

IMBA-H110A

Industrial Motherboard

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Chapter 1

Product overview

1.1 Package contents

Check your industrial motherboard package for the following items.

- 1 x Industrial Motherboard
- 1 x SATA 6.0Gb/s cable
- 1 x COM cable
- 1 x I/O Shield
- 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® 7th/ 6th Generation Core™ i7/ i5/ i3, Pentium® and Celeron® 14nm LGA1151 socket processor
- 2 x DIMMs, max. 32GB, DDR4 2400 / 2133/ 1867 MHz, non-ECC, un-buffered memory
- 3 x SATA III 6.0 Gb/s, 4x USB 3.0, 6 x USB 2.0
- Realtek® ALC887 6-Channel High Definition Audio CODEC
- Multi Display: VGA+HDMI, VGA+DP, HDMI+DP
- Dual Ethernet LAN: 1 x Intel® PHY i219V Giga LAN, 1 x Intel® i211AT Giga LAN, RJ45 x 2
- 1 x PCIe 3.0/2.0 [x16] slot, 1 x PCIe 2.0 [x4] slot, 4 x PCI slots
- 1 x M.2 M key (22 x 80mm) slot for SATA

1.3 Specifications

SYSTEM	
CPU	Intel® 7th/ 6th Generation (Kaby Lake-S/ Skylake-S) Core™ i7/ i5/ i3, Pentium® and Celeron® 14nm LGA1151 socket processor
Chipset	Intel® H110 Express Chipset
Memory	2 x DIMMs, max. 32 GB, DDR4 2400*/ 2133/ 1867 MHz, non-ECC, un-buffered memory Dual channel memory architecture *2400 MHz can only be reached when a Kaby Lake processor is used.
I/O Chipset	NCT6791D + F81216HD
Ethernet	1 x Intel® PHY i219V Giga LAN 1 x Intel® i211AT Giga LAN, RJ45 x 2
Audio	Realtek® ALC887 6-Channel High Definition Audio CODEC (Colay/ALC886)
TPM	Nuvoton NPCT650ABBYX TPM2.0 onboard (optional)
Expansion slots	1 x PCIe 3.0/2.0 [x16] slot 1 x PCIe 2.0 [x4] slot (open edge) 4 x PCI slots 1 x M.2 M-key (22 x 80mm) slot for SATA
BIOS	1 x 128Mbit Flash ROM, AMI BIOS Added Buffer IC
H/W Status Monitor	Monitors CPU/chassis temperature Monitors Vcore/5V/3.3V/12V/3VSB/VBAT voltages Monitors CPU/chassis fan speed
Watchdog Timer	1~255 steps by software program
Smart Fan Control	CPU Fan / Chassis Fan x 2
Wake On LAN / PXE	Yes (WOL, PXE)
Power States	S3, S4, S5
Graphics	
Graphics Chipset	Intel® HD Graphics VGA support via RTD2168
Graphics Multi Display	VGA+HDMI, VGA+DP, HDMI+DP
Resolution	VGA: Up to 1920 x 1200 @60Hz (via RTD2168) HDMI1.4: Up to 4096 x 2304 @24Hz DP1.2: Up to 4096 x 2304 @60Hz
Environment, Power, and ME	
Battery	Lithium battery
Power requirement	1 x 24-pin ATX connector 1 x 8-pin (2x4) ATX 12V power connector
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
Certificate	CE & FCC class A
Form factor	ATX form factor: 12 in. x 9.6 in. (305 mm x 244 mm)
Weight	1.76 lb (0.8 Kg)

(continued on the next page)

Back I/O	
USB	4 x USB 3.0 ports 2 x USB 2.0 ports
Display	1 x HDMI ports 1 x VGA port 1 x Display port
Serial port	1 x RS-232/422/485 COM port (COM1, supports 5V/12V/RL, optional)
PS/2 port	1 x PS/2 stack port (keyboard & mouse)
LAN	2 x LAN (RJ-45) ports
Audio	3 x Audio jacks: Line-in, Mic-in, Line-out
Internal I/O	
Storage	3 x SATA III 6.0Gb/s ports 1 x M.2 M-Key slot (22 x 80mm)
USB	2 x USB 2.0 connectors support additional 4 USB ports
Audio	1 x AMP speaker header (Line-out)
Serial port	5 x RS-232 headers
DIO	1 x 8-bit Digital I/O interface (In/Out programmable)
Fan	1 x CPU Fan connector (4-pin) 2 x Chassis Fan connectors (4-pin)
Power	1 x 24-pin EATX Power header 1 x 8-pin EATX 12V Power connector
Others	1 x Chassis Intrusion 1 x AT/ATX mode select jumper 1 x Front panel header 1 x Clear CMOS jumper
Others	
OS support	Windows® 10 64-bit Windows® 8.1 64-bit (not supported when using a Kaby Lake processor) Windows® 7 32-bit / 64-bit (not supported when using a Kaby Lake processor) Linux Fedora 64bit
Accessories	1 x SATA 6.0Gb/s cable 1 x COM cable 1 x I/O shield 1 x Support DVD



NOTE: Specifications are subject to change without notice.

