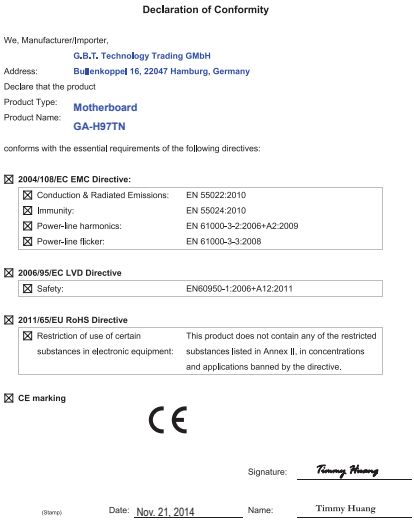
GA-H97TN

User's Manual

12ME0-H97TN0-00R



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-H97TN

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

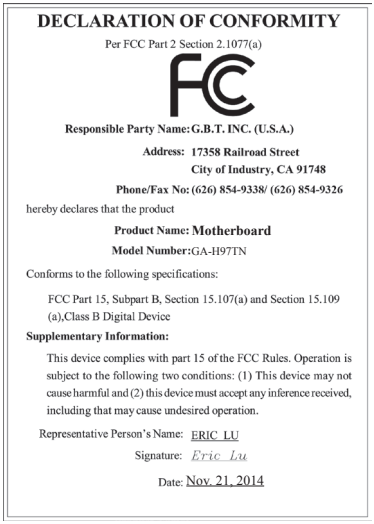
☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ CE marking

CE

Signature: Timmy Huang

(Stamp) Date: Nov. 21, 2014 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-H97TN

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: Nov. 21, 2014

Copyright

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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

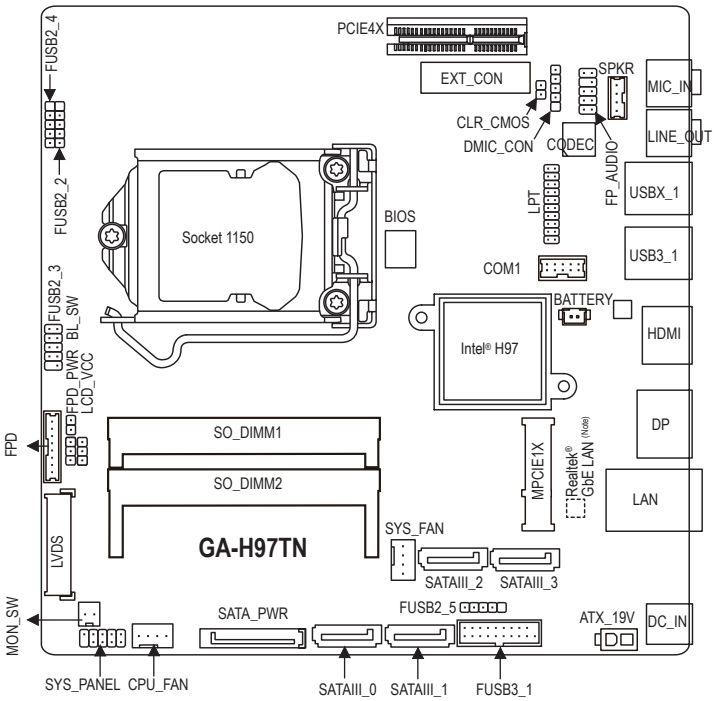
Table of Contents

Box Contents

- ☑ GA-H97TN 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-H97TN 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 LGA1150 package (Supports up to 84W) (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
Chipset	◆ Intel® H97 Express Chipset
Memory	◆ 2 x 1.5V DDR3/1.35V DDR3L SO-DIMM sockets supporting up to 8 GB 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 DDR3 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 1.4 port, supporting a maximum resolution of 4096x2160 - 1 x DisplayPort, supporting a maximum resolution of 3840x2160 - 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 Mini PCI Express x1 slot
Storage Interface	◆ Chipset: - 4 x SATA 6Gb/s connectors - 1 x mSATA connector
USB	◆ Chipset: - 6 x USB 3.0/2.0 ports; 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 ◆ 1 x mSATA connector ◆ 1 x SATA power connector ◆ 5 x USB 2.0/1.1 headers ◆ 1 x serial port header ◆ 1 x parallel port header ◆ 1 x front panel header

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

- GIGABYTE recommends 180W power adapters for processors above 84W TDP. Processors with a TDP lower than 84W, may use 150W power adapters.
- 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:

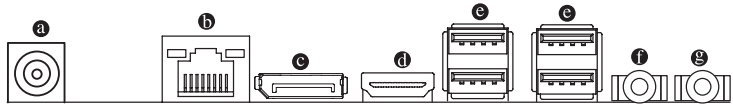
- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted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

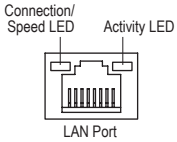


a DC Power Connector

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

HDMI™ 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)

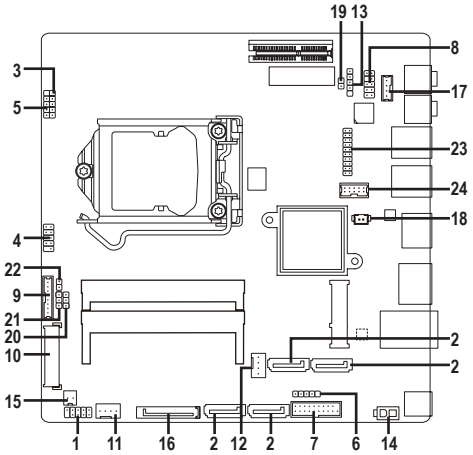
The default Line Out (Front Speaker Out) jack. Stereo speakers, earphone or front surroundspeakers can be connected to Line Out (Front Speaker Out) jack.

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



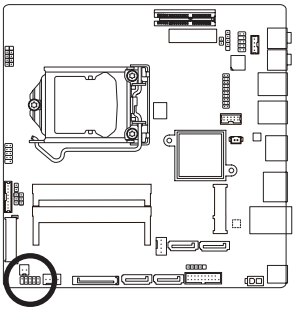
1)	SYS_PANEL	13)	DMIC_CON
2)	SATAIII_0/1/2/3	14)	ATX_19V
3)	FUSB2_2	15)	MON_SW
4)	FUSB2_4	16)	SATA_PWR
5)	FUSB2_5	17)	SPKR
6)	FUSB2_3	18)	BATTERY
7)	FUSB3_1	19)	CLR_CMOS
8)	FP_AUDIO	20)	LCD_VCC
9)	FPD	21)	FPD_PWR
10)	LVDS	22)	BL_SW
11)	CPU_FAN	23)	LPT
12)	SYS_FAN	24)	COM1

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.

