

P5G41-M LX

Motherboard



E4922

First Edition V1

August 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 electric shock hazard, disconnect the power cable from the electric 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.
- Ensure 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.
- The optical S/PDIF is an optional component (may or may not be included in your motherboard) and is defined as a CLASS 1 LASER PRODUCT.



INVISIBLE LASER RADIATION, AVOID EXPOSURE TO BEAM.

- Never dispose of the battery in fire. It could explode and release harmful substances into the environment.
- Never dispose of the battery with your regular household waste. Take it to a hazardous material collection point.
- Never replace the battery with an incorrect battery type.



-
- RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
 - DISPOSE OF USED BATTERIES ACCORDING TO THE ABOVE BATTERY-RELATED INSTRUCTIONS.
-

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, ensure that 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.



This motherboard should only be used in environments with ambient temperatures between 5°C (41°F) and 40°C (104°F).

- 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.

Conventions used in this guide

To ensure 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.

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.

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>

P5G41-M LX specifications summary

CPU	LGA775 socket for Intel® Core™2 Quad / Core™2 Extreme / Core™2 Duo / Pentium® Dual-Core / Celeron® Dual-Core / Celeron® processors Supports Intel® 45nm multi-core CPU * Refer to www.asus.com for Intel® CPU support list.
Chipset	Northbridge: Intel® G41 Southbridge: Intel® ICH7
Front Side Bus	1333/1066/800 MHz
Memory	Dual channel memory architecture - 2 x 240-pin DIMM sockets support maximum 8GB unbuffered non-ECC 1066(O.C.)/800/667 MHz DDR2 memory modules * Refer to www.asus.com or this user manual for the Memory QVL (Qualified Vendors Lists). ** 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.
Graphics	Intel® Graphics Media Accelerator (Intel® GMA X4500) integrated - Supports RGB with max. resolution of 2048 x 1536 @75HZ - Supports Microsoft® DirectX 10
Expansion slots	1 x PCI Express x16 slot 2 x PCI Express x1 slots 1 x PCI slot
Storage	Southbridge Intel® ICH7 supports: - 1 x UltraDMA 100/66 hard disk drive - 4 x Serial ATA 3Gb/s ports
LAN	RTL8103EL PCIe 10/100Mbps
Audio	ALC662-VC1 High Definition Audio 6-channel CODEC - Supports Jack-detection and Multi-streaming technologies
USB	Supports up to 8 x USB 2.0/1.1 ports (4 ports at mid-board, 4 ports at back panel)
ASUS special features	ASUS CrashFree BIOS 3 ASUS Q-Fan ASUS EZ Flash 2 ASUS MyLogo 2 ASUS AI NET 2 ASUS Turbo Key

(continued on the next page)

P5G41-M LX specifications summary

Back panel I/O ports	1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x COM port 1 x VGA port 1 x LAN (RJ-45) port 4 x USB 2.0/1.1 ports 6-channel audio I/O ports
Internal I/O connectors	2 x USB 2.0 connectors supports additional 4 USB 2.0 ports 1 x IDE connector 4 x Serial ATA connectors 1 x High definition front panel audio connector 1 x System panel connector 1 x Internal speaker connector 1 x CPU fan connector 1 x Chassis fan connector 1 x 24-pin EATX power connector 1 x 4-pin ATX 12V power connector
BIOS features	8Mb Flash ROM, AMI BIOS, PnP, DMI 2.0, WfM 2.0, ACPI v2.0a, SM BIOS v2.5
Support DVD contents	Drivers ASUS PC Probe II ASUS LiveUpdate Utility Anti-virus software (OEM version)
Accessories	2 x Serial ATA cables 1 x UltraDMA 100/66 cable 1 x I/O shield User Manual
Form factor	MicroATX form factor: 9.6 in x 7.2 in (24.4 cm x 18.3 cm)

*Specifications are subject to change without notice.

Chapter 1

Product introduction

Thank you for buying an ASUS® P5G41-M LX 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.



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

1.1 Before you proceed

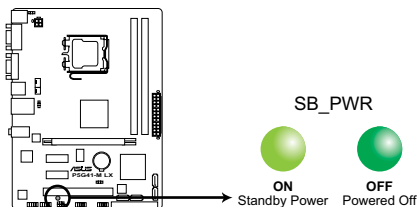
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- 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.



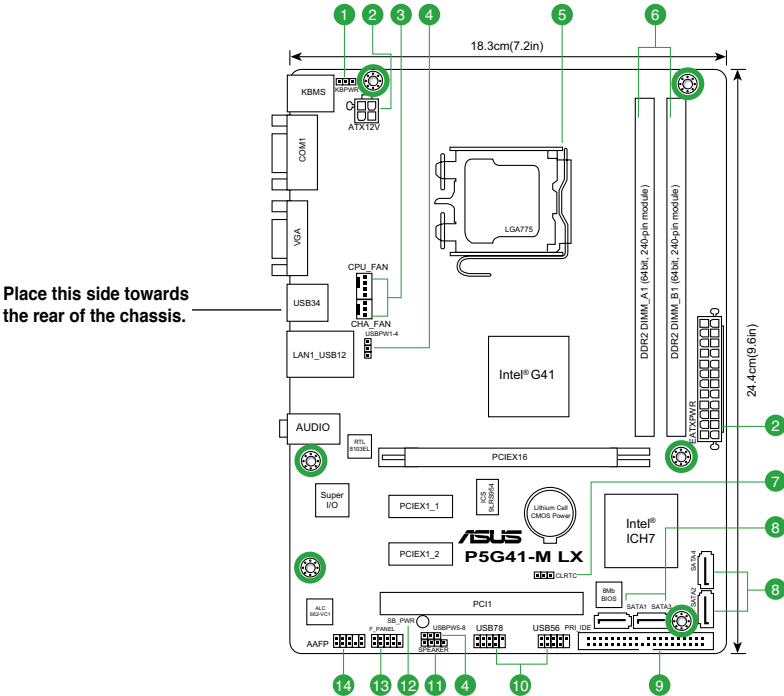
P5G41-M LX Onboard LED

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 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	8. Serial ATA connectors (7-pin SATA1-4)	1-13
2. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-12	9. IDE connector (40-1 pin PRI_IDE)	1-13
3. CPU and chassis fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN)	1-12	10. USB connectors (10-1 pin USB56, USB78)	1-14
4. USB device wake-up (3-pin USBPW1-4, 3-pin USBPW5-8)	1-10	11. Speaker connector (4-pin SPEAKER)	1-15
5. LGA775 CPU socket	1-3	12. Onboard LED (SB_PWR)	1-1
6. DDR2 DIMM slots	1-3	13. System panel connector (10-1 pin F_PANEL)	1-15
7. Clear RTC RAM (3-pin CLRTC)	1-9	14. Front panel audio connector (10-1 pin AAFP)	1-14

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® Dual-Core / Celeron® Dual-Core/ Celeron® 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.

