

**IMBA-Q87A**

**Industrial Motherboard**

### **Copyright Notice**

This document is copyrighted, 2013. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use. The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, the original manufacturer assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

The original manufacturer reserves the right to make changes in the product design without notice to its users.

### **Acknowledgments**

All other products' name or trademarks are properties of their respective owners.

- AMI is a trademark of American Megatrends Inc.
- Intel®, Core™ are trademarks of Intel® Corporation.
- Microsoft Windows® is a registered trademark of Microsoft Corp.
- IBM, PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

The original manufacturer reserves the right to make changes in the product design without notice to its users.

All other product names or trademarks are properties of their respective owners.

## Contents

<b>Chapter 1</b>	<b>Product overview</b>	
1.1	Package contents.....	1-1
1.2	Features .....	1-1
1.3	Specifications.....	1-2
<b>Chapter 2</b>	<b>Motherboard information</b>	<b>2-1</b>
2.1	Before you proceed .....	2-1
2.2	Motherboard layout.....	2-2
2.3	Screw size.....	2-4
	2.3.1 Component side.....	2-4
	2.3.2 Solder side .....	2-5
2.4	Central Processing Unit (CPU) .....	2-6
	2.4.1 Installing the CPU .....	2-7
	2.4.2 CPU heatsink and fan assembly installation.....	2-9
2.5	System memory .....	2-11
	2.5.1 Installing a DIMM .....	2-12
2.6	Jumpers .....	2-13
2.7	Onboard LEDs .....	2-15
2.8	Connectors .....	2-16
	2.8.1 Rear panel connectors.....	2-16
	2.8.2 Internal connectors .....	2-19
<b>Chapter 3</b>	<b>BIOS setup</b>	
3.1	BIOS setup program .....	3-1
	3.1.1 BIOS menu screen.....	3-2
	3.1.2 Menu bar .....	3-2
3.2	Main menu .....	3-2
	3.2.1 System Date [Day MM/DD/YYYY] .....	3-2
	3.2.2 System Time [HH:MM:SS] .....	3-2
3.3	Advanced menu .....	3-3
	3.3.1 S5 RTC Wake Settings .....	3-3
	3.3.2 Dynamic Digital IO .....	3-4
	3.3.3 ACPI Settings.....	3-4
	3.3.4 Trusted Computing.....	3-4
	3.3.5 CPU Configuration .....	3-5

3.3.6	SATA Configuration .....	3-5
3.3.7	PCH-FW Configuration .....	3-6
3.3.8	AMT Configuration .....	3-6
3.3.9	USB Configuration .....	3-6
3.3.10	F81216 Second Super IO Configuration .....	3-7
3.3.11	NCT6791D Super IO Configuration .....	3-7
3.3.12	NCT6791D HW Monitor .....	3-8
<b>3.4</b>	<b>Chipset menu .....</b>	<b>3-12</b>
3.4.1	System Agent (SA) Configuration .....	3-12
3.4.2	PCH-IO Configuration .....	3-13
<b>3.5</b>	<b>Boot menu .....</b>	<b>3-14</b>
3.5.1	Boot Configuration .....	3-14
3.5.2	Boot Option Priorities .....	3-14
<b>3.6</b>	<b>Security menu .....</b>	<b>3-15</b>
3.6.1	Administrator Password .....	3-15
3.6.2	User Password .....	3-15
<b>3.7</b>	<b>Save &amp; Exit menu .....</b>	<b>3-17</b>
 <b>Appendix</b>		
	<b>Notices .....</b>	<b>A-1</b>

# Chapter 1

## Product overview

### 1.1 Package contents

Check your industrial motherboard package for the following items.

- 1 x Industrial Motherboard
- 1 x SATA 6G cable
- 1 x I/O Shield
- 1 x COM port cable
- 1 x Support CD



---

If any of the above items is damaged or missing, contact your distributor or sales representative immediately.

---

### 1.2 Features

- Intel® Socket 1150 for 4th Generation Core™ i7/Core™ i5 / Core™ i3 / Pentium® / Celeron® Processors
- Four 240-pin Dual Channel DDR3 1600/1333MHz DIMMs up to 32GB
- Dual Intel® Giga LAN, PHY I217LM LAN (supports Intel® AMT 9.0)
- SATA 6.0 Gb/s x 6 (supports RAID 0/1/5/10), USB3.0 x 4, USB2.0 x 10, COM x 5
- PCI-Express 3.0/2.0 [x16] x 1, PCI-Express [x4] x 1, PCI x 5
- EuP/ErP Compliance

## 1.3 Specifications

SYSTEM	
Form factor	ATX
CPU	LGA1150 socket for Intel® 4th Generation Core™ i7 / Core™ i5 / Core™ i3 processors Supports Intel® 22nm CPU Supports Intel® Turbo Boost Technology 2.0* *Intel® Turbo Boost Technology 2.0 support depends on the CPU types.
Memory	4 x DIMM (8GB per DIMM), max. 32GB, unbuffered, non-ECC DDR3 1600 / 1333 MHz Dual-channel memory architecture
Chipset	Intel® Q87 Express Chipset
I/O Chipset	Nuvoton NCT6791D Fintek F81216HD
Ethernet	1 x Intel® PHY I217LM Gigabit LAN (Supports Intel® AMT 9.0) 1 x Intel® I210AT Gigabit LAN
BIOS	128Mbit Flash AMI BIOS ROM
Wake on LAN	Yes (WOL/PXE)
Watchdog Timer	1~255 steps by software program
TPM	Yes
H/W Status Monitor	Monitors CPU/Chassis temperature Monitors Vcore/5V/12V voltages Monitors CPU/Chassis fan speed
Smart Fan Control	CPU Fan/Chassis Fan x2
Power State	S3, S4, S5
Expansion slot	1 x PCI Express 3.0/2.0 x16 slot 1 x PCI Express x4 slot 5 x PCI
Battery	Lithium battery
Power requirement	1 x 24-pin ATX connector 1 x 4-pin ATX 12V power connector
Board size	12 in. x 9.6 in. (305 mm x 244 mm)
Gross weight	1.76 lb (0.8 Kg)
Operating temperature	32°F~140°F (0°C~60°C)
Storage temperature	-40°F~185°F (-40°C~85°C)
Operating humidity	0%~90% relative humidity, non-condensing
Power compliance	Compliant with Eup/ErP
Certificate	CE/FCC

