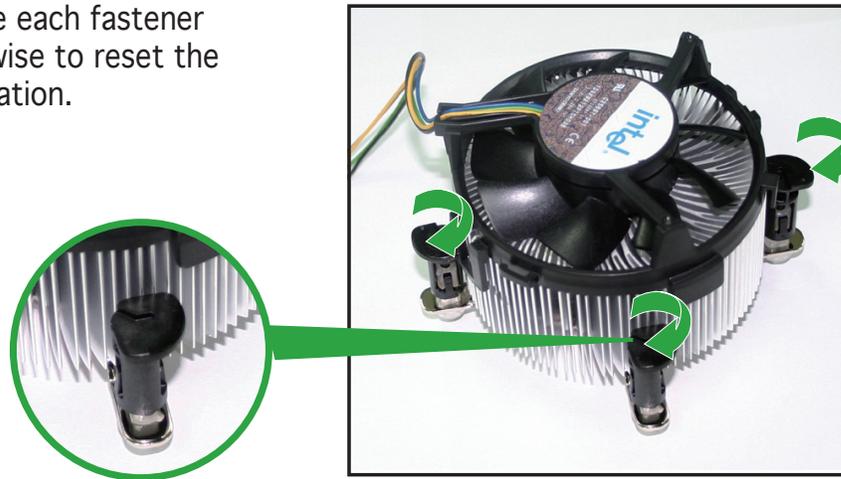
3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.



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



5. Rotate each fastener clockwise to reset the orientation.



Narrow end of the groove



When reset, each fastener should be oriented as shown, with the narrow groove directed outward.

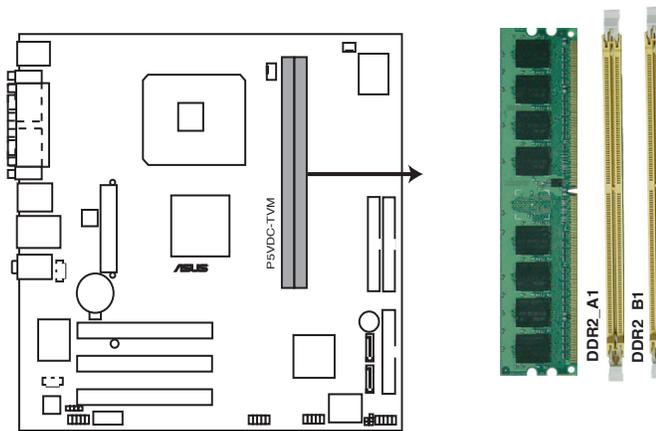


1.4 System memory

1.4.1 DIMM sockets location

The motherboard comes with two 240-pin Double Data Rate 2 (DDR2).

The following figure illustrates the location of the sockets:



P5VDC-TVM DDR2 DIMM Sockets

1.4.2 Memory Configurations

You may install 256 MB, 512 MB and 1 GB unbuffered and non-ECC DDR2 DIMMs into the DIMM sockets using the memory configurations in this section.



- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Refer to the DDR2 Qualified Vendors List on the next page for details. Visit the system builder's website for the latest DDR2 Qualified Vendors List.
- Due to chipset resource allocation, the system may detect less than 2 GB system memory when you installed two 1 GB DDR2 memory modules.
- This motherboard does not support memory modules made up of 128 Mb chips or double sided x16 memory modules.

DDR2 (533 MHz) Qualified Vendors List

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support
512MB	Hynix	HYMP564U64AP8-C3	Hynix	SS	HY5PS12821A	•
512MB	Hynix	HYMP564U64AP8-Y4 AA	Hynix	SS	HY5PS12821A	•
256MB	Infineon	HYS64T32000HU-3.7-A	N/A	SS	HYB18T512160AF-3.7	•
256MB	Infineon	HYS64T32000HU-3.7-B	N/A	SS	HYB18T5121608BF-3.7	•
512MB	Infineon	HYS64000GU-3.7-A	HY	SS	HYB18T512	•
512MB	Infineon	HYS64T64000GU-3.7-A	N/A	SS	HYB18T512800AC37	•
512MB	Infineon	HYS64T64000HU-3.7-A	N/A	SS	HYB18T512800AF37	•
1024MB	Infineon	HYS64T128020HU-3.7-A	N/A	DS	HYB18T512800AF37	•
2048MB	Infineon	HYS64T256020HU-3.7-A	N/A	DS	HYB18T1G800AF-3.7	•
512MB	MDT	M512-533-8	MDT	SS	18D51280D-3.7	•
256MB	Samsung	M378T3253FG0-CD5	Samsung	SS	K4T560830QF-GC05	•
256MB	Samsung	M378T3253FG0-CCC	Samsung	SS	K4T560830QF-GCCC	•
256MB	Samsung	M378T3253FG0-CD5	Samsung	SS	K4T560830QF-GCD5	•
512MB	Samsung	M378T6553BG0-CD5	Samsung	SS	K4T51083QB-GCD5	•
512MB	Samsung	M378T6453FG0-CD5	Samsung	DS	K4T560830QF-GCD5	•
1024MB	Samsung	M378T2953BG0-CD5	Samsung	DS	K4T51083QB-GCD5	•
512MB	NANYA	NT512T64U88A0F-37B	NANYA	SS	NT5TU64M8AF-37B	•
256MB	SimpleTech	M2GSP2F3G3110A9B0E	SimpleTech	SS	858S032F25A	•
512MB	ELPIDA	EBE51UD8ABFA-5C-E	ELPIDA	SS	E5108AB-5C-E	•
512MB	Kingston	KVR533D2N4/512	N/A	DS	HY5PS56821F-C4	•
1024MB	Kingston	KVR533D2N4/1G	N/A	DS	D6408TE7BL-37	•
2048MB	Kingston	KVR533D2N4/2G	N/A	DS	E1108AA-5C-E	•
256MB	Micron	MT8HTF3264AY-53EB3	Micron	SS	4FBID9CHM	•
512MB	Micron	MT16HTF6464AY-53EB2	Micron	DS	4FBID9CHM	•

SS - Single-sided

DS - Double-sided



Visit the system builder's website for the latest DDR2-533 Qualified Vendors List.

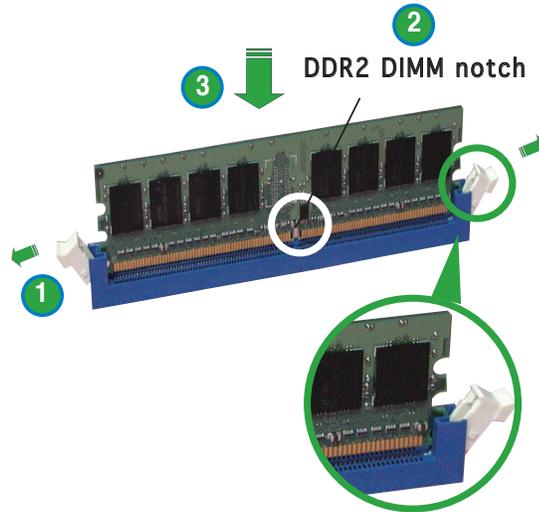
1.4.3 Installing a DDR2 DIMM



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

To install a DDR2 DIMM:

1. Unlock a DDR2 DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



Unlocked retaining clip



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

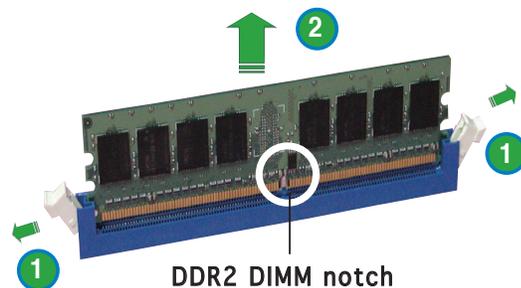
1.4.4 Removing a DDR2 DIMM

Follow these steps to remove a DDR2 DIMM.

