

**EMB-H81A**

**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 Cable
- 1 x I/O Shield
- 1 x Support CD



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

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### 1.2 Features

- Intel® Socket 1150 for 4<sup>th</sup> Generation Core™ i7/Core™ i5 / Core™ i3, Pentium® / Celeron™ Processors up to 65W
- Two 204-pin Dual Channel DDR3 1600/1333MHz SO-DIMMs up to 16GB
- SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2, USB3.0 x 2, USB2.0 x 7, COM x 6
- PCI-Express[x4] x 1, Full-size Mini Card (PCIe + USB) with mSATA option (with SATA 6Gb/s) x 1
- VGA, DVI, 18/24 bit Dual Channel LVDS supported

## 1.3 Specifications

SYSTEM	
Form factor	Mini-ITX
CPU	LGA1150 socket for Intel® 4 <sup>th</sup> Generation Core™ i7 / Core™ i5 / Core™ i3, Pentium® / Celeron® processors Supports Intel® CPU up to 65W
Memory	2 x SO-DIMM (8GB per DIMM), max. 16GB, non-ECC DDR3 1600 / 1333 MHz Dual-channel memory architecture
Chipset	Intel® H81 Express Chipset
I/O Chipset	NCT6791D & NCT5104D
Ethernet	2 x Realtek® 8111F PCIe Gigabit LAN
BIOS	64Mbit Flash ROM, AMI BIOS
Wake on LAN	Yes (WOL/PXE)
Watchdog Timer	1~255 steps by software program
TPM	Infineon SLB9635 TT 1.2
H/W Status Monitor	Monitors CPU/Chassis temperature Monitors Vcore/5V/3.3V/12V voltages Monitors CPU/Chassis fan speed
Smart Fan Control	CPU Fan/Chassis Fan
Power State	S3, S4, S5
Expansion slot	1 x PCI Express 2.0 x4 slot 1 x Full/Half-size Mini Card (USB+PCIe) with mSATA option (with SATA 6Gb/s)
Battery	Lithium battery
Power requirement	1 x 24-pin ATX connector 1 x 4-pin ATX 12V power connector
Board size	6.7 in. x 6.7 in. (17.0 cm x 17.0 cm)
Gross weight	1.1 lb (0.5 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 1920x 1200@60Hz, Dual Channel 18/24 bit Support LVDS
<b>Output interface</b>	1 x DVI 1 x VGA 1 x LVDS
<b>I/O</b>	
<b>Storage</b>	2 x SATA 6.0Gb/s ports 2 x SATA 3.0Gb/s ports
<b>Serial port</b>	1 x RS-232/422/485 supports 5V/12V/RI option at rear I/O 5 x RS-232 (1 x RS-232 at rear I/O, 4 x RS-232 at mid board)
<b>Parallel port</b>	SPP / EPP / ECP Mode
<b>USB</b>	2 x USB3.0 (rear panel) 7 x USB2.0 (3 ports at mid-board, 4 ports at rear panel)
<b>Fan</b>	1 x CPU Fan connector (4-pin) 1 x Chassis Fan connector (4-pin)
<b>RTC</b>	Internal RTC
<b>Keyboard/Mouse</b>	1 x PS/2 Keyboard / mouse port on rear I/O
<b>Audio</b>	Realtek ALC887, Mic-in/ Line-out 2 x Audio jacks (Mic-In, Line-Out) 1 x Front panel audio connector (supports AAFP)
<b>Ethernet</b>	2 x RJ-45 ports on rear I/O
<b>Display</b>	1 x VGA port on rear I/O 1 x DVI-I port on rear I/O
<b>Others</b>	1 x Front panel connector (Pin header) 1 x 8 bit Programmable Digital I/O 1 x AT/ATX mode selector





# 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.



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**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.
-

