MD80-TM0

Dual LGA2011 sockets R3 motherboard for Intel® E5-2600 V3/V4 series processors

User's Manual

Rev. 1002

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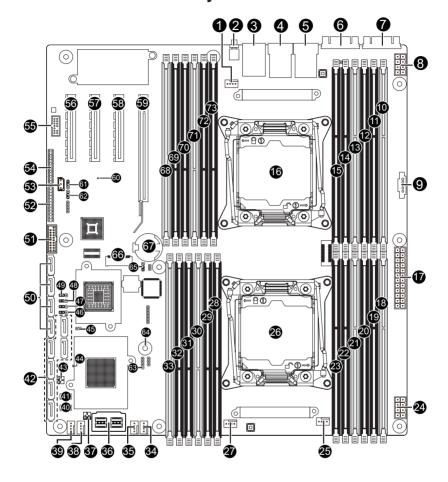
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- ✓ Driver CD
- ✓ User's Manual
- ☑ Two SATA cables
- √ I/O Shield

- 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.

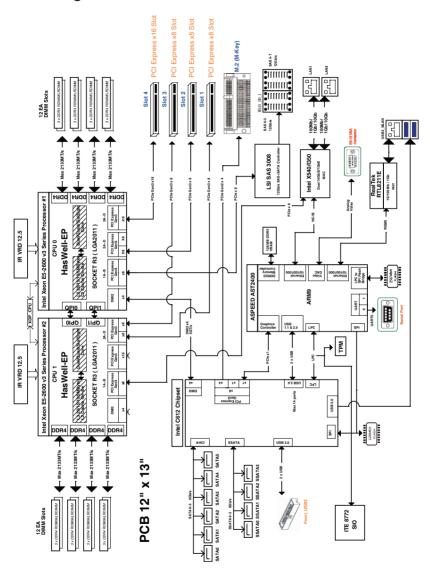
MD80-TM0 Motherboard Layout



Item	Code	Description
1	CPU1_FAN	CPU1 fan connector (for Secondary CPU)
2	SW_ID	ID switch button
3	USB3_MLAN	BMC Management LAN port (top) / USB 3.0 ports
4	LANIA	(bottom)
4 5	LAN1 LAN2	LAN port #2
6	VGA	LAN port #2
7	COM1	VGA port
8	P12V_AUX2	Serial port 8 pin power connector (for secondary CPU)
9	PMBUS	PMBus connector
10	DIMM_P1_G0	Channel 3 slot 0 (for secondary CPU)
11	DIMM_P1_G1	Channel 3 slot 1 (for secondary CPU)
12	DIMM P1 G2	Channel 3 slot 2 (for secondary CPU)
13	DIMM_P1_H0	Channel 4 slot 0 (for secondary CPU)
14	DIMM P1 H1	Channel 4 slot 1 (for secondary CPU)
15	DIMM_P1_H2	Channel 4 slot 2 (for secondary CPU)
16	CPU1	Intel LGA2011 Socket R (Secondary CPU)
17	ATX1	24 pin main power connector
18	DIMM_P0_A0	Channel 1 slot 0 (for primary CPU)
19	DIMM P0 A1	Channel 1 slot 1 (for primary CPU)
20	DIMM_P0_A2	Channel 1 slot 2 (for primary CPU)
21	DIMM P0 B0	Channel 2 slot 0 (for primary CPU)
22	DIMM_P0_B1	Channel 2 slot 1 (for primary CPU)
23	DIMM_P0_B2	Channel 2 slot 2 (for primary CPU)
24	P12V_AUX1	8 pin power connector (for primary CPU)
25	SYS_FAN5	System fan connector#5
26	CPU0	Intel LGA2011 Socket R (Primary CPU)
27	CPU0_FAN	CPU0 fan connector (for Primary CPU)
28	DIMM_P0_D2	Channel 4 slot 2 (for primary CPU)
29	DIMM_P0_D1	Channel 4 slot 1 (for primary CPU)
30	DIMM_P0_D0	Channel 4 slot 0 (for primary CPU)
31	DIMM_P0_C2	Channel 3 slot 2 (for primary CPU)
32	DIMM_P0_C1	Channel 3 slot 1 (for primary CPU)
33	DIMM_P0_C0	Channel 3 slot 0 (for primary CPU)
34	SYS_FAN4	System fan connector#4
35	SYS_FAN3	System fan connector#3
36	MSAS_HD_1	Mini-SAS HD connector
37	IMR_KEY	LSI RAID key header
38	SYS_FAN2	System fan connector#2
39	SYS_FAN1	System fan connector#1
40	SSATA_SGP	sSATA SGPIO header
41	SATA_SGP	SATA SGPIO header
42	SATA0/1/2/3/4/5	SATA 3 6Gb/s connectors
43	SW_RAID	Intel Software RAID Key jumper

44	LED5	LSI firmware readiness LED
45	CASE_OPEN	Case open intrusion alert header
46	ME_UPDATE	ME update jumper
47	ME_RCVR	ME recovry jumper
48	BIOS_PWD	Clearing Supervisor Password jumper
49	BIOS_RCVR	BIOS recovery jumper
50	SSATA0/1/2/3	SATA 3 6Gb/s connectors
51	F_USB3	USB 3.0 header
52	FP_1	Front panel header
53	IPMB	IPMB connector
54	BP_1	HDD back plane board header
55	TPM	TPM module connector
56	PCIE_1	PCI Express x8 slot
57	PCIE_2	PCI Express x8 slot
58	PCIE_3	PCI Express x8 slot
59	PCIE_4	PCI Express x16 slot
60	LED_BMC	BMC firmware readiness LED
61	BMC_FRB	Force to Stop FRB Timer jumper
62	S3_MASK	S3 Power On Select jumper
63	LSI_UART1	LSI UART header
64	BUZZER1	Buzzer
65	CLR_CMOS	Clear CMOS jumper
66	M2_SK	M.2 slot
67	BAT	Battery socket
68	DIMM_P1_E0	Channel 4 slot 0 (for secondary CPU)
69	DIMM_P1_E1	Channel 4 slot 1 (for secondary CPU)
70	DIMM_P1_E2	Channel 4 slot 2 (for secondary CPU)
71	DIMM_P1_F0	Channel 3 slot 0 (for secondary CPU)
72	DIMM_P1_F1	Channel 3 slot 1 (for secondary CPU)
73	DIMM_P1_F2	Channel 3 slot 2 (for secondary CPU)

