

**P5KPL IPC/SI**

**Motherboard**

**ASUS®**

E4595

First Edition V1

April 2009

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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.

### REACH

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at <http://green.asus.com/english/REACH.htm>.



**DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.



**DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

# 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.

## About this guide

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

## How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**  
This chapter describes the features of the motherboard and the new technology it supports.
- **Chapter 2: BIOS information**  
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

## Where to find more information

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

### 1. 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>

## P5KPL IPC/SI specifications summary

<b>CPU</b>	<p>LGA775 socket for Intel® Core™2 Quad / Core™2 Extreme / Core™2 Duo / Pentium® Extreme processors          Supports Intel® 45nm multi-core CPU          Intel® Hyper-Threading Technology ready          Supports Enhanced Intel SpeedStep® technology (EIST)</p> <p>* Ensure that you use a supported CPU, otherwise the system will show a warning message and automatically shut down.</p> <p>** Refer to <a href="http://www.asus.com">www.asus.com</a> for Intel® CPU support list.</p>
<b>Chipset</b>	<p>Northbridge: Intel® G31          Southbridge: Intel® ICH7</p>
<b>Front Side Bus</b>	1333/1066/800 MHz
<b>Memory</b>	<p>Dual channel memory architecture</p> <ul style="list-style-type: none"> <li>- 4 x 240-pin DIMM sockets support unbuffered non-ECC 800/667 MHz DDR2 memory modules</li> <li>- Supports up to 4GB system memory</li> </ul> <p>* Refer to <a href="http://www.asus.com">www.asus.com</a> or this user manual for the Memory QVL (Qualified Vendors Lists).</p> <p>** When you install a total memory of 4GB capacity or more, Windows® 32-bit operating system may only recognize less than 3GB. We recommend a maximum of 3GB system memory if you are using a Windows® 32-bit operating system.</p>
<b>Expansion slots</b>	<p>1 x PCI Express x16 slot          5 x PCI slots</p>
<b>Storage</b>	<p>Southbridge Intel® ICH7 supports:</p> <ul style="list-style-type: none"> <li>- 1 x UltraDMA 100/66 hard disk drive</li> <li>- 4 x Serial ATA 300/150 ports</li> </ul>
<b>LAN</b>	PCIe Gigabit LAN
<b>Audio</b>	<p>VT1705 High Definition Audio 6-channel CODEC</p> <ul style="list-style-type: none"> <li>- Supports Jack-detect technology</li> </ul>
<b>USB</b>	8 x USB 2.0/1.1 ports (4 ports at mid-board, 4 ports at back panel)
<b>ASUS special features</b>	<p>ASUS CrashFree BIOS 3          ASUS Q-Fan 2          ASUS EZ Flash 2          ASUS MyLogo™ 2          AI NET 2</p>

(continued on the next page)



## P5KPL IPC/SI specifications summary

<b>Back panel I/O ports</b>	1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x COM port 1 x VGA port 1 x LPT port (optional) 1 x LAN (RJ-45) port 4 x USB 2.0/1.1 ports 6-channel audio I/O ports
<b>Internal I/O Connectors</b>	2 x USB 2.0/1.1 connectors supports additional 4 USB 2.0/1.1 ports 1 x High definition front panel audio connector 1 x IDE connector 4 x SATA connectors 1 x System panel connector 1 x CPU fan connector 1 x Chassis fan connector 1 x Power fan connector 1 x Chassis intrusion connector 1 x COM connector 1 x 24-pin EATX power connector 1 x 4-pin ATX 12V power connector
<b>BIOS features</b>	8Mb Flash ROM, AMI BIOS, PnP, DMI v2.0, WfM 2.0, ACPI v2.0a, SM BIOS v2.5
<b>Support CD Contents</b>	Drivers ASUS PC Probe II ASUS LiveUpdate Utility Anti-virus software (OEM version)
<b>Accessories</b>	1 x Serial ATA cable 1 x UltraDMA 100/66 cable 1 x I/O shield User Manual
<b>Form factor</b>	ATX form factor: 12 in x 8 in (30.5 cm x 20.3 cm)

\*Specifications are subject to change without notice.

# Chapter 1

## Product introduction

Thank you for buying an ASUS® P5KPL IPC/SI motherboard!

Before you start installing the motherboard, and hardware devices on it, check the items in your motherboard package. Refer to page ix for the list of accessories.



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

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### 1.1 Before you proceed

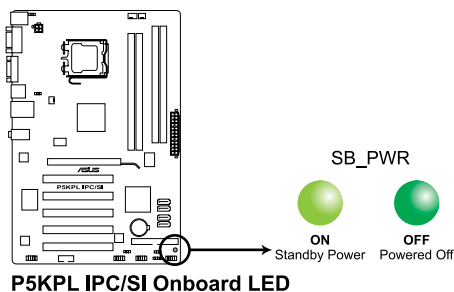
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- Unplug the power cord from the wall socket before touching any component.
  - Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, 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, 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 must 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.

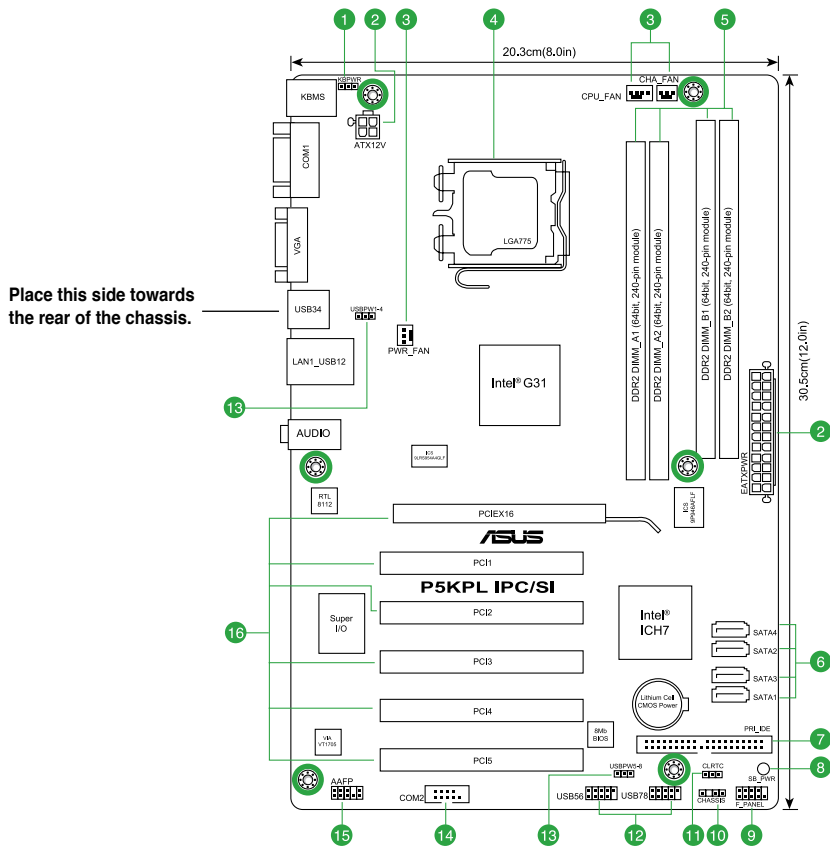


## 1.2 Motherboard overview

### 1.2.1 Motherboard layout



Ensure that you install the motherboard into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis.



Place this side towards the rear of the chassis.



Place six screws into the holes indicated by circles to secure the motherboard to the chassis. DO NOT overtighten the screws! Doing so can damage the motherboard.

