GA-H77TN
GA-B75TN
GA-H61TN

User's Manual

Rev. 1101
12ME0-H77TN1-00R

Declaration of Conformity

We, Manufacturer/Importer,

Address:

Declare that the product

Product Type:
Product Name:

G.B.T. Technology Trading GMbH

Bullenkoppel 16, 22047 Hamburg, Germany

Motherboard
GA-H77TN

conforms with the essential requirements of the following directives:

☒ **2004/108/IEC 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

(Stamp)

Signature: *Timmy Huang*

Date: Jan. 31, 2013   Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

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-H77TN

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: Jan. 31, 2013

Declaration of Conformity

We, Manufacturer/Importer,

Address:

G.B.T. Technology Trading GMbH

Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: Motherboard

Product Name: GA-B75TN

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

☒ CE marking

CE

(Stamp)

Signature: *Timmy Huang*

Date: Jan. 31, 2013   Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FCC

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-B75TN

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: Jan. 31, 2013

Declaration of Conformity

We, Manufacturer/Importer,

Address: **G.B.T. Technology Trading GMbH**
Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-H61TN**

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

☒ **CE marking**

C E

(Stamp)

Signature: *Timmy Huang*

Date: Feb. 08, 2013   Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

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-H61TN

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: Feb. 08, 2013

Copyright

Disclaimer

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-H77TN or GA-B75TN or GA-H61TN motherboard
- ☑ Motherboard driver disk
- ☑ User's Manual
- ☑ One SATA power cable
- ☑ I/O Shield
- ☑ Screws kit for expansion cards

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

GA-H77TN/GA-B75TN/GA-H61TN Motherboard Layout
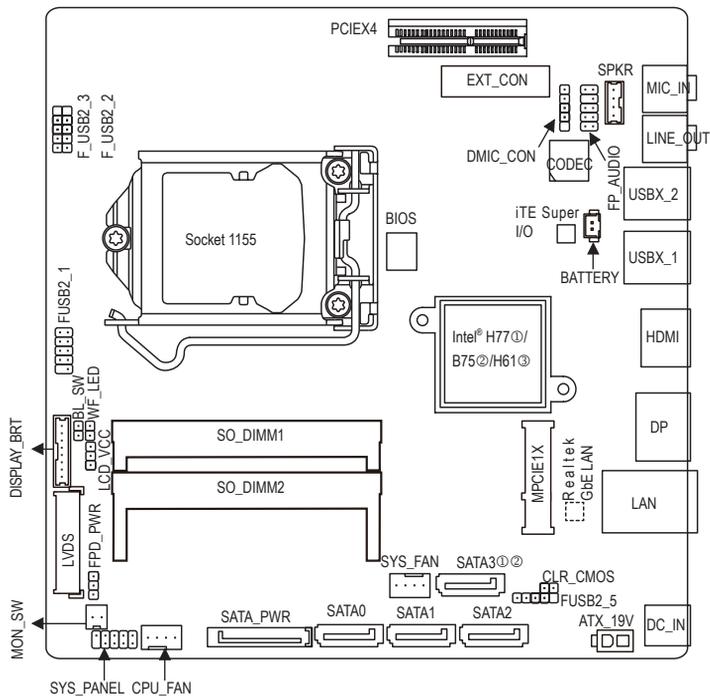
① Only for GA-H77TN.
② Only for GA-B75TN.
③ Only for GA-H61TN.

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 LGA1155 package (Supports up to 77W) (Go to GIGABYTE's website for the latest CPU support list.)
	◆	L3 cache varies with CPU
Chipset	◆	Intel® H77 ①/B75 ②/H61 ③ Express Chipset
Memory	◆	2 x 1.5V DDR3 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 1600/1333/1066/800 MHz memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
Onboard Graphics	◆	Integrated Graphics Processor: 　-　1 x HDMI 1.3 port, supporting a maximum resolution of 1920x1200 　-　1 x DisplayPort, supporting a maximum resolution of 2560x1600 　-　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	◆	1 x 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: GA-H77TN: 　-　2 x SATA 6Gb/s connectors (SATA0/1) supporting up to 2 SATA 6Gb/s devices 　-　2 x SATA 3Gb/s connectors (SATA2/3) supporting up to 2 SATA 3Gb/s devices 　-　1 x mSATA connector 　-　Support for RAID 0, RAID 1, RAID 5, and RAID 10 GA-B75TN: 　-　1 x SATA 6Gb/s connector (SATA0) supporting up to 1 SATA 6Gb/s device 　-　3 x SATA 3Gb/s connectors (SATA1/2/3) supporting up to 3 SATA 3Gb/s devices 　-　1 x mSATA connector GA-H61TN: 　-　3 x SATA 3Gb/s connectors (SATA0/1/2) supporting up to 3 SATA 3Gb/s devices 　-　1 x mSATA connector

① Only for GA-H77TN.
② Only for GA-B75TN.
③ Only for GA-H61TN.

🖭 USB	◆ Chipset: GA-H77TN/GA-B75TN: - Up to 4 USB 3.0/2.0 ports on the back panel - Up to 5 USB 2.0/1.1 ports available through the internal USB headers (Card reader/Touch panel/webcam and other devices) GA-H61TN: - Up to 9 USB 2.0/1.1 (4 ports on the back panel,5 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 ◆ 2 x SATA 6Gb/s connectors ① ◆ 2 x SATA 3Gb/s connectors ① ◆ 1 x SATA 6Gb/s connector ② ◆ 3 x SATA 3Gb/s connectors ② ◆ 3 x SATA 3Gb/s connectors ③ ◆ 1 x mSATA connector ◆ 1 x SATA power connector ◆ 4 x USB 2.0/1.1 headers ◆ 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 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 WIFI activity indicator LED 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 ② ◆ 4 x USB 2.0/1.1 ports1 x RJ-45 port ③ ◆ 2 x audio jacks (Line Out, Mic In) ◆ 1 x DC-In power connector
🖭 I/O Controller	◆ iTE® I/O Controller Chip

① Only for GA-H77TN.
② Only for GA-B75TN.
③ Only for GA-H61TN.

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 64 Mbit flash ◆ Use of licensed AMI EFI BIOS ◆ PnP 1.0a, DMI 2.0, SM BIOS 2.6, ACPI 2.0a
Operating System	◆ Support for Windows 8/7/XP
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.

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:
• 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
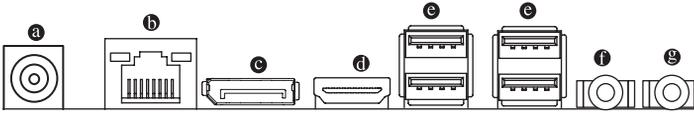
ⓐ **DC Power Jack**

Connect the DC power to this port.

