# MDH11BM

Intel® Socket LGA1151 processor motherboard

## User's Manual

Rev. 1002

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## Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentation:

- For detailed product information, carefully read the User's Manual.

For product-related information, check on our website at:
http://www.gigabyte.com

# Table of Contents

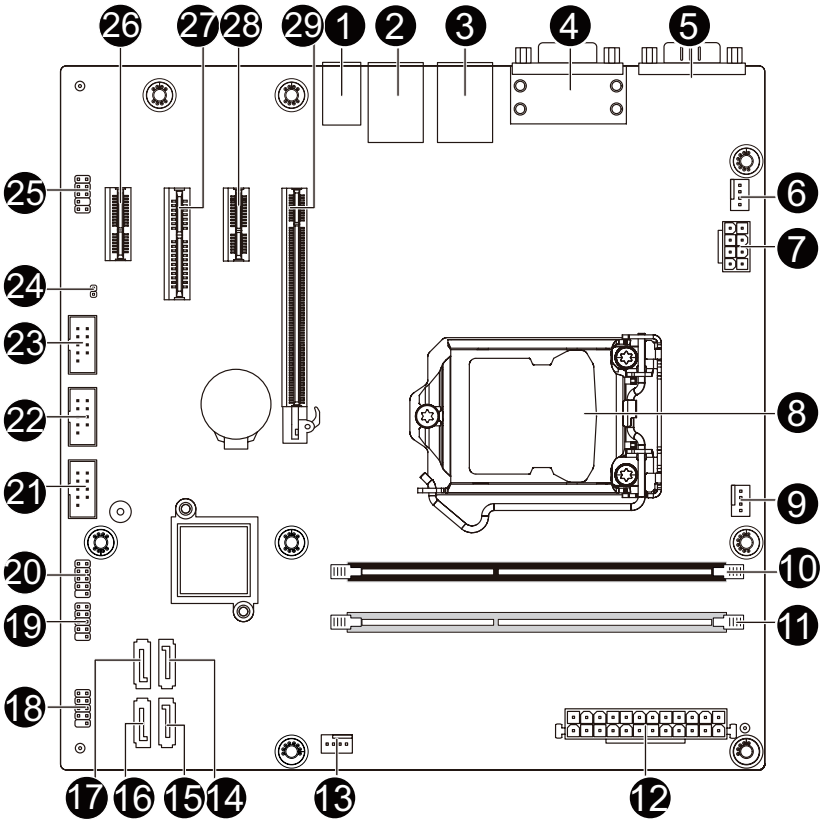

Box Contents ..... 4
MDH11BM Motherboard Layout ..... 5
Block Diagram ..... 7
Chapter 1 Hardware Installation ..... 8
1-1 Installation Precautions ..... 8
1-2 Product Specifications ..... 9
1-3 Installing the CPU and CPU Cooler ..... 11
1-3-1 Installing the CPU ..... 11
1-3-2 Installing the CPU Cooler ..... 13
1-4 Installing the Memory ..... 14
1-4-1 Installing a Memory ..... 14
1-5 Back Panel Connectors ..... 15
1-6 Internal Connectors ..... 17
Chapter 2 BIOS Setup ..... 24
2-1 The Main Menu ..... 26
2-2 Advanced Menu ..... 28
2-2-1 Trusted Computing ..... 29
2-2-2 Super IO Configuration ..... 30
2-2-2-1 Serial Port Configuration (for port #1/#2/#3#4) ..... 31
2-2-3 Hardware Monitor ..... 34
2-2-4 S5 RTC Wake Settings ..... 35
2-2-5 CPU Configuration ..... 36
2-2-6 SATA Configuration ..... 39
2-2-7 OS Selection ..... 40
2-3 Chipset Menu ..... 41
2-4 Security Menu ..... 42
2-4-1 Secure Boot menu ..... 43
2-4-1-1 Key Management ..... 44
2-5 Boot Menu ..... 45
2-6 Save & Exit Menu ..... 46
2-7 Flash Your BIOS ..... 48

# Box Contents

- ☑ Motherboard
- ☑ Driver CD
- ☑ I/O Shield

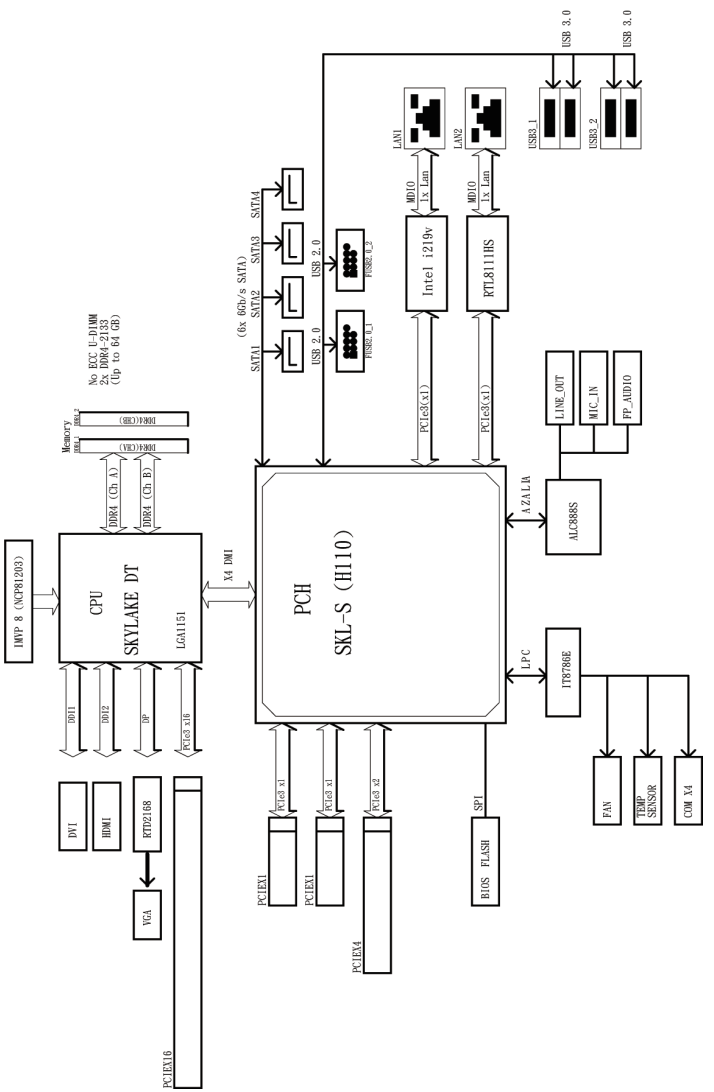
- The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.
- The motherboard image is for reference only.

## MDH11BM Motherboard Layout



| Item | Code | Description |
|---|---|---|
| 1 | AUDIO | Audio connectors |
| 2 | USB30_LAN2 | RJ45 LAN port (top) / USB 3.0 ports (buttom) |
| 3 | USB30_LAN1 | RJ45 LAN port (top) / USB 3.0 ports (buttom) |
| 4 | VGA_DVI | VGA port (top)/DVI-D port |
| 5 | COM_1/HDMI | Serial port (top)/HDMI port (bottom-right corner) |
| 6 | SYS_FAN1 | System fan connector #1 |
| 7 | ATX12V_2X4 | 8 pin power connector |
| 8 | CPU | Intel LGA 1151 socket |
| 9 | CPU_FAN | CPU fan connector |
| 10 | DDR4_1 | DDR4 DIMM slot#1 |
| 11 | DDR4_2 | DDR4 DIMM slot#2 |
| 12 | ATX | 24 pin main power connector |
| 13 | SYS_FAN2 | System fan connector #2 |
| 14 | SATAIII_1 | SATA 6Gb/s connector |
| 15 | SATAIII_3 | SATA 6Gb/s connector |
| 16 | SATAIII_2 | SATA 6Gb/s connector |
| 17 | SATAIII_0 | SATA 6Gb/s connector |
| 18 | F_PANEL | Front panel header |
| 19 | FUSB2_1 | USB 2.0 header |
| 20 | FUSB2_2 | USB 2.0 header |
| 21 | COM4 | Serial port cable connector#4 |
| 22 | COM3 | Serial port cable connector#3 |
| 23 | COM2 | Serial port cable connector#2 |
| 24 | CLR_CMOS | Clear CMOS header |
| 25 | F_AUDIO | Front audio header |
| 26 | PCIEX1_1 | PCI Express x1 slot |
| 27 | PCIEX4 | PCI Express x4 slot (running at x2) |
| 28 | PCIEX1_0 | PCI Express x1 slot |
| 29 | PCIEX16 | PCI Express x16 slot |

