GA-H170TN

User's Manual

12ME0-H17TN0-00R

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: Motherboard

Product Name: GA-H170TN

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A12:2011

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

CE

Signature: Timmy Huang

(Stamp) Date: Jul. 6, 2015 Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street
City of Industry, CA 91748

Phone/Fax No: (626) 854-9338/ (626) 854-9326

hereby declares that the product

Product Name: Motherboard

Model Number: GA-H170TN

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Jul. 6, 2015

Disclaimer

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Documentation Classifications

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

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

For product-related information, check on our website at:

http://www.gigabyte.com

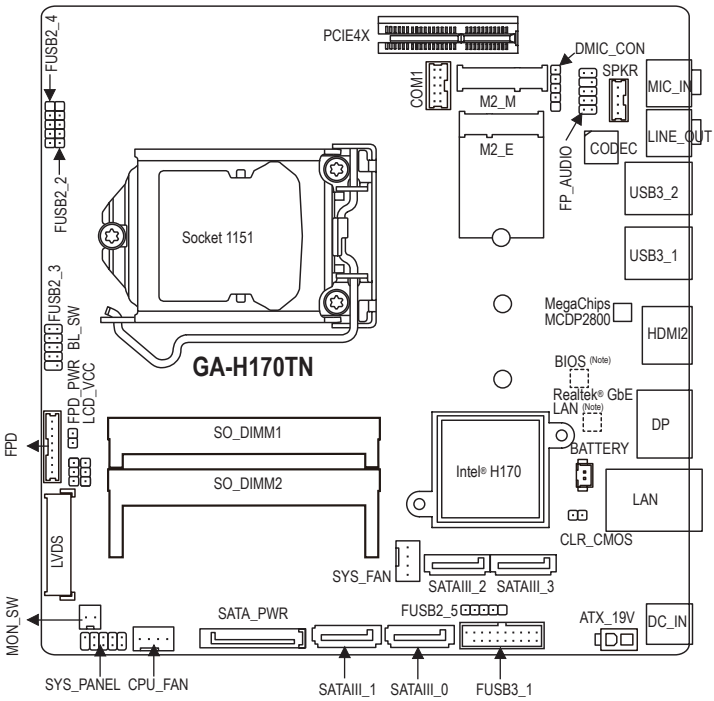
Table of Contents

Box Contents

- ☑ GA-H170TN motherboard
- ☑ Motherboard driver disk
- ☑ User's Manual
- ☑ I/O Shield (AIO Thin Mini-ITX x1, Standard Type x 1)
- ☑ Screws kit for expansion cards
- ☑ COM serial cable
- ☑ Cable SATA Power x 1

- The box contents above are for reference only and the actual items shall depend on the product package you obtain.

GA-H170TN Motherboard Layout



(Note) The chip is located on the back of the motherboard.

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, make sure the chassis is suitable for the motherboard.
- 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	◆ Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/ Intel® Core™ i3 processors/Intel® Pentium® processors/Intel® Celeron® processors in the LGA1151 package (Supports up to 65W) (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
Chipset	◆ Intel® H170 Express Chipset
Memory	◆ 2 x 1.35V DDR3L SO-DIMM sockets supporting up to 16GB(8GB X2) of system memory * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. ◆ Dual channel memory architecture ◆ Support for DDR3L 1600/1333 MHz memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
Onboard Graphics	◆ Chipset: - 1 x HDMI 2.0 port, supporting a maximum resolution of 4096x2160@60 Hz - 1 x DisplayPort, supporting a maximum resolution of 4096x2160@60 Hz - 1 x LVDS connector
Audio	◆ Realtek® ALC887 codec ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel * To configure 5.1/7.1-channel audio, you have to use an HD front panel audio module and enable the multi-channel audio feature through the audio driver.
LAN	◆ Realtek® GbE LAN chip (10/100/1000 Mbit)
Expansion Slots	◆ 1 x PCI Express x4 slot (Supports 25W only) (The PCIEX4 slot conforms to PCI Express 3.0 standard.) ◆ 1 x M.2 Socket 1 connector for the wireless communication module (M2_E)
Storage Interface	◆ Chipset: - 1 x M.2 Socket 3 connector (M2_M) - 4 x SATA 6Gb/s connectors (SATAIII 0~SATAIII 3)
USB	◆ Chipset: - 6 x USB 3.0/2.0 ports (4 ports on the back panel, 2 ports available through the internal USB header) - 5 x USB 2.0/1.1 ports * USB 2.0/1.1 ports available through the internal USB headers (Card reader/Touch panel/webcam and other devices)
Internal Connectors	◆ 1 x 2-pin power connector ◆ 1 x CPU fan header ◆ 1 x system fan header ◆ 4 x SATA 6Gb/s connectors ◆ 2 x M.2 connectors ◆ 1 x SATA power connector ◆ 5 x USB 2.0 headerss ◆ 1 x USB 3.0 header