Block Diagram



Chapter 1 Hardware Installation

1-1 Installation Precautions

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

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

1-2 Product Specifications

CPU	Support for Intel® Xeon® E5-2600 V3/V4 series processors in the LGA2011 package L3 cache varies with CPU Supports Dual QuickPath Interconnect up to 9.6GT/s Enhanced Intel SpeedStep Technology (EIST) Support Intel Virtualization Technology (VT)
Chipset	◆ Intel® C612 Express (Wellsburg) Chipset
Memory PLAN LAN	24 x DIMM slots DDR4 memory supported only Quad channel memory architecture ECC RDIMM / LRDIMM modules supported Single and dual rank RDIMM modules up to 32GB supported 3DS LRDIMM modules up to 128GB supported 1.2V modules: 1600/1866/2133/2400 MHz Intel® X540 supports supports dual 10GbE LAN port
Expansion Slots	 1 x PCI Express x16 slot, running at x16 (Gen3/PCIE_4) 3 x PCI Express x8 slots 1 x M.2 slot (PCI Express Interface): * Socket 3 * M key
Onboard Graphics	ASPEED® AST2400 supports 128MB DDR3 VRAM
Storage Interface	 Intel® C612 Express controller 10 x SATA3 6Gb/s connectors 2 x Mini-SAS HD connectors Support for Intel RSTe 4.0 with RAID 0,1,10, 5 LSI® 3008 controller supports LSI RAID 0, 1, 1E, 10
USB	Up to 4 USB 3.0 ports (2 on the back panel, 2 additional ports via the USB brackets connected to the internal USB headers)

Internal	1 x 24-pin ATX main power connector
Connectors	2 x 8-pin ATX 12V power connector
	2 x Mini-SAS HD connectors
	10 x SATA3 6Gb/s connectors
	◆ 1 x PMBus header
	2 x CPU fan headers
	• 5 x System fan headers
	1 x Front panel header
	1 x HDD Back plane borad header
	• 1 x USB 3.0 header
	1 x TPM module connector
	1 x SATA SPGIO header
	1 x sSATA SPGIO header
	1 x IPMB connector
	1 x Software RAID key connector
	1 x LSI RAID key connector
Rear Panel I/O	◆ 2 x USB 3.0 ports
	 3 x RJ-45 ports (1 x 10/100/1000 dedicated management LAN port)
	◆ 1 x COM port
	◆ 1 x VGA port
	↑ 1 x ID Button/LED
I/O Controller	ASPEED® AST2400 BMC chip
Hardware	System voltage detection
Monitor	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
A DIOC	the CPU/system cooler you install.
BIOS	• 1 x 128 Mbit flash
	AMI BIOS FATY F F 1 40: 1 40: 1
Form Factor	EATX Form Factor; 13 inch x 12 inch

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

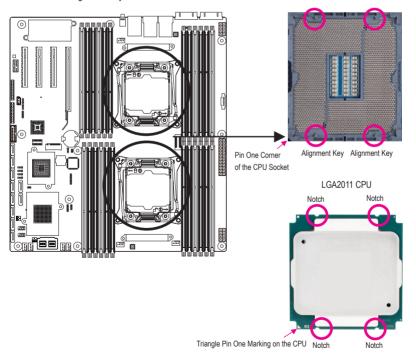
1-3 Installing the CPU and CPU Cooler

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

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

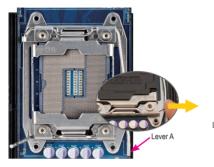
A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



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:

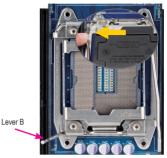
Push the lever closest to the "unlock" marking "

(below referred as lever A) down and away from the socket to release it.



Step 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 2:

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



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:

load plate. Then secure lever B under its retention tab. complete the installation of the CPU. 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:

Once the CPU is properly inserted, carefully replace the Finally, secure lever A under its retention tab to

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 twenty-four 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 (For pimary CPU)/

 ${\sf DIMM_P1_E0/DIMM_P1_E1/DIMM_P1_E2} \ (For secondary \ {\sf CPU})$

Channel 2: DIMM_P0_B0/DIMM_P0_B1/DIMM_P0_B2 (For pimary CPU)
DIMM_P1_F0/DIMM_P1_F1//DIMM_P1_F2 (For secondary CPU)

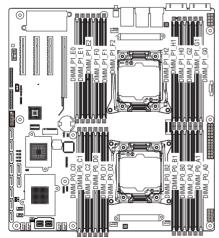
Channel 3: DIMM_P0_C0/DIMM_P0_C1/DIMM_P0_C2 (For pimary CPU)
DIMM_P1_G0/DIMM_P1_G1//DIMM_P1_G2 (For secondary CPU)

Channel 4: DIMM_P0_D0/DIMM_P0_D1/IDIMM_P0_D2 (For pimary CPU)

DIMM_P1_H0/DIMM_P1_H1//DIMM_P1_H2 (For secondary CPU)



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.
- 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.

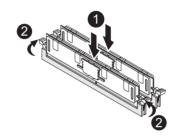
Installation Step:

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

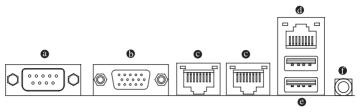
Two Slots Channel RDIMM Population Configuration Within a Channel

Type DIM!	Ranks Per DIMM and Data Width	Speed (MT/s); Slot Per Channel (SPC) and DIMM Per Channel (DPC)			
		1 Slot Per Channel	2 Slot Per Channel		
		1DPC	1DPC	2DPC	
RDIMM	SRx4	2133	2133	1866	
RDIMM	SRx8	2133	2133	1866	
RDIMM	DRx8	2133	2133	1866	
RDIMM	DRx4	2133	2133	1866	
LRDIMM	QRx4	2133	2133	2133	
LRDIMM 3DS	8Rx4	2400	2400	2400	



DDR4 2400MHz is only available on Intel Xeon® E5-2600 V4 processor.

1-5 Back Panel Connectors



Serial Port

Connects to serial-based mouse or data processing devices.

O Video Port

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

RJ-45 LAN Ports (10 Gigabit Ethernet LAN Ports)

The Gigabit Ethernet LAN port provides Internet connection at up to 10 Gbps data rate. The following describes the states of the LAN port LEDs.

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.

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.

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

ink/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
	On Blinking



Speed LED:

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

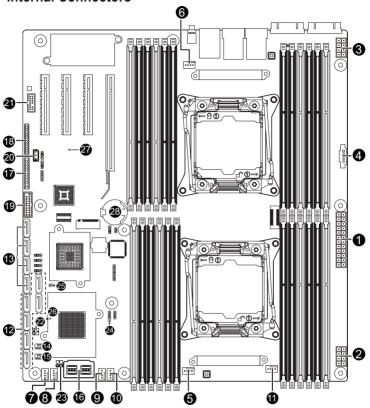
Link/Activity LED:

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	15)	SSATA_SGP
2)	P12V_AUX1	16)	MSAS_HD_1
3)	P12V_AUX2	17)	FP_1
4)	PMBUS	18)	BP_1
5)	CPU0_FAN (for primary CPU)	19)	F_USB3
6)	CPU1_FAN (for seconary CPU)	20)	IPMB
7)	SYS_FAN1 (System Fan)	21)	TPM
8)	SYS_FAN2 (System Fan)	22)	SW_RAID
9)	SYS_FAN3 (System Fan)	23)	IMR_KEY
10)	SYS_FAN4 (System Fan)	24)	LSI_UART1
11)	SYS_FAN5 (System Fan)	25)	CASE_OPEN
12)	SATA0/1/2/3/4/5	26)	LED5
13)	SSATA0/1/2/3	27)	LED_BMC
14)	SATA_SGP	28)	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.

