M4A78-VM IN/SI

Motherboard

E4596

First Edition V1
May 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.

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 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>

M4A78-VM IN/SI specifications summary

CPU	AMD® Phenom™ X4 / Phenom™ X3 / Athlon™ X2 / Athlon™ / Sempron™ processors (socket AM2+/AM2) Compatible with Phenom™ II / Athlon™ X4 / Athlon™ X3 / Athlon™ X2 processors (AM3 CPU) Supports 45nm CPU Supports AMD® Cool 'n' Quiet™ 2.0 Technology (depends on CPU type) Supports CPU up to 125W * Refer to www.asus.com for the AMD® CPU support list.
Chipset	AMD® 780G / SB700
System bus	Up to 5200 MT/s HyperTransport™ 3.0 interface for AM2+/AM3 CPU 2000/1600 MT/s for AM2 CPU

Memory	Dual-channel memory architecture
	  - 2 x 240-pin DIMM slots support unbuffered ECC and non-ECC DDR2 1066*/800/667MHz memory modules
	  - Supports up to 8GB system memory
	* DDR2 1066 is supported by AM2+/AM3 CPU only. Refer to www.asus.com for the AM2+/AM3 CPU models.
	** Refer to www.asus.com for the latest Memory QVL (Qualified Vendors List).
	*** When you install a total memory of 4GB or more, Windows® 32-bit operating system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended if you are using a Windows® 32-bit OS.

Graphics	Integrated ATI Radeon™ HD3200 GPU Maximum shared memory of 256 MB Supports DVI-D with HDCP compliant with max. resolution 2560 x 1600 (@60Hz dual-link) Supports HDMI™ Technology with max. resolution up to 1920 x 1200 (1080P) Supports RGB with max. resolution 2048 x 1536 (@75Hz) Hybrid CrossFireX™ Support (for Windows® Vista and XP only) Dual VGA out supports: RGB & DVI, RGB & HDMI * Refer to www.amd.com for the discrete GPUs which support Hybrid CrossFireX™. ** To playback the HD-DVD and Blu-ray Disc, we recommend system configuration: Graphic shared memory 256MB / Dual-Core CPU minimum / Maximum 1GB memory of Dual-channel DDR2 667 or Single-channel DDR2 800.
Expansion slots	1 x PCI Express x16 slot 2 x PCI slots Supports PCI Express™ 2.0/1.0 Architecture
LAN	PCIe Gigabit LAN
Audio	VT1708S High Definition Audio 6-channel CODEC

(continued on the next page)

M4A78-VM IN/SI specifications summary

Storage	AMD® SB700 southbridge: - 1 x UltraDMA 133/100/66 connector - 4 x Serial ATA 3Gb/s connectors support RAID 0, RAID 1, and RAID 0+1 configurations (*for Windows® Vista only) * Due to the Windows® XP/Vista limitation, the RAID array with the total capacity over 2TB cannot be set as a boot disk. A RAID array over 2TB can only be set as a data disk only.
USB	Supports up to 8 USB 2.0/1.1 ports (4 port at mid-board, 4 ports at back panel)
ASUS special features	ASUS Q-Fan ASUS CrashFree BIOS 3 ASUS EZ Flash 2 ASUS MyLogo 2
Back panel I/O ports	1 x PS/2 Keyboard port 1 x PS/2 Mouse port 1 x DVI port 1 x HDMI 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 2.0/1.1 connectors support additional 4 USB 2.0/1.1 ports 1 x IDE connector 1 x COM connector 4 x SATA connectors 1 x High definition front panel audio connector 1 x System panel connector 1 x Chassis intrusion connector 1 x S/PDIF Out connector 1 x CPU/Chassis/Power fan connectors 1 x LPT connector (optional) 1 x TPM connector (optional) 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, WfM 2.0, ACPI 2.0a, SM BIOS v2.5
Accessories	1 x UltraDMA 133/100/66 cable 1 x Serial ATA cable 1x I/O shield User manual
Support DVD	Drivers ASUS PC Probe II ASUS LiveUpdate Utility Anti-Virus software (OEM version)
Form Factor	MicroATX form factor: 9.6 in x 8.3 in (24.4cm x 21.1cm)

Specifications are subject to change without notice.

Chapter 1

Product introduction

Thank you for buying an ASUS® M4A78-VM IN/SI motherboard!

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

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.

SB_PWR

ON
Standby Power

OFF
Powered Off
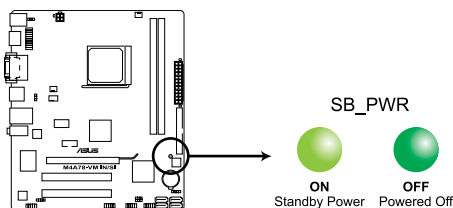
M4A78-VM IN/SI Onboard LED

1.2 Motherboard overview

1.2.1 Motherboard layout

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

Place this side towards the rear of the chassis.

