GA-6PXSV1

LGA 2011 socket motherboard for Intel® E5-1600 series processors

User's Manual

Rev. 1001

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Documentation Classifications

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

- For quick set-up of the product, read the Quick Installation Guide included with the product.
- For detailed product information, carefully read the User's Manual.

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

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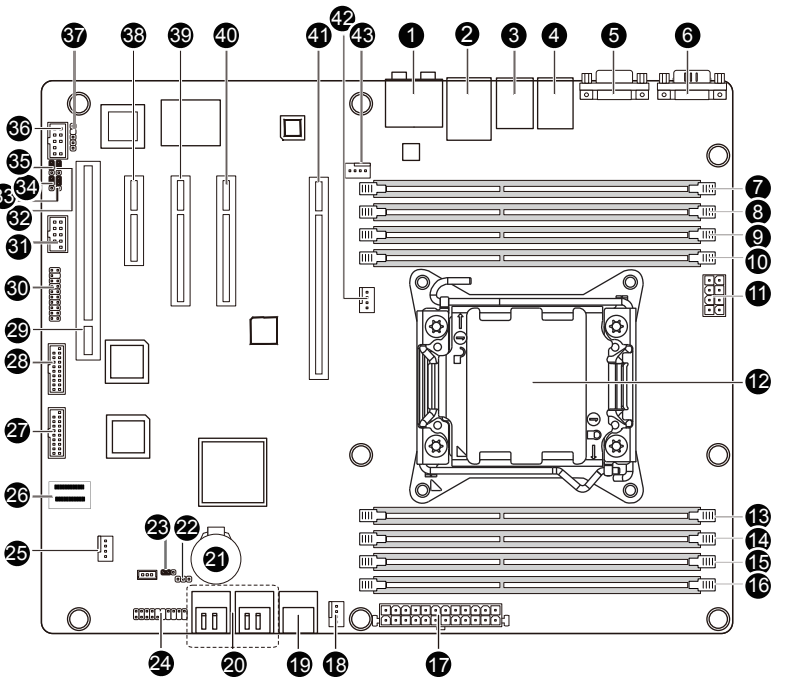
Box Contents

- ☑ GA-6PXSV1 motherboard
- ☑ User's Manual
- ☑ Driver CD
- ☑ Two SATA cables
- ☑ I/O Shield

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

GA-6PXSV1 Motherboard Layout



Item	Code	Description
1	AUDIO1	Audio jacks
2	USB_LAN1	LAN connector and USB connectors
3	USB_1394	1394 port and USB connectors
4	R_USB1	USB connectors
5	COM2	Serial port
6	COM1	Serial port
7	DDR3_P0_A0	DIMM slot (channel A-0)
8	DDR3_P0_A1	DIMM slot (channel A-1)
9	DDR3_P0_B0	DIMM slot (channel B-0)
10	DDR3_P0_B1	DIMM slot (channel B-1)
11	P2_CPU	8 pin power connector
12	CPU0	Intel LGA 2011 socket
13	DDR3_P0_D1	DIMM slot (channel D-1)
14	DDR3_P0_D0	DIMM slot (channel D-0)
15	DDR3_P0_C1	DIMM slot (channel C-1)
16	DDR3_P0_C0	DIMM slot (channel C-0)
17	P1	24 pin power connector
18	SYS_FAN2	System fan cable connectors
19	SATA01	SATA 6Gb/s connectors
20	SATA2345	SATA 3Gb/s connectors
21	BAT1	Battery socket
22	PWR_LED1	Power LED header
23	CLR_CMOS1	Clear CMOS jumper
24	F_PANEL1	Front panel connector
25	SYS_FAN3	System fan cable connectors
26	SAS0_3	Mini SAS connector
27	F_USB3_1	Front USB 3.0 connector
28	F_USB3_2	Front USB 3.0 connector
29	PCI	PCI slot (32bit/33MHz)
30	TPM	TPM module
31	F_1394	IEEE 1394 connector
32	BIOS_WP	BIOS write protect jumper
33	SSB_ME1	ME recovery jumper
34	BIOS_RVCR1	BIOS recovery jumper
35	PASSWORD1	Clear password jumper
36	FAUDIO_ACZ	Front Audio connector
37	SPDIF_JP1	SPDIF header
38	PCIE4	PCI-E slot 4 (x4 slot)
39	PCIE3	PCI-E slot 3 (x8 slot)
40	PCIE2	PCI-E slot 2 (x16 slot/x8 signal)
41	PCIE1	PCI-E slot 1 (x16 slot)

42	CPU_FAN1	CPU fan cable connector
43	SYS_FAN1	System fan cable connector

Chapter 1 Hardware Installation

1-1 Installation Precautions

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

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

1-2 Product Specifications

CPU	◆ Support for Intel® Xeon® E5 series processors in the LGA2011 package ◆ L3 cache varies with CPU
Chipset	◆ Intel® BD82C604 (X79) PCH
Memory	◆ 8 x 1.5V DDR3 DIMM sockets supporting up to 64 GB (UDIMM) and 256GB (RDIMM) of system memory * Due to 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 4 GB. ◆ Four channel memory architecture ◆ Support for DDR3 1600/1333/1066 MHz memory modules ◆ Support for ECC memory modules
LAN	◆ 1 x Intel® 82579LM supports 10/100/1000 Mbps
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x16 (Gen3/PCIE1) * For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot. ◆ 1 x PCI Express x16 slot, running at x8 (Gen3/PCIE2) ◆ 1 x PCI Express x8 slot, running at x8 (Gen3/PCIE3) ◆ 1 x PCI Express x4 slot, running at x4 (Gen2/PCIE4) ◆ 1 x PCI slot 32-Bit/33MHz
Onboard Audio	◆ REALTEK ACL892 HD
Storage Interface	◆ 2 x SATA 3Gb/s connectors (SATA0/1) ◆ 4 x SATA 3Gb/s connectors (SATA2/3/4/5) ◆ 1 x SAS 3Gb/s connectors (SAS0_3)
USB	◆ 6 x USB 2.0/1.1 ports ◆ Up to 4 USB 3.0 ports (4 via the USB brackets connected to the internal USB headers)
Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 4 x SATA 3Gb/s connectors ◆ 2 x SATA 6Gb/s connectors ◆ 1 x SAS 3Gb/s connector ◆ 1 x CPU fan header ◆ 3 x System fan header ◆ 1 x front panel header ◆ 2 x USB 3.0 headers ◆ 1 x TPM header ◆ 1 x Front 1394 header ◆ 1 x Front audio header ◆ 1 x Power LED header

Back Panel Connectors	◆ 6 x USB 2.0/1.1 ports ◆ 1 x RJ-45 port ◆ 1 x IEEE 1394 port ◆ 6 x Audio ports (4 x Line-out/ 1 x Line-in/ 1 x MIC) ◆ 2 x COM ports
I/O Controller	◆ iTE IT8728 chip
Hardware Monitor	◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System/Power fan speed detection ◆ CPU overheating warning ◆ CPU/System/Power fan fail warning ◆ CPU/System fan speed control * Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.
BIOS	◆ 1 x 64 Mbit flash ◆ AMI BIOS
Form Factor	◆ ATX Form Factor; 12 inch x 9.6 inch

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

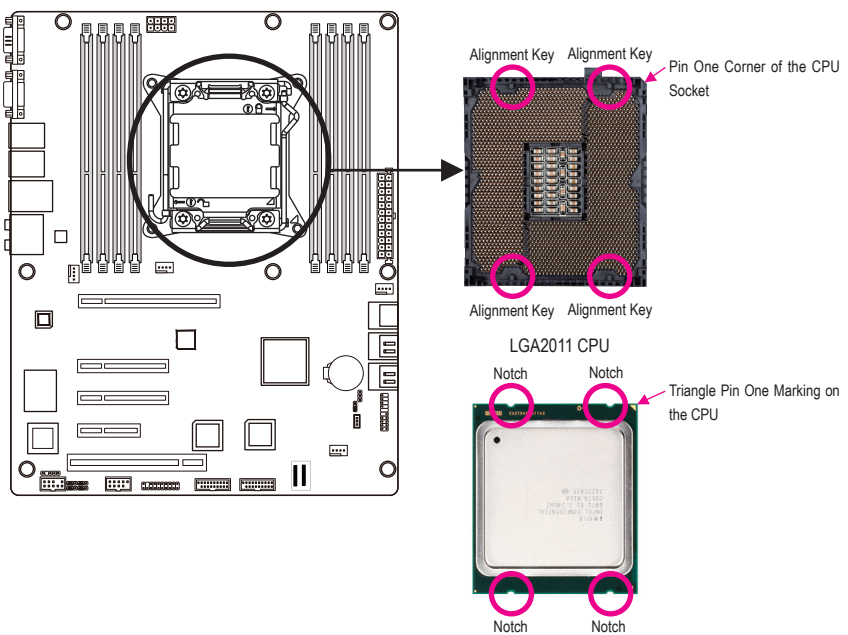
1-3 Installing the CPU and CPU Cooler

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

- Make sure that the motherboard supports the CPU.
  (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.

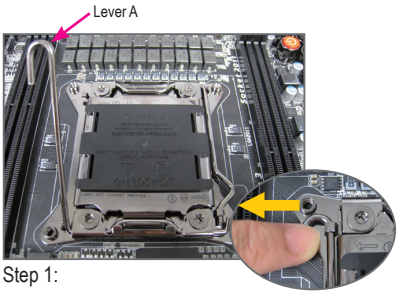
1-3-1 Installing the CPU

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



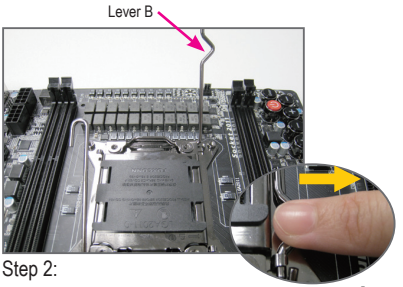
B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

- **Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.**
- **To protect the socket contacts, do not remove the protective plastic cover unless the CPU is inserted into the CPU socket. Save the cover properly and replace it if the CPU is removed.**



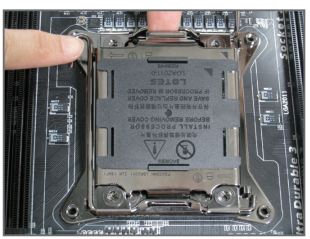
Step 1:

Push the lever closest to the "unlock" marking "🔓" (below referred as lever A) down and away from the socket to release it.



Step 2:

Push the lever closest to the "lock" marking "🔒" (below referred as lever B) down and away from the socket. Then lift the lever.



Step 3:

Gently press lever A to allow the load plate to rise. Open the load plate. (Note: DO NOT touch the socket contacts after the load plate is opened.)

Step 4:

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

Step 5:

Once the CPU is properly inserted, carefully replace the load plate. Then secure lever B under its retention tab. The protective plastic cover may pop off from the load plate during the process of engaging the lever. Remove the cover. Save the cover properly and always replace it when the CPU is not installed.

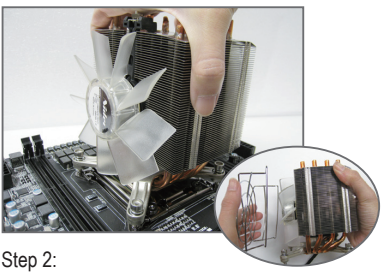
Step 6:

Finally, secure lever A under its retention tab to complete the installation of the CPU.

