M4A88TD-M EVO

Motherboard

E5341

First Edition V1
March 2010

Offer to Provide Source Code of Certain Software

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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>

M4A88TD-M EVO specifications summary

CPU	AMD® Socket AM3 for AMD® Phenom™ II / Athlon™ II / Sempron™ 100 series processors Supports 45nm CPU AMD® Cool 'n' Quiet™ Technology * Refer to www.asus.com for the AMD® CPU support list
Chipset	AMD® 880G / SB850
System bus	Up to 5200MT/s HyperTransport™ 3.0 interface
Memory	Dual-channel memory architecture 4 x 240-pin DIMM slots support maximum 16GB unbuffered ECC and non-ECC DDR3 2000(O.C.)/1333/1066 MHz memory modules * AMD® AM3 100 and 200 series CPU support up to DDR3 1066MHz. ** 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. We recommend a maximum of 3GB system memory if you are using a Windows® 32-bit operating system.
Graphics	Integrated ATI Radeon™ HD 4250 GPU Supports SidePort Memory – onboard 128MB DDR3 1333 memory Supports HDMI™ with max. resolution up to 1920x1200 (1080P) Supports DVI with max. resolution up to 2560x1600@60Hz Supports D-Sub with max. resolution up to 2560x1440 @75Hz Supports Microsoft® DirectX 10.1, OpenGL 2.0, and Shader Model 4.1 Hardware Decode Acceleration for H.264, VC-1, and MPEG-2 Dual independent displays support with HDMI/DVI and D-Sub Maximum shared memory of 1GB Supports Hybrid CrossFireX™ * Refer to www.amd.com for the discrete GPUs which support Hybrid CrossFireX™.
Expansion slots	1 x PCIe 2.0 x16 slot 2 x PCIe 2.0 x1 slots 1 x PCI slot
Storage / RAID	AMD® SB850 southbridge: – 5 x Serial ATA 6Gb/s connectors support RAID 0, RAID 1, RAID 5, and RAID 10 configurations – 1 x eSATA port (6Gb/s ready) VIA® VT6415 PATA controller: – 1 x Ultra DMA 133/100 connector for up to 2 PATA devices

(continued on the next page)

M4A88TD-M EVO specifications summary

Audio	Realtek® ALC892 8-channel High Definition Audio CODEC - BD Audio Layer Content Protection - Supports 192khz/24bit True BD Lossless Sound - Supports Jack-detection, Multi-streaming, and Front Panel Jack-Retasking technologies - Optical S/PDIF Out port at back I/O
IEEE 1394	VIA® VT6315N controller supports 2 IEEE 1394a ports (one at mid-board, the other at the back panel)
USB	Supports up to 14 USB 2.0/1.1 ports (8 ports at mid-board, 6 ports at the back panel)
LAN	Realtek® 8111E Gigabit LAN controller featuring AI NET2
ASUS special features	**ASUS Xtreme Design** ASUS Hybrid Processor - TurboV EVO - Auto Tuning, TurboV, CPU Level UP, and GPU Boost ASUS Hybrid Switch - Core Unlocker - Turbo Key II ASUS Hybrid OS - Express Gate **ASUS Power Solutions** 4 + 1 Phase Power Design ASUS Anti-Surge Protection ASUS EPU **ASUS Exclusive Feature** MemOK! **ASUS Quiet Thermal Solutions** ASUS Fanless Design: Heat sink solution ASUS FanXpert **ASUS EZ DIY** ASUS Q-Shield ASUS O.C. Profile ASUS CrashFree BIOS 3 ASUS EZ Flash 2 ASUS MyLogo 2 Multi-language BIOS
ASUS overclocking features	Precision Tweaker 2 – vCore: Adjustable CPU voltage at 0.003125V increment – vDIMM: 64-step DRAM voltage control – vChipset (NB): 64-step Chipset voltage control Stepless Frequency Solution (SFS) – HT frequency tuning from 100MHz to 550MHz at 1MHz increment – PCI Express frequency tuning from 100MHz to 150MHz at 1MHz increment Overclocking Protection – ASUS C.P.R. (CPU Parameter Recall)

(continued on the next page)

M4A88TD-M EVO specifications summary

Back panel I/O ports	1 x PS/2 Keyboard port 1 x HDMI port 1 x DVI-D port 1 x D-Sub port 1 x Optical S/PDIF Output port 1 x LAN (RJ-45) port 1 x IEEE1394a port 1 x eSATA port (6Gb/s ready) 6 x USB 2.0/1.1 ports 8-channel audio ports
Internal I/O connectors	4 x USB 2.0/1.1 connectors support additional 8 USB 2.0/1.1 ports 1 x IDE connector 5 x SATA 6Gb/s connectors 1 x CPU / 1 x Power / 1 x Chassis fan connectors 1 x IEEE1394a connector 1 x S/PDIF Out connector 1 x Core Unlocker Switch 1 x Turbo Key II Switch 1 x MemOK! button 1 x Clear CMOS jumper 1 x Front panel audio connector 1 x COM connector 1 x LPT connector 1 x 24-pin EATX power connector 1 x 4-pin ATX 12V power connector 1 x System panel connector
BIOS	16Mb Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, ACPI2.0a, SM BIOS 2.5
Manageability	WOL by PME, WOR by PME, WOR by Ring, PXE
Support DVD	Drivers ASUS Utilities ASUS Update Anti-virus software (OEM version)
Form factor	MicroATX form factor: 9.6 in x 9.6 in (24.4 cm x 24.4 cm)

** Specifications are subject to change without notice.*

Chapter 1
Product introduction

1.1 Welcome!

Thank you for buying an ASUS® M4A88TD-M EVO motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS M4A88TD-M EVO motherboard
Cables	2 x Serial ATA 6Gb/s cables 1 x Ultra DMA 133/100/66 cable
Accessories	1 x Q-Shield
Application DVD	ASUS motherboard Support DVD
Documentations	User Manual

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

1.3 Special features

1.3.1 Product highlights

AMD® Phenom™ II / Athlon™ II / Sempron™ 100 series CPU support

This motherboard supports AMD® Socket AM3 multi-core processors with unique L3 cache and delivers better overclocking capabilities with less power consumption. It features dual-channel DDR3 1333 memory support and accelerates data transfer rate up to 5200MT/s via HyperTransport™ 3.0-based system bus. This motherboard also supports AMD® CPUs in the new 45nm manufacturing process.

AMD® 880G Chipset

The AMD® 880G Chipset is designed to support up to 5200MT/s HyperTransport™ 3.0 (HT 3.0) interface speed and PCI Express 2.0 x16 graphics. It is optimized with AMD's latest AM3 multi-core CPUs to provide excellent system performance and overclocking capabilities.

DDR3 2000(O.C.)/1333/1066 support

This motherboard supports DDR3 memory that features data transfer rates of 2000(O.C.)/1333/1066 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR3 architecture enlarges the bandwidth of your system memory to boost system performance.

SidePort Memory

This motherboard features SidePort Memory, an individual onboard DDR3 memory serving as memory buffer for integrated graphics. With low CPU usage, the SidePort Memory provides integrated graphics acceleration and effectively boosts graphics performance.

Serial ATA 6.0 Gb/s technology

The AMD® SB850 chipset natively supports the next generation SATA 6.0 Gb/s data transfer rate, enhances scalability, provides faster data retrieval, and doubles the bandwidth of the current bus systems.

8-channel high definition audio

The onboard 8-channel HD audio (High Definition Audio, previously codenamed Azalia) CODEC enables high-quality 192KHz/24-bit audio jack-sensing feature, retasking functions, and multi-streaming technology.

HDMI/DVI/RGB output

This motherboard supports dual display output on digital HDMI, DVI, and analog D-Sub. DVI (Digital Visual Interface) provides high quality visuals for digital display devices like LCD monitors.

HDMI support

HDMI (High-Definition Multimedia Interface) is a set of digital video standards that deliver multi-channel digital audio and uncompressed digital video for full HD 1080p visuals through a single cable. Supporting HDCP copy protection such as HD DVD and Blu-ray discs, HDMI provides you with the highest-quality home theater experience.

Hybrid CrossFireX™ support

ATI Hybrid CrossFireX™ technology greatly boosts graphics performance with an onboard GPU and a discrete graphics GPU.

- Hybrid CrossFireX™ is supported by Windows® 7/Vista OS only.
- Refer to www.amd.com for the discrete GPUs which support Hybrid CrossFireX™.

S/PDIF digital sound ready

This motherboard provides convenient connectivity to external home theater audio systems via the coaxial and optical S/PDIF_OUT (SONY-PHILIPS Digital Interface) interface. The S/PDIF transfers digital audio without converting it to analog format and keeps the best signal quality.

1.3.2 Innovative ASUS features

Core Unlocker

ASUS Core Unlocker simplifies the activation of a latent AMD® CPU—with just a simple switch. Enjoy an instant performance boost by simply unlocking the extra cores, without performing complicated BIOS changes.

Turbo Key II

Enjoy superb performance by auto-tuning your processor to an extreme yet stable state. Simply activate a dedicated switch on the motherboard to unleash extra processing capabilities.

GPU Boost

GPU Boost overclocks the integrated GPU in real time for the best graphics performance. User-friendly UI facilitates flexible frequency and voltage adjustments. Its ability to deliver multiple overclocking profiles also provides rapid and stable system-level upgrades.

TurboV EVO

The ultimate O.C. processor satisfies every level of overclockers—from die-hard enthusiasts to beginners. Auto tuning intelligently pushes the system to the fastest clock speeds while maintaining stability. Turbo Key boosts performance with just one touch; while TurboV offers more options to advanced overclockers to achieve world O.C. record. Moreover, upgrade your CPU at no additional cost with CPU Level UP!

Auto Tuning

Auto Tuning is an intelligent tool that automates overclocking to achieve a total system level up. This tool also provides stability testing. Even O.C. beginners can achieve extreme yet stable overclocking results with Auto Tuning!

ASUS Turbo Key

ASUS Turbo Key allows you to turn the PC power button into an overclocking button. After the easy setup, Turbo Key boosts performances without interrupting ongoing work or games, simply through pressing the button.

MemOK!

MemOK! guickly ensures memory boot compatibility. This remarkable memory rescue tool requires a mere push of the button to patch memory issues. MemOK! determines failsafe settings and dramatically improves your system boot success. Get your system up and running in no time.

ASUS Express Gate

ASUS Express Gate is an ASUS exclusive OS that provides you with quick access to the Internet and key applications before entering Windows® OS.

- ASUS Express Gate supports installation on SATA HDDs, USB HDDs and flash drives with at least 1.2GB free disk space. When installing it on USB HDDs or flash drives, connect the drives to the motherboard USB port before turning on the computer.
- The actual boot time depends on the system configuration.
- ASUS Express Gate supports file uploading from SATA HDDs, ODDs and USB drives. It supports file downloading to USB drives only.

ASUS Anti-Surge Protection

This special design protects expensive devices and the motherboard from damage caused by power surges from switching power supply unit (PSU).

ASUS EPU

ASUS EPU is a unique power saving technology that detects the current system loadings and adjusts the power consumption in real time.

Fan Xpert

ASUS Fan Xpert intelligently allows you to adjust both the CPU and chassis fan speeds according to different ambient temperatures caused by different climate conditions in different geographic regions and your PC's loading. The built-in variety of useful profiles offer flexible controls of fan speed to achieve a quiet and cool environment.

ASUS EZ Flash 2

ASUS EZ Flash 2 is a user-friendly utility that allows you to update the BIOS without using a bootable floppy disk or an OS-based utility.

ASUS CrashFree BIOS 3

ASUS CrashFree BIOS 3 is an auto-recovery tool that allows you to restore a corrupted BIOS file using the bundled support DVD or a USB flash disk that contains the BIOS file.

ASUS O.C. Profile

The motherboard features the ASUS O.C. Profile that allows you to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving you the freedom to share and distribute your favorite settings.

ASUS Q-Shield

The specially-designed ASUS Q-Shield is convenient and easy to install. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against Electromagnetic Interference (EMI).

C.P.R. (CPU Parameter Recall)

The BIOS C.P.R. feature automatically restores the CPU default settings when the system hangs due to overclocking failure. C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and the BIOS automatically restores the CPU parameters to their default settings.

Green ASUS

This motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS). This is in line with the ASUS vision of creating environment-friendly and recyclable products/packaging to safeguard consumers' health while minimizing the impact on the environment.

1.4 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.