Internal Connectors	◆ 1 x serial port header ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x digital microphone header ◆ 1 x AIO speaker header ◆ 1 x LVDS connector ◆ 1 x flat panel display power header (both panel and backlight inverter) ◆ 1 x flat panel display power connector ◆ 1 x LCD_VCC pin header ◆ 1 x backlight switch header ◆ 1 x MON_SW ◆ 1 x Clear CMOS jumper ◆ 1 x NFC connector
Back Panel Connectors	◆ 1 x DC-In power connector ◆ 1 x RJ-45 port ◆ 1 x DisplayPort ◆ 1 x HDMI port ◆ 4 x USB 3.0 ports ◆ 2 x audio jacks (Line Out, Mic In)
I/O Controller	◆ Nuvoton I/O Controller Chip
Hardware Monitor	◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU fan speed control * For 4-pin CPU coolers only. * Whether the CPU fan speed control function is supported will depend on the CPU cooler you install.
BIOS	◆ 1 x 128 Mbit flash ◆ Use of licensed AMI UEFI BIOS ◆ PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0
Operating System	◆ Support for Windows 10/8.1/7
Form Factor	◆ Thin Mini-ITX Form Factor; 17.0cm x 17.0cm

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

Power adapter connector dimension: 7.4 x 5.1mm, 180W = 19V / 9.47A, 150W = 19V / 7.89A.

1-3 Installing the CPU and CPU Cooler

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

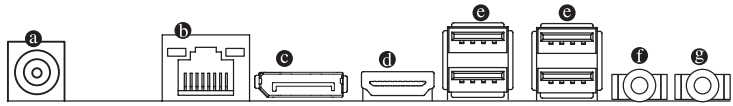
- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted 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.
- For installing the CPU cooler, please refer to chassis user's manual.

1-4 Installing the Memory/Expansion Card

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

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used. (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory/expansion card 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.

1-5 Back Panel Connectors

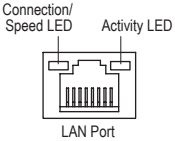


a DC Power Connector

Connect the DC power to this port.

b 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.



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

c DisplayPort

DisplayPort is a digital display interface which is primarily used to connect a video source to a display device such as a computer monitor, though it can also be used to transmit audio, USB, and other forms of data.

d 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 4096x2160 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.)

e USB 3.0/2.0/1.1 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.

f Line Out Jack (Green)

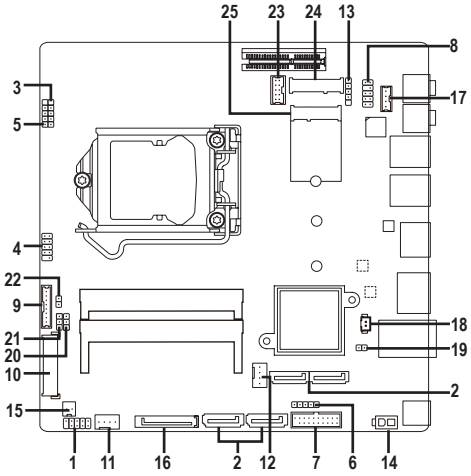
The default Line Out (Front Speaker Out) jack. Stereo speakers, earphone or front surroundspeakers can be connected to Line Out (Front Speaker Out) jack.

g Mic In Jack (Pink)

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

- 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



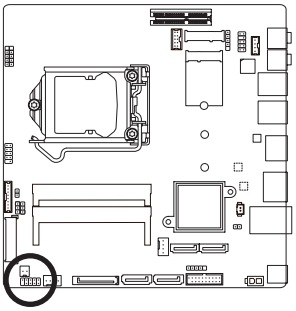
1)	SYS_PANEL	14)	ATX_19V
2)	SATAIII_0/SATAIII_1/SATAIII_2/SATAIII_3	15)	MON_SW
3)	FUSB2_2	16)	SATA_PWR
4)	FUSB2_3	17)	SPKR
5)	FUSB2_4	18)	BATTERY
6)	FUSB2_5	19)	CLR_CMOS
7)	FUSB3_1	20)	LCD_VCC
8)	FP_AUDIO	21)	FPD_PWR
9)	FPD	22)	BL_SW
10)	LVDS	23)	COM1
11)	CPU_FAN	24)	M2_M
12)	SYS_FAN	25)	M2_E
13)	DMIC_CON		

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) SYS_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.