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



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



2. Remove the DIMM from the socket.

1.5 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.

1.5.1 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.

1.5.2 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 2 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

1.5.3 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	Communications Port (COM1)*
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

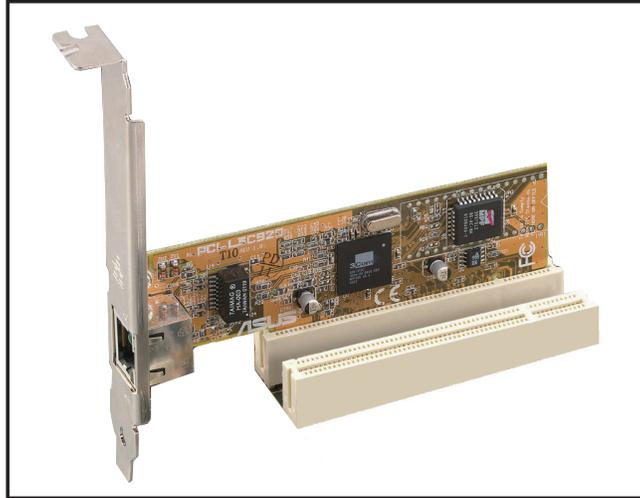
	A	B	C	D	E	F	G	H
PCI slot 1	shared	—	—	—	—	—	—	—
PCI slot 2	—	shared	—	—	—	—	—	—
PCI slot 3	—	—	shared	—	—	—	—	—
Onboard USB controller 0-1	shared	—	—	—	—	—	—	—
Onboard USB controller 2-3	shared	—	—	—	—	—	—	—
Onboard USB controller 4-5	—	shared	—	—	—	—	—	—
Onboard USB controller 6-7	—	shared	—	—	—	—	—	—
Onboard USB 2.0 controller	—	—	shared	—	—	—	—	—
Onboard AC `97 Audio	—	—	shared	—	—	—	—	—
Onboard PCI LAN (10/100 Mbps)	—	—	—	—	shared	—	—	—
Onboard PCI 1394	—	—	—	—	—	shared	—	—
AGP Slot	shared	—	—	—	—	—	—	—



When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments; otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

1.5.4 PCI slots

This motherboard has three 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.



1.6 Jumpers

1. Clear RTC RAM (CLRRTC)

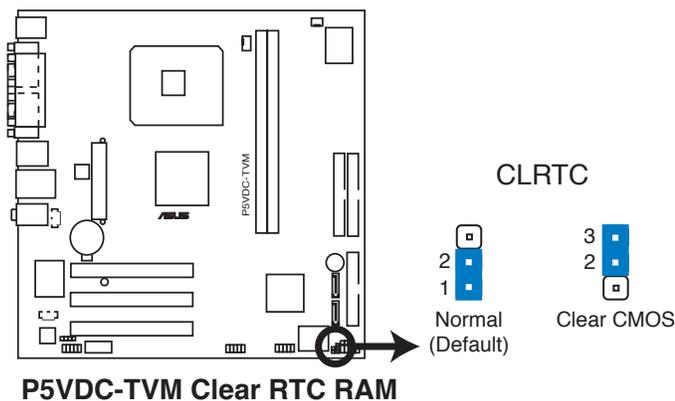
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. 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 key during the boot process and enter BIOS setup to re-enter data.



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

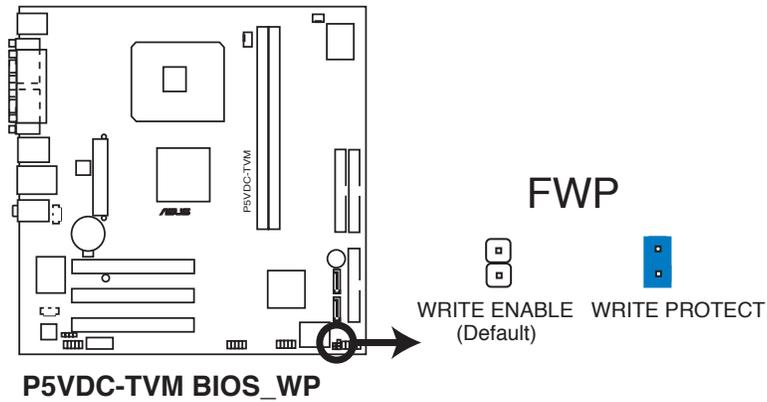


2. Flash Write Protection (FWP)

Place the jumper cap on this jumper to write protect the BIOS. If you need to update your BIOS, remove the jumper cap.

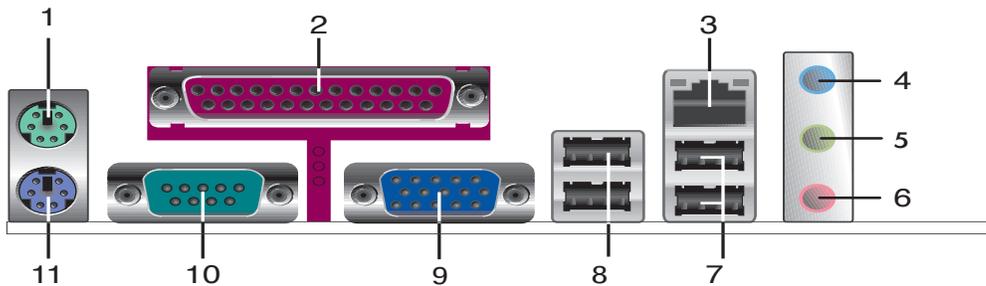


A warning message “Please make sure whether lockout jumper is set to correct or not.” appears when you flash the BIOS with the jumper cap. Remove the jumper cap before you update your BIOS.



1.7 Connectors

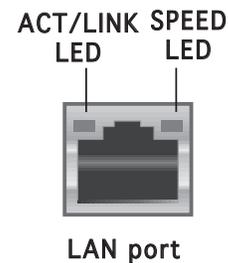
1.7.1 Rear panel connectors



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 10/100 Mbps connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
The optional Gigabit LAN controller allows connection to the Local Area Network (LAN) through a network hub.

LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
GREEN	Linked	ORANGE	100Mbps connection
BLINKING	Acting	GREEN	1Gbps connection



4. **Line In port (light blue).** This port connects a tape, CD, DVD player, or other audio sources.
5. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel, and 6-channel configuration, the function of this port becomes Front Speaker Out.
6. **Microphone port (pink).** This port connects a microphone.



Refer to the audio configuration table on the next page for the function of the audio ports with 6-channel configuration.

Audio 2, 4, or 6-channel configuration

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

- 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. Video Graphics Adapter port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
- 10. Serial port.** This 9-pin COM1 port is for pointing devices or other serial devices.
- 11. PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

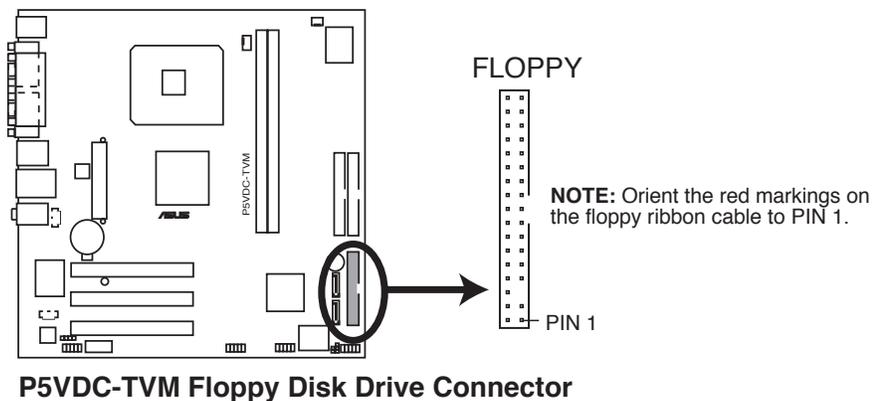
1.7.2 Internal connectors

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 a FDD cable with a covered Pin 5.