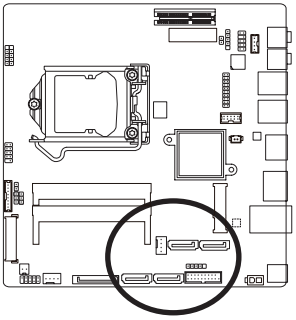


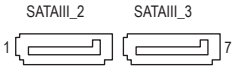
Pin No.	Signal Name	Definition
1	HD+	Hard Disk LED Signal anode (+)
2	MPD+	Power LED Signal anode (+)
3	HD-	Hard Disk LED Signal cathode(-)
4	MPD-	Power LED Signal cathode(-)
5	GND	Ground
6	PW+	Power Button anode (+)
7	RST	Reset Button
8	PW-	Power Button cathode(-)
9	WF_LED	Wifi active LED Signal

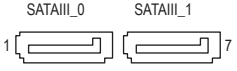
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

2) SATAIII_0/1/2/3 (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.



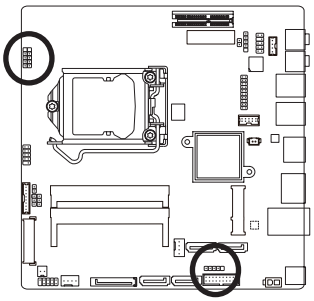




Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

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

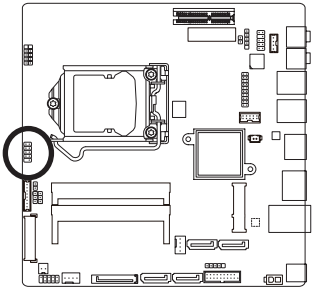
The headers conform to USB 2.0/1.1 specification. Each header supports a single device.



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

6) FUSB2_3 (USB Headers)

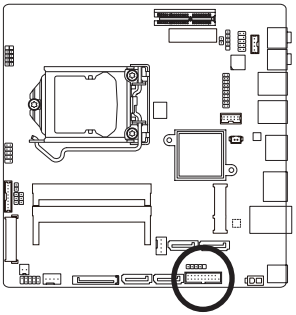
The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

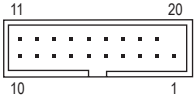


Pin No.	Definition
1	VCC
2	VCC
3	USB-
4	USB-
5	USB+
6	USB+
7	GND
8	GND
9	No Pin
10	NC

7) FUSB3 (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.



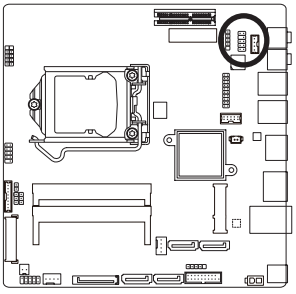


Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

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.



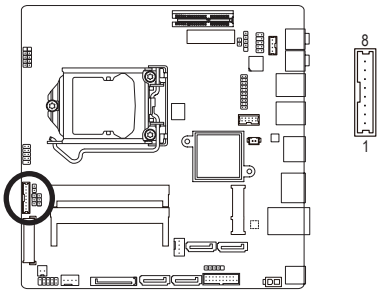
Pin No.	Definition
1	F_MIC_L
2	GND
3	F_MIC_R
4	GPIO_DET
5	F_LINE_R
6	F_MIC_JD
7	GND
8	No Pin
9	F_LINE_L
10	F_LINE_JD

- 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.

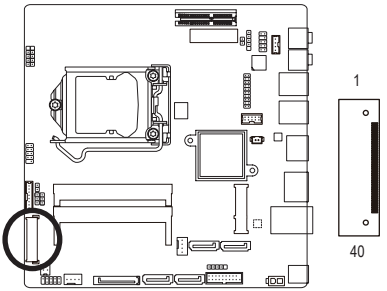
The headers conform to FPD specification.



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.

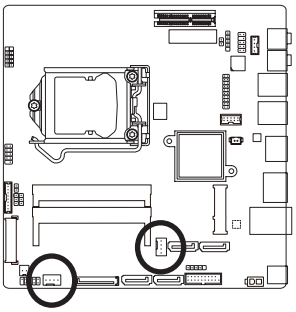


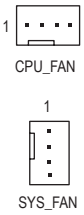
Pin No.	Definition	Pin No.	Definition
1	ODD_Lane3_P	21	NC
2	ODD_Lane3_N	22	EDID_3.3V
3	ODD_Lane2_P	23	LCD_GND
4	ODD_Lane2_N	24	LVDS SENSE (Note)
5	ODD_Lane1_P	25	LCD_GND
6	ODD_Lane1_N	26	ODD_CLK_P
7	ODD_Lane0_P	27	ODD_CLK_N
8	ODD_Lane0_N	28	BLKT_GND
9	EVEN_Lane3_P	29	BLKT_GND
10	EVEN_Lane3_N	30	BLKT_GND
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.



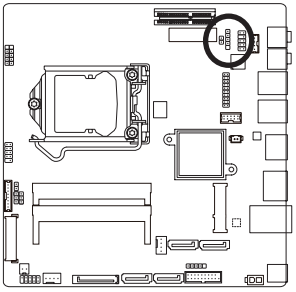


Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

- 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)

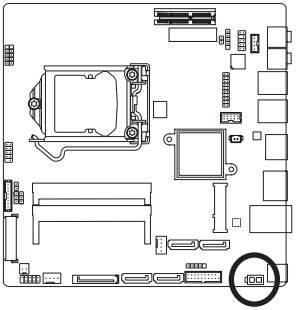
This header is for a digital microphone.



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

14) ATX_19V (2 Pin Power Connector)

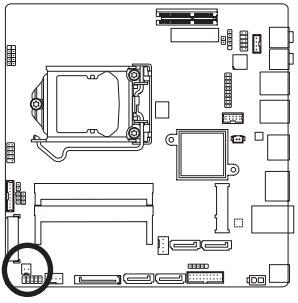
This power connector is for the integrated 19V chassis power supply.



Pin No.	Definition
1	GND
2	+19V

15) MON_SW (Flat panel display switch header)

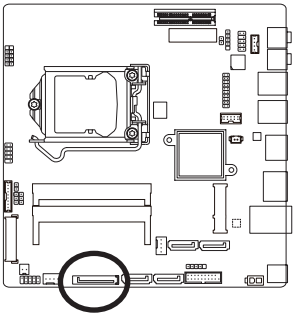
This header allows you to connect an on/off switch for the display.

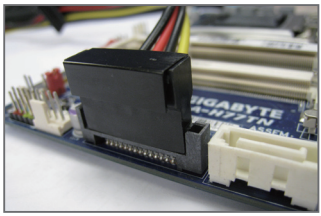


Pin No.	Definition
1	Mon_SW
2	GND

16) SATA_PWR (SATA Power Connector)

This connector provides power to installed SATA devices.

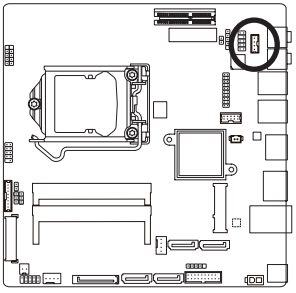




Connect the included SATA power cable to the SATA_PWR connector. Then connect the SATA/optical drive power connectors to your hard drive and optical drive.

