TROOPER
H110 D3

Motherboard

E10638
First Edition
September 2015

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Contents

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

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

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product Introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: BIOS Information**

  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

- **Chapter 3: Software Support**

  This chapter describes the contents of the support DVD that comes with the motherboard package and the software.

Where to find more information

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

1. **ASUS websites**

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

2. **Optional documentation**

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

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.
<Key1> + <Key2> + <Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Package contents

Check your motherboard package for the following items.

Motherboard	ASUS TROOPER H110 D3 motherboard
Cables	2 x Serial ATA 6Gb/s cables
Accessories	1 x I/O Shield 1 x TUF inside sticker
Application DVD	Support DVD
Documentation	User manual 1 x TUF Certification card 1 x TUF 5-Year Warranty card (by region)

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

TROOPER H110 D3 specifications summary

CPU	LGA1151 socket for the 6th Generation Intel® Core™ i7/ i5/ i3/Pentium®/Celeron® Processors Supports 14nm CPU Supports Intel® Turbo Boost Technology 2.0* *** The Intel® Turbo Boost Technology 2.0 support depends on the CPU types.** **** Refer to www.asus.com for CPU support list.**
Chipset	Intel® H110 Express Chipset
Memory	2 x DIMM, max. 32GB, DDR3 1600/1333 MHz, non-ECC, un-buffered memory Dual-channel memory architecture Supports Intel® Extreme Memory Profile (XMP) *** To prevent system instability, either install DDR3L DIMMs or DDR3 DIMMs with voltage lower than 1.5V.** **** Refer to www.asus.com or this user manual for the Memory QVL (Qualified Vendors List).**
VGA	Integrated Graphics Processor - Intel® HD Graphics support Multi-VGA output support: DVI/D-sub port - Supports DVI with max. resolution 1920 x 1200@60Hz - Supports D-sub with max. resolution 1920 x 1200@60Hz Supports Intel® InTru™ 3D/Quick Sync Video/Clear Video HD Technology/Insider™ *** Maximum shared memory of 512MB.**
Expansion slots	1 x PCI Express 3.0/2.0 x16 slot 1 x PCI Express 2.0 x16 slot [black] (max. at x1 mode, compatible with PCIe x1 device) 1 x PCI Express 2.0 x16 slot [black] (max. at x2 mode, compatible with PCIe x1 and x2 devices) 2 x PCI Express 2.0 x1 slots

(continued on the next page)

TROOPER H110 D3 specifications summary

Storage	Intel® H110 Express Chipset with Intel Rapid Storage Technology 14 Support: - 4 x SATA 6Gb/s ports (black)
LAN	Realtek® 8111H Gigabit LAN controller
Audio	Realtek® ALC887 8-Channel High Definition Audio CODEC - Supports Jack-detection, Multi-streaming, and Front Panel Jack-retasking - Separate layer for left and right track, ensuring both sound deliver equal quality - LED-lit Audio Shielding: Ensures precision analog/digital separation and greatly reduced multi-lateral interference, with a gorgeous illuminated trace path
USB	Intel® H110 Express Chipset - supports ASUS USB 3.0 Boost - 2 x USB 3.0/2.0 ports at mid-board for front panel support - 2 x USB 3.0/2.0 ports at back panel (blue) - 6 x USB 2.0/1.1 ports (2 ports at mid-board, 4 ports at the back panel)
Exclusive TUF features	"Ultimate COOL!" Thermal Solution - TUF Thermal Radar Core "TUF ENGINE!" Power Design - 3+2 Digital Phase Power Design - TUF Components (TUF Cap, TUF Chokes & MOSFET; certified by military-standard) - ASUS DIGI + VRM "Safe & Stable!" Guardian Angel - TUF LANGuard - TUF ESD Guards 2
Other special features	- USB 3.0 Boost featuring speedy USB 3.0 transmission - Ai Charger - ASUS UEFI BIOS EZ Mode featuring friendly graphics user interface - AI Suite 3 - ASUS Q-Slot - ASUS Q-DIMM - ASUS CrashFree BIOS 3 - EZ Update - Disk Unlocker - ASUS EZ Flash 3 - Multi-language BIOS
Back panel I/O ports	1 x PS/2 keyboard port (purple) 1 x PS/2 mouse port (green) 1 x DVI-D port 1 x D-sub port 1 x LAN (RJ-45) port 2 x USB 3.0/2.0 ports (blue) 4 x USB 2.0/1.1 ports 8-channel audio I/O ports

(continued on the next page)

TROOPER H110 D3 specifications summary

Internal I/O connectors	1 x USB 3.0/2.0 connector supports additional 2 USB 3.0/2.0 ports (19-pin; beige) 1 x USB 2.0/1.1 connector supports additional 2 USB 2.0/1.1 ports (black) 4 x SATA 6Gb/s connectors (black) 1 x CPU fan connector (4-pin beige) for both 4-pin (PWM mode) and 3-pin (DC mode) CPU coolers control 2 x Chassis fan connectors (4-pin Black) Front panel audio connector (AAFP) 24-pin EATX Power connector 8-pin EATX 12V Power connector 1 x S/PDIF Out header 1 x 14-1 pin TPM header 1 x CPU OV jumper 1 x DRCT header 1 x Clear CMOS header 1 x COM port 1 x Chassis intrusion header
BIOS features	128 Mb Flash ROM, UEFI AMI BIOS, PnP, DMI3.0, WfM2.0, SM BIOS 3.0, ACPI 5.0, Multi-language BIOS, ASUS EZ Flash 3, ASUS CrashFree BIOS 3, My Favorites, Quick Note, Last Modified log, F12 PrintScreen, and ASUS DRAM SPD (Serial Presence Detect) memory information
Manageability	WfM 2.0, DMI 3.0, WOL by PME, PXE
Support DVD	Drivers Anti-virus software (OEM version) ASUS/TUF CPU-Z ASUS Utilities
Operating system support	Windows® 10 (64-bit) Windows® 8.1 (64-bit) Windows® 7 (64-bit/32-bit)
Form factor	ATX Form Factor, 12” x 7.8” (30.5cm x 19.8cm)

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 into it.