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.
-

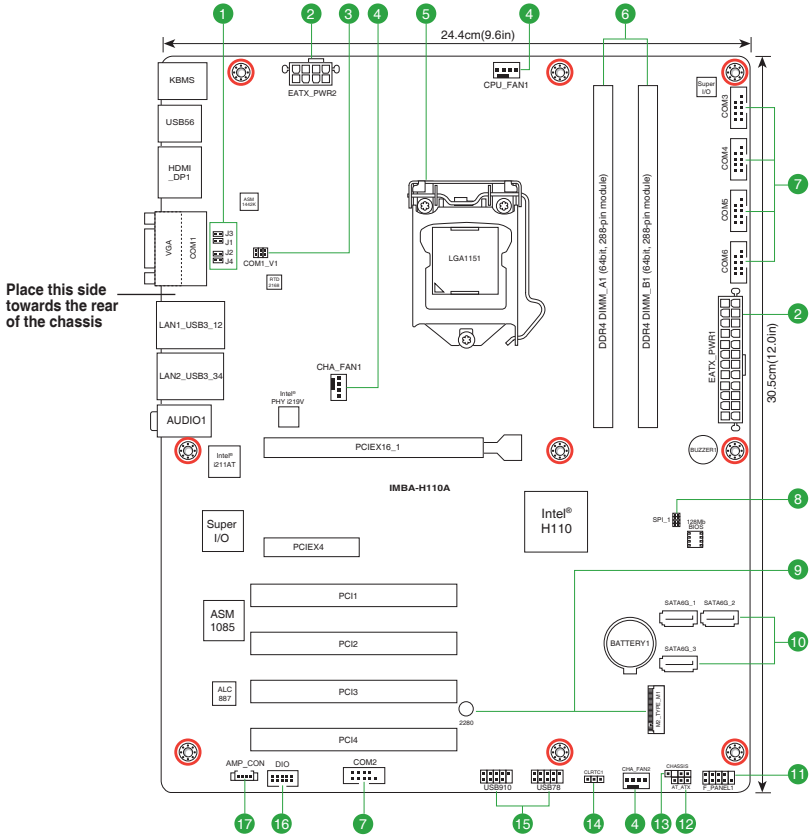
2.2 Motherboard layout



NOTE: Place nine screws into the holes indicated by circles with the motherboard to the chassis.



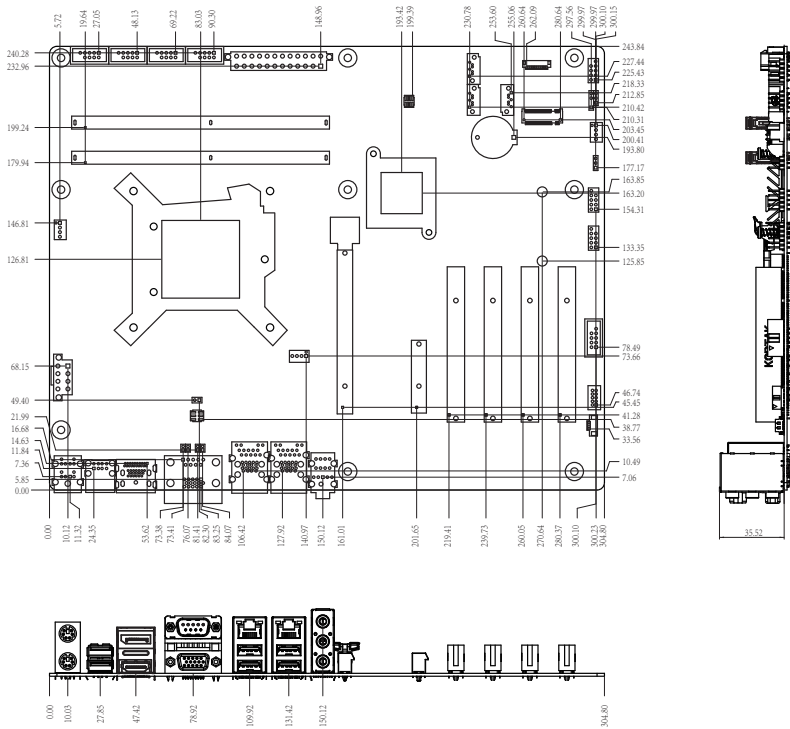
CAUTION! Do not overtighten the screws! Doing so can damage the motherboard.



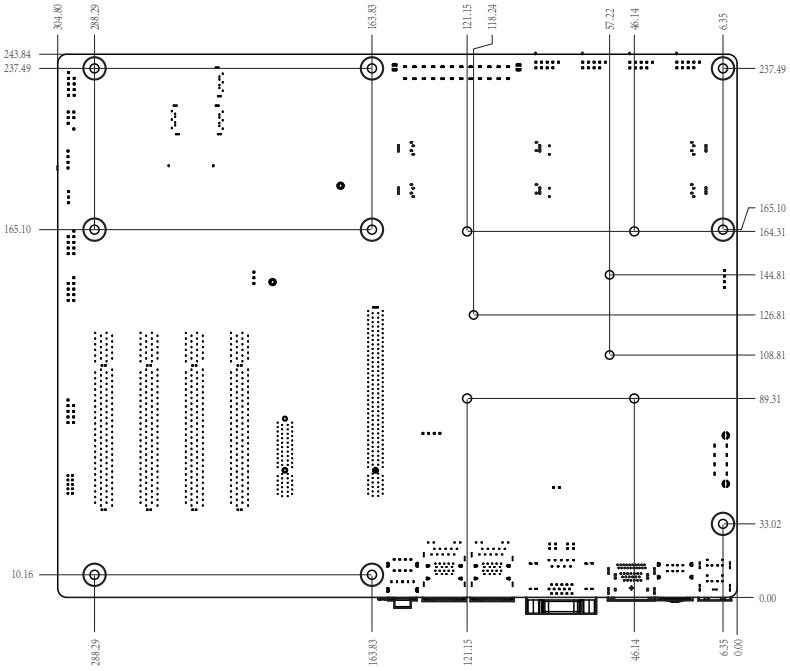
Connectors/Jumpers/Slots		Page
1.	COM1 operating mode selection jumpers (2-pin J1/J2/J3/J4)	2-13
2.	ATX power connectors (24-pin EATXPWR1, 8-pin EATX_PWR2)	2-17
3.	COM1 Ring/+5V/+12V selection jumper (6-pin COM1_V1)	2-13
4.	CPU and chassis fan connectors (4-pin CPU_FAN1, 4-pin CHA_FAN1/2)	2-18
5.	Intel® LGA1151 CPU socket	2-6
6.	DDR4 DIMM slots	2-10
7.	Serial port connectors (10-1pin COM2~6)	2-21
8.	BIOS programmable connector (8-pin SPI_1)	2-19
9.	M.2 M-Key slot	2-22
10.	Serial ATA 6.0Gb/s connectors (7-pin SATA6G_1~3)	2-18
11.	System panel connector (10-1 pin F_PANEL)	2-20
12.	AT/ATX mode selection (3-pin AT_ATX)	2-14
13.	Chassis intrusion jumper (4-1 pin CHASSIS)	2-14
14.	Clear RTC RAM (3-pin CLRTC1)	2-12
15.	USB 2.0 connectors (10-1 pin USB78 and USB910)	2-19
16.	Digital I/O connector (10-pin DIO)	2-22
17.	Speaker out connector (4-pin AMP_CON)	2-17

