GA-7PXSL

Dual LGA2011 sockets motherboard for Intel® E5-2600 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 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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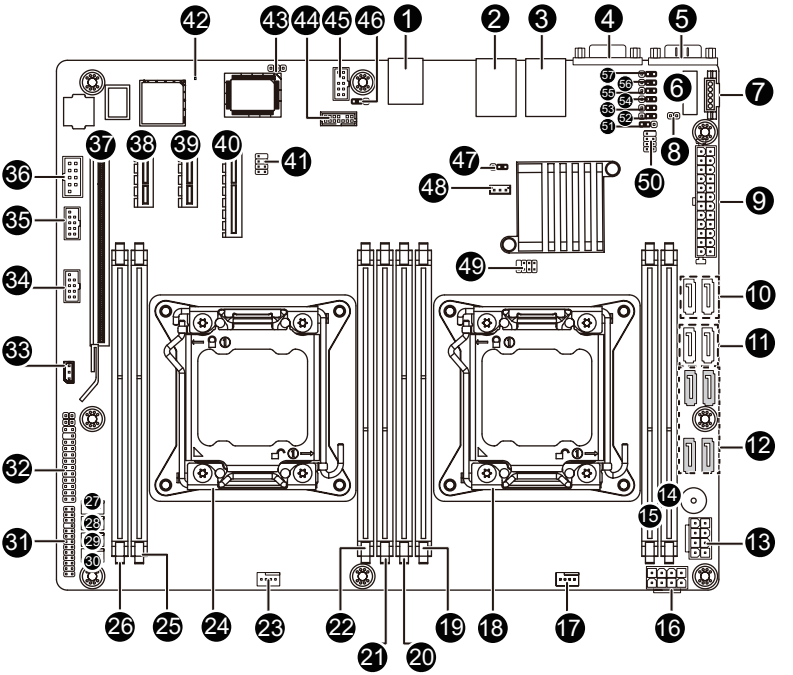
Box Contents

- ☑ Motherboard
- ☑ Driver CD
- ☑ Two SATA cables
- ☑ I/O Shield
- ☑ CPU Power cables

- 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.

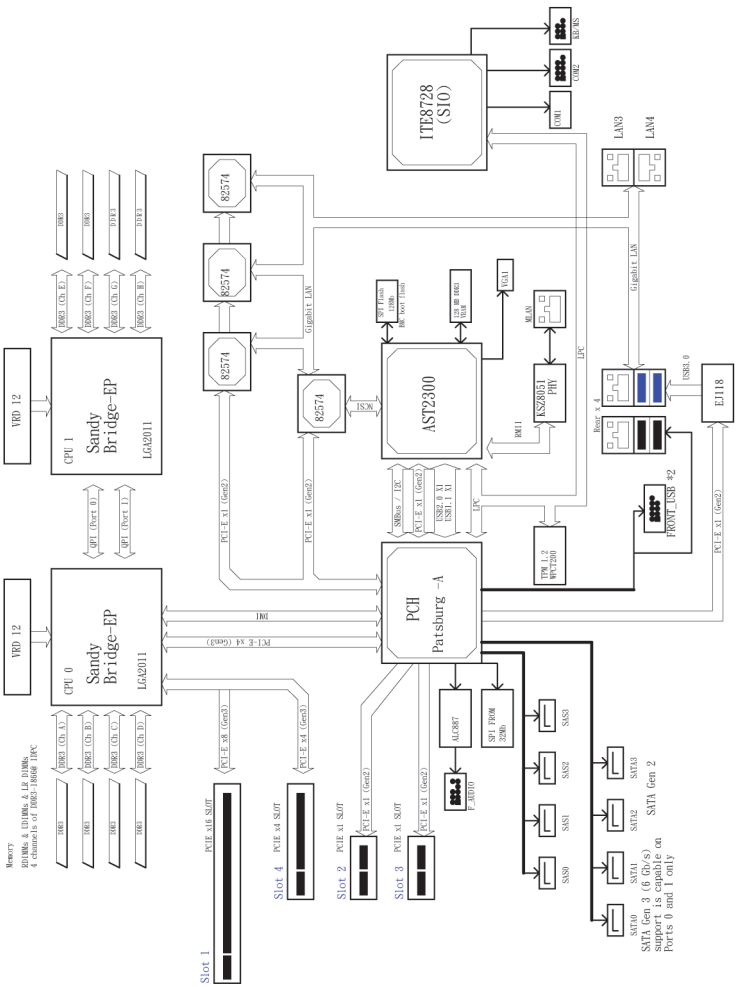
GA-7PXSL Motherboard Layout



Item	Code	Description
1	MLAN1	BMC Management LAN port
2	USB2_LAN1	LAN1 port (top) / USB 2.0 ports (bottom)
3	USB3_LAN2	LAN2 port (top) / USB 3.0 ports (bottom)
4	VGA1	VGA port
5	COM1	Serial port
6	BAT	Battery socket
7	PWR_DET1	PMBus connector
8	JP1	Chassis intrusion header
9	ATX1	24 pin power connector
10	SATA0/SATA1	SATA 6Gb/s connectors (SATA1 support SATA DOM function)
11	SATA2/SATA3	SATA 3Gb/s connectors
12	SAS0/SAS1/SAS2/SAS3	SAS 3Gb/s connectors
13	P12V_PWR2	8 pin power connector (for Secondary CPU)
14	DDR3_P1_E0	Channel 1 slot 0 (for secondary CPU)
15	DDR3_P1_F0	Channel 2 slot 0 (for secondary CPU)
16	P12V_PWR1	8 pin power connector (for Primary CPU)
17	CPU1_FAN1	CPU1 fan cable connector (for Secondary CPU)
18	CPU1	Intel LGA2011 socket (Secondary CPU)
19	DDR3_P1_H0	Channel 4 slot 0 (for secondary CPU)
20	DDR3_P1_G0	Channel 3 slot 0 (for secondary CPU)
21	DDR3_P0_A0	Channel 1 slot 0 (for primary CPU)
22	DDR3_P0_B0	Channel 2 slot 0 (for primary CPU)
23	CPU0_FAN1	CPU0 fan cable connector (for Primary CPU)
24	CPU0	Intel LGA2011 socket (Primary CPU)
25	DDR3_P0_D0	Channel 4 slot 0 (for primary CPU)
26	DDR3_P0_C0	Channel 3 slot 0 (for primary CPU)
27	SYS_FAN1	Systen fan connector #1
28	SYS_FAN2	Systen fan connector #2
29	SYS_FAN3	Systen fan connector #3
30	SYS_FAN4	Systen fan connector #4
31	BP_1	HDD back plane board header
32	FP_1	Front panel header
33	IPMB1	IPMB connector
34	F_USB2_1	USB 2.0 connector
35	F_USB2_2	USB 2.0 connector
36	COM2	Serial port cable connector
37	PCIE16X_1	PCI-E slot Running at x8
38	PCIE1X_3	PCI-E x1 slot
39	PCIE1X_2	PCI-E x1 slot
40	PCIE4X_1	PCI-E x4 slot
41	PS2_KB	PS2 Keyboard/Mouse header
42	BMC_LED1	BMC firmware readiness LED
43	SPDIF_OUT	SPDIF OUT header

44	TPM_1	TPM module connector
45	F_AUDIO	Front Audio connector
46	FLASH_DP1	Flash descriptor security jumper
47	BIOS_WP1	BIOS write protect jumper
48	SKU_KEY1	Intel C600 series upgrade key
49	SATA_SGPIO2	SATA SGPIO header
50	SATA_SGPIO1	SATA SGPIO header
51	PMBUS_SEL1	PMBUS Select jumper
52	S3_MASK	S3 Power On Select jumper
53	BMC_FRB1	Force to Stop FRB1 Timer jumper
54	CLR_CMOS1	Clear CMOS jumper
55	SSB_ME1	ME recovery jumper
56	PASSWORD1	Clearning supervisor password jumper
57	BIOS_RVCR1	BIOS recovery jumper

Block Diagram



Chapter 1 Hardware Installation

1-1 Installation Precautions

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

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

1-2 Product Specifications

CPU	◆ Support for Intel® Xeon® E5-2600 V2 series processors in the LGA2011 package ◆ L3 cache varies with CPU ◆ Supports QuickPath Interconnect up to 8GT/s ◆ Enhanced Intel SpeedStep Technology (EIST) ◆ Support Intel Virtualization Technology (VT)
Chipset	◆ Intel® C602 (Patsburg-A) Chipset
Memory	◆ 8 x 1.5V DDR3 DIMM sockets supporting up to 64GB (UDIMM) and 256GB (RDIMM/LRDIMM) of system memory ◆ 8 x 1.35V DDR3L DIMM sockets supporting up to 64GB of system memory ◆ Four channel memory architecture ◆ Support for 1866/1600/1033MHz memory modules ◆ Support for ECC RDIMM/ UDIMM memory modules
LAN	◆ Dual Intel® 82574L supports 10/100/1000 Mbps
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x8 (Gen3/PCIE16X) ◆ 1 x PCI Express x4 slot, running at x4 (Gen3/PCIE4X_1) ◆ 2 x PCI Express x1 slot, running at x1 (Gen2/PCIE1X_2/PCIE1X_3)
Onboard Graphics	◆ ASPEED® AST2300 supports 16MB VRAM
Storage Interface	◆ Intel® C602 controller ◆ 2 x SATA 6Gb/s connectors (SATA0/SATA1) ◆ 2 x SATA 3Gb/s connectors (SATA2/SATA3) ◆ 4 x SAS connectors (4 additional SATA ports (3Gb/s) /option SAS ports (3Gb/s) with upgrade key required) ◆ Support for Intel RSTe SATA RAID 0/1/10/5
USB	◆ Up to 6 USB 2.0/1.1 ports (2 on the back panel, 4 additional ports via the USB brackets connected to the internal USB headers) ◆ Up to 2 USB 3.0 ports (at back panel)

Intel C600 Upgrade ROM SKUs:

Upgrade ROM SKU#	SCU Ports	Protocol Enabled	Intel RSTe SAS RAID 5
Patsburg-A; no upgrade ROM	**4 ports**	**SATA Only**	**SATA RAID 5**
1	4 ports	SATA/SAS	No
2	4 ports	SATA/SAS	Yes
5	8 ports	SATA/SAS	No
6	8 ports	SATA/SAS	Yes
9	8 ports	SATA Only	SATA RAID 5

Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 2 x 8-pin ATX 12V power connector ◆ 4 x SAS connectors (SATA 3Gb/s signal) ◆ 2 x SATA 6Gb/s connectors ◆ 2 x SATA 3Gb/s connectors ◆ 1 x PMBus header ◆ 2 x CPU fan headers ◆ 4 x System fan headers ◆ 1 x Front panel header ◆ 1 x Back plane borad header ◆ 2 x USB 2.0/1.1 header ◆ 1 x TPM module connector ◆ 1 x Serial port connector ◆ 1 x Front audio connector ◆ 1 x SKU KEY header ◆ 2 x SPGIO headers
Rear Panel I/O	◆ 2 x USB 2.0/1.1 ports ◆ 2 x USB 3.0 ports ◆ 3 x RJ-45 ports (1 x 10/100 dedicated management LAN port) ◆ 1 x COM port ◆ 1 x VGA port
I/O Controller	◆ ASPEED® AST2300 BMC chip
Hardware Monitor	◆ System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ 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, 8 layers PCB

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

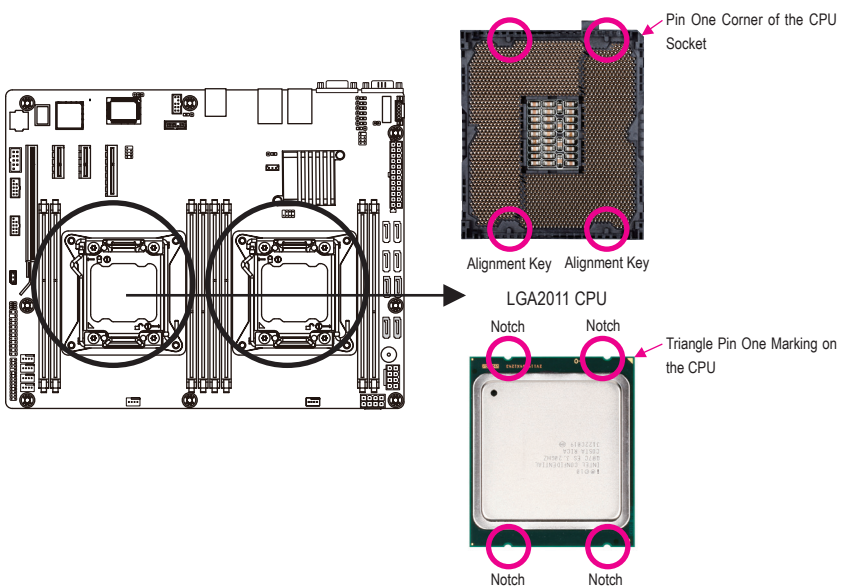
1-3 Installing the CPU and CPU Cooler

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

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

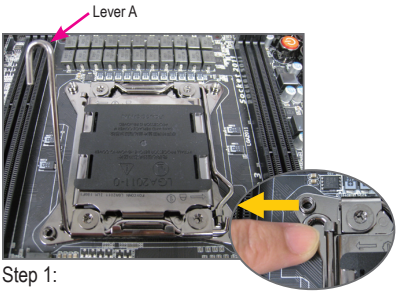
1-3-1 Installing the CPU

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



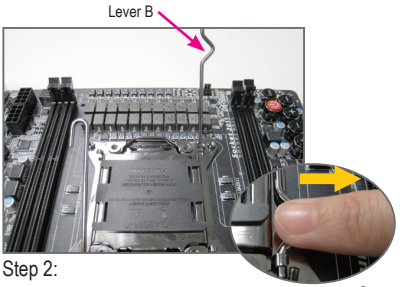
B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

- **Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet 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.

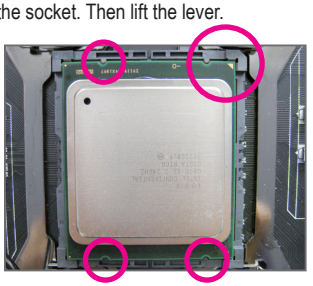


Step 2:

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:

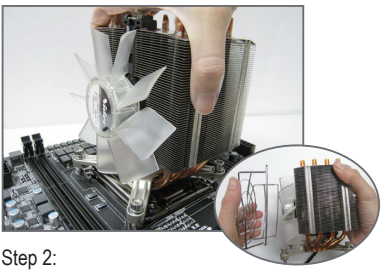
Finally, secure lever A under its retention tab to complete the installation of the CPU.

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.)

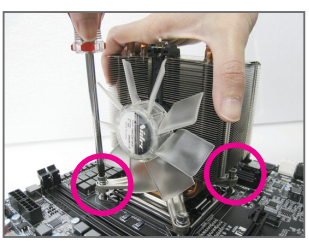
Step 1:

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



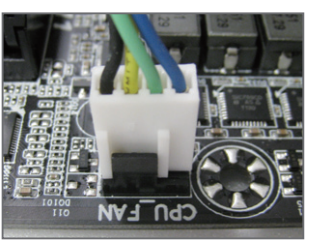
Step 2:

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 screws.)



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:

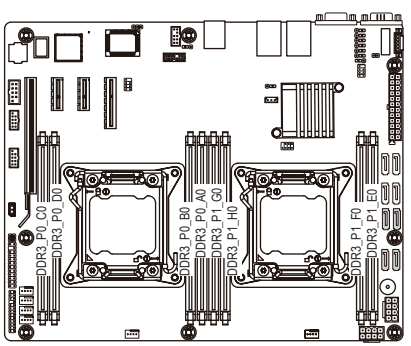
- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof 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 eight 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 be four times of the original memory bandwidth.