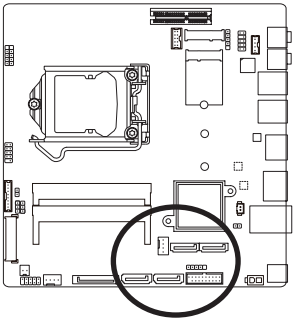


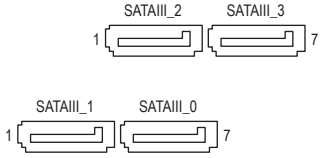
Pin No.	Signal Name	Definition
1	HD+	Hard Disk LED Signal anode (+)
2	MPD+	Power LED Signal anode (+)
3	HD-	Hard Disk LED Signal cathode(-)
4	MPD-	Power LED Signal cathode(-)
5	GND	Ground
6	PW+	Power Button anode (+)
7	RST	Reset Button
8	PW-	Power Button cathode(-)
9	NC	NC
10	NC	No Pin

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.

2) SATAIII_0/SATAIII_1/SATAIII_2/SATAIII_3 (SATA 6Gb/s Connector)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.

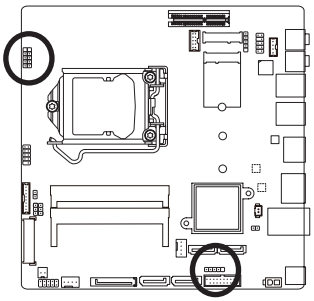


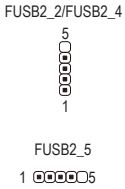


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

3/5/6) FUSB2_2/4/5 (USB Header)

The headers conform to USB 2.0/1.1 specification. Each header supports a single device.

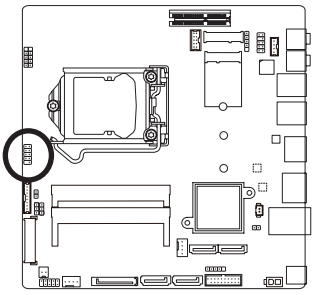




Pin No.	Definition
1	VCC
2	USB-
3	USB+
4	GND
5	No Pin

4) FUSB2_3 (USB Headers)

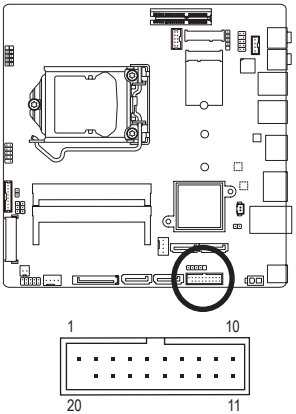
The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



Pin No.	Definition
1	VCC
2	VCC
3	USB-
4	USB-
5	USB+
6	USB+
7	GND
8	GND
9	No Pin
10	NC

7) FUSB3_1 (USB 3.0/2.0 Header)

The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.

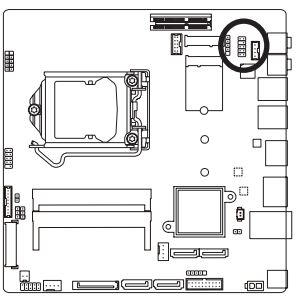


Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	USB_OC	20	No Pin

Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

8) FP_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.



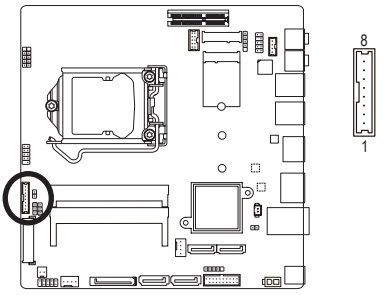
Pin No.	Definition
1	F_MIC_L
2	GND
3	F_MIC_R
4	GPIO_DET
5	F_LINE_R
6	F_MIC_JD
7	GND
8	No Pin
9	F_LINE_L
10	F_LINE_JD

- The front panel audio header supports HD audio by default.
- Audio signals will be present on both of the front and back panel audio connections simultaneously.
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

9) FPD (Flat Panel Display Headers)

The FPD is a high-speed interface connecting the output of a video controller in a laptop computer, computer monitor or LCD television set to the display panel. Most laptops, LCD computer monitors and LCD TVs use this interface internally.

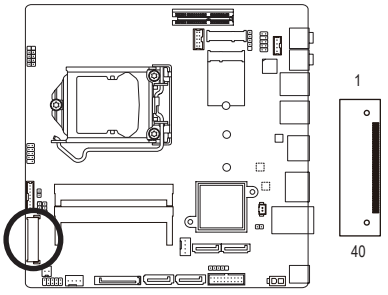
The headers conform to FPD specification.