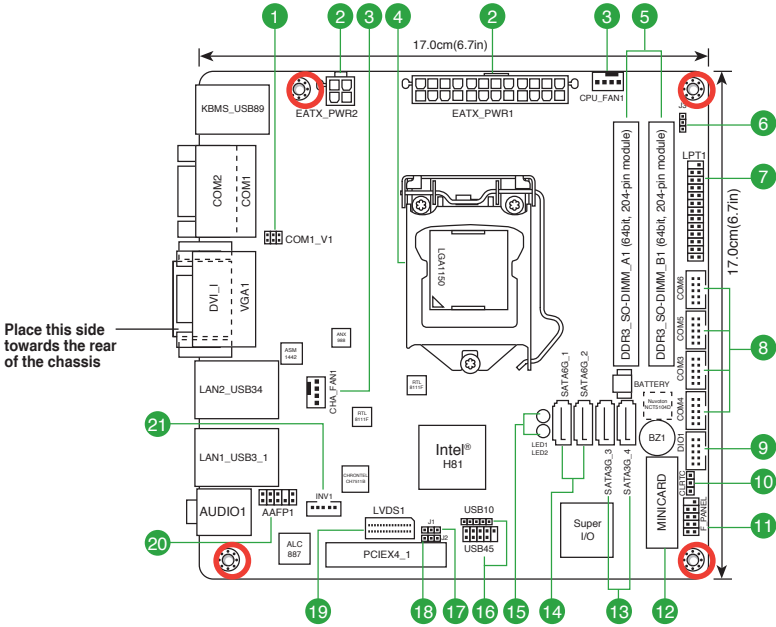
## 2.2 Motherboard layout



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



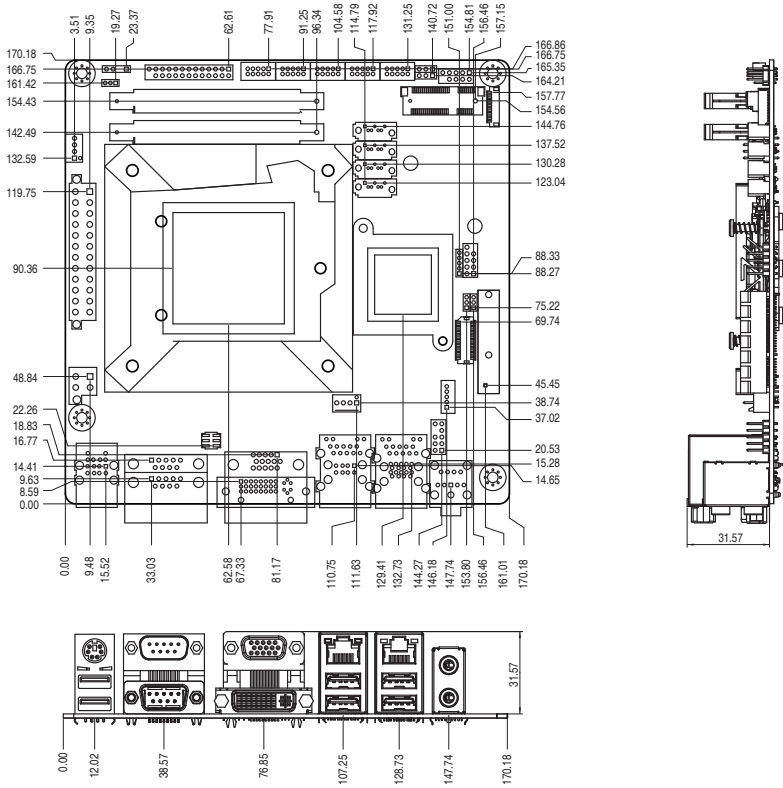
**CAUTION!** Do not overtighten the screws! Doing so can damage the motherboard.



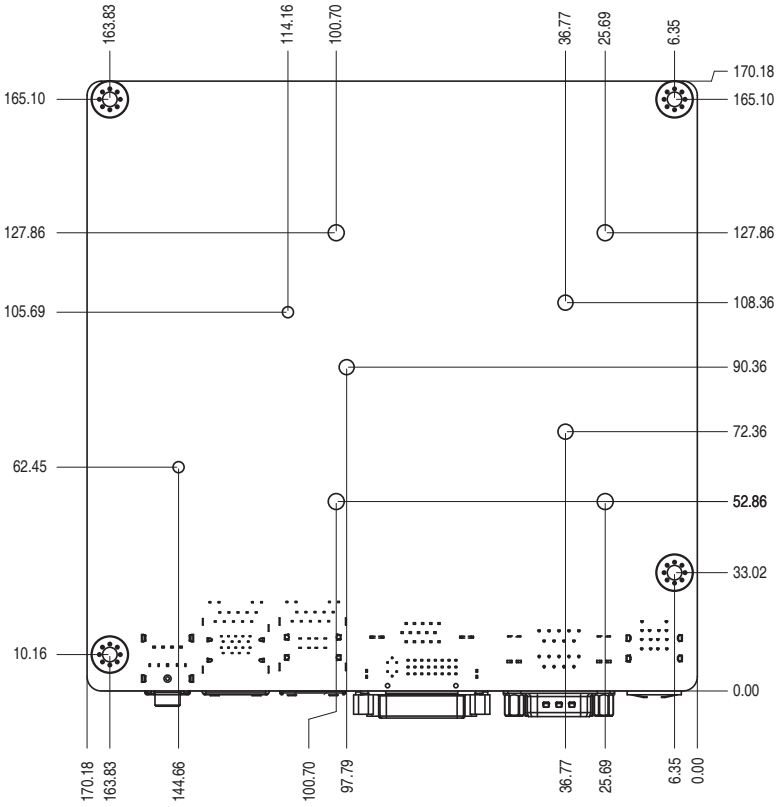
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## 2.3 Screw size

### 2.3.1 Component side

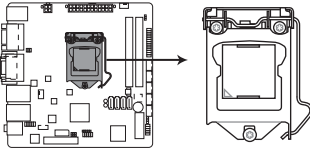


## 2.3.2 Solder side



## 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.



EMB-H81A CPU socket LGA1150



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

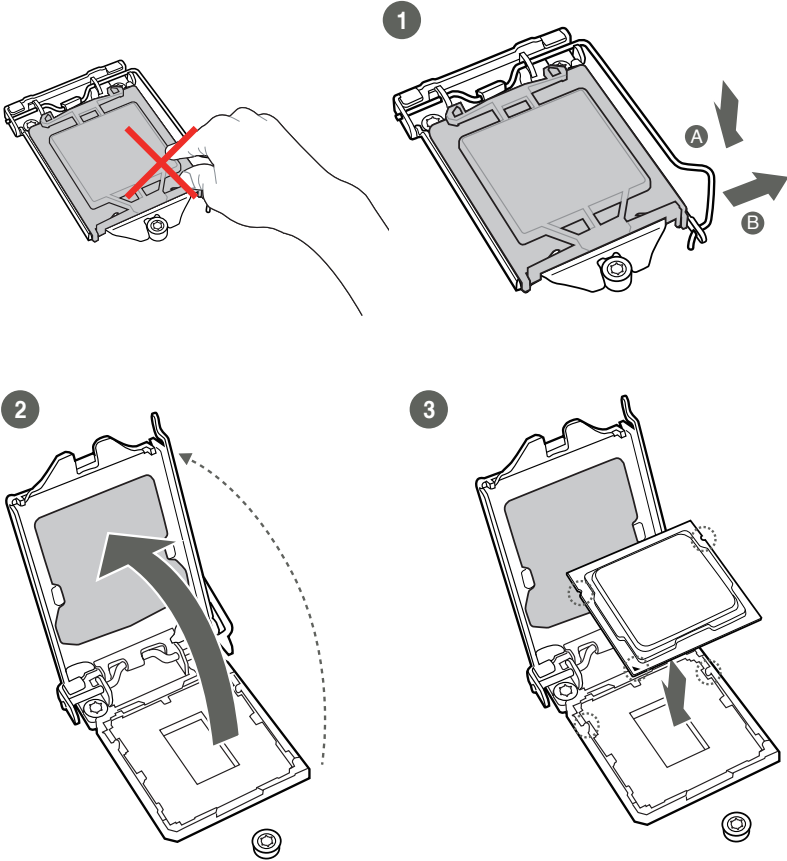
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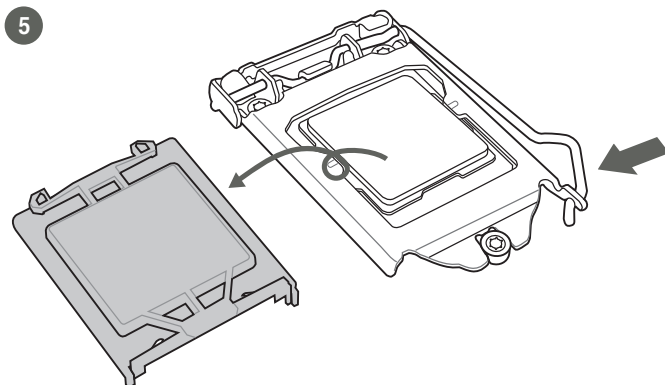
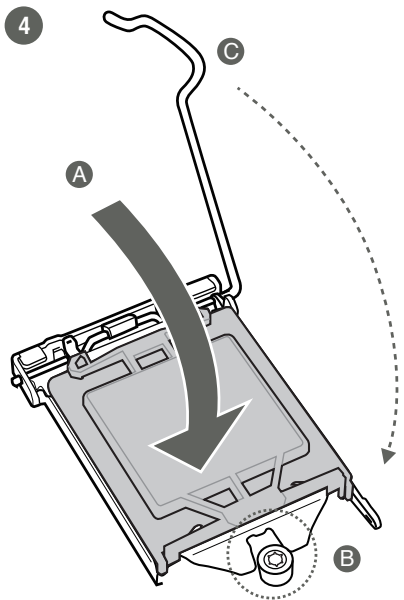