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

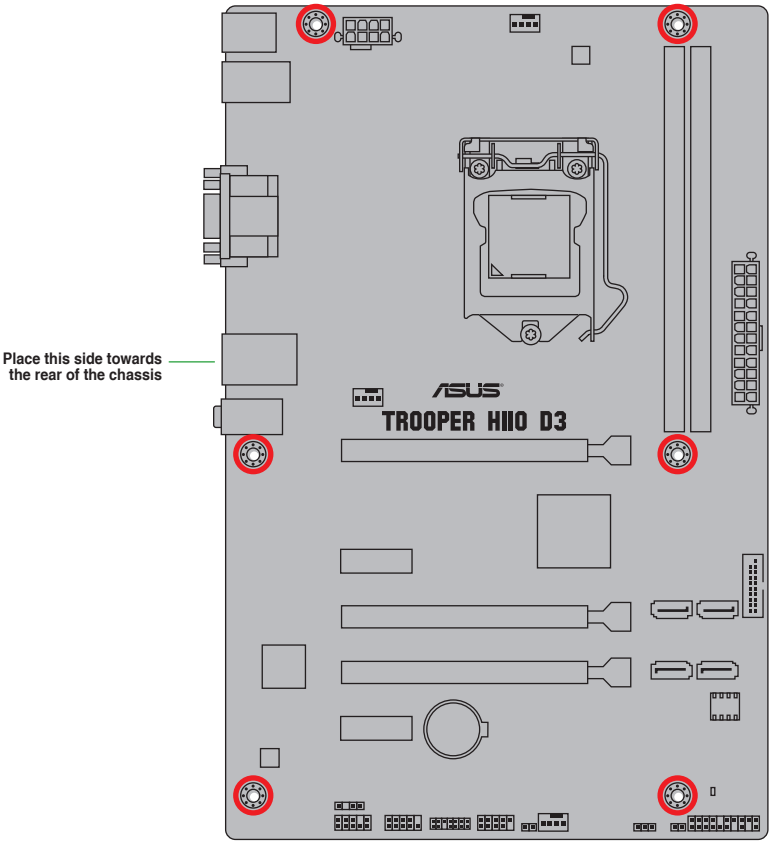
1.2.1 Placement direction

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

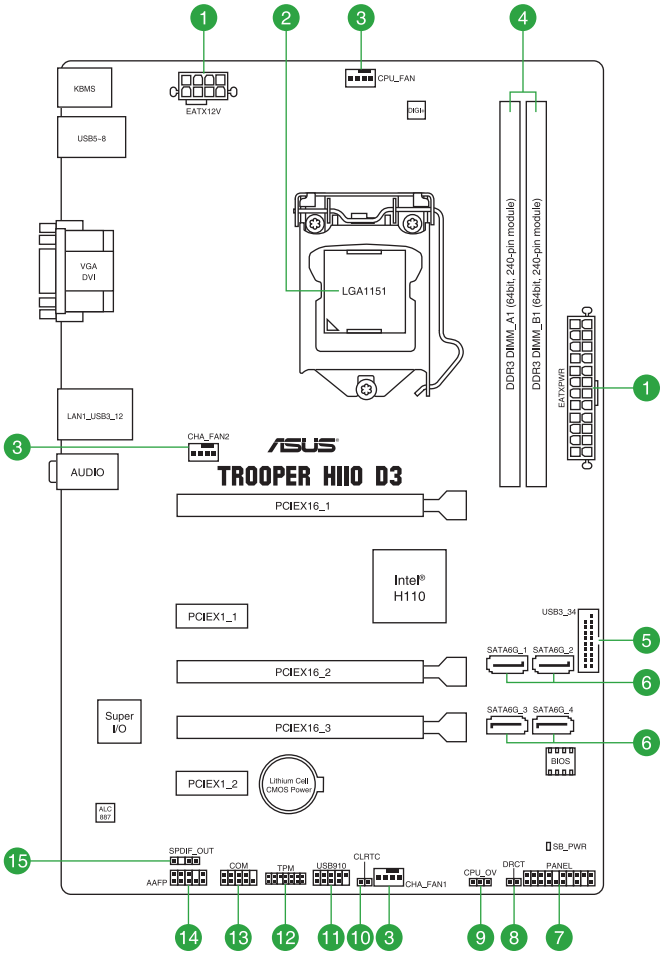
1.2.2 Screw holes

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

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



1.2.3 Motherboard layout

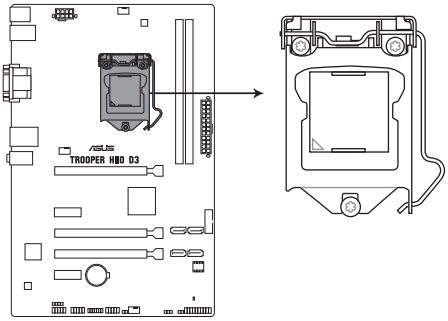


1.2.4 Layout contents

Connectors/Jumpers/Slots/LED		Page
1.	ATX power connectors (24-pin EATXPWR, 8-pin EATX12V)	1-25
2.	Intel® LGA1151 CPU socket	1-5
3.	CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN1-2)	1-23
4.	DDR3 DIMM slots	1-8
5.	USB 3.0 connector (20-1 pin USB3_34)	1-24
6.	Intel® H110 Serial ATA 6.0 Gb/s connector (SATA6G_1~4 [black])	1-26
7.	System panel connector (20-3 pin PANEL)	1-27
8.	Direct Connector (2 pin DRCT)	1-28
9.	CPU Over Voltage jumper (3-pin CPU_OV)	1-19
10.	Clear RTC RAM (2-pin CLRTC)	1-18
11.	USB 2.0 connector (10-1 pin USB910)	1-23
12.	TPM connector (14-1 pin TPM)	1-28
13.	Serial port connector (10-1 pin COM)	1-24
14.	Front panel audio connector (10-1 pin AAFP)	1-22
15.	Digital audio connector (4-1 pin SPDIF_OUT)	1-22

1.3 Central Processing Unit (CPU)

This motherboard comes with a surface mount LGA1151 socket designed for the 6th Generation Intel® Core™ i7/ i5/ i3/Pentium® and Celeron® processors.

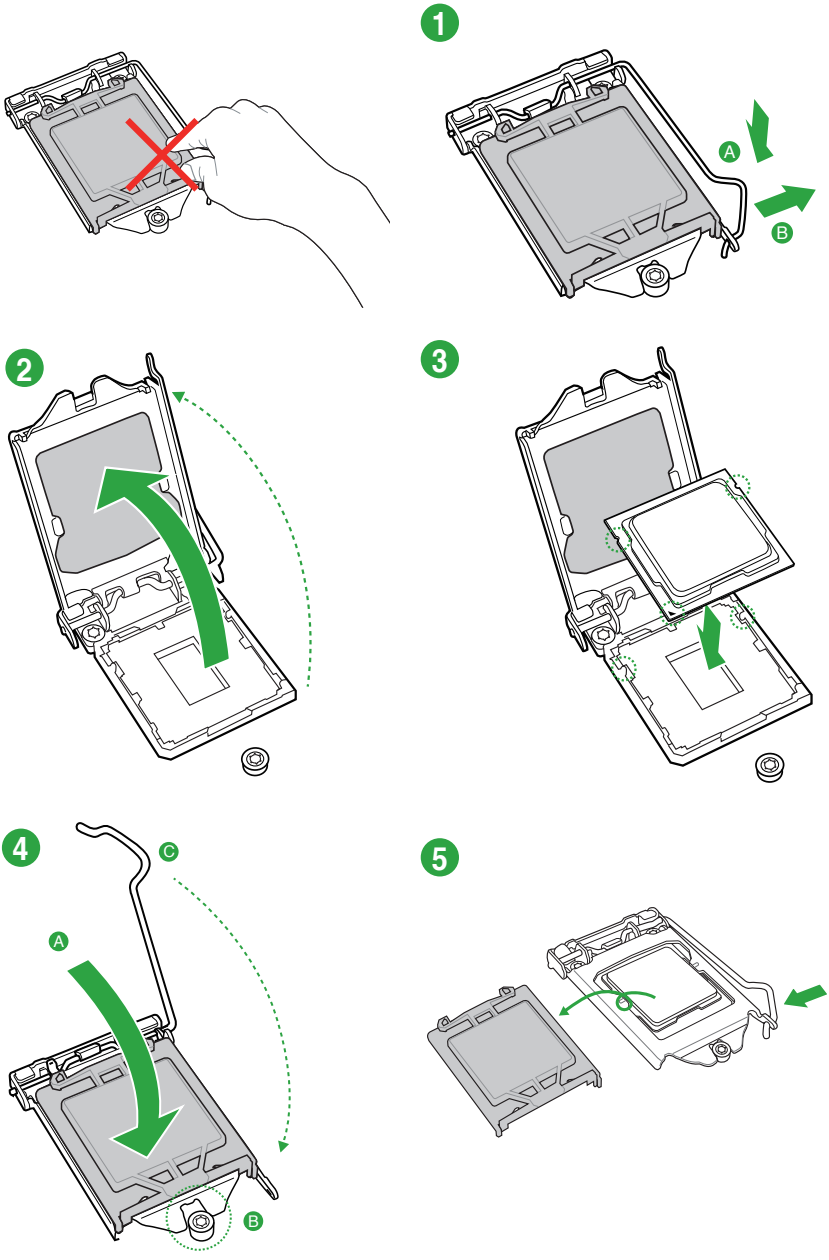


TROOPER H110 D3 CPU LGA1151

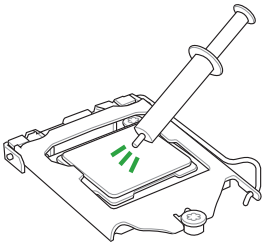
Unplug all power cables before installing the CPU.

- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
- 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 LGA1151 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

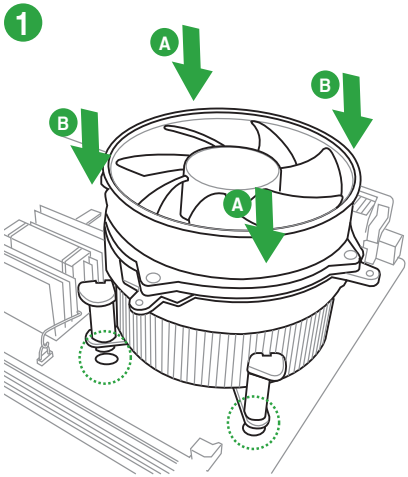


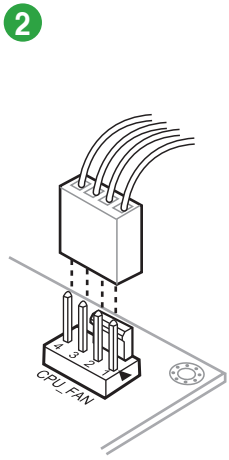
1.3.2 CPU heatsink and fan assembly installation

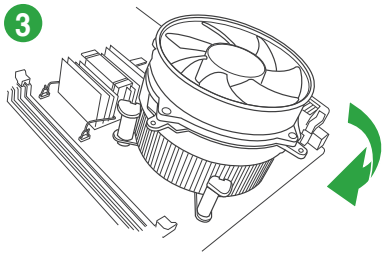


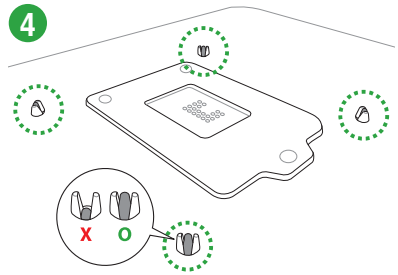
Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly:

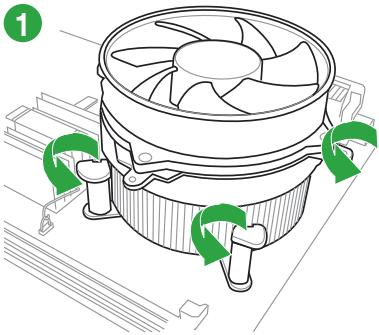


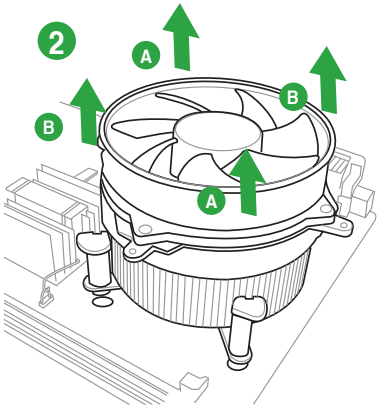






To uninstall the CPU heatsink and fan assembly:



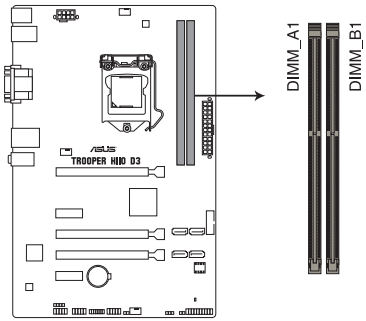


1.4 System memory

1.4.1 Overview

This motherboard comes with two 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.

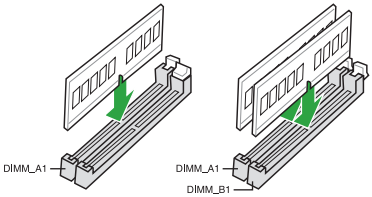
To prevent system instability, either install DDR3L DIMMs or DDR3 DIMMs with voltage lower than 1.5V



TROOPER H110 D3 240-pin DDR3 DIMM socket

Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

Recommended memory configurations



1.4.2 Memory configurations

You may install 1GB, 2GB, 4GB, 8GB, and 16GB unbuffered non-ECC DDR3 DIMMs into the DIMM sockets.

- You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.
- Always install DIMMs with the same CAS latency. For optimal compatibility, we recommend that you install memory modules of the same version or date code (D/C) from the same vendor. Check with the retailer to get the correct memory modules.
- Due to the memory address limitation on 32-bit Windows® OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following:

  - Use a maximum of 3GB system memory if you are using a 32-bit Windows® OS.

