

M4N78-AM



Motherboard

E4379

First Edition V1

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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.



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.

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.
- Place the product on a flat and 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.

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>

Command

Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.

Example: At the DOS prompt, type the command line:

afudos /i [filename]

afudos /iM4N78AM.ROM

M4N78-AM specifications summary

CPU	<p>AMD® Socket AM2+ / AM2 for AMD® Phenom™ x4 / Phenom™ x3 / Athlon™ x2 / Athlon™ / Sempron™ processors</p> <p>Compatible with Phenom™ II / Athlon™ x4 / Athlon™ x3 / Athlon™ x2 processors (AM3 CPU)</p> <p>AMD Cool 'n' Quiet™ Technology</p> <p>Supports CPU up to 95W</p> <p>Refer to www.asus.com for the AMD CPU support list</p>
Chipset	NVIDIA® GeForce 8200 (MCP78S)
System bus	<p>Up to 5200 MT/s HyperTransport™ 3.0 interface for AM3 / AM2+ CPU</p> <p>2000 / 1600 MT/s for AM2 CPU</p>
Memory	<p>Dual-channel memory architecture</p> <p>2 x 240-pin DIMM slots support unbuffered ECC and non-ECC DDR2 1066/800/667MHz memory modules</p> <p>Supports up to 8GB system memory</p> <p>* DDR2 1066 is supported by AM3 / AM2+ CPU only.</p> <p>** Refer to www.asus.com for the latest Memory QVL (Qualified Vendors List).</p> <p>*** When you install a total memory of 4GB 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>
Graphics	<p>Integrated NVIDIA® GeForce Series DirectX 10 graphics processor</p> <p>Maximum shared memory of 512MB</p> <p>Supports NVIDIA Hybrid SLI Technology</p> <p>* Refer to www.asus.com for details on how to use Hybrid SLI.</p> <p>Supports RGB with max. resolution up to 1920 x 1440 @ 75Hz</p>
Expansion slots	<p>1 x PCIe (Gen 2.0) x16 slot</p> <p>1 x PCIe (Gen 1.1) x1 slot</p> <p>2 x PCI slots</p>
Storage	<p>1 x UltraDMA 133/100/66 connector</p> <p>4 x Serial ATA 3Gb/s connectors support RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD configurations</p>
Audio	<p>VIA VT1708S High Definition Audio 6-channel CODEC</p> <p>Supports Multi-streaming and Anti Pop Function</p> <p>Supports S/PDIF_OUT interface at back I/O</p>
USB	Supports up to 10 USB 2.0/1.1 ports (6 ports at mid-board, 4 ports at the back panel)
LAN	Broadcom B5071 PHY Gigabit LAN

(continued on the next page)

M4N78-AM specifications summary

ASUS special features	ASUS Q-Fan ASUS CrashFree BIOS3 ASUS EZ Flash2 ASUS AI NET2 ASUS MyLogo2
Back panel I/O ports	1 x PS/2 Keyboard port 1 x PS/2 Mouse port 1 x RJ45 port 1 x VGA port 4 x USB 2.0/1.1 ports 6-channel audio I/O ports 1 x COM port 1 x LPT port
Internal I/O connectors	3 x USB 2.0/1.1 connectors support additional 6 USB 2.0/1.1 ports 1 x IDE connector 4 x SATA connectors 1 x system panel connector 1 x CD audio-in connector 1 x Internal speaker connector 1 x Front panel audio connector 1 x CPU fan connector 1 x S/PDIF_OUT connector 1 x 24-pin EATX power connector 1 x 4-pin ATX 12V power connector
BIOS	8Mb Flash ROM, AMI BIOS, PnP, DMI v2.0, WfM2.0, ACPI v2.0a, SM BIOS v2.5
Accessories	1 x Serial ATA cable 1 x UltraDMA 133/100/66 cable 1 x I/O shield 1 x User Manual
Form Factor	MicroATX form factor: 9.6 in x 8.0 in (24.4 cm x 20.3 cm)
Support DVD	Drivers ASUS Update ASUS PC Probe II Anti-Virus software (OEM version)

**Specifications are subject to change without notice.*

Chapter 1

Product introduction

Thank you for buying an ASUS® M4N78-AM 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

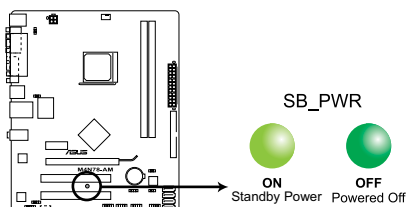
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- 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, switch off the ATX power supply and detach its power cord. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

Onboard LED

This 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.



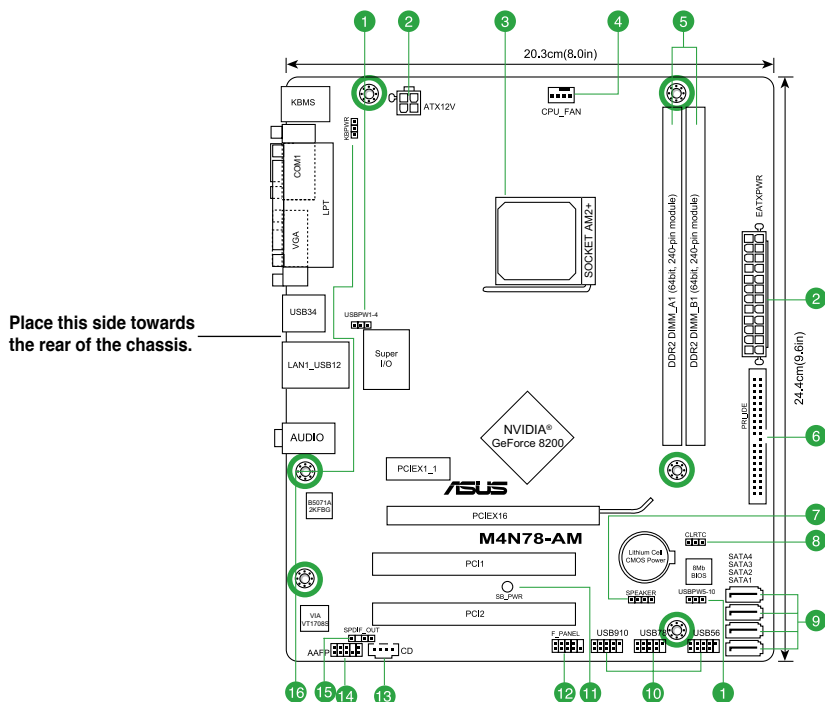
M4N78-AM Onboard LED

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. USB device wake-up (3-pin USBPW1-4, USBPW5-10)	1-7	9. Serial ATA connectors (7-pin SATA1/2/3/4)	1-10
2. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-13	10. USB connectors (10-1 pin USB56, USB78, USB910)	1-12
3. AM2+ CPU Socket	1-3	11. Standby power LED (SB_PWR)	1-1
4. CPU fan connector (4-pin CPU_FAN)	1-12	12. System panel connector (10-1 pin F_PANEL)	1-13
5. DDR2 DIMM slots	1-3	13. Optical drive audio in connector (4-pin CD)	1-11
6. IDE connector (40-1 pin PRI_IDE)	1-11	14. Front panel audio connector (10-1 pin AAFP)	1-10
7. Internal speaker connector (4-pin SPEAKER)	1-9	15. Digital audio connector (4-1 pin SPDIF_OUT)	1-14
8. Clear RTC RAM (3-pin CLRTC)	1-7	16. Keyboard power (3-pin KBPWR)	1-8