### CAUTION!

- 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.
-

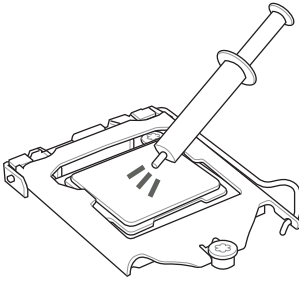
### 2.4.1 Installing the CPU





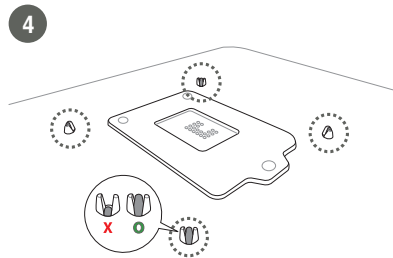
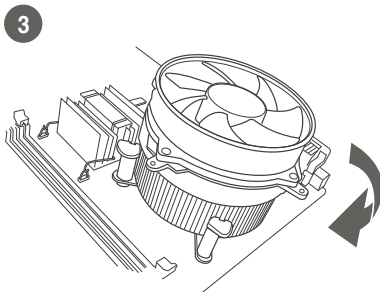
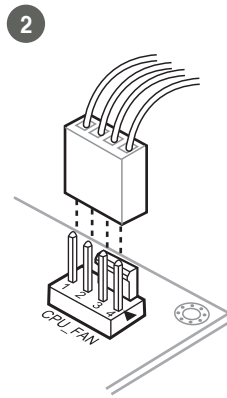
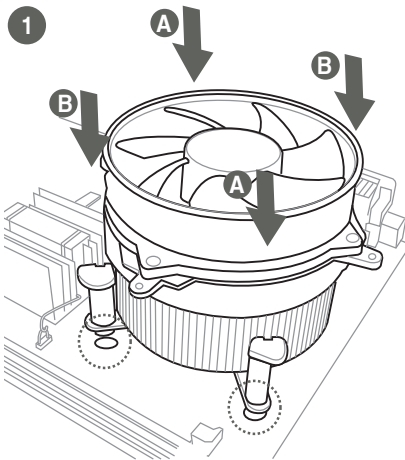


## 2.4.2 CPU heatsink and fan assembly installation

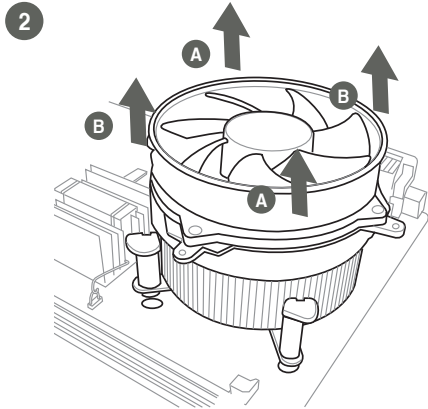
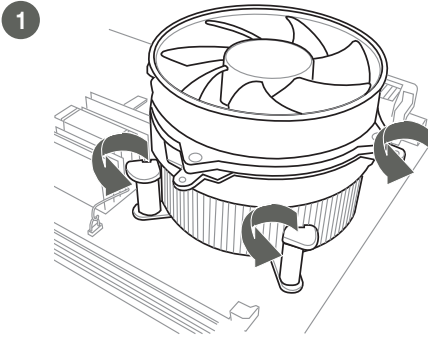


**CAUTION!** Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly



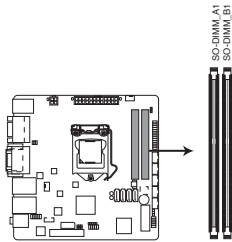
To uninstall the CPU heatsink and fan assembly



## 2.5 System memory

This motherboard comes with two Double Data Rate 3 (DDR3) Small Outline Dual Inline Memory Module (SO-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 SO-DIMM sockets:

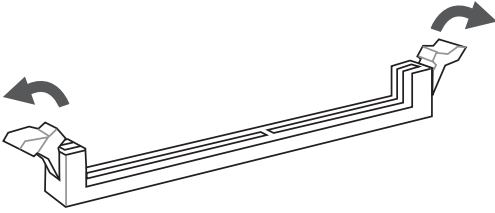


Channel	Sockets
Channel A	SO-DIMM_A1
Channel B	SO-DIMM_B1

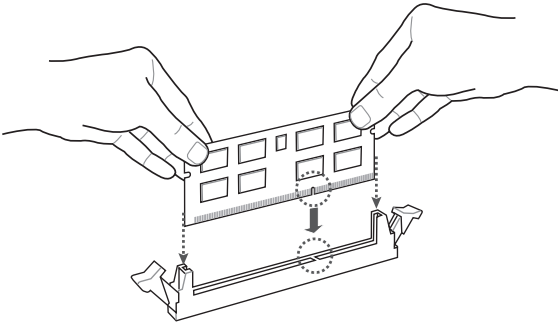
EMB-H81A 204-pin DDR3 SO-DIMM sockets

### 2.5.1 Installing a DIMM

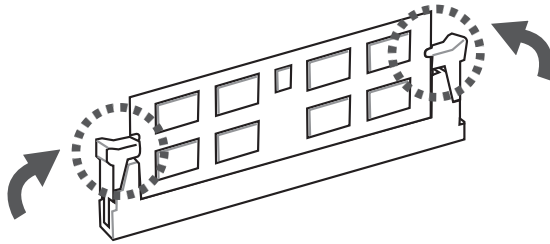
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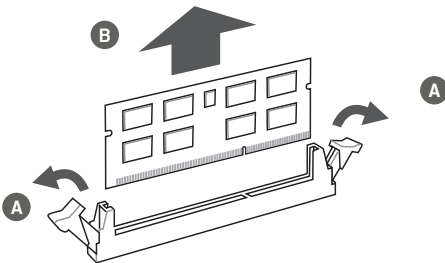
2



3



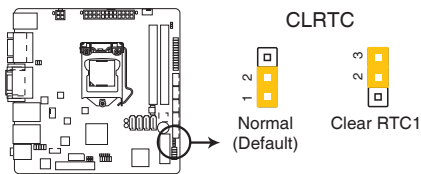
### To remove a DIMM



## 2.6 Jumpers

### 1. Clear RTC RAM (CLRRTC)

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.



**EMB-H81A 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.



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

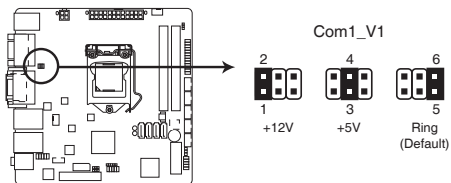
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#### NOTES:

- 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.
-

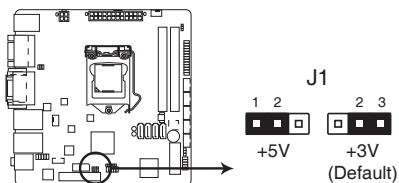
## 2. COM1 Ring/+5V/+12V selection (COM1\_V1)



**EMB-H81A COM VSET connector**

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

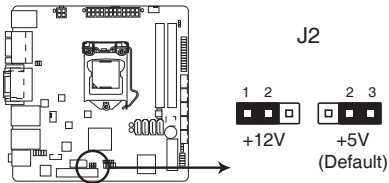
## 3. LVDS panel voltage selection (3-pin J1)



**EMB-H81A LVDS Panel Voltage Selection**

	Pins
+5V	1-2
+3.3V (Default)	2-3

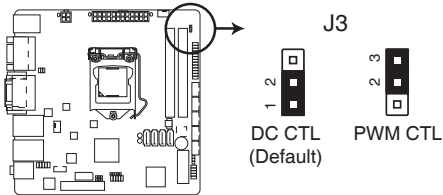
#### 4. Inverter voltage selection (3-pin J2)



#### EMB-H81A Inverter Voltage Selection

	Pins
+12V	1-2
+5V (Default)	2-3

#### 5. Inverter Backlight Control mode selection (3-pin J3)



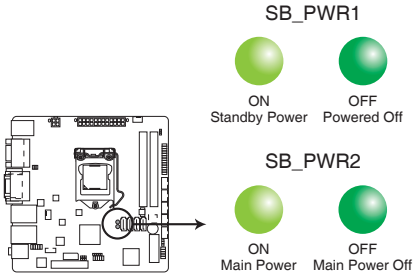
#### EMB-H81A Mode Selection for Back Light Control of Inverter

	Pins
DC Voltage Control (Default)	1-2
PWM Control	2-3

## 2.7 Onboard LEDs

### 1. Standby Power LED

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

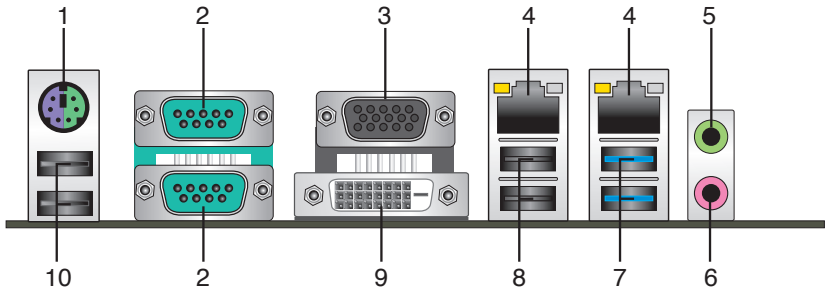


**EMB-H81A Onboard LEDs**



## 2.9 Connectors

### 2.9.1 Rear panel connectors



1. **PS/2 keyboard/mouse port (purple/green).** This port is for a PS/2 keyboard or mouse.
2. **Serial ports (COM1 / COM2).** These ports connect a modem, or other devices that conform 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	10	N.C.



#### NOTES:

- The COM module is purchased separately.
- Only COM1 can support RS-232 / RS-422 / RS-485.

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

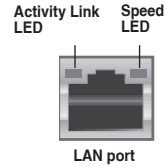


**NOTE:** If you use VGA port only, please disable LVDS function. Refer to section 3.4.1 **System Agent (SA) Configuration** for details.

4. **LAN1 (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/ LAN2 ports LED indications.

## LAN1 / LAN2 ports 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 Out port (lime).** This port connects to a headphone or a speaker. In a 4.1-channel, 5.1-channel and 7.1-channel configurations, the function of this port becomes Front Speaker Out.
- Microphone port (pink).** This port connects a microphone.
- USB 3.0 ports.** These two 9-pin Universal Serial Bus (USB) ports connect to USB 3.0/2.0 devices.