(continued on the next page)

<b>DISPLAY</b>	
<b>Chipset</b>	Intel® Graphics Media Accelerator
<b>Resolution</b>	Up to 1920x1200@60Hz for VGA Up to 1920x1200@60Hz for DVI Up to 4096x2610@24Hz for HDMI Up to 2560x1440@60Hz for Display Port
<b>Output interface</b>	<b>SKU1 (VGA / DVI / HDMI / DP)</b> VGA+DVI, VGA+HDMI, VGA+DP, DVI+HDMI, DVI+DP, HDMI+DP, VGA+DVI+HDMI, VGA+DVI+DP, DVI+HDMI+DP, HDMI+DP+VGA <b>SKU2 (VGA / DVI / 2xHDMI)</b> VGA+DVI, VGA+HDMI1, VGA+HDMI2, DVI+HDMI1, DVI+HDMI2, HDMI1+HDMI2, VGA+HDMI1+HDMI2, VGA+HDMI1+DVI
<b>I/O</b>	
<b>Storage</b>	6 x SATA 6.0Gb/s ports RAID 0 / 1 / 5 / 10
<b>Serial port</b>	1 x RS-232/422/485 supports 5V/12V/RI on rear IO 5 x RS-232 header on mid-board
<b>USB</b>	4 x USB3.0 (4 ports at rear panel) 10 x USB2.0 (8 ports at mid-board, 2 ports at rear panel)
<b>Fan</b>	1 x CPU Fan connector (4-pin) 2 x Chassis Fan connectors (4-pin)
<b>RTC</b>	Internal RTC
<b>Keyboard/Mouse</b>	1 x PS/2 Keyboard / mouse combo port on rear I/O
<b>Audio</b>	Realtek ALC887, Mic-in/Line-in/ Line-out
<b>Ethernet</b>	2 x RJ-45 ports on rear I/O
<b>Display</b>	1 x VGA connector on mid-board 1 x DV-D port on rear I/O 1 x HDMI port on rear I/O 1 x DisplayPort (option 1 x HDMI port)
<b>Others</b>	1 x LPT 1 x Digital I/O header



# Chapter 2

## Motherboard information

### 2.1 Before you proceed

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



---

**CAUTION!**

- 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.
-

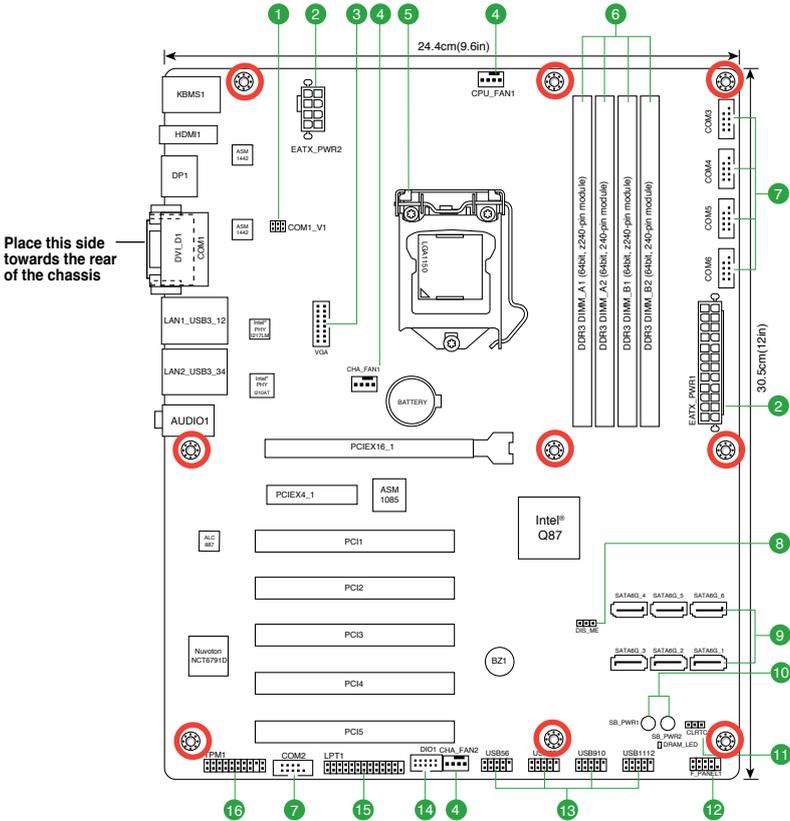
## 2.2 Motherboard layout



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



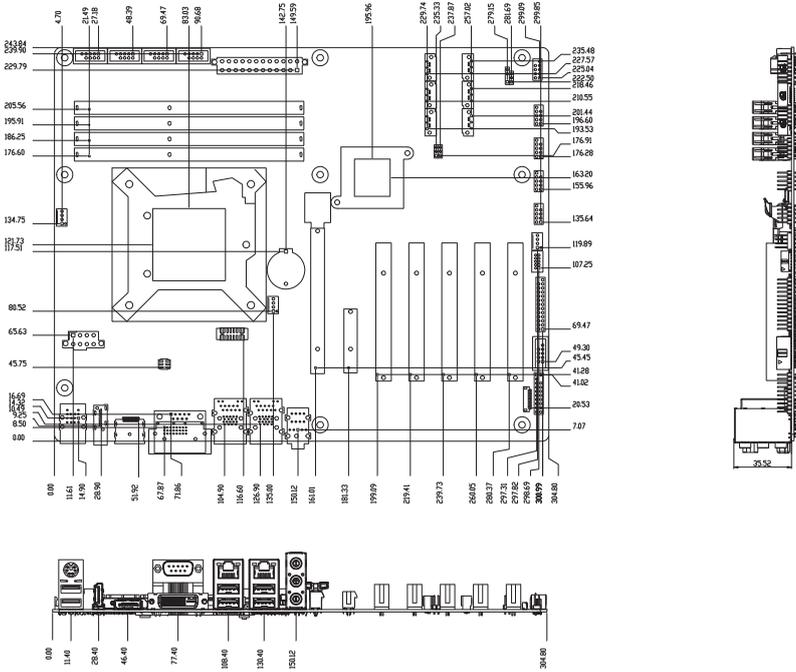
**CAUTION!** Do not overtighten the screws! Doing so can damage the motherboard.