# Block Diagram



# Chapter 1 Hardware Installation

## 1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

## 1-2 Product Specifications

| | |
|---|---|
| CPU | ◆ Supports Intel® Core™i7-6700 processors in Socket LGA1151<br>◆ Support Up to 65W<br>◆ L2/L3 cache varies with CPU |
| Chipset | ◆ Intel® H110 Express chipset |
| Memory | ◆ 2 x DDR4 slots support 2133MHz<br>◆ Supports Dual channel architecture<br>◆ Support up to 32GB |
| Audio | ◆ Realtek® ALC888S codec<br>◆ High Definition Audio<br>◆ 7.1 channel |
| Onboard Graphics | ◆ Intel® HD graphics |
| LAN | ◆ Intel® I219LM supports 10/100/1000 Mbps<br>◆ Realtek RTL8111HS 10/100/1000 Mbps |
| Expansion Slots | ◆ 1 x PCI Express x16 slot<br>◆ 1 x PCI Express x4 slot; running at x2<br>◆ 2 x PCI Express x1 slot |
| Storage Interface | ◆ 4 x SATA 6Gb/s connectors |
| USB | ◆ 4 x USB 3.0 ports (back panel)<br>◆ Up to 4 USB 2.0 ports (via the USB brackets connected to the internal USB headers) |
| Internal Connectors | ◆ 1 x 8 pin ATX 12V power connector<br>◆ 1 x 24 pin ATX main power connector<br>◆ 4 x SATA 6Gb/s connectors<br>◆ 1 x CPU fan header<br>◆ 2 x System fan headers<br>◆ 3 x Serial port cable connectors<br>◆ 1 x Front panel header<br>◆ 2 x USB 2.0 headers<br>◆ 1 x Front audio header |
| Back Panel Connectors | ◆ 1 x VGA port<br>◆ 1 x Serial port<br>◆ 1 x HDMI port<br>◆ 1 x DVI-D port<br>◆ 4 x USB 3.0 ports<br>◆ 2 x RJ-45 ports<br>◆ 3 x Audio connectors |
| I/O Controller | ◆ iTE IT8786E chip |

| | | |
|---|---|---|
| Hardware Monitor | ◆ | System voltage detection<br>◆ CPU/System temperature detection<br>◆ CPU/System fan speed control<br>* Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install. |
| BIOS | ◆ | AMI BIOS |
| Form Factor | ◆ | uATX Form Factor; 9.6 inch x 9.6 inch |

GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

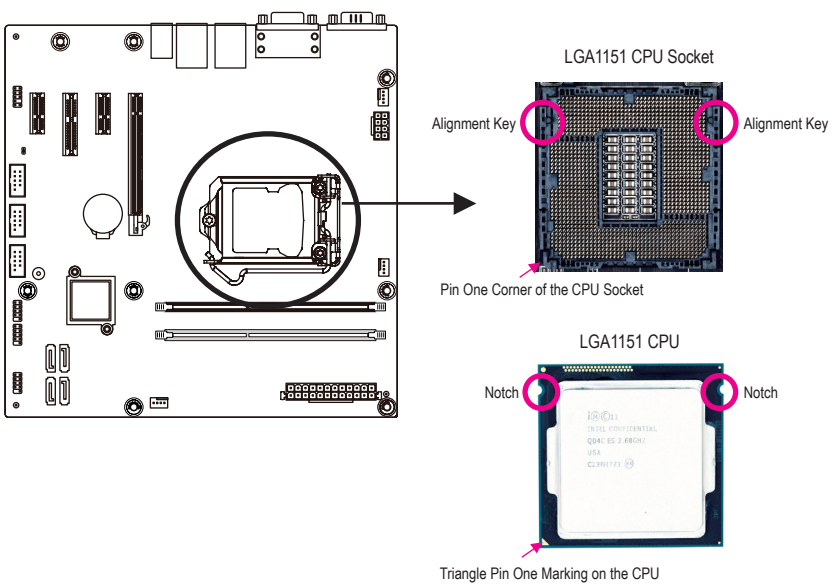
## 1-3 Installing the CPU and CPU Cooler

Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

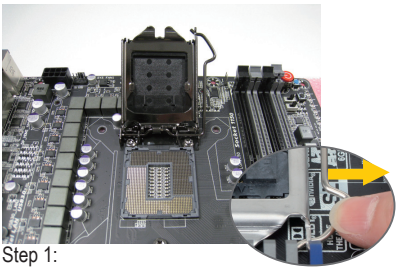
### 1-3-1 Installing the CPU

A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

**Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet power plug to prevent any damage to prevent damage to the CPU.**



Step 1:

Gently press the CPU socket lever handle down and away from the socket with your finger. Then completely lift the CPU socket lever and the metal load plate will be lifted as well.

Step 2:

Remove the CPU socket cover as shown. Hold your index finger down on the rear grip of the socket cover and use your thumb to lift up the front edge (next to the "REMOVE" mark) and then remove the cover. (DO NOT touch socket contacts. To protect the CPU socket, always replace the protective socket cover when the CPU is not installed.)

Step 3:

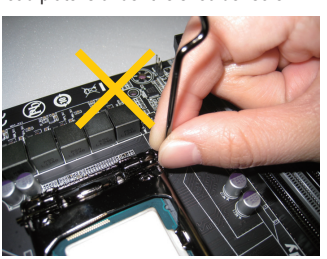
Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys) and gently insert the CPU into position.

Step 4:

Once the CPU is properly inserted, use one hand to hold the socket lever and use the other to lightly replace the load plate. When replacing the load plate, make sure the front end of the load plate is under the shoulder screw.

Step 5:

Push the CPU socket lever back into its locked position.

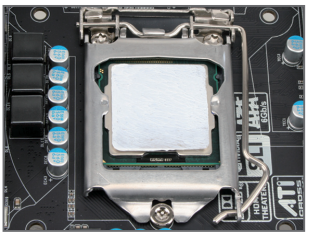


**NOTE:**

Hold the CPU socket lever by the handle, not the lever base portion.

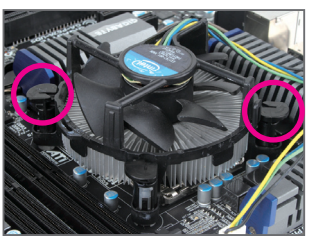
## 1-3-2 Installing the CPU Cooler

Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedure uses Intel® boxed cooler as the example cooler.)



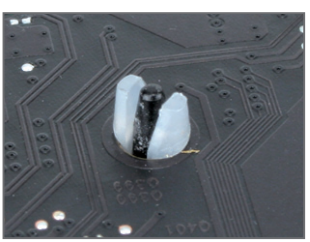
Step 1:

Apply an even and thin layer of thermal paste on the surface of the installed CPU.



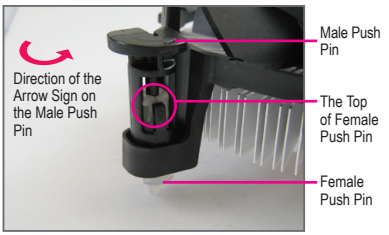
Step 3:

Place the cooler atop the CPU, aligning the four push pins through the pin holes on the motherboard. Push down on the push pins diagonally.



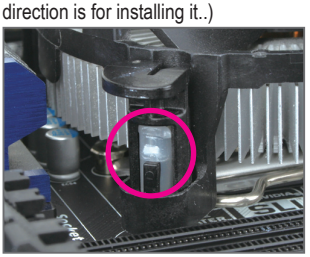
Step 5:

After the installation, check the back of the motherboard. If the push pin is inserted as the picture above shows, the installation is complete.



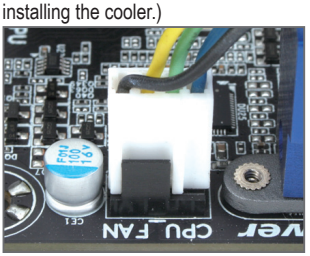

Step 2:

Before installing the cooler, note the direction of the arrow sign on the male push pin. (Turning the push pin along the direction of the arrow is for removing the cooler, and the opposite direction is for installing it..)



Step 4:

You should hear a "click" when pushing down each push pin. Check that the Male and Female push pins are joined closely. (Refer to your CPU cooler installation manual for instructions on installing the cooler.)




Step 6:

Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.

Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

# 1-4 Installing the Memory

Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

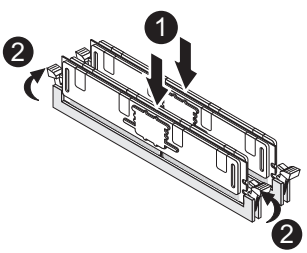
## 1-4-1 Installing a Memory

**Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.**

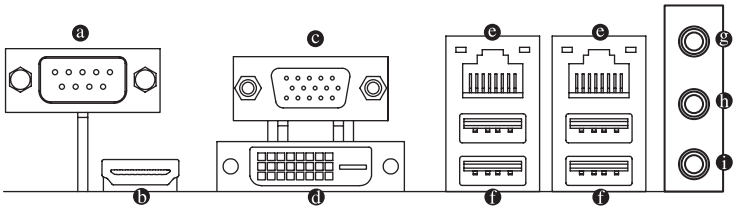
**Be sure to install DDR4 DIMMs on this motherboard.**

**Installation Step:**

Step 1. Insert the DIMM memory module vertically into the DIMM slot, and push it down.
Step 2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.
Note: For dual-channel operation, DIMMs must be installed in matched pairs.
Step 3. Reverse the installation steps when you wish to remove the DIMM module.



## 1-5 Back Panel Connectors




**a Serial Port**

Connects to serial-based mouse or data processing devices.

**b HDMI Port**

The HDMI (High-Definition Multimedia Interface) provides an all-digital audio/video interface to transmit the uncompressed audio/video signals and is HDCP compliant. Connect the HDMI audio/video device to this port. The HDMI Technology can support a maximum resolution of 1920x1080p but the actual resolutions supported depend on the monitor being used.

- When After installing the HDMI device, make sure the default device for sound playback is the HDMI device. (The item name may differ by operating system. Refer the figures below for details.), and enter BIOS Setup, then set Onboard VGA output connect to D-SUB/ HDMI under Advanced BIOS Features..
- Please note the HDMI audio output only supports AC3, DTS and 2-channel-LPCM formats. (AC3 and DTS require the use of an external decoder for decoding.)

**c Video Port**

The video in port allows connect to video in, which can also apply to video loop thru function.

**d DVI-D Port**

The DVI-D port supports DVI-D specifictation. Connect a monitor that supports DVI-D connection to this port.

**e RJ-45 LAN Port**

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.