2.3 Screw size

2.3.1 Component side

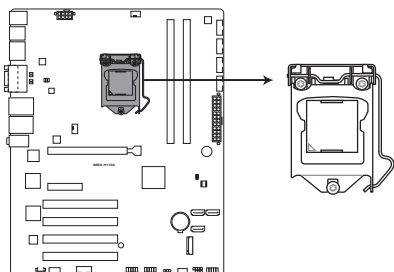


2.3.2 Solder side



2.4 Central Processing Unit (CPU)

This motherboard comes with an Intel® 7th/ 6th Generation Core™ i7 / i5 / i3, Pentium® and Celeron® 14nm LGA 1151 socket processor.



IMBA-H110A CPU socket LGA1151



IMPORTANT: Unplug all power cables before installing the CPU.



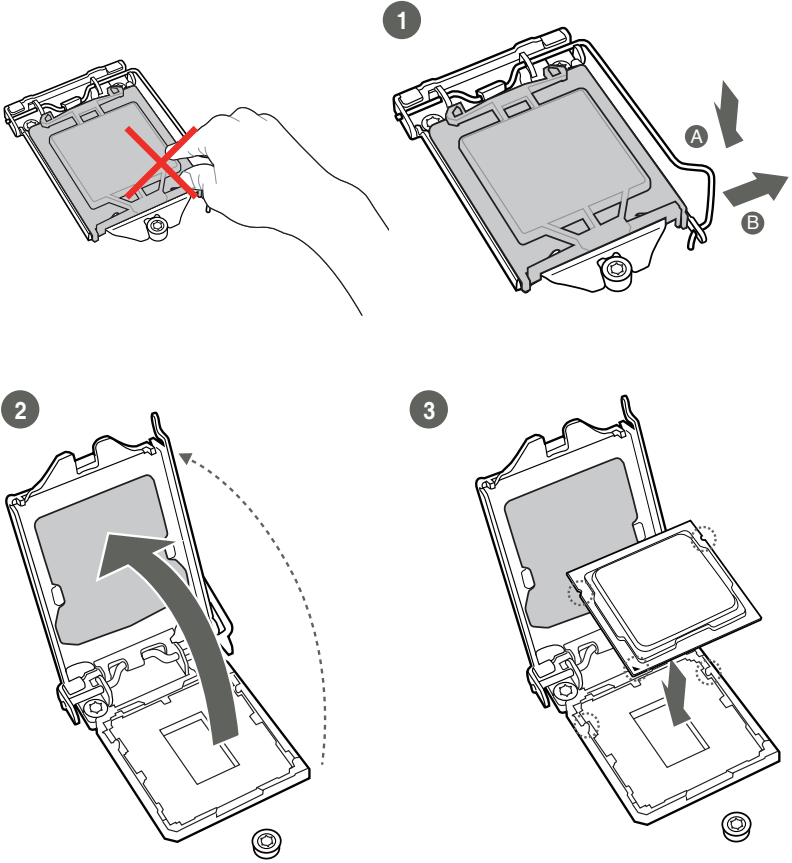
CAUTION!

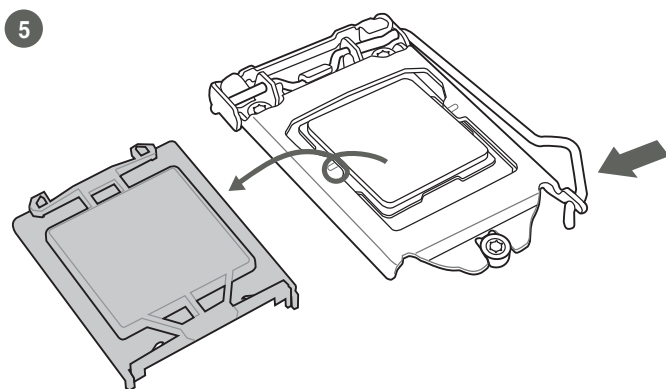
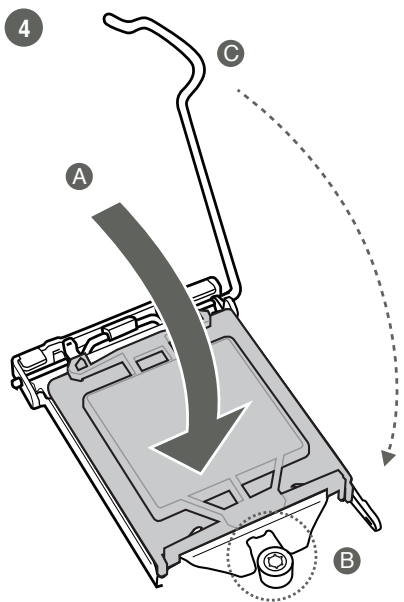
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components.
 - Keep the cap after installing the motherboard. The manufacturer will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the 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.
-

2.4.1 Installing the CPU

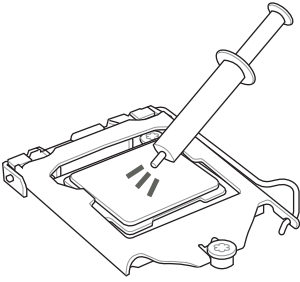


CAUTION! Ensure that you install the correct CPU designed for LGA1151 only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1151 socket.