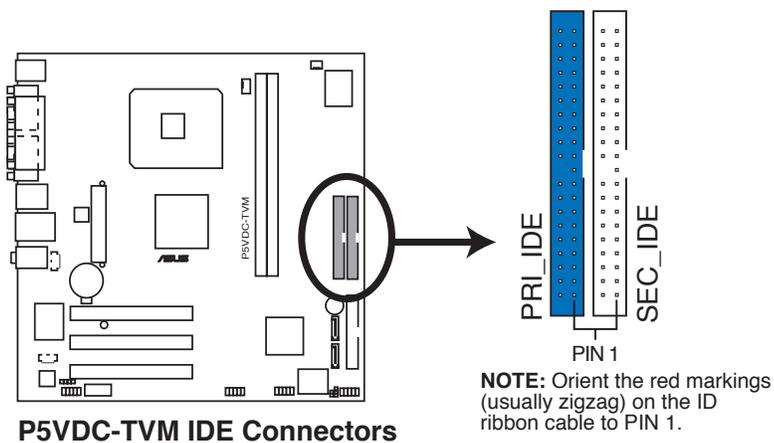


2. IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

These connectors are for Ultra DMA 133/100/66 signal cables. The Ultra DMA 133/100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 133/100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 133/100/66 IDE master device (hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

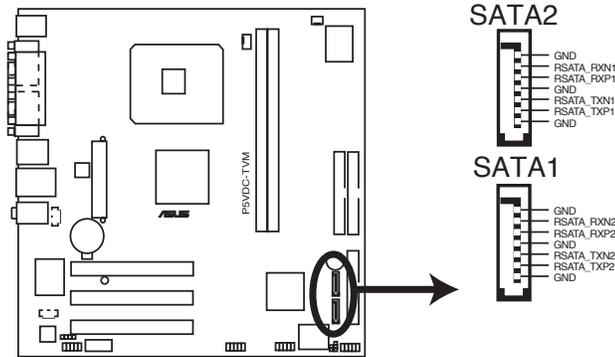


- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.



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

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



P5VDC-TVM SATA Connectors



Important notes on Serial ATA

- Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 before using Serial ATA.
- Plug your Serial ATA boot disk on the master port (SATA1 and SATA2) to support S3 function. Refer to the table below for details.

Serial ATA Master/Slave connectors

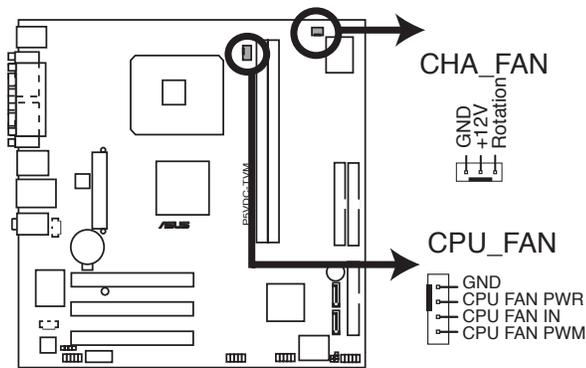
Connector	Color	Setting	Use
SATA1	Black	Master	Boot Disk
SATA2	Black	Slave	Data Disk

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.



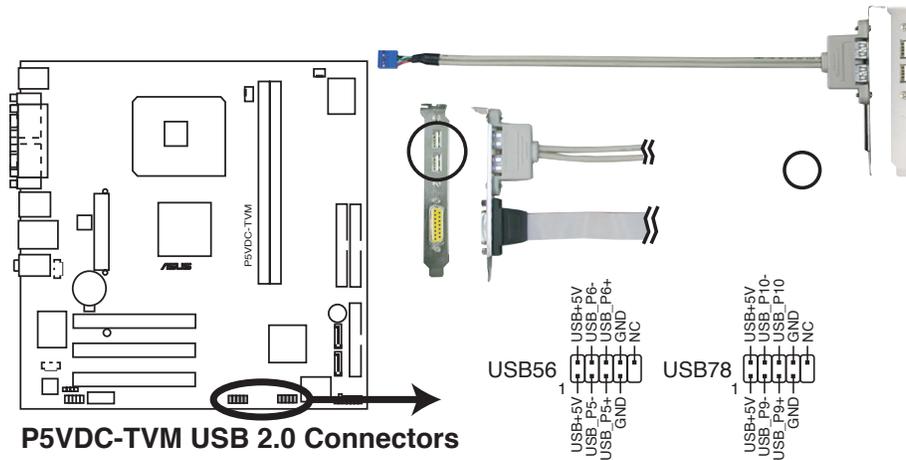
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!



P5VDC-TVM 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.



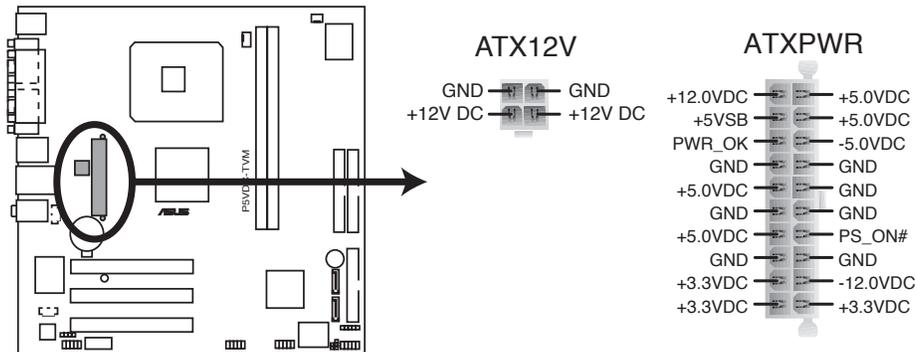
Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!



The USB module is purchased separately.

6. ATX power connectors (20-pin ATXPWR, 4-pin ATX12V)

These connectors are for ATX power supply plugs. 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.