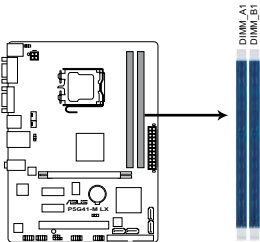


The motherboard supports Intel® LGA775 processors with the Intel® Enhanced Intel SpeedStep® Technology (EIST) and Hyper-Threading Technology.

1.4 System memory

1.4.1 Overview

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



Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

P5G41-M LX 240-pin 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.
- 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 8GB on Windows® XP Professional x64 and Windows® Vista x64 editions. You may install a maximum of 4GB DIMMs on each slot.

P5G41-M LX Motherboard Qualified Vendors Lists (QVL)

DDR2-667 MHz capability

Size	Vendor	Part No.	CL	Chip Brand	SS/DS	Chip No.	DIMM support	
							A*	B*
2G	Kingston	KVR667D2N5/2G	N/A	Micron	DS	7RE22 D9HNL	•	•
512MB	Kingston	KVR667D2N5/512	N/A	Kingston	SS	SO1237650821 SBP D6408TR4 CGL25USL074905PECNB	•	•
2G	Kingston	KVR667D2N5/2G	N/A	Elpida	DS	E1108ACBG-8E-E 0813A90CC	•	•
1G	Kingston	KVR667D2N5/1G	N/A	Kingston	DS	SO1280420822 SOP D6408TR4 CGL25USL156304PECXA	•	•
512MB	Qimonda	HYS64T64000EU-3S-B2	5	Qimonda	SS	HYB18T512B00B2F3SFSS28171	•	•
1G	Qimonda	HYS64T128020EU-3S-B2	5	Qimonda	DS	HYB18T512B00B2F3SFSS28171	•	•
1G	Corsair	VS1GB667D2	N/A	Corsair	DS	MID095D62864M8CEC	•	•
512MB	Corsair	VS512MB667D2	N/A	Corsair	DS	MII0052532M8CEC	•	•
1G	Corsair	XMS2-5400	4	Corsair	DS	Heat-Sink Package	•	•
1G	HY	HYMP512U64CP8-Y5 AB	5	Hynix	DS	HY5PS12521CFF-Y5	•	•
512MB	Kingmax	KLCC28F-A8KB5	N/A	Kingmax	SS	KKEA88B4LAUG-29DX	•	•
1G	Kingmax	KLCD48F-A8KB5	N/A	Kingmax	DS	KKEA88B4LAUG-29DX	•	•
512MB	Apacer	AU512E667C5KBGC	5	Apacer	SS	AM4B5708MIJS7E0627B	•	•
512MB	Apacer	AU512E667C5KBGC	5	Apacer	SS	AM4B5708QJJS7E06332F	•	•
512MB	Apacer	78.91G92.9K5	5	Apacer	SS	AM4B5708QJJS7E0751C	•	•
1G	Apacer	78.01G90.9K5	5	Apacer	SS	AM4B5808CQJS7E0751C	•	•
1G	Apacer	AU01GE667C5KBGC	N/A	Apacer	DS	AM4B5708QJJS7E0636B	•	•
1G	Apacer	AU01GE667C5KBGC	5	Apacer	DS	AM4B5708MIJS7E0627B	•	•
2G	Apacer	78.A1G90.9K4	5	Apacer	DS	AM4B5808CQJS7E0749B	•	•
2G	Apacer	AM4B5808CQJS7E0749B	5	Apacer	DS	78.A1G90.9K4	•	•
1G	Transcend	506010-4894	5	Elpida	DS	E5108AJBG-6E-E	•	•
512MB	ADATA	M20AD5G3H3160Q1C52	N/A	ADATA	SS	AD29608A8A-3EG20813	•	•
1G	ADATA	M20AD5G314170Q1C58	N/A	ADATA	DS	AD29608A8A-3EG80814	•	•
2G	ADATA	M20AD5H3J4170H1C53	N/A	ADATA	DS	AD20908A8A-3EG 30724	•	•
512MB	PSC	AL6E863J-6E1	5	PSC	SS	A3R12E3JFF717B9A00	•	•
1G	PSC	AL7E863J-6E1	5	PSC	DS	A3R12E3JFF717B9A01	•	•
1G	PSC	AL7E8F73C-6E1	5	PSC	SS	A3R1GE3CFF734MAAJ	•	•
512MB	Nanya	NT512T64U88A1BY-3C	N/A	Nanya	SS	NT5TU64M8AE-3C	•	•

(continued on the next page)