21.1cm(8.3in)

24.4cm(9.6in)

KBMS

HDMI

DVI_VGA

USB34

LAN1_USB12

AUDIO

KBPWR

HDSW

USBPW1-4

CHA_FAN

CPU_FAN

ICS 9LPRS485CGLF

RTL 8112

COM1

Super I/O

PCIEX16

M4A78-VM IN/SI

PCI1

PCI2

AAFP

SPDIF_OUT

ATX12V

PWR_FAN

SOCKET AM2+

DDR2 DIMM_A1 (64bit, 240-pin module)

DDR2 DIMM_B1 (64bit, 240-pin module)

EATXPWR

PRI_IDE

AMD® RS780G

SB_PWR

8Mb BIOS

AMD® SB700

Lithium Cell CMOS Power

CHASSIS

SATA1 SATA2 SATA3 SATA4

CLRTC

USBPW5-8

USB56 USB78

F_PANEL

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)	1-7	10. Chassis intrusion connector (4-1 pin CHASSIS)	1-14
2. HDSW setting (30-pin HDSW)	1-8	11. Serial ATA connectors (7-pin SATA1-4)	1-11
3. USB device wake-up (3-pin USBPW1-4, 3-pin USBPW5-8)	1-8	12. System panel connector (10-1 pin F_PANEL)	1-16
4. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-15	13. USB connectors (10-1 pin USB56, USB78)	1-13
5. Power, CPU, and chassis fan connectors (3-pin PWR_FAN, 4-pin CPU_FAN, 3-pin CHA_FAN)	1-14	14. Clear RTC RAM (3-pin CLRTC)	1-7
6. CPU Socket AM2+	1-3	15. Digital audio connector (4-1 pin SPDIF_OUT)	1-11
7. DDR2 DIMM slots	1-3	16. Front panel audio connector (10-1 pin AAFP)	1-13
8. IDE connector (40-1 pin PRI_IDE)	1-12	17. PCI / PCIe x16 slots	1-6
9. Onboard LED (SB_PWR)	1-1	18. Serial port connector (10-1 pin COM1)	1-15

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+ / 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. The figure illustrates the location of the DDR2 DIMM sockets:

Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

M4A78-VM IN/SI 240-pin DDR2 DIMM sockets
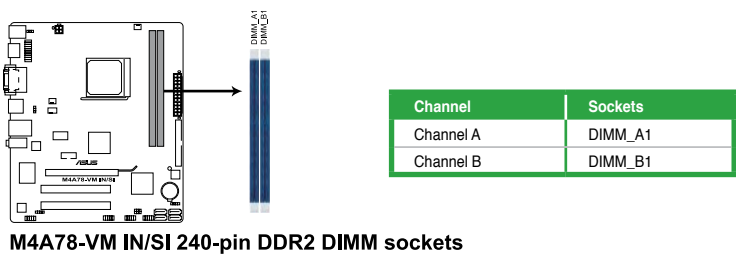
1.4.2 Memory configurations

You may install 512MB, 1GB, 2GB, and 4GB unbuffered ECC and 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 the 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 the 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 either 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.

📝 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.

M4A78-VM IN/SI Motherboard Qualified Vendors List (QVL)

DDR2-1066MHz capability

Size	Vendor	Part No.	SS/DS	CL	Chip NO.	Chip Brand	DIMM sockets support A*	B*
4096MB(Kit of 2)	A-Data	AD21066E002GU	DS	5-5-5-15	Heat-Sink Package	N/A		·
4096MB(kit of 2)	Apacer	78.AAGAL.9KZ	DS	5-5-5-15	Heat-Sink Package	N/A	·	·
1024MB	Corsair	CM2X1024-8500C5	DS	N/A	Heat-Sink Package	Corsair	·	·
1024MB	Crucial	BL12864AA1065.8FE5	SS	N/A	Heat-Sink Package	N/A	·	·
2048MB(Kit of 2)	G.SKILL	F2-8500CL5D-2GBPK	DS	5-5-5-15	Heat-Sink Package	N/A	·	·
1024MB	GEIL	GB22GB8500C5DC	DS	5	GL2L128M88BA18BW	GEIL	·	·
1024MB(Kit of 2)	Kingston	KHX8500D2K2/1GN(EPP)	SS	5-5-5-18	Heat-Sink Package	Kingston	·	·
1024MB	Kingston	KHX8500D2K2/2GN(EPP)	DS	5-5-5-18	Heat-Sink Package	Kingston	·	·
2048MB(Kit of 2)	OCZ	OCZ2N1066SR2DK(Epp)	DS	5-5-5-15	Heat-Sink Package 004820806001601-2	OCZ	·	·
2048MB	PSC	AL8E8G73F-AE1	DS	5-5-5-12	A3R1GE3FGF907MAT0FTAIWAN-G8E	PSC	·	·
1024MB	Qimonda	HYS64T128000EU-1.9-C2	DS	N/A	HYB18T1G800C2F-1.9FSS25253	Qimonda	·	·
2048MB(Kit of 2)	Transcend	TX1066QLU-2GK	SS	5	Heat-Sink Package	N/A	·	·

> · DDR2 1066 is supported by AM3/AM2+ CPU only.
> · 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