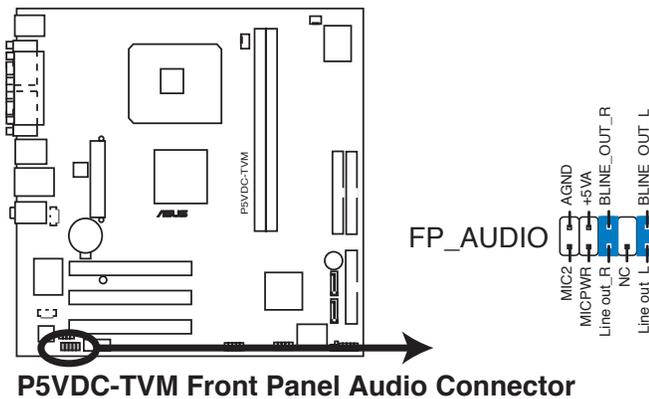
P5VDC-TVM ATX Power Connectors



- You can also use a Power Supply Unit (PSU) with a 24-pin ATX power connector on this motherboard.
- Do not forget to connect the 4-pin ATX +12 V power plug; otherwise, the system will not boot up.
- Use a PSU with a minimum power rating of 300 W on this motherboard. We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

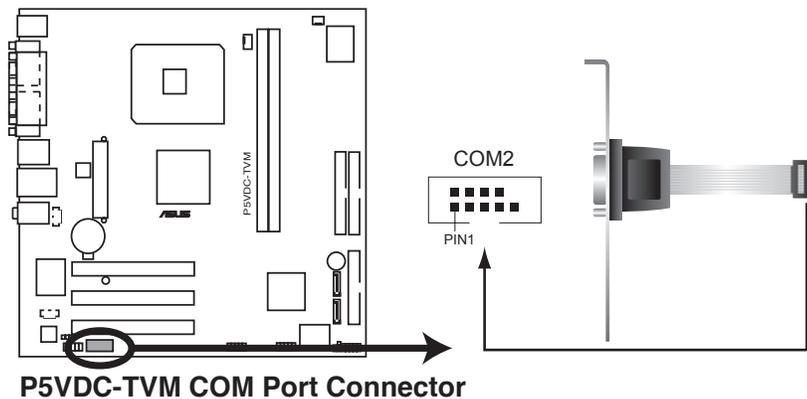
7. Front panel audio connector (10-1 pin FP_AUDIO)

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



8. Serial port connector (10-1 pin COM2)

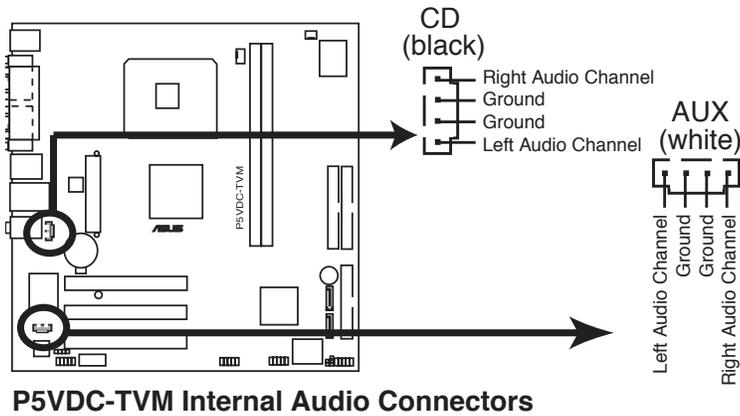
This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



Serial port module is purchased separately.

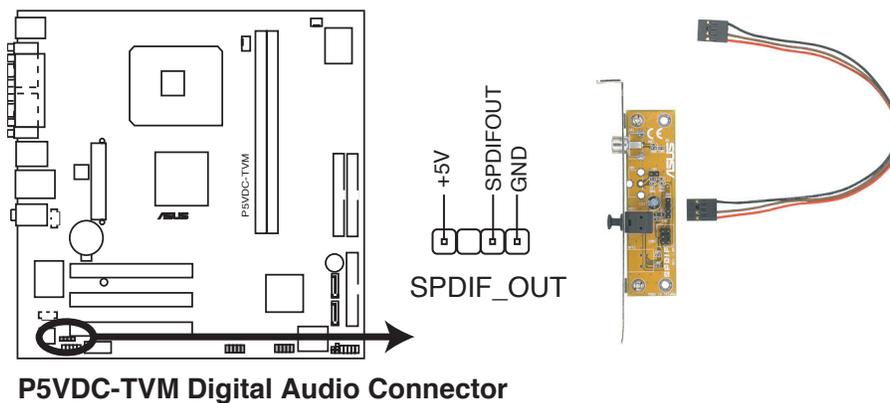
9. Internal audio connectors (4-pin CD, AUX)

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



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

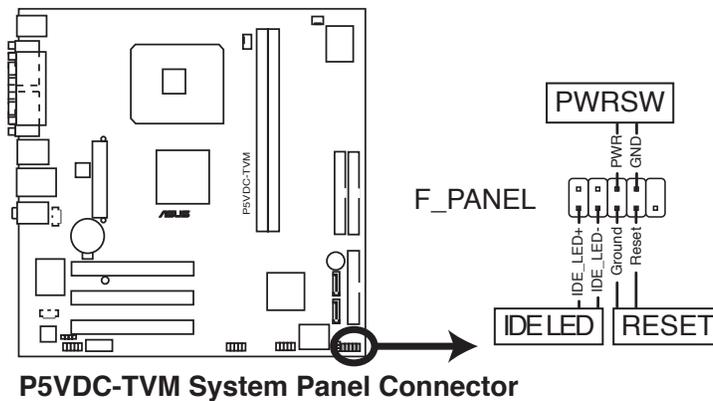
This connector is for additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF module cable to this connector, then install the module to a slot opening at the back of the system chassis.



The S/PDIF module is purchased separately.

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

This connector supports several chassis-mounted functions.



P5VDC-TVM System Panel Connector

- **System power LED (2-pin PLED)**

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



Power LED may remain blinking after AC Power loss or when AC Power cord is plugged in the first time. Only if turning on-off system normally one more time. Power Led will not blink afterwards.

- **Power/soft-off button (2-pin PWR SW)**

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.

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

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

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

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

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

BIOS setup **2**

2.1 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility.

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 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> + , 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.

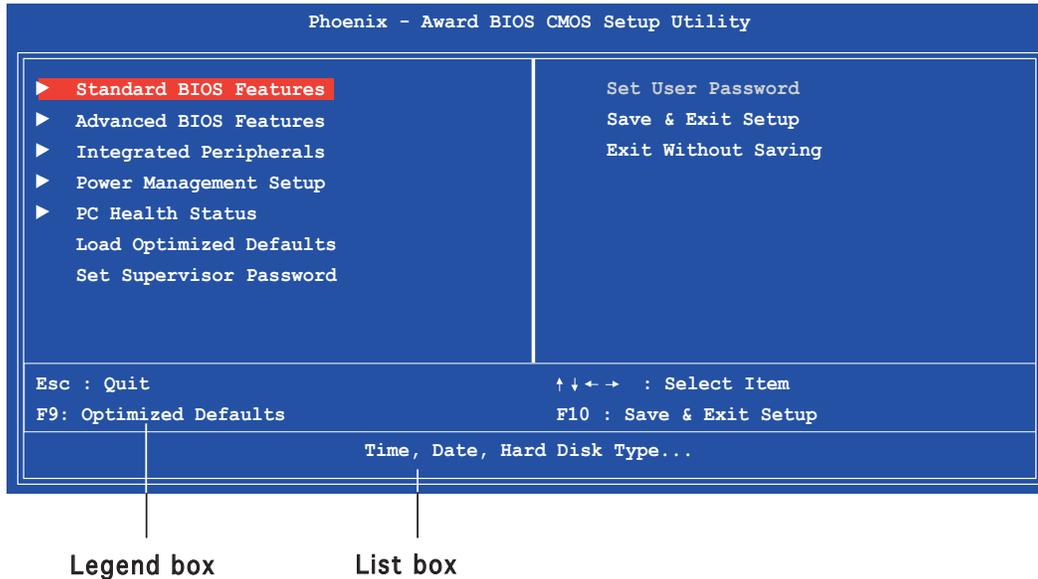
The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.



-
- 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 Optimized Defaults** from the BIOS menu screen. See section “2.2 BIOS menu screen.”
 - 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 system builder’s website to download the latest BIOS file for this motherboard.
-

2.2 BIOS menu screen

When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific menu.