17) SPKR (Speaker Header)

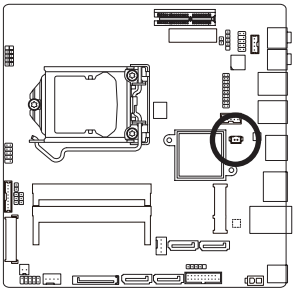
This speaker header is connected to a L/R audio pins from the board to support the 3W (4ohm) stereo speaker on your AIO chassis.



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

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.

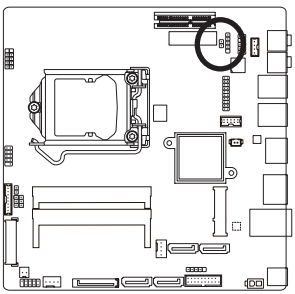


Pin No.	Definition
1	RTC Reset
2	GND

- 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.



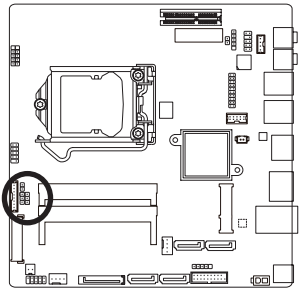
Open: Normal operation (Default setting)

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 Boltage Jumper)

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

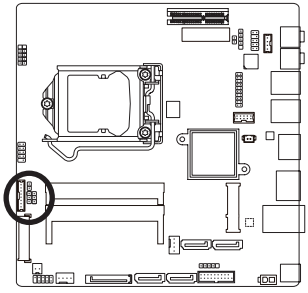


1 1-2 Close: Set to 3V.

1 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.

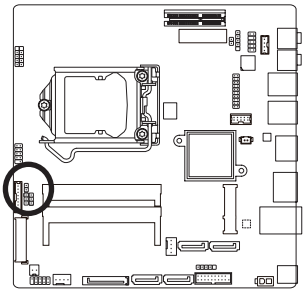


1 1-2 Close: Set to 12V.

1 2-3 Close: Set to 19V. (Default setting)

22) BL_SW (Back Light Switch)

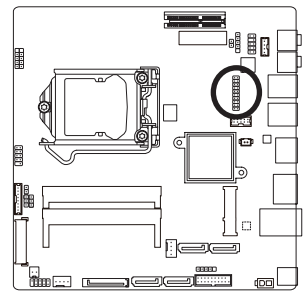
The Back Light switch provides the function for screen back light adjustment.

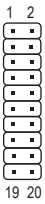


Pin No.	Definition
1	BL_DOWN
2	BL_UP

23) LPT (Parallel Port Header)

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

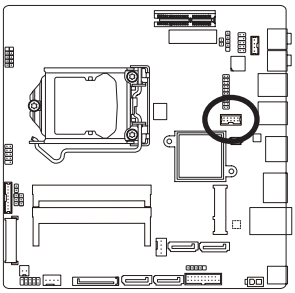




Pin No.	Definition	Pin No.	Definition
1	STB-	11	PD4
2	BUSY	12	INIT-
3	PD0	13	PD5
4	PE	14	SLIN-
5	PD1	15	PD6
6	SLCT	16	GND
7	PD2	17	PD7
8	AFD-	18	GND
9	PD3	19	ACK-
10	ERR-	20	GND

24) 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

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 <F2> 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 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
<K>	Scroll help area upwards
<M>	Scroll help area downwards

- **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. (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

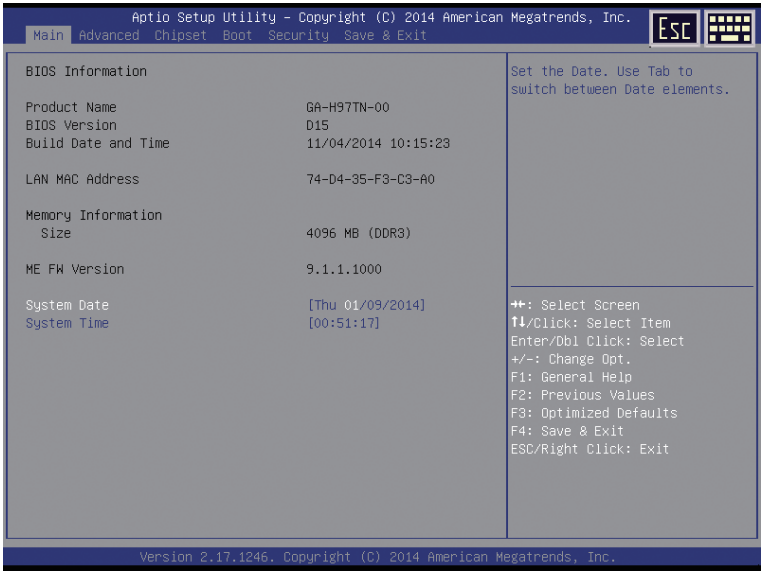
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

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: D15)

- 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**

☞ **Product Name**

Display the information motherboard model.

☞ **BIOS Version**

Display the BIOS version.

☞ **Build Date and Time**

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

☞ **LAN MAC Address**

Displays the MAC address information.

☞ **Memory Information**

☞ **Size**

Determines how much total memory is present during the POST.

☞ **ME FW Version**

Display the ME firmware version.

