

M5A78L-M LE/USB3

Motherboard

ASUS[®]

E10372
First Edition
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Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- 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 all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

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

How this guide is organized

This guide contains the following parts:

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

Where to find more information

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

1. ASUS websites

The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To 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.

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 (+).

Package contents

Check your motherboard package for the following items.

Motherboard	ASUS M5A78L-M LE/USB3 motherboard
Cables	2 x Serial ATA 3.0 Gb/s cables
Accessories	1 x I/O Shield
Application DVD	Support DVD
Documentation	User Guide



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

M5A78L-M LE/USB3 specifications summary

CPU	AMD® Socket AM3+ for AMD® FX™ / Phenom™ II / Athlon™ II / Sempron™ 100 series processors AMD® Cool 'n' Quiet™ Technology Supports CPU up to 125W * Refer to www.asus.com for the AMD® CPU support list
Chipset	AMD® 760G(780L) / SB710
Front side bus	Up to 5.2GT/s HyperTransport™ 3.0 interface
Memory	Dual-channel memory architecture 2 x 240-pin DIMM slots support maximum 16GB unbuffered ECC and non-ECC DDR3 1866 / 1600 / 1333 / 1066MHz memory modules * AMD® FX™ Series CPU on this motherboard supports up to DDR3 1866MHz as its standard memory frequency. ** Due to CPU specification, AMD® AM3 CPUs on this motherboard support up to DDR3 1333MHz. *** Refer to www.asus.com for the latest Memory QVL (Qualified Vendors List).
Expansion slots	1 x PCIe 2.0 x16 slot 1 x PCIe 2.0 x1 slot 1 x PCI slot
Storage / RAID	4 x Serial ATA 3Gb/s connectors support RAID 0, 1, 10 and JBOD
LAN	Realtek 8111GR Gigabit LAN Controller(s)
Audio	Realtek® ALC887 8-channel* High Definition Audio CODEC - Dedicated audio PCB layers: Separate layers for left and right channels to guard the quality of the sensitive audio signals - Premium Japanese-made audio capacitors: Provide warm, natural and immersive sound with exceptional clarity and fidelity * Use the chassis with HD audio module in the front panel to support 8-channel audio output.

(continued on the next page)

M5A78L-M LE/USB3 specifications summary

USB	8*USB 2.0 ports (4 at mid-board, 4 at back panel) 2*USB 3.0 ports (2 at back panel)
ASUS Unique Features	ASUS EPU - EPU Core Unlocker ASUS Exclusive Features - Anti-Surge - ASUS All 5K-Hour Solid Capacitors - RAM Overcurrent Protection - ESD Guards - Stainless Steel Back I/O ASUS Quiet Thermal Solution - ASUS Fan Xpert ASUS EZ DIY - ASUS CrashFree BIOS 3 - ASUS EZ Flash 2 - ASUS MyLogo 2
Back panel I/O ports	1 x PS/2 Keyboard/Mouse combo port 1 x DVI port 1 x D-Sub port 1 x LAN (RJ-45) port 1 x COM port 3 x Audio jacks 2 x USB 3.0 ports 4 x USB 2.0 ports
Internal I/O connectors	2 x USB 2.0 connectors support additional 4 USB 2.0 ports 4 x SATA 3.0Gb/s connectors 1 x CPU fan connector 1 x Chassis fan connector 1 x 24-pin EATX power connector 1 x 4-pin ATX 12V power connector 1 x Front panel audio connector 1 x Internal Speaker connector 1 x System panel connector
BIOS	16Mb Flash ROM, AMI BIOS, PnP, DMI v2.0, WfM2.0, SM BIOS 2.5, ACPI v3.0a
Support DVD	Drivers ASUS PC Probe II ASUS Update Anti-Virus software (OEM version)
Form factor	uATX form factor: 9.6 in x 7.8 in (24.4 cm x 19.8 cm)



Specifications are subject to change without notice.

Product introduction

1

1.1 Before you proceed

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



-
- Unplug the power cord from the wall socket before touching any component.
 - Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
 - Hold components by the edges to avoid touching the ICs on them.
 - Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
 - Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.
-

1.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits.



Unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage to motherboard components.

1.2.1 Placement direction

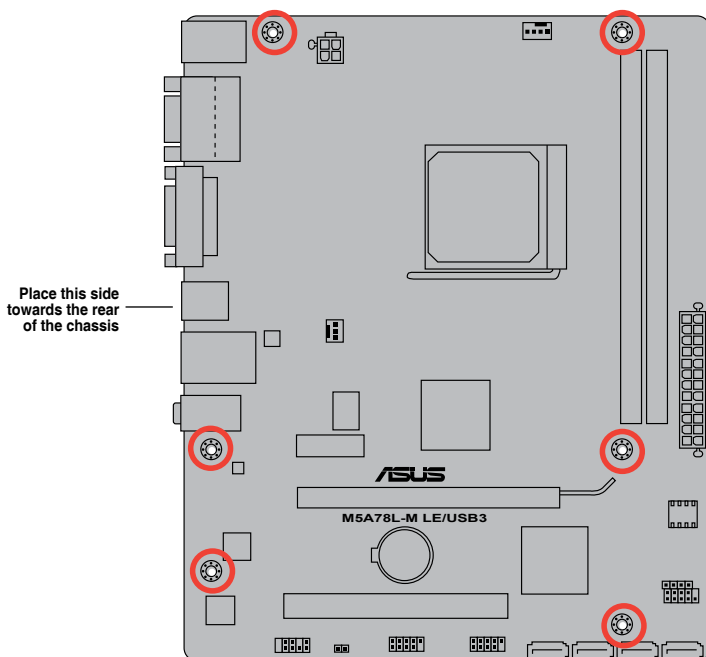
When installing the motherboard, place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image.

1.2.2 Screw holes

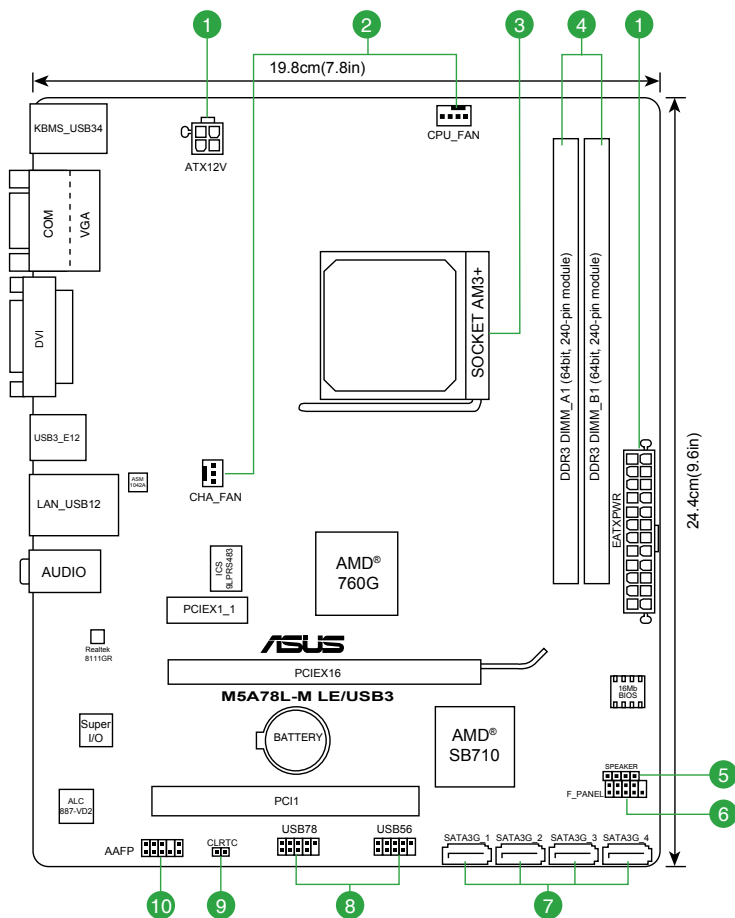
Place six screws into the holes indicated by circles to secure the motherboard to the chassis.