**f USB 3.0 Port**

The USB port supports the USB 3.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

**g Line In Jack (Blue)**

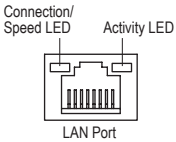
The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

**h Line Out Jack (Green)**

The default line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

**i MIC In (Pink)**

The default MIC In jack. Microphone cab be connected to MIC In jack.




Connection/Speed LED:

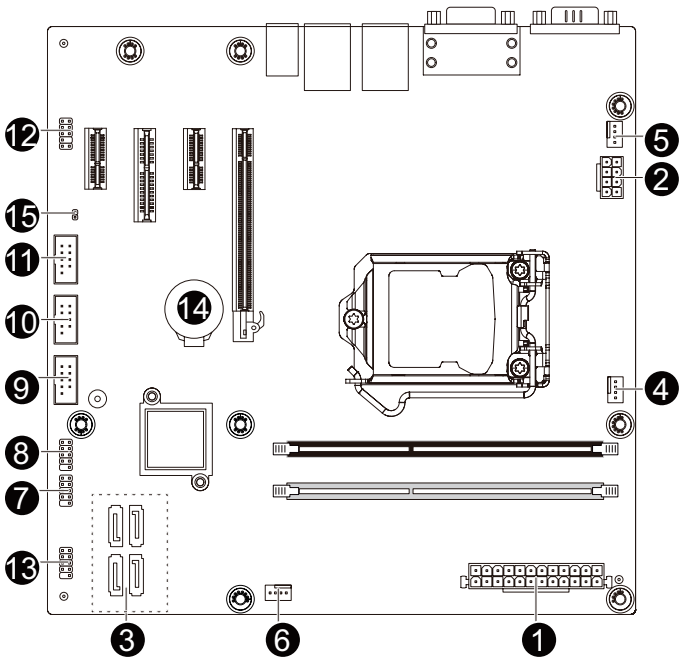
| State | Description |
|---|---|
| Orange | 1 Gbps data rate |
| Green | 100 Mbps data rate |
| Off | 10 Mbps data rate |

Activity LED:

| State | Description |
|---|---|
| Blinking | Data transmission or receiving is occurring |
| Off | No data transmission or receiving is occurring |

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

## 1-6 Internal Connectors




| | | | |
|---|---|---|---|
| 1) | ATX | 9) | COM4 |
| 2) | ATX12V_2X4 | 10) | COM3 |
| 3) | SATAIII_0/1/2/3 | 11) | COM2 |
| 4) | CPU_FAN | 12) | F_AUDIO |
| 5) | SYS_FAN1 | 13) | F_PANEL |
| 6) | SYS_FAN2 | 14) | BAT |
| 7) | FUSB2_1 | 15) | CLR_CMOS |
| 8) | FUSB2_2 | | |

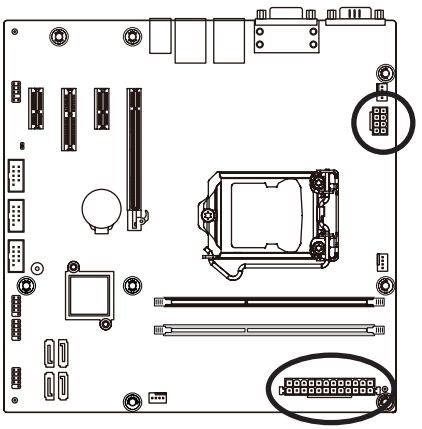
Read the following guidelines before connecting external devices:

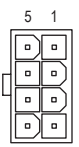
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

## 1/2) ATX/ATX12V_2X4 (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation. The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

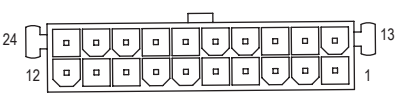
To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.






ATX12V_2X4

| Pin No. | Definition |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | GND |
| 4 | GND |
| 5 | +12V |
| 6 | +12V |
| 7 | +12V |
| 8 | +12V |

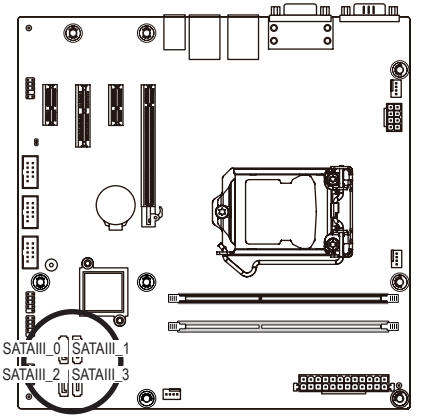


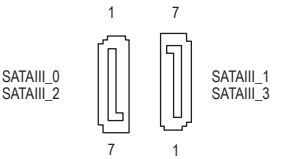

ATX

| Pin No. | Definition | Pin No. | Definition |
|---|---|---|---|
| 1 | 3.3V | 13 | 3.3V |
| 2 | 3.3V | 14 | -12V |
| 3 | GND | 15 | GND |
| 4 | +5V | 16 | PS_ON |
| 5 | GND | 17 | GND |
| 6 | +5V | 18 | GND |
| 7 | GND | 19 | GND |
| 8 | Power OK | 20 | NA |
| 9 | 5VSB (stand by +5V) | 21 | +5V |
| 10 | +12V | 22 | +5V |
| 11 | +12V | 23 | +5V |
| 12 | 3.3V | 24 | GND |

### 3) SATA1/SATA2 (SATA 6Gb/s Connectors)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s standard. Each SATA connector supports a single SATA device.

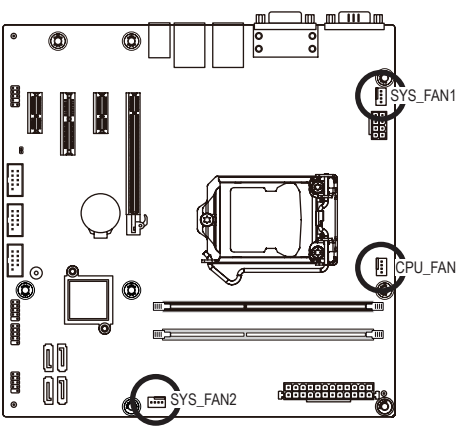


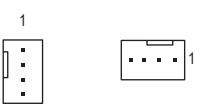




| Pin No. | Definition |
|---|---|
| 1 | GND |
| 2 | TXP |
| 3 | TXN |
| 4 | GND |
| 5 | RXN |
| 6 | RXP |
| 7 | GND |

### 4/5/6) CPU_FAN/SYS_FAN0/SYS_FAN1 (CPU Fan/System Fan Headers)

The motherboard has one 4-pin CPU fan header (CPU_FAN), and two 4-pin (SYS_FAN) system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The motherboard supports CPU fan speed control, which requires the use of a CPU fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



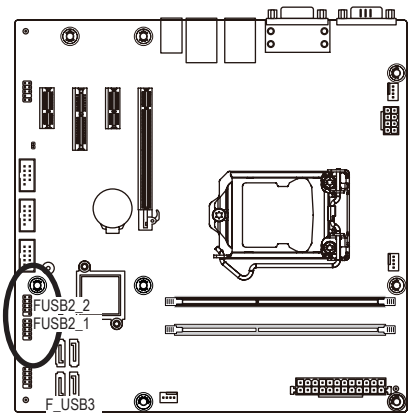



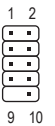

| Pin No. | Definition |
|---|---|
| 1 | GND |
| 2 | +12V |
| 3 | Sense |
| 4 | Speed Control |

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

### 7/8) F_USB1/F_USB2 (USB 2.0 Headers)

The headers conform to USB 2.0 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

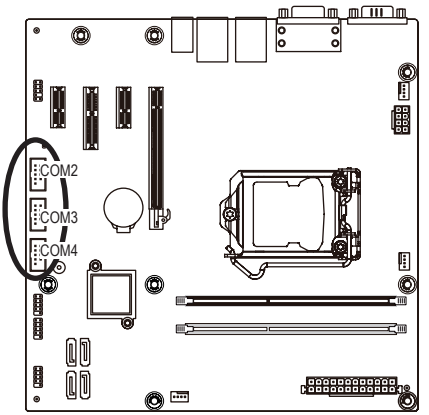


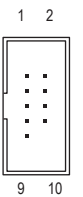




| Pin No. | Definition |
|---|---|
| 1 | Power (5V) |
| 2 | Power (5V) |
| 3 | USB DX- |
| 4 | USB DY- |
| 5 | USB DX+ |
| 6 | USB DY+ |
| 7 | GND |
| 8 | GND |
| 9 | No Pin |
| 10 | NC |

### 9/10/11) COM2/COM3/COM4 (Serial Port Cable Connectors #2/#3/#4)

The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.