1.3 Central Processing Unit (CPU)

This motherboard comes with an AM2+ / AM2 socket designed for AMD® Phenom™ x4 / Phenom™ x3 / Athlon™ x2 / Athlon™ / Sempron™ processors. It also supports AM3 CPUs including Phenom™ II / Athlon™ x4 / Athlon™ x3 / Athlon™ x2 processors.



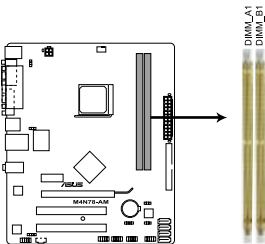
The AM2+ / AM2 socket has a different pinout from the 940-pin socket designed for the AMD Opteron™ processor. Use a CPU that is designed for the AM2+ socket.

1.4 System memory

1.4.1 Overview

This motherboard comes with two Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets. A DDR2 DIMM has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:



M4N78-AM 240-pin DDR2 DIMM sockets

Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

1.4.2 Memory configurations

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



The motherboard supports up to 8GB memory modules on Windows® XP Professional x64 and Vista x64 editions. You may install a maximum of 4GB DIMMs on each slot.



- 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, we recommend 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:
 - Install a maximum of 3GB system memory if you are using a 32-bit Windows® OS.
 - Use a 64-bit Windows® OS if 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.

M4N78-AM Motherboard Qualified Vendors Lists (QVL)

DDR2-1066MHz capability

Vendor	Part No.	Size	SS/DS	Chip No.	CL	Chip Brand	DIMM support A* B*
Apacer	78.AAGAL.9KZ	4G(kit of 2)	DS	Heat-Sink Package	5-5-5-15	NA	•
Corsair	CM2X1024-8500C5	1G	DS	Heat-Sink Package	N/A	Corsair	• •
crucial	BL12864AA1065.8FE5	2G(kit of 2)	SS	Heat-Sink Package	N/A	N/A	• •
G.SKILL	F2-8500CL5D-2GBPK	2G(kit of 2)	DS	Heat-Sink Package	5-5-5-15	N/A	•
G.SKILL	F2-8500CL5D-4GBPK	4G(kit of 2)	DS	Heat-Sink Package	5-5-5-15	N/A	•
G.SKILL	F2-8500CL5S-1GBPK	1G	DS	Heat-Sink Package	5-5-5-15	G.SKILL	•
GEIL	GB22GB8500C5DC	1G	SS	GL2L128M88BA25AB	5	GEIL	•
GEIL	GE24GB1066C5DC	2G	DS	Heat-Sink Package	5	GEIL	•
GEIL	GX24GB8500C5UDC	4G(kit of 2)	DS	Heat-Sink Package	5	N/A	• •
Kingmax	KLED48F-A8K15	1G	DS	KA8FFIXF-JFS-18A	N/A	Kingmax	• •
Kingston	KHX8500D2/ 512	512MB	SS	Heat-Sink Package	N/A	Kingston	• •
Kingston	KHX8500D2K2/1GN	512MB	SS	Heat-Sink Package	N/A	Kingston	• •
Kingston	KVR1066D2N7/ 512	512MB	SS	E5108AJBG-1J-E	N/A	Elpida	• •
Kingston	KHX8500D2/1G	1G	DS	Heat-Sink Package	N/A	Kingston	•
Kingston	KHX8500D2K2/2GN	1G	DS	Heat-Sink Package	N/A	Kingston	• •
Kingston	KVR1066D2N7/1G	1G	DS	E5108AJBG-1J-E	N/A	Elpida	•
OCZ	OC22N1066SR2DK	2G(kit of 2)	DS	Heat-Sink Package(EPP)	5-5-5-15	OCZ	•
Qimonda	HYB64T128020EU-19F-C	1G	DS	HYB18T 512800CF19FFSS24313	6	Qimonda	• •
Transcend	TX1066QLU-2GK	2G(kit of 2)	SS	Heat-Sink Package	5	Transcend	• •
Transcend	TX1066QLJ-2GK	1G	DS	Heat-Sink Package	5	Transcend	• •
Transcend	TX1066QLU-4GK	4G(kit of 2)	DS	Heat-Sink Package	5	Transcend	• •



- Due to AM3 / AM2+ CPU limitation, only one DDR2 1066 is supported per channel.
- The default DIMM frequency depends on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.

DDR2-800MHz capability

Vendor	Part No.	Size	SS/DS	Chip No.	CL	Chip Brand	DIMM support A* B*
A-Data	AD2800E001GOU	2G(kit of 2)	SS	Heat-Sink Package	4-4-4-13	N/A	• •
A-Data	M20AD6G3H5160Q1E58	512MB	SS	AD29608ABA-25EG80812	N/A	ADATA	• •
A-Data	AD2800E002GOU	4G(kit of 2)	DS	Heat-Sink Package	4-4-4-12	N/A	• •
A-Data	M20AD6G314170Q1E58	1G	DS	AD29608ABA-25EG80810	N/A	ADATA	• •
Apacer	78.01GA0.9K5	1G	SS	AM4B5808CQJS8E0749D	5	Apacer	• •
Apacer	78.91G91.9K5	512MB	SS	AM4B5708JQJS8E0751C	5	Apacer	• •
Apacer	78.A1GA0.9K4	2G	DS	AM4B5808CQJS8E0740E	5	Apacer	• •
Apacer	78.A1GA0.9K4	2G	DS	AM4B5808CQJS8E0747D	5	Apacer	• •
Corsair	CM2X2048-6400C5DHX	4G(Kit of 2)	DS	Heat-Sink Package	5	Corsair	• •
Corsair	CM2X2048-6400C5	4G(Kit of 2)	DS	Heat-Sink Package	5	Corsair	• •
Corsair	XMS2-6400	1G	DS	Heat-Sink Package	4	Corsair	• •
Corsair	XMS2-6400	1G	DS	Heat-Sink Package	5	Corsair	• •
Crucial	BL12864AA804.8FE5	2G(Kit of 2)(EPP)	SS	Heat-Sink Package	N/A	N/A	• •

