MU70-SU0

LGA2011 sockets R3 motherboard for Intel® E5-2600 V3 series processor

User's Manual

Rev. 1001

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Disclaimer

Documentation Classifications

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

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

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

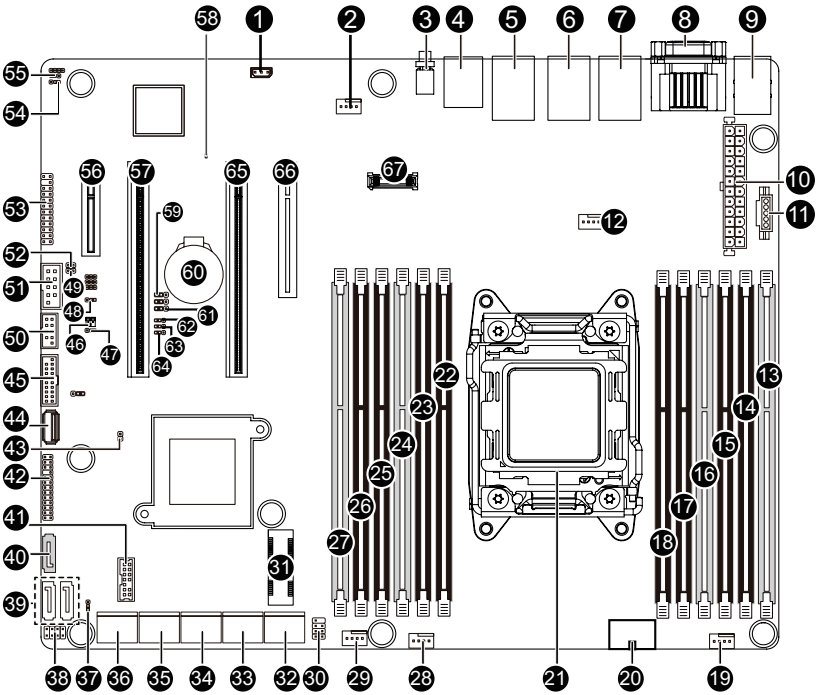
Table of Contents

Box Contents

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

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

MU70-SU0 Motherboard Layout

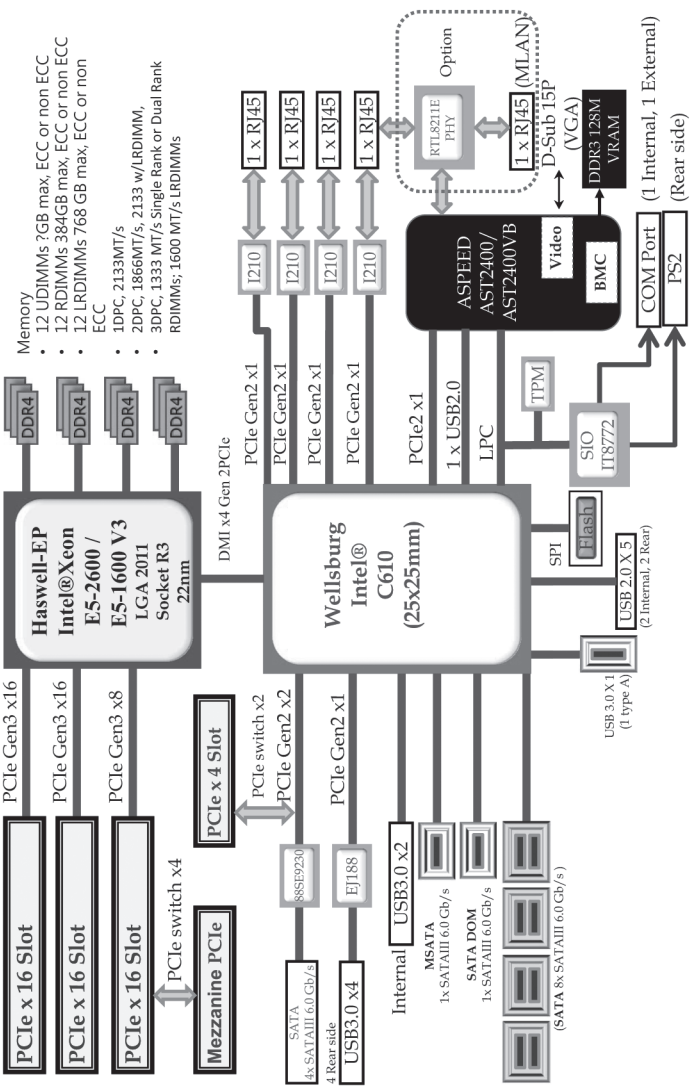


Item	Code	Description
1	IPMB	IPMB connector
2	SYS_FAN4	System fan connector#4
3	SW_ID	ID switch button
4	MLAN	BMC Management LAN port
5	USB3_LAN1	LAN1 port (top) / USB 3.0 ports (bottom)
6	USB3_LAN2	LAN2 port (top) / USB 3.0 ports (bottom)
7	LAN_3_1	LAN ports
8	COM1_VGA	Serial port (top)/VGA port (buttom)
9	PS2_USB2	PS/2 connector (top)/USB 2.0 ports (buttom)
10	ATX1	24 pin main power connector
11	PMBUS	PMBus connector
12	CPU_FAN	CPU fan connector
13	DIMM_P0_A0	Channel 1 slot 0
14	DIMM_P0_A1	Channel 1 slot 1
15	DIMM_P0_A2	Channel 1 slot 2
16	DIMM_P0_B0	Channel 2 slot 0
17	DIMM_P0_B1	Channel 2 slot 1
18	DIMM_P0_B2	Channel 2 slot 2
19	SYS_FAN1	System fan connector#1
20	P1_CPU0	8 pin power connector
21	CPU	Intel LGA2011 Socket R3
22	DIMM_P0_D2	Channel 4 slot 2
23	DIMM_P0_D1	Channel 4 slot 1
24	DIMM_P0_D0	Channel 4 slot 0
25	DIMM_P0_C2	Channel 3 slot 2
26	DIMM_P0_C1	Channel 3 slot 1
27	DIMM_P0_C0	Channel 3 slot 0
28	SYS_FAN2	System fan connector#2
29	SYS_FAN3	System fan connector#3
30	SATA_SGP	SATA SGPIO header
31	MSATA1	mSATA connector
32	SATA_0_1	SATA 3 6Gb/s connectors
33	SATA_2_3	SATA 3 6Gb/s connectors
34	SATA_4_5	SATA 3 6Gb/s connectors
35	SATA_6_7	SATA 3 6Gb/s connectors
36	SATA_9_10	SATA 3 6Gb/s connectors
37	SATA_DOM	SATA port 8 DOM support jumper
38	SSTAT_SGP1	sSATA SGPIO header
39	GSATA2/GSATA3	SATA 3 6Gb/s connectors
40	TPM	TPM module connector
41	SATA8	SATA 3 6Gb/s connector

42	BP_1	HDD back plane board header
43	CASE_OPEN	Case open intrusion alert header
44	USB3_A	Type A USB 3.0 connector
45	F_USB3	USB3.0 header
46	SW_RAID	Intel/LSI Software RAID Key jumper
47	BIOS_PWD	Clearing Supervisor Password jumper
48	PMBUS_SEL	PMbus select jumper
49	LAN4_ACT1	LAN port 4 active LED header
50	FUSB_2	USB 2.0 header
51	COM2	Serial port cable header
52	LAN3_ACT1	LAN port 3 active LED header
53	FP_1	Front panel header
54	S3_MASK	S3 Power On Select jumper
55	BMC_FRB	Force to Stop FRB Timer jumper
56	PCIE_1	PCI Express x4 slot
57	PCIE_2	PCI Express x16 slot
58	LED_BMC1	BMC firmware readiness LED
59	CLR_CMOS	Clear CMOS jumper
60	BAT	Battery socket
61	BIOS_WP	BIOS write protect jumper
62	BIOS_RCVR	BIOS recovery jumper
63	ME_RCVR	ME recovery jumper
64	ME_UPDATE	ME update jumper
65	PCIE_3	PCI Express x16 slot
66	PCIE_4	PCI Express x16 slot (Running at x8/Shared bandwidth with PCIE_5)
67	PCIE_5	PCI Express x4 slot (For Mezzanine Card/Running at x4)

CAUTION! If a SATA type hard drive is connected to the motherboard, please ensure the jumper is closed and set to **2-3 pins** (Default setting), in order to reduce any risk of hard disk damage. Please refer to Page 34 for SATA_DOM jumper setting instruction.

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® E5-1600 V3/E5-2600 V3 series processors in the LGA2011-3 package ◆ L3 cache varies with CPU ◆ Enhanced Intel SpeedStep Technology (EIST) ◆ Support Intel Virtualization Technology (VT)
Chipset	◆ Intel® C612 Express (Wellsburg) Chipset
Memory	◆ 12 x 1.2V DDR4 DIMM sockets supporting up to 384GB RDIMM of system memory ◆ 12 x 1.2V DDR4 DIMM sockets supporting up to 768GB LRDIMM of system memory ◆ Four channel memory architecture ◆ DDR4 2133MHz RDIMM memory modules ◆ DDR4 2133MHz LR-DIMM memory modules ◆ Support for ECC RDIMM/LRDIMM memory modules
LAN	◆ 4 x Intel® I210 supports GbE LAN ports ◆ Realtek® RTL8211E supports 1 Management LAN 10/100/1000Mpbs LAN port
Expansion Slots	◆ 2 x PCI Express x16 slot, running at x16 (Gen3/PCIE_2/PCIE_3) ◆ 1 x PCI Express x16 slot, running at x8 (Gen3/PCIE_4/Shard bandwidth with MEZZ_1) ◆ 1 x PCI Express x4 slot, running at x2 (GEN2/PCIE_1) ◆ 1 x Mezzine slot, running at x4 (Gen3/MEZZ_1)
Onboard Graphics	◆ ASPEED® AST2400 supports 16MB DDR3 VRAM
Storage Interface	◆ Intel® C612 Express controller ◆ 9 x SATA3 6Gb/s connectors (SATA_0_1/SATA_2_3/SSATA_0_1/SSATA_2_3/SATA4) ◆ 1 x mSATA3 connector (MSATA1) ◆ Support for Intel RSTe SATA RAID 0/1/5/10
USB	◆ Up to 7 USB 3.0 ports (1 Type A connector, 4 on the back panel, 2 additional ports via the USB brackets connected to the internal USB headers)

Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 13 x SATA3 6Gb/s connectors ◆ 1 x mSATA connector ◆ 1 x PMBus header ◆ 1 x CPU fan header ◆ 4 x System fan headers ◆ 1 x Front panel header ◆ 1 x HDD Back plane borad header ◆ 1 x USB 3.0 header ◆ 1 x USB 2.0 header ◆ 1 x USB 3.0 Type A connector ◆ 1 x TPM module connector ◆ 1 x Serial port connector ◆ 2 x SATA SPGIO headers ◆ 1 x IPMB connector
Rear Panel I/O	◆ 4 x USB 3.0 ports ◆ 2 x USB 2.0 ports ◆ 5 x RJ-45 ports (1 x 10/100/1000 dedicated management LAN port) ◆ 1 x COM port ◆ 1 x VGA port ◆ 1 x PS/2 connector
I/O Controller	◆ ASPEED® AST2400 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 128 Mbit flash ◆ AMI BIOS
Form Factor	◆ ATX Form Factor; 12 inch x 9.6 inch, 6 layers PCB

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

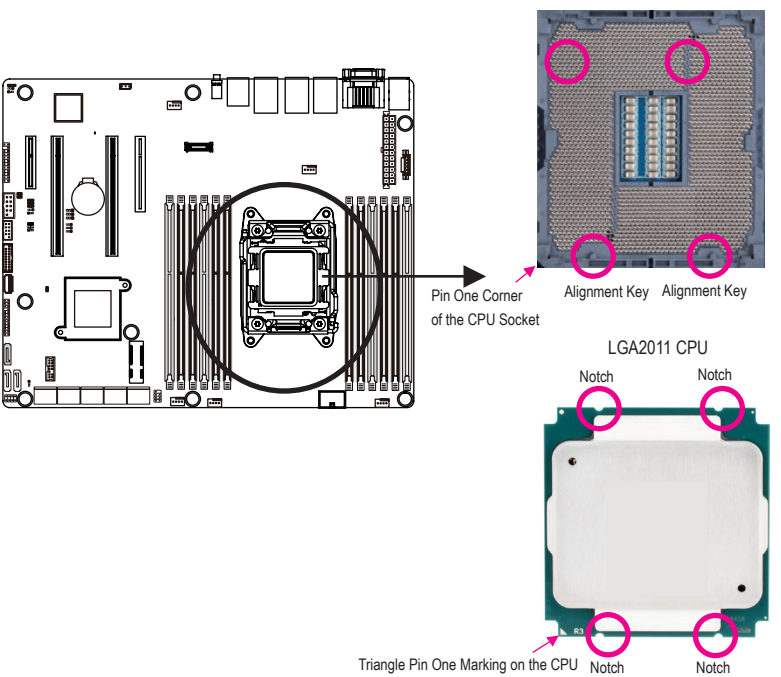
1-3 Installing the CPU and CPU Cooler

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.

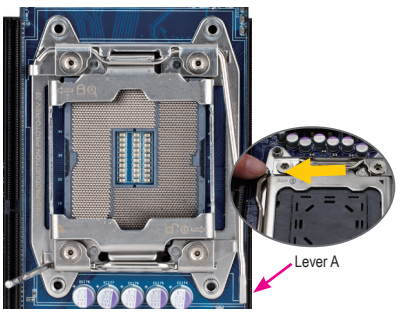
1-3-1 Installing the CPU

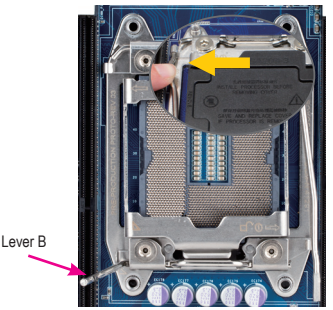
A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



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.**



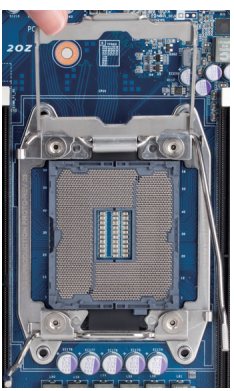


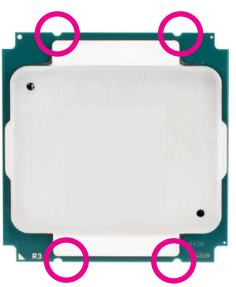
Step 1:

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.



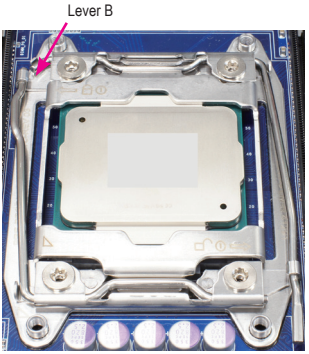


Step 3:

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:

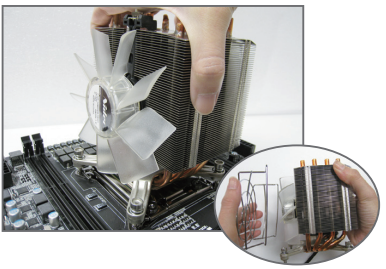
Finally, secure lever A under its retention tab to complete the installation of the CPU.

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.)

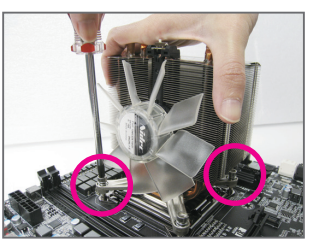
Step 1:

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



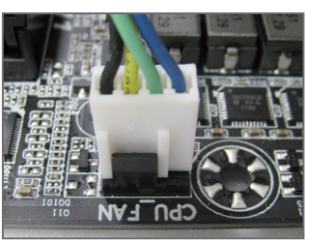
Step 2:

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 twelve DDR4 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 DDR4 memory sockets are divided into four channels each channel has two memory sockets as following:

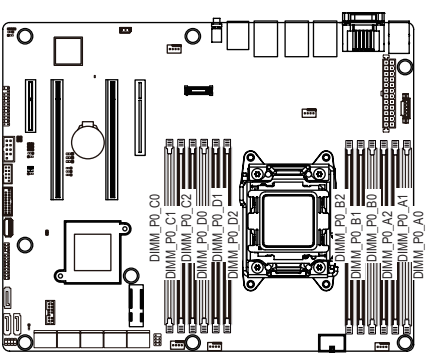
Channel 1: DIMM_P0_A0/DIMM_P0_A1/DIMM_P0_A2

Channel 2: DIMM_P0_B0/DIMM_P0_B1/DIMM_P0_B2

Channel 3: DIMM_P0_C0/DIMM_P0_C1/DIMM_P0_C2

Channel 4: DIMM_P0_D0/DIMM_P0_D1/DIMM_P0_D2

When only one DIMM is used, it must be populated in memory slot0 first.
Memory populated sequence must be followed with slot0/slot1/slot2.
System will not boot normally with incorrect populated sequence.



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 DDR4 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 DDR4 DIMMs on this motherboard.

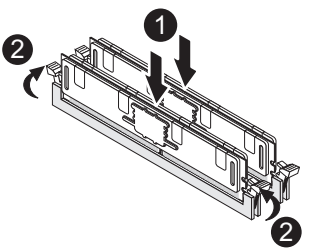
Installation Step:

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.

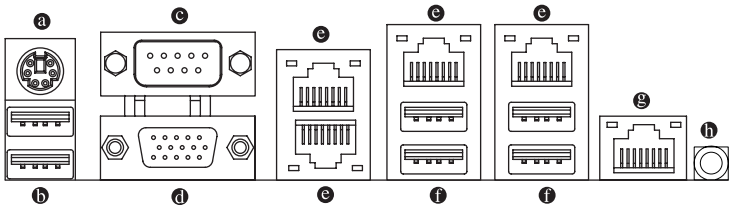


1-4-3 DIMM Population Table

Two Slots Channel RDIMM Population Configuration Within a Channel

Type	Ranks Per DIMM and Data Width	Speed (MT/s); Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
		3 Slot Per Channel		
		1DPC	2DPC	3DPC
RDIMM	SRx4	2133	1866	1600
RDIMM	SRx8	2133	1866	1600
RDIMM	DRx8	2133	1866	1600
RDIMM	DRx4	2133	1866	1600
LRDIMM	QRx4	2133	2133	1600

1-5 Back Panel Connectors



a PS/2 Keyboard/Mouse Port

Coonnect a PS/2 keyboard or mouse to this port.

b USB 2.0 Port

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

c Serial Port

Connects to serial-based mouse or data processing devices.

d Video Port

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

e 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.

f USB 3.0 Port

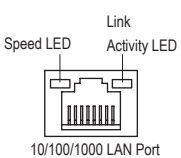
The USB port supports the USB 3.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

g KVM Server Management 10/100/1000 LAN Port (Dedicated LAN Port)

The LAN port provides Internet connection with data transfer speeds of 10/100/1000Mbps. This port is the decated LAN port for server management.

h ID Switch Button

This button provide the selected unit idenfication function.