  - Install a 64-bit Windows® OS if you want to install 4GB or more on the motherboard.
- This motherboard does not support DIMMs made up of 512 megabits (Mb) chips or less.

Trooper H110 D3 Motherboard Qualified Vendors Lists (QVL)

DDR3 1866 (O.C.) MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								1	2
CORSAIR	CMD16GX3M2A1866C9 (Ver5.29)(XMP)	16GB (2x 8GB)	DS	-	-	1866 9-9-9-27	1.5	•	•
CORSAIR	CMD16GX3M4A1866C9 (Ver4.13)(XMP)	16GB (4x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMD16GX3M4A1866C9 (Ver8.16)(XMP)	16GB (4x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMD32GX3M4A1866C9 (Ver3.24)(XMP)	32GB (4x 8GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMD8GX3M2A1866C9 (Ver4.13) (XMP)	8GB (2x 4GB)	DS	-	-	-	1.5	•	•
CORSAIR	CMD8GX3M2A1866C9 (Ver5.12) (XMP)	8GB (2x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMD8GX3M2A1866C9 (Ver8.16) (XMP)	8GB (2x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMY16GX3M2A1866C9 (Ver 4.21)(XMP)	16GB (2x 8GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMY8GX3M2A1866C9 (Ver3.24) (XMP)	8GB (2x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMY8GX3M2C1866C10 (Ver4.19)(XMP)	8GB (2x 4GB)	DS	-	-	10-11-10-30	1.35	•	•
CORSAIR	CMZ16GX3M2A1866C10 (Ver5.29)(XMP)	16GB (2x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
CORSAIR	CMZ16GX3M2A1866C9 (XMP)	16GB (2x 8GB)	DS	-	-	1866-9-10-9-27	1.5	•	•
CORSAIR	CMZ32GX3M4X1866C10 (Ver3.23)(XMP)	32GB (4x 8GB)	DS	-	-	10-11-10-27	1.5		•
CORSAIR	CMZ8GX3M2A1866C9 (Ver8.16) (XMP)	8GB (2x 4GB)	DS	-	-	9-10-9-27	1.5	•	•
CORSAIR	CMZ8GX3M2A1866C9G (Ver5.12)(XMP)	8GB (2x 4GB)	DS	-	-	1866 9-10-9-27	1.5	•	•
crucial	BLE4G3D1869DE1TX0.16FKR (XMP)	4GB	DS	-	-	9-9-9-27	1.5	•	•
crucial	BLE8G3D1869DE1TX0.16FED (XMP)	16GB (2x 8GB)	DS	-	-	1866-9-9-9-27	1.5	•	•
crucial	BLS8G3D18ADS3.16FED	8GB	DS	-	-	10-10-10-30	1.5	•	•
crucial	BLT8G3D1869DT1TX0.16FED (XMP)	8GB	DS	-	-	9-9-9-27	1.5	•	•
G.SKILL	F3-14900CL10Q-32GBZL (XMP)	32GB (4x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
G.SKILL	F3-14900CL9Q-16GBZL (XMP)	16GB (4x 4GB)	DS	-	-	9-10-9-28	1.5	•	•
G.SKILL	F3-1866C10Q2-64GZM (XMP)	64GB (2x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
G.SKILL	F3-1866C10Q2-64GZM (XMP)	64GB (2x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
G.SKILL	F3-1866C9Q-32GXM (XMP)	32GB (4x 8GB)	DS	-	-	9-10-9-28	1.5	•	•
GeIL	GEEL316GB1866C9DC (XMP)	16GB (2x 8GB)	DS	-	-	1866-9-10-9-28	1.65	•	•
Kingston	HX318C10FWK2/16	16GB (2x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
Kingston	KHX1866C9D3K2/8GX (XMP)	8GB (2x 4GB)	DS	-	-	-	1.65	•	•
Kingston	KHX18C10AT3K8/64X (XMP)	64GB (8x 8GB)	DS	-	-	10-11-10-30	1.5	•	•
panram	PUD31866C94GPSB (XMP)	4GB	SS	-	-	11-11-11-28	1.65	•	•
Silicon Power	SP004GXLYU186NSA (XMP)	4GB	SS	-	-	1866-9-11-9-27	-	•	•
Silicon Power	SP008GXLYU186NSA (XMP)	8GB	DS	-	-	1866-9-11-9-27	-	•	•
Team	TED38GM1866C13BK	8GB	DS	Hynix	H5TQ4G83AFR	13-13-13-32	1.5	•	•
V-color	TD4G16C13-RD	4GB	DS	-	-	1866-13-13-13-32	1.5	•	•

DDR3 1600 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								1	2
ADATA	ADDU1600W4G11-B	4GB	SS	A-DATA	DWND-1211A	9-9-9-24	-	•	•
ADATA	ADDU1600W8G11-B	8GB	DS	ELPIDA	J4208EBBG-GN-F	9-9-9-24	-	•	•
ADATA	AX3U1600W4G9-DB (XMP)	8GB (2x 4GB)	SS	-	-	9-9-9-24	1.5	•	•
ADATA	AX3U1600W8G9-DB (XMP)	16GB (2x 8GB)	DS	-	-	9-9-9-24	1.5	•	•
AMD	AE32G1609U1-U	2GB	SS	AMD	23EY4587MB6H	-	1.5	•	•
AMD	AE34G1609U2-U	4GB	DS	AMD	23EY4587MB6H	-	1.5	•	•
AMD	AP38G1608U2K (XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-28	1.65	•	•
Apacer	78.B1GE3.9L10C	4GB	DS	Apacer	AM5D5908DEQSCK	-	1.65	•	•
Apacer	78.B1GET.9K00C	4GB	SS	Apacer	AM5D6008BQQSCK	11-11-11-28	-	•	•
Apacer	78.C1GET.9K10C	8GB	DS	Apacer	AM5D6008BQQSCK	11-11-11-31	-	•	•
Apacer	AHU04GFA60C9Q3R (XMP)	4GB	DS	-	-	11-11-11-28	-	•	•
Apacer	AHU08GFA60CBT3R (XMP)	8GB	DS	-	-	9-9-9-24	-	•	•
ASint	SLA302G08-EGN1C	4GB	DS	ASint	302G08-GN1C	-	-	•	•
ASint	SLA304G08-EGN6A	4GB	SS	ASint	304G08-GN6A	1600-11-11-11-28	1.5	•	•
ASint	SLA304G08-EGN6B	4GB	SS	ASint	304G08-GN6B	1600-11-11-11-28	1.5	•	•
ASint	SLA304G08-ENG1B	4GB	SS	Asint	304G08-GN1B	9-11-11-28	-	•	•
ASint	SLB304G08-EGJ1B (XMP)	8GB	DS	-	-	9-9-9-27	-	•	•
ASint	SLB304G08-EGN1B	8GB	DS	ASint	304G08-GN1B	-	-	•	•
ASint	SLZ302G08-EGN1C	2GB	SS	ASint	302G08-GN1C	-	-	•	•
AVEXIR	AVD3U16000904G-2CW (XMP)	8GB (2x 4GB)	DS	-	-	11-11-11-28	1.5	•	•
CORSAIR	CMD16GX3M2A1600C9 (Ver8.21)(XMP)	16GB (2x 8GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CMD8GX3M2A1600C8 (Ver5.12) (XMP)	8GB (2x 4GB)	DS	-	-	1600 8-8-8-24	1.5	•	•
CORSAIR	CMD8GX3M2A1600C9 (Ver2.12) (XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CML16GX3M2A1600C10 (Ver2.21)(XMP)	16GB (2x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
CORSAIR	CML8GX3M2A1600C9 (Ver7.12) (XMP)	8GB (2x 4GB)	DS	-	-	9-9-9- 24	1.5	•	•
CORSAIR	CMV2GX3M1C1600C11	2GB	SS	-	-	11-11-11-28	-	•	•
CORSAIR	CMV4GX3M1C1600C11	4GB	SS	-	-	11-11-11-28	-	•	•
CORSAIR	CMV8GX3M1A1600C11	8GB	DS	-	-	11-11-11-30	-	•	•
CORSAIR	CMV8GX3M1C1600C11	8GB	DS	-	-	11-11-11-28	-	•	•
CORSAIR	CMX8GX3M2A1600C9 (Ver3.19) (XMP)	8GB (2x 4GB)	SS	-	-	9-9-9-24	1.65	•	•
CORSAIR	CMY8GX3M2C1600C9 (Ver4.19)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.35	•	•
CORSAIR	CMZ16GX3M2A1600C10 (Ver.3.24)(XMP)	16GB (2x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
CORSAIR	CMZ16GX3M4X1600C9 (Ver8.16)(XMP)	16GB (4x 4GB)	DS	-	-	1600-9-9-9-24	1.5	•	•
CORSAIR	CMZ32GX3M4X1600C10 (Ver2.2)(XMP)	32GB (4x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
CORSAIR	CMZ4GX3M1A1600C9 (Ver8.16) (XMP)	4GB (1x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CMZ8GX3M1A1600C10 (Ver3.23)(XMP)	8GB (1x 8GB)	DS	-	-	10-10-10-27	1.5	•	•

(continued on the next page)