Do not overtighten the screws! Doing so can damage the motherboard.



1.2.3 Motherboard layout



1.2.4 Layout contents

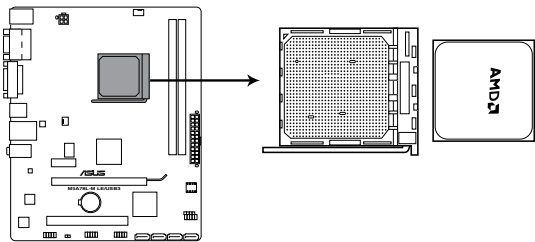
Connectors/Headers/Slots/LED	Page
1. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)	1-16
2. CPU and chassis fan connectors (4-pin CPU_FAN, and 3-pin CHA_FAN)	1-15
3. AMD AM3+ socket	1-4
4. DDR3 DIMM slots	1-8
5. Speaker connector (4-pin SPEAKER)	1-17
6. System panel connector (10-1 pin F_PANEL)	1-18
7. SATA 3.0 Gb/s connectors (7-pin SATA3G_1~4)	1-17
8. USB 2.0 connectors (10-1 pin USB56, USB78)	1-19
9. Clear RTC RAM (2-pin CLRTC)	1-12
10. Front panel audio connector (10-1 pin AAFP)	1-19

1.3 Central Processing Unit (CPU)

The motherboard comes with an AM3+ socket designed for AMD® FX™ Series/Phenom™ II/ Athlon™ II/Sempron™ 100 Series Processors.

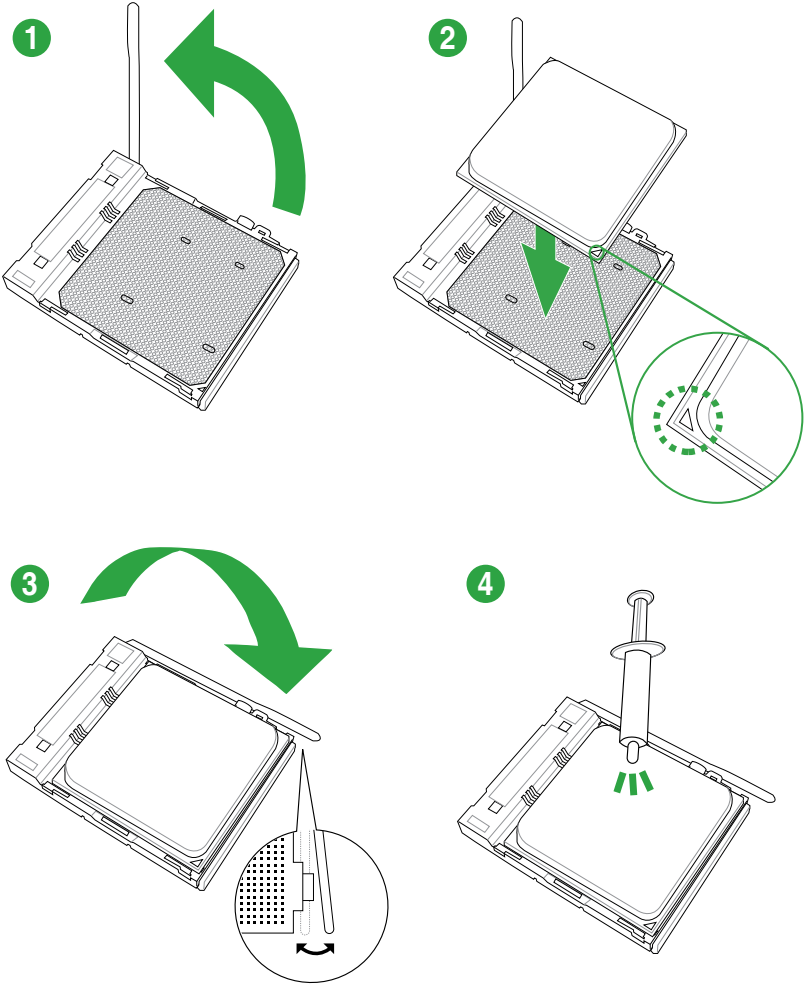


The AM3+ socket has a different pinout from the AM2+/AM2 socket. Ensure that you use a CPU designed for the AM3+ socket. The CPU fits in only one correct orientation. **DO NOT** force the CPU into the socket to prevent bending the pins and damaging the CPU!

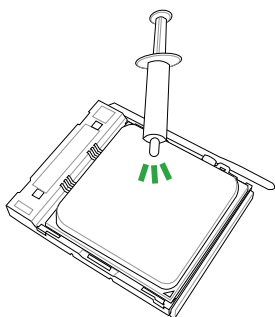


M5A78L-M LE/USB3 CPU socket AM3+

1.3.1 CPU installation



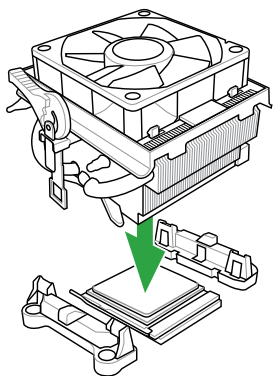
1.3.2 CPU heatsink and fan assembly installation



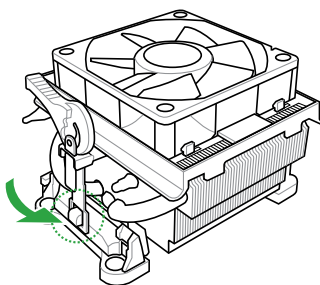
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly

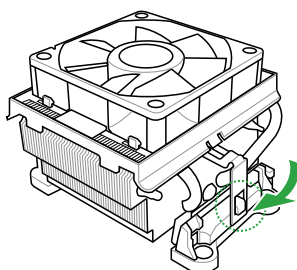
1



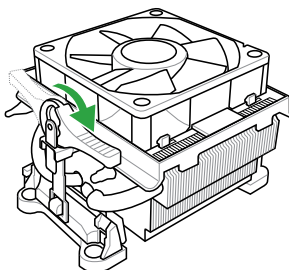
2



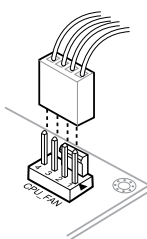
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4

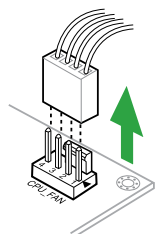


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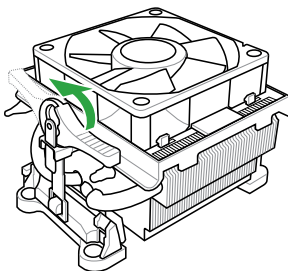