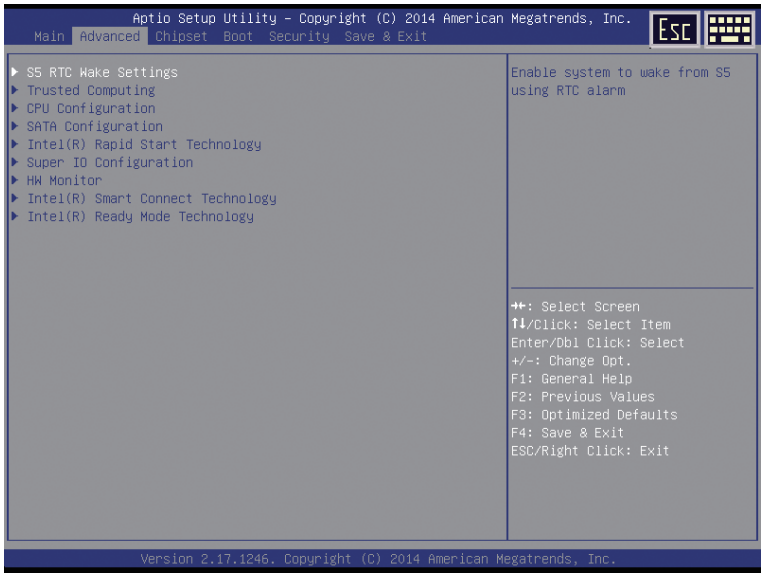
☞ **System Date**

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

☞ **System Time**

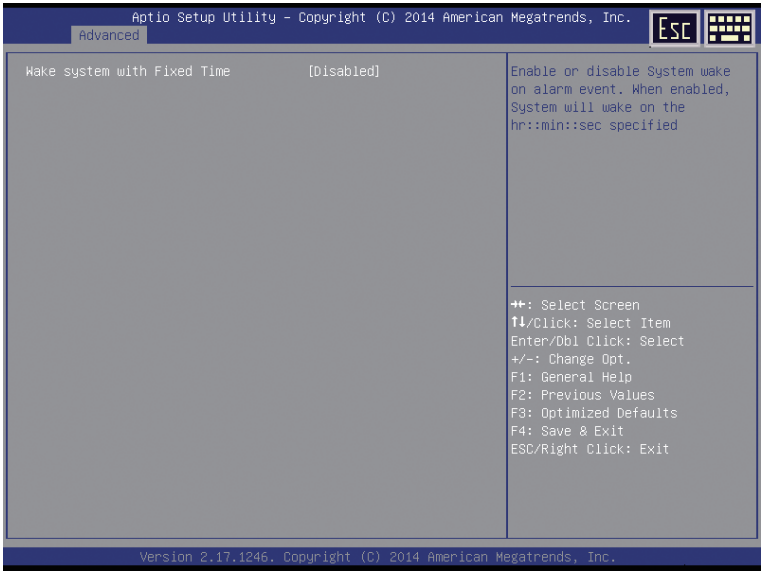
Set the system time following the hour-minute- second format.

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.

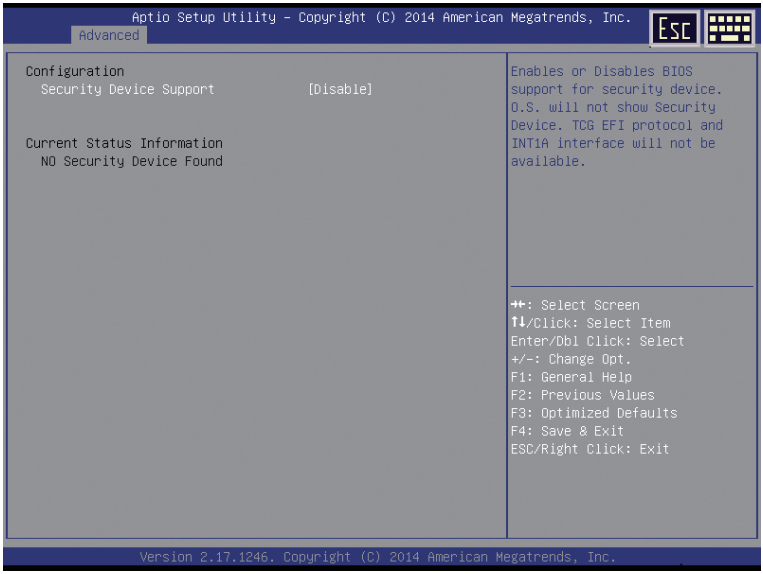
2-2-1 S5 RTC Wake Settings



☞ **Wake system with Fixed Time**

Enables or disables system wake on alarm event. (Default: Disabled)

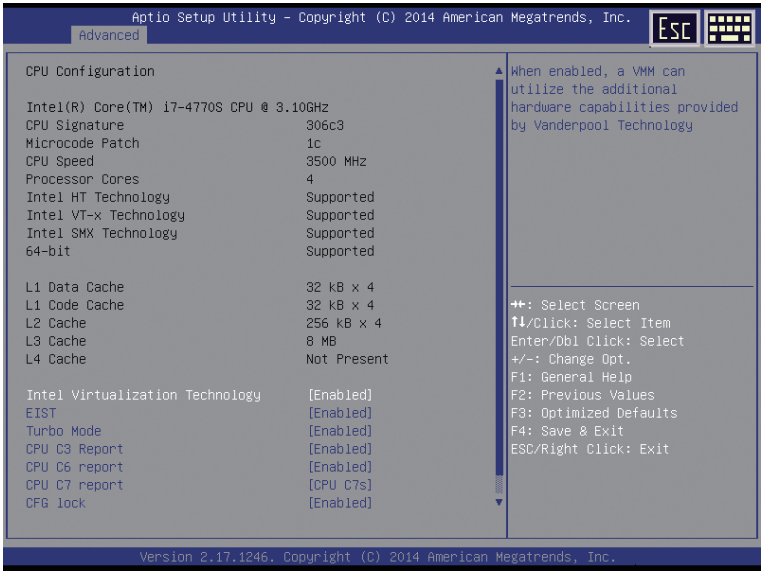
2-2-2 Trusted Computing



☞ **Security Device Support**

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

2-2-3 CPU Configuration



☞ **CPU Type**

Displays the processor type information.

☞ **CPU Signature**

Displays the processor ID information.

☞ **Microcode Patch**

Display the information of the processor microcode patch.

☞ **CPU Speed**

Display the information of the processor speed.

☞ **Processor Cores**

Display the information of the processor core.

☞ **Intel HT Technology**

Display Intel Hyper Threading Technology function support information.

☞ **Intel VT-x Technology**

Display Intel Virtualization Technology function support information.

☞ **Intel SMX Technology**

Display Intel Safer Mode Extensions Technology function support information.

☞ **64-bit**

Display the supported infprmation of installed CPU.

☞ **L1 Data Cache**

Display the information of L1 Data Cache.

☞ **L1 Code Cache**

Display the information of L1 Code Cache.

☞ **L2 Cache**

Display the information of L2 Cache per Core.

☞ **L3 Cache**

Display the information of total L3 Cache per socket.

☞ **L4 Cache**

Display the information of L4 Cache.

☞ **Intel Virtualization Technology** (Note)

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

Options available: Enabled/Disabled.

☞ **EIST (Enhanced Intel SpeedStep Technology)**

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

Options available: Enabled/Disabled.

☞ **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. (Default: Enabled)

Options available: Enabled/Disabled.

☞ **CPU C3/C6 Report** (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. (Default: Enabled)

Options available: Enabled/Disabled.

Default setting for C3 is **Enabled**.

Default setting for C6 is **Enabled**.