Speed LED:

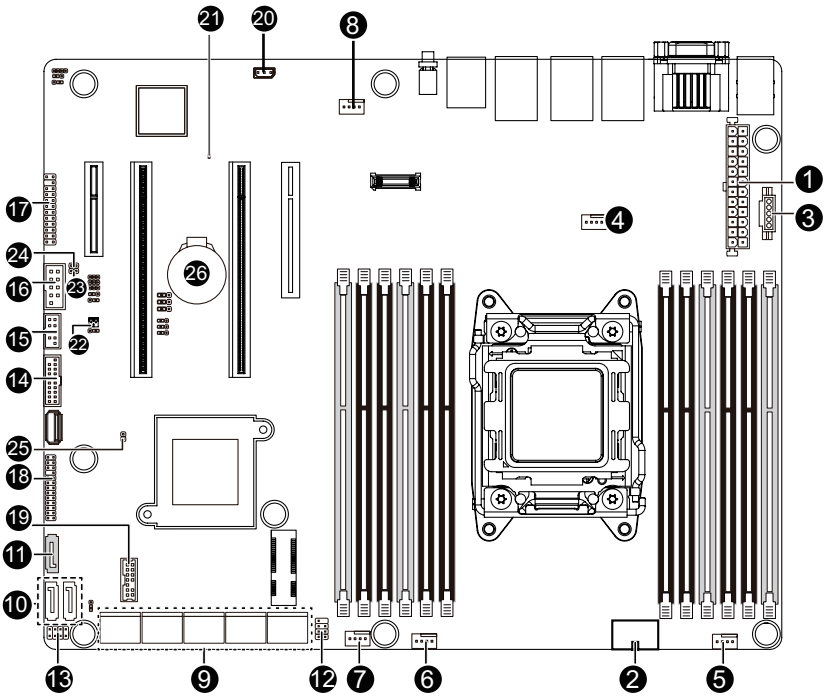
State	Description
Yellow On	1 Gbps data rate
Yellow Blink	Identify 1 Gbps data rate
Green On	100 Mbps data rate
Green Blink	Identify 100 Mbps data rate
Off	10 Mbps data rate

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	14)	F_USB3
2)	P1_CPU0	15)	F_USB2
3)	PMBUS	16)	COM2
4)	CPU0_FAN (CPU Fan)	17)	FP_1
5)	SYS_FAN1 (System Fan)	18)	BP_1
6)	SYS_FAN2 (System Fan)	19)	TPM
7)	SYS_FAN3 (System Fan)	20)	IPMB
8)	SYS_FAN4 (System Fan)	21)	LED_BMC
9)	SATA_0_1/SATA_2_3	22)	SW_RAID
10)	SSATA_0_1/SSATA_2_3	23)	LAN4_ACT1
11)	SATA4	24)	LAN3_ACT1
12)	SATA_SGP1	25)	CASE_OPEN
13)	SATA_SGP2	26)	BAT

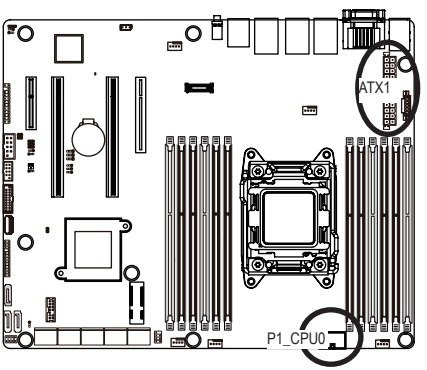
Read the following guidelines before connecting external devices:

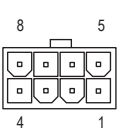
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the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

1/2/3) ATX1/P1_CPU0 (2x4 12V Power Connector and 2x12 Main Power Connector)

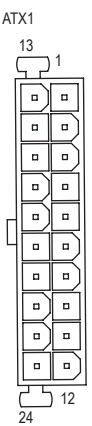
With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. 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.**





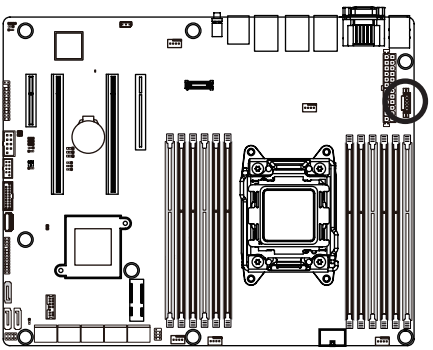
Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V



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

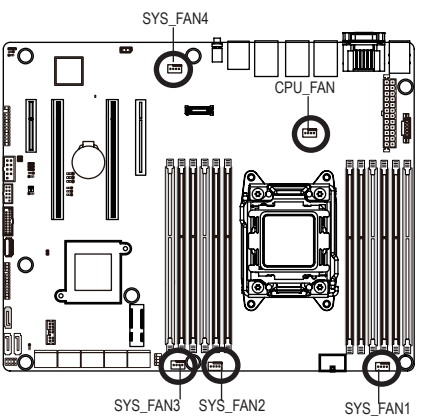
3) PMBUS (PMBus connector)



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

4/5/6/7/8) CPU_FAN/SYS_FAN1/SYS_FAN2/SYS_FAN3/SYS_FAN4 (CPU Fan/System Fan Headers)

The motherboard has one 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.

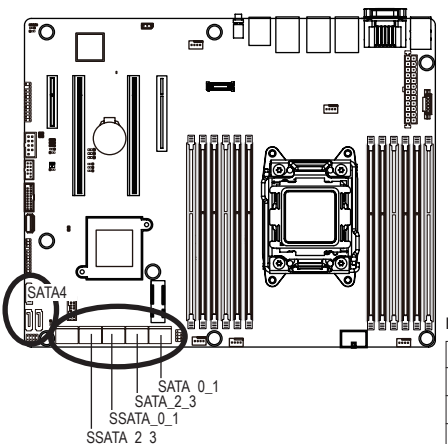
9) SATA0_1/SATA_2_3 (SATA 6Gb/s Connectors)

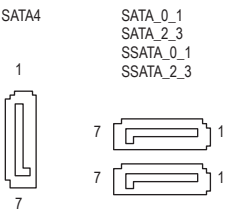
10) SSATA_0_1/SSATA_2_3 (SATA 6Gb/s Connectors)

11) SATA4 (SATA 6Gb/s Connector/Support 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.

Please see page 34 for SATA DOM jumper setting.





Normal Mode:

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

SATA DOM Mode:

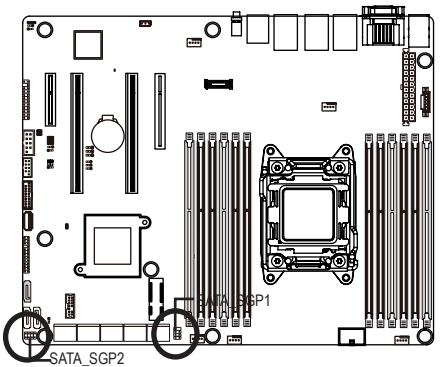
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	P5V

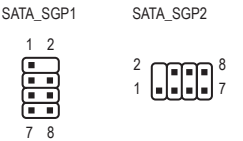
- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are configured, the total number of hard drives must be an even number.
- A RAID 10 configuration requires four hard drives.

(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.

12/13) SATA_SGP1/SATA_SGP2 (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.

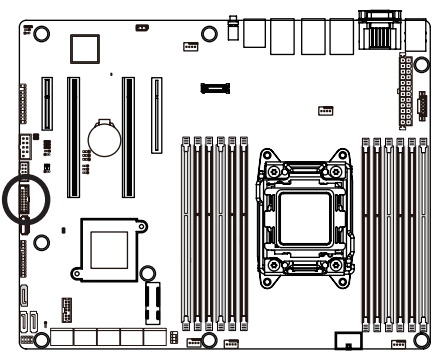




Pin No.	Definition
1	DATAIN
2	No Pin
3	DATAOUT
4	GND
5	GND
6	LOAD
7	NC
8	CLOCK

14) F_USB3 (USB 3.0 Header)

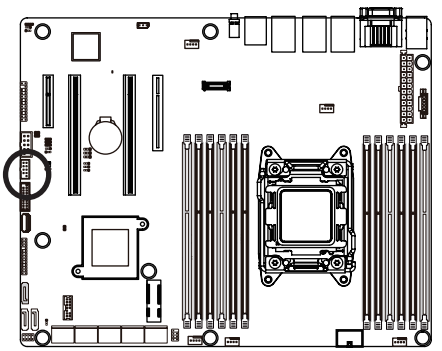
The headers conform to USB 3.0 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

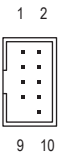


Pin No.	Definition
1	Power
2	IntA_P1_SSRX-
3	IntA_P1_SSRX+
4	GND
5	IntA_P1_SSTX-
6	IntA_P1_SSTX+
7	GND
8	IntA_P1_D-
9	IntA_P1_D+
10	NC
11	IntA_P2_D+
12	IntA_P2_D-
13	GND
14	IntA_P2_SSTX+
15	IntA_P2_SSTX-
16	GND
17	IntA_P2_SSRX+
18	IntA_P2_SSRX-
19	Power
20	No Pin

15) F_USB2 (Front USB Header)

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

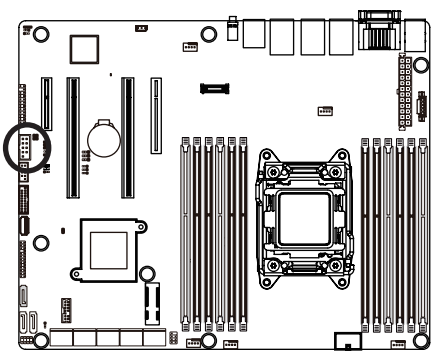


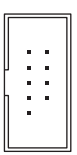


Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC

16) COM2 (Serial Port Header)

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

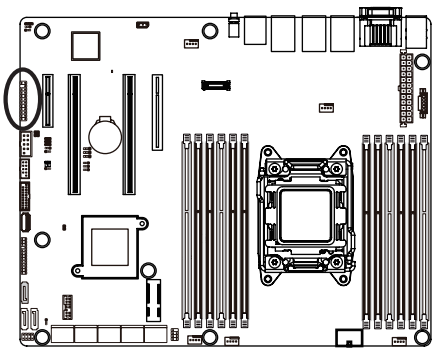




Pin No.	Definition
1	NDCD-
2	NSIN
3	NSOUT
4	NDTR-
5	GND
6	NDSR-
7	NRTS-
8	NCTS-
9	NRI-
10	No Pin

17) FP_1 (Front Panel Header)

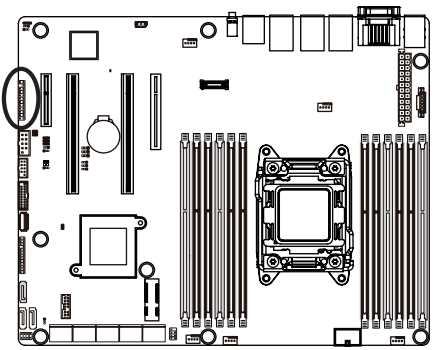
Connect the power switch, reset switch, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.



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	SYS_LED+	System Front board LED Signal anode (+)
9	HD-	Hard Disk LED Signal cathode(-)
10	SYS_LED-	System Status LED Signal cathode(-)
11	PWR_BTN	Power Button Signal
12	L1_ACT	LAN1 active LED Signal
13	PWR_BTN_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-	ID Switch Signal cathode(-)
22	L2_ACT	LAN2 active LED Signal
23	NMI_SW-	NMI switch Signal cathode(-)
24	L2_LINK-	LAN2 Link LED Signal cathode(-)

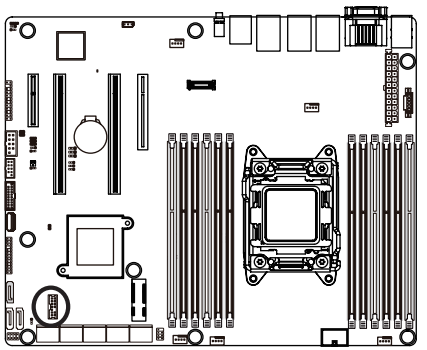
The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

18) BP_1 (HDD Back Plane Board Hearder)



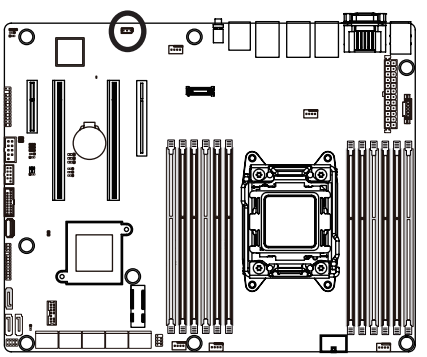
Pin No.	Definition
1	BP_SGP_CLK
2	NC
3	BP_SGP_GLD
4	FAN_GATE_N
5	BP_SGP_DOUT
6	GND
7	KEY
8	Rreset
9	GND
10	BP_LED_A_N
11	BP_LED_G_N
12	GND
13	BP_SGP_DIN
14	NC
15	GND
16	SMB_BP_DATA
17	GND
18	SMB_BP_CLK
19	P_3V3_AUX
20	BMC_ACK
21	P_3V3_AUX
22	BMC_REQ
23	GND
24	KEY
25	BP_PRESENSE
26	GND

19) TPM (TPM Module Connector)



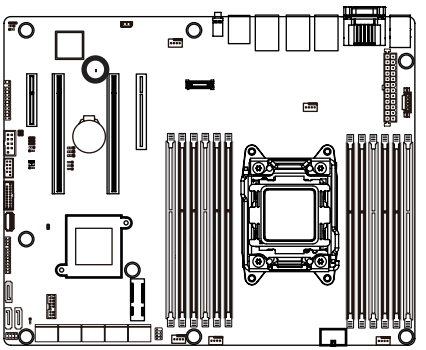
Pin No.	Definition
1	CLK_33M_TPM
2	P_3V3_AUX
3	LPC_RST
4	P3V3
5	LPC_LAD0
6	IRQ_SERIAL
7	LPC_LAD1
8	TPM_DET_N
9	LPC_LAD2
10	NC
11	LPC_LAD3
12	GND
13	LPC_FRAME_N
14	GND

20) IPMB (IPMB Connector)



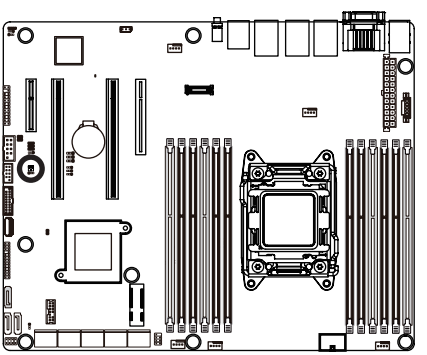
Pin No.	Definition
1	Clock
2	GND
3	Data

21) LED_BMC (BMC Firmware Readiness LED)



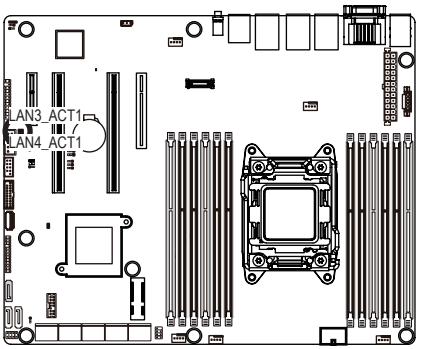
State	Description
On	BMC firmware is initial
Blinking	BMC firmware is ready
Off	AC loss

22) SW_RAID (Intel RAID Key Header)



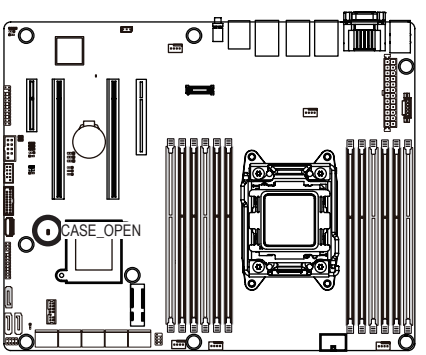
Pin No.	Definition
1	KEY
2	GND

23/24) LAN4_ACT1/LAN3_ACT1(LAN4/LAN3 Active LED Header)



Pin No.	Definition
1	LED+
2	LED-

25) CASE_OPEN (Chassis intrusion Header)

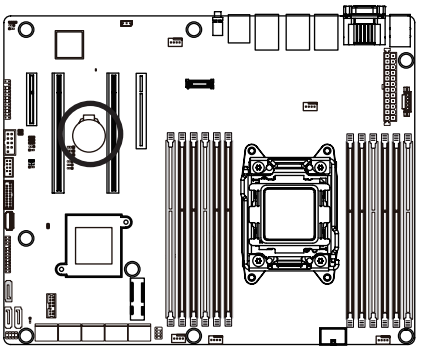


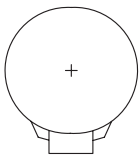
Open: Normal operation (Default setting)

Closed: Enable chassis intrusion alter.

26) BAT (Battery)

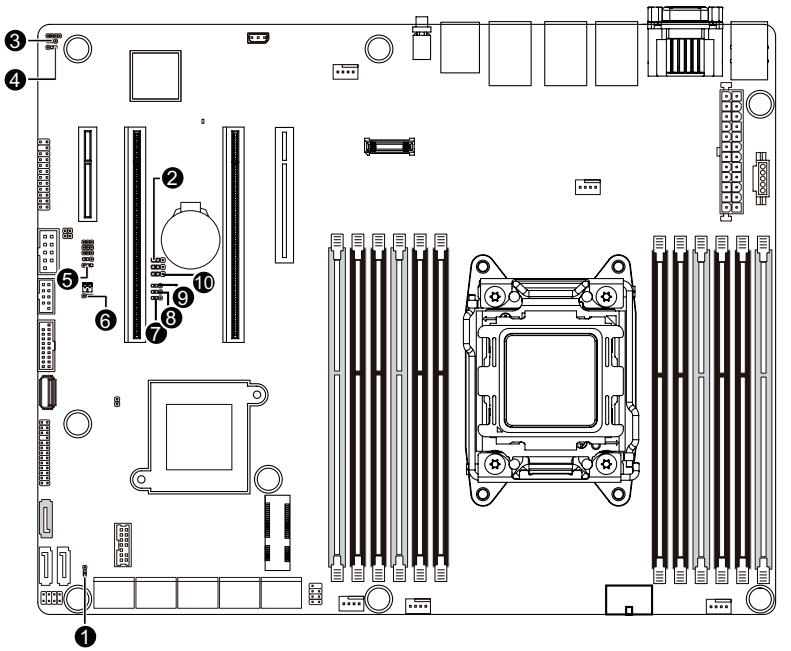
The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





- 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.