DDR3 1600 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								1	2
CORSAIR	CMZ8GX3M1A1600C10 (Ver8.21)(XMP)	8GB (1x 8GB)	DS	-	-	10-10-10-27	1.5	•	•
crucial	BLS4G3D1609DS1S00.16FMR (XMP)	4GB	DS	-	-	1600-9-9-9-24	1.5	•	•
crucial	CT102464BA160B.C16FED	8GB	DS	crucial	CT512X8-160B	11-11-11-28	-	•	•
G.SKILL	F3-1600C9Q-32GXM (XMP)	32GB (4x 8GB)	DS	-	-	-	1.5	•	•
KINGMAX	FLGE85F-B6SZB	2GB	SS	Samsung	K4B2G1646Q-BCMA	9-9-9-24	-	•	
KINGMAX	FLGF65F-C6HGB	4GB	SS	SK Hynix	H5TC4G63AFRPBA	11-11-11-28	-	•	•
Kingston	HX316C10FRK2/16	16GB (2x 8GB)	DS	-	-	10-10-10-30	1.5	•	•
Kingston	KHX16009CD3K2/8GX (XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-27	1.65	•	•
Kingston	KHX1600C9D3B1/4G (XMP)	4GB	SS	-	-	9-9-9-27	1.65	•	•
Kingston	KHX1600C9D3K4/16GX (XMP)	16GB (4x 4GB)	DS	-	-	9-9-9-24	1.65	•	•
Kingston	KHX1600C9D3LK2/8GX (XMP)	8GB (2x 4GB)	DS	-	-	9-9-9-24	1.35	•	•
Kingston	KHX16C10B1K2/16X (XMP)	16GB (2x 8GB)	DS	-	-	-	1.5	•	•
Kingston	KHX16C9K2/16	16GB (2x 8GB)	DS	-	-	1333-9-9-9-24	1.5	•	•
Kingston	KHX16C9P1K2/16	16GB (2x 8GB)	DS	-	-	-	1.5	•	•
Kingston	KVR13N9S6/2	2GB	SS	Kingston	D2516EC48XGGB	9-9-9-24	1.5	•	•
Kingston	KVR16LN11/4(註)	4GB	SS	Kingston	D5128EC4BPGGBU	11-11-11-28	1.35	•	•
Kingston	KVR16LN11/8	8GB	DS	Kingston	D5128EETBPGGBU	11-11-11-28	1.35	•	•
Kingston	KVR16N11/4	4GB	DS	Kingston	D2568JPUCPGGBU	11-11-11-28-1	-	•	•
Kingston	KVR16N11/4	4G	DS	SK Hynix	H5TQ2G83CFRPBC	-	1.5	•	•
Kingston	KVR16N11S6/2	2GB	SS	Kingston	D2516EC4BXGGB	11-11-11-28	1.5	•	•
Kingston	KVR16N11S6A/2-SP(註)	2GB	SS	Kingston	D2568JC98PGGBS	11-11-11-28	1.5	•	•
Micron	MT16JTF1G64AZ-1G6E1	8GB	DS	Micron	D9QBJ	-	-	•	•
Micron	MT16KTF2G64AZ-1G6A1	16GB	DS	Micron	D9STP	11-11-11-28	-	•	•
Micron	MT8JTF51264AZ-1G6E1	4GB	SS	Micron	D9QBJ	-	-	•	•
Micron	MT8KTF25664AZ-1G6M1	2GB	SS	Micron	D9PFJ	-	-	•	•
MIRA	PLAF8L93B-GN2	8GB	DS	-	BJE159C3G-M	11-11-11-28	1.5	•	•
panram	PUD31600C114GPSB	4GB	SS	-	-	11-11-11-28	1.5	•	•
panram	PUD31600C118GPSB	8GB	DS	-	-	11-11-11-28	1.5	•	•
PATRIOT	PV316G160C9K (XMP)	16GB (2x 4GB)	SS	-	-	1600-9-9-9-24	1.5	•	•
PATRIOT	PV316G160C9K (XMP)	16GB (2x 8GB)	SS	-	-	1600-9-9-9-24	1.5	•	•
SanMax	SMD-4G28N1P-16KM	4GB	SS	ELPIDA	J4208BBBG-GN-F	1600	-	•	•
SanMax	SMD-4G68NG-16KK	4GB	DS	ELPIDA	J2108BDBG-GN-F	-	-	•	•
SanMax	SMD-8G28NP-16KM	8GB	DS	ELPIDA	J4208BBBG-GN-F	1600	-	•	•
Silicon Power	SP002GBLTU160V02 (XMP)	2GB	SS	S-POWER	20YT5NG	9-11-11-28	1.5	•	•
Silicon Power	SP004GBLTU160V02 (XMP)	4GB	DS	S-POWER	20YT5NG	9-9-9-24	1.5	•	•
Silicon Power	SP004GXLYU160NSA (XMP)	4GB	SS	-	-	1600-9-9-9-27	-	•	•

(continued on the next page)

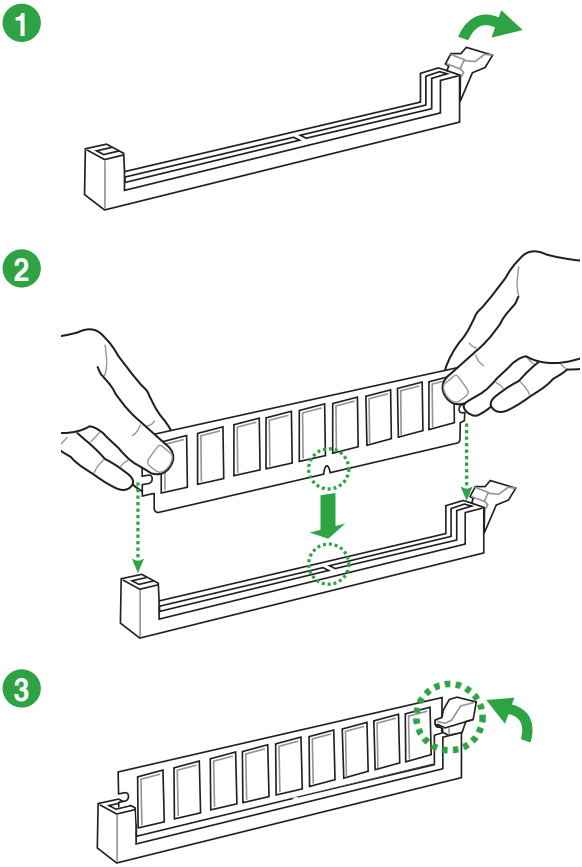
DDR3 1600 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								1	2
Silicon Power	SP008GXLYU160NSA (XMP)	8GB	DS	-	-	1600-9-9-9-27	-	•	•
SK Hynix	HMT41GU6AFR8A-PB	8GB	DS	SK Hynix	H5TC4G83AFR	1600-11-11-11-28-1	-	•	•
SK Hynix	HMT41GU6BFR8A-PB	8GB	DS	SK Hynix	H5TC4G83BFRPBA	11-11-11-28	-	•	•
SK Hynix	HMT451U6AFR8A-PB	4GB	SS	SK Hynix	H5TC4G83AFR	1600-11-11-11-28-1	-	•	•
SK Hynix	HMT451U6AFR8A-PB	4GB	SS	SK Hynix	H5TC4G83AFR	1600-11-11-11-28-1	-	•	•
SK Hynix	HMT451U6BFR8A-PB	4GB	SS	SK Hynix	H5TC4G83BFRPBA	11-11-11-28	-	•	•
Team	TED34G1600C11BK	4GB	SS	Team	T3D5128HT-16	11-11-11-28	1.5	•	•
Team	TED38G1600C11BK	8GB	SS	Team	T3D10248HT-16D4	11-11-11-28	1.5	•	•
Team	TLD38G1600HC9BK (XMP)	8GB	DS	-	-	9-9-9-24	1.5	•	•
UMAX	84E44G93UM-16BPSYW	4GB	SS	UMAX	U2S96D30TP-16	1600-11-11-11-28	-	•	•
UMAX	84E48G93UM-16BPSYW	8GB	DS	UMAX	U2S96D30TP-16	1600-11-11-11-28	-	•	•
V-color	TD4G8C11-H11	4GB	SS	SK Hynix	H5TQ4G83AFR	11-11-11-28	-	•	•

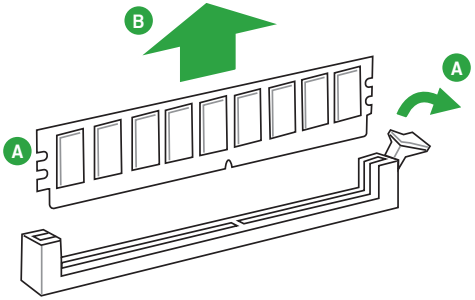
DDR3 1333 MHz capability

Vendors	Part No.	Size	SS/DS	Chip Brand	Chip NO.	Timing	Voltage	DIMM socket support (Optional)	
								1	2
AMD	AE32G1339U1-U	2GB	SS	AMD	23EY4587MB3H	-	1.5	•	•
AMD	AE34G1339U2-U	4GB	DS	AMD	23EY4587MB3H	-	1.5	•	•
ASint	SLA302G08-EDJ1C	2GB	SS	ASint	302G08-DJ1C	-	-	•	•
ASint	SLA304G08-EDJ1B	4GB	SS	Asint	304G08-DJ1B	9-10-10-26	-	•	•
ASint	SLA304G08-EDJ6A	4GB	SS	ASint	304G08-DJ6A	1333-9-9-9-24	1.5	•	•
ASint	SLA304G08-EDJ6B	4GB	SS	ASint	304G08-DJ6B	1333-9-9-9-24	1.5	•	•
ASint	SLB304G08-EDJ1B	8GB	DS	Asint	304G08-DJ1B	9-9-9-24	-	•	•
CORSAIR	CMV8GX3M1A1333C9	8GB	DS	-	-	9-9-9-24	-	•	•
CORSAIR	CMV8GX3M2A1333C9	8GB (2x 4GB)	DS	-	N/A	9-9-9-24	-	•	•
CORSAIR	CMX4GX3M1A1333C9 (Ver2.12)	4GB (1x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
CORSAIR	CMX4GX3M1A1333C9 (Ver5.11)	4GB (1x 4GB)	DS	-	-	9-9-9-24	1.5	•	•
innodisk	M3UN-2GHJBC09	2GB	SS	Hynix	H5TQ2G83CFRH9C	9-9-9-24	-	•	•
innodisk	M3UN-4GHJAC09	4GB	DS	Hynix	H5TQ2G83CFRH9C	9-9-9-24	-	•	•
Kingston	KVR1333D3N9H/4G	4GB	DS	ELPIDA	J2108BDBG-GN-F	-	1.5	•	•
Kingston	KVR13N9S8H/4	4GB	SS	ELPIDA	J4208BBBG-GN-F	-	1.5	•	•
MACH XTREME	MXD3U133316GQ	16GB (4x 4GB)	DS	-	-	-	-	•	•
MACH XTREME	MXD3V13332GS	2GB	SS	Mach Xtreme	C2S46D30-D313	-	-	•	•
Silicon Power	SP002GBLTU133V02	2GB	SS	S-POWER	20YT3NG	9-9-9-24	-		•
Silicon Power	SP004GBLTU133V02	4GB	DS	S-POWER	20YT3NG	9-9-9-24	-	•	•
UMAX	84E44G93UM-13BPSYW	4GB	SS	UMAX	U2S96D30TP-13	1333-9-9-9-24	-	•	•
UMAX	84E48G93UM-13BPSYW	8GB	DS	UMAX	U2S96D30TP-13	1333-9-9-9-24	-	•	•