☞ **CPU C7 report** (Note)

Allows you to determine whether to let the CPU enter C7 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 C7 state is a more enhanced power-saving state than C3. (Default: CPU C7s)

☞ **CFG lock** (Note)

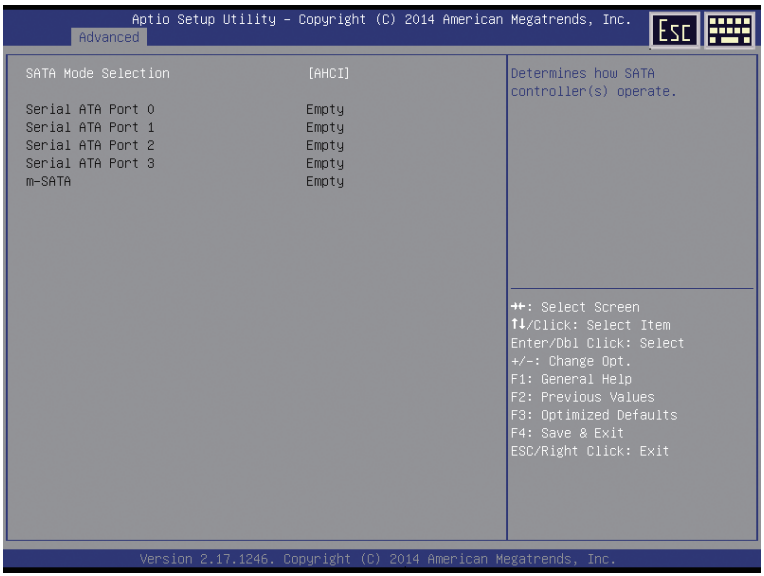
Configure MSR 0xE2[15], CFG lock bit. (Default: Enabled)

☞ **Intel TXT(LT) Support** (Note)

Enables or disables **Intel® Trusted Execution Technology** (Intel® TXT). Intel® Trusted Execution Technologyprovides a hardware-based security foundation. (Default: Disabled)

(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.

2-2-4 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.

- ▸▸ IDE Configures the SATA controller to IDE 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/mSATA(Note)**

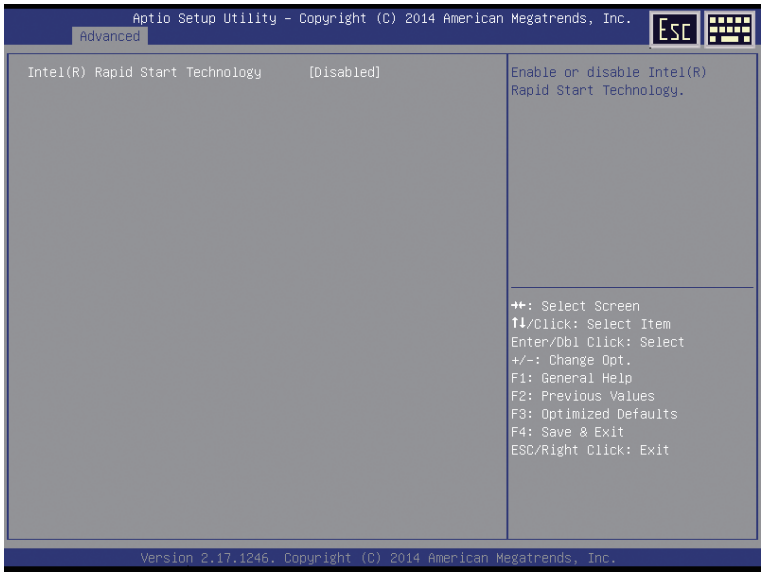
The category identifies Serial ATA and mSATA types of hard disk that are installed in the computer. System will automatically detect HDD type.

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.

(Note) Advanced items prompt when this item is enabled.

2-2-5 Intel (R) Rapid Start Technology

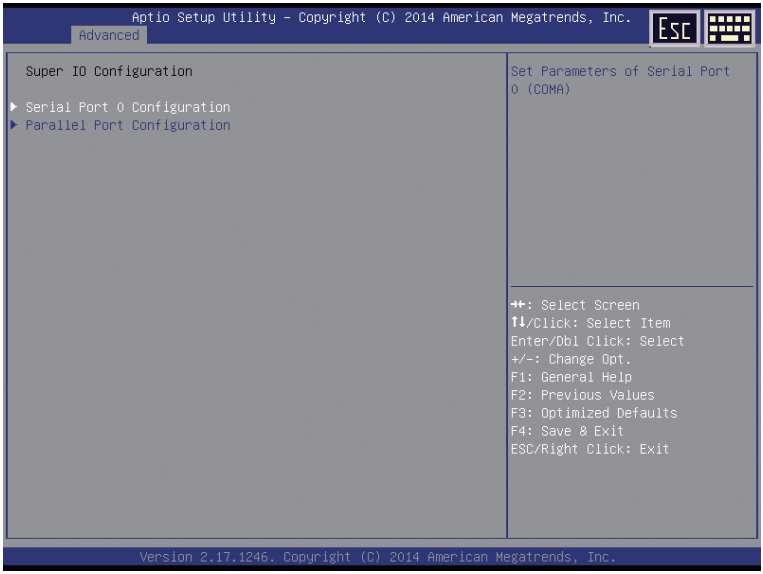


☞ **Intel(R) Rapid Start Technology**(Note)

Enable/Disable the Intel Rapid Start Technology (IRSTe) funciton. The IRSTe enables your system to get up and running faster from even the deepest sleep, saving time and power consumption. (Default: Disabled) Option available: Enabled/Disabled.

(Note) Advanced items prompt when this item is enabled.

2-2-6 Super IO Configuration



☞ **Super IO Configuration**

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

☞ **Serial Port 0 Configuration**

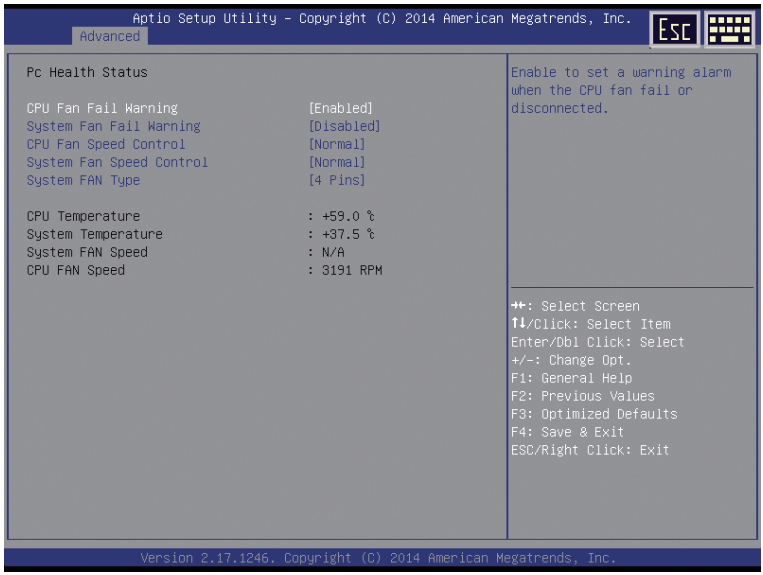
Enables or disables the onboard serial port. (Default: Enabled)

☞ **Parallel Port Configuration**

Enables or disables the onboard parallel port. (Default: Enabled)

2-2-7 H/W 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 Fan Fail Warning

Enable CPU Fan Stop Warning function. (Default: Enabled)

Option available: Enabled/Disabled.

☞ System Fan Fail Warning

Enable System Fan Stop Warning function. (Default: Disabled)

Option available: Enabled/Disabled.

☞ CPU/System Fan Speed Control

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

- ▸▸ Normal — Lets the BIOS automatically configure this setting. (Default)
- ▸▸ Silent — Allows the fan to run at slow speeds.
- ▸▸ Performance — Allows the fan to run at high speeds.
- ▸▸ Full — Allows the fan to run at full speeds.