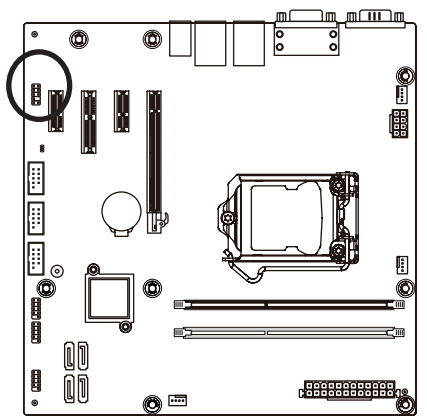


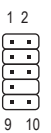




| Pin No. | Definition |
|---|---|
| 1 | NDCD- |
| 2 | NSIN |
| 3 | NSOUT- |
| 4 | NDTR- |
| 5 | GND |
| 6 | NDSR- |
| 7 | NRTS- |
| 8 | NCTS- |
| 9 | NRI- |
| 10 | NC |

### 12) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.

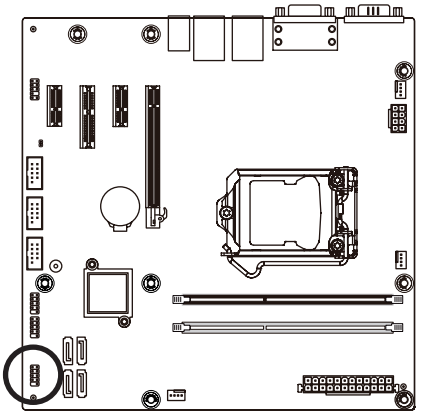


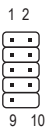



| Pin No. | Definition |
|---|---|
| 1 | MIC2_L |
| 2 | AGND |
| 3 | MIC2_R |
| 4 | FP_AUDIO_DET |
| 5 | LINE2_R |
| 6 | AGND |
| 7 | FAUDIO_JD |
| 8 | NC |
| 9 | LINE2_L |
| 10 | AGND |

## 13) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.



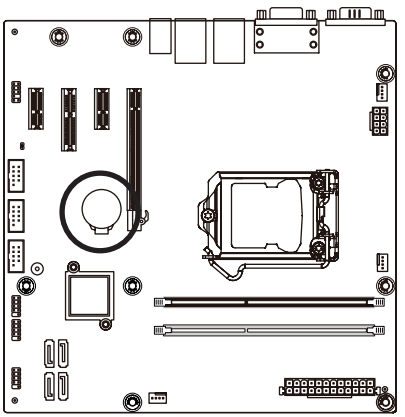


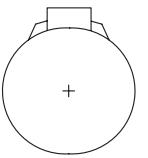

| Pin No. | Signal Name | Definition |
|---|---|---|
| 1 | HD+ | Hard Disk LED Signal anode (+) |
| 2 | MPD+ | Power LED Signal anode (+) |
| 3 | HD- | Hard Disk LED Signal cathode(-) |
| 4 | MPD- | Power LED Signal cathode(-) |
| 5 | GND | Ground |
| 6 | PW+ | Power Button anode (+) |
| 7 | -RST | Reset Button |
| 8 | PW- | Power Button cathode(-) |
| 9 | NC | No connect |
| 10 | NC | No Pin |

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

## 14) BAT (Battery Scoket)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.

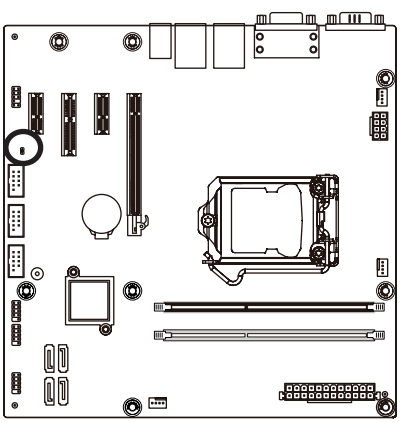




- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- Used batteries must be handled in accordance with local environmental regulations.

## 15) CLR_CMOS (Clearing CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, place a jumper cap on the two pins to temporarily short the two pins or use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal operation (Default setting)

Close: Clear CMOS data

# Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <DEL> key during the POST when the power is turned on.

- BIOS flashing is potentially risky, if you do not encounter problems of using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Restore Defaults" section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

**BIOS Setup Program Function Keys**

| | |
|---|---|
| <↑><↓> | Move the selection bar to select an item |
| <←><→> | Move the selection bar to select the screen |
| <Enter> | Execute command or enter the submenu |
| <Esc> | Main Menu: Exit the BIOS Setup program<br>Submenus: Exit current submenu |
| <+> | Increase the numeric value or make changes |
| <-> | Decrease the numeric value or make changes |
| <F1> | General Help |
| <F2> | Restore the previous BIOS settings for the current submenus |
| <F3> | Load the Optimized BIOS default settings for the current submenus |
| <F4> | Save all the changes and exit the BIOS Setup program |

- **Main**
  This setup page includes all the items in standard compatible BIOS
- **Advanced**
  This setup page includes all the items of AMI BIOS special enhanced features.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **Chipset**
  Northbridge and Southbridge additional features configuration.
- **Boot**
  This setup page provides items for configuration of boot sequence.
- **Security**
  Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.
  A supervisor password allows you to make changes in BIOS Setup.
  A user password only allows you to view the BIOS settings but not to make changes.
- **Save & Exit**
  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup.
  Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

# 2-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

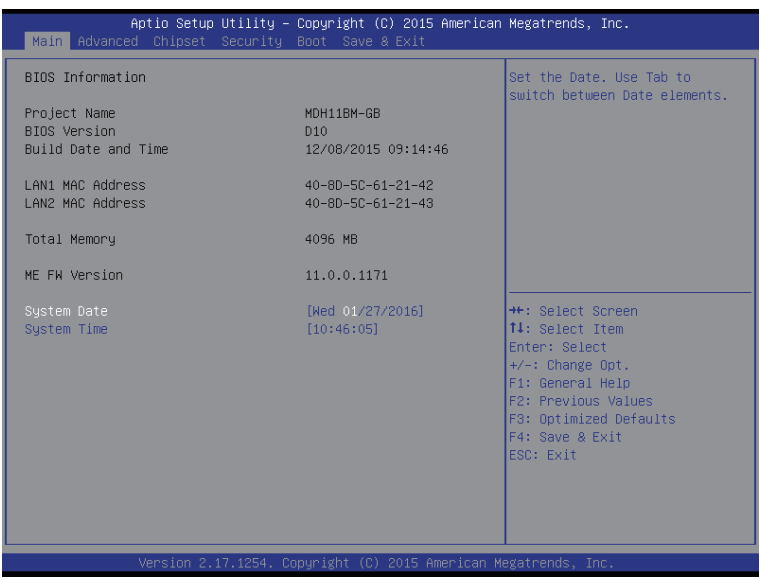
**Main Menu Help**

The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

**Submenu Help**

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.

- When the system is not stable as usual, select the **Restore Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.



☞ **BIOS Information**

☞ **Project Name**

Display name of the project.

☞ **BIOS Version**

Display version number of the BIOS.

☞ **BIOS Build Date and Time**

Displays the date and time when the BIOS setup utility was created.

☞ **LAN MAC Address**

Displays the LAN MAC address information.

☞ **Memory Information**

☞ **Total Memory**

Display the total memory size of the installed memory.

☞ **ME FW Version**

Display the ME firmware version.

☞ **System Date**

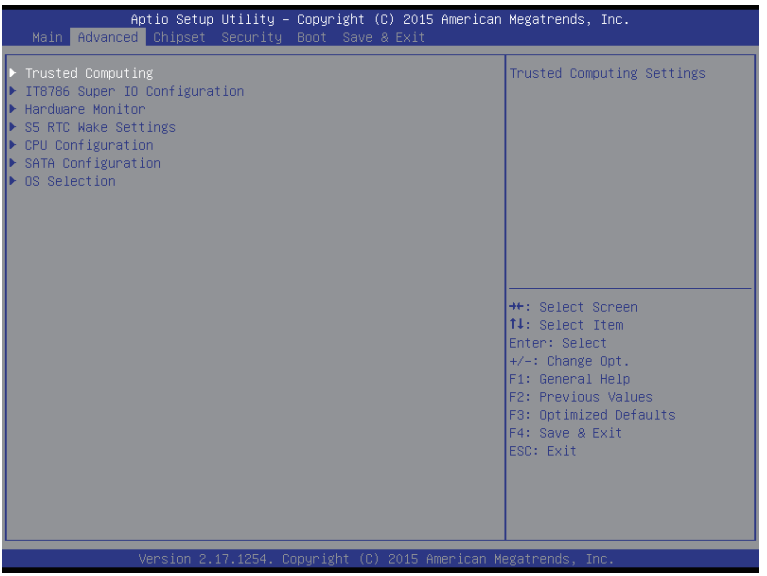
Set the date following the weekday-month-day- year format.

☞ **System Time**

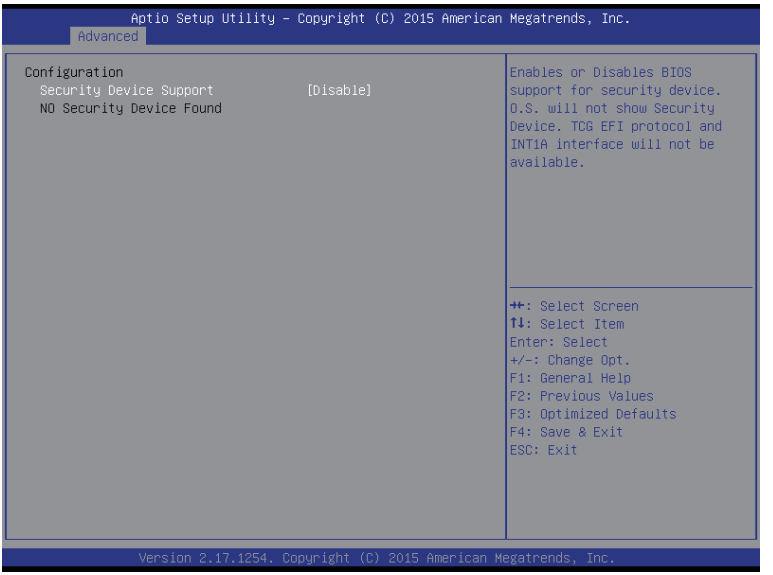
Set the system time following the hour-minute- second format.

## 2-2 Advanced Menu

The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press Enter to access the related submenu screen.