1.5 Motherboard overview

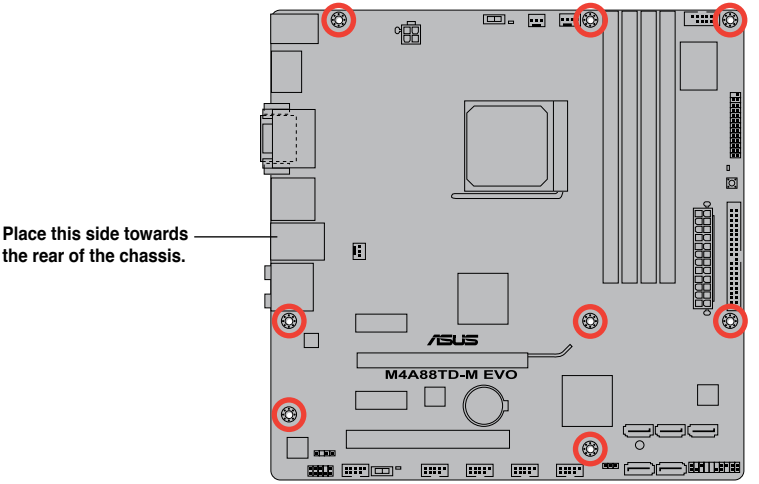
1.5.1 Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

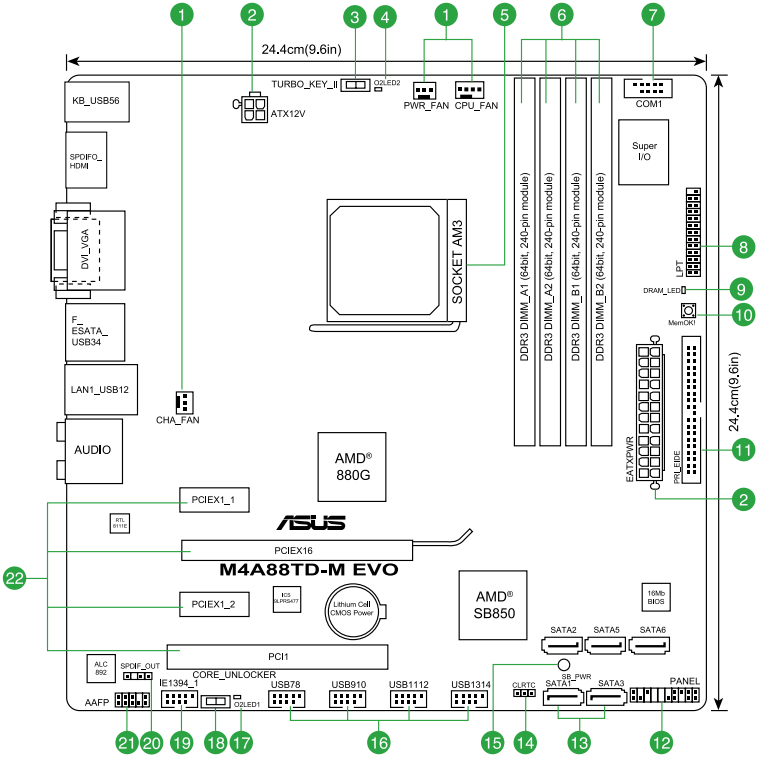
1.5.2 Screw holes

Place eight 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.



1.5.3 Motherboard layout



1.5.4 Layout contents

Connectors/Jumpers/Slots/LED	Page	Connectors/Jumpers/Slots/LED	Page
1. Power, CPU, and chassis fan connectors (3-pin PWR_FAN, 4-pin CPU_FAN, and 3-pin CHA_FAN)	1-29	12. System panel connector (20-8 pin PANEL)	1-26
2. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-23	13. SATA connectors (7-pin SATA1, SATA2, SATA3, SATA5, SATA6)	1-25
3. Turbo Key II switch (TURBO_KEY_II)	1-32	14. Clear RTC RAM (3-pin CLRTC)	1-19
4. Turbo Key II LED (02LED2)	1-34	15. Standby power LED (SB_PWR)	1-33
5. AM3 CPU socket	1-8	16. USB connectors (10-1 pin USB78, USB910, USB1112, USB1314)	1-27
6. DDR3 DIMM slots	1-11	17. Core Unlocker LED (02LED1)	1-34
7. Serial port connector (10-1 pin COM1)	1-27	18. Core Unlocker switch (CORE_UNLOCKER)	1-30
8. LPT connector (26-1 pin LPT)	1-25	19. IEEE 1394a port connector (10-1 pin IE1394_1)	1-29
9. DRAM LED (DRAM_LED)	1-33	20. Digital audio connector (4-1 pin SPDIF_OUT)	1-28
10. MemOK! switch	1-31	21. Front panel audio connector (10-1 pin AAFP)	1-28
11. IDE connector (40-1 pin PRI_EIDE)	1-24	22. PCIe x16 / PCIe x1 / PCI slots	1-18

1.6 Central Processing Unit (CPU)

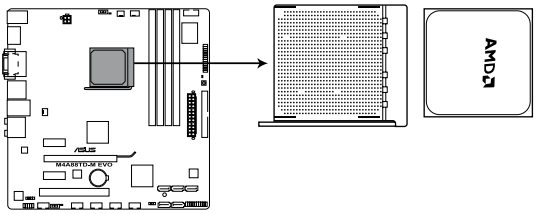
This motherboard comes with an AM3 socket designed for Phenom™ II / Athlon™ II / Sempron™ 100 series processors.

The AM3 socket has a different pinout from the AM2+/AM2 socket. Ensure that you use a CPU designed for the AM3 socket. The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

1.6.1 Installing the CPU

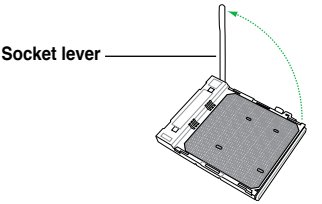
To install a CPU:

1. Locate the CPU socket on the motherboard.



M4A88TD-M EVO CPU socket AM3

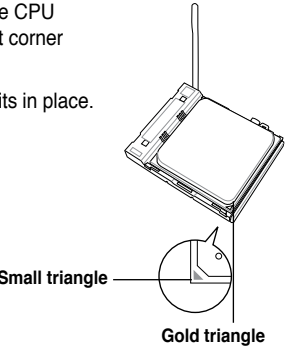
2. Press the lever sideways to unlock the socket, then lift it up to a 90°-100° angle.



Ensure that the socket lever is lifted up to a 90°-100° angle; otherwise, the CPU will not fit in completely.

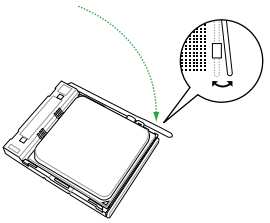
3. Position the CPU above the socket such that the CPU corner with the gold triangle matches the socket corner with a small triangle.
4. Carefully insert the CPU into the socket until it fits in place.

The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

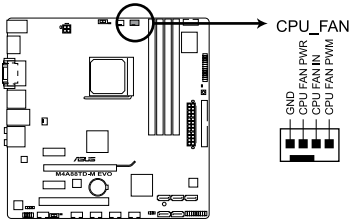


5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

6. Install a CPU heatsink and fan following the instructions that comes with the heatsink package. You can also refer to section **1.6.2 Installing heatsink and fan** for instructions.



7. Connect the CPU fan cable to the CPU_FAN connector on the motherboard.



M4A88TD-M EVO CPU fan connector

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

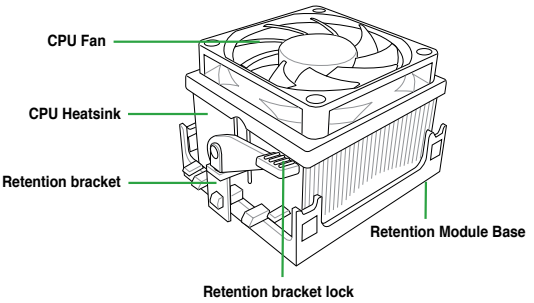
1.6.2 Installing the heatsink and fan

Ensure that you use only AMD-certified heatsink and fan assembly.

To install the CPU heatsink and fan:

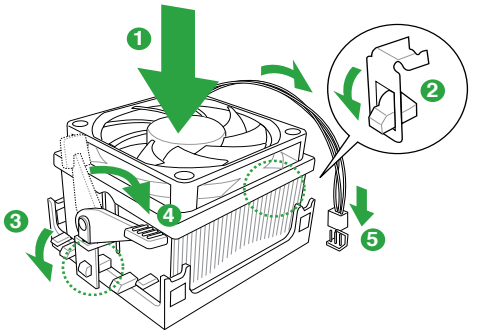
1. Place the heatsink on top of the installed CPU, ensuring that the heatsink fits properly on the retention module base.

- The retention module base is already installed on the motherboard upon purchase.
- You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
- If you purchased a separate CPU heatsink and fan assembly, ensure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.



Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

2. Attach one end of the retention bracket to the retention module base.



3. Align the other end of the retention bracket to the retention module base. A clicking sound denotes that the retention bracket is in place.

Ensure that the fan and heatsink assembly perfectly fits the retention mechanism module base, otherwise you cannot snap the retention bracket in place.

4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.

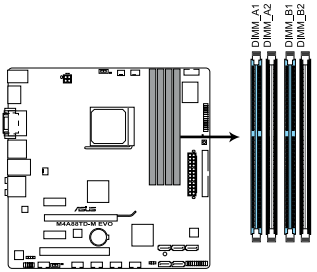
5. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.

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

1.7 System memory

1.7.1 Overview

This motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) sockets. A DDR3 module has the same physical dimensions as a DDR2 DIMM but is notched differently to prevent installation on a DDR2 DIMM socket. DDR3 modules are developed for better performance with less power consumption. The figure illustrates the location of the DDR3 DIMM sockets:



Channel	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

M4A88TD-M EVO 240-pin DDR3 DIMM sockets

1.7.2 Memory configurations

You may install 512MB, 1GB, 2GB, and 4GB unbuffered ECC and non-ECC DDR3 DIMMs into the DIMM sockets.

- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- We recommend that you install the memory modules from the blue slots for better overclocking capability.
- Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.
- AMD AM3 100 and 200 Series CPU support up to DDR3 1066 MHz.
- When overclocking, some AMD CPU models may not support DDR3 1600 MHz or higher frequency DIMMs.
- Due to the memory address limitation on 32-bit Windows® OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
  - 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 default memory operation frequency is dependent 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. To operate at the vendor-marked or at a higher frequency, refer to section **3.5 Ai Tweaker menu** for manual memory frequency adjustment.
- For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

M4A88TD-M EVO Motherboard Qualified Vendors Lists (QVL)

DDR3-2000(O.C.)MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
KINGSTON	KHX2000C8D3T1K3/3GX(XMP)	3072MB(kit of 3)	SS	-	-	-	1.65V	•		
KINGSTON	KHX2000C9D3T1K3/3GX(XMP)	3072MB(kit of 3)	SS	-	-	-	1.65V	•		
KINGSTON	KHX2000C8D3T1K3/6GX(XMP)	6144MB(Kit of 3)	DS	-	-	-	1.65V	•		
Transcend	TX2000KLU-4GK(XMP)	4096MB(Kit of 2)	DS	-	-	9-9-9-24	1.65V	•		

DDR3-1866(O.C.)MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
CORSAIR	CMG6GX3M3A1866C7(XMP)	6144MB(Kit of 3)	DS	-	-	7-8-7-20	1.65V	•		
KINGSTON	KHX1866C9D3T1K3/6GX(XMP)	6144MB(Kit of 3)	DS	-	-	-	1.65V	•		
OCZ	OCZ3P1866LV4GK	4096MB(Kit of 2)	DS	-	-	9-9-9-27	1.65V	•		
OCZ	OCZ3P1866C9LV6GK	6144MB(Kit of 3)	DS	-	-	9-9-9-28	1.65V	•		

DDR3-1800(O.C.)MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
OCZ	OCZ3P18004GK	4096MB(Kit of 2)	DS	-	-	8-8-8-27	1.9V	•		
OCZ	QCZ3P18004GK	4096MB(Kit of 2)	DS	-	-	8-8-8-27	1.9V	•		