## 1.2.2 Layout contents

Connectors/Jumpers/Slots/LED	Page	Connectors/Jumpers/Slots/LED	Page
1. Keyboard power (3-pin KBPWR)	1-10	9. System panel connector (10-1 pin F_PANEL)	1-16
2. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-14	10. Chassis intrusion connector (4-1 pin CHASSIS)	1-14
3. CPU, power, and chassis fan connectors (4-pin CPU_FAN, 3-pin PWR_FAN, 3-pin CHA_FAN)	1-12	11. Clear RTC RAM (3-pin CLRTC)	1-9
4. LGA775 CPU socket	1-3	12. USB connectors (10-1 pin USB56 and USB78)	1-12
5. DDR2 DIMM slots	1-4	13. USB device wake-up (3-pin USBPW1-4, 3-pin USBPW5-8)	1-10
6. Serial ATA connectors (7-pin SATA1-4)	1-15	14. Serial port connector (10-1 pin COM2)	1-13
7. IDE connector (40-1 pin PRI_IDE)	1-13	15. Front panel audio connector (10-1 pin AAFP)	1-15
8. Onboard LED (SB_PWR)	1-1	16. PCI / PCIe x 16 slots	1-8

## 1.3 Central Processing Unit (CPU)

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



- Upon purchase of the motherboard, ensure 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.

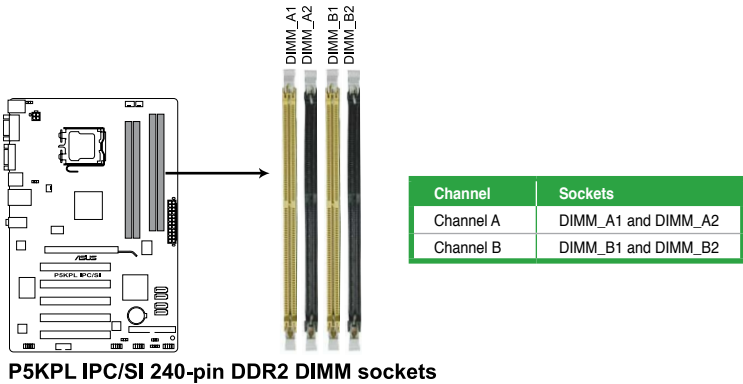


The motherboard supports Intel® LGA775 processors with the Intel® Enhanced Intel SpeedStep® Technology (EIST) and Hyper-Threading Technology.

# 1.4 System memory

## 1.4.1 Overview

The motherboard comes with four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets. The figure illustrates the location of the DDR2 DIMM sockets:



## 1.4.2 Memory configurations

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



- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- For single-channel configuration, you may:
  - install one double-sided DIMM in any of the four sockets OR
  - install two single-sided DIMMs in DIMM\_A1 and DIMM\_A2, or in DIMM\_B1 and DIMM\_B2.
- For dual-channel configuration, you may:
  - install two double-sided DIMMs OR
  - install four single-sided DIMMs.
- Due to the memory address limitation on 32-bit Windows® OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - Use a maximum of 3GB system memory if you are using a 32-bit Windows® OS.
  - Install a 64-bit Windows® OS when you want to install 4GB or more memory on the motherboard.
- This motherboard does not support DIMMs made up of 256 megabits (Mb) chips or less.



This motherboard supports up to 4GB on Windows® XP Professional x64 and Windows® Vista x64 editions.

# P5KPL IPC/SI Motherboard Qualified Vendors Lists (QVL)

## DDR2-667 MHz capability

Size	Vendor	Part No.	SS/DS	CL	Chip NO.	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
2048MB	A-Data	M20AD5H3J41701C53	DS	N/A	AD20908A8A-3EG 30724	ADATA	-	-	-
512MB	Apacer	78.91G90.9K5	SS	5	AM4B5708LQJS7E0751C	Apacer	-	-	-
512MB	Apacer	AU 512E667C5KBGC	SS	5	AM4B5708CQJS7E0632F	Apacer	-	-	-
512MB	Apacer	AU 512E667C5KBGC	SS	5	AM4B5708MJS7E0627B	Apacer	-	-	-
1024MB	Apacer	78.01G90.9K5	SS	5	AM4B5808CQJS7E0751C	Apacer	-	-	-
1024MB	Apacer	AU01GE667C5KBGC	DS	N/A	AM4B5708GQJS7E0636B	Apacer	-	-	-
1024MB	Apacer	AU01GE667C5KBGC	DS	5	AM4B5708MJS7E0627B	Apacer	-	-	-
2048MB	Apacer	AM4B5808CQJS7E0749B	DS	5	78.A1G90.9K4	Apacer	-	-	-
512MB	Corsair	VS 512MB667D2	DS	N/A	MII0052532M8CEC	Corsair	-	-	-
1024MB	Corsair	VS1GB667D2	DS	N/A	MID095D62864M8CEC	Corsair	-	-	-
1024MB	Corsair	XMS2-5400	DS	4	Heat-Sink Package	Corsair	-	-	-
2048MB(Kit of 2)	G.SKILL	F2-5400PHU2-2GBNT	DS	5-5-5-15	D2 64M8CCF 0815 C7173S	G.SKILL	-	-	-
4096MB(Kit of 2)	G.SKILL	F2-5300CL5D-4GBMQ	DS	5-5-5-15	Heat-Sink Package SN:8151030036559	G.SKILL	-	-	-
1024MB	GEIL	GX21GB5300SX	DS	3	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GX22GB5300LX	DS	5	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GX24GB5300LDC	DS	5	Heat-Sink Package	GEIL	-	-	-
512MB	Kingmax	KLCC28F-A8KB5	SS	N/A	KKEA88B4LAUG-29DX	Kingmax	-	-	-
1024MB	Kingmax	KLCD48F-A8KB5	DS	N/A	KKEA88B4LAUG-29DX	Kingmax	-	-	-
512MB	Kingston	KVR667D2N5/ 512(low profile)	SS	5	D6408TR7CGL25U	Kingston	-	-	-
1024MB	Kingston	KVR667D2N5/1G(low profile)	DS	5	E5108AJBG-8E-E	PSC	-	-	-
2048MB	Kingston	KVR667D2N5/2G(low profile)	DS	5	E1108ACBG-8E-E	Elpida	-	-	-
1024MB	Micron	MT8HTF12864AY-667E1	SS	5	D9HNL 7ZE17	Micron	-	-	-
512MB	PSC	AL6E8E63J-6E1	SS	5	A3R12E3JFF717B9A00	PSC	-	-	-
1024MB	PSC	AL7E8F73C-6E1	SS	5	A3R1GE3CFF734MAA0J	PSC	-	-	-
1024MB	PSC	AL6E8E63J-6E1	DS	5	A3R12E3JFF717B9A01	PSC	-	-	-
2048MB	PSC	AL8E8F73C-6E1	DS	5	A3R1GE3CFF733MAA00	PSC	-	-	-
1024MB	Super Talent	T667UB1GV	DS	5	PG 64M8-800 0750	Super Talent	-	-	-
1024MB	Transcend	JM667QLU-1G	SS	5	TQ243PCF8T0838	Transcend	-	-	-
1024MB	Transcend	JM667QLJ-1G	DS	5	E5108AJBG-6E-E	Elpida	-	-	-
2048MB	Transcend	JM667QLU-2G	DS	5	TQ243PCF8T0834	Transcend	-	-	-
512MB	Twinmos	8D-A3JK5MPETP	SS	5	A3R12E3GEF633ACAOY	PSC	-	-	-
2048MB	AENEON	AET860UD00-30DB08X	DS	5	AET03F30DB 0730	AENEON	-	-	-
512MB	Asint	SLX264M8-J6E	SS	N/A	DDRII6408-6E	Asint	-	-	-
1024MB	ASINT	SLY2128M8-J6E	SS	N/A	DDRIII208-6E 8115	ASINT	-	-	-
512MB	Century	CENTURY 512MB	SS	N/A	HY5PS12821AFP-Y5	Hynix	-	-	-
512MB	Century	CENTURY 512MB	SS	N/A	NT5TU64M8AE-3C	Nanya	-	-	-
1024MB	Century	CENTURY 1G	DS	N/A	HY5PS12821AFP-Y5	Hynix	-	-	-
1024MB	Century	CENTURY 1G	DS	N/A	NT5TU64M8AE-3C	Nanya	-	-	-
1024MB	ELIXIR	M2Y1G64TU8HA2B-3C	DS	5	M2TU 51280AE-3C717095R28F	elixir	-	-	-
1024MB	Elixir	M2Y1G64TU8HBOB-3C	DS	5	N2TU 51280BE-3C639009W1CF	Elixir	-	-	-
512MB	KINGBOX	512MB 667MHz	SS	N/A	EPD264082200-4	KINGBOX	-	-	-
1024MB	KINGBOX	DDRII 1G 667MHz	DS	N/A	EPD264082200-4	KINGBOX	-	-	-
1024MB	Leadmax	LRMP 512U64A8-Y5	DS	5	HY5PS12821CFP-Y5 C 702AA	Hynix	-	-	-
512MB	MDT	DDRII 512 PC667	DS	4	18D 51201D-30726E	MDT	-	-	-
1024MB	MDT	MDT 1024MB	DS	4	18D 51280D-30646E	MDT	-	-	-
512MB	TAKEMS	TMS51B264C081-665AP	SS	5	MS18T 51280-3S0627D	takeMS	-	-	-
512MB	TAKEMS	TMS51B264C081-665QI	SS	5	MS18T 51280-3	takeMS	-	-	-
1024MB	TAKEMS	TMS1GB264C081-665AE	DS	5	MS18T 51280-3SEA07100	takeMS	-	-	-
1024MB	TAKEMS	TMS1GB264C081-665AP	DS	5	MS18T 51280-3SP0717A	takeMS	-	-	-
1024MB	TAKEMS	TMS1GB264C081-665QI	DS	5	MS18T 51280-3	takeMS	-	-	-
1024MB	TEAM	TVDD1.02M667C4	DS	N/A	T2D648PT-6	TEAM	-	-	-
1024MB	UMAX	D46701GP-63BJU	DS	N/A	U2S12D30YP-6E	UMAX	-	-	-
2048MB	UMAX	D46702GP0-73BCU	DS	5	U2S24D30TP-6E	UMAX	-	-	-