## 2-2-1 Trusted Computing




☞ **Configuration**

☞ **Security Device Support**

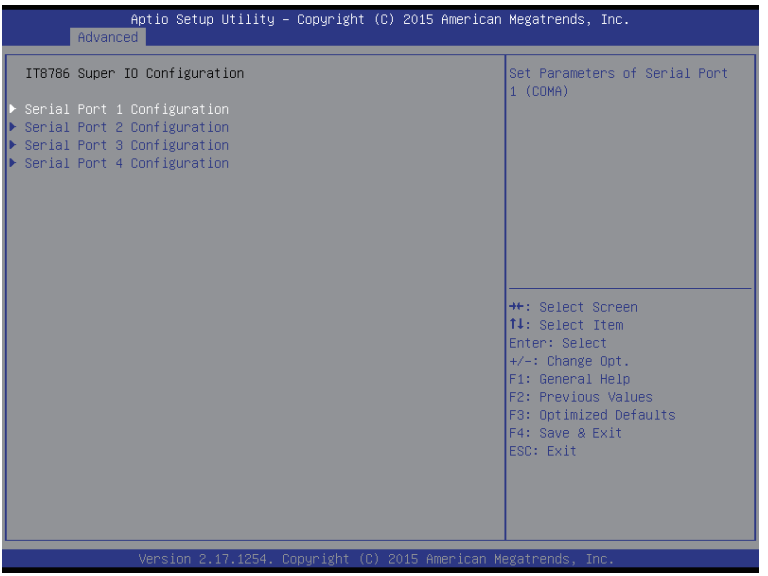
Select Enabled to activate TPM support feature.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Current Status Information**

Display current TPM status information.

## 2-2-2 Super IO Configuration




☞ **Super IO Configuration**

☞ **Serial Port 1 Configuration**

Press [Enter] for configuration of advanced items.

☞ **Serial Port 2 Configuration**

Press [Enter] for configuration of advanced items.

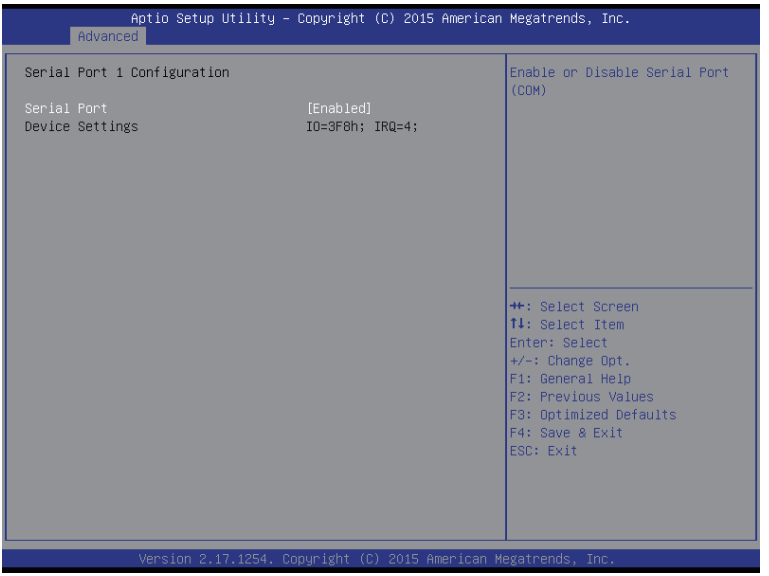
☞ **Serial Port 3 Configuration**

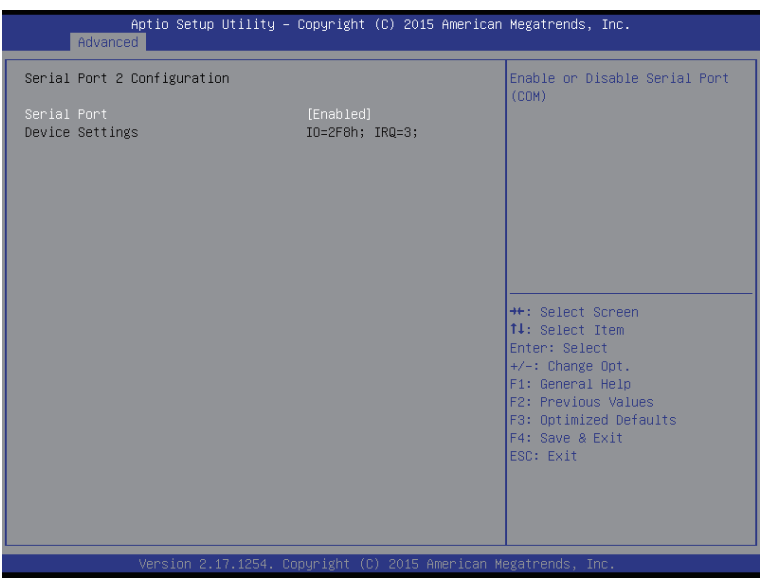
Press [Enter] for configuration of advanced items.

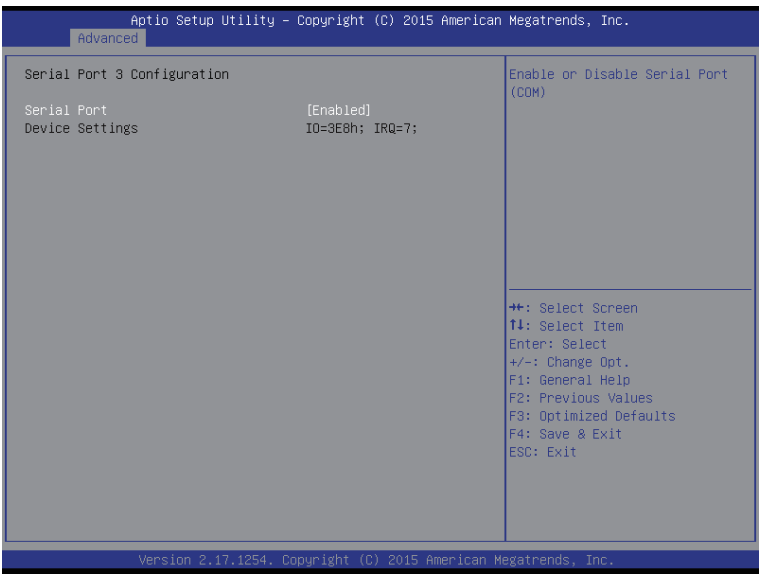
☞ **Serial Port 4 Configuration**

Press [Enter] for configuration of advanced items.

## 2-2-2-1 Serial Port Configuration (for port #1/#2/#3#4)




Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
Advanced
Serial Port 3 Configuration
Serial Port [Enabled]
Device Settings IO=3E8h; IRQ=7;
Enable or Disable Serial Port (COM)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.

Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
Advanced
Serial Port 4 Configuration
Serial Port [Enabled]
Device Settings IO=2E8h; IRQ=7;
Enable or Disable Serial Port (COM)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.

☞ **Serial Port Configuration**

☞ **Serial Port**

When enabled allows you to configure the serial port settings. When set to Disabled, displays no configuration for the serial port.

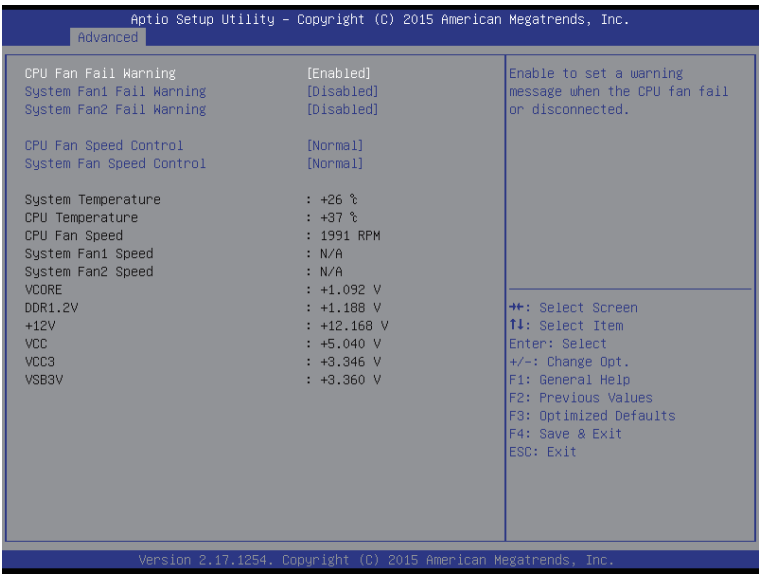
Options available: Enabled/Disabled. Default setting is **Enabled.**

☞ **Device Settings**

Display the specified Serial Port base I/O addressand IRQ.

## 2-2-3 Hardware Monitor

Press Enter to view the Hardware Monitor screen which displays a real-time record of the CPU/system temperature, and fan speed, Items on this window are non-configurable.




### ☞ CPU/System FAN Fail Warning

Enable/Disable CPU/System FAN Fail warning alert funciton.

Option available: Enabled/Disabled.

Default setting for CPU FAN Fail Warning is **Enabled**.

Default setting for System FAN Fail Warning is **Disabled**.

### ☞ CPU/System FAN Speed Control

Enable CPU/System Fan Speed Control function.

Option available: Normal/Full Speed. Default setting is **Normal**.

### ☞ System/CPU Temperature

Displays current CPU temperature.

### ☞ CPU/System Fan Speed (RPM)

Displays current CPU and system fan speed.

### ☞ VCORE/DDR1.2V/+12V/VCC/VCC3/VSB3V

Displays a real-time record of the related system voltage.