DDR2-667 MHz capability

Size	Vendor	Part No.	CL	Chip Brand	SS/ DS	Chip No.	DIMM support	
							A'	B'
1G	Nanya	NT1G64U8H80BY-3C	5	Nanya	DS	NT5TU64M8BE-3C72155700CP	•	•
1G	GEIL	GX21GB5300SX	3	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GX22GB5300LX	5	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GX24GB5300LDC	5	GEIL	DS	Heat-Sink Package	•	•
2G(2 x 1GB)	G.SKILL	F2-5400PHU2-2GBNT	5-5-5-15	G.SKILL	DS	D2 64M8CCF 0815 C7173S	•	•
4G(2 x 2GB)	G.SKILL	F2-5300CL5D-4GBMQ	5-5-5-15	G.SKILL	DS	Heat-Sink Package	•	•
1G	Super Talent	T667UB1GV	5	Super Talent	DS	PG 64M8-800 0750	•	•
512MB	Twinmos	8D-A3JK5MPETP	5	PSC	SS	A3R12E3GEF633ACA0Y	•	•
4G	Samsung	M378T5263AZ3-CE6	N/A	Samsung	DS	K4T2G084QA-HCE6	•	•
1G	ELIXIR	M2Y1G64TU8HA2B-3C	5	ELIXIR	DS	M2TU51280AE-3C717095R28F	•	•
1G	ELIXIR	M2Y1G64TU8HBOB-3C	5	ELIXIR	DS	N2TU51280BE-3C639009W1CF	•	•
1G	Leadmax	LRMP512U64A8-Y5	N/A	Hynix	DS	HY5PS12821CFP-Y5 C 702AA	•	•
512MB	MDT	DDR11 512 PC667	4	MDT	DS	18D51201D-30726E	•	•
512MB	AENEON	AET660UD00-30DB97X	5	AENEON	SS	AET93R300B 0634	•	•
1G	AENEON	AET760UD00-30DB97X	5	AENEON	DS	AET93R300B 0639	•	•
2G	AENEON	AET860UD00-30DB08X	5	AENEON	DS	AET03F30DB 0730	•	•
512MB	TAKEMS	TMS51B264C081-665QI	5	takeMS	SS	MS18T51280-3	•	•
512MB	TAKEMS	TMS51B264C081-665AP	5	takeMS	SS	MS18T51280-3S0627D	•	•
1G	TAKEMS	TMS1GB264C081-665QI	5	takeMS	DS	MS18T51280-3	•	•
1G	TAKEMS	TMS1GB264C081-665AE	5	takeMS	DS	MS18T51280-3S0627D	•	•
512MB	ASINT	SLX264M8-J6E	N/A	ASINT	SS	DDR116408-6E	•	•
1G	ASINT	SLY2128M8-J6E	N/A	ASINT	SS	DDR11208-6E 8115	•	•
512MB	Century	CENTURY 512MB	N/A	Nanya	SS	NT5TU64M8AE-3C	•	•
1G	Century	CENTURY 1G	N/A	Hynix	DS	HY5PS12821AFP-Y5	•	•
1G	Century	CENTURY 1G	N/A	Nanya	DS	NT5TU64M8AE-3C	•	•
1G	UMAX	D46701GP3-63BJU	N/A	UMAX	DS	U2S12D30YP-6E	•	•
2G	UMAX	D46702GP0-73BCU	5	UMAX	DS	U2S24D30TP-6E	•	•
512MB	KINGBOX	512MB 667MHz	N/A	KINGBOX	SS	EPD264082200-4	•	•

DDR2-800 MHz capability

Size	Vendor	Part No.	CL	Chip Brand	SS/ DS	Chip No.	DIMM support	
							A'	B'
1G	Kingston	KHX6400D2LL/1G	N/A	Kingston	DS	Heat-Sink Package	•	•
1G	Kingston	KVR800D2N5/1G	N/A	Promos	DS	V59C1512804QCF25S00619 04PECAJ	•	•
512MB	Kingston	KHX6400D2LLK2/1GN	N/A	Kingston	SS	Heat-Sink Package	•	•
1G(2 x 512MB)	Kingston	KHX6400D2K2/2G	N/A	Kingston	DS	Heat-Sink Package	•	•
512MB	Kingston	KVR800D2N6/512	N/A	Elpida	SS	E5108AJBG-8E-E	•	•
1G	Kingston	KVR800D2N5/1G	N/A	Elpida	DS	E5108AJBG-8E-E	•	•
1G	Kingston	KVR800D2N6/1G	N/A	Elpida	DS	E5108AJBG-8E-E	•	•
2G	Kingston	KVR800D2N5/2G	N/A	Elpida	DS	E1108ACBG-8E-E	•	•
2G	Kingston	KHX6400D2/2G	N/A	Kingston	DS	Heat-Sink Package	•	•
4G	Kingston	KVR800D2N6/4G	N/A	Elpida	DS	E2108ABSE-8G-E	•	•
512MB	Kingston	KVR800D2N5/512	N/A	Kingston	SS	E5108AJBG-8E-E 0803A9082	•	•
512MB	Samsung	M378T6553GZ3-CF7	6	Samsung	SS	K4T51083QG-HCF7	•	•
1G	Samsung	M378T2863QZ3-CF7	6	Samsung	SS	K4T1G084QQ-HCF7	•	•
1G	Samsung	M378T2953GZ3-CF7	6	Samsung	DS	K4T51083QG-HCF7	•	•
2G	Samsung	M378T5663QZ3-CF7	6	Samsung	DS	K4T1G084QQ-HCF7	•	•
4G	Samsung	M378T5263QZ3-CF7	N/A	Samsung	DS	K4T2G084QA-HCF7	•	•
1G	Qimonda	HY564T128020EU-2.5-B2	6	Qimonda	DS	HYB18T512800B2F25FS28380	•	•
2G	Qimonda	HY564T256020EU-2.5-C2	5	Qimonda	DS	HYB18T512800C2F-2.5	•	•
1G	Corsair	XMS2-6400	4	Corsair	DS	Heat-Sink Package	•	•
1G	Corsair	XMS2-6400	5	Corsair	DS	Heat-Sink Package	•	•
2G(2 x 1GB)	Corsair	CM2X2048-6400C5DHX	5	Corsair	DS	Heat-Sink Package	•	•
1G	Corsair	CM2X1024-6400	N/A	Corsair	DS	Heat-Sink Package	•	•
2G(2 x 1GB)	Corsair	CM2X2048-6400C5	5	Corsair	DS	Heat-Sink Package	•	•
2G(2 x 1GB)(EPP)	Crucial	BL12864AL80A.8FE5	4	N/A	SS	Heat-Sink Package	•	•
2G(2 x 1G)	Crucial	BL12864AL80A.8FE5(EPP)	4-4-4-12	N/A	SS	Heat-Sink Package	•	•
4G(2 x 2G)	Crucial	BL25664AL80A.16FE5(EPP)	4-4-4-12	N/A	DS	Heat-Sink Package	•	•
4G(2 x 2G)	Crucial	BL25664AR80A.16FE5(EPP)	4-4-4-12	N/A	DS	Heat-Sink Package	•	•
512MB	HY	HYMP564U64CP8-S5 AB	5	Hynix	SS	HY5PS12821CFP-S5	•	•
1G	HY	HYMP512U64CP8-S5 AB	5	Hynix	DS	HY5PS12821CFPS5	•	•