☞ System FAN Type

Select system fan type. (Default: 4 Pin)

Option available: 3 Pin/4 Pin.

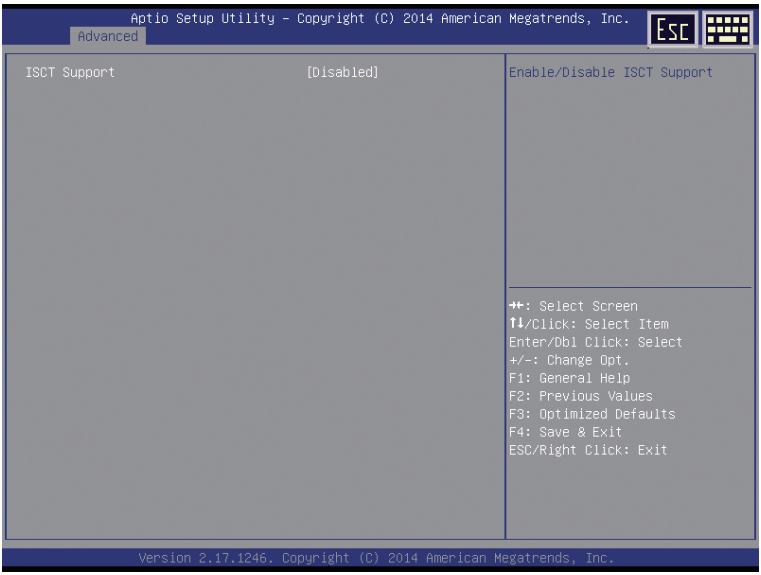
☞ CPU/System Temperature

Displays current system and CPU temperature.

☞ System/CPU FAN Speed (RPM)

Displays current system and system and CPU fan speed.

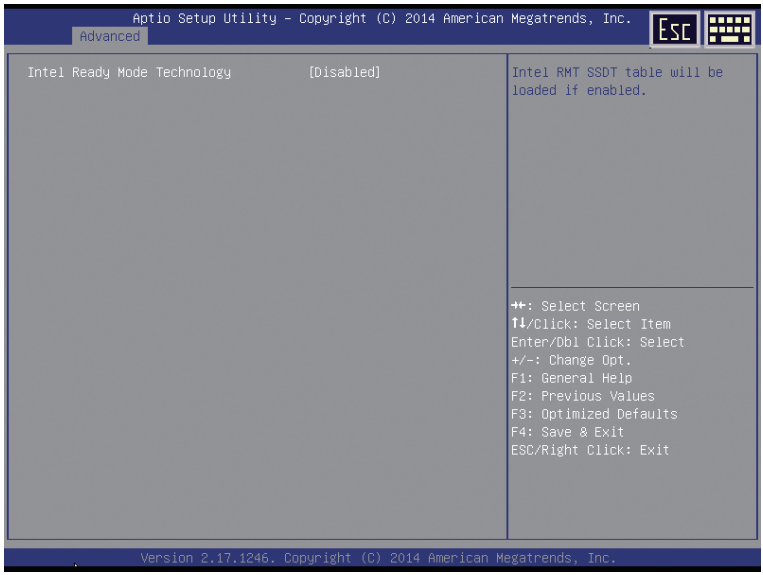
2-2-8 Intel(R) Smart Connect Technology



☞ **ISCT Configuration**

Enables or disables Intel Smart Connect Technology. (Default: Disabled)

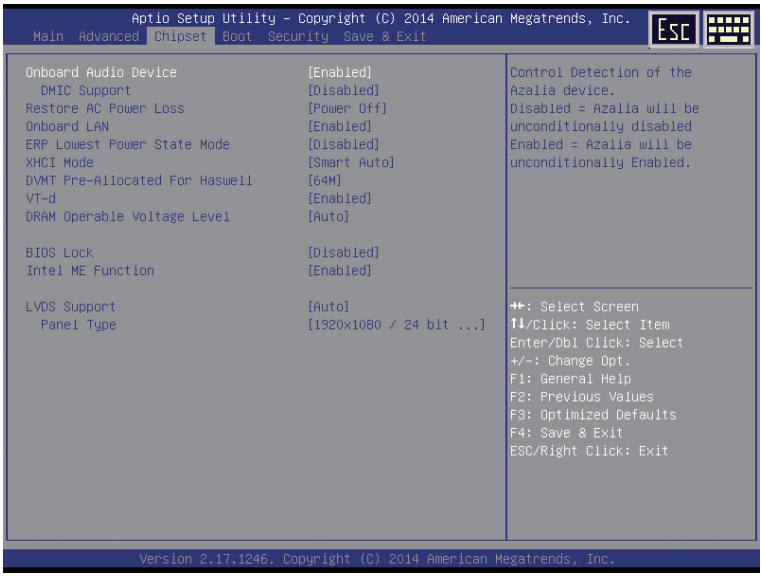
2-2-9 Intel(R) Ready Mode Technology



☞ **Intel Ready Mode Technology**

Enables or disables Intel Ready Mode Technology. (Default: Disabled)

2-3 Chipset Menu



Onboard Audio Device

Enables or disables onboard audio controller. (Default: Enabled)

Options available: Enabled/Disabled.

DMIC Support

Define the Verb Table. Mode A does not support DMIC. Mode B supports DMIC. (Default: Disabled)

Options available: Disabled/Enabled.

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. (Default)
- Last State — Set system to the last sate when AC power is removed.

Onboard LAN

Enable or disable onboard LAN controller. (Default: Enabled)

Options available: Enabled/Disabled.

ERP Lowest Power State Mode

Enables or disables the ERP Lowest Power State Mode. (Default: Disabled)

Options available: Enabled/Disabled.

XHCI Mode

Allows you to determine the operating mode for the xHCI controller in OS.

- Smart Auto — This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to **Auto**, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI

controller enabling and rerouting should follow the steps in **Auto**, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI pre-boot support. (Default)

- ▸▸ Auto — BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support.
- ▸▸ Enabled — All shared ports are eventually routed to the xHCI controller during the BIOS boot process. If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller. Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work.