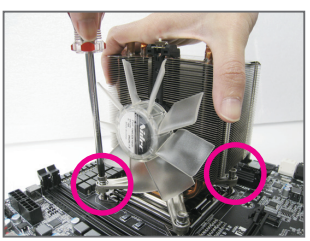
1-3-2 Installing the CPU Cooler

Refer to the steps below to correctly install the CPU cooler on the motherboard. (Actual installation process may differ depending the CPU cooler to be used. Refer to the user's manual for your CPU cooler.)

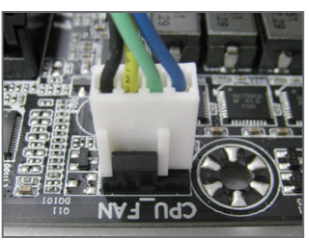
Step 1:
Apply an even and thin layer of thermal grease on the surface of the installed CPU.



Step 2:
Place the cooler atop the CPU, aligning the four mounting screws with the mounting holes on the ILM. (If your cooler has a fan grill which may cause interference when you tighten the screws, remove it first and replace it after tightening the



Step 3:
Use one hand to hold the cooler and the other to tighten the screws in a diagonal sequence with a screw driver. Begin tightening a screw with a few turns and repeat with the screw diagonally opposite the one you just tightened. Then do the same to the other pair. Next, fully tighten the four screws.



Step 4:
Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.

Please pay more attention when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

1-4 Installing the Memory

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

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

1-4-1 Four Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Four Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Four Channel memory mode will double the original memory bandwidth.

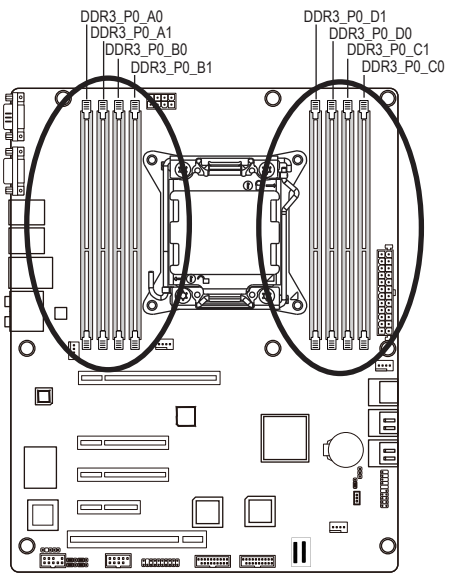
The eight DDR3 memory sockets are divided into four channels and each channel has two memory sockets as following:

Channel A: DDR3_P0_A0, DDR3_P0_A1

Channel B: DDR3_P0_B0, DDR3_P0_B1

Channel C: DDR3_P0_C0, DDR3_P0_C1

Channel D: DDR3_P0_D0, DDR3_P0_D1



Due to CPU limitations, read the following guidelines before installing the memory in Four Channel mode.

1. Four Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Four Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used for optimum performance.

1-4-2 Installing a Memory

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

Be sure to install DDR3 DIMMs on this motherboard.

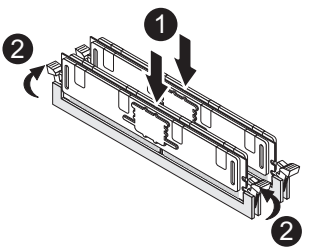
Installation Step:

Step 1. Insert the DIMM memory module vertically into the DIMM slot, and push it down.

Step 2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.

Note: For dual-channel and four-channel operation, DIMMs must be installed in matched pairs.

Step 3. Reverse the installation steps when you wish to remove the DIMM module.

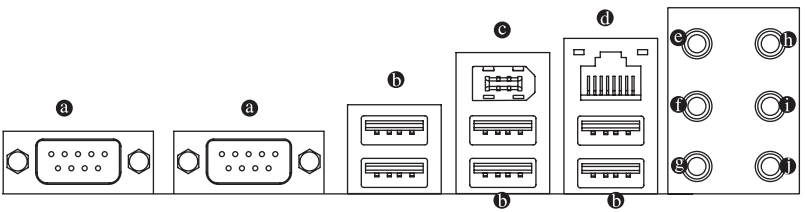


1-4-3 DIMM Population Table

	1N or 2N	DIMM1	DIMM0
R-DIMM	1N	Empty	Single-Rank
	1N	Empty	Dual-Rank
	1N	Empty	Quad-Rank
	1N	Single-Rank	Single-Rank
	1N	Single-Rank	Dual-Rank
	1N	Dual-Rank	Dual-Rank
	1N	Single-Rank	Quad-Rank
	1N	Dual-Rank	Quad-Rank
	1N	Quad-Rank	Quad-Rank

	1N or 2N	DIMM1	DIMM0
U-DIMM	1N	Empty	Single-Rank
	1N	Empty	Dual-Rank
	2N	Single-Rank	Single-Rank
	2N	Single-Rank	Dual-Rank
	2N	Dual-Rank	Dual-Rank

1-5 Back Panel Connectors



a Serial Port

Connects to serial-based mouse or data processing devices.

b USB 2.0/1.1 Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

c IEEE 1394 Port

Serial interface standard set by Institute of Electrical and Electronics Engineers, which hasfeatures with high speed, high bandwidth and hot plug.

d 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.

e Line In (Orange)

The default Line In jack. Devices like CD-ROM, walkman etc. can be connected to Line In jack.

f Line Out (Front Speaker Out/Black)

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 (Grey)

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

h Surround Speaker Out (Rear Speaker Out/Blue)

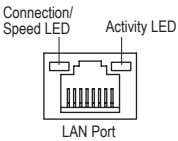
The default Surround Speaker Out (Rear Speaker Out) jack. Rear surround speakers can beconnected to Surround Speaker Out (Rear Speaker Out) jack.

i Center/Subwoofer Speaker Out (Green)

The default Center/Subwoofer Speaker Out jack. Center/Subwoofer speakers can be connectedto Center/Subwoofer Speaker Out jack.

j Side Speaker Out (Pink)

The default Side Speaker Out jack. Surround side speakers can be connected to Side SpeakerOut jack.



Connection/Speed LED:

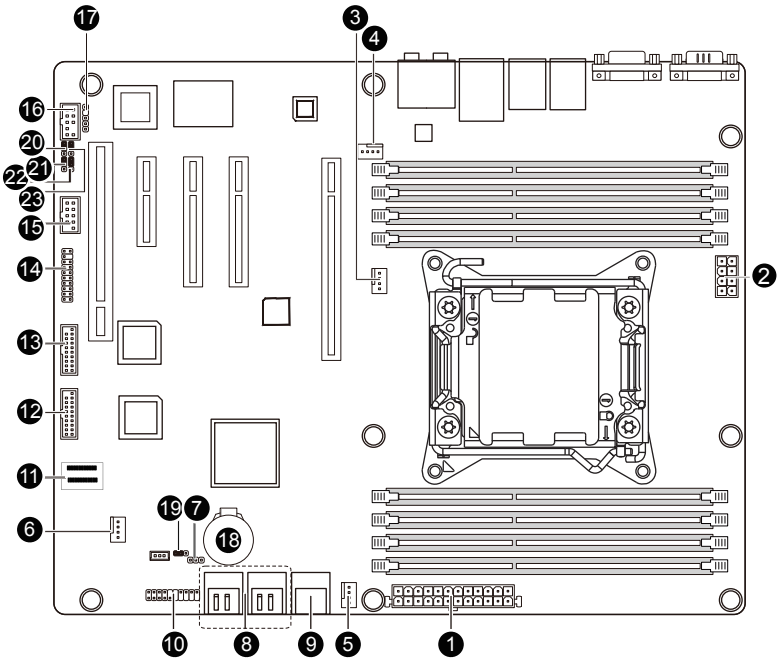
State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

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

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

1-6 Internal Connectors



1)	P1	13)	F_USB3_2
2)	P2_CPU	14)	TPM
3)	CPU_FAN1 (CPU Fan)	15)	F_1394
4)	SYS_FAN1 (System Fan)	16)	FAUDIO_ACZ
5)	SYS_FAN2 (System Fan)	17)	SPDIF_JP1
6)	SYS_FAN3 (System Fan)	18)	BAT1
7)	PWR_LED1	19)	CLR_CMOS1
8)	SATA23/SATA45	20)	PASSWORD1
9)	SATA01	21)	BIOS_RVCR1
10)	F_PANEL1	22)	SSB_ME1
11)	SAS0_3	23)	BIOS_WP
12)	F_USB3_1		

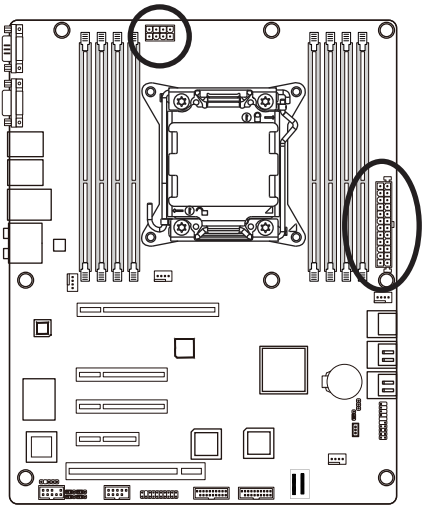
Read the following guidelines before connecting external devices:

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

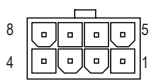
1/2) P1/P2_CPU (2x12 Main Power Connector and 2x4 12V Power Connector)

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

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



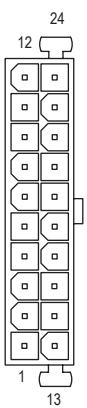
P2_CPU



P2_CPU:

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

P1

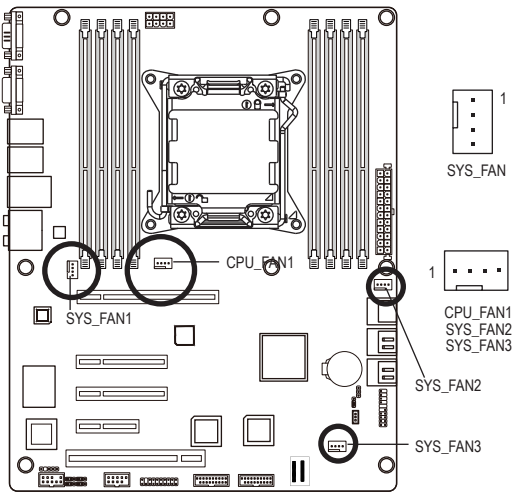


P1:

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

3/4/5/6) CPU_FAN1/SYS_FAN1/SYS_FAN2/SYS_FAN3 (CPU Fan/System Fan Headers)

The motherboard has a 4-pin CPU fan header (FAN1), a 4-pin (FAN4) system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The motherboard supports CPU fan speed control, which requires the use of a CPU fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



CPU_FAN1(CPU Fan):

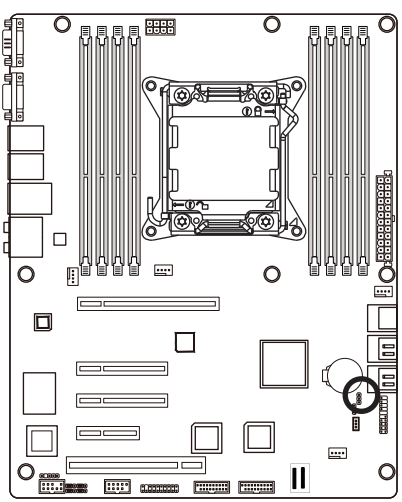
Pin No.	Definition
1	GND
2	+12V / Speed Control
3	Sense
4	Speed Control

SYS_FAN1/2/3 (System Fan):

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

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

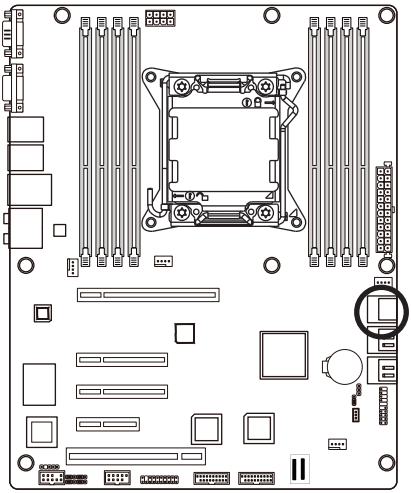
7) PWR_LED1 (Power LED Header)

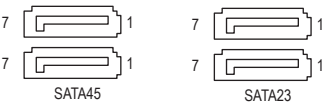


Pin No.	Definition
1	MPD+
2	GND
3	GND

8) SATA2345 (SATA 3Gb/s Connectors)

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.