ⓑ **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

ⓒ **DP (DisplayPort) Connector**

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.

ⓓ **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 1920x1200 but the actual resolutions supported depend on the monitor being used.

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.)

⊙ USB 3.0 Ports ① ②

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.

⊙ USB 2.0 Ports ③

The USB port supports the USB 2.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

❶ Line Out (Front Speaker Out/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.

❷ MIC In (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 Only for GA-H77TN.
② Only for GA-B75TN.
③ Only for GA-H61TN.

1-6   Internal Connectors
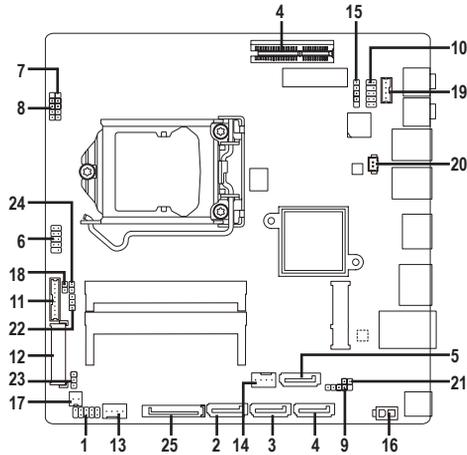
1)	SYS_PANEL	14)	SYS_FAN
2)	SATA0	15)	DMIC_CON
3)	SATA1	16)	ATX_19V
4)	SATA2	17)	MON_SW
5)	SATA3	18)	BL_SW
6)	FUSB2_1	19)	SPKR
7)	FUSB2_2	20)	BATTERY
8)	FUSB2_3	21)	CLR_CMOS
9)	FUSB2_5	22)	LCD_VCC
10)	FP_AUDIO	23)	FPD_PWR
11)	DISPLAY_BRT	24)	WF_LED
12)	LVDS	25)	SATA_PWR
13)	CPU_FAN		

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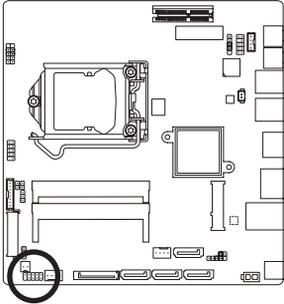
Pin No.	Signal Name	Definition
1	HD+	Hard Disk LED Signal anode (+)
2	MPD+	Power LED Signal anode (+)
3	HD-	Hard Disk LED Signal cathode(-)
4	MPD-	Power LED Signal cathode(-)
5	GND	Ground
6	PW+	Power Button anode (+)
7	RST	Reset Button
8	PW-	Power Button cathode(-)
9	WF_LED	Wifi active LED Signal

The system panel design may differ by chassis. A system 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) SATA0 (SATA 6Gb/s Connector)① ②

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.

SATA0 (SATA 3Gb/s Connector)③

The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.
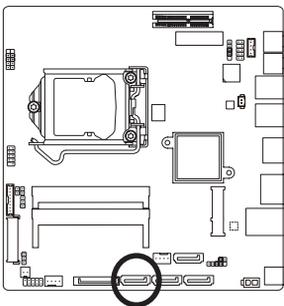
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

① Only for GA-H77TN.
② Only for GA-B75TN.
③ Only for GA-H61TN.

3) SATA1 (SATA 6Gb/s Connector)①

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.

SATA1 (SATA 3Gb/s Connector)② ③

The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.
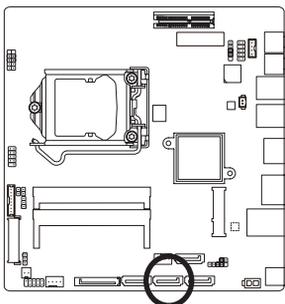
SATA1

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

4) SATA2 (SATA 3Gb/s Connector)

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

SATA2
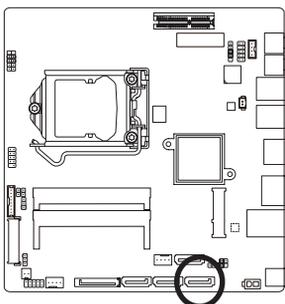
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

① Only for GA-H77TN.
② Only for GA-B75TN.
③ Only for GA-H61TN.

5) SATA3 (SATA 3Gb/s Connector)① ②

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

SATA3

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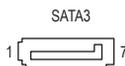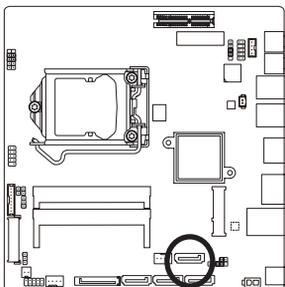
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

6) FUSB2_1 (USB 2.0/1.1 Header)

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.

1 2
9 10
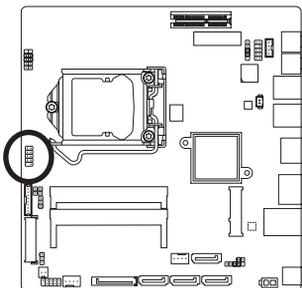
Pin No.	Definition
1	VCC
2	VCC
3	USB3-
4	USB2-
5	USB3+
6	USB2+
7	GND
8	GND
9	No Pin
10	NC

① Only for GA-H77TN.
② Only for GA-B75TN.

7/8/9) FUSB2_2/FUSB2_3/FUSB2_5 (USB 2.0/1.1 Headers)

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

FUSB2_2/FUSB2_3

FUSB2_5

Pin No.	Definition
1	VCC
2	USB-
3	USB+
4	GND
5	No Pin
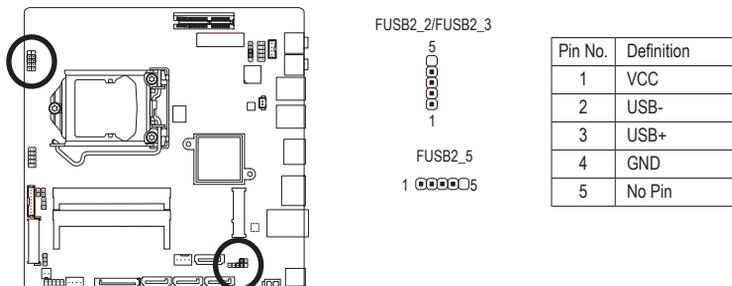
10) FP_AUDIO (Front Panel Audio Header)