☞ **DVMT Pre-Allocated For Haswell**

Select DVMT 5.0 Pre_Allocated(Fixed) Graphics Memory size used by the internal graphics device. (Default: 64M)

☞ **VT-d** (Note)

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

☞ **DRAM Operable Voltage Level**

Defined the VDD voltage at DDR modules. (Default: Auto)

☞ **BIOS Lock**

Enables or disables BIOS lock enable (BLE) bit. (Default: Disabled)

☞ **Intel ME Function**

Disables Intel ME to update ME after ME locked. (Default: Enabled)

☞ **LVDS Support**

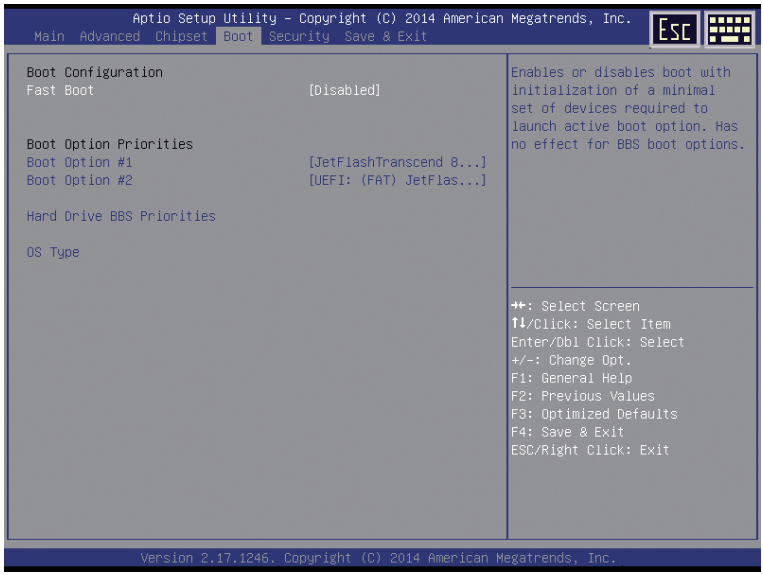
Enables or disables LVDS support. (Default: Audo)

☞ **Panel Type**

Select pre-define flat-panel display parameters. (Default: 1920x1080 / 24 bit / Dual Channel)

2-4 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.



☞ **Fast Boot**

Enables or disables Fast Boot to shorten the OS boot process. (Default: Disabled)

☞ **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 **Hard Drive 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.

☞ **Hard Drive/CD/DVD ROM Drive/Floppy Drive/Network Device BBS Priorities**

Specifies the boot order for a specific device type, such as hard drives, optical drives, floppy disk drives, and devices that support Boot from LAN function, etc. Press <Enter> on this item to enter the submenu that presents the devices of the same type that are connected. This item is present only if at least one device for this type is installed.

OS Type

OS Type

Allows you to select the operating system to be installed. (Default: Windows 7)

LAN PXE OpROM

Enables or disables LAN PXE OpROM. (Default: Disabled)

Options available: Enabled/Disabled.

This item is configurable only when **OS Type** is set to **Windows 7**.

LAN EFI driver

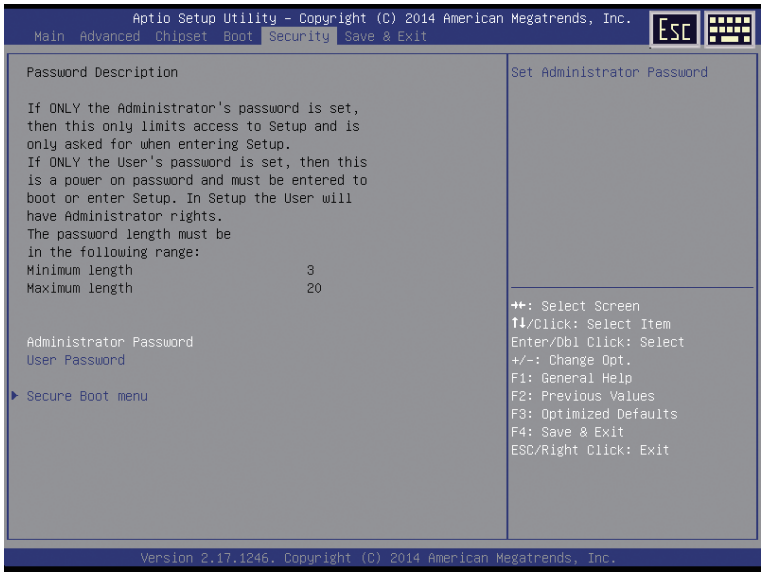
Enables or disables LAN EFI driver. (Default: Disabled)

Options available: Enabled/Disabled.

This item is configurable only when **OS Type** is set to **Windows 8.x**.

2-5 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

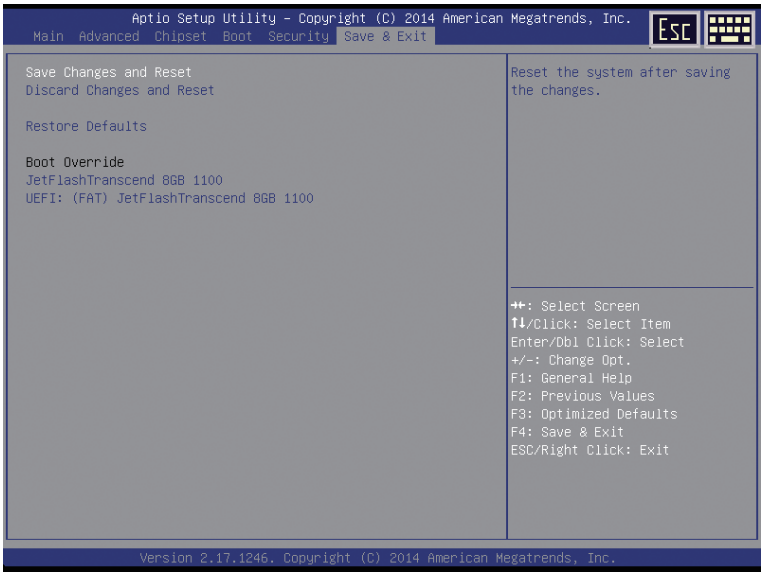
Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all the files being loaded before Windows 8 loads and gets to the login screen have not been tampered with. (Default: Enabled)
Options available: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

☞ Secure Boot Mode

Define the Secure Boot Mode. (Default: Standard)
Option available: Standard/Custom.

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.

☞ **UEFI: Built-in in EFI Shell**

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

Chapter 3 Appendix

3-1 Troubleshooting

3-1-1 Frequently Asked Questions

To read more FAQs for your motherboard, please go to the **Support & Downloads\FAQ** page on GIGABYTE's website.

Q: Why is the light of my keyboard/optical mouse still on after the computer shuts down?

A: Some motherboards provide a small amount of standby power after the computer shuts down and that's why the light is still on.

Q: How do I clear the CMOS values?