(continued on the next page)

DDR2-800MHz capability

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM support	
							A*	B*
Crucial	BL12864ALB04.8FE5	2G(Kit of 2)(EPP)	SS	Heat-Sink Package	4	N/A	*	*
Elixir	M2Y1G64TU8BD5B-AC 0828 GS	1G	SS	N2TU16800E-AC	N/A	Elixir	*	*
Elixir	M2Y2G64TU8HB0B-25C	1G	DS	N2TU 51280BE-25C802006Z1DV	5	Elixir	*	*
Elixir	M2Y2G64TU8HDSB-AC 0826 SG	2G	DS	N2TUG80DE-AC	N/A	Elixir	*	*
G.SKILL	F2-6400CL5D-1GBNQ	1G(Kit of 2)	SS	Heat-Sink Package	5-5-5-15	G.SKILL	*	*
G.SKILL	F2-6400CL4D-2GBHK	1G	DS	Heat-Sink Package	4	G.SKILL	*	*
G.SKILL	F2-6400CL4D-2GBPK	1G	DS	Heat-Sink Package	4	G.SKILL	*	*
G.SKILL	F2-6400CL4D-4GBPK	2G	DS	Heat-Sink Package	4	G.SKILL	*	*
G.SKILL	F2-6400CL5D-2GBNQ	1G	DS	Heat-Sink Package	5	G.SKILL	*	*
G.SKILL	F2-6400CL5D-4GBPK	2G	DS	Heat-Sink Package	5	G.SKILL	*	*
G.SKILL	F2-6400CL5D-16GNQ	4G	DS	Heat-Sink Package	5	G.SKILL	*	*
GEIL	GB22GB6400C4DC	1G	DS	GL2L64M088BA30EB	4	GEIL	*	*
GEIL	GB22GB6400C5DC	1G	DS	GL2L64M088BA30EB	5	GEIL	*	*
GEIL	GB24GB6400C4DC	2G	DS	GL2L128M88BA25AB	4	GEIL	*	*
GEIL	GB24GB6400C4QC	1G	DS	GL2L64M088BA30EB	4	GEIL	*	*
GEIL	GB24GB6400C5DC	2G	DS	GL2L128M88BA25AB	5	GEIL	*	*
GEIL	GB24GB6400C5QC	1G	DS	GL2L64M088BA30EB	5	GEIL	*	*
GEIL	GB28GB6400C4QC	2G	DS	GL2L128M88BA25AB	4	GEIL	*	*
GEIL	GB28GB6400C5QC	2G	DS	GL2L128M88BA25AB	5	GEIL	*	*
GEIL	GE22GB800C4DC	1G	DS	Heat-Sink Package	4	GEIL	*	*
GEIL	GE22GB800C5DC	1G	DS	Heat-Sink Package	5	GEIL	*	*
GEIL	GE24GB800C4DC	2G	DS	Heat-Sink Package	4	GEIL	*	*
GEIL	GE24GB800C4QC	1G	DS	Heat-Sink Package	4	GEIL	*	*
GEIL	GE24GB800C5DC	2G	DS	Heat-Sink Package	5	GEIL	*	*
GEIL	GE24GB800C5QC	1G	DS	Heat-Sink Package	5	GEIL	*	*
GEIL	GE28GB800C4QC	2G	DS	Heat-Sink Package	4	GEIL	*	*
GEIL	GE28GB800C5QC	2G	DS	Heat-Sink Package	5	GEIL	*	*
GEIL	GX22GB6400C5DC	2G	DS	Heat-Sink Package	4	GEIL	*	*
GEIL	GX22GB6400DC	1G	DS	Heat-Sink Package	5	GEIL	*	*
GEIL	GX22GB6400LX	2G	DS	Heat-Sink Package	5	GEIL	*	*
GEIL	GX22GB6400UDC	1G	DS	Heat-Sink Package	4	GEIL	*	*
GEIL	GX24GB6400DC	2G	DS	Heat-Sink Package	5	GEIL	*	*
HY	HYMP564U64CP8-S5 AB	512MB	SS	HYSP512821 CFP-S5	5	Hynix	*	*
HY	HYMP 512U64CP8-S5 AB	1G	DS	HYSP512821 CFP-S5	5	Hynix	*	*
Kingmax	KLDC28F-ABK15	512MB	SS	KKABFF1X-F-JFS-25A	N/A	Kingmax	*	*
Kingmax	KLDD48F-BBK85	1G	SS	KKB8FFBGXF-CFA-25U	N/A	Kingmax	*	*
Kingmax	KLDE88F-BBK85	2G	DS	KKB8FFBGXF-CFA-25U	N/A	Kingmax	*	*
Kingston	KHX6400D2LLK2/1G	512MB	SS	Heat-Sink Package	N/A	Kingston	*	*
Kingston	KVR80002N5/ 512	512MB	SS	E5108AJBG-8E-E 0803A9082	N/A	Kingston	*	*
Kingston	KVR80002N6/ 512	512MB	SS	E5108AJBG-8E-E	N/A	Elpida	*	*
Kingston	KHX6400D2/2G	2G	DS	Heat-Sink Package	N/A	Kingston	*	*
Kingston	KHX6400D2LL/1G	1G	DS	Heat-Sink Package	N/A	Kingston	*	*
kingston	KVR80002N5/1G	1G	DS	D6408TR4CGL25USL362406PECXA	N/A	kingston	*	*
Kingston	KVR80002N5/2G	2G	DS	E1108ACBG-8E-E	N/A	Elpida	*	*
Kingston	KVR80002N6/1G	1G	DS	E5108AJBG-8E-E	N/A	Elpida	*	*
Kingston	KVR80002N6/2G	2G	DS	461625.010819 PTGC	N/A	Kingston	*	*
Kingston	KVR80002N6/4G	4G	DS	E2108ABSE-8G-E	N/A	Elpida	*	*
Micron	MT9HTF12872AY-800E1	1G	SS	D9HNP 7YE22(ECC)	6	Micron	*	*
Micron	MT9HTF6472AY-80ED4	512MB	SS	6ED22D9GKX(ECC)	5	Micron	*	*
Micron	MT18HTF12872AY-80ED4	1G	DS	6TD22D9GKX(ECC)	5	Micron	*	*
OCZ	OC22G800R22GK	1G	DS	Heat-Sink Package	5	OCZ	*	*
OCZ	OC22P8004GK	2G	DS	Heat-Sink Package	5	OCZ	*	*
OCZ	OC22P800R22GK	1G	DS	Heat-Sink Package	4	OCZ	*	*
OCZ	OC22RPR8002GK	1G	DS	Heat-Sink Package	4	OCZ	*	*
OCZ	OC22VU8004GK	1G	DS	Heat-Sink Package	6	OCZ	*	*
PSC	AL7E8F73C-8E1	1G	SS	A3R1GE3CFF734MAA0E	5	PSC	*	*
PSC	AL7E8E63H-10E1K	2G	DS	A3R1GE3CFF750RABBP(ECC)	5	PSC	*	*
PSC	AL7E8F73C-8E1	2G	DS	A3R1GE3CFF734MAA0E	5	PSC	*	*
PSC	PL8E8F73C-8E1	2G	DS	SHG772-AA3G	N/A	psc	*	*
PSC	PL8E8G73E-8E1	2G	DS	XCP271A3G-A	N/A	psc	*	*
Qimonda	HY564T64000EU-2.5-B2	512MB	SS	HYB18T 512800B2F25FSS28380	6	Qimonda	*	*
Qimonda	HY564T128020EU-2.5-B2	1G	DS	HYB18T 512800B2F25FSS28380	6	Qimonda	*	*
Samsung	M37812863QZS-CF7	1G	SS	K4T1G084QQ-HCF7	6	Samsung	*	*
Samsung	M37816553GZS-CF7	512MB	SS	K4T51083QG-HCF7	6	Samsung	*	*
Samsung	M39172863QZ3-CF7	1G	SS	K4T1G084QQ-HCF7(ECC)	6	Samsung	*	*
Samsung	M378175663QZ3-CF7	2G	DS	K4T1G084QQ-HCF7	6	Samsung	*	*
Samsung	M37812953GZ3-CF7	1G	DS	K4T51083QG-HCF7	6	Samsung	*	*
Samsung	M37815263AZ3-CF7	4G	DS	K4T2G084QA-HCF7	N/A	Samsung	*	*
Super Talent	T800U1L GC4	1G	DS	Heat-Sink Package	4	Super Talent	*	*
Transcend	JM800QLU-1G	1G	SS	TQ1243PCF8	5	Transcend	*	*
Transcend	TS128MLQ64V8U	1G	SS	E1108ACBG-8E-E	5	Elpida	*	*
Transcend	TS64MLQ64V8J	512MB	SS	7HD22 D9GMH	5	Micron	*	*
Transcend	JM800QLJ-1G	1G	DS	TQ123PJF8F0801	5	Transcend	*	*
Transcend	JM800QLU-2G	2G	DS	TQ243PCF8	5	Transcend	*	*
Transcend	TS128MLQ64V8J	1G	DS	7HD22D9GMH	5	Micron	*	*
Transcend	TS256MLQ64V8U	2G	DS	E1108ACBG-8E-E	5	Elpida	*	*
VDATA	M2GVD6G3H3160Q1E52	512MB	SS	VD29608A8A-25EG20813	N/A	VDATA	*	*
VDATA	M2GVD6G3A1170Q1E58	1G	DS	VD29608A8A-25EG80813	N/A	VDATA	*	*