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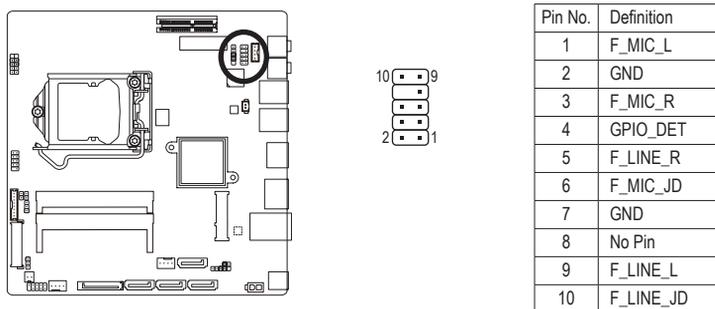
- The front panel audio header supports HD audio by default.
- Audio signals will be present on both of the front and back panel audio connections simultaneously.
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about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

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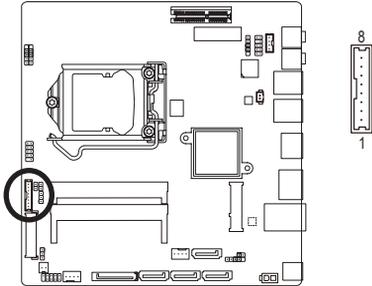
Pin No.	Definition
1	BKLT_EN
2	BKLT_PWM
3	BKLT_PWR
4	BKLT_PWR
5	BKLT_GND/Brightness_GND
6	BKLT_GND/Brightness_GND
7	Brightness_Up
8	Brightness_Down

12) 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.
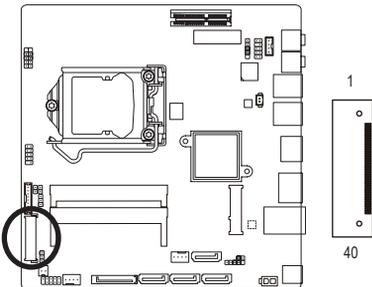
Pin No.	Definition	Pin No.	Definition
1	ODD_Lane3_P	21	NC
2	ODD_Lane3_N	22	EDID_3.3V
3	ODD_Lane2_P	23	LCD_GND
4	ODD_Lane2_N	24	LCD_GND
5	ODD_Lane1_P	25	LCD_GND
6	ODD_Lane1_N	26	ODD_CLK_P
7	ODD_Lane0_P	27	ODD_CLK_N
8	ODD_Lane0_N	28	BLKT_GND
9	EVEN_Lane3_P	29	BLKT_GND
10	EVEN_Lane3_N	30	BLKT_GND
11	EVEN_Lane2_P	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

13/14) 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.

1
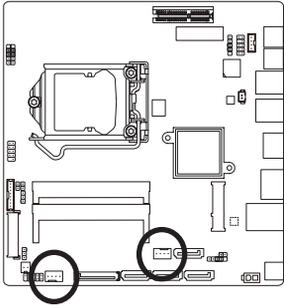
CPU_FAN

SYS_FAN

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.

15) DMIC_CON (Digital Microphone Header)

This header is for a digital microphone.

1

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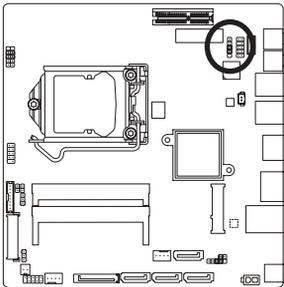
Pin No.	Definition
1	Power
2	DMI DATA
3	GND
4	DMI CLK
5	No Pin

16) ATX_19V (2 Pin Power Connector)

This power connector is for the integrated 19V chassis power supply.
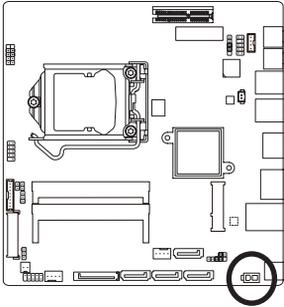
Pin No.	Definition
1	GND
2	+19V

17) MON_SW (Flat panel display switch header)

This header allows you to connect an on/off switch for the display.
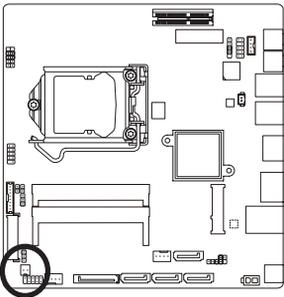
Pin No.	Definition
1	Mon_SW
2	GND

18) BL_SW (Back Light Switch)

The Back Light switch provides the function for screen back light adjustment.
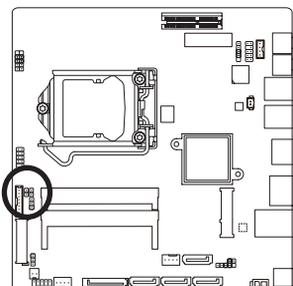
Pin No.	Definition
1	BL_DOWN
2	BL_UP

19) SPKR (Speaker Header)

This header connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.
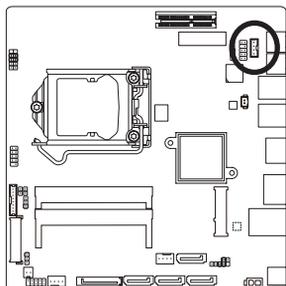
Pin No.	Definition
1	Speaker OUT L-
2	Speaker OUT L+
3	Speaker OUT R+
4	Speaker OUT R-

20) 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.
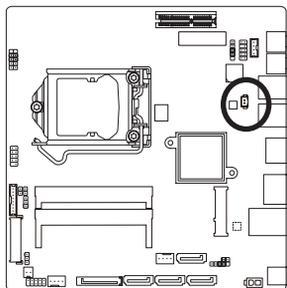
Pin No.	Definition
1	RTC Reset
2	GND

⚠️ • 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.

21) 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.
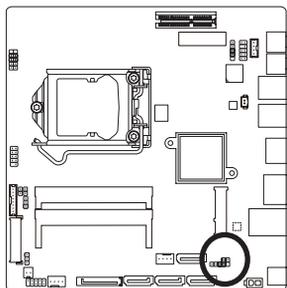
▢▪▪ Open: Normal operation (Default setting)

▪▪ 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).