To uninstall the CPU heatsink and fan assembly

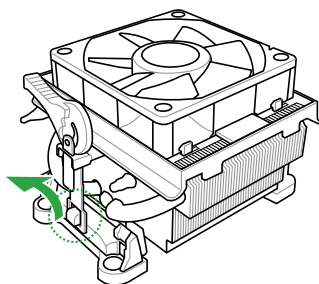
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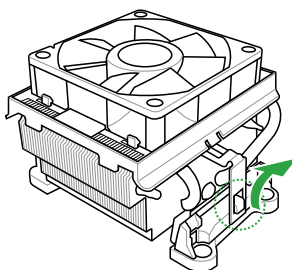
2



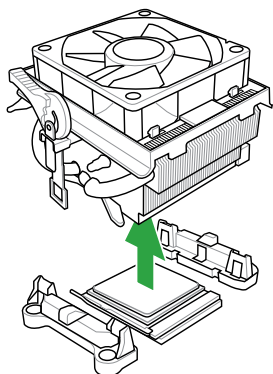
3



4



5



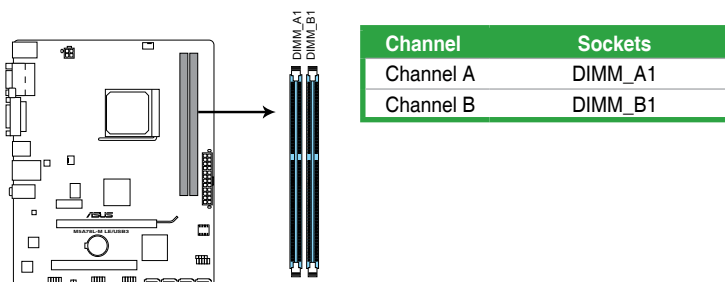
1.4 System memory

1.4.1 Overview

This motherboard comes with two 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:



M5A78L-M LE/USB3 240-pin DDR3 DIMM sockets

1.4.2 Memory configurations

You may install 1GB, 2GB, 4GB, and 8GB unbuffered non-ECC DDR3 DIMMs into the DIMM sockets.

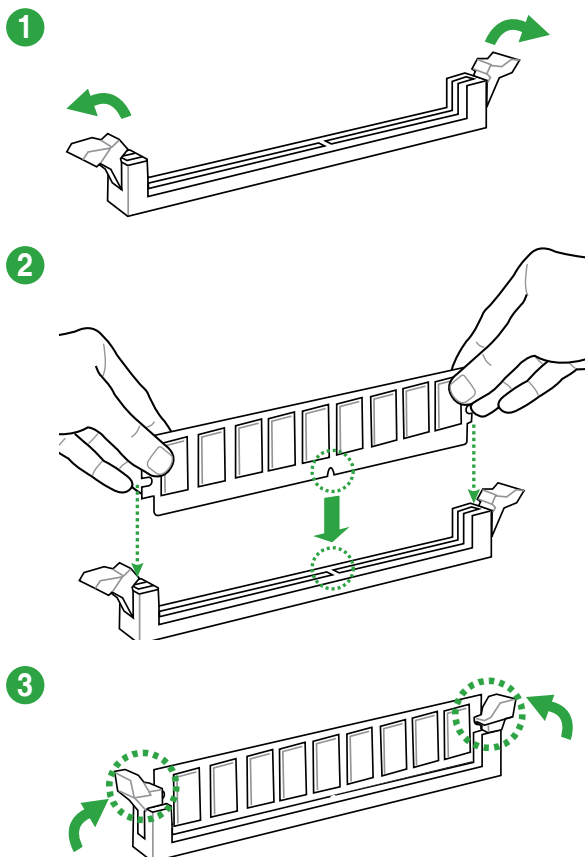


- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Always install DIMMs with the same CAS latency. For optimal compatibility, we recommend that you install memory modules of the same version or date code (D/C) from the same vendor. Check with the retailer to get the correct memory modules.
- Due to the memory address limitation on 32-bit Windows® OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:
 - Use a maximum of 3GB system memory if you are using a 32-bit Windows® OS.
 - Install a 64-bit Windows® OS if you want to install 4GB or more on the motherboard.
 - For more details, refer to the Microsoft® support site at <http://support.microsoft.com/kb/929605/en-us>.
- This motherboard does not support DIMMs made up of 512Mb (64MB) chips or less.

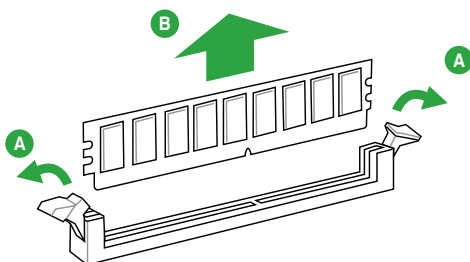


- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, refer to section **2.4 Advanced menu** for manual memory frequency adjustment.
- For system stability, use a more efficient memory cooling system to support a full memory load (2 DIMMs) or overclocking condition.
- Visit the ASUS website at: www.asus.com for the latest QVL.

1.4.3 Installing a DIMM



To remove a DIMM



1.5 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.



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

1.5.1 Installing an expansion card

To install an expansion card:

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

1.5.2 Configuring an expansion card

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

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



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

1.5.3 PCI slot

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

1.5.4 PCI Express 2.0 x1 slot

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

1.5.5 PCI Express x16 slot

This motherboard supports PCI Express x16 network cards, SCSI cards, and other cards that comply with the PCI Express specifications.

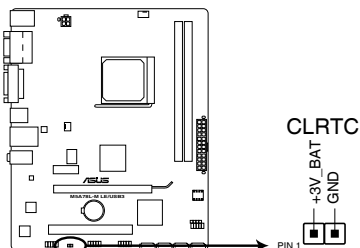
IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIEx16_1	–	–	shared	–	–	–	–	–
PCIEx1_1	–	shared	–	–	–	–	–	–
PCI1 slot	–	–	–	–	shared	–	–	–
Realtek LAN controller	shared	–	–	–	–	–	–	–
HD audio	shared	–	–	–	–	–	–	–
OnChip SATA	–	–	–	–	–	–	shared	–
OnChip OHCI 1	shared	–	–	–	–	–	–	–
OnChip OHCI 2	–	–	shared	–	–	–	–	–
ASM1042A	–	–	–	shared	–	–	–	–

1.6 Headers

Clear RTC RAM (2-pin CLRTC)

This header 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.



M5A78L-M LE/USB3 Clear RTC RAM

To erase the RTC RAM:

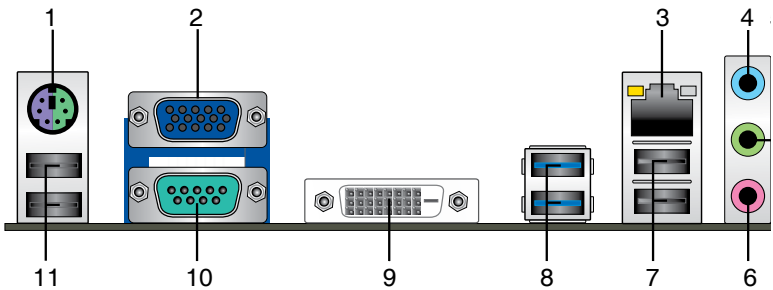
1. Turn OFF the computer and unplug the power cord.
2. Use a metal object such as a screwdriver to short the two pins.
3. Plug the power cord and turn ON the computer.
4. Hold down the key during the boot process and enter BIOS setup to re-enter data.