Size	Vendor	Part No.	SS/DS	CL	Chip NO.	Chip Brand	DIMM sockets support A*	B*
2048MB(Kit of 2)	A-Data	AD2800E001G0U	SS	4-4-4-12	Heat-Sink Package	N/A	·	·
512MB	Apacer	78.91G91.9K5	SS	5	AM4B5708JQJS8E0751C	Apacer	·	·
1024MB	Corsair	XMS2-6400	DS	4	Heat-Sink Package	Corsair	·	·
4096MB(kit of 2)	Crucial	BL25664AL80A.16FE5(EPP)	DS	4-4-4-12	Heat-Sink Package	N/A	·	·
4096MB	G.SKILL	F2-6400CL6Q-16GMQ	DS	5	Heat-Sink Package	N/A	·	·
1024MB	GEIL	GB24GB6400C5QC	DS	5	GL2L64M088BA30EB	GEIL	·	·
2048MB	GEIL	GX24GB6400DC	DS	5	Heat-Sink Package	GEIL	·	·
1024MB	Kingmax	KKB8FFBXF-CFA-25U	SS	N/A	KLDD48F-B8KB5	Kingmax	·	·
1024MB	Kingston	KVR800D2N6/1G(low profile)	DS	6	E510BAJBG-8E-E	Elpida	·	·
1024MB	OCZ	OCZ2RPR8002GK	DS	4-4-4-15	Heat-Sink Package	OCZ	·	·
2048MB	OCZ	OCZ2F8004GK(EPP)	DS	5-4-4-18	Heat-Sink Package	N/A	·	·
2048MB	PSC	AL8E8G73F-8E1	DS	N/A	P3R1GE3FGF850MAC19	PSC	·	·
2048MB	PSC	PL8E8F73C-8E1	DS	N/A	SHG772-AA3G	PSC	·	·
512MB	Samsung	K4T51083QG-HCF7	SS	6	M378T6553GZS-CF7	Qimonda	·	·
1024MB	Samsung	M378T2953GZ3-CF7	DS	N/A	K4T51083QG	Samsung	·	·
1024MB	Super Talent	T800UB1GC4	DS	4	Heat-Sink Package	Super Talent	·	·
2048MB	Transcend	TS256MLQ64V8U	DS	5	E1108ACBG-8E-E	Elpida	·	·
512MB	V-Data	M2GVD6G3H3160Q1E52	SS	N/A	VD29608A8A-25EG20813	VDATA	·	·

DDR2-667MHz capability

Size	Vendor	Part No.	SS/DS	CL	Chip NO.	Chip Brand	DIMM sockets support	
							A*	B*
1024MB	Apacer	78.01G9O.9K5	SS	5	AM4B5808CQJS7E0751C	Apacer	·	·
1024MB	Corsair	VS1GB667D2	DS	N/A	MID095D62864M8CEC	Corsair	·	·
4096MB(Kit of 2)	G.SKILL	F2-5300CL5D-4GBMQ	DS	5-5-5-15	Heat-Sink Package SN:8151030036559	G.SKILL	·	·
1024MB	Kingmax	KLCD48F-A8KB5	DS	N/A	KKEA88B4LAUG-29DX	Kingmax	·	·
1024MB	Kingston	KVR667D2N5/1G(low profile)	DS	5	E5108AJBG-8E-E	PSC	·	·
1024MB	Transcend	JM667QLJ-1G	DS	5	E5108AJBG-6E-E	Elpida	·	·

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 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 comes with it and make the necessary hardware settings for the card.
2.   Remove the chassis cover (if your motherboard is already installed in a chassis).
3.   Remove the bracket opposite the slot that you intend to 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.
6.   Replace the chassis cover.

1.5.2   Configuring an expansion card

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

1.   Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.
2.   Assign an IRQ to the card.
3.   Install the software drivers for the expansion card.

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

1.5.3   PCI slots

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

1.5.4   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.

CLRTC

Normal (Default)   Clear RTC
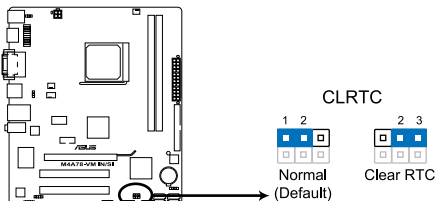
M4A78-VM IN/SI Clear RTC RAM

To erase the RTC RAM:

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

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.

KBPWR

+5V (Default)   +5VSB
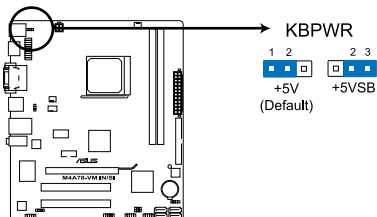
M4A78-VM IN/SI Keyboard Power Setting

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

   Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).
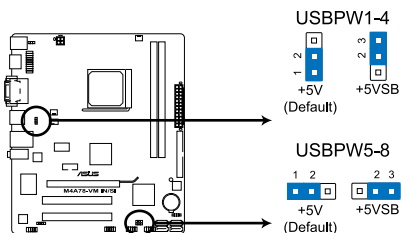
M4A78-VM IN/SI USB Device Wake Up

- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.

- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

4. **HDSW setting (30-pin HDSW)**

   This jumper allows you to switch between the HDMI and the DVI features. By default, the HDMI feature is enabled. To enable the DVI feature, set this jumber to pins 2-3. To switch to HDMI, set this jumper to pins 1-2.
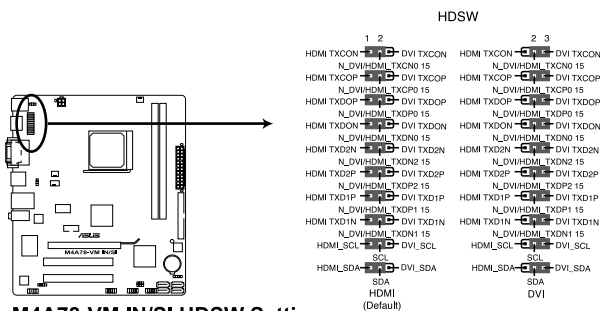
M4A78-VM IN/SI HDSW Setting

1.7 Connectors

1.7.1 Rear panel ports
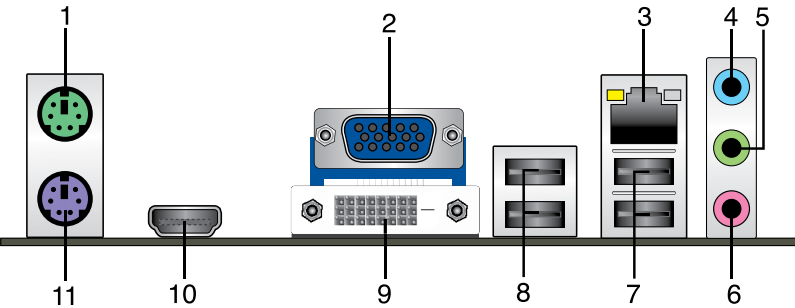
1. **PS/2 Mouse port (green).** This port is for a PS/2 mouse.

2. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible 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
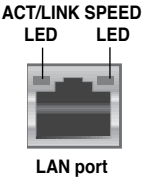
4. **Line In port (light blue).** This port connects to the tape, CD, DVD player, or other audio sources.

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 2.0/1.1 devices.

8.   **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports connect to USB 2.0/1.1 devices.

9.   **DVI-D Out port.** This port is for any DVI-D compatible device and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.

10.   **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.

Dual display output support

- This table indicates that whether the following dual display outputs are supported on your motherboard:

Dual display outputs	Supported	Not supported
DVI + D-Sub	•	
DVI + HDMI		•
HDMI + D-Sub	•	

- During POST, only the monitor connected to the D-Sub port has display. The dual display function works only under Windows.

Playback of HD DVD and Blu-Ray discs

- For better playback quality, we recommend that you follow the system requirements listed below.

Suggested list	
CPU	AMD® Athlon 4400+
DIMM	DDR2 800 (1GB or higher)
BIOS setup	Frame Buffer Size--256MB or higher

File format	Best resolution	
	Windows® XP	Windows® Vista
Non-protected clips	1920 x 1080p	1920 x 1080p
HD-DVD	1920 x 1080p	1280 x 1080p
Blu-Ray	1280 x 1080p	1280 x 1080p

- To play HD DVD or Blu-Ray disc, ensure to use HDCP compliant devices and software.

11.   **PS/2 Keyboard port (purple).** This port is for a PS/2 keyboard.

1.7.2   Internal connectors

1.   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 the standard parallel ATA with 133MB/s (Ultra DMA133).

M4A78-VM IN/SI SATA connectors
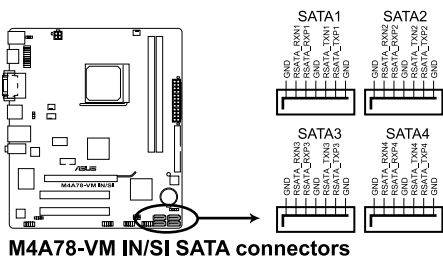
Install the Windows® XP Service Pack 1 before using Serial ATA.

• For detailed instructions on RAID configurations, refer to the RAID manual in the Support DVD.

• If you intend to create a Serial ATA RAID set using these connectors, set the **OnChip SATA Type** item in the BIOS to **[RAID]**. See **2.3.4 SATA Configuration** for details.

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

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

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

M4A78-VM IN/SI Digital audio connector
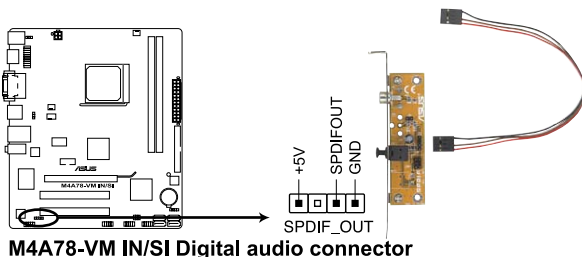
Ensure that the audio device of Sound playback is **VIA High Definition Audio (the name may be different based on the OS)**. Go to **Start > Control Panel > Sounds and Audio Devices > Sound Playback** to configure the setting.