(continued on the next page)

## DDR2-800 MHz capability

Size	Vendor	Part No.	SS/DS	CL	Chip NO.	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
512MB	A-Data	M2GV06G3H3160Q1E52	SS	N/A	VD29608A8A-25EG20813	VDATA	-	-	-
2048MB(Kit of 2)	A-Data	AD2800E001G00U	SS	4-4-4-12	Heat-Sink Package	N/A	-	-	-
1024MB	A-Data	M2GVD6G314170Q1E58	DS	N/A	VD29608A8A-25EG80813	VDATA	-	-	-
2048MB	A-Data	AD2800002GMU	DS	N/A	Heat-Sink Package	Hynix	-	-	-
4096MB(Kit of 2)	A-Data	AD2800E002G00U	DS	4-4-4-12	Heat-Sink Package	N/A	-	-	-
512MB	Apacer	78.91G91.9K5	SS	5	AM4B5708JQS8E0751C	Apacer	-	-	-
1024MB	Corsair	CM2X1024-6400	DS	N/A	Heat-Sink Package	Corsair	-	-	-
1024MB	Corsair	XMS2-6400	DS	4	Heat-Sink Package	Corsair	-	-	-
1024MB	Corsair	XMS2-6400	DS	5	Heat-Sink Package	Corsair	-	-	-
4096MB(Kit of 2)	Corsair	CM2X2048-6400C5DHX	DS	5	Heat-Sink Package	N/A	-	-	-
4096MB(Kit of 2)	Corsair	CM2X2048-6400C5	DS	5	Heat-Sink Package	N/A	-	-	-
2048MB(Kit of 2)	Crucial	BL12864AL80A.8FE5(EPP)	SS	4-4-4-12	Heat-Sink Package	N/A	-	-	-
4096MB(Kit of 2)	Crucial	BL25664AL80A.16FE5(EPP)	DS	4-4-4-12	Heat-Sink Package	N/A	-	-	-
4096MB(Kit of 2)	Crucial	BL25664AR80A.16FE5(EPP)	DS	4-4-4-12	Heat-Sink Package	N/A	-	-	-
512MB	G.SKILL	F2-6400CL5D-1GBNQ	SS	5-5-5-15	Heat-Sink Package SN:8151030036642	G.SKILL	-	-	-
1024MB	G.SKILL	F2-6400CL4D-2GBPK	DS	4	Heat-Sink Package	G.SKILL	-	-	-
1024MB	G.SKILL	F2-6400CL5D-2GBNQ	DS	5	Heat-Sink Package	G.SKILL	-	-	-
2048MB	G.SKILL	F2-6400CL4D-4GBPK	DS	4	Heat-Sink Package	G.SKILL	-	-	-
2048MB	G.SKILL	F2-6400CL5D-4GBPQ	DS	5	Heat-Sink Package	G.SKILL	-	-	-
1024MB	GEIL	GB22GB6400C4DC	DS	5	GL2L64M088BA30EB	GEIL	-	-	-
1024MB	GEIL	GB22GB6400C5DC	DS	5	GL2L64M088BA30EB	GEIL	-	-	-
1024MB	GEIL	GB24GB6400C4QC	DS	4	GL2L64M088BA30EB	GEIL	-	-	-
1024MB	GEIL	GB24GB6400C5QC	DS	5	GL2L64M088BA30EB	GEIL	-	-	-
1024MB	GEIL	GE22GB800C4DC	DS	4	Heat-Sink Package	GEIL	-	-	-
1024MB	GEIL	GE22GB800C5DC	DS	5	Heat-Sink Package	GEIL	-	-	-
1024MB	GEIL	GE24GB800C4QC	DS	4	Heat-Sink Package	GEIL	-	-	-
1024MB	GEIL	GE24GB800C5QC	DS	5	Heat-Sink Package	GEIL	-	-	-
1024MB	GEIL	GX22GB6400DC	DS	5	Heat-Sink Package	GEIL	-	-	-
1024MB	GEIL	GX22GB6400UDC	DS	4	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GB24GB6400C4DC	DS	4	GL2L128M88BA25AB	GEIL	-	-	-
2048MB	GEIL	GB24GB6400C5DC	DS	5	GL2L128M88BA25AB	GEIL	-	-	-
2048MB	GEIL	GB28GB6400C4QC	DS	4	GL2L128M88BA25AB	GEIL	-	-	-
2048MB	GEIL	GB28GB6400C5QC	DS	5	GL2L128M88BA25AB	GEIL	-	-	-
2048MB	GEIL	GE24GB800C4DC	DS	4	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GE24GB800C5DC	DS	5	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GE28GB800C4QC	DS	4	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GE28GB800C5QC	DS	5	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GX22GB6400CUSC	DS	4	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GX22GB6400LX	DS	5	Heat-Sink Package	GEIL	-	-	-
2048MB	GEIL	GX24GB6400DC	DS	5	Heat-Sink Package	GEIL	-	-	-
512MB	Kingmax	KLDC28F-A8K15	SS	N/A	KK48FF1XF-JFS-25A	Kingmax	-	-	-
1024MB	Kingmax	KKB8FFBXF-CFA-25U	SS	N/A	KLDD48F-B8KB5	Kingmax	-	-	-
2048MB	kingmax	KLDE88F-B8KB5	DS	N/A	KKB8FFBXF-CFA-25U	kingmax	-	-	-
512MB	Kingston	KVR800D2N6/ 512	SS	6	KVR800D2N6/ 512	Kingston	-	-	-
1024M(Kit of 2)	Kingston	KHX6400D2LLK2/1GN	SS	4-4-4-12	Heat-Sink Package	Kingston	-	-	-
1024MB	Kingston	KVR800D2N5/1G(low profile)	SS	5	D1288TEFCGL25U	Kingston	-	-	-
1024MB	Kingston	KHX6400D2LL/1G	DS	4-4-4-12	Heat-Sink Package	Kingston	-	-	-
1024MB	Kingston	KVR800D2N6/1G(low profile)	DS	6	E510BAJBG-8E-E	Elpida	-	-	-
2048MB(Kit of 2)	Kingston	KHX6400D2K2/2G	DS	5-5-5-15	Heat-Sink Package	N/A	-	-	-
2048MB	Kingston	KHX6400D2/2G	DS	5	Heat-Sink Package	Kingston	-	-	-
2048MB	Kingston	KVR800D2N5/2G(low profile)	DS	5	D1288TPFCGL25U	Kingston	-	-	-
2048MB	Kingston	KVR800D2N6/2G(low profile)	DS	6	E8105ACBG-8E-E	Elpida	-	-	-
2048MB	Kingston	KVR800D2N6/2G	DS	6	HYB18T1G800CF2-2.5	Qimonda	-	-	-
2048MB	Micron	MT16HTF25664AY-800G1	DS	6-6-6-12	8AG27 D9JWB	Micron	-	-	-
1024MB	OCZ	OC2ZG800R22GK	DS	4-5-5-15	Heat-Sink Package	OCZ	-	-	-
1024MB	OCZ	OC2ZP800R22GK	DS	4-4-4-15	Heat-Sink Package	OCZ	-	-	-
1024MB	OCZ	OC2ZRP8002GK	DS	4-4-4-15	Heat-Sink Package	OCZ	-	-	-
1024MB	OCZ	OC2VJ80004GK	DS	5-6-6-18	Heat-Sink Package	OCZ	-	-	-
2048MB(Kit of 2)	OCZ	OC2ZS88002GK	DS	5-5-5-15	Heat-Sink Package	N/A	-	-	-
2048MB	OCZ	OC2ZP8004GK(EPP)	DS	5-4-4-18	Heat-Sink Package	N/A	-	-	-
4096MB(Kit of 2)	OCZ	OC2ZP8004GK	DS	5-4-4-15	Heat-Sink Package	N/A	-	-	-
1024MB	PSC	AL7E8F73C-8E1	SS	5	A3R1GE3CFF734MAA0E	PSC	-	-	-