DDR3-1600(O.C.)MHz capability

Vendor	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
A-Data	AD31600E001GM(O)U3K	3072MB(Kit of 3)	SS	-	-	8-8-8-24	1.65V-1.85V	•	•	•
A-Data	AD31600X002GMU(XMP)	4096MB(Kit of 2)	DS	-	-	7-7-7-20	1.75-1.85V	•	•	•
CORSAIR	TR3X3G1600C8D(XMP)	3072MB(Kit of 3)	SS	-	-	8-8-8-24	1.65V	•	•	•
CORSAIR	CMX4GX3M2A1600C9(XMP)	4096MB(Kit of 2)	DS	-	-	9-9-9-24	1.65V	•	•	
CORSAIR	CMX4GX3M2A1600C9(XMP)	4096MB(Kit of 2)	DS	-	-	9-9-9-24	1.65V	•	•	•
CORSAIR	TR3X6G1600C8 G(XMP)	6144MB(Kit of 3)	DS	-	-	-	-	•	•	•
CORSAIR	TR3X6G1600C8D G(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-24	1.65V	•	•	
CORSAIR	TR3X6G1600C9 G(XMP)	6144MB(Kit of 3)	DS	-	-	9-9-9-24	1.65V	•	•	•
CORSAIR	TR3X6G1600C8D G(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-24	1.65V	•	•	•
CORSAIR	CMX8GX3M4A1600C9(XMP)	8192MB(Kit of 4)	DS	-	-	9-9-9-24	1.65V	•	•	•
Crucial	BL12864BA1608.8SFB(XMP)	3072MB(Kit of 3)	SS	-	-	8-8-8-24	1.8V	•	•	•
Crucial	BL12864BE2009.8SFB3(EPP)	3072MB(Kit of 3)	SS	-	-	9-9-9-28	2.0V	•	•	•
Crucial	BL25664BN1608.16FF(XMP)	6144MB(Kit of 3)	DS	-	-	-	-	•	•	
Crucial	BL25664TB1608.K16SF(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-24	-	•	•	•
Crucial	BL25664TG1608.K16SF(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-24	-	•	•	•
Crucial	BL25664TR1608.K16SF(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-24	-	•	•	•
G.SKILL	F3-12800CL9D-2GBNQ(XMP)	2048MB(Kit of 2)	SS	-	-	9-9-9-24	1.5V~1.6V	•	•	•
G.SKILL	F3-12800CL7D-4GBECO(XMP)	4096MB(Kit of 2)	DS	-	-	7-8-7-24	1.35V(low voltage)	•	•	•
G.SKILL	F3-12800CL8D-4GBRM(XMP)	4096MB(Kit of 2)	DS	-	-	8-8-8-24	1.60V	•	•	•
G.SKILL	F3-12800CL9D-4GBECO(XMP)	4096MB(Kit of 2)	DS	-	-	9-9-9-24	1.35V(low voltage)	•	•	•
G.SkiLL	F3-12800CL8T-6GBPI(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-21	1.6-1.65V	•		
G.SKILL	F3-12800CL9T-6GBNQ(XMP)	6144MB(Kit of 3)	DS	-	-	9-9-9-24	1.5V~1.6V	•	•	•
Kingmax	FLGD45F-B8KG9(XMP)	1024MB	SS	Kingmax	KFB8FNGXF-ANX-12A	-	-	•	•	•
Kingmax	FLGD45F-B8MF7 MAEH(XMP)	1024MB	SS	-	-	7	-	•	•	•
Kingmax	FLGE85F-B8KG9(XMP)	2048MB	DS	Kingmax	KFB8FNGXF-ANX-12A	-	-	•	•	•
Kingmax	FLGE85F-B8MF7 MEEH(XMP)	2048MB	DS	-	-	7	-	•	•	
KINGSTON	KHX1600C8D3K2/4GX(XMP)	4096MB(Kit of 2)	DS	-	-	-	1.65V	•	•	•
KINGSTON	KHX1600C8D3T1K2/4GX(XMP)	4096MB(Kit of 2)	DS	-	-	-	1.65V	•	•	•
KINGSTON	KHX1600C9D3K2/4G	4096MB(kit of 2)	DS	-	-	-	1.7-1.9V	•	•	•
KINGSTON	KHX1600C9D3K3/6GX(XMP)	6144MB(Kit of 3)	DS	-	-	-	1.65V	•	•	•
OCZ	OCZ3G1600LV3GK	3072MB(Kit of 3)	SS	-	-	8-8-8-24	1.65V	•	•	
OCZ	OCZ3BE1600C8LV4GK	4096MB(Kit of 2)	DS	-	-	8-8-8-24	1.65V	•	•	•
OCZ	OCZ3BE1600LV4GK	4096MB(Kit of 2)	DS	-	-	7-7-7-24	1.65V	•	•	
OCZ	OCZ3OB1600LV4GK	4096MB(Kit of 2)	DS	-	-	-	1.65V	•	•	•
OCZ	OCZ3P1600LV4GK	4096MB(Kit of 2)	DS	-	-	7-7-7-24	1.65V	•	•	•
OCZ	OCZ3G1600LV6GK	6144MB(Kit of 3)	DS	-	-	8-8-8-24	1.65V	•	•	•
Super Talent	WA160UX6G9	6144MB(Kit of 3)	DS	-	-	9	-	•	•	•
Elixir	M2Y2G64CB8HA9N-DG(XMP)	2048MB	DS	-	-	-	-	•	•	•
Kingtiger	KTG2G1600PG3	2048MB	DS	-	-	-	-	•	•	•
Mushkin	996657(XMP)	4096MB(Kit of 2)	DS	-	-	7-7-7-20	1.95V	•	•	•
Mushkin	998659(XMP)	6144MB(Kit of 3)	DS	-	-	9-9-9-24	1.5~1.6V	•	•	
Mushkin	998659(XMP)	6144MB(Kit of 3)	DS	-	-	9-9-9-24	-	•	•	•
PATRIOT	PGS34G1600LLKA	4096MB(Kit of 2)	DS	-	-	7-7-7-20	1.7V	•	•	•

DDR3-1333MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
A-Data	AD31333001GOU	1024MB	SS	A-Data	AD30908C8D-151C E0906	-	-	•	•	•
A-Data	AD31333G001GOU	3072MB(Kit of 3)	SS	-	-	8-8-8-24	1.65-1.85V	•	•	•
A-Data	AD31333002GOU	2048MB	DS	A-Data	AD30908C8D-151C E0903	-	-	•	•	•
A-Data	AD31333G002GMU	2048MB	DS	-	-	8-8-8-24	1.65-1.85V	•	•	•
Apacer	78.A1GC6.9L1	2048MB	DS	APACER	AM5D5808DEWSBG	-	-	•	•	•
CORSAIR	CM3X1024-1333C9DHX	1024MB	SS	-	-	9-9-9-24	1.60V	•	•	
CORSAIR	CM3X1024-1333C9	1024MB	SS	-	-	9-9-9-24	1.60V	•	•	•
CORSAIR	TR3X3G1333C9 G	3072MB(Kit of 3)	SS	-	-	9-9-9-24	1.50V	•	•	•
CORSAIR	TR3X3G1333C9 G	3072MB(Kit of 3)	SS	-	-	9-9-9-24	1.50V	•	•	•
CORSAIR	TR3X3G1333C9	3072MB(Kit of 3)	SS	-	-	9	1.5V	•	•	•
CORSAIR	CM3X1024-1333C9DHX	1024MB	DS	Corsair	-	-	-	•	•	
CORSAIR	CM3X2048-1333C9DHX	2048MB	DS	-	-	-	-	•	•	
CORSAIR	TW3X4G1333C9 G	4096MB(Kit of 2)	DS	-	-	9-9-9-24	1.50V	•	•	•
CORSAIR	CMX8GX3M4A1333C9	8192MB(Kit of 4)	DS	-	-	9-9-9-24	1.50V	•	•	•
Crucial	CT12864BA1339.8FF	1024MB	SS	Micron	9FF22D9KPT	9	-	•	•	•
Crucial	CT12872BA1339.9FF	1024MB	SS	Micron	91F22D9KPT(ECC)	9	-	•	•	•
Crucial	BL12864TA1336.8SFB1	2048MB(Kit of 2)	SS	-	-	6-6-6-20	1.8V	•	•	•
Crucial	CT25664BA1339.16FF	2048MB	DS	Micron	9KF27D9KPT	9	-	•	•	•
Crucial	CT25672BA1339.18FF	2048MB	DS	Micron	91F22D9KPT(ECC)	9	-	•	•	•
Crucial	BL25664ABA1336.16SFB1	4096MB(Kit of 2)	DS	-	-	6-6-6-20	1.8V	•	•	
Crucial	BL25664BA1336.16SFB1	4096MB(Kit of 2)	DS	-	-	6-6-6-20	1.8V	•	•	
Crucial	BL25664BN1337.16FF (XMP)	6144MB(Kit of 3)	DS	-	-	7-7-7-24	1.65V	•	•	•
ELPIDA	EBJ10UE8EDF0-DJ-F	1024MB	SS	ELPIDA	J1108EDSE-DJ-F	-	1.35V(low voltage)	•	•	•
ELPIDA	EBJ21UE8EDF0-DJ-F	2048MB	DS	ELPIDA	J1108EDSE-DJ-F	-	1.35V(low voltage)	•	•	
G.SKILL	F3-10600CL7D-2GBPI(XMP)	1024MB	SS	G.SKILL	-	-	-	•	•	•
G.SKILL	F3-10600CL8D-2GBHK	1024MB	SS	G.SKILL	-	-	-	•	•	•
G.SKILL	F3-10600CL9D-2GBPK	1024MB	SS	G.SKILL	-	-	-	•	•	•
G.SKILL	F3-10666CL7T-3GBPK	3072MB(Kit of 3)	SS	-	-	7-7-7-18	1.5~1.6V	•	•	•
G.SKILL	F3-10666CL9T-3GBNQ	3072MB(Kit of 3)	SS	-	-	9-9-9-24	1.5~1.6V	•	•	•
G.SKILL	F3-10600CL9D-2GBNQ	1024MB	DS	G.SKILL	-	-	-	•	•	•
G.SKILL	F3-10666CL8D-4GBECO(XMP)	4096MB(Kit of 2)	DS	-	-	8-8-8-8-24	1.35V(low voltage)	•	•	
G.SKILL	F3-10666CL8D-4GBHK(XMP)	4096MB(Kit of 2)	DS	-	-	8-8-8-21	1.5-1.6V	•	•	
G.SKILL	F3-10666CL7T-6GBPK(XMP)	6144MB(Kit of 3)	DS	-	-	7-7-7-18	1.5~1.6V	•	•	•
G.SKILL	F3-10666CL9T-6GBNQ	6144MB(Kit of 3)	DS	-	-	9-9-9-24	1.5V~1.6V	•	•	
GEIL	GV32GB1333C9DC	1024MB	SS	-	-	9	-	•	•	•
GEIL	GV34GB1333C7DC	2048MB	DS	-	-	7-7-7-24	1.5V	•	•	
GEIL	GG34GB1333C9DC	4096MB(Kit of 2)	DS	GEIL	GL1L128M88BA12N	9-9-9-24	1.3V(low voltage)	•	•	•
GEIL	GV32GB1333C9SC	6144MB(Kit of 3)	DS	-	-	9	1.5V	•	•	•
Kingmax	FLFD45F-B8MF9	1024MB	SS	Micron	8HD22D9JNM	-	-		•	•
Kingmax	FLFD45F-B8MH9 MAES	1024MB	SS	Micron	9CF22D9KPT	-	-	•	•	•
Kingmax	FLFE85F-B8MH9 MEES	2048MB	DS	Micron	9GF27D9KPT	-	-	•	•	•
KINGSTON	KVR1333D3N9/1G	1024MB	SS	KTC	D1288JELDPGD9U	-	-	•	•	•
KINGSTON	KVR1333D3N9/2G	2048MB	DS	Qimonda	IDSH1G-03A1F1C-13H	-	1.5V	•	•	•
KINGSTON	KVR1333D3N9/4G	4096MB	DS	Hynix	H5TQ2G83AFR	-	-	•	•	•
Micron	MT8JTF12864AZ-1G4F1	1024MB	SS	Micron	9FF22D9KPT	9	-	•	•	•
Micron	MT9JSF 12872AZ-1G4F1	1024MB	SS	Micron	91F22D9KPT(ECC)	9	-	•	•	•
Micron	MT16JTF25664AZ-1G4F1	2048MB	DS	Micron	9KF27D9KPT	9	-	•	•	•
Micron	MT18JSF25672AZ-1G4F1	2048MB	DS	Micron	91F22D9KPT(ECC)	9	-	•	•	•
OCZ	OCZ3X1333LV3GK(XMP)	3072MB(Kit of 3)	SS	-	-	-	1.6V	•	•	•
OCZ	OCZ3P1333LV4GK	4096MB(Kit of 2)	DS	-	-	7-7-7-20	1.65V	•	•	
OCZ	OCZ3P1333LV4GK	4096MB(Kit of 2)	DS	-	-	7-7-7-20	1.65V	•	•	•
OCZ	OCZ3RPX1333EB4GK	4096MB(Kit of 2)	DS	-	-	6-5-5-20	1.85V	•	•	
OCZ	OCZ3X13334GK(XMP)	4096MB(Kit of 2)	DS	-	-	7-7-7-20	1.75V	•	•	•
OCZ	OCZ3G1333LV6GK	6144MB(Kit of 3)	DS	-	-	9-9-9-20	1.65V	•	•	•
OCZ	OCZ3P1333LV6GK	6144MB(Kit of 3)	DS	-	-	7-7-7-20	1.65V	•	•	
OCZ	OCZ3X1333LV6GK(XMP)	6144MB(Kit of 3)	DS	-	-	8-8-8-20	1.60V	•	•	•
PSC	AL7F8G73D-DG1	1024MB	SS	PSC	A3P1GF3DGF928M9B05	8-8-8-24	1.5V	•	•	•

(continued on the next page)

DDR3-1333MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
PSC	AL8F8G73D-DG1	2048MB	DS	PSC	A3P1GF3DGF928M9B05	8-8-8-24	1.5V	•	•	•
SAMSUNG	M378B2873DZ1-CH9	1024MB	SS	Samsung	K4B1G0846D-HCH9	-	-	•	•	
SAMSUNG	M378B2873DZ1-CH9	1024MB	SS	SAMSUNG	SEC 846 HCH9 K4B1G08460	-	-	•	•	•
SAMSUNG	M378B2873EH1-CH9	1024MB	SS	Samsung	SEC 913 HCH9 K4B1G0846E	-	-	•	•	•
SAMSUNG	M391B2873DZ1-CH9	1024MB	SS	Samsung	K4B1G0846D-HCH9(ECC)	-	-	•	•	•
SAMSUNG	M378B5673DZ1-CH9	2048MB	DS	Samsung	K4B1G0846D-HCH9	-	-	•	•	•
SAMSUNG	M378B5673EH1-CH9	2048MB	DS	Samsung	SEC 913 HCH9 K4B1G0846E	-	-	•	•	•
SAMSUNG	M391B5673DZ1-CH9	2048MB	DS	Samsung	K4B1G0846D-HCH9(ECC)	-	-	•	•	•
Super Talent	W1333X2GB8(XMP)	1024MB	SS	-	-	-	-	•	•	•
Transcend	TS256MLK64V3U	2048MB	DS	Micron	9GF27D9KPT	-	-	•	•	•
ASINT	SLY3128M8-EDJ	1024MB	SS	ASINT	DDRII1208-DJ 0844	-	-	•	•	•
ASINT	SLY3128M8-EDJE	1024MB	SS	ELPIDA	J1108BASE-DJ-E	-	-	•	•	•
ASINT	SLY3128M8-EDJ	2048MB	DS	ASINT	DDRII1208-DJ 0844	-	-	•	•	•
ASINT	SLZ3128M8-EDJE	2048MB	DS	ELPIDA	J1108BASE-DJ-E	-	-	•	•	•
BUFFALO	FSX1333D3G-K2G	1024MB	SS	-	-	7-7-7-20	-	•	•	•
BUFFALO	FSX1333D3G-2G	2048MB	DS	-	-	7-7-7-20	-	•	•	•
Century	PC3-10600 DDR3-1333 9-9-9	1024MB	SS	Micron	8FD22D9JNM	-	-	•	•	
Century	PC3-10600 DDR3-1333 9-9-9	2048MB	DS	Micron	8DD22D9JNM	-	-		•	•
Elixir	M2Y2G64CB8HA9N-CG	2048MB	DS	-	-	7-7-7-20	-	•	•	•
Elixir	M2Y2G64CB8HC9N-CG	2048MB	DS	Elixir	-	-	-	•	•	•
Kingtiger	2GB DIMM PC3-10666	2048MB	DS	Samsung	SEC 904 HCH9 K4B1G0846D	-	-	•	•	•
Kingtiger	KTG2G1333PG3	2048MB	DS	-	-	-	-	•	•	•
PATRIOT	PSD31G13332H	1024MB	DS	-	-	9	-	•	•	•
PATRIOT	PSD31G13332	1024MB	DS	Patriot	PM64M8D38U-15	-	-	•	•	•
PATRIOT	PSD32G13332H	2048MB	DS	-	-	-	-	•	•	•
PATRIOT	PDC34G1333ELK	4096MB(Kit of 2)	DS	-	-	9-9-9-24	1.5V			•
SILICON POWER	SP001GBLTU133S01	1024MB	SS	NANYA	NT5CB128M8AN-CG	9	-	•	•	•
SILICON POWER	SP001GBLTU133S02	1024MB	SS	elixir	N2CB1680AN-C6	9	-	•	•	•
SILICON POWER	SP002GBLTU133S02	2048MB	DS	elixir	N2CB1680AN-C6	9	-	•	•	•
TAKEMS	TMS1GB364D081-107EY	1024MB	SS	-	-	7-7-7-20	1.5V	•	•	•
TAKEMS	TMS1GB364D081-138EY	1024MB	SS	-	-	8-8-8-24	1.5V	•	•	•
TAKEMS	TMS2GB364D081-107EY	2048MB	DS	-	-	7-7-7-20	1.5V	•	•	•
TAKEMS	TMS2GB364D081-138EY	2048MB	DS	-	-	8-8-8-24	1.5V	•	•	•
TAKEMS	TMS2GB364D082-138EW	2048MB	DS	-	-	8-8-8-24	1.5V	•	•	•
UMAX	E41302GP0-73BDB	2048MB	DS	UMAX	U2S24D30TP-13	-	-	•	•	•