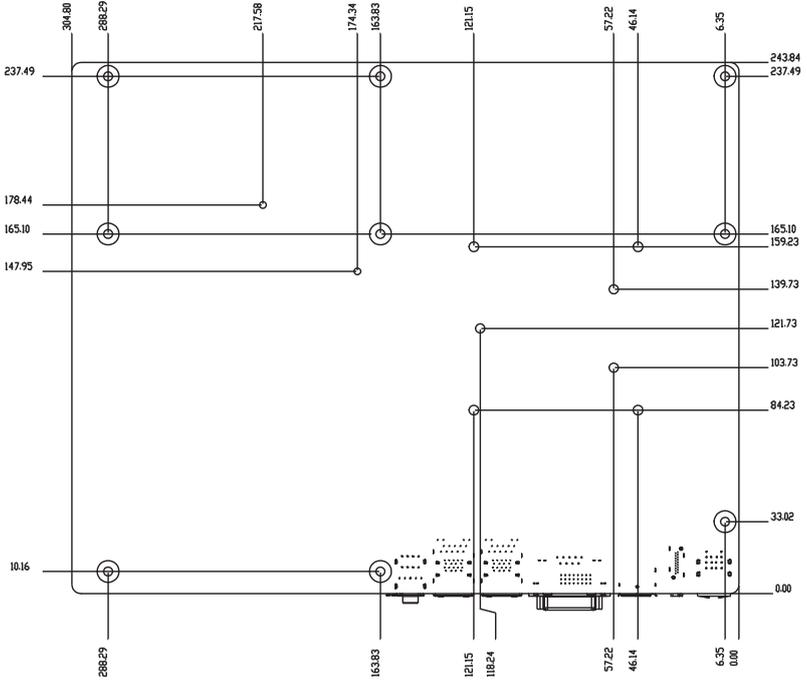
<b>Connectors/Jumpers/Slots</b>		<b>Page</b>
1.	COM1 VSET connector (COM1_V1)	2-14
2.	ATX power connectors (24-pin EATXPWR1, 8-pin EATX_PWR2)	2-19
3.	VGA connector (16-pin VGA)	2-23
4.	CPU and system fan connectors (4-pin CPU_FAN1, 4-pin CHA_FAN1~2)	2-20
5.	Intel® LGA1150 CPU socket	2-6
6.	DIMM memory slots	2-11
7.	Serial port connectors (10-1 pin COM2~6)	2-24
8.	Intel® ME Jumper (3-pin DIS_ME)	2-14
9.	Serial ATA 6.0Gb/s connectors (7-pin SATA6G_1~6)	2-22
10.	Standby Power LED (SB_PWR1~2)	2-15
11.	Clear RTC RAM (CLRTC)	2-13
12.	System panel connector (10-1 pin F_PANEL1)	2-21
13.	USB 2.0 connectors (10-1 pin USB1112, USB910, USB78, USB56)	2-23
14.	Digital I/O connector (10-pin DIO1)	2-22
15.	LPT connector (26-1 pin LPT1)	2-20
16.	TPM connector (20-1 pin TPM1)	2-19

## 2.3 Screw size

### 2.3.1 Component side

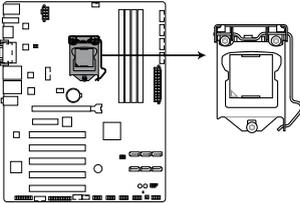


## 2.3.2 Solder side



## 2.4 Central Processing Unit (CPU)

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



IMBA-Q87A CPU socket LGA1150



---

**IMPORTANT:** Unplug all power cables before installing the CPU.

---



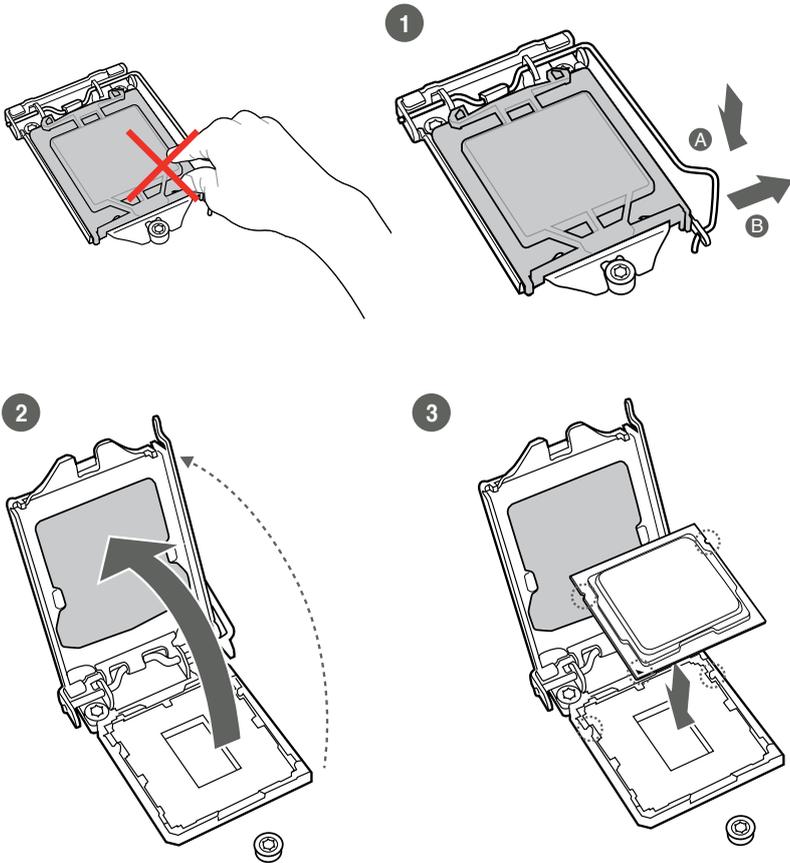
### CAUTION!