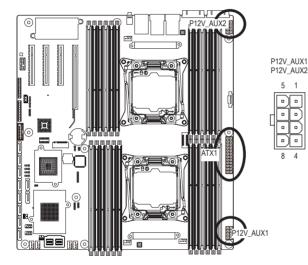
1/2/3) ATX1/P12V AUX1/P12V AUX2

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

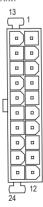
With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design.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



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



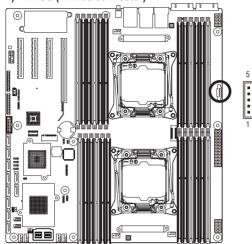
Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V



۸٦	ΓV	1

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	NC
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	NC
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

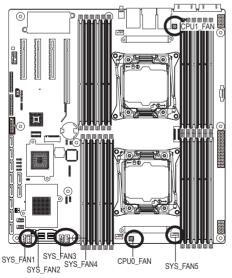
4) PMBUS (PMBus connector)

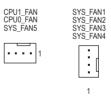


Pin No.	Definition
1	PMBus CLK
2	PMBus DATA
3	PMBus Alert
4	GND
5	3.3V Sense

5/6/7/8/9/10/11) CPU_FAN0/CPU_FAN1/SYS_FAN1/SYS_FAN2/SYS_FAN3/SYS_FAN4/ SYS_FAN5 (CPU Fan/System Fan Headers)

The motherboard has two 4-pin CPU fan headers, and five 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.





Definition
GND
+12V
Sense
Speed Control

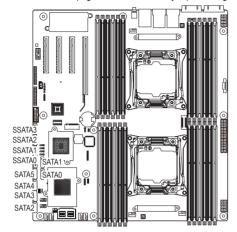


- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

12/13) SATA0/SATA1 (SATA 6Gb/s Connectors/SATA4/5 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 35 for SATA DOM jumper setting.





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

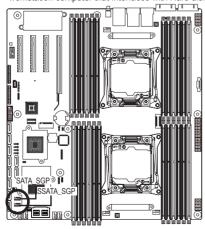


- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are configured, the total number of hard drives must be an even number.
- A RAID 10 configuration requires four hard drives.

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

14/15) SATA SGP/SSATA SGP (SAS 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.

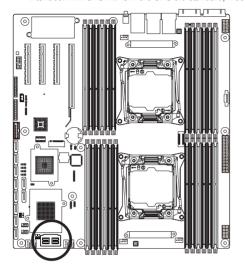


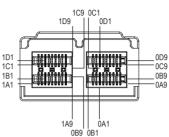


Pin No.	Definition
1	DATAIN
2	No Pin
3	DATAOUT
4	GND
5	GND
6	LOAD
7	NC
8	CLOCK

16) MSAS_HD_1 (Mini-SAS HD connectors)

Mini-SAS HD (High Density SFF-8644) is the next-generation SAS high-density and high-speed IO interface. Mini-SAS HD is in the SAS 3.0 standard, meets the 12Gb/s SAS specification.

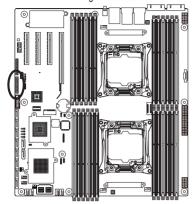




Pin No.	Definition	Pin No.	Definition	Pin No.	Definition	Pin No.	Definition
0A1	NC	0C1	GND	1A1	GND	1C1	GND
0A2	SGPIO_CLOCK0	0C2	GND	1A2	SGPIO_CLOCK1	1C2	GND
0A3	GND	0C3	GND	1A3	GND	1C3	GND
0A4	RXP1	0C4	TXP1	1A4	RXP5	1C4	TXP5
0A5	RXN1	0C5	TXN1	1A5	RXN5	1C5	TXN5
0A6	GND	0C6	GND	1A6	GND	1C6	GND
0A7	RXP3	0C7	TXP3	1A7	RXP7	1C7	TXP7
0A8	RXN3	0C8	TXN3	1A8	RXN7	1C8	TXN7
0A9	GND	0C9	GND	1A9	GND	1C9	GND
0B1	GND	0D1	SGPIO_DATAIN0	1B1	GND	1D1	SGPIO_DATAIN1
0B2	SGPIO_LOAD0	0D2	NC	1B2	SGPIO_LOAD1	1D2	GND
0B3	GND	0D3	GND	1B3	GND	1D3	GND
0B4	RXP0	0D4	TXP0	1B4	RXP4	1D4	TXP4
0B5	RXN0	0D5	TXN0	1B5	RXN4	1D5	TXN4
0B6	GND	0D6	GND	1B6	GND	1D6	GND
0B7	RXP2	0D7	TXP2	1B7	RXP6	1D7	TXP6
0B8	RXN2	0D8	TXN2	1B8	RXN6	1D8	TXN6
0B9	GND	0D9	GND	1B9	GND	1D9	GND

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.

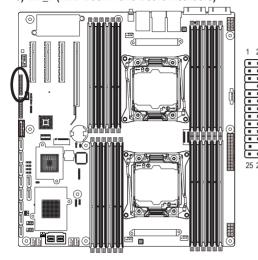




Pin No.	Signal Name	Definition
1	PWLED+	Power LED Signal anode (+)
2	5VSB	5V Stanndby Power
3	NC	No Pin
4	ID_LED+	ID LED Signal anode (+)
5	PWLED-	Power LED Signal cathode(-)
6	ID_LED-	ID LED Signal cathode(-)
7	HD+	Hard Disk LED Signal anode (+)
8	SYS_LED+	System Front board LED Signal anode (+)
9	HD-	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.

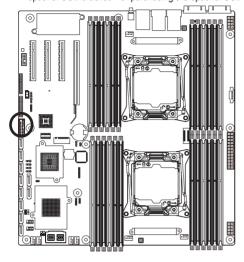
18) BP_1 (HDD Back Plane Board Hearders)

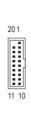


Pin No.	Definition
1	BP_SGP_CLK
2	NC
3	BP_SGP_GLD
4	FAN_GATE_N
5	BP_SGP_DOUT
6	GND
7	KEY
8	RESET
9	GND
10	BP_LED_A_N
11	BP_LED_G_N
12	GND
13	BP_SGP_DIN
14	NC
15	GND
16	SMB_BP_DATA
17	GND
18	SMB_BP_CLK
19	P_3V3_AUX
20	BMC_ACK
21	P_3V3_AUX
22	BMC_REQ
23	GND
24	KEY
25	BP_PRESENSE
26	GND

19) F_USB3 (USB 3.0 Header)

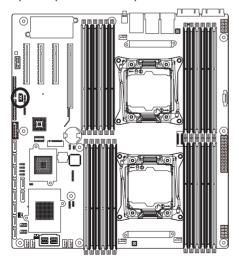
The headers conform to USB 3.0 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.





