H97-PRO GAMER

Motherboard

E9495

First Edition (V1)
June 2014

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Product introduction

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Safety information

Electrical safety

• To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

• When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

• Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

• Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

• Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

• If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

• Before installing the motherboard and adding 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 for 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 Gaming Motherboard – H97-PRO GAMER
Cables	4 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.

H97-PRO GAMER specifications summary

CPU	LGA1150 socket for the 4th Generation, New 4th Generation and 5th Generation Intel® Core™ i7 / Core™ i5 / Core™ i3, Pentium®, and Celeron® processors Supports Intel® 22nm CPU Supports Intel® Turbo Boost Technology 2.0* *** The Intel® Turbo Boost Technology 2.0 support depends type of CPU installed in your system.** **** Refer to www.asus.com for Intel® CPU support list.**
Chipset	Intel® H97 Express Chipset
Memory	4 x DIMM, maximum 32 GB, DDR3 1600 / 1333 MHz, non-ECC, un-buffered memory Dual-channel memory architecture Supports Intel® Extreme Memory Profile (XMP) *** Due to Intel® chipset limitation, DDR3 1600 MHz and higher memory modules on XMP mode will run at the maximum transfer rate of DDR3 1600 MHz.** **** Hyper DIMM support is subject to the physical characteristics of individual CPUs. Please refer to Memory QVL (Qualified Vendors List) for details.** ***** Refer to www.asus.com for the latest Memory QVL (Qualified Vendors List).**

Graphics	Integrated graphics processor - Intel® HD Graphics support
	Multi-VGA output support: HDMI / DVI-D / RGB ports
	   - Supports HDMI with maximum resolution of 4096 x 2160 @ 24 MHz or 2560 x 1600 @ 60 Hz
	   - Supports DVI-D with maximum resolution of 1920 x 1200 @ 60 Hz
	   - Supports RGB with maximum resolution of 1920 x 1200 @ 60 Hz
	   - Supports up to three displays simultaneously
	Supports Intel® InTru™ 3D, Quick Sync Video, Intel® Clear Video HD Technology, and Intel® Insider™
	Maximum shared memory of 512 MB

Expansion slots	1 x PCI Express 3.0 / 2.0 x16 slot (gray, at x16) 1 x PCI Express 2.0 x16 slot (max. at x4 mode, compatible with PCIE x1 and x4 devices. When PCIEX1_1 or PCIEX1_2 is occupied by x1 device, PCIEX16_2 will be at x2 mode) 2 x PCI Express 2.0 x1 slots 3 x PCI slots

H97-PRO GAMER specifications summary

Multi-GPU Support	Supports AMD® Quad-GPU CrossFireX™ technology
Audio	SupremeFX 8-Channel High Definition Audio CODEC - Supports Jack-detection, Multi-streaming, and Front Panel MIC Jack-retasking - High quality 115dB SNR stereo playback output Audio Features: - SupremeFX Shielding™ Technology - ELNA premium audio capacitors - Headphone AMP - Sonic Radar II - Optical S/PDIF out port at back panel
Storage	Intel® H97 Express Chipset with RAID 0, 1, 5, 10 and Intel® Rapid Storage Technology 13 support - 1 x SATA Express port (black, compatible with 2 x SATA 6.0 Gb/s ports) - 1 x M.2 Socket 3 with M Key, type 2260/2280 storage devices support (both SATA & PCIE mode)* - 4 x SATA 6.0 Gb/s ports (gray) - Supports Intel® Smart Response Technology, Intel® Rapid Start Technology, and Intel® Smart Connect Technology** *** M.2 Socket 3 shares bandwidth with PCIEx1_1 and PCIEx1_2 (in PCIE mode) and SATA6G_4 (in SATA mode), and supports M Key and type 2260/2280 storage devices.** **** These functions work depending on the type of CPU installed.**
LAN	Intel® Gigabit LAN GAMEFIRST II
USB	Intel® H97 Express Chipset - 6 x USB 3.0 / 2.0 ports* (2 ports at mid-board, 4 ports at rear panel, blue) - 8 x USB 2.0 ports (6 ports at mid-board, 2 ports at rear panel) *** with ASUS USB 3.0 Boost support**
ASUS gaming features	**Gamer's Guardian** - ESD Guards on VGA, LAN, Audio, KBMS and USB 3.0/ 2.0 ports - DRAM Overcurrent Protection - 10K Black Metallic Capacitors - Stainless Steel Back I/O - ASUS DIGI+ VRM **Performance Optimization** **Dual Intelligent Processors 2 with DIGI+ VRM** **ASUS DIGI+ VRM** - ASUS DIGI+ VRM utility **ASUS EPU** - EPU **ASUS TPU** - Auto Tuning, TurboV, GPU Boost - Fan Xpert 3 featuring Fan Auto Tuning function and multiple thermistors selection for optimized system cooling control

H97-PRO GAMER specifications summary

ASUS gaming features	**Interactive HomeCloud** **Media Streamer** - Pipe music or movies from your PC to a smart TV - Media Streamer app for portable smartphone/tablet, supporting iOS7 and Android 4.0 system **Gaming Scenario** **Steam support** - Compatible with the most fun gaming platform under Windows system **EZ DIY** **Push Notice** - Monitor your PC status with smart devices in real time **UEFI BIOS EZ Mode** featuring friendly graphics user interface - O.C. Tuner - CrashFree BIOS 3 - EZ Flash 2 **Q-Design** - ASUS Q-Shield - ASUS Q-DIMM - ASUS Q-Slot **ASUS Exclusive Features** - USB 3.0 Boost featuring speedy USB 3.0 transmission - AI Suite 3 - Disk Unlocker - AI Charger
Rear Panel I/O ports	1 x PS/2 keyboard/mouse combo port 1 x optical S/PDIF out 1 x DVI port 1 x HDMI port 1 x D-Sub port 1 x LAN (RJ-45) port 4 x USB 3.0 / 2.0 ports 2 x USB 2.0 / 1.1 ports 8-channel audio I/O ports

H97-PRO GAMER specifications summary

Internal connectors	1 x 19-pin USB 3.0 / 2.0 connector support additional 2 USB 3.0 / 2.0 ports
	3 x USB 2.0 / 1.1 connectors support additional 6 USB 2.0 / 1.1 ports
	1 x System panel connector
	1 x S/PDIF out header
	1 x Front panel audio connector (AAFP)
	4 x SATA 6.0 Gb/s connectors (gray)
	1 x M.2 Socket 3 for M Key, type 2260/2280 devices
	1 x SATA Express connector, compatible with 2 x SATA 6.0 Gb/s ports
	1 x 4-pin CPU fan connector
	1 x 4-pin CPU optional fan connector
	3 x Chassis fan connectors (4-pin) for both 3-pin (DC mode) and 4-pin (PWM mode) coolers control
	1 x Thermal sensor connector
	1 x COM header
	1 x TPM header
	1 x Clear CMOS jumper
	1 x 24-pin EATX power connector
	1 x 8-pin EATX 12V power connector
BIOS features	64 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI 2.7, WfM2.0, SM BIOS 2.8, ACPI 5.0, Multi-language BIOS, ASUS EZ Flash 2, ASUS 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
Manageability	Wfm 2.0, DMI 2.7, WOL by PME, PXE
Support DVD	Drivers
	ASUS utilities
	EZ Update
	Anti-virus software (OEM version)
OS support	Windows® 8.1, Windows® 8, Windows® 7
Form factor	ATX form factor: 12.0 in. x 9.6 in. (30.5 cm x 24.4 cm)

Specifications are subject to change without notice.

Product introduction 1

1.1 Before you proceed

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

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

1.2 Motherboard overview

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

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

1.2.1 Placement direction

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

1.2.2 Screw holes

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

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

Place this side towards the rear of the chassis

1.2.3 Motherboard layout

24.4cm(9.6in)

30.5cm(12in)

KBMS_USB78
HDMI
SPDIFO
ASM 1442K
EATX12V
DVI
VGA
USB3_56
LAN_USB3_34
AUDIO
CHA_FAN1
PCIEX1_1
TPM 218V
ASM 1083
PCIEX1_2
BATTERY
SUPREMEFX
ALC 1150

CPU_FAN
CPU_OPT
LGA1150

DDR3 DMM_A1 (64bit, 240-pin module)
DDR3 DMM_A2 (64bit, 240-pin module)
DDR3 DMM_B1 (64bit, 240-pin module)
DDR3 DMM_B2 (64bit, 240-pin module)

CHA_FAN3
EATXPWR
DRAM_LED
USB3_12

H97-PRO GAMER

CPU_LED
PCIEX16_1
VGA_LED
PCI1
PCIEX16_2
PCI2
Super I/O
PCI3

Intel® H97

BOOT_DEVICE_LED
TPU

SATA6G_12
SATA6G_34
SATA EXPRESS (2X7-PIN, 1P)
SB_PWR
PANEL

AAFP   SPDIF_OUT   T_SENSOR CLRTC   TPM   COM   CHA_FAN2   USB1314   USB1112   USB910

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1.2.4   Layout contents

Connectors/Jumpers/Slots/LED	Page
1. ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	1-17
2. CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CPU_OPT; 4-pin CHA_FAN1, 4-pin CHA_FAN2, 4-pin CHA_FAN3)	1-16
3. Intel® LGA1150 CPU socket	1-3
4. DDR3 DIMM slots	1-7
5. USB 3.0 connector (20-1 pin USB3_12)	1-19
6. M.2 Socket 3	1-22
7. Intel® H97 Serial ATA 6.0 Gb/s connector (7-pin SATA6G_1~6, SATAEXPRESS)	1-20
8. Standby Power LED (SB_PWR)	1-23
9. System panel connector (20-8 pin F_PANEL)	1-21
10. USB 2.0 connectors (10-1 pin USB910, USB1112, USB1314)	1-19
11. Serial port connectors (10-1 pin COM)	1-16
12. TPM connector (20-1 pin TPM)	1-17
13. T Sensor connector (2-pin T_SENSOR)	1-22
14. Clear RTC RAM (3-pin CLRTC)	1-13
15. Digital audio connector (4-1 pin SPDIF_OUT)	1-18
16. Front panel audio connector (10-1 pin AAFP)	1-18

1.3   Central Processing Unit (CPU)

This motherboard comes with a surface mount LGA1150 socket designed for the 4th Generation, New 4th Generation and 5th Generation Intel® Core™ i7 / Core™ i5 / Core™ i3, Pentium® , and Celeron® processors.
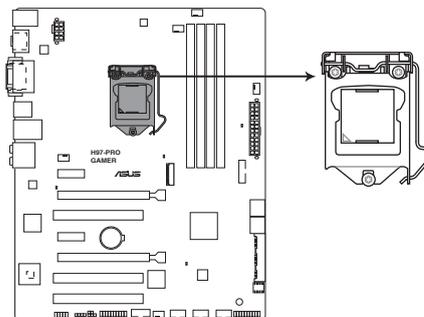
H97-PRO GAMER CPU socket LGA1150

Unplug all power cables before installing the CPU.