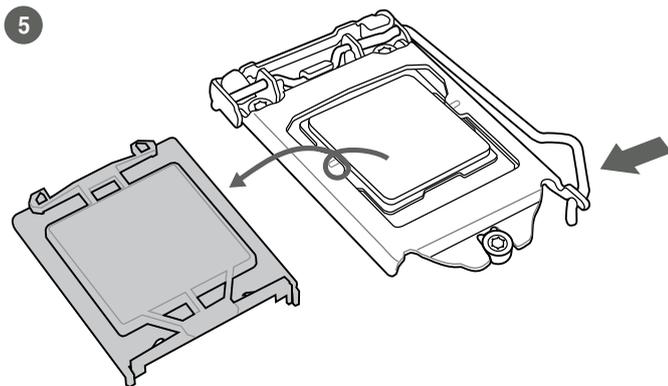
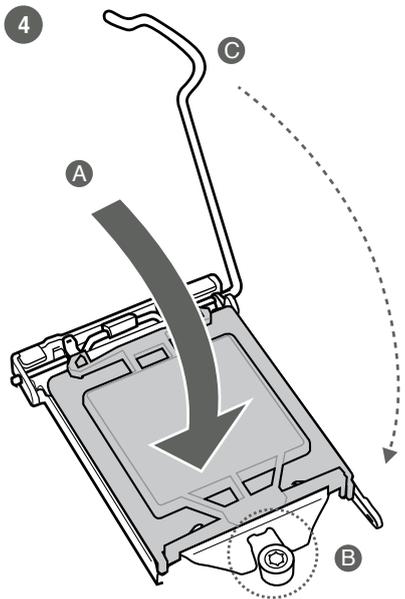
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. The manufacturer will shoulder the cost of repair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

## 2.4.1 Installing the CPU

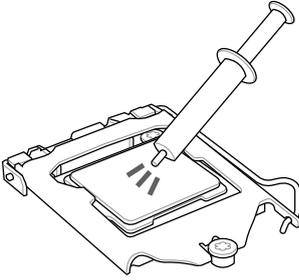


**CAUTION!** Ensure that you install the correct CPU designed for LGA 1150 only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1150 socket.



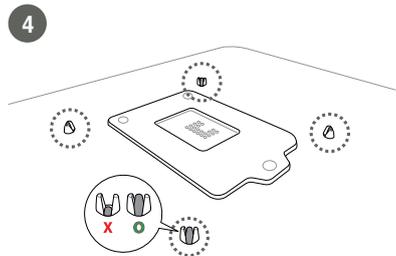
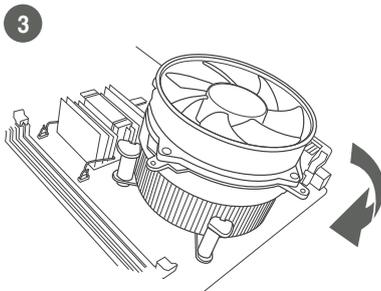
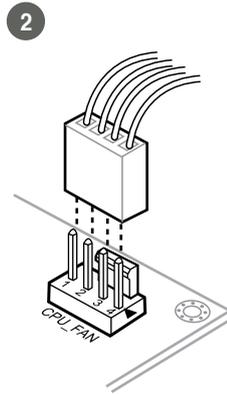
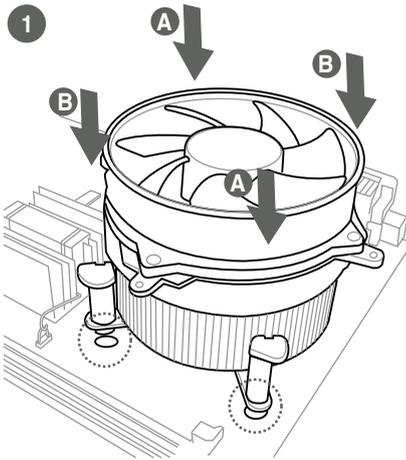


## 2.4.2 CPU heatsink and fan assembly installation

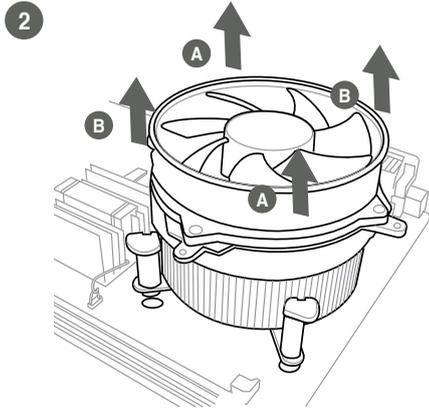
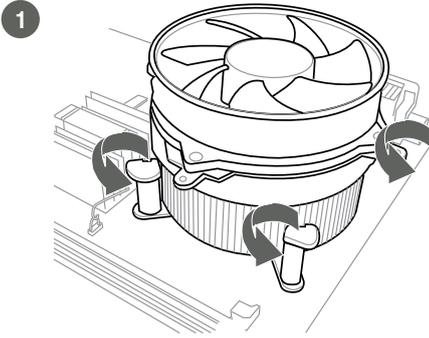


**CAUTION!** Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly



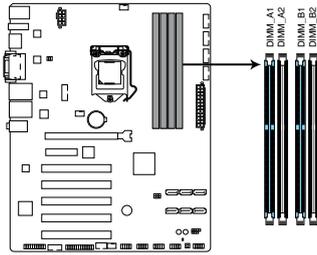
To uninstall the CPU heatsink and fan assembly



## 2.5 System memory

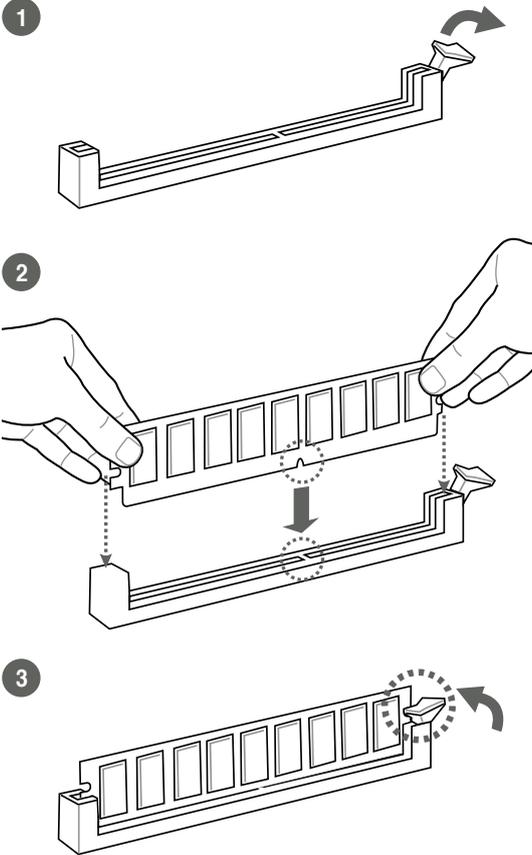
This motherboard comes with four Double Data Rate 3 (DDR3) Dual Inline Memory Module (DIMM) sockets. A DDR3 module has the same physical dimensions as a DDR2 DIMM but is notched differently to prevent installation on a DDR2 DIMM socket. DDR3 modules are developed for better performance with less power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