DDR2-667MHz capability

Vendor	Part No.	Size	SS/ DS	Chip No.	CL	Chip Brand	DIMM support	
							A*	B*
ADATA	M20AD5G314170Q1C58	1G	DS	AD29608A8A-3EG80814	N/A	ADATA	*	*
ADATA	M20AD5H34170H1C53	2G	DS	AD20908A8A-3EG 30724	N/A	ADATA	*	*
Apacer	78.A1G90.9K5	1G	SS	AM4B5808CQJS7E0751C	5	Apacer	*	*
Apacer	78.A1G90.9K4	2G	DS	AM4B5808CQJS7E0749B	5	Apacer	*	*
Corsair	V51GB667D2	1G	DS	MID095D62864M8CEC	N/A	Corsair	*	*
G.SKILL	F2-5300CL5D-4GBMQ	4G(kit of 2)	DS	Heat-Sink Package	5-5-5-15	G.SKILL	*	*
G.SKILL	F2-5400PHU2-2GBNT	2G(kit of 2)	DS	D2 64M8CCF 0815 C7173S	5-5-5-15	G.SKILL	*	*
GEIL	GX21GB5300SX	1G	DS	Heat-Sink Package	3	GEIL	*	*
GEIL	GX22GB5300LX	2G	DS	Heat-Sink Package	5	GEIL	*	*
HY	HYMP 512U64CP8-Y5 AB	1G	DS	HY5PS12521CFP-Y5	5	Hynix	*	*
Kingmax	KLCD48F-A8KB5	1G	DS	KKEA88B4LAUG-29DX	N/A	Kingmax	*	*
Kingston	KVR667D2N5/1G	1G	DS	SO1280420822 SOP D6408TR4CGL25U SL156304PECXA	N/A	Kingston	*	*
Kingston	KVR667D2N5/2G	2G	DS	E1108ACBG-8E-E 0813A90CC	N/A	Elpida	*	*
Nanya	NT1GT64U8HB0BY-3C	1G	DS	NT5TU64M8BE-3C72155700CP	5	Nanya	*	*
PSC	AL7E8F73C-6E1	1G	SS	A3R1GE3CFF734MAA0J	5	PSC	*	*
Qimonda	HY564T128020EU-3S-B2	1G	DS	HYB18T 512B00B2F3FSS28171	5	Qimonda	*	*
Samsung	M378T5263AZ3-CE6	4G	DS	K4T2G084QA-HCE6	N/A	Samsung	*	*
Super Talent	T667U81BV	1G	DS	PG 64M8-800 0750	5	Super Talent	*	*
Transcend	JM667QLJ-1G	1G	DS	E5108AJBG-6E-E	5	Elpida	*	*
Twinmos	8D-A3JK5MPETP	512MB	SS	A3R12E3GEF633ACA0Y	5	PSC	*	*
ELIXIR	M2Y1G64TU8HA2B-3C	1G	DS	M2TU 51280AE-3C717095R28F	5	ELIXIR	*	*
Leadmax	LMP 512U64A8-Y5	1G	DS	HY5PS12821CFP-Y5 G 702AA	N/A	Hynix	*	*



SS: Single-sided / DS: Double-sided

DIMM support:

- **A*:** Supports one module inserted into either slot as the single-channel memory configuration.
- **B*:** Supports one pair of modules inserted into both the yellow 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. Refer to the technical documentation that comes with your expansion card for installation details.