1.4.3 Installing a DIMM



To remove a DIMM



1.5 Expansion slots

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

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

1.5.1 Installing an expansion card

To install an expansion card:

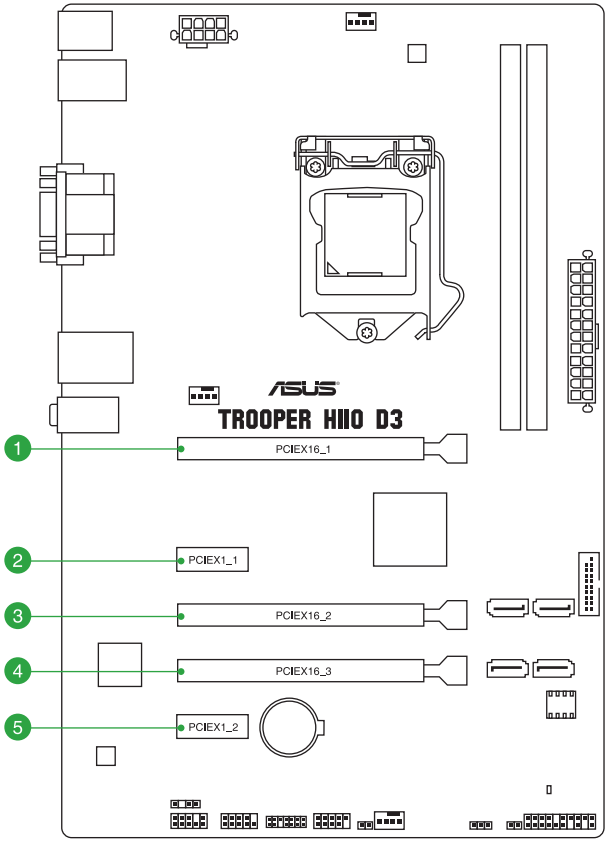
1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw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

1.5.2 Configuring an expansion card

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

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

1.5.3 PCI Express 3.0 / 2.0 slots



Slot No.	Expansion slot
1	PCIe 3.0/2.0 x16_1 slot
2	PCIe 2.0 x1_1 slot
3	PCIe 2.0 x16_2 slot
4	PCIe 2.0 x16_3 slot
5	PCIe 2.0 x1_2 slot

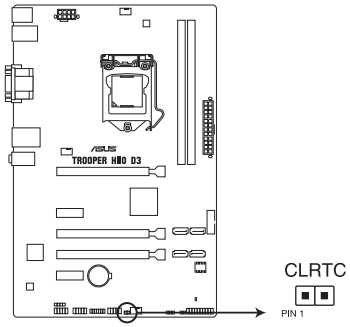
IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
LAN	shared	-	-	-	-	-	-	-
PCIe 3.0/2.0 x16_1	shared	-	-	-		-	-	-
PCIe 2.0 x16_2	-	-	-	shared	-	-	-	-
PCIe 2.0 x16_3	shared	-	-	-	-	-	-	-
PCIe 2.0 x1_1	-	shared	-	-	-	-	-	-
PCIe 2.0 x1_2	-	-	shared	-	-	-	-	-
Intel PCH SATA Controller	shared	-	-	-	-	-	-	-
HD Audio	shared	-	-	-	-	-		
USB 3.0	shared	-	-	-	-			-

1.6 Jumpers

1. Clear RTC RAM (2-pin CLRTC)

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



TROOPER H110 D3 Clear RTC RAM

To erase the RTC RAM:

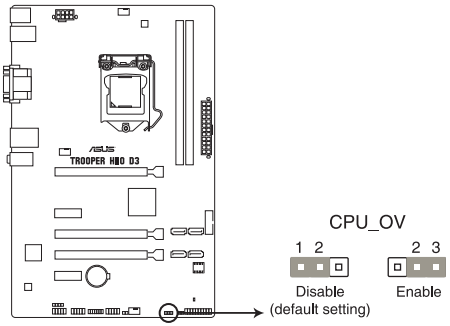
1. Turn OFF the computer and unplug the power cord.
2. Use a metal object such as a screwdriver to short the two pins.
3. Plug the power cord and turn ON the computer.
4. Hold down the <**Del**> key during the boot process and enter BIOS setup to re-enter data.

Except when clearing the RTC RAM, never short-circuit the CLRTC jumper. Shorting the CLRTC jumper will cause system boot failure!

- If the steps above do not help, remove the onboard battery and short the two pins again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R.) feature. Shut down and reboot the system, then the BIOS automatically resets parameter settings to default values.
- Due to chipset behavior, AC power off is required to enable C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before rebooting the system.

2. CPU Over Voltage jumper (3-pin CPU_OV)

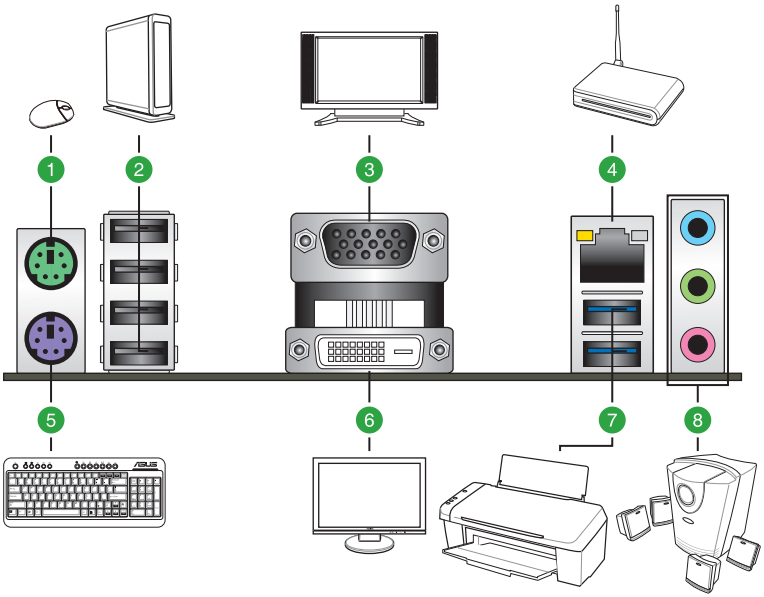
The CPU Over Voltage jumper allows you to set a higher CPU voltage for a flexible overclocking system, depending on the type of the installed CPU. To gain more CPU voltage setting, insert the jumper to pins 2-3. To go back to its default CPU voltage setting, insert the jumper to pins 1-2.



TROOPER H110 D3 CPU_OV setting

1.7 Connectors

1.7.1 Rear panel connectors



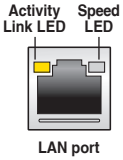
Rear panel connectors			
1.	PS/2 mouse port (green)	5.	PS/2 keyboard port (purple)
2.	USB 2.0 ports 5~8	6.	DVI-D port
3.	VGA port	7.	LAN_USB3_12 (supports USB 3.0 Boost)
4.	LAN port*	8.	Audio I/O ports**

*** and **: Refer to the tables on the next page for LAN port LEDs and audio port definitions.**

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

*LAN port LED indications

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



**Audio 2.1, 4.1, 5.1 or 7.1-channel configuration

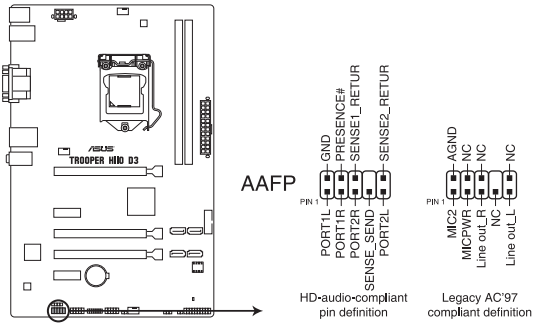
Port	Headset 2.1-channel	4.1-channel	5.1-channel	7.1-channel
Light Blue (Rear panel)	Line In	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Lime (Rear panel)	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink (Rear panel)	Mic In	Mic In	Bass/Center	Bass/Center
Lime (Front panel)	—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

For an 8-channel speaker setup, refer to the 7.1-channel configuration in the table.

1.7.2 Internal connectors

1. 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.

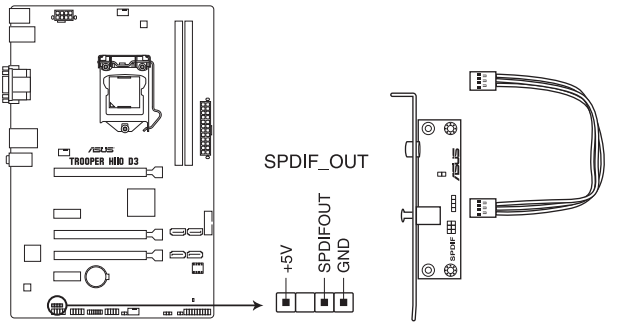


TROOPER H110 D3 Analog front panel connector

- 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 Audio]. 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 Audio].

2. 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.

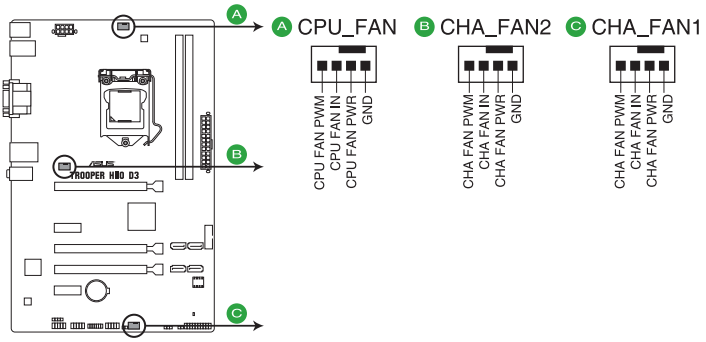


TROOPER H110 D3 Digital audio connector

The S/PDIF module is purchased separately.