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

1.7 Connectors

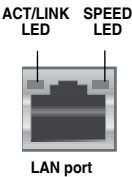
1.7.1 Rear panel connectors



1. **PS/2 keyboard/mouse combo port.** This port is for a PS/2 keyboard/mouse.
2. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
3. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

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



4. **Line In port (light blue).** This port connects to the tape, CD, DVD player, or other audio sources.
5. **Line Out port (lime).** This port connects to a headphone or a speaker. In the 2.1, 4.1, 5.1, and 7.1-channel configurations, the function of this port becomes Front Speaker Out.
6. **Microphone port (pink).** This port connects to a microphone.



Refer to the audio configuration table below for the function of the audio ports in 2.1, 4.1, 5.1 or 7.1-channel configuration.

Audio 2.1, 4.1, 5.1 or 7.1-channel configuration

Port	Headset 2.1-channel	4.1-channel	5.1-channel	7.1-channel
Light Blue (Rear panel)	Line In	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Lime (Rear panel)	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink (Rear panel)	Mic In	Mic In	Bass/Center	Bass/Center
Lime (Front panel)	—	—	—	Side Speaker Out



To configure a 7.1-channel audio output:

Use a chassis with HD audio module in the front panel to support a 7.1-channel audio output.

- 7. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0/1.1 devices.
- 8. **USB 3.0 ports 1 and 2.** These two 9-pin Universal Serial Bus (USB) ports connect to USB 3.0/2.0 devices.



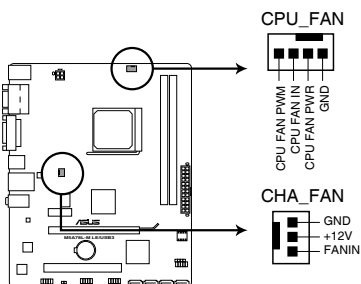
- Due to USB 3.0 controller limitations, USB 3.0 devices can only be used under a Windows® OS environment and after USB 3.0 driver installation.
- The plugged USB 3.0 device may run on xHCI or EHCI mode, depending on the operating system's setting.
- USB 3.0 devices can only be used for data storage.
- We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance from your USB 3.0 devices.

- 9. **DVI-D port.** This port is for any DVI-D compatible device. DVI-D can't be converted to output RGB Signal to CRT and isn't compatible with DVI-I.
- 10. **Serial port (COM).** This port connects a modem, or other devices that conform with serial specification.
- 11. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0/1.1 devices.

1.7.2 Internal connectors

1. CPU and chassis fan connectors (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.



M5A78L-M LE/USB3 Fan connectors



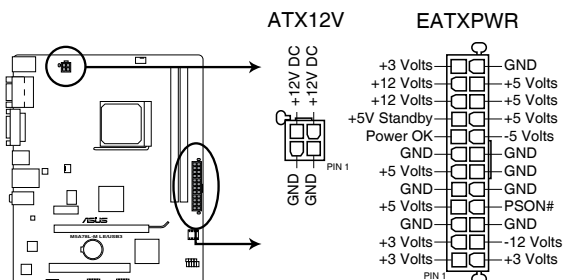
DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.



- The CPU_FAN connector supports a CPU fan of maximum 2A (24W) fan power.
- Only the 4-pin CPU fan support the ASUS Fan Xpert feature.

2. 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.



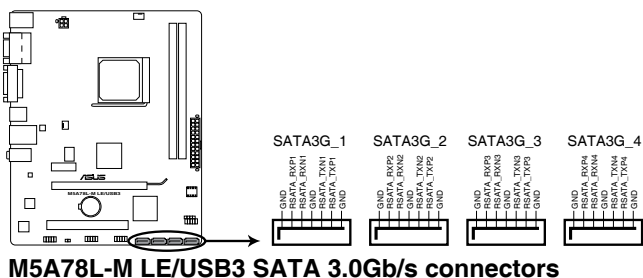
M5A78L-M LE/USB3 ATX power connectors



- 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.

3. Serial ATA 3.0 Gb/s connectors (7-pin SATA3G 1~4)

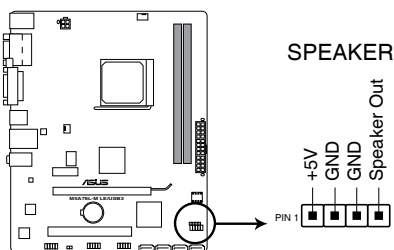
These connectors are for the Serial ATA 3.0 Gb/s signal cables for Serial ATA hard disk drives and optical disc drives. If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 10 and JBOD configuration through the onboard controller.



- These connectors are set to IDE mode by default. 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 3 or later version before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP3 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.

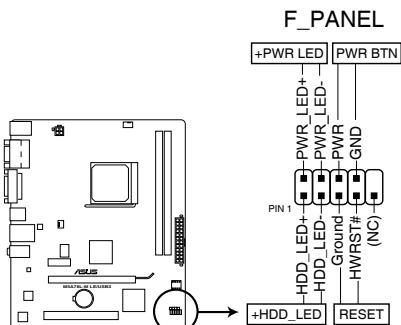
4. Speaker connector (4-pin SPEAKER)

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



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

This connector supports several chassis-mounted functions.



M5A78L-M LE/USB3 System panel connector

- **System power LED (2-pin +PWR_LED)**

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 +HDD_LED)**

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

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

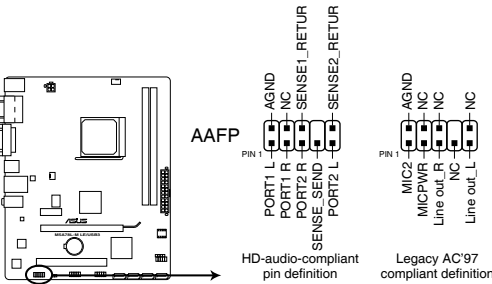
This 2-pin connector is for the system power button.

- **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. 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.



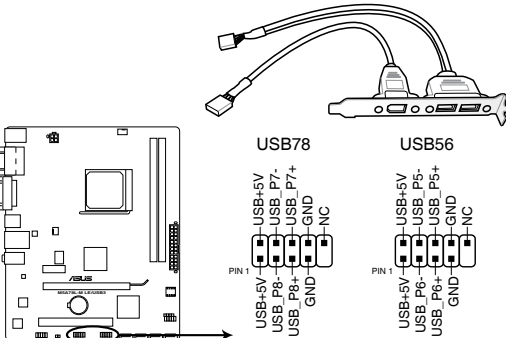
M5A78L-M LE/USB3 Front panel audio connector



- 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 **Azalia Front Panel** item in the BIOS to [HD]. See section 2.4.4 Onboard Devices Configuration for details.
- The front panel audio I/O module is purchased separately.

7. USB 2.0 connectors (10-1 pin USB56, USB78)

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



M5A78L-M LE/USB3 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.

