

H97M-PLUS



Motherboard

E9011
First Edition
April 2014

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Contents

Safety information	iv
About this guide	iv
Package contents	vi
H97M-PLUS specifications summary	vi
Product introduction	1-1
1.1 Before you proceed	1-1
1.2 Motherboard overview	1-1
1.3 Central Processing Unit (CPU)	1-3
1.4 System memory	1-6
1.5 Expansion slots.....	1-9
1.6 Jumpers	1-10
1.7 Connectors	1-11
1.8 Onboard switches	1-20
1.9 Onboard LEDs	1-22
1.10 Software support.....	1-23
BIOS information	2-1
2.1 Managing and updating your BIOS	2-1
2.2 BIOS setup program	2-6
2.3 My Favorites	2-10
2.4 Main menu	2-11
2.5 Ai Tweaker menu.....	2-13
2.6 Advanced menu	2-22
2.7 Monitor menu	2-31
2.8 Boot menu	2-35
2.9 Tools menu	2-41
2.10 Exit menu	2-42
Appendices	A-1
Notices.....	A-1
ASUS contact information	A-3

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 components, 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 be exposed to moisture.
- 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. It includes descriptions of the switches, jumpers, and connectors on the motherboard.
- **Chapter 2: BIOS information**
This chapter discusses changing 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 completing a task.



CAUTION: Information to prevent damage to the components when completing 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 H97M-PLUS motherboard
Cables	2 x Serial ATA 6.0 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.

H97M-PLUS specifications summary

CPU	<p>LGA1150 socket for the 4th, New 4th & 5th Generation Intel® Core™ i7 / i5 / i3, Pentium®, and Celeron® processors</p> <p>Supports 22nm CPU</p> <p>Supports Intel® Turbo Boost Technology 2.0*</p> <p>* The Intel® Turbo Boost Technology 2.0 support depends on the CPU types.</p> <p>** Refer to www.asus.com for Intel® CPU support list.</p>
Chipset	Intel® H97 Express Chipset
Memory	<p>4 x DIMM, max. 32GB, DDR3 1600/ 1333 MHz, non-ECC, un-buffered memory</p> <p>Dual-channel memory architecture</p> <p>Supports Intel® Extreme Memory Profile (XMP)</p> <p>* Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.</p> <p>** Refer to www.asus.com for the Memory QVL (Qualified Vendors List).</p>
Expansion slots	<p>1 x PCI Express 3.0/2.0 x16 slot (at x16 mode)</p> <p>1 x PCI Express 2.0 x16 slot (max. at x4 mode, compatible with PCIe x1 and x4 devices)</p> <p>2 x PCI slots</p>
Graphics	<p>Integrated Graphics Processor - Intel® HD Graphics support</p> <p>Multi-VGA output support: HDMI, DVI-D, RGB port</p> <p>Supports HDMI with max. resolution of 4096 x 2160 @ 24Hz / 2560 x 1600 @ 60Hz</p> <p>Supports DVI-D with max. resolution of 1920 x 1200 @ 60Hz</p> <p>Supports RGB with max. resolution of 1920 x 1200 @ 60Hz</p> <p>Supports up to three displays simultaneously</p> <p>Supports Intel® InTru™ 3D/Quick Sync Video / Clear Video HD Technology/Insider™</p> <p>Supports up to 3 displays simultaneously</p> <p>Maximum shared memory 512MB</p>
Multi-GPU support	Supports AMD® Quad-GPU CrossFireX™ Technology

(continued on the next page)

H97M-PLUS specifications summary

Storage	<p>Intel® H97 Express Chipset with RAID 0, 1, 5, 10 and Intel® Rapid Storage Technology 13 support</p> <ul style="list-style-type: none"> - 1 x M.2 Socket 3 with M Key, type 2260/2280 storage devices support (both SATA & PCIE mode)* - 6 x SATA 6.0 Gb/s ports (gray) - Supports Intel® Smart Response Technology, Intel® Rapid Start Technology, Intel® Smart Connect Technology** <p>* M.2 Socket 3 shares bandwidth with SATA_5/6, and supports M Key and type 2260/2280 storage devices.</p> <p>** These functions will work depending on the CPU installed.</p>
LAN	<p>Intel® Gigabit LAN controller- 802.3az Energy Efficient Ethernet (EEE) appliance Intel® I218-V Gigabit LAN - Dual interconnect between the integrated LAN controller and physical layer (PHY)</p>
Audio	<p>Realtek® ALC887 8-channel high definition audio CODEC featuring Crystal Sound 2</p> <ul style="list-style-type: none"> - Audio Shielding: Ensures precision analog/digital separation and greatly reduces multi-lateral interference - Dedicated audio PCB layers: Separate layers for left and right channels to guard the quality of the sensitive audio signals - Audio amplifier: Provides the highest-quality sound for headphone and speakers - Premium Japanese-made audio capacitors: Provide warm, natural and immersive sound with exceptional clarity and fidelity. - Unique de-pop circuit: Reduces start-up popping noise to audio outputs - Supports jack-detection, multi-streaming, and front panel jack-retasking
USB	<p>Intel® H97 Express Chipset - supports ASUS USB 3.0 Boost</p> <ul style="list-style-type: none"> - 6 x USB 3.0/2.0 ports (2 ports at mid-board; 4 ports at back panel, blue) - 8 x USB 2.0/1.1 ports (6 ports at mid-board; 2 ports at back panel)
ASUS exclusive features	<p>High Performance</p> <p>ASUS 5X Protection</p> <ul style="list-style-type: none"> - ASUS motherboards safeguard your PC with 5X PROTECTION: DIGI+ VRM, DRAM Fuse, ESD Guards, High-Quality 5K-Hour Solid Capacitors, and Stainless Steel Back I/O ensure the best quality, reliability, and durability <p>ASUS Digital Power Design</p> <ul style="list-style-type: none"> - ASUS Digital Power Control: Digital Power Design for the CPU - ASUS 4 Phase Power Design - ASUS CPU power utility <p>ASUS DRAM Fuse</p> <ul style="list-style-type: none"> - Enhanced DRAM overcurrent protection and short circuit damage prevention <p>ASUS ESD Guards</p> <ul style="list-style-type: none"> - Enhanced ESD protection <p>ASUS High-Quality 5K Solid Capacitors</p> <ul style="list-style-type: none"> - 2.5x Longer lifespan with excellent durability <p>ASUS Stainless Steel Back I/O</p> <ul style="list-style-type: none"> - 3x More durable corrosion-resistant coating <p>UEFI BIOS</p> <ul style="list-style-type: none"> - Most advanced options with fast response time <p>M.2 onboard</p> <ul style="list-style-type: none"> - The latest transfer technologies with up to 10 Gb/s data transfer speeds <p>ASUS Fan Xpert 2+</p> <ul style="list-style-type: none"> - Ultimate cooling and quietness

(continued on the next page)

H97M-PLUS specifications summary

<p>ASUS exclusive features</p>	<p>ASUS EPU</p> <ul style="list-style-type: none"> - EPU <p>Interactive HomeCloud</p> <p>Media Streamer</p> <ul style="list-style-type: none"> - Pipe music or movies from your PC to a smart TV - Media Streamer app for portable smartphone/tablet, supporting iOS 7 and Android 4.0 system <p>Gaming Scenario</p> <p>Crystal Sound 2</p> <ul style="list-style-type: none"> - Flawless audio that makes you part of the game <p>Steam Support</p> <ul style="list-style-type: none"> - Compatible with the most fun gaming platform under Windows® system <p>ASUS Exclusive Features</p> <ul style="list-style-type: none"> - USB 3.0 Boost - Ai Charger - Ai Suite 3 - Disk Unlocker - MemOK! <p>EZ DIY</p> <p>Push Notice</p> <ul style="list-style-type: none"> - Monitor your PC status with smart devices in real time <p>UEFI BIOS EZ Mode</p> <ul style="list-style-type: none"> - featuring friendly graphics user interface - ASUS O.C. Tuner - ASUS CrashFree BIOS 3 - ASUS EZ Flash 2 <p>ASUS Q-Design</p> <ul style="list-style-type: none"> - ASUS Q-Slot - ASUS Q-DIMM
<p>ASUS Quiet Thermal Solution</p>	<p>ASUS Quiet Thermal Design</p> <ul style="list-style-type: none"> - ASUS Fan Xpert 2+ - Stylish Fanless Design: PCH Heat-sink & MOS Heat-sink solution
<p>Rear panel I/O ports</p>	<p>1 x PS/2 keyboard/mouse combo port</p> <p>1 x HDMI port</p> <p>1 x DVI-D port</p> <p>1 x RGB port</p> <p>1 x LAN (RJ-45) port</p> <p>4 x USB 3.0/2.0 ports (blue)</p> <p>2 x USB 2.0/1.1 ports</p> <p>6-jack 8-channel audio I/O ports</p>

(continued on the next page)

H97M-PLUS specifications summary

Internal connectors	<p>1 x USB 3.0/2.0 connector supports additional 2 USB ports (19-pin)</p> <p>3 x USB 2.0/1.1 connectors support additional 6 USB ports</p> <p>1 x M.2 Socket 3 (for M Key, type 2260/2280 device)</p> <p>6 x SATA 6.0 Gb/s connectors (gray)</p> <p>1 x 4-pin CPU Fan connector (PWM mode)</p> <p>2 x 4-pin Chassis Fan connectors for 3-pin (DC mode) and 4-pin (PWM mode) coolers control</p> <p>1 x S/PDIF Out connector</p> <p>1 x LPT connector</p> <p>1 x COM connector</p> <p>1 x TPM connector</p> <p>1 x 24-pin EATX Power connector</p> <p>1 x 8-pin EATX 12V Power connector</p> <p>1 x Front panel audio connector (AAFP)</p> <p>1 x System panel connector</p> <p>1 x MemOK! button</p> <p>1 x GPU Boost switch</p> <p>1 x Clear CMOS jumper</p>
BIOS features	<p>64 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI 2.7, WfM 2.0, SM BIOS 2.8, ACPI 5.0, Multi-language BIOS, ASUS EZ Flash 2, CrashFree BIOS 3, F11 EZ Tuning Wizard, F6 Qfan Control, F3 My Favorites, Quick Note, Last Modified Log, F12 PrintScreen function, F3 Shortcut function, and ASUS DRAM SPD (Serial Presence Detect) memory information</p>
Manageability	<p>WfM 2.0, DMI 2.7, WOL by PME, PXE</p>
Support DVD	<p>Drivers</p> <p>ASUS utilities</p> <p>ASUS Update</p> <p>Anti-virus software (OEM version)</p>
OS support	<p>Windows® 8.1 / Windows® 8</p> <p>Windows® 7</p>
Form factor	<p>uATX form factor: 9.6 in. x 8.8 in. (24.4 cm x 22.4 cm)</p>



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

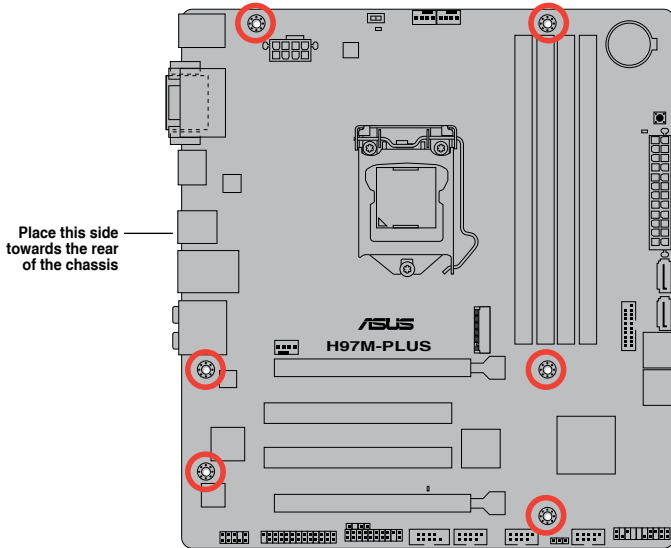
When installing the motherboard, place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image.