The figure below illustrates the location of the DDR3 DIMM sockets:

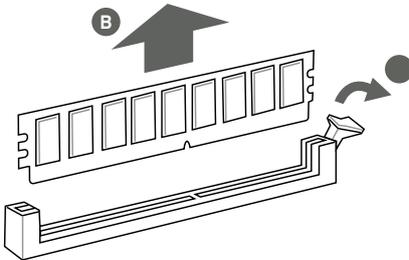


**IMBA-Q87A 240-pin DDR3 DIMM sockets**

## 2.5.1 Installing a DIMM



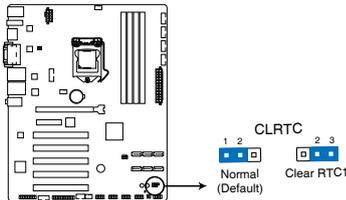
### To remove a DIMM



## 2.6 Jumpers

### 1. Clear RTC RAM (CLRTC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of 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.



IMBA-Q87A Clear RTC RAM

#### To erase the RTC RAM:

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



---

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

---

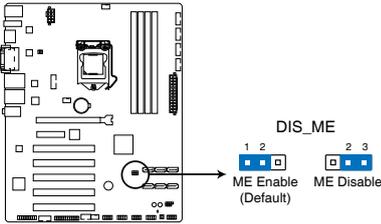


#### NOTES:

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

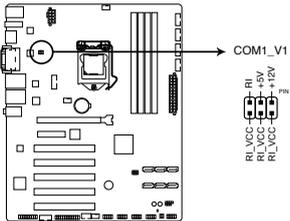
### 2. Intel® ME Jumper (3-pin DIS\_ME)

This jumper allows you to force the Intel® Management Engine (ME) to boot to recovery mode when ME becomes corrupted.



IMBA-Q87A Intel® ME jumper

### 3. COM1 VSET connector (COM1\_V1)



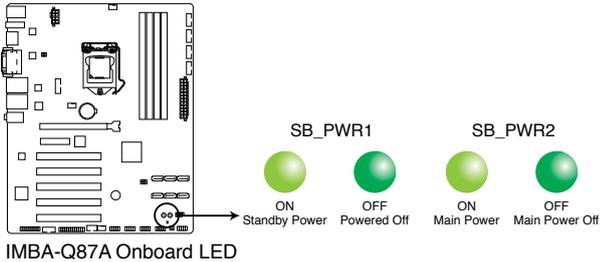
IMBA-Q87A COM VSET connector

Setting	Pins
+12V	1-2
+5V	3-4
Ring (Default)	5-6

## 2.7 Onboard LEDs

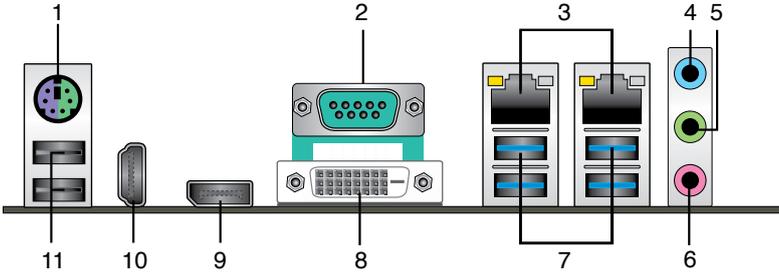
### 1. Standby Power LED

The motherboard comes with two standby power LEDs that light 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 LEDs.



## 2.8 Connectors

### 2.8.1 Rear panel connectors



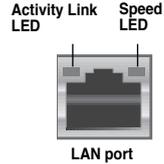
1. **PS/2 keyboard/mouse port (purple/green).** This port is for a PS/2 keyboard or mouse.
2. **Serial port (COM port).** This port connects to a modem, or other device that conforms with serial specification.

Pin	Signal	Pin	Signal
1	DCD (422TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI/+12V/+5V		

- LAN1~2 (RJ-45) port.** These ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN1 port LED indications.

### LAN1 port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection



- Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.
- Line Out port (lime).** This port connects to a headphone or a speaker. In a 4-channel, 6-channel and 8-channel configurations, the function of this port becomes Front Speaker Out.
- Microphone port (pink).** This port connects a microphone.




---

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

---

### Audio 2.1, 4.1, or 5.1-channel configuration

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

7. **USB1~4 3.0 ports.** These 9-pin Universal Serial Bus (USB) ports connect to USB 3.0/2.0 devices.



#### NOTES:

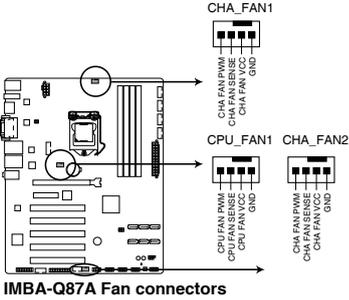
- DO NOT connect a keyboard / mouse to any USB 3.0 port when installing a Windows® operating system.
- Due to USB 3.0 controller limitations, USB 3.0 devices can only be used under a Windows® OS environment and after USB 3.0 driver installation.
- USB 3.0 devices can only be used for data storage.
-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

8. **DVI-D port.** This port is for any DVI-D compatible device. DVI-D can't be converted to output RGB Signal to CRT and isn't compatible with DVI-I.
9. **DisplayPort.\*** Connect a DisplayPort cable into this port for high-definition video and audio.  
\*Co-lay with HDMI. Dual HDMI BOM optional
10. **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-ray and other protected content.
11. **USB 2.0 ports.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0/1.1 devices.