(continued on the next page)

## DDR2-800 MHz capability

Size	Vendor	Part No.	SS/DS	CL	Chip NO.	Chip Brand	DIMM socket support (Optional)		
							A*	B*	C*
1024MB	PSC	AL7E9G73F-8E1	SS	N/A	P3R1GE3GF850MAC19	PSC	-	-	-
2048MB	PSC	AL8E8F73C-8E1	DS	5	A3R1GE3CF734MAA0E	PSC	-	-	-
2048MB	PSC	AL8E8G73F-8E1	DS	N/A	P3R1GE3GF850MAC19	PSC	-	-	-
2048MB	PSC	PL8E8F73C-8E1	DS	5	SHG772-AA3G	PSC	-	-	-
2048MB	PSC	PL8E8G73E-8E1	DS	5	XCP271A3G-A	PSC	-	-	-
2048MB	Qimonda	HY564T256020EU-2.5-C2	DS	5	HY818T1G800C2F-2.5	Qimonda	-	-	-
512MB	Samsung	K4T51083QG-HCF7	SS	6	M378T6553GZS-CF7	Qimonda	-	-	-
1024MB	Samsung	K4T1G084QQ-HCF7	SS	6	M378T2863QZS-CF7	Qimonda	-	-	-
1024MB	Samsung	M378T2863EHS-CF7	SS	N/A	K4T1G084QE	Samsung	-	-	-
1024MB	Samsung	K4T51083QG-HCF7	DS	6	M378T2953GZ3-CF7	Samsung	-	-	-
1024MB	Samsung	M378T2953GZ3-CF7	DS	N/A	K4T51083QG	Samsung	-	-	-
2048MB	Samsung	K4T1G084QQ-HCF7	DS	6	M378T5663QZ3-CF7	Samsung	-	-	-
1024MB	Super Talent	T800UB1GC4	DS	4	Heat-Sink Package	Super Talent	-	-	-
512MB	Transcend	TS64MLQ64V8J	SS	5	7HD22 D9GMH	Micron	-	-	-
1024MB	Transcend	JM800QLU-1G	SS	5	TQ1243PCF8	Transcend	-	-	-
1024MB	Transcend	TS128MLQ64V8U	SS	5	E1108ACBG-8E-E	ELPIDA	-	-	-
1024MB	Transcend	JM800QLJ-1G	DS	5	TQ123PJF80801	Transcend	-	-	-
1024MB	Transcend	JM800QLJ-1G	DS	5	TQ123YBF8 T0747	Transcend	-	-	-
1024MB	Transcend	TS128MLQ64V8J	DS	5	7HD22D9GMH	Micron	-	-	-
2048MB	Transcend	JM800QLU-2G	DS	5	TQ243PCF8	Transcend	-	-	-
2048MB	Transcend	TS256MLQ64V8U	DS	5	E1108ACBG-8E-E	Elpida	-	-	-
1024MB	AENEON	AET780UD00-25DC08X	SS	5	AET03R250C 0732	AENEON	-	-	-
2048MB	AENEON	AET860UD00-25DC08X	DS	5	AET03R25DC 0732	AENEON	-	-	-
1024MB	ASINT	SLY2128M8-JGE	SS	N/A	DDR1I1208-GE 8115	ASINT	-	-	-
2048MB	ASINT	SLZ2128M8-JGE	DS	N/A	DDR1I1208-GE 8115	ASINT	-	-	-
1024MB	Century	28V0H8	DS	5	HY5PS12821CFP-S5	Hynix	-	-	-
1024MB	Elixir	M2Y1G64TU88D5B-AC 0828.GS	SS	N/A	N2TU16800E-AC	Elixir	-	-	-
1024MB	ELIXIR	M2Y1G64TU8HB0B-25C	DS	5	N2TU 51280BE-25C802006Z1DV	ELIXIR	-	-	-
2048MB	Elixir	M2Y2G64TU8HD5B-AC 0826.SG	DS	N/A	N2TUG80DE-AC	Elixir	-	-	-
1024MB	Kingtiger	1GB DIMM PC2-6400	DS	N/A	HY5PS12821C FP-S5	Hynix	-	-	-
2048MB	Kingtiger	2GB DIMM PC2-6400	DS	N/A	HY5PS1G831C FP-S6	Hynix	-	-	-
2048MB	Kingtiger	KTG2G800PG2	DS	N/A	Heat-Sink Package	N/A	-	-	-
4096MB(Kit of 2)	Kingtiger	KTG2RX16P ST-01	DS	5-5-5-15	Heat-Sink Package	N/A	-	-	-
512MB	MDT	MDT 512MB	SS	5	18D 51280D-2.50726F	MDT	-	-	-
1024MB	MDT	MDT 1024MB	DS	5	18D 51280D-2.50726E	MDT	-	-	-
512MB	TAKEMS	TMS51B264C081-805EP	SS	5	MS18T 51280-2.5P0710	takeMS	-	-	-
1024MB	TAKEMS	TMS1GB264D082-805EE	SS	5	WS18T1G80-205 E0905	TAKEMS	-	-	-
1024MB	TAKEMS	TMS1GB264C081-804EE	DS	4-4-4-12	Heat-Sink Package	TAKEMS	-	-	-
1024MB	TAKEMS	TMS1GB264C081-805EP	DS	5	MS18T 51280-2.5P0716	takeMS	-	-	-
2048MB	TAKEMS	TMS2GB264D081-805KE	DS	5	MS18T1G80-205 E0907	TAKEMS	-	-	-
1024MB	UMAX	D48001GP3-63BJU	DS	N/A	U2S12D30TP-8E	UMAX	-	-	-
2048MB	UMAX	D48002GP0-73BCU	DS	5	U2S24D30TP-8E	UMAX	-	-	-
1024MB	VDATA	M2XSSK3147C1L1CSZ	DS	N/A	K4T51083QE	Samsung	-	-	-
2048MB	VDATA	M2XHYKH3J47CC01E5Z	DS	N/A	H5PS1G83EFRS6C 852AK	Hynix	-	-	-