DDR3-1066MHz capability

Vendor	Part No.	Size	SS/ DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)		
								A*	B*	C*
Crucial	CT12864BA1067.8FF	1024MB	SS	Micron	9GF22D9KPT	7	-	•	•	•
Crucial	CT12872BA1067.9FF	1024MB	SS	Micron	9HF22D9KPT(ECC)	7	-	•	•	•
Crucial	CT25664BA1067.16FF	2048MB	DS	Micron	9HF22D9KPT	7	-	•	•	•
Crucial	CT25672BA1067.18FF	2048MB	DS	Micron	9GF22D9KPT(ECC)	7	-	•	•	•
ELPIDA	EBJ51UD8BAFA-AC-E	512MB	SS	Elpida	J5308BASE-AC-E	-	-	•	•	•
ELPIDA	EBJ51UD8BAFA-AE-E	512MB	SS	Elpida	J5308BASE-AC-E	-	-	•	•	•
ELPIDA	EBJ21UE8EDF0-AE-F	2048MB	DS	ELPIDA	J1108EDSE-DJ-F	-	1.35V(low voltage)	•	•	•
KINGSTON	KVR1066D3N7/1G	1024MB	SS	Kingston	D1288JEKAPGA7U	7	1.5V	•	•	•
KINGSTON	KVR1066D3N7/2G	2048MB	DS	Kingston	D1288JEKAPGA7U	7	1.5V	•	•	•
Micron	MT8JTF12864AZ-1G1F1	1024MB	SS	Micron	9GF22D9KPT	7	-	•	•	•
Micron	MT9JSF12872AZ-1G1F1	1024MB	SS	Micron	9HF22D9KPT(ECC)	7	-	•	•	•
Micron	MT16JTF25664AZ-1G1F1	2048MB	DS	Micron	9HF22D9KPT	7	-	•	•	•
Micron	MT18JSF25672AZ-1G1F1	2048MB	DS	Micron	9GF22D9KPT(ECC)	7	-	•	•	•
SAMSUNG	M378B2873EH1-CF8	1024MB	SS	Samsung	SEC 901 HCF8 K4B1G0846E	-	-	•	•	•
Elixir	M2Y2G64CB8HC5N-BE	2048MB	DS	Elixir	N2CB1G80CN-BE	-	-	•	•	•
Elixir	M2Y2G64CBHA9N-BE	2048MB	DS	-	-	7-7-7-20	-	•	•	•
Elixir	M2Y2G64CBHC9N-BE	2048MB	DS	Elixir	-	-	-	•	•	•
Kingtiger	2GB DIMM PC3-8500	2048MB	DS	Hynix	H5TQ1G83AFP G7C	-	-	•	•	

- AMD AM3 100 and 200 Series CPU support up to DDR3 1066 MHz.
- When overclocking, some AMD CPU models may not support DDR3 1600 MHz or higher frequency DIMMs.

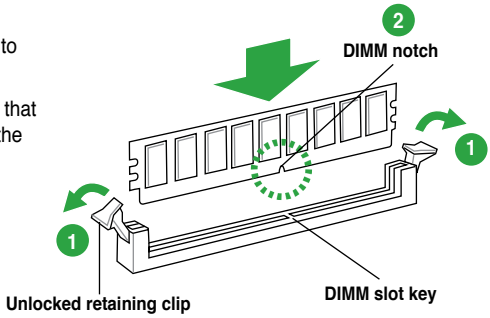
SS: Single-sided / DS: Double-sided
DIMM support:
- **A*:** Supports one module inserted into any slot as single-channel memory configuration.
- **B*:** Supports one pair of modules inserted into either the blue slots or the black slots as one pair of dual-channel memory configuration.
- **C*:** Supports two pairs of modules inserted into both the blue slots and the black slots as two pairs of dual-channel memory configuration.

Visit the ASUS website at www.asus.com for the latest QVL.

1.7.3 Installing a DIMM

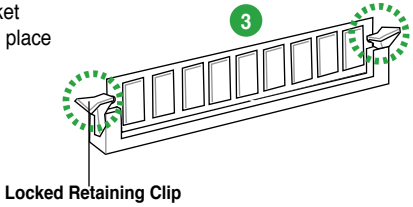
Unplug the power supply before adding or removing DIMMs or other system components. Failure to do so can cause severe damage to both the motherboard and the components.

1. Press the retaining clips outward to unlock a DIMM socket.
2. Align a DIMM on the socket such that the notch on the DIMM matches the DIMM slot key on the socket.



A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

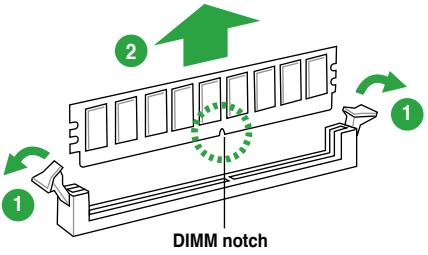


1.7.4 Removing a DIMM

To remove a DIMM:

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

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



2. Remove the DIMM from the socket.

1.8 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.

1.8.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.8.2 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.

1.8.3 PCI slot

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

1.8.4 PCI Express x1 slots

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

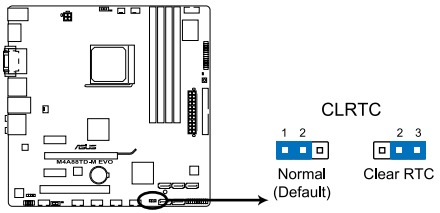
1.8.5 PCI Express x16 slot

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

1.9 Jumpers

1. Clear RTC RAM (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.



M4A88TD-M EVO Clear RTC RAM

To erase the RTC RAM:

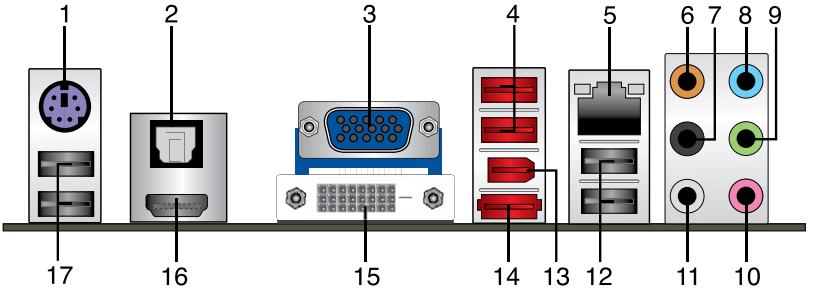
1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the **<Del>** key during the boot process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

1.10 Connectors

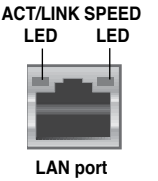
1.10.1 Rear panel ports



1. **PS/2 Keyboard port (purple).** This port is for a PS/2 keyboard.
2. **Optical S/PDIF_OUT port.** This port connects to an external audio output device via an optical S/PDIF cable.
3. **VGA port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
4. **USB 2.0 ports 3 and 4**. These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0 devices.
5. **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



6. **Center/Subwoofer port (orange).** This port connects to the center/subwoofer speakers.
7. **Rear Speaker Out port (black).** This port connects to the rear speakers in the 4, 6, and 8-channel audio configurations.
8. **Line In port (light blue).** This port connects to the tape, CD, DVD player, or other audio sources.
9. **Line Out port (lime).** This port connects to a headphone or a speaker. In the 4, 6 and 8-channel configurations, the function of this port becomes Front Speaker Out.
10. **Microphone port (pink)**. This port connects to a microphone.
11. **Side Speaker Out port (gray).** This port connects to the side speakers in the 8-channel audio configuration.

Refer to the audio configuration table below for the function of the audio ports in the 2, 4, 6, or 8-channel configuration.

Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

Ensure the audio device of sound playback is **Realtek 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 settings.

12. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0 devices.
13. **IEEE 1394a port.** This 6-pin IEEE 1394a port provides high-speed connectivity for audio/video devices, storage peripherals, or portable devices.
14. **eSATA port.** This port connects to an external Serial ATA hard disk drive.

To use hot-plug, set the type of this eSATA connector in the BIOS to **[AHCI]**. See section **2.3.4 SATA Configuration** for details.

15. **DVI-D 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.
16. **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 Blu-ray discs

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

Suggested list	
CPU	AMD® Phenom™ II x4 805
DIMM	DDR3 1333 2G x 2
BIOS setup	Frame Buffer Size – 256MB or higher

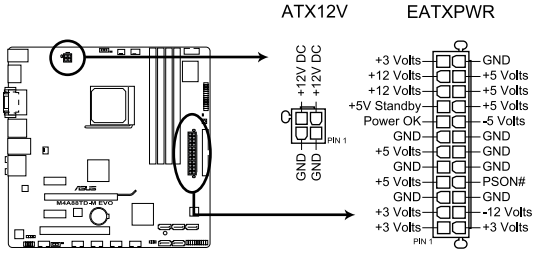
File format	Best resolution	
	Windows® XP	Windows® Vista
Non-protected clips	1920 x 1080p	1920 x 1080p
Blu-ray	1920 x 1080p	1920 x 1080p

17. **USB 2.0 ports 5 and 6.** These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0 devices.

1.10.2 Internal connectors

1. 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.



M4A88TD-M EVO 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, ensure 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 300W. The system may become unstable or may not boot up if the power is inadequate.
- DO NOT forget to connect the 4-pin ATX +12V 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.

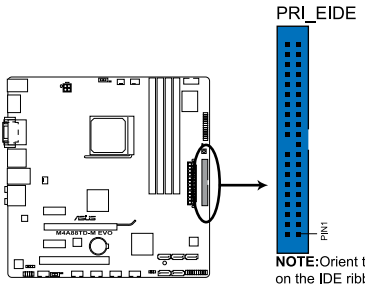
2. IDE connector (40-1 pin PRI_EIDE)

The onboard IDE connector is for 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.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

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

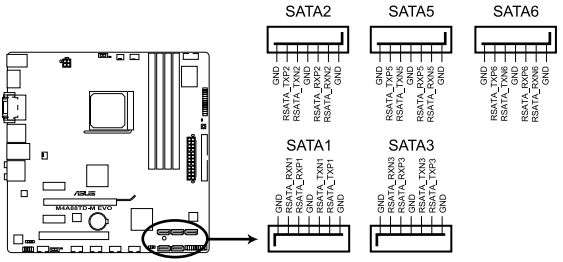


NOTE: Orient the red markings on the IDE ribbon cable to PIN 1.

M4A88TD-M EVO IDE connector

3. AMD® SB850 Serial ATA Serial ATA 6.0 Gb/s connectors (7-pin SATA 1, SATA 2, SATA 3, SATA 5, SATA 6)

These connectors are for the Serial ATA 6.0 Gb/s signal cables for Serial ATA hard disk drives and optical disc drives. If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 5, or RAID 10 configuration through the onboard AMD® SB850 controller.

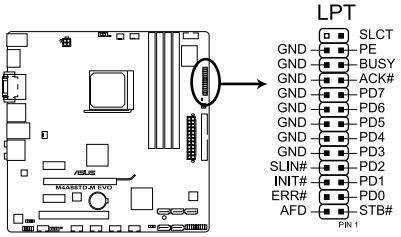


M4A88TD-M EVO SATA connectors

- These connectors are set to **IDE** mode by default. In IDE mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the type of the SATA connectors in the BIOS to **[RAID]**. See section **2.3.4 SATA Configuration** for details.
- You must install Windows® XP Service Pack 2 or later version before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP2 or later version.
- When using hot-plug and NCQ, set the type of the SATA connectors in the BIOS to **[AHCI]**. See section **2.3.4 SATA Configuration** for details.