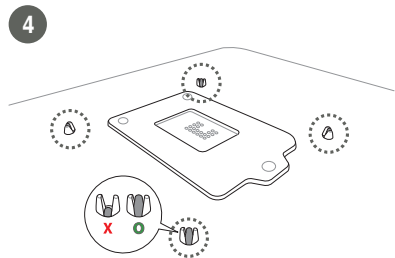
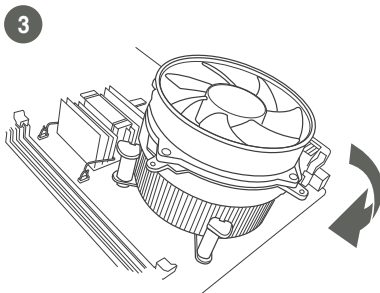
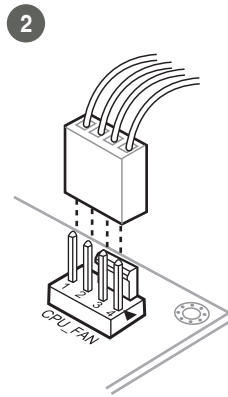
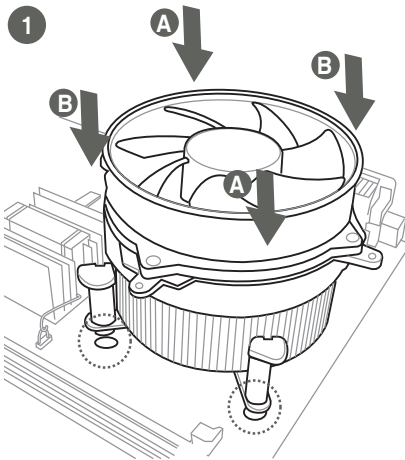


2.4.2 CPU heatsink and fan assembly installation

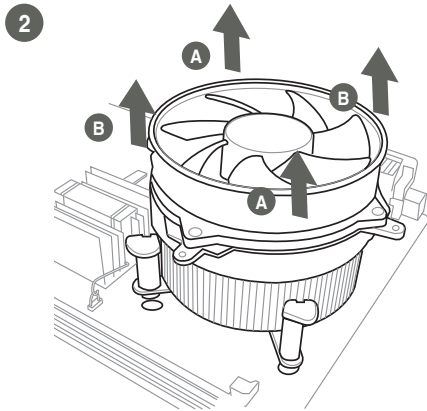
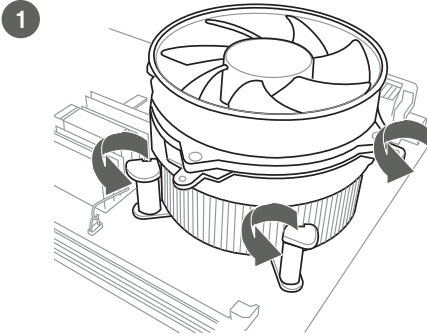


CAUTION! Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly

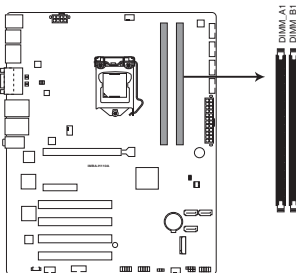


To uninstall the CPU heatsink and fan assembly



2.5 System memory

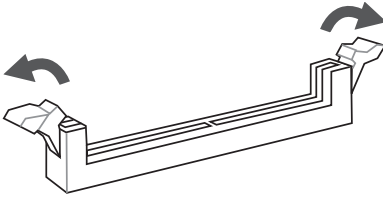
This motherboard comes with two Double Data Rate 4 (DDR4) Dual Inline Memory Modules (DIMM) sockets. The figure illustrates the location of the DDR4 DIMM sockets:



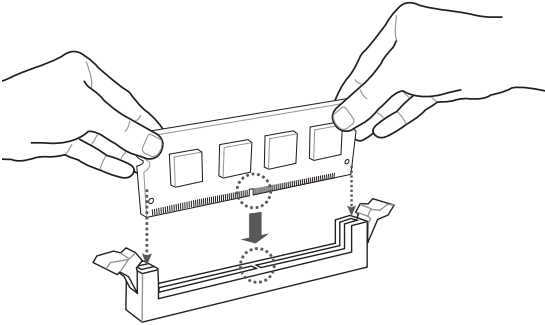
IMBA-H110A 288-pin DDR4 DIMM sockets

Installing a DIMM

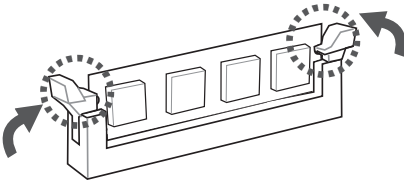
1



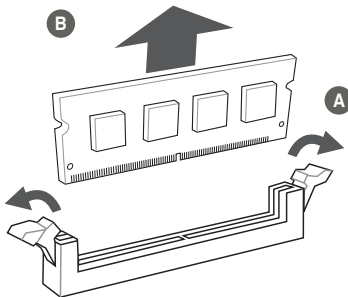
2



3



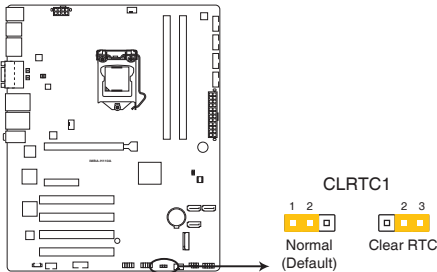
To remove a DIMM



2.6 Jumpers

1. Clear RTC RAM (3-pin CLRRTC1)

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-H110A Clear RTC RAM

To erase the RTC RAM:

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



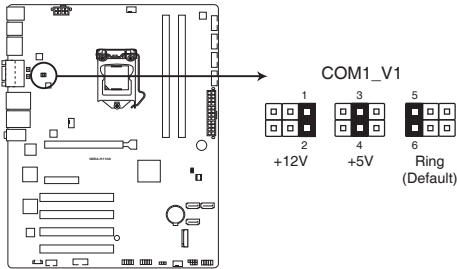
CAUTION! Except when clearing the RTC RAM, never remove the cap on CLRRTC jumper default position. Removing the cap will cause system boot failure!