1.2.2 Screw holes

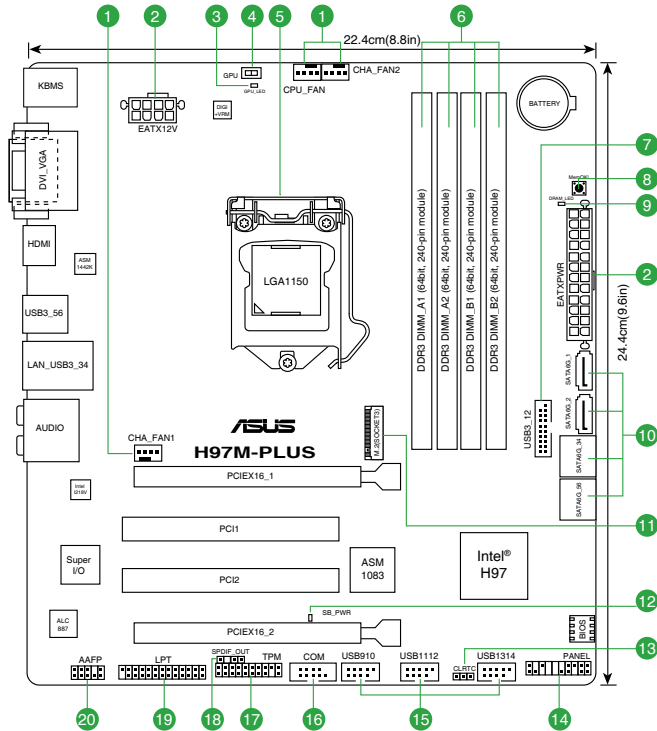
Place six screws into the holes indicated by circles to secure the motherboard to the chassis.



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



1.2.3 Motherboard layout

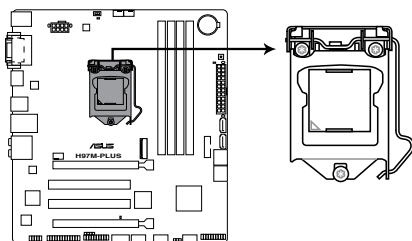


1.3.4 Layout contents

Connectors/Jumpers/Buttons/Slots/LED	Page
1. CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN1/2)	1-13
2. ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	1-16
3. GPU Boost LED	1-22
4. GPU Boost switch	1-21
5. LGA1150 CPU socket	1-3
6. DDR3 DIMM slots	1-6
7. USB 3.0 connector (20-1 pin USB3_12)	1-15
8. MemOK! switch	1-20
9. DRAM LED	1-22
10. Intel® H97 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1-6)	1-14
11. M.2 socket 3	1-18
12. Standby power LED (SB_PWR)	1-22
13. Clear RTC RAM (3-pin CLRTC)	1-10
14. System panel connector (20-8 pin F_PANEL)	1-19
15. USB 2.0 connectors (10-1 pin USB910, USB1112, USB1314)	1-17
16. Serial port connector (10-1 pin COM)	1-13
17. TPM connector (20-1 pin TPM)	1-17
18. Digital audio connector (4-1 pin SPDIF_OUT)	1-16
19. LPT connector (26-1 pin LPT)	1-18
20. Front panel audio connector (10-1 pin AAFP)	1-15

1.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA1150 socket designed for the 4th, New 4th & 5th Generation Intel® Core™ i7 / i5 / i3, Pentium® and Celeron® processors.



H97M-PLUS CPU socket LGA1150

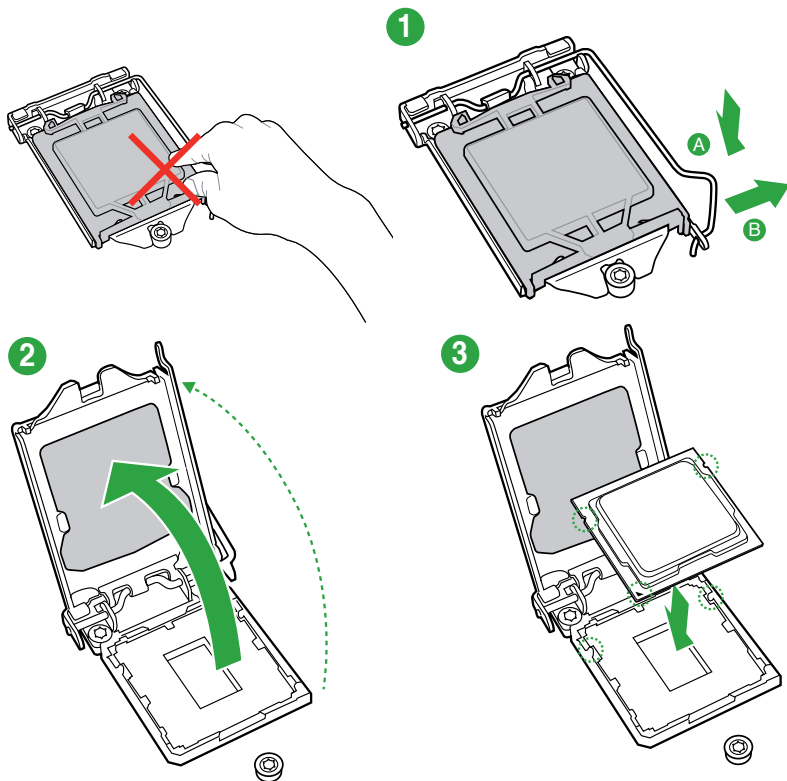


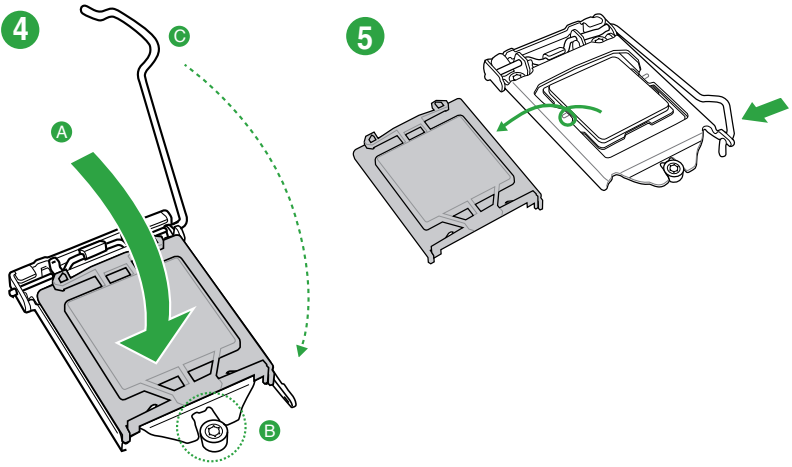
Unplug all power cables before installing the CPU.



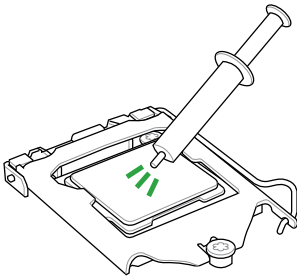
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
 - Ensure that you install the correct CPU designed for LGA1150 only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1150 socket.
 - Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1150 socket.
 - The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
-

1.3.1 Installing the CPU



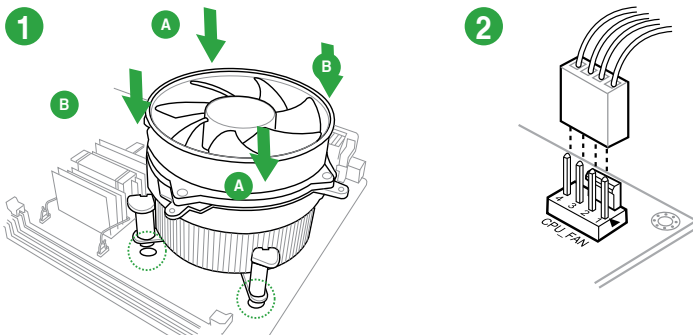


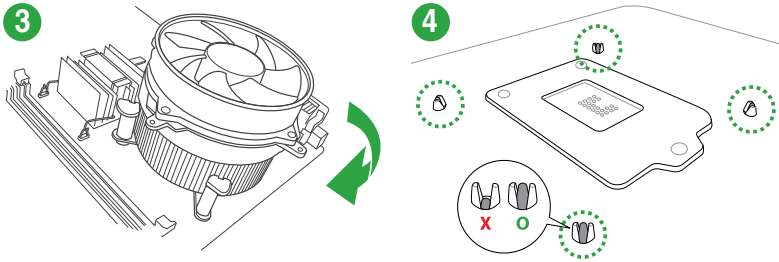
1.3.2 CPU heatsink and fan assembly installation



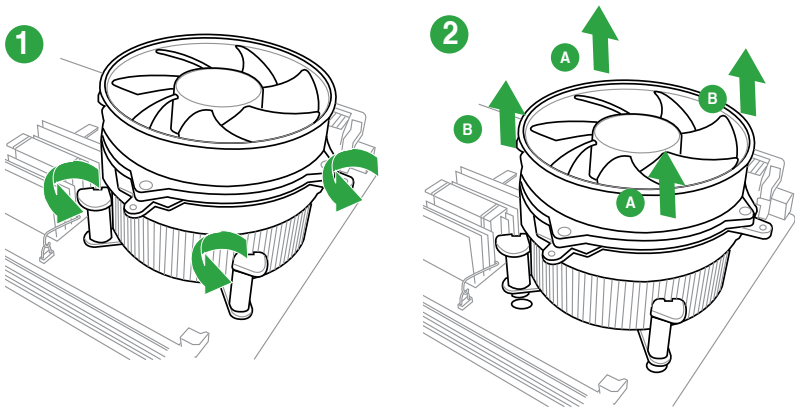
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly





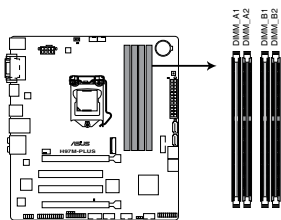
To uninstall the CPU heatsink and fan assembly



1.4 System memory

1.4.1 Overview

This motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Module (DIMM) sockets. 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

H97M-PLUS 240-pin DDR3 DIMM sockets

1.4.2 Memory configurations

You may install 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.
 - According to Intel CPU spec, DIMM voltage below 1.65V is recommended to protect the CPU.
 - 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 512 megabits (Mb) chips or less.
-



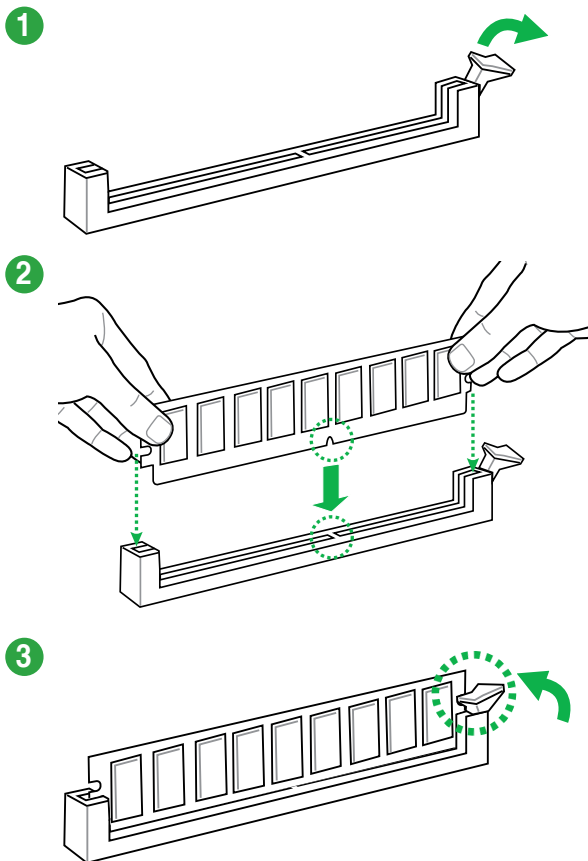
-
- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, refer to section **2.5 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.
 - Visit the ASUS website at: www.asus.com for the latest QVL.
-



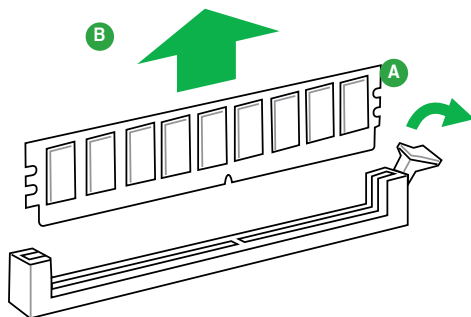
-
- ASUS exclusively provides hyper DIMM support function.
 - Hyper DIMM support is subject to the physical characteristics of individual CPUs. Load the X.M.P. or D.O.C.P. settings in the BIOS for the hyper DIMM support.
-

1.4.3 Installing a DIMM

To install 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 slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

1.5.4 PCI Express 3.0/2.0 x16 slot

This motherboard has a PCI Express 3.0/2.0 x16 slot that supports PCI Express 3.0/2.0 x16 graphic cards complying with the PCI Express specifications.