### SS - Single-sided / DS - Double - sided

#### DIMM support:

- **A\*:** Supports one module inserted into any slot as Single-channel memory configuration.
- **B\*:** Supports one pair of modules inserted into either the yellow or black slots as one pair of Dual-channel memory configuration.
- **C\*:** Supports four modules inserted into both the yellow and black slots as two pairs of Dual-channel memory configuration.



Visit the ASUS website at [www.asus.com](http://www.asus.com) for the latest QVL.



## 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.



---

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.
3. Install the software drivers for the expansion card.



---

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

---

### 1.5.3 PCI slots

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

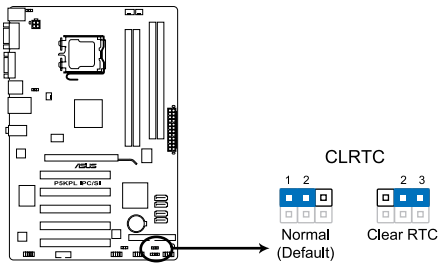
### 1.5.4 PCI Express x16 slot

This motherboard supports a PCI Express x16 graphics card that complies with the PCI Express specifications.

## 1.6 Jumpers

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

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



#### P5KPL IPC/SI Clear RTC RAM

To erase the RTC RAM:

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



---

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

---



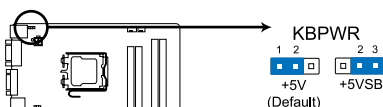
---

If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

---

## 2. Keyboard power (3-pin KBPWR)

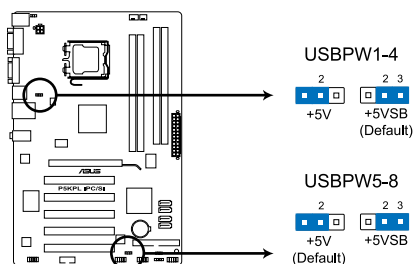
This jumper allows you to enable or disable the keyboard wake-up feature. When you set this jumper to pins 2–3 (+5VSB), you can wake up the computer by pressing a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



**P5KPL IPC/SI Keyboard Power Setting**

## 3. USB device wake-up (3-pin USBPW1-4, 3-pin USBPW5-8)

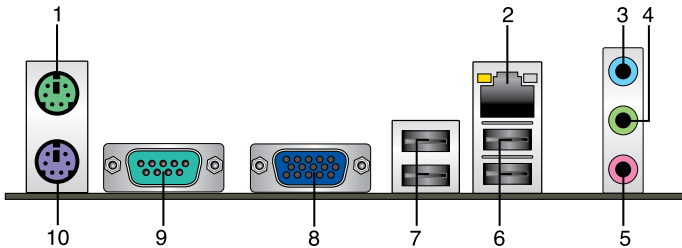
Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).



**P5KPL IPC/SI USB Device Wake Up**

## 1.7 Connectors

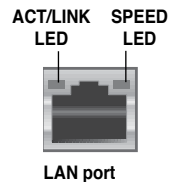
### 1.7.1 Rear panel connectors



- PS/2 mouse port (green).** This port is for a PS/2 mouse.
- 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
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection



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



Refer to the audio configuration table below for the function of the audio ports in 2, 4, or 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	Bass/Center

- USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
- USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
- Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
- COM port.** This port is for pointing devices or other serial devices.
- PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

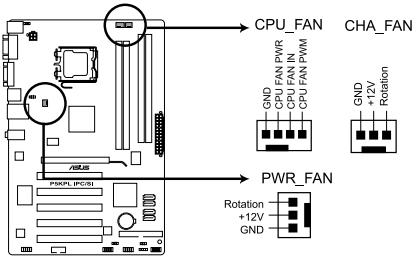
## 1.7.2 Internal connectors

### 1. CPU, power, and chassis fan connectors (4-pin CPU\_FAN, 3-pin PWR\_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, ensuring 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.



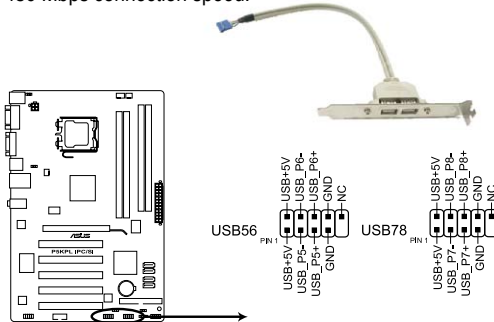
**P5KPL IPC/SI fan connectors**



Only the CPU fan and chassis fan support the ASUS Q-Fan 2 feature.

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

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



**P5KPL IPC/SI USB2.0 connectors**



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



The USB module cable is purchased separately.

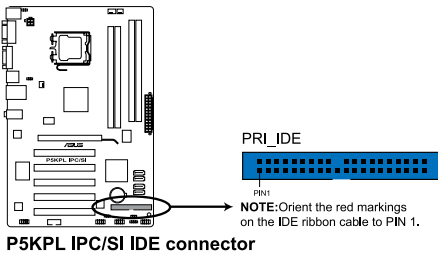
### 3. IDE connector (40-1 pin PRI\_IDE)

The onboard IDE connector is for the Ultra DMA 100/66/33 signal cable. There are three connectors on each Ultra DMA 100/66/33 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your device.

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



- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66/33 IDE devices.