(continued on the next page)

DDR2-800 MHz capability

Size	Vendor	Part No.	CL	Chip Brand	SS/ DS	Chip No.	DIMM support	
							A*	B*
512MB	Kingmax	KLDC28F-A8K15	N/A	Kingmax	SS	KK48FF1XF-JFS-25A	•	•
2G	Kingmax	GE24GB800C5DC	N/A	Kingmax	DS	KK48FF1XF-HFS-25U	•	•
512MB	Apacer	78.91G91.9K5	5	Apacer	SS	AM4B5708JQJS8E0751C	•	•
1G	Apacer	78.01GA0.9K5	5	Apacer	SS	AM4B5808CQJS8E0749D	•	•
2G	Apacer	78.A1GA0.9K4	5	Apacer	DS	AM4B5808CQJS8E0740E	•	•
2G	Apacer	78.A1GA0.9K4	5	Apacer	DS	AM4B5808CQJS8E0747D	•	•
1G	Transcend	505649-1993	5	Micron	DS	7HD22D9GMH	•	•
512MB	Transcend	TS64MLQ64V8J512MB	5	Micron	SS	7HD22 D9GMH	•	•
1G	Transcend	503499-7280	N/A	Micron	DS	7NB32 D9DCL	•	•
1G	Transcend	TS128MLQ64V8J	5	Transcend	DS	TQ123PJF8F0801	•	•
1G	Transcend	JM800QLJ-1G	5	Transcend	DS	TQ123YBF8 T0747	•	•
512MB	ADATA	M20AD6G3H3160Q1E58	N/A	ADATA	SS	AD29608A8A-25EG80812	•	•
1G	ADATA	M20AD6G314170Q1E58	N/A	ADATA	DS	AD29608A8A-25EG80810	•	•
1G	VDATA	M2GVD6G314170Q1E58	N/A	VDATA	DS	VD29608A8A-25EG80813	•	•
1G	PSC	AL7E8F73C-8E1	5	PSC	SS	A3R1GE3CFF734MAAOE	•	•
2G	PSC	AL8E8F73C-8E1	5	PSC	DS	A3R1GE3CFF734MAAOE	•	•
2G	PSC	PL8E8F73C-8E1	5	PSC	DS	SHG772-AA3G	•	•
2G	PSC	PL8E8G73E-8E1	5	PSC	DS	XC2P71A3G-A	•	•
1G	GEIL	GB22GB6400C4DC	4	GEIL	DS	GL2L64M088BA30EB	•	•
1G	GEIL	GB24GB6400C4QC	4	GEIL	DS	GL2L64M088BA30EB	•	•
1G	GEIL	GB22GB6400C5DC	5	GEIL	DS	GL2L64M088BA30EB	•	•
1G	GEIL	GB24GB6400C5QC	5	GEIL	DS	GL2L64M088BA30EB	•	•
1G	GEIL	GX22GB6400DC	5	GEIL	DS	Heat-Sink Package	•	•
1G	GEIL	GE22GB800C4DC	4	GEIL	DS	Heat-Sink Package	•	•
1G	GEIL	GE24GB800C4QC	4	GEIL	DS	Heat-Sink Package	•	•
1G	GEIL	GX22GB6400UDC	4	GEIL	DS	Heat-Sink Package	•	•
1G	GEIL	GE22GB800C5DC	5	GEIL	DS	Heat-Sink Package	•	•
1G	GEIL	GE24GB800C5QC	5	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GB24GB6400C4DC	4	GEIL	DS	GL2L128M88BA25AB	•	•
2G	GEIL	GB24GB6400C5DC	5	GEIL	DS	GL2L128M88BA25AB	•	•
2G	GEIL	GB28GB6400C5QC	5	GEIL	DS	GL2L128M88BA25AB	•	•
2G	GEIL	GB28GB6400C4QC	4	GEIL	DS	GL2L128M88BA25AB	•	•
2G	GEIL	GX22GB6400LX	5	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GX24GB6400DC	5	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GE28GB800C5QC	5	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GE28GB800C4QC	4	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GX22GB6400CUSC	4	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GE24GB800C4DC	4	GEIL	DS	Heat-Sink Package	•	•
2G	GEIL	GE24GB800C5DC	5	GEIL	DS	Heat-Sink Package	•	•
1G	Super Talent	T800UB1GC4	4	Super Talent	DS	Heat-Sink Package	•	•
1G	G.SKILL	F2-6400CL5D-2GBNQ	5	G.SKILL	DS	Heat-Sink Package	•	•
1G	G.SKILL	F2-6400CL4D-2GBPK	4	G.SKILL	DS	Heat-Sink Package	•	•
1G	G.SKILL	F2-6400CL4D-2GBHK	4	G.SKILL	DS	Heat-Sink Package	•	•
2G	G.SKILL	F2-6400CL5D-4GBPQ	5	G.SKILL	DS	Heat-Sink Package	•	•
2G	G.SKILL	F2-6400CL4D-4GBPK	4	G.SKILL	DS	Heat-Sink Package	•	•
512MB	G.SKILL	F2-6400CL5D-1GBNQ	5	G.SKILL	DS	Heat-Sink Package SN:8151030036642	•	•
4G	G.SKILL	F2-6400CL5Q-16GNQ	5	G.SKILL	DS	Heat-Sink Package	•	•
1G	OCZ	OCZ2RPR8002GK	4	OCZ	DS	Heat-Sink Package	•	•
1G	OCZ	OCZ2G800R22GK	5	OCZ	DS	Heat-Sink Package	•	•
1G	OCZ	OCZ2P800R22GK	4	OCZ	DS	Heat-Sink Package	•	•
1G	OCZ	OCZ2VU8004GK	6	OCZ	DS	Heat-Sink Package	•	•
2G	OCZ	OCZ2P8004GK	5	OCZ	DS	Heat-Sink Package	•	•
2G(2 x 1G)	OCZ	OCZ2SE8002GK	5-5-5-15	N/A	DS	Heat-Sink Package	•	•
2G	OCZ	OCZ2F8004GK	5	N/A	DS	Heat-Sink Package	•	•
1G	Elixir	M2Y1G64TU8HB0B-25C	5	Elixir	DS	N2TU51280BE-25C802006Z1DV	•	•
512MB	AENEON	AET660UD00-25DB98X	N/A	AENEON	SS	AET93F25DB 0621	•	•
1G	AENEON	AET760UD00-25DB97X	5	AENEON	DS	AET93R25DB 0640	•	•
1G	AENEON	AET760UD00-25DC08X	5	AENEON	SS	AET03R25OC 0732	•	•
512MB	MDT	MDT 512MB	5	MDT	SS	18D51280D-2.50726F	•	•
512MB	TAKEMS	TMS51B26AC081-805EP	5	takeMS	SS	MS18T51280-2.5P0710	•	•
1G	TAKEMS	TMS1GB26AC081-805AE	5	takeMS	DS	MS18T51280-25FEA0709A	•	•
1G	TAKEMS	TMS1GB26AC081-805EP	5	takeMS	DS	MS18T51280-2.5P0716	•	•
1G	ASINT	SLY2128M8-JGE	N/A	ASINT	SS	DRH11208-GE 8115	•	•
2G	ASINT	SLZ2128M8-JGE	N/A	ASINT	DS	DRH11208-GE 8115	•	•
1G	UMAX	D48001GP3-63BUJ	N/A	UMAX	DS	U2S12D30TP-8E	•	•
2G	UMAX	D48002GP0-73BCU	5	UMAX	DS	U2S24D30TP-8E	•	•