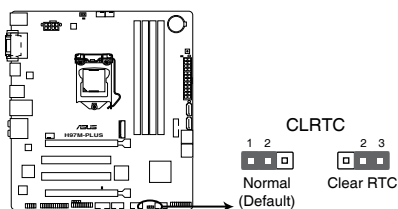
IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCIEx16_1	shared	-	-	-	-	-	-	-
PCIEx16_2	shared	-	-	-	-	-	-	-
PCI_1	-	-	-	shared	-	-	-	-
PCI_2	shared	-	-	-	-	-	-	-
Intel LAN controller	-	-	-	-	shared	-	-	-
EHCI0	-	-	-	-	-	-	-	shared
EHCI1	shared	-	-	-	-	-	-	-
HD audio	-	-	-	-	-	-	shared	-
SATA controller 0	-	-	-	shared	-	-	-	-
SATA controller 1	-	-	-	shared	-	-	-	-
XHCI	-	-	-	-	-	shared	-	-
I.G.F.X	shared	-	-	-	-	-	-	-

1.6 Jumpers

Clear RTC RAM (3-pin CLRTC)

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



H97M-PLUS Clear RTC RAM

To erase the RTC RAM:

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



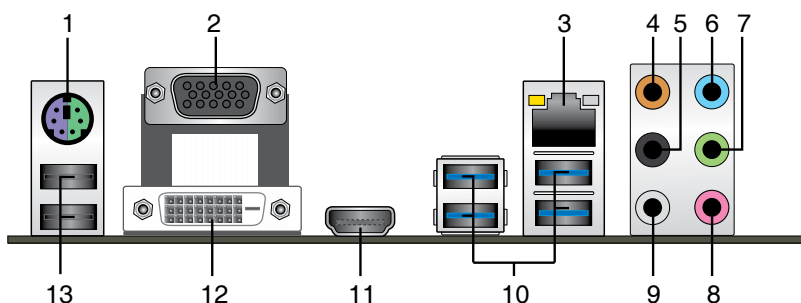
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



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

1.7 Connectors

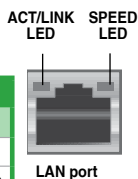
1.7.1 Rear panel connectors



1. **PS/2 Keyboard / Mouse Combo port.** This port is for a PS/2 keyboard or PS/2 mouse.
2. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
3. **LAN (RJ-45) port.** These ports allow 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
Orange (Blinking)	Data activity	GREEN	1Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode		



4. **Center / Subwoofer port (orange).** This port connects the center/subwoofer speakers.
5. **Rear Speaker Out port (black).** This port connects the rear speakers in a 4.1-channel, 5.1-channel, or 7.1-channel audio configuration.

6. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.
7. **Line Out port (lime).** This port connects a headphone or a speaker. In 4.1-channel, 5.1-channel, and 7.1-channel configurations, the function of this port becomes Front Speaker Out.
8. **Microphone port (pink).** This port connects a microphone.
9. **Side Speaker Out port (gray).** This port connects the side speaker in an 7.1-channel audio configuration.



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	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

10. **USB 3.0 ports 3, 4, 5 and 6.** These 9-pin Universal Serial Bus (USB) ports connect to USB 3.0/2.0 devices.



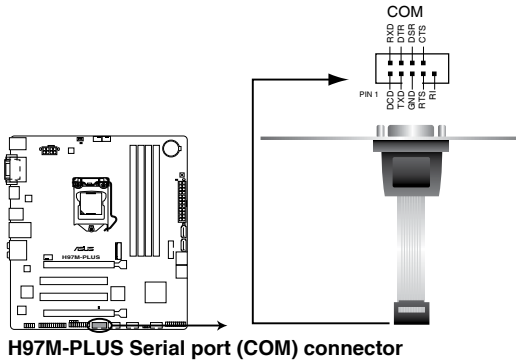
- DO NOT connect a keyboard / mouse to any USB 3.0 port when installing Windows® operating system.
- Due to USB 3.0 controller limitation, USB 3.0 devices can only be used under Windows® OS environment and after the USB 3.0 driver installation.
- USB 3.0 devices can only be used as data storage only.
- We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance for your USB 3.0 devices.

11. **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.
12. **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.
13. **USB 2.0 ports 7 and 8.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0/1.1 devices.

1.7.2 Internal connectors

1. Serial port connector (10-1 pin COM)

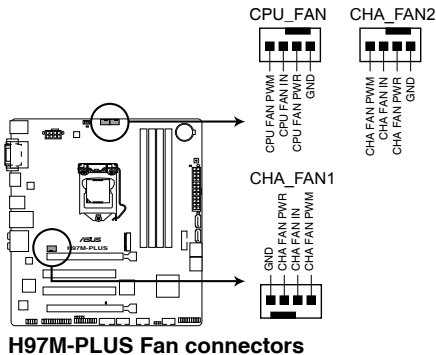
This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



The COM module is purchased separately.

2. CPU and chassis fan connectors (4-pin CPU_FAN, and 4-pin CHA_FAN1/2)

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



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

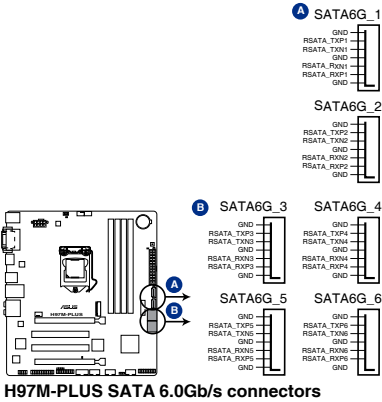


The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.

3. Intel® H97 Serial ATA 6.0Gb/s connectors (7-pin SATA6G_1-6)

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.

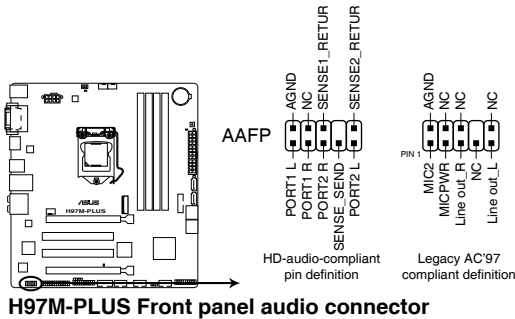
If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® H97 chipset.



- These connectors are set to **[AHCI]** by default. If you intend to create a Serial ATA RAID set using these connectors, set the **SATA Mode Selection** item in the BIOS to **[RAID]**. See section **2.6.3 PCH Storage Configuration** for details.
- Before creating a RAID set, refer to the RAID Supplementary Guide included in the folder named Manual in the support DVD.
- When using hot-plug and NCQ, set the **SATA Mode Selection** item in the BIOS to **[AHCI]**.
- M.2 Socket 3 shares bandwidth with SATA_5/6. To ensure that the M.2 PCIe device is working properly, SATA ports 5 and 6 are disabled. Refer to section **2.6.3 PCH Storage Configuration** of this user guide for more details.

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

This connector is for a chassis-mounted front panel HD audio I/O module. Connect one end of the front panel audio I/O module cable to this connector.



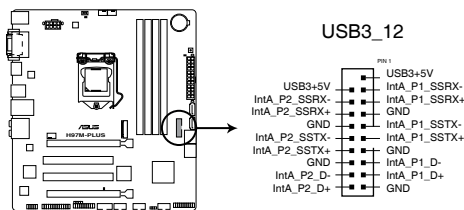
H97M-PLUS Front panel audio connector



- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
- If you want to connect a high-definition or an AC'97 front panel audio module to this connector, set the Front Panel Type item in the BIOS setup to **[HD]** or **[AC97]**.

5. USB 3.0 connector (20-1 pin USB3_12)

This connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds up to 5Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.



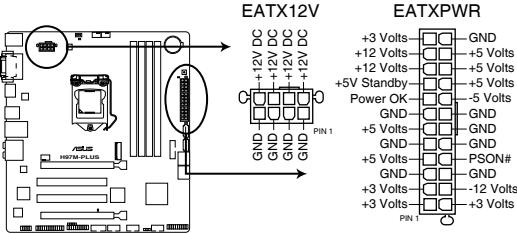
H97M-PLUS USB3.0 Front panel connector



- The USB 3.0 module is purchased separately.
- These connectors are based on xHCI specification. We recommend that you install the related driver to fully use the USB 3.0 ports under Windows® 7.
- The plugged USB 3.0 device may run on xHCI or EHCI mode depending on the operating system's setting.

6. ATX power connectors (24-pin EATXPWR; 8-pin EATX12V)

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



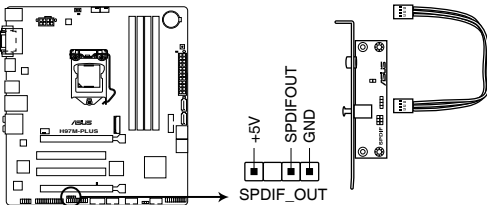
H97M-PLUS ATX power connectors



- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.3 (or later version) and provides a minimum power of 350 W.
- DO NOT forget to connect the 4-pin/8-pin EATX12 V power plug. Otherwise, the system will not boot.
- We recommend that you use a PSU with a higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability.
- 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.

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

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port. Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.



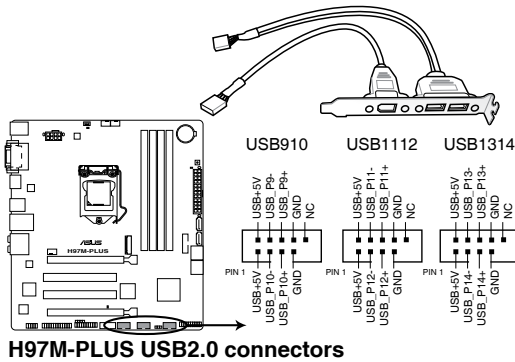
H97M-PLUS Digital audio connector



The S/PDIF module is purchased separately.

8. USB 2.0 connectors (10-1 pin 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 480 Mbps connection speed.



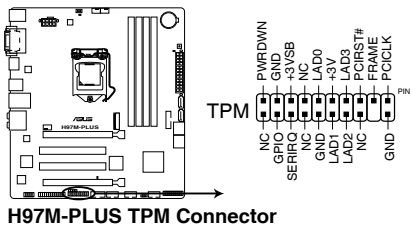
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!



The USB 2.0 module is purchased separately.

9. TPM connector (20-1 pin TPM)

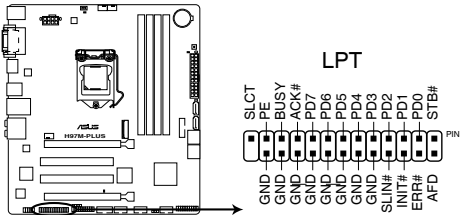
This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.



The TPM module is purchased separately.

10. LPT connector (26-pin LPT)

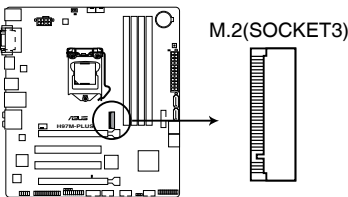
The LPT (Line Printing Terminal) connector supports devices such as a printer. LPT standardizes as IEEE 1284, which is the parallel port interface on IBM PC-compatible computers.



H97M-PLUS Parallel Port Connector

11. SATA M.2 connector

This connector is for a SATA M.2-compliant solid-state drive (SSD). The M.2 standard supports data transfer speeds up to 10.0Gb/s.



H97M-PLUS M.2(SOCKET3)



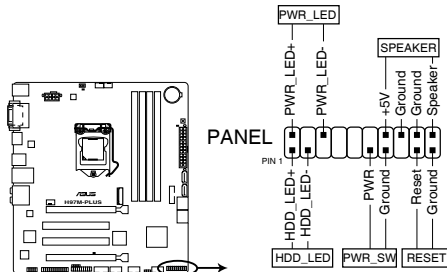
- This socket supports M Key and type 2260/2280 storage devices.
- The M.2 Socket 3 shares bandwidth with SATA ports 5 and 6. Refer to section **2.6.3 PCH Storage Configuration** of this user guide for more details.
- When using Intel® Desktop Responsiveness technologies with PCIe M.2 device, ensure to set up the Windows® UEFI operating system under RAID mode.



The M.2 (NGFF) SSD module is purchased separately.

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

This connector supports several chassis-mounted functions.



H97M-PLUS 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 HDD 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 PWR_SW)**

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

- **Reset button (2-pin RESET)**

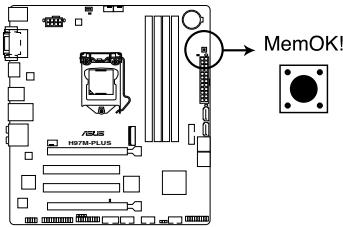
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

1.8 Onboard switches

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.