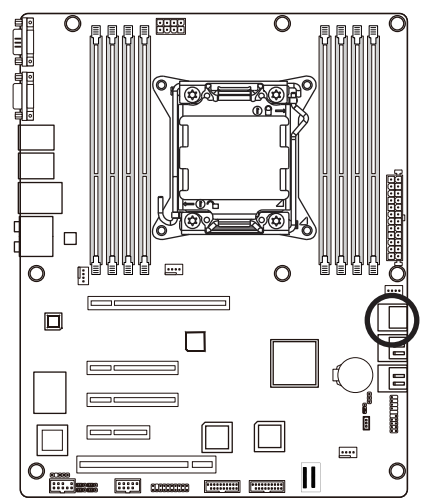
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

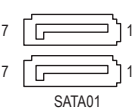
- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are configured, the total number of hard drives must be an even number.
- A RAID 10 configuration requires four hard drives.

(Note) When a RAID configuration is built across the SATA 6Gb/s channels, the system performance of the RAID configuration may vary depends on the devices are connected.

9) SATA01 (SATA 6Gb/s Connectors)

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

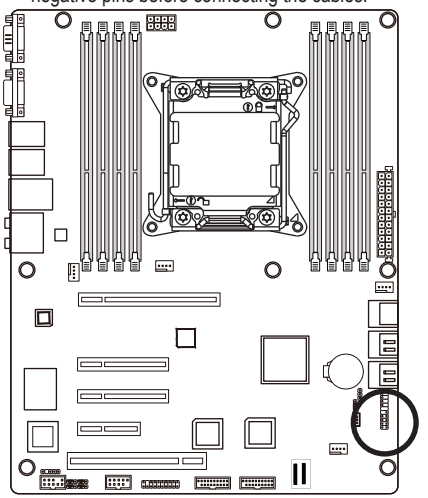




Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

10) F_PANEL (Front Panel Header)

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

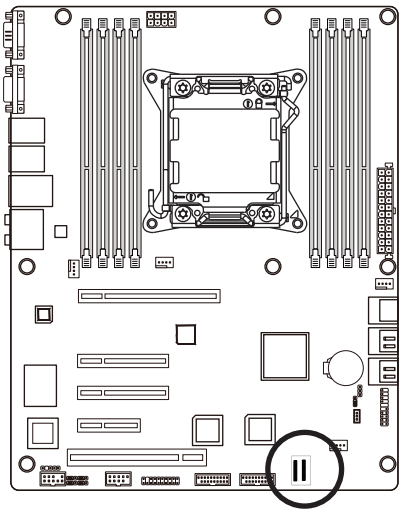


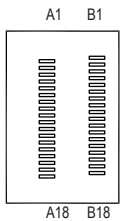
Pin No.	Signal Name	Definition
1	HD+	Hard Disk LED Signal anode (+)
2	MSG/PD+	Power LED Signal anode (+)
3	HD-	Hard Disk LED Signal cathode(-)
4	MSG/PD-	Power LED Signal cathode(-)
5	RST+	Reset button Signal anode (+)
6	PW+	Power Button Signal anode (+)
7	RST-	Reset button Signal cathode(-)
8	PW-	Power Button Signal cathode(-)
9	NC	No Connect
10	NC	No Connect
11	NC	No Connect
12	NC	No Connect
13	GD+	Message
14	SP+	5V Power
15	GD-	Ground
16	NC	No Connect
17	GN+	No Connect
18	NC	No Connect
19	GN-	Ground
20	SP-	Speaker Signal cathode(-)

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.

11) SAS0_3 (Mini SAS cable connector)

The mini SAS connectors conform to SAS 3Gb/s standard.



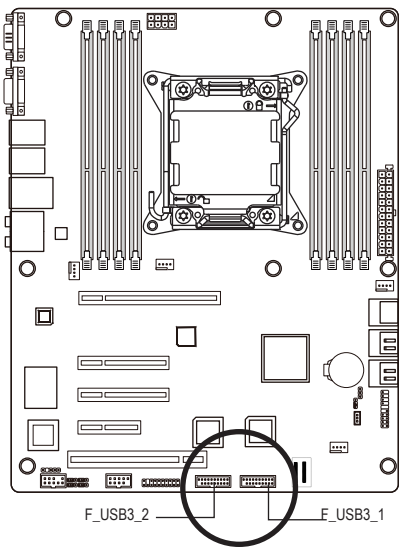


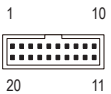
SAS0_3

Pin No.	Definition	Pin No.	Definition
A1	GND	B1	GND
A2	RX0+	B2	TX0+
A3	RX0-	B3	TX0-
A4	GND	B4	GND
A5	RX1+	B5	TX1+
A6	RX1-	B6	TX1-
A7	GND	B7	GND
A8	SIB7	B8	SIB0
A9	SIB3	B9	SIB1
A10	SIB4	B10	SIB2
A11	SIB5	B11	SIB6
A12	GND	B12	GND
A13	RX2+	B13	TX2+
A14	RX2-	B14	TX2-
A15	GND	B15	GND
A16	RX3+	B16	TX3+
A17	RX3-	B17	TX3-
A18	GND	A18	GND

12/13) F_USB3_1/F_USB3_2 (USB Headers)

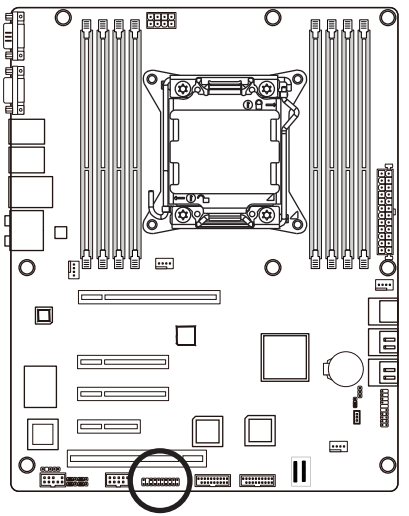
The headers conform to USB 3.0 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.





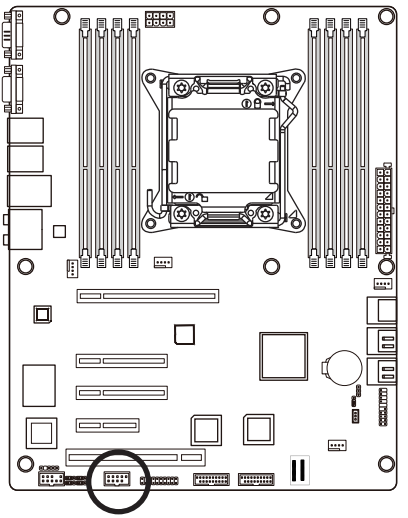
Pin No.	Definition
1	Power
2	IntA_P1_SSRX-
3	IntA_P1_SSRX+
4	GND
5	IntA_P1_SSTX-
6	IntA_P1_SSTX+
7	GND
8	IntA_P1_D-
9	IntA_P1_D+
10	NC
11	IntA_P2_D+
12	IntA_P2_D-
13	GND
14	IntA_P2_SSTX+
15	IntA_P2_SSTX-
16	GND
17	IntA_P2_SSRX+
18	IntA_P2_SSRX-
19	Power
20	No Pin

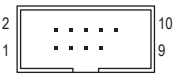
14) TPM (TPM Module)



Pin No.	Definition	Pin No.	Definition
1	CLK_33M_TPM	11	LPC_LAD0
2	GND	12	GND
3	LPC_LFRAME_N	13	NC
4	NC	14	NC
5	LPC_RST_TPM	15	P_3V3_AUX
6	NC	16	LPC_SERIRQ
7	LPC_LAD3	17	GND
8	LPC_LAD2	18	TPM Disable
9	P3V3	19	GND
10	LPC_LAD1	20	NC

15) F_1394 (IEEE 1394 Header)

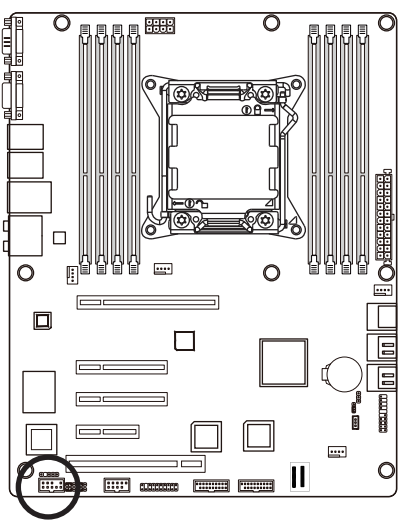


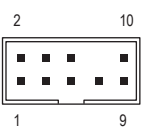


Pin No.	Definition
1	FTPA1+
2	FTPA1-
3	GND
4	GND
5	FTPB1+
6	FTPB1-
7	BUSVCC1
8	BUSVCC1
9	No Pin
10	NC

16) FAUDIO_ACZ (Front Panel Audio Header)

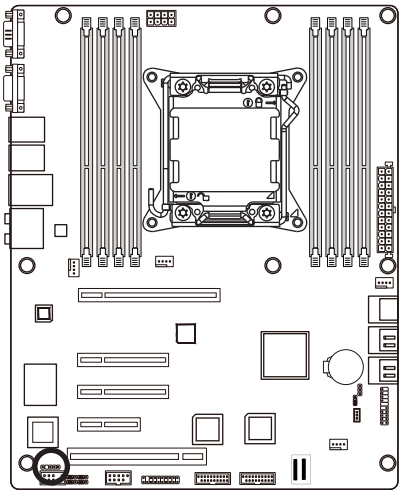
The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module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





Pin No.	Definition
1	MIC_L_F
2	AVD_GND
3	MIC_R_F
4	AVD
5	LINE2_R_F
6	MIC2_JD
7	AVD_JD
8	No Pin
9	LINE2_L_F
10	LINE2_JD

17) SPDIF_JP1 (SPDIF Header)

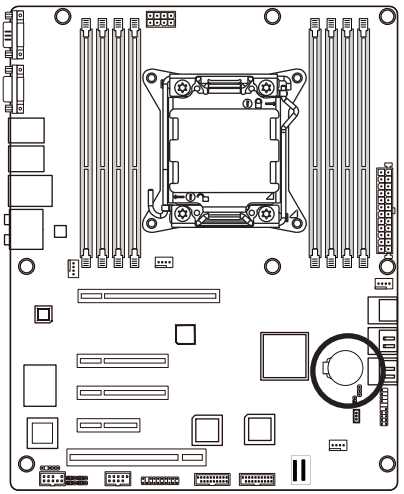


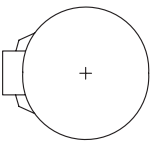
1 5

Pin No.	Definition
1	GND
2	No Pin
3	SPDIF In
4	SPDIF Out
5	GND

19) BAT1 (Battery)

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.