Pin No.	Definition
1	BKLT_EN
2	BKLT_PWM
3	BKLT_PWR
4	BKLT_PWR
5	BKLT_GND/Brightness_GND
6	BKLT_GND/Brightness_GND
7	Brightness_Up
8	Brightness_Down

10) LVDS (LVDS Header)

LVDS stands for Low-voltage differential signaling, which uses high-speed analog circuit techniques to provide multigigabit data transfers on copper interconnects and is a generic interface standard for high-speed data transmission.

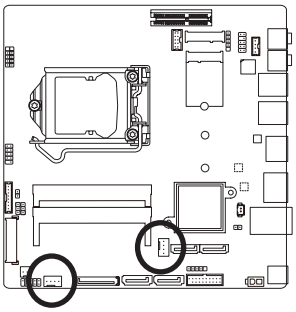


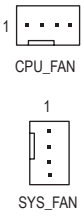
Pin No.	Definition	Pin No.	Definition
1	ODD_Lane3_P	21	NC
2	ODD_Lane3_N	22	EDID_3.3V
3	ODD_Lane2_P	23	LCD_GND
4	ODD_Lane2_N	24	LVDS SENSE (Note)
5	ODD_Lane1_P	25	LCD_GND
6	ODD_Lane1_N	26	ODD_CLK_P
7	ODD_Lane0_P	27	ODD_CLK_N
8	ODD_Lane0_N	28	BLKT_GND
9	EVEN_Lane3_P	29	BLKT_GND
10	EVEN_Lane3_N	30	BLKT_GND
11	EVEN_Lane2_P	31	EDID_CLK
12	EVEN_Lane2_N	32	BLKT_ENABLE
13	EVEN_Lane1_P	33	BLKT_PWM_DIM
14	EVEN_Lane1_N	34	EVEN_CLK_P
15	EVEN_Lane0_P	35	EVEN_CLK_N
16	EVEN_Lane0_N	36	BLKT_PWR
17	EDID_GND	37	BLKT_PWR
18	LCD_VCC	38	BLKT_PWR
19	LCD_VCC	39	NC
20	LCD_VCC	40	EDID_DATA

(Note) LVDS SENSE must link cable LCD Panel GND.

11/12) CPU_FAN/SYS_FAN (Fan Headers)

All fan headers on this motherboard are 4-pin. 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 speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



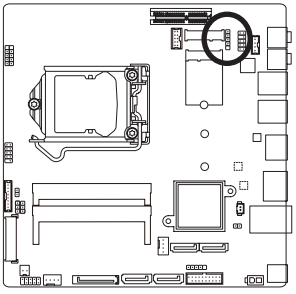


Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

- 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.

13) DMIC_CON (DMIC Headers)

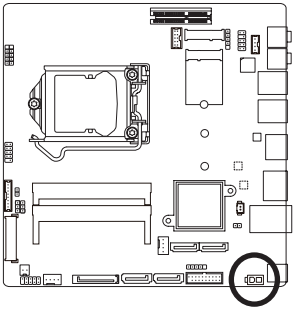
This header is for a digital microphone.



Pin No.	Definition
1	Power
2	DMI DATA
3	GND
4	DMI CLK
5	No Pin

14) ATX_19V (2 Pin Power Connector)

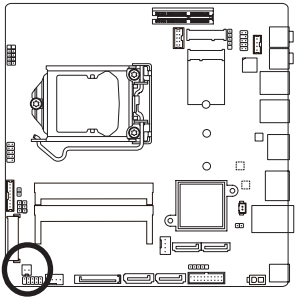
This power connector is for the integrated 19V chassis power supply.



Pin No.	Definition
1	GND
2	+19V

15) MON_SW (Flat panel display switch header)

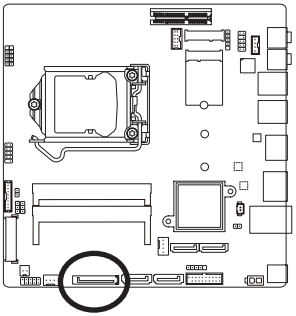
This header allows you to connect an on/off switch for the display.

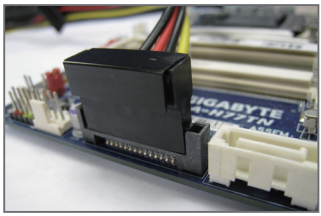


Pin No.	Definition
1	Mon_SW
2	GND

16) SATA_PWR (SATA Power Connector)

This connector provides power to installed SATA devices.

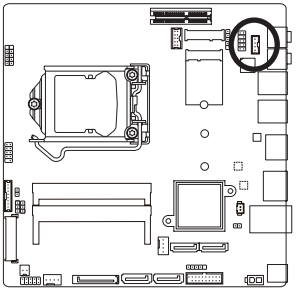




Connect the included SATA power cable to the SATA_PWR connector. Then connect the SATA/optical drive power connectors to your hard drive and optical drive.