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.



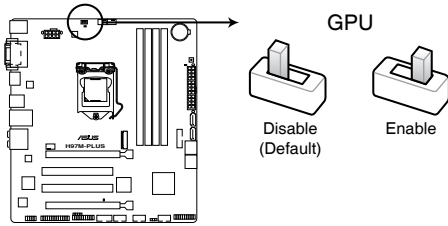
H97M-PLUS MemOK! button



- Refer to section **1.9 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) 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.

2. GPU Boost switch

This switch allows you to enable or disable the GPU Boost function.

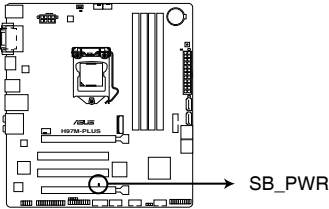


H97M-PLUS GPU switch

1.9 Onboard LEDs

1. Standby Power LED

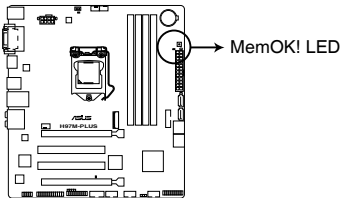
The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows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



H97M-PLUS Onboard LED

2. DRAM LED

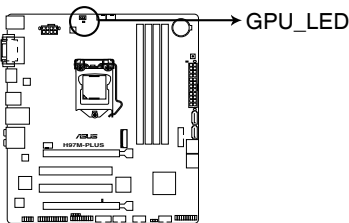
DRAM LED checks the DRAM in sequence during motherboard booting process. If an error is found, the LED next to the error device will continue lighting until the problem is solved. This user-friendly design provides an intuitive way to locate the root problem within a second.



H97M-PLUS MemOK! LED

3. GPU Boost LED

The GPU Boost LED lights up when the GPU Boost switch is enabled.



H97M-PLUS GPU LED

1.10 Software support

1.10.1 Installing an operating system

This motherboard supports Windows® 7 (32/64bit), Windows® 8 (32/64bit) and Windows® 8.1 (32/64bit) 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.

1.10.2 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 lists the unique features of your ASUS motherboard. Click Drivers, Utilities, AHCI/RAID Driver, Manual, Contact, and Specials 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 in your computer, browse the contents of the Support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

BIOS information

2

2.1 Managing and updating your BIOS

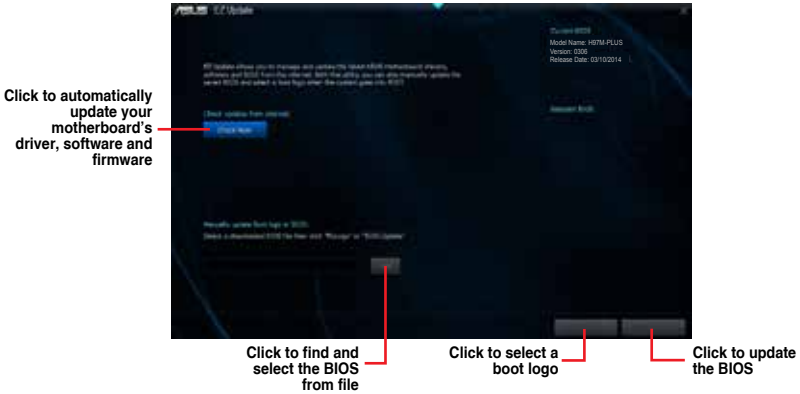


Save a copy of the original motherboard BIOS file to a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update utility.

2.1.1 EZ Update

EZ Update is a utility that allows you to automatically update your motherboard's softwares, drivers and the BIOS version easily. With this utility, you can also manually update the saved BIOS and select a boot logo when the system goes into POST.

To launch EZ Update, click **EZ Update** on the AI Suite 3 main menu bar.



EZ Update requires an Internet connection either through a network or an ISP (Internet Service Provider).

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.
2. Enter the **Advanced Mode** of the BIOS setup program. Go to the **Tool** menu to select **ASUS EZ Flash 2 Utility** and press <Enter> to enable it.
3. Press the Left/Right arrow keys to switch to the **Drive** field.
4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
5. Press <Tab> to switch to the **Folder Info** field.
6. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.



-
- This function supports USB flash disks formatted using FAT32/16 on a single partition only.
 - DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!
-

2.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can 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 removable device into **H97MP.CAP**.
 - 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.
-

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 enters ASUS EZ Flash 2 utility automatically.
4. The system requires you to enter BIOS Setup to recover BIOS settings. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.



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

2.1.4 ASUS BIOS Updater

ASUS BIOS Updater allows you to update the BIOS in DOS environment.



The screen captures used in this section are for reference only and may not be exactly the same as actually shown on your computer screen.

Before updating BIOS

- Prepare the motherboard support DVD and a USB flash drive.
- Download the latest BIOS file and BIOS Updater from <http://support.asus.com> and save them in your USB flash drive.



NTFS is not supported under FreeDOS environment. Ensure that your USB flash drive is in single partition and in FAT32/16 format.

- Turn off the computer.
- Ensure that your computer has a DVD optical drive.

Booting the system in DOS environment

To boot the system in DOS:

1. Insert the USB flash drive with the latest BIOS file and BIOS Updater to the USB port.
2. Boot your computer then press <F8> to launch the select boot device screen.
3. When the select boot device screen appears, insert the Support DVD into the optical drive then select the optical drive as the boot device.

Please select boot device:

↑ and ↓ to move selection
ENTER to select boot device
ESC to boot using defaults

```
P2: ST3808110AS (76319MB)
aigo miniking (250MB)
UEFI: (FAT) ASUS DRW-2014L1T(4458MB)
P1: ASUS DRW-2014L1T(4458MB)
UEFI: (FAT) aigo miniking (250MB)
Enter Setup
```

4. When the booting message appears, press <Enter> within five (5) seconds to enter FreeDOS prompt.

```
ISOLINUX 3.20 2006-08-26 Copyright (C) 1994-2005 H. Peter Anvin
A Bootable DVD/CD is detected. Press ENTER to boot from the DVD/CD.
If no key is pressed within 5 seconds, the system will boot next priority
device automatically. boot:
```