4. LPT connector (26-1 pin LPT)

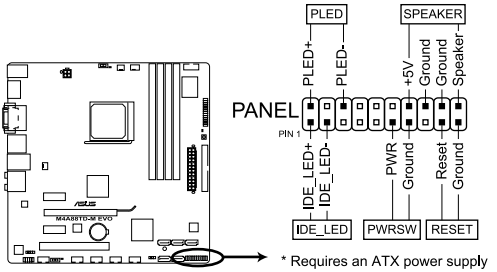
The LPT (Line Printing Terminal) connector supports devices such as a printer. LPT is standardized as IEEE 1284, which is the parallel port interface on IBM PC-compatible computers.



M4A88TD-M EVO LPT Connector

5. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.



M4A88TD-M EVO 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 IDE_LED)**

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

- **System warning speaker (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.

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

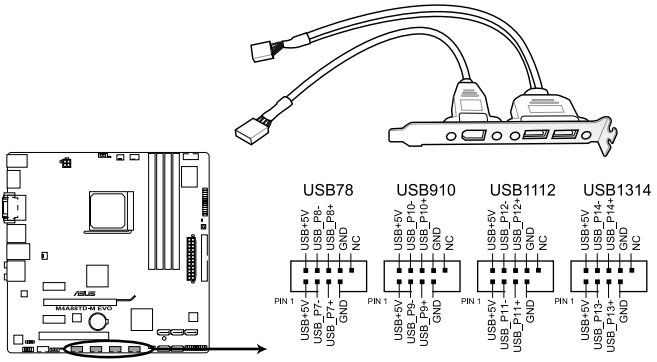
  This connector is for the system power button.

- **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.

6. USB connectors (10-1 pin USB78, USB910, USB1112, USB1314)

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



M4A88TD-M EVO USB2.0 connectors

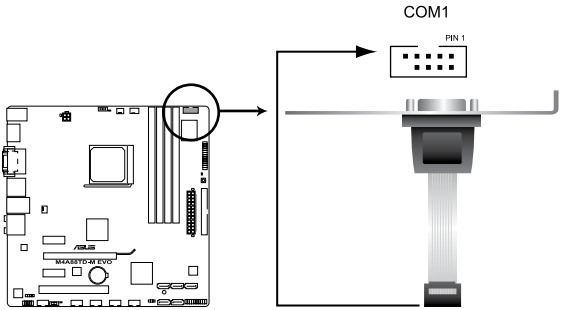
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

The USB 2.0 module is purchased separately.

7. 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.

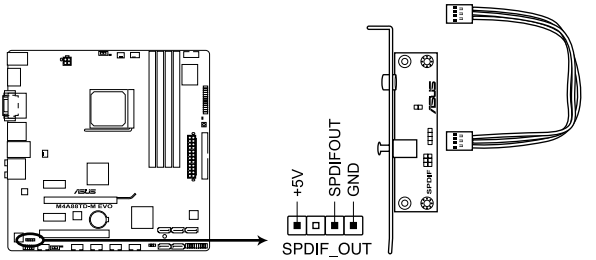
The serial port module is purchased separately.



M4A88TD-M EVO Serial port (COM1) connector

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

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



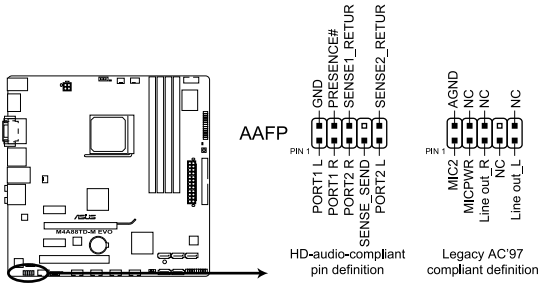
M4A88TD-M EVO Digital audio connector

Ensure that the audio device of Sound playback is **Realtek 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.

9. 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.

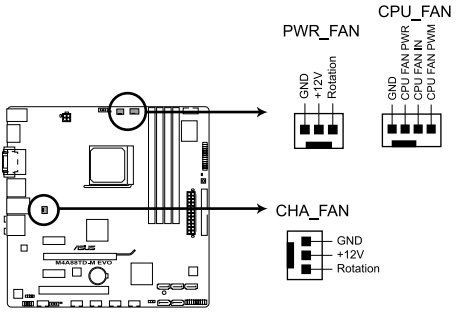


M4A88TD-M EVO Front panel audio connector

- 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, set the **Front Panel Select** item in the BIOS to **[HD Audio]**. See section **2.5.3 Onboard Devices Configuration** for details.
- The front panel audio I/O module is purchased separately.

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

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.



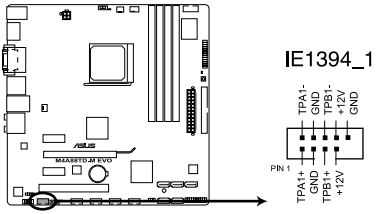
M4A88TD-M EVO Fan connectors

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

Only the 4-pin CPU fan and chassis fan supports the ASUS FanXpert feature.

11. IEEE 1394a port connector (10-1 pin IE1394_1)

This connector is for an IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.



M4A88TD-M EVO IEEE 1394a Connector

Never connect a USB cable to the IEEE 1394a connector. Doing so will damage the motherboard.

The IEEE 1394a module is purchased separately.

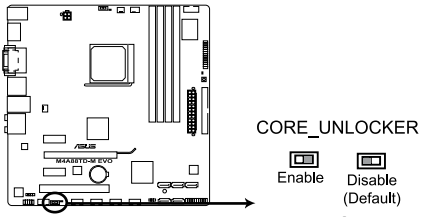
1.11 Onboard switch

Onboard switches allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

1. Core Unlocker switch

This switch allows you to unlock the extra cores of your CPU.

To ensure system performance, turn the switch setting to **Enable** when the system is powered off.

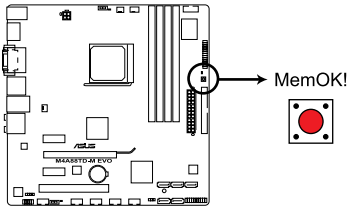


M4A88TD-M EVO Core Unlocker Switch

- The O2LED1 LED near the Core Unlocker switch lights when the switch setting is turned to **Enable**. Refer to section **1.12 Onboard LEDs** for the exact location of the O2LED1 LED.
- You may also press <4> during the Power-On-Self-Test (POST) or enable the **ASUS Core Unlocker** item in the BIOS menu to activate the Core Unlocker function.
- The system will use the last setting you have made.
- If you clear the CMOS or load the BIOS setup defaults, the **ASUS Core Unlocker** item in the BIOS menu follows the current setting of the Core Unlocker switch.

2. MemOK! switch

Installing DIMMs that are incompatible with the motherboard may cause system boot failure, and the DRAM_LED near the MemOK! switch lights continuously. Press and hold the MemOK! switch until the DRAM_LED starts blinking to begin automatic memory compatibility tuning for successful boot.



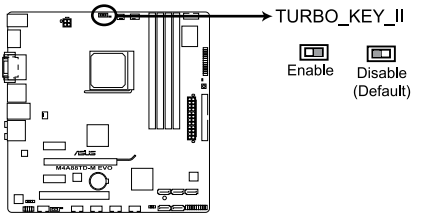
M4A88TD-M EVO MemOK! switch

- Refer to section **1.12 Onboard LEDs** for the exact location of the DRAM_LED.
- The DRAM_LED also lights when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! function.
- The MemOK! switch does not function under Windows® OS environment.
- During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and test the next set of failsafe settings. The blinking speed of the DRAM_LED increases, indicating different test processes.
- Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM_LED lights continuously. Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) in this user manual or on the ASUS website at www.asus.com.
- If you turn off the computer and replace DIMMs during the tuning process, the system continues memory tuning after turning on the computer. To stop memory tuning, turn off the computer and unplug the power cord for about 5–10 seconds.
- If your system fail to boot due to BIOS overclocking, press the MemOK! switch to boot and load BIOS default settings. A message will appear during POST reminding you that the BIOS has been restored to its default settings.
- We recommend that you download and update to the latest BIOS version from the ASUS website at www.asus.com after using the MemOK! function.

3. Turbo Key II switch

This switch allows you to auto-tune your CPU to enhance the system performance.

To ensure system performance, turn the switch setting to **Enable** when the system is powered off.



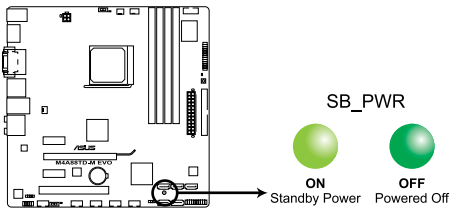
M4A88TD-M EVO TURBO_KEY_II Switch

- The O2LED2 LED near the Turbo Key II switch lights when the switch setting is turned to Enable. Refer to section **1.12 Onboard LEDs** for the exact location of the O2LED2 LED.
- If you clear the CMOS or load the BIOS setup defaults, the related overclocking items in the BIOS menu follow the current setting of the Turbo Key II switch.
- If you change the switch setting to Enable under the OS environment, the Turbo Key II function will be activated after the next system bootup.
- You may use the TurboV Auto Tuning, overclock in the BIOS setup program, and enable the Turbo Key II function at the same time. However, the system will use the last setting you have made.

1.12 Onboard LEDs

1. Standby Power LED

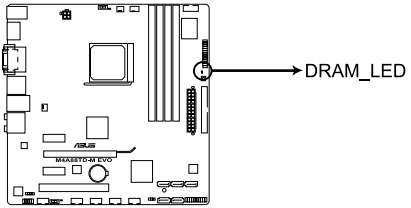
The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows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



M4A88TD-M EVO Onboard LED

2. DRAM LED

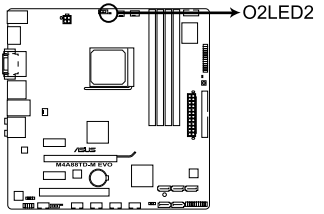
DRAM LED checks the DRAM in sequence during motherboard booting process. If an error is found , the LED next to the error device will continue lighting until the problem is solved. This user-friendly design provides an intuitional way to locate the root problem within a second.



M4A88TD-M EVO DRAM LED

3. Turbo Key II LED

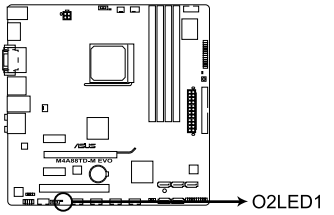
The Turbo Key II LED lights when the Turbo Key II switch is turned to **Enable**.



M4A88TD-M EVO TURBO_KEY_II LED

4. Core Unlocker LED

The Core Unlocker LED lights when the Core Unclocker switch is turned to **Enable**.



M4A88TD-M EVO Core Unlocker LED

The Core Unlocker LED keeps on lighting even though the ASUS Core Unlocker item in the BIOS menu is set to [Disabled].

1.13 Software support

1.13.1 Installing an operating system

This motherboard supports Windows® XP/Vista/7 Operating Systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

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

1.13.2 Support DVD information

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

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

To run the Support DVD

Place the Support DVD into the optical drive. If Autorun is enabled in your computer, the DVD automatically displays the Specials screen which contains the unique features of ASUS motherboard. Click Drivers, Utilities, Make Disk, Manual, and Contact tabs to display their respective menus.

The following screen is for reference only.

If Autorun 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 the ASSETUP.EXE to run the DVD.

Chapter 2

BIOS information

2.1 Managing and updating your BIOS

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

2.1.1 ASUS Update utility

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

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

Installing ASUS Update

To install ASUS Update:

1. Place the support DVD 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 that 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

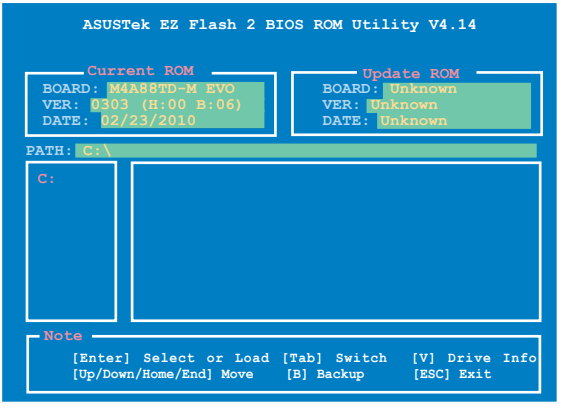
The ASUS EZ Flash 2 feature allows you to update the BIOS without using an OS-based utility.

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

To update the BIOS using EZ Flash 2:

1. Insert the USB flash disk that contains the latest BIOS file to the USB port, then launch EZ Flash 2 in either of these two ways:
   - Press **<Alt> + <F2>** during POST.
   - Enter the BIOS setup program. Go to the **Tools** menu to select **EZ Flash 2** and press **<Enter>** to enable it.

     Press **<Tab>** to switch between drives until the correct BIOS file is found.



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

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

2.1.3 ASUS CrashFree BIOS

The ASUS CrashFree BIOS is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can restore a corrupted BIOS file using the motherboard support DVD or a removable device that contains the updated BIOS file.

- Before using this utility, rename the BIOS file in the removable device into **M4A88TDM.ROM**.
- The BIOS file in the support DVD may not be the latest version. Download the latest BIOS file from the ASUS website at www.asus.com.
- The removable devices that ASUS CrashFree BIOS support vary with motherboard models. For motherboards without the floppy connector, prepare a USB flash disk before using this utility.

Recovering the BIOS

To recover the BIOS:

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

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

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit menu. Refer to section **2.9 Exit menu** for details.

2.1.4 ASUS BIOS Updater

The ASUS BIOS Updater allows you to update BIOS in DOS environment. This utility also allows you to copy the current BIOS file that you can use as a backup when the BIOS fails or gets corrupted during the updating process.