17) SPKR (Speaker Header)

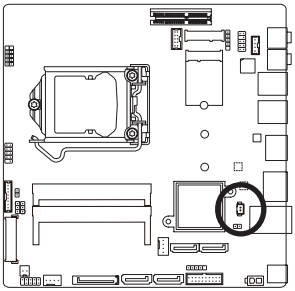
This speaker header is connected to a L/R audio pins from the board to support the 3W (4ohm) stereo speaker on your AIO chassis.



Pin No.	Definition
1	Speaker OUT R-
2	Speaker OUT R+
3	Speaker OUT L+
4	Speaker OUT L-

18) BATTERY (Battery Cable Connector)

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.

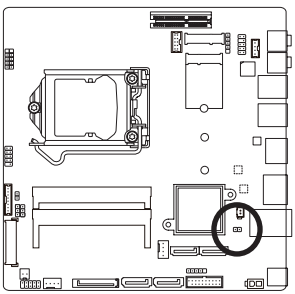


Pin No.	Definition
1	RTC Reset
2	GND

- 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.

19) 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, use a metal object like a screwdriver to touch the two pins for a few seconds.



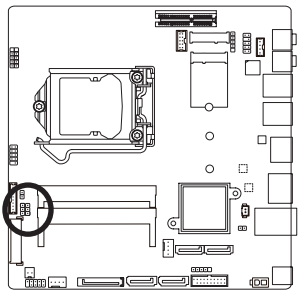
Open: Normal operation (Default setting)

Close: Clear CMOS data

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

20) LCD_VCC (LVDS Drive Voltage Jumper)

This jumper can be used to provide different screen voltage settings.

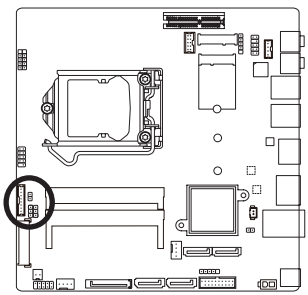


1-2 Close: Set to 3V.

2-3 Close: Set to 5V. (Default setting)

21) FPD_PWR (Flat Panel Display Power Jumper)

This jumper allows you to select the required operating voltage for the backlight panel.

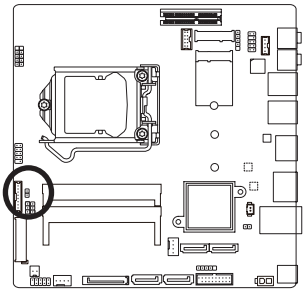


1-2 Close: Set to 12V.

2-3 Close: Set to 19V. (Default setting)

22) BL_SW (Back Light Switch)

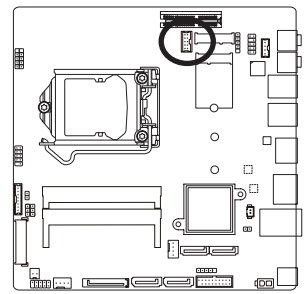
The Back Light switch provides the function for screen back light adjustment.

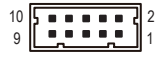


Pin No.	Definition
1	BL_DOWN
2	BL_UP

23) COM1 (Serial Port Header)

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.

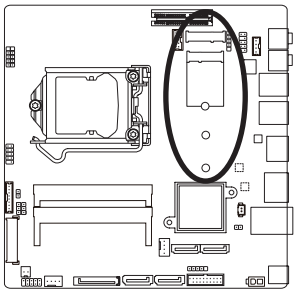


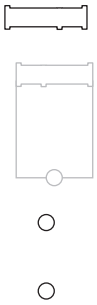


Pin No.	Definition
1	NDCD-
2	NDSR-
3	NSIN
4	NRTS-
5	NSOUT
6	NCTS-
7	NDTR-
8	NRI-
9	GND
10	No Pin

24) M2_M (M.2 Socket 3 Connector)

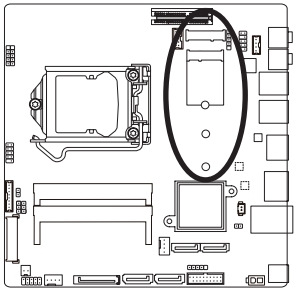
You can insert an M.2 SSD into this connector.





25) M2_E (M.2 Socket 1 Connector)

You can insert an M.2 Wifi card into this connector.