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.
-

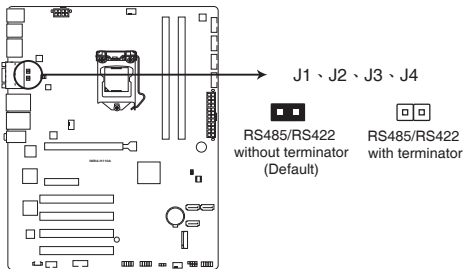
2. COM1 Ring/+5V/+12V selection jumper (6-pin COM1_V1)



IMBA-H110A COM1 Ring/+5V/+12V Selection

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

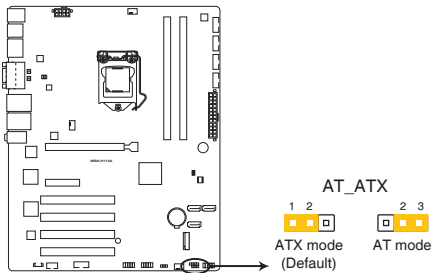
3. COM1 operating mode selection jumpers (2-pin J1/J2/J3/J4)



IMBA-H110A COM1 RS422/RS485 Terminator (J1、J2、J3、J4)

Setting	Pins
Open jumpers J1, J2, J3 and J4 (Default)	RS485/RS422 without terminator
Short-circuit jumpers J1, J2, J3 and J4	RS485/RS422 with terminator

4. AT/ATX mode selection (3-pin AT_ATX)



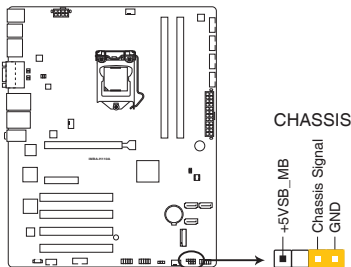
IMBA-H110A H/W AT/ATX mode selection

	Pins
ATX mode (Default)	1-2
AT mode	2-3

5. Chassis intrusion jumper (4-1 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.

Move the jumper cap to pins 1-2 when you intend to use the chassis intrusion detection feature.

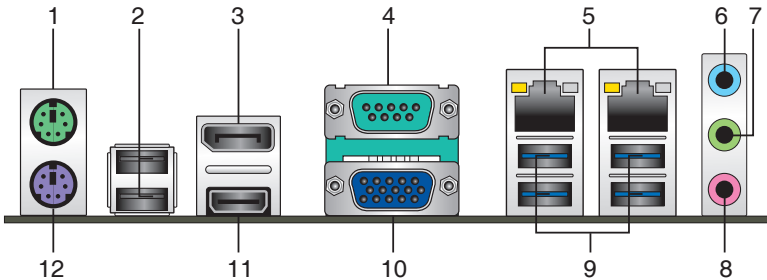


IMBA-H110A Chassis intrusion connector

Pins	
1-2	Enables the chassis intrusion detection feature
3-4	Disables the chassis intrusion detection feature (Default)

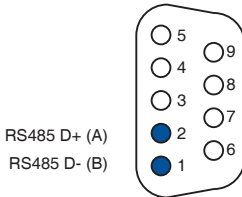
2.7 Connectors

2.7.1 Rear panel connectors

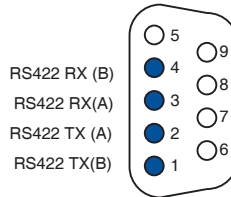


1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **USB 2.0 ports.** These 9-pin Universal Serial Bus (USB) ports connect to USB 2.0 devices.
3. **DisplayPort.** This port is for a DisplayPort-compatible devices.
4. **Serial port (COM port).** This port connects to a modem, or other device that conforms with serial specification.

Serial Port Connector for
(COM1 / RS485)



Serial Port Connector for
(COM1 / RS422)

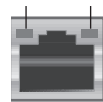


5. **LAN (RJ-45) ports.** These ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN 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
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode	—	—

Activity Link LED Speed LED



6. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.
7. **Line Out port (lime).** This port connects to a headphone or a speaker. In a 4.1-channel and 5.1-channel configurations, the function of this port becomes Front Speaker Out.
8. **Microphone port (pink).** This port connects to 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	Line In	Rear Speaker Out	Rear Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Bass/Center

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



NOTES:

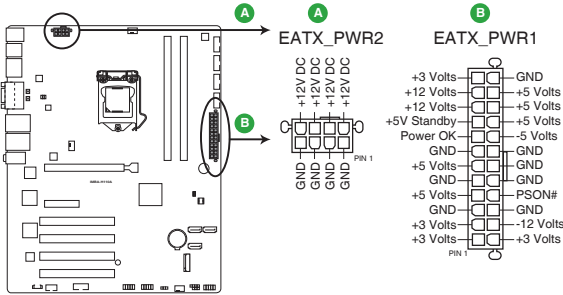
- DO NOT connect a keyboard / mouse to any USB 3.0 port when installing a Windows® operating system.
 - Windows® 7 requires USB 3.0 driver to use USB 3.0 devices.
 - We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for a faster and better performance from your USB 3.0 devices.
-

10. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
11. **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connectors, and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.
12. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

2.7.2 Internal connectors

1. ATX power connectors (24-pin EATX_PWR1, 8-pin EATX_PWR2)

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.