22) LCD_VCC (LVDS drive voltage Jumper)

This jumper can be used to provide different screen voltage settings.
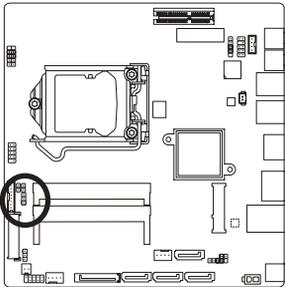
1-2 Close: Set to 3V

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

23) FPD_PWR (Flat panel display power Jumper)

This jumper allows you to select the required operating voltage for the backlight panel.
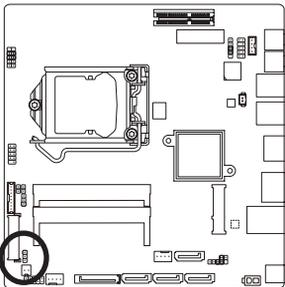
1-2 Close: Set to 12V

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

24) WF_LED (WIFI activity indicator LED Header)

This header allows you to connect a WiFi operation indicator LED.
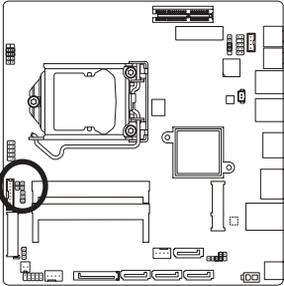
Pin No.	Definition
1	GND
2	LED_WLAN

25) SATA_PWR (SATA Power Connector)

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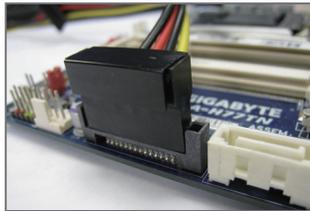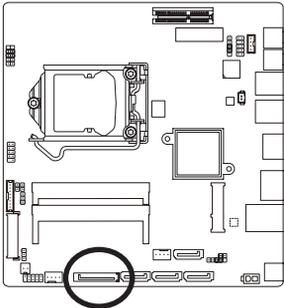
Connect the included SATA power cable to the SATA_PWR connector. Then connect the SATA/optical drive power connectors to your hard drive and optical drive.

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

■ **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 mes-
   sage 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: GA-H77TN F1)

- • If you do not find the settings you want in the Main Menu or a submenu, press <Ctrl>+<F1> to access more advanced options.
- • 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.

```
                    Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  Chipset  Boot  Security  Save & Exit

     BIOS Information                                         Set the Date. Use Tab to
     BIOS Vendor                    American Megatrends       switch between Date elements.
     Core Version                   4.6.5.3
     Compliancy                     UEFI 2.3; PI 1.2
     Project Version                F1/ GA-H77TN-00
     Build Date and Time            03/08/2013 11:23:13
     MAC Address                    90-2B-34-EF-E9-E0

     Total Memory                   2048 MB (DDR3)
     Memory Frequency               1333 Mhz

     ME FW Version                  8.1.2.1318

     System Date                    [Fri 03/08/2013]          →←: Select Screen
     System Time                    [14:34:17]                ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit




                    Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

- **BIOS Information**
- **BIOS Vendor**

  Display BIOS vendor information.
- **Core Version**

  Display version of the processor.
- **Compliency**

  Display compliency information.
- **Project Version**

  Display version number of the project.
- **BIOS Build Date and Time**

  Displays the date and time when the BIOS setup utility was created.
- **MAC Address**

  Displays the MAC address information.
- **Total Memory**

  Determines how much total memory is present during the POST.
- **Memory Frequency**

  Display the memory frequency information.
- **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.

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  Chipset   Boot   Security   Save & Exit

      DDR over voltage                    [Disabled]              DDR over voltage

    ▶ ACPI Settings
    ▶ CPU Configuration
    ▶ SATA Configuration
    ▶ Intel(R) Rapid Start Technology
    ▶ H/W Monitor
    ▶ Intel(R) Smart Connect Technology
    ▶ Network Stack
    ▶ CPU PPM Configuration

    ▶ Realtek PCIe GBE Family Controller (MAC:90:2B:34:EF:E9:E0)
                                                                 ─────────────────────
                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



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```

☞ **DDR over voltage**

Enable/Disable DDR over voltage.

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

2-2-1   ACPI Settings
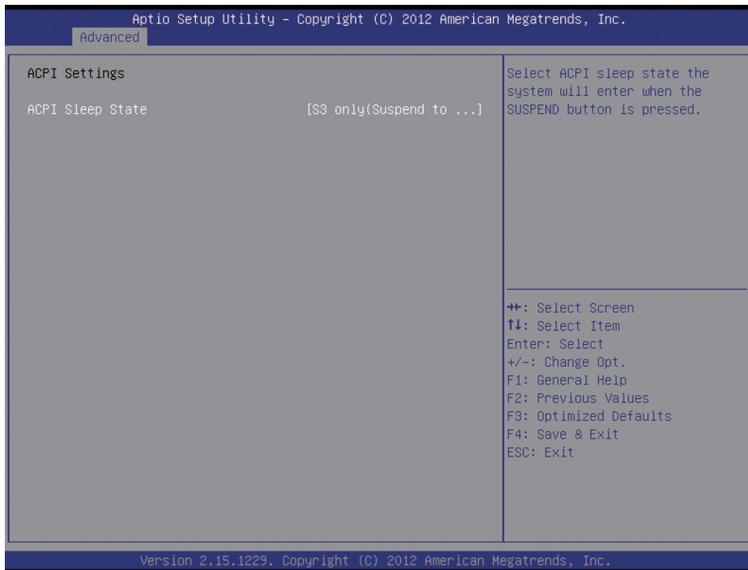
☞ **ACPI Sleep State**

Select the highest ACPI sleep state the system will enter, when the suspend button is pressed.
Suspend Disabled/S1 only (CPU Stop Clock)/S3 only (Suspend to RAM).
Default setting is **S3 only (Suspend to RAM)**.

2-2-2 CPU Configuration
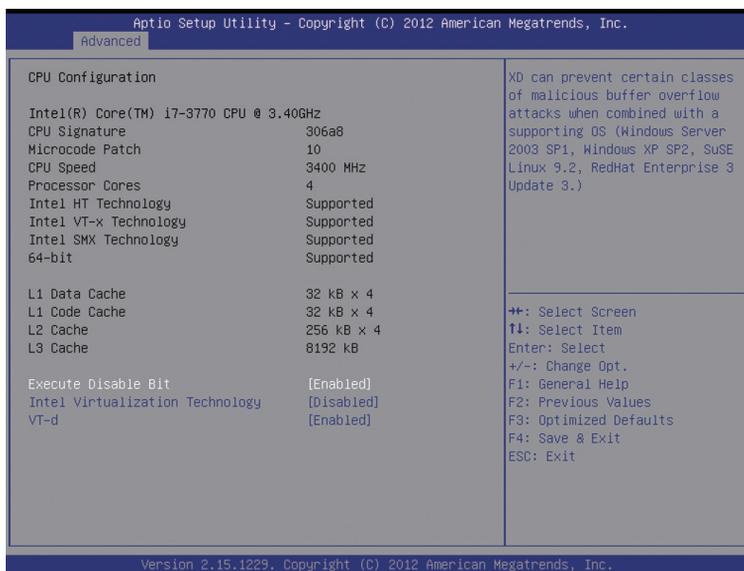
☞ **CPU Type**

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.
- **Execute Disable Bit** (Note)

    When this item enabled, the processor prevents the execution of code in data-only memory pages. This provides some protection against buffer overflow attacks.
    Options available: Enabled/Disabled. Default setting is **Enabled**.
- **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.
    Options available: Enabled/Disabled. Default setting is **Disabled**.
- **VT-d** (Note)

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

2-2-3 SATA Configuration