The S/PDIF module is purchased separately.

3. **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.

PRI_IDE

PIN1

NOTE: Orient the red markings on the IDE ribbon cable to PIN 1.
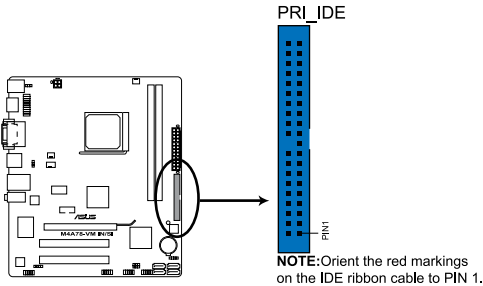
M4A78-VM IN/SI IDE connector

4.   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 the USB 2.0 specification that supports up to 480Mbps connection speed.

M4A78-VM IN/SI USB2.0 connectors
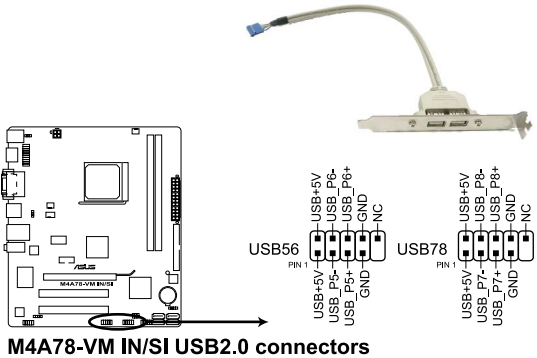
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

The USB 2.0 module is purchased separately.

5.   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.

M4A78-VM IN/SI Analog front panel connector
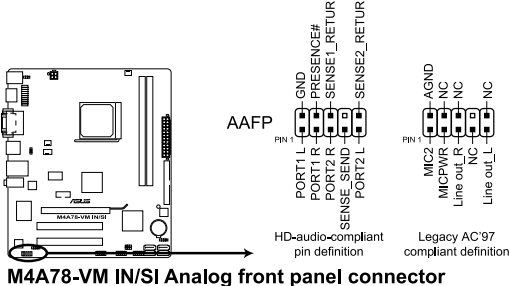
If you want to connect a high-definition front panel audio module to this connector, ensure that the **Front Panel Type** item in the BIOS is set to **[HD Audio]**. If you want to connect an AC97 front panel audio module to this connector, set the item to **[AC97]**. See **2.4.4 Onboard Devices Configuration** for details.

6. **Power, CPU, and chassis fan connectors (3-pin PWR_FAN, 4-pin CPU_FAN, 3-pin CHA_FAN)**

    The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, 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.

PWR_FAN

Rotation
+12V
GND

GND
+12V
Rotation

CHA_FAN

GND
CPU FAN PWR
CPU FAN IN
CPU FAN PWM
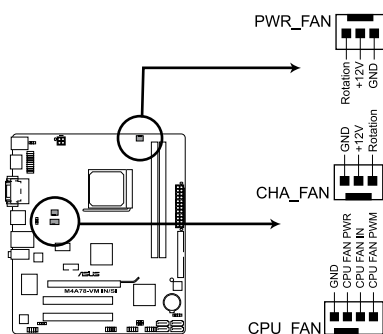
CPU_FAN

M4A78-VM IN/SI fan connectors

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

7. **Chassis intrusion connector (4-1 pin CHASSIS)**

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

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

+5VSB_MB
Chassis Signal
GND
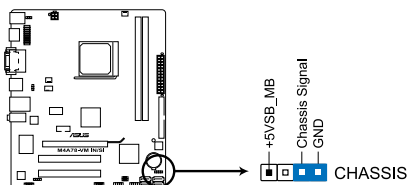
CHASSIS

M4A78-VM IN/SI Chassis intrusion connector

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.

ATX12V   EATXPWR

+12V DC
+12V DC
GND
GND

+3 Volts — GND
+12 Volts — +5 Volts
+12 Volts — +5 Volts
+5V Standby — +5 Volts
Power OK — -5 Volts
GND — GND
+5 Volts — GND
GND — GND
+5 Volts — PSON#
GND — GND
+3 Volts — -12 Volts
+3 Volts — +3 Volts

PIN 1

M4A78-VM IN/SI ATX power connectors
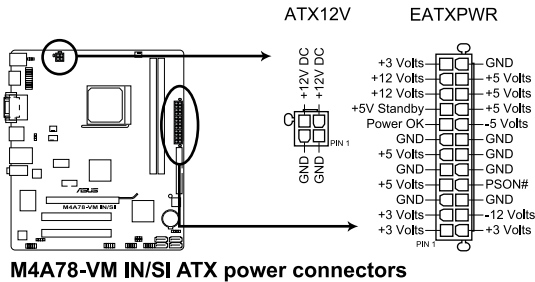
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.
- Do not forget to connect the 4-pin ATX12V power plug. Otherwise, the system will not boot.
- We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or may not boot up if the power is inadequate.