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

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

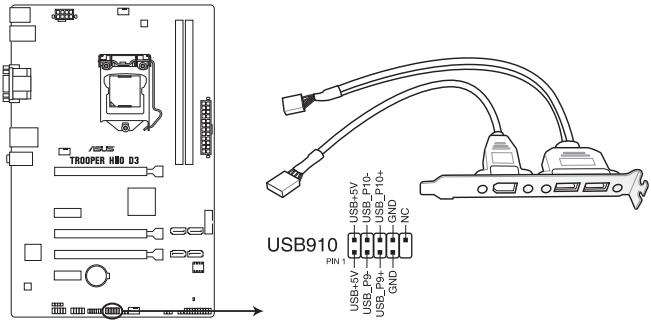


TROOPER H110 D3 Fan connectors

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 1A (12W) fan power.

4. USB 2.0 connector (10-1 pin USB910)

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.



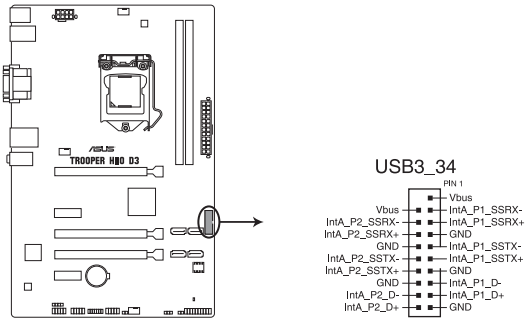
TROOPER H110 D3 USB2.0 connectors

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

The USB 2.0 module is purchased separately.

5. USB 3.0 connector (20-1 pin USB3_34)

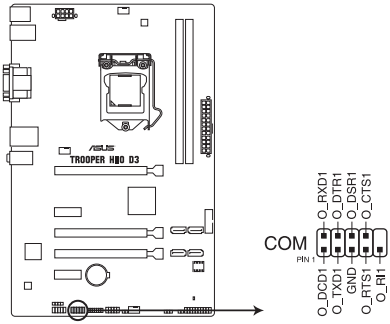
These connectors allow you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds of up to 5Gbps, faster charging time for USB-chargeable devices, optimized power efficiency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



TROOPER H110 D3 USB3.0 connector

6. 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.

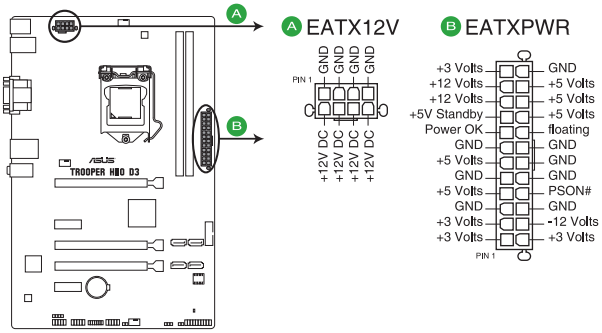


TROOPER H110 D3 Serial port connector

The COM module is purchased separately.

7. 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.

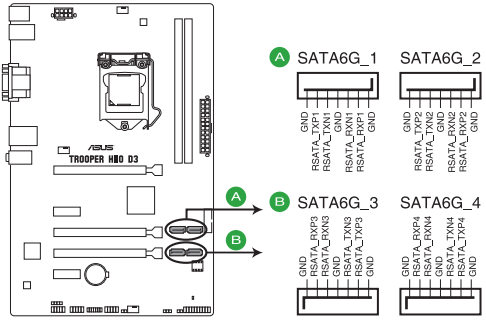


TROOPER H110 D3 ATX power connectors

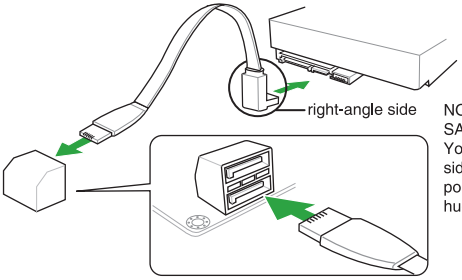
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V specification 2.4 (or later version) and provides a minimum power of 350W.
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices 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.

8. Intel® H110 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G_1-4 [black])

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



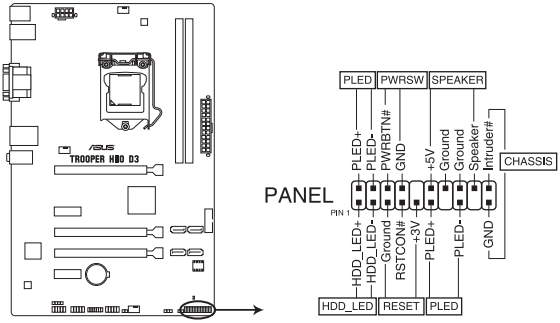
TROOPER H110 D3 Intel® SATA 6 Gb/s connectors



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.

9. System panel connector (20-3 pin PANEL)

This connector supports several chassis-mounted functions.



TROOPER H110 D3 System panel connector

- **System power LED (3-1 pin or 2-pin PLED)**

  This 3-1 pin or 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.

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

  This connector is for the system power button.

- **Reset button (3-pin RESET)**

  This 3-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

- **Speaker connector (4-pin SPEAKER)**

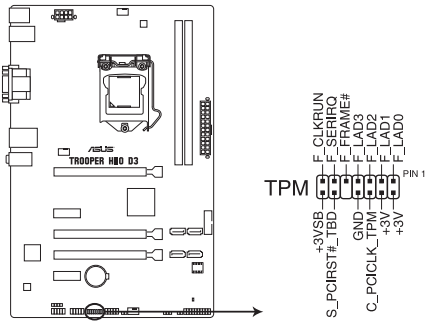
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **Chassis intrusion connector (2-pin CHASSIS)**

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

10. TPM connector (14-1 pin TPM)

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

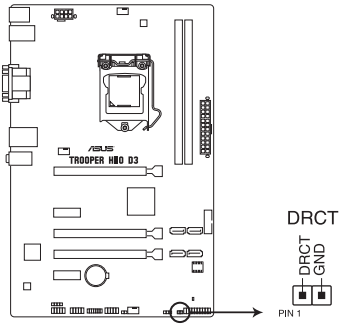


TROOPER H110 D3 TPM connector

The TPM module is purchased separately.

11. Direct Connector (2 pin DRCT)

This connector is for the chassis-mounted button that supports the DirectKey function. Connect the button cable that supports DirectKey, from the chassis to this connector on the motherboard.



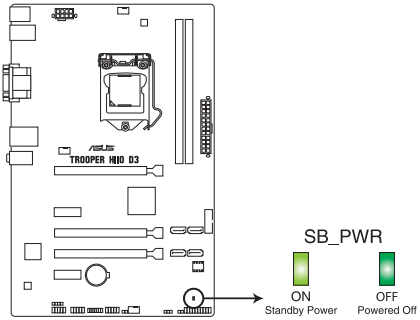
TROOPER H110 D3 DRCT connector

Ensure that your chassis comes with the button cable that supports the DirectKey feature. Refer to technical documentation that came with the chassis for details.

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.



TROOPER H110 D3 Standby Power LED

BIOS Information

2

2.1 Managing and updating your BIOS

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

2.1.1 EZ Update

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

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

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

2.1.2 ASUS EZ Flash 3

ASUS EZ Flash 3 allows you to download and update to the latest BIOS through the Internet without having to use a bootable floppy disk or an OS-based utility.

Updating through the Internet varies per region and Internet conditions. Check your local Internet connection before updating through the Internet.

To update the BIOS by USB:

1. Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select **ASUS EZ Flash 3 Utility** and press <Enter>.
2. Insert the USB flash disk that contains the latest BIOS file to the USB port.
3. Select **Storage Device**.

4. Press <Tab> to switch to the Drive field.
5. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
6. Press <Tab> to switch to the Folder Info field.
7. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.

- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent 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. See section **2.10 Exit Menu** for details.

To update the BIOS by Internet:

1. Enter the Advanced Mode of the BIOS setup program. Go to the Tool menu to select **ASUS EZ Flash Utility** and press <Enter>.
2. Select **via Internet**.

3. Press the Left/Right arrow keys to select an Internet connection method, and then press <Enter>.

4. Follow the onscreen instructions to complete the update.
5. Reboot the system when the update process is done.

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu. See section **2.10 Exit Menu** for details.

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 **H110TP.CAP**.
- The BIOS file in the support DVD may not be the latest version. Download the latest BIOS file from the ASUS website at www.asus.com.

Recovering the BIOS

To recover the BIOS:

1. Turn on the system.
2. Insert the support DVD to the optical drive or the USB flash drive that contains the BIOS file to the USB port.
3. The utility automatically checks the devices for the BIOS file. When found, the utility reads the BIOS file and enters ASUS EZ Flash 3 utility automatically.
4. The system requires you to enter BIOS Setup to recover BIOS settings. To ensure system compatibility and stability, we recommend that you press <F5> to load default BIOS values.

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

2.1.4 ASUS BIOS Updater

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

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

Before updating BIOS

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

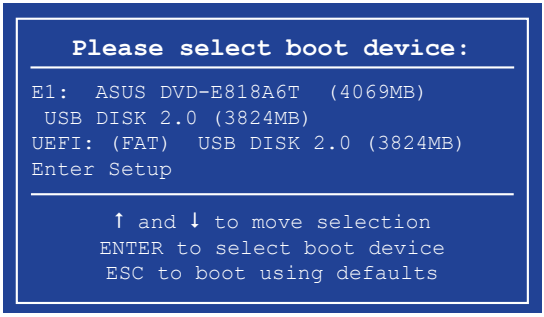
NTFS is not supported under FreeDOS environment. Ensure that your USB flash drive is in single partition and in FAT32/16 format.