The succeeding utility screens are for reference only. The actual utility screen displays may not be same as shown.

Before updating BIOS

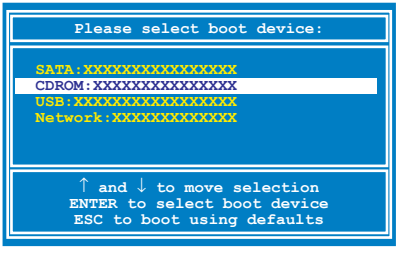
1. Prepare the motherboard support DVD and a USB flash drive in FAT32/16 format and single partition.
2. Download the latest BIOS file and BIOS Updater from the ASUS website at http://support.asus.com and save them on the USB flash drive.

- NTFS is not supported under DOS environment. Do not save the BIOS file and BIOS Updater to a hard disk drive or USB flash drive in NTFS format.
- Do not save the BIOS file to a floppy disk due to low disk capacity.

3. Turn off the computer and disconnect all SATA hard disk drives (optional).

Booting the system in DOS environment

1. Insert the USB flash drive with the latest BIOS file and BIOS Updater to the USB port.
2. Boot your computer. When the ASUS Logo appears, press <F8> to show the **BIOS Boot Device Select Menu**. Insert the support DVD into the optical drive and select the optical drive as the boot device.



3. When the **Make Disk** menu appears, select the **FreeDOS command prompt** item by pressing the item number.
4. At the FreeDOS prompt, type `d:` and press <Enter> to switch the disk from Drive C (optical drive) to Drive D (USB flash drive).

```
Welcome to FreeDOS (http://www.freedos.org)!
C:\>d:
D:\>
```

Backing up the current BIOS

To backup the current BIOS file using the BIOS Updater

Ensure that the USB flash drive is not write-protected and has enough free space to save the file.

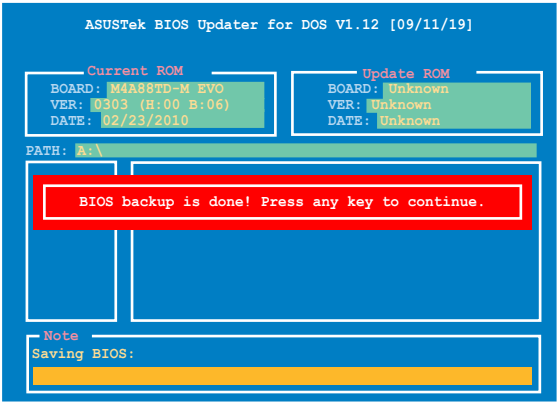
1. At the FreeDOS prompt, type **`bupdater /o[filename]`** and press <Enter>.

```
D:\>bupdater /oOLDBIOS1.rom
```

Filename **Extension**

The [filename] is any user-assigned filename with no more than eight alphanumeric characters for the filename and three alphanumeric characters for the extension.

2. The BIOS Updater backup screen appears indicating the BIOS backup process. When BIOS backup is done, press any key to return to the DOS prompt.



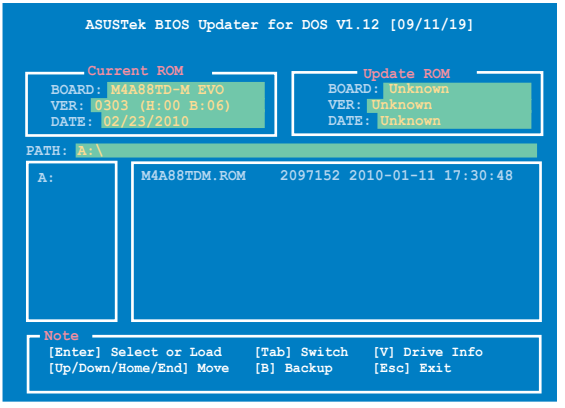
Updating the BIOS file

To update the BIOS file using BIOS Updater

1. At the FreeDOS prompt, type **`bupdater /pc /g`** and press <Enter>.

```
D:\>bupdater /pc /g
```

2. The BIOS Updater screen appears as below.



3. Press <Tab> to switch between screen fields and use the <Up/Down/Home/End> keys to select the BIOS file and press <Enter>. BIOS Updater checks the selected BIOS file and prompts you to confirm BIOS update.

4. Select **Yes** and press <Enter>. When BIOS update is done, press <ESC> to exit BIOS Updater. Restart your computer.

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

- For BIOS Updater version 1.04 or later, the utility automatically exits to the DOS prompt after updating BIOS.
- Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** BIOS menu. See section **2.9 Exit Menu**.
- Ensure to connect all SATA hard disk drives after updating the BIOS file if you have disconnected them.

2.2 BIOS setup program

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

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

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

Entering BIOS Setup after POST

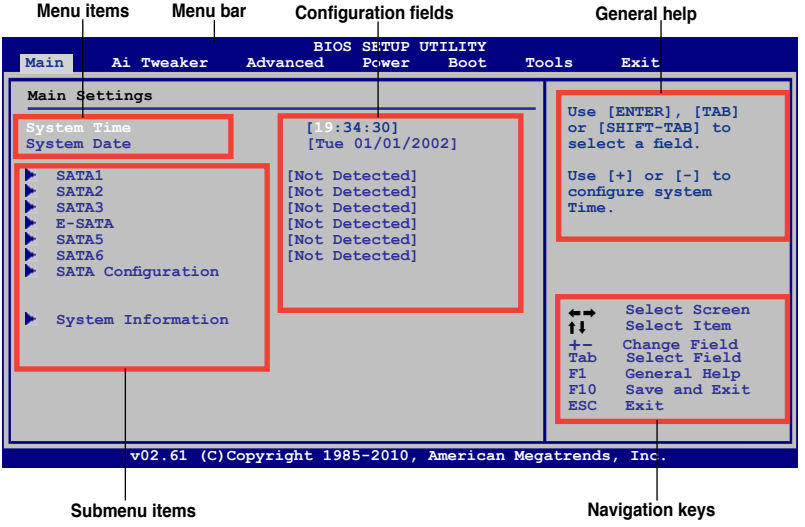
To enter BIOS Setup after POST:

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

Using the **power button**, **reset button**, or the **<Ctrl>+<Alt>+<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 **2.9 Exit Menu**.
- The BIOS setup screens in this chapter 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.

2.2.1 BIOS menu screen



2.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Tools	For configuring options for special functions
Exit	For selecting the exit options and loading default settings.

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

2.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

2.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Ai Tweaker, Advanced, Power, Boot, Tools, and Exit) on the menu bar have their respective menu items.

2.2.5 Submenu items

A solid triangle before each item on a menu screen means that the item has a submenu. To display the submenu, select the item and press **<Enter>**.

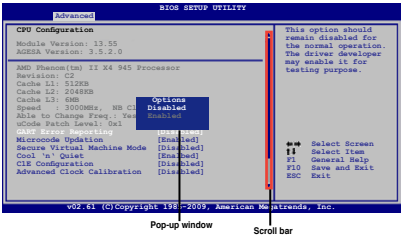
2.2.6 Configuration fields

These fields show the values for the menu items. If an item is user- configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press **<Enter>** to display a list of options. Refer to **2.2.7 Pop-up window**.

2.2.7 Pop-up window

Select a menu item then press **<Enter>** to display a pop-up window with the configuration options for that item.



2.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the **<Up> / <Down>** arrow keys or **<Page Up> /<Page Down>** keys to display the other items on the screen.

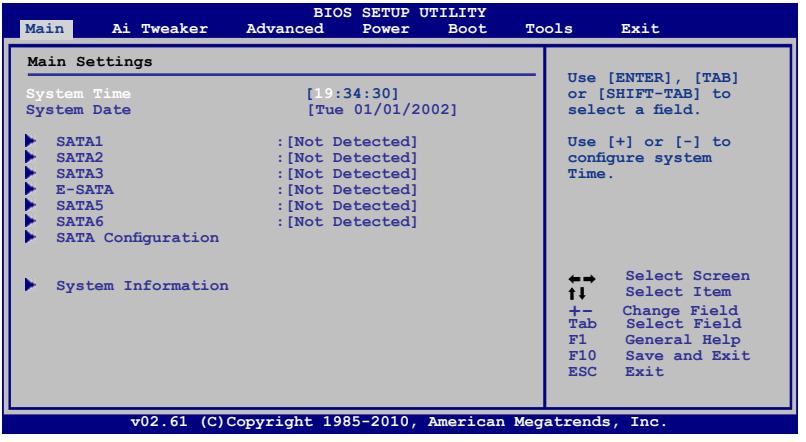
2.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

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.

Refer to section **2.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.



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 SATA 1/2/3/5/6, E-SATA,

While entering Setup, the BIOS automatically detects the presence of SATA devices. There is a separate submenu for each SATA device. Select a device item then press **<Enter>** to display the 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 SATA device is installed in the system.

Type [Auto]

Selects the type of SATA drive. Setting this item to **[Auto]** allows automatic selection of the appropriate SATA 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 **SATA5/6** menus.

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting this item 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 this item is 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 this item is 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 storage devices. Select an item then press **<Enter>** to display the submenu.

OnChip SATA Channel [Enabled]

Enables or disables onboard channel SATA port. Configuration options: [Disabled] [Enabled]

The following two items only appear when you set **OnChip SATA Channel** to [**Enabled**].

SATA Port1 - Port4 [IDE]

Allows you to set the SATA configuration.

[IDE] Set to [IDE] when you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices.

[RAID] Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.

[AHCI] Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

- When this item is set to [AHCI], the information of the SATA connectors 1–6 can be seen only under the OS environment or during POST.
- For Windows® XP OS, you have to install the AHCI driver, so that you could use the SATA connectors 1–6 in AHCI mode under the OS environment.

SATA Port5 - Port6 [IDE]
Setting this item to [IDE] instead of [RAID] or [AHCI] allows the system to recognize the optical dirves connected to the SATA connectors 5 or 6 when installing OS.

If you use a SATA optical drive to run the OS installation disk, we strongly recommend that you install the optical dirve to the SATA connectors 5/6 and set them to [IDE] 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

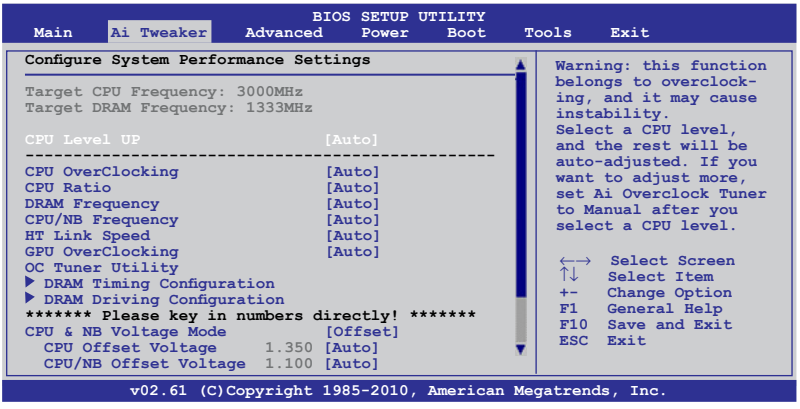
Displays the auto-detected system memory.

2.4 Ai Tweaker menu

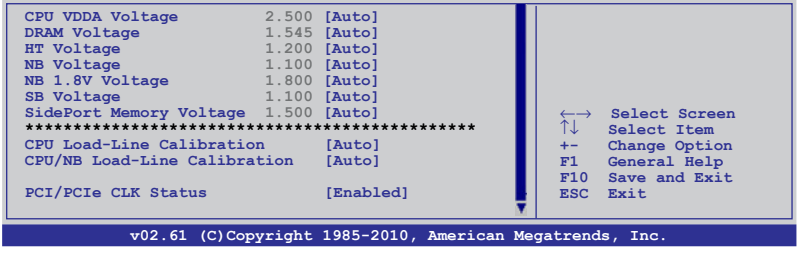
The Ai Tweaker menu items allow you to configure overclocking-related items.

Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.

The configuration options for this chapter vary depending on the CPU and DIMM model you installed on the motherboard.



Scroll down to display the following items:



2.4.1 CPU Level UP [Auto]

Allows you to select a CPU level, and the related parameters will be automatically adjusted according to the selected CPU level. If you want to manually configure the settings in detail, set **CPU Overclocking** to [Manual] after selecting a CPU level.
Configuration options: [Auto] [Phenom II-955] [Phenom II-3.4G] [Phenom II-3.6G]

- The configuration options vary depending on the CPU model you install on the motherboard.
- The CPU Level UP function support depends on CPU types.

2.4.2 CPU OverClocking [Auto]

Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Select any of these preset overclocking configuration options:

Manual	Allows you to individually set overclocking parameters.
Auto	Loads the optimal settings for the system.
D.O.C.P	Allows you to select a DRAM O.C. profile, and the related parameters will be adjusted automatically.
CPU Level UP	Allows you to select a CPU level, and the related parameters will be adjusted automatically.
Overclock Profile	Allows you to select an overclocking profile.
TestMode	Allows you to set the overclocking parameter to 5%.

The configuration options for the following sub-items vary depending on the CPU/DIMMs you install on the motherboard.

OC From CPU Level UP [Auto]

This item appears only when you set the **CPU OverClocking** item to [Manual] and allows you to select a CPU level. The related parameters will be automatically adjusted according to the selected CPU level.

CPU/HT Reference Clcok (MHz) [XXX]

This item appears only when you set the **CPU OverClocking** item to [Manual] and displays the frequency sent by the clock generator to the system bus and PCI bus. Use the <+> and <-> keys to adjust the CPU Bus frequency. You can also key in the desired frequency using the numeric keypad. The values range from 100 to 550.