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	

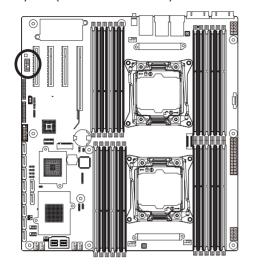
20) IPMB (IPMB Connector)





Pin No.	Definition
1	Clock
2	GND
3	Data

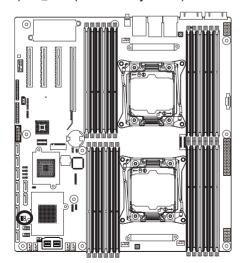
21) TPM (TPM Module Connector)





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 TPM_DET_N LPC_LAD2	
8		
9		
10	NC	
11	LPC_LAD3	
12	GND	
13	LPC_FRAME_N	
14	GND	

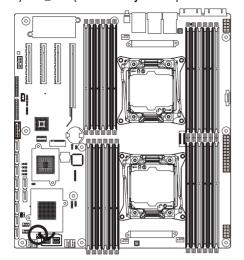
22) SW_RAID (Intel RAID Key Header)





Pin No.	Definition	
1	KEY	
2	GND	

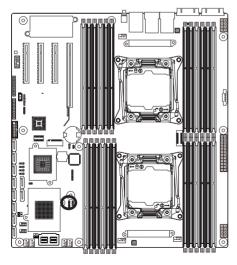
23) IMR_KEY (LSI RAID Key Header)





Pin No.	Definition	
1	KEY	
2	GND	

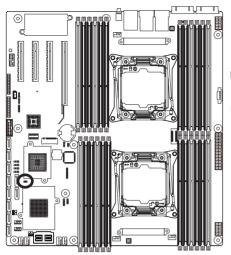
24) LSI_UART1 (LSI UART Header)





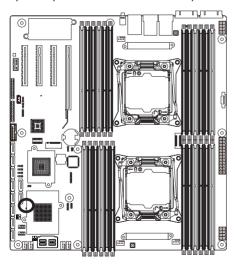
Pin No.	Definition	
1	UART0_TX	
2	GND	
3	UART0_RX	
4	P1V8	

25) CASE_OPEN (Case open intrusion alert header)



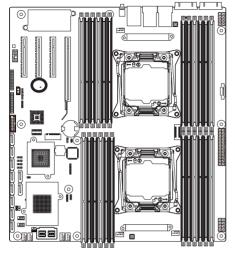
- •• Open: Normal operation.
- Closed: Active chassis intrustion alert.

26) LED5 (LSI Firmware Readiness LED)



	State	Description
	On	LSI firmware is initial
Blinking LSI firmware is rea		LSI firmware is ready
	Off	AC loss

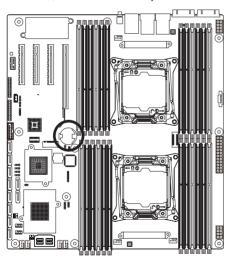
27) LED BMC (BMC Firmware Readiness LED)



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

28) 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.

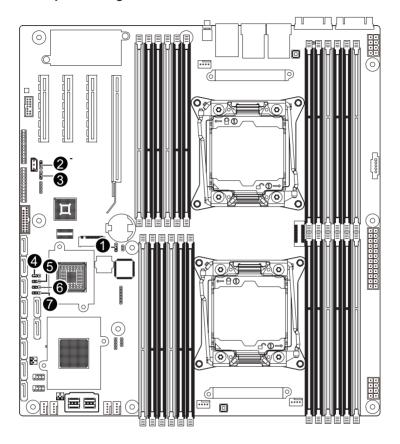






- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself 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 un)
- · Used batteries must be handled in accordance with local environmental regulations.

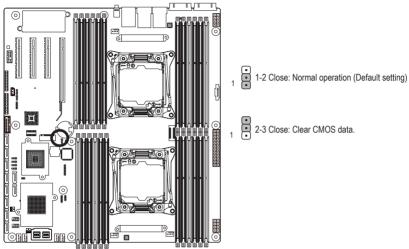
1-7 Jumper Settings



1)	CLR_CMOS	5)	BIOS_PWD
2)	BMC_FRB	6)	ME_RCVR
3)	S3_MASK	7)	ME_UPDATE
4)	BIOS_RCVR		

1) CLR CMOS (Clearing CMOS Jumper)

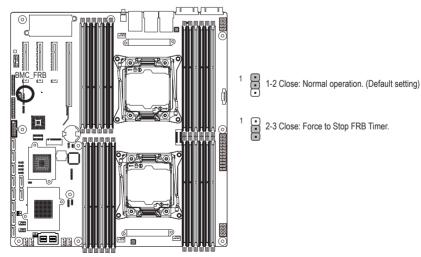
Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, place a jumper cap on the two pins to temporarily short the two pins or use a metal object like a screwdriver to touch the two pins for a few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



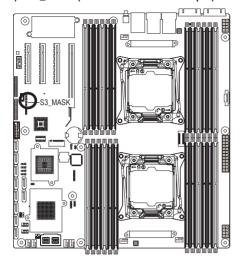


- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS
 values.
- After clearing the CMOS values and before turning on your computer, be sure to remove the jumper cap from the jumper. Failure to do so may cause damage to the motherboard.

2) BMC_FRB (Force to Stop FRB Timer Jumper)

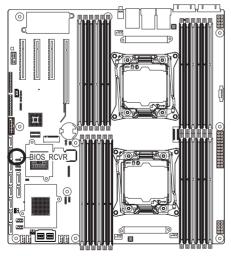


3) S3 MASK (S3 Power On Select Jumper)



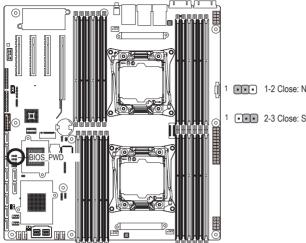
- 1-2 Close: Stop an initial power on when BMC is not ready.
- 2-3 Close: Keep initial power on. (Default setting)

4) BIOS_RVCR (BIOS Recovery Jumper)



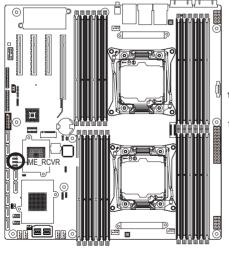
- 1 1-2 Close: Normal operation. (Default setting)
- 1 2-3 Close: BIOS recovery mode.

5) BIOS_PWD (Clearing Supervisor Password Jumper)



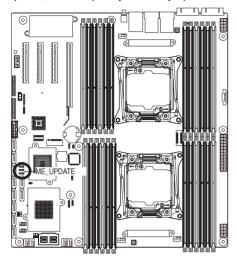
- 1 1-2 Close: Normal operation. (Default setting)
- 1 2-3 Close: Skip supervisor password.