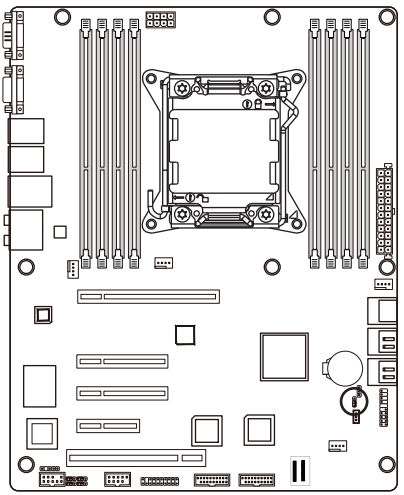
You may clear the CMOS values by removing the battery:

1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.

- 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.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

20) CLR_CMOS1 (Clearing CMOS Jumper)

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

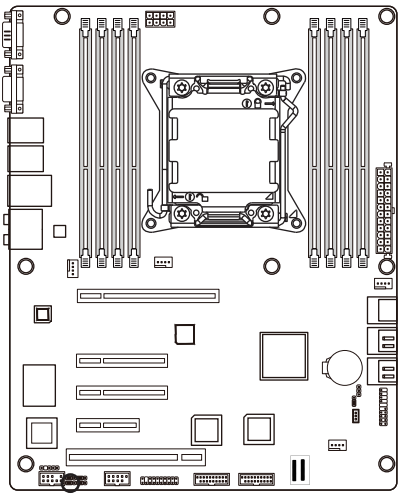


1-2 Close: Normal operation (Default setting)

2-3 Close: Clear CMOS data

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After clearing the CMOS values and before turning on your computer, be sure to remove the jumper cap from the jumper. Failure to do so may cause damage to the motherboard.
- After system restart, go to BIOS Setup Exit menu and load factory defaults (select **Load Default Values**) or manually
  configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

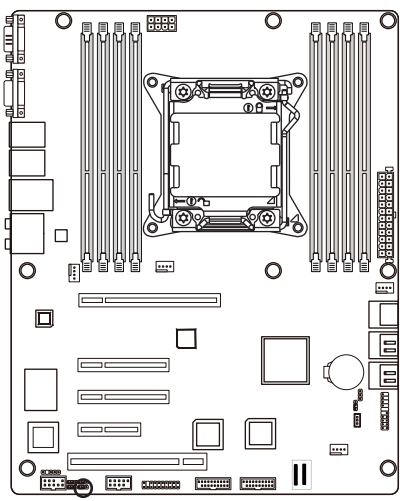
21) PASSWORD1 (Clearing Supervisor Password Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: Clear supervisor password.

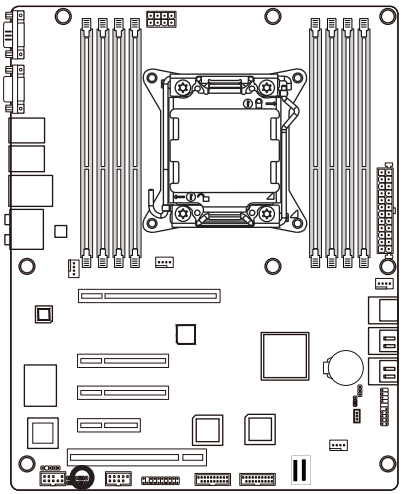
22) BIOS_RVCR1 (BIOS Recovery Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: BIOS recovery mode.

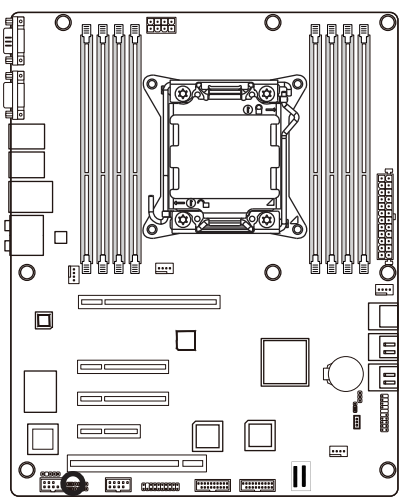
23) SSB_ME1 (ME Recovery Jumper)



1 1-2 Close: Enable ME recovery.

1 2-3 Close: Disable ME recovery. (Default setting)

24) BIOS_WP (BIOS Write Protect Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: Enable BIOS write protect function.

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. To see more advanced BIOS Setup menu options, you can press <Ctrl> + <F1> in the main menu of the BIOS Setup program.

- 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 "Load Optimized 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
<+/->	Press the buttons to change options
<F1>	Show descriptions of the function keys
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program

The Function of the <F10> (For the Main Menu Only)

▶ F10: Save CMOS to BIOS

This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles (Profile 1-8) and name each profile. First enter the profile name (to erase the default profile name, use the SPACE key) and then press <Enter> to complete.

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.)

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.

Chipset

Northbridge and Southbridge additional features configuration.

Boot Options

This setup page provides items for configuration of boot sequence.

Boot Manager

This setup page provides configuration of boot up devices.

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.

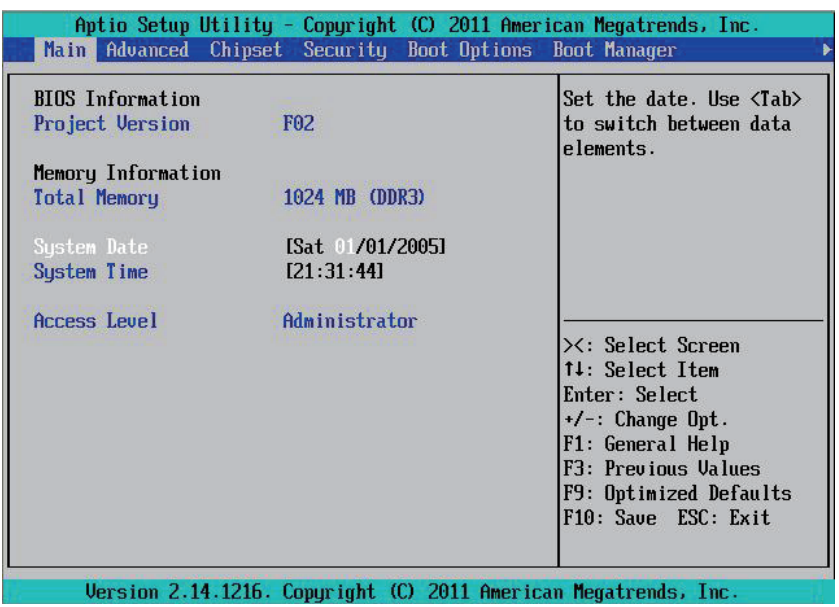
Main Menu Help

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.

- 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 **Load Default Values** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.



☞ **BIOS Information:**

☞ **Project Version**

Display version number of the project.

☞ **Memory Information:**

☞ **Total Memory**

Determines how much total memory is present during the POST.

☞ **System Date**

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

☞ **System Time**

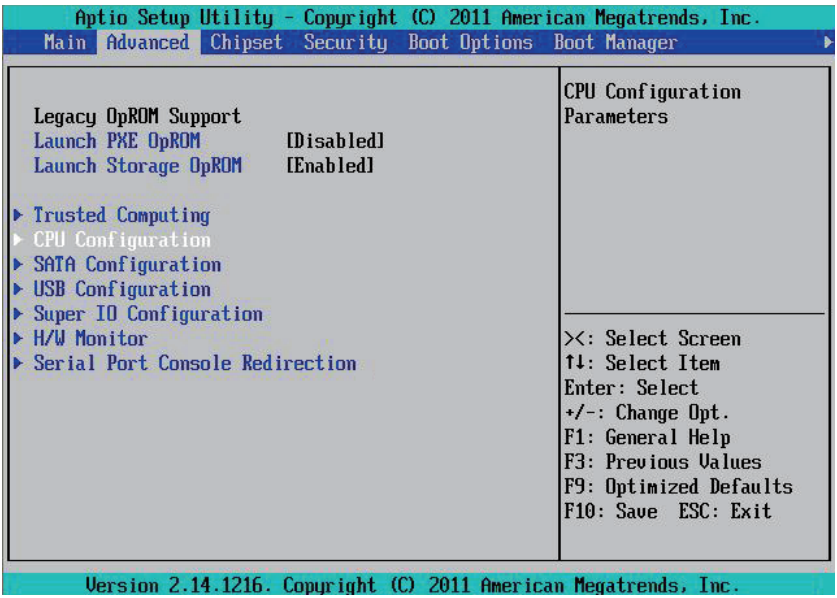
Set the system time following the hour-minute- second format.

☞ **Access Level**

Display the current access privilege level.

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.



☞ **Legacy OpROM Support**

☞ **Launch PXE OpROM**

Enable/Disable PXE option ROM.

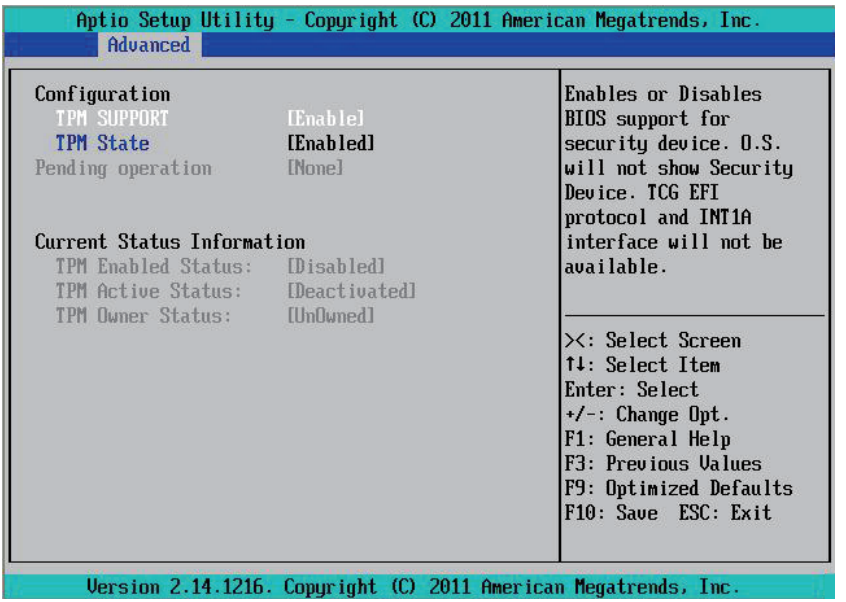
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Launch Storage OpROM**

Enable/Disable storage option ROM.

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

2-2-1 Trusted Computing



☞ **TPM Support**

Select Enabled to activate TPM support feature.

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

☞ **TPM State**

Select Enabled to activate TPM State function.

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

☞ **Pending TPM Support**

Schedule TPM operation.

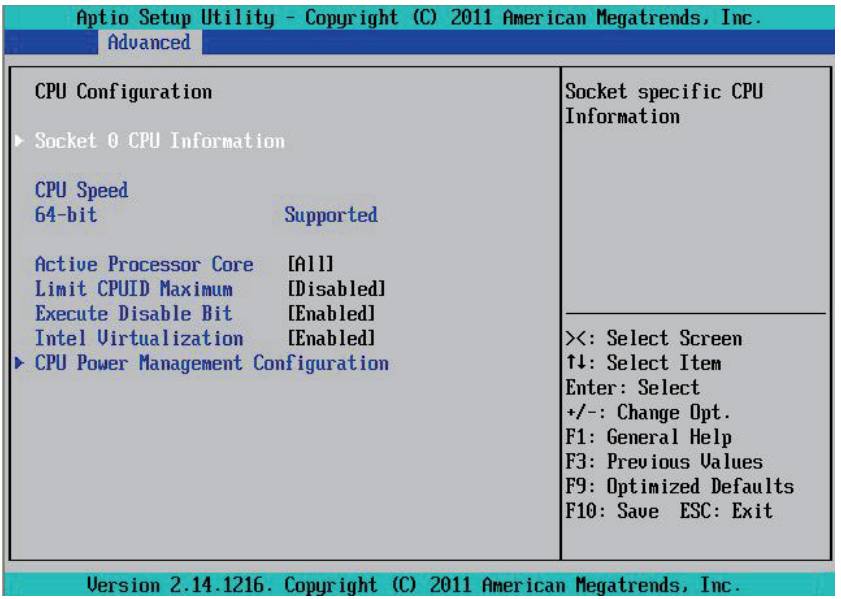
Options available: None/Enable Take Ownership.