PCIE Frequency [XXX]

This item appears only when you set the **CPU OverClocking** item to [Manual] and allows you to set the PCI Express frequency. Use the <+> and <-> keys to adjust the PCIE frequency. You can also key in the desired value using the numeric keypad. The values range from 100 to 150.

DRAM O.C. Profile [DDR3-1600MHz]

This item appears only when you set the **CPU OverClocking** item to [D.O.C.P.] and allows you to select a DRAM O.C. profile, which applies different settings to DRAM frequency, DRAM timing and DRAM voltage. Configuration options: [DDR3-1600MHz] [DDR3-1800MHz] [DDR3-1866MHz] [DDR3-2000MHz]

Profile Info : xxxxMHz–x-x-x-xx

This item appears only when you set the **CPU OverClocking** item to [D.O.C.P.] and displays the current DRAM profile information. The profile information varies according to the **DRAM O.C. Profile** you've selected.

Overclock Options [Auto]

This item appears only when you set the **CPU OverClocking** item to [Overclock Profile] and allows you to select an overclocking profile. Configuration options: [Auto] [Overclock 2%] [Overclock 5%] [Overclock 8%] [Overclock 10%]

2.4.3 CPU Ratio [Auto]

Allows you to set the ratio between the CPU Core Clock and the FSB Frequency. Use the <+> and <-> keys to adjust the ratio. The valid value ranges vary according to your CPU model.

2.4.4 DRAM Frequency [Auto]

Allows you to set the DDR3 operating frequency. The configuration options vary with the **CPU Bus Frequency** item settings.

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

2.4.5 CPU/NB Frequency [Auto]

Allows you to select the CPU/NB frequency. Configuration options: [Auto] [800MHz] [1000MHz] [1200MHz] [1400MHz] [1600MHz] [1800MHz] [2000MHz]

2.4.6 HT Link Speed [Auto]

Allows you to select the HyperTransport link speed. Configuration options: [Auto] [200MHz] [400MHz] [600MHz] [800MHz] [1000MHz] [1200MHz] [1400MHz] [1600MHz] [1800MHz] [2000MHz]

2.4.7 GPU OverClocking [Auto]

Allows you to configure the GPU overclocking settings. Configuration options: [Auto] [Manual]

GPU Engine Clock [560]

This item appears only when you set the **GPU OverClocking** item to [Manual] and allows you to set the GPU Engine Clock. Use the <+> and <-> keys to adjust the value. You can also key in the desired value using the numeric keypad. The values range from 150 to 2000.

2.4.8 OC Tuner Utility

OC Tuner utility automatically overclocks the frequency and voltage of the CPU and DRAM. Press <Enter> to start auto tuning. It takes around five minutes, and the system will reboot for several times until auto tuning is completed.

2.4.9 DRAM Timing Configuration

The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.

DRAM CAS# Latency [Auto]

Configuration options: [Auto] [4 CLK] – [12 CLK]

DRAM RAS# to CAS# Delay [Auto]

Configuration options: [Auto] [5 CLK] – [12 CLK]

DRAM RAS# PRE Time [Auto]

Configuration options: [Auto] [5 CLK] – [12 CLK]

DRAM RAS# ACT Time [Auto]

Configuration options: [Auto] [15 CLK] – [30 CLK]

DRAM READ to PRE Time [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK] [6 CLK] [7 CLK]

DRAM Row Cycle Time [Auto]

Configuration options: [Auto] [11 CLK] – [41 CLK]

DRAM WRITE Recovery Time [Auto]

Configuration options: [Auto] [5 CLK] [6 CLK] [7 CLK] [8 CLK] [10 CLK] [12 CLK]

DRAM RAS# to RAS# Delay [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK] [6 CLK] [7 CLK]

DRAM READ to WRITE Delay [Auto]

Configuration options: [Auto] [3 CLK] – [17 CLK]

DRAM WRITE to READ Delay(DD) [Auto]

Configuration options: [Auto] [2 CLK] – [10 CLK]

DRAM WRITE to READ Delay(SD) [Auto]

Configuration options: [Auto] [4 CLK] [5 CLK] [6 CLK] [7 CLK]

DRAM WRITE to WRITE Timing [Auto]

Configuration options: [Auto] [3 CLK] – [10 CLK]

DRAM READ to READ Timing [Auto]

Configuration options: [Auto] [3 CLK] – [10 CLK]

DRAM REF Cycle Time [Auto]

Configuration options: [Auto] [90ns] [110ns] [160ns] [300ns] [350ns]

DRAM Refresh Rate [Auto]

Configuration options: [Auto] [Every 7.8ms] [Every 3.9ms]

DRAM Command Rate [Auto]

Configuration options: [Auto] [1T] [2T]

2.4.10 DRAM Driving Configuration

The configuration options for some of the following items vary depending on the DIMMs you install on the motherboard.

CKE drive strength [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

CS/ODT drive strength [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

ADDR/CMD drive strength [Auto]

Configuration options: [Auto] [1x] [1.25x] [1.5x] [2x]

MEMCLK drive strength [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

Data drive strength [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

DQS drive strength [Auto]

Configuration options: [Auto] [0.75x] [1x] [1.25x] [1.5x]

Processor ODT [Auto]

Configuration options: [Auto] [240 ohms +/- 20%] [120 ohms +/- 20%] [60 ohms +/- 20%]

Some of the following items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.

2.4.11 CPU & NB Voltage Mode [Offset]

Allows you to set the CPU & CPU/NB Voltage Mode. Different sub-items appear according to the **CPU & NB Voltage Mode** item setting. Configuration options: [Offset] [Manual]

CPU Offset Voltage [Auto]

This item appears only when you set the **CPU & NB Voltage Mode** item to [Offset] and allows you to set the CPU Offset voltage. The values range from 0.006250V to 0.500000V with a 0.006250V interval.

CPU/NB Offset Voltage [Auto]

This item appears only when you set the **CPU & NB Voltage Mode** item to [Offset] and allows you to set the CPU/NB Offset voltage. The values range from 0.006250V to 0.500000V with a 0.006250V interval.

CPU Voltage [Auto]

This item appears only when you set the CPU & NB Voltage Mode item to [Manual] and allows you to set a fixed CPU voltage.

CPU/NB Voltage [Auto]

This item appears only when you set the CPU & NB Voltage Mode item to [Manual] and allows you to set a fixed CPU/NB voltage.

2.4.12 CPU VDDA Voltage [Auto]

Allows you to set the CPU VDDA voltage. The values range from 2.50V to 2.80V with a 0.10V interval.

2.4.13 DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.20000V to 2.44500V with a 0.01500V interval.

2.4.14 HT Voltage [Auto]

Allows you to set the HyperTransport voltage. The values range from 1.20000V to 1.40000V with a 0.01000V interval.

2.4.15 NB Voltage [Auto]

Allows you to set the Northbridge voltage. The values range from 1.10000V to 1.50000V with a 0.01000V interval.

2.4.16 NB 1.8V Voltage [Auto]

Allows you to set the Northbridge 1.8V voltage. The values range from 1.80V to 1.90V with a 0.10V interval.

2.4.17 SB Voltage [Auto]

Allows you to set the Southbridge voltage. The values range from 1.10V to 1.40V with a 0.10V interval.

2.4.18 SidePort Memory Voltage [Auto]

Allows you to set the SidePort memory voltage. The values range from 1.50V to 1.80V with a 0.10V interval.

- Setting the above voltages to a high level may damage the CPU, memory module, and chipset permanently. Proceed with caution.
- The system may require a better cooling system to work stably under high voltage settings.

2.4.19 CPU Load-Line Calibration [Auto]

Allows you to select the CPU Load-Line mode.
Configuration options: [Auto] [Disabled] [Enabled]

2.4.20 CPU/NB Load-Line Calibration [Auto]

Allows you to select the CPU/NB Load-Line mode.
Configuration options: [Auto] [Disabled] [Enabled]

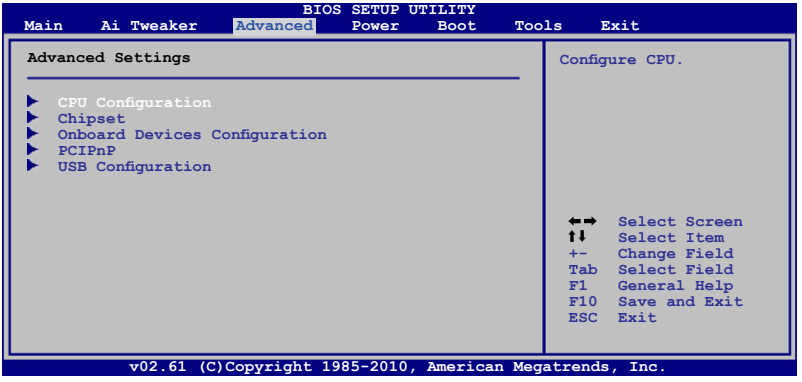
2.4.21 PCI/PCIe CLK Status [Enabled]

Allows you to enable and disable clock for PCI/PCIe slot.
Configuration options: [Disabled] [Enabled]

2.5 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.



2.5.1 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]

Enables or disables Microcode Updation. Configuration options: [Disabled] [Enabled]

Secure Virtual Machine Mode [Disabled]

Enables or disables Secure Virtual Machine Mode (SVM) Configuration options: [Disabled] [Enabled]

Cool ‘n’ Quiet [Enabled]

Enables or disables the AMD Cool ‘n’ Quiet technology. Configuration options: [Enabled] [Disabled]

ACPI SRAT Table [Enabled]

Enables or disables the building of ACPI SRAT table. Configuration options: [Enabled] [Disabled]

ASUS Core Unlocker [Disabled]

Enables the ASUS Core Unlocker to get the full computing power of the processor. Select [Disabled] to disable this function. Configuration options: [Enabled] [Disabled]

C1E Configuration [Disabled]

Enables or disables the CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When this item is enabled, the CPU core frequency and voltage will be reduced during the system halt state to decrease power consumption.
Configuration options: [Disabled] [Enabled]

2.5.2 Chipset

NorthBridge Configuration

DRAM Controller Configuration

Bank Interleaving [Auto]
Allows you to enable the bank memory interleaving. Configuration options: [Disabled] [Auto]

Channel Interleaving [XOR of Address bit]
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 unused Clocks to DIMMs even though memory slots are not populated.
Configuraiton options: [Enabled] [Disabled]

MemClk Tristate C3/ATLVID [Disabled]
Allows you to enable or disable MemClk Tri-Stating during C3 and Alt VID.
Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]
Allows you to enable or disable memory remapping around memory hole.
Configuration options: [Disabled] [Enabled]

DCT Unganged Mode [Auto]
Allows you to select the unganged DRAM mode (64-bit width).
Configuration options: [Auto] [Always]

Power Down Enable [Disabled]
Allows you to enable or disable 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]

Internal Graphics

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

Allows you to set the primary display adapter. Configuration options: [GFX0-GPP-IGFX-PCI] [GPP-GFX0-IGFX-PCI] [PCI-GFX0-GPP-IGFX] [IGFX-GFX0-GPP-PCI]

Internal Graphics Mode [UMA+SidePort]

Selects the internal graphics mode. Configuration options: [Disabled] [UMA] [SidePort] [UMA+SidePort]

UMA Frame Buffer Size [Auto]

This item appears only when you set the Internal Graphics Mode item to [UMA] or [UMA+SIDEPORT]. Configuration options: [Auto] [32MB] [64MB] [128MB] [256MB] [512MB]

SidePort Clock Speed [DDR3-1333MHz]

This item appears only when you set the Internal Graphics Mode item to [SIDEPORT] or [UMA+SIDEPORT]. Configuration options: [DDR3-1333MHz] [DDR3-1400MHz] [DDR3-1430MHz] [DDR3-1460MHz] ~ [DDR3-2000MHz]

UMA-SP Interleave Mode [Auto]

This item appears only when you set the Internal Graphics Mode item to [UMA+SIDEPORT]. Configuration options: [Auto] [Coarse] [Fine]

Surround View [Auto]

If you set the PCI Express device as the primary display and enable this item, you may use the internal graphics as the secondary display. This item appears only when you set the **Internal Graphics Mode** item to [UMA], [SIDEPORT], or [UMA+SIDEPORT]. Configuration options: [Auto] [Enabled] [Disabled]

When set to [Auto], only the primary display could be activated.

Frame Buffer Location [Above 4G]

Allows you to select the FB Location. Configuration options: [Below 4G] [Above 4G]

AMD HDMI Audio [Enabled]

Allows you to disable or enable the AMD 880 HD Audio.
Configuration options: [Disabled] [Enabled]

2.5.3 Onboard Devices Configuration

Serial Port1 Address [3F8/IRQ4]

Selects the Serial Port1 base address. Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Selects the Parallel Port base addresses. Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [Normal]

Selects the Parallel Port mode. Configuration options: [Normal] [EPP] [ECP] [EPP + ECP]

Parallel Port IRQ [IRQ7]

Allows BIOS to select the Parallel Port IRQ. Configuration options: [IRQ5] [IRQ7]

HDAudio Controller [Enabled]

Enables or disables the high definition audio controller. Configuration options: [Disabled] [Enabled]

Front Panel Select [HD Audio]

Selects the front panel type. Configuration options: [AC97] [HD Audio]

OnBoard LAN Controller [Enabled]

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

OnBoard LAN Boot ROM [Disabled]

Enables or disables the Onboard LAN Boot ROM. Configuration options: [Disabled] [Enabled]

OnBoard IDE Controller [Enabled]

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

1394 Controller [Enabled]

Enables or disables the onboard 1394 controller. Configuration options: [Disabled] [Enabled]

2.5.4 PCIPnP

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

2.5.5 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press **<Enter>** to display the configuration options.