IMBA-H110A ATX power connectors

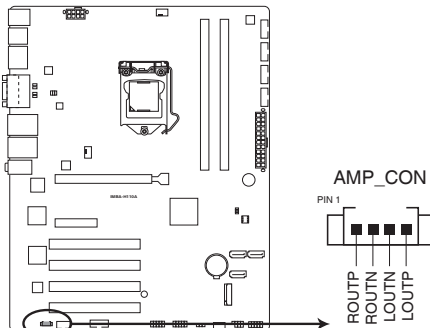


IMPORTANT:

- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 230W.
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

2. Speaker out connector (4-pin AMP_CON)

The 4-pin connector is for the chassis-mounted speaker.



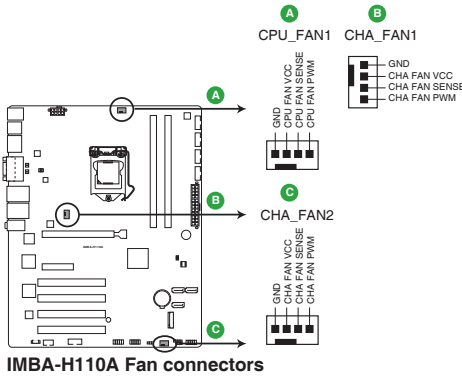
**IMBA-H110A Audio Stere.
Output with Amp connector**



The Speaker module is purchased separately.

3. Chassis / CPU fan connectors (4-pin CHA_FAN1/2, 4-pin CPU_FAN1)

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.



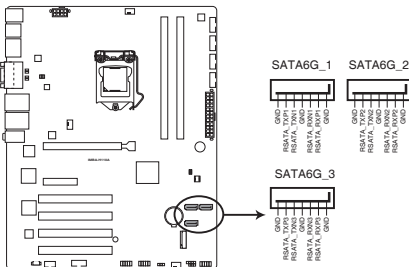
IMBA-H110A Fan connectors



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!

4. Serial ATA 6.0Gb/s connectors (7-pin SATA6G_1~3)

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



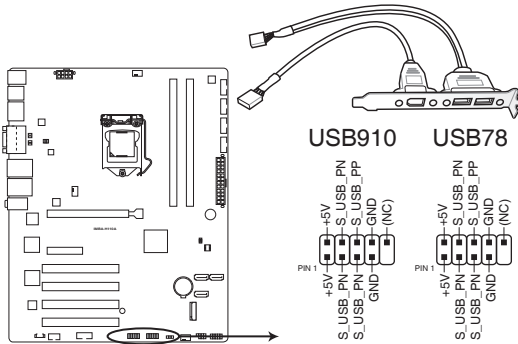
IMBA-H110A Intel® SATA 6 Gb/s connectors



IMPORTANT: When using hot-plug and NCQ, set the SATA Mode Selection item in the BIOS to [AHCI]. See section 3.3.3 SATA Configuration for details.

5. USB 2.0 connectors (10-pin USB78 and USB910)

These USB connectors comply with USB 2.0 specifications.



IMBA-H110A USB2.0 connectors



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



NOTES:

- The USB module cable is purchased separately.
- Intel® has released an official Windows® 7 XHCI Driver Creator Utility, please download it from: <https://downloadcenter.intel.com/download/25476/Windows-7-USB-3-0-Creator-Utility>.

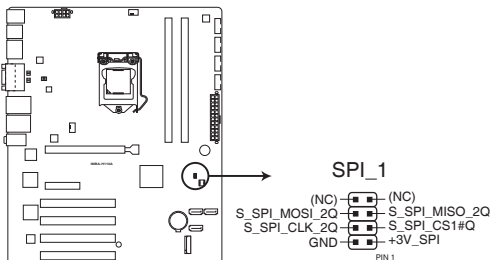
To install Windows® 7 in the Skylake platform:

Step1. Use this utility to pack XHCI driver into the original Windows® 7 OS image, there will be another OS image released.

Step2. Use the new OS image to install via any device.

6. BIOS programmable connector (8-pin SPI_1)

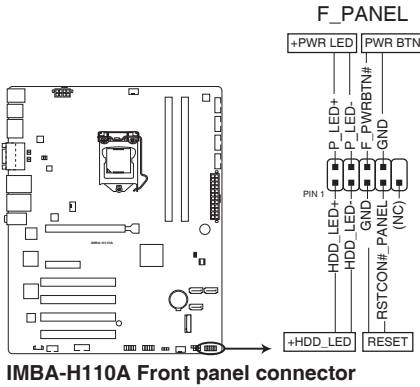
Use this connector to flash the BIOS ROM.



IMBA-H110A BIOS Programmable connector

7. System panel connectors (10-1 pin F_PANEL)

This connector supports several chassis-mounted functions.



IMBA-H110A Front panel connector

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

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin HDD_LED)**

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE 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)**

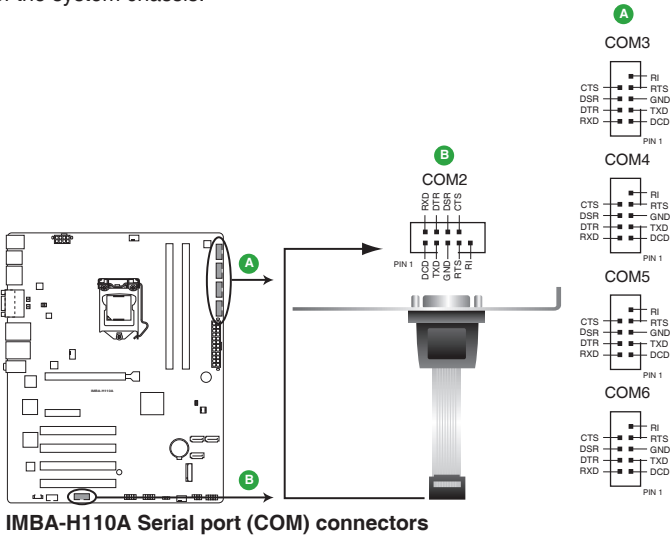
This 2-pin connector is for the system power button.