1-7 Jumper Settings



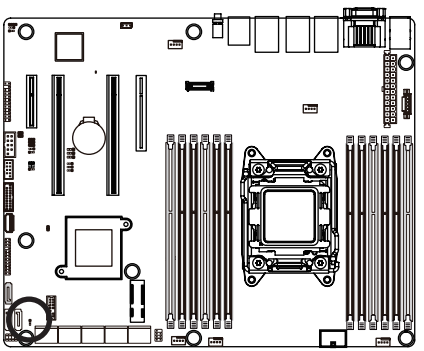
1)	SATA_DOM	6)	BIOS_PWD
2)	CLR_CMOS	7)	ME_UPDATE
3)	BMC_FRB	8)	ME_RCVR
4)	S3_MASK	9)	BIOS_RCVR
5)	PMBUS_SEL	10)	BIOS_WP

1) SATA_DOM (SATA port 4 DOM Jumper)

CAUTION!

- If the SATA DOM power is supplied by the motherboard, set the jumper to pin 1-2.
- If the SATA DOM power is supplied by external power, set the jumper to pin 2-3.
- If a SATA type hard drive is connected to the motherboard, please ensure the jumper is closed and set to **2-3 pins** (Default setting), in order to reduce any risk of hard disk damage.

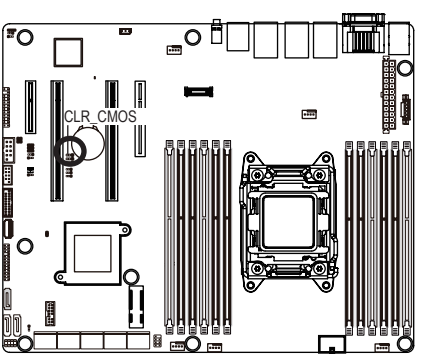
Please refer to the pin definition table in the following.



Pin No.	Definition
1	P5V
2	SATA4 Pin7
3	GND

2) CLR_CMOS (Clearing CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, 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.

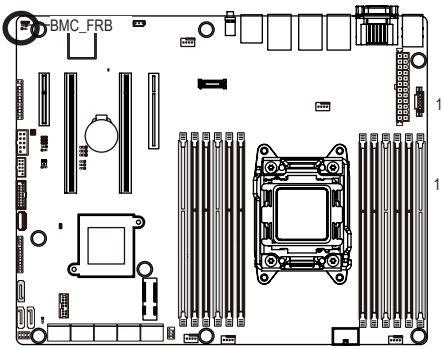


1-2 Close: Normal operation (Default setting)

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.

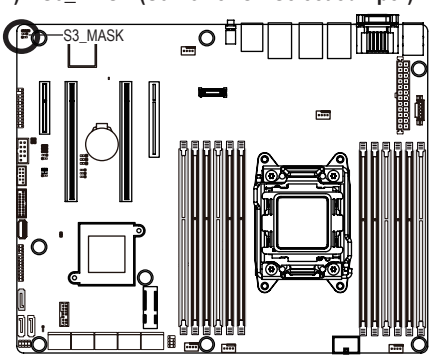
3) BMC_FRB (Force to Stop FRB Timer Jumper)



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

1 2-3 Close: Force to Stop FRB Timer.

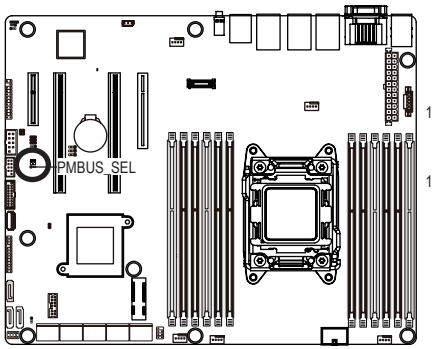
4) S3_MASK (S3 Power On Select Jumper)



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

1 2-3 Close: Keep initial power on. (Default setting)

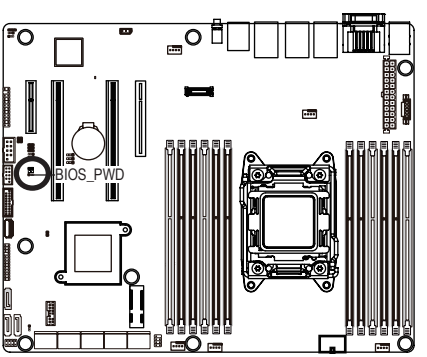
5) PMBUS_SEL (PMBus Power Select Jumper)



1 1-2 Close: PMBus connects to PCH.

1 2-3 Close: PMBus connects to BMC. (Default setting)

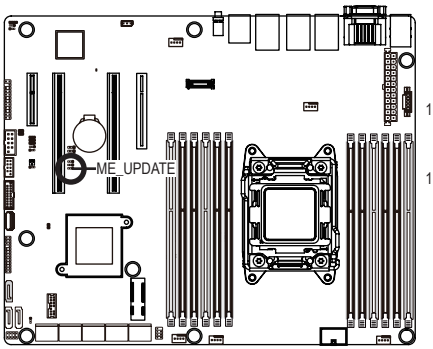
6) BIOS_PWD (Clearing Supervisor Password Jumper)



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

1 2-3 Close: Skip supervisor password.

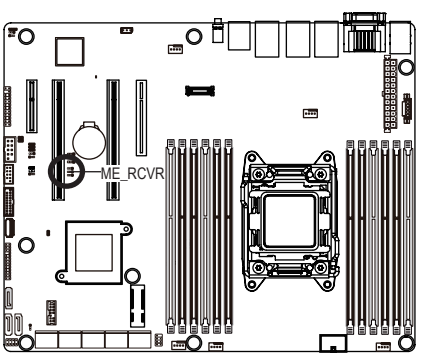
7) ME_UPDATE (ME Update Jumper)



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

1 2-3 Close: ME recovery mode.

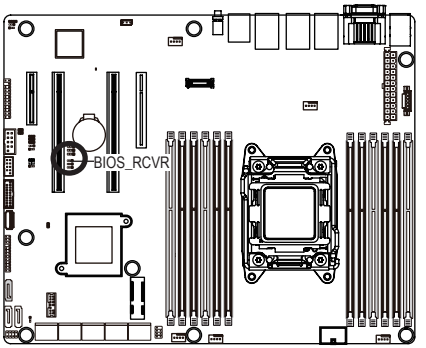
8) ME_RCVR (ME Recovery Jumpers)



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

1 2-3 Close: ME recovery mode.

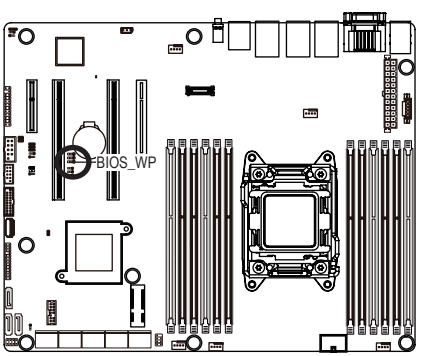
9) BIOS_RCVR (BIOS Recovery Jumper)



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

1 2-3 Close: BIOS recovery mode.

10) BIOS_WP (BIOS Write Protect Jumper))



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

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

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the 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 **Exit** 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
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<Enter>	Execute command or enter the submenu
<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.)
- **Intel RC Setup**
  This setup page includes all the submenu options for configuring the function of processor, network, North Bridge, South Bridge, and System event logs.
- **Server Management**
  Server additional features enabled/disabled setup menus.
- **Security**
  Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.
  A supervisor password allows you to make changes in BIOS Setup.
  A user password only allows you to view the BIOS settings but not to make changes.
- **Boot**
  This setup page provides items for configuration of boot sequence.
- **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.

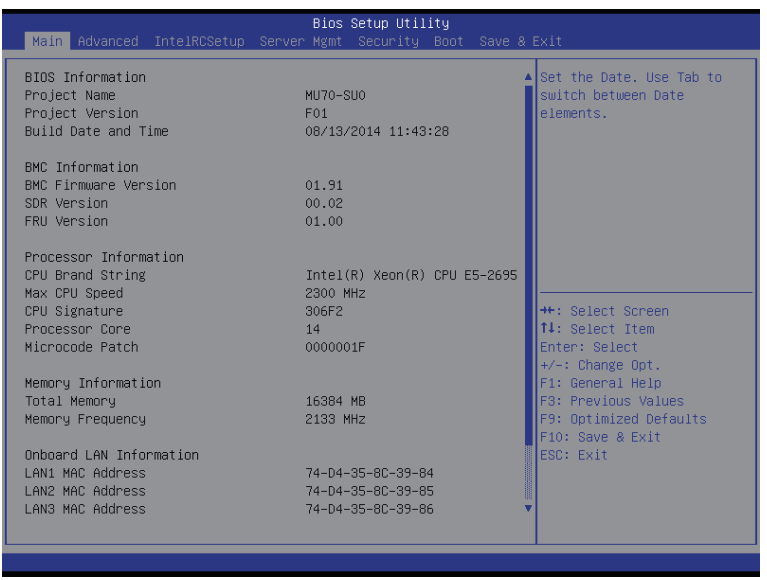
Main Menu Help

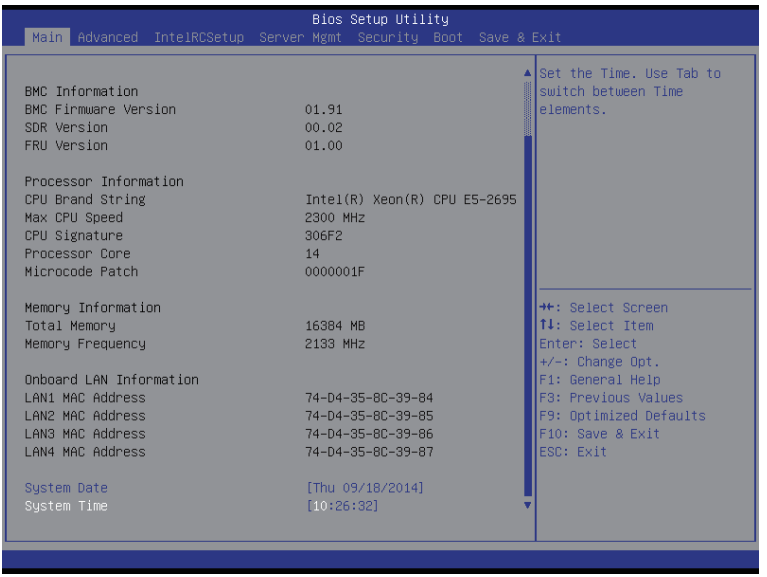
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

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**
- **Porject Name**

  Display the project name information.
- **Porject Version**

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

  Displays the date and time when the BIOS setup utility was created.
- **BMC Information**
- **BMC Firmware Version**

  Display BMC firmware version information.
- **SDR Reversion**

  Display the SDR version information.
- **FRU Version**

  Display the FRU version information.
- **Processor Information**
- **CPU Brand String/Max CPU Speed/CPU Signature/Processors Core/Microcode Patch**

  Displays the technical specifications for the installed processor.
- **Memory Information**
- **Total Memory**

  Display the total memory size of the installed memory.
- **Memory Frequency**

  Display the frequency information of the installed memory.

☞ **Onboard LAN Information**

☞ **LAN1/LAN2/LAN3/LAN4 MAC Address**

Display LAN1/LAN2/LAN/LAN4 MAC address information.

☞ **System Date**

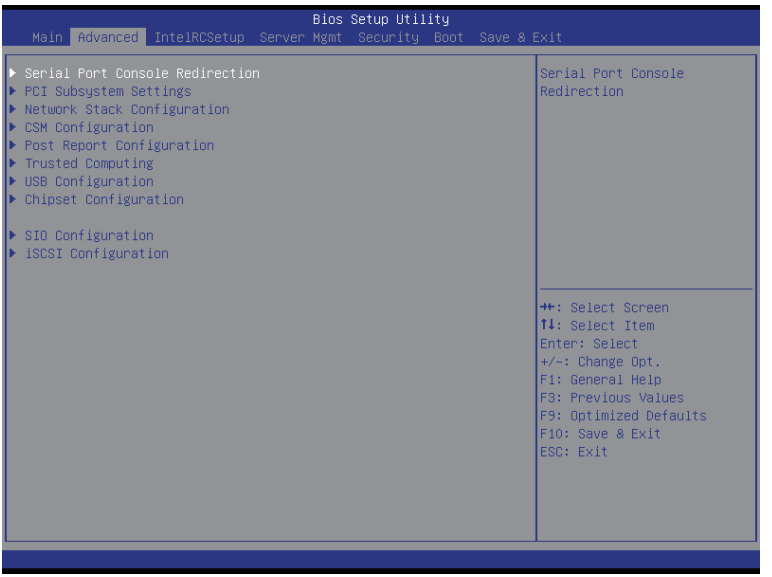
Set the date following the weekday-month-day- year format.

☞ **System Time**

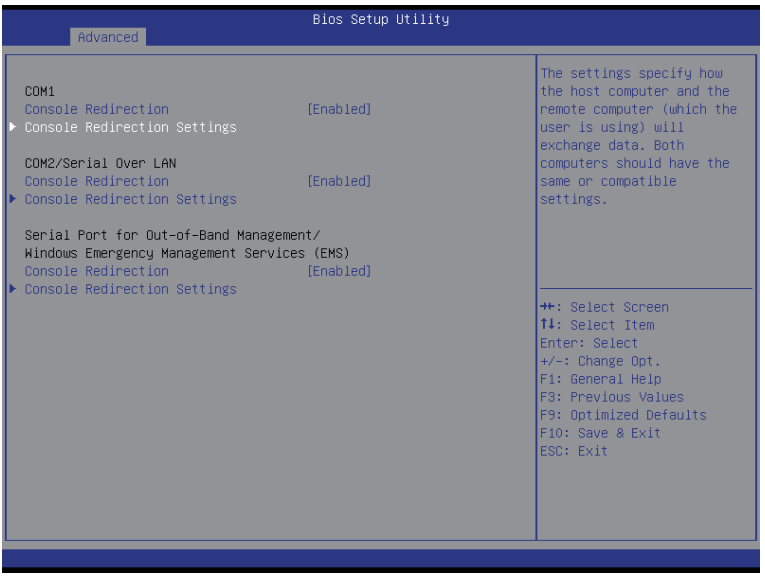
Set the system time following the hour-minute- second format.

2-2 Advanced Menu

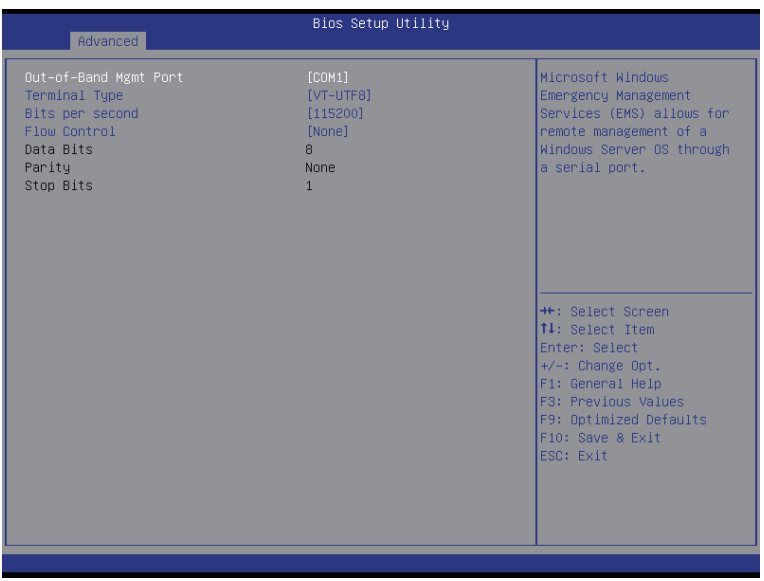
The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press Enter to access the related submenu screen.



2-2-1 Serial Port Console Redirection




Bios Setup Utility
Advanced
COM2/Serial Over LAN
Console Redirection Settings
Terminal Type [ANSI]
Bits per second [115200]
Data Bits [8]
Parity [None]
Stop Bits [1]
Flow Control [None]
VT-UTF8 Combo Key Support [Enabled]
Recorder Mode [Disabled]
Resolution 100x31 [Enabled]
Legacy OS Redirection Resolution [80x24]
Putty KeyPad [VT100]
Redirection After BIOS POST [Always Enable]
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit


Bios Setup Utility
Advanced
Out-of-Band Mgmt Port [COM1]
Terminal Type [VT-UTF8]
Bits per second [115200]
Flow Control [None]
Data Bits 8
Parity None
Stop Bits 1
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

☞ COM1/COM2/Serial Over LAN Console Redirection Settings

☞ 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. Default setting is **ANSI**.

☞ Bits per second

Select the baud rate for console redirection.

Options available: 9600/19200/38400/57600/115200. Default setting is **115200**.

☞ Data Bits

Select the data bits for console redirection.

Options available: 7/8. Default setting is **8**.

☞ Parity

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

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

Odd: parity bit is 0 if num of 1's in 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. Default setting is **None**.

☞ 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. Default setting is **1**.

☞ 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. Default setting is **None**.

☞ 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.

Default setting is **Disabled**.

☞ Resolution 100x31 (Note)

Enables or disables extended terminal resolution. Default setting is **Enabled**.

Options available: Enabled/Disabled.

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

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

On Legacy OS, the number of Rows and Columns supported redirection.

Options available: 80x24/80X25. Default setting is **80x24**.

☞ **Putty KeyPad** (Note)

Select function FunctionKey and KeyPad on Putty.

Options available: VT100/LINUX/XTERMR6/SCO/ESCN/VT400. Default setting is **VT100**.

☞ **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. Default setting is **COM1**.

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

2-2-2 PCI Subsystem Settings

☞ PCI Express Slot #1/#2/#3/#4/#5 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 LAN#1/#2/#3/#4 Controller

Enable/Disable onboard LAN devices.

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

☞ Onboard LAN #1/#2/#3/#4 I/O ROM

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

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

☞ PCI Devices Common Settings

☞ PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

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 Palette Snoop

Enable/Disable VGA Palette Tegisters Snooping.