5. On the FreeDOS prompt, type **d:** then 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: />
```

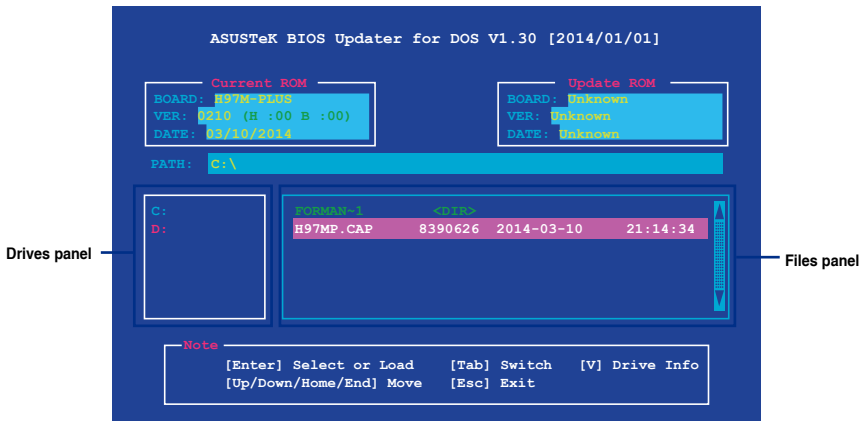
Updating the BIOS file

To update the BIOS file:

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

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

2. On the BIOS Updater screen, press <Tab> to switch from Files panel to Drives panel then select **D:**.



3. Press <Tab> to switch from Drives panel to Files panel then press <Up/Down or Home/End> keys to select the BIOS file and press <Enter>.
4. After the BIOS Updater checks the selected BIOS file, select **Yes** to confirm the BIOS update.



The BIOS Backup feature is not supported due to security regulations.

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



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



Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit BIOS** menu. See Chapter 2 of your motherboard user guide 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:

- To enter BIOS Setup at startup, press <Delete> or <F2> during the Power-On Self Test (POST). If you do not press <Delete> or <F2>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

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



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



- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
 - Visit the ASUS website at www.asus.com to download the latest BIOS file for this motherboard.
 - Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.
 - If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the Exit menu or press hotkey F5. See section 2.10 **Exit menu** for details.
 - If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section 1.6 **Jumpers** for information on how to erase the RTC RAM.
-

BIOS menu screen

The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. Press F7 to change between the two modes.

EZ Mode

By default, the EZ Mode screen appears when you enter the BIOS setup program. The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance mode and boot device priority. To access the Advanced Mode, press F7.



The default screen for entering the BIOS setup program can be changed. Refer to the **Setup Mode** item in section 2.8 **Boot menu** for details.

Displays the system information, CPU voltage and CPU/motherboard temperature

Sets the system date and time

Selects the display language of the BIOS setup program



Launches the overclocking (OC) and RAID configuration wizard

Sets the system performance mode

Selects the boot device priority

Selects the boot device priority

Displays the CPU/chassis fan speed

IRST support setting

Loads optimized default

Saves changes and exits the BIOS setup program

Displays the Advanced mode menus

Displays the X.M.P. status

Click to set Fan Tuning manually



- The boot device options vary depending on the devices you installed to the system.
- The **Boot Menu (F8)** button is available only when the boot device is installed to the system.

Advanced Mode

The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the **Advanced Mode**. Refer to the following sections for the detailed configurations.



To access the EZ Mode, press F7.



Quick settings bar

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

	For setting the system date and time
	For setting the system language
	For saving the frequently-used system settings and configuration
	For taking notes
	For displaying the navigation shortcuts
	For changing the fan speed settings
	For configuring the overclocking and RAID settings

Menu bar

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

My Favorites	For saving the frequently-used system settings and configuration
Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Monitor	For displaying the system temperature, power status, and changing the fan settings
Boot	For changing the system boot configuration
Tool	For configuring options for special functions
Exit	For selecting the exit options and loading default settings

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, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items.

Submenu items

A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

Language

This button above the menu bar contains the languages that you can select for your BIOS. Click this button to select the language that you want to display in your BIOS screen.

MyFavorites (F3)

This button above the menu bar shows all BIOS items in

Q-Fan Control (F6)

This button above the menu bar displays the current settings of your fans. Use this button to manually tweak the fans to your desired settings.

EZ Tuning Wizard (F11)

This button above the menu bar allows you to view and tweak the overclocking settings of your system. It also allows you to change the motherboard's SATA mode from AHCI to RAID mode.

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.

General help

At the lower left corner of the menu screen is a brief description of the selected item.

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 highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

Quick Note (F9)

This button above the menu bar allows you to key in notes of the activities that you have done in BIOS.



- The Quick Note function does not support the following keyboard functions: delete, cut, copy and paste.
- You can only use the alphanumeric characters to enter your notes.

Hot keys

This button above the menu bar contains the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

Last Modified button

This button shows the items that you last modified and save in BIOS Setup.

Hardware Monitor

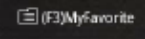
At the right side of the menu screen is a brief description of system hardware monitor information.

2.3 My Favorites


MyFavorites is your personal space where you can easily save and access your favorite BIOS items.

Adding items to My Favorites

To add BIOS items:

1. Press <F3> on your keyboard or click  from the BIOS screen to open Setup Tree Map screen.
2. On the Setup Tree Map screen, select the BIOS items that you want to save in MyFavorites screen.



3. Select an item from main menu panel, then click the submenu that you want to save as favorite from the submenu panel and tap or click  or press <Enter> on your keyboard.



You cannot add the following items to My Favorite items:

- User-managed items such as language and boot order

4. Click **Exit (ESC)** or press <Esc> key to close Setup Tree Map screen.
5. Go to My Favorites menu to view the saved BIOS items.

2.4 Main menu

The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.



2.4.1 System Language [English]

Allows you to choose the BIOS language version from the options. Configuration options: [English] [Français] [Deutsch] [简体中文] [繁體中文] [日本語] [Español] [Русский] [한국어]

2.4.2 Access Level [Administrator]

Displays the current user's access level.

2.4.3 Security

The Security menu items allow you to change the system security settings.



- If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. See section 1.6 **Jumpers** for information on how to erase the RTC RAM.
- The **Administrator** or **User Password** items on top of the screen show the default **Not Installed**. After you set a password, these items show **Installed**.

Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change an administrator password:

1. Select the **Administrator Password** item and press <Enter>.
2. From the **Enter Current Password** box, key in the current password, then press <Enter>.
3. From the **Create New Password** box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **Administrator Password** item on top of the screen shows **Not Installed**.

User Password

If you have set a user password, you must enter the user password for accessing the system. 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 **User Password** item and press <Enter>.
2. From the **Create New Password** box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change a user password:

1. Select the **User Password** item and press <Enter>.
2. From the **Enter Current Password** box, key in the current password, then press <Enter>.
3. From the **Create New Password** box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

2.5 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 section vary depending on the CPU and DIMM model you installed on the motherboard.



Scroll down to display the following items:



Target CPU Turbo-Mode Frequency: xxxxMHz

Displays the target CPU Turbo-Mode frequency.

Target DRAM Frequency: xxxxMHz

Displays the target DRAM frequency.

Target Cache Frequency: xxxxMHz

Displays the target Cache frequency.

Target DMI/PEG Frequency: xxxxMHz

Displays the target DMI/PEG frequency.

Target CPU Graphics Frequency: xxxxMHz

Displays the target iGPU frequency.

2.5.1 CPU Core Ratio [Auto]

Allows you to set the CPU core ratio automatically or manually.

[Auto] Sets all CPU Core Ratio to Intel® CPU default settings automatically.

[Sync All Cores] Allows you to set CPU Core Ratio settings for all cores.

[Per Core] Allows you to set CPU Core Ratio individually.



The following two items appear only when you set the **CPU Core Ratio** to **[Sync All Cores]** or **[Per Core]**.

1-Core Ratio Limit [Auto]

Select [Auto] to apply the CPU default Turbo Ratio setting or manually assign a 1-Core Limit value, which should be higher than or equal to the 2-Core Ratio Limit.

2-Core Ratio Limit [Auto]

Allows you to set the 2-Core Ratio Limit. Select [Auto] to apply the CPU default Turbo Ratio setting or manually assign a 2-Core Ratio Limit value that is higher than or equal to the 3-Core Ratio Limit. 1-Core Ratio Limit must not be set to [Auto].

3-Core Ratio Limit [Auto]

Allows you to set the 3-Core Ratio Limit. Select [Auto] to apply the CPU default Turbo Ratio setting or manually assign a 3-Core Ratio Limit value that is higher than or equal to the 4-Core Ratio Limit. 1-Core/2-Core Ratio Limit must not be set to [Auto].

4-Core Ratio Limit [Auto]

Allows you to set the 4-Core Ratio Limit. Select [Auto] to apply the CPU default Turbo Ratio setting or manually assign a 4-Core Ratio Limit value that is higher than or equal to the 3-Core Ratio Limit. 1-Core/2-Core/3-Core Ratio Limit must not be set to [Auto].

2.5.2 Min. CPU Cache Ratio [Auto]

Allows you to set the uncore ratio of the processor to its possible minimum value. Use <+>/<-> to adjust the value. The values depend on the CPU installed.

2.5.3 Max. CPU Cache Ratio [Auto]

Allows you to set the uncore ratio of the processor to its possible maximum value. Use <+>/<-> to adjust the value. The values depend on the CPU installed.

2.5.4 CPU Ratio Tuner [Auto]

This item allows you to enable or disable the CPU ratio tuner. Enabling this item may enhance the overclocking capability of non-K series CPUs. Configuration options: [Auto] [Enabled] [Disable]

2.5.5 BCLK Frequency: DRAM Frequency Ratio [Auto]

Allows you to set the CPU bus speed to DRAM speed ratio mode.

[Auto] DRAM speed is set to the optimized settings.

[100:133] The CPU bus speed to DRAM speed ratio is set to 100:133.

[100:100] The CPU bus speed to DRAM speed ratio is set to 100:100.

2.5.6 DRAM Frequency [Auto]

Allows you to set the memory operating frequency. Configuration options: [DDR3-800MHz][DDR3-1066MHz][DDR3-1333MHz][DDR3-1600MHz][DDR3-1866MHz][DDR3-2133MHz]~[DDR3-3400MHz]



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

2.5.7 Max. CPU Graphics Ratio [Auto]

Allows you to set the CPU Graphics maximum ratio. The maximum ratio is 60x. Use <+>/<-> to adjust the value.

2.5.8 GPU Boost [Keep Current Settings]

Allows you to enable the GPU Boost to accelerate the integrated GPU for extreme graphics performance. Configuration options: [Keep Current Settings] [Enabled].



Ensure to install an efficient CPU fan for the CPU and graphics tuning before selecting [Enabled].

2.5.9 EPU Power Saving Mode [Disabled]

ASUS EPU (Energy Processing Unit) sets the CPU in its minimum power consumption settings. Enable this item to set lower CPU VCCIN and Vcore voltages and achieve the best energy saving condition. Configuration options: [Disabled] [Enabled]

2.5.10 DRAM Timing Control

The subitems in this menu allow you to set the DRAM timing control features. Use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key.



Changing the values in this menu may cause the system to become unstable! If this happens, revert to the default settings.

2.5.11 DIGI+ VRM

CPU Load-Line Calibration [Auto]

Load-line is defined by Intel VRM specification and affects the CPU power voltage. The CPU working voltage will decrease proportionally depending on the CPU loading. Higher levels of the load-line calibration can get a higher voltage and a better overclocking performance but increases the CPU and VRM thermal. Configuration options: [Auto] [Regular] [Medium] [High] [Ultra High] [Extreme]



The boosted performance may vary depending on the CPU specification. Do not remove the thermal module.

CPU VRM Switching Frequency [Auto]

Frequency switching affects the VRM transient response speed and the thermal component. Higher frequency gets quicker transient response. Configuration options: [Auto] [Manual].

Fixed CPU VRM Switching Frequency (KHz) [250]

This item appears only when you set CPU VRM Switching Frequency to [Manual] and allows you to set a fixed CPU VRM Switching frequency. Use the <+> or <-> to adjust the value. The value ranges from 200KHz to 350KHz with a 50KHz interval.

CPU Power Phase Control [Auto]

Allows you to set the CPU power phase control based on the CPU. Configuration options: [Auto] [Standard] [Optimized] [Extreme] [Power Phase Response].



DO NOT remove the thermal module when switching to Extreme and Power Phase Response. The thermal conditions should be monitored.

Power Phase Response [Fast]

This item appears only when you set the CPU Power Phase Control item to [Power Phase Response]. Select [Ultra Fast] for a faster response. The reaction time will be longer when [Regular] is selected. Configuration options: [Ultra Fast] [Fast] [Medium] [Regular]

CPU Power Duty Control [T.Probe]

DIGI + VRM Duty control adjusts the current of every VRM phase and thermal conditions of every phase component.

[T. Probe] Select to maintain the VRM thermal balance.

[Extreme] Select to maintain the current VRM balance.



DO NOT remove the thermal module. The thermal conditions should be monitored.

CPU Current Capability [Auto]

Allows you to configure the total power range, and extends the overclocking frequency range simultaneously. Configuration options: [Auto] [100%] [110%] [120%] [130%] [140%]



Choose a higher value when overclocking, or under a high CPU loading for extra power support.

2.5.12 Internal CPU Power Management

The subitems in this menu allow you to set the CPU ratio and features.

Enhanced Intel® SpeedStep Technology [Enabled]

Allows you to enable or disable the Enhanced Intel® SpeedStep Technology (EIST).

[Disabled] Disables this function.