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

Channel 1: DDR3_P0_A0 (For pimary CPU)/DDR3_P1_E0 (For secondary CPU)
Channel 2: DDR3_P0_B0 (For pimary CPU)/DDR3_P1_F0 (For secondary CPU)
Channel 3: DDR3_P0_C0 (For pimary CPU)/DDR3_P1_G0 (For secondary CPU)
Channel 4: DDR3_P0_D0 (For pimary CPU)/DDR3_P1_H0 (For secondary CPU)



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.

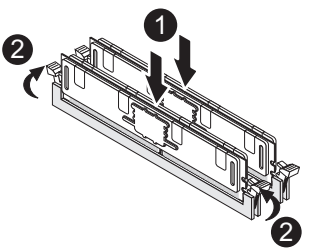
Installation Step:

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 operation, DIMMs must be installed in matched pairs.

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

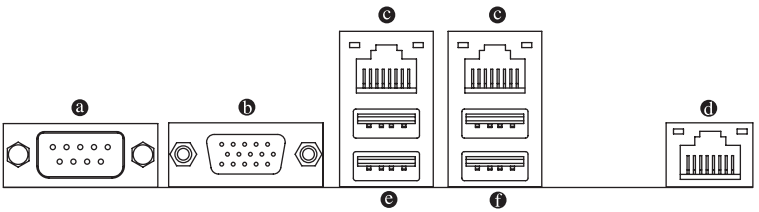


1-4-3 DIMM Population Table

	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 Video Port

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

c RJ-45 LAN Ports (Gigabit Ethernet LAN Ports)

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.

d KVM Server Management 10/100 LAN Port (Dedicated LAN Port)

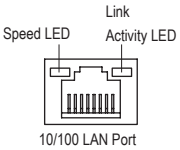
The LAN port provides Internet connection with data transfer speeds of 10/100Mbps. This port is the decated LAN port for server management.

e USB 3.0 Port

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

f 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.

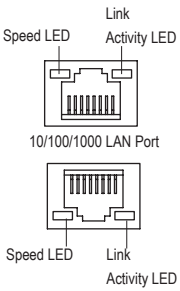


MLAN Speed LED:

State	Description
Green On	100 Mbps data rate
Green Blink	10 Mbps or 100 Mbps data rate
Off	10 Mbps data rate

Link/Activity LED:

State	Description
On	Link between system and network or no access
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring



LAN1/LAN2 Speed LED:

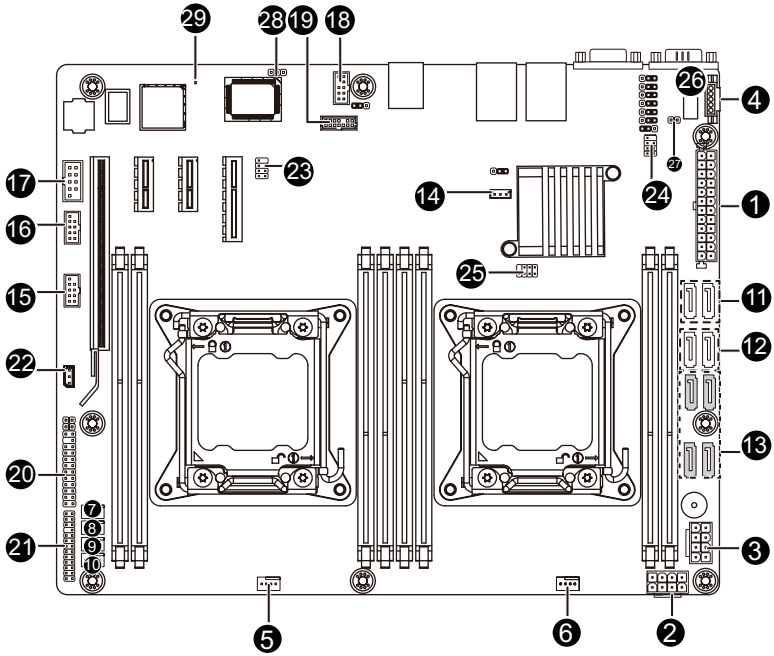
State	Description
Yellow On	1 Gbps data rate
Yellow Blink	Identify 1 Gbps data rate
Green On	100 Mbps data rate
Green Blink	Identify 100 Mbps data rate
Off	10 Mbps data rate

Link/Activity LED:

State	Description
On	Link between system and network or no access
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)	ATX1	16)	F_USB2_2
2)	P12V_PWR1	17)	COM2
3)	P12V_PWR2	18)	F_ADUIO
4)	PWR_DET1 (PMBus)	19)	TPM_1
5)	CPU0_FAN1 (for primary CPU)	20)	FP_1
6)	CPU1_FAN1 (for seconary CPU)	21)	BP_1
7)	SYS_FAN1 (System Fan)	22)	IPMB1
8)	SYS_FAN2 (System Fan)	23)	PS2_KB
9)	SYS_FAN3 (System Fan)	24)	SATA_SGPIO1
10)	SYS_FAN4 (System Fan)	25)	SATA_SGPIO2
11)	SATA0/1	26)	BAT
12)	SATA2/3	27)	JP1
13)	SAS0/1/2/3	28)	SPDIF_OUT
14)	SKU_KEY1	29)	BMC_LED1
15)	F_USB2_1		

Read the following guidelines before connecting external devices:

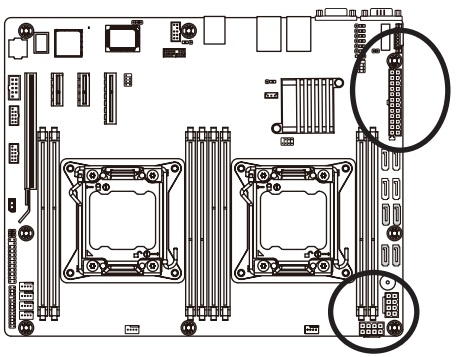
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the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

1/2/3) ATX1/P12V_AUX1/P12V_AUX2

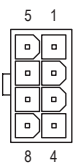
(2x4 12V Power Connector and 2x12 Main Power Connector)

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

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

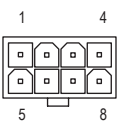


P12V_PWR1

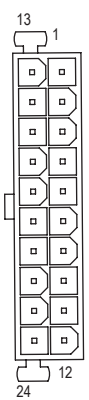


Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V

P12V_PWR2



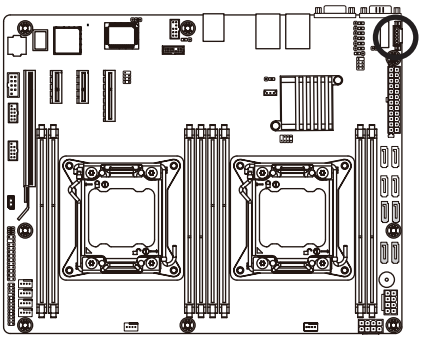
ATX1



ATX1

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

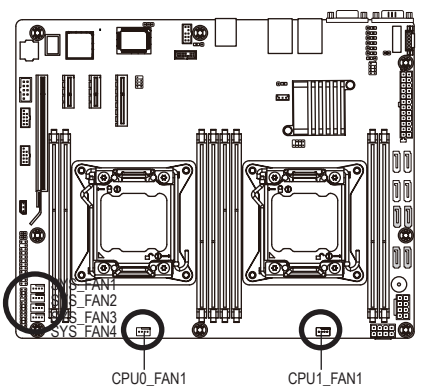
4) PWR_DET1 (PMBus connector)



Pin No.	Definition
1	SMB CLK
2	SMB DATA
3	SMB Alert
4	GND
5	3.3V Sense

5/6/7/8/9/10) CPU0_FAN1/CPU1_FAN1/SYS_FAN1/SYS_FAN2/SYS_FAN3/SYS_FAN4 (CPU Fan/System Fan Headers)

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

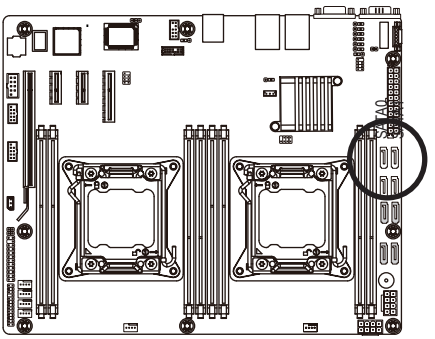


Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

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

11) SATA0/SATA1 (SATA 6Gb/s Connectors/SATA1 Supports SATA DOM Function)

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.
The SATA1 connector supports SATA DOM function.



Normal Mode:

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

SATA DOM Mode:

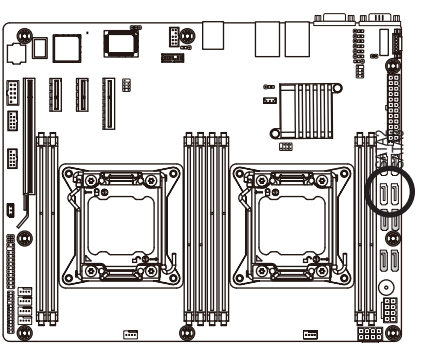
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	P5V

- 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.

12) SATA2/SATA3 (SATA 3Gb/s Connectors)

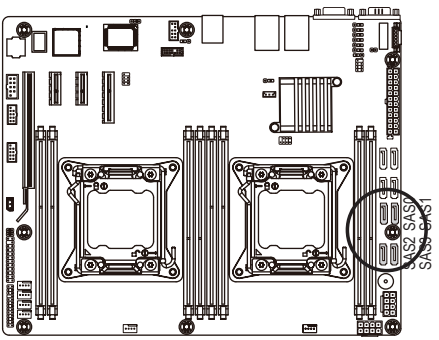
The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.



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

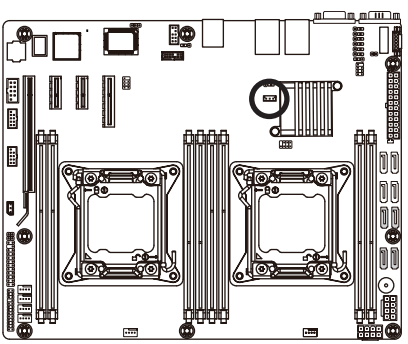
13) SAS0/SAS1/SAS2/SAS3 (SAS cable connectors)

The SAS connectors conform to SATA 3Gb/s standard. To support SAS function, it is required to connect the SKU Key on the SKY Key connector. Please refer to item 14 for the detail information for the SKU Key connector.



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

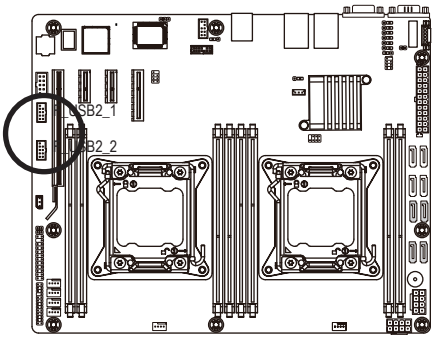
14) SKU_KEY1 (Intel C600 Series Upgrade Key)

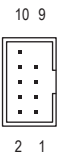


Pin No.	Definition
1	GND
2	FM_PBG_DYN_SKU_KEY
3	GND

15/16) F_USB2_1/F_USB2_2 (Front USB Headers)

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

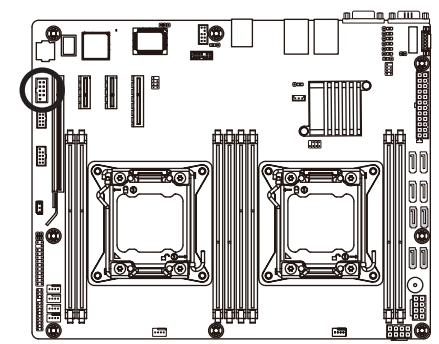


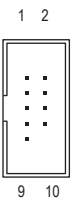


Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC

17) COM2 (Serial Port Headers)

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

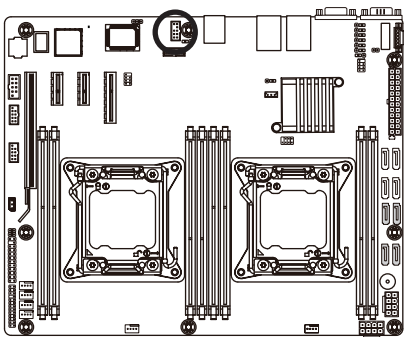




Pin No.	Definition
1	NDCD-
2	NDSR-
3	NSIN
4	NRTS-
5	NSOUT
6	NCTS-
7	NDTR-
8	NRI-
9	GND
10	No Pin

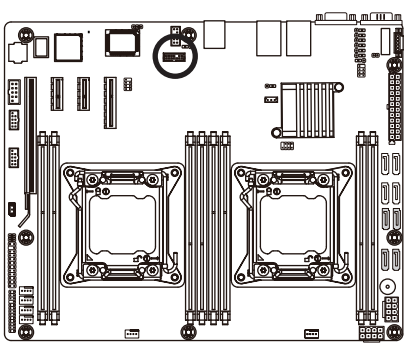
18) F_AUDIO (Front Panel Audio Header)

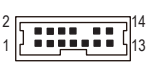
The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module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



Pin No.	Definition
1	MIC_L
2	GND
3	MIC_R
4	5V
5	LINE_R
6	MIC_Detect
7	GND
8	No Pin
9	LINE_L
10	LINE_Detect

19) TPM_1 (TPM Module Connector)

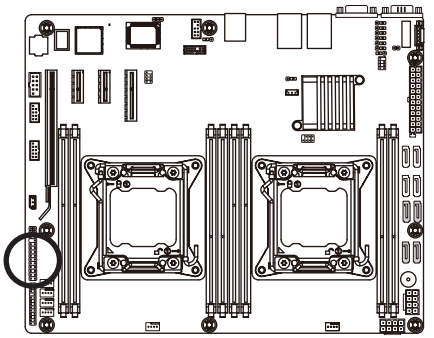




Pin No.	Definition
1	CLK_33M_TPM
2	P_3V3_AUX
3	LPC_RST_DEBUG
4	P3V3
5	LPC_LAD0
6	IRQ_SERIAL
7	LPC_LAD1
8	TPM_DET_N
9	LPC_LAD2
10	NC
11	LPC_LAD3
12	GND
13	LPC_FRAME_N
14	GND

20) FP_1 (Front Panel Headers)

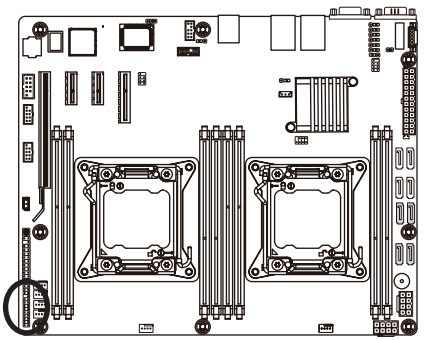
Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.