9. **Serial port connector (10-1 pin COM1)**

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

The serial port bracket (COM1) is purchased separately.

COM1

PIN 1

M4A78-VM IN/SI Serial port (COM1) connector
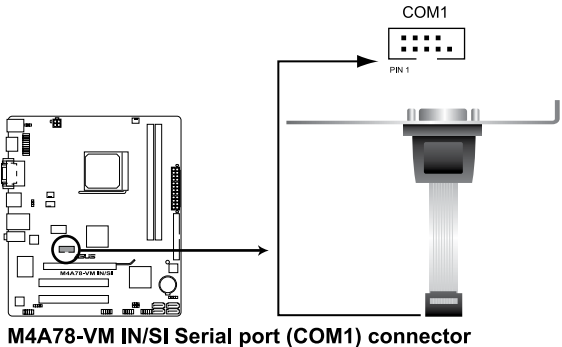
10. **System panel connector (10-1 pin F_PANEL)**

This connector supports several chassis-mounted functions.
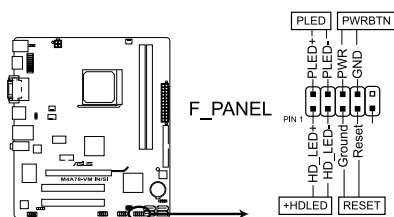
M4A78-VM IN/SI System panel connector

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

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

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

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HD 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.

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.

> The following screen is for reference only.
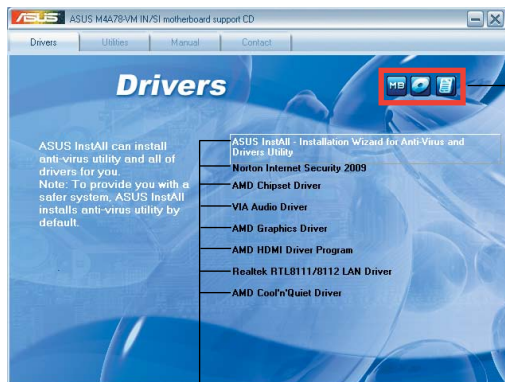
Click an icon to display Support DVD/ motherboard information

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 get 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 the following ways.

    •   Press **<Alt> + <F2>** during POST to display the following:

```
        ASUSTek EZ Flash 2 BIOS ROM Utility V3.36
  FLASH TYPE:  WOINBOND W25X80
       Current ROM                        Update ROM
  BOARD:  M4A78-VM IN               BOARD:  Unknown
  VER:  0308 (H:00 B:01)            VER:  Unknown
  DATE:  04/29/2009                 DATE:  Unknown
  PATH:  A:\

  A:



       Note
  [Enter] Select or Load [Tab] Switch [V] Drive Info
  [Up/Down/Home/End] Move[B] Backup    [Esc] Exit
```
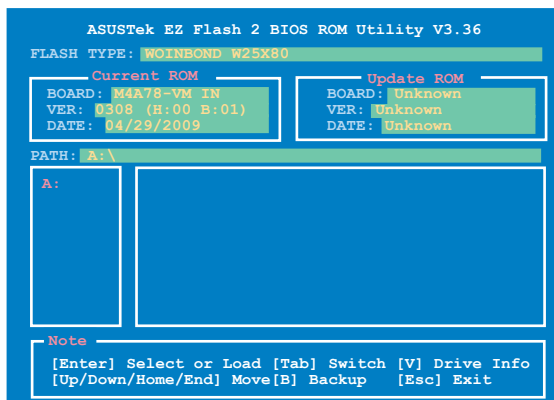
    •   Enter the BIOS setup program. Go to the **Tools menu** to select **EZ Flash 2** and press **<Enter>** to enable it.

2. Press **<Tab>** to locate the correct file. Press **<Enter>**.

When the correct BIOS file is found, EZ Flash 2 performs the BIOS updating process and automatically reboots the system when done.

•   Only a USB flash disk with FAT 32/16 format and single partition supports the ASUS EZ Flash 2 utility.

•   DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

2.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard Support 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 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 "M4A78VSI.ROM". Completed.
    Start Erasing...
    Start Programming...
    ```

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

> • Only a 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>**+**<Del>** simultaneously.

*   Press the reset button on the system chassis.

*   Press the power button to turn the system off then back on.

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

```
                              BIOS SETUP UTILITY
  Main      Advanced      Power      Boot      Tools      Exit

   Main Settings
                                                     Use [ENTER], [TAB]
  System Time                 [19:34:30]             or [SHIFT-TAB] to
  System Date                 [Tue 01/01/2002]       select a field.

  ▶  Primary IDE Master         :[Not Detected]      Use [+] or [-] to
  ▶  Primary IDE Slave          :[Not Detected]      configure system
  ▶  SATA1                      :[Not Detected]      Time.
  ▶  SATA2                      :[Not Detected]
  ▶  SATA3                      :[Not Detected]
  ▶  SATA4                      :[Not Detected]
  ▶  SATA Configuration

  ▶  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 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   SATA Configuration

The **SATA Configuration** menu allows you to configure your SATA device(s). Select an item then press **<Enter>** to display the sub-menu.

OnChip SATA Channel [Enabled]

Enables or disables OnChip SATA Channel. Configuration options: [Disabled] [Enabled]

OnChip SATA Type [SATA]

Allows you to select the SATA type. Configuration options: [SATA] [RAID] [AHCI]

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.