• Ensure that you install the correct CPU designed for the LGA1150 socket only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1150 socket.

• 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.

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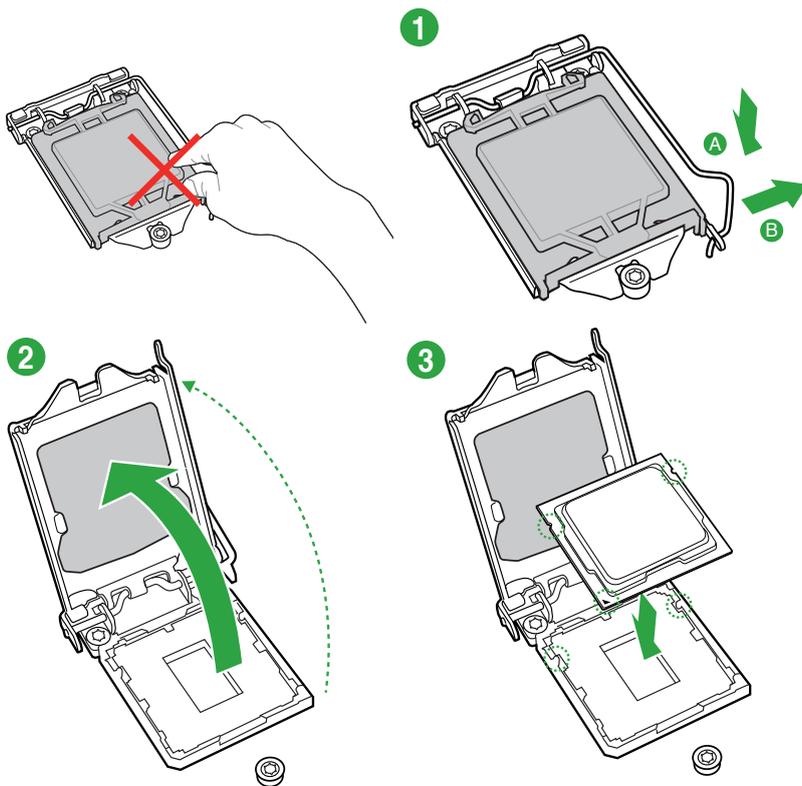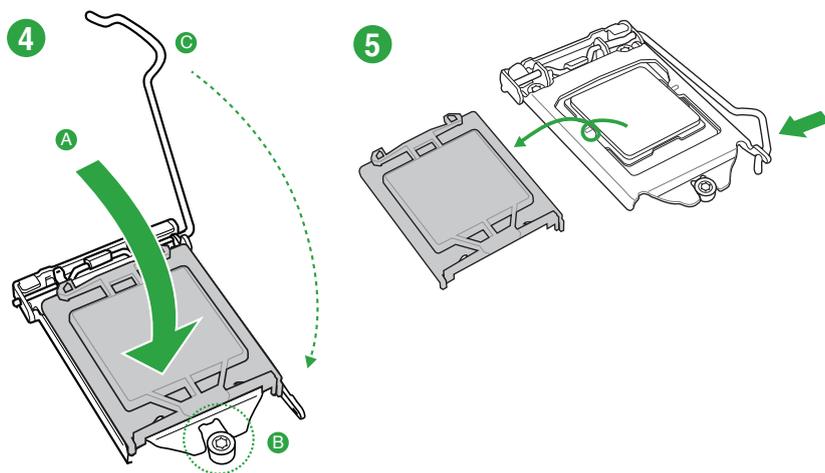
1.3.2   CPU heatsink and fan assembly installation
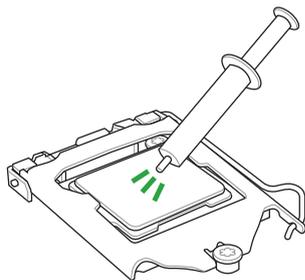
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly
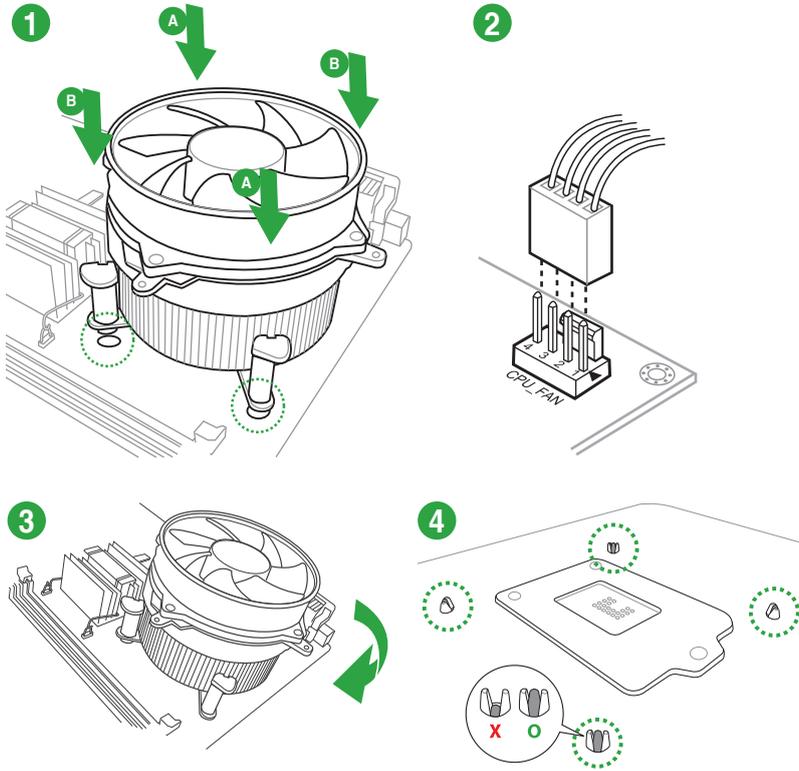
To uninstall the CPU heatsink and fan assembly
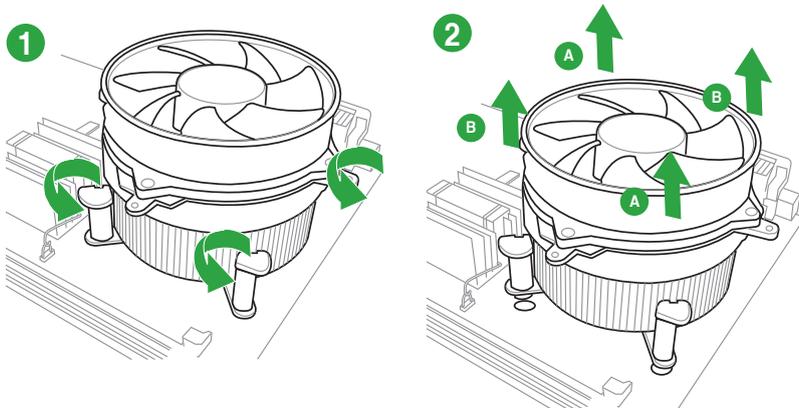
1.4 System memory

1.4.1 Overview

This motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Module (DIMM) sockets. A DDR3 module is notched differently from a DDR or DDR2 module. DO NOT install a DDR or DDR2 memory module to the DDR3 slot.

> According to Intel® CPU spec, DIMM voltage below 1.65 V is recommended to protect the CPU.
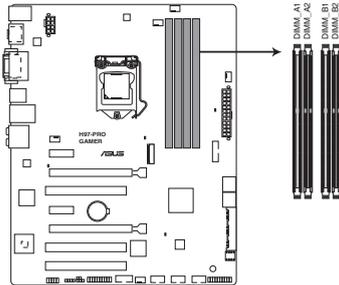
H97-PRO GAMER 240-pin DDR3 DIMM sockets

1.4.2 Memory configurations

You may install 2 GB, 4 GB, and 8 GB unbuffered non-ECC DDR3 DIMMs into the DIMM sockets. You can refer to the recommended memory population below.
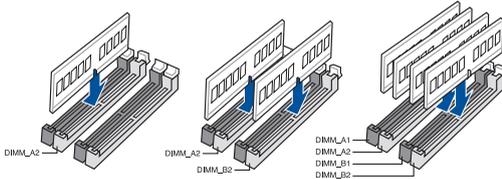
> • You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
>
> • Due to Intel® chipset limitation, DDR3 1600 MHz and higher memory modules on XMP mode will run at the maximum transfer rate of DDR3 1600 MHz.
>
> • 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 3 GB 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.
>
> • This motherboard does not support DIMMs made up of 512 Mb (64 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.

• For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs).

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

1.4.3 Installing a DIMM

To remove a DIMM

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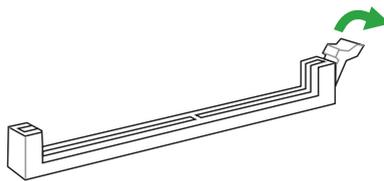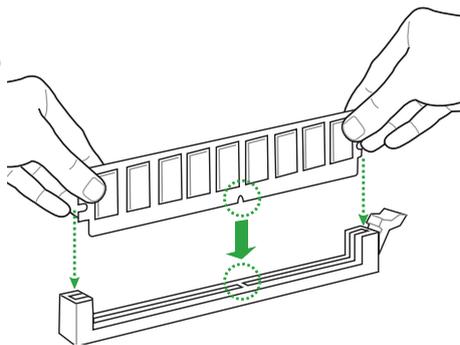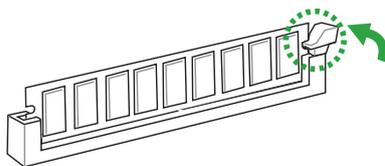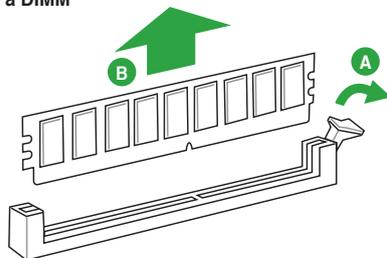
H97-PRO GAMER motherboard memory Qualified Vendors Lists (QVL)

DDR3 2400MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
AMD	AG34G2401G1S	4GB	SS	N/A	N/A	11-12-12-31	1.65V	•	•