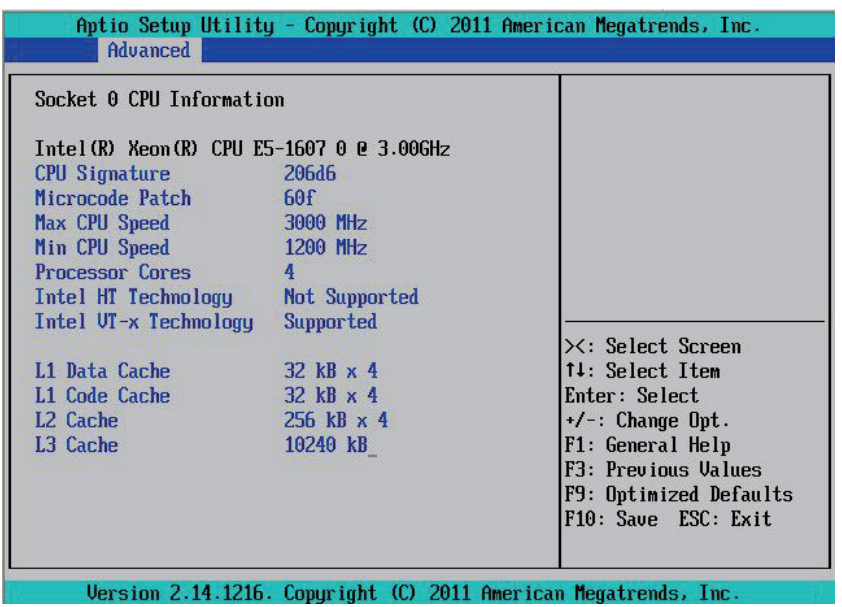
☞ **Current TPM Status Information**

Display current TPM status information.

(Note) This item is present only if TPM module is attached.

2-2-2 CPU Configuration





☞ **Socket 0 Information**

☞ **CPU Signature**

Displays the processor ID information.

☞ **Microcode Patch**

Display Microcode patch.

☞ **Max CPU Speed**

Display the maximum processor speed.

☞ **Min CPU Speed**

Display the minimum 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.

☞ **Cache Information**

☞ **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.

☞ **Active Processor Cores** (Note)

Allows you to determine whether to enable all CPU cores.
Options available: All/1/2/3. Default setting is **All**.

☞ **Limit CPUID Maximum**

When enabled, the processor will limit the maximum COUID input values to 03h when queried, even if the processor suppports a higher CPUID input value.
When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Execute Disable Bit**

When enabled, the processor prevents the execution of code in data-only memory pages. This provides some protection against buffer overflow attacks.
When disabled, the processor will not restrict code execution in any memory area. This makes the processor more vulnerable to buffer overflow attacks.
Options available: Enabled/Disabled. Default setting is **Enabled**.

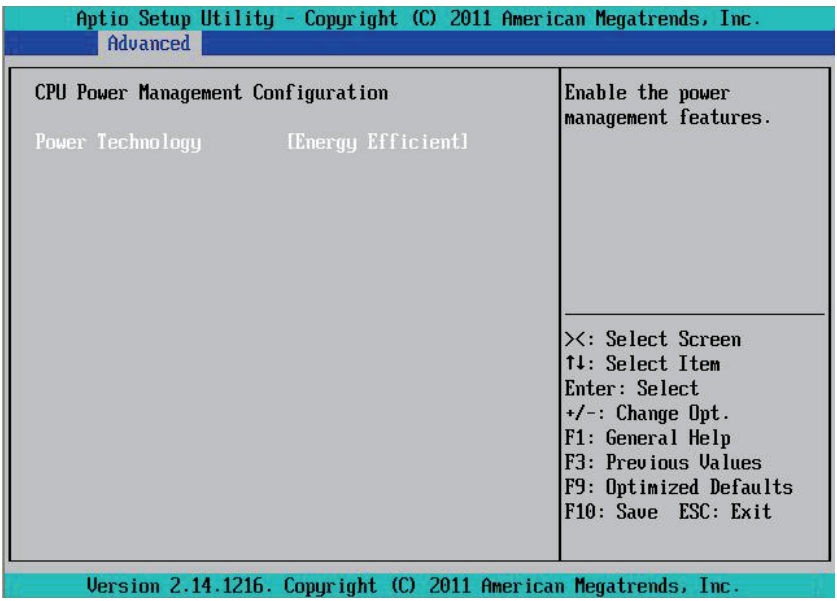
☞ **Intel Virtualization**

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

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

(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.

2-2-2-1 CPU Power Management Configuration

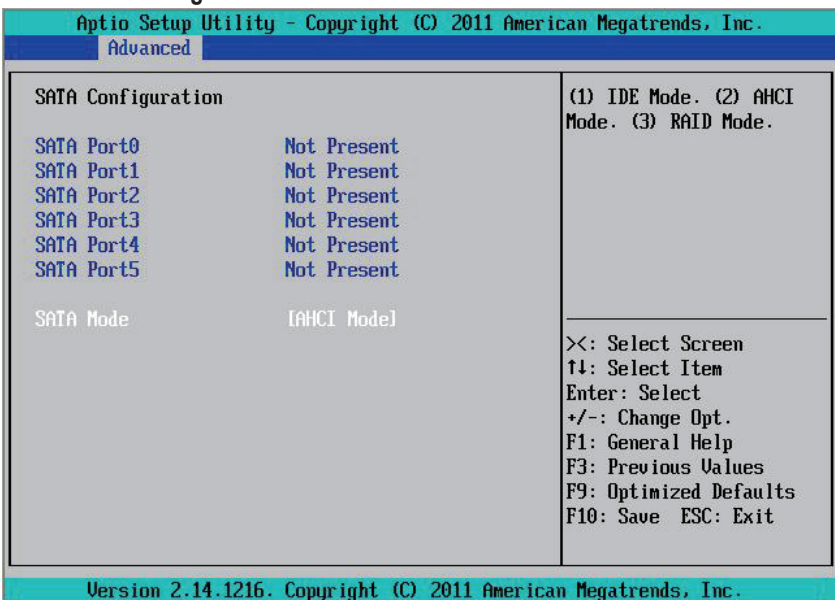


☞ **Power Technology**

Configure the power management features.

Options available: Disable/Energy Efficient/Custom. Default setting is **Energy Efficient**.

2-2-3 SATA Configuration



☞ **SATA Port 0/1/2/3/4/5**

Press [Enter] to view the installed HDD devices.

☞ **SATA Mode**

Select the on chip SATA type.

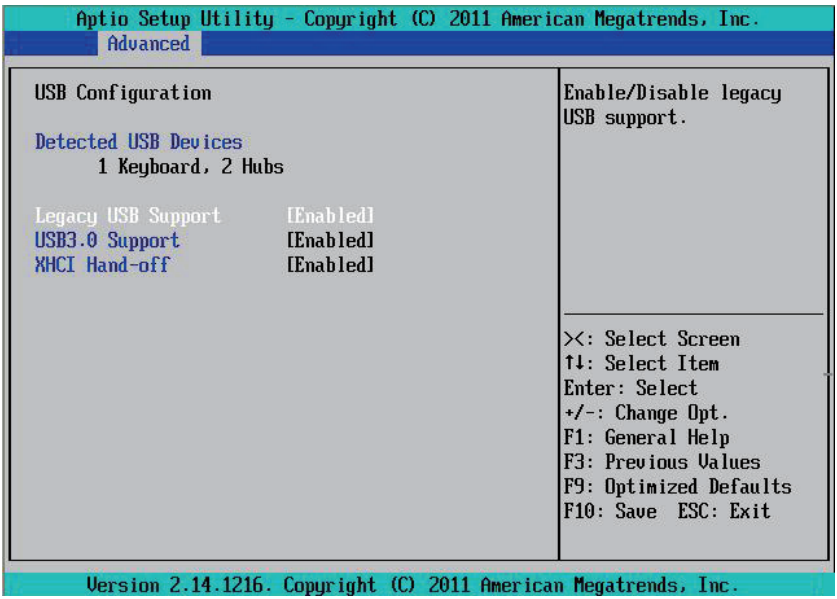
IDE Mode: When set to IDE, the SATA controller disables its RAID and AHCI functions and runs in the IDE emulation mode. This is not allowed to access RAID setup utility.

RAID Mode: When set to RAID, the SATA controllerenables both its RAID and AHCI functions. You will be allows access the RAID setup utility at boot time.

ACHI Mode: When set to AHCI,the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time.

Options available: IDE/RAID/ACHI. Default setting is **ACHI Mode**.

2-2-4 USB Configuration



☞ **Detected USB Devices**

Display the information of detected USB devices.

☞ **Legacy USB Support**

Enables or disables support for legacy USB devices.

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

☞ **USB 3.0 Support**

When enabled, the onboard USB 3.0 device will function normally.

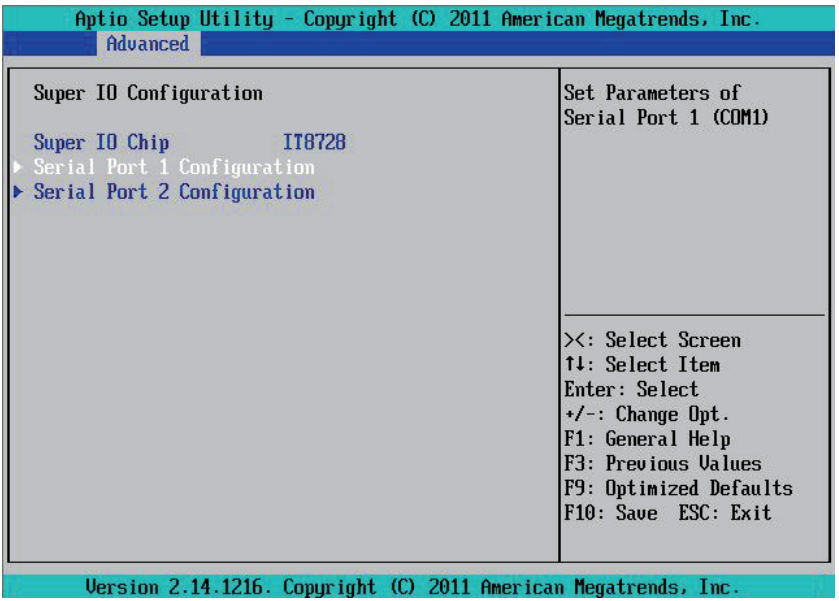
Options available: Enabled/Disabled. Default setting is **Enabled**.