6) ME_RCVR (ME Recovery Jumper)



- 1 1-2 Close: Normal operation. (Default setting)
- 1 2-3 Close: ME recovery mode.

7) ME_UPDATE (ME Update Jumper)



- 1 1-2 Close: Normal operation (Default setting)
- 1 2-3 Close: ME updated.

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></enter>	Execute command or enter the submenu
<esc></esc>	Main Menu: Exit the BIOS Setup program
	Submenus: Exit current submenu
<f1></f1>	Show descriptions of general help
<f3></f3>	Restore the previous BIOS settings for the current submenus
<f9></f9>	Load the Optimized BIOS default settings for the current submenus
<f10></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.

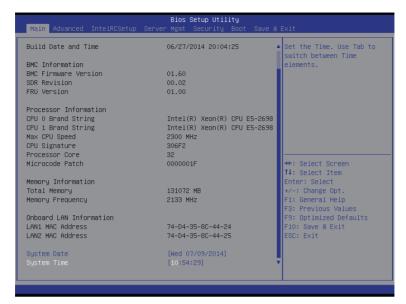
Submenu Help

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 version number of the Firmware setup utility.

→ SDR Version

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 MAC Address

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

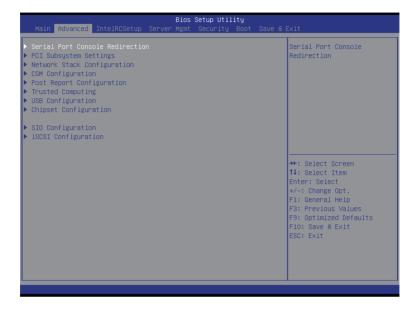
Set the date following the weekday-month-day- year format.

→ System Time

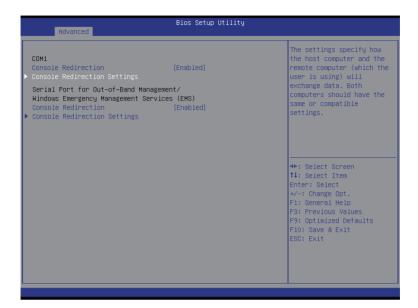
Set the system time following the hour-minute- second format.

2-2 Advanced Menu

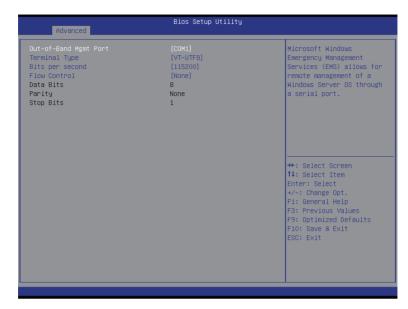
The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press Enter to access the related submenu screen.



2-2-1 Serial Port Console Redirection







COM1/COM2/Serial Over AN Console Redirection Settings

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.

(Note) Advanced items prompt when this item is defined

→ 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.

□ 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.

2-2-2 PCI Subsystem Settings



PCI Express Slot #1/#2/#3/#4 I/O ROM

When enabled, This setting will initialize the device expansion ROM for the related PCI-E slot. Options available: Enabled/Disabled. Default setting is **Enabled**.

→ Onboard LAN#1/#2 Controller

Enable/Disable onboard LAN devices.

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

○ Onboard LAN #1/#2 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

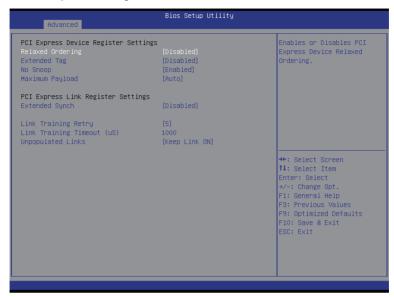
If system has SR-IOV capable PCIe Devices, this option enables or disables Single Root IO Virtualization Support.

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

When 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

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

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)

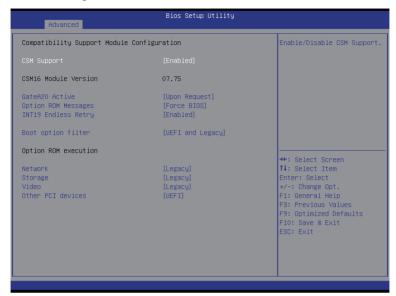
Press <+> / <-> keys to increase or decrease the desired values.

→ Media detect time^(Note)

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

BIOS Setup

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 Reguest: 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 only/Legacy. Default setting is Legacy.

→ Storage

Controls the execution UEFI and Legacy Storage OpROM.

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

→ Video

Controls the execution UEFI and Legacy Video OpROM.

Options available: Do not launch/UEFI only/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
- → Post Error Message

Enable/Disable Info Error Message support.

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

2-2-6 Trusted Computing



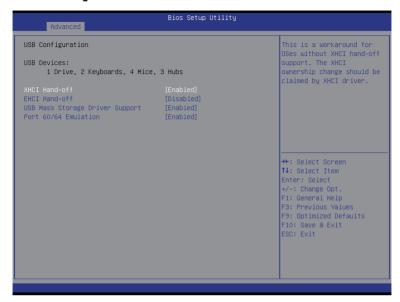
Select Enabled to activate TPM support feature.

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.

Legacy USB Support

Enables or disables support for legacy USB devices.

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

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.

Chassis Opened Warning

Enable/Disable Chassis intrusion alter funtion

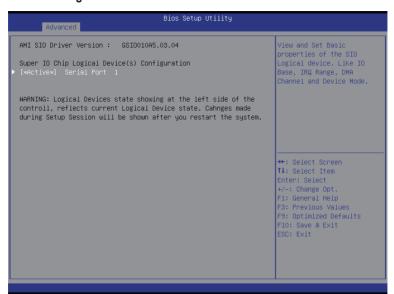
Options available: Enabled/Disabled. Default setting is Enabled.

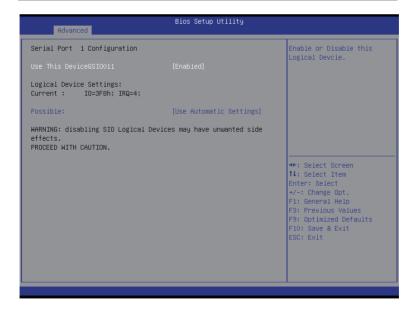
Chassis Opened Status

Display the chassis opened status.

(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





→ 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.

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=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**.

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:

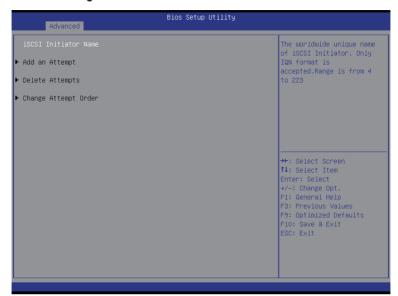
Display the Serial Port 2 base I/O addressand IRQ.

→ Possible:

Configure Serial Port 2 base I/O addressand IRQ.