## 2-2-4 S5 RTC Wake Settings

☞ **Wake system from S5**

Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified. Default setting is **Disabled**.

☞ **Wake up hour**(Note)

Press <+> and <-> to define the wake up hour.

☞ **Wake up minute**(Note)

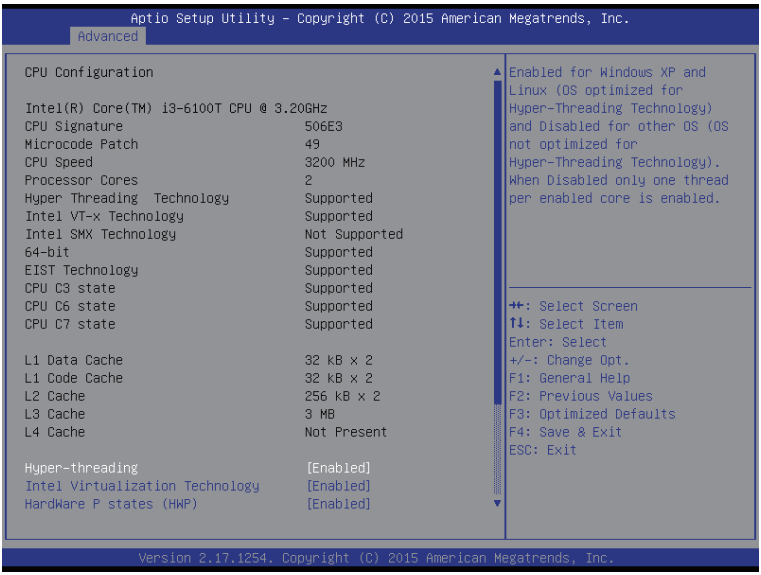
Press <+> and <-> to define the wake up minute.

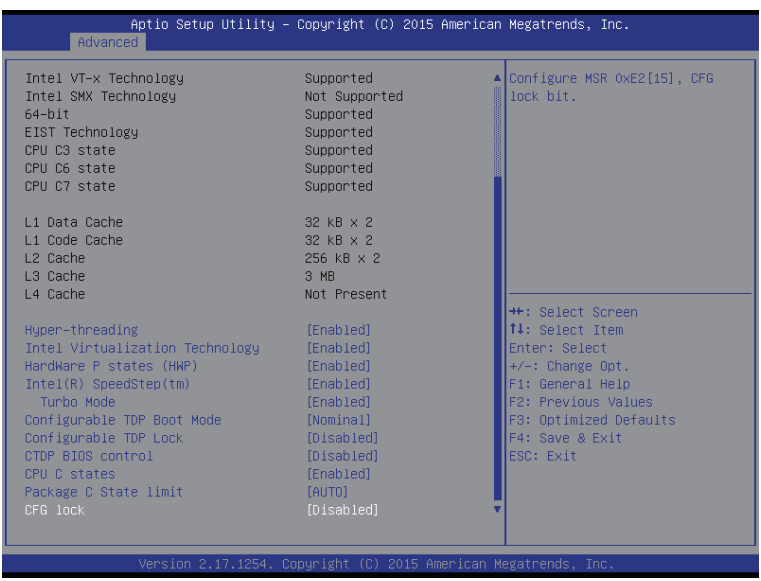
☞ **Wake up second**(Note)

Press <+> and <-> to define the wake up second.

(Note) This item appears when **Wake system from S5** is set to **Fixed time**.

## 2-2-5 CPU Configuration



☞ **CPU Configuration**

☞ **CPU Type/Signature/Microcode Patch/CPU Speed/Processor Cores/ Hyper Threading Technology/Intel VT-x Technology/Intel SMX Technology/64bit/ EIST Technology/ CPU C3/C6/C7 State**

Displays the technical specifications for the installed processor.

☞ **Cache Information**

☞ **L1 Data Cache/L1 Code Cache /L2 Cache /L3 Cache/L4 Cache**

Displays the technical specifications for the installed processor.

☞ **Hyper-threading**

The Intel Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Intel Virtualization Technology**

Select whether to enable the Intel Virtualization Technology function. VT allows a single platform to run multiple operating systems in independent partitions.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Hardware P State**

Enable/Disable Hardware P State feature.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Intel(R) SpeedStep(tm) (EISTEnhanced Intel SpeedStep Technology)**

Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Turbo Mode**

When this feature is enabled, the processor can dynamically overclock one or two of its four processing cores to improve performance with applications that are not multi-threaded or optimized for quad-core processors.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Configurable TDP Boot Mode**

Options available: Nominal. Default setting is **Nominal**.

☞ **Configurable TDP Lock**

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **CTDP BIOS control**

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **CPU C State**

Enable/Disable CPU C State report function.

Options available: Nominal. Default setting is Nominal.

☞ **Package C State Limit**

Configure state for the C-State package limit.

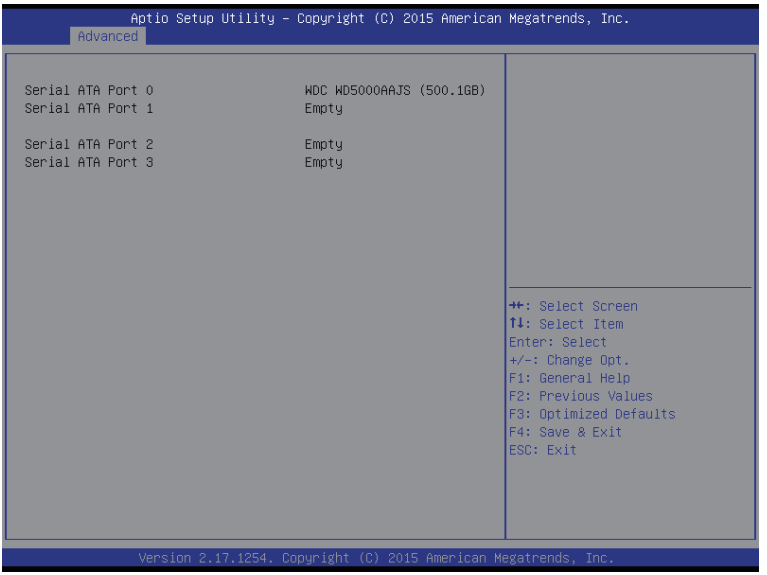
Options available: C0/C1/C3/C6/C7/C7s/C8/C9/C10/Auto. Default setting is **Auto**.

☞ **CFG lock**

Enable/Disable CFG lock.

Options available: Enabled/Disabled. Default setting is **Disabled**.

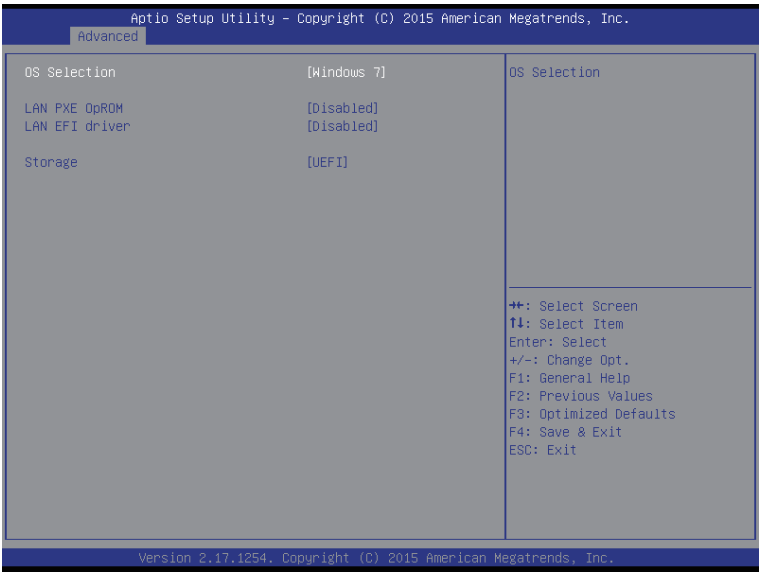
## 2-2-6 SATA Configuration




☞ **SATA Port 0/1/2/3**

Displays the installed HDD devices information. System will automatically detect HDD type.

## 2-2-7 OS Selection




### ☞ OS Selection

Option Available: Windows8.x/10/Windows 7.

**Note:** You have to select the OS mode in the BIOS setup before installing any OS on your system.

### ☞ LAN PXE OpROM

Enable/Disable LAN PXE OpROM.

Options available: Enabled/DIsabled. Default setting is **Disabled**.

### ☞ LAN EFI driver

Enable/Disable LAN EFI driver.

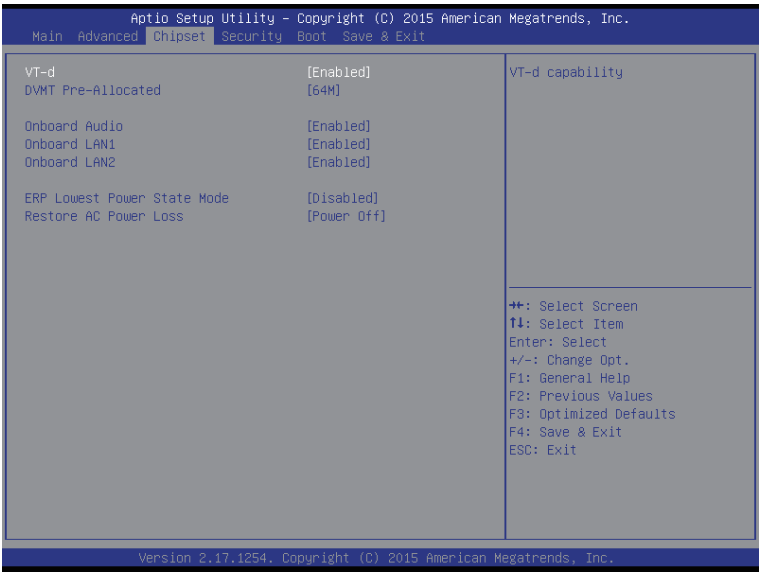
Options available: Enabled/DIsabled. Default setting is **Disabled**.