### NOTES:

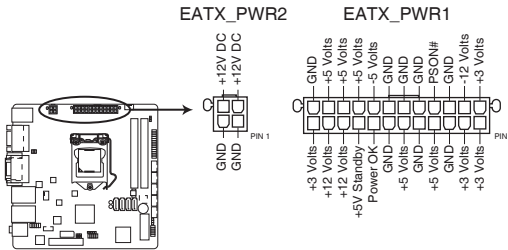
- DO NOT connect a keyboard / mouse to any USB 3.0 port when installing Windows® operating system.
- Due to USB 3.0 controller limitation, USB 3.0 devices can only be used under Windows® OS environment and after the USB 3.0 driver installation.
- USB 3.0 devices can only be used as data storage only.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

- USB 2.0 ports.** These four 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0/1.1 devices.
- 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.
- USB 2.0 ports.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0/1.1 devices.

## 2.9.2 Internal connectors

### 1. ATX power connectors (24-pin EATXPWR, 4-pin EATX12V)

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



**EMB-H81A ATX power connectors**

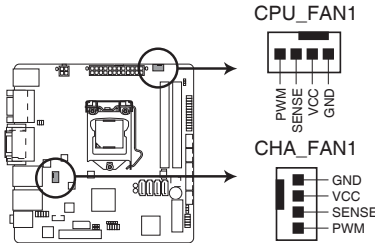


#### IMPORTANT:

- 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.
- DO NOT forget to connect the 4-pin ATX +12V power plug. Otherwise, the system will not have enough power.
- 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. CPU and chassis fan connectors (4-pin CPU\_FAN1, 4-pin CHA\_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.



**EMB-H81A Fan connectors**



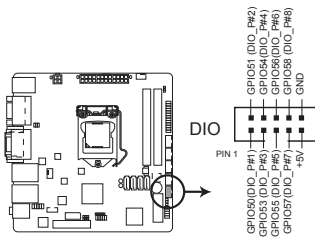
**CAUTION:** Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!



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

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

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



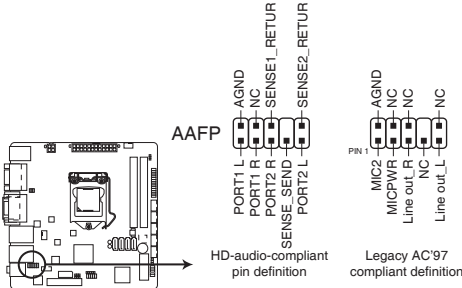
**EMB-H81A DIO connector**



**NOTE:** To configure the I/O pins in BIOS, click **Advanced** tab > **SIO GPIO** > **GPIO 50-57**. See section 3.4.6 SIO GPIO for details.

#### 4. Front panel audio connector (10-1 pin AAFP1)

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



**EMB-H81A Front panel audio connector**

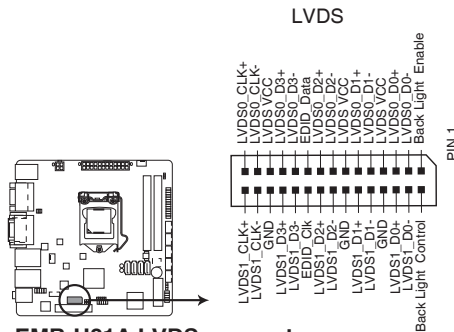


#### IMPORTANT:

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

#### 5. LVDS connector (30-pin LVDS)

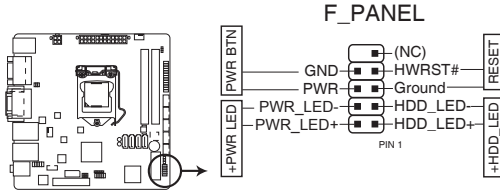
This connector is for a LCD monitor that supports Low-voltage differential signaling (LVDS) interface.



**EMB-H81A LVDS connector**

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

This connector supports several chassis-mounted functions.



**EMB-H81A System panel connector**

- **System power LED (2-pin PWR\_LED)**

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

- **Hard disk drive activity LED (2-pin HDD\_LED)**

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.

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

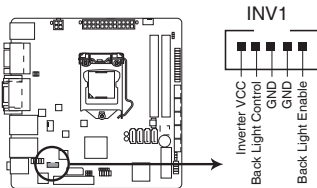
This 2-pin connector is for the system power button.

- **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.

## 7. Backlight inverter power connector (5-pin INV)

Connect the backlight inverter power cable to this connector.



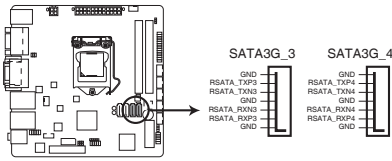
**EMB-H81A Inverter Connector**



**NOTE:** The backlight inverter power cable is purchased separately.

## 6. Serial ATA 3.0Gb/s connectors (7-pin SATA3G\_1, SATA3G\_2)

These connectors connect to Serial ATA 3.0 Gb/s hard disk drives and optical drives via Serial ATA 3.0 Gb/s signal cables.



**EMB-H81A SATA 3.0Gb/s connectors**

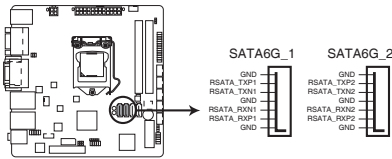


### NOTES:

- 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 **3.3.4 SATA Configuration** for details.

## 9. Serial ATA 6.0Gb/s connector (7-pin SATA6G\_1, SATA6G\_2)

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



**EMB-H81A SATA 6.0Gb/s connectors**

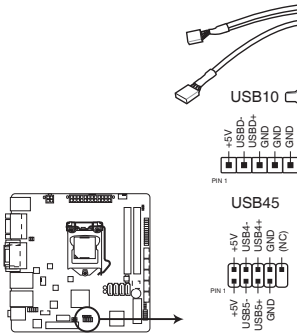


### NOTES:

- 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 **3.3.3 SATA Configuration** for details.

### 10. USB 2.0 connector (10-1 pin USB45, USB10)

This connector is for USB 2.0 ports. Connect the USB module cable to connector USB1112. This USB connector complies with USB 2.0 specification that supports up to 480 Mbps connection speed.