DDR3 2250MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
KINGSTON	KHX2250C9D3T1K2/4GX(XMP)	4GB (2x 2GB)	DS	N/A	N/A	9-9-9-24-33	1.65V	•	•

DDR3 2200MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
GEIL	GET38GB2200C9ADC(XMP)	4GB	DS	N/A	N/A	9-11-9-28	1.65V	•	•

DDR3 2133MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
CORSAIR	CMD32GX3M4A2133C9(Ver4.21)	8GB	DS	N/A	N/A	9-11-11-31	1.65V	•	•
ADATA	AX3U2133W8G10-DR	16GB (2x 8GB)	DS	N/A	N/A	10-11-11-30	1.65V	•	•

DDR3 2000MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
AVEXIR	AVD3U20000908G-4CI	8GB	DS	N/A	Heat-Sink Package	11-11-11-28-39	1.65V	•	•

DDR3 1866MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
CORSAIR	CMY16GX3M2A1866C9(Ver3.24)	8GB	DS	N/A	N/A	9-10-9-27	1.50V	•	•
CORSAIR	CMY32GX3M4A1866C9	8GB	DS	N/A	N/A	9-10-9-27	1.50V	•	•
KINGSTON	KHX1866C9D3K2/8GX(XMP)	8GB(4GBX2)	DS	N/A	N/A	9-9-9-24-33	1.65V	•	•
KINGSTON	KHX18C10T3K4/32X	8GB	DS	N/A	N/A	11-11-11-28-39	1.5V	•	•
AMD	AP38G1869U2K	8GB(4GBX2)	DS	HYNIX	H5TQ2GB3CFR	9-10-9-27	1.5V	•	•
AMD	AP38G1869U2K	8GB(4GBX2)	DS	N/A	N/A	9-10-9-27	1.5V	•	•

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DDR3 1600MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
APACER	78.BAQEJ.9LK0C⊡XMP)	4GB	DS	N/A	N/A	9-9-9-27	-	•	•
CORSAIR	TR3X6G1600C8D G(XMP)	6GB(3 x 2GB)	DS	N/A	N/A	8-8-8-24	1.65V	•	•
CORSAIR	CML16GX3M2A1600C10	8GB	DS	N/A	N/A	10-10-10-27	1.50V	•	•
CORSAIR	CMZ8GX3M1A1600C10(XMP)	8GB	DS	N/A	N/A	10-10-10-27	1.50V	•	•
G.SKILL	F3-12800CL9D-4GBRL(XMP)	4GB(2 x 2GB)	DS	N/A	N/A	9-9-9-24	1.5V	•	•
G.SKILL	F3-12800CL10S-8GBXL(XMP)	8GB	DS	N/A	N/A	10-10-10-30	1.50V	•	•
KINGSTON	KHX1600C9D3K2/8GX⊡XMP)	4GB	SS	N/A	N/A	11-11-28-39	1.65V	•	•
KINGSTON	KHX1600C9D3P1K2/8G	8GB(2 x 4GB)	DS	N/A	N/A	9-9-9-27-39	1.5V	•	•
KINGSTON	KHX1600C9D3K2/8GX	8GB	DS	N/A	N/A	11-11-11-28-39	1.65V	•	•
MICRON	MT16JTF1G64AZ-1G6E1	8GB	DS	MICRON	D9QBJ	11-11-11-28-39	1.50V	•	•
ADATA	ADDU1600W4G11-B	4GB	SS	ADATA	DWND-1211A	11-11-11-28-39	1.35V	•	•
ADATA	AX3U1600W4G9-DB(XMP)	8GB (2x 4GB)	SS	N/A	N/A	9-9-9-24	1.5V	•	•
ADATA	AX3U1600W8G9-DB	16GB (2x 8GB)	DS	N/A	N/A	9-9-9-24	1.5V	•	•

DDR3 1333MHz Capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								2 DIMMs	4 DIMMs
A-DATA	AD3U1333C2G9	2GB	SS	A-DATA	3CCD-1509HNA1126L	9-9-9-24-33	1.5V	•	•
A-DATA	AX3U1333C2G9-BP	2GB	SS	N/A	N/A	9-9-9-24-33	1.5V	•	•
Apacer	78.A1GC6.9L1	2GB	DS	Apacer	AM5D5808FEQSBG	9	1.5V	•	•
GEIL	GVP34GB1333C7DC	4GB (2 x 2GB)	DS	N/A	N/A	7-7-7-24	1.5V	•	•
KINGMAX	FLFF65F-C8KM9 NEES	4GB	DS	KINGMAX	KFC8FNMXF-BXX-15A	9-9-9-24-33	1.5V	•	•
KINGSTON	KVR13N9S8/4(low profile)	4GB	SS	KINGSTON	D5128GC28PGG8U	9-9-9-24-33	1.5V	•	•
Micron	MT16JTF51264AZ-1G4D1	4GB	DS	Micron	OLD22D9LGK	9-9-9-24-33	1.5V	•	•
Super Talent	W1333UB2GS	2GB	DS	SAMSUNG	K4B1G0846F	9	1.5V	•	•
Asint	SLA304G08-EDJ1B	4GB	SS	Asint	304G08-DJ1B1301	9-9-9-24-33	1.5V	•	•
HMD	HMDD308GU648D1B9C-MEX	8GB	DS	FFCT	512X8DDR3 WT	9-9-9-24-33	1.5V	•	

- **SS**: Single-sided / **DS**: Double-sided

  DIMM support:

  - **2 DIMMs:** Supports two (2) modules inserted into either the black slots or the gray slots as one pair of Dual-channel memory configuration.

  - **4 DIMMs:** Supports four (4) modules inserted into both the gray and black slots as two pairs of Dual-channel memory configuration

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

1.5 Expansion slots

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

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

1.5.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that 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 slots

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

1.5.4 PCI Express 2.0 x1 slots

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

1.5.5 PCI Express 2.0 x16 slot

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

Recommended PCIE expansion cards configuration:

	PCIE Auto mode			M.2 PCIE mode enabled
PCIEX1_1	N/A	x1	x1	N/A
PCIEX1_2	N/A	N/A	x1	N/A
PXIEX16_2	x4	x2	x2	x2
M.2 socket	N/A	N/A	N/A	x2

M.2 Socket 3 shares bandwidth with PCIEx1_1 & PCIEx1_2 (in PCIE mode) and SATA6G_4 (in SATA mode), and supports M Key and type 2260/2280 storage devices. Refer to section **2.6.3 PCH Storage Configuration** and **2.6.7 Onboard Device Configuration** of this user guide for more details.

1.5.6   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.

VGA configuration	PCI Express operating mode	
	PCIe 3.0/2.0 x16_1 (gray)	PCIe 2.0 x16_2
Single VGA/PCIe card	x16 (Recommended for single VGA card)	N/A
Dual VGA/PCIe card	x16	x4

- In single VGA card mode, use the PCIe 3.0/2.0 x16_1 slot (gray) for a PCI Express x16 graphics card to get better performance.
- We recommend that you provide sufficient power when running CrossFireX™ mode. See page 1-15 for details.
- Connect a chassis fan to the motherboard connector labeled CHA_FAN1/2/3 when using multiple graphics cards for better thermal environment.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
I.G.D.	Shared	–	–	–	–	–	–	–
HD Audio 1 Controller	–	–	–	–	–	–	Shared	–
EHCI 1 Controller	–	–	–	–	–	–	–	Shared
EHCI 2 Controller	Shared	–	–	–	–	–	–	–
XHCI Controller	–	–	–	–	–	Shared	–	–
SATA Controller	–	–	–	Shared	–	–	–	–
PCIE x16_1	Shared	–	–	–	–	–	–	–
PCIE x16_2	Shared	–	–	–	–	–	–	–
PCIE x1_1	–	–	Shared	–	–	–	–	–
PCIE x1_2	–	–	–	Shared	–	–	–	–
Intel LAN	–	–	–	–	Shared	–	–	–
PCI Slot 1	–	–	–	Shared	–	–	–	–
PCI Slot 2	Shared	–	–	–	–	–	–	–
PCI Slot 3	–	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.
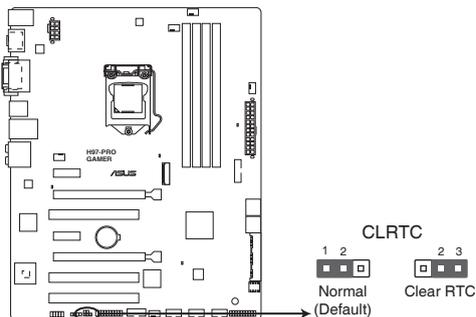
H97-PRO GAMER Clear RTC RAM

To erase the RTC RAM:

1.   Turn OFF the computer and unplug the power cord.

2.   Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5-10 seconds, then move the cap back to pins 1-2.

3.   Plug the power cord and turn ON the computer.

4.   Hold down the <**Del**> key during the boot process and enter BIOS setup to 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
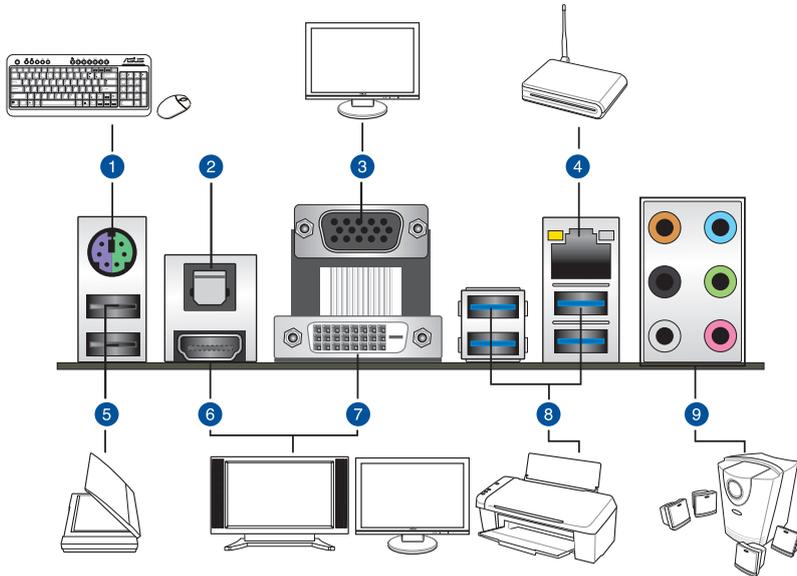
1. **PS/2 Mouse/Keyboard combo port.** This port connects to a PS/2 mouse or PS/2 keyboard.