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

Booting the system in DOS environment

To boot the system in DOS:

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



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

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

5. On the FreeDOS prompt, type **d:** then press <Enter> to switch the disk from Drive C (optical drive) to Drive D (USB flash drive).

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

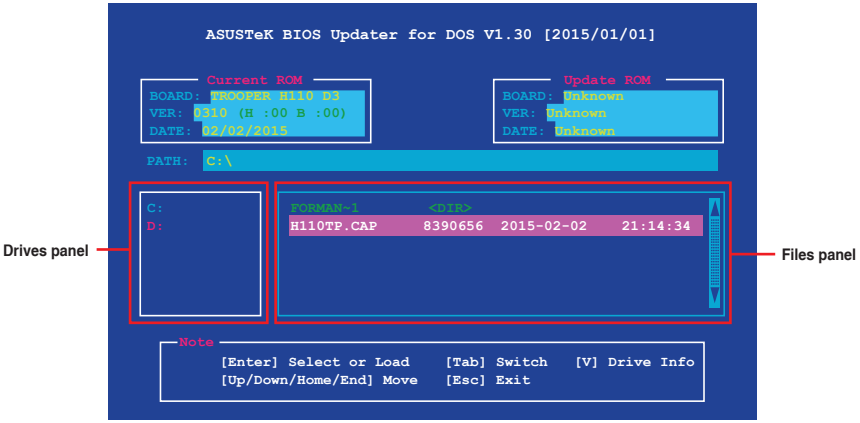
Updating the BIOS file

To update the BIOS file:

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

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

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



3. Press <Tab> to switch from Drives panel to Files panel then press <Up/Down> or <Home/End> keys to select the BIOS file and press <Enter>.

4. After the BIOS Updater checks the selected BIOS file, select **Yes** to confirm the BIOS update.

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

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

6. Restart your computer.

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

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** BIOS menu.

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**> or <**F2**> during the Power-On Self Test (POST). If you do not press <**Delete**> or <**F2**>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+<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 purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website at **www.asus.com** to download the latest BIOS file for this motherboard.
- 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**>.
- If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value. See section **1.6 Jumpers** for information on how to erase the RTC RAM.

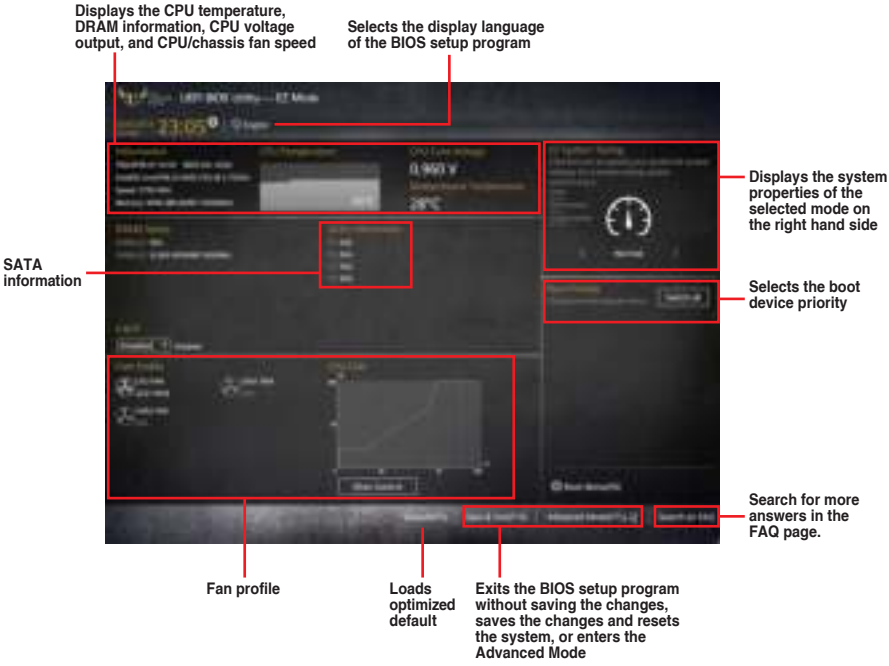
BIOS menu screen

The BIOS setup program can be used under two modes: **EZ Mode** and **Advanced Mode**. 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, click **Advanced Mode** or press <**F7**> for the advanced BIOS settings.

The default screen for entering the BIOS setup program can be changed.

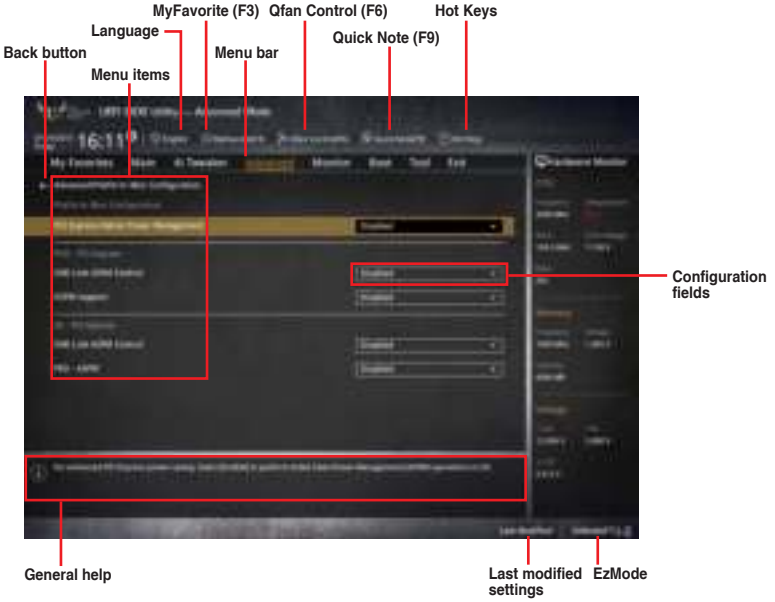


- The boot device options vary depending on the devices you installed to the system.
- The **Boot Menu (F8)** button is available only when the boot device is installed to the system.

Advanced Mode

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

To access the EZ Mode, click **EzMode** or press <**F7**>.



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

2.3 My Favorites

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

My Favorites comes with several performance, power saving, and fast boot related items by default. You can personalize this screen by adding or removing items.

Adding items to My Favorites

To add frequently-used BIOS items to My Favorites:

1. Press <F3> on your keyboard or click [redacted] to open Setup Tree Map screen.
2. On the Setup Tree Map screen, select the BIOS items that you want to save in My Favorites screen then click the plus sign ("+") to save it in My Favorites screen.

You cannot add the following items to My Favorite items:

- Items with sub-menu options.
- User-managed items such as language and boot order.
- Configuration items such as Memory SPD Information, system time and date.

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

2.4 Main menu

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

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

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.

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.

2.7 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings. Scroll down on the menu to display more items.

2.8 Boot menu

The Boot menu items allow you to change the system boot options. Scroll down on the menu to display more items.

2.9 Tool menu

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

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.

Software Support

3

3.1 Support DVD information

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

3.1.1 Running the support DVD

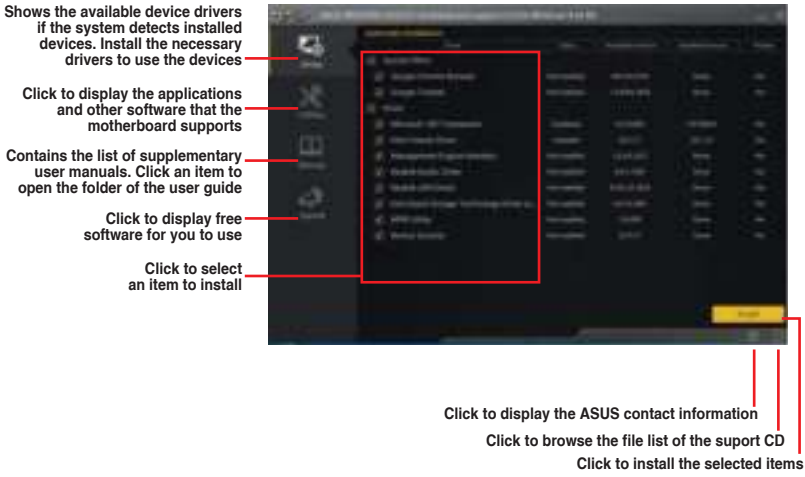
Ensure that you have an Administrator account before running the support DVD in Windows® 7, Windows® 8, Windows® 8.1, or Windows® 10 OS.

To run the support DVD:

1. Place the Support DVD into the optical drive.
2. In the **AutoPlay** dialog box, click **Run Instv2.exe**.

If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file **SETUP.EXE**. Double-click to run the support DVD.

Support DVD main menu



3.1.2 Obtaining the software manuals

The software manuals are included in the support DVD. Follow the instructions below to get the necessary software manuals.

The software manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the **Utilities** tab before opening the files.

To read about your motherboard's software manual:

1. Run the Support DVD.
2. In the Support DVD main menu, click the **Manual** tab.
3. Click the software manual that you wish to read.

3.2 Software information

Most of the applications in the support DVD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software application for more information.

3.3 AI Suite 3

AI Suite 3 is an all-in-one interface that integrates several ASUS utilities and allows you to launch and operate these utilities simultaneously.

Installing AI Suite 3

Ensure that you have an Administrator account before installing AI Suite 3 in Windows® 7, Windows® 8, Windows® 8.1, or Windows® 10 OS.

To install AI Suite 3 on your computer:

Windows® 7 OS

1. Place the Support DVD into the optical drive.
2. In the **AutoPlay** dialog box, click **Run Instv2.exe** then select the **Utilities** tab.
3. From the **Utilities** tab, check **AI Suite 3** and select **Install,** then follow the succeeding onscreen instructions.

Windows® 8 / Windows® 8.1 / Windows® 10 OS

1. Place the Support DVD into the optical drive then follow onscreen instructions.
2. From the **ASUS motherboard support DVD** main menu, select the **Utilities** tab and check **AI Suite 3** and select **Install.**
3. Follow the succeeding onscreen instructions.

   If the **ASUS motherboard support DVD** main menu did not appear, try the following steps:

   a. Go to the **Start Screen** then click the **Desktop** app.

   b. On the lower left corner of the Desktop, click **File Explorer** then select your DVD drive and double-click the **Setup** application.