### ☞ Storage

Determines which devices system will boot to.

Options available: Do not launch/UEFI/Legacy . Default setting is **UEFI.**

# 2-3 Chipset Menu




### ☞ VT-d

Enable/Disable VT-d function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

### ☞ DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

Options available: 64M/128M/192M/256M/320M/384M/512M. Default setting is **32M**.

### ☞ Onboard Audio

Enable/Disable onboard audio controller.

Options available: Enabled/Disabled. Default setting is **Enabled**.

### ☞ Onboard LAN

Enable/Disable onboard LAN controller.

Options available: Enabled/Disabled. Default setting is **Enabled**.

### ☞ ERP Lowest Power State Mode

Enable/Disable ERP Lowest Power State Mode.

Options available: Enabled/Disabled. Default setting is **Disabled**.

### ☞ Restore AC Power Loss

This option provides user to set the mode of operation if an AC / power loss occurs.

**Power On**: System power state when AC cord is re-plugged.

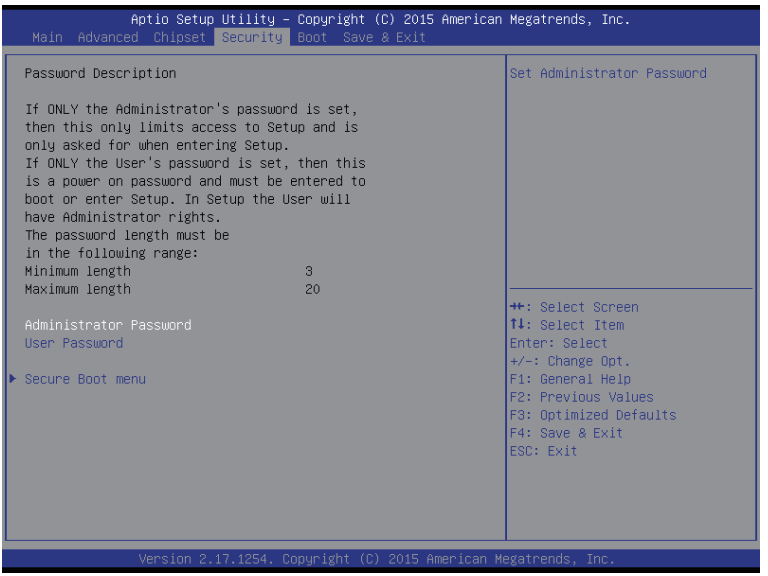
**Power Off**: Do not power on system when AC power is back.

**Last State**: Set system to the last sate when AC power is removed.

Options available: Power On/Power Off/Last State. Default setting is **Power Off**.

## 2-4 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.




There are two types of passwords that you can set:

- Adminstrator Password
  Entering this password will allow the user to access and change all settings in the Setup Utility.
- User Password
  Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

☞ **AdministratorPassword**

Press Enter to configure the Administrator password.

☞ **User Password**

Press Enter to configure the user password.

☞ **Secure Boot menu**

Press [Enter] for configuration of advanced items.

## 2-4-1 Secure Boot menu

☞ **System Mode**

Display the System Mode state.

☞ **Secure Boot**

Display the System Mode State.

☞ **Vendor Keys**

Display the Vendor Keys information.

☞ **Secure Boot**

Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all the files being loaded before Windows 8 loads and gets to the login screen have not been tampered with.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Secure Boot Mode**(Note)

Define the Secure Boot Mode. Set this item to **Custom** to advanced items configuration.

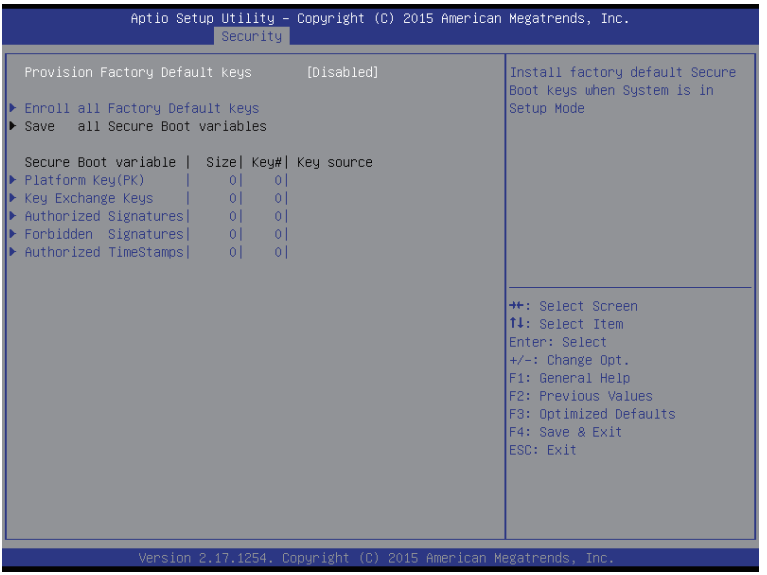
Option available: Standard/Custom. Default setting is **Custom**.

☞ **Key Management**

Press Enter to configure the advanced items.

(Note) Advanced items prompt when this item is set to **Cutom**.

## 2-4-1-1 Key Management




### ☞ Key Management

This item appears only when the **Secure Boot Mode** is set to **Custom**.

### ☞ Provision Factory Default Keys

Force the system to Setup Mode. This will clear all Secure Boot Variables such as Platform Key (PK), Key-exchange Key (KEK), Authorized Signature Database (db), and Forbidden Signaures Database (dbx).

Options available: Enabled/Disabled. Default setting is **Disabled**.

### ☞ Enroll All Factory Default Keys

Press [Enter] to install all factory default keys.

### ☞ Save All Secure Boot Variables

Press [Enter] to save all Secure Boot Variables.

### ☞ Platform Key (PK)

Press Enter to configure the advanced items.

### ☞ Key Exchange Key

Press Enter to configure the advanced items.

### ☞ Authorized Signature

Press Enter to configure the advanced items.

### ☞ Forbidden Signature

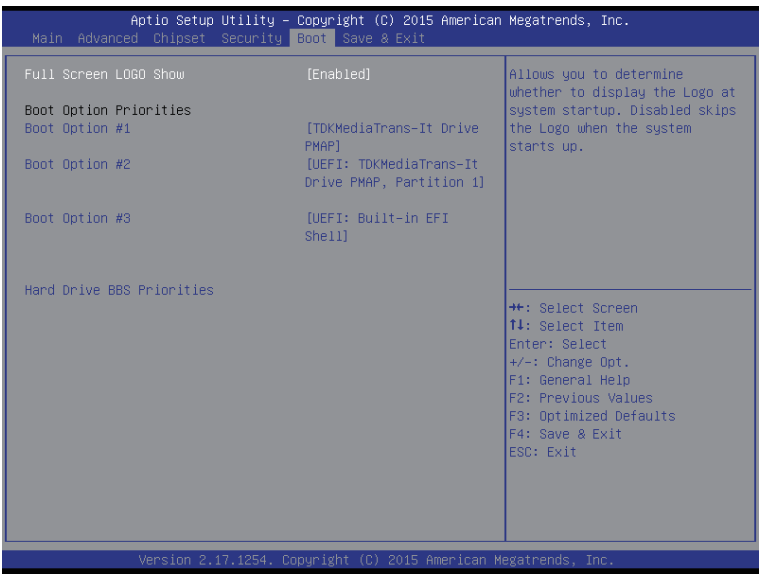
Press Enter to configure the advanced items.

### ☞ Authorized TimeStamps

Press Enter to configure the advanced items.

## 2-5 Boot Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the drive(s) specified is not bootable.




☞ **Boot Configuration**

☞ **Boot Option Priorities**

☞ **Boot Option #1/#2#3**

Press Enter to configure the boot priority.

By default, the server searches for boot devices in the following secquence:

1. UEFI device.
2. Hard drive.
3. Network device.

☞ **Hard Drive BBS Priorities**

Press Enter to configure the boot priority.

## 2-6 Save & Exit Menu

The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.

### ☞ Save Changes and Exit

Saves changes made and close the BIOS setup.

Options available: Yes/No.

### ☞ Discard Changes and Exit

Discards changes made and close the BIOS setup.

Options available: Yes/No.

### ☞ Save Changes and Reset

Saves changes made and reset the system.

Options available: Yes/No.

### ☞ Discard Changes and Reset

Discards changes made and reset the system.

Options available: Yes/No.

### ☞ Save Changes

Saves changes made in the BIOS setup.

Options available: Yes/No.

### ☞ Discard Changes

Discards changes made in the BIOS setup.

Options available: Yes/No.

☞ **Restore Defaults**

Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly.
Options available: Yes/No.

☞ **Save as User Defaults**

Save to current BIOS settings as user-defined default settings.

☞ **Restore as User Defaults**

Load the user-define default settings for all BIOS options

☞ **Boot Override**

Allows you to select a device to boot immediately. Press <Enter> on the device you select and select Yes to confirm. Your system will restart automatically and boot from that device.

☞ **UEFI: Built-in in EFI Shell**

Press <Enter> on this item to Launch EFI Shell from filesystem device.