Legend box

The keys in the legend bar allow you to navigate through the various setup menus.

Navigation Key(s)	Function Description
<F1>	Displays the General Help screen from anywhere in the BIOS Setup
<Esc>	Returns to the main menu from a sub-menu or prompts you to quit the setup program
Left or Right arrow	Selects the menu item to the left or right
Up or Down arrow	Moves the highlight up or down between fields
<Enter>	Brings up a selection menu for the highlighted field
<+> or <PgUp>	Moves the cursor to the first field
<-> or <PgDn>	Moves the cursor to the last field
<F5>	Loads the previous values
<F6>	Loads the fail-safe defaults
<F9>	Loads the optimized defaults
<F10>	Saves changes and exits Setup

List box

This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

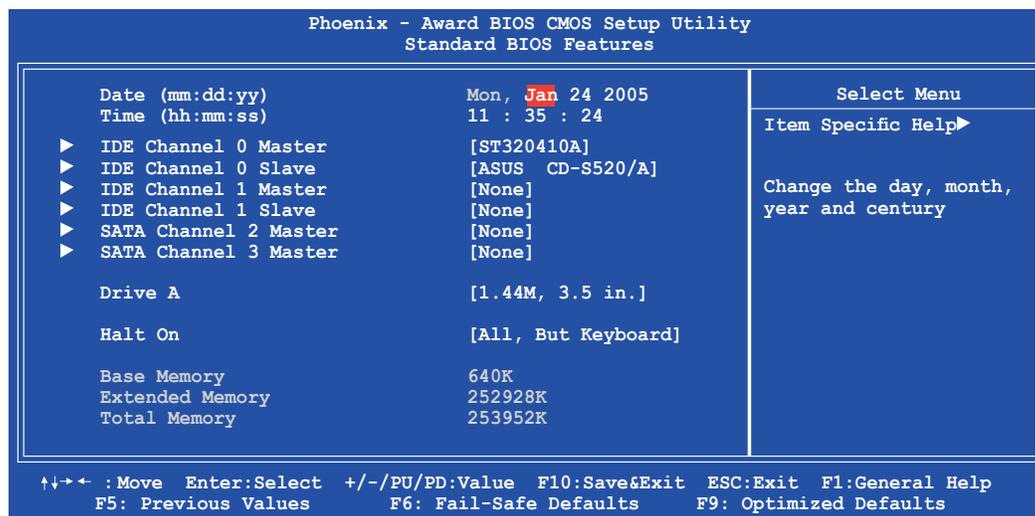
Sub-menu

Note that a right pointer symbol (▶) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, press <F6> to load the fail-safe default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

2.3 Standard BIOS Features

The Standard BIOS Features screen gives you an overview of the basic system information.



Date [Day, xx/xx/xxxx]

Allows you to set the system date.

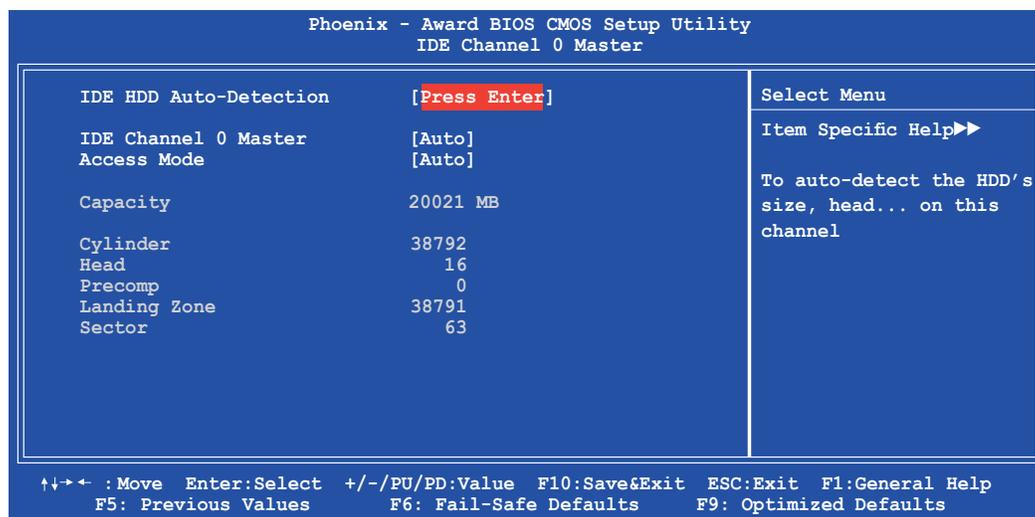
Time [xx:xx:xx]

Allows you to set the system time.

IDE Channel 0 Master/Slave

IDE Channel 1 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.



IDE HDD Auto-Detection [Press Enter]

Allows auto-detection of the hard disk drive's specifications.

IDE Channel 0, 1 Master/Slave [Auto]

Sets the selected channel as Master or Slave.

Configuration options: [None] [Auto] [Manual]

Access Mode [Auto]

This item allows the user to select the sector addressing mode. CHS mode supports 528 MB hard disks. LBA (logical block addressing) mode supports hard disks up to 128 GB in size. Large mode (also called extended CHS mode) supports hard disks above 528 MB in size, but does not support LBA mode. Configuration options: [CHS] [LBA] [Large] [Auto]



Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

Capacity

Displays the auto-detected hard disk capacity. This item is not configurable.

Cylinder

Shows the number of the hard disk cylinders. This item is not configurable.

Head

Shows the number of the hard disk read/write heads. This item is not configurable.

Precomp

Shows the number of precomp per track. This item is not configurable.

Landing Zone

Shows the number of landing zone per track. This item is not configurable.

Sector

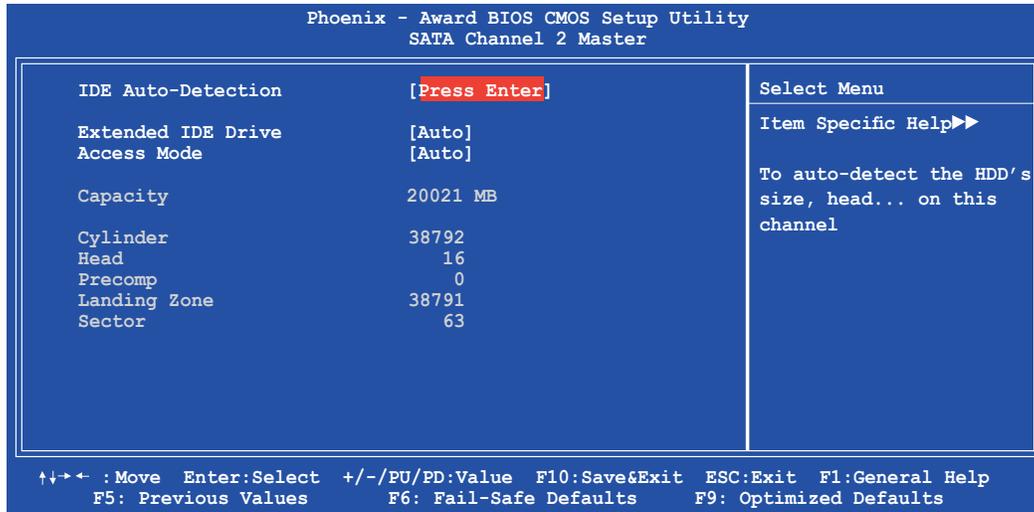
Shows the number of sectors per track. This item is not configurable.