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

1.5.1 PCI slots

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

1.5.2 PCI Express x1 slot

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

1.5.3 PCI Express x16 slot

This motherboard supports PCI Express x16 graphics cards that comply 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.

To erase the RTC RAM:

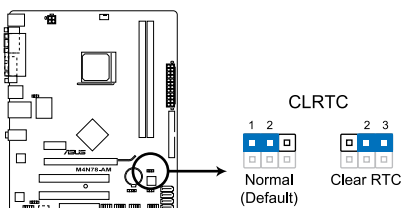
1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5-10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the **** key during the boot process and enter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



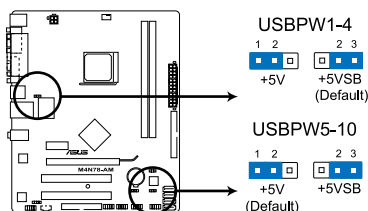
- If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R.) feature. Shut down and reboot the system, then the BIOS automatically resets parameter settings to default values.



M4N78-AM Clear RTC RAM

2. USB device wake-up (3-pin USBPW1-4, USBPW5-10)

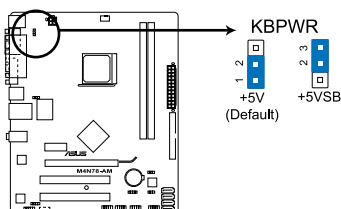
Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set these jumpers to +5VSB to wake up the computer from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced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



M4N78-AM USB Device Wake Up

3. Keyboard power (3-pin KBPWR)

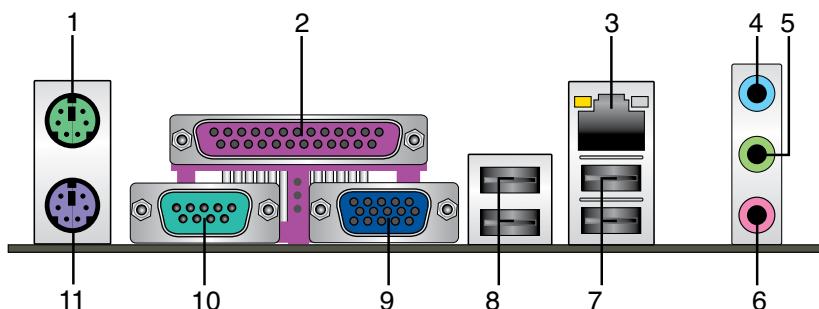
This jumper allows you to enable or disable the keyboard wake-up feature. When you set this jumper to pins 2-3 (+5VSB), you can wake up the computer by pressing a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead,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



M4N78-AM Keyboard Power Setting

1.7 Connectors

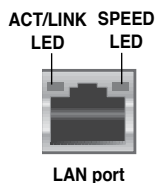
1.7.1 Rear panel ports



1. **PS/2 Mouse port (green).** This port is for a PS/2 mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
3. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
ORANGE	Linked	ORANGE	100Mbps connection
BLINKING	Data activity	GREEN	1Gbps connection



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

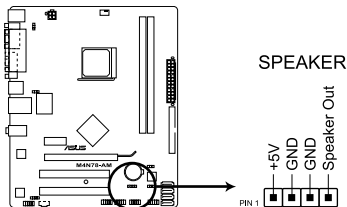
Port	Headset 2-channel	4-channel	6-channel
Light Blue	Line In	Rear Speaker Out	Rear Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Bass/Center

7. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports connect to USB 2.0 devices.
8. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports connect to USB 2.0 devices.
9. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
10. **COM port.** This 9-pin COM1 port is for pointing devices or other serial devices.
11. **PS/2 Keyboard port (purple).** This port is for a PS/2 keyboard.

1.7.2 Internal connectors

1. Speaker connector (4- pin SPEAKER)

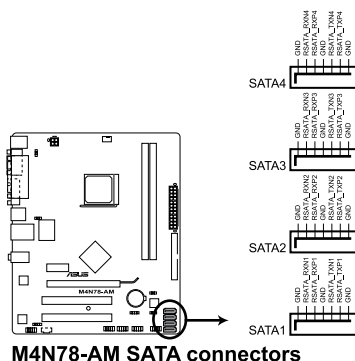
This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.



M4N78-AM Speaker Out Connector

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

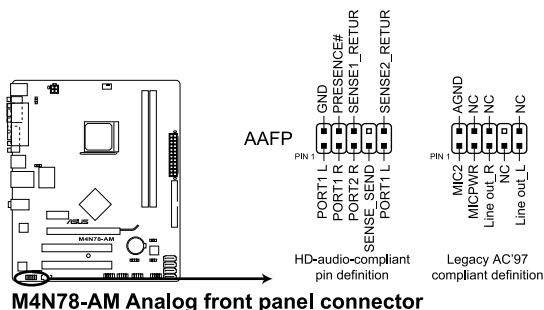
These connectors are for the Serial ATA signal cables for Serial ATA 3Gb/s hard disk and optical disk drives. The Serial ATA 3Gb/s is backward compatible with Serial ATA 1.5Gb/s specification. The data transfer rate of the Serial ATA 3Gb/s is faster than that of the standard parallel ATA (133MB/s).



Install the Windows® XP Service Pack 1 before using Serial ATA.

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

This connector is for a chassis-mounted front panel audio I/O module that supports either High Definition Audio or 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 high-definition audio capability.



If you want to connect a high-definition front panel audio module to this connector, ensure that the **Front Panel Select** item in the BIOS is set to **[HD Audio]**. If you want to connect an AC97 front panel audio module to this connector, set the item to **[AC97]**. See page 2.4.3 **Chipset** for details.

4. IDE connector (40-1 pin PRI_IDE)

The onboard IDE connector is for an Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133/100/66 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 devices.

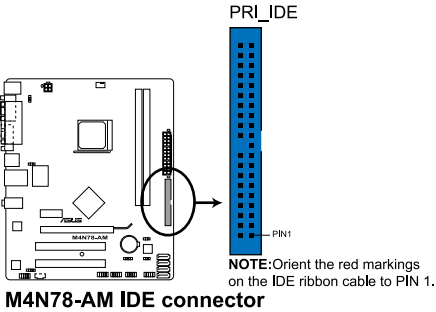
	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	



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.