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

☞ Above 4G Decoding

Enable/Disable Above 4G Decoding.

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

☞ **SR-IOV Support**

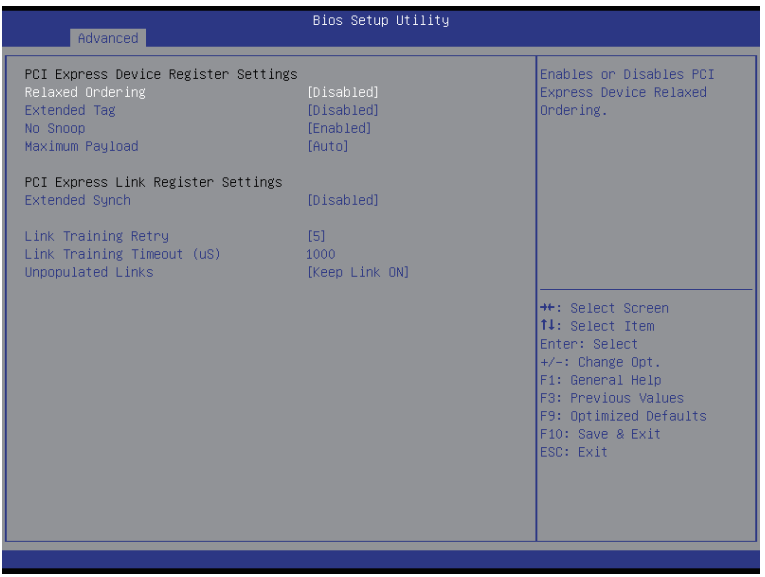
If system has SR-IOV capable PCIe Devices, this option enables or disables Single Root IO Virtualization Support.

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

☞ **PCI Express Settings**

Press [Enter] for configuration of advanced items.

2-2-2-1 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 playload 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**.

☞ PCI Express Link Register Settings

☞ Extended Synch

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

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

☞ Link Training Retry

Define the number of Retry Attempts software wil take to retrain the link if previous training attempt was unsuccessful.

Options available: Disabled/2/3/5.Default setting is **5**.

☞ **Link Training Timeout (us)**

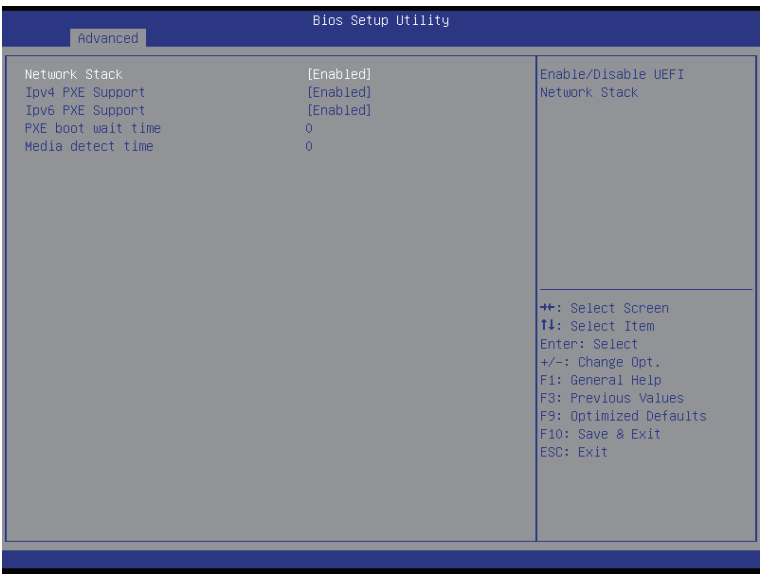
Define the number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Press <+> / <-> keys to increase or decrease the desired values. Value rang is from 10 to 10000 us.

☞ **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 Link. Default setting is **Keep Link ON**.

2-2-3 Network Stack



☞ **Network stack**

Enable/Disable UEFI network stack.

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

☞ **Ipv4 PXE Support**(Note)

Enable/Disable Ipv4 PXE feature.

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

☞ **Ipv6 PXE Support**(Note)

Enable/Disable Ipv6 PXE feature.

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

☞ **PXE boot wait time**(Note)

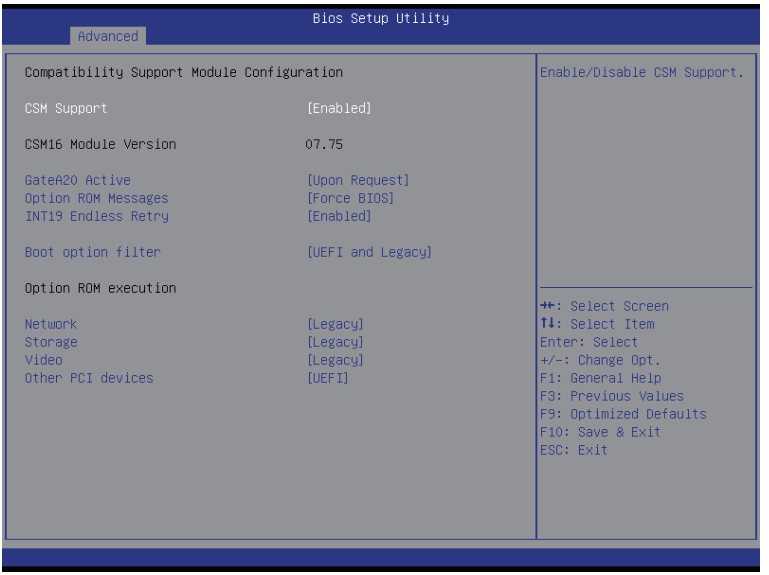
Press <+> / <-> keys to increase or decrease the desired values.

☞ **Media detect time**(Note)

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

(Note) This item appears when **Network Stack** is set to **Enabled**.

2-2-4 CSM Configuration



☞ **Compatibility Support Module Configuration**

☞ **CSM Support**

Enable/Disable Compatibility Support Module (CSM) support.

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

☞ **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 **Enabled**.

☞ **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**.

☞ **Option ROM execution**

☞ **Network**

Controls the execution UEFI and Legacy PXE OpROM.

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

☞ **Storage**

Controls the execution UEFI and Legacy Storage OpROM.

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

☞ **Video**

Controls the execution UEFI and Legacy Video OpROM.

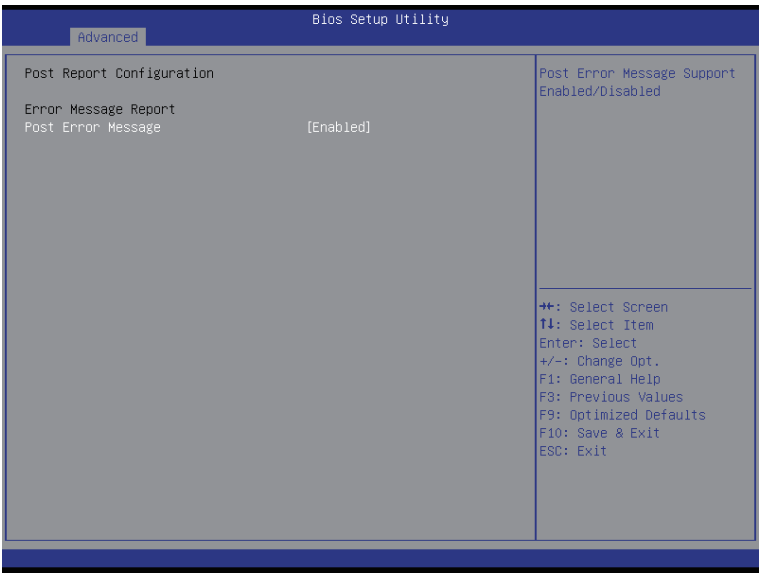
Options available: Do not launch/UEFI/Legacy. Default setting is **Legacy**.

☞ **Other PCI devices**

Determines OpROM execution policy for devices other than network, Storage, or Video.

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

2-2-5 Post Report Configuration



☞ **Post Report Configuration**

☞ **Error Message Report**

☞ **Post Error Message**

Enable/Disable Info Error Message support.

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

2-2-6 Trusted Computing

☞ **Configuration**

☞ **Security Device Support**

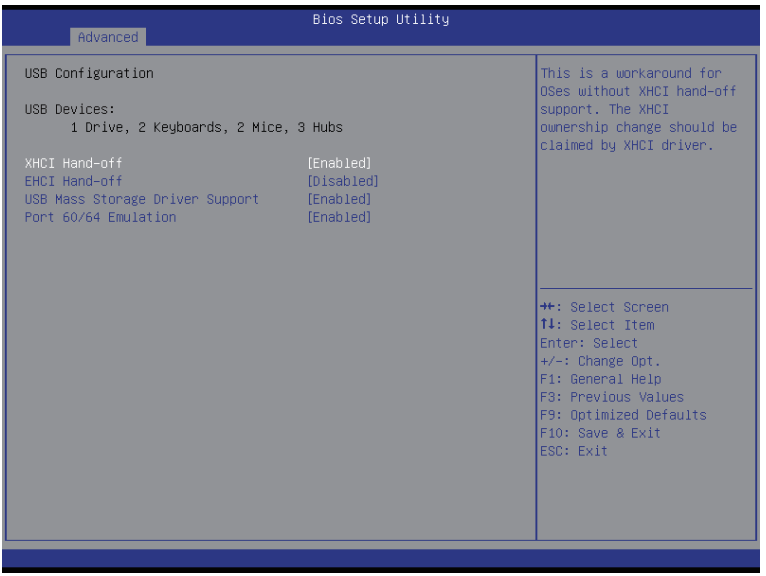
Select Enabled to activate TPM support feature.

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

☞ **Current Status Information**

Display current TPM status information.

2-2-7 USB Configuration



☞ **USB Configuration**

☞ **USB Devices:**

Display the USB devices connected to the system.

☞ **XHCI Hand-off**

Enable/Disable XHCI (USB 3.0) Hand-off support.

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**.

☞ **USB Mass Storage Driver Support**(Note)

Enable/Disable USB Mass Storage Driver Support.

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

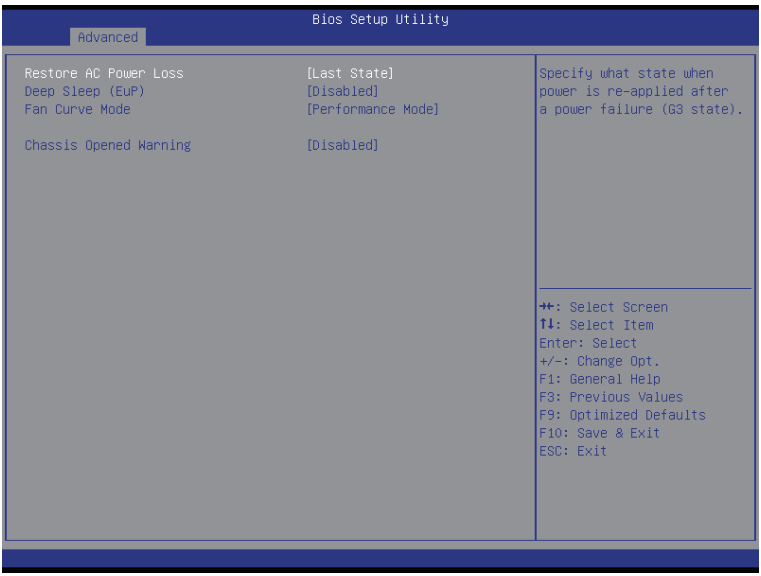
☞ **Port 60/64 Emulation**

Enable I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OS.

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

(Note) This item is present only if you attach USB types of device.

2-2-8 Chipset Configuration



☞ **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.

☞ **Deep Sleep (EuP)**

Enable/Disable Deep Sleep mode.

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

☞ **Fan Curve Mode**

Configure ystem fan curve mode

Options available: Full Dpeed Mode/Performance ModeBalanced mode/Energy Saving Mode.

Default setting is **Performance Mode**.

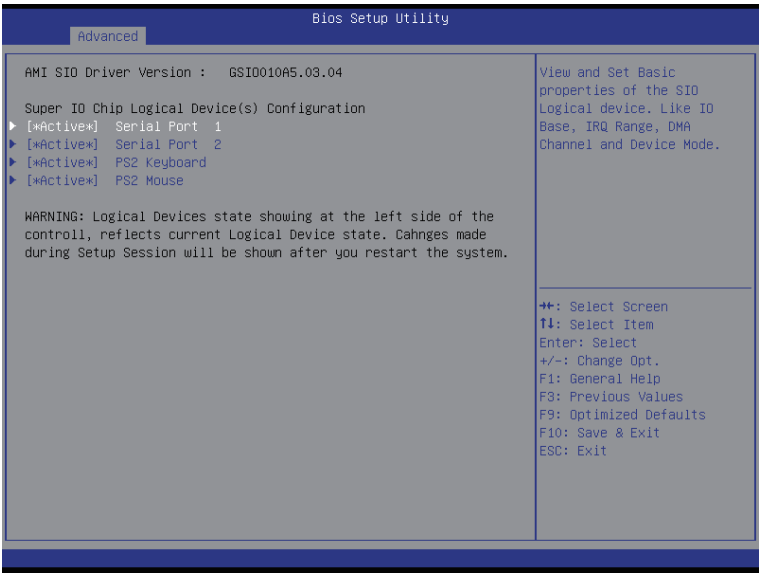
☞ **Chassis Opened Warning**

Enable/Disable Chassis intrusion alter funtion.

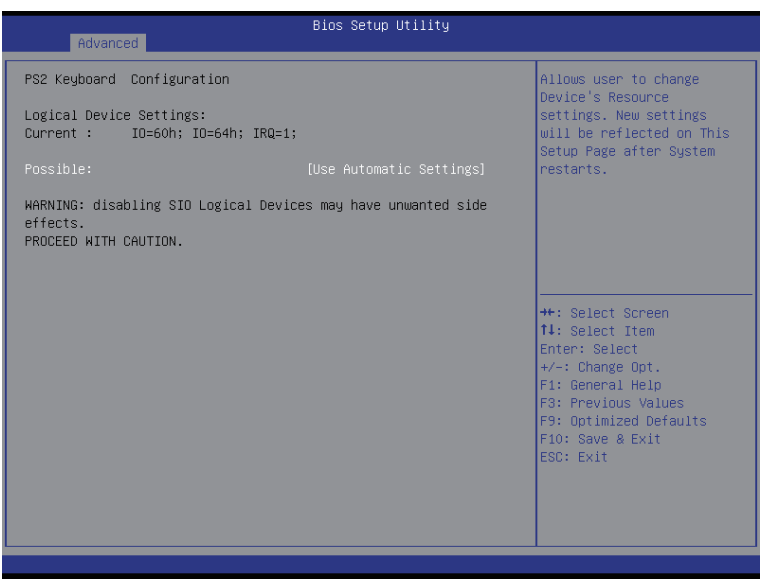
Options available: Enabled/Disabled. Default setting is **Disabled**.

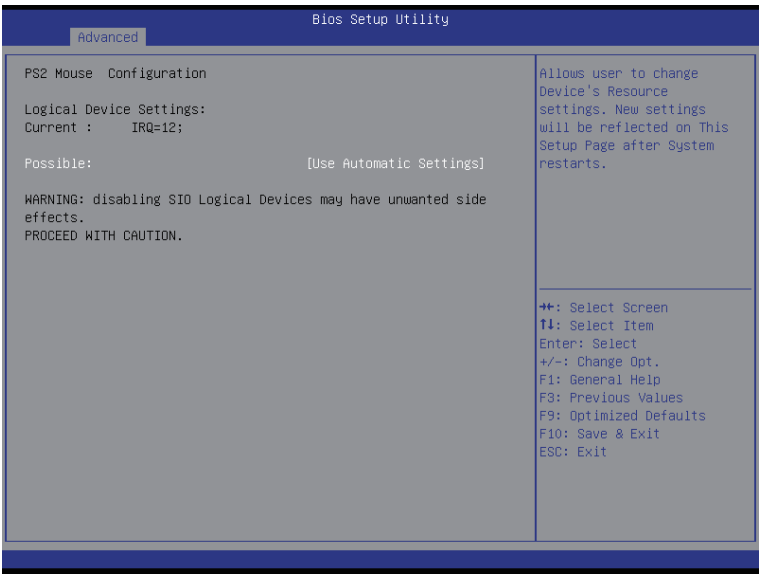
(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

2-9 SIO Configuration




Bios Setup Utility
Advanced
Serial Port 2 Configuration
Use This DeviceGSIO011 [Enabled]
Logical Device Settings:
Current : IO=2F8h; IRQ=3;
Possible: [Use Automatic Settings]
WARNING: disabling SIO Logical Devices may have unwanted side effects.
PROCEED WITH CAUTION.
Enable or Disable this Logical Devcie.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit


Bios Setup Utility
Advanced
PS2 Keyboard Configuration
Logical Device Settings:
Current : IO=60h; IO=64h; IRQ=1;
Possible: [Use Automatic Settings]
WARNING: disabling SIO Logical Devices may have unwanted side effects.
PROCEED WITH CAUTION.
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit



☞ **AMI SIO Driver Version**

Display the AMI SIO driver version information.

☞ **Super IO Chip Logical Device(s) Configuration**

☞ **[*Active*] Serial Port 1/2**

Press [Enter] for confuguration of advanced items.

☞ **[*Active*] PS2 Keyboard**

Press [Enter] for confuguration of advanced items.

☞ **[*Active*] PS2 Mouse**

Press [Enter] for confuguration of advanced items.

☞ **Serial Port 1 Configuration**

☞ **Use This Device**

When enabled allows you to configure the serial port 1 settings. When set to Disabled, displays no configuration for the serial port.

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

☞ **Logical Device Settings:**

☞ **Current:**

Display the Serial Port 1 base I/O addressand IRQ.

☞ **Possible:**

Configure Serial Port 1 base I/O addressand IRQ.

Option available:

Use Automatic Settings

IO=3F8h; IRQ=4; DMA;/

IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/

IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/

IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;
Default setting is **Use Automatic Settings**.

☞ **Serial Port 2 Configuration**

☞ **Use This Device**

When enabled allows you to configure the serial port 2 settings. When set to Disabled, displays no configuration for the serial port.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Logical Device Settings:**

☞ **Current:**

Display the Serial Port 2 base I/O addressand IRQ.

☞ **Possible:**

Configure Serial Port 2 base I/O addressand IRQ.
Option available:
Use Automatic Settings/
IO=2F8h; IRQ=3; DMA;/
IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
Default setting is **Use Automatic Settings**.

☞ **PS2 Keyboard Configuration**

☞ **Logical Device Settings:**

☞ **Current:**

Display the PS2 keyboard base I/O addressand IRQ.