[Enabled] The operating system dynamically adjusts the processor voltage and core frequency which may result in decreased average consumption and decreased average heat production.

Turbo Mode [Enabled]

Allows you to enable your core processor's speed to run faster than the marked frequency in a specific condition. Configuration options: [Disabled] [Enabled]



- Turbo Mode is only available on selected CPU models only.
- The following first three items appear only when you set the Turbo Mode to [Enabled].

Turbo Mode Parameters

Long Duration Package Power Limit [Auto]

Allows you to limit the turbo ratio's long duration package power. Use the <+> and <-> keys to adjust the value.

Package Power Time Window [Auto]

Allows you to set the package power time window. Use the <+> and <-> keys to adjust the value.

Short Duration Package Power Limit [Auto]

Allows you to limit the turbo ratio's long duration power. Use the <+> and <-> keys to adjust the value.

CPU Integrated VR Current Limit [Auto]

Allows you to limit the CPU Integrated VR current. Use <+> and <-> key to adjust the value.

CPU Internal Power Switching Frequency

Frequency Tuning Mode [Auto]

Allows you to set the frequency tuning mode. Configuration options: [Auto] [+] [-]

CPU Internal Power Fault Control

Thermal Feedback [Auto]

When enabled, it allows CPU to take precautionary actions when the thermal of the external regulator exceeds the limit. Configuration options: [Auto] [Disabled] [Enabled]

CPU Integrated VR Fault Management [Auto]

Allows you to manage the CPU Integrated VR fault. Configuration options: [Auto] [Disabled] [Enabled]

CPU Internal Power Configuration

CPU Integrated VR Efficiency Management [Auto]

Allows you to manage the CPU integrated VR efficiency. Configuration options: [Auto] [High Performance] [Balanced]

Power Decay Mode [Auto]

Enable to improve power saving on the Fully Integrated Voltage Regulator as the processor enters low current mode. Configuration options: [Auto] [Disabled] [Enabled]

Idle Power-in Response [Auto]

Allows you to set the idle power-in response. Configuration options: [Auto] [Regular] [Fast]

Idle Power-out Response [Auto]

Allows you to set the idle power-out response. Configuration options: [Auto] [Regular] [Fast]

Power Current Slope [Auto]

Allows you to set the power current slope. Configuration options: [Auto] [Level 4] [Level 3] [Level 2] [Level 1] [Level 0] [Level -1] [Level -2] [Level -3] [Level -4].

Power Current Offset [Auto]

Allows you to set the power current offset. Configuration options: [Auto] [100%] [87.5%] [75%] [62.5%] [50%] [37.5%] [25%] [12.5%] [0%] [-12.5%] [-25%] [-37.5%] [-50.0%] [-62.5%] [-75%] [-87.5%] [-100%]

Power Fast Ramp Response [Auto]

Allows you to set the power fast ramp response. Use the <+> and <-> keys to adjust the value.

CPU Internal Power Saving Control

Power Saving Level 1 Threshold [Auto]

Allows you to set the power saving level 1 threshold. Use the <+> and <-> keys to adjust the value.

Power Saving Level 2 Threshold [Auto]

Allows you to set the power saving level 2 threshold. Use the <+> and <-> keys to adjust the value.

Power Saving Level 3 Threshold [Auto]

Allows you to set the power saving level 3 threshold. Use the <+> and <-> keys to adjust the value.

2.5.13 Extreme Over-voltage [Disabled]

By default, this item is set to [Disabled] and helps provide over voltage protection for the CPU. When you set this item to [Enabled], you can select voltage settings for overclocking, but this will not guarantee the CPU's lifespan. Configuration options: [Disabled] [Enabled]

2.5.14 CPU Core Voltage [Auto]

This item allows you to set the CPU Core voltage. Increase the core voltage when increasing the ring frequency. Configuration options: [Auto] [Manual Mode] [Offset Mode].

CPU Core Voltage Override [Auto]

This item appears only when you set the CPU Core Voltage to [Manual Mode] and allows you to set the CPU Core voltage override. The values range from 0.001V to 1.920V with a 0.001V interval.

Offset Mode Sign [+]

This item appears only when you set the **CPU Core Voltage** to [Offset Mode] and allows you to set the offset mode sign. Configuration options: [+] [-].

CPU Core Voltage Offset [Auto]

This item appears only when you set the **CPU Core Voltage** to [Offset Mode] and allows you to set the CPU core voltage offset. Use the <+> or <-> keys to adjust the value. The values range from 0.001V to 0.999V with a 0.001V interval.

2.5.15 CPU Cache Voltage [Auto]

This item allows you to set the CPU Cache voltage. Increase the cache voltage when increasing the ring frequency. Configuration options: [Auto] [Manual Mode] [Offset Mode].

CPU Cache Voltage Override [Auto]

This item appears only when you set the CPU Cache Voltage to [Manual Mode] and allows you to set the CPU Cache voltage override. The values range from 0.001V to 1.920V with a 0.001V interval.

Offset Mode Sign [+]

This item appears only when you set the **CPU Cache Voltage** to [Offset Mode] and allows you to set the offset mode sign. Configuration options: [+] [-].

CPU Cache Voltage Offset

This item appears only when you set the **CPU Cache Voltage** to [Offset Mode] and allows you to set the CPU cache voltage offset. Use the <+> or <-> keys to adjust the value. The values range from 0.001V to 0.999V with a 0.001V interval.

2.5.16 CPU Graphics Voltage [Auto]

This item allows you to set the CPU graphics voltage. Increase the graphics voltage when increasing the iGPU frequency. Configuration options: [Auto] [Manual Mode] [Offset Mode] [Adaptive Mode].



[Adaptive Mode] is available for some specific CPU types.

CPU Graphics Voltage Override [Auto]

This item appears only when you set the **CPU Graphics Voltage** to [Manual Mode] and allows you to set the CPU graphics voltage override. The values range from 0.001V to 1.920V with a 0.001V interval.

Offset Mode Sign [+]

This item appears only when you set the **CPU Graphics Voltage** to [Offset Mode] or [Adaptive Mode] and allows you to set the offset mode sign. Configuration options: [+] [-]

CPU Graphics Voltage Offset [Auto]

This item appears only when you set the **CPU Graphics Voltage** to [Offset Mode] or [Adaptive Mode] and allows you to set the CPU graphics voltage offset. The values range from 0.001V to 0.999V with a 0.001V interval.

Additional Turbo Mode CPU Graphics Voltage [Auto]

This item appears only when you set the **CPU Graphics Voltage** to [Adaptive Mode] and allows you to set the additional turbo mode CPU graphics voltage. The values range from 0.001V to 1.920V with a 0.001V interval.

Total Adaptive Mode CPU Graphics Voltage [Auto]

This item appears only when you set the **CPU Graphics Voltage** to [Adaptive Mode] and allows you to set the total adaptive mode CPU graphics voltage. The values range from 0.001V to 1.920V with a 0.001V interval.

2.5.17 CPU System Agent Voltage Offset Mode Sign [+]

This item allows you to set the CPU system agent voltage offset mode sign. Configuration options: [+] [-].

CPU System Agent Voltage Offset [Auto]

This item allows you to set the CPU system agent voltage offset. Increase the value when increasing DRAM frequency. The values range from 0.001V to 0.999V with a 0.001V interval.

2.5.18 CPU Analog I/O Voltage Offset Mode Sign [+]

This item allows you to set the CPU analog I/O voltage offset mode sign. Configuration options: [+] [-].

CPU Analog I/O Voltage Offset [Auto]

This item allows you to set the CPU analog I/O voltage offset. Increase the value when increasing DRAM frequency. The values range from 0.001V to 0.999V with a 0.001V interval.

2.5.19 CPU Digital I/O Voltage Offset Mode Sign [+]

This item allows you to set the CPU digital I/O voltage offset mode sign. Configuration options: [+] [-].

CPU Digital I/O Voltage Offset [Auto]

This item allows you to set the CPU digital I/O voltage offset. Increase the value when increasing DRAM frequency. The values range from 0.001V to 0.999V with a 0.001V interval.

2.5.20 SVID Support [Auto]

Set this item to **[Enabled]** when overclocking your system. Disabling this item stops the CPU from communicating with the external voltage regulator.

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



The following item appears only when you set SVID Support to **[Enabled]**.

SVID Voltage Override [Auto]

This item allows you to set the SVID Voltage override. By default, this item takes the standard value of the installed CPU. You can use the <+> or <-> keys to adjust the value. The values range from 0.001 V to 2.440 V with a 0.001 V interval.

2.5.21 CPU Input Voltage (VCCIN) [Auto]

This item allows you to set an input voltage for the CPU by the external voltage regulator. By default, this item takes the standard value of the installed CPU. You can use the <+> or <-> keys to adjust the value. The values range from 0.800 V to 2.700 V with a 0.010 V interval.

2.5.22 DRAM Voltage [Auto]

Allows you to set the DRAM voltage. The values range from 1.20000V to 1.92000V with a 0.01000V interval.

2.5.23 PCH VLX Voltage [Auto]

Allows you to set the I/O voltage on the PCH (Platform Controller Hub). You can use the <+> or <-> keys to adjust the value. The values range from 1.1850V to 2.1350V with a 0.0050V interval.

2.5.24 PCH Core Voltage [Auto]

Allows you to set the Core voltage for the PCH (Platform Controller Hub). You can use the <+> or <-> keys to adjust the value. The minimum value is 0.7350V and the maximum value depends on the DRAM Voltage.



The system may need better cooling system for a more stable performance under high voltage settings.

2.5.25 DRAM CTRL REF Voltage [Auto]

Allows you to set the DRAM CTRL REF Voltage. The values range from 0.39500x to 0.63000x with a 0.00500x interval.

2.5.26 DRAM DATA REF Voltage on CHA/CHB [Auto]

Allows you to set the DRAM DATA REF Voltage on CHA/CHB. The values range from 0.39500V to 0.63000V with a 0.00500V interval.

2.5.27 CPU Spread Spectrum [Auto]

- | | |
|------------|--|
| [Auto] | Automatic configuration. |
| [Disabled] | Enhances the BCLK overlocking ability. |
| [Enabled] | Sets to [Enabled] for EMI control. |

2.6 Advanced menu

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



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



2.6.1 CPU Configuration

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



The items shown in submenu may be different due to the CPU you installed.

Intel® Adaptive Thermal Monitor [Enabled]

[Enabled] Enables the overheated CPU to throttle its clock speed to cool down.

[Disabled] Disables the CPU thermal monitor function.

Hyper-threading [Enabled]

The Intel Hyper-Threading Technology allows a hyper-threading processor to appear as two logical processors to the operating system, allowing the operating system to schedule two threads or processes simultaneously.

[Enabled] Two threads per activated core are enabled.

[Disabled] Only one thread per activated core is enabled.

Active Processor Cores [All]

Allows you to choose the number of CPU cores to activate in each processor package.

Configuration options: [All] [1] [2] [3].

Limit CPUID Maximum [Disabled]

[Enabled] Allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.

[Disabled] Disables this function.

Execute Disable Bit [Enabled]

[Enabled] Enables the No-Execution Page Protection Technology.

[Disabled] Forces the XD feature flag to always return to zero (0).

Intel Virtualization Technology [Disabled]

[Enabled] Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

[Disabled] Disables this function.

Hardware Prefetcher (L2 Cache) [Enabled]

[Enabled] Allows a hardware platform to automatically analyze the requirements and prefetch data and codes for the CPU.

[Disabled] Disables this function.

Adjacent Cache Line Prefetch [Enabled]

[Enabled] Allows a hardware platform to perform adjacent cache line prefetching.

[Disabled] Disables this function.

Boot performance mode [Max Non-Turbo Performance]

This item allows you to select the boot performance mode. Configuration options: [Max Non-Turbo Performance] [Max battery] [Turbo Performance].

CPU Power Management Configuration

This item allows you to manage and configure the CPU's power.

Enhanced Intel SpeedStep Technology [Enabled]

Allows you to enable or disable the Enhanced Intel® SpeedStep Technology (EIST).

[Disabled] The CPU runs at its default speed.

[Enabled] The operating system controls the CPU speed.

Turbo Mode [Enabled]

Allows you to set the processor cores to run faster than the marked frequency in a specific condition. Configuration options: [Enabled] [Disabled]



Turbo Mode is only available on selected CPU models only.

CPU C states [Auto]

[Auto]	Automatic configuration.
[Enabled]	Enables the CPU C states.
[Disabled]	Disables the CPU C states..



The following items appear only when you set the CPU C states to **[Enabled]**.

Enhanced C1 state [Enabled]

[Enabled] Enables enhanced C1 state.

[Disabled] Disables enhanced C1 state.

CPU C3 Report [Enabled]

Allows you to disable or enable the CPU C3 report to OS. Configuration options: [Enabled] [Disabled]

CPU C6 Report [Enabled]

Allows you to disable or enable the CPU C6 report to OS. Configuration options: [Enabled] [Disabled]

C6 Latency [Short]

Allows you to choose short or long latency for C6. Configuration options: [Short] [Long]

CPU C7 Report [CPU C7s]

Allows you to disable or enable the CPU C7 report to OS. Configuration options: [Disabled] [CPU C7] [CPU C7s]

C7 Latency [Long]

Allows you to choose short or long latency for C6. Configuration options: [Short] [Long]

Package C State Support [Auto]

Allows you to disable or enable the whole C-State package support. Configuration options: [Auto] [Enabled] [C0/C1] [C2] [C3] [C6] [CPU C7] [CPU C7s]

2.6.2 PCH Configuration

PCI Express Configuration

PCI-E Speed [Auto]

Allows you to select the PCI Express port speed. Configuration options: [Auto] [Gen1] [Gen2].

Intel Rapid Start Technology

Intel® Rapid Start Technology [Disabled]

Allows you to enable or disable Intel® Rapid Start Technology. Configuration options: [Disabled] [Enabled].



The following items appear only when you set the **Intel® Rapid Start Technology** to [Enabled].

Entry on S3 RTC Wake [Enabled]

The system automatically wakes up and set to Rapid Start Technology S4 mode. Configuration options: [Enabled] [Disabled].

Entry After [x]

Allows you to set the wake-up time. The values range from 0 (immediately) to 120.

Active Page Threshold Support [Enabled]

The system automatically set itself to sleep when the partition size is not enough for Rapid Start Technology to work. Configuration options: [Enabled] [Disabled]

Active Memory Threshold [0]

Key in the value for the additional partition size for Rapid Start Technology to work.



Ensure that the caching partition size is larger than the total memory size.

Hybrid Hard Disk Support [Disabled]

Allows you to enable or disable hybrid hard disk support. Configuration options: [Enabled] [Disabled]

Intel Smart Connect Technology