```
                 Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

   SATA Mode Selection              [AHCI]              Determines how SATA
                                                        controller(s) operate.
   Serial ATA Port 0                Empty
   Serial ATA Port 1                Empty
   Serial ATA Port 2                Empty
   Serial ATA Port 3                Empty
   mSATA                            Empty



                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit




                 Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

☞ **SATA Mode Selection①**

   Enables or disables RAID for the SATA controllers integrated in the Intel H77 Chipset or configures the SATA controllers to AHCI mode.
   ▶▶ IDE   Configures the SATA controller to IDE mode.
   ▶▶ RAID   Enables RAID for the SATA controller.
   ▶▶ 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)

☞ **SATA Mode Selection②③**

   Allows you to decide whether to configure the SATA controller integrated in the Chipset 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)

☞ **Serial ATA Port 0/Serial ATA Port 1/Serial ATA Port 2/Serial ATA Port 3①②/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.

①   Only for GA-H77TN.
②   Only for GA-B75TN.
③   Only for GA-H61TN.

2-2-4 Intel (R) Rapid Start Technology

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

   Intel(R) Rapid Start Technology      [Disabled]            Enable or disable Intel(R)
                                                              Rapid Start Technology.




                                                              ↔: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit


              Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```
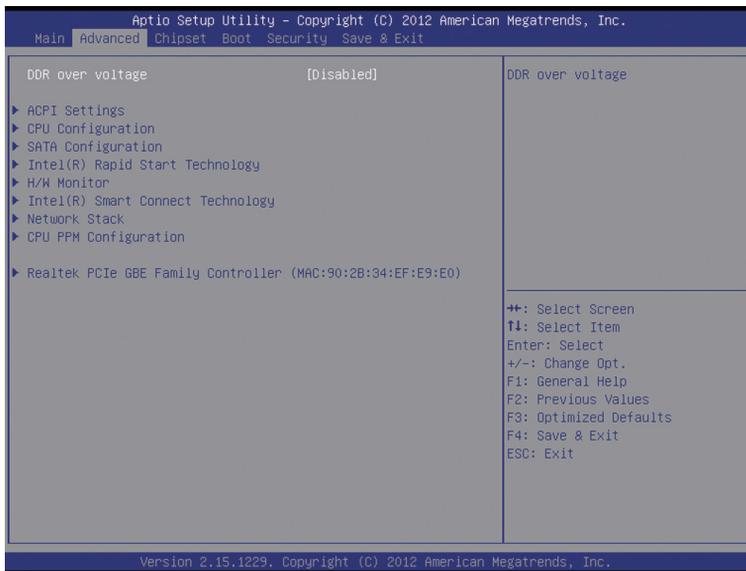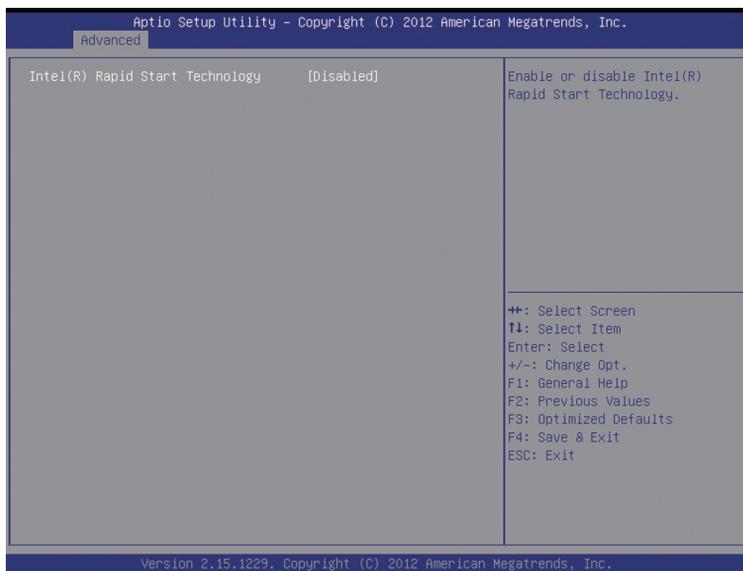
☞ **Intel(R) Rapid Start Technology**(Note)

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

☞ **Entry on S3 RTC Wake**

Enable/Disable Entry on S3 RTC Wake function.
Option available: Enabled/Disabled. Default setting is **Enabled**.
This item is configurable only when Intel(R) Rapid Start Technology is enabled.

☞ **Entry After**

If enabled, will allow you to set a timer to wake the computer at a particular interval.
Option available: 10 minutes. Default setting is **10 minutes**.
This item is configurable only when Intel(R) Rapid Start Technology is enabled.

☞ **Active Page Threshold Support**

If enabled, the system will support RST with small partition.
Option available: Enabled/Disabled. Default setting is **Disabled**.
This item is configurable only when Intel(R) Rapid Start Technology is enabled.

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

2-2-5 H/W Monitor

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

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Advanced

 Pc Health Status                                              CPU FAN Fail Detect
  CPU FAN Fail Detect                    [Enabled]
  System FAN Fail Detect                 [Disabled]
  CPU SMART FAN Control                  [Enabled]
  SYS SMART FAN Control                  [Enabled]
  SYS FAN Type                           [3 Pin]

  System temperature                     : +33 ℃
  CPU temperature                        : +43 ℃
  SYS Fan Speed                          : N/A
  CPU Fan Speed                          : 3229 RPM

                                                              ←→: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

              Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

☞ **CPU/System FAN Fail Detect**

Enable CPU/System Fan Stop Warning function.
Option available: Enabled/Disabled. Default setting is **Enabled**.

☞ **CPU/System SMART FAN Control**

Enable CPU/System Smart Fan function.
Option available: Enabled/Disabled. Default setting is **Enabled**.

☞ **SYS FAN Type**

Select system fan type.
Option available: 3 Pin/4 Pin. Default setting is **3 Pin**.

☞ **System/CPU Temperature**

Displays current system and CPU temperature.

☞ **System/CPU Fan Speed (RPM)**

Displays current system and CPU and system fan speed.