DDR2 1066(O.C.) Qualified Vendors List

Size	Vendor	Part No.	SS/ DS	Chip Brand	Chip NO.	DIMM support	
						A*	B*
1024MB	Apacer	78.0AGBD.9L5	SS	N/A	Heat-Sink Package	•	•
1024MB	Corsair	CM2X1024-8500C5	DS	Corsair	Heat-Sink Package	•	•
4096MB(kit of 2)	Corsair	CM2X2048-8500C5D	DS	N/A	Heat-Sink Package	•	•
1024MB	Crucial	BL12864AA1065.8FE5	SS	N/A	Heat-Sink Package	•	•
2048MB	Crucial	CT25664AA1067.16FE1	DS	Micron	9CE12 D9JKH	•	•
1024MB	G.SKILL	F2-8500CL5S-1GBPK	DS	N/A	Heat-Sink Package	•	•
2048MB(Kit of 2)	G.SKILL	F2-8500CL5D-2GBPK	DS	N/A	Heat-Sink Package	•	•
4096MB(kit of 2)	G.SKILL	F2-8500CL5D-4GBPK	DS	N/A	Heat-Sink Package	•	•
1024MB	GEIL	GB22GB8500C5DC	SS	GEIL	GL2L128M88BA18BW	•	•
1024MB	GEIL	GB24GB8500C5QC	SS	GEIL	GL2L128M88BA25AB	•	•
1024MB	GEIL	GE22GB1066C5DC	SS	GEIL	Heat-Sink Package	•	•
1024MB	GEIL	GE24GB1066C5QC	SS	GEIL	Heat-Sink Package	•	•
2048MB	GEIL	GB24GB8500C5DC	DS	GEIL	GL2L128M88BA25AB	•	•
2048MB	GEIL	GE24GB1066C5DC	DS	GEIL	Heat-Sink Package	•	•
4096MB(kit of 2)	GEIL	GX24GB8500C5UDC	DS	N/A	Heat-Sink Package	•	•
1024MB	Kingmax	KLED48F-B8KU6-NGES	SS	Kingmax	KKB8FNUXF-DXX-18A	•	•
2048MB	Kingmax	KLEE88F-B8KU6-NNAS	SS	Kingmax	KKB8FNUXF-DXX-18A	•	•
1024MB(Kit of 2)	Kingston	KHX8500D2K2/1GN(EPP)	SS	Kingston	Heat-Sink Package	•	•
1024MB	Kingston	KHX8500D2/1G	SS	N/A	Heat-Sink Package	•	•
2048MB	Kingston	KHX8500D2K2/4G	DS	N/A	Heat-Sink Package	•	•
2048MB	Micron	MT16HTF25664AY-1GAE1	DS	Micron	9CE12 D9JKH	•	•
2048MB(Kit of 2)	OCZ	OCZ2N10662GK(EPP)	DS	N/A	Heat-Sink Package	•	•
4096MB(kit of 2)	OCZ	OCZ2F10664GK	DS	N/A	Heat-Sink Package	•	•
2048MB	PSC	AL8E8G73F-AE1	DS	PSC	A3R1GE3FGF907MATOFTAIWAN-G8E	•	•
2048MB(Kit of 2)	Transcend	TX1066QLU-2GK	SS	N/A	Heat-Sink Package	•	•
4096MB(kit of 2)	Transcend	TX1066QLU-4GK	DS	Transcend	Heat-Sink Package	•	•
1024MB	Elixir	M2Y1G64TU88D5B-BD	SS	Elixir	M2TU1G800E-BD	•	•
2048MB(Kit of 2)	Mushkin	996684	SS	N/A	Heat-Sink Package	•	•
2048MB(kit of 2)	Mushkin	996612	DS	N/A	Heat-Sink Package	•	•
2048MB(Kit of 2)	PATRIOT	PDC22G8500ELK	DS	N/A	Heat-Sink Package	•	•
4096MB(Kit of 2)	PATRIOT	PDC24G8500ELKR2	DS	N/A	Heat-Sink Package	•	•



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 both the blue slots as one pair of dual-channel memory configuration.



Visit the ASUS website at 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 slot

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

1.5.4 PCI Express x1 slots

This motherboard supports PCI Express x1 network cards, SCSI cards, and other cards that comply with the PCI Express specifications.

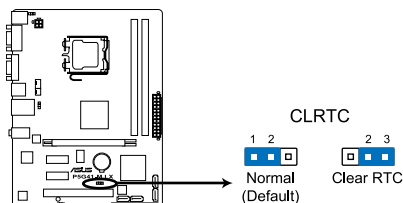
1.5.5 PCI Express x16 slot

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 CLRTC)

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



P5G41-M LX 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 **** key during the boot process and enter BIOS setup to re-enter data.