After entering the IDE hard disk drive information into the BIOS, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

SATA Channel 2, 3 Master

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



Extended IDE Drive [Auto]

Select [Auto] to automatically detect a SATA hard disk drive. If automatic detection is successful, Setup program automatically fills in the correct values for the remaining fields (including Capacity, Cylinder, Head, Precomp, Landing Zone, Sector) on this sub-menu. Configuration options: [None] [Auto]

Access Mode [Auto]

Allows the user to select the sector addressing mode. Configuration options: [Large] [Auto]



Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

Capacity

Displays the auto-detected hard disk capacity. This item is not configurable.

Cylinder

Shows the number of the hard disk cylinders. This item is not configurable.

Head

Shows the number of the hard disk read/write heads. This item is not configurable.

Precomp

Shows the number of precomp per track. This item is not configurable.

Landing Zone

Shows the number of landing zone per track. This item is not configurable.

Sector

Shows the number of sectors per track. This item is not configurable.



After entering the IDE hard disk drive information into the BIOS, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

Drive A [1.44M, 3.5 in.]

Specifies the capacity and physical size of diskette drive A. Do not select [None] if you are using a floppy disk drive. Configuration options: [None] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.]

Halt On [All, But Keyboard]

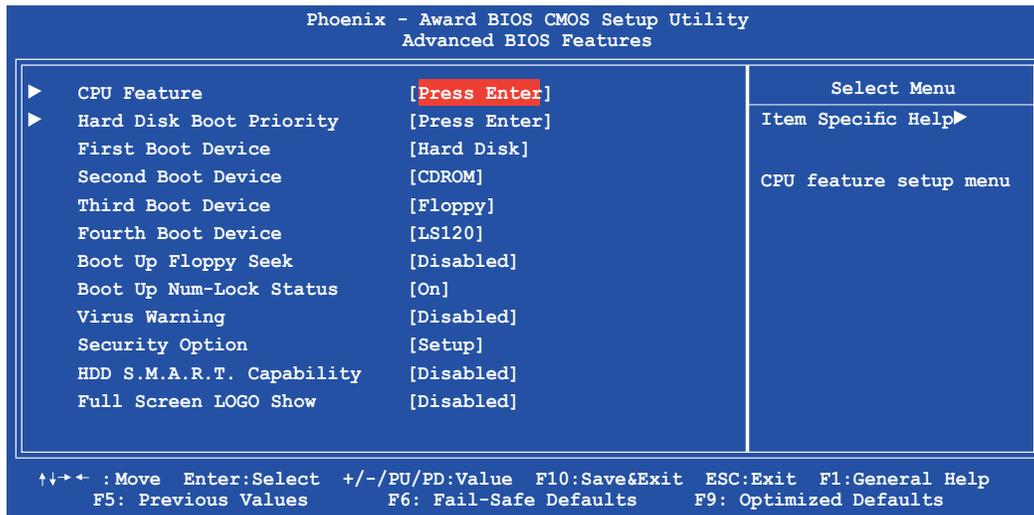
Sets the system to halt on errors according to the system functions specified in each option. Configuration options: [All Errors] [No Errors] [All, But Keyboard] [All, But Diskette] [All, But Disk/Key]

2.4 Advanced BIOS Features

The Advanced BIOS Features menu items allow you to change the advanced BIOS settings.



Take caution when changing the settings of the Advanced BIOS Features items. Incorrect field values may cause the system to malfunction.



CPU Feature [Press Enter]

Allows you to view the CPU feature setup menu.

Execute Disable Bit [Enabled]

When disabled, the processor forces the XD feature flag to always return 0. Configuration options: [Disabled] [Enabled]

CPU Hyper-Threading [Enabled]

Enables or disabled the processor Hyper-Threading technology. Set this item to [Enabled] if you are using Windows® XP, Linux 2.4, or other operating systems optimized for Intel® Hyper-Threading technology. Set this item to [Disabled] if you are using other operating systems that are not optimized for Intel® Hyper-Threading technology. Configuration options: [Disabled] [Enabled]

Hard Disk Boot Priority [Press Enter]

Allows you to select the hard disk boot device priority. The number of devices that appears on the screen depends on the number of devices installed in the system.

First/Second/Third/Fourth Boot Device

Allows you to assign the boot device priority. Configuration options:
[Floppy] [LS120] [Hard Disk] [CDROM] [ZIP] [USB-FDD] [USB-ZIP]
[USB-CDROM] [LAN] [Disabled]

Boot Up Floppy Seek [Disabled]

When [Enabled], the BIOS will seek the floppy disk drive to determine whether the drive has 40 or 80 tracks.
Configuration options: [Disabled] [Enabled]

Boot Up Num-Lock Status [On]

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

Virus Warning [Disabled]

When [Enabled], the BIOS will seek the floppy disk drive to determine whether the drive has 40 or 80 tracks.
Configuration options: [Disabled] [Enabled]

Security Option [Setup]

Select [Setup] to require the password before entering the BIOS Setup.
Select [System] to require the password before entering the system.
Configuration options: [Setup] [System]

HDD S.M.A.R.T. Capability [Disabled]

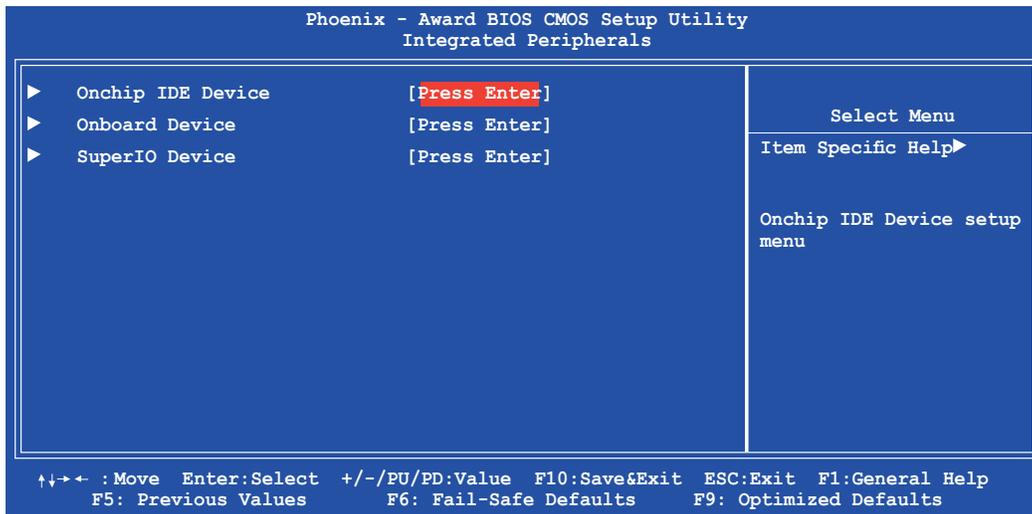
Enables or disables Hard Disk SMART capability support.
Configuration options: [Disabled] [Enabled]

Full Screen LOGO Show [Disabled]

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

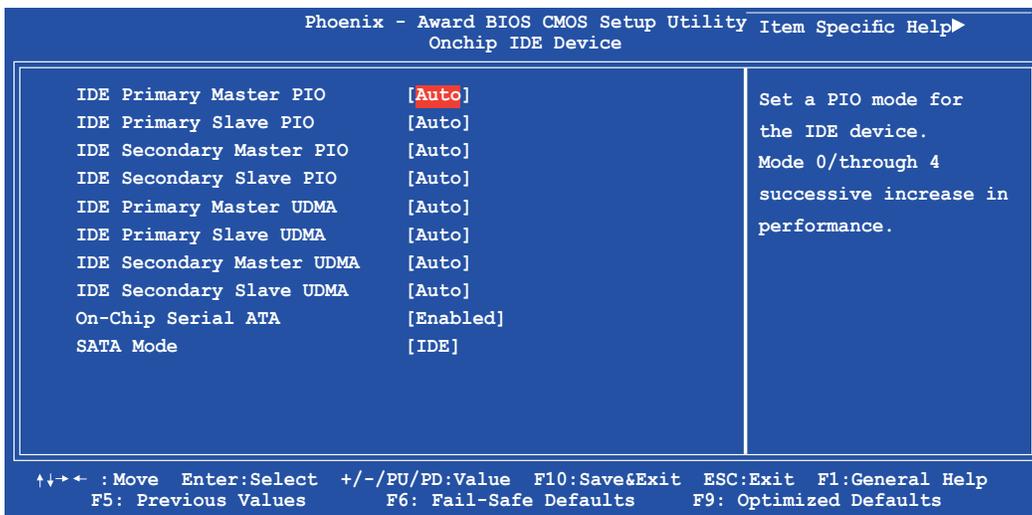
2.5 Integrated Peripherals

The Integrated Peripherals menu items allow you to change the onboard devices configuration settings.