2-2-6   Intel(R) Smart Connect Technology
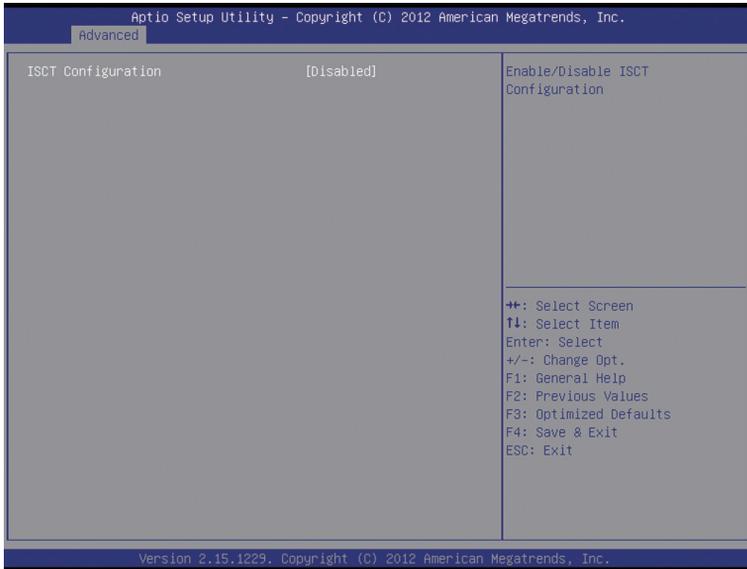
☞ **ISCT Configuration**

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

2-2-7 Network Stack
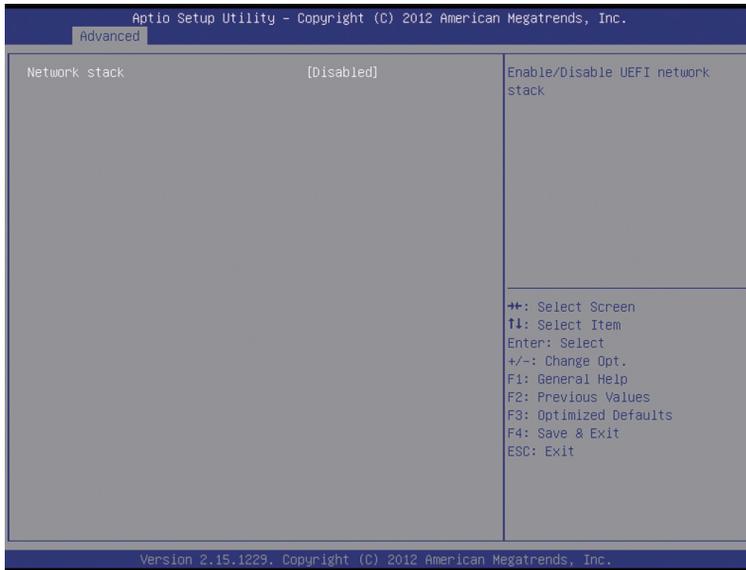
☞ **Network stack**
Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disable Link)

☞ **Ipv4 PXE Support**
Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Ipv6 PXE Support**
Enables or disables IPv6 PXE Support. This item is configurable only when   is enabled.

2-2-8 CPU PPM Configuration

☞ **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.
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 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 con-sumption. The C3/C6 state is a more enhanced power-saving state than C1.
Options available: Enabled/Disabled. Default setting is **Enabled**.
Default setting for C3 is **Enabled**.
Default setting for C6 is **Enabled**.

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

2-2-9　Realtek PCIe GBE Family Controller
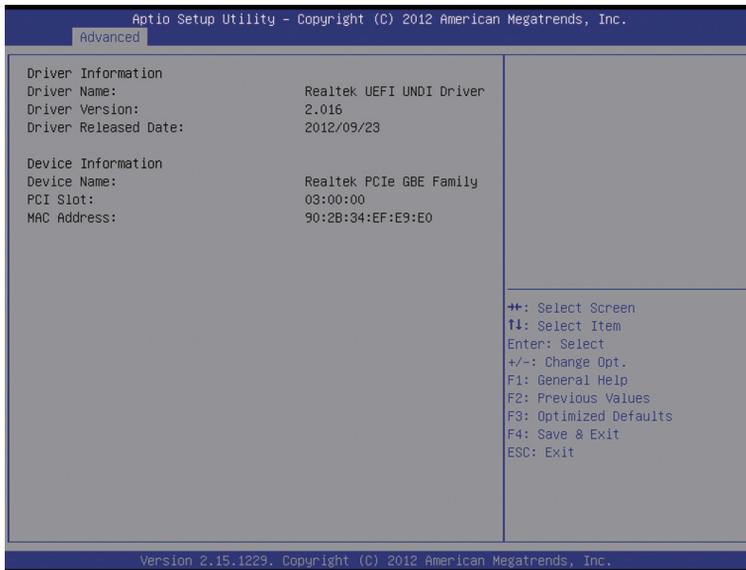
Get driver information and configure Realtek ethernet controller parameter.

2-3 Chipset Menu

```
Azalia                            [Enabled]          Control Detection of the
  Verb Table                      [Mode A]           Azalia device.
Onboard LAN                       [Enabled]          Disabled = Azalia will be
ERP support                       [Disabled]         unconditionally disabled
Restore AC Power Loss             [Power Off]        Enabled = Azalia will be
                                                     unconditionally Enabled
                                                     Auto = Azalia will be enabled
LVDS Control                      [Disabled]         if present, disabled otherwise.


                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit



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```

☞ **Azalia**

Enable/Disable onboard audio controller.

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

☞ **Verb Table**

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

Options available: Mode A/Mode B. Default setting is **Mode A**.

☞ **Onboard LAN**

Enable/Disable onboard LAN controller.

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

☞ **ERP Support**

Enable/Disable Erp support function.

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

☞ **Restore AC Power Loss**

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

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

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

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

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

☞ **LVDS Control function**

Enable/Disable LVDS control function.

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

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.
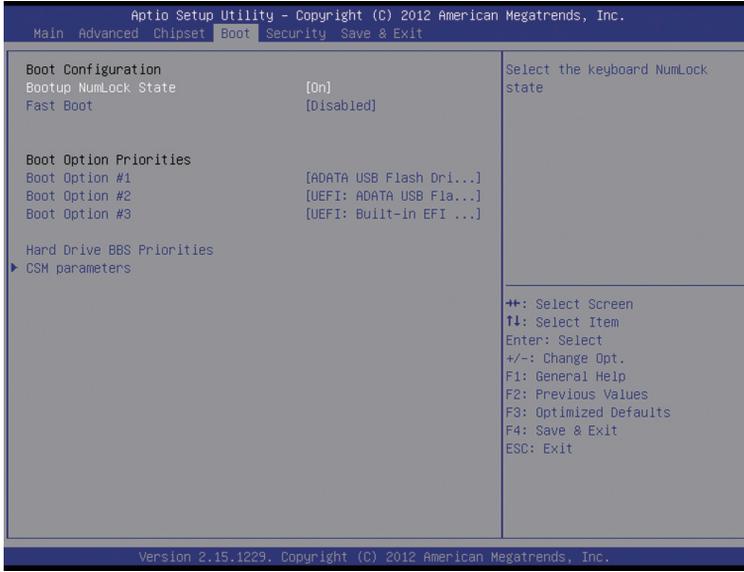
C→ **Bootup NumLock State**

Allows you to select power-on state for NumLock function.
Options available: On/Off. Default setting is **On**.

C→ **Fast Boot**

If enabled, the system will speed the boot up time.
Options available: Enabled/Disabled. Default setting is **Disabled**.

C→ **Boot Option #1/2/3**

Press Enter to configure the boot priority.

C→ **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.

▶ **CSM parameters**