Pin No.	Signal Name	Definition
1	PWLED+	Power LED Signal anode (+)
2	5VSB	5V Stanndby Power
3	NC	No Pin
4	ID_LED+	ID LED Signal anode (+)
5	PWLED-	Power LED Signal cathode(-)
6	ID_LED-	ID LED Signal cathode(-)
7	HD+	Hard Disk LED Signal anode (+)
8	F_SYSRDY	System Front board LED Signal
9	HD-	Hard Disk LED Signal cathode(-)
10	SYS_STATUS-	System Status LED Signal cathode(-)
11	PWB+	Power Button Signal anode (+)
12	L1_ACT	LAN1 active LED Signal
13	PWB+_GND	Ground
14	L1_LINK-	LAN1 Link LED Signal cathode(-)
15	RST_BTN+	Reset button Signal anode (+)
16	SENSOR_SDA	SMBus Data Signal
17	RST_BTN_GND	Ground
18	SENSOR_SCL	SMBus Clock Signal
19	ID_SW+	ID Switch Signal anode (+)
20	CASE_OPEN-	Chassis intrusion Signal cathode(-)
21	ID_SW (GND)	Ground
22	L2_ACT	LAN2 active LED Signal
23	NMI_SW-	NMI switch Signal cathode(-)
24	L2_LINK-	LAN2 Link LED Signal cathode(-)

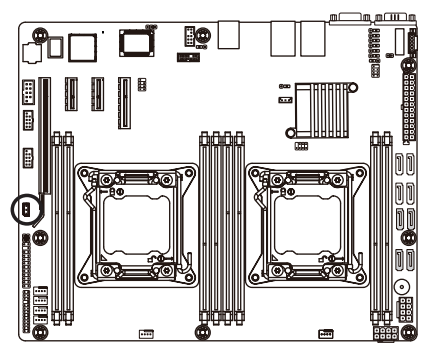
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

21) BP_1 (HDD Back Plane Board Hearders)



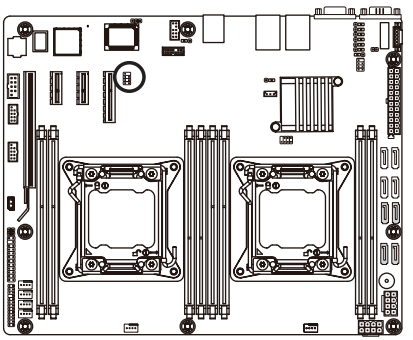
Pin No.	Definition
1	AST2300_SCGCLK
2	FM_THROTTLE_AND_N
3	AST2300_SGLD
4	IQO_FAN_12v_GATE_N
5	AST2300_SGDOUT
6	GND
7	KEY
8	RresetL_BRB
9	GND
10	BP_ALED_N
11	BP_LED_G_N
12	GND
13	AST2300_SGDIN
14	ASSESS#_LED_BPB
15	GND
16	SMB_BPB1_DATA
17	GND
18	SMB_BPB1_CLK
19	P_3V3_AUX
20	BP_HDD_TYPE
21	P_3V3_AUX
22	FAN_TYPE
23	GND
24	KEY
25	BP_PRESENSE
26	GND

22) IPMB1 (IPMB Connector)



Pin No.	Definition
1	SCL
2	GND
3	SDA

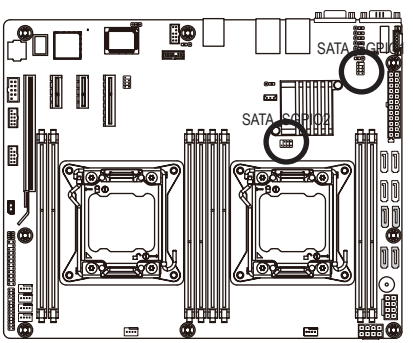
23) PS2_KS (PS/2 Keyboard and Mouse Header)

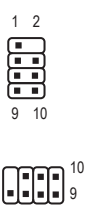


Pin No.	Definition
1	GND
2	No Pin
3	Mouse Clock
4	Keyboard Clock
5	Mouse Data
6	Keyboard Data
7	5V
8	5V

24/25) SATA_SGPIO1/SATA_SGPIO2 (SATA SGPIO Headers)

SGPIO stands for Serial General Purpose Input/Output which is a 4-signal (or 4-wire) bus used between a Host Bus Adapter (HBA) and a backplane. Out of the 4 signals, 3 are driven by the HBA and 1 is driven by the backplane. Typically, the HBA is a storage controller located inside a server, desktop, rack or workstation computer that interfaces with Hard disk drives (HDDs) to store and retrieve data.

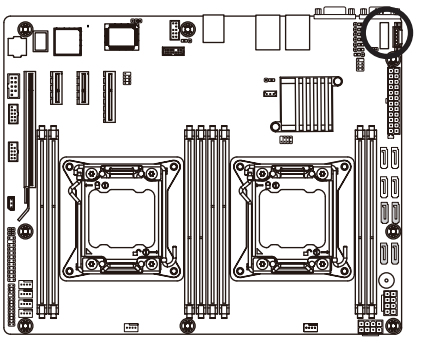


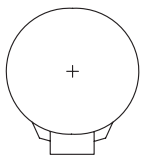


Pin No.	Definition
1	SGPIO_SATA_DATAIN
2	No Pin
3	SGPIO_SATA_DATAOUT
4	GND
5	GND
6	SGPIO_SATA_LOAD
7	NC
8	SGPIO_SATA_CLOCK

26) BAT (Battery)

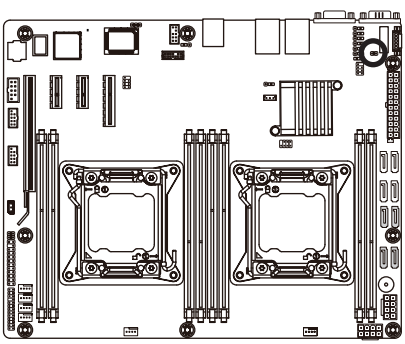
The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





- 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.

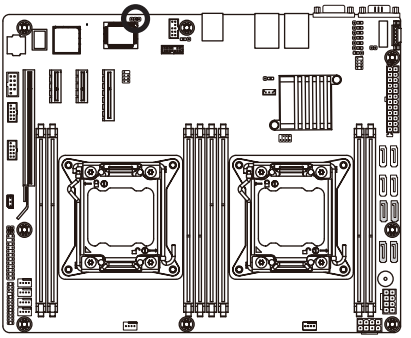
27) JP1 (Chassis intrusion Header)



Open: Normal operation (Default setting)

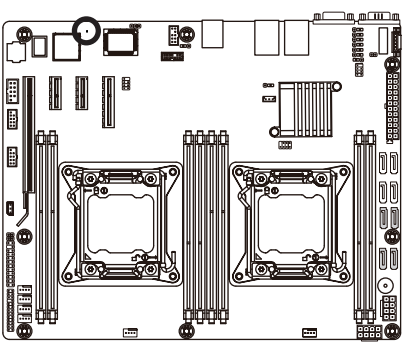
Closed: Enable chassis intrusion alter.

28) SPDIF_OUT (S/PDIF Out Header)



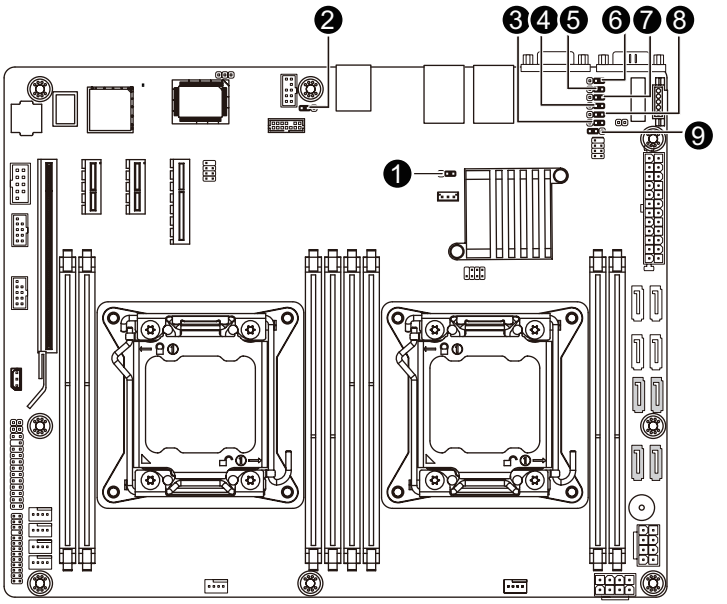
Pin No.	Definition
1	5V
2	SPDIF Out
3	GND

29) BMC_LED1 (BMC Firmware Readiness LED)



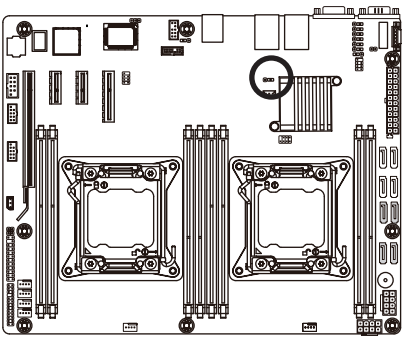
State	Description
On	BMC firmware is initial
Blinking	BMC firmware is ready
Off	System is powered off

1-7 Jumper Settings



1)	BIOS_WP1	6)	CLR_CMOS1
2)	FLASH_DP1	7)	SSB_ME1
3)	PMBUS_SEL1	8)	PASSWORD1
4)	S3_MASK	9)	BIOS_RVCR1
5)	BMC_FRB1		

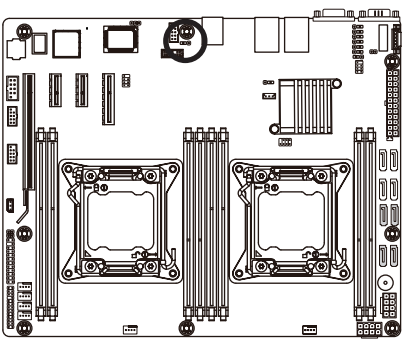
1) BIOS_WP1 (BIOS Write Protect Jumper)



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

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

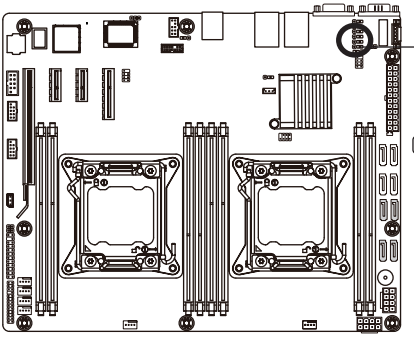
2) FLASH_DP1 (Flash Descriptor Security Jumper)



1 1-2 Close: Flash Descriptor Security Overridden.

1 2-3 Close: Flash Descriptor Security in effect.
(Default setting)

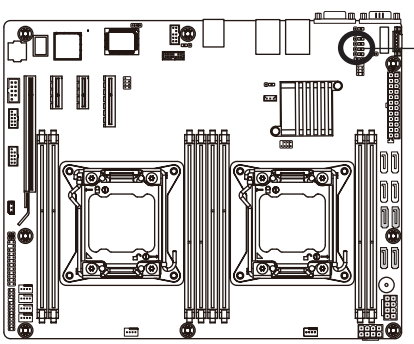
3) PMBUS_SEL1 (PMBus Power Select Jumper)



1-2 Close: PMBus connects to PCH.

2-3 Close: PMBus connects to BMC. (Default setting)

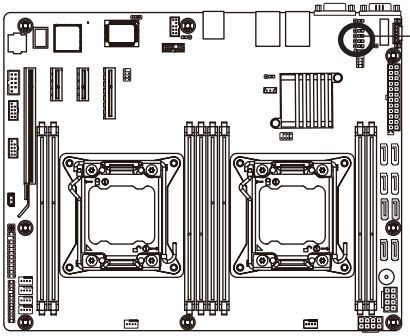
4) S3_MASK (S3 Power On Select Jumper)



1-2 Close: Stop an initial power on when BMC is not ready.

2-3 Close: Keep initial power on. (Default setting)

5) BMC_FRB1 (Force to Stop FRB1 Timer Jumper)

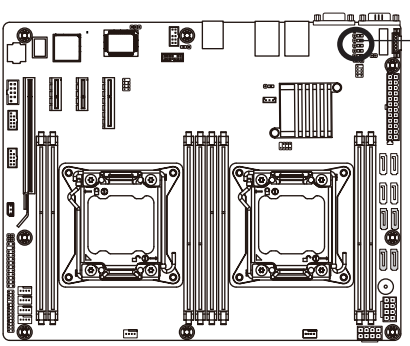


1-2 Close: Normal operation. (Default setting)

2-3 Close: Force to Stop FRB1 Timer.

6) 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.

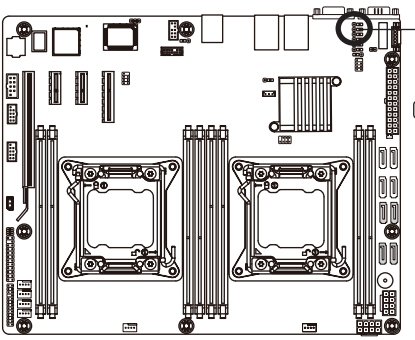


1-2 Close: Normal operation (Default setting)

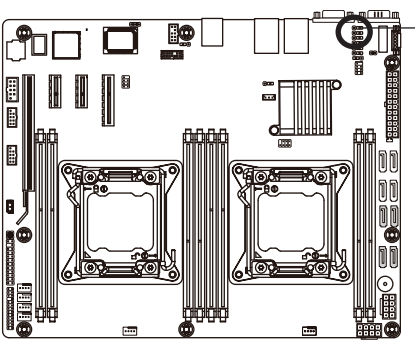
2-3 Close: Clear CMOS data.

- 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).

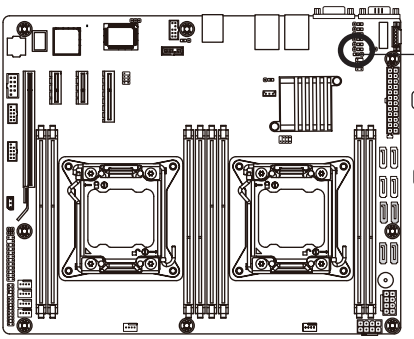
7) SSB_ME1 (ME enable/disable Jumper)



8) PASSWORD1 (Clearing Supervisor Password Jumper)



9) BIOS_RVCR1 (BIOS Recovery Jumper)



Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI 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 the screen
<↑><↓>	Move the selection bar to select an item
<Enter>	Execute command or enter the submenu
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<F1>	Show descriptions of general help
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program

- **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**
  This setup page includes all the submenu options for configuring the function of North Bridge and South Bridge.
  (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.
- **Server Management**
  Server additional features enabled/disabled setup menus.
- **Boot**
  This setup page provides items for configuration of boot sequence.
- **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.

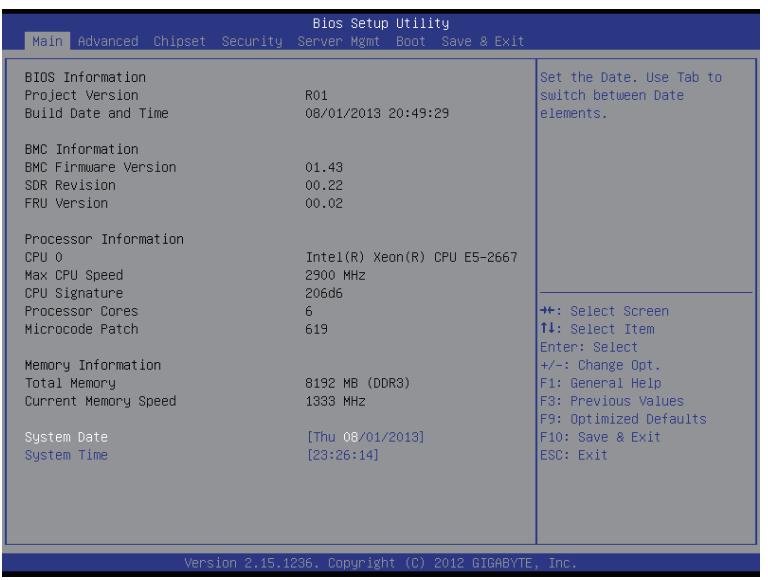
Main Menu Help

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.

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



☞ **BIOS Information**

☞ **Project Version**

Display version number of the project.

☞ **BIOS Build Date and Time**

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

☞ **BMC Information**

☞ **BMC Firmware Version**

Display version number of the Firmware setup utility.

☞ **SDR Reversion**

Display the SDR reversion information.

☞ **FRU Version**

Display the FRU reversion information.

☞ **Processor Information**

☞ **CPU Type/ Max CPU Speed/ CPU Signature / Processor Cores / Microcode Patch**

Displays the technical specifications for the installed processor.

☞ **Memory Information**

☞ **Total Memory / Current Memory Speed**

Displays the technical specifications for the installed memory.