2. **Optical S/PDIF out port.** This port allows you to connect your PC to amplified speakers, headphones, or Sony/Phillips Digital Interconnect Format (S/PDIF) compliant devices.

3. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.

4. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
Off	No link	OFF	10 Mbps connection
Orange	Linked	ORANGE	100 Mbps connection
Orange (Blinking)	Data activity	GREEN	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode		
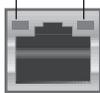
Activity Link LED   Speed LED

LAN port

5.	**USB 2.0 ports 7 and 8.** These two 4-pin Universal Serial Bus (USB) ports are for USB 2.0/1.1 devices.

6.	**HDMI port.** This port connects to the tape, CD, DVD player, or other audio sources.

7.	**DVI-D port.** This port is for any DVI-D compatible device.

> DVI-D can not be converted to output from RGB Signal to CRT and is not compatible with DVI-I.

8.	**USB 3.0 ports 3, 4, 5 and 6**. These 9-pin Universal Serial Bus (USB) ports are for USB 3.0 devices.

> • 	The plugged USB 3.0 device may run on xHCI or EHCI mode, depending on the operating system's setting.
>
> • 	USB 3.0 devices can only be used for data storage.
>
> • 	We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance from your USB 3.0 devices.
>
> • 	Due to the design of the Intel® 9 series chipset, all USB devices connected to the USB 2.0 and USB 3.0 ports are controlled by the xHCI controller. Some legacy USB devices must update their firmware for better compatibility.
>
> • 	Multi-VGA output supports up to three displays under Windows® OS environment, two displays under BIOS, and one display under DOS.
>
> • 	Intel display architecture design supports the following maximum supported pixel clocks (Pixel Clock = H total x V Total x Frame Rate (Screen refresh rate)):
>
> 	- 	DVI port: 165 MHz
>
> 	- 	VGA port: 180 MHz
>
> 	- 	HDMI port: 300 MHz

9.	**8-channel audio ports.** Refer to the following table for the recommended audio configuration.

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

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Side Speaker Out
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
Gray	–	–	–	Side Speaker Out
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out

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.
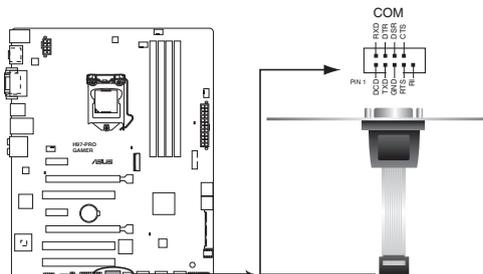
H97-PRO GAMER Serial port (COM) connector

The COM module is purchased separately.

2.   CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CPU_OPT; 4-pin CHA_FAN1, 4-pin CHA_FAN2, 4-pin CHA_FAN3)

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.
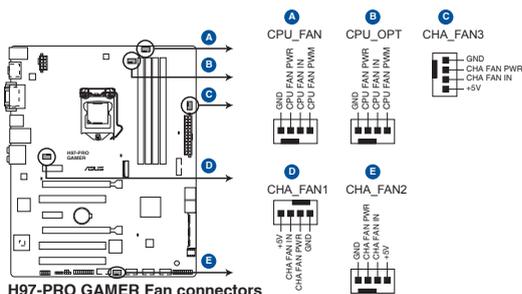
H97-PRO GAMER Fan connectors

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors! The CPU_FAN connector supports a CPU fan of maximum 1 A (12 W) fan power.

- The CPU_FAN connector and CHA_FAN connectors support the ASUS FAN Xpert 3 feature.

- The CPU fan connector detects the type of CPU fan installed and automatically switches the control modes. To configure the CPU fan's control mode, go to **Advanced** > **Monitor** > **CPU Q-Fan Control** item in BIOS.

- The chassis fan connectors support DC and PWM modes. To set these fans to DC or PWM, go to **Advanced** > **Monitor** > **Chassis Fan 1/2/3 Q-Fan Control** items in BIOS.

3. 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.

H97-PRO GAMER ATX power connectors

- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.

- DO NOT forget to connect the 4-pin/8-pin ATX +12V power plug. Otherwise, the system will not boot up.

- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices or when you intend to install additional devices. The system may become unstable or may not boot up if the power is inadequate.

- If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at http://support.asus.com/PowerSupplyCalculator/PSCalculator.aspx?SLanguage=en-us for details.

4. TPM connector (20-1 pin TPM)

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

H97-PRO GAMER TPM Connector

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

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.
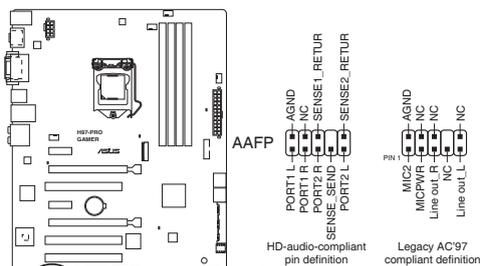
H97-PRO GAMER Front panel audio connector

- 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 front panel audio module to this connector, set the Front Panel Type item in the BIOS setup to [HD]. If you want to connect an AC'97 front panel audio module to this connector, set the item to [AC97]. By default, this connector is set to [HD]. See section **2.6.7 Onboard Devices Configuration** for details.

6. 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.
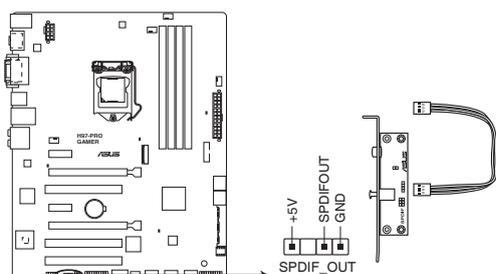
H97-PRO GAMER Digital audio connector

The S/PDIF module is purchased separately.

7. 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 of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.

USB3_12

USB3+5V	USB3+5V
IntA_P2_SSRX-	IntA_P1_SSRX-
IntA_P2_SSRX+	IntA_P1_SSRX+
GND	GND
IntA_P2_SSTX-	IntA_P1_SSTX-
IntA_P2_SSTX+	IntA_P1_SSTX+
GND	GND
IntA_P2_D-	IntA_P1_D-
IntA_P2_D+	IntA_P1_D+
	GND

H97-PRO GAMER USB3.0 Front panel connector
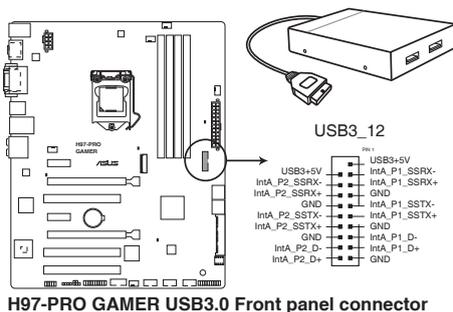
The USB 3.0 module is purchased separately.

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 specifications and supports up to 480Mbps connection speed.

USB1314   USB1112   USB910

H97-PRO GAMER USB2.0 connectors
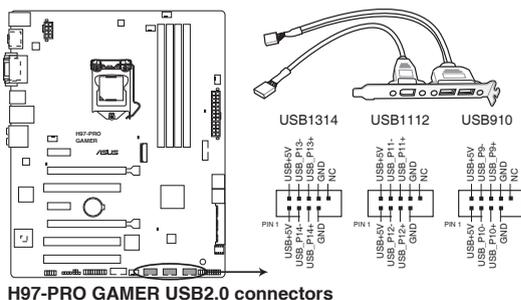
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

The USB 2.0 module is purchased separately.

9.   Intel® H97 Serial ATA 6.0Gb/s connector (7-pin SATA6G_1~6, SATAEXPRESS)

This connector connects 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.
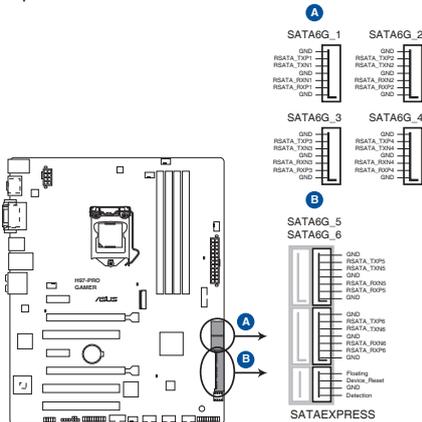
H97-PRO GAMER Intel® SATA 6.0Gb/s connectors
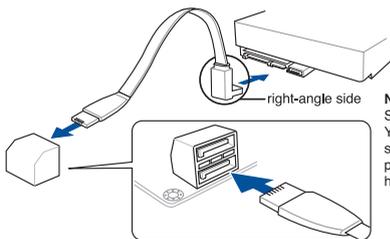
right-angle side

NOTE: Connect the right-angle side of SATA signal cable to SATA device. You may also connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

- These connectors are set to **[AHCI Mode]** by default. If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to **[RAID Mode]**. Refer to section **2.6.3 PCH Storage Configuration** for details.

- Before creating a RAID set, refer to the manual bundled in the motherboard support DVD.

The SATAEXPRESS connector can support one SATA Express device or two SATA devices.

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

This connector supports several chassis-mounted functions.
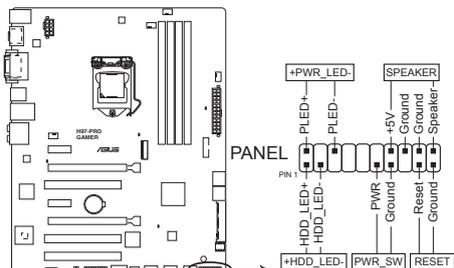
H97-PRO GAMER System panel connector

- **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.

11. M.2 socket 3

This socket allows you to install an M.2 (NGFF) SSD module.
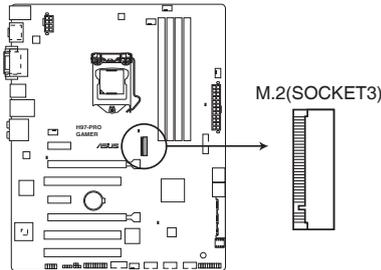
M.2(SOCKET3)

H97-PRO GAMER M.2(SOCKET3)

- This socket supports M Key and 2260/2280 storage devices.

- M.2 Socket 3 shares bandwidth with PCIEx1_1 & PCIEx1_2 (in PCIE mode) and SATA6G_4 (in SATA mode), and supports M Key and type 2260/2280 storage devices. Refer to section **2.6.3 PCH Storage Configuration** and **2.6.7 Onboard Device 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. T Sensor connector (2-pin T_SENSOR)

This connector is for the thermistor cable that allows you to monitor the temperature of your motherboard's critical components and connected devices.