```
                          BIOS SETUP UTILITY
  Main    Advanced    Power     Boot     Tools     Exit

  Advanced Settings
                                                        Configure HT links.
  ►  Hyper Transport Configuration
  ►  CPU Configuration
  ►  Chipset
  ►  Onboard Devices Configuration
  ►  PCIPnP
  ►  USB Configuration
```
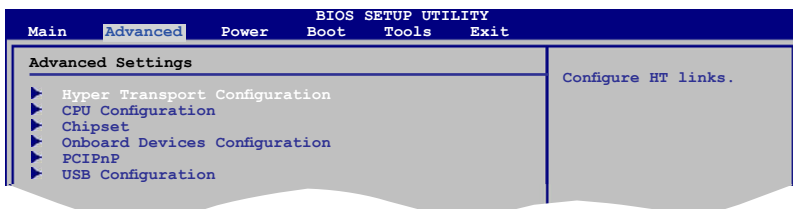
2.4.1 Hyper Transport Configuration

Hyper Transport Speed [Auto]

Allows you to select the Hyper Transport speed. Configuration options: [Auto] [200 MHz] [400 MHz] [600 MHz] [800 MHz] [1 GHz] [1.2 GHz] [1.4 GHz] [1.6 GHz] [1.8 GHz] [2.0 GHz]

Hyper Transport Width [Auto]

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

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]

Processor Frequency Multiplier [Auto]

Allows you to select the processor frequency. Configuration options: [Auto] [x8.0 1600 MHz] [x8.5 1700 MHz] [x9.0 1800 MHz] [x9.5 1900 MHz] ... [x23.5 4700 MHz] [x24.0 4800 MHz] [x24.5 4900 MHz] [x25 5000 MHz]

CPU Prefetching [Enabled]

Enables or disables the CPU prefetching. Configuration options: [Enabled] [Disabled]

C1E Configuration [Disabled]

Allows you to enable or disable C1E Dual-Core related CPU power State. Configuration options: [Disabled] [Enabled]

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 Unganed 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]

DRAM Timing Configuration

Memory Clock Mode [Auto]
Allows you to set 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 [333 MHz]

Allows you to set the Memclock value. Configuration options: [333 MHz] [400 MHz] [533 MHz]
DRAM Timing Mode [Auto]
Allows you to set the DRAM timing mode. Configuration options: [Auto] [Both]

The following items appear only when the **DRAM Timing Mode** item is set to [Both].

CAS Latency (CL) [Auto]
Allows you to set CAS latency. Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK] [7 CLK DH_Only]

TRCD [Auto]
Allows you to set TRCD. Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

TRP [Auto]
Allows you to set TRP. Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

tRTP [Auto]
Allows you to specify the read CAS# to percharge time.
Configuration options: [Auto] [2-4 CLK] [3-5 CLK]

TRAS [Auto]
Allows you to set TRAS.
Configuration options: [Auto] [5 CLK] [6 CLK] [7 CLK] [8 CLK] ... [17 CLK] [18 CLK]

TRRD [Auto]
Allows you to set TRRD. Configuration options: [Auto] [2 CLK] [3 CLK] [4 CLK] [5 CLK]

TRC [Auto]
Allows you to set TRC. Configuration options: [Auto]

tWR [Auto]
Allows you to specify when the last write is registered by the DRAM. Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

tWTR [Auto]
Allows you to specify the write to read delay when accessing the same DRAM.
Configuration options: [Auto] [1 CLK] [2 CLK] [3 CLK]

tRFC0/1/2/3 [Auto]
Allows you to specify the Trfc0/1/2/3 time. Configuration options: [Auto] [75ns] [105ns] [127.5ns] [195ns] [327.5ns]

Alternate VID [Auto]

Allows you to specify the alternate VID while in low power states. Configuration options: [Auto] [0.800 V] [0.825V] [0.850V] [0.875V] [0.900V] ... [1.500V] [1.525V] [1.550V]

Internal Graphics

Primary Video Controller [GFX0-GPP-IGFX-PCI]

Allows you to set the primary video controller. Configuration options: [GFX0-GPP-IGFX-PCI] [GPP-GFXO-IGFX-PCI] [PCI-GFXO-GPP-IGFX] [IGFX-GFXO-GPP-PCI]

UMA Frame Buffer Size [Auto]
Configuration options: [Auto] [32MB] [64MB] [128MB] [256MB]

Surround View [Auto]

Allows you to disable or enable the Surround View function. Configuration options: [Auto] [Disabled] [Enabled]

This item becomes user-configurable when you install an ATI graphics card into the PCIe x16 slot.

Frame Buffer Location [Above 4G]

Configuration options: [Below 4G] [Above 4G]

AMD 780 HD Audio [Enabled]

Allows you to enable or disable AMD 780 HD audio. Configuration options: [Enabled]
[Disabled]

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]

Onboard HD Audio Controller [Enabled]

Allows you to enable or disable the onboard HD Audio Controller. Configuration options:
[Disabled] [Enabled]

> *Front Panel Type [HD Audio]*
> Allows you to set the HD audio mode. Configuration options: [AC97] [HD Audio]

Onboard Gigabit LAN [Enabled]

Allows you to enable or disable the onboard Gigabit 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]

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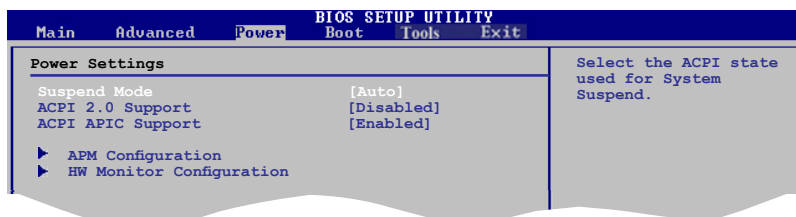Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller Mode [HiSpeed]

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

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.

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot   Tools   Exit

  Power Settings                                    Select the ACPI state
                                                    used for System
  Suspend Mode              [Auto]                  Suspend.
  ACPI 2.0 Support          [Disabled]
  ACPI APIC Support         [Enabled]

  ▶  APM Configuration
  ▶  HW Monitor Configuration
```