1.8 Software support

1.8.1 Installing an operating system

This motherboard supports 32 bit/64 bit Windows® XP, 32 bit/64 bit Windows® 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 before installing the drivers for better compatibility and system stability.

1.8.2 Support DVD information

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



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

To run the Support DVD

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



The following screen is for reference only.



Click an icon to display Support DVD/motherboard information

Click an item to install



If Autorun is NOT enabled 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.

BIOS information

2

2.1 Managing and updating your BIOS



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

2.1.1 ASUS Update utility

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



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

Installing ASUS Update

To install ASUS Update:

1. Place the support DVD in the optical drive. The **Specials** menu appears.
2. Click the **Utilities** tab, then click **AI Suite II**.
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 > AI Suite II > AI Suite II X.XX.XX** to launch the AI Suite II utility. The AI Suite II Quick Bar appears.
2. Click **Update** button from the Quick Bar, and then click **ASUS Update** from the popup menu. The **ASUS Update** main screen appears. From the 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, then click **Next**.
- c. From the FTP site, select the BIOS version that you wish to download then click **Next**.



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

Updating from a BIOS file

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

2.1.2 ASUS EZ Flash 2 utility

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



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

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 3

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



- Before using this utility, rename the BIOS file in the USB flash drive into **MA78LMU3.ROM**.
- Download the latest BIOS file from the ASUS website at www.asus.com.

Recovering the BIOS

To recover the BIOS:

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



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



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

2.2 BIOS setup program

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

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

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

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

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

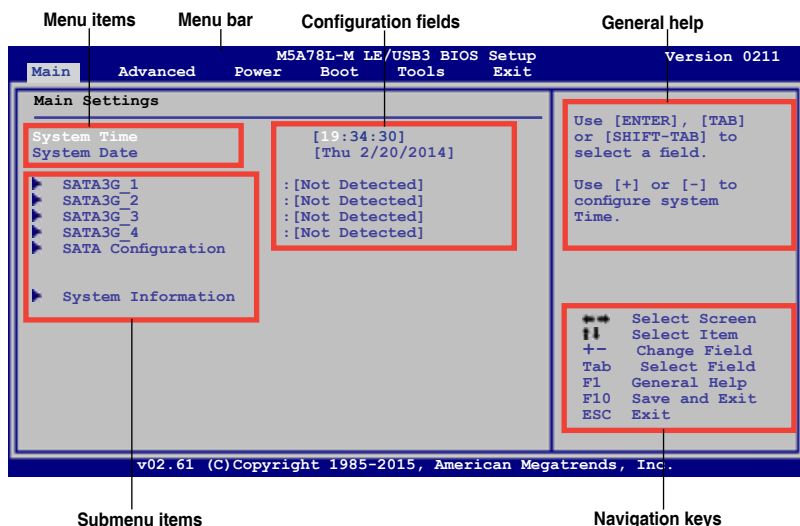


Using the **power button**, **reset button**, or the <Ctrl>+<Alt>+ keys to force reset from a running operating system can cause damage to your data or system. We recommend that you always shut down the system properly from the operating system.



-
- The default BIOS settings for this motherboard apply to most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section **2.8 Exit Menu**.
 - The BIOS setup screens in this 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 |
| 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 (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.

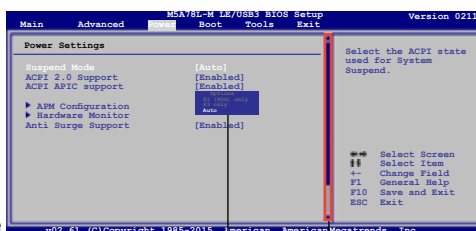
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press **<Enter>** to display a list of options. Refer to **2.2.7 Pop-up window**.

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.



Pop-up window

Scroll bar

2.2.9 General help

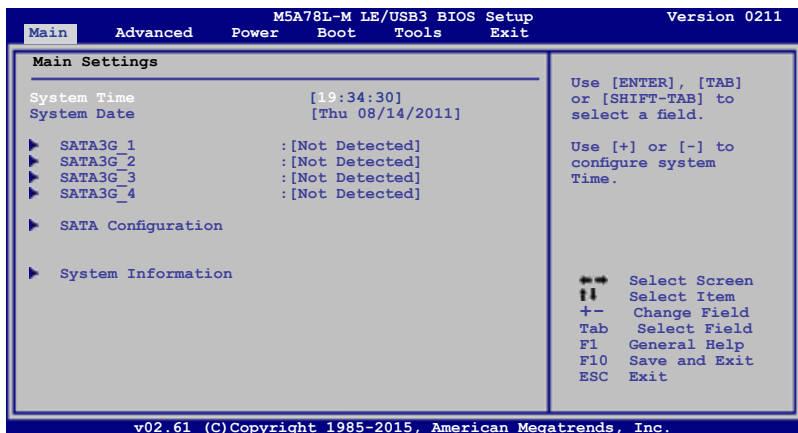
At the top right corner of the menu screen is a brief description of the selected item.

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 SATA3G_1~4

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, LBA/Large Mode, Block (Multi-Sector Transfer) Mode, PIO Mode, DMA Mode, SMART monitoring and 32Bit Data Transfer). These values are not user-configurable. These items show Not Detected if no SATA device is installed in the system.

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 the onboard channel SATA port. Configuration options: [Disabled] [Enabled]



The following item only appears 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. |

2.3.5 System Information

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

BIOS Information

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

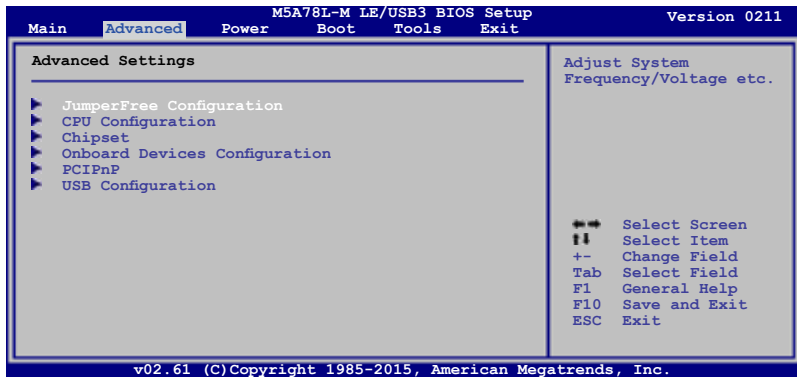
Displays the auto-detected system memory.

2.4 Advanced menu

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



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



2.4.1 JumperFree Configuration



The items and configuration options in this menu may vary depending on the AMD CPU type.

CPU OverClocking [Overclock Profile]

Selects the CPU overclocking options to achieve desired CPU internal frequency.
Configuration options: [Manual] [Auto] [Overclock Profile] [Test Mode]



The following item appears only when you set **CPU Overclocking** to [Manual].

CPU/HT Reference Clock (MHz) [200]

Sets the CPU/HT Reference Clock. Configuration options: [Min.=200] [Max.=550]



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

Overclock Options [Auto]

Selects the overclocking profile. Configuration options: [Auto] [Overclock 2%]
[Overclock 5%] [Overclock 8%] [Overclock 10%]

GPU Overclocking [Auto]

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



The following item appears only when you set **GPU Overclocking** to [Manual].