**EMB-H81A USB2.0 connectors**



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

---



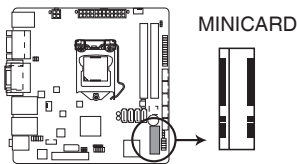
---

The USB module cable is purchased separately.

---

### 11. Minicard connector

Use this connector to connect a Minicard reader.



**EMB-H81A MINICARD connector**



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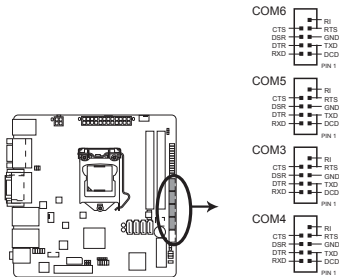
The Mini card module is purchased separately.

---



## 12. Serial port connectors (10-1 pin COM3 ~ COM6)

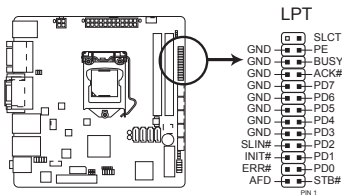
These connectors are for serial (COM) ports. Connect the serial port module cables to these connectors, then install the module to a slot opening at the back of the system chassis.



EMB-H81A Serial port connectors

## 13. 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.



EMB-H81A Parallel Port Connector

# 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.

---

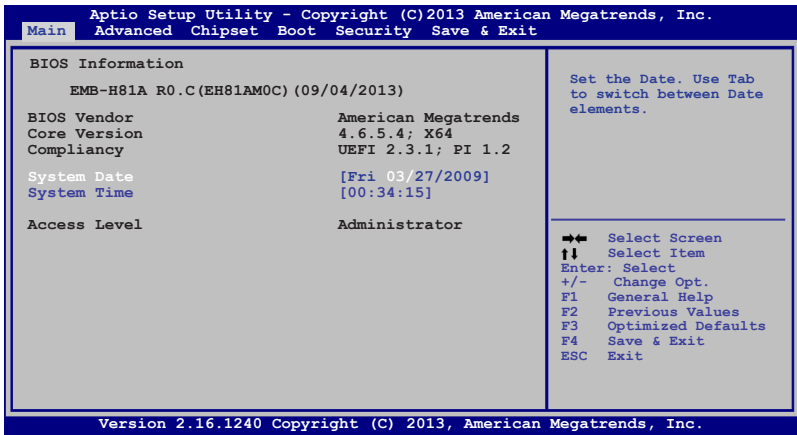


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#### IMPORTANT:

- 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 Exit Menu**.
  - 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

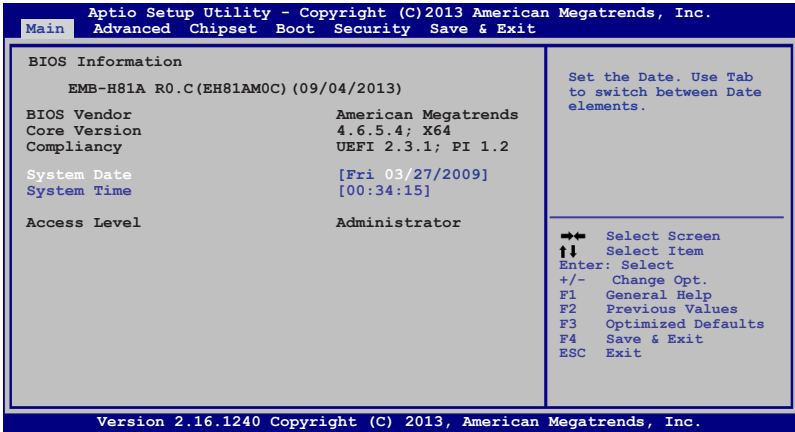
The menu bar on top of the screen has the following main items:

- Main** For changing the basic system configuration.
- Advanced** For changing the advanced system settings.
- Chipset** For viewing and changing chipset settings.
- Boot** For changing the system boot configuration.
- Security** For viewing and changing security Information.
- Save & Exit** For selecting the save & 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]

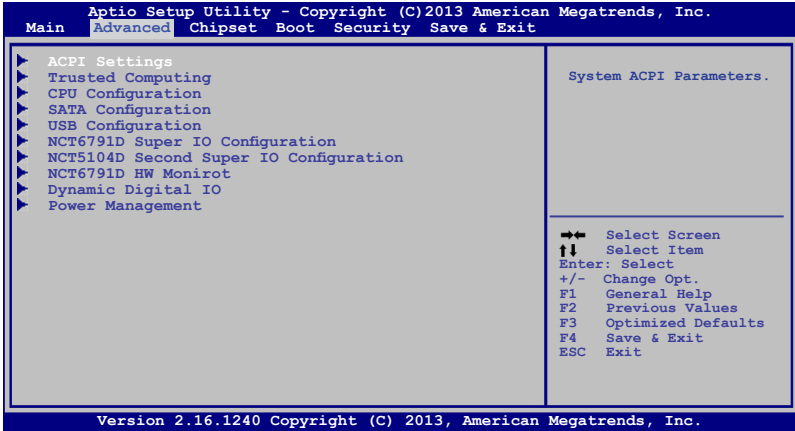
Allows you to set the system time.

### 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 ACPI Settings

This item allows you to change the ACPI settings.

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

Allows you to select the ACPI Sleep State that the system will enter when the SUSPEND button is pressed. Configuration options: [Suspend Disabled] [(S3 only (Suspend to RAM))]

#### 3.3.2 Trusted Computing

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

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

#### 3.3.3 CPU Configuration

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



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

### Turbo Mode [Enabled]

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

## 3.3.4 SATA Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Present** if no SATA device is installed to the corresponding SATA port.

### SATA Controller(s) [Enabled]

Allows you to enable or disable the SATA device(s).

[Enabled] Enables the SATA device(s).

[Disabled] Disables this SATA device(s).

### 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.

### Serial ATA Port 0, 1, 4, 5

#### Port 0, 1, 4, 5 [Enabled]

These items become configurable only when you set the SATA Mode Selection item to [AHCI], and allow you to enable/disable the SATA port(s). Configuration options: [Disabled] [Enabled]

### Hot Plug [Disabled]

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

### 3.3.5 USB Configuration

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



---

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

---

### Legacy USB Support [Enabled]

- [Enabled] Enables the support for USB devices on legacy operating systems (OS).
- [Disabled] The USB devices can be used only for the BIOS setup program.
- [Auto] Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

### 3.3.6 NCT6791D Super IO Configuration

Allows you to configure the system super I/O chip parameters.