The Module Version and USB Devices Enabled items show the auto-detected values. If no USB device is detected, the item shows **None**.

USB Functions [Enabled]

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

Legacy USB Support [Auto]

Enables or disables support for Legacy USB storage devices including USB flash drives and USB hard drives. Setting this item 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]

Configures the USB 2.0 controller in HiSpeed (480Mbps) mode or FullSpeed (12Mbps) mode. 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]

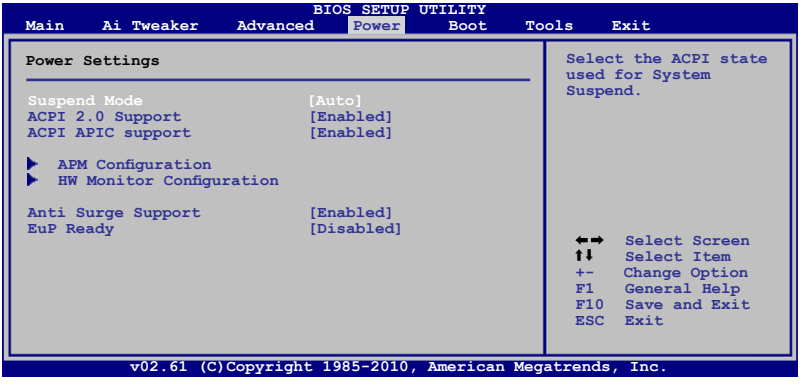
Sets the maximum time that the BIOS waits for the USB storage device to initialize. Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

Emulation Type [Auto]

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

2.6 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.



2.6.1 Suspend Mode [Auto]

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

2.6.2 ACPI 2.0 Support [Enabled]

Enables or disables the Advanced Configuration and Power Interface (ACPI) 2.0 support. Configuration options: [Disabled] [Enabled]

2.6.3 ACPI APIC Support [Enabled]

Enables or disables the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When this item is set to **[Enabled]**, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

2.6.4 APM Configuration

Restore on AC Power Loss [Power Off]

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

Power on From S5 By PME# [Disabled]

Enables or disables PME wake from sleep states. Configuration options: [Disabled] [Enabled]

Power on From S5 By Ring [Disabled]

Enables or disables ring to generate a wake event. Configuration options: [Disabled] [Enabled]

Power on By PS/2 Keyboard [Disabled]

Enables or disables PS/2 Keyboard to generate a wake event.
Configuration options: [Disabled] [Space Bar] [Power Key] [Ctrl - Esc]

Power on From S5 By RTC Alarm [Disabled]

Enables or disables RTC to generate a wake event. Configuration options: [Disabled] [Enabled]

2.6.5 HW Monitor Configuration

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

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

CPU Fan Speed [xxxxRPM] or [Ignored] / [N/A]
Chassis Fan Speed [xxxxRPM] or [Ignored] / [N/A]
Power Fan Speed [xxxxRPM] or [Ignored] / [N/A]

The onboard hardware monitor automatically detects and displays the CPU / Chassis / Power fan speeds 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 [xx.xxxV] or [Ignored]

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. Select **[Ignored]** if you do not want the detected voltage to be displayed.

CPU Q-Fan Function [Enabled]

Enables or disables the CPU Q-Fan control feature. Configuration options: [Disabled] [Enabled]

The following item appears only when you set **CPU Q-Fan Function** to [Enabled].

CPU Q-Fan Mode [Optimal]

[Performance] Sets to [Performance] to achieve maximum CPU fan speed.

[Optimal] Sets to [Optimal] to make the CPU fan automatically adjust depending on the CPU temperature.

[Silent] Sets to [Silent] to minimize the fan speed for quiet CPU fan operation.]

Chassis Q-Fan Function [Disabled]

Enables or disables the Chassis Q-Fan control feature. Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Chassis Q-Fan Function** to [Enabled].

Chassis Q-Fan Mode [Optimal]

[Performance] Sets to [Performance] to achieve maximum chassis fan speed.

[Optimal] Sets to [Optimal] to make the chassis fan automatically adjust depending on the chassis temperature.

[Silent] Sets to [Silent] to minimize fan speed for quiet chassis fan operation.

2.6.6 Anti Surge Support [Enabled]

Enables or disables the Anti Surge support. Configuration options: [Disabled] [Enabled]

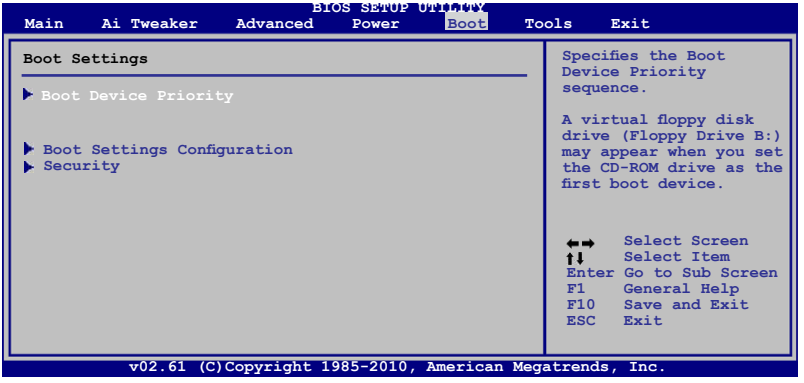
2.6.7 EuP Ready [Disabled]

[Disabled] Disables the Energy Using Products (EuP) Ready function.

[Enabled] Allows BIOS to switch off some power at S5 state to get system ready for the EuP requirement. When set to [Enabled], power for WOL, WO_USB, audio and onboard LEDs will be switched off at S5 state.

2.7 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.



2.7.1 Boot Device Priority

1st ~ xxth Boot Device [xxx Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system. Configuration options: [Removable Dev.] [Hard Drive] [ATAPI CD-ROM] [Disabled]

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

2.7.2 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 this item is set to **[Disabled]**, BIOS performs all the POST items. Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

Enables or disables the full screen logo display feature. Configuration options: [Disabled] [Enabled]

Set this item to **[Enabled]** to use the ASUS MyLogo2™ feature.

AddOn ROM Display Mode [Force BIOS]

Sets the display mode for option ROM. Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Selects the power-on state for the NumLock. Configuration options: [Off] [On]

Wait for 'F1' If Error [Enabled]

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

2.7.3 Security

The Security menu items allow you to change the system security settings. Select an item then press **<Enter>** to display the configuration options.

Change Supervisor Password

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

To set a Supervisor Password:

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

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

To change the supervisor password, follow the same steps as 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 **1.9 Jumpers** for information on how to erase the RTC RAM.

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

User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

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

To set a User Password:

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

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

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

Clear User Password

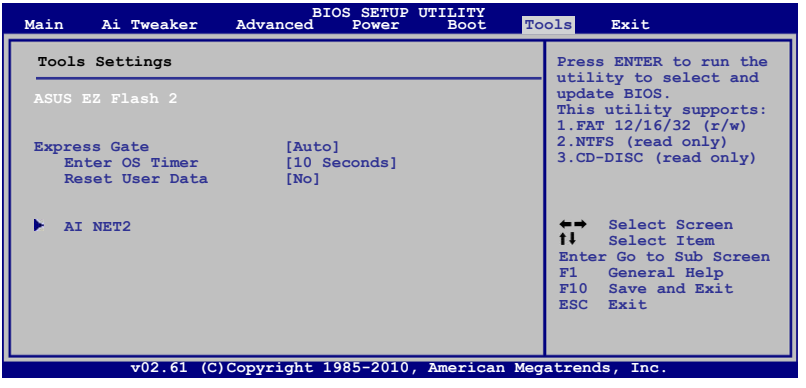
Select this item to clear the user password.

Password Check [Setup]

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

2.8 Tools menu

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



2.8.1 ASUS EZ Flash 2

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

2.8.2 Express Gate [Auto]

Enables or disables the ASUS Express Gate feature. ASUS Express Gate is a unique instant-on environment that provides quick access to the Internet and Skype. Configuration options: [Disabled] [Enabled] [Auto]

Enter OS Timer [10 Seconds]

Sets countdown duration that the system waits at the Express Gate's first screen before starting Windows or other installed OS. Choose [Prompt User] to stay at the first screen of Express Gate for user action. Configuration options: [Prompt User] [1 second] [3 seconds] [5 seconds] [10 seconds] [15 seconds] [20 seconds] [30 seconds]

Reset User Data [No]

Allows you to clear Express Gate's user data. Configuration options: [No] [Reset]

When setting this item to **[Reset]**, ensure to save the setting to the BIOS so that the user data will be cleared the next time you enter the Express Gate. User data includes the Express Gate's settings as well as any personal information stored by the web browser (bookmarks, cookies, browsing history, etc.). This is useful in the rare case where corrupt settings prevent the Express Gate environment from launching properly.

The first time wizard will run again when you enter the Express Gate environment after clearing its settings.

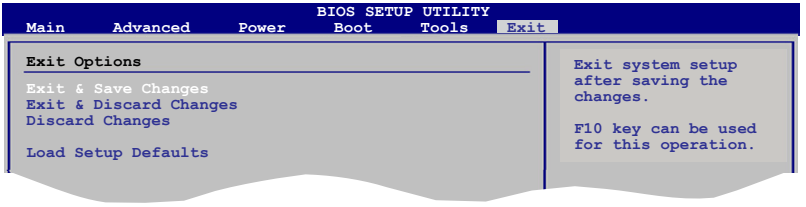
2.8.3 AI NET 2

Check Realtek LAN cable [Disabled]

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

2.9 Exit menu

The **Exit** menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



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

Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **OK** to save changes and exit.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **OK** to discard any changes and load the previously saved values.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press **<F5>**, a confirmation window appears. Select **OK** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

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Online support	support.asus.com

ASUS COMPUTER INTERNATIONAL (America)

Address	800 Corporate Way, Fremont, CA 94539, USA
Telephone	+1-510-739-3777
Fax	+1-510-608-4555
Web site	usa.asus.com

Technical Support

Telephone	+1-812-282-2787
Support fax	+1-812-284-0883
Online support	support.asus.com

ASUS COMPUTER GmbH (Germany and Austria)

Address	Harkort Str. 21-23, D-40880 Ratingen, Germany
Fax	+49-2102-959911
Web site	www.asus.de
Online contact	www.asus.de/sales

Technical Support

Telephone (Component)	+49-1805-010923*
Telephone (System/Notebook/Eee/LCD)	+49-1805-010920*
Support Fax	+49-2102-9599-11
Online support	support.asus.com

*** EUR 0.14/minute from a German fixed landline; EUR 0.42/minute from a mobile phone.**

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

Responsible Party Name: **Asus Computer International**

Address: **800 Corporate Way, Fremont, CA 94539.**

Phone/Fax No: **(510)739-3777/(510)608-4555**

hereby declares that the product

Product Name : Motherboard

Model Number : M4A88TD-M EVO

Conforms to the following specifications:

- ☒ FCC Part 15, Subpart B, Unintentional Radiators
- ☐ FCC Part 15, Subpart C, Intentional Radiators
- ☐ FCC Part 15, Subpart E, Intentional Radiators

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person's Name : **Steve Chang / President**

Signature :

Date : **Mar. 04, 2010**

EC Declaration of Conformity

We, the undersigned,

Manufacturer:	ASUSTek COMPUTER INC.
Address, City:	No. 150, LI-TE RD., PEITOU, TAIPEI 112, TAIWAN R.O.C.
Country:	TAIWAN
Authorized representative in Europe:	ASUS COMPUTER GmbH
Address, City:	HARKORT STR. 21-23, 40880 RATINGEN
Country:	GERMANY

declare the following apparatus:

Product name :	**Motherboard**
Model name :	**M4A88TD-M EVO**

conform with the essential requirements of the following directives:

☒2004/108/EC-EMC Directive

☒ EN 55022:2006+A1:2007	☒ EN 55024:1998+A1:2001+A2:2003
☒ EN 61000-3-2:2006	☒ EN 61000-3-3:1995+A1:2001+A2:2005
☐ EN 55013:2001+A1:2003+A2:2006	☐ EN 55020:2007

☐1999/5/EC-R &TTE Directive

☐ EN 300 328 V1.7.1(2006-05)	☐ EN 301 489-1 V1.8.1(2008-04)
☐ EN 300 440-1 V1.4.1(2008-05)	☐ EN 301 489-3 V1.4.1(2002-08)
☐ EN 300 440-2 V1.2.1(2008-03)	☐ EN 301 489-4 V1.3.1(2002-08)
☐ EN 301 511 V9.0.2(2003-03)	☐ EN 301 489-7 V1.3.1(2005-11)
☐ EN 301 908-1 V3.2.1(2007-05)	☐ EN 301 489-9 V1.4.1(2007-11)
☐ EN 301 908-2 V3.2.1(2007-05)	☐ EN 301 489-17 V1.3.2(2008-04)
☐ EN 301 893 V1.4.1(2005-03)	☐ EN 301 489-24 V1.4.1(2007-09)
☐ EN 50360:2001	☐ EN 302 326-2 V1.2.2(2007-06)
☐ EN 50371:2002	☐ EN 302 326-3 V1.3.1(2007-09)

☒2006/95/EC-LVD Directive

☒ EN 60950-1:2001+A11:2004	☐ EN60065:2002+A1:2006
☐ EN 60950-1:2006	

☐2005/32/EC-EuP Directive

Regulation (EC) No. 1275/2008	Regulation (EC) No. 278/2009
☐ EN 62301:2005	☐ EN 62301:2005

☒CE marking

(EC conformity marking)

Position : **CEO**

Name : **Jerry Shen**

Declaration Date: Mar. 04, 2010

Year to begin affixing CE marking:2010

Signature : _____