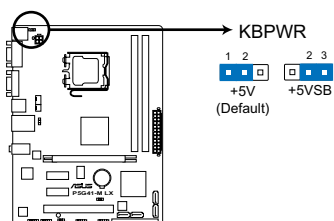
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



- 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.
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R.) feature. Shut down and reboot the system, then the BIOS automatically resets parameter settings to default values.

2. Keyboard power (3-pin KBPWR)

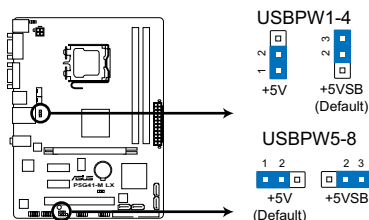
This jumper allows you to enable or disable the keyboard wake-up feature. When you set this jumper to pins 2–3 (+5VSB), you can wake up the computer by pressing a key on the keyboard (the default is the Space Bar)s. This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead,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



P5G41-M LX Keyboard Power Setting

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

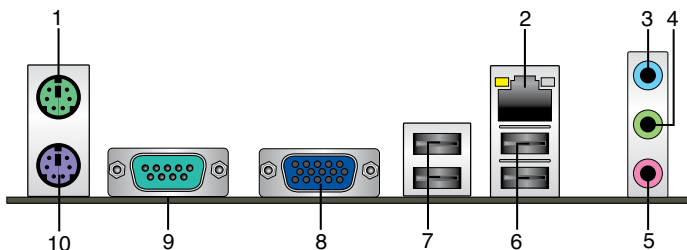
Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).



P5G41-M LX USB Device Wake Up

1.7 Connectors

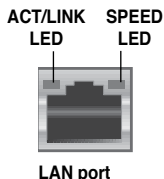
1.7.1 Rear panel connectors



1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **LAN (RJ-45) port.** This port allows 10/100Mbps 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	No link
BLINKING	Data activity	OFF	10 Mbps connection
BLINKING	Data activity	ORANGE	100 Mbps connection



3. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.
4. **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.
5. **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

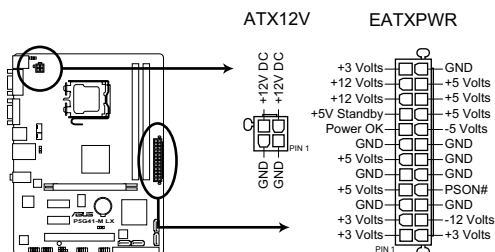
Port	Headset 2-channel	4-channel	6-channel
Light Blue	Line In	Rear Speaker Out	Rear Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Bass/Center

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

1.7.2 Internal connectors

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

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



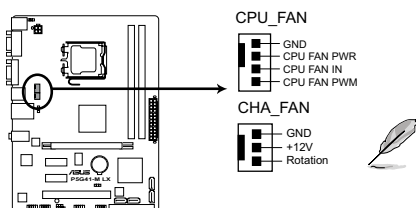
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.
- Do not forget to connect the 4-pin ATX12V power plug. Otherwise, the system will not boot.
- We recommend that 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.
- If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at <http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us> for details.

2. CPU and chassis fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN)

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



Only the 4-pin CPU fan supports the ASUS Q-Fan feature.

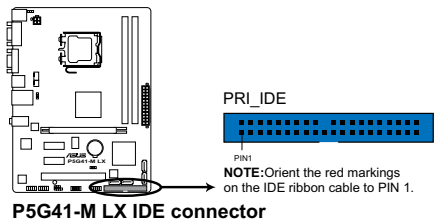
3. IDE connector (40-1 pin PRI_IDE)

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

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



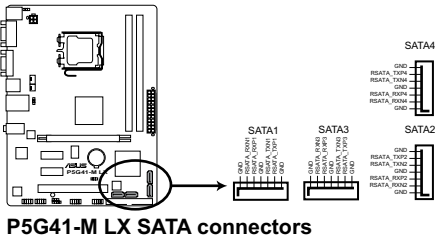
- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66 IDE devices.



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

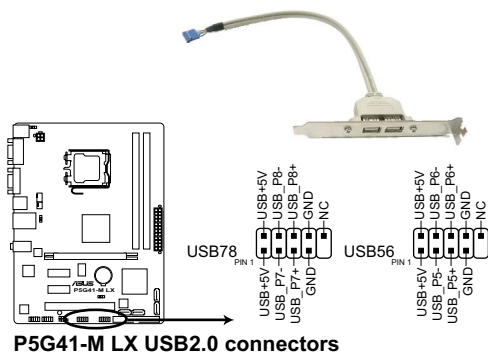
4. Serial ATA connectors (7-pin SATA1-4)

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).



5. 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 480Mbps connection speed.



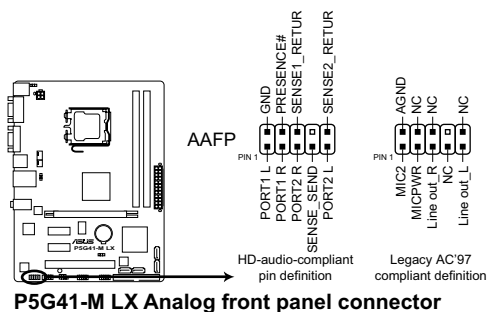
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



The USB 2.0 module is purchased separately.

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

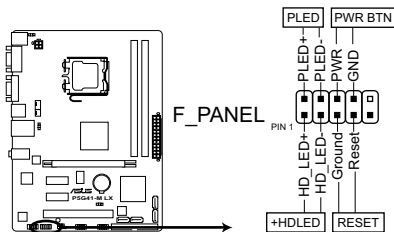
This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.



- 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 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.

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

This connector supports several chassis-mounted functions.



P5G41-M LX 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 HD LED lights up or flashes when data is read from or written to the HDD.

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

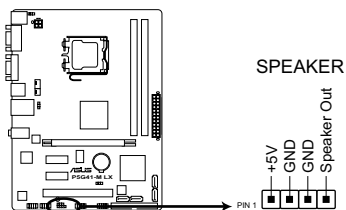
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **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.

8. Speaker connector (4-pin SPEAKER)

This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.