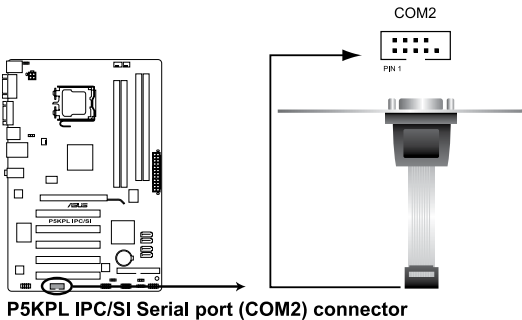
If any device jumper is set as "Cable-Select," ensure that all other device jumpers have the same setting.

### 4. Serial port connector (10-1 pin COM2)

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

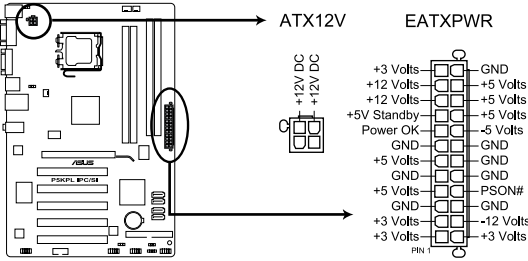


The serial port bracket (COM2) is purchased separately.



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

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



**P5KPL IPC/SI ATX power connectors**

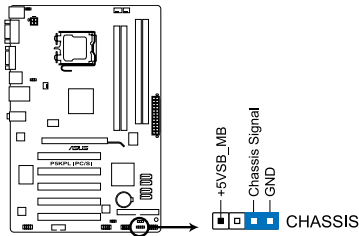


- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.
- Do not forget to connect the 4-pin ATX12V power plug. Otherwise, the system will not boot.
- We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or may not boot up if the power is inadequate.

### 6. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

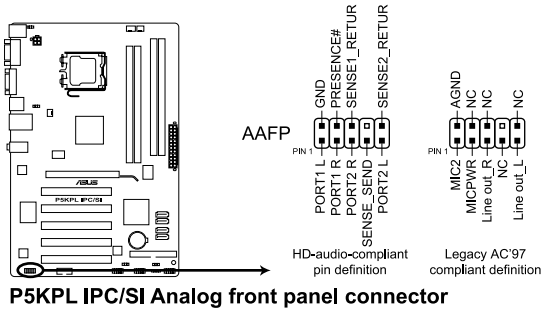
By default, the pins labeled “Chassis Signal” and “GND” are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.



**P5KPL IPC/SI Chassis intrusion connector**

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

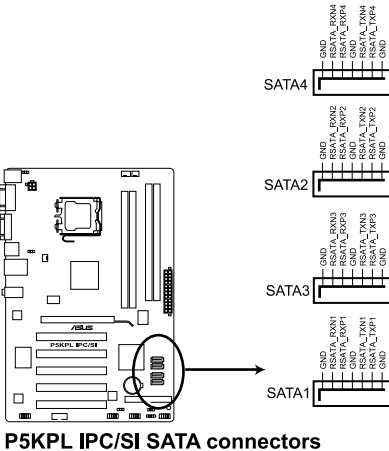
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
- If you want to connect a high-definition front panel audio module to this connector, set the **Front Panel Support Type** item in the BIOS setup to **[HD Audio]**. If you want to connect an AC'97 front panel audio module to this connector, set the item to **[AC97]**. By default, this connector is set to **[HD Audio]**. See section 2.4.3 Chipset for details.

## 8. Serial ATA connectors (7-pin SATA1-4)

These connectors are for the Serial ATA signal cables for Serial ATA 3Gb/s hard disk drives and optical disk drives. The Serial ATA 3Gb/s is backward compatible with the Serial ATA 1.5Gb/s specification. The data transfer rate of the Serial ATA 3Gb/s is faster than the standard parallel ATA (133 Mb/s).

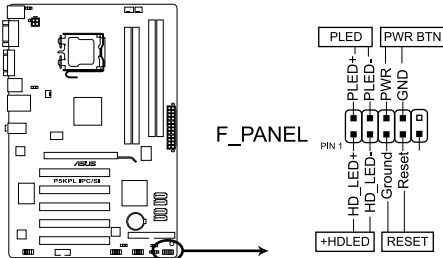


The numbers (1, 3, 2, 4) on the SATA ports only indicate the order that the SATA devices are detected and will not affect the use of the SATA devices.



**9. System panel connector (10-1 pin F\_PANEL)**

This connector supports several chassis-mounted functions.



**P5KPL IPC/SI System panel connector**

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

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

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

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.

- **ATX power button/soft-off button (2-pin PWRBTN)**

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

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

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

## 1.8 Software support

### 1.8.1 Installing an operating system

This motherboard supports Windows® XP/Vista Operating Systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.



- Motherboard settings and hardware options vary. Refer to your OS documentation for detailed information.
- Ensure that you install Windows® XP Service Pack 3 or later versions / Windows® Vista Service Pack 1 or later versions before installing the drivers for better compatibility and system stability.

### 1.8.2 Support CD information

The Support CD that comes with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.



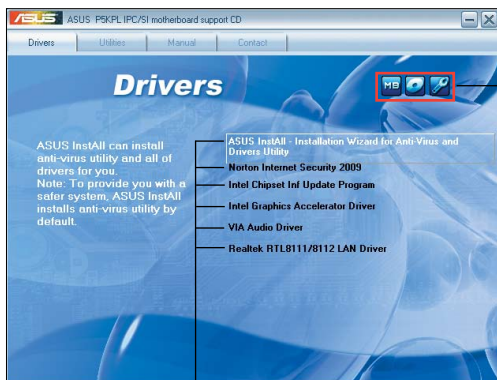
The contents of the Support CD are subject to change at any time without notice. Visit the ASUS website at [www.asus.com](http://www.asus.com) for updates.

### To run 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.



The following screen is for reference only.



Click an icon to display Support CD/motherboard information

Click an item to install



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.

# Chapter 2

## BIOS information

### 2.1 Managing and updating your BIOS



---

Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update utility.

---

#### 2.1.1 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment.



- ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).
  - This utility is available in the support CD that comes with the motherboard package.
- 

#### 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 **ASUS Update**.
3. Follow the onscreen instructions to complete the installation.



---

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

---

#### Updating the BIOS

To update the BIOS:

1. From the Windows® desktop, click **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate** to launch the ASUS Update utility.
2. From the dropdown list, select any of the updating process:  
*Updating from the Internet*
  - a. Select **Update BIOS from the Internet**, then click **Next**.
  - b. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select** then click **Next**.
  - c. From the FTP site, select the BIOS version that you wish to download then click **Next**.



---

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

---

#### *Updating from a BIOS file*

- a. Select **Update BIOS from a file**, then click **Next**.
  - b. Locate the BIOS file from the **Open** window, then click **Open**.
3. Follow the onscreen instructions to complete the updating process.

### 2.1.2 ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without using an OS-based utility.



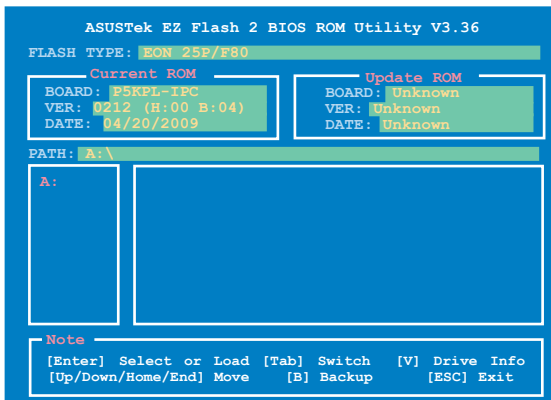
---

Before you start using this utility, download the latest BIOS file from the ASUS website at [www.asus.com](http://www.asus.com).