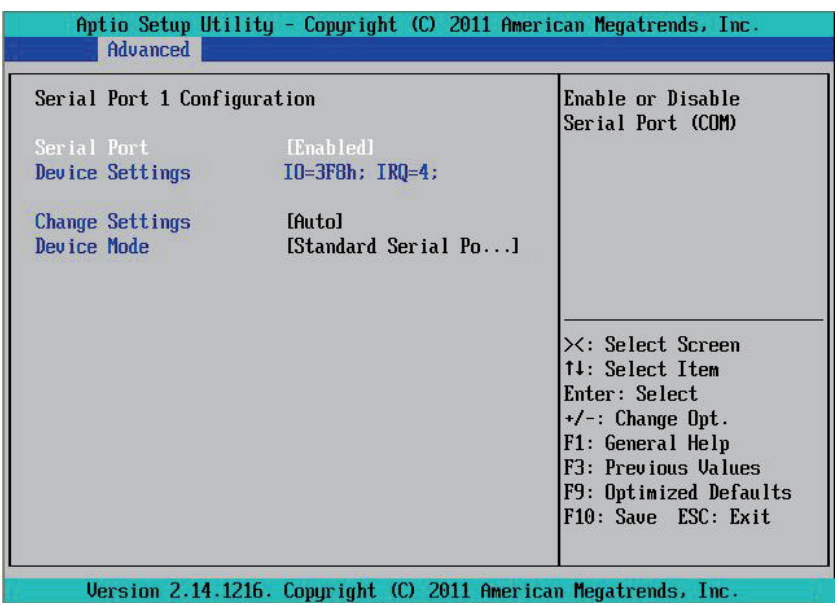
☞ **XHCI Hand-off**

This is a workround for OS without xHCI hand-off support. The xHCI ownership change should be claimed by XHCI driver.

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

2-2-5 Super IO Configuration





☞ Super IO Chip

DIsplay super IO chip information.

☞ Serial Port 1/2 Configuration

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

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

☞ Device Settings

Displays Serial Port 1/2 device configuration information.

☞ Change Settings

Change Serial Port 1/2 device settings. When set to Auto allows the server's BIOS or OS to select a configuration.

Options available: Auto/IO=3F8; IRQ=4/IO=3F8h; IRQ=3,4,5,6,7,10,11,12/ IO=2F8h; IRQ=3,4,5,6,7,10,11,12 /IO=3E8h; IRQ=3,4,5,6,7,10,11,12/IO=2E8h; IRQ=3,4,5,6,7,10,11,12.

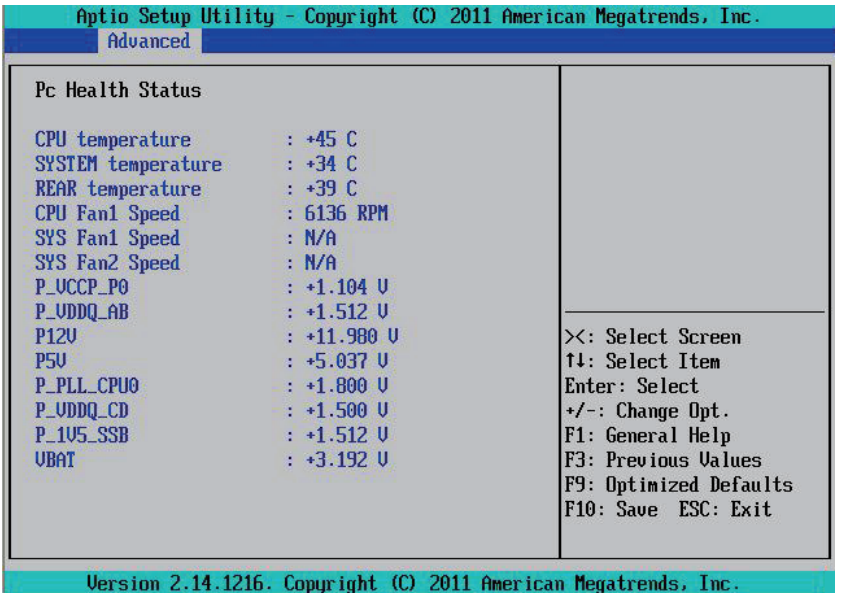
☞ Device Mode

Change the Serial Port mode.

Options available: Standard Serial Port Mode (Normal Mode)/IrDA 1.0 (HP SIR) Mode (High Speed)/ ASKIRfdgdg Mode.

2-2-6 H/W Monitor

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



☞ **CPU Temperature/System Temperature/Rear Temperature**

Displays current CPU, System, and rear edge of motherboard temperature.

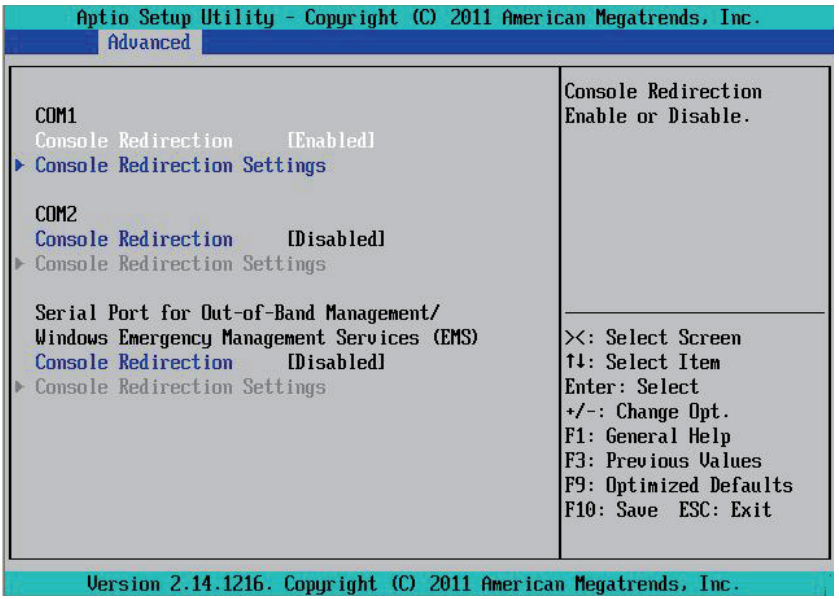
☞ **CPU/System FAN1/2/3 Speed (RPM)**

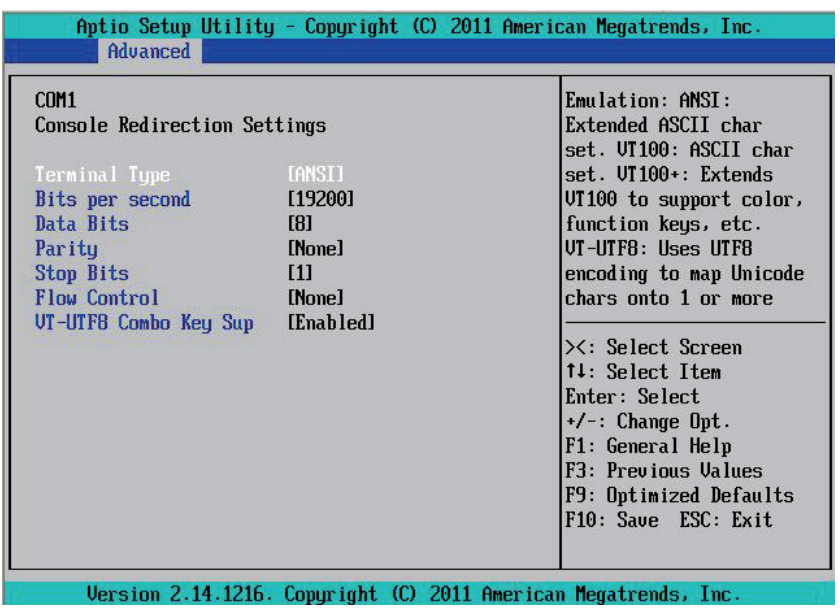
Displays current CPU and system fan speed.

☞ **Current Voltage: P_VCCP_P0/P_VCCQ_AB/P12V/P5V/P_PLL_CPU0/ P_VDDQ_CD/P_1V5_SSB/VBAT**

Displays the current CPU and system voltages.

2-2-7 Serial Port Console Redirection





☞ Console Redirection (Note)

Select whether to enable console redirection for specified device. Console redirection enables users to manage the system from a remote location.

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

☞ Console Redirection Settings

Press [Enter] to enter advanced meun for console redirection settings.

☞ Terminal Type

Select a terminal type to be used for console redirection.

Options available: VT100/VT100+/ANSI /VT-UTF8.

☞ Bits per second

Select the baud rate for console redirection.

Options available: 9600/19200/57600/115200.

☞ Data Bits

Select the data bits for console redirection.

Options available: 7/8.

☞ Parity

A parity bit can be sent with the data bits to detect some transmission errors.

Even: parity bi is 0 if the num of 1's in the data bits is even.

Odd: parity bit is0if num of 1's the data bits is odd.

Mark: parity bit is always 1. Space: Parity bit is always 0.

Mark and Space Parity do not allow for error detection.

Options available: None/Even/Odd/Mark/Space.

☞ Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Options available: 1/2.

☞ Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

Options available: None/Hardware RTS/CTS.

☞ VT-UTF8 Combo Key Support

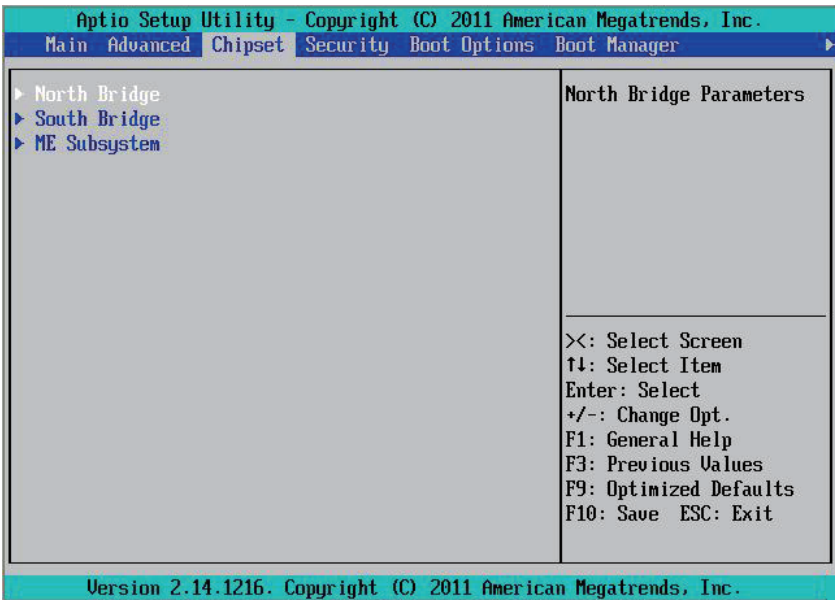
Enable/Disable VT-UTF8 Combo Key Support.

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

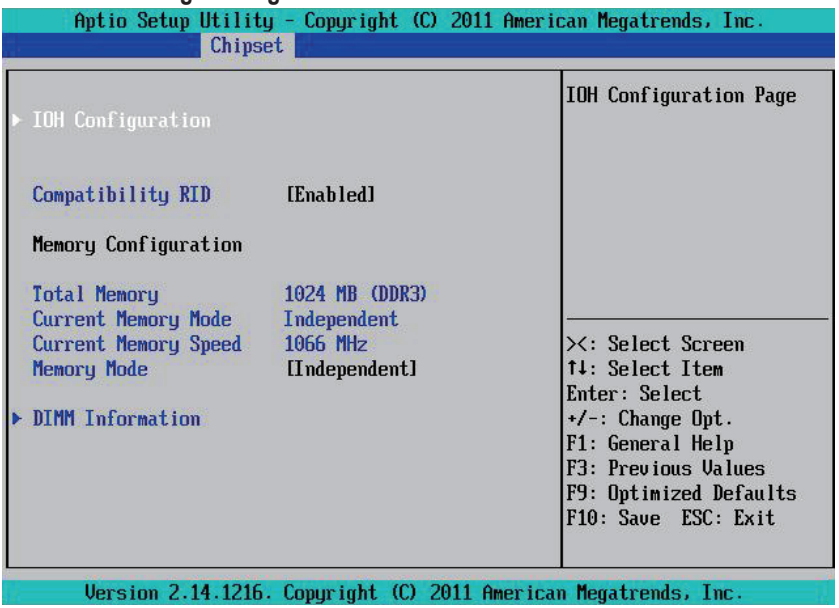
(Note) Advanced items prompt when this item is defined.