**3. CPU and chassis fan connectors (4-pin CPU\_FAN1, 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.



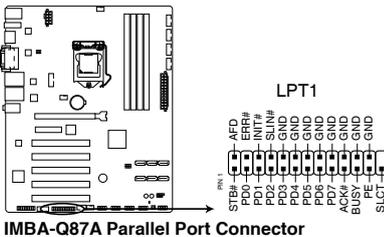
**CAUTION:** Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!



**NOTE:** The CPU\_FAN connector supports a CPU fan of maximum 2A (24 W) fan power.

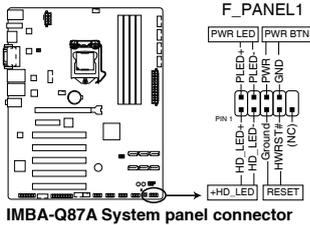
**4. LPT connector (26-1 pin LPT)**

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



## 5. System panel connector (10-1 pin F\_PANEL1)

This connector supports several chassis-mounted functions.



- **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.

- **ATX power button/soft-off button (2-pin PWR\_BTN)**

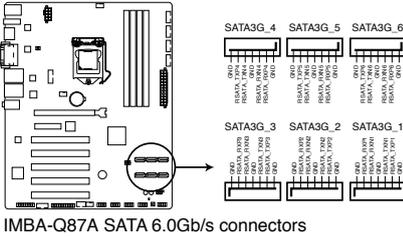
This 2-pin connector is for the system power button.

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

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

## 6. Serial ATA 6.0Gb/s connector (7-pin SATA6G\_1~6)

This connector connects to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables.

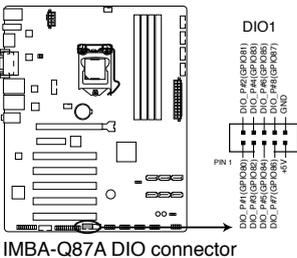


### NOTES:

- You must install Windows® XP Service Pack 3 or later version before using Serial ATA hard disk drives.
- When using hot-plug and NCQ, set the SATA Mode Selection item in the BIOS to [AHCI]. See section 3.3.5 **SATA Configuration** for details.

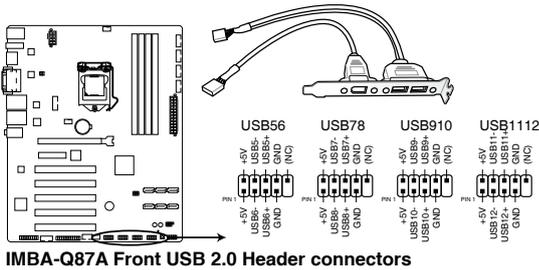
## 7. Digital I/O connector (10-pin DIO1)

This connector includes 8 I/O lines (In/Out programmable). All of the Digital I/O lines are programmable and each I/O pin can be individually programmed to support various devices.



## 8. USB 2.0 connector (10-1 pin USB1112, USB56, USB78, USB910)

These connector are for USB 2.0 ports. Connect the USB module cable to the connectors. These USB connectors comply with USB 2.0 specifications that supports up to 480 Mbps connection speed.



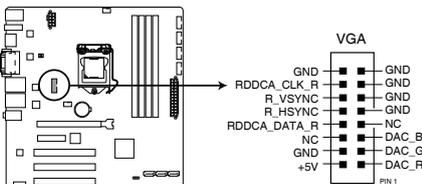
**CAUTION:** Never connect a 1394 cable to the USB connector. Doing so will damage the motherboard.



**NOTE:** The USB module cable is purchased separately.

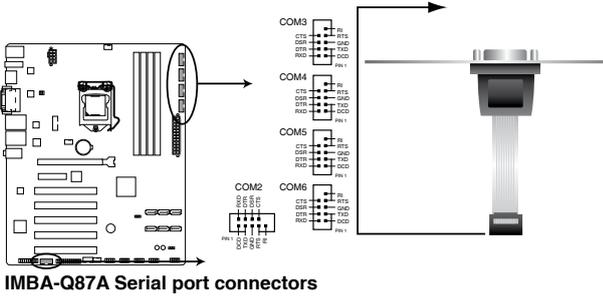
## 9. VGA connector (16 pin VGA)

Connect the VGA cable to the pin-header, then install the module to a slot opening at the back of the system chassis.



### 10. Serial port connectors (10-1 pin COM2~6)

These connectors are for serial (COM) ports. Connect the serial port module cables to these connectors, then install the module to a slot opening at the back of the system chassis.



**NOTE:** The COM module is purchased separately.

# Chapter 3

## BIOS setup

### 3.1 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 routine.

#### 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.



---

**NOTE:** Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to reboot a running operating system can cause damage to your data or system. Always shut down the system properly from the operating system.

---



---

#### IMPORTANT:

- The default BIOS settings for this motherboard apply to most working conditions and ensures optimal performance. If the system becomes unstable after changing any BIOS settings, load the default settings to regain system stability. Select the option **Restore Defaults** under the Save & Exit Menu. See section **3.7 Save & Exit**.
  - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
-

### 3.1.1 BIOS menu screen

### 3.1.2 Menu bar

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

<b>Main</b>	For changing the basic system configuration.
<b>Advanced</b>	For changing the advanced system settings.
<b>Chipset</b>	For viewing and changing chipset settings.
<b>Boot</b>	For changing the system boot configuration.
<b>Security</b>	For setting up BIOS security settings.
<b>Save &amp; Exit</b>	For selecting the exit options and loading default settings.

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

## 3.2 Main menu

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.

### 3.2.1 System Date [Day MM/DD/YYYY]

Allows you to set the system date.

### 3.2.2 System Time [HH:MM:SS]

Allows you to set the system time.

## 3.3 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.

---

### 3.3.1 S5 RTC Wake Settings

#### Wake System with Fixed Time [Disabled]

Enable or disable system wake on at an alarm event. When enabled, the system will wake up at the specified hr::min::sec. Configuration options: [Disabled]  
[Enabled]



---

The following items appear when **Wake System with Fixed Time** is enabled.

---

#### Wake up day/hour/minute/second [0]

Specify the values for day/hour/minute/second.

#### Wake System with Dynamic Time [Disabled]

Enable or disable system wake on at an alarm event. When enabled, the system will wake up at the current time plus a specified number of minutes.



---

The following items appear when **Wake System with Dynamic Time** is enabled.