T_SENSOR

PIN 1   GND
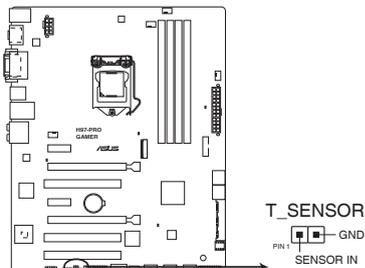
SENSOR IN

H97-PRO GAMER T Sensor connector

1.8 Onboard LEDs

1. **Standby Power LED (SB_PWR)**

   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.

SB_PWR

ON
Standy Power

OFF
Powered Off

H97-PRO GAMER Onboard LED
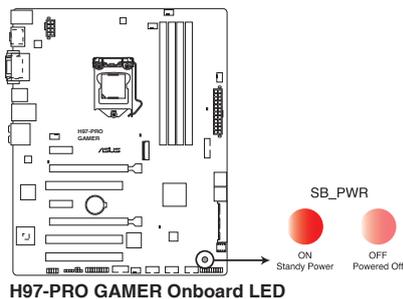
1.9   Software support

1.9.1   Installing an operating system

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

1.9.2   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 lists of the unique features of your ASUS motherboard. Click the **Drivers**, **Utilities**, **AHCI/RAID Driver**, **Manual**, **Contact**, or **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

The ASUS website publishes the latest BIOS versions to provide enhancements on system stability, compatibility,and performance. However, BIOS updating is potentially risky. If there is no problem using the current version of BIOS, DO NOT manually update the BIOS. Inappropriate BIOS updating may result to system's failure to boot. Carefully follow the instructions in this chapter to update your BIOS when necessary.

Visit **http://www.asus.**com to download the latest BIOS file for this motherboard.

The following utilities allow you to manage and update the motherboard BIOS setup program.

1. **EZ Update**: Updates the BIOS in Windows® environment.

2. **ASUS EZ Flash 2:** Updates the BIOS using a USB flash drive.

3. **ASUS CrashFree BIOS 3:** Restores the BIOS using the motherboard support DVD or a USB flash drive when the BIOS file fails or gets corrupted.

4. **ASUS BIOS Updater:** Updates the BIOS in DOS environment using the motherboard support DVD and a USB flash disk drive.

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 utlity, you can also manually update the saved BIOS and select a boot logo when the system goes into POST.

Click to automatically update your motherboard's driver, software and firmware

Click to find and select the BIOS from file

Click to select a boot logo

Click to update the BIOS

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 Utility** and press <Enter>.

3.   Press <Tab> to switch to the **Drive** field.

4.   Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS 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 then press <Enter> to perform the BIOS update process.

7.   Reboot the system when the update process is done.

- •   This function supports USB flash disks formatted using FAT32 or FAT16 on a single partition only.
- •   Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu.
- •   DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!
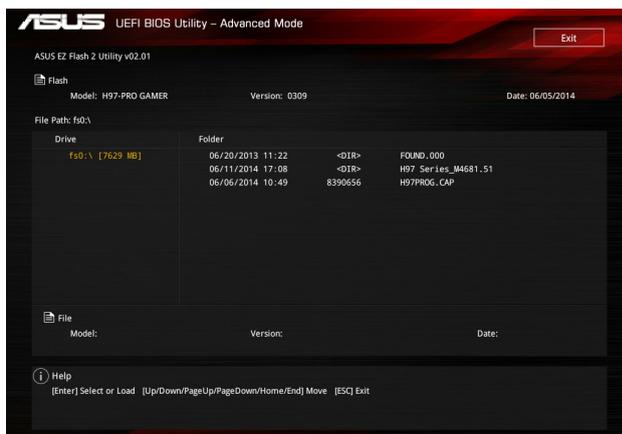
2.1.3   ASUS CrashFree BIOS 3 utility

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 **H97PROG.CAP**.
>
> • 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 into the optical drive or the USB flash drive that contains the BIOS file to the USB port.

> The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and automatically enters ASUS EZ Flash 2 utility. The system requires you to enter BIOS Setup to recover BIOS settings.

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

3. Press <F5> to load default BIOS values (Highly recommended).

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 / FAT16 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 BIOS Boot Device Select menu.

3.   When the BIOS Boot Device Select Menu appears, insert the Support DVD into the optical drive then select the optical drive as the boot device.

```
        Please select boot device:
    ─────────────────────────────────────
    E1:  ASUS DVD-E818A6T  (4069MB)
     USB DISK 2.0 (3824MB)
    UEFI: (FAT)  USB DISK 2.0 (3824MB)
    Enter Setup
    ─────────────────────────────────────
           ↑ and ↓ to move selection
          ENTER to select boot device
           ESC to boot using defaults
```

4.   When the Boot Loader 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:**.

```
              ASUSTeK BIOS Updater for DOS V1.30 [2014/01/01]

            ┌─── Current ROM ───┐              ┌─── Update ROM ───┐
            │ BOARD: H97-PRO GAMER │            │ BOARD: Unknown │
            │ VER:  0209 (H :00 B :00) │        │ VER:  Unknown │
            │ DATE: 06/04/2014  │              │ DATE: Unknown │
            └───────────────────┘              └──────────────┘
            PATH:  C:\

            ┌──────────┐  ┌──────────────────────────────────────┐
            │ C:       │  │ FORMAN~1        <DIR>                 │ ▲
            │ D:       │  │ H97PGM.CAP     8390626  2014-06-04    21:14:34 │
            │          │  │                                      │
            │          │  │                                      │
            │          │  │                                      │ ▼
            └──────────┘  └──────────────────────────────────────┘

            ┌── Note ──────────────────────────────────────────────┐
            │     [Enter] Select or Load    [Tab] Switch   [V] Drive Info │
            │     [Up/Down/Home/End] Move   [Esc] Exit            │
            └──────────────────────────────────────────────────────┘
```

Drives panel
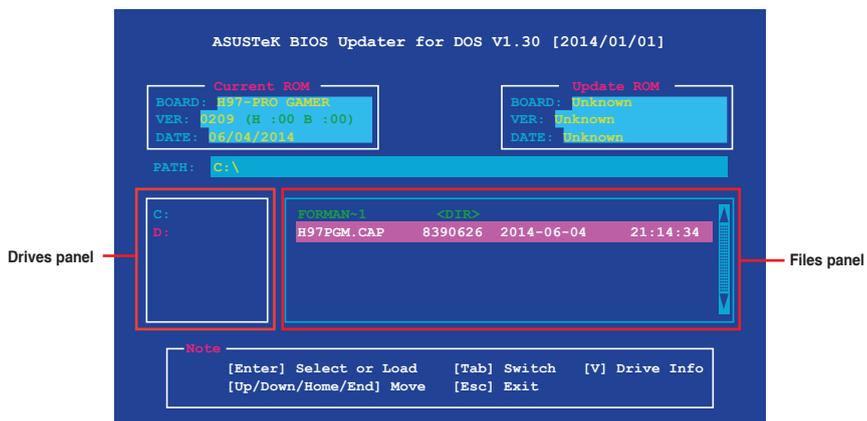
Files panel

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.

```
┌──────────────────────────────────────────────┐
│                                              │
│   Are you sure you want to update the BIOS?  │
│                                              │
│              Yes    No                       │
│                                              │
└──────────────────────────────────────────────┘
```

> 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** menu for more information.

2.2 BIOS setup program

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

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

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

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

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

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

- The BIOS setup screens shown in this section are for reference only. Some screen displays may not be the same as 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 **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 **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**. You can change modes from the **Exit** menu or from the Exit/Advanced Mode button in the EZ Mode/Advanced Mode screen.

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.

Refer to the item **Setup Mode** in section **Boot menu** for more details on how to change the default screen when entering the BIOS setup program.

Displays the CPU/motherboard temperature, CPU voltage output, CPU/chassis/power fan speed, and SATA information

Sets the system date and time

Selects the display language of the BIOS setup program

Creates storage RAID and configures system overclocking

Sets the system performance mode

ASUS   UEFI BIOS Utility – EZ Mode

01/26/2009 Monday **12:42** ⚙   🌐 English   💡 EZ Tuning Wizard(F11)

Information
H97-PRO GAMER   BIOS Ver. 0309
Intel(R) Core(TM) CPU 0000 @ 2.80GHz
Speed: 2800 MHz
Memory: 4096 MB (DDR3 1333MHz)

CPU Temperature
53°C

CPU Voltage
0.833 V
Motherboard Temperature
33°C

EZ System Tuning
Click the icon to specify your preferred system settings for an improved system performance or a power-saving system environment
Quiet
Performance
Energy Saving
< Normal >

DRAM Status
DIMM_A1: Kingston 4096MB 1333MHz
DIMM_A2: N/A
DIMM_B1: N/A
DIMM_B2: N/A

SATA Information
SATA6G_1: N/A
SATA6G_2: N/A
SATA6G_3: N/A
SATA6G_4: N/A
SATA6G_5: N/A
SATA6G_6: N/A

X.M.P ▼ Disabled

Intel Rapid Storage Technology
On   Off

Boot Priority
Choose one and drag the items.   Switch all

SanDisk Cruzer Pop (7633MB)

UEFI: (FAT) SanDisk Cruzer Pop (7633MB)

FAN Profile
CPU FAN
1609 RPM
CHA2 FAN
N/A
CPU OPT FAN
N/A
CHA1 FAN
N/A
CHA3 FAN
N/A

CPU FAN
100 %
50
0   30   70   100
Manual Fan Tuning

⚙ Boot Menu(F8)

Default(F5)   Save & Exit(F10)   Advanced Mode(F7)

Enables or disables the SATA RAID mode for Intel Rapid Storage Technology

Selects the boot device priority

Displays the CPU Fan's speed. Click the button to manually tune the fans

Loads optimized default settings

Saves the changes and resets the system

Displays the Advanced mode menus

Selects the boot device priority

- 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. Refer to the following sections for the detailed configurations.

To access the EZ Mode, press F7.

Quick settings bar   Configuration fields

Hardware information

Menu bar

Submenu item

General help   Menu items

Drop-down list

Scroll bar

Last modified settings   Enters EZ mode

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.

Back button

This button appears when entering a submenu. Press <Esc> or use the USB mouse to click this button to return to the previous menu screen.

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>.

Pop-up window

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

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.

Navigation keys

At the bottom right corner of the menu screen are the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

For the navigation key, it's only available in English. If you delete the default shortcuts, they will appear on your next system bootup.