☞ **System Date**

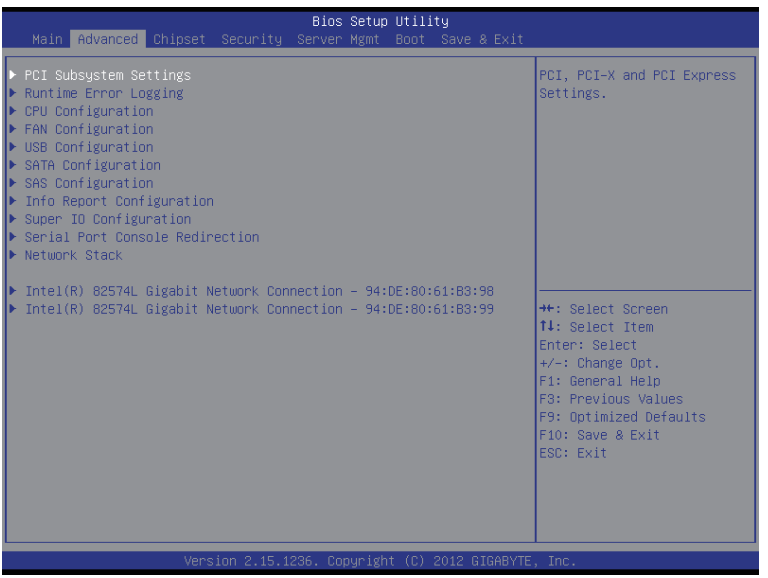
Set the date following the weekday-month-day- year format.

☞ **System Time**

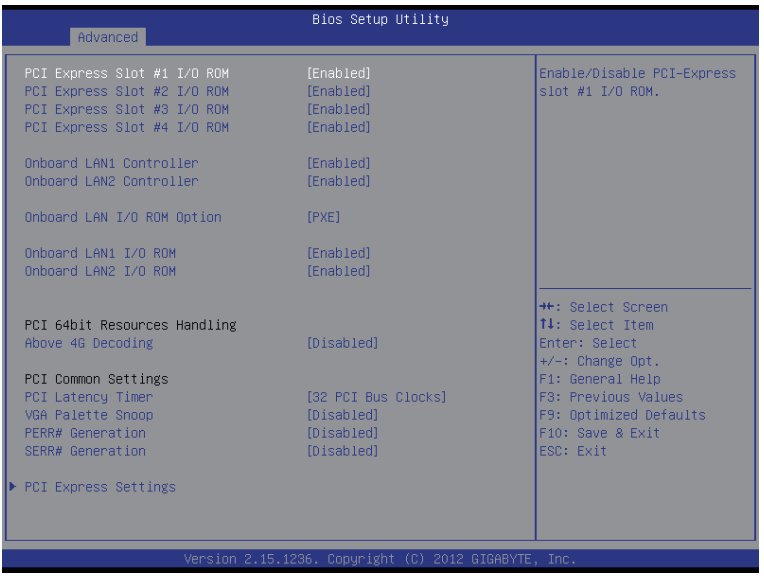
Set the system time following the hour-minute- second format.

2-2 Advanced Menu

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



2-2-1 PCI Subsystem Settings



☞ PCI Express Slot 1/2/3/4 I/O ROM

When enabled, This setting will initialize the device expansion ROM for the related PCI-E slot.

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

☞ Onboard LAN1/2 Controller

Enable/Disable Onboard LAN controllers.

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

☞ Onboard LAN I/O ROM Option

Configure onboard LAN devices and initialize device expansion ROM.

Options available: PXE/iSCSI. Default setting is **PXE**.

☞ Onboard LAN1/2 I/O ROM

Enable/Disable onboard LAN devices and initialize device expansion ROM.

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

☞ PCI 64bit Resources Handling

☞ Above 4G Decoding

Enable/Disable Above 4G Decoding.

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

☞ PCI Common Settings

☞ PCI Latency Timer

Configure PCI Latency Timer.

Options available: 32 PCI Bus Clocks/64 PCI Bus Clocks/96 PCI Bus Clocks/128 PCI Bus Clocks/160 PCI Bus Clocks/192 PCI Bus Clocks/224 PCI Bus Clocks/248 PCI Bus Clocks.

Default setting is **32 PCI Bus Clocks**.

☞ VGA Platte Snoop

Enable/Disable VGA Palette Tegisters Snooping.

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

☞ PERR Generation

When this item is set to enabled, PCI bus parity error (PERR) is generated and is routed to NMI.

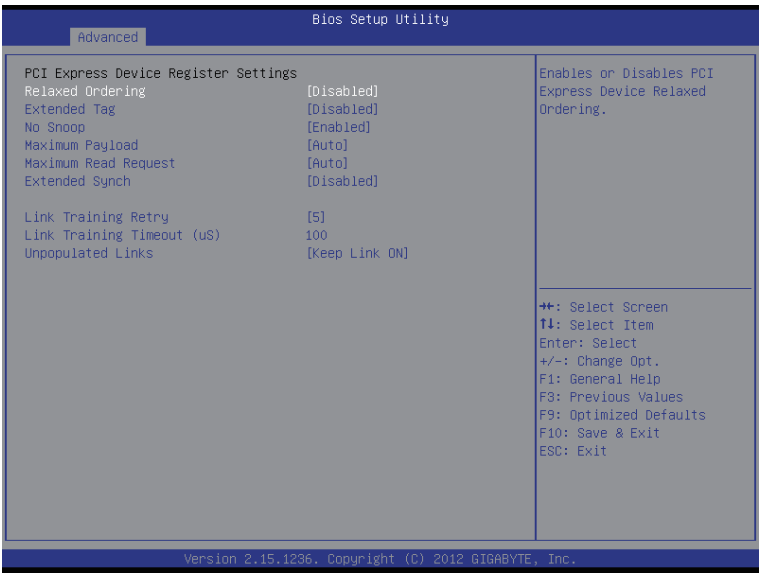
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ SERR Generation

When this item is set to enabled, PCI bus system error (SERR) is generated and is routed to NMI.

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

2-2-1-1 PCI Express Settings



☞ PCI Express Device Register Settings

☞ Relaxed Ordering

Enable/DIsable PCI Express Device Relaxed Ordering feature.

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

☞ Extended Tag

Wnen this feature is enabled, the system will allow device to use 8-bit Tag field as a requester.

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

☞ No Snoop

Enable/Disable PCI Express Device No Snoop option.

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

☞ Maximum Playload

Set maximum playlooad for PCI Express Device or allow system BIOS to select the value.

Options available: Auto/128 Bytes/256 Bytes/512 Bytes/1024 Bytes/2048 Bytes/4096 Bytes.

Default setting is **Auto**.

☞ Maximum Read Request

Set maximum Read Reuest size for PCI Express Device or allow system BIOS to select the value.

Options available: Auto/128 Bytes/256 Bytes/512 Bytes/1024 Bytes/2048 Bytes/4096 Bytes.

Default setting is **Auto**.

☞ Extended Synch

Wnen this feature is enabled, the system will allow generation of Extended Synchronization patterns.

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

☞ Link Training Retry

Define the number of Retry Attempts software wil take to retrain the link if previous training attempt was unsuccessful. Press <+> / <-> keys to increase or decrease the desired values.

☞ Link Training Timeout (us)

Define the number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Press <+> / <-> keys to increase or decrease the desired values. Value rang is from 10 to 10000 us.

☞ Unpopulated Links

When this item is set to 'Disable Link, the system will operate power save feature for those unpopulated PCI Express links.

Options available: Keep Link ON/ Disable. Default setting is **Keep Link ON**.

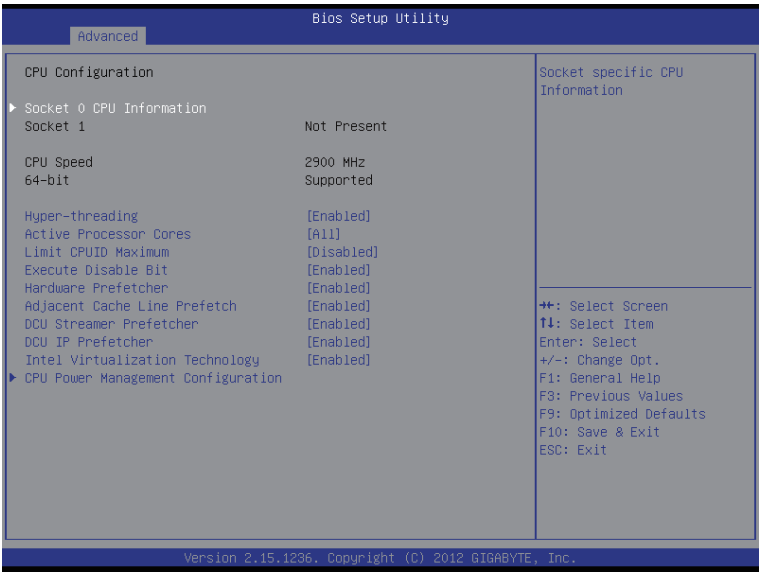
2-2-2 Runtime Error Logging

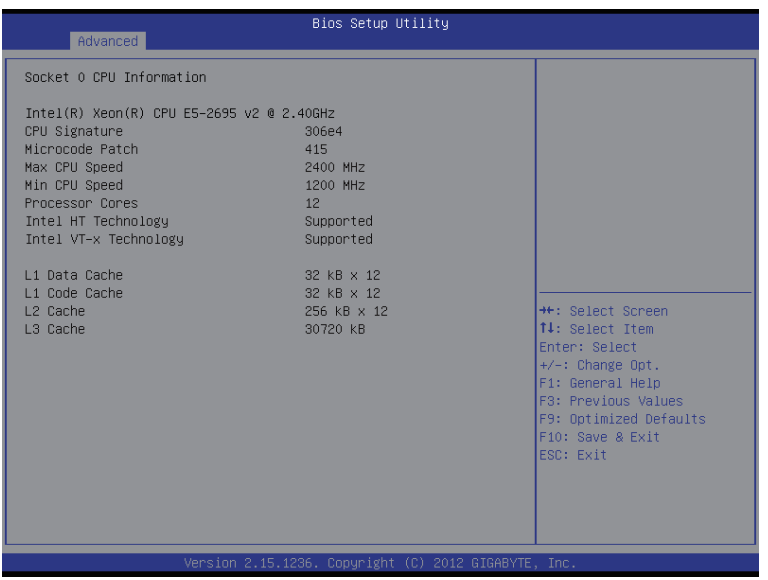
☞ **Runtime Error Logging**

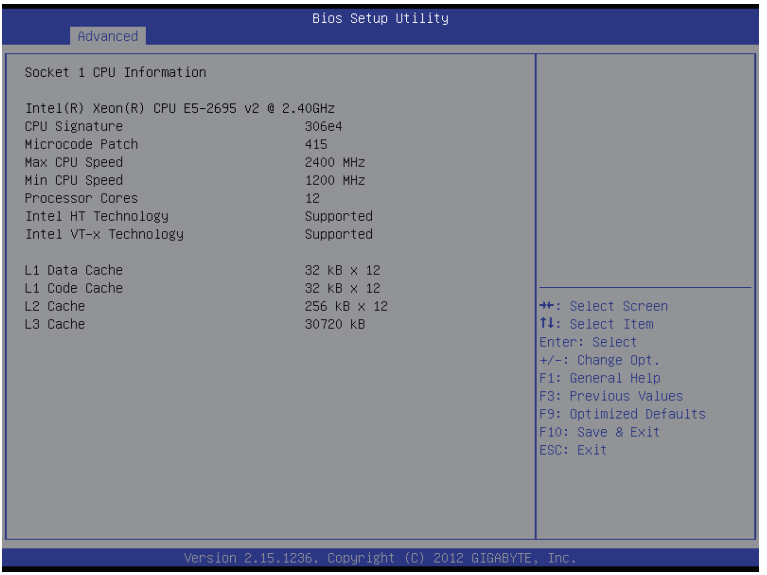
Enable/Disable Runtime error logging support.

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

2-2-3 CPU Configuration







- **CPU Information**
- **Socket 0/1 CPU Information**
- **CPU Type/ Signature / Microcode Patch / Max CPU Speed / Min CPU Speed / Processor Cores / Intel HT Technology / Intel VT-x Technology**

  Displays the technical specifications for the installed processor.
- **Intel HT Technology / Intel VT-x Technology**

  Displays the support information for the installed processor.
- **Cache Information**
- **L1 Data Cache / L1 Code Cache / L2 Cache / L3 Cache**

  Displays the technical specifications for the installed processor.
- **CPU Speed / 64-bit**

  Displays the technical specifications for the installed processor.
- **Hyper-threading** (Note)

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

  Options available: Enabled/Disabled. Default setting is **Enabled**.
- **Active Processor Cores** (Note)

(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.

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**.

☞ Hardware Prefetcher

Select whether to enable the speculative prefetch unit of the processor.

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

☞ Adjacent Cache Line Prefetch

When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched.

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

☞ DCU Streamer Prefetch

Enable prefetch of next L1 Data line based upon multiple loads in same cache line.

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

☞ DCU IP Prefetch

Enable prefetch of next L1 Data line based upon sequential load history.

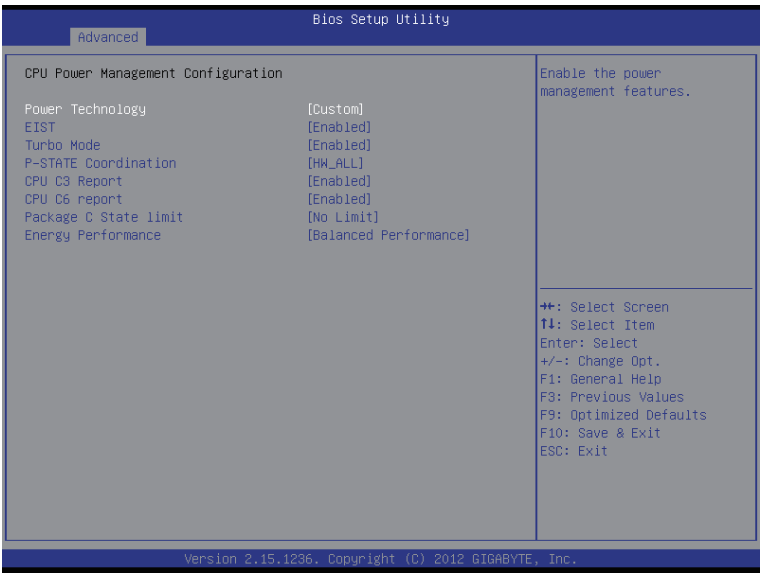
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ Intel Virtualization Technology

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

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

2-2-3-1 CPU Power Management Configuration



☞ CPU Power Management Configuration

☞ Power Technology

Configure the power management features.

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

☞ 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 item is enabled, tje processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance.

When this item is disabled, the processor will not overclock any of its core.

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

☞ P-STATE Coordination

In HW_ALL mode, the processor hardware is responsible for coordinating the P-state among logical processors dependencies. The OS is responsible for keeping the P-state request up to date on all logical processors.

In SW_ALL mode, the OS Power Manager is responsible for coordinating the P-state among logical processors with dependencies and must initiate the transition on all of those Logical Processors.

In SW_ANY mode, the OS Power Manager is responsible for coordinating the P-state among logical processors with dependencies and may initiate the transition on any of those Logical Processors.

Options available: HW_ALL/SW_ALL/SW_ANY. Default setting is **HW_ALL**.