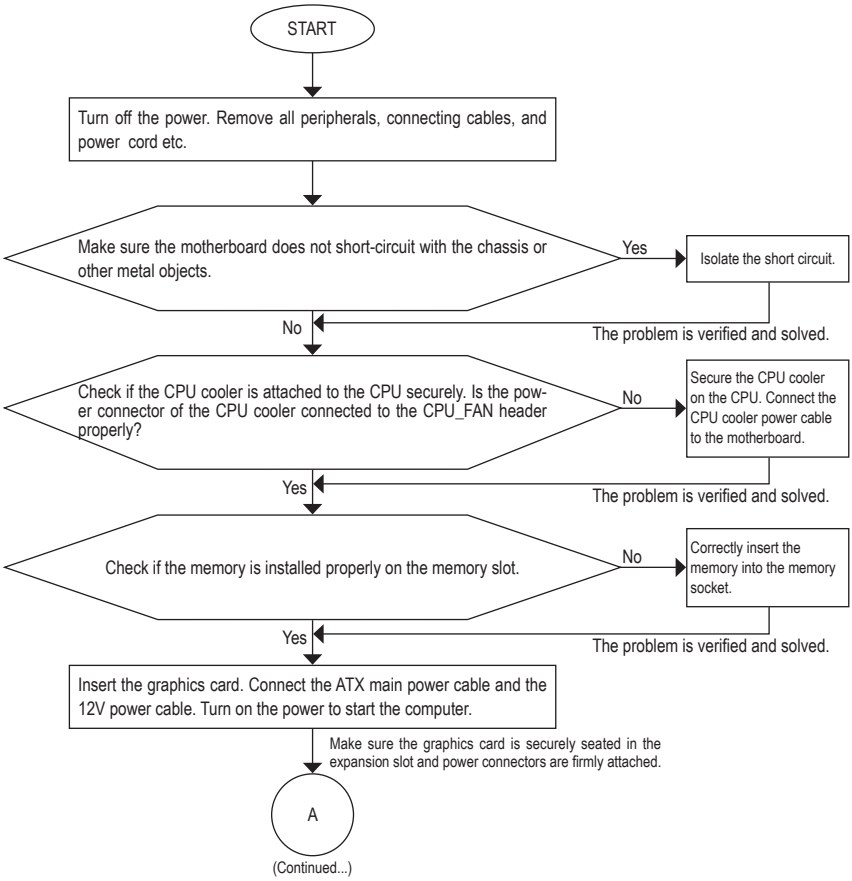
A: For motherboards that have a Clear CMOS button, press this button to clear the CMOS values (before doing this, please turn off the computer and unplug the power cord). For motherboards that have a Clear CMOS jumper, refer to the instructions in Chapter 1 to short the jumper to clear the CMOS values. If your board doesn't have this jumper/button, refer to the instructions on the motherboard battery in Chapter 1. You can temporarily remove the battery from the battery holder to stop supplying power to the CMOS, which will clear the CMOS values after about one minute.

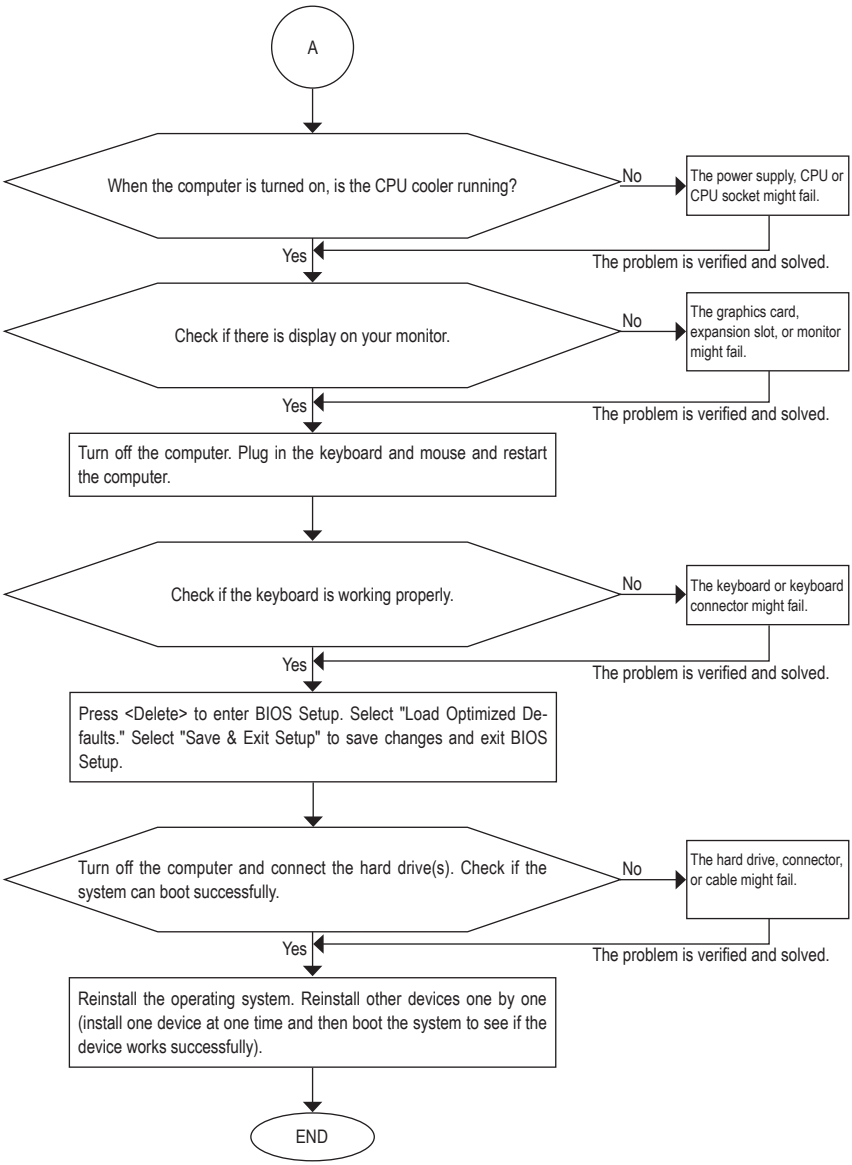
Q: Why do I still get a weak sound even though I have turned my speaker to the maximum volume?

A: Make sure your speaker is equipped with an internal amplifier. If not, try a speaker with power/amplifier.

3-1-2 Troubleshooting Procedure

If you encounter any troubles during system startup, follow the troubleshooting procedure below to solve the problem.





If the procedure above is unable to solve your problem, contact the place of purchase or local dealer for help. Or go to the **Support & Downloads\Technical Support** page to submit your question. Our customer service staff will reply you as soon as possible.

Regulatory Statements

Regulatory Notices

This document must not be copied without our written permission, and the contents there of must not be imparted to a third party nor be used for any unauthorized purpose. Contravention will be prosecuted. We believe that the information contained herein was accurate in all respects at the time of printing. GIGABYTE cannot, however, assume any responsibility for errors or omissions in this text. Also note that the information in this document is subject to change without notice and should not be construed as a commitment by GIGABYTE.

Our Commitment to Preserving the Environment

In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

Restriction of Hazardous Substances (RoHS) Directive Statement

GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

FCC Notice (U.S.A. Only)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer or experienced TV/radio technician for help.

Canada, Industry Canada (IC) Notices / Canada, avis d'Industry Canada (IC)

- This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.
- Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

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- **G.B.T. TECH. CO., LTD. - U.K.**

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You may go to the GIGABYTE website, select your language in the language list on the top right corner of the website.

- **GIGABYTE eSupport**

  To submit a technical or non-technical (Sales/Marketing) question, please link to: http://esupport.gigabyte.com