Launching AI Suite 3

Windows® 7 OS

From the Desktop, click **Start** > **All Programs** > **ASUS** > **AI Suite 3** > **AI Suite 3**.

You can also launch AI Suite 3 in Windows® 7 by clicking on the Notification area.

Windows® 8 / Windows® 8.1 / Windows® 10 OS

To launch AI Suite 3 in Windows® 8 or Windows® 10, tap the **AI Suite 3** app on the Start Screen (or if you're using a mouse, click the **AI Suite 3** app on the Start screen).

3.4 Thermal Radar Core

ASUS Thermal Radar Core offers you an efficient thermal management system to monitor CPU temperature and voltages, control overclocking settings, and adjust fan speeds and voltages manually or automatically.

ASUS Thermal Core includes these three main management screens: **Fan Control**, **Recorder**, and **DIGI+ VRM**.

3.4.1 Fan Control screen

The Fan Control screen includes these utilities: **Thermal Tuning**, **Fan Control**, **CPU Assessment**, and **Live Update**.

Thermal Tuning

The Thermal Tuning utility allows you to automatically optimize your system's cooling solution such as the CPU fan, and chassis fans in just one click. It provides you with the Fan Auto Tuning function, allowing you to get the best customized settings for your fans.

Fan Control

The Fan Control utility provides easy-to-use preset fan profiles that automatically tweak the fan speed. It also allows you to customize the speed of each fan and save it as a fan profile.

You can customize your fan's speed using the Smart Mode and RPM (rotations per minute) Mode.

Smart Mode

Smart Mode allows you to customize the fan's rotation speed for a certain temperature.

RPM Mode

The RPM mode allows you to set the fan speed when the temperature is below 75°C.

CPU Assessment

The CPU Assessment utility allows you to get an assessment of the CPU's temperature during system load.

Live Update

The Live Update utility allows you to get the latest firmware updates.

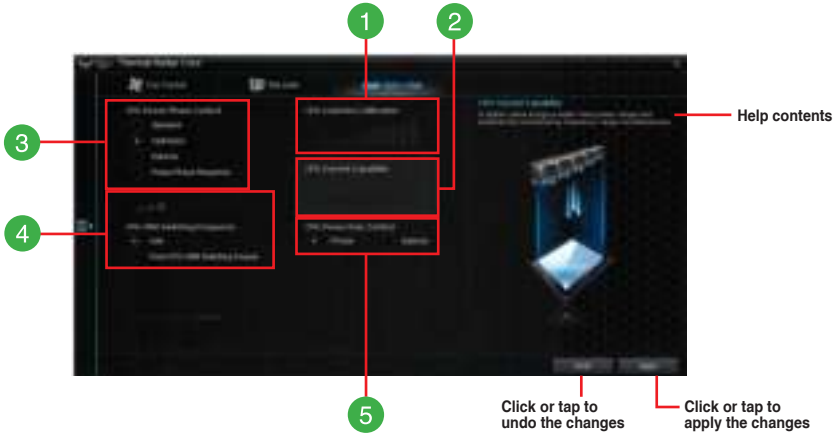
3.4.2 Recorder screen

The Recorder screen provides you with graphs of the changes in the system voltage, temperature, and fan speeds.

To view a History Record, move your mouse on a graph line's specific point to display the date and value of that specific point.

3.4.3 DIGI+ VRM

DIGI+ VRM allows you to adjust VRM voltage and frequency modulation to enhance reliability and stability. It also provides the highest power efficiency, generating less heat to extend component lifespan and minimize power loss.



1	**CPU Load-line Calibration** CPU Load-line Calibration adjusts the voltage range and controls the system temperature. Higher load-line calibration could get higher voltage and good overclocking performance but increases the CPU and VRM thermal conditions.
2	**CPU Current Capability** CPU Current Capability provides wider total power range for overclocking. A higher value setting gets higher VRM power consumption delivery.
3	**CPU Power Phase Control** CPU Power Phase Control allows you to get more transient and better thermal performance by increasing the phase number under heavy system load. To increase VRM efficiency, reduce the phase number under light system load.
4	**CPU VRM Switching Frequency** CPU Voltage Frequency affects the VRM transient response and thermal components. Higher VRM frequency gets quicker transient response.
5	**CPU Power Duty Control** CPU Power Duty Control allows to balance the CPU load based on the temperature or on the current system load.

Appendices

Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IC: Canadian Compliance Statement

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

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

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

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

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

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

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

VCCI: Japan Compliance Statement

Class B ITE

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

取扱説明書に従って正しい取り扱いをしてください。

VCCI－B

KC: Korea Warning Statement

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

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.

Google™ License Terms

English AsusTek Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of CE Directives. Please see the CE Declaration of Conformity for more details.

Français AsusTek Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres clauses pertinentes des directives européennes. Veuillez consulter la déclaration de conformité CE pour plus d'informations.

Deutsch AsusTek Inc. erklärt hiermit, dass dieses Gerät mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der CE-Richtlinien übereinstimmt. Weitere Einzelheiten entnehmen Sie bitte der CE-Konformitätserklärung.

Italiano AsusTek Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti alle direttive CE. Per maggiori informazioni fate riferimento alla dichiarazione di conformità CE.

Компания ASUS заявляет, что это устройство соответствует основным требованиям и другим соответствующим условиям европейских директив. Подробную информацию, пожалуйста, смотрите в декларации соответствия.

Български С настоящото AsusTek Inc. декларира, че това устройство е в съответствие със съществените изисквания и другите приложими постановления на директивите CE. Вижте CE декларацията за съвместимост за повече информация.

Hrvatski AsusTek Inc. ovim izjavljuje da je ovaj uređaj sukladan s bitnim zahtjevima i ostalim odgovarajućim odredbama CE direktiva. Više pojedinosti potražite u CE izjavi o sukladnosti.

Čeština Společnost AsusTek Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení směrnic CE. Další podrobnosti viz Prohlášení o shodě CE.

Dansk AsusTek Inc. Erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene and andre relevante bestemmelser i CE-direktiverne. Du kan læse mere i CE-overensstemmelseserklæring.

Nederlands AsusTek Inc. verklaart hierbij dat dit apparaat compatibel is met de essentiële vereisten en andere relevante bepalingen van CE-richtlijnen. Raadpleeg de CE-verklaring van conformiteit voor meer details.

Eesti Käesolevaga kinnitab AsusTek Inc., et see seade vastab CE direktiivide oluliste nõuetele ja teistele asjakohastele sätetele. Vt üksikasju CE vastavusdeklaratsioonist.

Suomi AsusTek Inc. vakuuttaa täten, että tämä laite on CE-direktiivien olennaisten vaatimusten ja muiden asiaan kuuluvien lisäysten mukainen. Katso lisätietoja CE-vaatimustenmukaisuusvakuutuksesta.

Ελληνικά Με το παρόν, η AsusTek Inc. Δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Για περισσότερες λεπτομέρειες ανατρέξτε στην Δήλωση Συμμόρφωσης ΕΕ.

Magyar Az AsusTek Inc. ezennel kijelenti, hogy a készülék megfelel a CE-irányelvek alapvető követelményeinek és ide vonatkozó egyéb rendelkezéseinek. További részletekért tekintse meg a CE-megfelelőségi nyilatkozatot.

Latviski Līdz ar šo AsusTek Inc. paziņo, ka šī ierīce atbilst būtiskajām prasībām un citiem saistošajiem nosacījumiem, kas norādīti CE direktīvā. Lai uzzinātu vairāk, skatiet CE Atbilstības deklarāciju.

Lietuvių Šiuo dokumentu bendrovė „AsusTek Inc." pareiškia, kad šis įrenginys atitinka pagrindinius CE direktyvų reikalavimus ir kitas susijusias nuostatas. Daugiau informacijos rasite CE atitikties deklaracijoje.

Norsk AsusTek Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i CE-direktiver. Du finner mer informasjon i CE-samsvarserklæringen.

Polski Niniejszym AsusTek Inc. deklaruje, że to urządzenie jest zgodne z istotnymi wymaganiami oraz innymi powiązanymi zaleceniami Dyrektyw CE. W celu uzyskania szczegółów, sprawdź Deklarację zgodności CE.

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

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

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

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

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

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

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

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

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

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

ASUS contact information

ASUSTeK COMPUTER INC.

Address	15 Li-Te Road, Peitou, Taipei, Taiwan 11259
Telephone	+886-2-2894-3447
Fax	+886-2-2890-7798
E-mail	info@asus.com.tw
Web site	www.asus.com.com/

Technical Support

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

ASUS COMPUTER INTERNATIONAL (America)

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

Technical Support

Support fax	+1-812-284-0883
Telephone	+1-812-282-2787
Online support	http://www.service.asus.com/

ASUS COMPUTER GmbH (Germany and Austria)

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

Technical Support

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

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

Responsible Party Name: **Asus Computer International**

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

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

hereby declares that the product

Product Name : Motherboard

Model Number : TROOPER B150 D3 , TROOPER H110 D3

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 :

Original Declaration Date : **Aug. 06, 2015**

Corrected Declaration Date : **Sep. 01, 2015**

Ver. 140331

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 :	**TROOPER B150 D3 , TROOPER H110 D3**

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 61000-3-3:2013
☐ EN 55013:2001+A1:2003+A2:2006	☐ EN 55020:2007+A11:2011

☐1999/5/EC-R&TTE Directive

☐ EN 300 328 V1.8.1(2012-06)	☐ 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 V1.7.1(2012-06)	☐ 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	☐ EN 50566:2013

☒2006/95/EC-LVD Directive

☒ EN 60950-1: 2006 / A12: 2011	☐ EN 60065:2002 / A12: 2011
☒ EN 60950-1: 2006 / A2: 2013	

☐2009/125/EC-ErP Directive

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

☒2011/65/EU-RoHS Directive Ver. 150326

☒CE marking

(EC conformity marking)

Position : **CEO**

Name : **Jerry Shen**

Signature :

Original Declaration Date: 06/08/2012

Corrected Declaration Date: 01/09/2015

Year to begin affixing CE marking: 2015