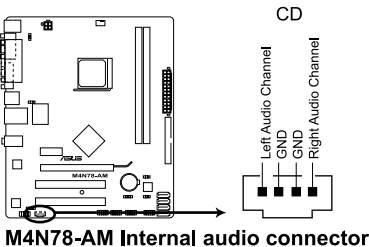


- If any device jumper is set as "Cable-Select", ensure that all other device jumpers have the same setting.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.



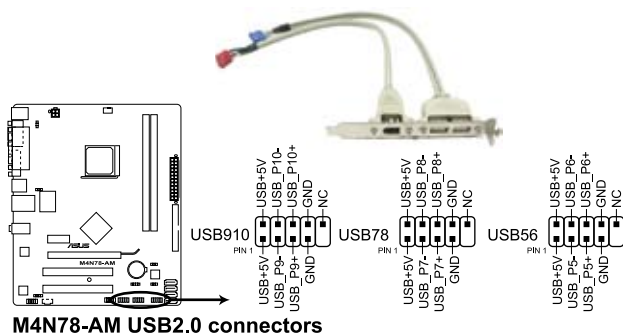
5. Optical drive audio in connector (4-pin CD)

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



6. USB connectors (10-1 pin USB56, USB78, USB910)

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 the 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.

7. CPU fan connector (4-pin CPU_FAN)

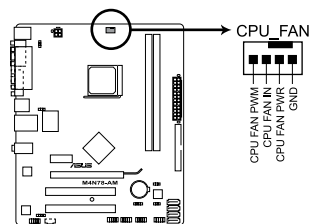
The CPU fan connector supports cooling fans of 350mA~740mA (8.88W max.). Connect the CPU fan cable to the CPU fan connector on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



DO NOT forget to connect the CPU fan cable to the CPU fan connector. Insufficient air flow inside the system may damage the motherboard components. It is not a jumper! DO NOT place a jumper cap on the CPU fan connector.

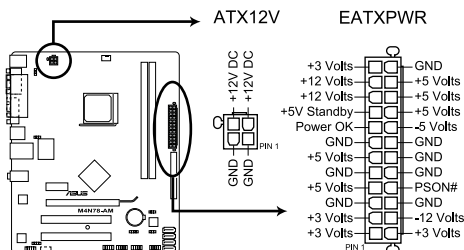


Only the CPU fan supports the ASUS Q-Fan feature.



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

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



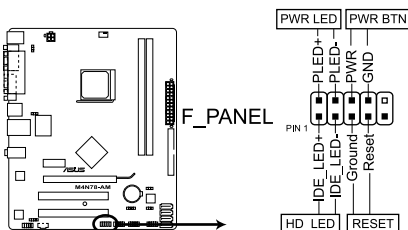
M4N78-AM ATX power connectors



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

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

This connector supports several chassis-mounted functions.



M4N78-AM System panel connector

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

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.

- **Power/Soft-off button (2-pin PWRBTN)**

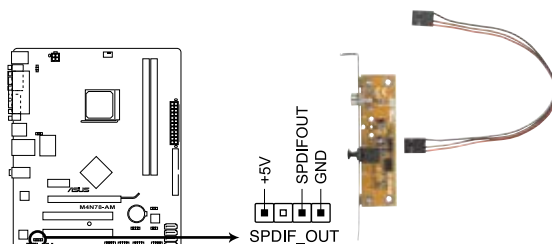
This 2-pin connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **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.

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

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) ports.



M4N78-AM Digital audio connector



Ensure that the audio device of Sound playback is **VIA High Definition Audio** (the name may be different based on the OS). Go to **Start > Control Panel > Sounds and Audio Devices > Sound Playback** to configure the setting.



The S/PDIF module is purchased separately.

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 DVD information

The Support DVD that comes with the motherboard package contains drivers, software applications, and utilities that you can install to get 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 into the optical drive. The DVD automatically displays the **Drivers** menu if the Autorun function is enabled on your computer.



Click an icon to display Support DVD/motherboard information

Click an item to install



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

1. Place the Support DVD into 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 > ASUS Update > ASUS Update** to launch the ASUS Update utility.
2. From the dropdown list, select either of the following methods:

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 you want 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

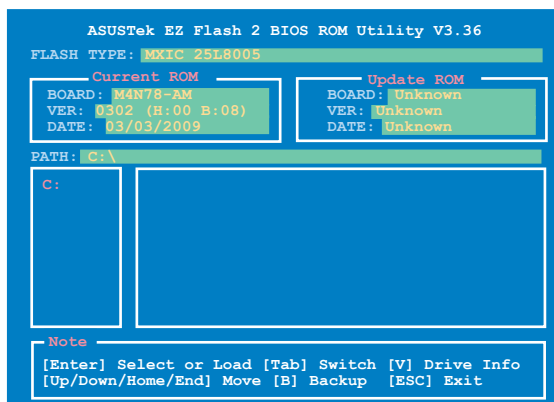
The ASUS EZ Flash 2 feature allows you to update the BIOS without using an OS-based utility.



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 a USB port, then launch EZ Flash 2 in either of these two ways:
 - Press **<Alt> + <F2>** during POST to display the following:



- Enter the BIOS setup program. Go to **Tools > EZ Flash 2** then press **<Enter>**.
2. Press **<Tab>** to locate the correct file. Press **<Enter>**. EZ Flash 2 performs the BIOS updating 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 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 DVD or a USB flash disk that contains the updated BIOS file.



- Prepare the motherboard Support DVD or a 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 DVD or the USB flash disk containing the BIOS file to the optical disk drive or a USB port.

The utility displays the following message and automatically checks the Support DVD or the USB flash disk for the BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for CD-ROM...
```

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for CD-ROM...
CD-ROM found!
Reading file "M4N78AM.ROM". Completed.
Start Erasing...
Start Programming...
```

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



- Only the USB flash disk with FAT 32/16 format and single partition supports 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.

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 shut-down procedure.
- Press <Ctrl>+<Alt>+ simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on.



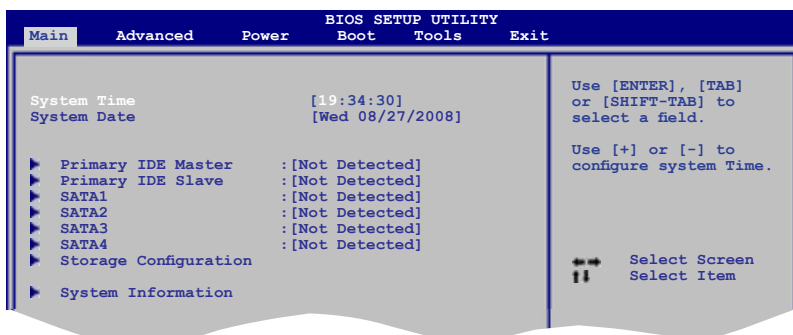
Using the **power button**, **reset button**, or the <Ctrl>+<Alt>+ keys to force reset from a running operating system can cause damage to your data or system. We recommend that you always shut down the system properly from the operating system.