---

#### Wake up minute increase [1]

Specify the number of minutes added to the current time before waking up system.

### 3.3.2 Dynamic Digital IO

The items listed in this screen configure Digital IO settings.

#### **DI00~DI03 Direction [Input]**

Configuration options: [Input] [Output]

#### **DI04~DI07 Direction [Output]**

Configuration options: [Input] [Output]

#### **Output Level [Hi]**

Configuration options: [Hi] [Low]

### 3.3.3 ACPI Settings

#### **ACPI Sleep State [S3 only (Suspend to...)]**

This item selects the ACPI sleep state the system will enter when the system is in Suspend mode.

Configuration options: [Suspend Disabled] [S3 only (Suspend to RAM)]

### 3.3.4 Trusted Computing

#### **Security Device Support [Disable]**

Allows you to enable or disable BIOS support for security devices. Configuration options: [Disable] [Enable]

### 3.3.5 CPU Configuration

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



---

The items shown in the submenu may be different depending on the type of CPU installed.

---

#### 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.

---



Configuration options for active processor cores are dependent on the installed CPU.

---

#### Intel Virtualization Technology [Enabled]

[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.

### 3.3.6 SATA Configuration

The BIOS automatically detects the presence of SATA devices. The Serial ATA Ports listed will display **Empty** if there are no Serial devices connected to the ports.

#### SATA Controller(s) [Enabled]

Configuration options: [Enabled] [Disabled].

#### SATA Mode Selection [IDE]

Allows you to set the SATA configuration.

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

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

### 3.3.7 PCH-FW Configuration

This screen displays ME Firmware Mode, Type, SKU and version.

### 3.3.8 AMT Configuration

The items in this menu allow you to change the Intel® Active Management Technology (AMT) feature.

#### Intel® AMT [Enabled]

Allow you to enable or disable the Intel® Active Management Technology (AMT) in the BIOS extension. Configuration options: [Enabled] [Disabled]



- 
- iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.
  - The following two items become configurable only when you set the Intel®AMT item to [Enabled].
- 

#### Un-Configure ME [Disabled]

Sets this item to [Disabled] to unconfigure AMT/ME without using a password or set it to [Enabled] to use a password. Configuration options: [Enabled] [Disabled]

### 3.3.9 USB Configuration

The items in this menu allow you to change USB settings.



---

The USB Devices lists detected USB devices. If no USB device is connected, the item shows **None**.

---

#### Legacy USB Support [Enabled]

- |            |   |
|------------|---|
| [Enabled]  | Enables support for USB devices on legacy operating systems (OS).   |
| [Disabled] | USB devices can only be in BIOS setup.  |
| [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. |

### 3.3.10 F81216 Second Super IO Configuration

The items in this menu allow you to configure Serial Port settings.

#### Serial Port 3~6 Configuration

##### Serial Port [Enabled]

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

##### Change Settings [Auto]

Allows you to select the Serial Port base address. Configuration options: [IO=2C0h; IRQ=5] [IO=2C8h; IRQ=5] [IO=2B0h; IRQ=5] [IO=2B8h; IRQ=5]



---

The following item is only supported by Serial Port 3.

---

### 3.3.11 NCT6791D Super IO Configuration

The items in this menu allow you to configure Super IO settings.

#### Serial Port 1~2 Configuration

##### Serial Port [Enabled]

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

##### Change Settings [Auto]

Allows you to select an optimal setting for Super I/O devices. Configuration options: [Auto] [IO=3F8h; IRQ=4;] [IO=3F8h; IRQ=3,4,5,6,7,10,11,12;] [IO=2F8h; IRQ=3,4,5,6,7,10,11,12;] [IO=3E8h; IRQ=3,4,5,6,7,10,11,12;] [IO=2E8h; IRQ=3,4,5,6,7,10,11,12;]

##### Device Mode [Serial Port Functio..]

Allows you to select the Serial Port mode. Configuration options: [RS-232] [RS-422] [RS-485]

## Parallel Port Configuration

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

### Parallel Port [Enabled]

Allows you to enable or disable the parallel port (LPT/LPTE).

Configuration options: [Enabled] [Disabled]



---

The following items appear only when you set the **Parallel Port Configuration** item to [Enabled].

---

### Change Settings [Auto]

Allows you to select an optimal setting for Super I/O devices. Configuration

options: [Auto] [IO=378h; IRQ=5;] [IO=378h; IRQ=5,6,7,9,10,11,12;]

[IO=278h; IRQ=5,6,7,9,10,11,12;] [IO=3BCh; IRQ=5,6,7,9,10,11,12;]

### Device Mode [STD Printer Mode]

Allows you to select the Printer Port mode. Configuration options: [STD

Printer Mode] [SPP Mode] [EPP-1.9 and SPP Mode] [EPP-1.7 and SPP

Mode] [ECP Mode] [ECP and EPP 1.9 Mode] [ECP and EPP 1.7 Mode]

## 3.3.12 NCT6791D HW Monitor

The items in this menu allow you to configure Super IO settings.

### Smart Fan Configuration

#### CPU / System / Chassis Smart Fan Control [Enabled]

Allows you to enable or disable Smart Fan Control. Configuration options:

[Enabled] [Disabled]

## Fan Control Mode [Thermal Cruise Mode]

Configuration options: [Manual Mode] [Thermal Cruise Mode] [Speed Cruise Mode] [Smart Fan IV Mode]



---

The following items appear only when you set Fan Control Mode to [Thermal Cruise Mode].

---

### Target Temperature [50]

Input value range: [0~127]

### Tolerance of Temperature [0]

Input value range: [0~7]

### Fan Out Start-Up Value [127]

Input value range: [0~255]

### Fan Out Stop Value [100]

The Fan Out value decreases to this value if the temperature reaches below the lowest temperature limit. Input value range: [0~255]

### Fan Out Stop Time [60]

Determines the amount of time it takes for the the Fan Out value to fall from the stop value to zero. Input value range: [0~255]

### Critical Temperature [75]

Determines the amount of time Fan Out takes to decrease its value by one step. Input value range: [0~255]

### Fan Out Step Up Time [10]

Determines the amount of time Fan Out takes to increase its value by one step. Input value range: [0~255]

### Fan Out Step Down Time [10]

Determines the amount of time Fan Out takes to decrease its value by one step in intervals of 0.1 seconds. Input value range: [0~255]



---

The following item appears only when you set Fan Control Mode to [Manual Mode].