---

To update the BIOS using EZ Flash 2:

1. Insert the USB flash disk that contains the latest BIOS file to the USB port, then launch EZ Flash 2 in any of these two ways:
  - Press **<Alt> + <F2>** during POST to display the following:



- Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press **<Enter>** to enable it.  
Press **<Tab>** to switch between drives until the correct BIOS file is found.
2. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.



- 
- Only a USB flash disk with FAT 32/16 format and single partition can support the ASUS EZ Flash 2 utility.
  - Do not shut down or reset the system while updating the BIOS to prevent system boot failure!
- 

### 2.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or a USB flash disk that contains the updated BIOS file.



- 
- Prepare the motherboard support CD or the USB flash disk containing the updated motherboard BIOS before using this utility.
  - Always connect the SATA cable to the SATA1/2/3/4 connector. Otherwise, the utility will not function.
- 

### Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the support CD or USB flash disk containing the BIOS file to the optical drive or USB port.
3. The utility displays the following message and automatically checks the support CD or USB flash disk for the BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for CD-ROM...
CD-ROM not found!
Checking for USB Device...
```

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for USB Device...
USB Device found.
Reading file "P5KPLIPC.ROM". Completed.
Start Erasing...\
```

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



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



---

The recovered BIOS may not be the latest BIOS version for this motherboard. Download the latest BIOS file from the ASUS website at [www.asus.com](http://www.asus.com).

---

## 2.2 BIOS setup program

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.

If you want to enter Setup after POST, reboot the system by doing any of the following procedures:

- Restart using the OS standard shutdown procedure.
- Press <Ctrl>+<Alt>+<Del> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on.



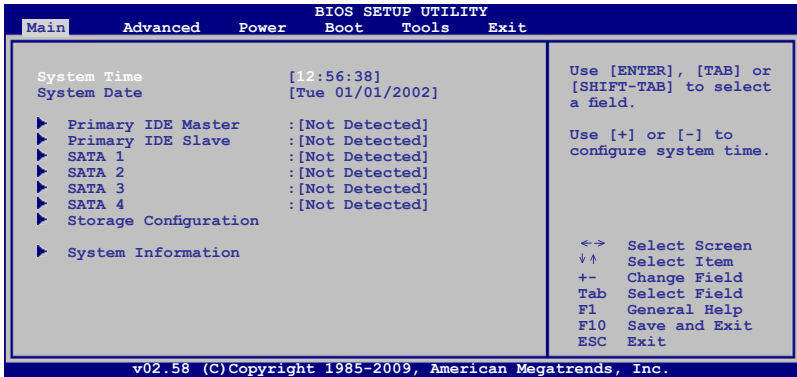
Using the **power button**, **reset button**, or the <Ctrl>+<Alt>+<Del> keys to force reset from a running operating system can cause damage to your data or system. We recommend to always shut down the system properly from the operating system.



- 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 Setups Default** item under the Exit Menu. See section 2.8 **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 at [www.asus.com](http://www.asus.com) to download the latest BIOS file for this motherboard.

## 2.3 Main menu

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



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

Allows you to set the system time.

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

Allows you to set the system date.

### 2.3.3 Primary IDE Master/Slave, SATA1~4

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

The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE/SATA 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]



---

This item does not appear when you select the **SATA 1/2/3/4** devices.

---

#### 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]

#### SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.

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

#### 32Bit Data Transfer [Enabled]

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

## 2.3.4 Storage Configuration

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

### ATA/IDE Configuration [Enhanced]

Allows you to set the ATA/IDE configuration. Configuration options: [Disabled] [Compatible] [Enhanced]

*Enhanced Mode Support On [S-ATA]*

Set Serial ATA, Parallel ATA or both as native mode. Configuration options: [S-ATA] [S-ATA+P-ATA] [P-ATA].

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

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

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

## 2.3.5 System Information

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

### BIOS Information

Displays the auto-detected BIOS information.

### Processor

Displays the auto-detected CPU specification.

### System Memory

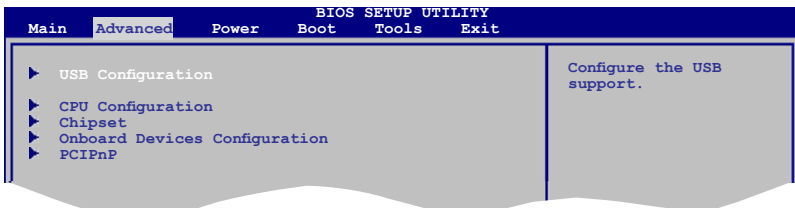
Displays the auto-detected system memory.

## 2.4 Advanced menu

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



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



### 2.4.1 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 Functions [Enabled]

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

### USB 2.0 Controller [Enabled]

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

### Legacy USB Support [Auto]

Allows you to enable or disable support for Legacy USB storage devices, including USB flash drives and USB hard drives. 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]

### USB 2.0 Controller Mode [HiSpeed]

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



---

The following items may only appear when a USB storage device is plugged.

---

## USB Mass Storage Device Configuration

### *USB Mass Storage Reset Delay [20 Sec]*

Allows you to set the maximum time that the BIOS waits for the USB storage device to initialize. Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

### *Emulation Type [Auto]*

Allows you to select the emulation type. Configuration options: [Auto] [Floppy] [Forced FDD] [Hard Disk] [CDROM]

## 2.4.2 CPU Configuration

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

### CPU Ratio Setting [Auto]

Sets the ration between CPU core clock and the FSB frequency. Configuration option: [Auto]



- 
- If an invalid ratio is set in CMOS then actual and set values may differ.
  - Key in ratio numbers directly.
- 

### C1E Support [Enabled]

Allows you to enable or disable C1E Support. Configuration options: [Disabled] [Enabled]

### Max CPUID Value Limit [Disabled]

Setting this item to **[Enabled]** allows legacy operating systems to boot even without support for CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

## Vanderpool Technology [Enabled]

Enables or disables this item when the processor supports Vanderpool technology. Users need to reset the computer to change the configuration of this item. Configuration options: [Enabled] [Disabled]

## CPU TM function [Enabled]

Enables or disables Intel® CPU Thermal Monitor (TM) function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage are reduced when the CPU overheats. Configuration options: [Disabled] [Enabled]

## Execute Disable Bit [Enabled]

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



---

The following item appears only when you installed an Intel® CPU that supports the Enhanced Intel® SpeedStep® Technology (EIST).

---

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

Allows you to use the Enhanced Intel® SpeedStep® Technology. When set to **[Enabled]**, you can adjust the system power settings in the operating system to use the EIST feature. Set this item to **[Disabled]** if you do not want to use the EIST.

Configuration options: [Enabled] [Disabled]

### 2.4.3 Chipset

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

#### North Bridge Configuration

##### Memory Remap Feature [Enabled]

Allows you to enable or disable the remapping of the overlapped PCI memory above the total physical memory. Enable this option only when you install 64-bit operating system.

Configuration options: [Disabled] [Enabled]

##### Configure DRAM Timing by SPD [Enabled]

Allows you to enable or disable configuring the DRAM Timing by SPD.

Configuration options: [Enabled] [Disabled]

##### Initiate Graphic Adapter [PEG/PCI]

Allows you to decide which graphics controller to use as the primary boot device.

Configuration options: [IGD] [PCI/IGD] [PCI/PEG] [PEG/IGD] [PEG/PCI]

##### Internal Graphics Mode Select [Enabled, 8MB]

Allows you to select the amount of system memory used by the IGD graphics device.