Intel Smart Connect Technology Support [Disabled]

Allows you to enable or disable the Intel Smart Connect Technology support. Configuration options: [Enabled] [Disabled].

2.6.3 PCH Storage Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show Empty if no SATA device is installed to the corresponding SATA port.

SATA (SATA5,6) and M.2 Configuration [Auto]

This item allows you to set an automatic detection between the SATA5, 6 devices and M.2 devices.

- [Auto] The system automatically detects the connected SATA or M.2 devices and set a higher priority for M.2 interface.
- [SATA] The system assigns the priority bandwidth to SATA (SATA5,6) interface.
- [M.2] The system assigns the priority bandwidth to M.2 Socket 3.



By default, the system detects the first priority device. The device detection priority is as follows: PCIe M.2 > SATA Mode M.2 > SATA devices.

SATA Mode Selection [AHCI]

Allows you to set the SATA configuration.

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

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

Aggressive LPM Support [Disabled]

This item appears only when you set **SATA Mode Selection** to [AHCI] and allows you to enable or disable PCH entering link power state aggressively. Configuration options: [Disabled] [Enabled]

S.M.A.R.T. Status Check [On]

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a monitor system. When read/write of your hard disk errors occur, this feature allows the hard disk to report warning messages during the POST. Configuration options: [On] [Off]

Hot Plug [Disabled]

These items appear only when you set the SATA Mode Selection item to [AHCI] and allow you to enable/disable SATA Hot Plug Support. Configuration options: [Disabled] [Enabled]

2.6.4 System Agent Configuration

VT-d [Disabled]

Allows you to enable or disable VT-d function on MCH. Configuration options: [Enabled] [Disabled].

CPU Display Audio[Enabled]

Allows you to enable or disable the CPU display audio support. Configuration options: [Enabled] [Disabled].

DVI Port Audio [Off]

Allows you to enable or disable the DVI port. Configuration options: [On] [Off].

Graphics Configuration

Allows you to select a primary display from iGPU, and PCIe graphical devices.

Primary Display [Auto]

Allows you to select the primary display from iGPU, PCIE and PCI Graphics devices. Configuration options: [Auto] [CPU Graphics] [PCIE] [PCI]

CPU Graphics Memory [Auto]

Allows you to set the system memory size allocated to DVMT 5.0 used by the iGPU. Configuration options: [Auto] [32M] [64M] [96M] [128M] ~ [448M] [480M] [512M]

Render Standby [Auto]

Allows you to enable or disable Intel® Graphics Render Standby support to reduce the iGPU power use when the system is idle. Configuration options: [Auto] [Disabled] [Enabled]

CPU Graphics Multi-Monitor [Disabled]

Allows you to empower both integrated and discrete graphics devices for the multi-monitor output. The CPU graphics shared system memory size will be fixed at 64MB. Configuration options: [Disabled] [Enabled]

DMI Configuration

Allows you to control various DMI functions.

DMI Gen 2 [Enabled]

Allows you to enable or disable DMI Gen 2. Configuration options: [Enabled] [Disabled]

NB PCI-E Configuration

Allows you to configure the NB PCI Express settings.

PCIEx16_1 Link Speed [Auto]

Allows you to configure the PCIEx16 speed for slot 1. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

Memory Configuration

Allows you to configure the memory configuration parameters.

Memory Scrambler [Enabled]

Allows you to enable or disable the Memory Scrambler support. Configuration options: [Enabled] [Disabled]

Memory Remap [Enabled]

Allows you to enable remapping the memory above 4GB. Configuration options: [Enabled] [Disabled]

2.6.5 USB Configuration

The items in this menu allow you to change the USB-related features.



The **USB Devices** item shows the auto-detected values. If no USB device is detected, the item shows None.

Legacy USB Support [Enabled]

- [Disabled] The USB devices can be used only for the BIOS setup program.
- [Enabled] Enables the support for USB devices on legacy operating systems (OS).
- [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.

Intel® xHCI Mode [Smart Auto]

- [Auto] Keeps the last operation of xHCI controller in OS during bootup.
- [Smart Auto] Enables the operation of xHCI controller.
- [Enabled] Enables the function.
- [Disabled] Disables the function.

EHCI Hand-off [Disabled]

- [Enabled] Enables the support for operating systems without an EHCI hand-off feature.
- [Disabled] Disables the function.

USB Single Port Control

USB3_1-6 [Enabled]

Allows you to enable or disable an individual USB port. Refer to the section **1.2.3 Motherboard layout** in this user manual for the locations of the USB ports.
Configuration options: [Enabled] [Disabled].

USB 7-14 [Enabled]

Allows you to enable or disable an individual USB port. Refer to the section **1.2.3 Motherboard layout** in this user manual for the locations of the USB ports.
Configuration options: [Enabled] [Disabled].

2.6.6 Platform Misc Configuration

The items in this menu allow you to configure the Platform Misc.

PCI-E Native Power Management [Disabled]

Allows you to enable or disable PCI-E express native power management. Configuration options: [Enabled] [Disabled]

PCH-PCI Express

DMI Link ASPM Control [Disabled]

Allows you to enable or disable the control of Active State Power Management on both NB side and Sb side of the DMI Link. Configuration options: [Disabled] [Enabled]

ASPM Support [Disabled]

Allows you to select the ASPM (Active State Power Management) state. Configuration options: [Disabled] [L0s] [L1] [L0sL1] [Auto]

SA-PCI Express

DMI Link ASPM Control [Disabled]

Allows you to enable or disable the control of Active State Power Management on SA side of the DMI Link. Configuration options: [Disabled] [L0s] [L1] [L0sL1]

PEG ASPM Support [Disabled]

Allows you to control ASPM support for the PEG device. Configuration options: [Disabled] [Auto] [ASPM L0s] [L1] [L0sL1]

2.6.7 Onboard Devices Configuration

HD Audio Controller [Enabled]

[Enabled] Enables the HD Audio Device.
[Disabled] Disables the HD Audio Device.



The following two items appear only when you set the HD Audio Controller item to **[Enabled]**.

Front Panel Type [HD Audio]

Allows you to set the front panel audio connector (AAFP) mode to legacy AC'97 or high-definition audio depending on the audio standard that the front panel audio module supports.

[HD Audio] Sets the front panel audio connector (AAFP) mode to high definition audio.

[AC97] Sets the front panel audio connector (AAFP) mode to legacy AC'97

SPDIF Out Type [SPDIF]

[SPDIF] Sets to an SPDIF audio output.

[HDMI] Sets to an HDMI audio output.

Depop [Enabled]

Allows you to enable or disable Depop. Configuration options: [Enabled] [Disabled]

Intel LAN Controller [Enabled]

[Enabled] Enables the Intel LAN controller.

[Disabled] Disables the Intel LAN controller.

Intel LAN PXE OPROM [Disabled]

This item appears only when you set the previous item to [Enabled] and allows you to enable or disable the PXE OptionRom of the Intel LAN controller. Configuration options: [Enabled] [Disabled]

Charging USB devices in Power State S5 [Disabled]

[Enabled] Charges USB devices even when the system is in Power State S5. State S5 is the soft-off mode or shutdown state where your computer has no memory state and is not doing any computing tasks.

[Disabled] Disables this function.

Serial Port Configuration

The sub-items in this menu allow you to set the serial port configuration.

Serial Port [Enabled]

Allows you to enable or disable the serial port (COM). Configuration options: [Enabled] [Disabled]

Change Settings [IO=3F8h; IRQ=4]

This item appears only when you set the **Serial Port** to [On] and allows you to select the Serial Port base address. Configuration options: [IO=3F8h; IRQ=4] [IO=2F8h; IRQ=3] [IO=3E8h; IRQ=4] [IO=2E8h; IRQ=3]

Parallel Port Configuration

The sub-items in this menu allow you to set the parallel port configuration.

Parallel Port [On]

Allows you to enable or disable the parallel port (LPT). Configuration options: [On] [Off]

Change Settings [Auto]

Allows you to select an optimal setting for Super I/O devices. Configuration options: [Auto] [IO=378h; IRQ=5;] [IO=378h; IRQ=5,6,7,9,10,11,12;] [IO=278h; IRQ=5,6,7,9,10,11,12;] [IO=3BCh; IRQ=5,6,7,9,10,11,12;]

Device Mode [STD Printer Mode]

Allows you to change the printer port mode. Configuration options: [STD Printer Mode] [SPP Mode] [EPP-1.9 and SPP Mode] [EPP-1.7 and SPP Mode] [ECP Mode] [ECP and EPP 1.9 Mode] [ECP and EPP 1.7 Mode]

2.6.8 APM

Deep S4 [Disabled]

When enabled, the system in S4 state will further reduce power usage and will power off the USB and PS/2 devices. The system in deep S4 state can be woken up via the power button, devices in LAN, or other ways except via the USB and PS/2 devices. Configuration options: [Disabled] [Enabled]

Restore AC Power Loss [Power Off]

[Power On] The system goes into on state after an AC power loss.
[Power Off] The system goes into off state after an AC power loss.
[Last State] The system goes into either off or on state, whatever the system state was before the AC power loss.

Power On By PS/2 Keyboard [Disabled]

[Disabled] Disables the Power On by a PS/2 keyboard.
[Space Bar] Sets the Space Bar on the PS/2 keyboard to turn on the system.
[Ctrl-Esc] Sets the Ctrl+Esc key on the PS/2 keyboard to turn on the system.
[Power Key] Sets Power key on the PS/2 keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Power On By PS/2 Mouse [Disabled]

[Disabled] Disables the Power On by a PS/2 mouse.
[Enabled] Enables the Power On by a PS/2 mouse. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead.

Power On By PCI-E/PCI [Disabled]

[Disabled] Disables the PCI-E/PCI devices to generate a wake-on-LAN feature of the onboard LAN controller or other installed PCI-E/PCI LAN devices.
[Enabled] Enables the PCI-E/PCI devices to generate a wake-on-LAN feature of the onboard LAN controller or other installed PCI-E/PCI LAN devices.

Power On By Ring [Disabled]

[Disabled] Disables Ring to generate a wake event.
[Enabled] Enables Ring to generate a wake event.

Power On By RTC [Disabled]

[Disabled] Disables RTC to generate a wake event.

[Enabled] When set to [Enabled], the items **RTC Alarm Date (Days)** and **Hour/Minute/Second** will become user-configurable with set values.

2.6.9 Network Stack Configuration

Network Stack [Disabled]

This item allows user to disable or enable the UEFI network stack. Configuration options: [Disabled] [Enabled]



The following two items appear only when you set the previous item to [Enabled].

Ipv4 / Ipv6 PXE Support [Enabled]

This item allows user to disable or enable the Ipv4 / Ipv6 PXE Boot support. Configuration options: [Disabled] [Enabled]

2.7 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.



Scroll down to display the following items:



2.7.1 QFan Tuning

Click this item to automatically detect the lowest speed and configure the minimum duty cycle for each fan.

2.7.2 CPU / MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the CPU / motherboard temperature.

2.7.3 CPU Fan / Chassis Fan 1/2 Speed [xxxx RPM] or [Ignore] / [N/A]

The onboard hardware monitor automatically detects and displays the CPU / chassis fan 1/2 speeds in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A.

2.7.4 CPU Input Voltage (VCCIN), CPU Core Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

2.7.5 CPU Q-Fan Control [Enabled]

[Disabled] Disables the CPU Q-Fan control feature.

[Enabled] Enables the CPU Q-Fan control feature.

CPU Fan Speed Low Limit [200 RPM]

This item appears only when you enable the CPU Q-Fan Control feature and allows you to disable or set the CPU fan warning speed. Configuration options: [Ignore] [100RPM] [200RPM] [300 RPM] [400 RPM] [500 RPM]

CPU Fan Profile [Standard]

This item appears only when you enable the CPU Q-Fan Control feature and 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] Sets to [Turbo] to achieve maximum CPU fan speed.

[Manual] Sets to [Manual] to assign detailed fan speed control parameters.



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

CPU Upper Temperature [70]

Use the <+> and <-> keys to adjust the upper limit of the CPU temperature. The values range from 20°C to 75°C.

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

Use the <+> and <-> keys to adjust the maximum CPU fan duty cycle. The values range from 60% to 100%. When the CPU temperature reaches the upper limit, the CPU fan will operate at the maximum duty cycle.

CPU Middle Temperature [25]

Displays the CPU middle temperature.

CPU Fan Middle Duty Cycle(%) [20]

Use the <+> and <-> keys to adjust the middle CPU fan duty cycle. The values range from 20% to 100%. When the CPU reaches the middle temperature, the CPU fan will operate at the middle duty cycle.

CPU Lower Temperature [20]

Displays the lower limit of the CPU temperature.

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

Use the <+> and <-> keys to adjust the minimum CPU fan duty cycle. The values range from 20% to 100%. When the CPU temperature is under the lower limit, the CPU fan will operate at the minimum duty cycle.

2.7.6 Chassis Fan 1/2 Q-Fan Control [DC Mode]

- [Disabled] Disables the Chassis Q-Fan control feature.
- [PWM Mode] Enables DC mode Q-Fan control for a 4-pin chassis fan.
- [DC Mode] Enables the Chassis Q-Fan control feature for a 3-pin chassis fan.

Chassis Fan 1/2 Q-Fan Source [CPU]

The assigned fan will be controlled according to the selected temperature source.
Configuration options: [CPU] [MB]

Chassis Fan 1/2 Speed Low Limit [600 RPM]

This item appears only when you enable the Chassis Q-Fan Control feature and allows you to disable or set the chassis fan warning speed. Configuration options: [Ignore] [200RPM] [300 RPM] [400 RPM] [500 RPM] [600 RPM]

Chassis Fan 1/2 Profile [Standard]

This item appears only when you enable the Chassis Q-Fan Control feature and allows you to set the appropriate performance level of the chassis fan.

- [Standard] Sets to [Standard] to make the chassis fan automatically adjust depending on the chassis temperature.
- [Silent] Sets to [Silent] to minimize the fan speed for quiet chassis fan operation.
- [Turbo] Sets to [Turbo] to achieve maximum chassis fan speed.
- [Manual] Sets to [Manual] to assign detailed fan speed control parameters.



The following four items appear only when you set **Chassis Fan 1/2 Profile** to [Manual].

Chassis Fan 1/2 Upper Temperature [70]

Use the <+> and <-> keys to adjust the upper limit of the chassis temperature. The values range from 20°C to 75°C.

Chassis Fan 1/2 Max. Duty Cycle(%) [100]

Use the <+> and <-> keys to adjust the maximum chassis fan duty cycle. The values range from 60% to 100%. When the chassis temperature reaches the upper limit, the chassis fan will operate at the maximum duty cycle.

Chassis Fan 1/2 Middle Temperature [45]