- **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.

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

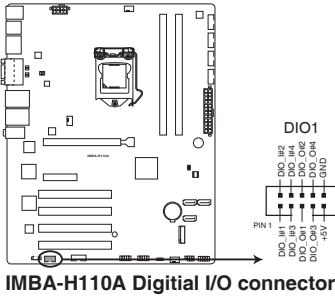
These connectors are for serial (COM) ports. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



NOTES: The COM module is purchased separately.

9. Digital I/O connector (10-pin DIO)

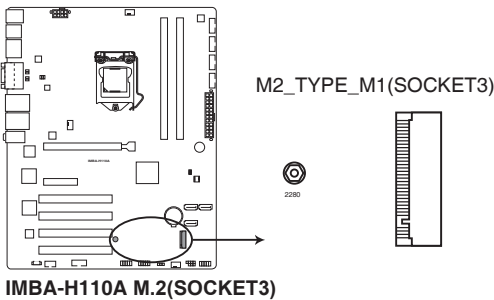
This connector includes 8 I/O lines (In/Out programmable). All of the Digital I/O lines are programmable and each I/O pin can be individually programmed to support various devices.



NOTE: To configure the I/O pins in BIOS, go to the Advanced tab > Digital IO Port Configuration. See section 3.3.8 Digital IO Port Configuration for details.

10. M.2 M-Key slot

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



NOTES:

- The M.2 SSD module is purchased separately.
- The M.2 M-key slot supports type 2280 SATA devices.

Chapter 3

BIOS setup

3.1 BIOS setup

Use the BIOS Setup to update the BIOS or configure settings. The BIOS screens include navigation keys and 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>+ 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>+ 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 Menu**.
 - The BIOS setup items described in this section are for reference purposes only, and may not exactly match what you see on your screen.
-

Menu bar

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

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

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

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.

Case Open Warning [Disabled]

Allows you to enable or disable case open warning function. Configuration options: [Disabled] [Enabled] [Clear]

3.3.1 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.

Intel (VMX) 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.

Active Processor Cores [All]

Allows you to choose the number of CPU cores to activate in each processor package. Configuration options: [All] [1] [2] [3]



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

3.3.2 Trusted Computing

Security Device Support [Enable]

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

SHA-1 PCR Bank [Enabled]

Allows you to enable or disable SHA-1 PCR Bank. Configuration options: [Enabled] [Disabled]

SHA256 PCR Bank [Enabled]

Allows you to enable or disable SHA256 PCR Bank. Configuration options: [Enabled] [Disabled]

Pending operation [None]

Allows you to schedule an operation for security devices. Reboot your system for the changes to take effect. Configuration options: [None] [TPM Clear]

Platform Hierarchy [Enabled]

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

Storage Hierarchy [Enabled]

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

Endorsement Hierarchy [Enabled]

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

TPM2.0 UEFI Spec Version [TCG_2]

Allows you to select the TCG2 spec version support.

[TCG_1_2] Compatible mode for Windows® 8 / Windows® 10.

[TCG_2] Newer TCG2 protocol and event format for Windows® 10 or later.

Physical Presence Spec Version [1.3]

Allows you to select which TCG Physical Presence Interface Specification Version is supported by the OS. Configuration options: [1.2] [1.3]

Device Select [Auto]

Allows you to schedule an operation for security devices. Reboot your system for the changes to take effect. Configuration options: [Auto] [TPM 1.2] [TPM 2.0]

[Auto] Select this item to support both TPM 1.2 and TPM 2.0 devices with default support of TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

[TPM 1.2] Select this item to support TPM 1.2 devices only.

[TPM 2.0] Select this item to support TPM 2.0 devices only.

3.3.3 SATA Configuration

SATA Controller(s) [Enabled]

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

SATA Mode Selection [AHCI]

Allows you to set the working mode of the SATA controller. Configuration options: [AHCI]

Port 1, Port 2, Port 3, Port 4 [Enabled]

These items allow you to enable/disable the SATA port(s). Configuration options: [Disabled] [Enabled]

Hot Plug [Disabled]

These items allow you to enable/disable SATA Hot Plug Support. Configuration options: [Disabled] [Enabled]

3.3.4 PCH-FW Configuration

Firmware Update Configuration

Me FW Image Re-Flash [Disabled]

This item allows you to enable or disable Me FW Image Re-Flash function. Configuration options: [Disabled] [Enabled]

Local FM Update [Enabled]

This item allows you to enable or disable Local FM Update function. Configuration options: [Disabled] [Enabled]

3.3.5 SIO Configuration

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

[*Active*] Serial Port 1

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]



The following two items appear only when you set **Use this device** to [Enabled].

Possible [Use Automatic Settings]

Allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=3F8h; IRQ=4;] [IO=2F8h; IRQ=3]

Mode [RS232]

Allows you to select the Serial Port mode. Configuration options: [RS232] [RS422] [RS485]

[*Active*] Serial Port 2

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]



The following item appears only when you set **Use this device** to [Enabled].

Possible [Use Automatic Settings]

This item appears only when you set **Use this device** to [Enabled] and allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=2F8h; IRQ=3] [IO=3F8h; IRQ=4;]

[*Active*] Serial Port 3, [*Active*] Serial Port 4

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]



The following item appears only when you set **Use this device** to [Enabled].