General help

At the top right 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 button

This button allows you to enter notes of the activities that you have done in BIOS.

Last Modified button

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

2.3 My Favorites

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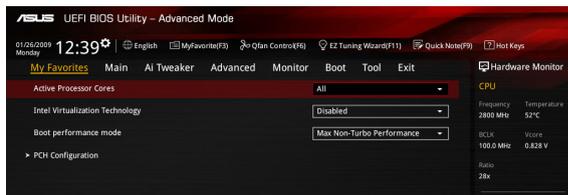
Adding items to My Favorites

To add BIOS items:

1. Press <F3> on your keyboard or click [MyFavorite(F3)] 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.

Main menu panel

Submenu panel

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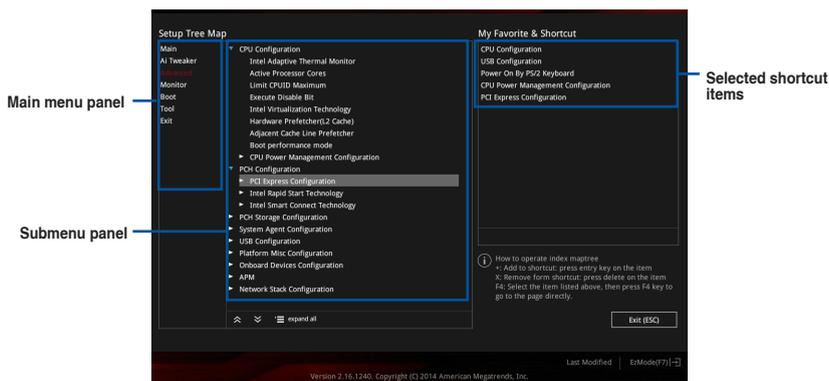
3. Select an item from main menu panel, then click the submenu that you want to save as favorite from the submenu panel and tap or click ＋ or press <Enter> on your keyboard.

> You cannot add the following items to My Favorite items:
>
> • Items with submenu options
>
> • User-managed items such as language and boot order
>
> • Configuration items such as Memory SPD Information, system time and date.

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 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 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

2.4.3 System Time [xx:xx:xx]

Allows you to set the system time.

2.4.4 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 **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:

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 CPU Graphics frequency.

2.5.1 Ai Overclock Tuner [Auto]

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

[Auto]   Loads the optimal settings for the system.

[XMP]   When the XMP (Extreme Memory Profile) mode is selected, the memory parameters will be optimized automatically.

The following item appears only when you set the Ai Overclock Tuner to **[XMP]**.

XMP DDR3-xxxxxxxxxx [Profile #1]

Selects the XMP mode supported by the memory module.

2.5.2 CPU Ratio Unlock [Disabled]

Allows you to enable or disable the ratio unlock feature of K series CPUs. Configuration options: [Enabled] [Disabled]

> This motherboard supports unlock CPU depending on Intel Chipset, CPU and firmware.

2.5.3 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]

Allows you to set the 1-Core Ratio Limit. Select [Auto] to apply the CPU default Turbo Ratio setting or manually assign a 1-Core Ratio Limit value that is higher than or equal to the 2-Core Ratio Limit.

2-Core/3-Core/4-Core Ratio Limit [Auto]

These items become configurable only when you set the **CPU Core Ratio** item to [Per Core].

2.5.4 Min. / Max. CPU Cache Ratio [Auto]

Allows you to set the uncore ratio of the processor to its possible minimum or maximum value depending on the type of CPU installed. Configuration options: [Auto] [x] ~ [xx].

2.5.5 CPU Ratio Tuner [Auto]

Allows you to enhance the overclocking capability of non-K series CPUs when enabled. Configuration options: [Auto] [Enabled] [Disabled]

2.5.6 BCLK Frequency : DRAM Frequency Ratio [Auto]

Allows you to set the ratio of the BCLK and DRAM frequency.

[Auto]   The Ratio will be set to the optimized settings.

[100:133]   The Ratio will be set to 100:133.

[100:100]   The Ratio will be set to 100:100.

2.5.7 DRAM Frequency [Auto]

Allows you to set the memory operating frequency. The configuration options vary with the BCLK Frequency item settings.

> Selecting a very high frequency may cause the system to become unstable! If this happens, revert to the defualt settings.

2.5.8 Max. CPU Graphics Ratio [Auto]

[Auto] The CPU Graphics Maximum ratio is set to its optimized setting depending on the system loading.

[Manual] Use the <+> or <-> keys to adjust the optimal Max. CPU Graphics ratio. The value may vary depending on the system loading.

2.5.9 GPU Boost [Keep Current Settings]

GPU Boost accelerates the integrated GPU for extreme graphics performance. Configuration options: [Keep Current Settings] [Enabled].

2.5.10 EPU Power Saving Mode [Disabled]

Allows you to enable or disable the EPU power saving function. Configuration options: [Disabled] [Enabled]

2.5.11 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.

Primary Timings

DRAM CAS# Latency [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

DRAM RAS# to CAS# Delay [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

DRAM RAS# PRE Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

DRAM RAS# ACT Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [63 DRAM Clock]

DRAM Command Rate [Auto]
Configuration options: [Auto] [1 DRAM Clock] [2 DRAM Clock]

Secondary Timings

DRAM RAS# to RAS# Delay [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM REF Cycle Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [511 DRAM Clock]

DRAM Refresh Interval [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [65535 DRAM Clock]

DRAM WRITE Recovery Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [16 DRAM Clock]

DRAM READ to PRE Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM FOUR ACT WIN Time [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [255 DRAM Clock]

DRAM WRITE to READ Delay [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM CKE Minimum pulse width [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

DRAM CAS# Write Latency [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

RTL IOL control

DRAM RTL Initial Value [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHA_R0D0) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHA_R0D1) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHA_R1D0) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHA_R1D1) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHB_R0D0) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHB_R0D1) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHB_R1D0) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM RTL (CHB_R1D1) [Auto]
Configuration options: [Auto] [1] - [63]

DRAM IO-L (CHA_R0D0) [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHA_R0D1) [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHA_R1D0 [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHA_R1D1 [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHB_R0D0 [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHB_R0D1 [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHB_R1D0 [Auto]
Configuration options: [Auto] [1] - [15]

DRAM IO-L (CHB_R1D1 [Auto]
Configuration options: [Auto] [1] - [15]

Third Timings

tRDRD [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [7 DRAM Clock]

tRDRD_dr [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

tRDRD_dd [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

tWRRD [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [63 DRAM Clock]

tWRRD_dr [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

tWRRD_dd [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

tWRWR [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [7 DRAM Clock]

tWRWR_dr [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

tWRWR_dd [Auto]
Configuration options: [Auto] [1 DRAM Clock] – [15 DRAM Clock]

Dec_WRD [Auto]
Configuration options: [Auto] [0] [1]

tRDWR [Auto]

Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

tRDWR_dr [Auto]

Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

tRDWR_dd [Auto]

Configuration options: [Auto] [1 DRAM Clock] – [31 DRAM Clock]

MISC

MRC Fast Boot [Auto]

Allows you to enable or disable the MRC fast boot.

[Auto]   Selects the optimum MRC fast boot.

[Enabled]   Enables the MRC fast boot.

[Disable]   Disables the MRC fast boot.

DRAM CLK Period [Auto]

Configuration options: [Auto] [1] – [14]

Channel A DIMM Control [Enable Bot...]

Configuration options: [Enable Both DIMMS] [Disable DIMM0] [Disable DIMM1] [Disable Both DIMMS]

Channel B DIMM Control [Enable Bot...]

Configuration options: [Enable Both DIMMS] [Disable DIMM0] [Disable DIMM1] [Disable Both DIMMS]

Scrambler Setting [Optimized ...]

Configuration options: [Optimized (ASUS)] [Default (MRC)]

MCH Full Check [Auto]

Allows you to enable, disable, or automatically set the MCH Full Check function. Configuration options: [Auto] [Enabled] [Disabled]

Skew Control

Adjust these items may enhance the DRAM overclocking capability and stability.

Transmitter Rising Slope [Auto]
Configuration options: [0] ~ [31]

Transmitter Fallng Slope [Auto]
Configuration options: [0] ~ [31]

Transmitter Control Time [Auto]
Configuration options: [0] ~ [31]

Receiver Rising Slope [Auto]
Configuration options: [0] ~ [31]

Receiver Fallng Slope [Auto]
Configuration options: [0] ~ [31]

Receiver Control Time [Auto]
Configuration options: [0] ~ [31]

2.5.12   DIGI+ VRM

CPU Load-Line Calibration [Auto]

Load-line is defined by Intel VRM specification and affects CPU voltage. The CPU working voltage will decrease proportionally to CPU loading. Higher value gets a higher voltage and better overclocking performance, but increases the CPU and VRM thermal conditions. This item allows you to adjust the voltage range from the following percentages to boost the system performance. Configuration options: [Auto] [Level 1] ~ [Level 9]

> The actual performance boost may vary depending on your CPU specification.

CPU VRM Switching Frequency [Auto]

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

> DO NOT remove the thermal module when switching to Manual Mode. The thermal conditions should be monitored.

CPU Fixed Frequency [xxxx] [Disabled]

This item only appears when you set the CPU VRM Switching Frequency to [**Manual**]. This allows you set a fixed CPU frequency. The configuration options ranges from 300 KHz to 500 KHz. Uset the <+> or <-> keys to adjust the interval.

VRM Spread Spectrum [Disabled]

This item becomes configurable only when you set the **CPU VRM Switching Frequency** item to **[Auto]** and allows you to enable the spread spectrum to enhance system stability.

CPU Power Phase Control [Auto]

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

> DO NOT remove the thermal module when setting this item to **[Extreme]**. The thermal conditions should be monitored.

CPU Power Duty Control [T.Probe]

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

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

[Extreme]   Select to maintain the current VRM balance.

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.

2.5.13 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.

Package Power Time Window [Auto]

Allows you to set the package power time window.

Use the <+> and <-> keys to adjust the value. Configuration options: [Auto] [1~127]

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. Configuration options: [Auto] [1~4096]

CPU Integrated VR Current Limit [Auto]

Allows you to limit the CPU Integrated VR current. The configuration options range from 0.125 to 1023.8 with a 0.125 interval. 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 Threshhold [Auto]

Allows you to set the power saving level 1 threshhold.

Use the <+> and <-> keys to adjust the value.

Power Saving Level 2 Threshhold [Auto]

Allows you to set the power saving level 2 threshhold.

Use the <+> and <-> keys to adjust the value.