Use the <+> and <-> keys to adjust the chassis middle temperature. The values range from 45°C to 70°C.

Chassis Fan 1/2 Middle Duty Cycle(%) [60]

Use the <+> and <-> keys to adjust the chassis fan middle duty cycle. The values range from 60% to 100%. When the chassis reaches the middle temperature, the chassis fan will operate at the middle duty cycle.

Chassis Fan 1/2 Lower Temperature [40]

Displays the lower limit of the chassis temperature.

Chassis Fan 1/2 Min. Duty Cycle(%) [60]

Use the <+> and <-> keys to adjust the minimum chassis fan duty cycle. The values range from 60% to 100%. When the chassis temperature is under 40°C, the chassis fan will operate at the minimum duty cycle.

2.7.7 Allow Fan Stop [Disabled]

This item allows the fan to run at 0% duty cycle when the temperature drops below the lower temperature. Configuration options: [Disabled] [Enabled]

2.7.8 Anti Surge Support [Enabled]

This item allows you to enable or disable the Anti Surge function. Configuration options: [Disabled] [Enabled]

2.8 Boot menu

The Boot menu items allow you to change the system boot options.



Scroll down to display the following items:



2.8.1 Fast Boot [Enabled]

- [Enabled] Select to accelerate the boot speed.
- [Disabled] Select to go back to normal boot.



The following five items appear when you set **Fast Boot** to [Enabled].

SATA Support [All Devices]

- [All Devices] All devices connected to SATA ports will be available during POST. This process will extend the POST time.
- [Hard Drive Only] Only hard drives connected to SATA ports will be detected during POST. Any hardware change will disable fast boot.
- [Boot Drive Only] Only boot drive connected to SATA ports will be detected during POST. Any hardware change will disable fast boot.

USB Support [Partial Initialization]

- [Disabled] All USB devices will not be available until OS boot up for a fastest POST time.
- [Full Initialization] All USB devices will be available during POST. This process will extend the POST time.
- [Partial Initialization] For a faster POST time, only the USB ports with keyboard and mouse connections will be detected.

PS/2 Keyboard and Mouse Support [Auto]

Select any of these settings when PS/2 keyboard and mouse are installed. These settings only apply when Fast Boot is enabled.

- [Auto] For a faster POST time, PS/2 devices will only be available when the system boots up or rebooted when the PS/2 devices have not been reconnected or changed. If you disconnect or change PS/2 devices before restarting the system, PS/2 devices will not be available and BIOS setup program will not be accessible via PS/2 devices.
- [Full Initialization] For full system control, PS/2 devices will be available during POST at any circumstances. This process will extend POST time.
- [Disabled] For the fastest POST time, all PS/2 devices will not be available until your computer enters the operating system.

Network Stack Driver Support [Disabled]

- [Disabled] Select to skip the network stack driver from loading during POST.
- [Enabled] Select to load the network stack driver during POST.

Next Boot after AC Power Loss [Normal Boot]

- [Normal Boot] Returns to normal boot on the next boot after AC power loss.
- [Fast Boot] Accelerates the boot speed on the next boot after AC power loss.

2.8.2 Boot Logo Display [Auto]

- [Auto] Adjusts the logo size automatically based on Windows® display requirements.
- [Full Screen] Maximize the boot logo size.
- [Disabled] Hide the logo during POST.

POST Delay Time [3 sec]

This item appears only when you set Boot Logo Display to [Enabled]. This item allows you to select the desired additional POST waiting time to easily enter the BIOS setup. You can only execute the POST delay time during Normal Boot. The values range from 0 to 10 seconds.



This feature will only work under normal boot.

Post Report [5 sec]

This item appears only when you set Boot Logo Display to [Disabled]. This item allows you to select a desired post report waiting time. Configuration options: [1 sec] ~ [10 sec] [Until Press ESC].

2.8.3 Bootup NumLock State [Enabled]

Allows you to enable or disable the keyboard NumLock during the system boot. Configuration options: [Enabled] [Disabled]

2.8.4 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]

2.8.5 Option ROM Messages [Enabled]

- [Enabled] The option ROM messages will be shown during the POST (Power-on self-test).
- [Disabled] Only the ASUS logo will be shown during POST.

2.8.6 Interrupt 19 Capture [Disabled]

- [Enabled] Allows the option ROMs to trap Interrupt 19.
- [Disabled] Disables this function.

2.8.7 Above 4G Decoding [Disabled]

Enables or disables 64bit capable devices to be decoded in above 4G address space (Only if the system supports 64-bit PCI decoding). Configuration options: [Disabled] [Enabled]

2.8.8 Setup Mode [EZ Mode]

- [Advanced Mode] Sets Advanced Mode as the default screen for entering the BIOS setup program.
- [EZ Mode] Sets EZ Mode as the default screen for entering the BIOS setup program.

2.8.9 CSM (Compatibility Support Module)

Allows you to configure the CSM (Compatibility Support Module) items to fully support the various VGA, bootable devices and add-on devices for better compatibility.

Launch CSM [Enabled]

- | | |
|------------|---|
| [Auto] | The system automatically detects the bootable devices and the add-on devices. |
| [Enabled] | For better compatibility, enable the CSM to fully support the non-UEFI driver add-on devices or the Windows® UEFI mode. |
| [Disabled] | Disable the CSM to fully support the Windows® Security Update and Security Boot. |



The following four items appear when you set **Launch CSM** to [Enabled].

Boot Devices Control [UEFI and Legacy OPROM]

Allows you to select the type of devices that you want to boot up. Configuration options: [UEFI and Legacy OPROM] [Legacy OPROM only] [UEFI only]

Boot from Network Devices [Legacy OPROM first]

Allows you to select the type of network devices that you want to launch. Configuration options: [Legacy OPROM first] [UEFI driver first] [Ignore]

Boot from Storage Devices [Legacy OPROM first]

Allows you to select the type of storage devices that you want to launch. Configuration options: [Both, Legacy OPROM first] [Both, UEFI first] [Legacy OPROM first] [UEFI driver first] [Ignore]

Boot from PCI-E/PCI Expansion Devices [Legacy OPROM first]

Allows you to select the type of PCI-E/PCI expansion devices that you want to launch. Configuration options: [Legacy OPROM first] [UEFI driver first]

2.8.10 Secure Boot

Allows you to configure the Windows® Secure Boot settings and manage its keys to protect the system from unauthorized access and malwares during POST.

OS Type [Windows UEFI mode]

Allows you to select your installed operating system.

- | | |
|---------------------|---|
| [Windows UEFI mode] | Executes the Microsoft® Secure Boot check. Only select this option when booting on Windows® UEFI mode or other Microsoft® Secure Boot compliant OS. |
| [Other OS] | Get the optimized function when booting on Windows® non-UEFI mode, Windows® Vista/XP, or other Microsoft® Secure Boot non-compliant OS. Only on Windows® UEFI mode that Microsoft® Secure Boot can function properly. |

Key Management

This item appears only when you set Secure Boot Mode to [Custom]. It allows you to manage the Secure Boot keys.

Install Default Secure Boot keys

Allows you to immediately load the default Security Boot keys, Platform key (PK), Key-exchange Key (KEK), Signature database (db), and Revoked Signatures (dbx). The Platform Key (PK) state will change from Unloaded mode to Loaded mode. The settings are applied after reboot or at the next reboot.



Key-exchange Key (KEK) refers to Microsoft® Secure Boot Key database (KEK).

Clear Secure Boot keys

This item appears only when you load the default Secure Boot keys. This item allows you to clear all default Secure Boot keys.

Save Secure Boot keys

This item appears only when you load the default Secure Boot keys. This item allows you to save all default Secure Boot keys.

PK Management

The Platform Key (PK) locks and secures the firmware from any non-permissible changes. The system verifies the PK before your system enters the OS.

Delete PK

Allows you to delete the PK from your system. Once the PK is deleted, all the system's Secure Boot keys will not be active. Configuration options: [Yes] [No]

Load Default PK

Select Yes to load the system default PK (Platform key) or select No to load a downloaded PK from a USB storage device.



The PK file must be formatted as a UEFI variable structure with time-based authenticated variable.

KEK Management

The KEK (Key-exchange Key or Key Enrollment Key) manages the Signature database (db) and Revoked Signature database (dbx).



Key-exchange Key (KEK) refers to Microsoft® Secure Boot Key-Enrollment Key (KEK).

Delete the KEK

Allows you to delete the KEK from your system. Configuration options: [Yes] [No]

Load Default KEK

Select Yes to load the system default KEK (key-exchange key) or select No to load a downloaded KEK from a USB storage device.

Append Default KEK

Select Yes to append the system default KEK (key-exchange key) or select No to append a downloaded additional KEK from a USB storage device for the db (signature database) and dbx (revoked signature database) management.



The KEK file must be formatted as a UEFI variable structure with time-based authenticated variable.

DB Management

The db (Authorized Signature database) lists the signers or images of UEFI applications, operating system loaders, and UEFI drivers that you can load on the single computer.

Delete the db

Allows you to delete the db file from your system. Configuration options:
[Yes] [No]

Load Default db

Select Yes to load the system default db (signature database) or select No to load a downloaded db from a USB storage device.

Append Default db from file

Select Yes to append the system default db (signature database) or select No to append a downloaded additional db from a USB storage device to load certain customized UEFI executable files.



The DB file must be formatted as a UEFI variable structure with time-based authenticated variable.

DBX Management

The dbx (Revoked Signature database) lists the forbidden images of db items that are no longer trusted and cannot be loaded.

Delete the dbx

Allows you to delete the dbx file from your system. Configuration options:
[Yes] [No]

Load DBX from File

Select Yes to load the system default dbx (revoked signature database) or select No to load a downloaded dbx from a USB storage device.

Append Default dbx

Select Yes to append the system default dbx (revoked signature database) or select No to append a downloaded additional dbx from a USB storage device to forbid certain customized UEFI executable files.



The DBX file must be formatted as a UEFI variable structure with time-based authenticated variable.

2.8.11 Boot Option Priorities

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.



- 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.

2.8.12 Boot Override

These items displays the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

2.9 Tools menu

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



2.9.1 ASUS EZ Flash 2 Utility

Allows you to run ASUS EZ Flash 2. Press [Enter] to launch the ASUS EZ Flash 2 screen.



For more details, see section 2.1.2 **ASUS EZ Flash 2**.

2.9.2 Setup Animator [Enabled]

Enables or disables Setup Animator. Configuration options: [Disabled] [Enabled]

2.9.3 ASUS Overclocking Profile

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



The **Overclocking Profile** items show **Not assigned** if no profile is created.

Load from Profile

Allows you to load the previous BIOS settings saved in the BIOS Flash. Key in the profile number that saved your CMOS settings, press <Enter>, and then select Yes.



- 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.
-

Profile Name

Allows you to create a name for the profile you want to save.

Save to Profile

Allows you to save the current BIOS settings to the BIOS Flash, and create a profile. Key in a profile number from one to eight, press <Enter>, and then select Yes.

2.9.4 ASUS SPD Information

DIMM Slot # [DIMM_A1]

Displays the Serial Presence Detect (SPD) information of the DIMM module installed on the selected slot. Configuration options: [DIMM_A1] [DIMM_A2] [DIMM_B1] [DIMM_B2]

2.10 Exit menu

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



Load Optimized 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 Yes to load the default values.

Save Changes & Reset

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved. When you select this option or if you press <F10>, a confirmation window appears. Select Yes to save changes and exit.

Discard Changes & Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select Yes to discard changes and exit.

Launch EFI Shell from USB drives

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available USB drives.

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.

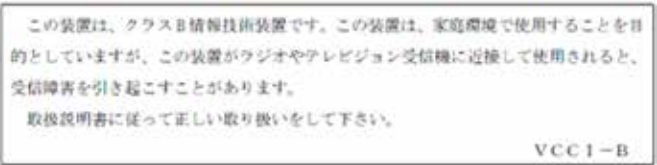
Canadian Department of Communications Statement

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



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

B급 기기 (가정용 방송통신기자재)

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

*당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다.

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://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.

ASUS contact information

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Technical Support

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Technical Support

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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 : H87M-PLUS

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. 14, 2014

Ver. 140331



EC Declaration of Conformity

We, the undersigned,

Manufacturer: **ASUSTeK COMPUTER INC.**
Address: **4F, No. 150, LI-TSE RD., PEITOU, TAIPEI 112, 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 : **H87M-PLUS**

conform with the essential requirements of the following directives:

2004/108/EC-EMC Directive

EN 55022:2010/A2:2011
 EN 55024:2010
 EN 55013:2001/A1:2003/A2:2006
 EN 55020:2007/A1:12011

1989/5/EC-RATE Directive

EN 300 328 V1.7.1 (2006-10)
 EN 300 445-1 V1.6.1 (2010-08)
 EN 300 445-2 V1.6.1 (2010-08)
 EN 301 511 V1.0.2 (2005-03)
 EN 301 488-9 V1.4.1 (2007-11)
 EN 301 988-1 V6.2.1 (2011-05)
 EN 301 988-2 V6.2.1 (2011-07)
 EN 301 883 V1.6.1 (2011-11)
 EN 302 54-2 V1.1.1 (2009-01)
 EN 302 54-1 V1.1.1 (2009-01)
 EN 300 620:2001
 EN 62479:2010
 EN 55018:2002
 EN 55018:2002

2006/95/EC-LVD Directive

EN 60950-1: A12:2011

2009/125/EC-EIP Directive

Regulation (EC) No. 1775/2008
 Regulation (EC) No. 642/2009

2011/65/EU-RoHS Directive

CE marking



(EC conformity marking)

Position : **CEO**
Name : **Jerry Shen**

Signature : _____

Declaration Date: **14/04/2014**
Year to begin affixing CE marking: **2014**

Ver. 140331