Possible [Use Automatic Settings]

This item appears only when you set **Use this device** to [Enabled] and allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=3E8h; IRQ=11;] [IO=2E8h; IRQ=11;]

[*Active*] Serial Port 5, [*Active*] Serial Port 6

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]



The following item appears only when you set **Use this device** to [Enabled].

Possible [Use Automatic Settings]

This item appears only when you set **Use this device** to [Enabled] and allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=2D0h; IRQ=11;] [IO=2C0h; IRQ=11;]

3.3.6 NCT6791D HW Monitor

The items in this menu allow you to configure the smart fan.

Smart Fan Configuration

CPU Smart Fan Control, CHA Smart Fan1 Control, CHA Smart Fan2 Control [Enabled]

Allows you to enable or disable CPU Smart Fan/CHA Smart Fan1/CHA Smart Fan2 Control. Configuration options: [Enabled] [Disabled]



The following sub-items appear only when you set **CPU Smart Fan Control** to [Enabled].

Fan Control Mode [Smart Fan IV 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 [Smart Fan IV Mode].

Temperature 1 [40] / Temperature 2 [50] / Temperature 3 [60] / Temperature 4 [70]

Sets the temperature value for the Smart Fan IV mode.

Fan PWM 1 [150] / Fan PWM 2 [170] / Fan PWM 3 [200] / Fan PWM 4 [220]

Sets the Fan PWM value for the Smart Fan IV mode.

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 [1]

Input value range: [0~15]

Fan Count Step Down [1]

Input value range: [0~15]

Fan Out Step Up Time [10]

Sets 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]

Sets 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 [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 Stop Duty [To Fan Out Stop Value]

Configuration options: [Down to 0] [To Fan Out Stop Value]

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 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 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]

Input value range: [0~255]

Fan Out Step Down Time [10]

Input value range: [0~255]

3.3.7 USB Configuration



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

Legacy USB Support [Enabled]

- [Enabled] Enables the support for USB devices on legacy operating systems (OS).
- [Disabled] USB devices are only available when running 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.

3.3.8 Digital IO Port Configuration

The items listed in this screen configure Digital IO settings.

DIO Port1~DIO Port4 [Output]

Configuration options: [Input] [Output]

DIO Port5~DIO Port8 [Input]

Configuration options: [Input] [Output]



The following item appears only when you set **DIO Port1~8** to [Output].

Output Level [High]

Configuration options: [High] [Low]

3.3.9 Power Management

Power Mode [ATX Type]

Select power supply mode. Configuration options: [ATX Type] [AT Type]



The following items appear when you set Power Mode to [ATX Type].

Restore AC Power Loss [Always Off]

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

RTC Wake system from S5 [Disabled]

- [Disabled] Disables system wake up from S5.
- [Fixed Time] The system will wake up at the specified hr::min::sec.
Configuration options: [Disabled] [Enabled] .
- [Dynamic Time] The system will wake up at the current time plus a specified number of minutes.



The following items appear when Fixed Time is enabled.

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

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



The following item appears 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. Input value range: [1~5]

3.4 Chipset menu

The Chipset menu items allow you to change configuration options for the North Bridge and South Bridge.

3.4.1 System Agent (SA) Configuration

MAX TOLUD [Dynamic]

Allows you to select the maximum memory size of TOLUD (Top of Low Usable DRAM). Configuration options: [Dynamic] [1 GB] [1.25 GB] [1.5 GB] [1.75 GB] [2 GB] [2.25 GB] [2.5 GB] [2.75 GB] [3 GB] [3.25 GB] [3.5 GB]

Graphics Configuration

Primary Display [Auto]

Allows you to decide which graphics controller to use as the primary boot device. Configuration options: [Auto] [IGFX] [PEG] [PCI]

Primary IGFX Boot Display [VBIOS Default]

Select the video device which will be activated during POST. This setting has no effect if an external graphics device is present. The secondary boot display selection appears based on your selection and the VGA mode is supported only on primary display. Configuration options: [VBIOS Default] [DP] [HDMI] [VGA]

PCIEX16_1 Gen Speed [Auto]

Allows you to configure the PEG 0:1:0 maximum speed. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

3.4.2 PCH-IO Configuration

HD Audio [Auto]

This item controls the detection of HD Audio devices. Configuration options: [Auto] [Disabled] [Enabled]

PCIEX4_1 Gen Speed [Auto]

Configures the speed of PCIe x4 slot 1. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

3.5 Security menu

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

3.5.1 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.

3.5.2 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**.

3.6 Boot menu

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

3.6.1 Boot Configuration

Quiet Boot [Enabled]

This item enables/disables Quiet Boot. Configuration options: [Disabled] [Enabled]

Launch PXE ROM [Do not launch]

This item controls the execution of UEFI and Legacy PXE OpROM. Configuration options: [Do not launch] [Legacy]

3.6.2 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.

3.7 Save & Exit menu

Save Changes and Reset

Once you are finished making your selections, choose this option from the Save & Exit menu to ensure the values you selected are saved. When you select this option, a confirmation window appears. Select Yes to save changes and reset.

Discard Changes and 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

Save or restore User Defaults to all setup options.

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.



電子電氣產品有害物質限制使用標識要求：圖中之數字為產品之環保使用期限。僅指電子電氣產品中含有的有害物質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。

部件名稱	有害物質					
	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	×	○	○	○	○	○
外殼	×	○	○	○	○	○
電源適配器	×	○	○	○	○	○
外部信號連接頭 及線材	×	○	○	○	○	○
中央處理器與內 存	×	○	○	○	○	○

本表格依據 SJ/T 11364 的規定編制。

○：表示該有害物質在該部件所有均質材料中的含量均在 GB/T 26572 規定的限量要求以下。

×

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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。