Power Saving Level 3 Threshhold [Auto]

Allows you to set the power saving level 3 threshhold.

Use the <+> and <-> keys to adjust the value.

2.5.14 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.

2.5.15   CPU Core Voltage [Auto]

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

> The following item appears only when you set the **CPU Core Voltage** to **[Manual Mode]**.

CPU Core Voltage Override [Auto]

This item allows you to set the CPU core voltage override. The values range from 0.001V to 1.920V with a 0.001V interval.

> The following item appears only when you set the **CPU Core Voltage** to **[Offset Mode]**.

Offset Mode Sign [+]

This item 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. The values range from 0.001V to 0.999V with a 0.001V interval.

> The following two items appear only when you set the **CPU Core Voltage** to **[Offset Mode]**.

Offset Mode Sign [+]

This item allows you to set the sign of the Offset mode.

CPU Core Voltage Offset [Auto]
This item allows you to set the CPU core voltage offset. The values range from 0.001V to .999V with a 0.001V interval.

2.5.16   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 [Auto]

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

2.5.17 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]

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 [By CPU]

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.

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.

2.5.20   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.

2.5.21   SVID Support [Auto]

Disabling SVID Support stops the processor from communicating with the external voltage regulator. Configuration options: [Auto] [Disabled] [Enabled].

SVID Voltage Override [Auto]
This item appears only when you enable SVID Support and allows you to set the SVID voltage override. The values range from 0.001V to 2.440V with a 0.001V interval.

2.5.22   CPU Input Voltage (VCCIN) [Auto]

This item allows you to set the CPU input voltage. The values range from 0.800V to 2.700V with a 0.010V interval.

2.5.23   DRAM Voltage [Auto]

Allows you to set the DRAM Voltage for the sytem memory. The values range from 1.20000V to 1.92000V with a 0.01000V interval.

> According to Intel CPU specifications, DIMMs with voltage requirement over 1.65V may damage the CPU permanently. We recommend that you install the DIMMs with the voltage requirement below 1.65V.

2.5.24   PCH VLX Voltage [Auto]

Allows you to set the voltage for the I/O on the PCH. Use the <+> or <-> keys to adjust the value. The values range from 1.2V to 2.0V with a 0.0125V interval.

2.5.25   PCH Core Voltage [Auto]

Allows you to set the Platform Controller Hub voltage. Use the <+> or <-> keys to adjust the value. The minimum voltage is 0.70000V and the maximum voltage varies with DRAM voltage with a 0.01250V interval.

> The system may need better cooling system to work stably under high voltage settings.

2.5.26   DRAM CTRL REF Voltage [Auto]

Allows you to set the DRAM CTRL REF Voltage. The values range from 0.3950x to 0.6300x with a 0.0050x interval.

2.5.27 DRAM DATA REF Voltage on CHA [Auto]

Allows you to set the DRAM DATA REF Voltage on CHA. The values range from 0.3950x to 0.6300x with a 0.0050x interval

2.5.28 DRAM DATA REF Voltage on CHB [Auto]

Allows you to set the DRAM DATA REF Voltage on CHB. The values range from 0.3950x to 0.6300x with a 0.0050x interval

2.5.29 CPU Spread Spectrum [Auto]

[Auto]   Automatic configuration.

[Disabled]   Enhances the BCLK overclocking 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]

This item allows you to protect the CPU by decreasing its frequency as it reaches the thermal throttle point. The thermal monitor includes TM1 (Thermal monitor 1), TM2 (Thermal monitor 2), and EMTTM (Enhanced Multi-threaded Thermal Monitoring).

Configuration options: [Disabled] [Enabled]

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 [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 [Enabled]

[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

PCIe 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: [Enabled] [Disabled]

> 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 [0]

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 [Disabled]

ISCT Configuration [Disabled]

Allows you to enable or disable the ISCT configuration. 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 Not Present if no SATA device is installed to the corresponding SATA port.

M.2 SATA mode [Disabled]

[Enabled]   M.2 (SATA) devices are enabled when SATA6G_4(Gray) devices are disabled.

[Disabled]   SATA6G_4(Gray) will be enabled when no M.2(SATA) devices are installed.

SATAExpress SRIS Support [Auto]

This item allows you to set the SATAExpress SRIS support.

[Auto]   The system automatically adjust the SRIS (Separate Reference Clock Independent Spread Spectrum Clocking Architecture) support for connected SATA Express devices.

[Disabled]   Select this option for ASUS RUNWAY SATA Express bridge card.

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 the previous item 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] (SATA 6G 1~6 [Gray])

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 [Enabled]

Allows you to enable the virtualization technology fundtion on the memory controller hub (MCH). Configuration options: [Enabled] [Disabled]

CPU Display Audio [Enabled]

Allows you to enable or disable CPU SA Audio Device. Configuration options: [Enabled] [Disabled]

DVI Port Audio [On]

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

Graphics Configuration

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

Primary Display [Auto]

Allows you to select which of the CPU Graphics/PCIE Graphics device should be the Primary Display. Configuration options: [Auto] [CPU Graphics] [PCIE] [PCI]

CPU Graphics Memory [Auto]

Allows you to select the amount of system memory allocated to DVMT 5.0 used by the CPU Graphics. Configuration options: [Auto] [32M] [64M] [96M] [128M] [160M] [192M] [224M] [256M] [288M] [320M] [352M] [384M] [416M] [448M] [480M] [512M]

Render Standby [Auto]

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

CPU Graphics Multi-Monitor [Disabled]

Allows you to enable the iGPU Multi-Monitor. For LucidLogix Virtu MVP function support, set this item to [Enabled] to empower both integrated and discrete graphics. The iGPU 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 [Auto]

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

NB PCI-E Configuration

Allows you to configure the NB PCI Express settings.

PCI-EX16_1 Link Speed [Auto]

Allows you to configure the PCI-EX16_1 speed.

Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

Memory Configuration

Memory Scrambler [Enabled]

Allows you to enable or disable Memory Scrambler support.

Memory Remap [Enabled]

Allows you to enable or disable remapping the memory above 4GB.

[Enabled]   Enables the function.

[Disabled]   Disables this function.

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]

[Enabled]   Enables the support for USB devices on legacy operating systems (OS).

[Disabled]   The USB devices can be used only for the BIOS setup program.

[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, USB7~14 [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 enhance the power saving feature of PCI Express and perform ASPM operations in the operating system. Configuration options: [Disabled] [Enabled]

The following item appears only when you set the PCI Express Native Power Management to **[Enabled]**.

Native ASPM [Disabled]

[Enabled]　　　Windows® Vista OS controls the ASPM (active state power management) support for devices.

[Disabled]　　　BIOS controls the ASPM support for the device.

PCH - PCI Express options

DMI Link ASPM Control [Disabled]

This item allows you to control the Active State Power Management on both NB (NorthBridge) side and SB (SouthBridge) side of the DMI Link.

Configuration options: [Disabled] [Enabled]

ASPM Support [Disabled]

This item allows you to select the ASPM state for energy-saving conditions.

Configuration options: [Disabled] [L0s] [L1] [L0sL1] [Auto]

SA - PCI Express options

DMI Link ASPM Control [Disabled]

This item allows you to control the Active State Power Management on both CPU and PCH (platform controller hub) Both DMI link ASPM control items of the CPU and PCH sides must be enabled for the ASPM to take effect.

Configuration options: [Disabled] [L0s] [L1] [L0sL1]

PEG ASPM Support [Disabled]

This item allows you to select the ASPM state for energy-saving conditions, or use the ASUS optimized energy saving profile.

Configuration options: [Disabled] [ASPM] [L0s] [L1] [L0sL1] [Auto]

2.6.7　　Onboard Devices Configuration

HD Audio Controller [Enabled]

[Enabled]　　　Enables the HD Audio Device.

[Disabled]　　　Disables the HD Audio Device.

The following item appears 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.

SupremeFX Lighting LED [Enabled]

Allows you to enable or disable the SupremeFX Lighting LED. Configuration options: [Enabled] [Disabled]

M.2 PCIe Mode Socket [Disabled]

Allows you to enable or disable the M.2 (PCIE Mode) socket.

[Enabled]   The bandwidth will be assigned to M.2 for add-on devices (PCIEX16_2 slot runs at X2 mode while PCIEX1_1 and PCIEX1_2 will be disabled).

[Disabled]   M.2 socket will be disabled.

PCI-Express x16_2 slot (Black) bandwidth [Auto]

Allows you to select the PCI-Express x16_2 slot bandwidth. Configuration options: [Auto] [x2 mode] [x4 mode]

Intel LAN Controller [Enabled]

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

Intel PXE Option ROM [Disabled]

This item only appears when the item Intel LAN Controller is set to [Enabled]. This item allows you to enable or disable the Intel PXE Option ROM. Configuration options: [Enabled] [Disabled]

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 [Enabled] 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]

2.6.8   APM

ErP Ready [Disabled]

Allows you to switch off some power at S4+S5 or S5 to get the system ready for ErP requirement. When set to **[Enabled]**, all other PME options will be switched off. Configuration options: [Disabled] [Enabled (S4+S5)] [Enabled (S5)]

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 Intel®/Realtek LAN device.

[Enabled]   Enables the PCI-E/PCI devices to generate a wake-on-LAN feature of the Intel®/Realtek LAN device.

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 PXE Support [Enabled]

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

Ipv6 PXE Support [Enabled]

This item allows user to disable or enable the Ipv6 PXE Boot support. Configuration options: [Disable Link] [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 Temperature, MB Temperature, VRM Temperature, PCH CORE Temperature, SENSOR Temperature [xxx°C/xxx°F] or [Ignore]

The onboard hardware monitor automatically detects and displays the CPU / motherboard / VRM / PCH CORE / SENSOR temperatures. Select **[Ignore]** if you do not wish to display the detected temperatures.

2.7.3 CPU Fan Speed, CPU Optional Fan Speed, Chassis Fan 1 / Chassis Fan 2 / Chassis Fan 3 Speed [xxxx RPM] or [Ignore] / [Monitor]

The onboard hardware monitor automatically detects and displays the CPU Fan Speed / CPU Optional Fan Speed / Chassis fan 1, 2, and 3 speeds in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A. Select Ignore if you do not wish to display the detected speed.

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. Select Ignore if you do not want to detect this item.

2.7.5   CPU Q-Fan Control [Auto]

[Auto]   Enables the CPU Q-Fan control for 4-pin CPU fan.

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

[PWM Mode]   Enable the CPU Q-Fan control in PWM mode for 4-pin CPU fan.

[DC Mode]   Enable the CPU Q-Fan control in DC mode for 3-pin CPU fan.