Onchip IDE Device

This sub-menu contains IDE function-related items. Select an item then press <Enter> to edit.



IDE Primary, Secondary Master/Slave PIO [Auto]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successive increase in performance. Configuration options: [Auto] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4]

IDE Primary, Secondary Master/Slave UDMA [Auto]

Ultra DMA capability allows improved transfer speeds and data integrity for compatible IDE devices. Set to [Disabled] to suppress Ultra DMA capability. Configuration options: [Disabled] [Auto]

On-Chip Serial ATA [Enabled]

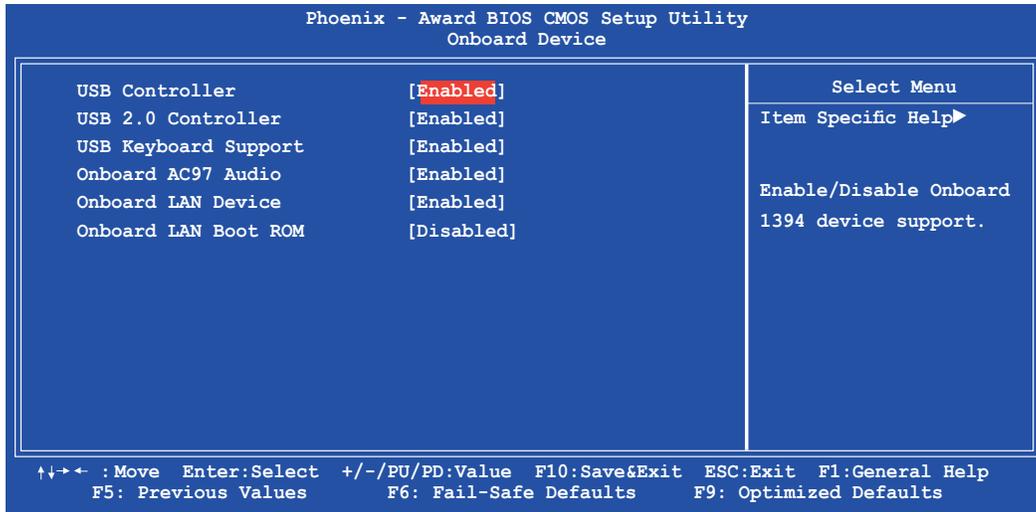
Configuration options: [Disabled] [Enabled]

SATA Mode [IDE]

Configuration options: [IDE] [RAID]

Onboard Device

This sub-menu allows you to set the configurations for onboard devices. Select an item then press <Enter> to edit.



USB Controller [Enabled]

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

USB 2.0 Controller [Enabled]

Allows you to enable or disable the EHCI controller. If the BIOS has built-in high speed USB support, this item will be enabled automatically when a high speed device is attached. Configuration options: [Enabled] [Disabled]

USB Keyboard Support [Enabled]

Allows you to enable or disable legacy USB device support.
Configuration options: [Disabled] [Enabled]

AC97 Audio [Auto]

Allows the BIOS to automatically enable support for legacy AC`97 audio, or disable the onboard AC`97 Audio controller.
Configuration options: [Enabled] [Disabled]

Onboard LAN Device [Enabled]

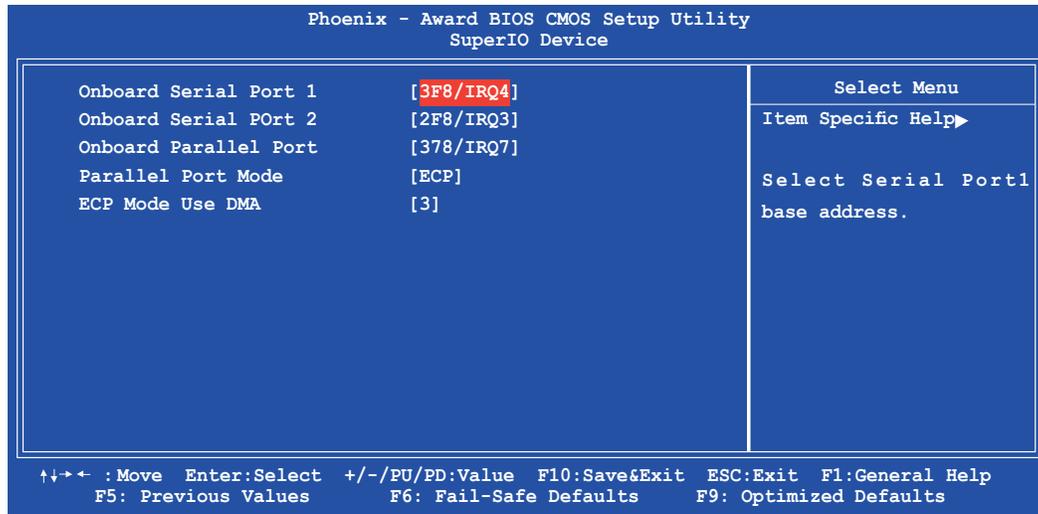
Allows you to enable or disable the onboard LAN device support.
Configuration options: [Disabled] [Enabled]

Onboard LAN Boot ROM [Disabled]

Allows you to enable or disable the boot ROM of the onboard LAN chip.
Configuration options: [Enabled] [Disabled]

SuperIO Device

This sub-menu allows you to set the configurations for SuperIO devices. Select an item then press <Enter> to edit.



Onboard Serial Port 1 [3F8/IRQ4]

Allows you to set the Serial Port 1 base address. Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3] [Auto]

Onboard Serial Port 2 [2F8/IRQ3]

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

Onboard Parallel Port [378/IRQ7]

Allows you to set the base address of the onboard parallel port connector. Configuration options: [Disabled] [378/IRQ7] [278/IRQ5] [3BC/IRQ7]

Onboard Serial Port 1 [3F8/IRQ4]