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> or <F12> 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
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<F1>	General Help
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu

- **Main**
  This setup page includes all the items in standard compatible BIOS
- **Advanced**
  This setup page includes all the items of UEFI BIOS special enhanced features.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **Chipset**
  Use this menu to configure Chipset-related options.
- **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.
- **Boot**
  This setup page provides items for configuration of boot sequence.
- **Save & Exit**
  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)
  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

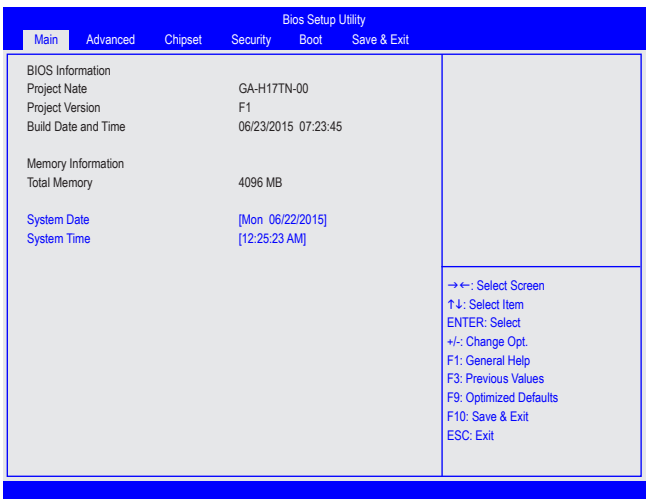
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

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.

(Sample BIOS Version: F1)

- 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.

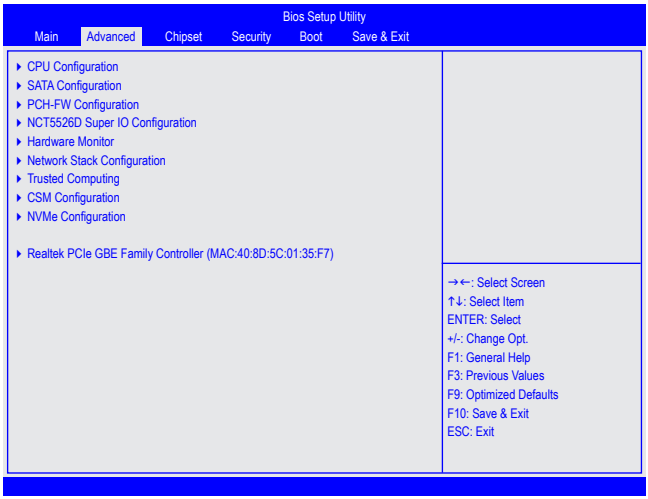


- **BIOS Information**
- **Project Name**
  Display the information motherboard model.
- **Project Version**
  Display the BIOS version.
- **Build Date and Time**
  Displays the date and time when the BIOS setup utility was created.

- **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.



▸ CPU Configuration

Displays the information on processor frequencies/parameters.

☞ 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**.

☞ Intel(R) SpeedStep(tm)

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**.

☞ CPU C states (Note)

Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3/C6 state is a more enhanced power-saving state than C1.

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

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

SATA Configuration

SATA Mode Selection

Enables or disables RAID for the SATA controllers integrated in the Intel Chipset or configures the SATA controllers to AHCI mode.

- AHCI Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- RAID Enables RAID for the SATA controller.

Serial ATA Port 0/Serial ATA Port 1/Serial ATA Port 2/Serial ATA Port 3/M.2

The category identifies Serial ATA and M.2 types of hard disk that are installed in the computer. System will automatically detect HDD type.

Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category.

Hard drive information should be labeled on the outside device casing. Enter the appropriate option based on this information.

PCH-FW Configuration

This section allows you to configure all peripheral devices.

NCT5526D Super IO Configuration

Serial Port 1 Configuration

This section provides information on the super I/O chip and allows you to configure the serial port.

Hardware Monitor

Press Enter to view the Hardware Monitor screen which displays a real-time record of the CPU/system temperature, and fan speed.

CPU/System FAN Fail Warning

Enable CPU/System Fan Stop Warning function.

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

CPU/System Fan Speed Control

Enable CPU/System Smart Fan function.

Option available: Normal/Performance/Silent. Default setting is **Normal**.

System FAN Type

Select system fan type.

Option available: 3 Pins/4 Pins. Default setting is **4 Pins**.

Network Stack Configuration

Network Stack

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disabled)

▶ Trusted Computing

☞ Security Device Support

Option available: Enabled/Disabled. Default setting is **Enable**.

☞ Pending operation

To clear TPM related settings, set this item to **TPM Clear**. (Default: None)

☞ Platform Hierarchy

The section provides platform protection options.

☞ Storage Hierarchy

The section provides general cryptographic usage options.

☞ Endorsement Hierarchy

The section provides privacy control options.