```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                                    Boot

  Launch CSM                        [Enabled]              This option controls if CSM
  Boot option filter                [UEFI and Legacy]      will be launched
  Launch PXE OpROM policy           [Do not launch]
  Launch Storage OpROM policy       [UEFI only]
  Launch Video OpROM policy         [Legacy only]

  Other PCI device ROM priority     [UEFI OpROM]



                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



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```

☞ **Launch CSM**

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.

☞ **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 op-
                     tion 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.

This item is configurable only when **Launch CSM** is set to **Enabled**.

☞ **Launch PXE OpROM policy**

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

▶ Do not launch   Disables option ROM. (Default)
▶ Legacy only   Enables legacy Option ROM only.
▶ UEFI only   Enables UEFI Option ROM only.

This item is configurable only when **Launch CSM** is set to **Enabled**.

☞ **Launch Storage OpROM policy**

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

▶ Do not launch   Disables option ROM.
▶ Legacy Only   Enables legacy option ROM only. (Default)
▶ UEFI Only   Enables UEFI option ROM only.

This item is configurable only when **Launch CSM** is set to **Enabled**.

⍜ **Launch Video OpROM policy**

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

▸▸ Do not launch Disables option ROM.
▸▸ Legacy only Enables legacy option ROM only. (Default)
▸▸ UEFI only Enables UEFI option ROM only.
▸▸ Legacy first Enables legacy option ROM first.
▸▸ UEFI first Enables UEFI option ROM first.

This item is configurable only when **Launch CSM** is set to **Enabled**.

⍜ **Other PCI device ROM priority**

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.

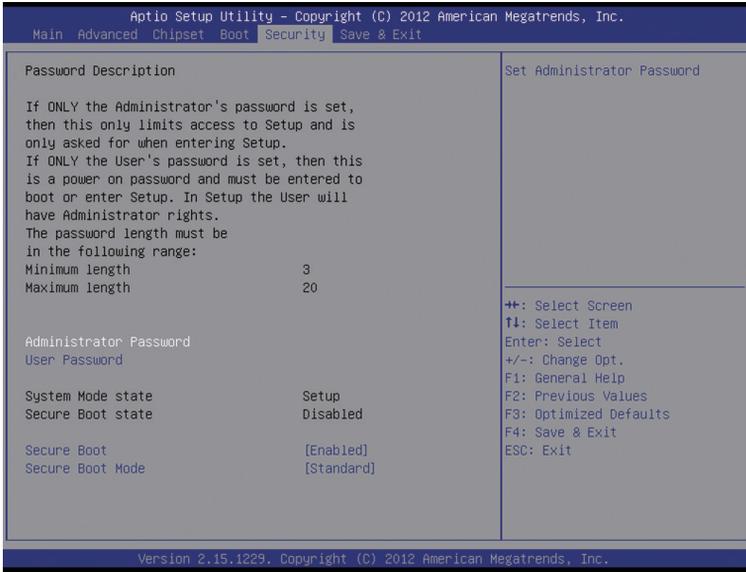▸▸ Legacy OpROM Enables legacy option ROM only.
▸▸ UEFI OpROM Enables UEFI option ROM only. (Default)

This item is configurable only when **Launch CSM** is set to **Enabled**.

2-5   Security Menu

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

```
                    Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main   Advanced   Chipset   Boot   Security   Save & Exit

    Password Description                                      Set Administrator Password

    If ONLY the Administrator's password is set,
    then this only limits access to Setup and is
    only asked for when entering Setup.
    If ONLY the User's password is set, then this
    is a power on password and must be entered to
    boot or enter Setup. In Setup the User will
    have Administrator rights.
    The password length must be
    in the following range:
    Minimum length                    3
    Maximum length                    20                      ➜←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
    Administrator Password                                    +/-: Change Opt.
    User Password                                             F1: General Help
                                                              F2: Previous Values
    System Mode state                 Setup                   F3: Optimized Defaults
    Secure Boot state                 Disabled                F4: Save & Exit
                                                              ESC: Exit
    Secure Boot                       [Enabled]
    Secure Boot Mode                  [Standard]



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```

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

☞ **AdministratorPassword**

Press <Enter> to configure the Administrator password.

☞ **User Password**

Press Enter to configure the user password.

☞ **System Mode state**

Display the System Mode state.

☞ **Secure Boot state**

Display the System Mode State.

☞ **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 **Enabled**.

☞ **Secure Boot Mode**

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

2-6 Exit Menu

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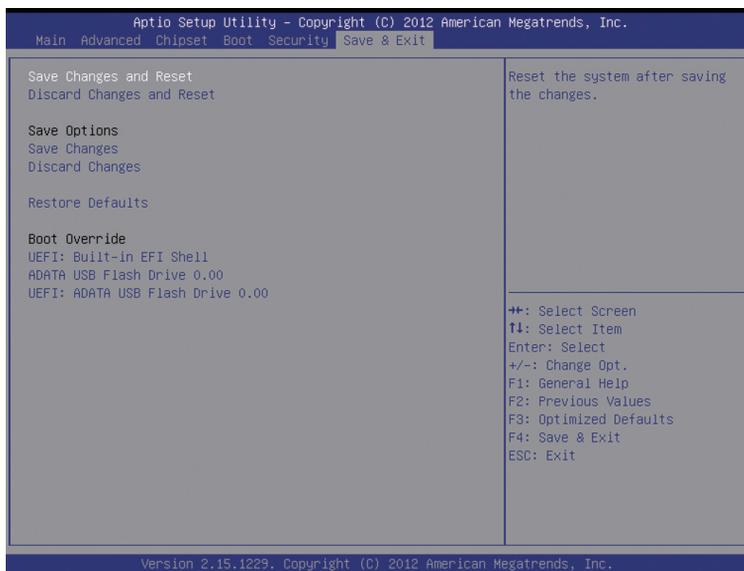
☞ **Save Changes and Exit**

Saves changes made and close the BIOS setup and exit system setup.
Options available: Yes/No.

☞ **Discard Changes and Exit**

Discards changes made and close the BIOS setup and exit system setup .
Options available: Yes/No.

☞ **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.

☞ **Save Changes**

Active this option to save all the changes.

☞ **Discard Changes**

Discards changes made and close the BIOS setup.

☞ **Restore Defaults**

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

☞ **Save as User Defaults**

Press <Enter> on this item and then press the <Y> key to save as user default settings.

Options available: Yes/No.

☞ **Restore User Defaults**

Press <Enter> on this item and then press the <Y> key to restore user default 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.

Q: Why cannot I install the onboard HD audio driver successfully? (For Windows XP only)
A: Step 1: First, make sure Service Pack 1 or Service Pack 2 has been installed (check in My Computer > Properties > General > System). If not, please update it from Microsoft's website. Then make sure the Microsoft UAA Bus Driver for High Definition Audio has been installed successfully (check in My Computer > Properties > Hardware > Device Manager > System Devices).
    Step 2: Check if **Audio Device on High Definition Audio Bus** or **Unknown device** is present in **Device Manager** or **Sound, video, and game controllers**. If yes, please disable this device. (If not, skip this step.)
    Step 3: Then go back to My Computer > Properties > Hardware > Device Manager > System devices and right-click on **Microsoft UAA Bus Driver for High Definition Audio** and select **Disable** and **Uninstall**.
    Step 4: In **Device Manager**, right-click on the computer name and select **Scan for hardware changes**. When the **Add New Hardware Wizard** appears, click **Cancel**. Then install the onboard HD audio driver from the motherboard driver disk or download the audio driver from GIGABYTE's website to install.
    For more details, go to the **Support & Downloads\FAQ** page on our website and search for "onboard HD audio driver."

3-1-2   Troubleshooting Procedure

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