---

### **PWM/DC Voltage Output [255]**

Sets the voltage allocated for Fan Control. Input value range: [0~255]



---

The following items appear only when you set Fan Control Mode to [Speed Cruise Mode].

---

### **Target Speed [0]**

Input value range: [0~4096]

### **Speed Tolerance [2]**

Input value range: [0~64]

### **Fan Out Step Up Time [10]**

Determines the amount of time Fan Out takes to increase its value by one step. Input value range: [0~255]

### **Fan Out Step Down Time [10]**

Determines the amount of time Fan Out takes to decrease its value by one step in intervals of 0.1 seconds. Input value range: [0~255]



---

The following items appear only when you set Fan Control Mode to [Smart Fan IV Mode].

---

### **Temperature 1~4**

Determines the temperature value for the Smart Fan IV mode. Input value range: [0~255]

### **Fan PWM 1~4**

Determines the amount of Fan PWM value for the Smart Fan IV mode Input value range: [0~255]

### **Tolerance of Temperature [0]**

Input value range: [0~7]

### **Critical Temperature [75]**

Input value range: [0~255]

**Critical Temp Tolerance [0]**

Input value range: [0~7]

**Fan Count Step Up [5]**

Input value range: [0~15]

**Fan Count Step Down [5]**

Input value range: [0~15]

**Fan Out Step Up Time [10]**

Determines the amount of time Fan Out takes to increase its value by one step. Input value range: [0~255]

**Fan Out Step Down Time [10]**

Determines the amount of time Fan Out takes to decrease its value by one step in intervals of 0.1 seconds. Input value range: [0~255]

## 3.4 Chipset menu

The Chipset menu items allow you to change the settings for the chipset.

### 3.4.1 System Agent (SA) Configuration

#### VT-d [Enabled]

Allows you to enable virtualization technology function on memory control hub.

[Enabled] Enables the function.

[Disabled] Disables this function.



---

The VT-d feature is available only for specific types of CPU.

---

#### PCIEx16\_1 Link Speed [Auto]

Allows you to configure the PCIEx16 speed.

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

#### Primary Display [Auto]

Allows you to decide which graphics controller to use as the primary boot device.

Configuration options: [Auto] [iGFX] [PEG]

#### Graphics Configuration

##### Internal Graphics [Auto]

Configures IGD enabled based on setup options. Configuration options:

[Auto] [Disabled] [Enabled]

##### DVMT Pre-Allocated [32M]

Allows you to select the amount of system memory allocated to DVMT 5.0

used by the Internal Graphics Device. Configuration options: [32M] [64M]

[96M] [128M] ~ [416M] [448M] [480M] [512M] [1024M]

##### DVMT Total Gfx Mem [256M]

Allows you to select the total amount of system memory allocated to DVMT

5.0 used by the Internal Graphics Device. Configuration options: [128M]

[256M] [MAX]

##### Primary IGFX Boot Display [VBIOS Default]

Select the video device activated during POST. This setting has no effect if an external graphics device is present.

SKU1 Configuration options: [VBIOS Default] [CRT] [HDMI] [DVI] [Display Port]

SKU2 Configuration options: [VBIOS default] [CRT] [HDMI1] [DVI] [HDMI2]

## Memory Information

This screen displays detailed memory information including currently available physical memory, total memory and installed DIMMs.

### 3.4.2 PCH-IO Configuration

#### Power Mode [ATX Type]

This item selects Power Supply Mode.

Configuration options: [ATX Type] [AT Type]

#### Resume on Ring [Enabled]

This item disables/enables resuming system on ring.

Configuration options: [Disabled] [Enabled]

#### Restore AC Power Loss [Power Off]

[Power On]                      The system goes into on state after an AC power loss.

[Power Off]                     The system goes into off state after an AC power loss.

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

#### ERP/EUP mode [Disabled]

This item disables/enables ERP/EUP mode for energy star compliance.

Configuration options: [Disabled] [Enabled]

#### Intel WGI210AT Speed / Intel I217LM Speed / Asmedia ASM1085 Speed / PCIe x4 port Speed [Auto]

Each item configures the speed of a specific PCI Express port.

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

## 3.5 Boot menu

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

### 3.5.1 Boot Configuration

#### Quick Boot [Enabled]

This item enables/disables Quiet Boot.

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

#### Launch I217LM PXE OpROM [Disabled]

This item enables/disables Legacy Boot Option for I217LM.

Configuration options: [Disabled] [Enabled]

#### Launch WGI210AT PXE OpROM [Disabled]

This item enables/disables Legacy Boot Option for WGI210AT.

Configuration options: [Disabled] [Enabled]

### 3.5.2 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 <F7> during POST.
  - To access Windows OS in Safe Mode, do any of the following:
    - Press <F5> during POST.
    - Press <F8> after POST.
-

## 3.6 Security menu

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

### 3.6.1 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**.

### 3.6.2 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**.

## 3.7 Save & Exit menu

### **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 & Reset**

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.

### **Restore Defaults**

This option allows you to restore/load default values for all setup options.

### **Save as User Defaults**

This item saves current configuration as User Default.

### **Restore User Defaults**

This option restores User Defaults to all setup options.

### **Boot Override**

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

### **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.



# Appendix

## 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 A 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.



---

**WARNING!** 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.

---



---

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.

---



電子信息產品污染控制標示：圖中之數字為產品之環保使用期限。僅指電子信息產品中含有的有毒有害物質或元素不致發生外洩或突變從而對環境造成污染或對人身、財產造成嚴重損害的期限。

**有毒有害物質或元素的名稱及含量說明標示：**

部件名稱	有害物質或元素					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr(VI))	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
印刷電路板及其電子組件	×	○	○	○	○	○
外部信號連接頭及線材	×	○	○	○	○	○

○：表示該有毒有害物質在該部件所有均質材料中的含量均在 SJ/T 11363-2006 標準規定的限量要求以下。

×：表示該有毒有害物質至少在該部件的某一均質材料中的含量超出 SJ/T 11363-2006 標準規定的限量要求，然該部件仍符合歐盟指令 2002/95/EC 的規範。

備註：此產品所標示之環保使用期限，係指在一般正常使用狀況下。