GPU Engine Clock [350]

Sets the GPU Engine Clock. Use <+> / <-> keys to adjust the ratio or input a number between 200 and 350.

PCIe Overclocking [Auto]

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



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

PCIe Clock [100]

Sets the PCIe Clock. Use <+> / <-> keys to adjust the ratio or input a number between 100 and 150.

CPU Ratio [Auto]

Sets the CPU ratio. Configuration options: [Auto] [x4.0 800MHz] [x4.5 900MHz] [x5.0 1000MHz] [x5.5 1100MHz] [x6.0 1200MHz] [x6.5 1300MHz] [x7 1400MHz] [x7.5 1500MHz] [x8.0 1600MHz] [x8.5 1700MHz] [x9 1800MHz] [x9.5 1900MHz] [x10.0 2000MHz] [x10.5 2100MHz] [x11 2200MHz]

CPU/NB Frequency [Auto]

Sets the CPU/Northbridge frequency. Configuration options: [Auto] [840MHz] [1050MHz] [1260MHz] [1470MHz] [1680MHz] [1890MHz] [2100MHz]

CPU Over Voltage [Auto]

Sets the CPU over voltage. The valid value ranges vary depending on your CPU model. Use <+> / <-> keys to adjust the ratio. Configuration options: [Auto]

VDDNB Over Voltage [Auto]

Sets the VDDNB over voltage. The valid value ranges vary depending on your CPU model. Use <+> / <-> keys to adjust the ratio. Configuration options: [Auto]

LoadLine Calibration [Auto]

Sets the LoadLine. Configuration options: [Auto] [0%] [3.225%] [6.450%] [9.675%] [12.90%] ~ [87.075%] [90.3%] [93.525%] [96.75%] [100%]



If the system becomes unstable after changing the setting, set it back to [Auto] for safe mode.

HT Link Speed [Auto]

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

DRAM Timing Config [Auto]

Configuration options: [Auto] [Manual]



The following items only appear when you set **DRAM Timing Config** to [Manual].

Memory Clock Speed [400MHz]

Selects the memory clock frequency programming method. Configuration options: [400MHz] [533MHz] [667MHz] [800MHz]

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] [12 CLK] ~ [42 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] [2 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]

Memory Voltage [Auto]

Sets the memory voltage. Configuration options: [Auto] [1.350V] [1.500V] [1.650V] [1.800V]

PCI/PCle CLK Status [Enabled]

Enables or disables clock for PCI/PCle slot. Configuration options: [Disabled] [Enabled]

2.4.2 CPU Configuration

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

GART Error Reporting [Disabled]

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

Microcode Update [Enabled]

Enables or disables Microcode Update. 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]

C1E Support [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]

Advanced Clock Calibration [Disabled]

Adjusts the processor's overclocking capability. When this item is set to **[Auto]**, the BIOS automatically adjusts this function. When this item is set to **[All Cores]**, the processor has the best overclocking performance. When this item is set to **[Per Core]**, the processor's overclocking capability is enhanced. Configuration options: [Disabled] [Auto] [All Cores] [Per Core] [By Hotkey]



The following items appear only when you set **Advanced Clock Calibration** to **[Auto]**, **[All Cores]**, or **[Per Core]**.

Unleashing Mode [Disabled]

Enable the Unleashing Mode to get full computing power of the processor. However, this might make your system unstable depending on your processor's overclocking capability. Configuration options: [Enabled] [Disabled]

Active CPU Cores [Auto]

Allows you to manually turn ON/OFF a process core. Configuration options: [Auto] [Manual]

2nd / 3rd / 4th Core [On]

These items appear only when you set **Active CPU Cores** to **[Manual]**.

Configuration options: [On] [Off]

Value (All Cores) [-2%]

This item appears only when you set **Advanced Clock Calibration** to **[All Cores]**. It allows you to set the overclocking percentage for all the processor cores as a whole.

Configuration options: [0%] [+2%] [+4%] [+6%] [+8%] [+10%] [+12%] [-2%] [-4%] [-6%] [-8%] [-10%] [-12%]

Value (Core 0) / (Core 1) / (Core 2) / (Core 3) [-2%]

These items only appear when you set **Advanced Clock Calibration** to [Per Core] and allow you to set the overclocking percentage for each process core separately. Configuration options: [0%] [+2%] [+4%] [+6%] [+8%] [+10%] [+12%] [-2%] [-4%] [-6%] [-8%] [-10%] [-12%]

2.4.3 Chipset

NorthBridge Configuration

DRAM Controller Configuration

Bank Interleaving [Auto]

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

Node Interleaving [Disabled]

Allows you to enable the node memory interleaving. Configuration options: [Disabled] [Auto]

Channel Interleaving [Auto]

Allows you to enable the channel memory interleaving. Configuration options: [Disabled] [Auto]

Memory Hole Remapping [Enabled]

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

DCT Unganged Mode [Always]

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

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]

DRAM ECC Enable [Enabled]

This item appears only when you set **ECC Mode** to [User] and allows hardware to report and correct memory errors automatically maintaining system integrity.

Internal Graphics

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

Selects the primary display adapter. Configuration options: [GFX0-GPP-IGFX-PCI] [GPP-GFX0-IGFX-PCI] [PCI-GFX0-GPP-IGFX] [IGFX-GFX0-GPP-PCI]



GFX0: primary video controller on a PCIe x16 slot
GPP: primary video controller on a PCIe x1 slot
IGFX: onboard display output port
PCI: primary video controller on a PCI slot

UMA Frame Buffer Size [Auto]

Selects the UMA frame buffer size. Configuration options: [Auto] [32MB] [64MB] [128MB] [256MB] [512MB]



- The [512MB] option only appears when you install 1GB system memory or more.
- The [1GB] option only appears when you install 2GB system memory or more.

Surround View [Auto]

Disables or enables the Surround View function. Configuration options: [Auto] [Disabled] [Enabled]



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

Frame Buffer Location [Above 4G]

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

2.4.4 Onboard Devices Configuration

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address. Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

HDAudio Controller [Enabled]

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

Front Panel Select [HD Audio]

This item appears only when you set the previous item to [Enabled]. Configuration options: [AC97] [HD Audio]

OnBoard LAN Controller [Enabled]

Configuration options: [Disabled] [Enabled]

OnBoard LAN Boot ROM [Disabled]

This item appears only when you set the previous item to [Enabled]. Configuration options: [Disabled] [Enabled]

USB 3.0 Controller [Enabled]

Allows you to enable or disable the USB 3.0 controller. Configuration options: [Disabled] [Enabled]

2.4.5 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]

2.4.6 USB Configuration

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



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

USB Functions [Enabled]

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



The following items appear only when you set **USB Functions** to **[Enabled]**.