Option available: Use Automatic Settings. Default setting is Use Automatic Settings.

2-2-10 iSCSI Configuration



- Add an Attempts

Press [Enter] for configuration of advanced items.

Delete Attempts

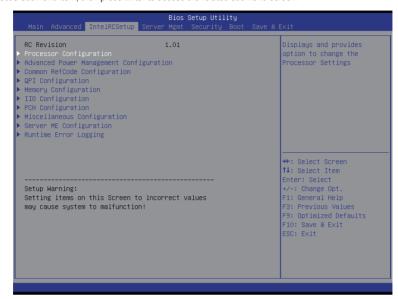
Press [Enter] for configuration of advanced items.

Change Attempt Order

Press [Enter] for configuration of advanced items.

2-3 Intel RC Setup Menu

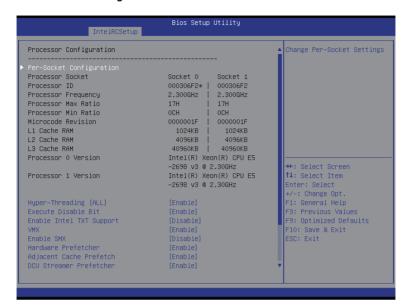
Intel RC Setup menu displays submenu options for configuring the function of North Bridge and South Bridge. Select a submenu item, then press Enter to access the related submenu screen.

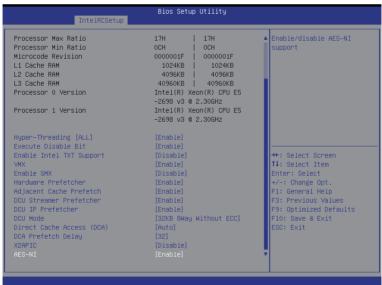


→ RC Revision

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.

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/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 ECC.

☐ 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.

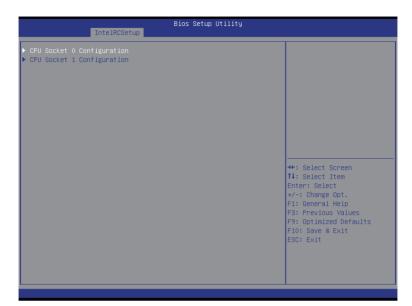
→ X2APIC

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

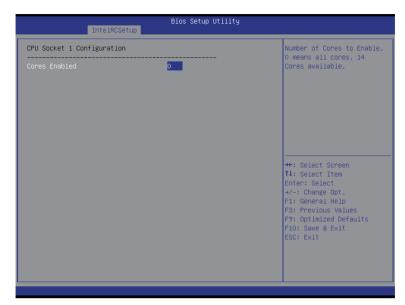
→ AES-NI

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





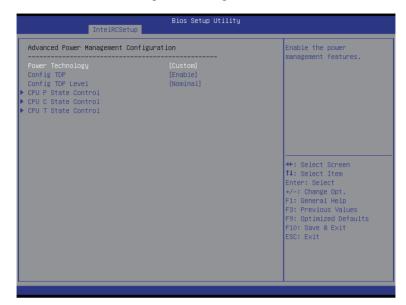


□ CPU Socket 0/1 Configuration

Press [Enter] for configuration of advanced items.

Number of Cores to enable. 0 means all cores. 14 Cores is available. Press <+> and <-> 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 **Enabled**.

Config TDP Level

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

 ☐ CPU P State Control

Press [Enter] for configuration of advanced items.

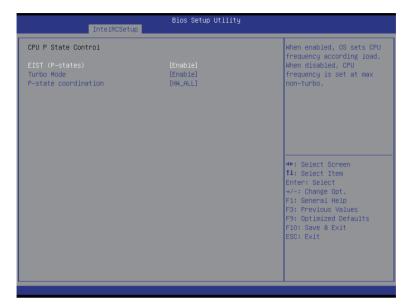
□ CPU C State Control

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.

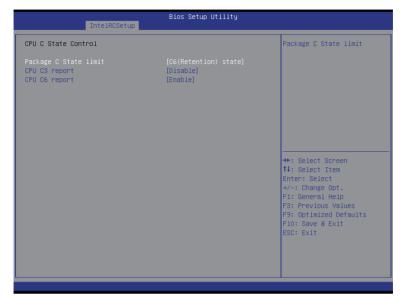
Options available: Enabled/Disabled. Default setting is Enabled.

→ 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.

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

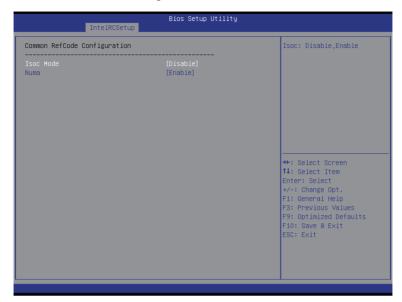
2-3-2-3 CPU T State Control



→ 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

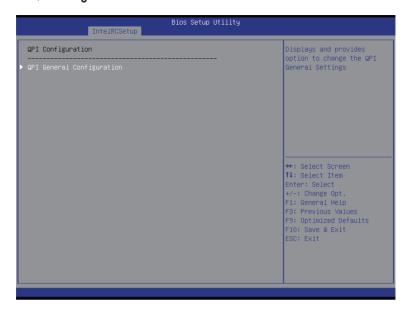


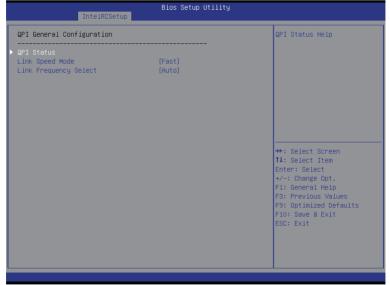
- → Isoc Mode

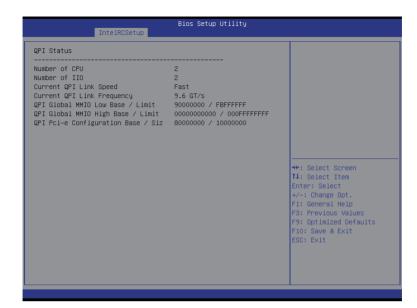
Options available: Auto/Enabled/Disabled. Default setting is Auto.

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.

Press [Enter] for configuration of advanced items.

2-3-5-1 Memory Topology



2-3-5-2 Memory Thermal



○ Set Throttling

Configure Thermal Throttling Mode. Select OLTT or CLTT mode.
Options available: Disabled/CLTT Mode. Default setting is **CLTT Mode**.

→ DIMM Temp Stat

Display DIMM Temp Stat.

☞ 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.