2-3 Chipset Menu

The Chipset menu display submenu options for configuring the function of North Bridge and South Bridge. Select a submenu item, then press Enter to access the related submenu screen.



2-3-1 North Bridge Configuration



Compatibility RID

Enable/Disable Compatibility RID function.

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

Total Memory

Determines how much total memory is present during the POST.

Current Memory Mode

Displays the cuurent memory mode. Memory mode can be determined in **Memory Mode** item.

Current Memory Speed

Displays the cuurent memory speed.

Memory Mode

Determine the memory mode.

When set to Indendent mode, all DIMMs are available to the operation system.

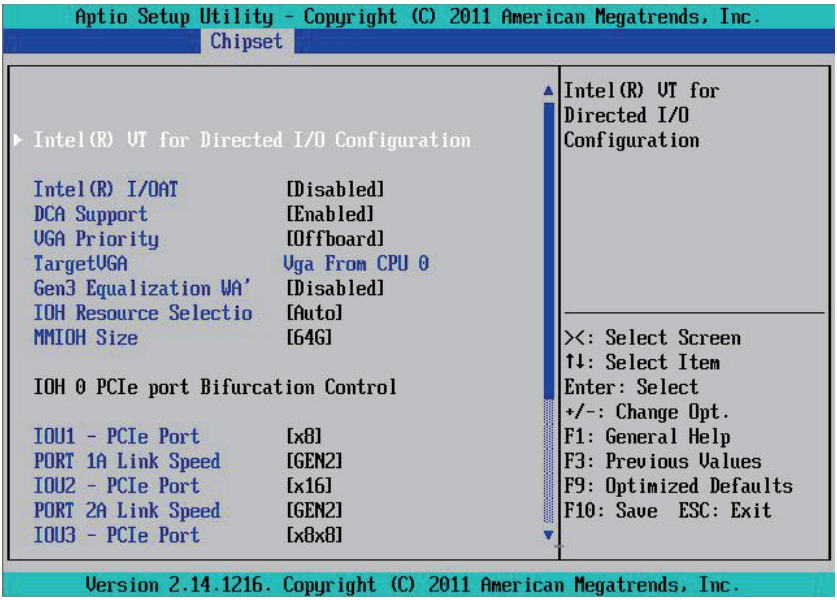
When set to Mirroring mode, the motherboard maintains two identical (redundant) copies of all data in memory.

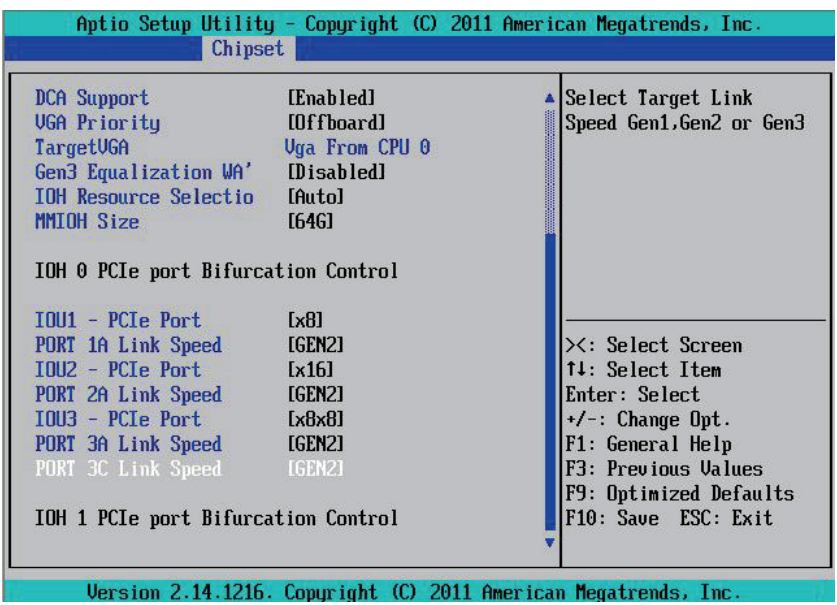
When set to Lockstep mode, the motherboard uses two areas of memory to run the same set of operations in parallel.

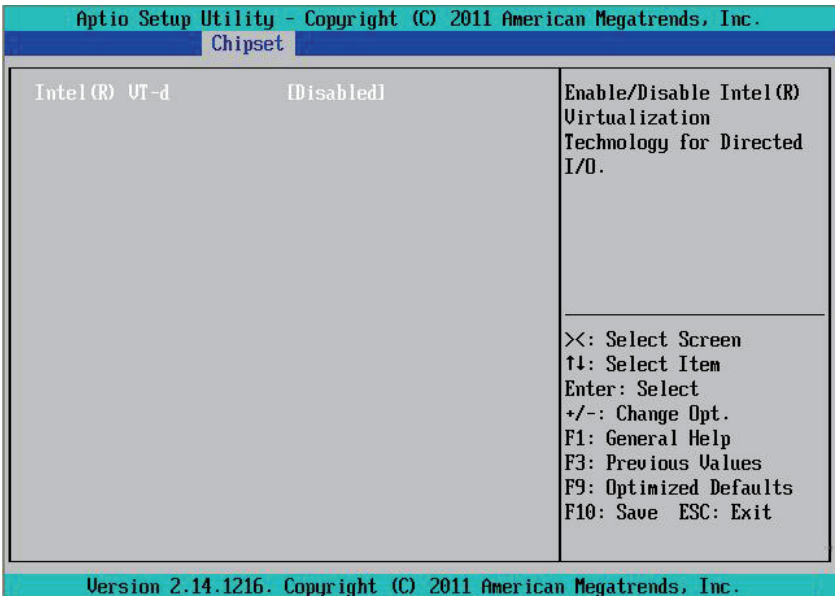
When set to Sparing mode, a preset threshold of coorectable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

Options available: Indpendent /Mirroring/ Lockstep/Sparing.

2-3-1-1 IOH Configuration







- **IOH Configuration**
- **Intel(R) VT for Directed I/O Configuration**
- **Intel(R) I/OAT**

  Enable/Disable Intel OAT Technology function.

  Options available: Enabled/Disabled. Default setting is **Disabled**.
- **DCA Support**

  Enable/Disable Direct Cache Access Support function.

  Options available: Enabled/Disabled. Default setting is **Enabled**.
- **VGA Priority**

  Define the display device priority.

  Options available: Onboard/Offboard. Default setting is **Offboard**.
- **Target VGA**

  Displays the information of Target VGA.
- **Gen3 Equalization WA's**

  Enable/DIsable the support for Gen3 Equalization Workaround.

  Options available: Enabled/Disabled. Default setting is **Disabled**.
- **IOH Resource Selection Type**

  When this item is set to Auto, PCI resources allocation across multiple IOHs is optimized automatically based on the PCI device present. When this item is set to Manual, user can force the PCI resource allocation across multiple IOHs based rations.

  Options available: Auto/Manual. Default setting is **Auto**.
- **MMIOH Size**

  Options available: 1GB/2GB/4GB/8GB/16GB/32GB/64GB/128GB.

- **IOH 0/1 PCIe port Bifurcation Control**
- **IOU1 - PCIe Port**

  Options available: x4x4/x8.
- **PORT 1A Link Speed**

  Options available: Gen1/Gen2.
- **IOU2 - PCIe Port**

  Options available: x4x4x4x4/x4x4x8/x8x4x4/x8x8/x16.
- **PORT 2A Link Speed**

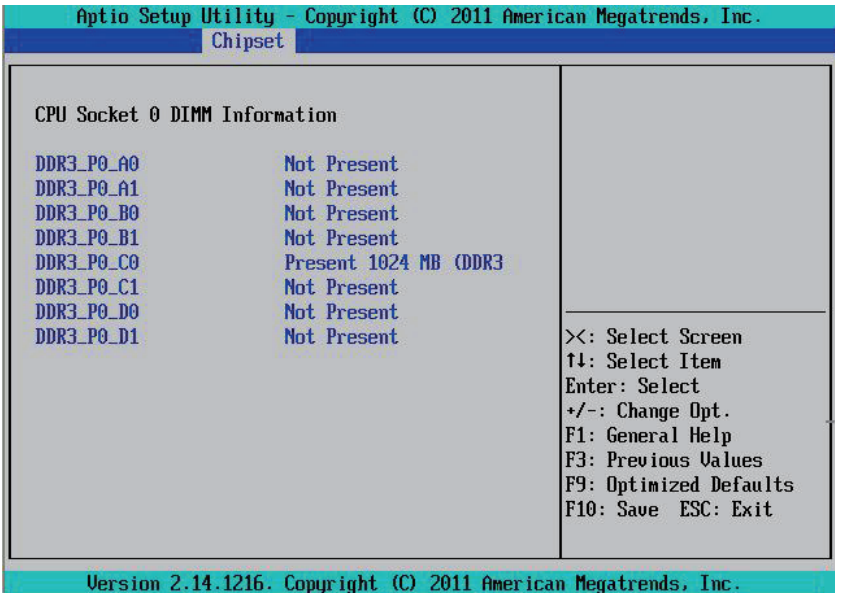
  Options available: Gen1/Gen2/Gen3.
- **IOU3 - PCIe Port**

  Options available: x4x4/x8.
- **PORT 3A Link Speed**

  Options available: Gen1/Gen2/Gen3.
- **Intel(R) VT-d**

  Enable/Disable Intel VT-d Technology function.
  Options available: Enabled/Disabled. Default setting is **Disabled**.

2-3-1-2 DIMM Information



- **DIMM Information:**
- **DIMM Group: CPU Socket 0 DIMM Information**

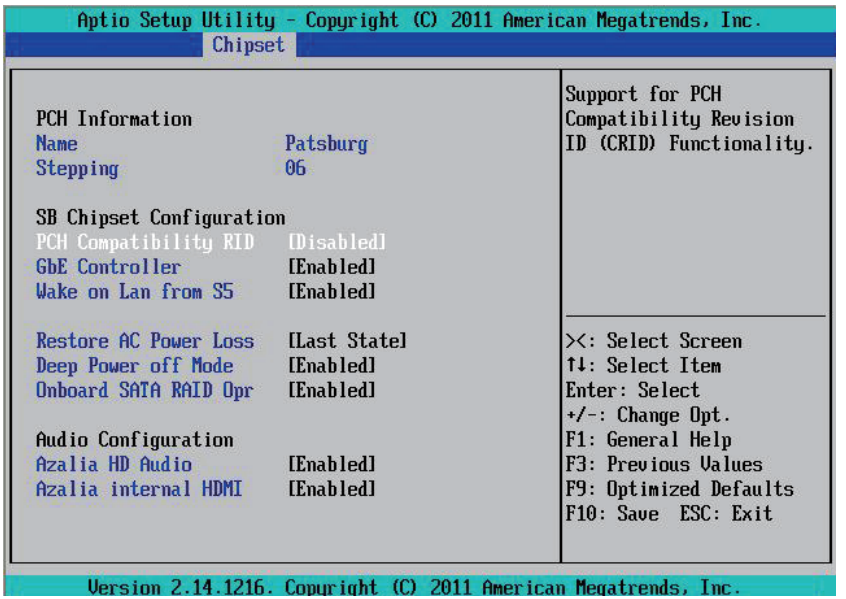
  CPU Socket 0:

  DDR3_P0_A0/DDR3_P0_A1/DDR3_P0_B0/DDR3_P0_B1 Status

  DDR3_P0_C0/DDR3_P0_C1/DDR3_P0_D0/DDR3_P0_D1 Status

  The size of memory installed on each of the DDR3 slots.