☞ **Possible:**

Configure PS2 keyboard base I/O addressand IRQ.
Option available: Use Automatic Settings/IO=60h; IO=64h; IRQ=1.
Default setting is **Use Automatic Settings**.

☞ **PS2 Mouse Configuration**

☞ **Logical Device Settings:**

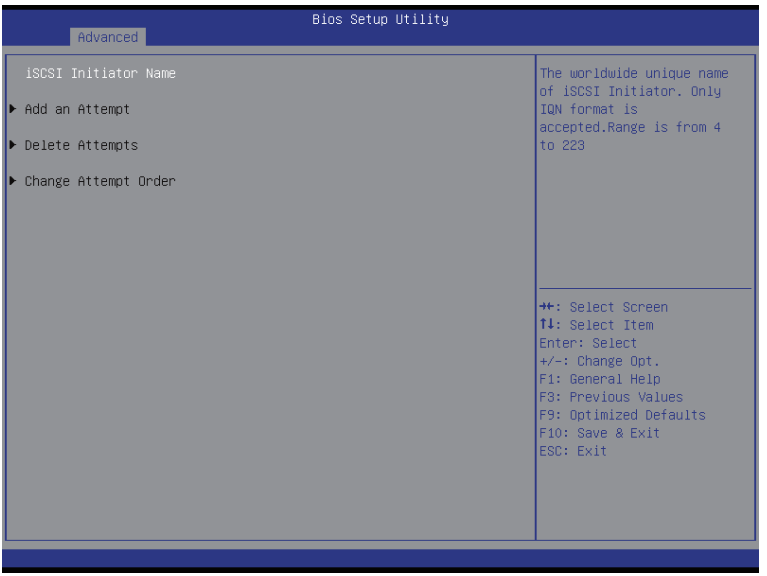
☞ **Current:**

Display the PS2 mouse base I/O addressand IRQ.

☞ **Possible:**

Configure PS2 nouse base I/O addressand IRQ.
Option available: Use Automatic Settings/IRQ=12;. Default setting is **Use Automatic Settings**.

2-2-10 iSCSI Configuration



☞ **iSCSI Initiator Name**

☞ **Add an Attempts**

Press [Enter] for configuration of advanced items.

☞ **Delete Attempts**

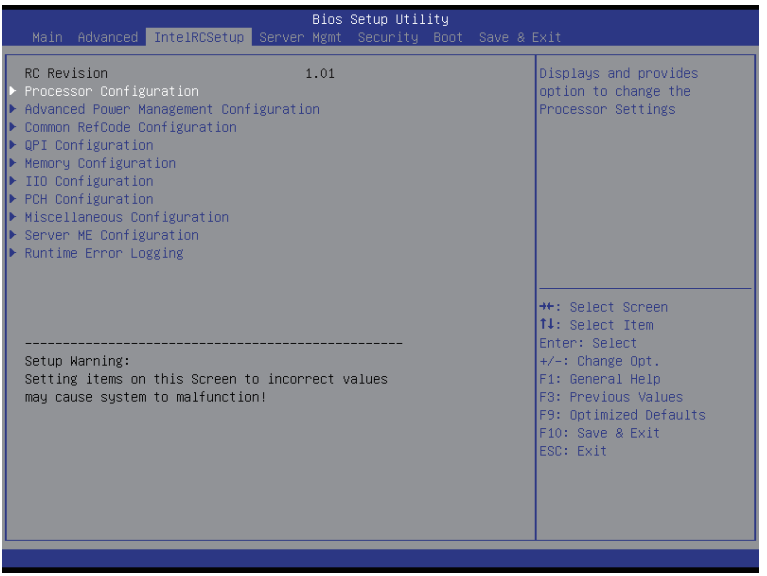
Press [Enter] for configuration of advanced items.

☞ **Change Attempt Order**

Press [Enter] for configuration of advanced items.

2-3 Intel RC Setup Menu

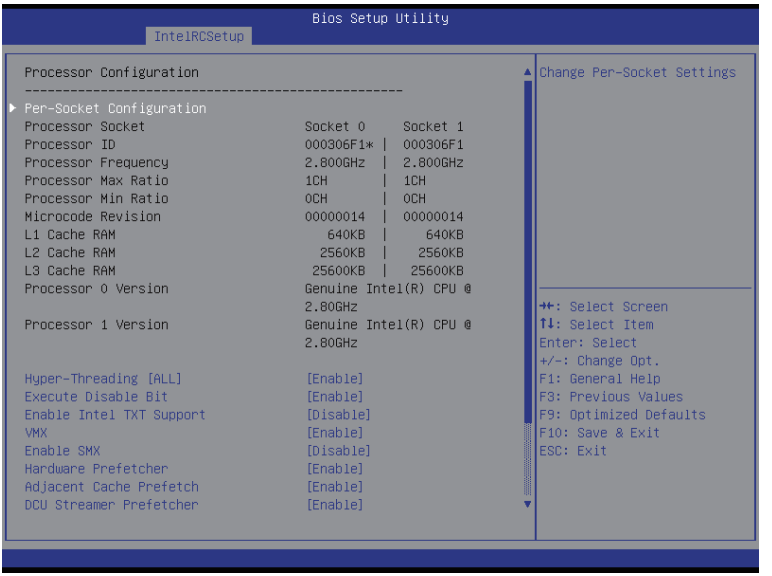
Intel RC Setup menu displays submenu options for configuring the function of North Bridge and South Bridge. Select a submenu item, then press Enter to access the related submenu screen.

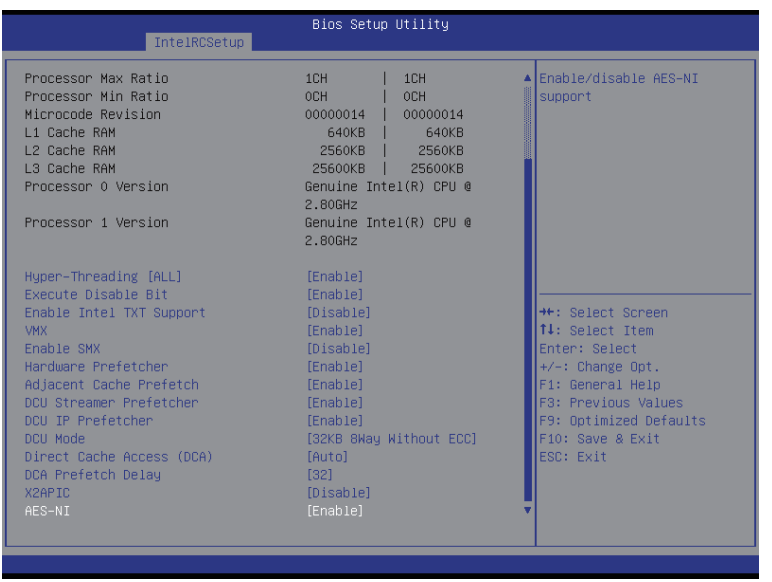


☞ **RC Revision**

Display Intel RC version information.

2-3-1 Processor Configuration





☞ **Processor Configuration**

☞ **Pre-Socket Configuration**

Press [Enter] for configuration of advanced items.

☞ **Processor Socket/Processor ID/Processor Frequency/Processor Max Raito/ Processor Min Raio/Microcode Revision/L1 Cache RAM/L2 Cache RAM/L3 Cache RAM/ Processor 0/1Version**

Displays the technical specifications for the installed processor.

☞ **Hyper-Threading [All]**

The 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**.

☞ **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**.

☞ **Enable Intel TXT Support**

Enable/Disable Intel Trusted Execution Technology support function.
Options available: Enabled/Disabled. Default setting is **Disabled.**

☞ **VMX (Vanderpool Technology)**

Enable/Disable Vanderpool Technology. This will take effect after rebooting the system.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Enable SMX (Intel Safer Mode Extensions Technology)**

Enable/Disblae Intel Safer Mode Extensions (SMX) support function.
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **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**.

☞ **DCU Mode**

Configure DCU mode.
Options available: 32KB 8Way Without ECC/16KB 4Way With ECC. Default setting is **32KB 8Way Without ECCC**.

☞ **Direct Cache Access (DCA)**

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

☞ **DCA Prefetch Delay**

Options available: Disabled/8/16/24/32/40/48/56/64/72/80/88/96/104/112. Default setting is **32**.

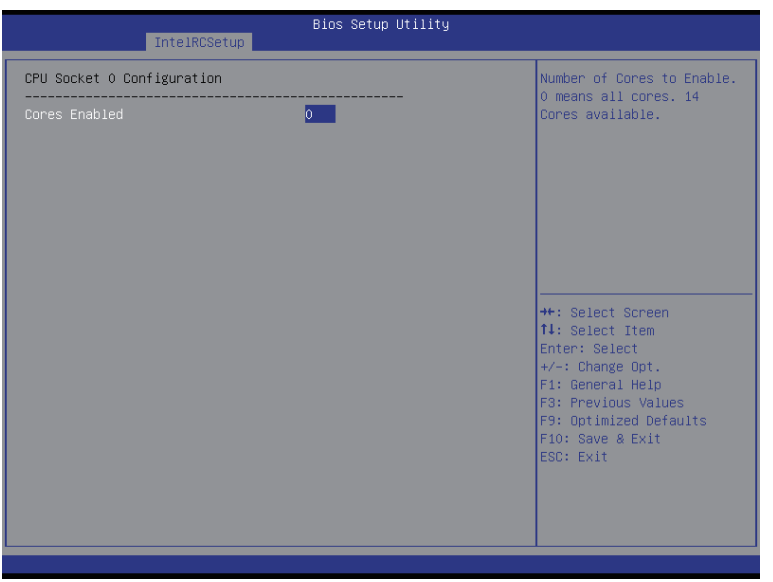
☞ **X2APIC**

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

☞ **AES-NI**

Enable/Disable AES-NI (Intel Advanced Encryption Standard New Instructions) support function.
Options available: Enabled/Disabled. Default setting is **Enabled**.

2-3-1-1 Pre-Socket Configuration



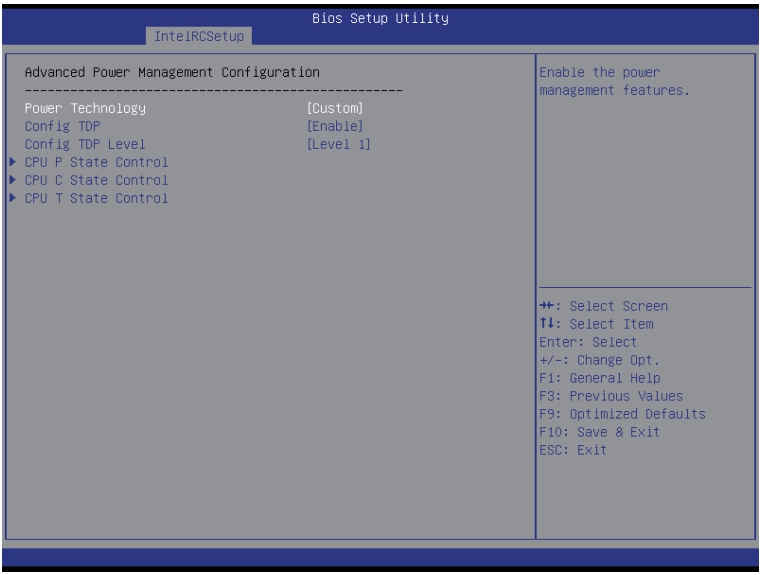
☞ **CPU Socket 0 Configuration**

Press [Enter] for configuration of advanced items.

☞ **Cores Enabled (for CPU socket 0)**

Number of Cores to enable. 0 means all cores. 14 Cores is available. Press the numeric keys to adjust desired values.

2-3-2 Advanced Power Management Configuration



☞ **Advanced Power Management Configuration**

☞ **Power Technology**

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

☞ **Config TDP**

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

☞ **CPU P State Control**

Press [Enter] for configuration of advanced items.

☞ **CPU C State Control**

Press [Enter] for configuration of advanced items.

☞ **CPU T State Control**

Press [Enter] for configuration of advanced items.

2-3-2-1 CPU P State Control

☞ EIST (P-State)

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**.

2-3-2-2 CPU C State Control

☞ Package C State Limit

Configure state for the C-State package limit.

Options available: C0/C1 state/C2 state/C6(non Retention) state/C6(Retention) state.

Default setting is **C6(non Retention) state**.

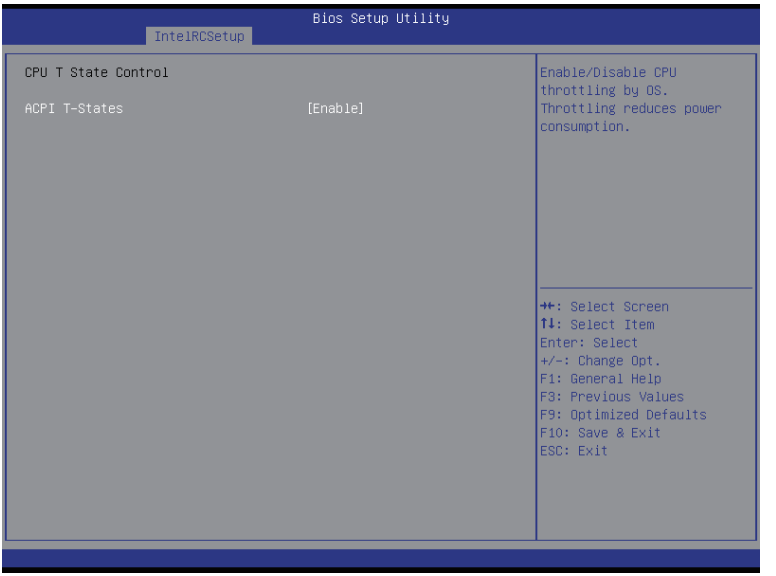
☞ CPU C3/C6 Report

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 for C3 is **Disabled**; default setting for C6 is **Enabled**.

2-3-2-3 CPU T State Control



ACPI T-States

Enable/Disable CPU throttling by OS. Thorttling reduces power comsumption.

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

2-3-3 Common RefCode Configuration

☞ **Common RefCode Configuration**

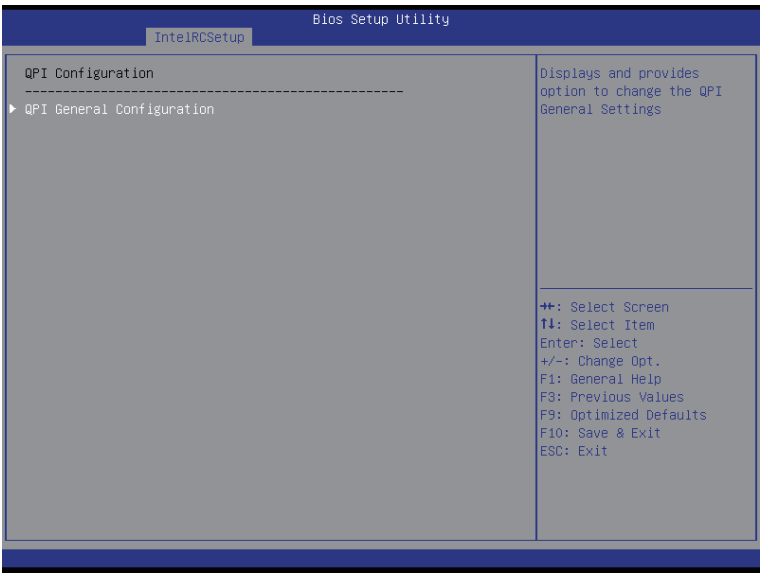
☞ **Isoc Mode**

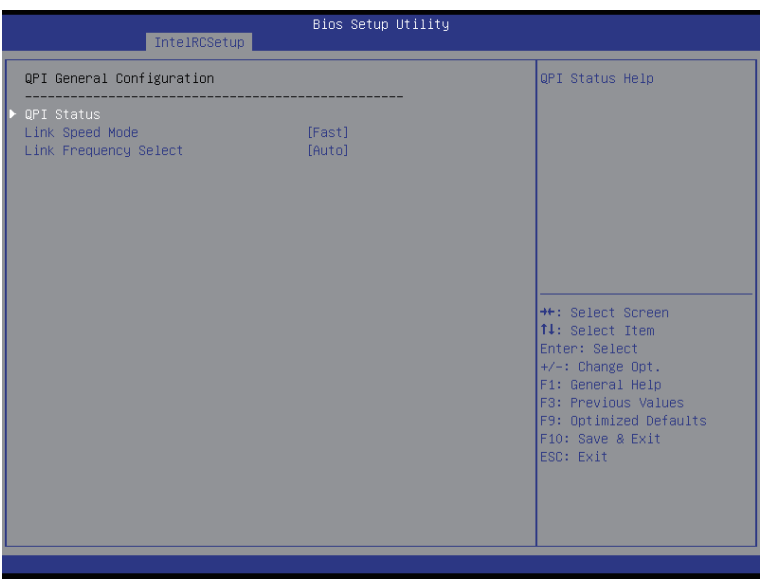
Options available: Auto/Enabled/Disabled. Default setting is **Auto**.

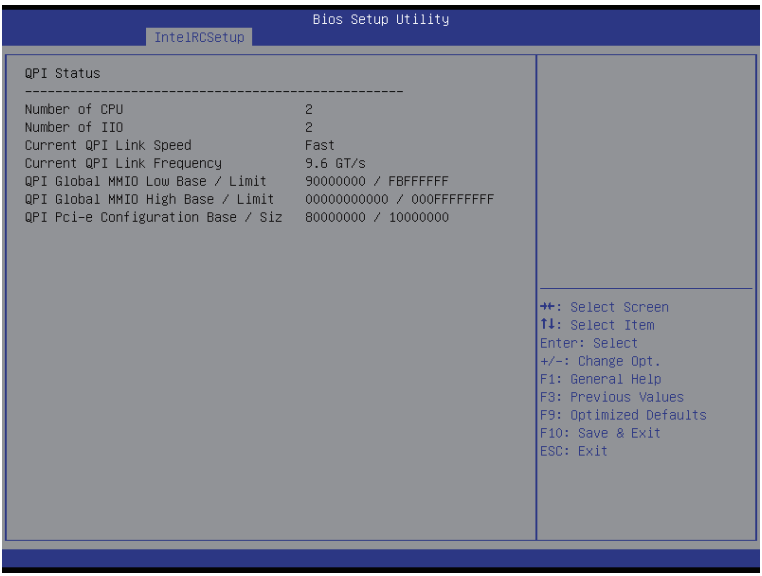
☞ **Numa (Non-Uniform Memory Access)**

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

2-3-4 QPI Configuration







☞ **QPI General Configuration**

Press [Enter] for configuration of advanced items.