☞ HashPolicy

In a protected non-volatile location that can only be modified by the platform owner.

☞ TPM 20 InterfaceType

Allows you to select the communication interface for the TPM 2.0 device. Set to External TPM2.0 if you install an Infineon TPM 2.0 module (optional). (Default: CRB)

☞ Device Select

Allows you to select whether to support TPM 1.2 or TPM 2.0 device. Auto lets the BIOS automatically configure this setting. (Default: Auto)

☞ CSM Support

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

- ⏩ Enabled — Enables UEFI CSM. (Default)
- ⏩ Disabled — Disables UEFI CSM and supports UEFI BIOS boot process only.

☞ GateA20 Active

Allows you to disabled using BIOS services.

☞ Option ROM Messages

Set display mode for Option ROM.

☞ INT19 Endless Retry

Retry PXE boot.

☞ Boot option filter

Allows you to select which type of operating system to boot.

- ⏩ UEFI and Legacy — Allows booting from operating systems that support legacy option ROM or UEFI option ROM. (Default)
- ⏩ Legacy only — Allows booting from operating systems that only support legacy Option ROM.
- ⏩ UEFI only — Allows booting from operating systems that only support UEFI Option ROM.

☞ Network

Allows you to select whether to enable the UEFI or legacy option ROM for the LAN controller.

- ⏩ Do not launch — Disables option ROM.
- ⏩ UEFI — Enables UEFI option ROM only.
- ⏩ Legacy — Enables legacy option ROM only. (Default)

Storage

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

- Do not launch — Disables option ROM.
- UEFI — Enables UEFI option ROM only.
- Legacy — Enables legacy option ROM only. (Default)

Video

Allows you to select whether to enable the UEFI or legacy option ROM for the graphic device controller.

- Do not launch — Disables option ROM.
- UEFI — Enables UEFI option ROM only.
- Legacy — Enables legacy option ROM only. (Default)

Other PCI devices

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

- Do not launch — Disables option ROM.
- UEFI — Enables UEFI option ROM only. (Default)
- Legacy — Enables legacy option ROM only.

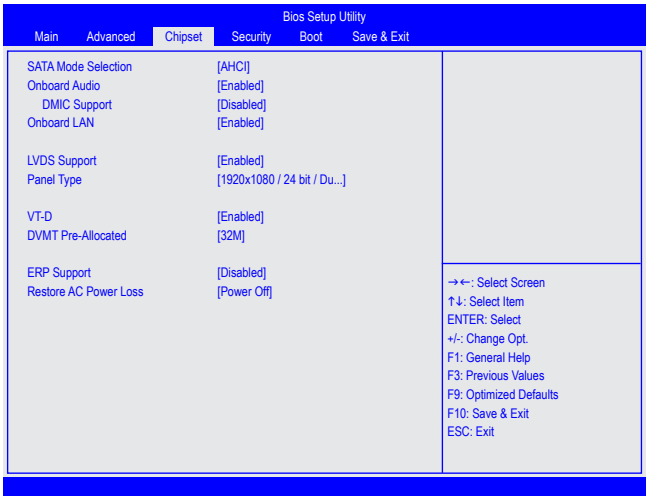
NVMe Configuration

Displays information on your M.2 NVME PCIe SSD if installed.

Realtek PCIe GBE Family Controller

This sub-menu provides information on LAN configuration.

2-3 Chipset Menu



☞ **SATA Mode Selection**

Enables or disables RAID for the SATA controllers integrated in the Intel Chipset or configures the SATA controllers to AHCI mode.

- ▸▸ AHCI Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- ▸▸ RAID Enables RAID for the SATA controller.

☞ **Onboard Audio Device**

Enable/Disable onboard audio controller.

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

☞ **DMIC Support**

Define the Verb Table. Mode A does not support DMIC. Mode B supports DMIC.

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

☞ **Onboard LAN**

Enable/Disable onboard LAN controller.

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

☞ **LVDS Support**

Support Full HD 1920x1080.

☞ **Panel Type**

Support Full HD 1920x1080.