```
                              ┌─────┐
                              │  A  │
                              └──┬──┘
                                 │
                                 ▼
      ╱────────────────────────────────────────────────╲         ┌─────────────────────┐
     ╱                                                    ╲   No   │ The power supply, CPU or │
     ╲   When the computer is turned on, is the CPU cooler running? ├───────►│ CPU socket might fail.  │
      ╲────────────────────────────────────────────────╱         └─────────────────────┘
                       │ Yes ◄─────────────────────────────────────────
                       ▼                    The problem is verified and solved.

      ╱────────────────────────────────────────────────╲         ┌─────────────────────┐
     ╱                                                    ╲   No   │ The graphics card,      │
     ╲        Check if there is display on your monitor.          ├───────►│ expansion slot, or monitor │
      ╲────────────────────────────────────────────────╱         │ might fail.             │
                       │ Yes ◄────────────────────────────          └─────────────────────┘
                       ▼                    The problem is verified and solved.
```

Turn off the computer. Plug in the keyboard and mouse and restart the computer.

```
      ╱────────────────────────────────────────────────╲         ┌─────────────────────┐
     ╱                                                    ╲   No   │ The keyboard or keyboard │
     ╲        Check if the keyboard is working properly.          ├───────►│ connector might fail.   │
      ╲────────────────────────────────────────────────╱         └─────────────────────┘
                       │ Yes ◄────────────────────────────
                       ▼                    The problem is verified and solved.
```

Press <Delete> to enter BIOS Setup. Select "Load Optimized Defaults." Select "Save & Exit Setup" to save changes and exit BIOS Setup.

```
      ╱────────────────────────────────────────────────╲         ┌─────────────────────┐
     ╱  Turn off the computer and connect the hard drive(s). Check if the ╲ No │ The hard drive, connector, │
     ╲  system can boot successfully.                              ├───────►│ or cable might fail.    │
      ╲────────────────────────────────────────────────╱         └─────────────────────┘
                       │ Yes ◄────────────────────────────
                       ▼                    The problem is verified and solved.
```

Reinstall the operating system. Reinstall other devices one by one (install one device at one time and then boot the system to see if the device works successfully).

```
                              ┌─────────┐
                              │   END   │
                              └─────────┘
```

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.

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Regulatory Notices

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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.

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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.

Contact Us

• **GIGA-BYTE TECHNOLOGY CO., LTD.**

Address: No.6, Bao Chiang Road, Hsin-Tien Dist.,

New Taipei City 231,Taiwan

TEL: +886-2-8912-4000

FAX: +886-2-8912-4005

Tech. and Non-Tech. Support (Sales/Marketing) :

http://ggts.gigabyte.com.tw

WEB address (English): http://www.gigabyte.com

WEB address (Chinese): http://www.gigabyte.tw

• **G.B.T. INC. - U.S.A.**

TEL: +1-626-854-9338

FAX: +1-626-854-9326

Tech. Support: http://ggts.gigabyte.com.tw

Warranty Info: http://rma.gigabyte.us

Web address: http://www.gigabyte.us

• **G.B.T. INC (USA) - Mexico**

Tel: +1-626-854-9338 x 215 (Soporte de habla hispano)

FAX: +1-626-854-9326

Correo: soporte@gigabyte-usa.com

Tech. Support: http://rma.gigabyte.us

Web address: http://latam.giga-byte.com

• **Giga-Byte SINGAPORE PTE. LTD. - Singapore**

WEB address : http://www.gigabyte.sg

• **Thailand**

WEB address : http://th.giga-byte.com

• **Vietnam**

WEB address : http://www.gigabyte.vn

• **NINGBO G.B.T. TECH. TRADING CO., LTD. - China**

WEB address : http://www.gigabyte.cn

Shanghai

TEL: +86-21-63400912

FAX: +86-21-63400682

Beijing

TEL: +86-10-62102838

FAX: +86-10-62102848

Wuhan

TEL: +86-27-87685981

FAX: +86-27-87579461

GuangZhou

TEL: +86-20-87540700

FAX: +86-20-87544306

Chengdu

TEL: +86-28-85483135

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Xian

TEL: +86-29-85531943

FAX: +86-29-85510930

Shenyang

TEL: +86-24-83992342

FAX: +86-24-83992102

• **GIGABYTE TECHNOLOGY (INDIA) LIMITED - India**

WEB address : http://www.gigabyte.in

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WEB address : http://www.gigabyte.com.sa

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