#### Serial Port1~2 Configuration

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

##### Serial Port [Enabled]

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



---

The following two items appear only when you set the **Serial Port** to [Enabled].

---

##### Change Settings [Auto]

Allows you to select the Serial Port base address. Configuration options: [Auto] [IO=3F8h; IRQ=4] [IO=2F8h; IRQ=3]

##### RS 232/422/485 [RS232]

This item is only supported by Serial Port 1 and allows you to select COM RS Mode.

Configuration options: [RS232] [RS422] [RS485]

### Parallel Port [Enabled]

Allows you to enable or disable the parallel port (LPT/LPTE). Configuration options: [Enabled] [Disabled]



---

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

---

#### Change Settings [Auto]

Allows you to select the Parallel Port base address.

Configuration options: [Auto] [IO=378h; IRQ=7] [IO=378h; IRQ=5,7] [IO=278h; IRQ=5,7] [IO=3BCh; IRQ=5,7]

#### 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]

## 3.3.7 NCT5104D Second Super IO Configuration

Allows you to configure the system super I/O chip parameters.

### Serial Port3~6 Configuration

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

#### Serial Port [Enabled]

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



---

The following two items appear only when you set the **Serial Port** to [Enabled].

---

#### Change Settings [Auto]

Allows you to select the Serial Port base address.

Configuration options: [Auto] [IO=3F8h; IRQ=10] [IO=3F8h; IRQ=10, 11] [IO=2E8h; IRQ=10, 11] [IO=2D0h; IRQ=10, 11] [IO=2C0h; IRQ=10, 11]

## 3.3.8 NCT6791D HW Monitor

Allows you to monitor the hardware status.

### Smart Fan Configuration

The sub-items in this menu allow you to set the smart fan configuration.



### **CPU Smart Fan Control [Disabled]**

Allows you to enable or disable the CPU Smart Fan Control. Configuration options: [Enabled] [Disabled]

### **Chassis Smart Fan Control [Disabled]**

Allows you to enable or disable the Chassis Smart Fan Control. Configuration options: [Enabled] [Disabled]

## **3.3.9 Dynamic Digital IO**

Allows you to change the Dynamic Digital IO.

### **GPIO 1~4 [Input]**

Allows you to set the GPIO 1~4 as Input or Output. Configuration options: [Input] [Output]

### **GPIO 5~8 [Output]**

Allows you to set the GPIO 5~8 as Input or Output. Configuration options: [Input] [Output]

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

Allows you to set the Output Level as high or low. Configuration options: [Hi] [Low]

## **3.3.10 Power Management**

The items in this menu allow you to change the Power Management features.

### **Power Mode [ATX Type]**

Allow you to select the power supply mode. Configuration options: [ATX Type] [AT Type]

### **Power Failure [Last State]**

Allows you to set the NCT6791D power failure feature. Configuration options: [Always Off] [Always On] [Last State]

### **Resume from RI [Enabled]**

Allows you to enable or disable resume from RI. Configuration options: [Disabled] [Enabled]

### **S5 RTC ake Settings [Enabled]**

#### **Wake system with Fixed Time [Disabled]**

Allows you to enable or disable system wake up on alarm event When enabled, the system will wake up on hr::min::sec specified . Configuration options: [Disabled] [Enabled]

### Wake system with Dynamic Time [Disabled]

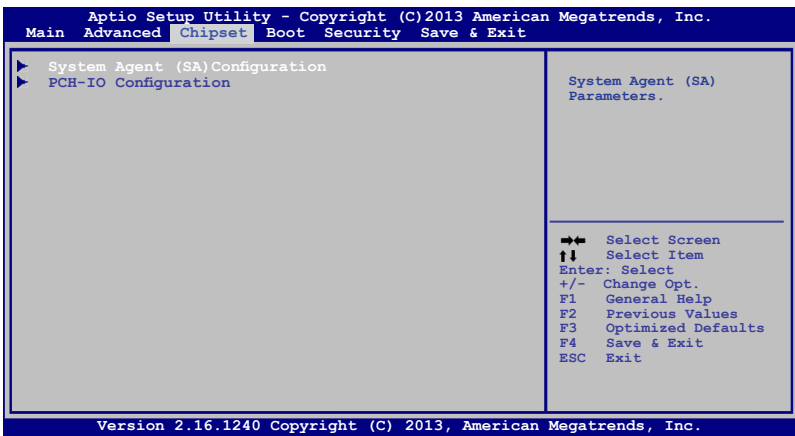
Allows you to enable or disable system wake up on alarm event. When enabled, the system will wake up xx minutes after current time. Configuration options: [Enabled] [Disabled]

## 3.4 Chipset menu

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



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



### 3.4.1 System Agent (SA) Configuration

Allows you to change the System Agent (SA) parameters.

#### PEG0 - Gen X [Auto]

Allows you to configure PEG0, B0:D1:F0. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

#### Enable PEG [Auto]

Allows you to enable or disable the PEG. Configuration options: [Disabled] [Enabled] [Auto]

#### Detect Non-Compliance Device [Disabled]

Allows you to enable or disable detection of non-compliance PCI Express Device in PEG. Configuration options: [Disabled] [Enabled]

### **Primary Display [Auto]**

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

### **Primary iGFX Boot Display [VBIOS Default]**

Select the Video Device which will be activated during POST. Your selection does not take effect if you have installed an external graphics device. Secondary boot display selection will appear based on your selection. VGA modes can be supported only on the primary display. Configuration options: [VBIOS Default] [CRT] [DVI] [LVDS] [CRT2]

### **LVDS [Enabled]**

Allows you to enable or disable LVDS (CH7511). Configuration options: [Disabled] [Enabled]

### **LVDS Panel Type [1024x768 18Bit, 60Hz]**

Allows you to configure LVDS panel used by Internal Graphics Device. Configuration options: [640x480, 18bit, 60Hz] [800x480, 18bit, 60Hz] [800x600, 18bit, 60Hz] [1024x600, 18bit, 60Hz] [1024x768, 18bit, 60Hz] [1024x768, 24bit, 60Hz] [1280x768, 24bit, 60Hz] [1280x1024, 48bit, 60Hz] [1366x768, 24bit, 60Hz] [1440x900, 48bit, 60Hz] [1600x1200, 48bit, 60Hz] [1920x1080, 48bit, 60Hz] [1920x1200, 48bit, 60Hz]

### **LVDS Backlight Level [80%]**

Allows you to select the backlight brightness of LVDS. Configuration options: [100%] [90%] [80%] ~ [0%]

### **LVDS Backlight Type [Normal]**

Allows you to select the backlight control type of LVDS. Configuration options: [Normal] [Inverted]

## **3.4.2 PCH-IO Configuration**

Allows you to change the PCH parameters.