CPU Fan Speed Low Limit [300 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] [200RPM] [300 RPM] [400 RPM] [500 RPM] [600 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 <+> or <-> keys to adjust the upper limit of the CPU temperature. The values range from 25°C to 75°C.

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

Use the <+> or <-> keys to adjust the maximum CPU fan duty cycle. The values range from 20% to 100%. When the CPU temperature reaches the upper limit, the CPU fan operates at the maximum duty cycle.

CPU Middle Temperature [45]

Use the <+> or <-> keys to set the value for CPU Middle Temperature. The range of the values depends on the CPU installed.

CPU Fan Middle Duty Cycle(%) [60]

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

CPU Lower Temperature [40]

Use the <+> or <-> keys to adjust the CPU fan's lower temperature. The values range from 20% to 75%.

CPU Fan Min. Duty Cycle(%) [60]

Use the <+> or <-> keys to adjust the minimum CPU fan duty cycle. The values range from 20% to 100%. When the CPU temperature is under 20°C, the CPU fan operates at the minimum duty cycle.

2.7.6 Chassis Fan 1/ Chassis Fan 2 / Chassis Fan 3 Q-Fan Control [Enabled]

[Disabled]   Disables the Chassis fan 1/2/3/4 Q-Fan control feature.

[Enabled]   Enables the Chassis fan 1/2/3/4 Q-Fan control feature.

Chassis Fan 1/ Chassis Fan 2/ Chassis Fan 3 Q-Fan Source [CPU]

This item appears only when you enable the Chassis Fan Q-Fan Control feature and allows you to control the assigned fan according to the selected temperature source. When select T_SENSOR, plug a thermistor cable to T_SENSOR header and stick it to the desired component as the temperature source. Configuration options: [CPU] [MB] [VRM] [PCH CORE] [T_SENSOR]

Chassis Fan 1/ Chassis Fan 2/ Chassis Fan 3 Speed Low Limit [300 RPM]

This item appears only when you enable the Chassis Fan 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/ Chassis Fan 2/ Chassis Fan 3 Profile [Standard]

This item appears only when you enable the Chassis Fan 1/2/3/4 Q-Fan Control feature and allows you to set the appropriate performance level of the chassis fan 1/2/3/4.

[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 Chassis1/2 Fan Profile to [**Manual**].

Chassis Fan 1/2/3 Upper Temperature [70]

Use the <+> or <-> keys to adjust the upper limit of the chassis temperature. The values range from 40°C to 90°C.

Chassis Fan 1/2/3 Max. Duty Cycle(%) [100]

Use the <+> or <-> keys to adjust the maximum chassis fan duty cycle. The values range from 20% to 100%. When the chassis temperature reaches the upper limit, the chassis fan will operate at the maximum duty cycle.

Chassis Fan 1/2/3 Middle Temperature [45]

Use the <+> or <-> keys to set the value for Chassis Fan Middle Temperature.

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Chassis Fan 1/2/3 Middle Duty Cycle(%) [60]

Use the <+> or <-> keys to adjust the chassis fan middle duty cycle. The values range from 20% to 100%.

Chassis Fan 1/2/3 Lower Temperature [40]

Use the <+> or <-> keys to adjust the chassis fans' lower temperature. The values range from 20% to 75%.

Chassis Fan 1/2/3 Min. Duty Cycle(%) [60]

Use the <+> or <-> keys to adjust the minimum chassis fan duty cycle. The values range from 20% to 100%. When the chassis temperature is under 40°C, the chassis fan operates at the minimum duty cycle.

Allow Fan Stop [Disabled]

This item allows you to enable to disable fan stop. Configuration options: [Enabled] [Disabled]

2.7.7   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 four 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 In...]

[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 [Fast 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]   Adjust automatically for Windows® requrement.

[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 [Auto] or [Full Screen]. 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. Configuration options: [0 sec] ~ [10 sec].

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]

[Enabled]   Sets the power-on state of the NumLock to [Enabled].

[Disabled]   Sets the power-on state of the NumLock to [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 the 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]

This item allows you to decode the 64-bit capable devices above 4G address space. Ensure that your 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 Device 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 OPR...]

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 OPR...]

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 OPR...]

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 UE...]

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.

The following item appears when OS Type is set to [Windows UEFI mode].

Key Management

This item appears only when you set OS Type to [Windows UEFI mode]. It allows you to manage the Secure Boot keys.

Install Default Secure Boot keys

This item allows you to immediately load the default Security Boot keys, Platform key (PK), Key-exchange Key (KEK), Signature database (db), and Revoked Signatures (dbx). When the default Secure boot keys are loaded, the PK state will change from Unloaded mode to loaded mode.

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

Allows you to save the PK (Platform Keys) to a USB storage device.

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 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 KEK

This item allows you to delete the KEK from your system.

Configuration options: [Yes] [No]

Load Default KEK

Select Yes to load the system default KEK or select No to load a downloaded KEK from a USB storage device.

Append Default KEK

Select Yes to append the system default KEK or select No to append a downloaded KEK from a USB storage device.

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 or select No to load a downloaded db from a USB storage device..

Append Default db

Select Yes to append the system default db or select No to append a downloaded db from a USB storage device.

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 Default dbx

Select Yes to load the system default dbx or select No to load a downloaded dbx from a USB storage device.

Configuration options: [Yes] [No]

Append Default dbx

Select Yes to append the system default dbx or select No to append a downloaded dbx from a USB storage device.

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　Hard Drive BBS Priorities

Allows you to set the order of the legacy devices in this group.

2.8.13　Boot Override

These items displays the available devices. The number of device items that appear 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 Tool menu

The Tool menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.
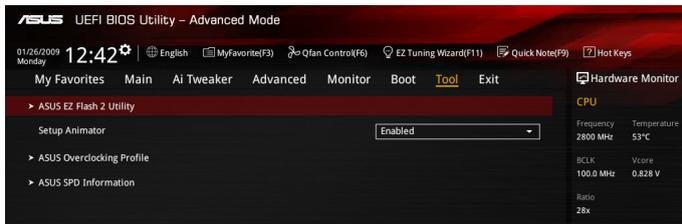
2.9.1 ASUS EZ Flash 2 Utility

Allows you to run ASUS EZ Flash 2. Press <Enter> to launch the ASUS EZ Flash 2 screen.

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

Setup Animator [Enabled]

This item allows you to enable or disable the Setup animator.

Configuration options: [Disabled] [Enabled]

2.9.2 ASUS Overclocking Profile

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

> The **Setup Profile Status** items show **Not Installed** if no profile is created.

Profile Name

Allows you to key in a profile name.

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**.

Load 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.

Load/Save CMOS Profile from/to USB Drive

Allows you to load/save CMOS profile from/to USB drive.

2.9.3 ASUS SPD Information

DIMM Slot # [Slot 1]

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. You can access the EZ Mode from the Exit menu.
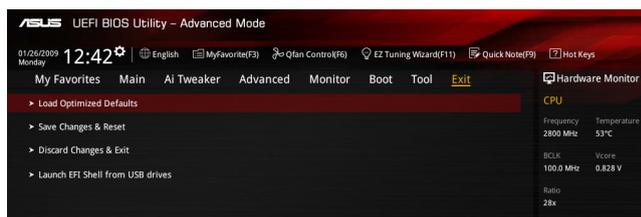
Load Optimized Defaults

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 filesystem device

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available devices that have a filesystem.

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.
Cut 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

情報処理装置等電波障害自主規制について
この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は家庭環境で使用されることを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

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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Support Fax   +49-2102-959911
Online support   http://www.asus.com/de/support/

Manufacturer:	ASUSTeK Computer Inc.
Address:	4F, No. 150, LI-TE RD., PEITOU, TAIPEI 112, TAIWAN
Authorised representative in Europe:	ASUS Computer GmbH
Address:	HARKORT STR. 21-23, 40880 RATINGEN, GERMANY

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 : H97-PRO GAMER

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 : ___Jun. 20, 2014___

Ver. 120601

EC Declaration of Conformity

We, the undersigned,

Manufacturer:	ASUSTeK COMPUTER INC.
Address:	4F, No. 150, LI-TE 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 :	**H97-PRO GAMER**

conform with the essential requirements of the following directives:

☒2004/108/EC-EMC Directive

☒ EN 55022:2010+AC:2011	☒ EN 55024:2010
☒ EN 61000-3-2:2006+A2:2009	☒ EN 61000-3-3:2008
☐ EN 55013:2001+A1:2003+A2:2006	☒ EN 55020:2007+A11:2011

☐1999/5/EC-R&TTE Directive

☐ EN 300 328 V1.7.1(2006-10)	☐ EN 301 489-1 V1.9.2(2011-09)
☐ EN 300 440-1 V1.6.1(2010-08)	☐ EN 301 489-3 V1.4.1(2002-08)
☐ EN 300 440-2 V1.4.1(2010-08)	☐ EN 301 489-4 V1.4.1(2009-05)
☐ EN 301 511 V9.0.2(2003-03)	☐ EN 301 489-7 V1.3.1(2005-11)
☐ EN 301 908-1 V5.2.1(2011-05)	☐ EN 301 489-9 V1.4.1(2007-11)
☐ EN 301 908-2 V5.2.1(2011-07)	☐ EN 301 489-17 V2.2.1(2012-09)
☐ EN 301 893 V1.6.1(2011-11)	☐ EN 301 489-24 V1.5.1(2010-09)
☐ EN 302 544-2 V1.1.1(2009-01)	☐ EN 302 326-2 V1.2.2(2007-06)
☐ EN 302 623 V1.1.1(2009-01)	☐ EN 302 326-3 V1.3.1(2007-09)
☐ EN 50360:2001	☐ EN 301 357-2 V1.4.1(2008-11)
☐ EN 62479:2010	☐ EN 302 291-1 V1.1.1(2005-07)
☐ EN 50385:2002	☐ EN 302 291-2 V1.1.1(2005-07)
☐ EN 62311:2008	

☒2006/95/EC-LVD Directive

☒ EN 60950-1 / A12:2011	☐ EN 60065:2002 / A12:2011

☐2009/125/EC-ErP Directive

☐ Regulation (EC) No. 1275/2008	☐ Regulation (EC) No. 278/2009
☐ Regulation (EC) No. 642/2009	☐ Regulation (EC) No. 617/2013

☒2011/65/EU-RoHS Directive Ver. 140331

☒CE marking

(EC conformity marking)

Position : **CEO**

Name : **Jerry Shen**

Signature : _____

Declaration Date: 20/06/2014

Year to begin affixing CE marking: 2014