☞ **ME FW Image Re-Flash**

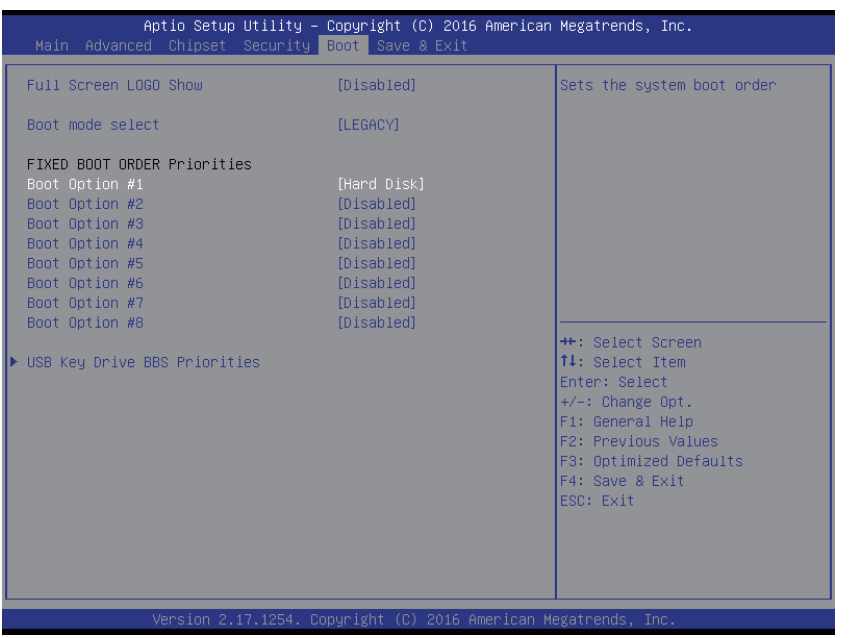
Enable/Disable reflashing ME firmware.
Options available: Enabled/DIsabled. Default setting is **Disabled**.

## 2-7 Flash Your BIOS

Follow the steps below to flash your BIOS.

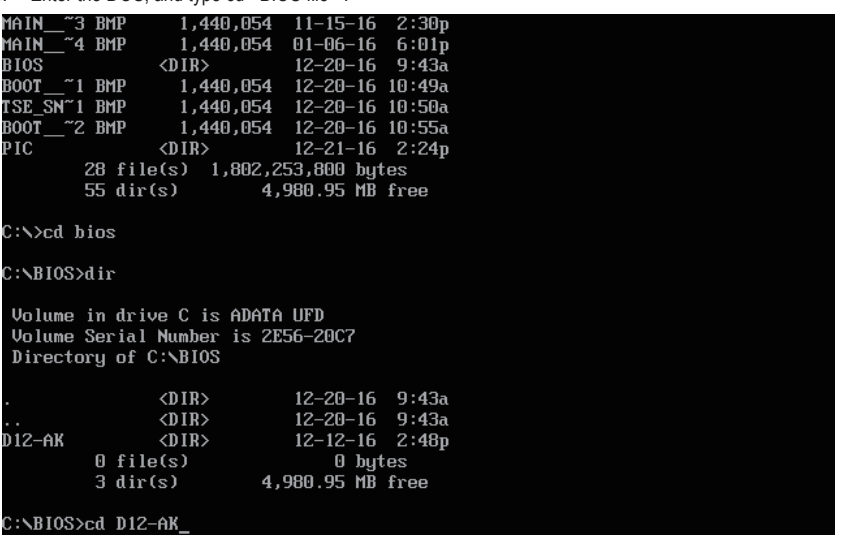
1. Put the BIOS files onto a bootable USB stick.

2. Press **F2** and enter into BIOS setup menu. Go to Boot and configure the first boot device to USB disk.

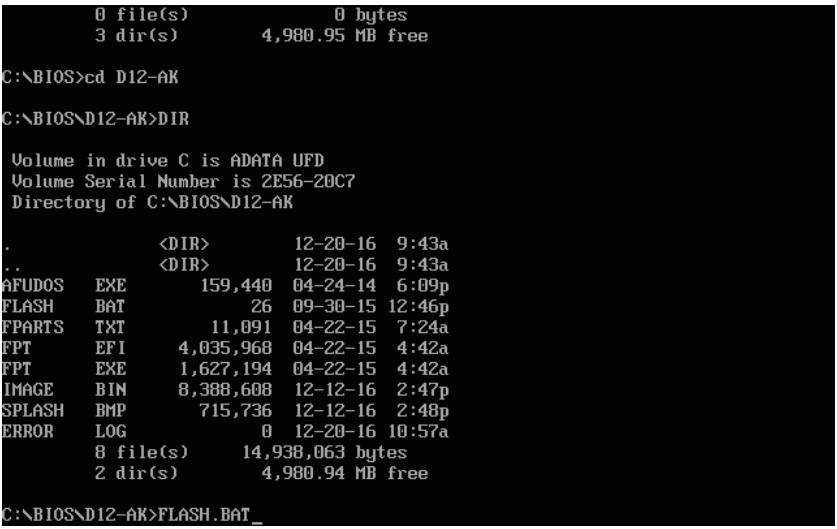


3. Press **F4** and select **Yes** to save the configuration.

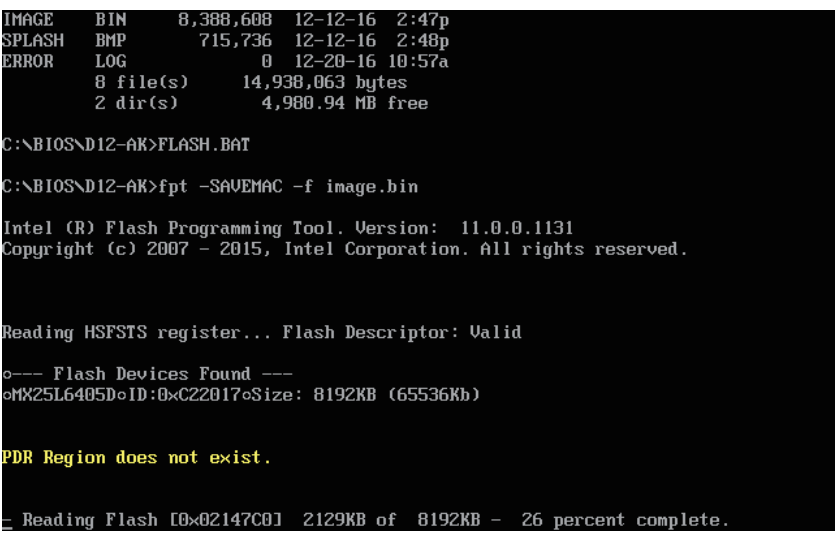
4. Enter the DOS, and type cd <BIOS file >.



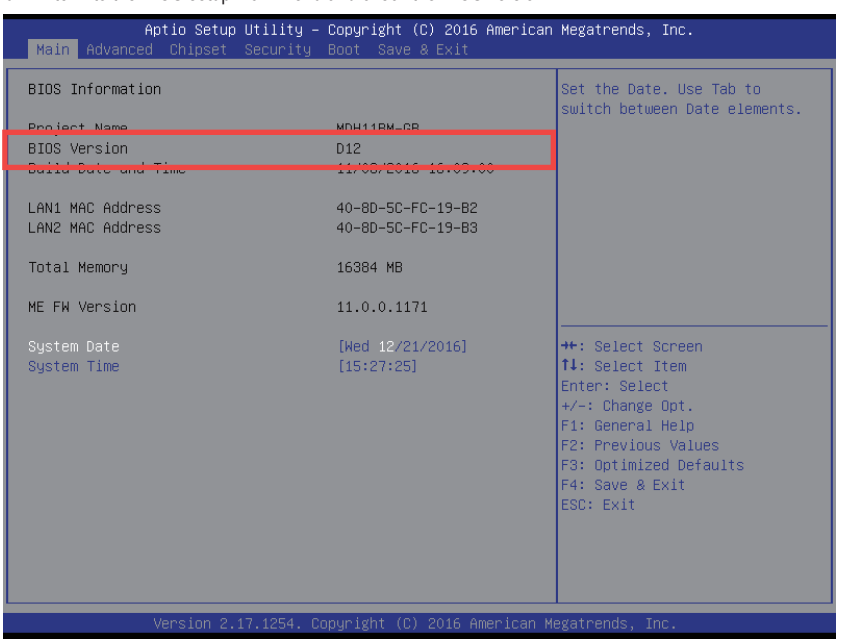
5. Enter “FLASH.bat” to run the batch file.




6. Wating for the BIOS update.



7. When the flashing is completed, the screen will show the following message: FPT Operation Successful
8. Press "Ctrl+alt+del" to exit.

```
- Programming Flash [0x010C000]     4KB of     4KB - 100 percent complete.

- Erasing Flash Block [0x111000] - 100 percent complete.

- Programming Flash [0x0111000]    16KB of    16KB - 100 percent complete.

- Erasing Flash Block [0x1C0000] - 100 percent complete.

- Programming Flash [0x01C0000]     4KB of     4KB - 100 percent complete.

- Erasing Flash Block [0x20C000] - 100 percent complete.

- Programming Flash [0x020C000]    44KB of    44KB - 100 percent complete.

- Erasing Flash Block [0x220000] - 100 percent complete.

- Programming Flash [0x0220000]     4KB of     4KB - 100 percent complete.

- Verifying Flash [0x0800000]  8192KB of  8192KB - 100 percent complete.
RESULT: The data is identical.

FPT Operation Successful.

C:\BIOS\D12-AK>_
```

9. Reboot he system and press **F2**.
10. Enter into the BIOS setup main menu and check the BIOS version.