Configuration options: [Disabled] [Enabled, 1MB] [Enabled, 8MB]

##### PEG Port Configuration

*PEG Port*

Configuration options: [Disabled] [Auto]

#### *PEG Force x 1*

Allows you to enable or disable the PEG Force x 1. Configuration options: [Disabled] [Enabled]

### **Video Function Configuration**

#### *DVMT Mode Select [DVMT Mode]*

Allows you to select the DVMT mode. Configuration options: [Fixed Mode] [DVMT Mode]

#### **DVMT/FIXED Memory [256MB]**

Allows you to select the DVMT/FIXED memory. Configuration options: [128MB] [256MB] [Maximum DVMT]



---

The [Maximum DVMT] option only appears when installing 1GB DDR2 DIMMs into the DIMM sockets.

---

### **South Bridge Configuration**

#### **Audio Controller [Azalia]**

Allows you to set the audio controller. Configuration options: [Azalia] [Disabled]

#### *Front Panel Support Type [HD Audio]*

Allows you to select the front panel support type. If High Definition Audio Front Panel used, set this item to [HD Audio] mode. Configuration options: [AC97] [HD Audio]

### **2.4.4 Onboard Devices Configuration**

#### **Onboard LAN [Enabled]**

Allows you to enable or disable the onboard LAN controller.

Configuration options: [Enabled] [Disabled]

#### *OnBoard LAN Boot ROM [Disabled]*

Allows you to enable or disable the boot ROM in the onboard LAN controller. This item appears only when the Onboard LAN item is set to Enabled. Configuration options: [Disabled] [Enabled]

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

Allows you to select the Serial Port1 base address.

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

#### **Serial Port2 Address [3F8/IRQ4]**

Allows you to select the Serial Port2 base address.

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

### **2.4.5 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]

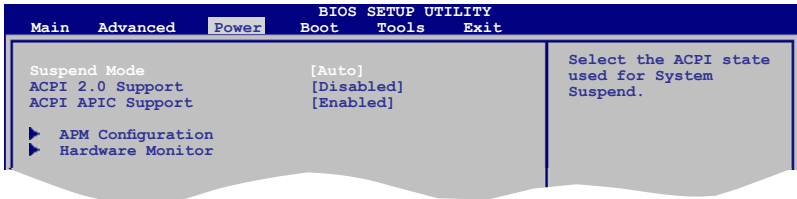
When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

### 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]

## 2.5 Power menu

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



### 2.5.1 Suspend Mode [Auto]

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

### 2.5.2 ACPI 2.0 Support [Disabled]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [Disabled] [Enabled]

### 2.5.3 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]

## 2.5.4 APM Configuration

### Restore on AC Power Loss [Power Off]

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

### Resume On Ring [Disabled]

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

### Resume On PCI Devices [Disabled]

When set to [Enabled], this parameter allows you to wake the system through a PCI LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

### Resume On PCIE Devices [Disabled]

When set to [Enabled], this parameter allows you to wake the system through a PCI Express card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

### Resume On 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]

### Power On By PS/2 Keyboard [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] [Space Bar] [Ctrl-Esc] [Power Key] [Any Key]

### Power 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]

## 2.5.5 Hardware Monitor

### CPU Temperature [xxx°C/xxx°F] or [Ignored]

### MB Temperature [xxx°C/xxx°F] or [Ignored]

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

### CPU/Chassis/Power Fan Speed [xxxxRPM] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU/chassis/power fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows **N/A**. Select **Ignored** if you do not wish to display the detected speed.

### CPU/Chassis Q-Fan Control [Disabled]

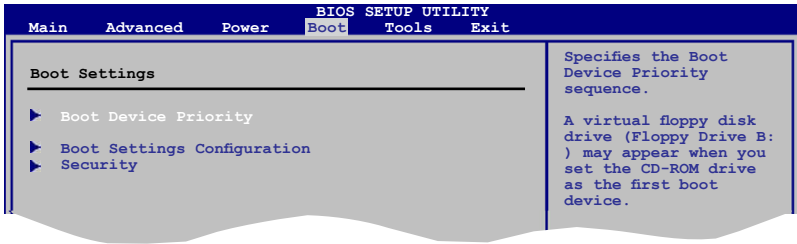
Allows you to enable or disable the CPU/chassis Q-Fan control. Configuration options: [Disabled] [Enabled]

## VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage [xxxV] or [Ignored]

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

## 2.6 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.



### 2.6.1 Boot Device Priority

#### 1st ~ xxth Boot Device

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: [Removable Dev.] [Hard Drive] [ATAPI CD-ROM] [Disabled]

### 2.6.2 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]

#### Wait For 'F1' If Error [Enabled]

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

## Hit 'DEL' Message Display [Enabled]

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

### 2.6.3 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 set a password, this item shows **Installed**.

To set a Supervisor Password:

1. Select the **Change Supervisor Password** item and press **<Enter>**.
2. On the password box, key in a password containing up to six letters or numbers, or both.
3. Confirm the password when prompted.

The message **Password Installed** appears after you successfully set your password.

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

To clear the supervisor password, select the **Change Supervisor Password** then press **<Enter>** twice. The message **Password uninstalled** appears.



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If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **1.6 Jumpers** for information on how to erase the RTC RAM.

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

#### User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items.

Configuration options: [No Access] [View Only] [Limited] [Full Access]

**[No Access]** - prevents user access to the Setup utility.

**[View Only]** - allows access but does not allow change to any field.

**[Limited]** - allows changes only to selected fields, such as Date and Time.

**[Full Access]** - allows viewing and changing all the fields in the Setup utility.

#### Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a User Password:

1. Select the **Change User Password** item and press **<Enter>**.
2. On the password box, key in a password containing up to six letters or numbers, or both.
3. Confirm the password when prompted.

The message **Password Installed** appears after you set your password successfully.

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

## Clear User Password

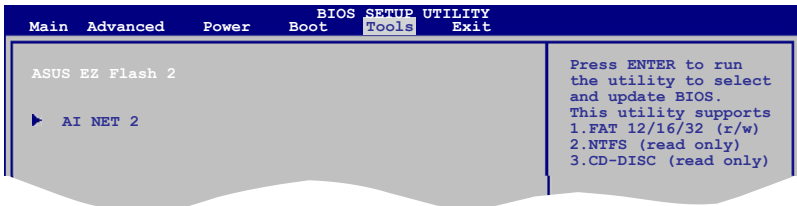
Select this item to clear the user password.

## Password Check [Setup]

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

## 2.7 Tools menu

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



### 2.7.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press **<Enter>**, a confirmation message appears. Use the left/right arrow key to select between **[Yes]** or **[No]**, then press **<Enter>** to confirm your choice. Please see section 2.1.2 **ASUS EZ Flash 2 utility** for details.

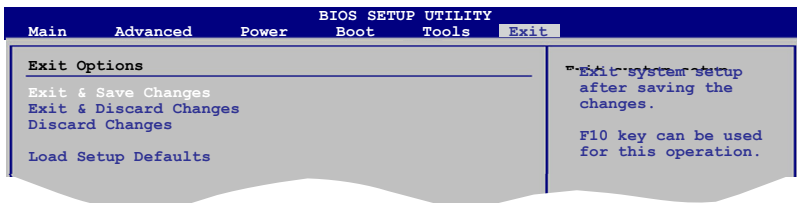
### 2.7.2 AI NET 2

#### Check Realtek LAN cable [Disabled]

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

## 2.8 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.