- The default BIOS settings for this motherboard apply to 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 Setup Defaults** item under the **Exit** menu. See section 2.8 **Exit menu**.
- The BIOS setup screens in this section are for reference only. They 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, SATA 1/2/3/4

While entering Setup, the BIOS automatically detects the presence of IDE/SATA devices. There is a separate submenu 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 only appears in the Primary IDE Master/Slave menus.

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 storage devices installed in the system. Select an item then press <Enter> if you want to configure the item.

Onboard PCI IDE Controller [Enabled]

Enables or disables the onboard IDE controller. Configuration options: [Disabled] [Enabled]

OnChip S-ATA Controller [Enabled]

Enables or disables the onchip SATA controller. Configuration options: [Enabled] [Disabled]

SATA Mode Select [SATA Mode]

Selects the SATA mode. Configuration options: [SATA Mode] [RAID Mode] [AHCI Mode]

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

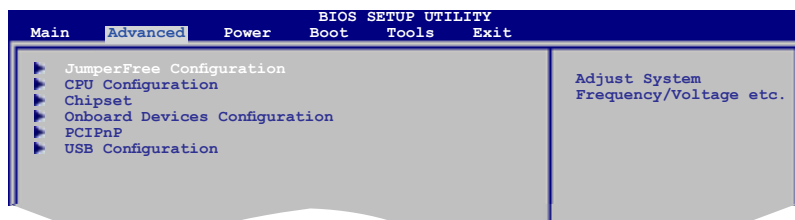
Displays the auto-detected system memory

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 may vary depending on the AMD CPU type.

CPU Overclocking [Auto]

Selects the CPU overclocking options to achieve desired CPU internal frequency.

[Manual] - Allows you to manually 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 item appears only when the **CPU Overclocking** item is set to **[Manual]**.

CPU Frequency [200]

Allows you to set the CPU frequency. Configuration options: [Min.=200], [Max.=550]



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

Overclocking Options [Auto]

Allows you to select the overclocking profile. Configuration options: [Auto]

[Overclock 3%] [Overclock 5%] [Overclock 7%] [Test Mode]

GPU Overclocking [Auto]

Configures the GPU overclocking options. Configuration options: [Auto] [Manual]



The following items appear only when the **GPU Overclocking** item is set to **[Manual]**.

GPU Frequency [500]

Allows you to set the GPU frequency. Configuration options: [Min.=500] [Max.=999]

Shader Frequency [1200]

Allows you to set the shader frequency. Configuration options: [Min.=1000]

[Max.=2000]

PCIe Overclocking [Auto]

Configures the PCIe overclocking options. Configuration options: [Auto] [Manual]



The following item appears only when the **PCIe Overclocking** item is set to **[Manual]**.

PCIe Frequency [100]

Allows you to set the PCIe frequency. Configuration options: [Min.=100], [Max.=150]

Processor Frequency Multiplier [Auto]

Allows you to select the processor frequency. Configuration options: [Auto] [x4.0 800MHz] [x5.0 1000MHz] [x6.0 1200MHz] [x7.0 1400MHz] [x8.0 1600MHz] [x9.0 1800MHz]

Processor Voltage [Standard]

Allows you to set the processor voltage. Configuration options: [Power Saving Mode] [Standard] [+50mv] [+100mv]

Hyper Transport Speed [Auto]

Allows you to select the Hyper Transport speed. Configuration options: [200MHz] [400MHz] [600MHz] [800MHz] [1GHz] [Auto]

Hyper Transport Width [16 ↓ 16 ↑]

Allows you to select the Hyper Transport width. Configuration options: [8 ↓ 8 ↑] [16 ↓ 16 ↑]

Memory Clock Mode [Auto]

Allows you to select the memory clock mode. Configuration options: [Auto] [Manual]



The following item appears only when the **Memory Clock Mode** item is set to **[Manual]**.

Memclock Value [333MHz]

Allows you to set the memory clock value.
Configuration options: [333MHz] [400MHz]

DRAM Timing Mode [Auto]

Allows you to set the DRAM timing mode. Configuration options: [Auto] [DCT 0]



The following items appear only when you set the **DRAM Timing Mode** item to **[DCT 0]**.

CAS Latency (CL) [Auto]

Configuration options: [Auto] [3 CLK] ~ [6 CLK] [7 CLK DH_Only]

TRCD [Auto]

Configuration options: [Auto] [3 CLK] ~ [6 CLK]

TRP [Auto]

Configuration options: [3 CLK] ~ [6 CLK] [Auto]

tRTP [Auto]

Configuration options: [Auto] [2-4 CLK] [3-5 CLK]

TRAS [Auto]

Configuration options: [Auto] [5 CLK] ~ [18 CLK]

TRC [Auto]

Configuration options: [11 CLK] ~ [26 CLK] [Auto]

tWR [Auto]

Configuration options: [Auto] [3 CLK] ~ [6 CLK]

TRRD [Auto]

Configuration options: [Auto] [2 CLK] ~ [5 CLK]

tRWTTO [Auto]

Configuration options: [Auto] [2 CLK] ~ [9 CLK]

tWRD [Auto]

Configuration options: [Auto] [0 CLK] ~ [3 CLK]

tWTR [Auto]

Configuration options: [Auto] [1 CLK] [2 CLK] [3 CLK]

tWRWR [Auto]

Configuration options: [Auto] [1 CLK] [2 CLK] [3 CLK]

tRDRD [Auto]

Configuration options: [Auto] [2 CLK] [3 CLK] [4 CLK] [5 CLK]

tRFC0/1/2/3 [Auto]

Configuration options: [Auto] [75ns] [105ns] [127.5ns] [195ns] [327.5ns]

Memory Over Voltage [Auto]

Allows you to set the memory over voltage. The value ranges from 1.85000V to 2.24375V with a 0.00625V increment. Use the <+> / <-> keys to adjust the value. Configuration options: [Auto] [Max. = 2.24375V] [Min. = 1.85000V]

Chipset Voltage [Auto]

Allows you to set the chipset voltage. Configuration options: [Auto] [+50mv] [+100mv] [+150mv]

2.4.2 CPU Configuration

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

GART Error Reporting [Disabled]

This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose. Configuration options: [Disabled] [Enabled]

Microcode Updation [Enabled]

Allows you to enable or disable the microcode updation. Configuration options: [Disabled] [Enabled]

Secure Virtual Machine Mode [Disabled]

Allows you to enable or disable the AMD Secure Virtual Machine mode. Configuration options: [Disabled] [Enabled]

Cool 'n' Quiet [Enabled]

Allows you to enable or disable the generation of ACPI_PPC, _PSS, and _PCT objects. Configuration options: [Disabled] [Enabled]

CPU Prefetching [Enabled]

Enables or disables the CPU prefetching. 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.