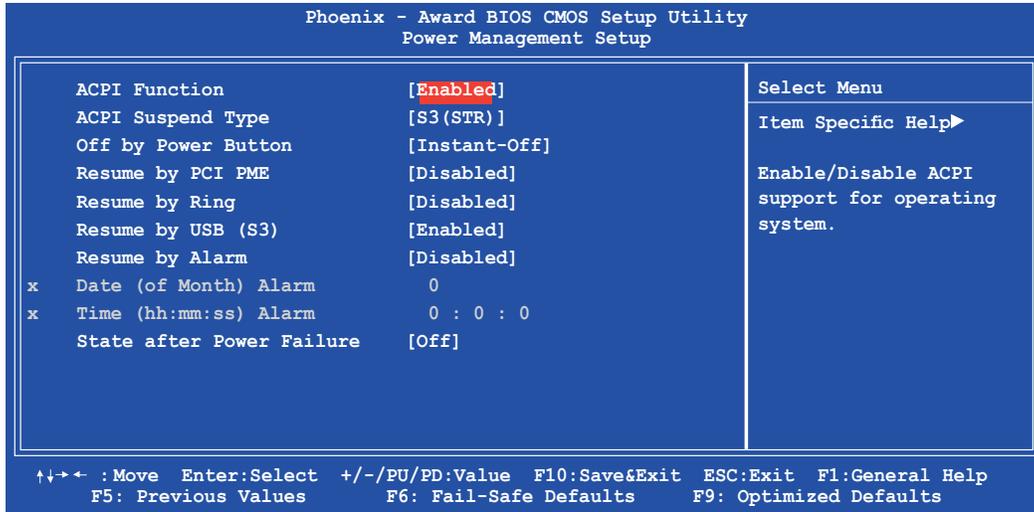
Allows you to set the Serial Port 1 base address. Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3] [Auto]

Onboard Serial Port 2 [2F8/IRQ3]

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

2.6 Power Management Setup

The Power Management Setup menu items allow you to change the settings for the Advanced Power Management (APM) and Advanced Configuration and Power Interface (ACPI).



ACPI Function [Enabled]

Allows you to enable or disable the ACPI support for the operating system.
Configuration options: [Enabled] [Disabled]

ACPI Suspend Type [S1(POS)]

Allows you to select the ACPI state used for system suspend.
Configuration options: [S1(POS)] [S3(STR)]

Off by Power Button [Instant-Off]

When set to [Instant-Off], the system goes to soft-off when you press the power button for less than 4 seconds. When set to [Delay 4 Sec], press the power button for more than 4 seconds to power off the system.
Configuration options: [Instant-Off] [Delay 4 Sec]

Resume by PCI PME [Enabled]

Enables or disables system wake-up by power management event (PME).
Configuration options: [Disabled] [Enabled]

Resume by Ring [Enabled]

Allows you to enable or disable system power up when the external modem receives a call while the computer is in soft-off mode.

Configuration options: [Disabled] [Enabled]



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

Resume by USB (S3) [Enabled]

Allows you to wake up the system using a USB mouse or keyboard.

Configuration options: [Disabled] [Enabled]

Resume by Alarm [Disabled]

Allows you to enable or disable RTC to generate an event. When this item is enabled, you can set the date and time of alarm using the two following items. Configuration options: [Disabled] [Enabled]



The following items become configurable only when the Resume by Alarm item is set to [Enabled].

Day of Month Alarm [NA]

To set the day of alarm, highlight this item and press <Enter> to display a pop-up menu. Key in a value (Min=0, Max=31), then press <Enter>. Selecting [0] means the alarm will set off everyday.

Time (hh:mm:ss) Alarm [0 : 0 : 0]

To set the time of alarm:

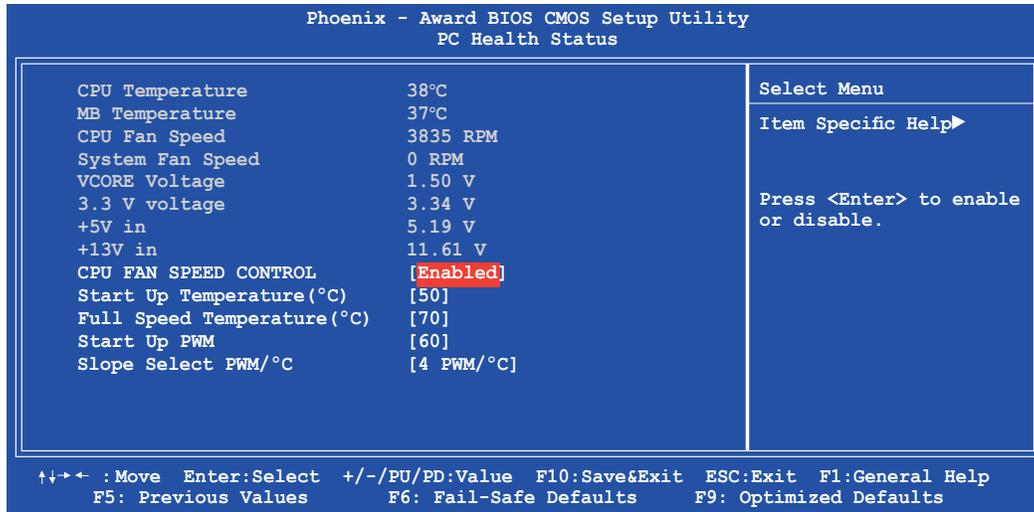
1. Highlight this item and press <Enter> to display a pop-up menu for the hour field.
2. Key-in a value (Min=0, Max=23), then press <Enter>.
3. Press tab to move to the minutes field, then press <Enter>.
4. Key-in a minute value (Min=0, Max=59), then press <Enter>.
5. Press tab to move to the seconds field, then press <Enter>.
6. Key-in a value (Min=0, Max=59), then press <Enter>.

State after Power Failure [Off]

When set to Off, the system goes into off state after an AC power loss. When set to On, the system turns on after an AC power loss. When set to Former-Sts, the system goes to its previous state before the AC power loss. Configuration options: [Off] [On] [Former-Sts]

2.7 PC Health Status

The PC Health Status screen shows the motherboard CPU and fan temperatures, and allows you to set threshold levels for efficient system operation.



The BIOS auto-detects the former eight items. The user cannot configure these items.

CPU Temperature [xxx°C]

MB Temperature [xxx°C]

The onboard hardware monitor automatically detects and displays the CPU and motherboard temperatures.

CPU Fan Speed [xxxxRPM]

System Fan Speed [xxxxRPM]

The onboard hardware monitor automatically detects and displays the CPU and system fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows 0 RPM.

VCORE Voltage, 3.3V Voltage, +5V in, +12V in

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

CPU Fan Speed Control [Enabled]

Allows you to enable or disable the CPU fan speed controller.
Configuration options: [Enabled] [Disabled]

Start Up Temperature (°C) [50]

Allows you to set the fan start-up temperature.
Configuration options: [0] [1] ~ [100]

Full Speed Temperature (°C) [70]

Allows you to set the threshold temperature before the fan begins running at full speed. Configuration options: [0] [1] ~ [100]

Start Up PWM [60]

Sets the start-up Pulse Width Modulation (PWM) value when the fan starts running. Configuration options: [0] [1] ~ [127]

Slope Select PWM/°C [4 PWM/°C]

Sets the PWM increase value per degree Celcius to control the fan speed when the system temperature increases.
Configuration options: [0 PWM/°C] [1 PWM/°C] [2 PWM/°C] [4 PWM/°C] [8 PWM/°C] [16 PWM/°C] [32 PWM/°C] [64 PWM/°C]

2.8 Other items

2.8.1 Load Optimized Defaults

Allows you to load the optimized defaults.

2.8.2 Set Supervisor Password

Allows you to set the supervisor password. To set a password, press <Enter>. Type in and confirm the password when prompted.

2.8.3 Set User Password

Allows you to set a user password for access to system after boot-up.

2.8.4 Save & Exit Setup

Once you are finished making your selections, choose this option to ensure that the values you selected are saved to the CMOS RAM. When you select this option, a confirmation window appears. Select **Yes** to save changes and exit.

2.8.5 Exit Without Saving

Select this option only if you do not want to save the changes that you made to the Setup program.