☞ CPU C3/C6 Report (Note)

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

☞ Package C State Limit

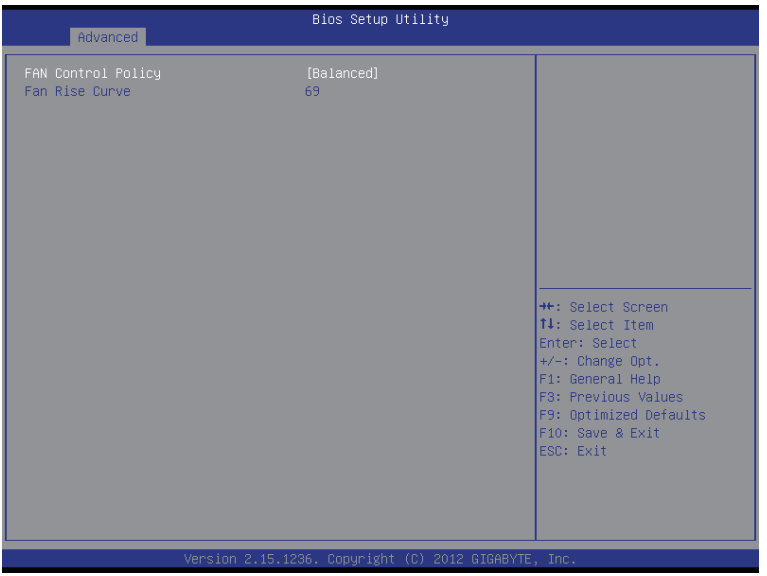
Configure state for the C-State package limit.
Options available: C0/C1/C6/C7/No Limit. Default setting is **No Limit**.

☞ Energy Performance

Energy Performance Bias is Intel CPU function.
The larger value in MSR_ENERGY_PERFORMANCE_BIAS register,
CPU will save more power but lose more performance.
Note: This register will be changed by OS too if OS support it like Windows 2008 or newer Linux.
Options available:
Performance : Write value 0 into MSR_ENERGY_PERFORMANCE_BIAS
Balanced Performance: Write value 7 into MSR_ENERGY_PERFORMANCE_BIAS
Balanced Energy: Write value 11 into MSR_ENERGY_PERFORMANCE_BIAS
Energy Efficient: Write value 15 into MSR_ENERGY_PERFORMANCE_BIAS
Default setting is **Performance**.

(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.

2-2-4 Fan Configuration



☞ Fan Contol Policy

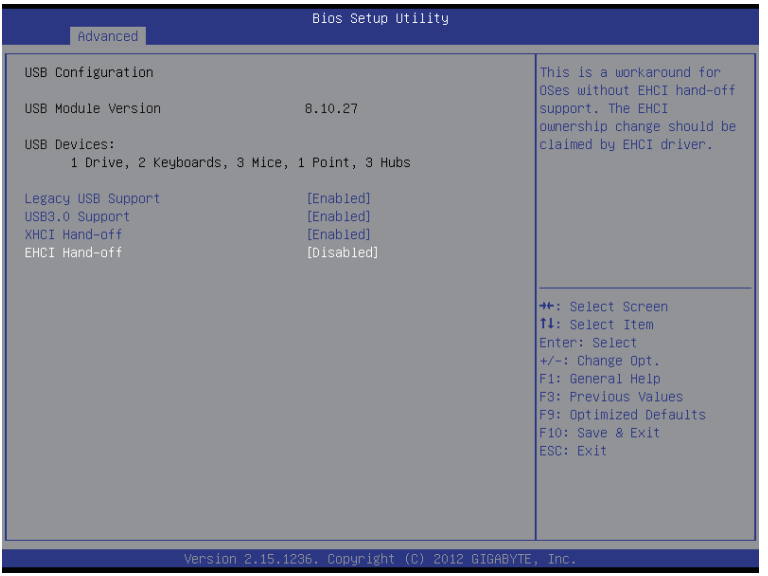
Define the fan policies.

Options available: Full Speed/Performance/Balanced/Quiet. Default setting is **Balanced**.

☞ Fan Rise Curve

Press <+> / <-> keys to increase or decrease the desired values.

2-2-5 USB Configuration



☞ **USB Configuration**

☞ **Legacy USB Support**

Enables or disables support for legacy USB devices.

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

☞ **USB3.0 Support**

Enables or disables onboard USB 3.0 devices.

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

☞ **XHCI Hand-off**

Enable/Disable EHCI (USB 3.0) Hand-off function.

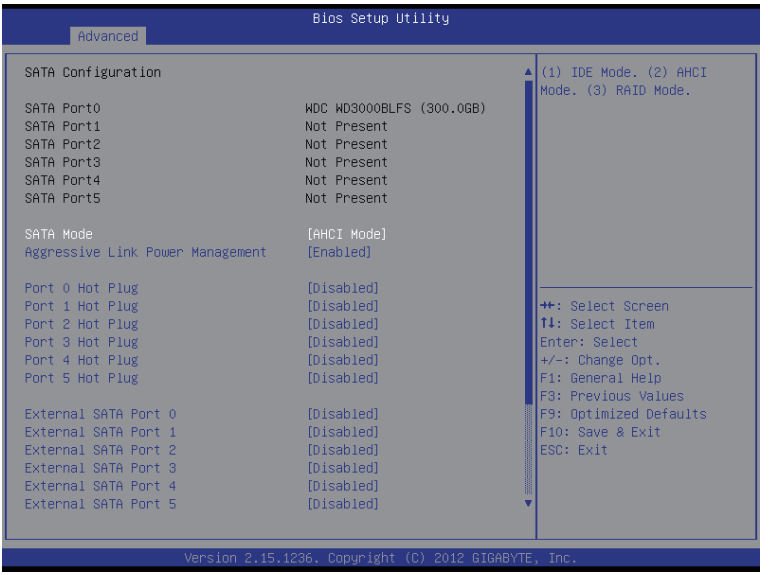
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **EHCI Hand-off**

Enable/Disable EHCI (USB 2.0) Hand-off function.

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

2-2-6 SATA Configuration



☞ **SATA Configuration**

☞ **SATA Port 0/1/2/3/4/5** (Note)

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

☞ **SATA Mode Selection**

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/Disabled. Default setting is **ACHI Mode**.

☞ **Aggressive Link Power Management**

Enable PCH to aggressively enter link power state.

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

☞ **Hot Plug (for Serial SATA Port 0/1/2/3/4/5)**

Enable/Disable Hot Plug support for Serial ATA Port 0/1/2/3/4/5.

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

☞ **External SATA (for Serial SATA Port 0/1/2/3/4/5)**

Enable/Disable External SATA support for Serial ATA Port 0/1/2/3/4/5.

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

☞ **SATA Device Type (for Serial SATA Port 0/1)**

Define the SATA Device for Serial ATA Port 0/1.

Options available: Hard Disk Drive/Solid State Drive. Default setting is **Disabled**.

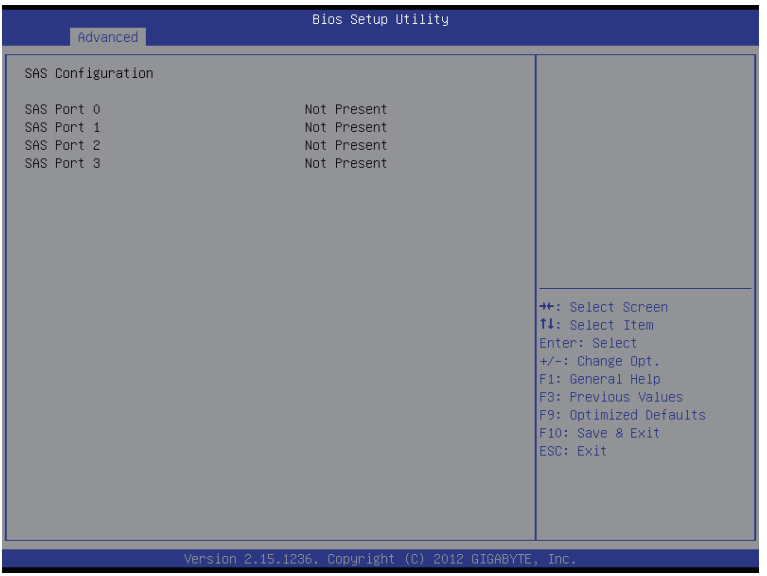
☞ **Straggered Spin Up (for Serial SATA Port 0/1/2/3/4/5)**

On an edge detect from 0 to 1, the PCH starts a COMreset initialization to the device.

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

(Note) This item is will not appear when the SATA mode is set ot RAID mode.

2-2-7 SAS Configuration



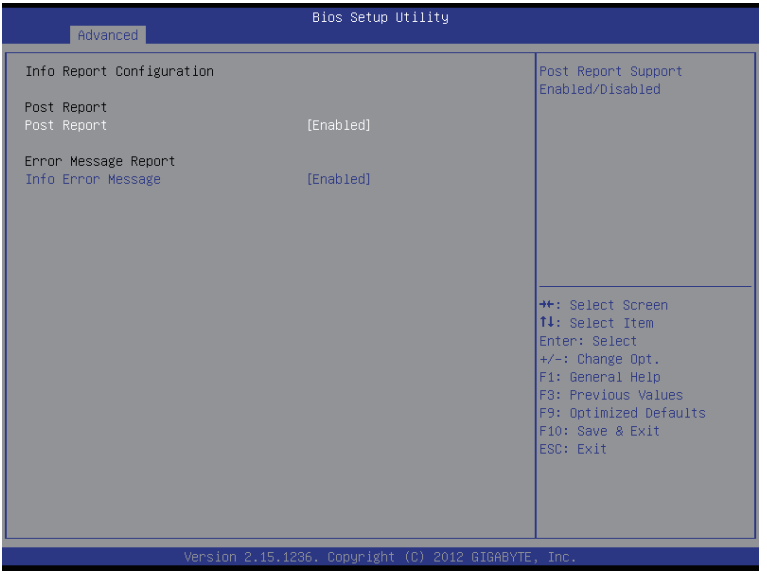
☞ **SAS Configuration**

☞ **SAS Port 0/1/2/3** (Note)

Press [Enter] to view the installed HDD devices.

(Note) The number of SATA and SAS devices depends of the PCH SKU.

2-2-8 Info Report Configuration



☞ **Info Report Configuration**

☞ **Post Report**

☞ **Post Report**

Enable/Disable Post Report support.

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

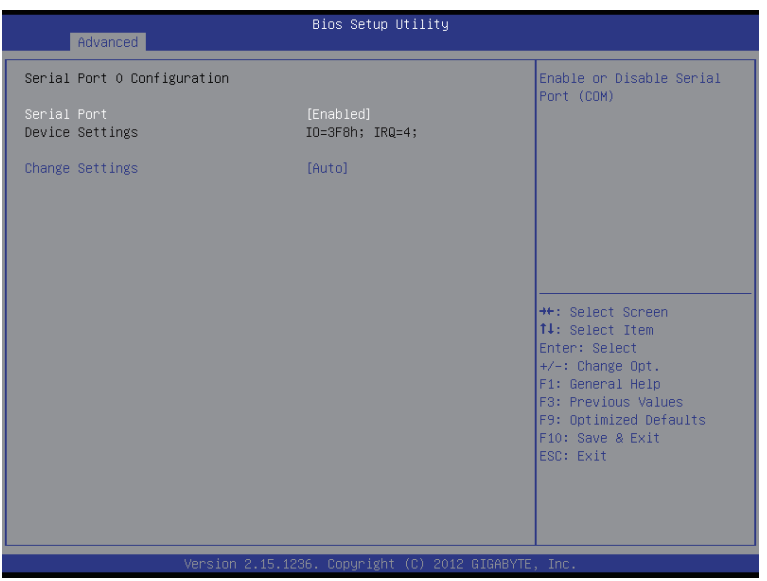
☞ **Error Message Report**

☞ **Info Error Message**

Enable/Disable Info Error Message support.

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

2-2-9 Super IO Configuration



Super IO Configuration

Super IO Chip

Display the model name of Super IO chipset.

Serial Port 0/1 Configuration

Serial Port

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

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

Device Settings

Displays the Serial Port base I/O address and IRQ.

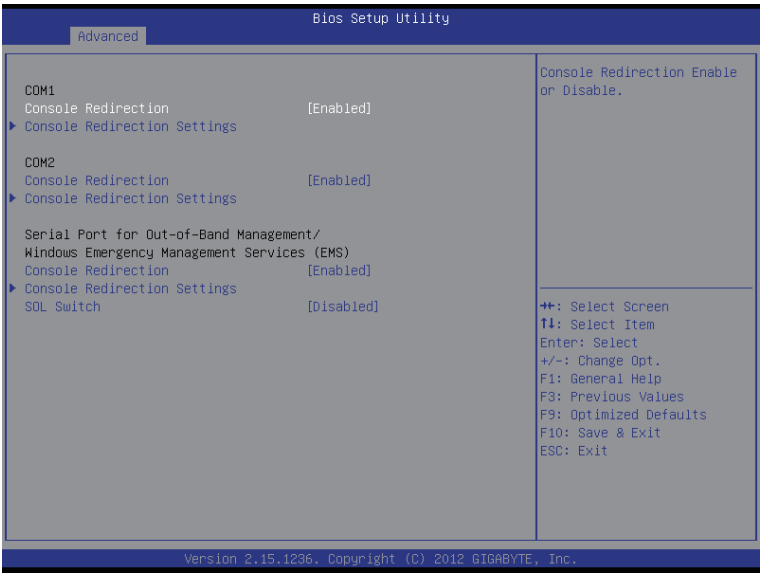
Change Settings

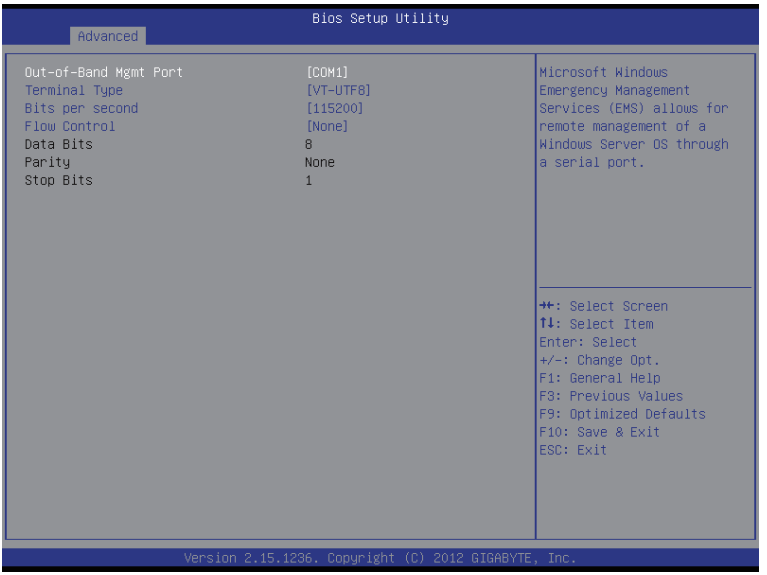
Change Serial Port 0/1 device settings. When set to Auto allows the server's BIOS or OS to select a configuration.

Options available for Serial Port 0: 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.

Options available for Serial Port 1: Auto/IO=3F8h; IRQ=3/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.

2-2-10 Serial Port Console Redirection





☞ **COM1/COM2/Serial Port for Out-of Band Management / Windows Emergency Management Service (EMS)**

☞ **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**

☞ **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.

☞ **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.

Options available: 7/8.

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

☞ **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.

☞ **VT-UTF8 Combo Key Support** (Note)

Enable/Disable VT-UTF8 Combo Key Support.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Recorder Mode** (Note)

When this mode enabled, only text will be send. This is to capture Terminal data.
Options available: Enabled/Disabled.

☞ **Resolution 100x31** (Note)

Enables or disables extended terminal resolution.
Options available: Enabled/Disabled.

☞ **Legacy OS Redirection Resolution** (Note)

On Legacy OS, the number of Rows and Columns supported redirection.
Options available: 80x24/80X25.

☞ **Putty KeyPad** (Note)

Select function FunctionKey and KeyPad on Putty.
Options available: VT100/LINUX/XTERMR6/SCO/ESCN/VT400.

☞ **Redirection After BIOS POST** (Note)

This option allows user to enable console redirection after O.S has loaded.
Options available: Always Enable/Boot Loader. Default setting is **Always Enable**.

☞ **Out-of-Bnad Mgmt Port**

Microsoft Windows Emerency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port.
Options available: COM1/COM2.

☞ **SOL Switch**

When enabled, COM1 Switch to AST2300 SOL UART.
When disabled, COM1 Switch to IT8728 SOL UART.
Options available: Enabled/Disabled. Default setting is **Disabled**.