☞ **QPI Status**

Press [Enter] to view QPI status.

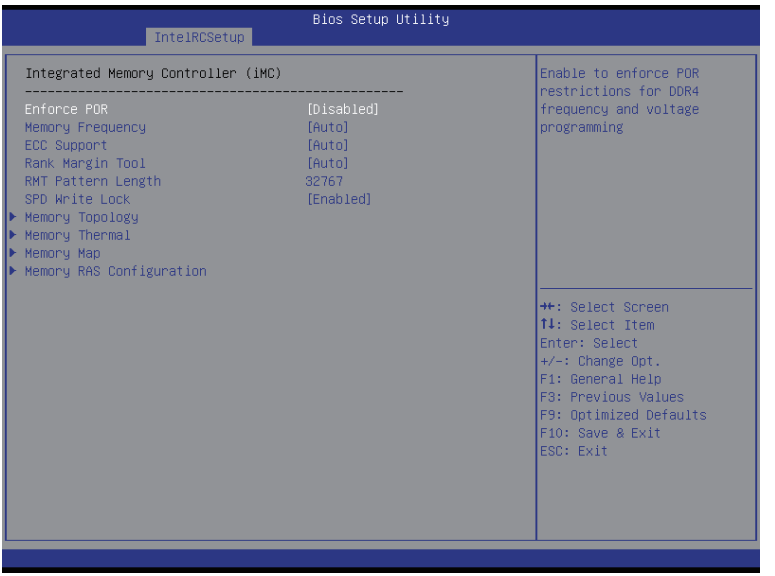
☞ **Link Speed Mode**

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

☞ **Link Frequency Select**

Options available: 6.4GB/s/8.0GB/s/9.6GB/s/Auto/Auto Limited. Default setting is **Auto**.

2-3-5 Memory Configuration



☞ **Integrated Memory Controller (iMC)**

☞ **Enforce POR**

Enable to enforce POR restrictions for DDR4 frequency and voltage programming.

Options available: Enforce POR/Disabled/Enforce Stretch Goals. Default setting is **Enforce POR**.

☞ **Memory Frequency**

Configure memory frequency.

Options available: Auto/1333/1400/1600/1800/1867/2000/2133.

Default setting is **Auto**.

☞ **ECC Support**

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

☞ **Rank Margin Tool**

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

☞ **RMT Pattern Length**

Display RMT Pattern Length.

☞ **SPD Write Lock**

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

☞ **Memory Topology**

Press [Enter] for configuration of advanced items.

☞ **Memory Thermal**

Press [Enter] for configuration of advanced items.

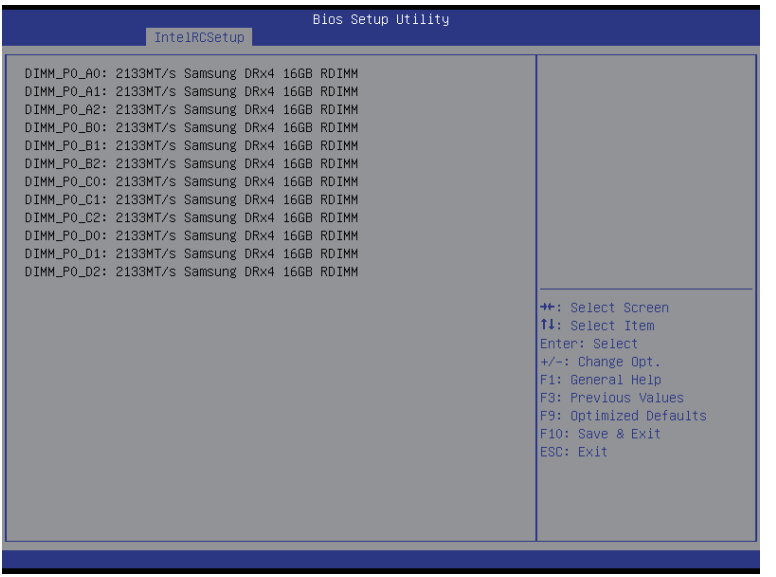
☞ **Memory Map**

Press [Enter] for configuration of advanced items.

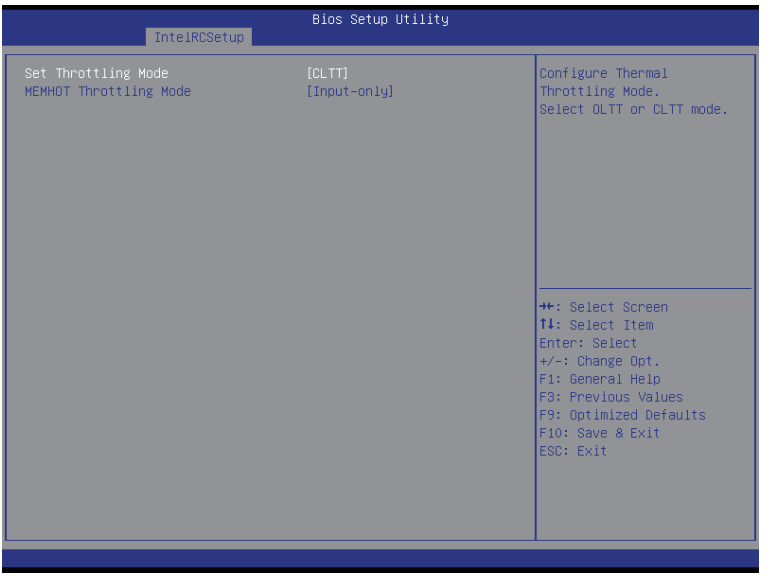
☞ **Memory RAS Configuration**

Press [Enter] for configuration of advanced items.

2-3-5-1 Memory Topology



2-3-5-2 Memory Thermal



☞ Set Throttling Mode

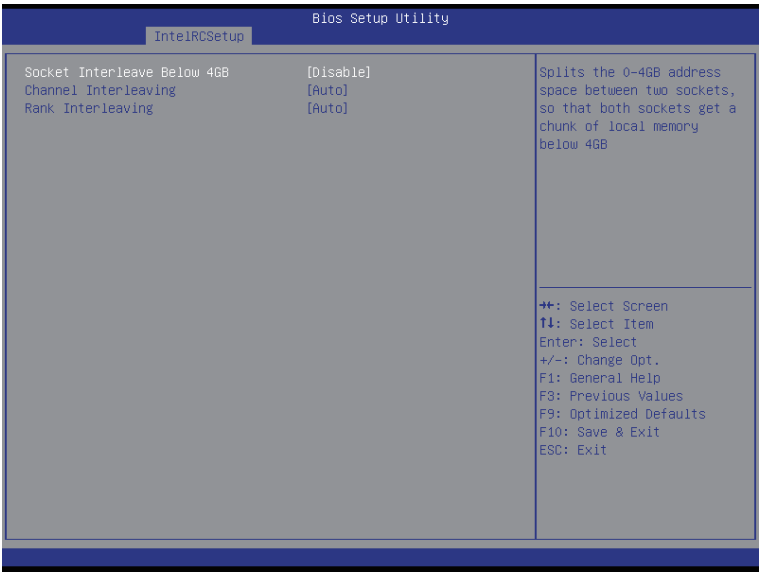
Configure Thermal Throttling Mode. Select OLTT or CLTT mode.

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

☞ MEMHOT Throttling Mode

Options available: Disabled/Output-only/Input-only. Default setting is **Input-only**.

2-3-5-3 Memory Map



☞ Socket Interleave Below 4GB

Splits the 0-4GB address space between two sockets, so that both sockets get a chunk of local memory below 4GB.

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

☞ Channel Interleaving

Options available: Auto/1-way Interleave/2-way Interleave/3-way Interleave/4-way Interleave. Default setting is **Auto**.

☞ Rank Interleaving

Options available: Auto/1-way Interleave/2-way Interleave/4-way Interleave/8-way Interleave. Default setting is **Auto**.

2-3-5-4 Memory RAS Configuration

☞ RAS Mode

Enable/Disable RAS modes. Enabling Sparing and Mirroring is not supported. When this item is set to enabled, Sparing will be selected.

Options available: Disable/Mirror/Lockstep Mode. Default setting is **Disabled**.

☞ Lockstep x4 DIMMs

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

☞ Memory Rank Sparing

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

☞ Correctable Error Threshold

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

2-3-6 IIO Configuration

☞ **IIO Configuration**

☞ **EV DFX Features**

Set this option to allow DFX Lock Bits to remain clear.

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

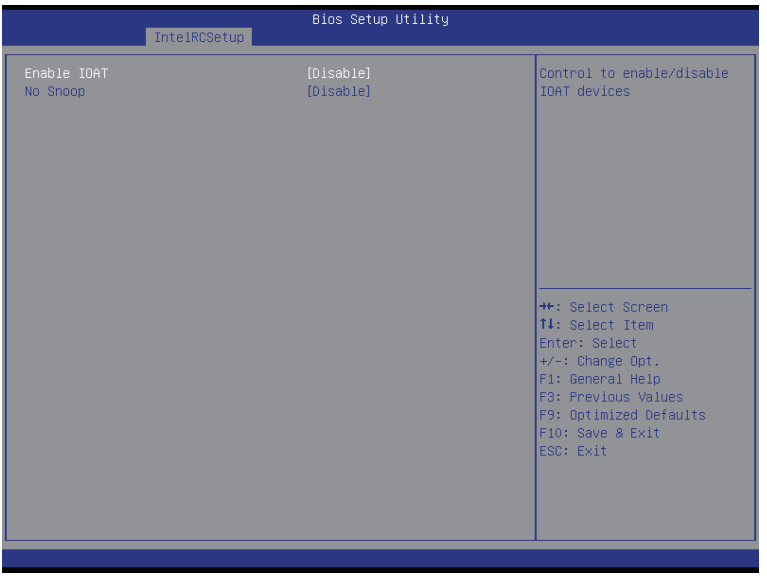
☞ **IOAT Configuration**

Press [Enter] for configuration of advanced items.

☞ **Intel VT for Directed I/O (VT-d)**

Press [Enter] for configuration of advanced items.

2-3-6-1 IOAT Configuration



☞ **IOAT Configuration**

☞ **Enable IOAT**

Control to enable/disable IOAT (Intel I/O Acceleration Technology) device.

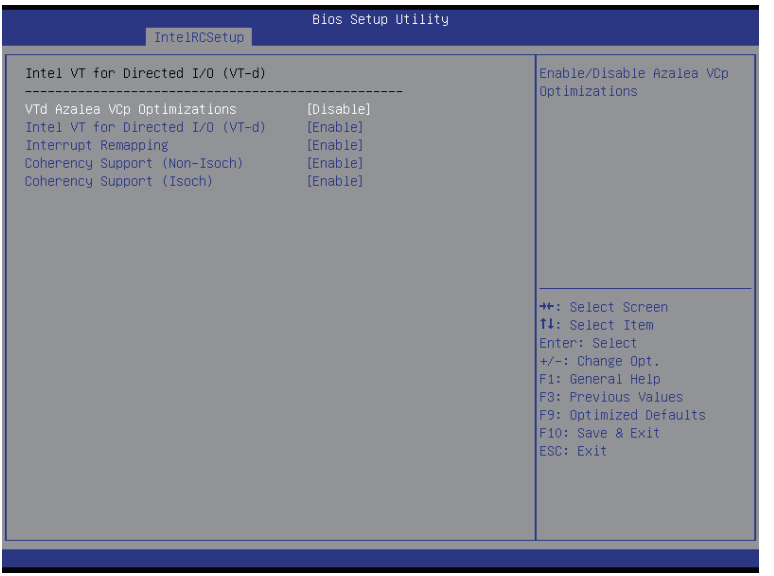
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **No Snoop**

Enable/Disable PCI Express Device No Snoop option.

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

2-3-6-2 Intel VT for Directed I/O (VT-d)



☞ **Intel VT for Directed I/O (VT-d)**

☞ **VT-d Azalea VCp Optimizations**

Enable/Disable Azalea VCp optimizations.

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

☞ **Intel VT for Directed I/O (VT-d)**

Enable/Disable Intel VT for Directed I/O (VT-d) support function.

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

☞ **Interrupt Remapping**

Enable/Disable interrupt remapping support function.

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

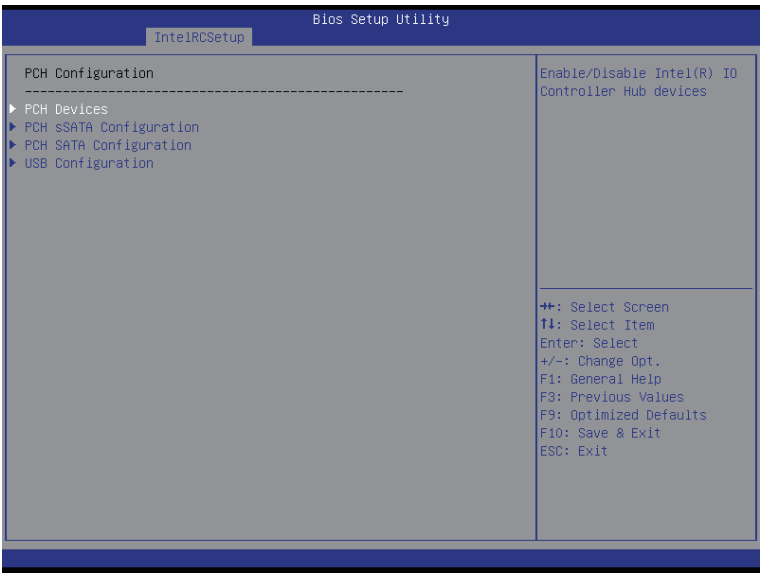
☞ **Coherency Suuport (Non-Isoch)**

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

☞ **Coherency Suuport (Isoch)**

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

2-3-7 PCH Configuration



☞ **PCH Configuration**

☞ **PCH Devices**

Press [Enter] for configuration of advanced items.

☞ **PCH sSATA Configuration**

Press [Enter] for configuration of advanced items.

☞ **PCH SATA Configuration**

Press [Enter] for configuration of advanced items.

☞ **USB Configuration**

Press [Enter] for configuration of advanced items.

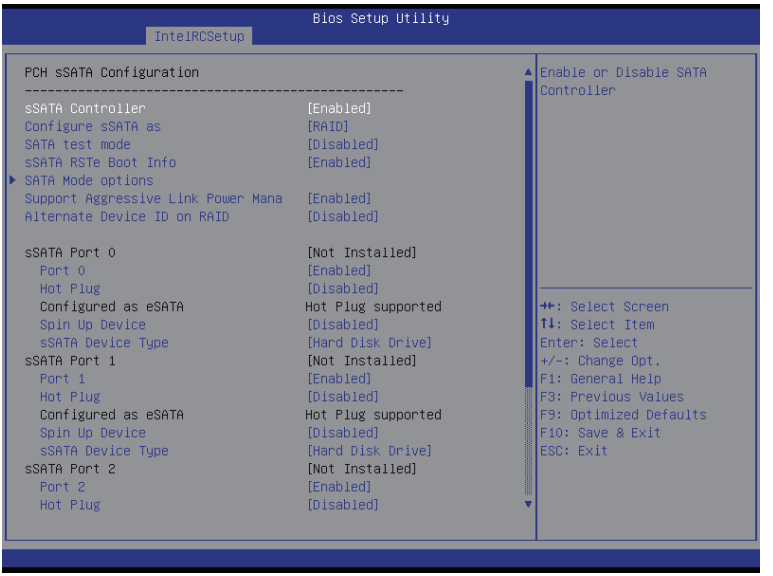
2-3-7-1 PCH Devices

☞ PCH CRID

Enable/Disable Intel Compatible Revision ID.

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

2-3-7-2 PCH sSATA Configuration



When SATA Type is set to IDE

☞ PCH sSATA Configuration

☞ sSATA Controller(s)

Enable/Disable sSATA controller.

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

☞ Configure sSATA as

Coonfigure 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**.

☞ SATA Test Mode

Enable/Disable SATA Test Mode.

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

☞ SATA RSTe Boot Info(Note 1)

Enable/Disable SATA RSTe Boot Information.

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

☞ SATA Mode options(Note 2)

Press [Enter] for configuration of advanced items.

(Note 1) Only Supported When HDD is in **RAID** Mode.

(Note 2) Only Supported When HDD is in **AHCI** or **RAID** Mode.

☞ **Support Aggressive Link Power Mana(Note)**

Enable PCH to aggressively enter link power state.

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

☞ **Alternate Device ID on RAID**

Enable /Disable Alternate Device ID on RAID mode.

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

Please note that this option appears when HDD is in RAID Mode.

☞ **sSATA Port 0/1/2/3**

The category identifies sSATA type of hard disk that are installed in the computer.

System will automatically detect HDD type.

☞ **Port 0/1/2/3**

Enable/Disable Port 0/1/2/3 device.

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

☞ **Hot Plug (for Port 0/1/2/3)(Note)**

Enable/Disable HDD Hot-Plug function.

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

☞ **Configured as eSATA(Note)**

Display Hot-Plug supported information.

☞ **Spin Up Device (for Port 0/1/2/3)(Note)**

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

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

☞ **sSATA Device Type**

Select sSATA device type.

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

(Note) Only Supported When HDD is in **AHCI** or **RAID** Mode.

2-3-7-2-1 SATA Mode Options

When SATA Type is set to IDE/AHCI Mode

☞ **SATA LED locate**

When this option is enabled, LED/SGPIO hardware is attached.

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

When SATA Type is set to RAID Mode

☞ **SATA LED locate**

When this option is enabled, LED/SGPIO hardware is attached.

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

☞ **Intel Rapid Recovery Technology**

Enable/Disable Intel Rapid Recovery Technology support function.

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

☞ **RAID Option ROM UI banner**

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

☞ **IRRT Only on ESATA**

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

☞ **Smart Response Technology**

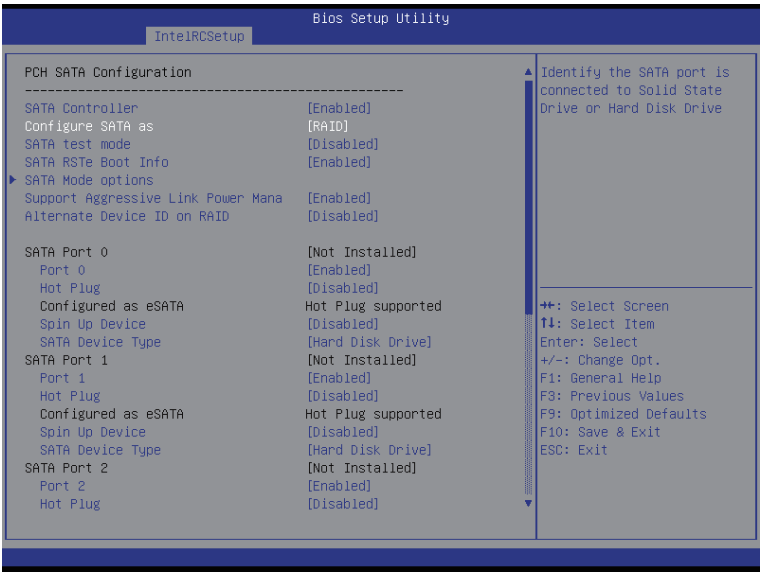
Enable/Disable Intel Smart Response Technology support function.