☞ **VT-d**

Enables or disables Intel® Virtualization Technology for Directed I/O. (Default: Disabled)

☞ **DVMT Pre-Allocated**

Allows you to allocate the DVMT memory size of the onboard graphics.
Options are: 32M~512M. (Default: 32M)

☞ **ERP Support**

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

☞ **Restore AC Power Loss**

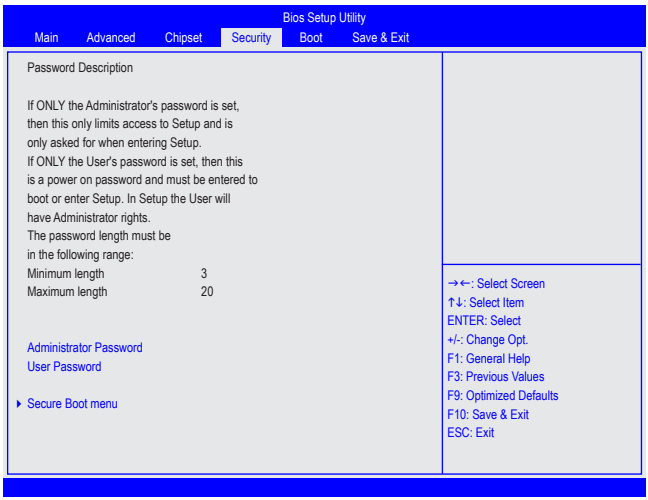
This option provides user to set the mode of operation if an AC / power loss occurs.

- ⏩ 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.

☞ **Administrator Password**

Press <Enter> to configure the Administrator password.

☞ **User Password**

Press Enter to configure the user password.

▶ **Secure Boot menu**

☞ **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**.

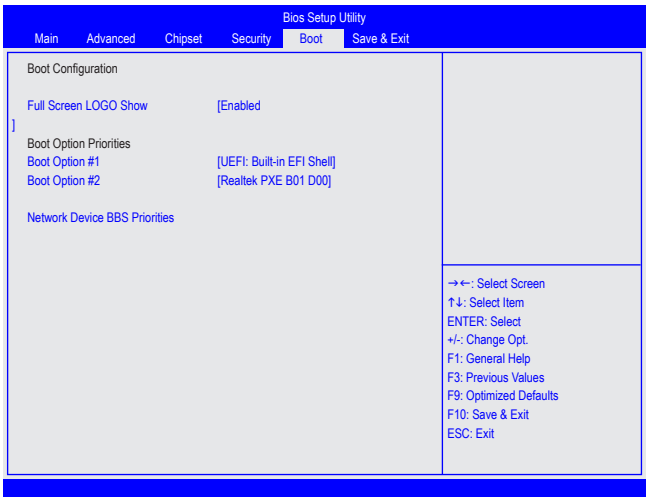
☞ **Secure Boot Mode**

Define the Secure Boot Mode.
Option available: Standard/Custom. Default setting is **Standard**.

▶ **Key Management**

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.



☞ Full Screen LOGO Show

Allows you to determine whether to display the GIGABYTE Logo at system startup. Disabled skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

☞ Boot Option Priorities

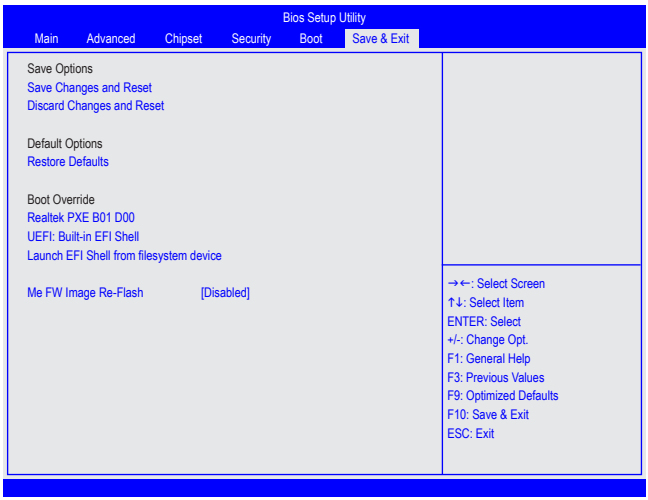
Specifies the overall boot order from the available devices. For example, you can set hard drive as the first priority (Boot Option #1) and DVD ROM drive as the second priority (Boot Option #2). The list only displays the device with the highest priority for a specific type. For example, only hard drive defined as the first priority on the **Network Device BBS Priorities** submenu will be presented here.

Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

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 Reset**

Active this option to reset system after saving the changes.
Options available: Yes/No.

☞ **Discard Changes and Reset**

Active this option to reset system after without saving any changes.
Options available: Yes/No.

☞ **Restore Defaults**

Press <Enter> on this item and then press the <Y> key to load the default BIOS settings.
Options available: Yes/No.

☞ **Boot Override**

Press Enter to configure the device as the boot-up drive.

☞ **Realtek PXE B01 D00**

Allows you to select whether to enable the legacy option ROM for the LAN controller.

☞ **UEFI: Built-in EFI Shell**

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

☞ **Launch EFI Shell from filesystem device**

Attempts to Launch EFI Shell application (SHell.dfi) from one of the available filesystem devices.

☞ **Me FW Image Re-Flash**

Active this option to reflash Firmware.