(Note) The item is only available for COM1.

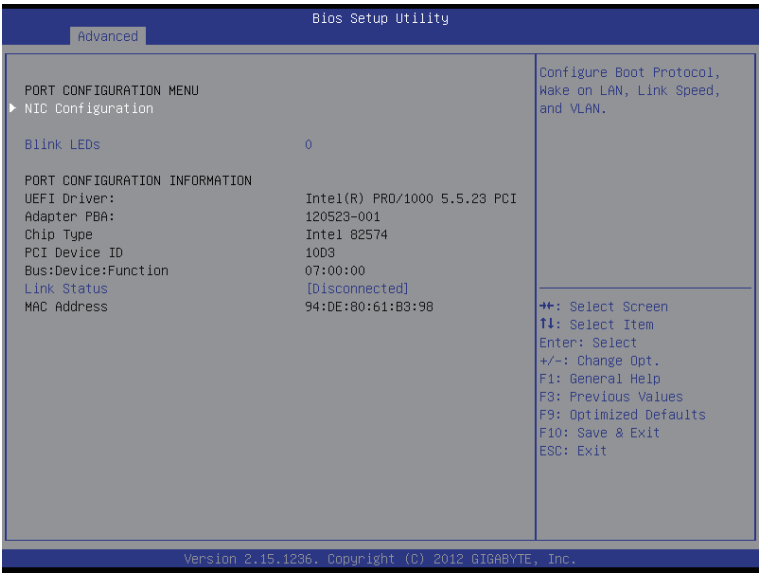
2-2-11 Network Stack

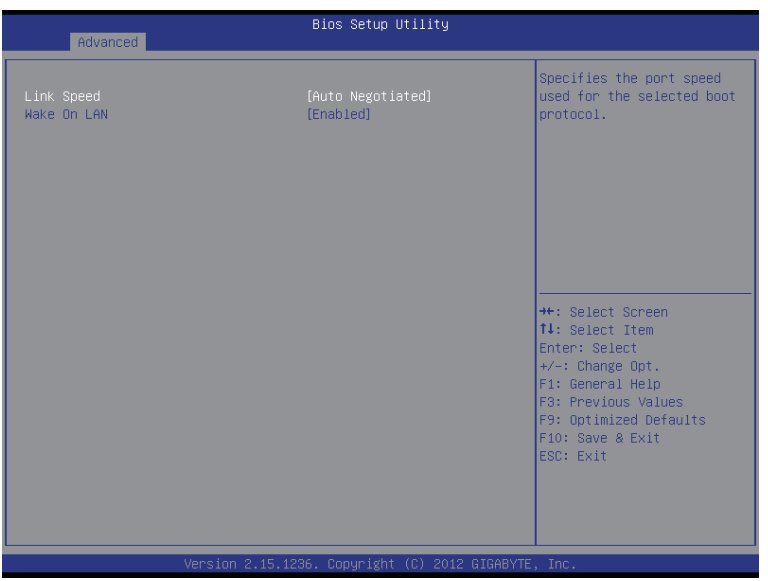
☞ **Network stack**

Enable/Disable UEFI network stack.

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

2-2-12 Intel (R) 82574L Gigabit Network Connection





☞ **PORT CONFIGURATION MENU**

☞ **NIC Configuration**

☞ **Link Speed**

Change link speed duplex for current port.

Options available: AutoNeg/10Mbps Half/10Mbps Half/10Mbps Half/100Mbps Full.

Default setting is **AutoNeg**.

☞ **Wake On LAN**

Enable/Disable Wake On LAN feature.

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

☞ **Blink LEDs (range 0-15 seconds)**

Blink LEDs for the specified duration (up to 15 seconds).

Press the numberic keys to input the desired value.

☞ **Link Status**

Display the link status.

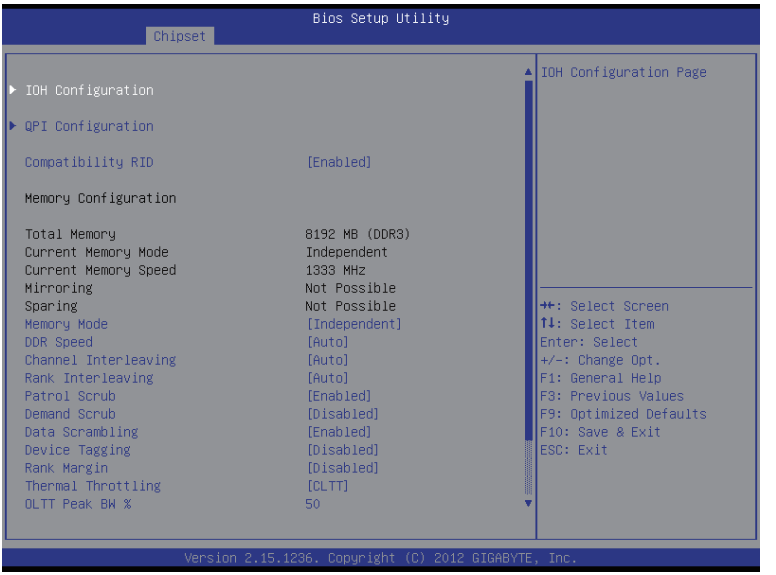
☞ **Factory MAC Address/Alternate MAC Address**

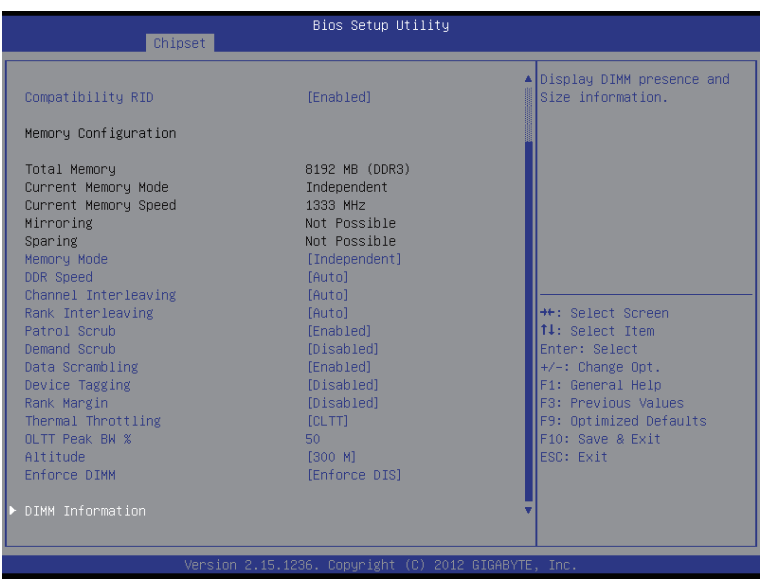
Display the Factory and Alternate MAC address information.

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





☞ **IOH Configuration**

Press [Enter] for configuration of advanced items.

☞ **QPI Configuration**

Press [Enter] for configuration of advanced items.

☞ **Compatibility RID**

Enable/Disable Compatibility RID function.

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

☞ **Memory Configuration**

☞ **Total Memory**

Displays the total capacity of the installed memory.

☞ **Current Memory Mode**

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

☞ **Current Memory Speed**

Displays the current memory speed.

☞ **Mirroring/Sparing**

Displays the current support memory mode.

☞ **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.

☞ **DDR Speed**

Configure the DDR Speed.

Options available: Auto/Force DDR3 800/Force DDR3 1066/Force DDR3 1333/Force DDR3 1600/Force DDR3 1866. Default setting is **Auto**.

☞ **Channel interleaving**

Configure DDR Channel Interleaving.

Options available: Auto/1 Way/2 Way/3 Way/4 Way. Default setting is **Auto**.

☞ **Rank interleaving**

Configure DDR Rank Interleaving. This improves memory performance by masking the refresh cycles of each memory bank. The Rank Interleaving works between different physical banks.

Options available: Auto/1 Way/2 Way/3 Way/4 Way. Default setting is **Auto**.

☞ **Patrol Scrub**

Enable/Disable Patrol Scrub function.

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

☞ **Demand Scrub**

Enable/Disable Demand Scrub function.

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

☞ Data Scrambling

Enable/Disable Data Scrambling function.

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

☞ Device Tagging

Enable/Disable Device Tagging function.

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

☞ Rank Margin

Enable/Disable Rank Margin function.

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

☞ Thermal Thortting

Configure theThermal Thortting.

Options available: Disabled/OLTT/CLTT. Default setting is **CLTT**.

☞ OLTT Peak BW %

Press the numberic keys to increase or decrease the desired values.

☞ Altitude

Configure the Altitude value.

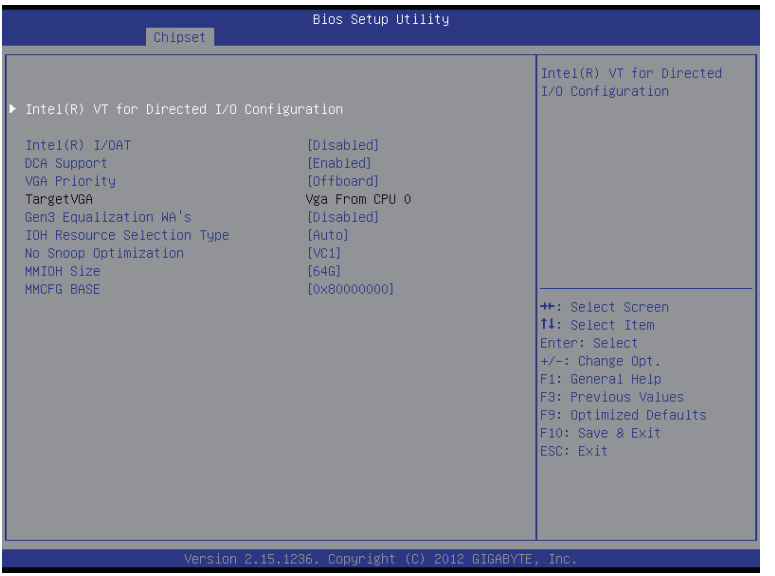
Options available: Auto/300 M/900 M/1500 M/3000 M. Default setting is **3000 M**.

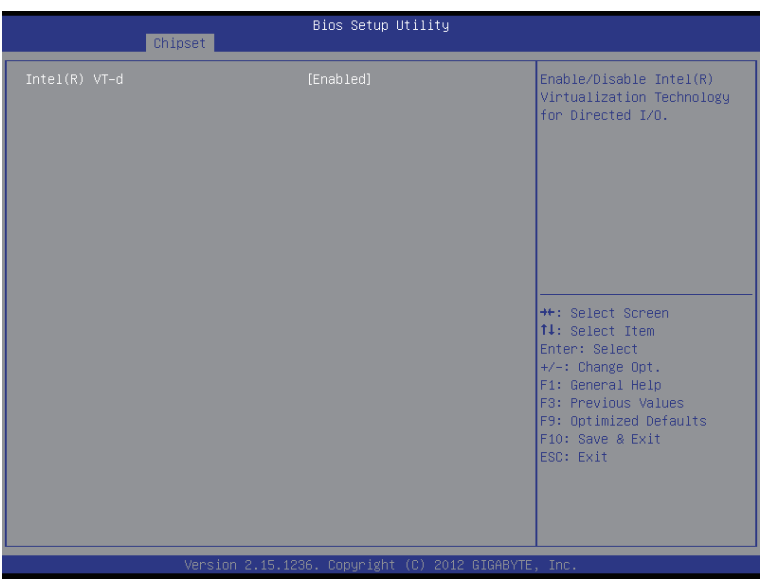
☞ Enforce DIMM

To enforce POR function. When disabled, the system will enforce 1600MHz LRDIMM.

Options available: Enforce EN/Stretch EN/Enforce DIS. Default setting is **Enforce DIS**.

2-3-1-1 IOH Configuration





☞ **IOH Configuration**

☞ **Intel(R) VT for Directed I/O Configuration**

Press [Enter] for configuration of advanced items.

☞ **Intel(R) I/OAT (Intel I/O Acceleration Technology)**

Enable/Disable Intel I/OAT function.

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

☞ **DCA Support (Direct Cache Access)**

Enable/Disable Intel DCA Support function.

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

☞ **VGA Priority**

Define the display device priority.

Options available: Onboard/Offboard. Default setting is **Offboard**.

☞ **TargetVGA**

Display the Target VGA support informaiton.

☞ **Gen3 Equalization WA's**

Enable/DIsable the support for Gen3 Equalization Workaround.

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

☞ **IOH Resource Seletion Type**

Configure IOH Resource Seletion Type.

Options available: Auto/Manual. Default setting is **Auto**.

☞ **No Snoop Optimization**

Options VC0/VCP/VC1. Default setting is **VC1**.

☞ **MMCFG Size (Size of the Memory Mapped Configuration Space)**

Options available: 1G/2G/4G/8G/16G/32G/64G. Default setting is **64G**.

☞ **MMCFGBASE (Base address of the Memory Mapped Configuration Space)**

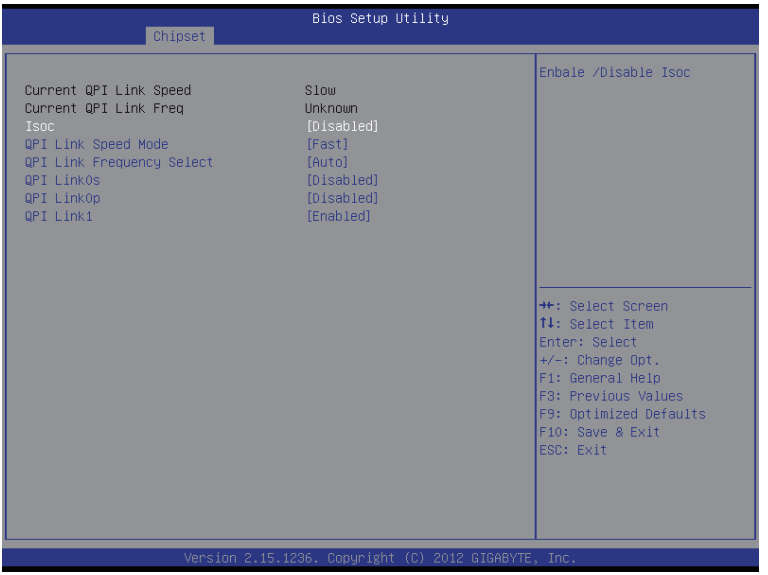
Options available: 0x80000000/0xA0000000/0xC0000000/0x40000000. Default setting is **0x80000000**.

☞ **Intel(R) VT-d**

Enable/Disable Intel VT-d Technology function.

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

2-3-1-2 QPI Configuration



☞ **Current QPI Link Speed/ Current QPI Link Freq**

Displays the current QPI Link Speed and Frequency information.

☞ **Isoc**

Enable/Disable Isoc.

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

☞ **QPI Link Speed Mode**

Configure QPI Link Speed mode.

Options available: Fast/Slow. Default setting is **Fast**.

☞ **QPI Link Frequency Select**

Configure QPI Link Frequency.

Options available: Auto/6.4 GT/s7.2 GT/s/8.6 GT/s. Default setting is **Auto**.