NorthBridge Configuration

Memory Configuration

Bank Interleaving [Auto]

Allows you to enable the bank memory interleaving.

Configuration options: [Disabled] [Auto]

Channel Interleaving [Disabled]

Allows you to enable the channel memory interleaving.

Configuration options: [Disabled] [Address bits 6] [Address bits 12]

[XOR of Address bits [20:16, 6]] [XOR of Address bits [20:16, 9]]

Enable Clock to All DIMMs [Disabled]

Enables or disables clock to all DIMMs. Configuration options: [Disabled] [Enabled]

MemClk Tristate C3/ATLVID [Disabled]

Enables or disables the MemClk Tristate C3/ALTVID.

Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]

Enables or disables the memory remapping around memory hole.

Configuration options: [Disabled] [Enabled]

DCT Unganged Mode [Auto]

Allows you to enable or disable Unganged mode.

Configuration options: [Auto] [Always]

Power Down Enable [Enabled]

Enables or disables the DDR power down mode.

Configuration options: [Disabled] [Enabled]

ECC Configuration

ECC Mode [Disabled]

Enables or disables the DRAM ECC that allows the hardware to report and correct memory errors automatically. Configuration options: [Disabled] [Basic] [Good] [Super] [Max] [User]

SouthBridge Configuration

Primary Graphics Adapter [PCIe VGA Card First]

Allows you to select the primary graphics adapter.

Configuration options: [PCIe VGA Card First] [PCI VGA Card First] [Internal VGA First]

Hybrid SLI Mode [mGPU Auto]

Allows you to select the Hybrid SLI mode.

Configuration options: [mGPU Auto] [mGPU always enable]

iGPU Frame Buffer Size [128MB]

Sets the iGPU frame buffer size. Configuration options: [32MB] [64MB] [128MB] [256MB]

PCIE 2.0 Support [Auto]

Configures the PCIE 2.0 support. Configuration options: [Disabled] [Auto]

AZALIA AUDIO [Enabled]

Allows you to enable or disable the HD audio mode. Configuration options: [Disabled] [Enabled]

Front Panel Select [HD Audio]

Allows you to set the HD audio mode. Configuration options: [AC97] [HD Audio]

Onboard LAN [Enabled]

Allows you to set or disable the Onboard LAN. Configuration options: [Enabled] [Disabled]

Onboard LAN Boot ROM [Disabled]

Allows you to enable or disable the Onboard LAN boot ROM.

Configuration options: [Enabled] [Disabled]

SouthBridge ACPI HPET TABLE [Enabled]

Allows you to enable or disable SouthBridge ACPI HPET TABLE.

Configuration options: [Disabled] [Enabled]

2.4.4 Onboard Devices Configuration

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]

Parallel Port Address [378]

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

Parallel Port Mode [Normal]

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

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]

2.4.6 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]

Enables or disables the USB functions. Configuration options: [Enabled] [Disabled]

USB 2.0 Controller [Enabled]

Enables or disables the 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 only appear when a USB storage device is plugged in.

USB Mass Storage Device Configuration

USB Mass Storage Reset Delay [20 Sec]

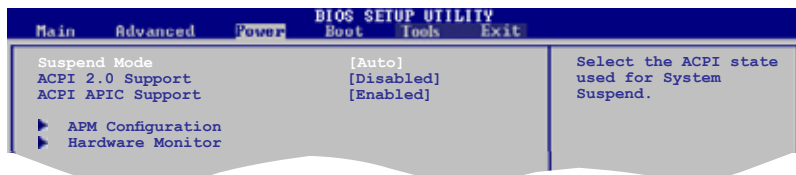
Allows you to set the maximum time that the BIOS waits for the USB storage device to initialize. Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

Emulation Type [Auto]

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

2.5 Power menu

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



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]

[S1(POS) Only] - Enables the system to enter the ACPI S1 (Power on Suspend) sleep state. In S1 sleep state, the system appears suspended and stays in a low power mode. The system can be resumed at any time.

[S3 Only] - Enables the system to enter the ACPI S3 (Suspend to RAM) sleep state (default). In S3 sleep state, the system appears to be off and consumes less power than in the S1 state. When signaled by a wake-up device or event, the system resumes to its working state exactly where it was left off.

[Auto] - Detected by OS.

2.5.2 ACPI 2.0 Support [Disabled]

Allows you to add additional tables as per 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.

Configuration options: [Power On] [Power Off] [Last State]

Power On By PCI/PCIE Device [Disabled]

When set to **[Enabled]**, this parameter allows you to turn on the system through a PCI/PCIE card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Configuration options: [Disabled] [Enabled]

Power On By Ring [Disabled]

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

Power On By PS/2 KB/MS [Disabled]

Enable or disable PS/2 Keyboard/Mouse to generate a wake event.

Configuration options: [Disabled] [Enabled]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to **Enabled**, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values. Configuration options: [Disabled] [Enabled]

2.5.5 Hardware Monitor

CPU Temperature [xxx°C/xxx°F]

MB Temperature [xxx°C/xxx°F]

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

CPU Fan Speed [xxxxRPM] or [Ignored]

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

CPU Q-Fan Control [Disabled]

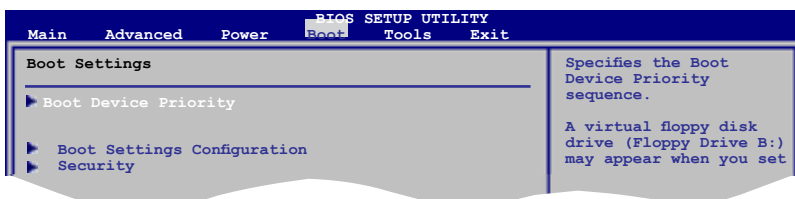
Allows you to enable or disable the ASUS Q-Fan feature that smartly adjusts the CPU fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]

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

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 Device] [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 MyLogo 2™ 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 then press **<Enter>**.
2. From the password box, key in a password composed of up to six letters and/or numbers, 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.
2. From the password box, key in a password composed of up to six letters and/or numbers, 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



2.7.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. After 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.

2.7.2 AI NET 2

Check Broadcom Phy LAN cable [Disabled]

Enables or disables checking of the Broadcom 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.