P5G41-M LX Speaker Out Connector

1.8 Software support

1.8.1 Installing an operating system

This motherboard supports Windows® XP/Vista/7 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 DVD information

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



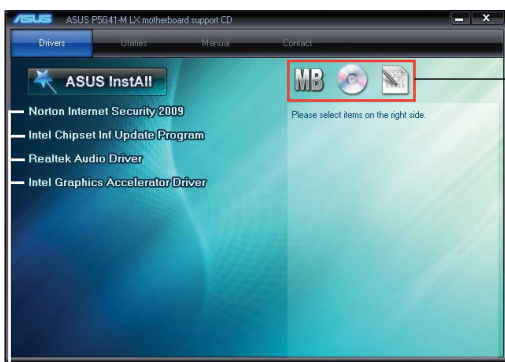
The contents of the Support DVD are subject to change at any time without notice. Visit the ASUS website at www.asus.com for updates.

To run the Support DVD

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



The following screen is for reference only.



Click an icon to display Support DVD/motherboard information

Click an item to install



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

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 DVD that comes with the motherboard package.
-

Installing ASUS Update

To install ASUS Update:

1. Place the support DVD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **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

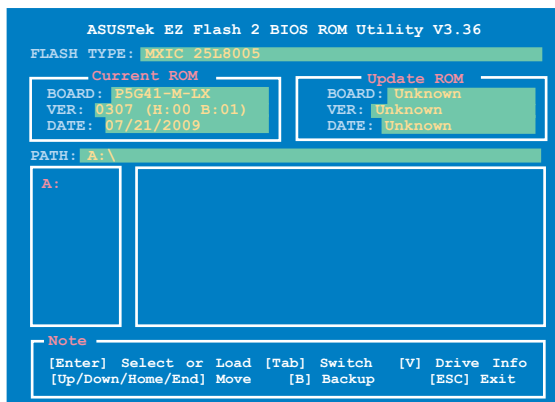
The ASUS EZ Flash 2 feature allows you to update the BIOS without using an OS-based utility.



Before you start using this utility, download the latest BIOS file from the ASUS website at www.asus.com.

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.
 - 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.



- This function supports USB flash disks with **FAT 32/16** format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

2.1.3 ASUS CrashFree BIOS

The ASUS CrashFree BIOS 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 restore a corrupted BIOS file using the motherboard support DVD or a removable device that contains the updated BIOS file.



- The BIOS file in the support DVD may not be the latest version. Download the latest BIOS file from the ASUS website at www.asus.com.
- The removable devices that ASUS CrashFree BIOS support vary with motherboard models. For motherboards without the floppy connector, prepare a USB flash disk before using this utility.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the support DVD to the optical drive or the removable device that contains the BIOS file to the USB port or to the floppy disk drive, if supported.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Turn off the system after the utility completes the updating process and turn on again.



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



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit menu. Refer to section **2.8 Exit menu** for details.

2.2 BIOS setup program

Use the BIOS Setup program to update the BIOS or configure its parameters. The BIOS screens include navigation keys and brief online help to guide you in using the BIOS Setup program.

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

- Press <Delete> during the Power-On Self Test (POST). If you do not press <Delete>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+ simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.



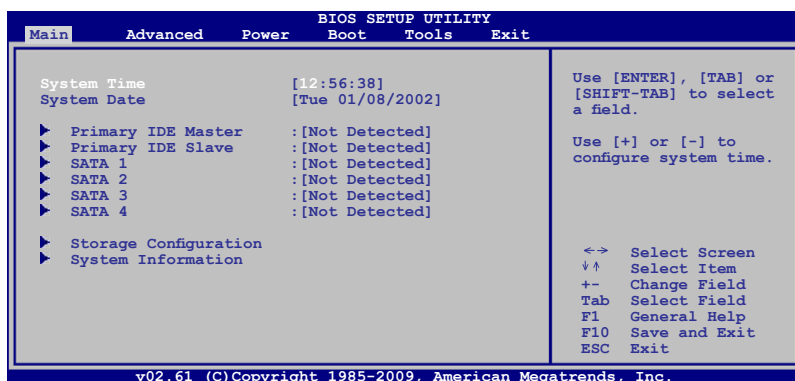
Using the **power button**, **reset button**, or the **<Ctrl>+<Alt>+** keys to force reset from a running operating system can cause damage to your data or system. We recommend to always shut down the system properly from the operating system.



- 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 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 Not Detected 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]

Sets 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

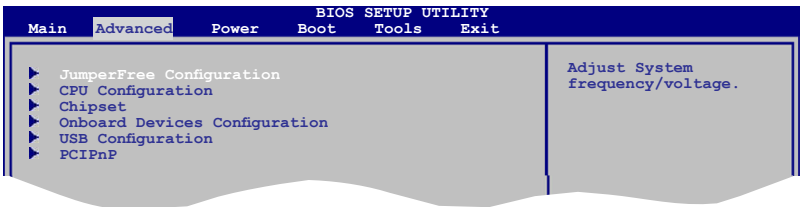
Displays the auto-detected system memory.

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 JumperFree Configuration

The items in this menu allows you to adjust the system frequency/voltage.

Ai Overclocking [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking configuration options:

Manual - allows you to individually set overclocking parameters.

Auto - loads the optimal settings for the system.

Overclock Profile - loads overclocking profiles with optimal parameters for stability when overclocking.



The following two items appear only when you set the **Ai Overclocking** item to **[MANUAL]**.

CPU Frequency [xxx]

Displays the frequency sent by the clock generator to the system bus and PCI bus. The value of this item is auto-detected by the BIOS. Use the <+> and <-> keys to adjust the CPU frequency. You can also type the desired CPU frequency using the numeric keypad. The values range from 133 to 800. Refer to the table on the next page for the correct Front Side Bus and CPU External Frequency settings.

FSB / CPU External Frequency Synchronization

Front Side Bus	CPU External Frequency
FSB 1333	333 MHz
FSB 1066	266 MHz
FSB 800	200 MHz

PCI Express Frequency [Auto]

Allows you to select the PCI Express frequency. Configuration options: [Auto] [90] [91] [92]~[150]



The following item appears only when you set the **AI Overclocking** item to **[Overclock Profile]**.