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 PME [Disabled]

Allows you to enable or disable PME wake from sleep state. Configuration options: [Disabled] [Enabled]

Power On By Ring [Disabled]

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

Power On By PS/2 Keyboard [Disabled]

Allows you to use the PS/2 keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power On By PS/2 Mouse [Disabled]

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

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   HW Monitor Configuration

CPU Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

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

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

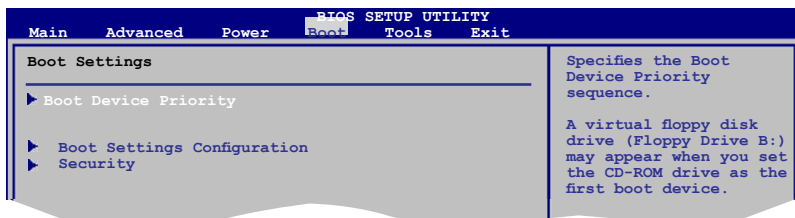**Vcore Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage or [Ignored]**

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select **Ignored** if you do not wish to display the detected voltage output.

CPU Q-Fan Function [Disabled]

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

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.

```
                              BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Tools    Exit

   Boot Settings                                    Specifies the Boot
   ──────────────────────────────────────          Device Priority
                                                    sequence.
  ▶ Boot Device Priority
                                                    A virtual floppy disk
  ▶  Boot Settings Configuration                    drive (Floppy Drive B:)
  ▶  Security                                       may appear when you set
                                                    the CD-ROM drive as the
                                                    first boot device.
```

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, type 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, type 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.
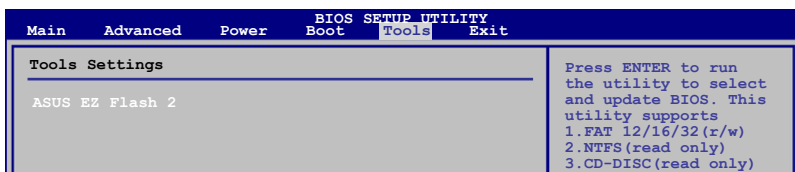
Clear User Password

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

```
                              BIOS SETUP UTILITY
  Main      Advanced     Power     Boot    Tools    Exit

  Tools Settings                                       Press ENTER to run
                                                       the utility to select
  ASUS EZ Flash 2                                      and update BIOS. This
                                                       utility supports
                                                       1.FAT 12/16/32(r/w)
                                                       2.NTFS(read only)
                                                       3.CD-DISC(read only)
```
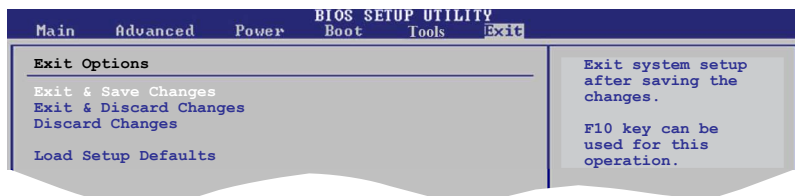
2.7.1   ASUS EZ Flash 2

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

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.

```
                             BIOS SETUP UTILITY
  Main      Advanced     Power     Boot    Tools    Exit

  Exit Options                                         Exit system setup
                                                       after saving the
  Exit & Save Changes                                  changes.
  Exit & Discard Changes
  Discard Changes                                      F10 key can be
                                                       used for this
  Load Setup Defaults                                  operation.
```

Pressing **<Esc>** does not immediately exit this menu. Select one of the options from this menu or **<F10>** from the legend bar to exit.