2-3-2 South Bridge Configuration



☞ **PCH Information:**

☞ **Name/Stepping Information**

Displays the name and stepping information of the south bridge.

☞ **PCH Compatibility RID**

Enable/Disable the support for PCH Compatibility Revision ID (CRID) functionality.

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

☞ **GbE Controller**

Enable/Disable onboard GbE LAN controller.

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

☞ **Wake on Lan from S5**

Enable/Disable GbE control PXE in S5.

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

☞ **Restore on AC Power Loss**

Defines the power state to resume to after a sys- tem shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Stay Off, the system remains off after power shutdown.

Options available: Last State/Stay Off/Power On. The default setting depends on the BMC setting.

☞ **Deep Power off Mode**

Enable/Disable Deep Power off Mode.

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

☞ **Onboard SATA RAID oprom**

Enable/Disable onboard SATA RAID option ROM.

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

☞ **Audio Configuration**

☞ **Azalia HD Audio**

Enable/Disable onboard audio controller.

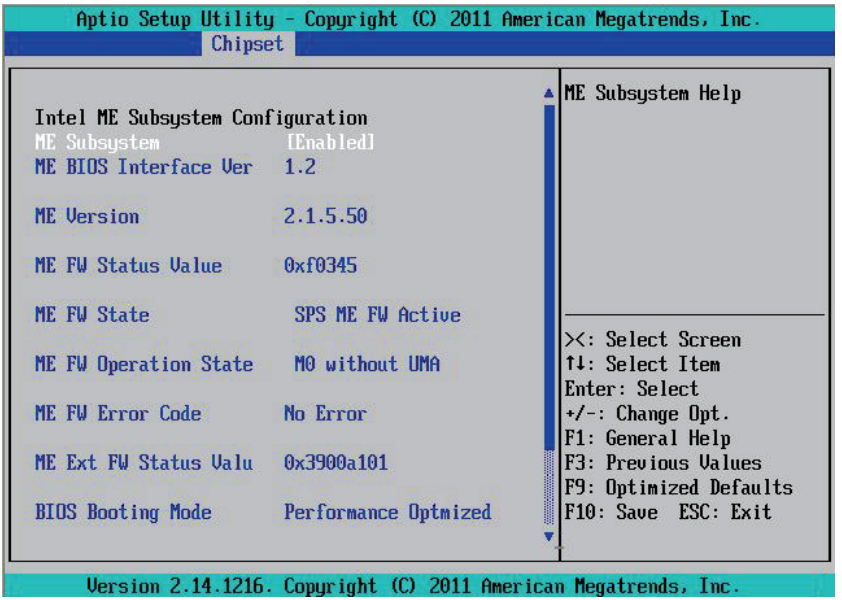
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Azalia internal HDMI**

Enable/Disable onboard audio HDMI controller.

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

2-3-3 ME Subsystem



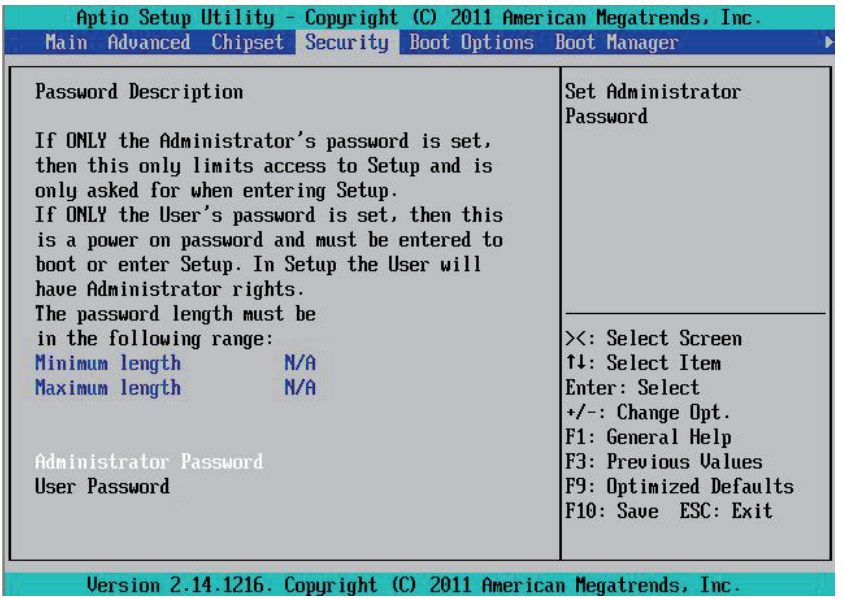
ME Subsystem Configuration

Enable/Disable ME subsystem configuration.

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

2-4 Security Menu

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



There are two types of passwords that you can set:

- Administrator 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**

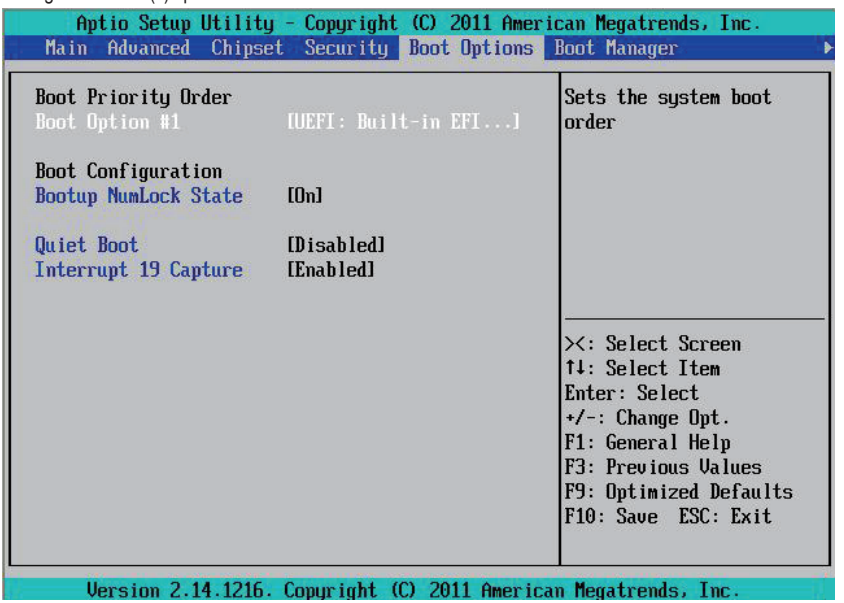
Press Enter to configure the Administrator password.

☞ **User Password**

Press Enter to configure the user password.

2-5 Boot Option Menu

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



☞ Boot Priority Order

☞ Boot Option

Press Enter to configure the boot priority.

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

1. Hard drive.
2. UEFI device.
3. Optical disc drive.
4. Removable device.

☞ Bootup NumLock State

Enable or Disable Bootup NumLock function.

Options available: On/Off. Default setting is **On**.

☞ Quiet Boot

Enables or disables showing the logo during POST.

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

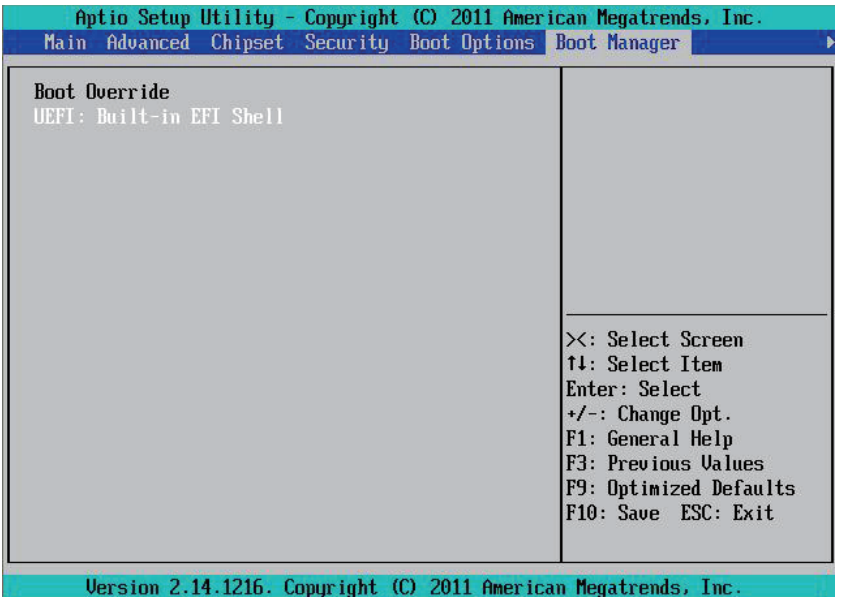
☞ Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of those host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks.

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

2-6 Boot Manager

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

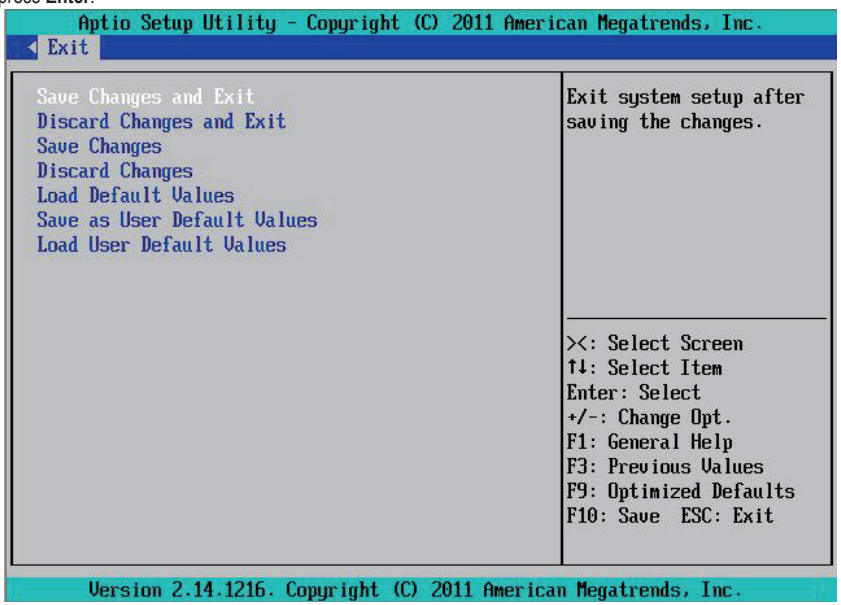


☞ **Built-in EFI Shell**

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

2-7 Exit Menu

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



☞ Save Changes and Exit

Saves changes made and close the BIOS setup.

Options available: Yes/No.

☞ Discard Changes and Exit

Discards changes made and close the BIOS setup.

Options available: Yes/No.

☞ Save Changes

Saves changes made in the BIOS setup.

Options available: Yes/No.

☞ Discard Changes

Discards all changes made in the BIOS setup.

Options available: Yes/No.

☞ Load Default Values

Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly.

Options available: Yes/No.

☞ **Save as User Default Values**

Saves as user default and close the BIOS setup.

Options available: Yes/No.

☞ **Load User Default Values**

Loads the user default settings for all BIOS setup parameters.

Options available: Yes/No.