Overclock Options [Overclock 5%]

Allows you to select the overclock options. Configuration options: [Overclock 5%] [Overclock 10%] [Overclock 15%] [Overclock 20%] [Test Mode]

DRAM Frequency [Auto]

Allows you to set the DDR2 operating frequency.

Configuration options: [Auto] [667 MHz] [800 MHz] [1067MHz]



The following table shows the DRAM Frequency options that appear when the FSB value is 1333, 1066, and 800.

FSB	DRAM Frequency						
	Auto	667MHz	800MHz	960MHz	1000MHz	1067MHz	1100MHz
1333	v	v	v		v		v
1066	v	v	v			v	
800	v	v	v				



Selecting a very high DRAM frequency may cause the system to become unstable! If this happens, revert to the default setting.

Memory Voltage [Auto]

Allows you to set the memory voltage. The values range from 1.85000V to 2.24375V with a 0.00625V increment. Key in the value directly or use +/- to adjust the voltage.

Configuration options: [Auto]

Chipset Over Voltage [Auto]

Allows you to set the chipset over voltage. The values range from 1.10000V to 1.49375V with a 0.00625V increment. Key in the value directly or use +/- to adjust the voltage.

Configuration options: [Auto]

VTT Over Voltage [Auto]

Allows you to set the VTT over voltage. The values range from 1.10000V to 1.49375V with a 0.00625V increment. Key in the value directly or use +/- to adjust the voltage.

Configuration options: [Auto]

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 ratio 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]

Intel(R) Virtualization Tech [Enabled]

Enables or disables Intel® Virtualization Technology. Virtualization enhanced by Intel® Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. 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 Capability [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® Pentium® 4 or later 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 sub-menu.

North Bridge Configuration

Memory Remap Feature [Enabled]

Allows you to enable or disable the remapping of overlapped PCI memory above the total physical memory. Configuration options: [Enabled] [Disabled]

Configure DRAM Timing by SPD [Enabled]

Allows you to enable or disable configuring DRAM Timing by SPD.
Configuration options: [Enabled] [Disabled]

Initiate Graphic Adapter [PEG/PCI]

Allows you to select the graphics controller as the primary boot device.
Configuration options: [IGD] [PCI/IGD] [PCI/PEG] [PEG/IGD] [PEG/PCI]

IGD Graphics Mode Select [Enabled, 32MB]

Allows you to select the amount of system memory used by the Internal graphics device.
Configuration options: [Disabled] [Enabled, 32MB] [Enabled, 64MB] [Enabled, 128MB]

GTT Graphics Memory Size [No VT mode, 2MB]

This item is not user- configurable.

DVMT Memory [256MB]

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



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

Protect Audio Video Path Mode [Lite]

This item is not user- configurable.

South Bridge Configuration

Audio Controller [Enabled]

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

Front Panel 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]

LAN Option 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] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

2.4.5 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]

2.4.6 PCI PnP

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



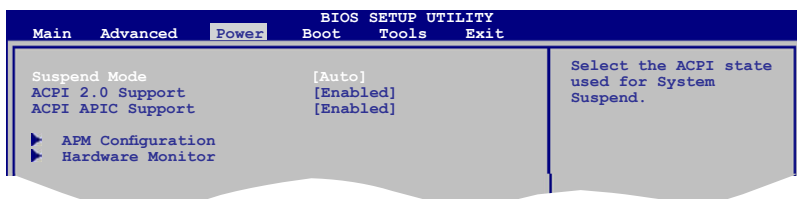
Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction.

Plug and Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot. Configuration options: [No] [Yes]

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 [Enabled]

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]

Power On By PS/2 Keyboard/Mouse [Disabled]

Allows you to enable or disable the PS/2 keyboard/mouse to generate a wake event. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

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]

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 Fan Speed [xxxxRPM] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU/chassis 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 Q-Fan Function [Disabled]

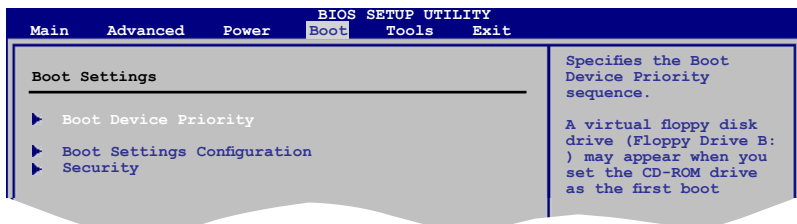
Allows you to enable or disable the CPU's Q-Fan function. Configuration options: [Disabled] [Enabled]

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]



- To select the boot device during system startup, press **<F8>** when ASUS Logo appears.
- To access Windows® OS in Safe Mode, do any of the following:
 - Press **<F5>** when ASUS Logo appears.
 - Press **<F8>** after POST.

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]

Startup 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. In the password box, key in a password containing up to six letters or numbers, or both, then press **<Enter>**.
3. Confirm the password when prompted.

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

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

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



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

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

User Access Level [Full Access]

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. In the password box, key in a password containing up to six letters or numbers, or both, then press **<Enter>**.
3. Confirm the password when prompted.

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

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

Clear User Password

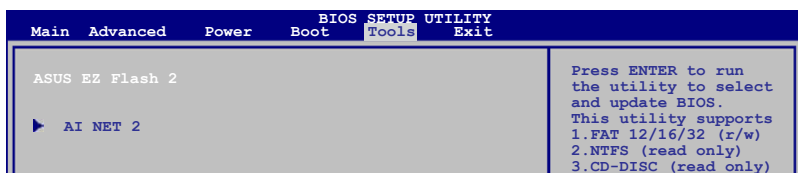
Select this item to clear the user password.

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. See section 2.1.2 **ASUS EZ Flash 2** for details.

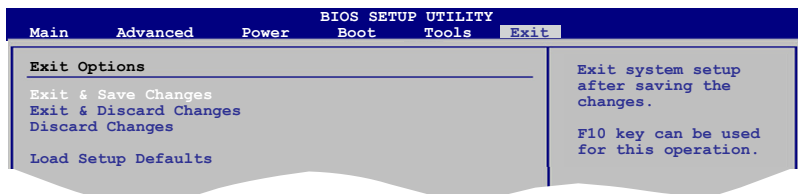
2.7.2 AI NET 2

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.