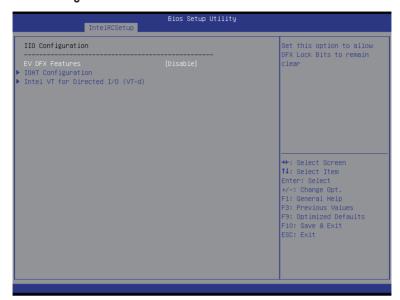
Memory Rank Sparing

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

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

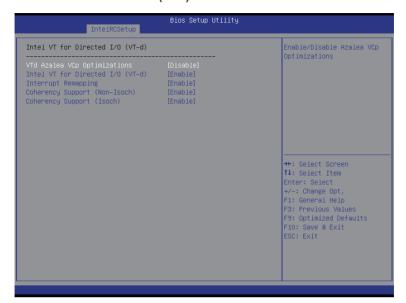
Control to enable/disable IOAT (Intel I/O Acceleration Technology) device. Options available: Enabled/Disabled. Default setting is **Disabled**.

→ 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.

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.

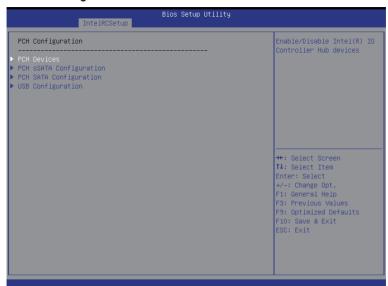
Options available: Enabled/Disabled. Default setting is Enabled.

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

Coherency Support (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

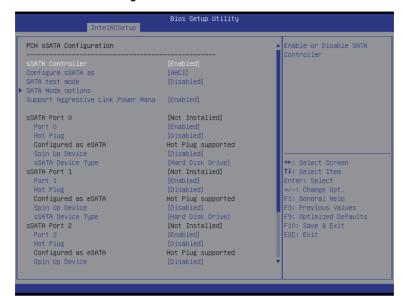


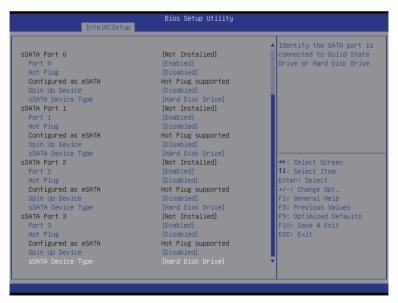
→ PCH CRID

Enable/Disable Intel Compatible Revision ID.

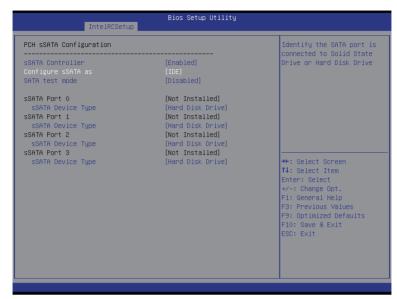
Options available: Enabled/Disabled. Default setting is Disabled.

2-3-7-2 PCH sSATA Configuration





When SATA Type is set to IDE



→ PCH sSATA Configuration

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 Mode options^(Note)

Press [Enter] for configuration of advanced items.

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.

- 87 -

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

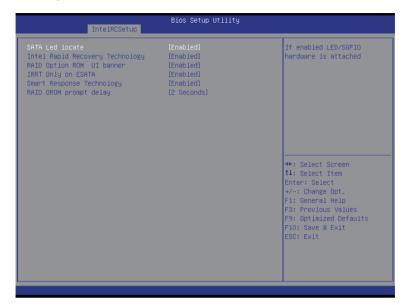
When SATA Type is set to IDE/AHCI Mode



□ 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

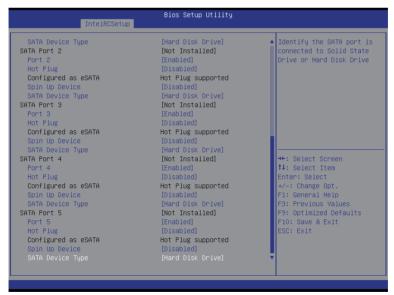
Enable/Disable Intel Smart Response Technology support function. Options available: Enabled/Disabled. Default setting is **Enabled**.

□ 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.

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.

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.

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.

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.

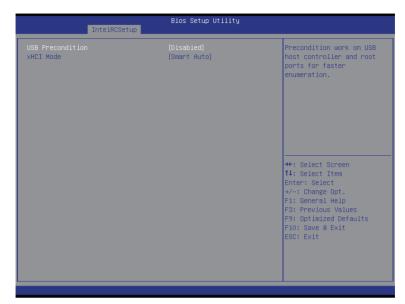
Smart Response Technology

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

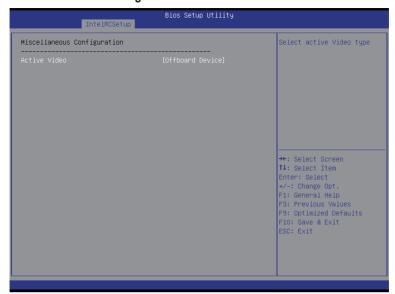
 $\label{precondition} \mbox{Precondition work on USB host conteoller and root ports for faster enumeration.}$

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

Enable/Disable xHCI (USB 3.0) support function.

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

2-3-8 Miscellaneous Configuration

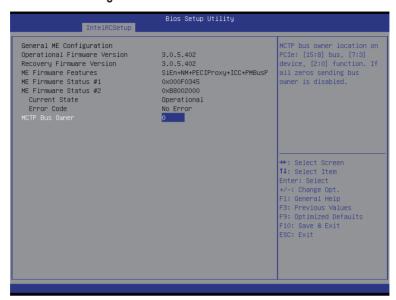


Active Video

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.

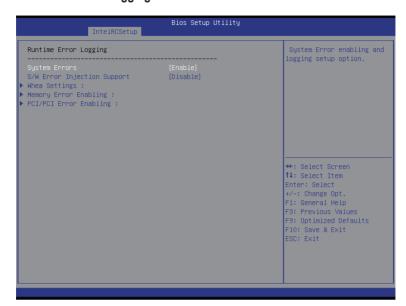
☞ Error Code (for ME Firmware)

Display ME Firmware status error code.

→ MCTP Bus Owner

Configure MCTP Bus Owner.

2-3-10 Runtime Error Logging



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 Error Enabling

Press [Enter] for configuration of advanced items.

2-3-10-1 Whea Setting

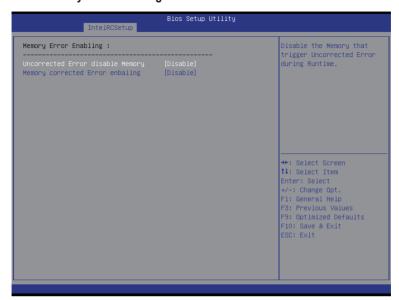


☞ WHEA Support (Windows Hardware Error Architecture)

Enable/Disable WHEA Support.

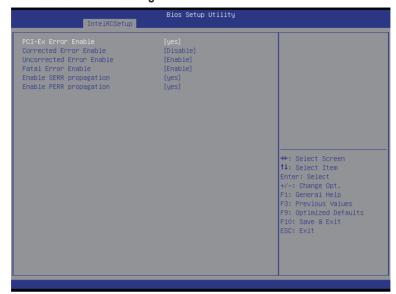
Options available: Enabled/Disabled. Default setting is Enabled.