☞ **QPI Link0s**

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

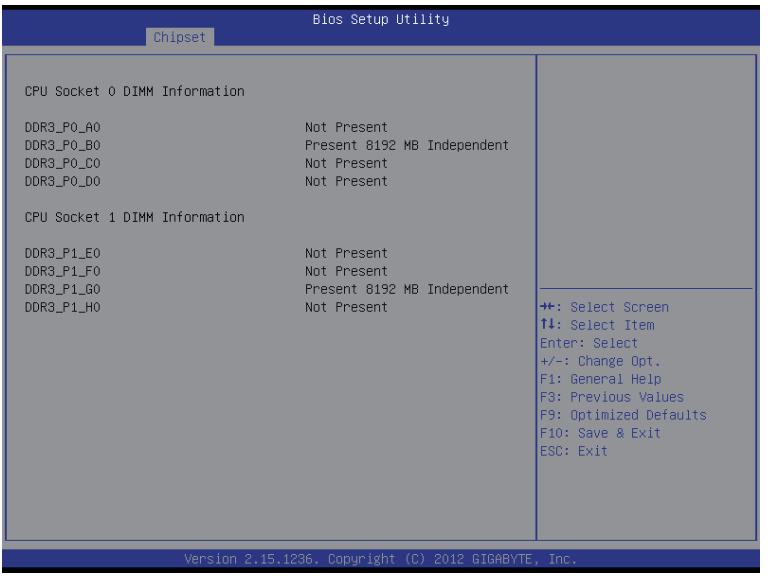
☞ **QPI Link0p**

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

☞ **QPI Link1**

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

2-3-1-3 DIMM Information

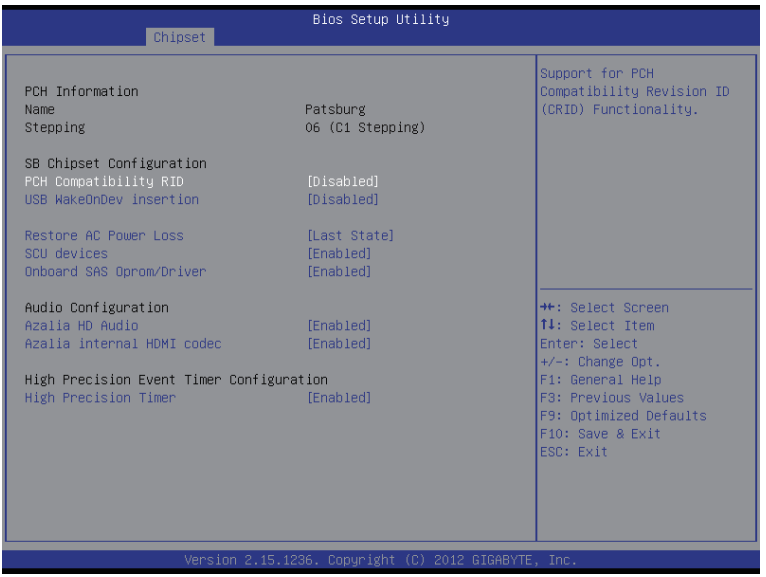


- **CPU Socket 0/1 DIMM Information**
- **CPU Socket 0:**
- **DDR3_P0_A0/DDR3_P0_B0/DDR3_P0_C0/DDR3_P0_D0 Status**

  The size of memory installed on each of the DDR3 slots.
- **CPU Socket 1:**
- **DDR3_P1_E0/ DDR3_P1_F0/ DDR3_P1_G0/DDR3_P1_H0Status**

  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.

☞ **SB Chipset Configuration**

☞ **PCH Compatibility RID**

Enable/Disable PCH Compatibility RID support.

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

☞ **USB WakeOnDev insertion**

Enable/Disable USB Device WakeOn support.

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

☞ **Restore on AC Power Loss** (Note)

Defines the power state to resume to after a system 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.

☞ **SCU Devices**

Enable/Disable Patsburg SCU device.

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

☞ **Onboard SAS oprom**

Enable/Disable onboard SAS option ROM.

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

(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

☞ **Audio Configuration**

☞ **Azalia HD Audio**

Enable/Disable onboard HD aduio device.

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

☞ **Azalia internal HDMI codec**

Enable/Disable onboard HDMI codec support.

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

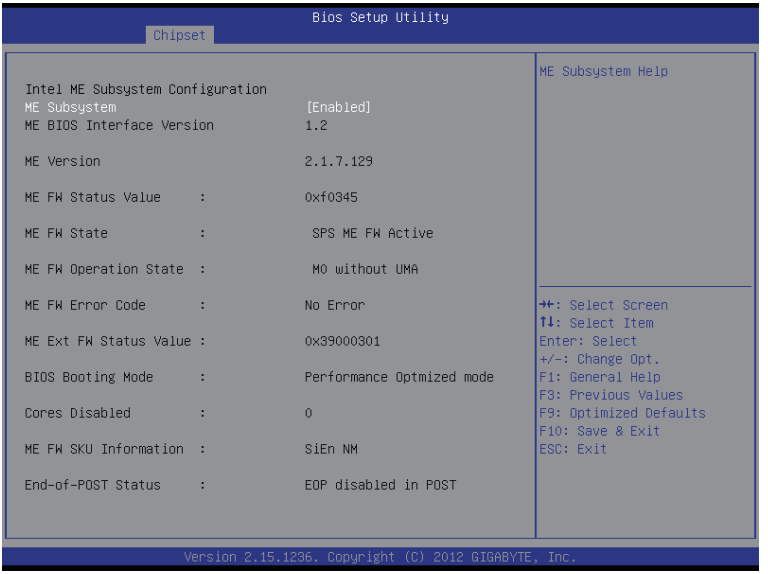
☞ **High Precision Event Timer Configuration**

☞ **High Precision Event Timer**

Enable/Disable High Precision Event Timer.

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

2-3-3 Intel 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**

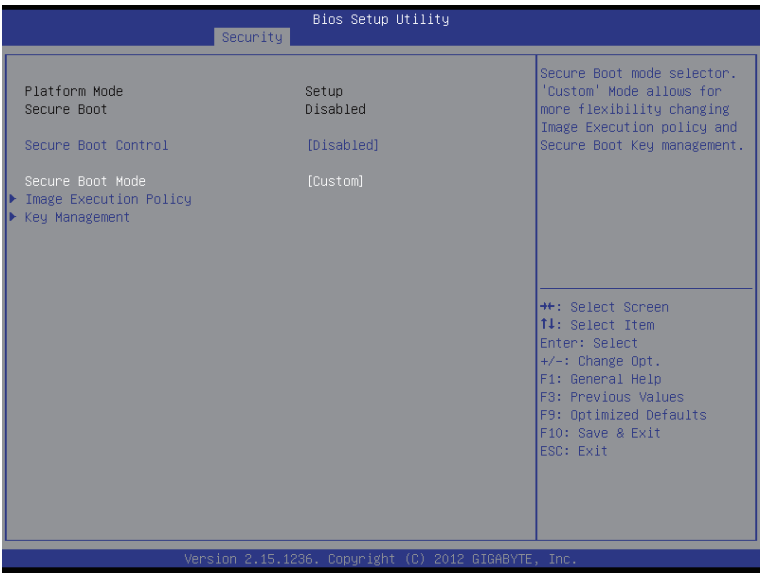
Press Enter to configure the Administrator password.

☞ **User Password**

Press Enter to configure the user password.

2-4-1 Secure Boot menu (Optional)

The Secure Boot Menu is applicable when your device is installed the Windows® 8 operatin system.



☞ **Secure Boot menu**

☞ **Platform Mode**

Display the System Platform Mode State.

☞ **Secure Boot**

Display the status of Secure Boot.

☞ **Secure Boot Control**

Enable/Disable Secure Boot function.

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

☞ **Secure Boot Mode** (Note)

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.

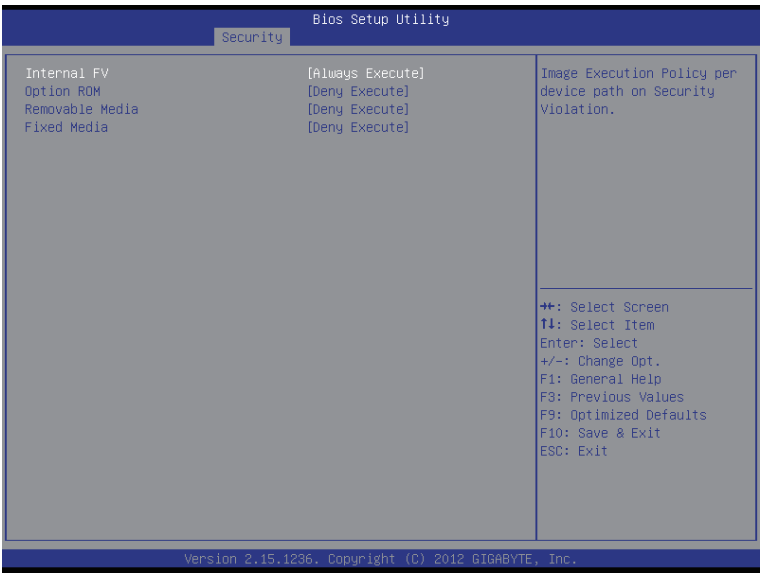
When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases.

When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database.

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

(Note) Image Execution Policy and Key Management are configurable when this item is set to **Custom**.

2-4-1-1 Image Execution Policy



☞ **Image Execution Policy**

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

☞ **Image Execution policy**

☞ **Internal FV**

Image Execution Policy per device path on Security Violation.

Options available: Always Execute. Default setting is **Always Execute**.

☞ **Option ROM**

Image Execution Policy per device path on Security Violation.

Options available: Always Execute/Always Deny/Allow Execute/Defer Execute/ Deny Execute/ Query User. Default setting is **Deny Execute**.

☞ **Removable Media**

Image Execution Policy per device path on Security Violation.

Options available: Always Execute/Always Deny/Allow Execute/Defer Execute/ Deny Execute/ Query User. Default setting is **Deny Execute**.

☞ **Fixed Media**

2-4-1-2 Key Management

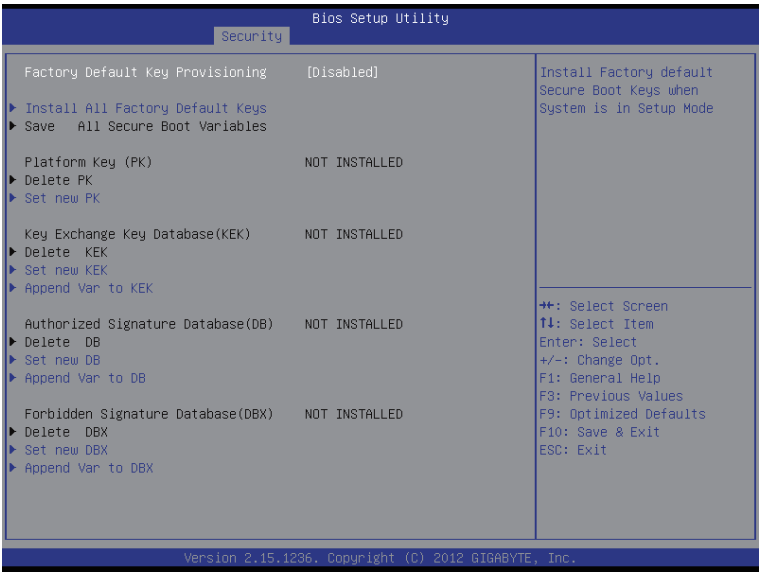


Image Execution Policy per device path on Security Violation.

Options available: Always Execute/Always Deny/Allow Execute/Defer Execute/ Deny Execute/ Query User. Default setting is **Deny Execute**.

☞ Key Management

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

☞ Factory Default Key Provisioning

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

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

☞ Install All Factory Default Keys

Press [Enter] to install all Factory Default Keys.

☞ Save All Factory Variables

Press [Enter] to save all Factory Variables.

☞ Platform Key (PK)

Display the status of Platform Key.

☞ Delete the PK

Press [Enter] to delete the existed PK. Once the PK is deleted, all the system's Secure Boot keys will not be activated.

☞ Set new PK

Press [Enter] to configure a new PK.

☞ **Key Exchange Key Database (KEK)**

Display the status of Platform Key.

☞ **Delete KEK**

Press [Enter] to delete the KEK from your system.

☞ **Set new KEK**

Press [Enter] to configure a new KEK.

☞ **Append Var to KEK**

Press [Enter] to load additional KEK from a storage devices for an additional db and dbx management.

☞ **Authorized Signature Database (DB)**

Display the status of Authorized Signature Database.

☞ **Delete DB**

Press [Enter] to delete the db from your system.

☞ **Set new DB**

Press [Enter] to configure a new db.

☞ **Append Var to DB**

Press [Enter] to load additional db from a storage devices.

☞ **Forbidden Signature Database (DBX)**

Display the status of Forbidden Signature Database.

☞ **Delete the DBX**

Press [Enter] to delete the dbx from your system.

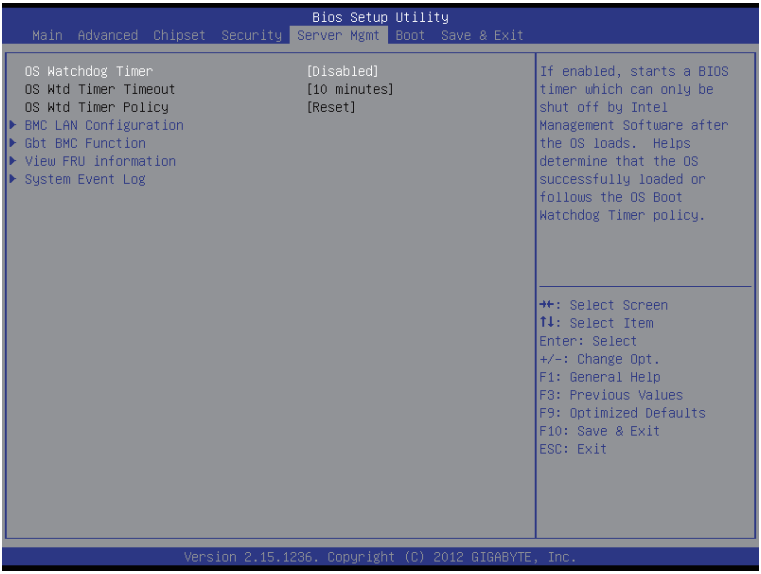
☞ **Set DBX from File**

Press [Enter] to configure a new dbx.

☞ **Append Var to DBX**

Press [Enter] to load additional db from a storage devices.

2-5 Server Management Menu



☞ OS Watchdog Timer

Enable/Disable OS Watchdog Timer function.

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

☞ OS Wtd Timer Timeout

Configure OS Watchdog Timer.

Options available: 5 minutes/10 minutes/15 minutes/20 minutes. Default setting is **10 minutes**.

☞ OS Wtd Timer Policy

Configure OS Watchdog Timer Policy.

Options available: Reset/Do Nothing/Power Down. Default setting is **Reset**.

☞ BMC LAN Configuration

BMC LAN Configuration. Press Enter to access the related submenu.

☞ Gbt BMC Function

BMC related function configuration.Press Enter to access the related submenu.

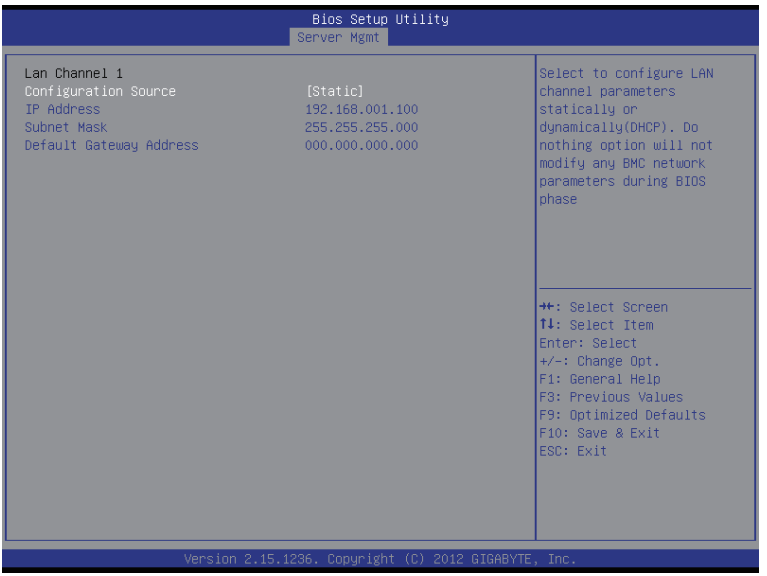
☞ View FRU information

The FRU information submenu is a simple display page for basic system ID information, as well as system product information. Items on this window are non-configurable.