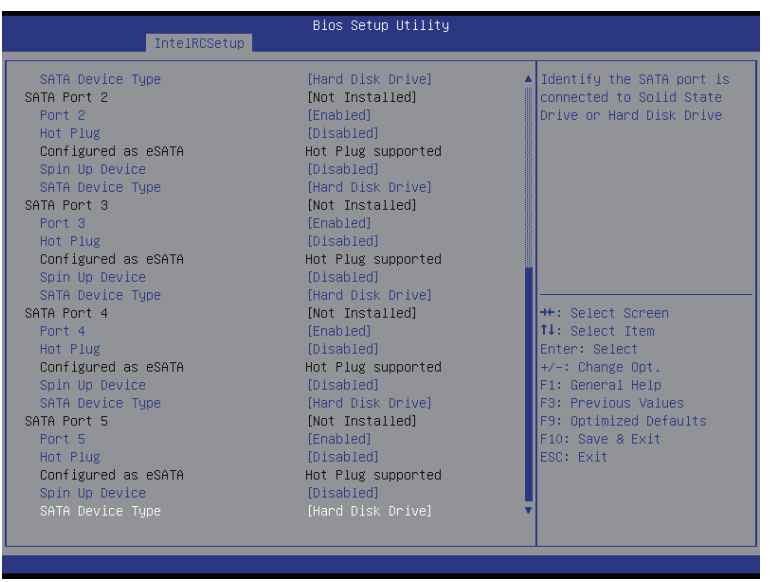
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **RAID OROM prompt delay**

Options available: 2 Seconds/4 Seconds/6 Seconds/8 Seconds. Default setting is **2 Seconds**.

2-3-7-3 PCH SATA Configuration





When SATA Type is set to IDE

☞ **PCH SATA Configuration**

☞ **SATA Controller(s)**

Enable/Disable sSATA controller.

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

☞ **Configure sSATA as**

Coonfigure 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**.

☞ **SATA Test Mode**

Enable/Disable SATA Test Mode.

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

☞ **SATA RSTe Boot Info**(Note 1)

Enable/Disable SATA RSTe Boot Information.

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

☞ **SATA Mode options**(Note 2)

Press [Enter] for configuration of advanced items.

(Note 1) Only Supported When HDD is in **RAID** Mode.

(Note 2) Only Supported When HDD is in **AHCI** or **RAID** Mode.

☞ **Support Aggressive Link Power Mana(Note)**

Enable PCH to aggressively enter link power state.

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

☞ **Alternate Device ID on RAID**

Enable /Disable Alternate Device ID on RAID mode.

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

Please note that this option appears when HDD is in RAID Mode.

☞ **sSATA Port 0/1/2/3/4/5**

The category identifies sSATA type of hard disk that are installed in the computer.

System will automatically detect HDD type.

☞ **Port 0/1/2/3/4/5**

Enable/Disable Port 0/1/2/3 device.

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

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

Enable/Disable HDD Hot-Plug function.

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

☞ **Configured as eSATA(Note)**

Display Hot-Plug supported information.

☞ **Spin Up Device (for Port 0/1/2/3/4/5)(Note)**

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

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

☞ **sSATA Device Type**

Select sSATA device type.

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

(Note) Only Supported When HDD is in **AHCI** or **RAID** Mode.

2-3-7-3-1 SATA Mode Options

When SATA Type is set to IDE/AHCI Mode

☞ **SATA LED locate**

When this option is enabled, LED/SGPIO hardware is attached.

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

When SATA Type is set to RAID Mode

☞ SATA LED locate

When this option is enabled, LED/SGPIO hardware is attached.

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

☞ Intel Rapid Recovery Technology

Enable/Disable Intel Rapid Recovery Technology support function.

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

☞ RAID Option ROM UI banner

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

☞ Smart Response Technology

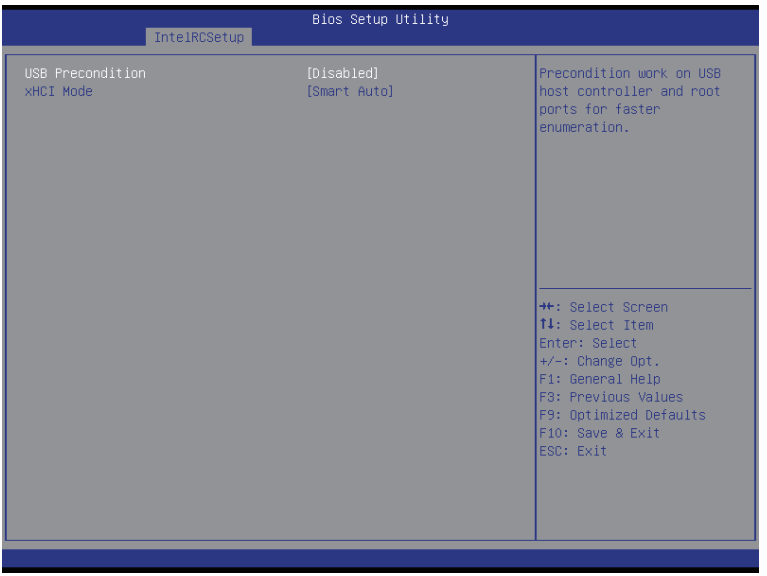
Enable/Disable Intel Smart Response Technology support function.

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

☞ RAID OROM prompt delay

Options available: 2 Seconds/4 Seconds/6 Seconds/8 Seconds. Default setting is **2 Seconds**.

2-3-7-4 USB Configuration



☞ USB Precondition

Precondition work on USB host conteoller and root ports for faster enumeration.

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

☞ xHCI Mode

Enable/Disable xHCI (USB 3.0) support function.

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

2-3-8 Miscellaneous Configuration

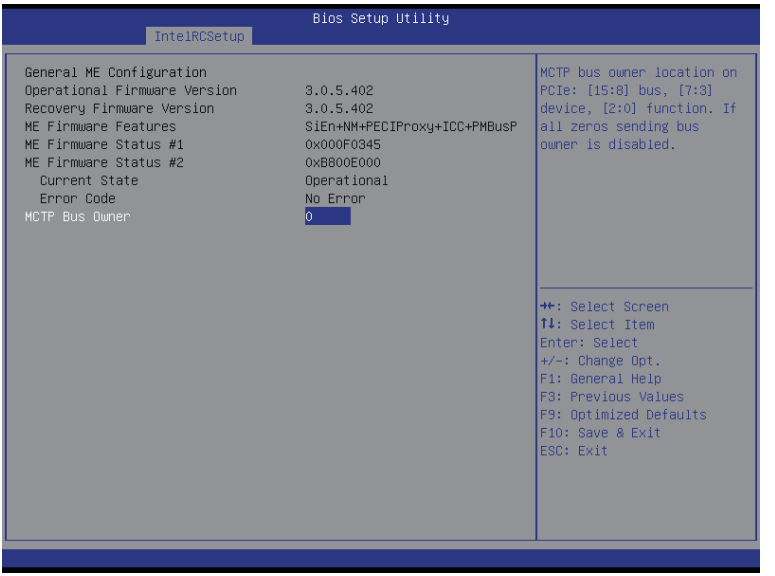
☞ **Miscellaneous Configuration**

☞ **Active Video**

Select active Video type.

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

2-3-9 Server ME Configuration



☞ **Greneral ME Configuration**

☞ **Operational Firmware Version**

Display Operational Firmware Version information.

☞ **Recovery Firmware Version**

Display Recovery Firmware Version information.

☞ **ME Firmware Features**

Display ME Firmware features information.

☞ **ME Firmware Status #1/#2**

Display ME Firmware status information.

☞ **Current State (for ME Firmware)**

Display ME Firmware current status information.

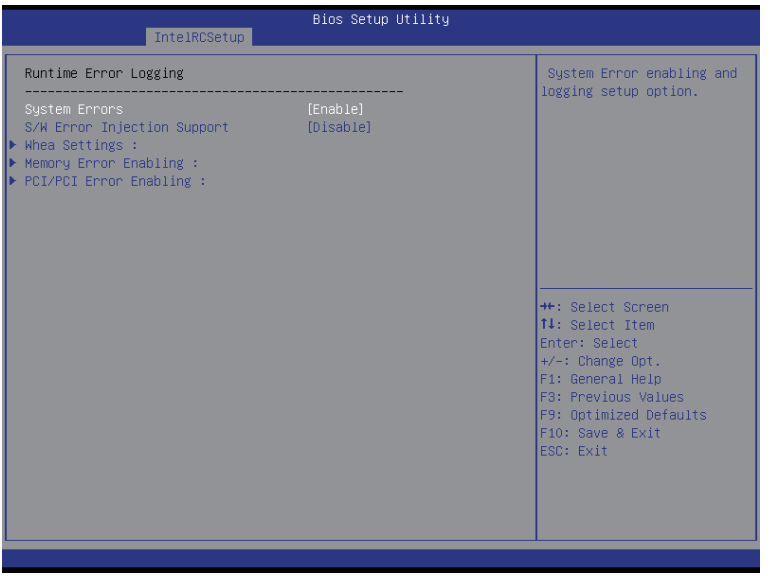
☞ **Error Code (for ME Firmware)**

Display ME Firmware status error code.

☞ **MCTP Bus Owner**

Configure MCTP Bus Owner.

2-3-10 Runtime Error Logging



☞ **Runtime Error Logging**

☞ **System Errors**

Enable/Disable system error logging function.

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

☞ **S/W Error Injection Support**

Enable/Disable software injection error logging function.

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

☞ **Whea Settings**

Press [Enter] for configuration of advanced items.

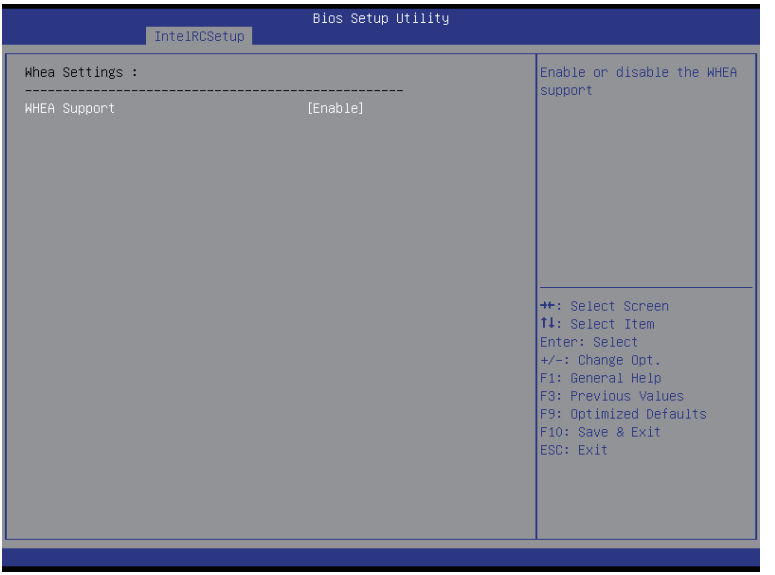
☞ **Memory Error Enabling**

Press [Enter] for configuration of advanced items.

☞ **PCI/PCI-E Error Enabling**

Press [Enter] for configuration of advanced items.

2-3-10-1 Whea Setting



☞ WHEA Support (Windows Hardware Error Architecture)

Enable/Disable WHEA Support.

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

2-3-10-2 Memory Error Enabling

☞ **Memory Error Enabling**

☞ **Un-Correctable Errors disable Memory**

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

☞ **Memory corrected Errors enabling**

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

2-3-10-3 PCI/PCI-E Error Enabling

☞ **PCI-Ex Error Enable** (Note)

Options available: Yes/No. Default setting is **No**.

☞ **Corrected Error Enable**

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

☞ **Uncorrected Error Enable**

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

☞ **Fatal Error Enable**

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

☞ **Enable SERR propagation**

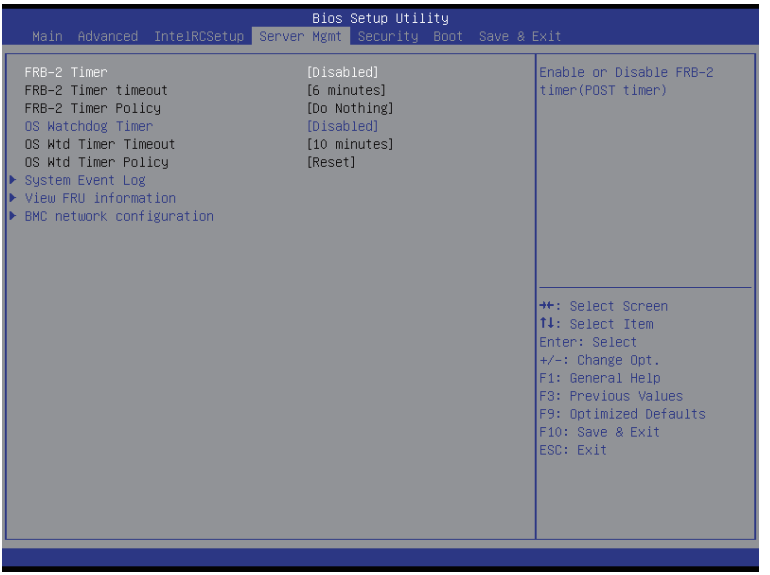
When this item is set to enabled, PCI bus system error (SERR) is generated and is routed to NMI.
Options available: Yes/No. Default setting is **Yes**.

☞ **Enable PERR propagation**

When this item is set to Yes, PCI bus parity error (PERR) is generated and is routed to NMI.
Options available: Yes/No. Default setting is **Yes**.

(Note) Advanced items prompt when this item is set to **Yes**.

2-4 Server Management Menu



☞ FRB-2 Timer

Enable/Disable FRB-2 timer (POST timer).

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

☞ FRB2 Timer timeout

Configure the FRB2 Timer timeout.

Options available: 3 minutes/4 minutes/5 minutes/6 minutes. Default setting is **6 minutes**.

Please note that this item is configurable when FRB-2 Timer is set to Enabled.

☞ FRB2 Timer Policy

Configure the FRB2 Timer policy.

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

Please note that this item is configurable when FRB-2 Timer is set to Enabled.

☞ 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**.

Please note that this item is configurable when OS Watchdog Timer is set to Enabled.

☞ OS Wtd Timer Policy

Configure OS Watchdog Timer Policy.

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

Please note that this item is configurable when OS Watchdog Timer is set to Enabled.

☞ **System Event Log**

Press [Enter] for configuration of advanced items.

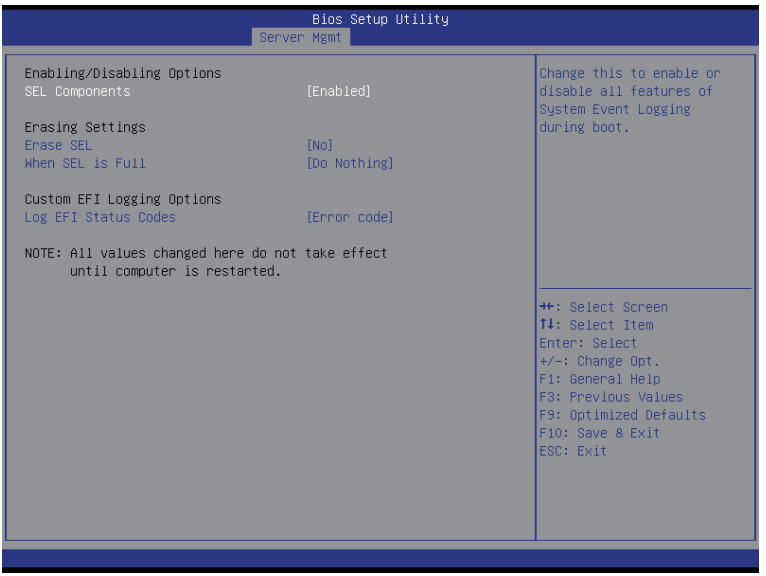
☞ **View FRU Information**

Press [Enter] to view the advanced items.

☞ **BMC network configuration**

Press [Enter] for configuration of advanced items.

2-4-1 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

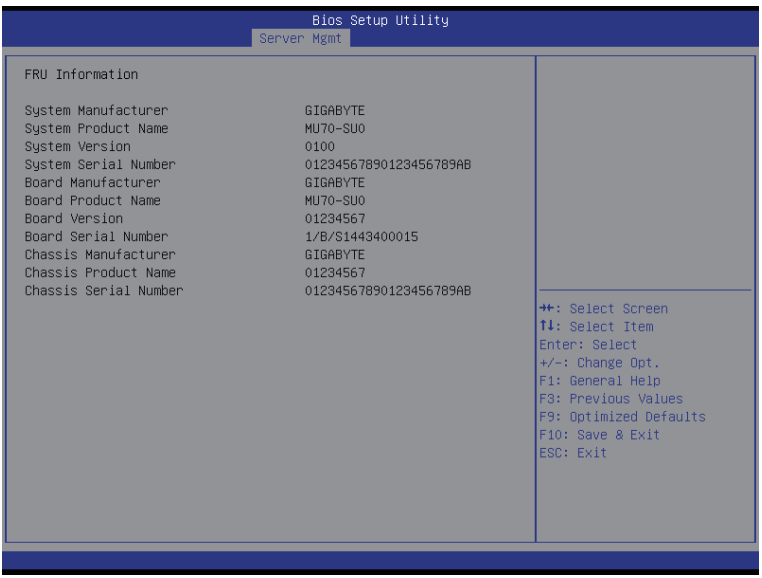
☞ Log EFI Status Codes

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

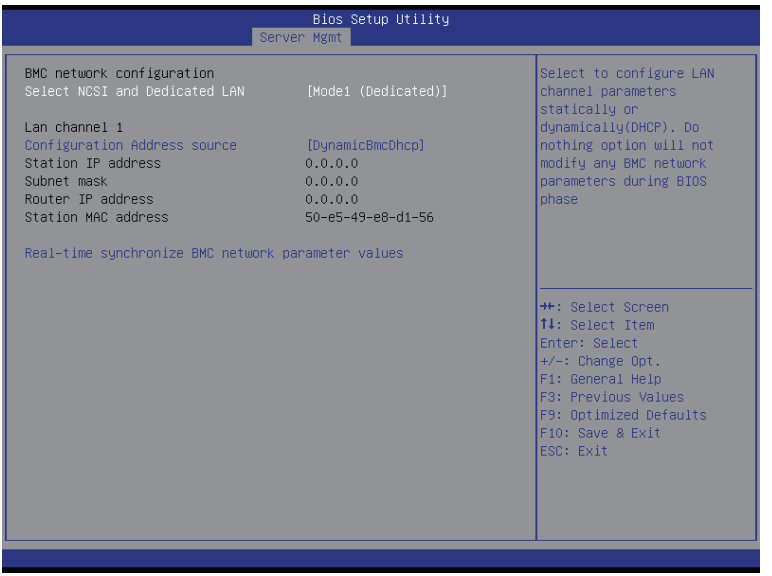
Options available: Disabled/Both/Error code/Progress code. Default setting is **Error code**.