### **PCIe Mini Card [Enabled]**

Allows you to enable or disable the PCIe Mini Card function. Configuration options: [Enabled] [Disabled]

### **PCIe Mini Card Speed [Auto]**

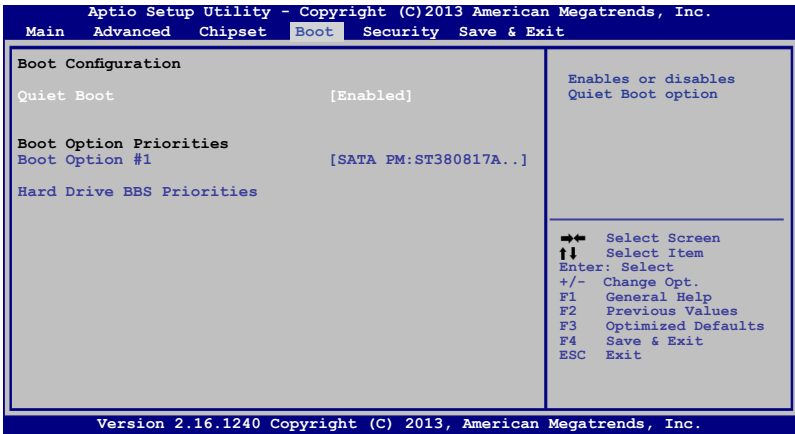
Allows you to select the PCIe Mini Card speed. Configuration options: [Auto] [Gen1] [Gen2]

### **Azalia [Enabled]**

Allows you to enable or disable the control detection of the Azalia device. Configuration options: [Enabled] [Disabled]

## 3.5 Boot menu

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



### 3.5.1 Boot Configuration

Allows you to change the boot configurations.

#### Quiet Boot [Enabled]

Allows you to enable or disable the Quiet Boot option. Configuration options: [Enabled] [Disabled]

### 3.5.2 Boot Option Priorities

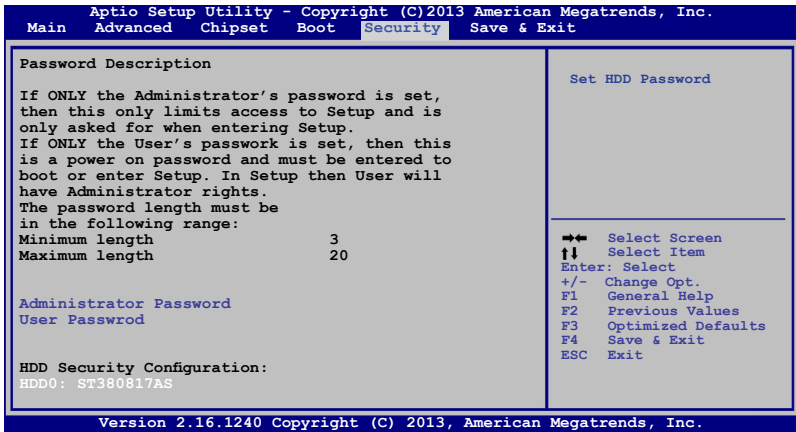
These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.



- 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.



### 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:



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

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

#### To change an administrator password:

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

4. Confirm the password when prompted.

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

### **User Password**

If you have set a user password, you must enter the user password for accessing the system. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

#### **To set a user password:**

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

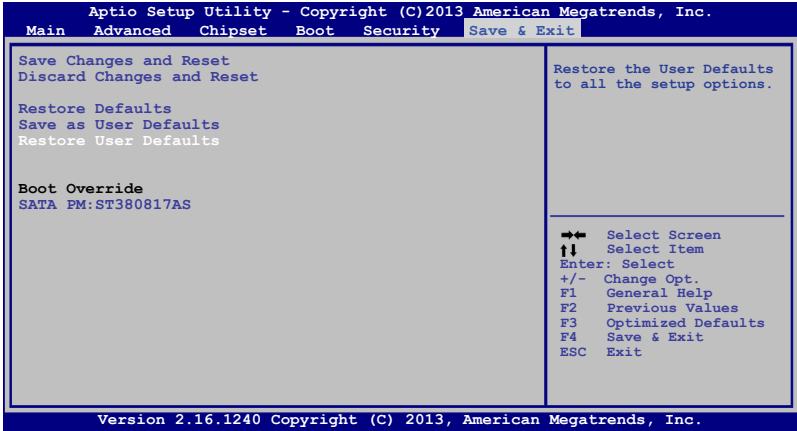
#### **To change a user password:**

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

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

### 3.7 Save & Exit menu

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



#### Save Changes & 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 or if you press <F4>, a confirmation window appears. Select Yes to save changes and reset.

#### Discard Changes & Reset

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

#### Restore Defaults

This option allows you to restore the default values for each of the parameters on the Setup menus. When you select this option or if you press <F3>, a confirmation window appears. Select Yes to load the default values.

#### Save as User Defaults

This option allows you to save the changes made so far as User Defaults. When you select this option, a confirmation window appears. Select Yes to save as user defaults.

#### Restore User Defaults

This option allows you to restore the User Defaults to all the setup options. When you select this option, a confirmation window appears. Select Yes to restore user defaults.

**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.





# 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.



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**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.

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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.

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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.

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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。

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×：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。