2-3-10-2 Memory Error Enabling



- 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 Error Enabling



→ PCI-Ex Error Enable

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.

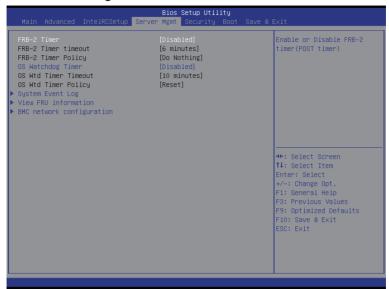
Options available: Enabled/Disabled. Default setting is **Enabled**.

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**.

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.

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.

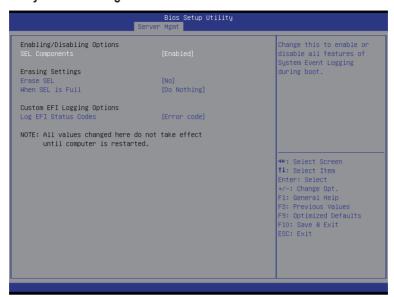
▽ View FRU Information

Press [Enter] to view the advanced items.

→ BMC network configuration

Press [Enter] for configuration of advanced items.

2-4-1 System Event Log



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

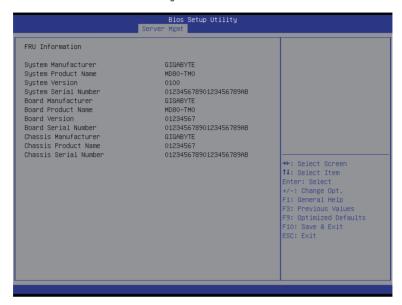
Log EFI Status Codes

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

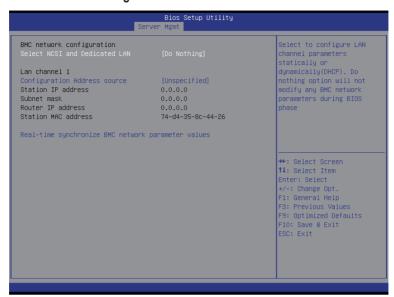
Options available: Disabled/Both/Error code/Progress code. Default setting is **Error code**.

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). Default setting is Mode1 (Dedicated).

□ 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 **DynamicBmcDhcp**.

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.

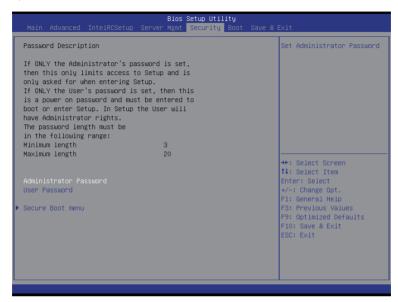
Display the MAC Address information.

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.



Press Enter to configure the Administrator password.

User Password

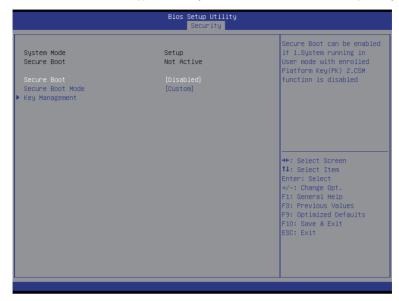
Press Enter to configure the user password.

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.



Display the System secure mode state.

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.

Press [Enter] for configuration of advanced items.

2-5-1-1 Key Management

Default Key Provision Enroll All Factory Default Keys Save All Secure Boot Variables		Install Factory default Secure Boot Keys when System is in Setup Mode.
Platform Key ►Delete PK ►Set new PK	NOT INSTALLED	
Key Exchange Key ▶ Delete KEK ▶ Set new KEK ▶ Aopend KEK	NOT INSTALLED	
	NOT INSTALLED	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt.
Authorized TimeStamps Delete DBT Set new DBT Adopend DBT	NOT INSTALLED	F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit
Forbidden Signatures Delete DBX Set new DBX Append DBX	NOT INSTALLED	ESC: Exit

□ 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 Signatures Database (dbx). Options available: Enabled/Disabled. Default setting is **Disabled**.

□ Enroll All Factory Default Keys

Press [Enter] to install all factory default keys.

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.

Press [Enter] to configure a new PK.

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

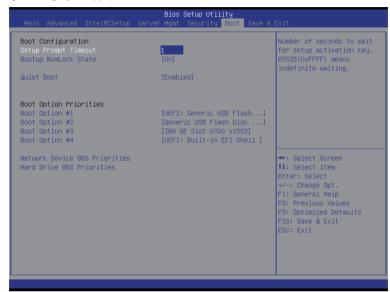
Press [Enter] to configure a new dbx.

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

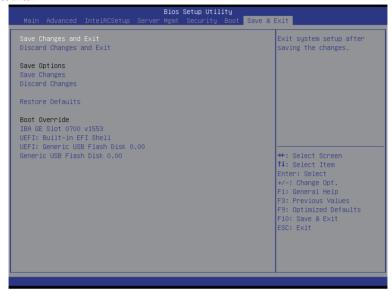
Network Device BBS Priorities
 Press Enter to configure the boot priority.

→ 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

2.001.001.0000	
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

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DXE CPU INIT	0x63
//reserved for CPU 0x64 - 0x67	UNUS .
DXE NB HB INIT	0x68
DXE_NB_INIT	0x69
DXE NB SMM INIT	0x6A
//reserved for NB 0x6B - 0x6F	OXO/ (
DXE SB INIT	0x70
DXE SB SMM INIT	0x71
DXE SB DEVICES INIT	0x72
//reserved for SB 0x73 - 0x77	UNIZ
DXE ACPLINIT	0x78
DXE CSM INIT	0x79
//reserved for AMI use: 0x7A - 0x7F	0.779
//reserved for OEM use: 0x80 - 0x8F	
DXE BDS STARTED	0x90
DXE BDS CONNECT DRIVERS	0x90 0x91
DXE PCI BUS BEGIN	0x92
DXE_PCI_BUS_BEGIN DXE_PCI_BUS_HPC_INIT	0x92 0x93
DXE_PCI_BUS_FIPC_INIT	0x94
DXE PCI_BUS_ENUM DXE PCI_BUS_REQUEST_RESOURCES	0x95
DXE PCI BUS ASSIGN RESOURCES	0x96
DXE_CON_OUT_CONNECT	0x96 0x97
	0x98
DXE_CON_IN_CONNECT DXE_SIO_INIT	1 11
	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	044
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	2.12
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

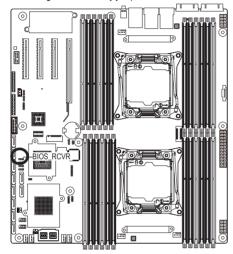
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available

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:

- Change xxx.ROM to amiboot.rom.
- 2. Copy amiboot.rom and AFUDOS.exe to USB diskette.
- 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.

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