2-4-2 View FRU Information

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



2-4-3 BMC network configuration



☞ **BMC network configuration**

☞ **Select NCSI and Dedicated LAN**

Switch NCSI and dedicated LAN and send KCS command.

Options available: Mode2(NSCI)/ Mode1 (Dedicated)/Do Nothing. Default setting is **Do Nothing**.

☞ **Lan Channel 1**

☞ **Configuration Address 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: Unspecified/Static/DynamicBmcDhcp. Default setting is **Unspecified/Static**.

☞ **Station 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.

☞ **Router IP address**

Display the Router IP Address information.

☞ **Station MAC Address**

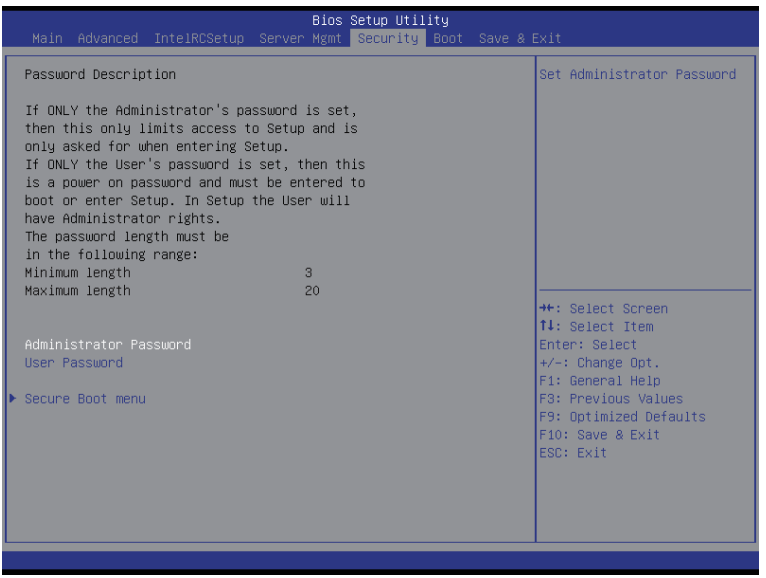
Display the MAC Address information.

☞ **Real-time synchronize BMC network parameter values**

Press [Enter] to synchronize BMC network parameter values.

2-5 Security Menu

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



There are two types of passwords that you can set:

- 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**

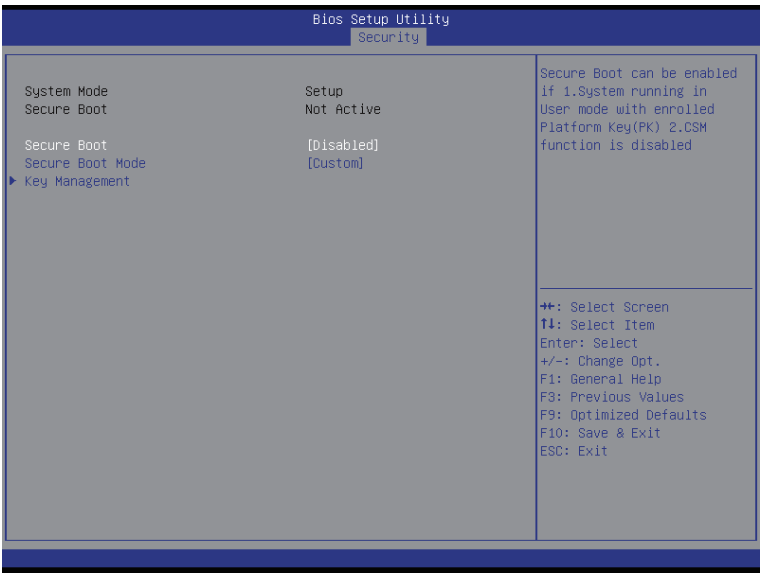
Press Enter to configure the user password.

☞ **Secure Boot menu**

Press [Enter] for configuration of advanced items.

2-5-1 Secure Boot menu

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



☞ Secure Mode

Display the System secure mode state.

☞ Secure Boot

Display the status of Secure Boot.

☞ Secure Boot

Enable/Disable Secure Boot function.

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

☞ Secure Boot Mode

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.

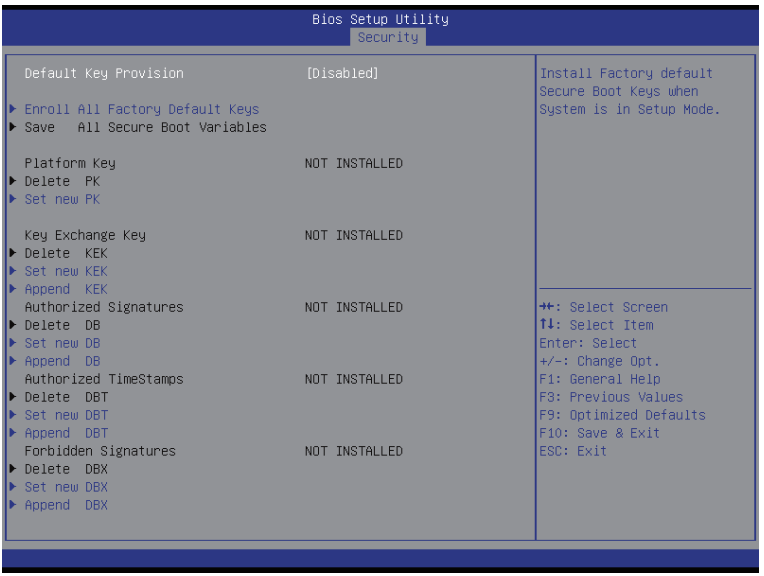
Options available: Standard/Custom. Default setting is **Custom**.

☞ Key Management(Note)

Press [Enter] for configuration of advanced items.

(Note) Advanced items prompt when this item is set to **Cutom**.

2-5-1-1 Key Management



☞ 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**.

☞ Enroll All Factory Default Keys

Press [Enter] to install all factory default keys.

☞ Save All Secure Boot Variables

Press [Enter] to save all Secure Boot 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 File

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 aVar 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**

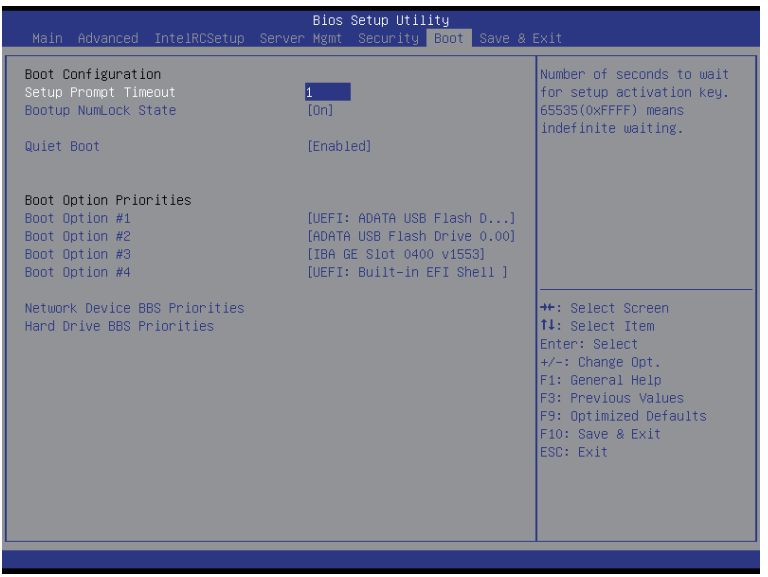
Press [Enter] to configure a new dbx.

☞ **Append Var to DBX**

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

2-6 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

Enables or disables showing the logo during POST.

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

☞ Boot Option Priorities

☞ 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. USB device

☞ **Network Device BBS Priorities**

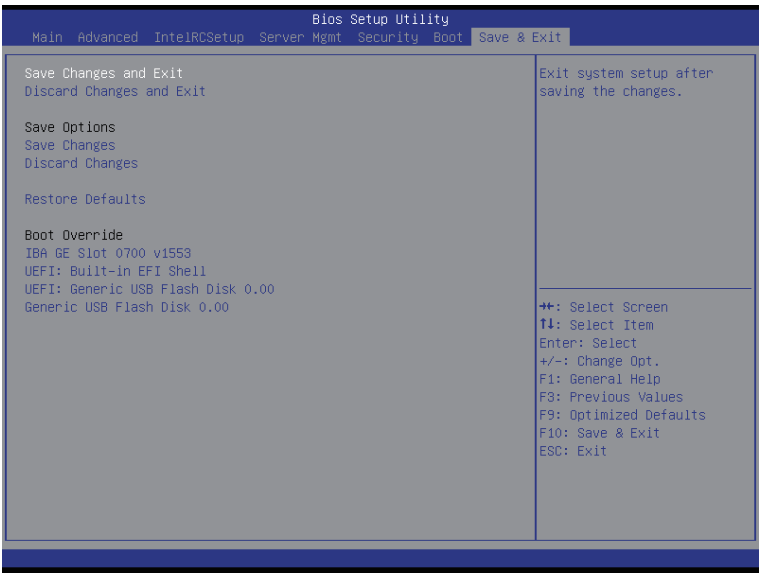
Press Enter to configure the boot priority.

☞ **Hard Drive BBS Priorities**

Press Enter to configure the boot priority.

2-7 Save & Exit Menu

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



☞ Save Changes and Exit

Saves changes made and close the BIOS setup.

Options available: Yes/No.

☞ Discard Changes and Exit

Discards changes made and exit the BIOS setup.

Options available: Yes/No.

☞ Save Options

☞ Save Changes

Saves changes made in the BIOS setup.

Options available: Yes/No.

☞ Discard Changes

Discards changes made and close 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 POST Codes

PEI_CORE_STARTED	0x10
PEI_CAR_CPU_INIT	0x11
// reserved for CPU 0x12 - 0x14	
PEI_CAR_NB_INIT	0x15
// reserved for NB 0x16 - 0x18	
PEI_CAR_SB_INIT	0x19
// reserved for SB 0x1A - 0x1C	
PEI_MEMORY_SPD_READ	0x1D
PEI_MEMORY_PRESENCE_DETECT	0x1E
PEI_MEMORY_TIMING	0x1F
PEI_MEMORY_CONFIGURING	0x20
PEI_MEMORY_INIT	0x21
// reserved for OEM use: 0x22 - 0x2F	
// reserved for AML use: 0x30	
PEI_MEMORY_INSTALLED	0x31
PEI_CPU_INIT	0x32
PEI_CPU_CACHE_INIT	0x33
PEI_CPU_BSP_SELECT	0x34
PEI_CPU_AP_INIT	0x35
PEI_CPU_SMM_INIT	0x36
PEI_MEM_NB_INIT	0x37
// reserved for NB 0x38 - 0x3A	
PEI_MEM_SB_INIT	0x3B
// reserved for SB 0x3C - 0x3E	
// reserved for OEM use: 0x3F - 0x4E	
PEI_DXE_IPL_STARTED	0x4F
//Recovery	
PEI_RECOVERY_AUTO	0xF0
PEI_RECOVERY_USER	0xF1
PEI_RECOVERY_STARTED	0xF2
PEI_RECOVERY_CAPSULE_FOUND	0xF3
PEI_RECOVERY_CAPSULE_LOADED	0xF4
//S3	
PEI_S3_STARTED	0xE0
PEI_S3_BOOT_SCRIPT	0xE1
PEI_S3_VIDEO_REPOST	0xE2
PEI_S3_OS_WAKE	0xE3
//DXE_STATUS_CODE	
DXE_CORE_STARTED	0x60
DXE_NVRAM_INIT	0x61

DXE_SBRUN_INIT	0x62
DXE_CPU_INIT	0x63
//reserved for CPU 0x64 - 0x67	
DXE_NB_HB_INIT	0x68
DXE_NB_INIT	0x69
DXE_NB_SMM_INIT	0x6A
//reserved for NB 0x6B - 0x6F	
DXE_SB_INIT	0x70
DXE_SB_SMM_INIT	0x71
DXE_SB_DEVICES_INIT	0x72
//reserved for SB 0x73 - 0x77	
DXE_ACPI_INIT	0x78
DXE_CSM_INIT	0x79
//reserved for AMI use: 0x7A - 0x7F	
//reserved for OEM use: 0x80 - 0x8F	
DXE_BDS_STARTED	0x90
DXE_BDS_CONNECT_DRIVERS	0x91
DXE_PCI_BUS_BEGIN	0x92
DXE_PCI_BUS_HPC_INIT	0x93
DXE_PCI_BUS_ENUM	0x94
DXE_PCI_BUS_REQUEST_RESOURCES	0x95
DXE_PCI_BUS_ASSIGN_RESOURCES	0x96
DXE_CON_OUT_CONNECT	0x97
DXE_CON_IN_CONNECT	0x98
DXE_SIO_INIT	0x99
DXE_USB_BEGIN	0x9A
DXE_USB_RESET	0x9B
DXE_USB_DETECT	0x9C
DXE_USB_ENABLE	0x9D
//reserved for AMI use: 0x9E - 0x9F	
//reserved for AML use: 0xA0	
DXE_IDE_BEGIN	0xA1
DXE_IDE_RESET	0xA2
DXE_IDE_DETECT	0xA3
DXE_IDE_ENABLE	0xA4
DXE_SCSI_BEGIN	0xA5
DXE_SCSI_RESET	0xA6
DXE_SCSI_DETECT	0xA7
DXE_SCSI_ENABLE	0xA8
DXE_SETUP_VERIFYING_PASSWORD	0xA9
//reserved for AML use: 0xAA	
DXE_SETUP_START	0xAB

DXE_SETUP_INPUT_WAIT	0xAC
DXE_READY_TO_BOOT	0xAD
DXE_LEGACY_BOOT	0xAE
DXE_EXIT_BOOT_SERVICES	0xAF
RT_SET_VIRTUAL_ADDRESS_MAP_BEGIN	0xB0
RT_SET_VIRTUAL_ADDRESS_MAP_END	0xB1
DXE_LEGACY_OPROM_INIT	0xB2
DXE_RESET_SYSTEM	0xB3
DXE_USB_HOTPLUG	0xB4
DXE_PCI_BUS_HOTPLUG	0xB5
DXE_NVRAM_CLEANUP	0xB6
DXE_CONFIGURATION_RESET	0xB7
//reserved for AMI use: 0xB8 - 0xBF	
//reserved for OEM use: 0xC0 - 0xCF	
//PEI_STATUS_CODE	
//Errors	
//Regular boot	
PEI_MEMORY_INVALID_TYPE	0x50
PEI_MEMORY_INVALID_SPEED	0x50
PEI_MEMORY_SPD_FAIL	0x51
PEI_MEMORY_INVALID_SIZE	0x52
PEI_MEMORY_MISMATCH	0x52
PEI_MEMORY_NOT_DETECTED	0x53
PEI_MEMORY_NONE_USEFUL	0x53
PEI_MEMORY_ERROR	0x54
PEI_MEMORY_NOT_INSTALLED	0x55
PEI_CPU_INVALID_TYPE	0x56
PEI_CPU_INVALID_SPEED	0x56
PEI_CPU_MISMATCH	0x57
PEI_CPU_SELF_TEST_FAILED	0x58
PEI_CPU_CACHE_ERROR	0x58
PEI_CPU_MICROCODE_UPDATE_FAILED	0x59
PEI_CPU_NO_MICROCODE	0x59
PEI_CPU_INTERNAL_ERROR	0x5A
PEI_CPU_ERROR	0x5A
PEI_RESET_NOT_AVAILABLE	x5B
//reserved for AMI use: 0x5C - 0x5F	
//Recovery	
PEI_RECOVERY_PPI_NOT_FOUND	0xF8
PEI_RECOVERY_NO_CAPSULE	0xF9
PEI_RECOVERY_INVALID_CAPSULE	0xFA
//reserved for AMI use: 0xFB - 0xFF	

//S3 Resume	
PEI_MEMORY_S3_RESUME_FAILED	0xE8
PEI_S3_RESUME_PPI_NOT_FOUND	0xE9
PEI_S3_BOOT_SCRIPT_ERROR	0xEA
PEI_S3_OS_WAKE_ERROR	0xEB
//reserved for AMI use: 0xEC - 0xEF	
// DXE_STATUS_CODE	
DXE_CPU_ERROR	0xD0
DXE_NB_ERROR	0xD1
DXE_SB_ERROR	0xD2
DXE_ARCH_PROTOCOL_NOT_AVAILABLE	0xD3
DXE_PCI_BUS_OUT_OF_RESOURCES	0xD4
DXE_LEGACY_OPROM_NO_SPACE	0xD5
DXE_NO_CON_OUT	0xD6
DXE_NO_CON_IN	0xD7
DXE_INVALID_PASSWORD	0xD8
DXE_BOOT_OPTION_LOAD_ERROR	0xD9
DXE_BOOT_OPTION_FAILED	0xDA
DXE_FLASH_UPDATE_FAILED	0xDB
DXE_RESET_NOT_AVAILABLE	0xDC
//reserved for AMI use: 0xDE - 0xDF	

2-9 BIOS POST Beep code

2-9-1 PEI Beep Codes

# of Beeps	Description
1	Memory not Installed.
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

2-9-2 DEX Beep Codes

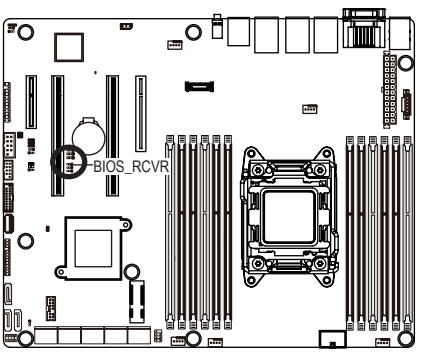
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available

2-10 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.