☞ System Event Log

Displays Event Log advanced settings. Press Enter to access the related submenu.

2-5-1 BMC LAN Configuration



☞ **Lan Channel 1**

☞ **Configuration Source**

Select to configure LAN channel parameters statically or dynamically (DHCP). Do nothing option willnot modify any BMC network parameters during BIOS phase.

Options available: Static/Dynamic/Do Nothing.

☞ **IP Address**

Display IP Address information.

☞ **Subnet Mask**

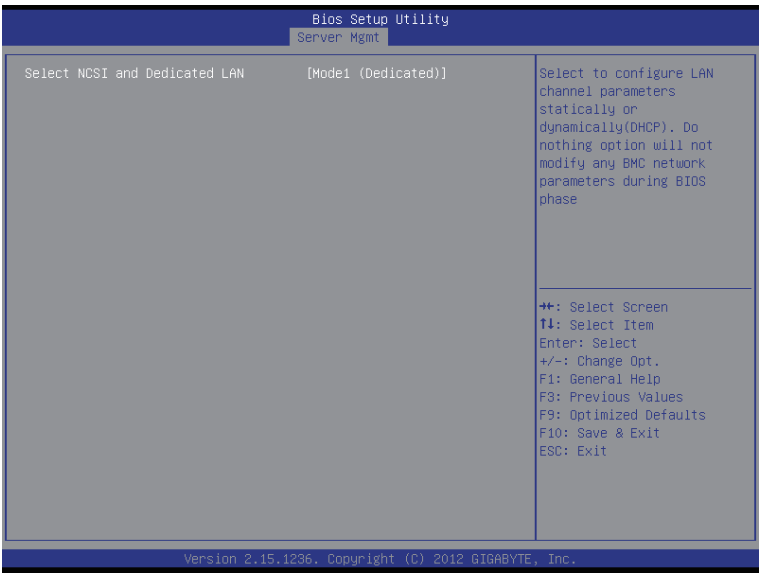
Display Subnet Mask information.

Please note that the IP address must be in three digitals, for example, 192.168.000.001.

☞ **Default Gateway Address**

Display Default Gateway Address information.

2-5-2 Gbt BMC Function



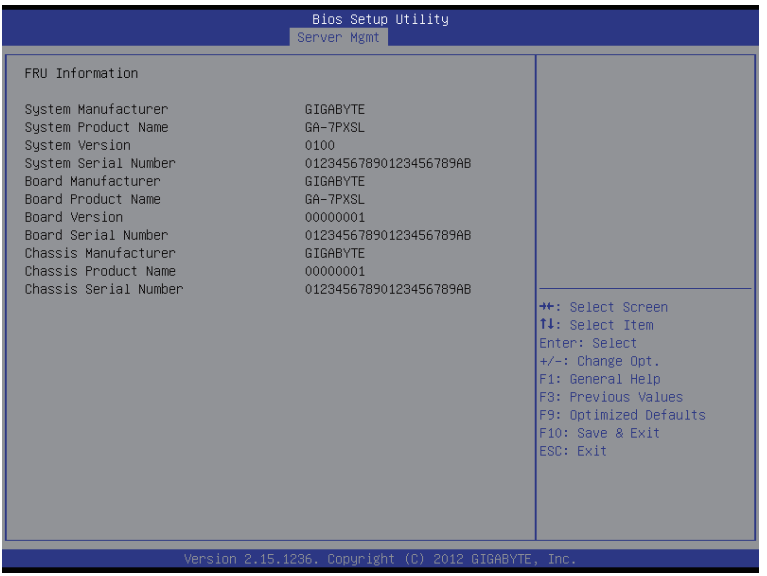
☞ Select NCSI and Dedicated LAN

Switch NCSI and dedicated LAN and send KCS command.

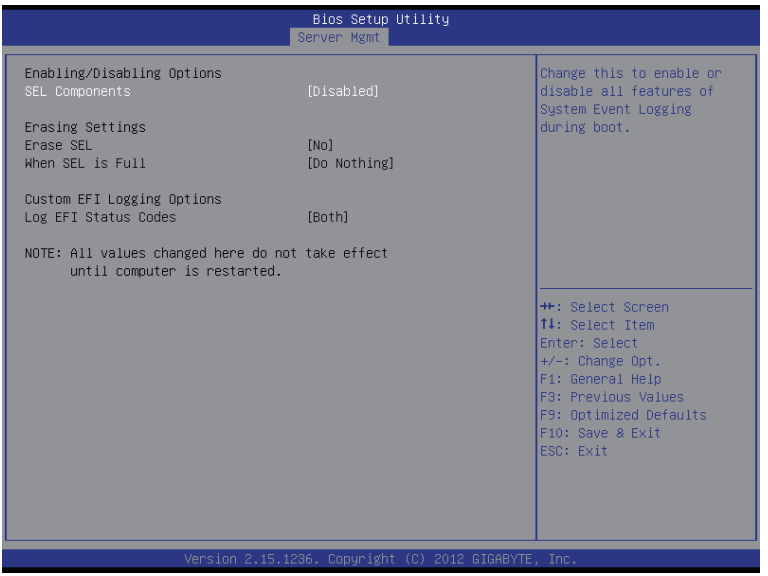
Options available: Mode2(NSCI)/ Mode1 (Dedicated). Default setting is **Mode1 (Dedicated)**.

2-5-3 View FRU Information

The System Management submenu is a simple display page for basic system ID information, as well as System product information. Items on this window are non-configurable.



2-5-4 System Event Log



☞ Enabling/Disabling Options

☞ SEL Components

Change this to enable or disable all features of System Event Logging during boot.

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

☞ Erasing Settings

☞ Erasing SEL

Choose options for erasing SEL.

Options available: No/Yes, On next reset/Yes, On every reset. Default setting is **No**.

☞ When SEL is Full

Choose options for reactions to a full SEL.

Options available: Do Nothing/Erase Immediately. Default setting is **Do Nothing**.

☞ Custom EFI Logging Options

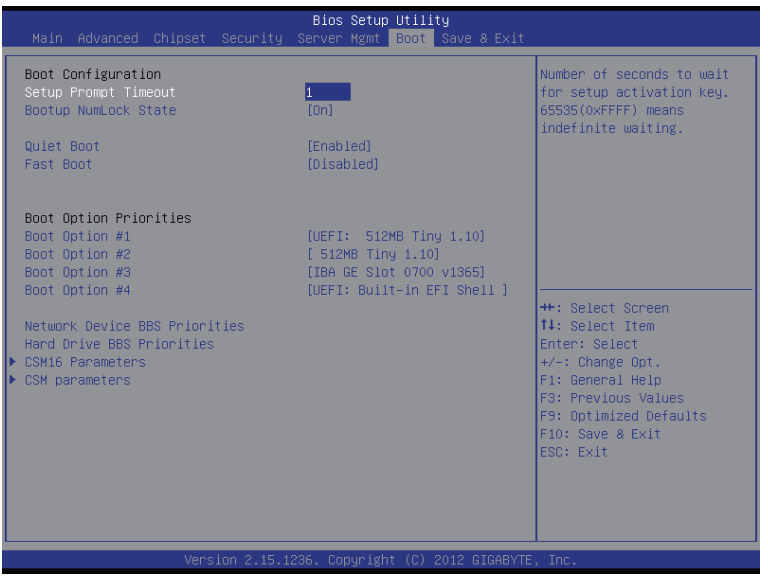
☞ Log EFI Status Codes

Enable/Disable the logging of EFI Status Codes (if not already converted to legacy).

Options available: Disabled/Both/Error code/Progress code. Default setting is **Both**.

2-6 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 legacy drive(s) specified is not bootable.



☞ **Boot Configuration**

☞ **Setup Prompt Timeout**

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting."
Press the numberic keys to input the desired value.

☞ **Bootup NumLock State**

Enable or Disable Bootup NumLock function.
Options available: On/Off. Default setting is **On**.

☞ **Quiet Boot**

Enable/Disbable showing the manufacturer's logo during POST.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Fast Boot**

This BIOS feature alows you to decrease the time it takes to boot up the system by skipping certain booting procedures.
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Boot Priority Order**

☞ **Boot Option #1/#2/#3/#4**

Press Enter to configure the boot priority.

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

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

☞ **Network Device BBS Priorities**

Press Enter to configure the boot priority.

☞ **Hard Drive BBS Priorities**

Press Enter to configure the boot priority.

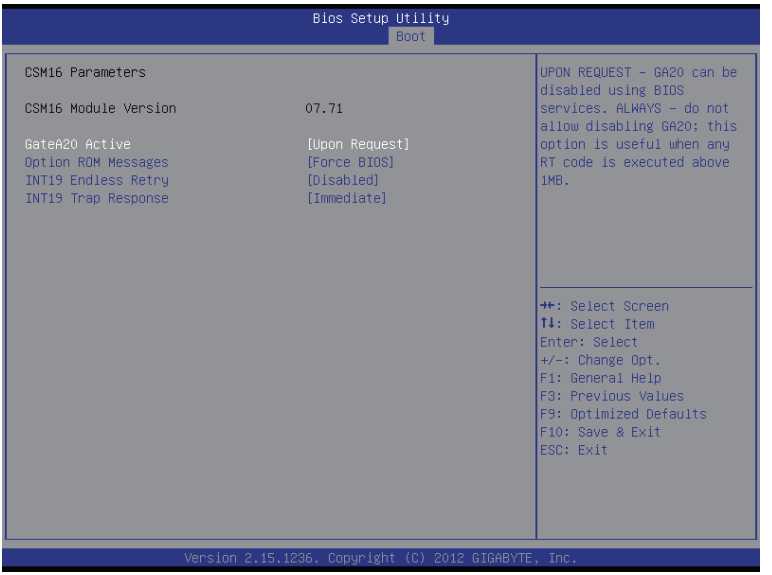
☞ **CSM16 Parameters**

Press Enter to configure the CSM16 parameters.

☞ **CSM Parameters**

Press Enter to configure the CSM parameters.

2-6-1 CSM16 Parameters



☞ **CSM16 Parameters**

☞ **CSM16 Module Version**

Display CSM Module version information.

☞ **Gate20 Active**

Upon Request: GA20 can be disabled using BIOS services.

Always: Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Options available: Upon Request/Always. Default setting is **Upon Request**.

☞ **Option ROM Messages**

Option ROM Messages.

Options available: Force BIOS/Keep Current. Default setting is **Force BIOS**.

☞ **INT19 Endless Retry**

Enabled: Allowed headless retry boot

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

☞ **INT19 Trap Response**

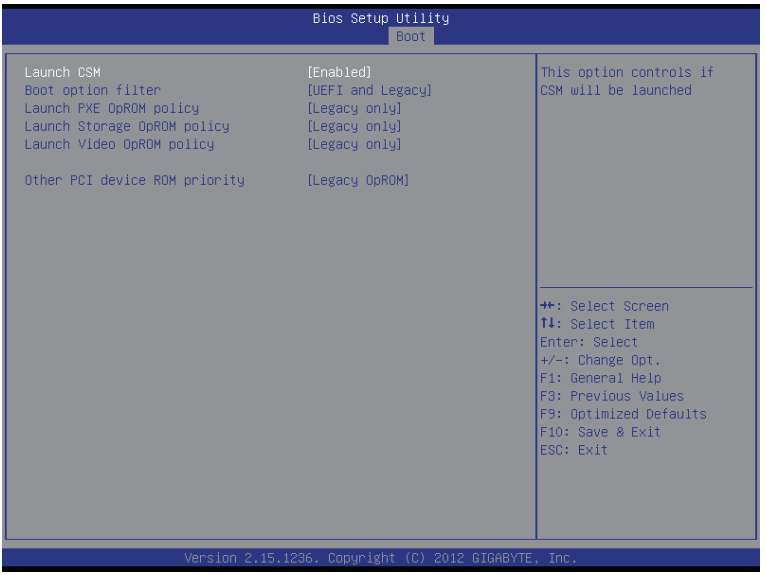
BIOS reaction on INT19 trapping by Option ROM

Immediate: execute the trap right away.

Postpone: execute the trap during legacy boot.

Options available: Immediate/Postpone. Default setting is **Immediate**.

2-6-2 CSM Parameters



☞ CSM parameters

Press Enter to configure the advanced items.

☞ Launch CSM (Compatibility Support Module)

Enable/Disable Compatibility Support Module (CSM) launch.

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

- The following five items appears and configurable when the **Launch CSM** is set to **Enabled**.
- If the **Launch CSM** is set to **Disabled,** the following five items will not be able to support Legacy mode.

☞ Boot option filter

Determines which devices system will boot to.

Options available: UEFI and Legacy/Legacy only/UEFI only. Default setting is **UEFI and Legacy**.

☞ Launch PXE OpROM policy

Determines which devices system will boot to.

Options available: UEFI only/Legacy only. Default setting is **Legacy only**.

☞ Launch Storage OpROM policy

Determines which devices system will boot to.

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

☞ Launch Video OpROM policy

Determines which devices system will boot to.

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

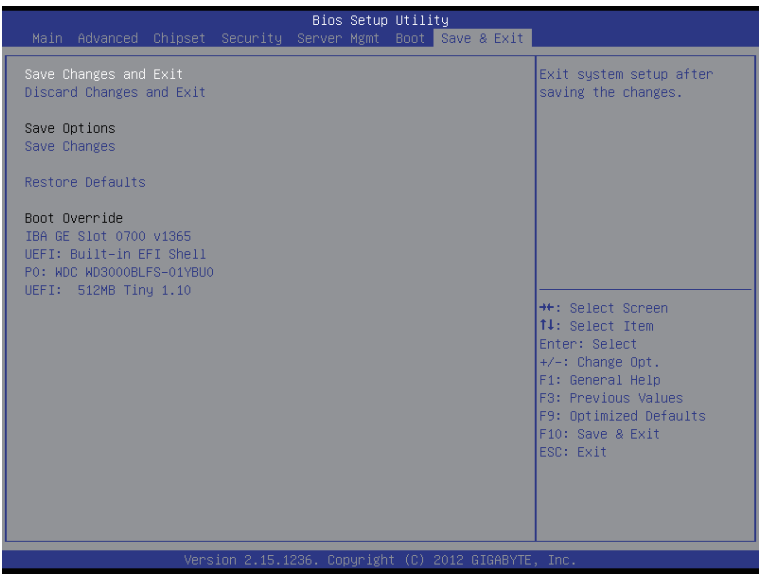
☞ Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video device, defines which OpROM to launch.

Options available: UEFI OpROM/Legacy OpROM. Default setting is **UEFI OpROM.**

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 Options**

☞ **Save Changes**

Saves changes made in the BIOS setup.
Options available: Yes/No.

☞ **Restore Defaults**

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

☞ **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.

2-8 BIOS Beep Codes

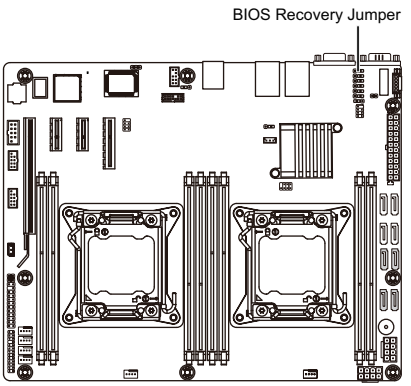
# of Beeps	Description
1	Invalid password
2	Recovery started
4	S3 Resume failed
4	DXEIPL was not found
5	No Console Input/Output Devices are found
6	Flash update is failed

2-9 BIOS Recovery Instruction

The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

1. Change xxx.ROM to amiboot.rom.
2. Copy amiboot.rom and AFUDOS.exe to USB diskette.
3. Setting BIOS Recovery jump to enabled status.



4. Boot into BIOS recovery.
5. Run Proceed with flash update.
6. BIOS update.

Chapter 3 Appendix

3-1 Regulatory Statements

Regulatory Notices

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

Our Commitment to Preserving the Environment

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

Restriction of Hazardous Substances (RoHS) Directive Statement

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

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

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

WEEE Symbol Statement

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

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

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