USB 2.0 Controller [Enabled]

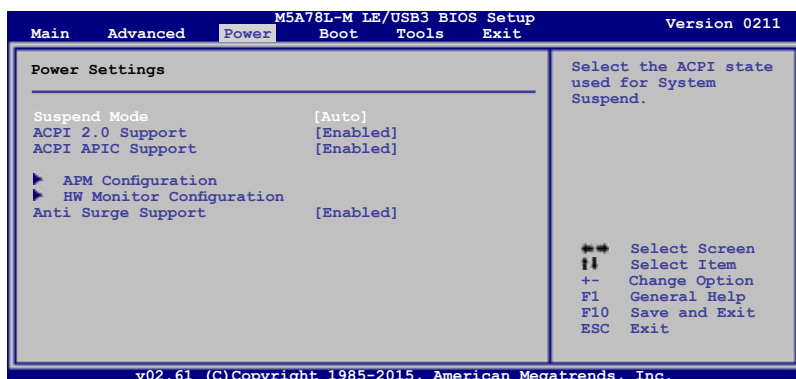
Enables or disables USB 2.0 Controllers. Configuration options: [Disabled] [Enabled]

Legacy USB Support [Auto]

Allows you to enable or disable support for Legacy USB storage devices, including USB flash drives and USB hard drives. Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. Configuration options: [Disabled] [Enabled] [Auto]

2.5 Power menu

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



2.5.1 Suspend Mode [Auto]

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

2.5.2 ACPI 2.0 Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) 2.0 support. Configuration options: [Disabled] [Enabled]

2.5.3 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

2.5.4 APM Configuration

Restore on AC Power Loss [Power Off]

When this item is set to **[Power Off]**, the system goes into off state after an AC power loss. When this item is set to **[Power 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]

2.5.5 HW Monitor Configuration

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

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

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

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

The onboard hardware monitor automatically detects and displays the CPU / Chassis 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 want the detected speed to be displayed.

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.

CPU Q-Fan Function [Enabled]

Enables or disables the ASUS Q-Fan feature that smartly adjusts the CPU fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]



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

CPU Fan Speed Low Limit [200 RPM]

Allows you to manually set a lower limit for the CPU fan speed. If the CPU fan speed is below the specified limit, the system sends out warning beeps. Configuration options: [600 RPM] [500 RPM] [400 RPM] [300 RPM] [200 RPM] [Ignored]

CPU Q-Fan Mode [Standard]

Allows you to set the appropriate performance level of the CPU fan.

- | | |
|------------|---|
| [Standard] | Sets to [Standard] 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. |
| [Turbo] | Set to [Turbo] to achieve maximum CPU fan speed. |
| [Manual] | Allows you to individually set the CPU fan parameters. |



The following four items appear only when you set **CPU Q-Fan Mode** to [Manual].

CPU Upper Temperature [70°C/158°F]

Allows you to select the CPU upper temperature. Configuration options: [30°C/86°F] [40°C/104°F] [50°C/122°F] [60°C/140°F] [70°C/158°F] [80°C/176°F] [90°C/194°F]

CPU Fan Max. Duty Cycle(%) [100%]

Allows you to select the maximum CPU fan duty cycle. When the CPU temperature reaches the upper limit, the CPU fan will operate at the maximum duty cycle. Configuration options: [20%] [30%] [40%] [50%] [60%] [70%] [80%] [90%] [100%].

CPU Lower Temperature [20°C/68°F]

Displays the lower limit of the CPU temperature.

CPU Fan Min. Duty Cycle(%) [20%]

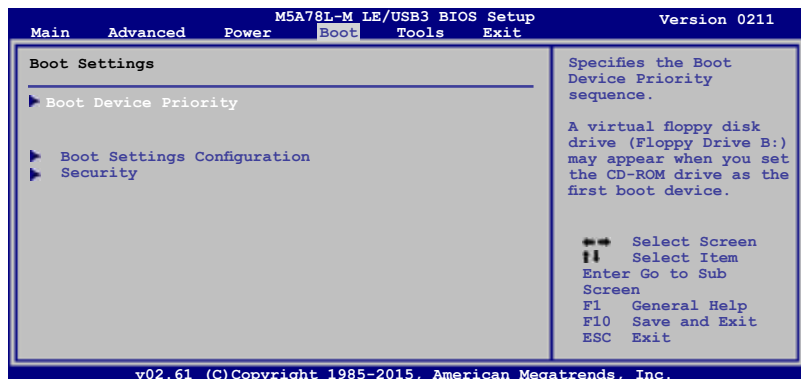
Allows you to select the minimum CPU fan duty cycle. When the CPU temperature is under 40°C, the CPU fan will operate at the minimum duty cycle. Configuration options: [00%] [10%] [20%] [30%] [40%] [50%] [60%] [70%] [80%] [90%] [100%].

2.5.6 Anti Surge Support [Enabled]

Allows you to enable or disable the Anti-Surge protection feature. Configuration options: [Disabled] [Enabled]

2.6 Boot menu

The **Boot** menu items allow you to change the system boot options. Select an item then press **<Enter>** to display the submenu.



2.6.1 Boot Device Priority

1st ~ xxth Boot Device

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



- To select the boot device during system startup, press **<F8>** when ASUS logo appears.
- To access Windows OS in Safe Mode, press **<F8>** after POST.

2.6.2 Boot Settings Configuration

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When 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]

2.6.3 Security

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

Change Supervisor Password

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

To set a Supervisor Password:

1. Select the **Change Supervisor Password** item and press **<Enter>**.
2. On the password box, key in a password containing up to six letters, or numbers, or both, 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 **1.6 Headers** 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. On 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

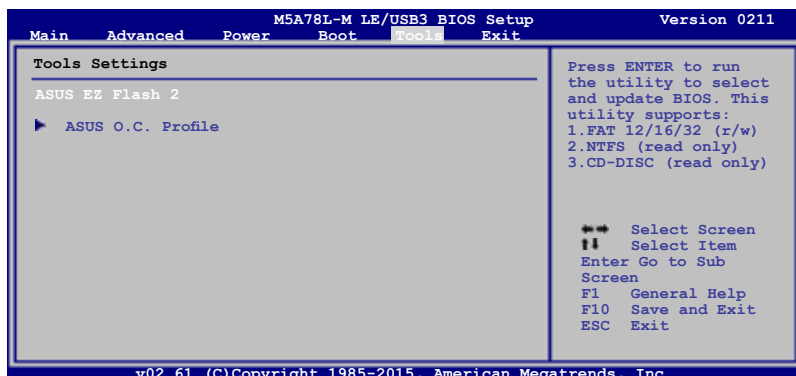
Select this item to clear the user password.

Password Check [Setup]

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

2.7 Tools menu

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



2.7.1 ASUS EZ Flash 2

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

2.7.2 ASUS O.C. Profile

This item allows you to store or load multiple BIOS settings.

Add Your CMOS Profile

Allows you to save the current BIOS file to the BIOS Flash. In the Name sub-item, key in your profile name and press **<Enter>**, and then choose a profile number to save your CMOS settings in the **Save to** sub-item.

Load CMOS Profiles.

Allows you to load the previous BIOS settings saved in the BIOS Flash. Press **<Enter>** to load the file.

Start O.C. Profile

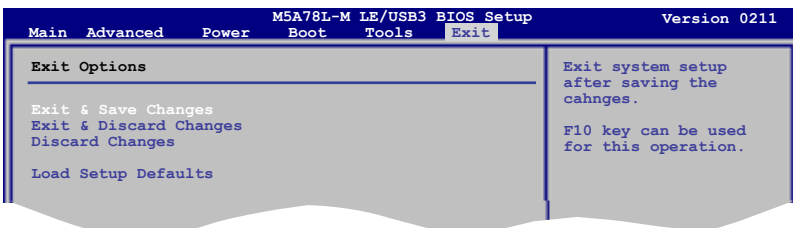
Allows you to run the utility to save and load CMOS. Press **<Enter>** to run the utility.



- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent the system boot failure!
- We recommend that you update the BIOS file only coming from the same memory/CPU configuration and BIOS version.
- Only the CMO file can be loaded.

2.8 Exit menu

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



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

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.

Appendices

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.
- 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.

IC: Canadian Compliance Statement

Complies with the Canadian ICES-003 Class B specifications. This device complies with RSS 210 of Industry Canada. This Class B device meets all the requirements of the Canadian interference-causing equipment regulations.

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada. Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Cet appareil est conforme aux normes CNR exemptes de licence d'Industrie Canada. Le fonctionnement est soumis aux deux conditions suivantes :

(1) cet appareil ne doit pas provoquer d'interférences et

(2) cet appareil doit accepter toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité de l'appareil.

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.

VCCI: Japan Compliance Statement

VCCI Class B Statement

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

This is a Class B product based on the standard of the VCCI Council. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

KC: Korea Warning Statement

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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://csr.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.

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to <http://csr.asus.com/english/Takeback.htm> for detailed recycling information in different regions.

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Português A AsusTek Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas da CE. Para mais detalhes, consulte a Declaração de Conformidade CE.

Română Prin prezenta, AsusTek Inc. declară faptul că acest dispozitiv respectă cerințele esențiale și alte prevederi relevante ale directivelor CE. Pentru mai multe detalii, consultați declarația de conformitate CE.

Srpski AsusTek Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa ključnim zahtevima i drugim relevantnim odredbama CE Direktiva. Molimo vas, pogledajte CE Deklaraciju o usklađenosti za više detalja.

Slovensky Spoločnosť AsusTek Inc. týmto prehlasuje, že toto zariadenie vyhovuje príslušným požiadavkám a ďalším súvisiacim ustanoveniam smerníc ES. Viac podrobností si pozrite v prehlásení o zhode ES.

Slovenščina AsusTek Inc. tukaj izjavlja, da je ta naprava skladna s temeljnimi zahtevami in drugimi relevantnimi določili direktiv CE. Za več informacij glejte izjavo CE o skladnosti.

Español Por la presente, AsusTek Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones relevantes de las directivas de la CE. Consulte la Declaración de conformidad de la CE para obtener más detalles.

Svenska AsusTek Inc. förklarar härmed att denna enhet är i överensstämmelse med de grundläggande kraven och andra relevanta bestämmelser i CE-direktiven. Se CE-försäkran om överensstämmelse för mer information.

Українська AsusTek Inc. заявляє, що цей пристрій відповідає основним вимогам відповідних Директив ЄС. Будь ласка, див. більше деталей у Декларації відповідності нормам ЄС.

Türkçe AsusTek Inc., bu aygıtın temel gereksinimlerle ve CE Yönergelerinin diğer ilgili koşullarına uyumlu olduğunu beyan eder. Daha fazla ayrıntı için lütfen CE Uygunluk Beyanına bakın.

Bosanski AsusTek Inc. ovim potvrđuje da je ovaj uređaj uskladen s osnovnim zahtjevima i drugim relevantnim propisima Direktiva EK. Za više informacija molimo pogledajte Deklaraciju o usklađenosti EK.

ASUS contact information

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Address	15 Li-Te Road, Peitou, Taipei, Taiwan 11259
Telephone	+886-2-2894-3447
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Web site	www.asus.com.com/

Technical Support

Telephone	+86-21-38429911
Fax	+86-21-5866-8722, ext. 9101#
Online support	http://www.asus.com/tw/support/

ASUS COMPUTER INTERNATIONAL (America)

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Technical Support

Support fax	+1-812-284-0883
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Technical Support

Telephone	+49-1805-010923*
Support Fax	+49-2102-9599-11
Online support	http://www.asus.com/de/support/

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 : M5A78L-M LE/USB3

Conforms to the following specifications:

- ☒ FCC Part 15, Subpart B, Unintentional 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 : Apr. 27, 2015

Steve Chang

Ver. 140331

EC Declaration of Conformity



We, the undersigned,

Manufacturer:	ASUSTEK COMPUTER INC.
Address:	ASUSTEK COMPUTER CORP., 10000 N. TAYLOR AVE., TAYLOR, MI 48180, U.S.A.
Authorized Representative in Europe:	ASUSTEK COMPUTER LTD., 10000 N. TAYLOR AVE., TAYLOR, MI 48180, U.S.A.
Address, City:	HARBOR CITY, 21-25, 40880 RATINGEN, GERMANY
Country:	GERMANY

declare the following apparatus:

Product name :	Motherboard
Model name :	M5A78L-M LE/USB3

conform with the essential requirements of the following directives:

☒ 2004/108/EC EMC Directive	☒ EN 55022:2010 A2:2011	☒ EN 55022:2010 A2:2011
☒ EN 55022:2010 A2:2011	☒ EN 1000-3-3:2006	☒ EN 15005:2007 V1.1:2011
☒ 1989/5/EEC BATTIE Directive	☒ EN 300-328 V1.3:10012-06	☒ EN 301-488-1 V1.9:2001-1-09
☒ EN 300-328 V1.3:10012-06	☒ EN 300-440 V1.6:12010-08	☒ EN 301-488-3 V1.4:12002-08
☒ EN 300-440 V1.6:12010-08	☒ EN 301-488-2 V1.5:12010-08	☒ EN 301-488-7 V1.3:12005-11
☒ EN 301-488-2 V1.5:12010-08	☒ EN 301-598-1 V5.2:12011-05	☒ EN 301-488-9 V1.4:12007-11
☒ EN 301-598-1 V5.2:12011-05	☒ EN 301-488-4 V1.5:12010-07	☒ EN 301-488-24 V1.2:12010-09
☒ EN 301-488-4 V1.5:12010-07	☒ EN 301-883 V1.7:12012-06	☒ EN 302-328-2 V1.2:12007-08
☒ EN 301-883 V1.7:12012-06	☒ EN 302-544-2 V1.1:12009-01	☒ EN 302-328-2 V1.2:12007-08
☒ EN 302-544-2 V1.1:12009-01	☒ EN 305-652 V1.1:12009-01	☒ EN 301-357-3 V1.3:12006-11
☒ EN 305-652 V1.1:12009-01	☒ EN 305-652 V1.1:12009-01	☒ EN 302-281-1 V1.1:12005-07
☒ EN 305-652 V1.1:12009-01	☒ EN 302-281-2 V1.1:12005-07	

☒ 2006/95/EC LVD Directive	☒ EN 60561-1:2006 A1Z:2011	☒ EN 60561-2:2002 A1Z:2011
☒ EN 60561-1:2006 A1Z:2011	☒ EN 60561-2:2002 A1Z:2011	

☒ 2009/175/EC RoHS Directive	☒ Regulation (EC) No. 1275/2008	☒ Regulation (EC) No. 279/2009
☒ Regulation (EC) No. 1275/2008	☒ Regulation (EC) No. 642/2009	☒ Regulation (EC) No. 617/2013

☒ 2011/65/EU RoHS Directive	☒ Regulation (EC) No. 617/2013	
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CE marking



(EC conformity marking)

Position : CEO
Name : Jerry Shen

Jerry Shen

Signature : _____

Declaration Date: 27/04/2015

You to begin affixing CE marking: 2015